



**CAMBRIDGESHIRE
& PETERBOROUGH**
COMBINED AUTHORITY

TRANSPORT & INFRASTRUCTURE COMMITTEE

Date: Wednesday, 18 January 2023

Democratic Services

Edwina Adefehinti
Interim Chief Officer Legal and Governance
Monitoring Officer

10:00 AM

72 Market Street
Ely
Cambridgeshire
CB7 4LS

**Huntingdonshire District Council
Civic Suite Room A, Pathfinder House, St Mary's Street,
Huntingdon, PE29 3TN**

AGENDA

Open to Public and Press

Part 1: Governance Items

1.1 Apologies for Absence

1.2 Declarations of Interest

1.3 Minutes - 16th November 2022

5 - 16

1.4 Combined Authority Forward Plan

[Forward Plan](#)

1.5 Public Questions

Arrangements for asking a public question can be viewed here

- [Public Questions - Cambridgeshire & Peterborough Combined Authority \(cambridgeshirepeterborough-ca.gov.uk\)](#)

Part 2: Delivery

2.1	A1260 Junction 32-3 Full Business Case	17 - 352
2.2	Fengate Access Study - Eastern Industries Access - Phase 1	353 - 640
2.3	Local Transport & Connectivity Plan	641 - 760
2.4	Transport Modelling for Cambridgeshire and Peterborough	761 - 844
2.5	March Area Transport Study (MATS)	845 - 1296
2.6	Authorisation of Expenditure on ZEBRA zero emissions buses project	1297 - 1300
2.7	Bus Update, including Framework	1301 - 1324

Date of next meeting:

10am, Wednesday, 15th March 2023

COVID-19

The legal provision for virtual meetings no longer exists and meetings of the Combined Authority therefore take place physically and are open to the public. Public access to meetings is managed in accordance with current COVID-19 regulations and therefore if you wish to attend a meeting of the Combined Authority, please contact the Committee Clerk who will be able to advise you further.

The Transport & Infrastructure Committee comprises the following members:

For more information about this meeting, including access arrangements and facilities for people with disabilities, please contact

Mayor Dr Nik Johnson

Councillor Ian Bovingdon

Councillor Marco Cereste

Councillor Peter McDonald

Councillor Chris Seaton

Councillor Neil Shailer

Councillor Katie Thornburrow

Councillor Sam Wakeford

Clerk Name:	Daniel Snowdon
Clerk Telephone:	01223 699177
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Cambridgeshire and Peterborough Combined Authority
Transport and Infrastructure Committee: Minutes

Date: 16 November 2022

Time: 10.00a.m. – 11.55p.m.

Present: Councillor L Herbert (Deputy Mayor and Chair), Councillors Bovingdon, Cereste, McDonald, Seaton, Shailer, Smart and Wakeford

47. Apologies for Absence

Apologies were received from Mayor Dr N Johnson, substituted by Councillor L Herbert, and Councillor K Thornburrow, substituted by Councillor M Smart.

48. Declarations of interest

There were no declarations of interest.

49. Minutes – 13 July 2022

The minutes of the meeting on 13 July 2022 were approved as an accurate record and signed by the Deputy Mayor.

50. Combined Authority Forward Plan

The Combined Authority Forward Plan was noted.

51. Public Questions

Three questions had been received from members of the public, as set out in Appendix A, together with responses from the Chair.

52. A16 Norwood Dualling

The Committee received a report detailing an overview of the Outline Business Case for the A16 Norwood Improvement Project. The scheme continued to demonstrate high value for money, with a Benefit Cost Ratio of 2.9. It also had strategic value by supporting local growth, critically, the construction of at least 2,000 homes on the Norwood growth side. Attention was drawn to the following two options for consideration, which were to defer approval or to draw down £1.2m from the Medium-Term Financial Plan for the development of the full business case subject to a

Transforming Cities Funding (TCF) allocation. It was noted that there were ongoing discussions taking place with the Department for Transport (DoT) around the management of the TCF fund and deliverability within the necessary timescales. It had been agreed with Peterborough City Council that the scheme could not be constructed within TCF timescales so construction would not be funded through this funding stream.

One Member questioned the confidence in the risk adjusted base cost of £12.9m. It was noted that this figure was based on the latest information from the Engineering Council and had been adjusted for inflation; Members were informed that officers would continue to monitor this figure closely.

It was resolved unanimously to:

- a) approve the Outline Business Case for the A16 Norwood Improvement Project.
- b) recommend to the Combined Authority Board to approve the drawdown of £1.2 million from the Medium-Term Financial Plan for the development of the Full Business Case and to seek delegated authority to the Interim Head of Transport to enter into a Grant Funding Agreement with Peterborough City Council following consultation with the Monitoring Officer and Chief Financial Officer.

53. Wisbech Rail

The Committee received a report detailing the next steps for Wisbech Rail. Network Rail had identified a strong strategic focus within the 2020 business case for public transport links from Wisbech and the potential benefits of connecting to Cambridge. It had recommended removing assumptions about Ely Area Capacity Enhancement (EACE) to enable Wisbech to Cambridge to be a standalone project. It was also assumed that one train path might be available at Ely North Junction and a further train path could be sought through EACE. There was no guarantee that EACE would be successful given that the Government had not yet announced the next steps. Network Rail had also produced a high-level feasibility study for potential light rail to enable further options to be considered. The report had concluded that there was potential for a light rail passenger operation between March and Wisbech highlighting Tram-Train or Very Light Rail.

During discussion, individual Members:

- highlighted the need to keep both the heavy and light rail options open. There was great concern over the Ely Junction and its impact on the Wisbech to March route. A recent letter from Grant Shapps MP had inferred that Ely Junction was unlikely to happen soon. The Interim Head of Transport reported that he had attended parliament on 15 November 2022 for a discussion on the rail priority for Transport East who had suggested that EACE was a higher priority in its rail plan than other schemes. Several MPs present had suggested the need to push forward on EACE and there would be an event held in the new year with MPs to lobby DoT Ministers. It was believed that it was one of the highest priorities for the country, which had also been endorsed by senior officers from Great British Rail and Network Rail.

- queried whether opting for an Options Assessment Report would have a negative impact on EACE. The Interim Head of Transport highlighted the need for an options appraisal, which would assess all options. EACE was a national priority so would not be impacted adversely.
- highlighted the omission of future possibilities in the report such as using existing rolling stock. The report referred strongly to EACE but did not mention the new university at Peterborough, which meant that trains could be used by Wisbech residents to travel via March not necessarily to Cambridge. The report was about connecting Wisbech, which included freight and future expansion, but it was not about doing all or nothing. Heavy rail should not be removed as it was hoped it might enhance the business case for EACE.
- suggested that the more capacity available on peripheral routes added to the pressure to do the Ely project.
- highlighted figure 29 on page 407, which provided a comparative qualitative assessment of each vehicle option against key elements. It was suggested that the ability to operate on the main line should be weighted higher than the other options. The Chair reported that there was also the issue of cost in relation to heavy rail.
- acknowledged the importance of proceeding with the options assessment report to be ready if something changed nationally. It was noted that Members in the Wisbech area had expressed a preference for a heavy rail option to be included.
- queried the likely impact of the Autumn Statement on the project. The Interim Head of Transport reported that whilst the Combined Authority awaited the impact on its budget, at the moment funding to progress this scheme was currently in the budget.
- confirmed that the Network Rail document valid until 6 October 2022 could be rolled forward.

It was resolved unanimously to:

- a) continue to promote and lobby for heavy rail based on the information provided by the 2020 business case and GRIP 3b and recognise that potential delivery of Wisbech to Cambridge timeframe was linked to the delivery of Ely Area Capacity Enhancements (EACE).
- b) undertake an Options Assessment Report to provide the economic analysis on mode options, including existing information on heavy rail, based on a service operating between Wisbech and March which removed the current dependency on EACE whilst still being mindful of the future strategy to link into Cambridge.
- c) recommend to the Combined Authority Board to approve the drawdown of £80,000 from the Medium-Term Financial Plan for the development of an Options Assessment Report and to seek delegated authority to the Interim Head of

Transport to enter into a Development Services agreement with Network Rail following consultation with the Monitoring Officer and Chief Financial Officer.

54. Snailwell Loop

The Committee considered a report which was looking to enhance the rail network to improve the offer for national, regional, and local businesses, as well as enhancing the connectivity from and to its communities. The potential improvements included EACE and Snailwell Loop schemes. The benefits of the Snailwell Loop could not be released until the EACE scheme to the north was completed, as the area around Ely currently acted as a significant bottleneck for rail services.

During discussion of the report, Members:

- highlighted that one of the key benefits to Soham Railway Station was its links to Ely but another fundamental issue was its ability to transport people to Cambridge to access education. The Snailwell Loop had always been part of the proposals for Soham Railway Station. Although, it was acknowledged that the Snailwell Loop was tied into the EACE scheme, Network Rail had indicated that it could proceed independently of EACE. It was therefore important to support recommendations b and c.
- highlighted the fact that this scheme faced the same issues as Wisbech Rail. However, it was important to support anything which helped the local area transport communication.

It was resolved unanimously to:

- a) recommend to the Combined Authority Board to pause works on Snailwell Loop for a period of 6 months while there was on-going uncertainty about the Ely Area Capacity Enhancement (EACE) scheme and slip the existing budget into 2023-24.
- b) recommend to the Combined Authority Board to approve £150k of the current £500k subject to approval budget to enable continued development of the project and slip the balance into 2023-24.
- c) continue to work with local and regional partners to urge Government to support the EACE scheme.

55. Bus Strategy

The Committee considered a report outlining the programme undertaken to enable the development of an appropriate Bus Strategy for the region. The Strategy was strongly aligned to the vision, aims and objectives of the Local Transport and Connectivity Plan (LTCP). Attention was drawn to the Strategy which would be subject to a six-week consultation period. Feedback had already been received from Members and officers in relation to providing more access to key destinations such as education, retail, leisure and healthcare thereby providing social equality. There had also been a lot of focus on economic growth particularly in relation to access to educational establishments, and

the importance of the environment. It was acknowledged that there was a need to tighten the language and remove ambiguity in the Strategy.

The Combined Authority was required to submit a Bus Service Improvement Plan (BSIP), which reflected the work undertaken on the draft Bus Strategy thereby ensuring a golden thread with the emerging LTCP, the Strategy and how improvements would be delivered. As such the DfT had extended the submission date for the BSIP; consultation would take place with bus operators following submission. The Interim Head of Transport reported that the Strategy would be updated following the meeting and he encouraged Members to submit any further comments to the Transport Team. It was noted that a virtual meeting between 11.30a.m. and 12.30p.m had been organised for the Committee and officers from the constituent councils with the Transport Team for 24 November 2022 before the meeting of the Board on 30 November 2022. The Interim Head of Transport also offered to hold one to one meetings with Chief Executives.

During the course of discussion, Members:

- highlighted the importance of an ambitious Strategy which was essential for interconnectivity and for supporting the skills agenda. There needed to be integration with all forms of transport but there should also be an aspiration regarding reducing care usage. It was important to bear in mind the people who could not afford to own a car.
- noted the draft vision for the Strategy set out in Section 2.13. It was suggested that “comprehensive” should cover a network of all the towns and villages served by Stagecoach before its withdrawal of some services. It was also suggested that “convenient, easy to use, reliable and good value for money” was about providing the routes people needed rather than the existence of routes.
- noted that Sections 2.18 and 2.19 referred to franchising. It was suggested that how the authority had carried out this work along with the conclusions should be made available to the public.
- suggested that the Strategy was currently too generic with some of the wording open to interpretation. There was concern about the inference to road charging in the Strategy particularly in relation to integration of travel. Some Members reported that they could not support road charging, which did not recognise the impact on rural areas. The Interim Head of Transport reported that there was nothing in the Strategy relating to road charging as any decision would depend upon the outcome of the Greater Cambridge Partnership consultation. He asked Members to identify any reference so that it could be addressed.
- noted the reference in the report to working with constituent authorities, but one Member highlighted that there had been no contact with officers at his authority.
- suggested that the major problem with buses was the lack of convenience. The buses needed to be comfortable and clean with courteous and knowledgeable staff. In relation to franchising, it was important that it was made clear to everyone what was happening particularly for those with no access to technology.

- highlighted the importance of buses to the skills agenda. It was noted that the March to Chatteris bus route cut by Stagecoach meant it was now not possible for young people to access the new apprenticeship building in Chatteris by public transport. Another discussion about this issue was therefore welcomed.
- acknowledged that the Strategy was not about removing car use but providing options by increasing capacity. It was also important to consider the benefits beyond those to bus users, which included the provision of infrastructure to create an environment where people could thrive.
- highlighted the need for a joined-up system with education transport for example, and on demand services using a ticket which could be used across several services. The Interim Head of Transport reported that in relation to integration through ticketing and interoperability was a key part of the LTCP.
- highlighted the need for more information as to how the Combined Authority could integrate with GCP City Access.
- suggested that the Combined Authority needed something credible to access government funding in a timely fashion.
- suggested that franchising was key to making the network work for the public, which could include the possibility of having an “Uber” type partner. The Interim Head of Transport reported that the Committee should have received a briefing on franchising.
- queried whether six weeks was sufficient for a consultation.
- highlighted the need for the Strategy to be sustainable, flexible and adaptable. Bus provision needed to be of a good quality, attractive and efficient.

In conclusion, the Chair reiterated the importance of involving Members and officers from the constituent authorities. He reported that the county could not afford to have any further cuts to its rural bus network as buses were a lifeline for some villages. The Combined Authority therefore had an essential role in the provision of bus services working with existing providers such as Stagecoach. However, it was important that the reliability of services was improved, and that franchising was discussed so that the county could benefit from having a range of bus operators. It was disappointing that the Government was only funding 40% of the bus network nationally.

It was resolved by a majority to:

- a) provide feedback on the draft Bus Strategy;
- b) recommend that the Combined Authority Board approves the Bus Strategy to allow for a 6-week public consultation; and
- c) delegate the responsibility to the Interim Head of Transport and the chair of the Transport and Infrastructure Committee in consultation with the Chief Finance

Officer and Monitoring Officer to submit the final Bus Service Improvement Plan to central government in a timely manner.

56. Demand Responsive Transport

The Interim Head of Transport highlighted a breach of process in relation to the absence of an appropriate authorisation, which had resulted in the Chief Executive instigating an internal investigation. On conclusion of this investigation, improvement measures would be implemented, and a summary would be provided to Members.

The Committee received a report detailing the outcomes of the Ting trial in West Huntingdonshire. Attention was drawn to the background to Ting Demand Responsive Transport. It had been successful in carrying more passenger numbers (nearly 30,000 per annum) contributing to modal shift. Market research involving two different types of survey (one app based and one paper based) and had shown a significant breakthrough into carrying teenagers and young adults on Ting. It was noted that 27% of people were using Ting to commute to and from work so it was therefore making a real difference to travel patterns. Value for money was assessed by cost per passenger carried, Ting was thirtieth out of forty-six services supported by the Combined Authority.

The Chair reported that there was a proposed change to the recommendations, which included amending recommendation b) so that the contract was only for one year and adding an additional recommendation c) to cover years 2 and 3.

During discussion, Members:

- welcomed the increase in numbers to 30,000, which reflected the kind of innovation needed, and provided lessons for elsewhere. It was hoped that it could be rolled out to other areas of the Combined Authority.
- highlighted the fact that the Board had been told the cost per passenger was £17 when the committee papers stated £14. It was noted that the cost varied monthly depending on how many people used the service.
- highlighted comparisons to the cost of the Ely Zipper at £10,400 which carried 22,000 passengers per annum. The Chair reported that the Ely Zipper and the Wisbech bus would be funded until next year when a further decision would need to be made.
- expressed support to extending the service but not instead of innovative approaches to filling in the gaps which conventional services could not fill. The report made a compelling case for the value of extending this scheme, which was capturing a different demographic. It was important to note that the qualitative feedback also included face to face interviews. It was disappointing that anecdotally what was perceived to be hugely valuable, which was providing a service for people with no alternative, had not been picked up. It was therefore important in future to capture data around the absence of alternative provision.
- queried whether passengers preferred Ting because it was so much cheaper than conventional services. It was noted that it was not significantly cheaper, but it was

carrying more passengers. It was also queried whether the demand resulting from Ting could be applied to existing services. It was noted that officers were looking at existing services, which carried passengers on a market day, to see whether they could be part of the Ting service. The Interim Head of Transport reported that the surveys set a baseline for this year which would need to be monitored in the future; any additional questions could be built into the surveys going forward.

- suggested that Ting needed to be seen as an experiment so it might not make money at this point.

It was resolved unanimously to:

- a) retrospectively authorise the expenditure to continue to procure the Ting service for the period 17 July to 16 October 2022;
- b) retrospectively authorise the tender and award of a new Ting DRT bus service contract in West Huntingdonshire starting 27 November 2022 for year one only of up to 3 years at a cost of £424,950 per annum; and
- c) recommend the Combined Authority Board retrospectively authorise the tender and award of a new Ting DRT bus service contract in West Huntingdonshire starting 27 November 2022 for years 2 and 3 at a cost of £424,950 per annum

57. Transforming Cities Fund

The Committee received a report setting out the expected (forecasted) spend in relation to the Transforming Cities Fund (TCF). The total budget in Cambridgeshire and Peterborough was £95m and following a robust and thorough review of the programme, it was noted that there was likely to be a £3m underspend. The Authority was working with the DoT on the deliverability of the TCF and as such it had submitted a realistic programme update to DoT. Central government had reiterated that projects needed to be delivered by March 2024 at the latest. It was noted that there were several capital replacement schemes which had been assessed robustly. However, it was important to set this programme in the context of the government's Autumn Statement with any updates in relation to TCF being reported to the committee.

Councillor Cereste declared a non-statutory disclosable interest as a Board Member of the Centre for Green Technology which had made an application for funding.

During discussion, individual Members:

- requested information on the passenger statistics for Soham Railway Station. Another Member requested an update on the dualling of the A47.
- queried the deadline for spending the TCF. It was noted that the Authority needed to get a spade in the ground by March 2023 with spend complete by March 2024, which was why a deliverability assessment had been made of the capital replacement schemes. Although the underspend was relatively small, it had been reduced robustly by challenging the Authority's programme management.

- noted the additional capital replacement schemes that would be funded utilising TCF set out in section 2.17 and queried what they were dependent on. It was also noted that there was a £3m underspend and approximately £2m which could be moved from Gainshare to pay a proportion of the Kings Dyke project.
- queried the reduction in the Mill Road scheme from £500k. It was noted that several schemes had scored incredibly highly so this scheme had been reduced to £150k to remain with the budget envelope and be deliverable.
- expressed disappointment that the A141 and St Ives project was not proceeding and that there was not a Huntingdonshire scheme in the capital replacement schemes.

It was resolved unanimously to:

- a) note the progress in managing the overarching TCF programme and recognise the positive feedback from central government;
- b) agree the recommended capital replacement schemes for the TCF programme for approval by the Combined Authority Board and central government;
- c) delegate powers to the Chair of the Transport and Infrastructure Committee to inform the Department for Transport of the revised TCF programme with the expectation that the fund will be allocated in full; and
- d) delegate powers to the interim Head of Transport in consultation with the Chief Finance Officer and Monitoring Officer to ensure the timely sign off for the Grant Funding Agreements with the County Council and other delivery partners, thereby reducing any potential delay in the programme.

58. Date of next meeting

It was resolved to note the date of the next Transport and Infrastructure Committee would be 18 January 2023.

Chair

Cambridgeshire and Peterborough Combined Authority – Public Questions

No.	Question from:	Question to:	Question
1.	Ely Cycling Campaign (Not in attendance)	Deputy Mayor Lewis Herbert	<p>The Combined Authority wrote to both Ely Cycling Campaign and Smarter Cambridge Transport about sustainable/integrated and active travel in letters both dated 30 September 2021. These letters mentioned that the Authority would be looking to advertise for an Active Travel Tsar in the near future. Further announcements about recruitment were promised for the near future.</p> <p>The same letters mentioned that there were proposals to bring together interested parties within an Active Travel Forum. Please would the Authority provide an update to the progress made in appointing an Active Travel Tsar and also in inaugurating an Active Travel Forum.</p>
	Response from:	Response to:	Response:
	Deputy Mayor Lewis Herbert	Ely Cycling Campaign	<p>Thank you to the Ely Cycling Campaign for your question. The Combined Authority is committed to developing an Active Travel Advocate. The name we will use rather than Tsar, and an Active Travel Lead to bring together interested parties in a new Active Travel Forum.</p> <p>The Combined Authority were recently invited to apply for over £800,000 of national funding called Capability and Ambition Funding being led by the new Active Travel England organisation. If successful, this will enable us to further progress the role of the Advocate and Lead, alongside developing projects and training and getting input from many organisations including yours.</p> <p>The Combined Authority is also trying to identify funds within its own budgets to ensure that these roles can continue beyond the period of the Capability and Ambition Funding.</p> <p>We await with hope and ambition the outcome of the bid that we have put into Active Travel England so thank you for that question.</p>

No.	Question from:	Question to:	Question
2	Paul Hollinghurst – Railfuture East Anglia (Question presented by Nick Dibben)	Deputy Mayor Lewis Herbert	<p>Network Rail’s light rail team concluded in their "Wisbech to March: Potential for Light Rail" report (that’s part of this meeting) that a Tram-Train solution appeared the best credible light rail option for the reopening, and rates highly in a comparative analysis with other rail based options.</p> <p>In another part of Cambridgeshire, the railway line to Haverhill was also assessed by Network Rail’s light rail team as part of the Department for Transport Restoring Your Railway fund bid which was rated as "a good case for future development " about which they commented that "this proposal has potential as a Tram-Train scheme" and "a light rail solution would reduce capital infrastructure costs for the reinstatement to Haverhill. The development of a Tram-Train fleet in this area could also tie with other opportunities such as Wisbech."</p> <p>Does the Combined Authority see the potential of Network Rail's light rail team's stated view that Tram-Train is not only appropriate for the Wisbech reopening, but also for the Haverhill reopening, and will the Combined Authority work with Network Rail's light rail team to evaluate Tram-Train in the Cambridgeshire area covering both these reopening schemes, and including services through to Cambridge on existing rail routes where paths are available? Such a study can be done irrespective of whatever decision is taken about the next step for the Wisbech reopening.</p>
	Response from:	Response to:	Response
	Deputy Mayor Lewis Herbert	Paul Hollinghurst – Railfuture East Anglia	<p>Thank you for your question from Railfuture East Anglia. The issue before us today is the Wisbech Rail and we have no stated preference currently about whether that’s light rail or heavy rail. In terms of the Wisbech Scheme, the paper provides options for the reopening of the line, including this proposal in the Options Assessment Report to consider both heavy and light rail and also to undertake an economic analysis on the preferred mode option.</p> <p>On the Haverhill project, essentially the additionality that the Combined Authority provides leaves that decision and those options primarily to the Greater Cambridge Partnership in that they were also awarded up to £500m for transport within that area so our focus is on the Wisbech project.</p>

			<p>Given that government has not announced also the future of the Ely Area Rail Capacity Enhancements, there is also a challenge there. The focus is on the Wisbech to March service in terms of the Combined Authority. The Option Assessment Report is to be undertaken including work by Network Rail given that they have got a light rail team as well as obviously heavy rail experience.</p> <p>So, at this stage the Combined Authority has got no view on either heavy or light rail for Wisbech, and we can't pre-empt, this Committee, the outcome of that work. So really, we have got to wait until we complete that Options Assessment Report before we can see. Of course, we are concerned about transport to and from Haverhill and if there are ways that we can assist and input into the work the GCP's doing then we will. Thank you.</p>
No.	Question from:	Question to:	Question
3	Verity Stow (not in attendance and received after main deadline)	Deputy Mayor Lewis Herbert	Since the 18 bus has been replaced by Whippet, every day essential service times are being cancelled. What is the Board going to do to fix this? As the public are left stranded.
	Response from:	Response to:	Response
	Deputy Mayor Lewis Herbert	Verity Stow	Officers have been in touch with Whippet, and we actually had an exchange which resulted in adding back a couple of services into their schedule, but a fuller answer will be sent to Verity and made available publicly so that other users of that essential 18 bus service can see. It is quite clear that the some of the problems particularly Stagecoach are suffering in terms of driver numbers are also being experienced by Whippet. We are talking to them, and I actually met Stagecoach a week ago Monday, and each of the bus operators are making efforts to recruit more drivers. That's essential because we can't actually operate a decent bus network if the level of cancellations we have been suffering recently continues.



**CAMBRIDGESHIRE
& PETERBOROUGH**
COMBINED AUTHORITY

Agenda Item No:2.1

A1260 Junction 32 / 3 Full Business Case

- To: Transport & Infrastructure Committee
- Meeting Date: 18 January 2023
- Public report: Yes
- Lead Member: Cllr Anna Smith, Chair of Transport and Infrastructure Committee
- From: Nathan Bunting, Programme Manager
- Key decision: N/A
- Forward Plan ref: N/A
- Recommendations: The Transport and Infrastructure Committee are invited to;
- a) Recommend that the Combined Authority Board approve the Full Business Case in Appendix 1;
 - b) Recommend to the Combined Authority Board to approve the drawdown of £5,850,000 from the subject to approval line in the MTFP to begin construction;
 - c) Recommend to the Combined Authority Board to approve £3,441,880 from the Transforming Cities Fund programme also for construction of this scheme; and
 - d) Recommend to the Combined Authority Board to delegate authority to the Interim Head of Transport in consultation with the Chief Finance Officer and Monitoring Officer to enter into a Grant Funding Agreement with Peterborough City Council.
- Voting arrangements: Item (a) and (d) A simple majority of Members present and voting
- Item (b) and (c) A vote in favour by at least two thirds of all Members (or their Substitute Members) appointed by the Constituent Councils who are present and voting, to include the Members appointed by

Cambridgeshire County Council and Peterborough City Council, or their
Substitute Members

1. Purpose

- 1.1 To recommend to the Combined Authority Board to approve to proceed with the construction of the A1260 Junction 32 / 3 scheme, through approval of the Full Business Case and construction funding.

2. Background

- 2.1 Junction 3 is a large, grade separated junction between two of Peterborough's busiest strategic roads. The junction is a crucial cornerstone of the Parkway Network, connecting the A1139 Fletton Parkway and A1260 Nene Parkway, thus providing the majority of access to south-west Peterborough. 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.
- 2.2 The junction is heavily used by trips in the southwest of Peterborough, as it accommodates eastbound, westbound, and northbound trips. A large number of facilities, businesses, and residences are also accessed by the southern arm.
- 2.3 The scheme will address severe levels of peak hour congestion and delay that compromise the operational efficiency of the junction, and the surrounding road network. By addressing existing issues, and building in additional capacity, the scheme will assist with delivering growth aspirations across Peterborough. The scheme will also address severance for active travel the vicinity of Junction 3 and provide better quality and more coherent routes for pedestrians and cyclists, especially for journeys traversing the A1139 Fletton Parkway.
- 2.4 This Full Business Case (FBC) demonstrates that there is a very strong strategic and economic case for investment in the Junction 3 Improvement Schemes. The improvements consist of a balanced mix of highway and active travel schemes and will provide Very High Value for Money with a benefit to cost ratio (BCR) of 6.49, whilst facilitating continued growth across Peterborough, particularly in the Hampton area.
- 2.5 The scheme is LTN 1/20 Gear Change compliant and there will be achievement of minimum 20% biodiversity net gain.
- 2.6 The FBC has been independently assessed by our external assurers who have confirmed that the business case is to Green Book standard and is accurate in its conclusions.
- 2.7 The current allocation for this project within the MTFP is for £5.85m. Since the publication of the Outline Business Case in August 2020, the cost of construction has increased. The reason for this increase is as follows:
 - Inflation: if the OBC were to be re-costed at today's rates the cost would be in the region of £1m more as costs are circa 29% higher in November 2022 than they were in May 2021. Note this does not refer to inflation between now and construction, however that is captured in the outturn cost.
 - Active travel: a decision has been made by PCC to include extra active travel elements into the scheme.
 - Construction methodology: additional cost associated with the change in construction methodology for Phase 4 (The Serpentine) where we now plan to use piling to support the lane gain rather extend the embankment. This will avoid tree loss which is currently

screening the road from adjacent residential properties and avoid extending the base of the embankment towards the properties.

- Traffic management: approximate increase in traffic management costs.

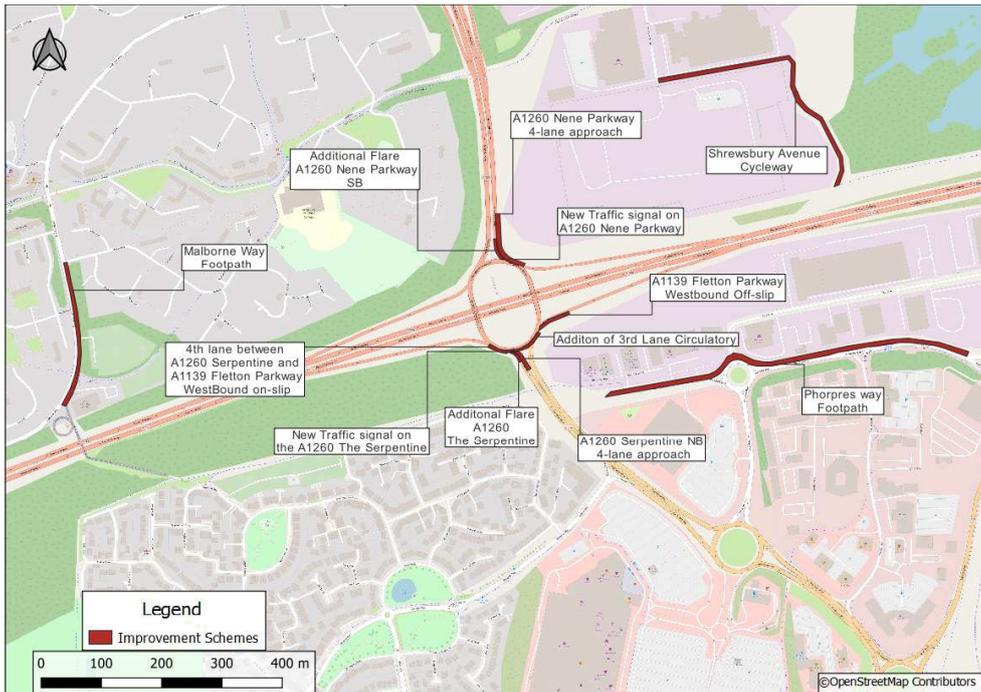
2.8 As a result, if approved, the gap in funding will come from the Transforming Cities Fund programme, specifically from the project underspends from Fengate Phase 1. Fengate Phase 1 has descoped the Storeys Bar Rd scheme due to nonalignment with Transforming Cities Fund timescales. This has saved cost which is available for use within this project.

3. Deliverables

3.1 The final package of schemes consists of the following components:

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

Map of improvements



4. Next steps

4.1 The table below shows the timeline for the construction of the scheme.

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

Significant Implications

5. Financial Implications

- 5.1 A1260 Junction 15 has an allocation within the Medium-Term Financial Plan for £5,850,000. This paper is requesting drawdown of this funding, plus an additional £3,441,880 allocation from Transforming Cities Fund allocation.
- 5.2 The Combined Authority Board in October 2022 also approved drawdown of £518,988 to accelerate the active travel element of the scheme. This takes to full funding for construction to £9,810,868.

6. Legal Implications

- 6.1 A Grant Funding Agreement will be entered into with Peterborough City Council.

7. Public Health Implications

- 7.1 The A1260 Junction 32/3 seeks to encourage active travel by improving the footpath and cycle ways in the area. Increasing those walking and cycling as the subsequent health and wellbeing benefits of exercise. Therefore, the delivery of the scheme will have a positive implication for public health.

8. Environmental and Climate Change Implications

- 8.1 The delivery of the scheme will have a positive implication on environment and climate change by encouraging active travel in the area and therefore reducing existing and future year peak hour congestion and delay. Without an improvement in active travel infrastructure, they study area will remain a car dependent destination with untapped potential for walking and cycling.
- 8.2 The project will protect and improve the biodiversity value within the study area by mitigate any adverse impact of a scheme and enhance biodiversity net gain within the Study Area Achievement of minimum 20% biodiversity net gain.

9. Other Significant Implications

- 9.1 No other significant implications

10. Appendices

- 10.1 Appendix 1 – A1260 J32 / 3 Full Business Case

11. Background Papers

[July 2020: A1260 J32 / 3 TIC Outline Business Case paper](#): 08 July 2020

[Aug 2020: A1260 J32 / 3 CA Board Outline Business Case paper](#): 05 August 2020



Junction 3, Peterborough

Full Business Case

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Contents

Executive Summary.....	i
Strategic Dimension.....	i
Financial Dimension	v
Commercial Dimension.....	vi
Management Dimension.....	vii
1. Introduction	1
1.2 Location.....	2
1.3 Study Area.....	3
1.4 Growth Context	4
1.5 Document Structure	5
2. Strategic Dimension	6
2.1 Introduction.....	6
2.2 Business Strategy	6
2.3 Fit with the Wider Policy Context	19
2.4 The Need for Change.....	23
2.5 Impact of Not Changing	35
2.6 Internal Drivers for Change.....	38
2.7 External Drivers for Change.....	42
2.8 Scheme Objectives	45
2.9 Measures of Success.....	46
2.10 Constraints	47
2.11 Scope	51
2.12 Interdependencies.....	51
2.13 Key Risks	52
2.14 Stakeholders	56
2.15 Scheme Development.....	59
2.16 Scheme Development Since OBC.....	63
2.17 Carbon Assessment.....	68

3.	Economic Dimension	78
3.1	Introduction.....	78
3.2	Options Appraised.....	79
3.3	Economic Assessment.....	79
3.4	Present Value Costs	80
3.5	Present Value Benefits.....	82
3.6	Benefit Cost Ratio	91
3.7	Scheme Risks, Sensitivities and Uncertainties	93
3.8	Distributional Impacts.....	98
3.9	Additional Qualitative Assessments.....	99
3.10	Summary of Benefits and Costs.....	113
4.	Financial Dimension	114
4.1	Introduction.....	114
4.2	Scheme Costs	114
4.3	Scheme Cost Estimate.....	116
4.4	Budgets and Funding Cover	122
5.	Commercial Dimension	124
5.1	Introduction.....	124
5.2	Output Based Specification.....	124
5.3	Procurement Strategy	126
5.4	Market Maturity.....	127
5.5	Sourcing Options.....	128
5.6	Contract and Payment Mechanisms	129
5.7	Pricing Framework / Charging Mechanisms	129
5.8	Risk Allocation and Management.....	130
5.9	Contract Length.....	131
5.10	Contract Management.....	132
6.	Management Dimension.....	133
6.1	Introduction.....	133
6.2	Evidence of Similar Projects	133
6.3	Programme / Project Dependencies	136
6.4	Governance, Organisational Structures and Roles.....	137
6.5	Programme / Project Reporting.....	140
6.6	Programme / Project Plan	141
6.7	Assurance and Approvals	142
6.8	Communications and Stakeholder Management.....	142
6.9	Risk Management Strategy.....	146
6.10	Scheme Evaluation	146
6.11	Scheme Logic Map.....	151

Appendices.....	153
Appendix A – Risk Registers	154
Appendix B – Sensitivity Testing Technical Note	155
Appendix C – General Arrangement Drawings.....	156
Appendix D – 60 Year Cost Profile: Economic Dimension	157
Appendix E – TAG Worksheets	158
Appendix F – Appraisal Summary Table (AST).....	159
Appendix G – Environment Impact Assessment Report.....	160
Appendix H – Ecology Surveys	161
Appendix I – Technical Note For Early Release of Funding	162
Appendix J – 60 Year Cost Profile: Financial Dimension	163
Appendix K – Scheme Evaluation Plan	164
Appendix L – Construction Programmes	165

Figures

Figure 1.1: Junction 3 Location Plan.....	2
Figure 1.2: Study Area Extents	3
Figure 2.1: CPCA Policy Framework	8
Figure 2.2: Existing and Future Developments around Junction 3	10
Figure 2.3: Observed PM Peak Hour Queuing on the A1260 Nene Parkway Southbound	24
Figure 2.4: Google Traffic, Typical AM Peak Congestion surrounding Junction 3 (January 2022).....	25
Figure 2.5: Google Traffic, Typical PM Peak Congestion surrounding Junction 3 (January 2022).....	26
Figure 2.6: Accident Locations, 2014 - 2019	27
Figure 2.7: Walking and Cycling Infrastructure Locations	29
Figure 2.8: Existing Cycle Infrastructure in the Junction 3 Study Area.....	30
Figure 2.9: Shrewsbury Avenue Cycle Way	31
Figure 2.10: Malborne Way.....	32
Figure 2.11: Phorpres Way Desirable Crossing Points on Cygnet Road (Left) and Phorpres Close / Club Way Roundabout (Right)	33
Figure 2.14: 2019 Index of Multiple Deprivation (Consumer Data Research Centre)	39
Figure 2.15: Through-Route via Malborne Way compared to the Preferred Route via Junction 3.....	43
Figure 2.16: COVID-19 Traffic Monitoring - A1260 Nene Parkway	54
Figure 2.17: Junction 3 Peak Hour Congestion (March 17 th , 2022).....	55
Figure 2.18: Area of Level Difference.	64
Figure 2.20: Junction 3 Improvement Scheme Detailed Design Carbon Footprint by Work Activity Series	70
.....	71
Figure 2.21: Preliminary Design Carbon Footprints of Junction 3 Active Travel Schemes	71
Figure 2.24: Project Lifecycle Carbon Reduction Process	77
Figure 3.1: Sensitivity Test BCR Ranges.....	97
Figure 3.2: National Character Areas	101
Figure 3.3: Peterborough Landscape Character Areas	102
Figure 3.4: Historic Environment Within 1km Radius of Junction 3	105
Figure 3.5: Land Based Designations within the Vicinity of Junction 3	108
Figure 3.6: Junction 3 Great Crested Newt Risk Zones	109
Figure 3.7: Environment Agency Flood Map for Planning	111
Figure 6.1: Junction 20 Improvement (Post Scheme)	134
Figure 6.2: Junction 17 Improvement (Post Scheme)	135
Figure 6.3: Haddon Cycleway Improvement.....	136
Figure 6.4: Key Project Roles and Responsibilities	139
Figure 6.5: Junction 3 Logic Map.....	152

Tables

Table 2.1: Wider Policy Context and Impact of the Scheme	20
Table 2.2: Environment Policy Context and Impact of the Scheme	22
Table 2.3: Accident Data by Severity and Year	27
Table 2.4: Delay Comparison between 2018 Base Model and the 2031 DM Scenario	36
Table 2.5: Combined Authority Criteria	41
Table 2.6: Development in the Hampton Area	44
Table 2.7: Study Objectives and Measures of Success	47
Table 2.8: Constraints and Measures of Mitigation	48
Table 2.9: Table of Required Powers and Approvals	50
Table 2.10: Junction 3 Long List of Options	59
Table 2.11: Scheme Objectives	60
Table 2.12: Options Shortlisting Summary	61
Table 2.13: Preferred Option Amendments Since Preliminary Design	63
Table 2.14: Aimsun Modelling Lane Gain Sensitivity Test	65
Table 2.15: LinSig Modelling Lane Gain Sensitivity Test	66
Table 2.16: AMCB Comparison for Lane Gain and No Lane Gain Scenario	67
Table 3.1: Base Investment Cost (2022 Prices)	80
Table 3.2: Economic Dimension Scheme Cost Estimate	81
Table 3.3: TUBA Annualisation Factors	83
Table 3.4: TUBA Benefits Breakdown	83
Table 3.5: Non-Monetised Time Benefits by Time Saving	84
Table 3.6: Transport User Benefits by Time Period	84
Table 3.7: Non-Monetised Time Benefits by Distance	85
Table 3.8: Do Nothing and Do Something Daily Active Travel Trips by Scheme	89
Table 3.9: Summary of Active Mode Appraisal Toolkit Benefits by Scheme	90
Table 3.10: Transport User, Active Mode, and Accident Benefits Summary	91
Table 3.11: DfT VfM Categories	92
Table 3.12: Junction 3 Study Improvements AMCB Table	92
Table 3.13: Value for Money Categories and the Associated Present Value of Costs (£,000s)	93
Table 3.14: Sensitivity Test Summary	96
Table 3.15: Distributional Impact Appraisal	98
Table 3.16: Historic Environment Features within a 1km Radius of Junction 3	106
Table 4.1: Implementation Timeline	115
Table 4.2: Financial Dimension Scheme Cost Estimate	116
Table 4.3: Base Investment Cost (2022 Prices)	117
Table 4.4: Base Investment Cost (2022 Prices) by Scheme	118
Table 4.5: Risk Adjusted Base Cost (2022 Prices)	119

Table 4.6: Risk Adjusted Base Cost (2022 Prices) by Scheme	119
Table 4.7: Inflated Risk Adjusted Base Cost (2022 Prices)	120
Table 4.8: Maintenance Costs by Asset Type (2022 Prices).....	121
Table 4.9: Calculation of Annual Maintenance Costs	121
Table 4.10: Inflated Risk Adjusted Cost Including Whole Life Costs	122
Table 4.11: Funding Profile by Source.....	123
Table 5.1: Project Implementation Timescales	131
Table 6.1: Project Implementation Timeline.....	141
Table 6.2: Scheme Benefits Realisation Plan Summary	147
Table 6.3: Scheme Monitoring and Evaluation Timescales	148
Table 6.4: Scheme Evaluation Summary.....	150

Executive Summary

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

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

Strategic Dimension

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

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



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

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

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

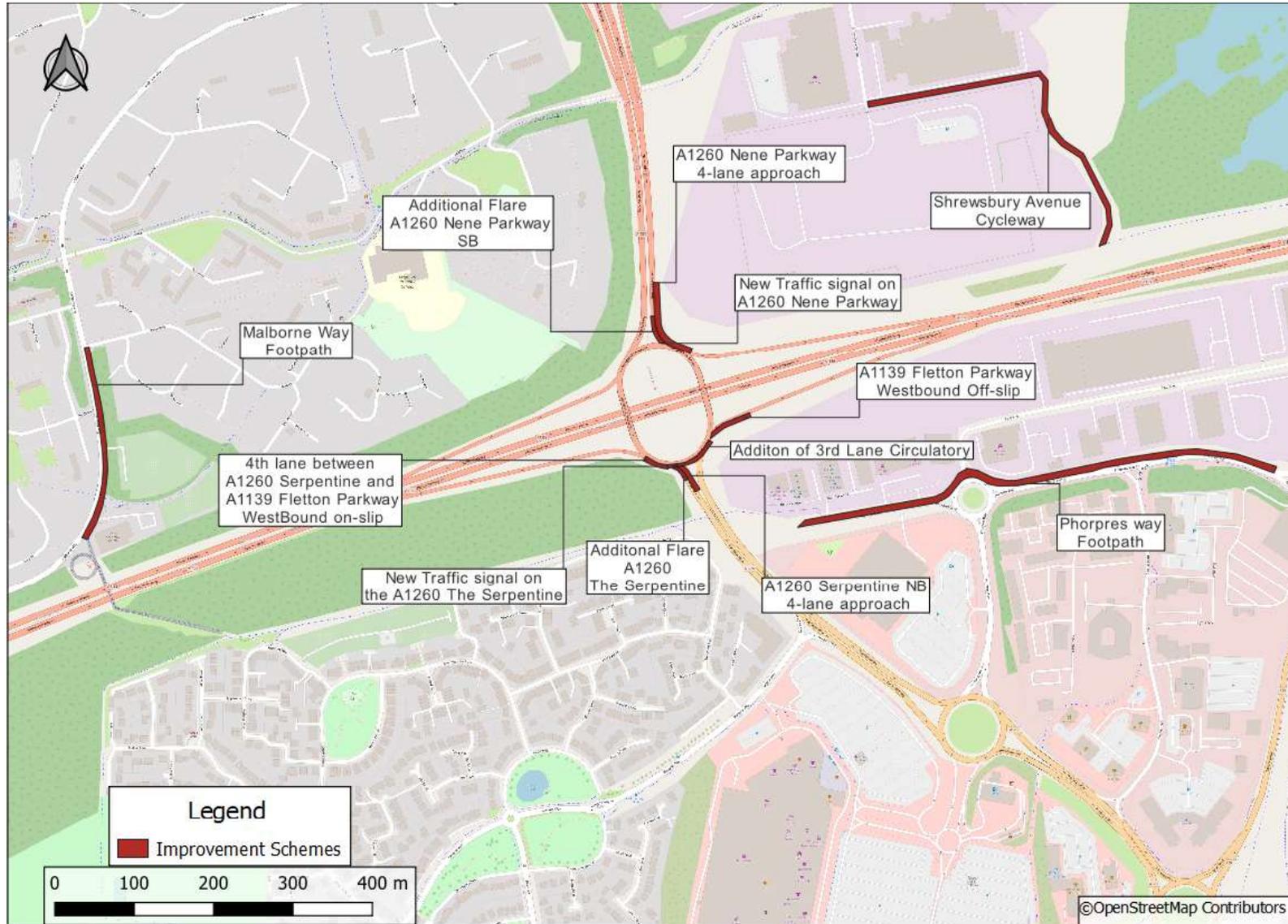
1. **Tackle congestion and improve journey times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3.
2. **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth within Hampton is promoted whilst providing for future demand.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

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

The final package of schemes consists of the following components:

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

The scheme outputs are shown in the Figure beneath.



Economic Dimension

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

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

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

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

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

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

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

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

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

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

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

Financial Dimension

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

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

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

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

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

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

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

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

Commercial Dimension

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

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

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

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

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

Management Dimension

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

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

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

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

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

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

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

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

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

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

¹ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>.

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

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

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

1. Introduction

- 1.1.1 This document sets out the Full Business Case for the Junction 3 Improvement Scheme in Peterborough.
- 1.1.2 The scheme will address severe levels of peak hour congestion and delay that compromise the operational efficiency of the junction, and the surrounding road network. By addressing existing issues, and building in additional capacity, the scheme will assist with delivering growth aspirations across Peterborough. The scheme will also address severance for active travel the vicinity of Junction 3 and provide better quality and more coherent routes for pedestrians and cyclists, especially for journeys traversing the A1139 Fletton Parkway.
- 1.1.3 This Full Business Case is the final stage of the decision-making process using the format as set out in “The Transport Business Cases” guidance published by the Department for Transport (DfT) in February 2022.
- 1.1.4 The level of detail provided within the Business Case continually builds as the project progresses from Strategic Outline Business Case (SOBC) to Outline Business Case (OBC), and then onto Full Business Case (FBC). This reflects the greater level of detail that becomes available as the scheme design matures and there is increased clarity around procurement and construction management.
- 1.1.5 An SOBC and an Optional Appraisal Report (OAR) were completed in October 2019. These were followed by an OBC that was approved by the approval by the Cambridgeshire and Peterborough Combined Authority (CPCA) in July 2020, paving the way for Detailed Design work to commence and which has culminated in the production of this FBC.
- 1.1.6 The primary purpose of the FBC is to:
- Confirm the need for change and the policy fit of the scheme, as established in the OBC.
 - Demonstrate that a range of options have been considered, and that a preferred option has been identified that meets the scheme objectives.
 - Evidence that the preferred option offers value for money, and has been robustly costed, and:
 - Explain how the scheme will be procured, and how delivery of the project will be managed.

1.2 Location

- 1.2.1 Junction 3 is a large, grade separated junction serving two of Peterborough's busiest strategic roads. The junction is a crucial cornerstone junction of the Parkway Network, connecting the A1139 Fletton Parkway and A1260 Nene Parkway, thus providing the majority of access to south-west Peterborough.
- 1.2.2 The junction is used by vehicles from across the Peterborough area as well as longer distance trips destined for the A1(M), and experiences significant levels of peak hour congestion on the A1260 Nene Parkway and the A1260 The Serpentine approaches. Due to its strategic location, the junction is critical to Peterborough's growth aspirations.
- 1.2.3 Figure 1.1 beneath shows the location of Junction 3 in relation to the Parkway Network and Peterborough City Centre.

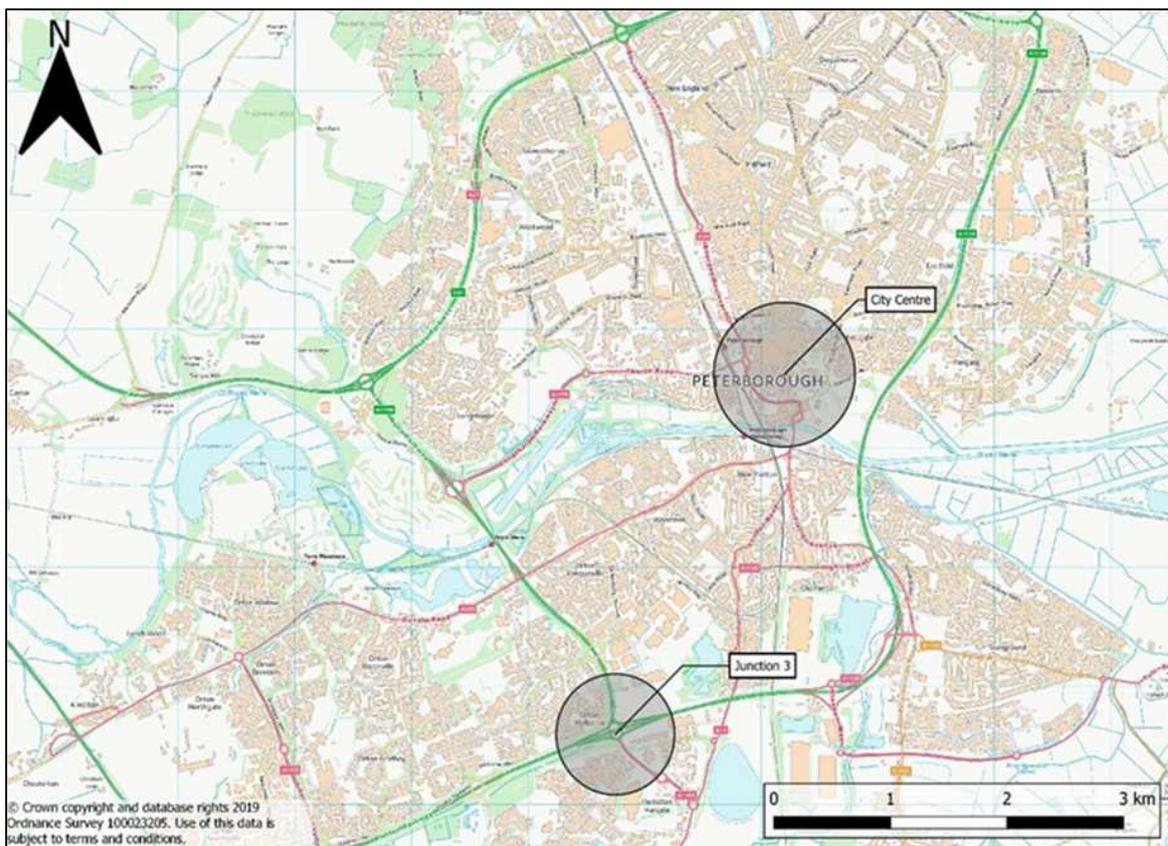


Figure 1.1: Junction 3 Location Plan

1.3 Study Area

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

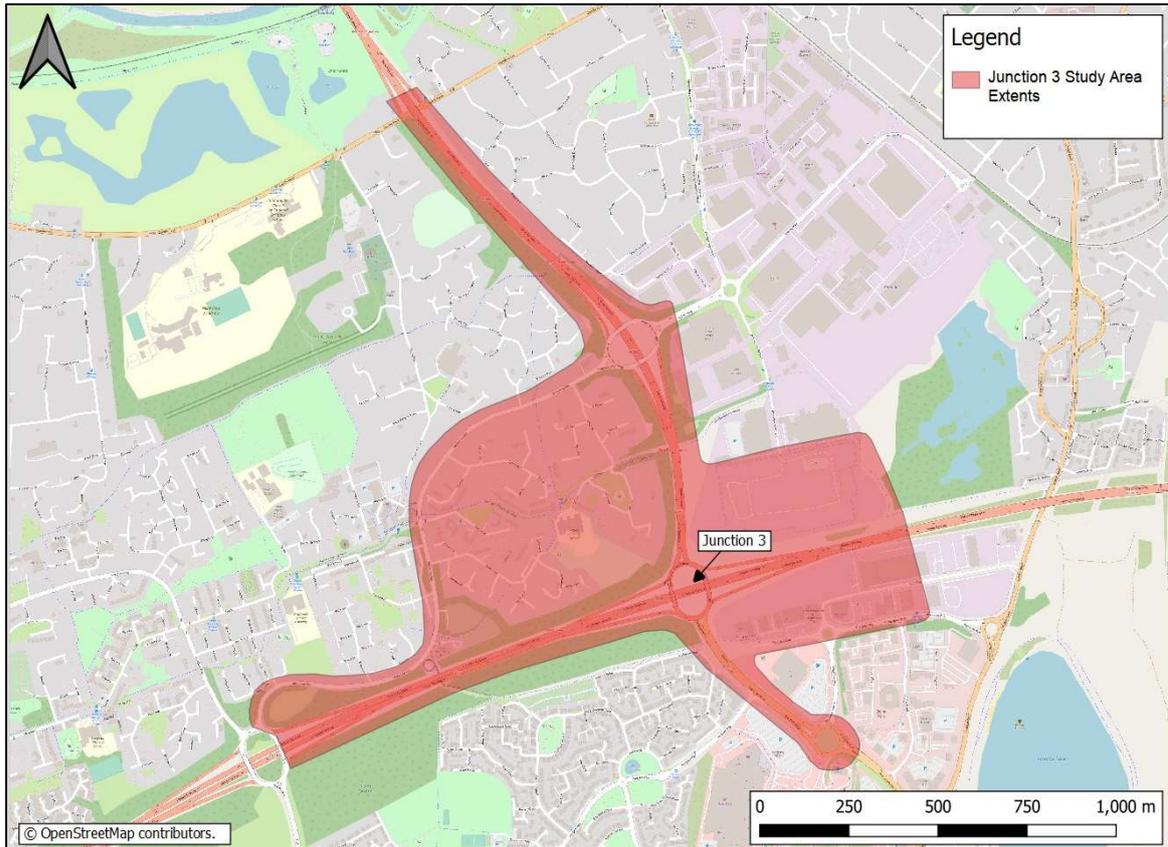


Figure 1.2: Study Area Extents

1.4 Growth Context

- 1.4.1 Junction 3 is a partially signalised grade-separated roundabout positioned above the A1139 Fletton Parkway. It is situated on the southern edge of Peterborough's urban area. The junction provides access to the A1260 Nene Parkway, A1139 Fletton Parkway, and A1260 The Serpentine.
- 1.4.2 The junction is heavily used by trips in the southwest of Peterborough, due to a large number of leisure facilities, businesses, and residences being located immediately south of the junction.
- 1.4.3 On average 56,000 vehicles pass through Junction 3 on a typical weekday, of which 5% are classified as commercial vehicles².
- 1.4.4 Peterborough's Local Plan was adopted in July 2019 and sets out the overall vision, priorities and objectives for Peterborough for the period up to 2036. The updated strategy identifies the required delivery of approximately 21,315 new homes and 17,600 new jobs between 2016 and 2036³.
- 1.4.5 The population of Peterborough has grown considerably over recent years, increasing by 9.6% between 2011 and 2019, reaching a total population of 202,260 as of mid-2020 (based on Office for National Statistics estimates⁴). Peterborough's population growth is notably above the national average for England of 6.1%, making the area one of the country's fastest growing cities.
- 1.4.6 Most of this growth has been, and will continue to occur, south of the A1139 Fletton Parkway in and around the Hamptons, making Junction 3 the primary point of access onto Peterborough's strategic road network. The Local Plan identifies 7,400 homes and nearly 350,000 sqm (GFA) of employment space to be developed within Hampton over the next 15 years.
- 1.4.7 The A1139 Fletton Parkway also creates a significant barrier to active travel trips between the growth sites south of Junction 3 and the rest of Peterborough to the north. Improvements in this location should address this by improving the provision and quality of north-south active travel routes intersecting Fletton Parkway.
- 1.4.8 Peterborough's transport network was fundamentally redesigned in the 1970s to accommodate the then "Peterborough New Town" and has served the city well. However, capacity issues are now emerging on the road network because of recent housing growth, resulting in significant levels of peak hour congestion and delay. As congestion increases on the Parkway Network, and queues form at key junctions, the potential for delivering new homes and jobs in the area becomes increasingly constrained. Peterborough City Council are committed to addressing these highway constraints to ensure that its full growth aspirations can be realised.

² Manual Traffic Survey Data: November 2018

- 1.4.9 This Business Case promotes a scheme that will provide the necessary increase in highway capacity to unlock congestion and significantly reduce peak hour delay at Junction 3, which is a major pinch-point on the network. This will improve the capacity and operational performance of the Peterborough Parkway Network which is crucial to supporting further growth.
- 1.4.10 Improvements at Junction 3 are also expected to have wider network benefits beyond the Parkway Network, particularly to Malborne Way which experiences peak hour congestion as vehicles route away from Junction 3 in order to avoid queues.
- 1.4.11 Additionally, the improvements will improve north-south active travel routes that traverse the A1139 Fletton Parkway, reducing severance for pedestrians and cyclists, and increasing opportunities for active travel around Junction 3.
- 1.4.12 The Junction 3 Improvement Scheme set out within this document has been developed with significant input from environmental specialists and will mitigate the environmental impacts associated with construction, as well as deliver a biodiversity net gain.

1.5 Document Structure

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

³ Peterborough Local Plan, 24th July 2019, <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/LTP.pdf>.

⁴ Office National Statistics, [Mid-Year Population Estimates, UK, June 2020](#).

2. Strategic Dimension

2.1 Introduction

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

2.2 Business Strategy

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

Department for Transport Single Departmental Plan

2.2.2 The Single Departmental Plan published in June 2019⁵ sets out the DfT's objectives and the plans for achieving them. The objectives are:

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

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

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

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

Cambridgeshire and Peterborough Combined Authority

- 2.2.5 The CPCA was formed as a Mayoral Combined Authority in 2017. It is made of seven local authorities (Cambridgeshire County Council, Peterborough City Council (PCC), Huntingdonshire District Council, East Cambridgeshire District Council, Fenland District Council, Cambridge City Council and South Cambridgeshire District Council) and the Business Board (Local Enterprise Partnership).
- 2.2.6 The focus of the CPCA is on strategic issues (such as housing, transport and infrastructure demand) which cross council borders and span the entire Cambridgeshire and Peterborough area. The Devolution Deal for Cambridgeshire and Peterborough runs for 30 years and sets out key ambitions for the CPCA as well as including a list of specific projects which the CPCA and its member councils will support over that time.
- 2.2.7 To help achieve these ambitions and provide the requisite support, the CPCA has set out a short-term business plan⁶ that is aimed at giving a clear pathway to deliver on their ambitious and transformational agenda for Cambridgeshire and Peterborough. The business plan sets out the CPCA budget plans for the next four-year period alongside a focussed to-do list of projects of which Improvement works at Junction 3 are listed. Figure 2.1 overleaf sets out the CPCA Policy Framework.

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

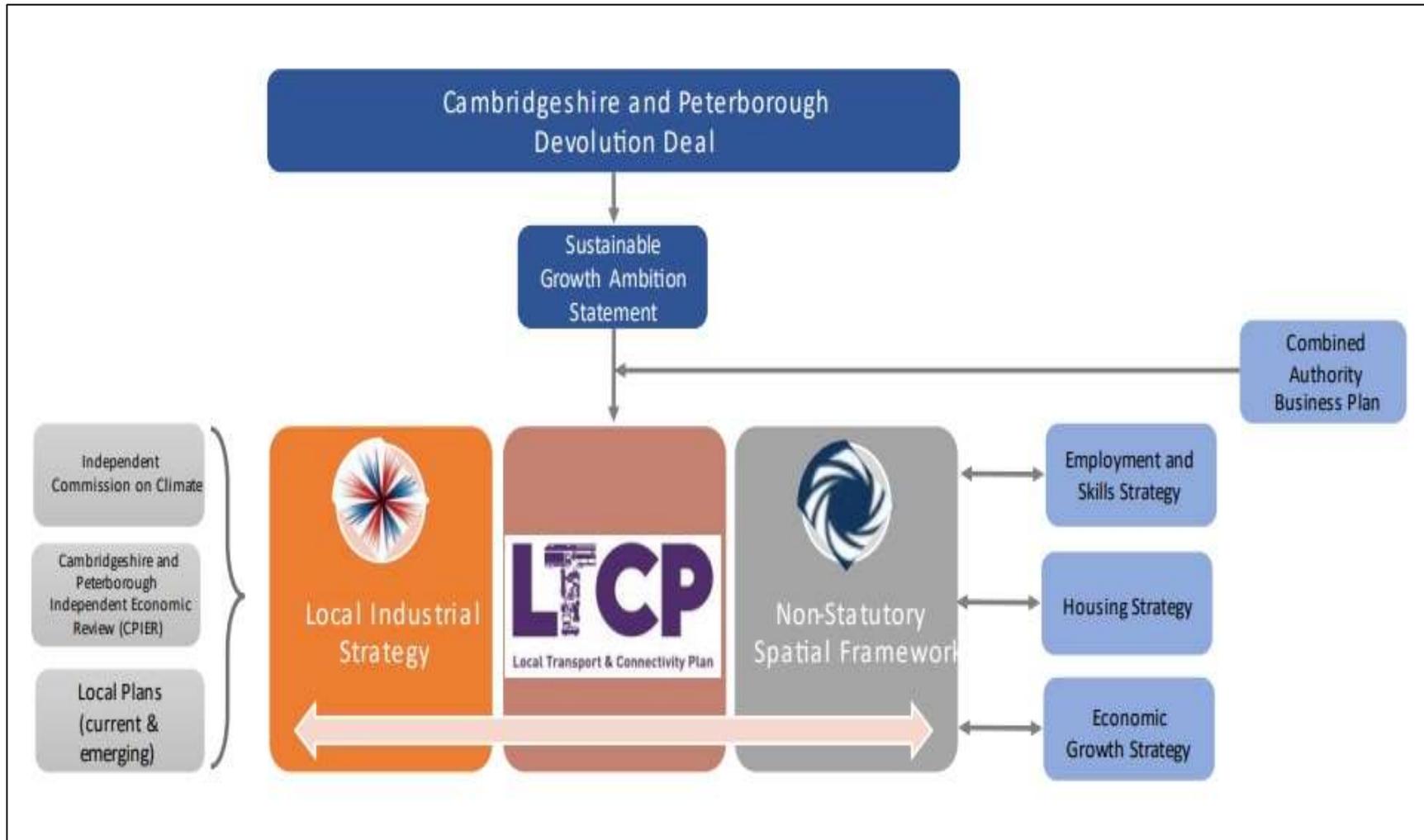


Figure 2.1: CPCA Policy Framework

Cambridgeshire and Peterborough Sustainable Growth Ambition Statement

- 2.2.8 The CPCA Mayor's Growth Ambition Statement sets out the region's priorities for achieving ambitious levels of inclusive growth and meeting the commitments of the Devolution Deal. The Statement's six themes for achieving regional growth focus on:
- People
 - Climate and Nature
 - Infrastructure
 - Innovation
 - Reducing inequalities
 - Financial and systems.
- 2.2.9 The statement is underpinned by work undertaken by the Cambridgeshire and Peterborough Independent Economic Review (CPIER)⁷. The assessment makes a number of recommendations for the CPCA to take forward over the short, medium and long-term.
- 2.2.10 The success of Cambridgeshire and Peterborough as a project of national importance is highlighted in the CPIER. This is because the area contains some of the most important companies and institutions in the country, much of the country's high value agricultural land, and the cities and towns that continue to support both.
- 2.2.11 The CPIER identifies Peterborough as a City with a dynamic business environment, built on its history of industry including brickmaking and manufacturing. It is an attractive place for business due to its position on the A1 and East Coast Main Line, as well as for aspirational workers who want easy access to London, the Midlands and the North. The significance of Peterborough as a growing employment hub is demonstrated by the decision to relocate 1,000 civil servants from the Passport Office and Department for Environment, Food and Rural Affairs (DEFRA) to newly built offices in Fletton Quays in late 2022⁸.
- 2.2.12 The Junction 3 Scheme will help achieve the ambition set out within the CPIER for 'Peterborough to become a leading place to live, learn and work' by 2030. The Improvement Scheme will address issues of delay and poor journey times at Junction 3, enabling the continued growth of the Hampton Township immediately south of the junction, and a key residential and employment sector to the south of the City. By addressing existing highway issues, increasing accessibility and enhancing the local area, the attractiveness of the Hampton area will increase - helping to retain existing businesses and support prospective investment in the area.

⁷ <https://www.cpier.org.uk>.

⁸ <https://www.gov.uk/government/news/work-begins-on-a-major-new-government-hub-in-peterborough>

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

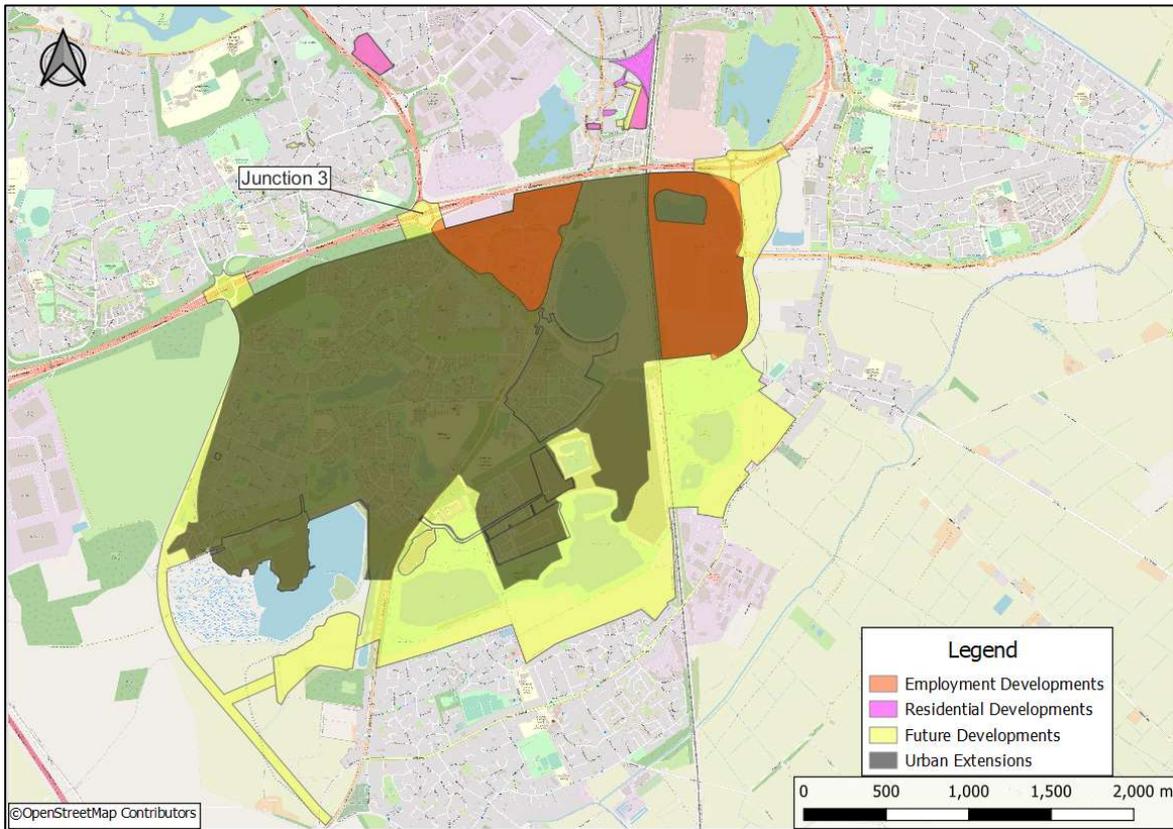


Figure 2.2: Existing and Future Developments around Junction 3

Cambridgeshire and Peterborough Independent Commission on Climate

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

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

2.2.16 Recommendations featured within the October 2021 report⁹ specifically relating to transport and most relevant to major schemes funded by the CPCA include:

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

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

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

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

Local Industrial Strategy

- 2.2.19 The Local Industrial Strategy¹⁰ sets out the economic strategy for Cambridgeshire and Peterborough, taking a lead role in implementing the business growth, productivity and skills elements of the Growth Ambitions Statement.
- 2.2.20 In response to the findings of the CPIER, the Local Industrial Strategy focuses on the three sub-economies of:
- Greater Cambridge
 - Greater Peterborough
 - The Fens.
- 2.2.21 The CPCA Assurance Framework¹¹ states that investments will only be made if they can demonstrate that they will support the delivery of the Growth Ambitions Statement and the Local Industrial Strategies, as well as the more detailed place and sector strategies.
- 2.2.22 This has a direct implication for the Junction 3 Scheme, with a need to ensure it supports CPCA growth ambitions and align with the Local Industrial Strategy. As stated above Peterborough is identified as one of the three sub-economies and providing an efficient and reliable local transport network within the city is crucial to ensuring the continued success of the local economy in line with the CPCA Growth Ambition Statement. The Junction 3 Scheme will provide improvements to journey times and delay on a key junction to the south of the City, and directly support the growth 7,400 homes and nearly 350,000 sqm (GFA) of employment in the Hampton Township.

¹⁰

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

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

Local Transport Plan

- 2.2.23 In January 2020, the CPCA adopted a Local Transport Plan for Cambridgeshire and Peterborough¹² and it replaces the interim Local Transport Plan published in 2017. The plan describes how transport interventions can be used to address current and future challenges and opportunities for Cambridgeshire and Peterborough and sets out the policies and strategies needed to secure growth and ensure that planned large-scale development can take place in the county in a sustainable way.
- 2.2.24 The Local Transport Plan is split in to two main parts: The 'Local Transport Plan' which sets out the vision, goals and objectives and the policies designed to deliver the objectives, and the 'Transport Delivery Plan' (2019 to 2035) which explains how the Local Transport Plan strategy will be delivered. It details programmes for delivery of improvements to the transport network and for its day-to-day management and maintenance.
- 2.2.25 The development of the Local Transport Plan was undertaken concurrently with the CPIER and the Growth Ambition Statement which enabled the challenges and opportunities detailed in these documents to be reflected within the Local Transport Pan. The Local Transport Plan completes the suite of documents which articulates the Combined Authority's response to the CPIER.
- 2.2.26 The vision for the Local Transport Plan is:
- 'To deliver a world-class transport network for Cambridgeshire and Peterborough that supports sustainable growth and opportunity for all'.*
- 2.2.27 The goals of the Local Transport Plan outline the wider outcomes the transport network in Cambridgeshire and Peterborough will aim to achieve. They are:
- **Economy:** Deliver economic growth and opportunity for all communities
 - **Society:** Provide an accessible transport system to ensure everyone can thrive and be healthy
 - **Environment:** Protect and enhance our environment and tackle climate change.
- 2.2.28 The objectives of the Local Transport Plan underpin the delivery of the goals for an improvement at Junction 3, and form the basis against which schemes, initiatives and policies will be assessed. The initial scheme objectives for a Junction 3 Improvement Scheme were devised at the beginning of the study and pre-date the objectives of the Local Transport Plan.

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

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

2.2.30 The objectives of the CPCA Local Transport Plan are:

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

2.2.31 Junction 3 is identified within the Local Transport Plan as a congestion pinch point on the Peterborough Parkway Network, where improvements are necessary to improve journey time reliability and enable the growth identified within the Local Plan to emerge¹³.

¹³ Peterborough Long Term Transport Strategy, 2010.

Emerging CPCA Local Transport and Connectivity Plan (LTCP)

- 2.2.32 The CPCA has drafted a new LTCP which sets out the transport strategy to meet the new challenges and opportunities faced within the region. The LTCP is expected to be finalised in late 2022 and will supersede the current Local Transport Plan (described above) which was adopted in January 2020.
- 2.2.33 The new LTCP for the region follows the election of a new Mayor (May 2021), and reflects updated priorities for the combined authority, acknowledging the shifting demands on transport (at a national and local scale) following the COVID-19 pandemic, better aligning with recent national strategies for decarbonising transport set forward by government, and reflecting climate change aspirations put forward by the Cambridgeshire and Peterborough Independent Panel of Climate Change.
- 2.2.34 The vision, aims and objectives set forward within the draft LTCP focus on areas of; improved public health, accelerated carbon reduction, protection of the environment, reduced inequalities, and making growth in housing, employment, and the economy more sustainable by investing in better transport infrastructure. Future transport projects for Cambridgeshire and Peterborough region will be guided by the LTCP.
- 2.2.35 The consultation phase for the draft LTCP ran from 12th May 2022 to 4th August 2022. Feedback from the consultation has been received and will be incorporated into the final version of the LTCP, which will be subject to approval of the CPCA Board in 2023.

Mayoral Ambitions

- 2.2.36 The CPCA Mayoral Election on the 6th May 2021 resulted in a new Labour Mayor (Dr Nik Johnson) being elected, replacing the incumbent Conservative Mayor who had held office since 2017.
- 2.2.37 The new Mayor vision is that future policies and actions will be driven by inclusivity and the '3 C's' of Compassion, Co-operation and Community, and have a stronger 'greenprint' running through strategy aiding the acceleration in carbon reduction by 2050¹⁴.
- 2.2.38 In July 2021, the Combined Authority Board agreed to produce an updated Local Transport Plan. In September 2021, it was announced that the Local Transport Plan would become the Local Transport and Connectivity Plan (LTCP), to reflect the growing dependence on digital infrastructure.

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

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

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

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

2.2.40 In October 2020, The Council adopted the Local Transport Note 1 / 20: Cycle Infrastructure Design (LTN 1/20) guidance. The guidance sets out five core principles¹⁵ for which new cycle infrastructure implemented by local authorities should comply to secure funding from government. Core principles set out within the guidance include routes that are:

- Coherent
- Direct
- Safe
- Comfortable
- Attractive.

2.2.41 The above LTN 1/20 core principles are embedded within the wider DfT Gear Change Policy, adopted in 2020¹⁶, which sets out the vision to transform our future transport systems to a point where active travel becomes the 'natural first choice' for journeys by 2030, and is prioritised within policy and local transport schemes.

¹⁵ [Cycle Infrastructure Design \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872227/cycle-infrastructure-design-guidance.pdf)

¹⁶ [Gear change: a bold vision for cycling and walking \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872227/gear-change-a-bold-vision-for-cycling-and-walking.pdf)

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

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

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

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

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

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

2.3 Fit with the Wider Policy Context

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

Table 2.1: Wider Policy Context and Impact of the Scheme

Policy Framework	Policy Function	Objectives	Study Impact
Department for Transport Single Departmental Plan	Sets out the DfT's objectives and the plans for achieving them	<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 Help connect residents to places of employment and encourage sustainable travel through active travel enhancements
Cambridgeshire and Peterborough Combined Authority Local Transport Plan	Describes how transport interventions can be used to address current and future challenges and opportunities. Sets out policies and strategies needed to secure growth and ensure planned large scale development can take place in the county in a sustainable way. The Local Transport Plan completes the suite of documents which articulates the Combined Authority's response to the CPIER	<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 into all planning and transport operations to achieve Vision Zero (zero fatalities or serious injuries) Accessibility – promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all Health and Well-being – provide 'healthy streets' and high-quality public realm that puts people first and promotes active lifestyles Air quality – ensure transport initiatives improve air quality across the region to exceed good practice standards Environment – deliver a transport network that protects and enhances our natural, historic and built environments Climate Change – reduce emissions to as close to zero as possible to minimise the impact of transport and travel on climate change. 	<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 Help connect residents to places of employment through active travel enhancements, and will enhance the north-south access over the A1139 Fletton Parkway Undergo carbon assessments to ensure carbon cost savings are incorporated into design and construction Enhance the transport network by incorporating environmental enhancements into the final scheme and achieve Biodiversity Net Gain
Peterborough City Council Strategic Priorities	The Council's priorities to help meet its vision to 'create a bigger and better Peterborough that grows the right way, and through truly sustainable growth'	<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 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 	<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 Encourage greater uptake of sustainable travel, reducing operational impacts and improving health and wellbeing
Peterborough City Council Local Plan	Updates the 2011 Core Strategy and looks to deliver 21,315 homes and 17,600 jobs by 2036	<ul style="list-style-type: none"> Theme 1 - Better streets for cycling and people Theme 2 - Putting cycling and walking at the heart of transport, place and policy Theme 3 – Empowering and encouraging local authorities Theme 4 - Enabling and protecting those who choose cycling and walking 	<p>Improvements at Junction 3 will:</p> <ul style="list-style-type: none"> Enhance cycle and walking infrastructure within the study area Ensure improvements to active travel are of the latest design standards, ensuring that they are safeguarded appropriately.
DfT Gear Change / LTN 1/20 Guidance	Introduces higher design standards for cycle infrastructure in which local authorities must comply. Sets the vision to transform future transport systems, so that active travel becomes the 'natural first choice' for journeys by 2030.	<ul style="list-style-type: none"> Theme 1 - Better streets for cycling and people Theme 2 - Putting cycling and walking at the heart of transport, place and policy Theme 3 – Empowering and encouraging local authorities Theme 4 - Enabling and protecting those who choose cycling and walking 	<p>Improvements at Junction 3 will:</p> <ul style="list-style-type: none"> Enhance cycle and walking infrastructure within the study area Ensure improvements to active travel are of the latest design standards, ensuring that they are safeguarded appropriately.

Fit within Wider Environmental Policy

- 2.3.2 Alongside the overarching policies outlined in Table 2.1, local policy has a strong emphasis on the environment, particularly integrating environmental improvements into the development of new infrastructure at an early stage to minimise disruption on the environment during scheme design, construction, and ongoing operation.
- 2.3.3 Table 2.2 below outlines the policy context in relation to the environment, documenting policy objectives and how the proposed scheme will support and facilitate each objective. Environmental considerations within the scheme will be explored further within the latter stages of this chapter.

Table 2.2: Environment Policy Context and Impact of the Scheme

Policy Framework	Policy Description / Function	Objectives	Junction 3 Improvements Will:
Cambridgeshire and Peterborough Combined Authority Local Transport Plan	Objective 9: Deliver a transport network that protects and enhances our natural, historic and built environment. Ensuring schemes improve rather than damage the environment based on DEFRA, Environment Agency and Natural England guidance.	<ul style="list-style-type: none"> Protection and enhancement of the natural environment Improving sustainable access to the natural environment Delivering green infrastructure 	<ul style="list-style-type: none"> Enhance the transport network by incorporating environmental enhancements into the final scheme Will achieve Biodiversity Net Gain Undergo extensive surveys, ensuring the protection of species Engage with environmental stakeholders throughout the project, ensuring protection and licences for construction
Peterborough City Council Local Plan	Policy LP29: Any development should be prepared based on the overriding principle that; the existing tree and woodland cover is maintained, improved and expanded; and opportunities for expanding woodland are actively considered, and implemented where practical and appropriate to do so.	<ul style="list-style-type: none"> Where the proposal will result in the loss of tree or woodland the Council will expect the retainment of trees that make a significant contribution to the landscape or biodiversity value of the area, provided this can be done without compromising the achievement of good design for the site. Where it is appropriate for higher value tree(s) (category A or B trees) and/or woodland to be lost, then appropriate mitigation via compensatory tree planting will be required. Such planting should meet the five Tree Planting Principles Where appropriate and practical, opportunities for new tree planting should be explored as part of all development (in addition to any necessary compensatory tree provision). 	<ul style="list-style-type: none"> Undergo extensive surveys, gaining understanding of the species and value of trees located within the study area Actively explore / implement additional planting areas within the study area following guidance on replanting principles
Peterborough City Council – Trees and Woodland Strategy (2018)	The strategy sets out the benefits provided by trees and woodlands, how the Council aim to maintain, improve and expand tree cover, as well as the wider management of the City's tree stock in regards to development.	<ul style="list-style-type: none"> To maintain and enhance the tree population of the city To increase the tree canopy cover across the city with particular reference to areas with low canopy cover. To maintain and maximise the ecosystem services provided by the Council's trees. To promote biodiversity and conserve tree and woodland ecosystems. To conserve and protect ancient woodland and ancient trees with significant ecological, historical and amenity value. To work with partners to expand the woodland cover through sustainable external funding. 	<ul style="list-style-type: none"> Include environmental elements within the final scheme design, enhancing the local environment and biodiversity within the study area Actively explore / implement additional planting areas within the study area following guidance on replanting principles whilst working with partners Aragon Undergo extensive surveys, gaining understanding of the species / habitats, and possible impact to these within the study area and identify mitigations Engage with environmental stakeholders to protect the identified species and historic environment on site within design and construction
DfT proposed Environment Bill (Nature and Conservation Covenants) 2020	The Environment Bill will use a localised action approach to help contribute to the recovery of our natural environment, improving biodiversity and protecting urban street trees.	<ul style="list-style-type: none"> 10% biodiversity net gain requirement on new development / schemes Strengthened biodiversity duty on public authorities Local Nature Recovery Strategies (LNRSs) Species Conservation Strategies and Protected Sites Strategies Targeted measures to protect existing trees 	<ul style="list-style-type: none"> Achieve Biodiversity Net Gain at a minimum of 20 % Provide substantial evidence during option development with regard to tree loss, accounting for species type, maturity and ecological value. Provide mitigations for species / historic environment protection during construction
CPCA / PCC endorsed Natural Cambridgeshire Doubling Nature Vision	By doubling the area of rich wildlife habitats and natural green-space, Cambridgeshire and Peterborough will become a world-class environment where nature and people thrive, and businesses prosper.	<ul style="list-style-type: none"> Access to green space for communities Air Quality, quality of life and public health Long term financial gains Ownership of the vision and growth agenda by local communities through an enhanced 'sense of place' Increasing tree cover and the network of woodlands, hedgerows, within and around our towns and cities Expanding the flower-rich grasslands on the limestone plateau west of Peterborough Ensuring that at least 90% of our richest wildlife areas are in good ecological condition 	<ul style="list-style-type: none"> Include environmental elements within the final scheme design, enhancing the local environment and biodiversity within the study area Implement compensation tree planting where necessary and achieve Biodiversity Net Gain at a minimum of 20% Explore low maintenance environmental options for long-term gain for the Council

2.4 The Need for Change

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

Problems Identified

- 2.4.3 There is a very clear and compelling case for improvements within the vicinity of Junction 3.
- 2.4.4 Junction 3 is the cornerstone of the Parkway Network in the south of Peterborough, linking the A1139 Fletton Parkway with the A1260 Nene Parkway. The Hampton Township to the south of Junction 3 has experienced high levels of residential and economic growth over the past 20 years and this is set to continue to at least 2036. The Local Plan identifies 7,400 homes and nearly 350,000 sqm (GFA) of employment space to be developed within Hampton over the next 15 years. The employment area is set to deliver approximately 13,000 jobs¹⁷.
- 2.4.5 Evidence of existing and future conditions demonstrates that the following issues need to be addressed to ensure that further growth can be realised:
- Extensive peak hour queues on the A1260 Nene Parkway
 - Peak hour queueing on the A1260 The Serpentine
 - High accident rate, particularly rear end shunts
 - Inadequate pedestrian / cycle facilities and connectivity.
- 2.4.6 If not resolved, these issues will compromise the City's growth aspirations, as well as the Council's objective to remain a pleasant place to live and work, and negatively impact on residents' lives.

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

Extensive Queues on the A1260 Nene Parkway

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



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

- 2.4.8 This is considered to be a “rolling queue”. Rolling queues are characterised by the vehicles spending a large proportion of their time moving at low speeds, as opposed to coming to a full stop for an extended time. This sort of queueing tends to occur as a result of congestion at major roundabouts, where vehicles at the head of the queue slow down to find a gap.
- 2.4.9 The majority of traffic on this approach will make a right turn onto the A1139 Fletton Parkway. This creates a high number of weaving movements for vehicles coming from the Junction 31 on-slip.
- 2.4.10 The queueing at this location also results in trips diverting along Malborne Way which is an adjacent residential distributor road. Vehicles approaching Junction 31 on the A1260 Nene Parkway southbound and on Morley Way have the opportunity to decide whether to continue on to Junction 3 or re-route via Malborne Way based on the level of queueing that is occurring on A1260 Nene Parkway southbound in the PM peak hour. The rat-running traffic on Malborne Way can cause queueing and congestion along Malborne Way approaching Junction 2.

Queuing on the A1260 The Serpentine

- 2.4.11 During both the AM and PM peak congestion occurs on the A1260 The Serpentine approach. As shown in Figure 2.4 and 2.5, queues generally extend back to the junction with Hargate Way but can sometimes extend back to the Tesco roundabout (500m to the south-east) in the AM Peak. In the PM peak period, queuing / slow moving traffic extends back beyond the Tesco roundabout.
- 2.4.12 The queuing at Junction 3 on the A1260 The Serpentine approach is a result of the high volume of vehicles exiting the circulatory on to A1139 Fletton Parkway westbound resulting in few gaps being available to exit the approach.

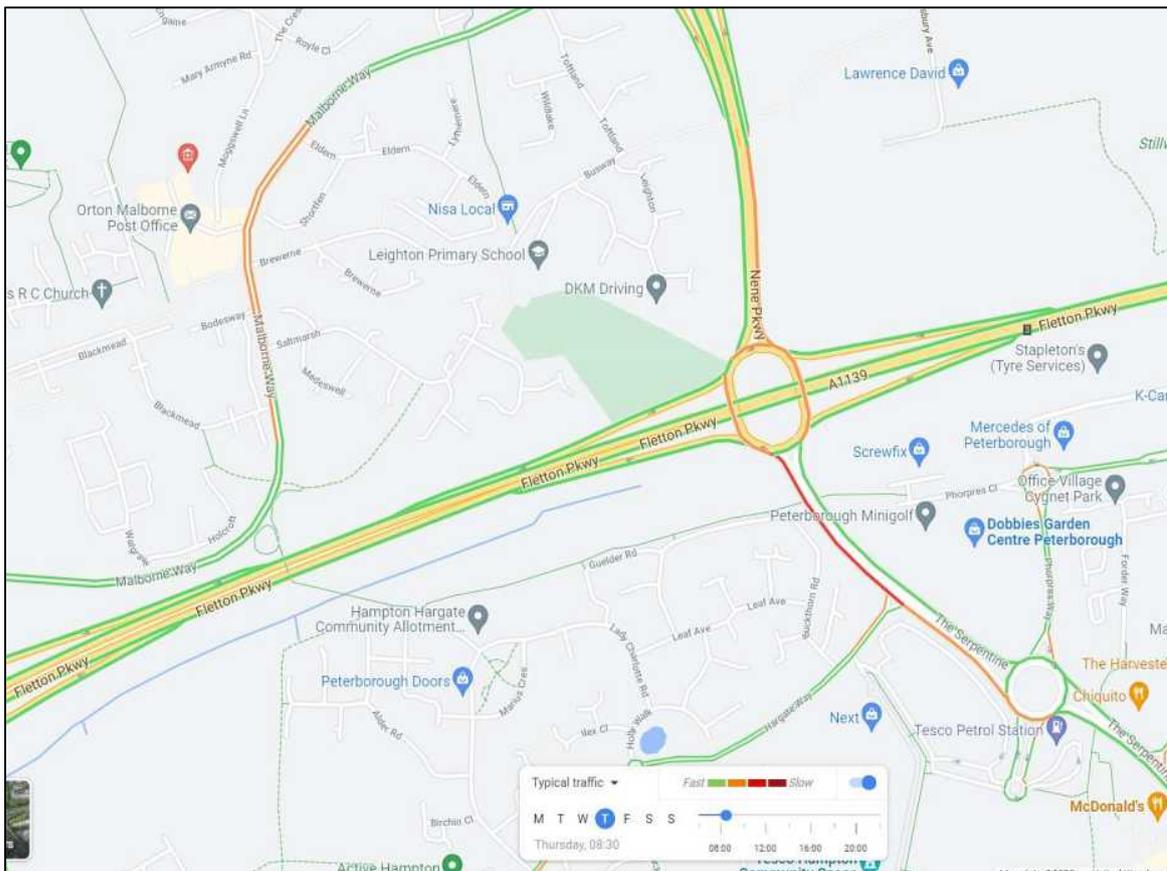


Figure 2.4: Google Traffic, Typical AM Peak Congestion surrounding Junction 3 (January 2022)

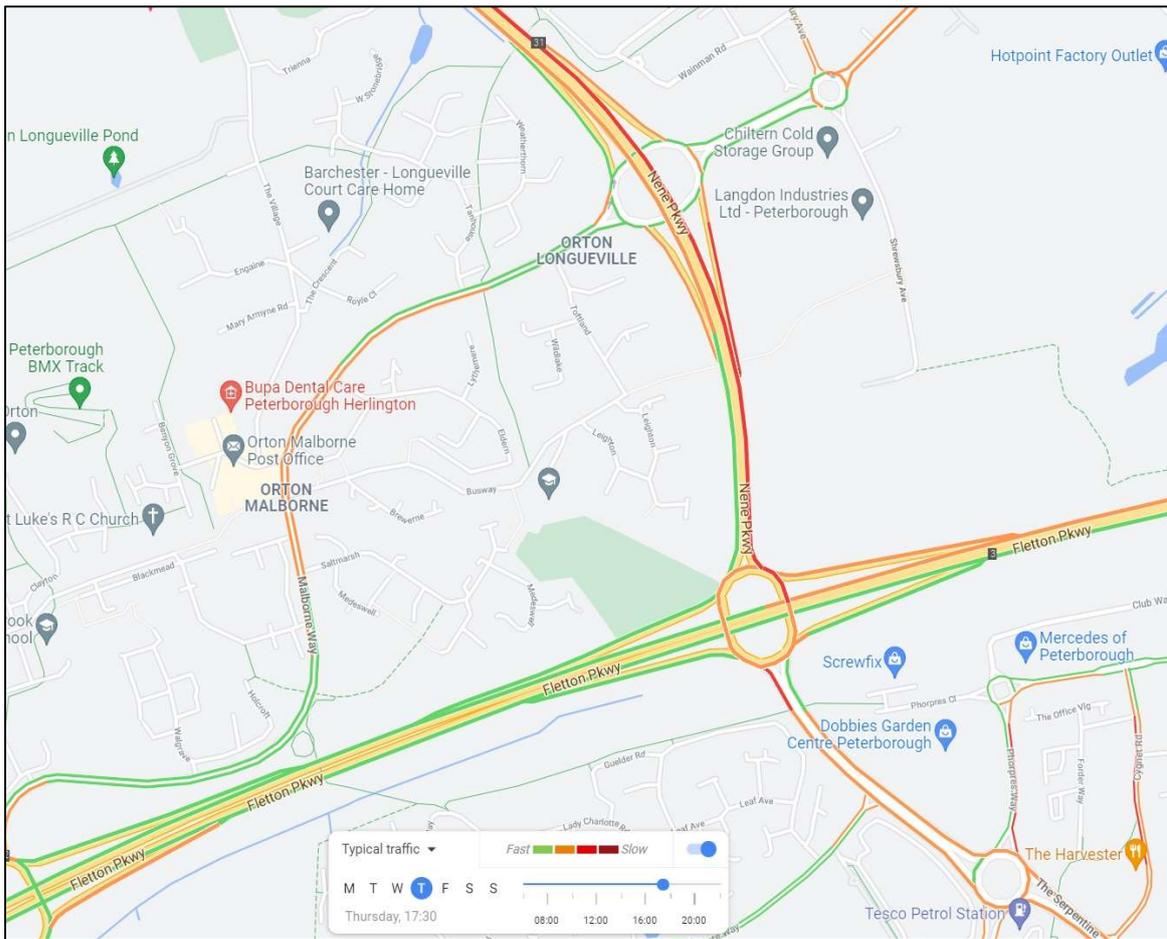


Figure 2.5: Google Traffic, Typical PM Peak Congestion surrounding Junction 3 (January 2022)

High Accident Rate

- 2.4.13 Personal Injury Accident (PIA) data was collected for the period between 2014 and 2019, during which time there were 69 accidents recorded at Junction 3. Table 2.3 highlights the majority of these accidents (88%) were classified as ‘Slight’, with the remaining 12% classified as ‘Serious’. There have been no fatal accidents recorded at the junction between 2014 - 2019.
- 2.4.14 Note that the data in Table 2.3 covers the period of January 2014 to June 2019, representing five and a half years of data.

Table 2.3: Accident Data by Severity and Year

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

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

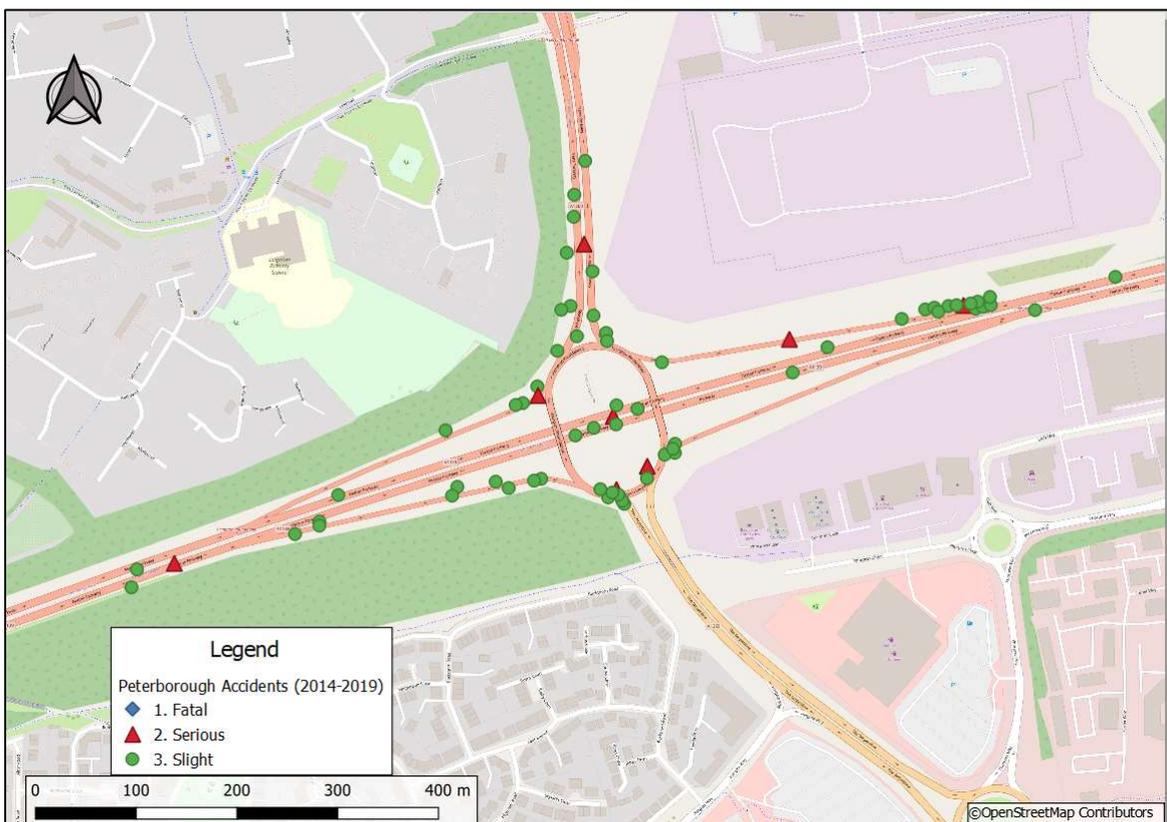


Figure 2.6: Accident Locations, 2014 - 2019

- 2.4.16 Figure 2.6 shows an accident cluster present on the A1260 The Serpentine approach as vehicles join the circulatory. Accident data shows a high number of rear end shunts occur at the stop line of The Serpentine approach, reflecting the driver behaviour of the roundabout. Due to the high number of right turning vehicles from the A1260 Nene Parkway to the A1139 Fletton Parkway westbound, gap availability for vehicles on the A1260 The Serpentine is limited, leading to driver frustration.
- 2.4.17 Accidents on the A1139 Fletton Parkway eastbound on-slip result from the merge with the parkway. Poor visibility for drivers on the slip road coupled with heavy traffic on the parkway result in high incident rates at this location. Improvements to this slip road to improve the safety for motorists is outside the scope of this project, however this issue has been identified for resolution by the Junction 3 - 3A project which is being considered for funding.
- 2.4.18 Analysis into the time of accidents has shown that of 26% of accidents within the vicinity of Junction 3 have occurred during peak periods (AM 08:00 – 09:00, IP 14:00 – 15:00, PM 17:00 – 18:00).

Poor Pedestrian / Cycle Facilities and Connectivity

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

2.4.20 Figure 2.7 beneath shows the location of these facilities.

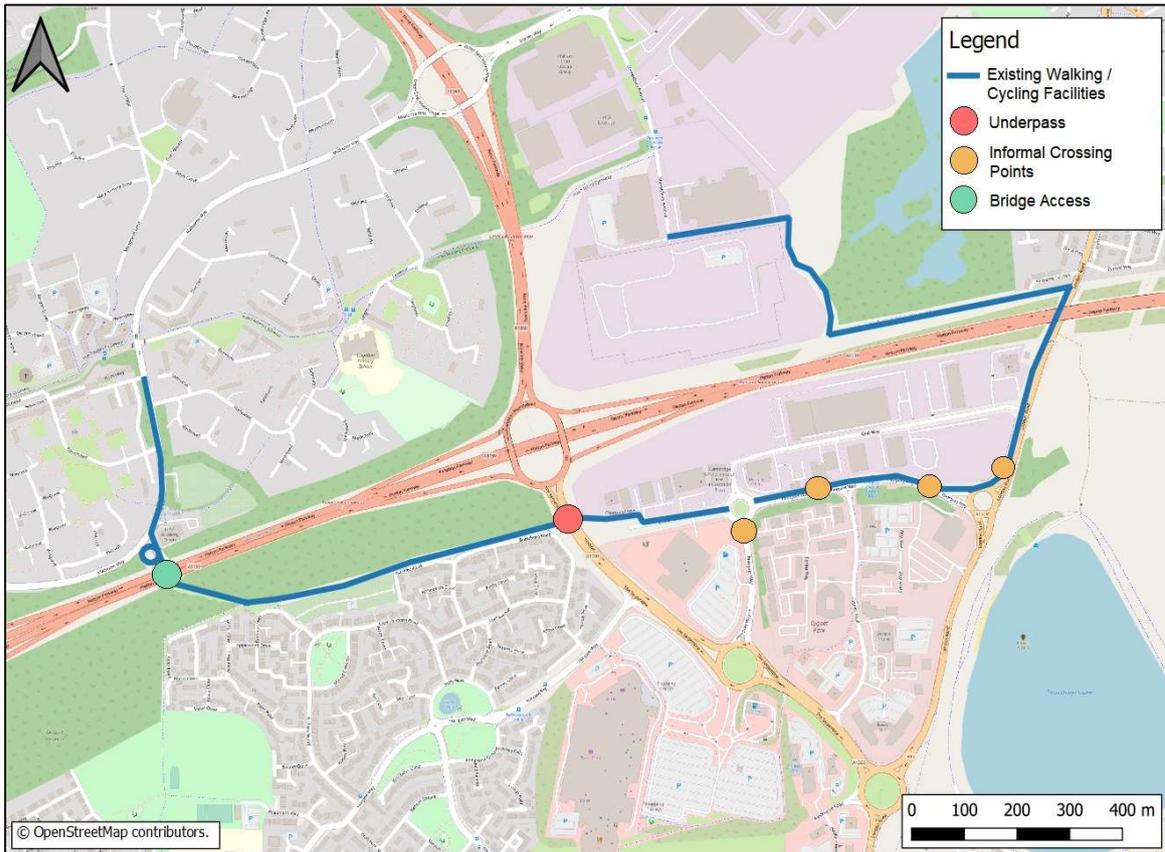


Figure 2.7: Walking and Cycling Infrastructure Locations

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

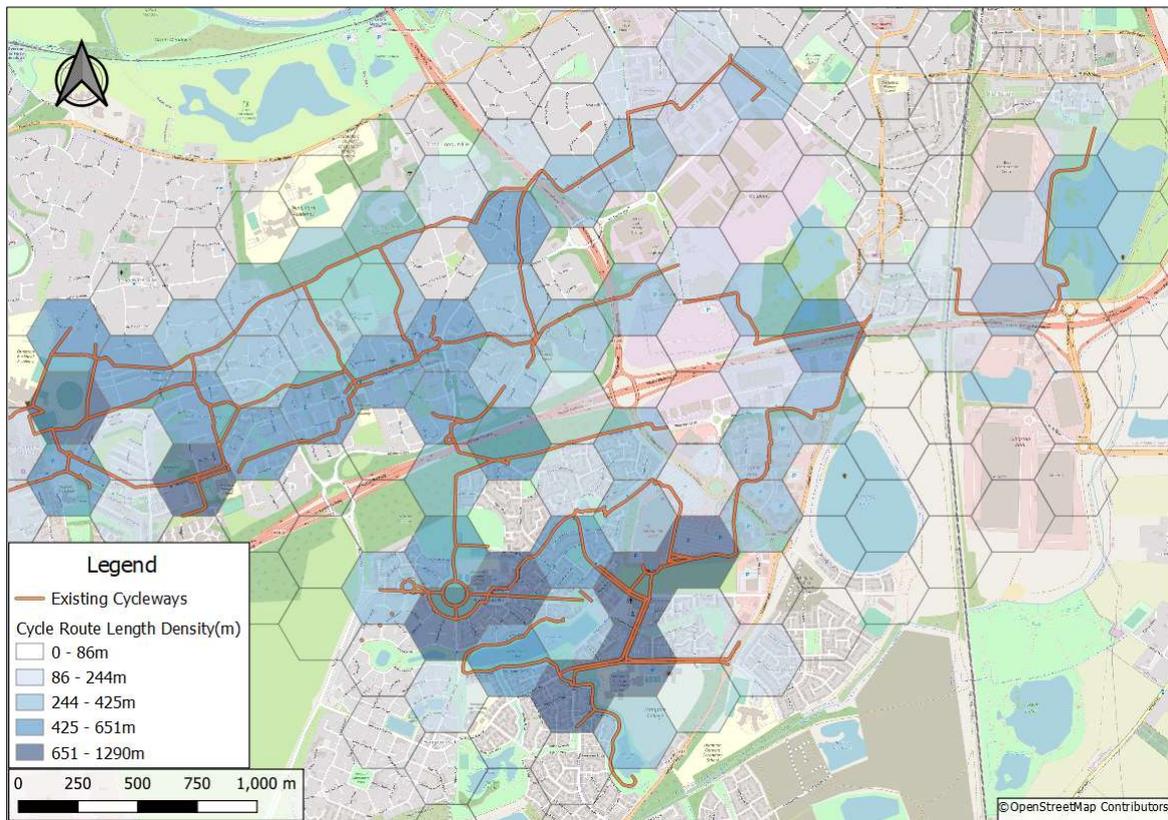


Figure 2.8: Existing Cycle Infrastructure in the Junction 3 Study Area

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

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

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

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

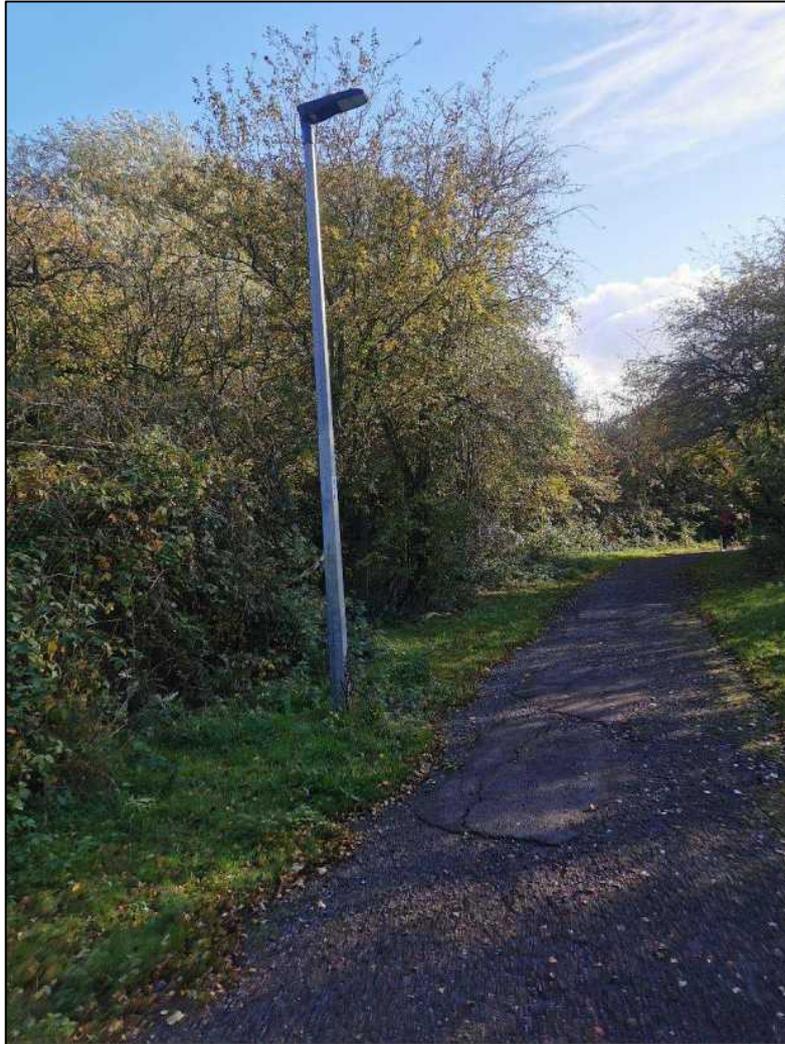


Figure 2.9: Shrewsbury Avenue Cycle Way

- 2.4.25 Figure 2.10 overleaf shows a section of the route which passes over the A1139 Fletton Parkway to the west of Junction 3. This is located along Malborne Way between Saltmarsh and the footbridge over the parkway.
- 2.4.26 There is no footpath along this stretch although a clear desire line exists as evidenced by the worn track through the grass.



Figure 2.10: Malborne Way

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



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

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

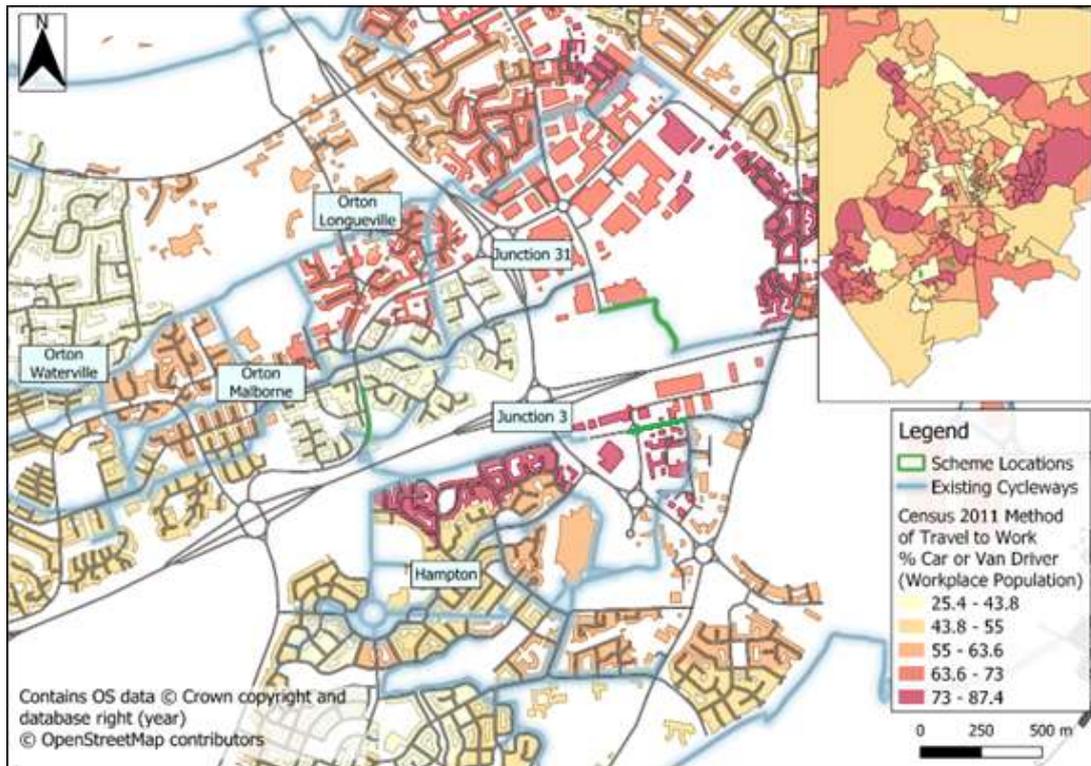


Figure 2.12: Census 2011 Method of Travel to Work - Percentage Car or Van Driver within Workplace Population

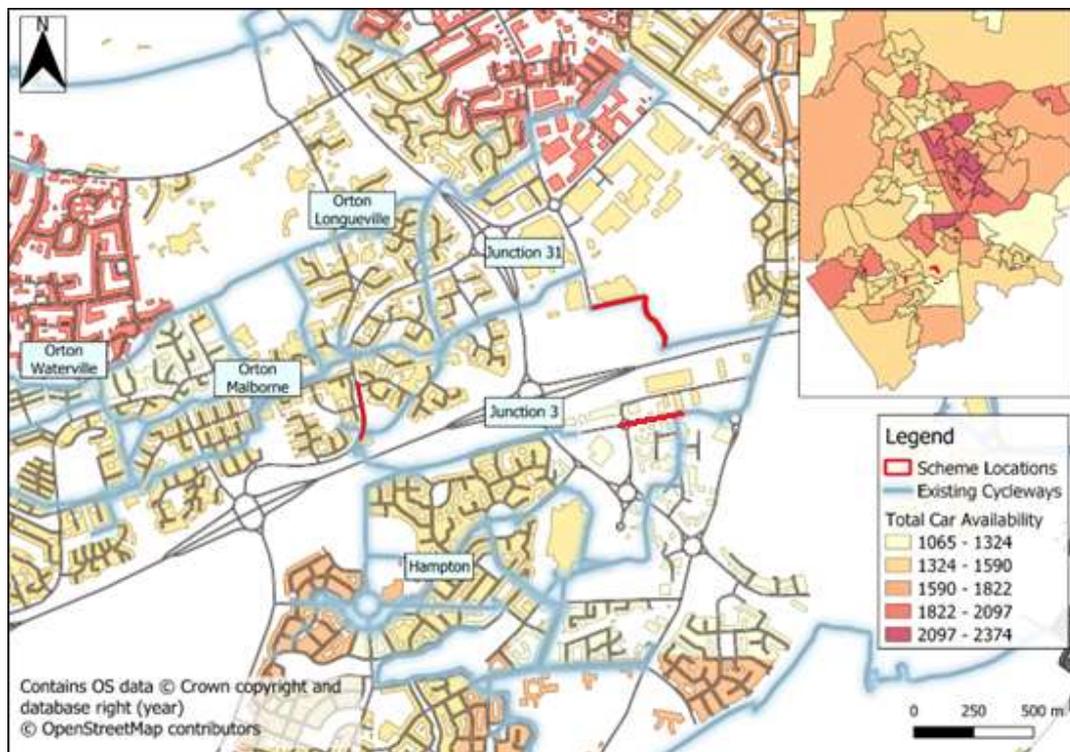


Figure 2.13: Census 2011 Total Car Availability by LSOA

- 2.4.29 The average car travel to work mode share for the Ortons and Hampton is 62%, whereas the whole of Peterborough is 61%. Whilst local car driver levels to workplaces are representative of overall Peterborough levels and local car availability is lower than the rest of the city, there is still potential to reduce car driver trips from local residential areas and increase the number of walking and cycling commuter trips.
- 2.4.30 It is expected that providing improved active travel infrastructure will encourage residents to travel by foot or bicycle instead of by car, and therefore help reduce existing and future year peak hour congestion and delay. Without an improvement in active travel infrastructure, the study area will remain a car-dependent destination with untapped potential for walking and cycling.

2.5 Impact of Not Changing

2.5.1 The impact of not progressing this scheme would be:

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

Congestion, Delay and Poor Journey Times

- 2.5.2 The existing issues of congestion, delay and poor journey times will continue to worsen, impacting the operational performance of Junction 3 and the wider highway network within its vicinity, including Junction 31, the A1260 Nene Parkway and Malborne Way.
- 2.5.3 Table 2.4 beneath compares the delay and total travel time through Junction 3 in 2018 (Base scenario) and in 2031 (Do Minimum scenario). The data highlights the operation of Junction 3 will deteriorate if nothing is implemented.

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

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

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

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

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

Likelihood of Accidents will Increase

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

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

- 2.5.8 Junction 3 provides the main access to the Hampton Township, which contains many large businesses and residential developments, which will all be affected by its operation. As traffic, queueing, and delays increase, it is likely that the area will become gridlocked in peak times. Businesses and their employees in this area will become increasingly frustrated with the difficulty in accessing and exiting their premises and may look to relocate or work elsewhere.
- 2.5.9 This may also have a detrimental impact on the Council's objective for Peterborough to be an attractive place to live and work. If residents and employees experience increased journey times around the City when accessing employment opportunities, they may choose to work elsewhere. In addition, companies looking to relocate to the city may instead consider other towns and cities with better transport conditions.
- 2.5.10 The location of Junction 3 on the main route into Peterborough from the A1 (M) and southwest, and the impact of delay and congestion on the A1139 Fletton Parkway (often queuing back to Junction 17 of the A1 (M) during PM peaks) means that issues at this junction have an impact across the whole City, and also on strategic long-distance trips using the A1139 to transition from the A1 (M) and the A47.

Active Transport Network Will Not Serve User's Needs

- 2.5.11 The potential for active travel is greatest when good quality and coherent routes are provided. Gaps have been identified in the active travel infrastructure around Junction 3, which may result in less active mode uptake in the area.
- 2.5.12 The A1139 Fletton Parkway acts as a barrier to active travel, although there are crossing points for non-motorised users at the overbridge to the west and beneath the bridge to the east. Gaps identified in the active travel network include routes that feed these crossing points. The potential uptake in active travel trips will be suppressed if these crossing points are not made easily accessible.
- 2.5.13 If north / south active travel is suppressed, use of the nearby business parks and shopping centres will be discouraged.

2.6 Internal Drivers for Change

- 2.6.1 Internal drivers for change are the factors which are driving the need for change, and come from the scheme promoter, such as aspirations for growth, or to increase network resilience. In this instance the scheme promoters are the CPCA and Peterborough City Council.
- 2.6.2 The internal drivers for improvements at Junction 3 come from levels of deprivation for the city, local growth aspirations, the support provided by the CPCA to enable growth to be realised, and recent policy adoptions emphasising active travel.

Index of Deprivation

- 2.6.3 As highlighted in the introduction, Peterborough's population has grown considerably over recent years, with levels of growth being significantly higher than the national average and other counties within the region.
- 2.6.4 The socio-economic growth of the city has not kept pace with population growth, resulting in the city being reported as one of the 'most deprived' areas within the country and CPCA region¹⁸, in relation to income deprivation and income disparity¹⁹.
- 2.6.5 Figure 2.9 beneath shows residential areas of the city by Index of Multiple Deprivation (2019)²⁰. Areas in dark red are amongst the top 10% most deprived in England and areas of dark green are amongst the 10% least deprived.

¹⁸ [Peterborough.pdf \(cambridgeshireinsight.org.uk\)](#)

¹⁹ Office of National Statistics, English indices of deprivation 2019

²⁰ [CDRC Mapmaker: Deprivation Indices \(IMD\) \(English 2019 IMD \(E19\)\)](#)

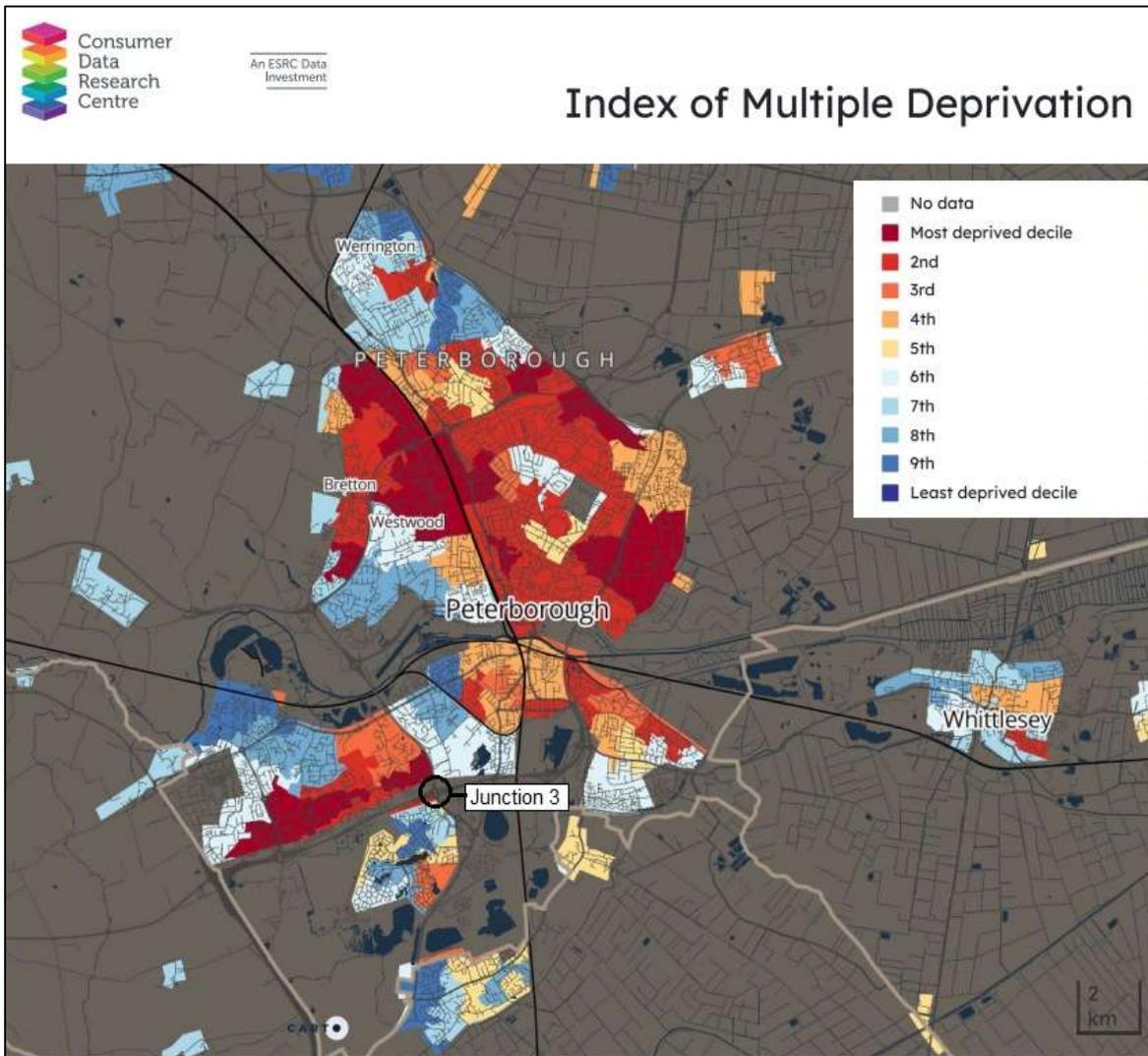


Figure 2.14: 2019 Index of Multiple Deprivation (Consumer Data Research Centre)

- 2.6.6 As highlighted in Figure 2.14, residential areas surrounding the City Centre rank amongst the top 40% of the most deprived in the country, whilst residential areas surrounding the study area are shown to vary from the top percentile to the 6th percentile for deprivation within Peterborough.
- 2.6.7 The deprivation issues of Peterborough have been acknowledged by government with the city being categorised as a ‘Priority One Area’ within the context of the Levelling Up Agenda. This allocation demonstrates investment is required within the city to tackle economic differences and drive prosperity, enabling socio-economic opportunities to be realised. The £4.8 billion Levelling Up Fund will allow Peterborough and other Priority One areas to be prioritised for investment into local infrastructure, essentially ‘levelling up’ left behind regions of the UK.

Local Growth Aspirations

- 2.6.8 Peterborough is forecast to experience significant employment and population growth over the next few decades, reflecting a continuation of past trends. The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities, and objectives for Peterborough for the period up to 2036. The updated strategy identifies the required delivery of 19,440 new homes and 17,600 new jobs by 2036²¹, a significant proportion of which is located in the Hamptons immediately to the south of Junction 3. This level of growth will in turn further strengthen the City's economy, contribute to regional growth, and increase the demand for travel on the local network.
- 2.6.9 Peterborough strives to become a 'destination of choice', to be continually recognised as a regional centre and economic partner with Cambridge. With the attractiveness of the City set to increase as a place to live, work and travel, this in turn creates pressure in relation to housing and employment growth, which in turn increases the strain on the transport infrastructure. Improving the transport infrastructure to enable Peterborough's strong history of growth to continue is the main internal driver for change at Junction 3.
- 2.6.10 The Local Transport Plan identifies Junction 3 as a key scheme for introducing infrastructure requirements that are needed to address existing capacity constraints on the network and those that are required to cater for the travel demand arising from the growth ambitions of the City.
- 2.6.11 Similarly, findings from The Long Term Transport Strategy (LTTS) which feeds into the Peterborough Local Plan identifies the A1139 Fletton Parkway and The Serpentine / Phorpres Way roundabout as key locations for scheme improvements. With such locations directly connected to Junction 3, future schemes are likely to further mitigate the impact of growth and improve traffic conditions to the south of the City.
- 2.6.12 It is acknowledged that if no changes are made to existing congestion and journey time issues on major routes across the City, then growth aspirations will be compromised.

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

Combined Authority Support

- 2.6.13 The CPCA has identified a number of strategic projects which it believes will provide transformational benefits for the area. The feasibility study for Junction 3 Improvements was one of the studies shortlisted as a priority, beginning in 2017.
- 2.6.14 The CPCA recognises that the development of a wider, multi-year pipeline of transport schemes can also contribute towards its objectives. The benefits of such a pipeline include:
- The provision of a steady flow of transport improvements over the short, medium and long-term including potential strategic projects of the future
 - Greater opportunity to consider local issues and spread investment around the Combined Authority area
 - Early investment in the development of schemes places the Combined Authority in a strong position to bid for and secure additional funding as alternative sources become available.
- 2.6.15 In order to populate the pipeline of work, feasibility studies and technical assessment of potential schemes of schemes needs to be undertaken and business cases produced. These are essential steps in defining an improvement and securing funding for its realisation.
- 2.6.16 At the onset of the Junction 3 project in October 2017, the CPCA methodology for prioritising investment was based on the criteria shown in Table 2.5 beneath.

Table 2.5: Combined Authority Criteria

Dimension	Criteria
Strategic	<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

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

Adoption of Gear Change Policy and LTN 1/20 Guidance

- 2.6.18 In July 2020 DfT published the 'Gear Change: A Bold Vision for Cycling and Walking' strategy, announcing £2 billion of new funding for improving walking and cycling infrastructure across the UK, enabling active travel to become the 'natural choice for journeys by 2030', as stated in the strategy vision²².
- 2.6.19 This new national guidance for highway authorities places greater importance on active travel, introducing higher design standards for implementing new and improving existing infrastructure.
- 2.6.20 The Local Transport Note (LTN 1/20), a key tool for delivering the strategy, was adopted by PCC in October 2020 placing greater emphasis on incorporating active travel schemes or improvements within larger highway schemes. Under the adoption it is acknowledged that where government funding is sought after by local authorities for schemes where the main element is not walking and cycling, 'there is a presumption that schemes must deliver or improve infrastructure to standards outlined in the LTN 1/20 guidance to secure funding'²³.
- 2.6.21 The recent publication and adoption of these strategies by the CPCA and PCC has diversified the scope of highway schemes for the City of Peterborough. The adoption of LTN 1/20 has resulted in three active travel schemes being incorporated into the overall Junction 3 project, including measures to extend the existing shared use provisions, create new footpaths on missing links within the wider network and increase safety for active travel users by installing additional crossing points.

2.7 External Drivers for Change

- 2.7.1 External drivers for change come from outside of the scheme promoter's organisation, and include factors such as public opinion, legislative changes or as a response to other events.
- 2.7.2 There are no direct external drivers for change behind the Junction 3 improvement schemes, however there are several other factors relating to Malborne Way and wider employment areas that support the case for investment at Junction 3. These are discussed overleaf.

²² [Gear change: a bold vision for cycling and walking \(publishing.service.gov.uk\)](#).

²³ [LCWIP \(Aug 21\) \(peterborough.gov.uk\)](#).

Malborne Way Quality of Life

- 2.7.3 Malborne Way provides vehicle access to residential areas in Orton Malborne. During the PM peak hour, the congestion and delay at Junction 3 results in many drivers choosing to re-route via Malborne Way and use less appropriate residential and local distributor roads.
- 2.7.4 This reduces the quality of life for residents of Orton Malborne, as the otherwise quiet road is flooded with traffic during the peak periods. Improvements to Junction 3 should reduce the need for vehicles to re-route along Malborne Way, and thus improve the quality of life for residents.
- 2.7.5 Figure 2.12 shows the through-route used along Malborne Way in Red, and the strategically preferred route via Junction 3 in Blue.

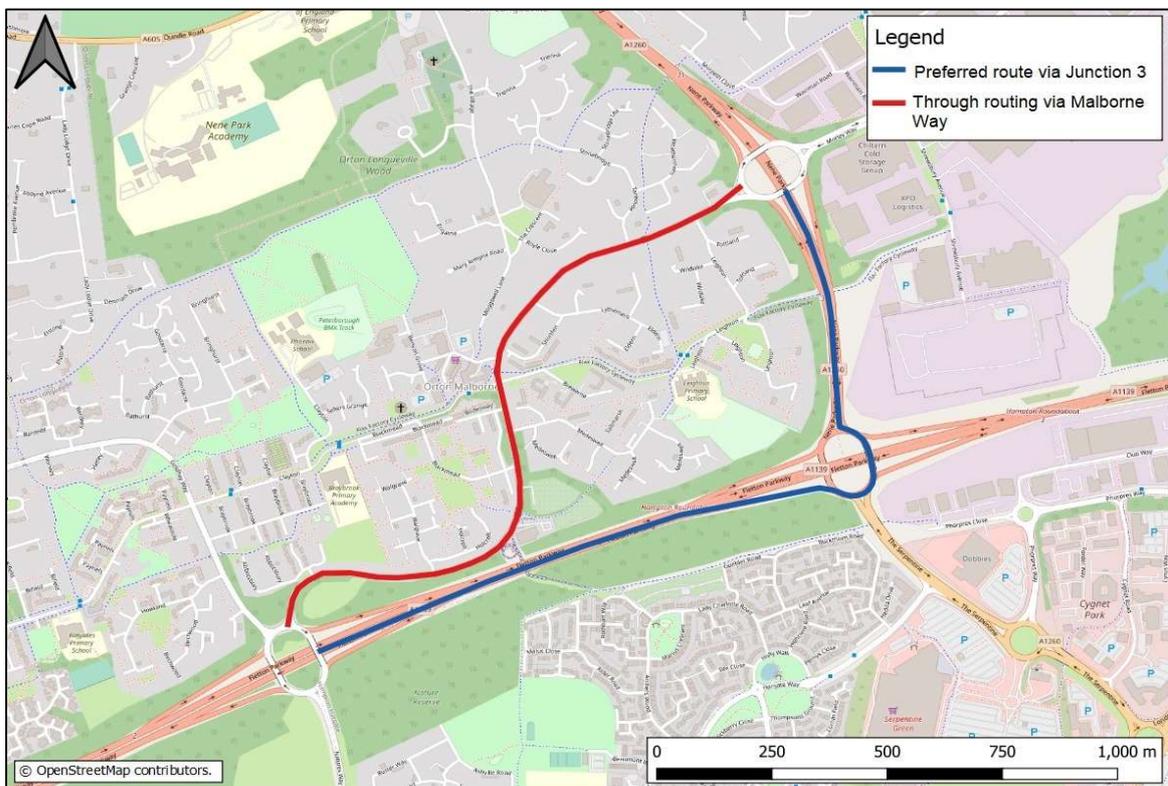


Figure 2.15: Through-Route via Malborne Way compared to the Preferred Route via Junction 3

Employment Areas

- 2.7.6 Junction 3 acts as a gateway to a large residential and employment area known as Hampton. The Hampton Township has been developed over the past 25 years and is identified for a significant proportion of residential and employment growth in the Local Plan for the next 15 years. Table 2.6 below summarises information about recent and planned developments in the area²⁴.

Table 2.6: Development in the Hampton Area

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

- 2.7.7 Table 2.6 demonstrates that Junction 3 is a key location for growth in Peterborough. Improvements will be necessary to accommodate the full growth ambition. If peak hour journey times are not improved around Junction 3, it could inhibit the operation of current and prospective businesses, resulting in restriction to their growth which could ultimately cause them to relocate.
- 2.7.8 Lynchwood Business Park, whilst not located in the study area, will also benefit from improvements to Junction 3. Commuters travelling between the north of Peterborough and Lynchwood often use A605 Oundle Road as an alternative to the Parkway Network and Junction 3.
- 2.7.9 Ideally commuters to Lynchwood would use the Parkway Network (and thus Junction 3), as the parkway is better suited to the traffic volumes than the A605 Oundle Road. Improvements to Junction 3 should attract trips from Oundle Road, which benefits both the Lynchwood commuters and the other users of the A605 Oundle Road (including residents and schools, as well as non-motorised users).

²⁴ [Peterborough Local Plan \(Adopted version\)](#).

2.8 Scheme Objectives

Strategic Objectives

- 2.8.1 A transport scheme can have both primary and secondary objectives. The primary objectives are the fundamental outputs required from the scheme and therefore must be achieved. Secondary objectives are other outputs that may be achieved but are not necessary to the success of the scheme.
- 2.8.2 The objectives for the Junction 3 Improvement Schemes were developed ahead of the option development workshop to provide a framework for participants of the workshop, through which the relative benefits and disadvantages of the proposed options could be discussed. The objectives are based on the goals and outcomes from local policy documents such as the Peterborough Local Plan.
- 2.8.3 Although these objectives pre-date those of the CPCA as previously discussed in this chapter, work has been undertaken to build upon the objectives and ensure they align with those of the CPCA. The primary and secondary objectives for the Junction 3 scheme are listed beneath.
- 2.8.4 Primary objectives include:
1. **Tackle Congestion and Improve Journey Times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3.
 2. **Support Peterborough's Growth Agenda:** Ensure that the planned employment and housing growth within Hampton is promoted whilst providing for future demand.
 3. **Protect and Improve Biodiversity Within the Study Area:** Mitigate any adverse impact of a scheme and ensure biodiversity net gain within the study area.
 4. **Improve Active Travel Routes to Provide a Viable Alternative to Private Car Travel:** Ensure that the scheme provides a comprehensive network of pedestrian and cycling routes where needed.
 5. **Improve Road Safety:** Reduce accidents and improve personal security for all travellers around the junction.
- 2.8.5 Secondary objectives include:
6. **Positively Impact Traffic Conditions on the Wider Network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as the A1260 Nene Parkway and Malborne Way.

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

SMART Objectives

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

2.8.8 The Primary SMART objectives are:

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

2.8.9 Secondary objectives include:

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

2.9 Measures of Success

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

Table 2.7: Study Objectives and Measures of Success

Objective	Scheme Outcome	Measure of Assessment
Tackle congestion and improve journey times	<ul style="list-style-type: none"> To reduce congestion and journey time delays on the primary approaches to Junction 3 	<ul style="list-style-type: none"> Traffic surveys to be conducted within the study area Comparison of existing and future journey times for key approaches of Junction 3
Support Peterborough's growth agenda	<ul style="list-style-type: none"> To increase capacity at Junction 3, to ensure successful delivery of committed and statutory development in Hampton catering for existing and future traffic demand 	<ul style="list-style-type: none"> Preferred scheme to be assessed against future traffic growth.
Protect and improve the biodiversity value within the study area	<ul style="list-style-type: none"> Increase biodiversity through planting and landscaping as part of the scheme delivery. 	<ul style="list-style-type: none"> Post-scheme review of biodiversity gain compared to pre-scheme situation.
Improve Active Travel routes to provide a viable alternative to private car travel	<ul style="list-style-type: none"> To improve the quality and cohesion of active travel routes around Junction 3. 	<ul style="list-style-type: none"> Audit of existing and post scheme active travel provision.
Improve road safety	<ul style="list-style-type: none"> To reduce delay and journey times on Malborne Way, positively impacting the interaction between A1260 Nene Parkway and Malborne Way. 	<ul style="list-style-type: none"> Comparison of existing and future accident rates on the approaches to Junction 3.
Positively impact traffic conditions on the wider network	<ul style="list-style-type: none"> To reduce traffic flows along Malborne Way. 	<ul style="list-style-type: none"> Traffic surveys to be conducted along Malborne Way.

2.10 Constraints

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

Table 2.8: Constraints and Measures of Mitigation

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

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

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

Table 2.9: Table of Required Powers and Approvals

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

2.11 Scope

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

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

2.12 Interdependencies

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

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

2.13 Key Risks

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

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

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

Funding Limitations

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

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

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

Environmental Constraints

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

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

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

COVID-19 (Legacy)

- 2.13.7 There is a risk that the legacy of COVID-19 on travel patterns could undermine the need for the scheme should traffic levels remain significantly below those observed when the scheme was identified and developed prior to the pandemic.
- 2.13.8 Constant monitoring of traffic levels has been in place across Peterborough throughout the COVID-19 pandemic and has been used to assess the impact of the pandemic on traffic levels on Peterborough's highway network.
- 2.13.9 Figure 2.13 overleaf shows traffic data from a permanent monitoring site located on the A1260 Nene Parkway approach / exit from Junction 3. The data is from March 2020 through to November 2022, and shows that traffic levels have remained consistent and stable for much of 2022, and there is now little fluctuation due to the pandemic.

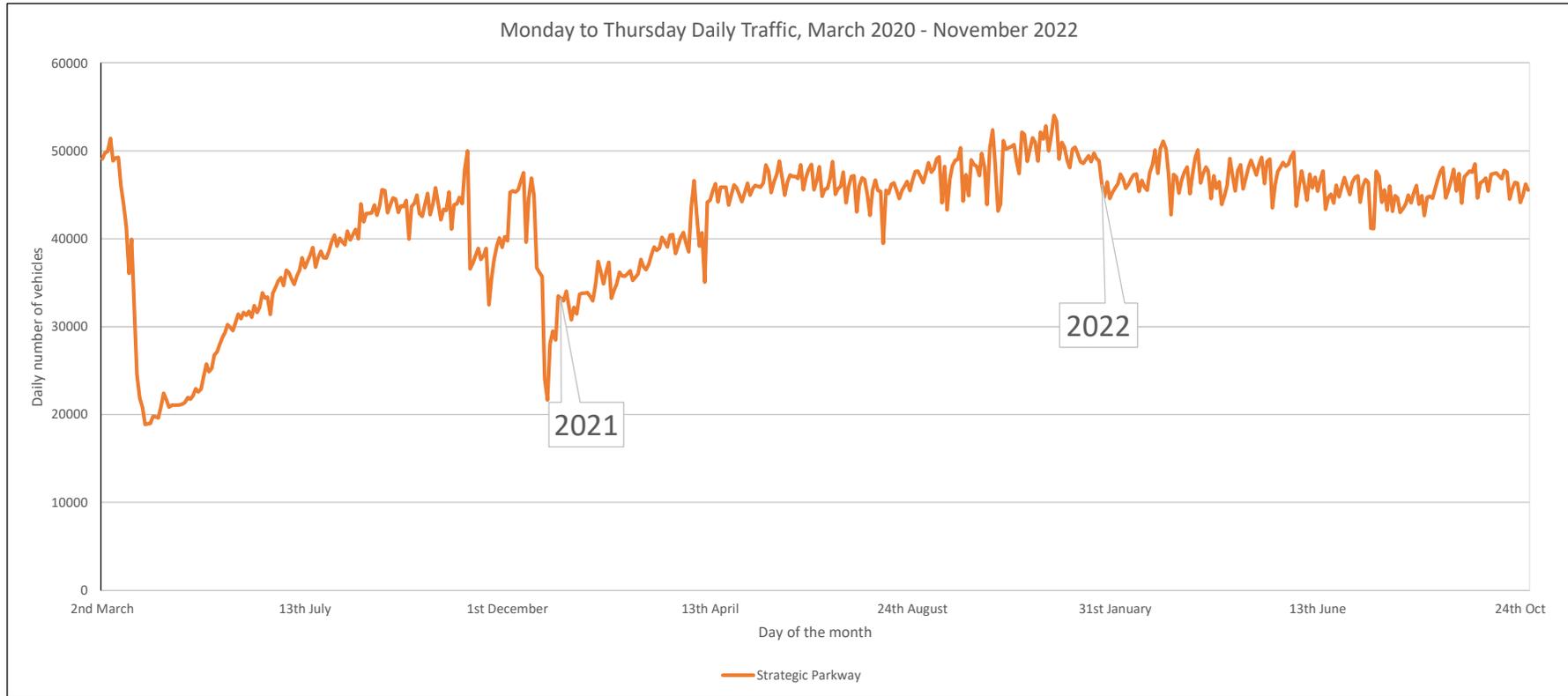


Figure 2.16: COVID-19 Traffic Monitoring - A1260 Nene Parkway

- 2.13.10 Figure 2.13 shows a clear reduction in demand on the A1260 Nene Parkway at Junction 3 during the early phases of the pandemic, and that this was consistently below the pre-COVID-19 levels of approximately 52,000 vehicles a day (24-hour flow). Traffic levels began to rise as government restrictions levelled off during 2022 and are now consistent with minimal fluctuation.
- 2.13.11 Traffic flows since March 2022 (when restrictions were lifted) are generally within 95% of pre-pandemic levels. This increase in traffic has resulted in the return of congestion and significant queuing at Junction 3. Figure 2.14 shows peak hour queuing captured during site visits on the 17th of March 2022.
- 2.13.12 The image on the left shows queues during the AM peak hour extending back along the A1260 The Serpentine approach to the Tesco / Serpentine shopping centre roundabout located approximately 460m to the south.
- 2.13.13 The image on the right highlights the PM peak hour southbound queue on the A1260 Nene Parkway approach to Junction 3.



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

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

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

2.14 Stakeholders

2.14.1 The key stakeholders for the Junction 3 Scheme are:

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

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

Stakeholder Consultation

- 2.14.3 Stakeholder consultations were undertaken by the Project Team following the approval of the OBC. All key stakeholders were consulted via email or letter for comments on the Preferred scheme design.
- 2.14.4 Responses to the consultation primarily focused on the environment, including drainage in relation to the close proximity to the Orton Pit SSSI and SAC, biodiversity as Junction 3 is located in a Red Zone for the protected species of Great Crested Newts, as well as the need for wider improvements to active travel.
- 2.14.5 The environment and biodiversity were discussed with Natural England. As the statutory regulator for the adjacent SSSI and SAC, Natural England were provided with a series of scheme drawings (in March 2022), including vegetation clearance, groundworks, and drainage designs.
- 2.14.6 Initial concerns set forward by Natural England focused on drainage and the potential of pollution to the sites water courses and soil. As a result of the construction and operation of the Junction 3 works. If pollution were to occur, it would negatively impact the sensitive water chemistry present within the confines of the Orton Pit SSSI and SAC. The recommendation from Natural England was that a Habitat Regulation Assessment (HRA) screening is to be undertaken to further assess if the design is likely to have significant effect on the SSSI and SAC. This has been done, and results from the HRA have been provided to Natural England and the application for consent is being reviewed.
- 2.14.7 Additional comments from Natural England were received in relation to Great Crested Newts, as extensive populations are known within the immediate vicinity of Junction 3. The species are afforded protected status under the Wildlife and Countryside Act 1981 (schedule 5 and 8) and the Conservation of Habitats and Species Regulations 2017 (as amended), and it was advised that the appropriate licences are required prior to construction along with a Precautionary Method of Working (PMoW) for GCN'S. The PMoW states that works will be programmed during GCN active season (March – September) and that any habitat manipulation will be carried out under the supervision of a suitably qualified Ecologist, who either holds a low-class impact licence or a surveying and handling licence for the species.
- 2.14.8 Stakeholder consultation with active travel groups also emphasised the opportunities to improve active travel connections around Junction 3, and this resulted in the addition of the Malborne Way and Shrewsbury Avenue active travel schemes.

Public Consultation

- 2.14.9 Public consultation on the concept of a scheme at Junction 3 was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan²⁵ that was adopted in January 2020. This consultation made residents of the City aware that Junction 3 had been identified as a location for improvements. It should be noted that no details on the form of the scheme were provided at the time of the consultation and that no objections relating to the principle of improvements to Junction 3 were received.
- 2.14.10 Public perceptions of the Preferred Scheme were then assessed following the approval of the OBC (July 2020) and prior to the commencement of Detailed Design. The online consultation featured on the PCC website and social media for a six-week period (between the 21st October – 4th December 2020), and presented the scheme identified at OBC and Preliminary Design.
- 2.14.11 In addition to the online consultation exercise, 62 individual properties located within close proximity to Junction 3 (including Hedda Drive and Buckthorn Road in Hampton Hargate) were contacted via letter during the consultation period. The letter provided residents with details of the online consultation and invited them to comment.
- 2.14.12 One comment was received during the consultation period in relation to the 3rd lane on the A1260 The Serpentine northbound approach, north of Hargate Way', voicing concerns about difficulties faced when exiting Hargate Way, and how proposed changes along the A1260 The Serpentine may impact drivers from the residential area further.
- 2.14.13 Design changes were made during Detailed Design and the extension of the existing flare on the A1260 is now unlikely to impact the operation of the A1260 The Serpentine / Hargate Way junction as vehicles exiting will experience no change to conditions.
- 2.14.14 Monitoring of the junction will be undertaken at regular intervals and is included with the scheme monitoring and evaluation plan. If the monitoring identifies an issue at the junction, then further consideration will be given to potential improvements.
- 2.14.15 More information regarding the design changes from Preliminary to Detailed Design are discussed in Section 2.17.
- 2.14.16 It should be noted that the public consultation outlined above did not include the final design for the Phorpres Way active travel improvements, nor did it include the Malborne Way and Shrewsbury Avenue improvements. This was due to design for Phorpres Way being developed during later phases of the design work, and additional active travel improvements being identified as the project has progressed to FBC phase. This is in line with the greater emphasis placed on active travel improvements by both the Council and the CPCA.

²⁵ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>.

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

2.15 Scheme Development

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

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

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

Table 2.10: Junction 3 Long List of Options

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

EAST Assessment

- 2.15.4 The EAST assessment was used to assess the Long List of options against the scheme objectives identified in the Strategic Dimension, and to refine this to a Short List of options that were taken forward for technical assessment as described in the OAR.
- 2.15.5 The options were scored against the following CPCA and PCC objectives using the EAST framework. Scores were based on the discussion and collective opinion of the workshop delegates. The objectives against which the options were scored are shown in Table 2.11 overleaf.

Table 2.11: Scheme Objectives

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

Shortlisting Summary

- 2.15.6 Table 2.12 summarises the EAST assessment and which options have been shortlisted for progression to the OAR.
- 2.15.7 It should be noted that the option ‘to improve lane markings on the roundabout circulatory and reduce circulatory speeds’ will not be assessed as a standalone option, however it will be included within the final scheme design.

Table 2.12: Options Shortlisting Summary

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

Technical Assessments

- 2.15.8 The shortlisted options were assessed using a purpose built AIMSUN microsimulation model. The traffic model was constructed to represent the morning (AM) Peak hour from 08:00 to 09:00, and an evening (PM) peak hour from 17:00 to 18:00, in order to represent the most congested time periods. These peak periods were defined from the traffic surveys undertaken at the site in 2018.
- 2.15.9 A 2018 base model was built using current traffic data at the junction. The model was then validated and calibrated to ensure it represented the traffic conditions experienced by drivers on this part of the network.
- 2.15.10 To understand traffic conditions in future years, growth factors were derived from the DfT's Trip End Model Presentation Program (TEMPro). Future year models were built using these growth factors for 2021, 2026 and 2031 scenarios.
- 2.15.11 The results from the Do Minimum (without scheme) modelling showed that the worst delays and longest travel time in both the AM and PM peak hours for the 2026 and 2031 forecast years were on the A1260 Nene Parkway southbound approach. The A1260 The Serpentine northbound approach also experienced significant delays and long travel times in both forecast years.
- 2.15.12 The modelling then assessed each of the shortlisted options to determine which were the best performing and most appropriate to select as the Preferred Option. Full details of the modelling can be found in the OAR and the LMVR.

Preferred Option

- 2.15.13 The modelling results confirmed that many of the shortlisted options would have a positive impact on the operation of Junction 3 in the forecast years of 2026 and 2031. However, no single option provided a suitable solution to address all of the issues identified at Junction 3, and so several of the options were packaged together to form the Preferred Scheme.
- 2.15.14 The Preferred Scheme, as it stood at OBC, included the following improvements:
- Create a third southbound lane on Nene Parkway from Junction 31 to Junction 3.
 - Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a third lane.
 - Signalisation of the A1260 Nene Parkway approach to Junction 3, with a 4-lane approach.
 - Signalisation of the A1260 The Serpentine approach to Junction 3, with a 4-lane approach.
 - Create a third lane on the A1260 The Serpentine northbound approach, extending approximately 200 metres back from Junction 3.

2.16 Scheme Development Since OBC

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

Table 2.13: Preferred Option Amendments Since Preliminary Design

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

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

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

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

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



Figure 2.18: Area of Level Difference.

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

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

Table 2.14: Aimsun Modelling Lane Gian Sensitivity Test

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

- 2.16.7 The removal of the lane gain is shown to provide benefit to all approaches of Junction 3 in relation to both delay and journey times across both the AM and PM peak hours. In 2031 the total junction delay is reduced by 190 seconds (3 minutes 10 seconds) in the AM peak hour and 63 seconds (1 minute 3 seconds) in the PM peak hour under the 'without lane gain' scenario.
- 2.16.8 The greatest saving in delay resulting from this change is experienced on the A1260 Nene Parkway approach, with a 173 seconds (2 minutes 53 seconds) reduction.
- 2.16.9 The impact of the lane gain removal on delay along Malborne Way is also shown to be minimal, with a decrease of 9 seconds shown in the AM peak hour and 5 seconds in the PM peak hour, for those travelling eastbound. For motorists travelling westbound an increase of 4 seconds delay is expected in the AM peak hour, and a decrease of 4 seconds delay in the PM peak hour. In the PM peak, the total travel time for vehicles is less in the 'without lane gain' scenario for both eastbound and westbound movements.
- 2.16.10 Results from the LinSig modelling shown in Table 2.15 concurs with the modelling from AIMSUN Next detailed above, highlighting a benefit in the 'without lane gain scenario'.

Table 2.15: LinSig Modelling Lane Gain Sensitivity Test

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

- 2.16.11 Table 2.15 shows the AM peak hour sees an increase in Practical Reserve Capacity (PRC) at the junction in the 'without lane gain' scenario, whilst the PRC in the PM peak hour remains the same across both scenarios.
- 2.16.12 It was concluded from the LinSig modelling that the removal of the lane gain arrangement on the A1260 Nene Parkway would have no significant effect on the spare capacity of Junction 3 and would not have a negative impact on the operation of the Junction.
- 2.16.13 The final step to understanding the impact of removing the lane gain from the scheme was to assess the impact on the Scheme Benefit to Cost Ratio (BCR) and value for Money category.
- 2.16.14 The BCR reported in the Junction 3 Outline Business Case was 3.251, which reflects 'High Value for Money'. The Economic Assessment for the 'without lane gain' scenario was updated using the Junction 3 AIMSUN Next model outputs, and the scheme cost reduced by £500,000 to reflect the reduction in construction costs associated with the lane gain element.

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

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

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

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

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

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

2.17 Carbon Assessment

- 2.17.1 CPCA and PCC have committed to combat climate change and PCC aim to achieve 'Net Zero' carbon emissions by 2030. Preliminary and detailed design carbon assessments have been undertaken for the main Junction 3 Improvement Scheme in accordance with the following commitment from the Council's Carbon Management Action Plan (Council CMAP) 2021: "Develop detailed carbon assessments for major highway projects and use the information to influence the final design." Preliminary Design carbon assessments have also been undertaken for the 3 Active Travel Schemes linked to this project: Phorpres Way, Malborne Way, and Shrewsbury Avenue.
- 2.17.2 The purpose of the preliminary design carbon assessments was to baseline the construction carbon cost of the schemes early in the design process and highlight 'hotspot' areas where carbon reduction efforts needed to be focused. The detailed design carbon assessment was undertaken to highlight carbon reductions achieved primarily through value engineering and using less carbon intensive materials. It has also provided an updated carbon footprint to demonstrate where construction phase carbon reduction initiatives need to be focused and provides the foundation for future workshops.
- 2.17.3 The preliminary design baseline carbon cost of the main Junction 3 Improvement Scheme was **1,490 tCO₂e**. This was reduced to **1,276 tCO₂e** after completion of detailed design (Figure 2.20). This represents a carbon reduction of **214 tCO₂e (-14%)**, which is equivalent to 43 return flights from London to Sydney using direct flights. This was achieved primarily through value engineering. It is also worth noting that certain increases in carbon output for the detailed design phase assessments may be attributed to having more information available for carbon accounting. Although this can partly mask the impacts of certain carbon reduction initiatives, it does increase the accuracy of the assessment and ensures efforts are focused in the correct areas during future stages (Figure 2.19). Breakdowns of the preliminary design carbon assessments for the 3 Active Travel Schemes (Phorpres Way: 240 tCO₂e, Shrewsbury Avenue: 47 tCO₂e, and Malborne Way: 123 tCO₂e) are also presented below.

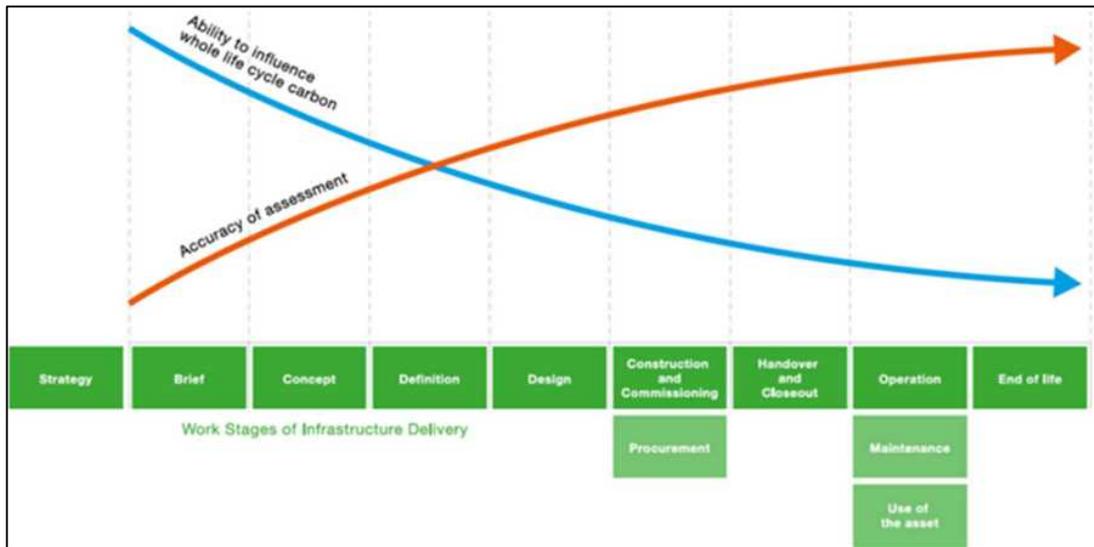


Figure 2.19: Relationship Between Work Stages, Assessment Accuracy and Ability to Influence Whole Life Cycle Carbon. Source: Green Construction Board

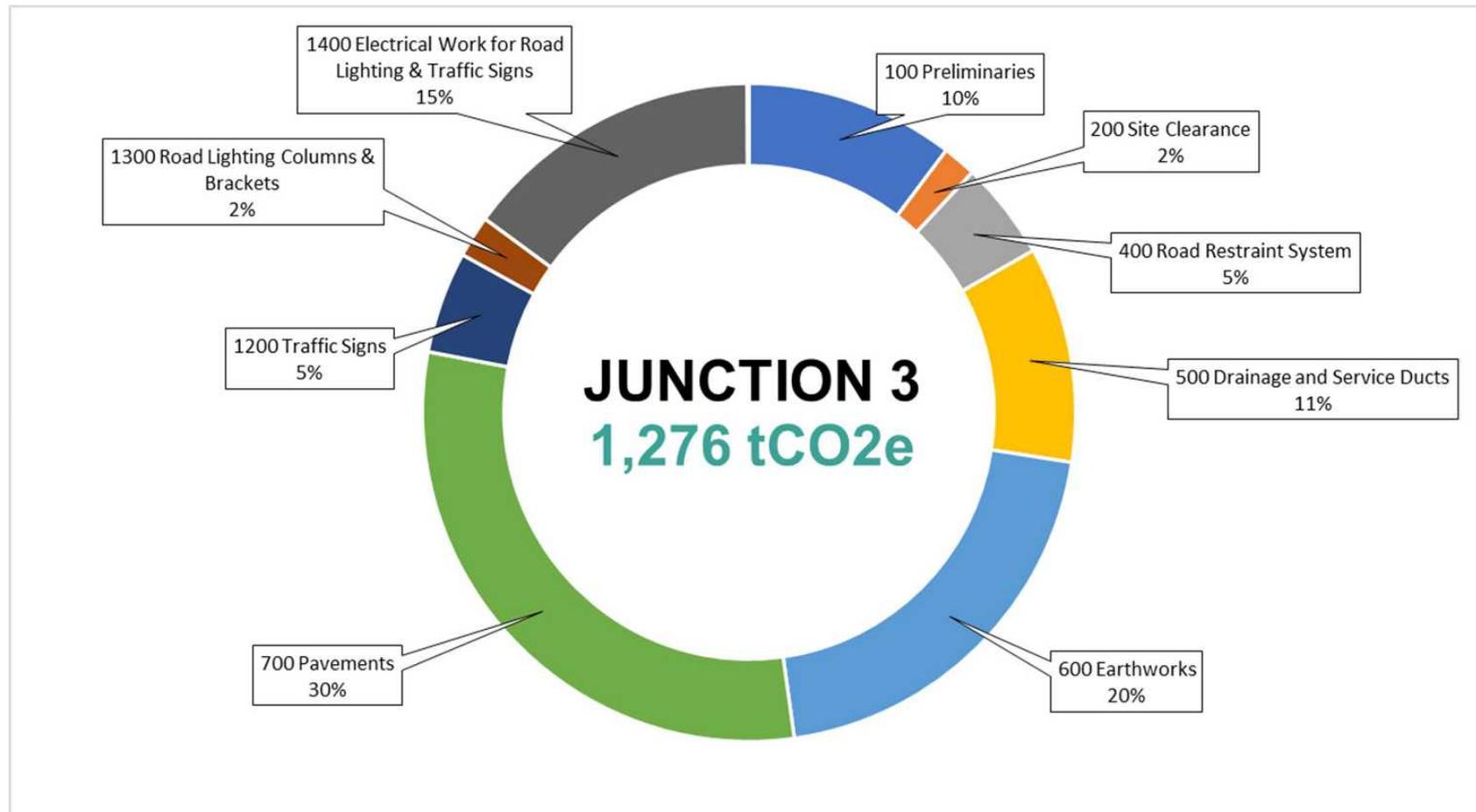


Figure 2.20: Junction 3 Improvement Scheme Detailed Design Carbon Footprint by Work Activity Series



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

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

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

Junction 3:

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

Phorpres Way:

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

Shrewsbury Avenue:

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

Malborne Way:

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

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

Table 2.17: Carbon Footprints at Preliminary and Detailed Design Stages

Scheme	Preliminary (tCO ₂ e)	Detailed (tCO ₂ e)	% change
Junction 3	1490	1276	-14%
Phorpres Way	240	-	-
Shrewsbury Avenue	47	-	-
Malborne Way	123	-	-
Total	1900	-	-

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

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

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

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

Activity	Carbon Output (tCO ₂ e)	Potential Carbon Reduction Measures
Imported Acceptable material Class 6P in embankments and other areas of fill	114.5	<ul style="list-style-type: none"> • Re-use site-won material as fill • Use recycled alternative • Identify closest approved supplier(s)
Cement Bound Granular Material Base Course to Clause 822 - Minimum C8/10 or T3 210mm thick in carriageway, hardshoulder and hardstrip	74.0	<ul style="list-style-type: none"> • Use of Cold Recycled Bound Materials • Use of geotextiles to reduce base depth
CASC+ 68+ PSV Surface Course 50mm in carriageway, hardshoulder and hardstrip	63.9	<ul style="list-style-type: none"> • Use of ‘SuperLow’ asphalt • Use of asphalt with higher RAP content
Trench for duct not exceeding 300mm wide, depth not exceeding 1500mm in verges/unmade ground SL	52.9	<ul style="list-style-type: none"> • Use of electric plant • Use of Hydrotreated Vegetable Oil (HVO) fuel
CASC+ 58 PSV Surface Course 50mm in carriageway, hardshoulder and hardstrip	50.9	<ul style="list-style-type: none"> • Use of ‘SuperLow’ asphalt • Use of asphalt with higher RAP content
Imported Acceptable material Class 6F4 in embankments and other areas of fill	49.7	<ul style="list-style-type: none"> • Re-use site-won material as fill • Use recycled alternative • Identify closest approved supplier(s)
AC 20 Dense Bin 40/60 Binder Course to Clause 929 270 thick (laid in three layers) in carriageway, hardshoulder and hardstrip	44.8	<ul style="list-style-type: none"> • Use of Cold Recycled Bound Materials • Use of asphalt with higher RAP content
Precast concrete chamber 1200mm internal diameter with D400 cover/frame, depth exceeding 1m not exceeding 2m in verge	43.0	<ul style="list-style-type: none"> • Use of recycled plastic alternative • Retain and re-use existing assets
375 mm internal diameter UPVC drain on bed Type S, in trench, depths to invert not exceeding 2 metres	39.4	<ul style="list-style-type: none"> • Use of recycled aggregates for bedding • Use of ducting with higher recycled content
Safety barrier, N2W2, designed to be impacted on one side only, straight or curved exceeding 120m radius	36.7	<ul style="list-style-type: none"> • Re-use existing barrier • Use of steel with higher recycled content
AC 20 Dense Bin 40/60 Binder Course to Clause 929 110 thick (laid in two layers) in carriageway, hardshoulder and hardstrip	36.2	<ul style="list-style-type: none"> • Use of Cold Recycled Bound Materials • Use of asphalt with higher RAP content
Pre-Cast Concrete Kerb Splay 255x914x125mm (SP) laid straight or curved exceeding 12 metres radius	32.2	<ul style="list-style-type: none"> • Use of Durakerb products • Use of concrete with higher GGBS content
Trapped gully specified design group PERCS Appendix D3 with D400 grating and frame	32.2	<ul style="list-style-type: none"> • Use of recycled plastic alternative • Retain and re-use existing assets
Sub-Contractors General Prelim Construction	31.2	Mains power connection for welfare

Contractors General Prelim Construction	31.2	<ul style="list-style-type: none">· On-site renewable energy solutions· Use of HVO fuel within diesel generators
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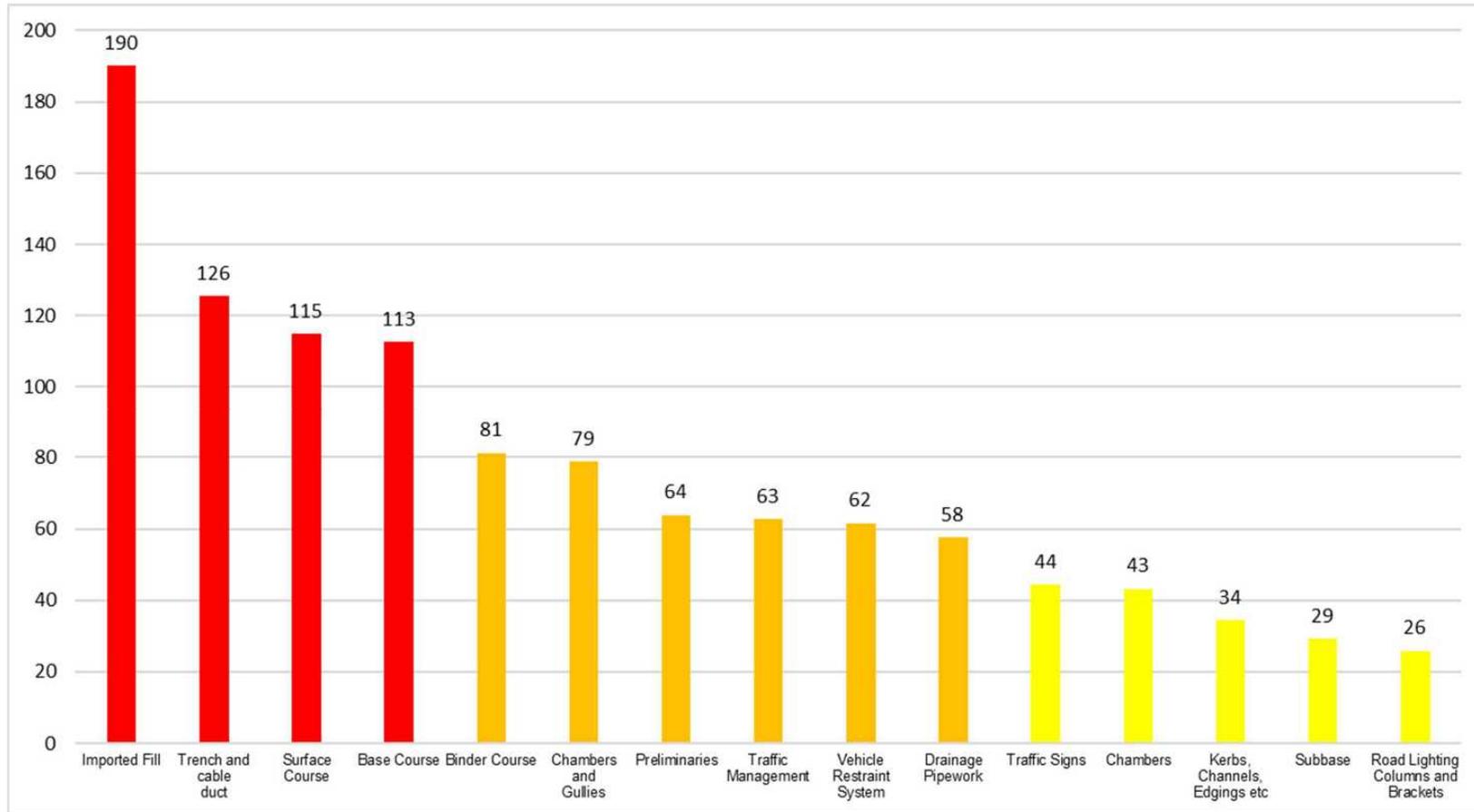


Figure 2.22: Junction 3 Detailed Design Carbon Footprint By Work Activity

- 2.17.9 It is recommended that a carbon reduction workshop is arranged at the earliest opportunity to help collaboratively identify further initiatives which could be considered for implementation. It is advised that this is coordinated at the earliest opportunity with representation from client, design, principal contractor, and supply chain organisations. Linked to the carbon 'hotspots' identified above, the workshop should focus on construction phase carbon reduction initiatives for Junction 3, and detailed design value engineering options for the active travel schemes. This will provide an opportunity to develop a carbon reduction plan for the schemes incorporating clear actions, responsibilities, and deadlines to ensure effective implementation of carbon reduction measures which also deliver cost savings. In all cases, construction will prioritise non-hazardous, reused, refurbished, recycled, and recyclable equipment and materials within specification, and those made from renewable sources with low(er) embodied energy, carbon footprint and water footprint.
- 2.17.10 The data generated from these carbon assessments can also be used to quantify the potential carbon savings associated with such interventions. This helps to ensure that we get the greatest carbon reductions for any additional expenditure required though, overall, it is anticipated that there will be a cost saving associated with such initiatives. For example, a simple switch to Hydrotreated Vegetable Oil (HVO) during the construction phase of the main Junction 3 works could save up to 308 tCO₂e (24% of detailed design footprint) and £14,321 (based on November 2022 fuel rates).
- 2.17.11 As has been achieved for Junction 3 through detailed design, the principles of 'Build Less' and 'Build Clever' should always be embedded within the design development of a scheme to help drive the most significant carbon reductions possible (Figure 2.23). In the interest of continuous improvement, this reinforces the importance of undertaking the initial carbon assessment and workshop at the earliest opportunity when there is sufficient information available (i.e. BoQ). It should also be noted that there are operational phase carbon savings associated with the Junction 3 improvements and associated active travel schemes which have not yet been quantified, such as reducing congestion and idling traffic, and promoting active travel instead of driving. The intention is to quantify these aspects more effectively as suitable carbon accounting methods are developed and agreed.

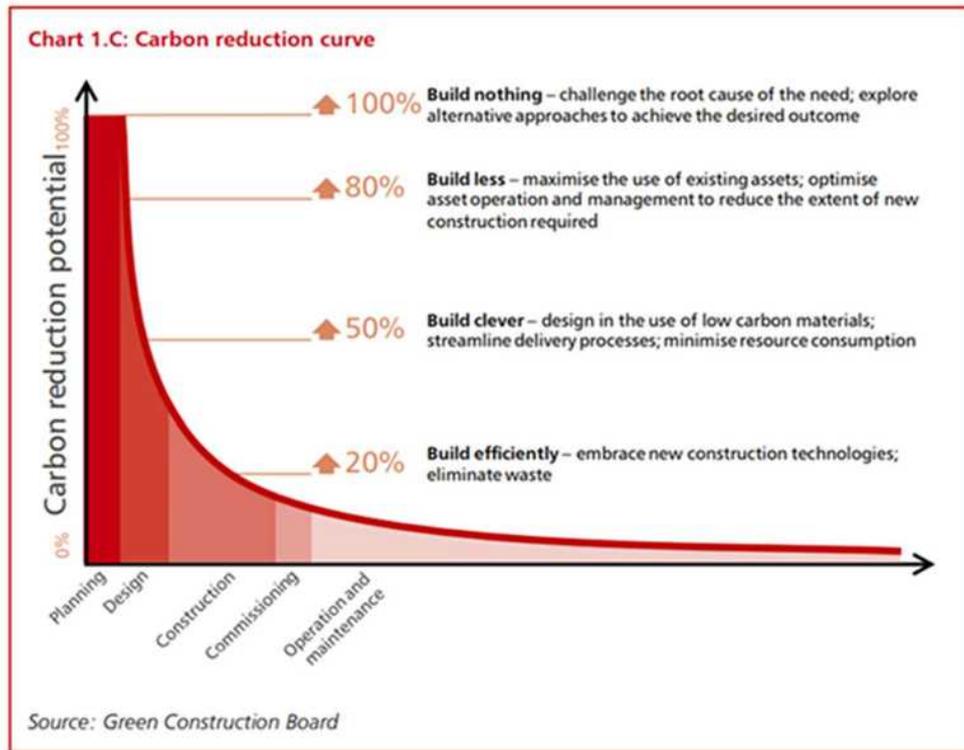


Figure 2.23: Relationship Between Work Stages and Carbon Reduction Potential

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

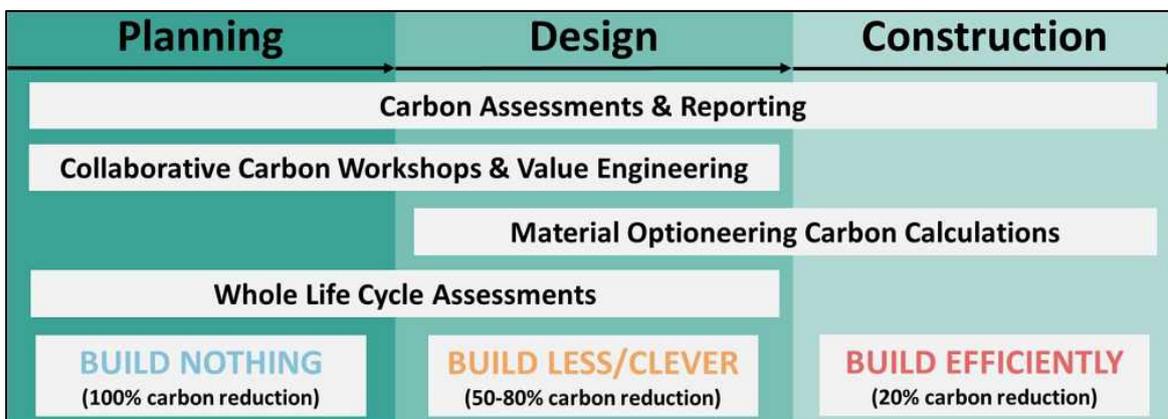


Figure 2.24: Project Lifecycle Carbon Reduction Process

3. Economic Dimension

3.1 Introduction

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

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

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

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

3.2 Options Appraised

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

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

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

3.3 Economic Assessment

Approach to Appraisal

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

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

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

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

3.4 Present Value Costs

- 3.4.1 A robust scheme cost estimate has been produced based on the Detailed Design information. The Base Investment Costs are detailed in Table 3.1 below, and the subsequent steps taken to calculate the Present Value Costs (PVC) are described beneath.
- 3.4.2 The benefits assessment was undertaken over a 60-year appraisal period from the scheme opening year (2024 to 2084), with costs included from 2022 through to 2085. Further detail about the scheme costs is provided within the Financial Dimension.
- 3.4.3 The Base Investment Cost is the capital cost required to construct the scheme in current year (2022) prices, without a risk allowance or optimism bias. This is derived from the scheme cost estimate based on design information and early contractor involvement (ECI) and is the building block for all subsequent cost calculations. All Sunk Costs (those already incurred) have been omitted from the economic assessment in line with TAG unit A1.2.
- 3.4.4 Table 3.1 shows the Base Investment Cost profiled in line with the construction programme, and broken down into Construction, Land, Preparation and Supervision, and Other costs.

Table 3.1: Base Investment Cost (2022 Prices)

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

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

²⁶ [Turner & Townsend raises inflation forecast to 8.5% \(theconstructionindex.co.uk\)](https://www.theconstructionindex.co.uk)

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

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

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

Table 3.2: Economic Dimension Scheme Cost Estimate

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

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

3.5 Present Value Benefits

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

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

Transport User Benefits

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

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

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

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

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

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

- 3.5.7 The model output files were then entered into the Transport User Benefits Appraisal (TUBA, 1.9.17) software to undertake the Economic Assessment and calculate a BCR.
- 3.5.8 The annualisation factors shown below in Table 3.3 were used within TUBA to calculate the likely annual transport user benefits for the AM, Inter, and PM peak hours. The figures have been derived using data from nearby National Highways (formerly Highways England) WebTRIS data and local ATC data from 2017, compared against the survey data.

Table 3.3: TUBA Annualisation Factors

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

- 3.5.9 TUBA produces figures for a number of benefits, including Greenhouse Gases, User benefits, and Indirect taxation. Indirect taxation often provides a negative benefit figure. This is a result of the reduced fuel being purchased as journeys become more efficient with the improvements. This in turn reduces the money the government receives in fuel taxes.
- 3.5.10 This identifies the Present Value Benefits (PVB) to be £13,471,000. A breakdown of the TUBA benefits can be seen in Table 3.4 beneath.

Table 3.4: TUBA Benefits Breakdown

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

- 3.5.11 The breakdown of benefits demonstrates that the scheme is anticipated to have a positive impact on greenhouse gas emissions (£143,000). There is a disbenefit of - £163,000 to indirect taxation as a result of improved journey times reducing fuel consumption which is directly taxed by central government.
- 3.5.12 TUBA also provides data on where the benefits of the scheme are found including but not limited to; benefits by time saving and benefits by distance. These benefits are broken down by vehicle type and journey purpose to best understand who benefits from the scheme.
- 3.5.13 Table 3.5 below shows the time benefits saving by vehicle.

Table 3.5: Non-Monetised Time Benefits by Time Saving

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

- 3.5.14 Table 3.5 shows that car users experience the greatest time benefit from the implementation of this scheme and that within car users, those that are undertaking 'other' journeys (not for business or commuting) experience the greatest impact.
- 3.5.15 Table 3.5 also shows that the majority of journey time savings are between 0 to 2 minutes, followed by 2-5 minutes. Time savings greater than 5 minutes are experienced by HGVs only, and to a very small degree (3,000 person hours)
- 3.5.16 The TUBA benefits arising from each time period are shown in Table 3.6 below.

Table 3.6: Transport User Benefits by Time Period

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

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

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

Table 3.7: Non-Monetised Time Benefits by Distance

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

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

Accident Benefits

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

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

Environment Benefits

- 3.5.22 Changes in greenhouse gas emissions, air quality, and noise have been quantitatively assessed and monetised, with and without scheme.
- 3.5.23 The TUBA assessment estimated £143,000 benefits relating to a reduction of 1,711 tonnes of untraded CO₂ emissions and 8 tonnes of traded CO₂ emissions across all three modelled time periods over a 60-year appraisal period.
- 3.5.24 The combined AMATs estimated £5,650 benefits relating to Greenhouse Gas Reductions over the 20-year appraisal period of the active travel improvements, and £790 of Noise benefits.
- 3.5.25 Air quality and noise impact assessments had also been undertaken and the quantitative results of which had been used within the Air Quality Valuation and Noise Workbooks. The air quality and noise impact assessments used 24-hour AADT and 18-hour AAWT total vehicular flow, % HGV, and speed data extracted from the SATURN models as input.
- 3.5.26 Baseline noise surveys were undertaken in line with the Calculation of Road Traffic Noise (CRTN) using the 1988 Shortened Measurement method. All surveys have been carried out by suitably qualified acousticians.
- 3.5.27 Road traffic noise calculations have been carried out in accordance with the methodology set out in the Department for Transport's Memorandum 'Calculation of Road Traffic Noise' using SoundPLAN noise modelling software.
- 3.5.28 Existing receptor locations have been considered and used to establish the change in the daytime LA_{10,16h} noise levels. As per TAG Unit A3, the results have been converted to LA_{eq} 16h (07:00 to 23:00 hours) to avoid overlap with the L_{night} period (23:00 to 07:00). Predictions were generated for the following scenarios:
- 3.5.29 Short Term Assessment – Do Minimum scenario in the opening year against the Do Something scenario in the opening year (2026).
- 3.5.30 Long Term Assessment (With Scheme) – Do Minimum scenario in the opening year against the Do Something scenario in the future (opening + 15) year (2036 – latest available modelled year).
- 3.5.31 Long Term Assessment (Without Scheme) – Do Minimum scenario in the opening year against the Do Minimum scenario in the future (opening +15) year (2036 – latest available modelled year).
- 3.5.32 The impact magnitudes scales for road traffic noise have been determined based on the guidance within the DMRB LA 111 (Rev 2) and mitigation options presented, if required.

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

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

3.5.34 The following scenarios have been assessed:

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

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

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

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

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

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

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

Active Travel

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

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

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

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

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

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

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

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

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

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

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

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

3.5.47 Table 3.9 beneath summarises the benefits for each scheme.

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

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

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

Benefits Summary

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

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

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

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

3.6 Benefit Cost Ratio

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

Table 3.11: DfT VfM Categories

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

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

Table 3.12: Junction 3 Study Improvements AMCB Table

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

Value for Money Statement

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

3.7 Scheme Risks, Sensitivities and Uncertainties

Risks

- 3.7.1 Sensitivity tests have been undertaken to understand the robustness of the Junction 3 Improvement Schemes BCR against key risks and common DfT sensitivity scenarios.
- 3.7.2 A full record of the risks associated with this project are captured in the Project and Construction Risk Registers included in Appendix A.
- 3.7.3 The key risks identified for this project include programme delays which affect the availability of funding (TCF funding is time limited) and higher than expected costs associated with the creation of a third lane along the A1260 The Serpentine approach due to level differences.

Sensitivity Testing

- 3.7.4 Sensitivity tests have been undertaken to confirm the robustness of the business case in a number of eventualities. These eventualities can affect the benefits (such as changes to forecast trips from high and low levels of growth) or the costs (such as a greater proportion of risk being realised).
- 3.7.5 A summary of each of the sensitivity tests undertaken is provided beneath along with the resultant BCRs, and full details on the sensitivity tests undertaken are provided in the Junction 3 Sensitivity Testing Technical Note which is included in Appendix C.

Cost Sensitivity Test

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

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

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

Low Growth

- 3.7.7 The Low Growth sensitivity test assesses the impact of a reduced number of forecast motor vehicle trips in the SATURN forecast mode.
- 3.7.8 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would still offer Very High Value for Money in a Low Growth scenario with a BCR of 7.258.

High Growth

- 3.7.9 The High Growth sensitivity test assesses the impact of an increased number of forecast motor vehicle trips in the SATURN forecast model.
- 3.7.10 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money in a High Growth scenario with a BCR of 9.253.

Reduced Accident Benefits

- 3.7.11 The Reduced Accident Benefits sensitivity test assesses the impact on the total PVB if the benefits by accident saving are reduced by 50%.
- 3.7.12 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 4.267 should the predicted accident savings benefits be severely reduced.

No Accident Benefits

- 3.7.13 The No Accident Benefits sensitivity test assesses the impact of removing the accident saving benefits from the PVB.
- 3.7.14 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer High Value for Money with a BCR of 2.039 if accident benefits were excluded from the monetary assessment.

Low Active Travel Uptake

- 3.7.15 The Low Active Travel Uptake sensitivity test assesses the impact of reducing the number of new active travel users assumed in the Active Mode Appraisal Toolkit.
- 3.7.16 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 6.367 should the actual uptake in active travel be less than forecast in core scenario.

High Active Travel Uptake

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

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

Reduced AMAT Appraisal Periods

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

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

Increased AMAT Appraisal Periods

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

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

Low Environment Values

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

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

High Environment Values

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

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

Sensitivity Test Summary

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

Table 3.14: Sensitivity Test Summary

Sensitivity Test	PVB (£,000)	PVC (£,000)	NPV (£,000)	BCR	VfM
Core	48,991	7,543	41,449	6.49	Very High
Low Growth	54,743	7,543	47,200	7.25	Very High
High Growth	69,793	7,543	62,250	9.25	Very High
Reduced Accident Benefits	32,188	7,543	24,645	4.26	Very High
No Accident Benefits	15,384	7,543	7,841	2.03	High
Low Active Travel Uptake	48,022	7,543	40,480	6.36	Very High
High Active Travel Uptake	49,912	7,543	42,369	6.61	Very High
Reduced AMAT Appraisal Period	47,970	7,543	40,427	6.36	Very High
Increased AMAT Appraisal Period	49,902	7,543	42,359	6.61	Very High
Low Environment Values	48,836	7,543	41,294	6.47	Very High
High Environment Values	49,457	7,543	41,914	6.55	Very High

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

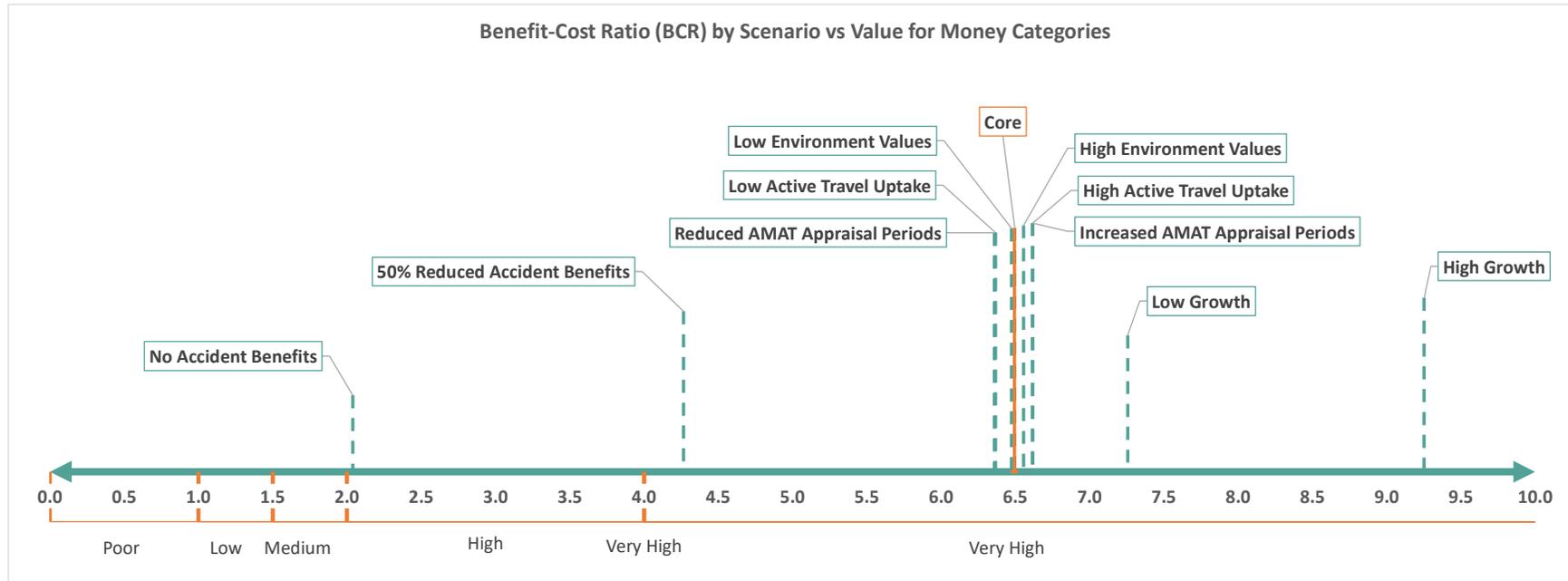


Figure 3.1: Sensitivity Test BCR Ranges

3.8 Distributional Impacts

- 3.8.1 The quantitative distributional impacts of the package have been considered to understand the variance of transport user benefits across social groups using grading outlined in TAG Unit A4.2 Distributional Impact Appraisal.
- 3.8.2 The transport user benefits have been assessed against the Income Deprivation domain from the latest English Indices of Multiple Deprivation (IMD 2019), as shown in Table 3.15 below.

Table 3.15: Distributional Impact Appraisal

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

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

3.9 Additional Qualitative Assessments

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

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

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

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

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

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

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

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

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

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

Landscape Impacts

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

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

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

²⁷ [TAG UNIT A3 Environmental Impact Appraisal \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/414812/TAG_UNIT_A3_Environmental_Impact_Appraisal.pdf)

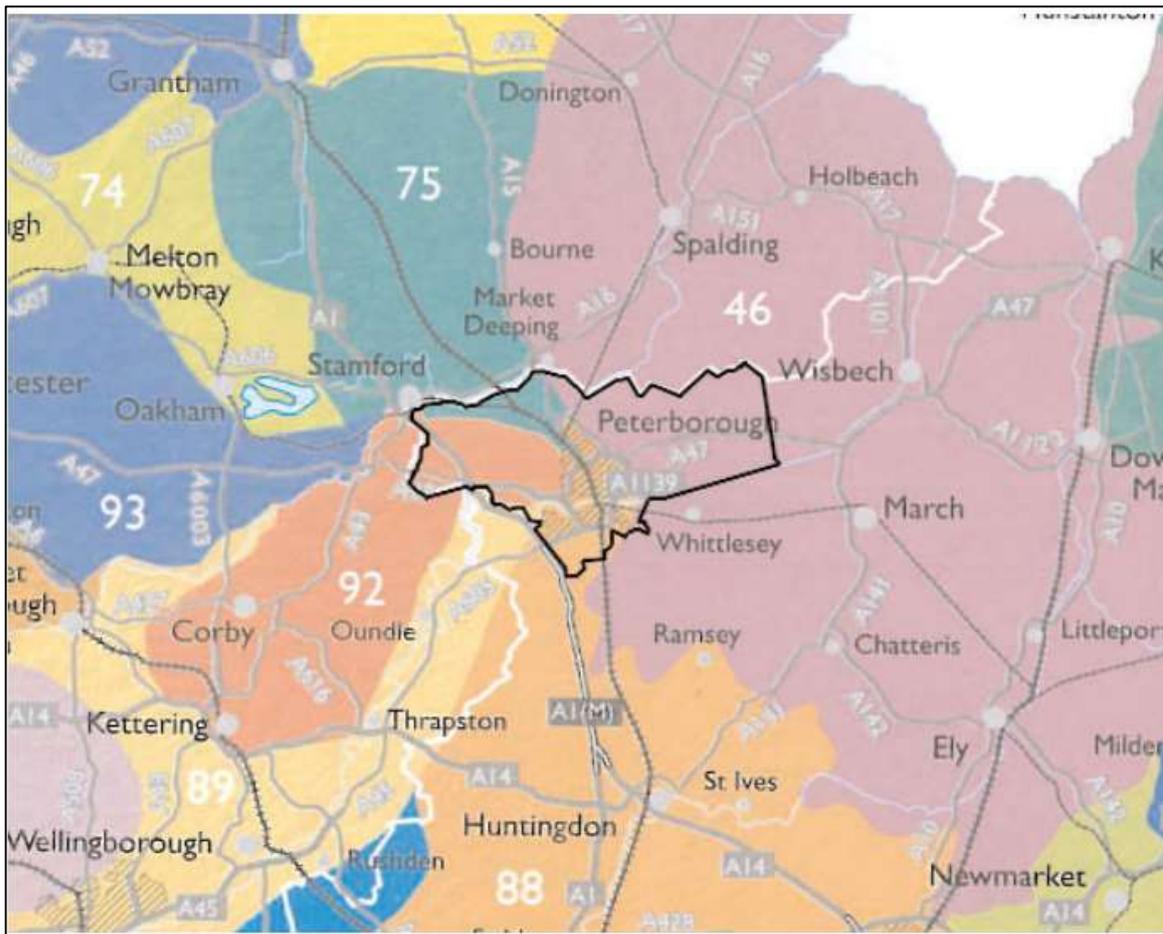


Figure 3.2: National Character Areas

3.9.10 On a smaller scale the Peterborough Landscape Character Assessment (LCA) undertaken in 2007 identified six landscape character areas within the City, as displayed within Figure 3.4 overleaf. The LCA provided guidance on the character and local distinctiveness of the landscape within these areas and assessed the landscape in terms of its sensitivity to change and ability to accept development. The six landscape character areas are²⁸:

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

²⁸ [Peterborough Local Plan \(Adopted version\)](#)

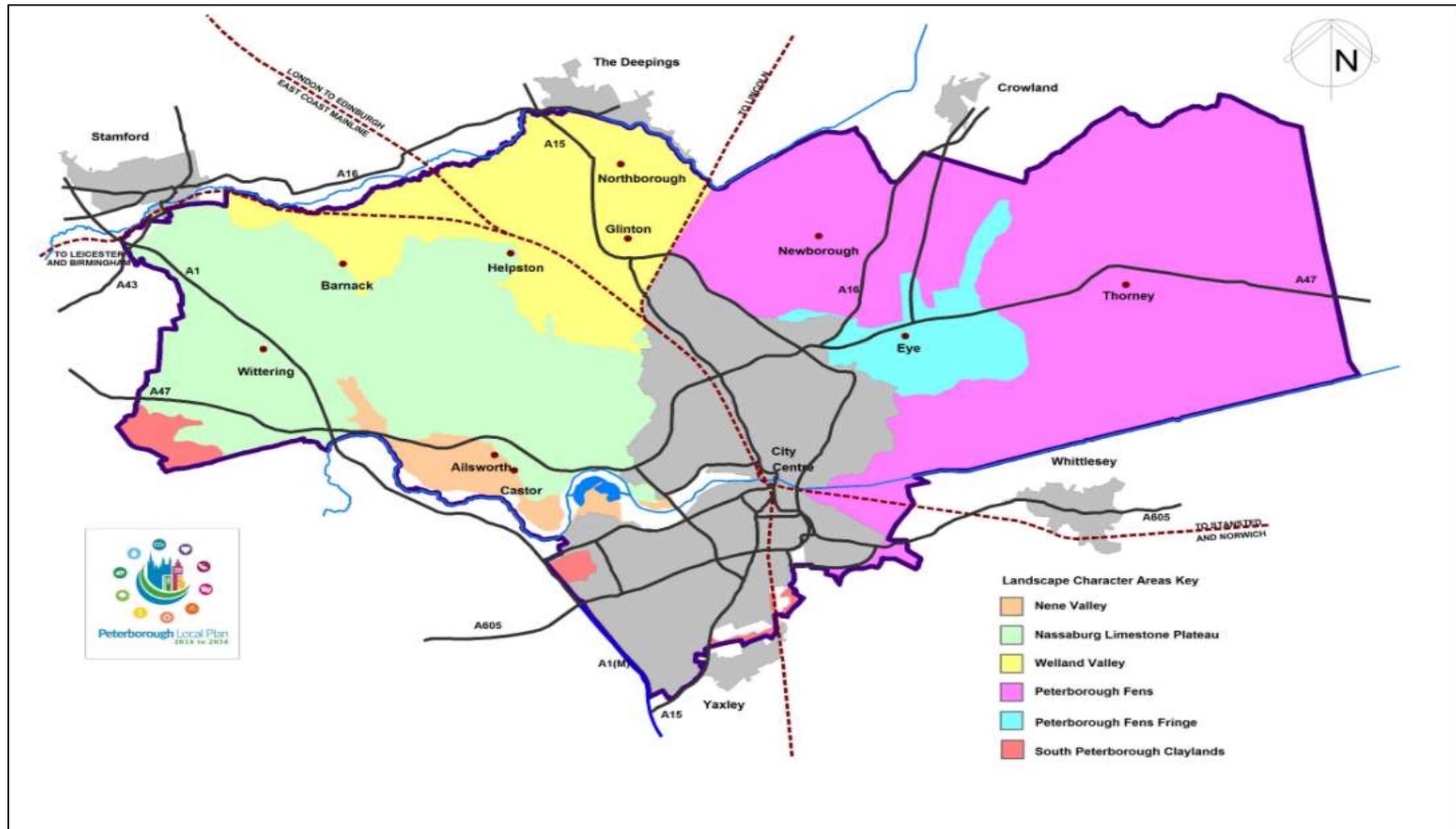


Figure 3.3: Peterborough Landscape Character Areas

- 3.9.11 Most of the urban area of Peterborough (indicated in grey above), within which Junction 3 is situated, lies on the South Peterborough Claylands. The clays have been a resource for the brick industry, which overtime has mostly disappeared and been replaced by development.
- 3.9.12 The study area surrounding Junction 3 is located near to residential boundaries of Orton Malborne to the north-west and Hampton Hargate to the south-west, as well as industrial areas to the north-east along Shrewsbury Avenue and commercial areas of The Serpentine Green Shopping Centre to the south.
- 3.9.13 The grade separated interchange layout is typical of infrastructure found across the City, resulting in the landscape characteristic of the junction being not locally distinctive. Despite this, the landscape surrounding junction 3 does hold local importance in regard to the screening effect on its embankments. This is particularly seen to the north of the junction and along the A1139 Fletton Parkway embankments where linear groups of mature shelterbelts can be found. To the south of the junction more ornamental planting and managed landscaping is present, providing the setting for the shopping centre and surrounding retail outlets.
- 3.9.14 The trees along the A1139 Fletton Parkway and to the north of Junction 3 typically comprises of a shelterbelt for the residential areas of Orton Malborne and Hampton Vale. These shelterbelts are formed by semi-mature, mass planting of species such as Ash, Sycamore, Field Maple, Cherry, Hawthorn, Hazel and Dogwood trees. These trees provide an important screening function for residential receptors.
- 3.9.15 Increased exposure of the highways infrastructure from the result of tree loss will likely lead to a perceived increase in noise levels and reduced tranquillity. Options for retaining more trees / vegetation and replacement planting on site are being carefully explored, and other trees and vegetation will be retained in accordance with the Arboricultural Method Statement.
- 3.9.16 Overall, it is expected that there will be a slight adverse effect on Landscape.

Townscape Impacts

- 3.9.17 The Junction 3 Improvements have been assessed as having a slight beneficial (positive) impact on the surrounding townscape.
- 3.9.18 Townscape is the physical and social characteristics of the built and non-built urban environment, as well as the perception of those characteristics. It is the combination of these that make up and contribute to townscape character and 'sense of place'.
- 3.9.19 Physical characteristics include development form of buildings, structures, and spaces. Social characteristics are determined by how physical characteristics are used and managed.

- 3.9.20 The Townscape character of the area is a busy, active and urban highways interchange, to the south of the city centre. There is a presence of significant development within the surrounding area consisting of residential, commercial, and/or light industrial buildings and facilities.
- 3.9.21 The proposed schemes will retain the essential townscape character of the area whilst promoting active travel by expanding the pedestrian and cycleway network and improving safety and connectivity.

Historic Environment Impacts

- 3.9.22 The man-made historic environment ('heritage', or heritage resource, heritage assets) comprises of:
- Buildings of architectural or historic significance
 - Areas, such as parks, gardens, other designed landscapes or public spaces, remnant historic landscapes and archaeological complexes
 - Sites, such as ancient monuments, places with historical associations such as battlefields, preserved evidence of human effects on the landscape, and archaeological sites.
- 3.9.23 The historic environment includes the sense of identity and place that the combination of buildings, areas and sites provides. Characteristics of the historic environment can contribute to local identity and be representative of an area's distinctiveness. They can be significant within the study area of a scheme as a result of form, rarity, or historical associations, with appreciation of characteristics changing with time.
- 3.9.24 Listed Buildings and Conservation Areas, and their settings, have statutory protection under the Planning (Listed Buildings and Conservation Areas) Act 1990. A Listed Building may not be demolished, altered, or extended in any manner which would affect its character or setting without Listed Building Consent. There are three grades of listing: • Grade I – buildings of exceptional interest • Grade II* - particularly important buildings of more than special interest • Grade II – buildings of special interest. Conservation Areas manage and protect the special architectural and historic features that make a place unique. Higher building design quality is required to ensure the area can be preserved, and character and appearance improved.
- 3.9.25 Figure 3.4 show the historic features within a 1km radius of Junction 3.

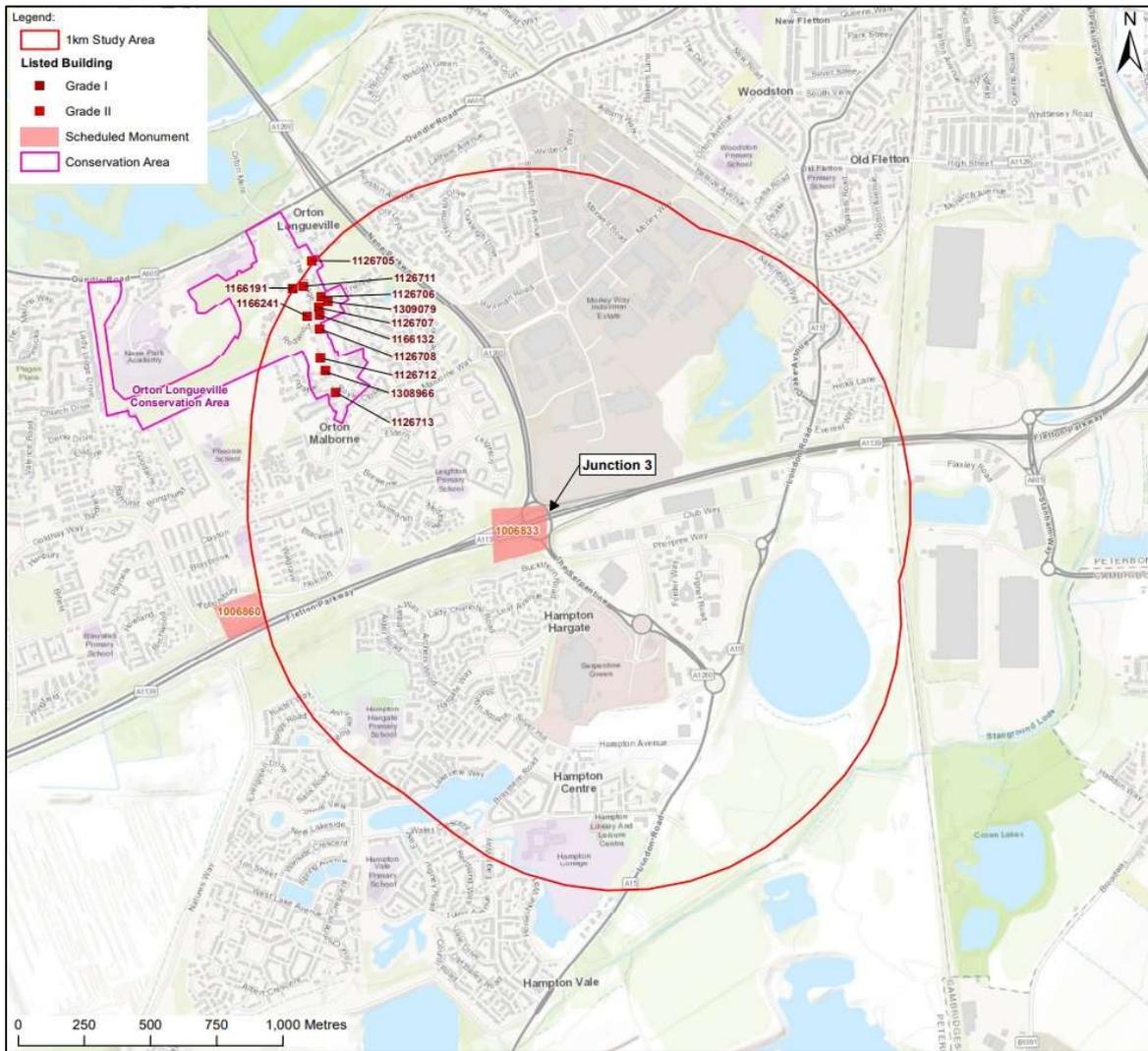


Figure 3.4: Historic Environment Within 1km Radius of Junction 3

- 3.9.26 As shown above there is one Scheduled Monument (NHLE 1006833), one Conservation Area (Orton Longueville) and 12 Listed Buildings; 11 Grade II and one Grade I within 1km of Junction 3.
- 3.9.27 The Conservation Area of Orton Longueville was designated in October 1970 and includes the historic core of the village, which holds positive townscape elements, The Grade I Listed Church of the Holy Trinity dates from c.1275 and is considered of high heritage importance due to its architectural and historical interest. These elements, which are detailed further in Table 3.16, are not impacted as a result of the proposed scheme at Junction 3.

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

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

- 3.9.28 The nearest of these designated heritage assets is the Scheduled Monument NHLE 1006833; a ‘Romano-British Settlement SE of Orton Longueville’, which is situated directly underneath the western side of current junction’s roundabout. This site was scheduled following archaeological excavations undertaken in the 1970’s prior to the construction of the parkway. At the time a total of 1.4ha was excavated prior to road construction, however it remains unclear what archaeological remains may have survived within the area following the construction of the parkway. At present the setting of the monument is one of road infrastructure, and no remains of the monument are visible above ground.
- 3.9.29 The Heritage Impact Appraisal for the scheme concluded that the proposed development would not impact on the setting of the scheduled monument, especially considering that this does not contribute to its heritage significance. Buried archaeological remains associated with the Scheduled monument are not expected to fall within the footprint of the scheme. A Scheduled Monument Consent will need to be obtained for the works regardless due to the proximity of the feature.
- 3.9.30 Recent Archaeological investigations in the immediate area surrounding the scheme have produced no significant archaeological features or artefacts.

- 3.9.31 If archaeological remains were to be uncovered onsite within undisturbed pockets of land, a slight adverse impact on the historic environment would be realised, however the impact on such remains will be mitigated against through the implementation of an archaeological programme of work (e.g., watching brief of all new ground disturbance / strip, map and record methodology to be followed). This would be agreed with key PCC stakeholders such as The Council's Archaeologist and Principal Conservation Officer and aligned with the Local Plans LP19 policy and subsequent Archaeology policy statements.
- 3.9.32 Overall, the impact to the historic environment from the proposed scheme is considered to be a neutral effect. Historic England have been consulted throughout the Detailed Design phase, gaining the necessary consent for constructing within the boundary of the identified Scheduled Monument.

Biodiversity Impacts

- 3.9.33 The Junction 3 Improvement Schemes have been assessed as having a neutral impact of biodiversity.
- 3.9.34 TAG appraisal of biodiversity focuses on the effects of transport schemes on biodiversity and earth heritage (geological) interests.
- 3.9.35 Policy LP28 (Biodiversity and Geological Conservation) of the Peterborough Local Plan states that for:
- International Sites – Proposals having an adverse impact on the integrity of such areas, that cannot be avoided or adequately mitigated to remove any adverse effect, will not be permitted other than in exceptional circumstances. Such circumstances include no suitable alternatives, imperative reasons of overriding public interest, and necessary compensatory provision can be secured
 - National Sites – Development proposals within or outside an SSSI, likely to have an adverse effect on an SSSI, will not normally be permitted unless the benefits of the development, at this site, clearly outweigh both the adverse impacts on the features of the site and any adverse impacts on the wider network of SSSIs
 - Local Sites – Developments likely to have an adverse effect on locally designated sites will only be permitted where the need and benefits of the development clearly outweigh the loss and the coherence of the local ecological network is maintained
 - Habitats and Species of Principal Importance – Where adverse impacts are likely, development will only be permitted where the need for and benefits of the development clearly outweigh these impacts. In such cases, appropriate mitigation or compensatory measures will be required.

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

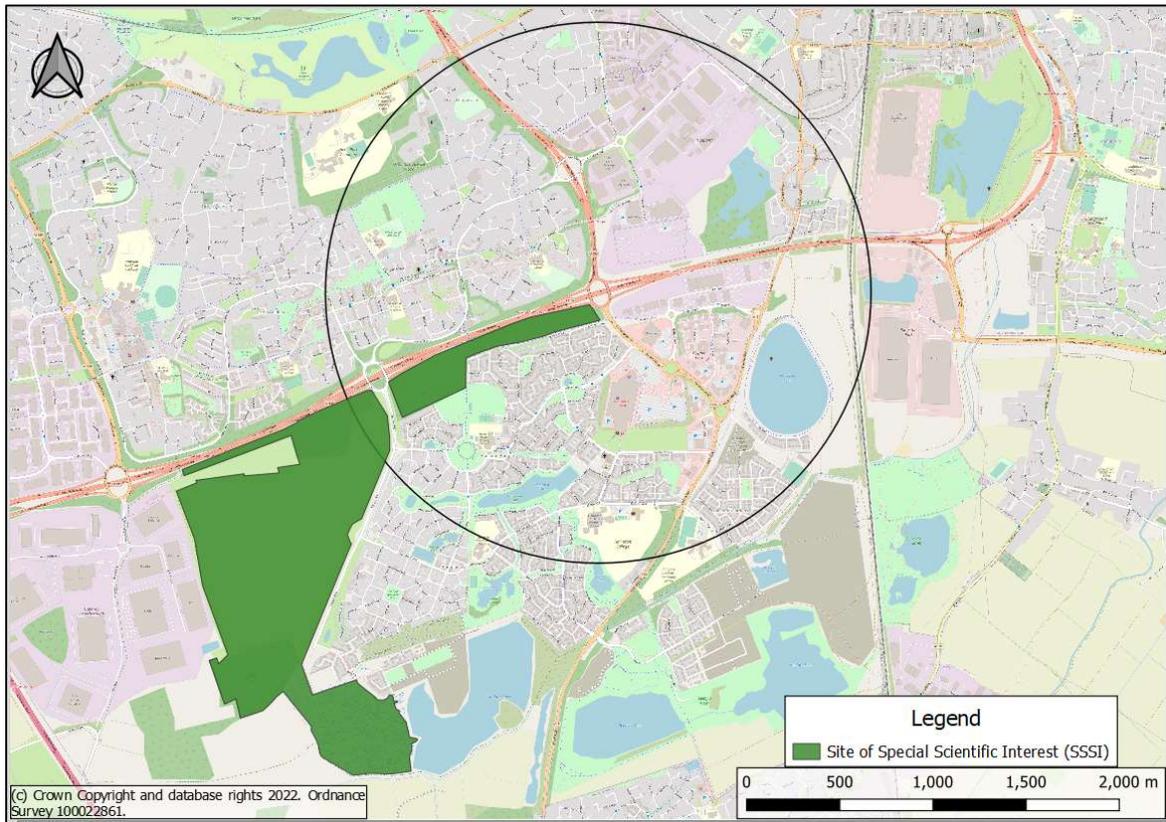


Figure 3.5: Land Based Designations within the Vicinity of Junction 3

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

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

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

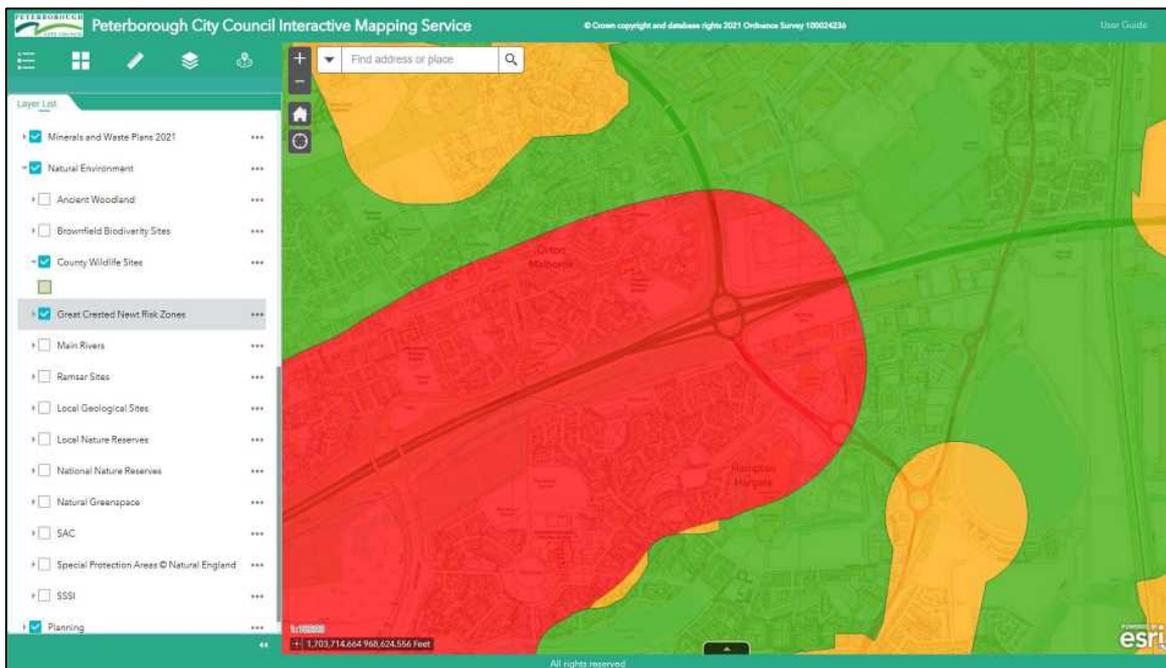


Figure 3.6: Junction 3 Great Crested Newt Risk Zones

- 3.9.40 Suitable foraging and commuting terrestrial habitats for GCN's have been identified between such waterbodies of the SAC and SSSI and the proposed area of works for the scheme. Consistent engagement with Natural England has been maintained throughout this phase of work, and assent from Natural England will be obtained prior to the start of works.
- 3.9.41 A Likely Significant Effects (LSE) assessment has been undertaken and concluded there will be no significant effects on the interest features or condition providing suitable Precautionary Methods of Working are implemented.
- 3.9.42 Alongside biodiversity features mentioned above, habitats within the vicinity of Junction 3 includes amenity grassland (A1139 verges), areas of scattered scrub and tall ruderals, as well as landscape screening planting for the existing parkway network. Ecological surveys undertaken in March 2021 have identified the following findings:
- **The site has negligible potential for hosting bats and badgers:** Suitable trees were assessed however a lack of suitable features (e.g. cracks/crevices) were observed. Despite negligible potential for bats, the potential for light pollution exists during the construction and operational phases of the proposed scheme. In response to this, all lighting that is required for the proposed scheme will be designed in accordance with the relevant British Standards and Institute of Lighting Professionals

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

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

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

Water Environment Impacts

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

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

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

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

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

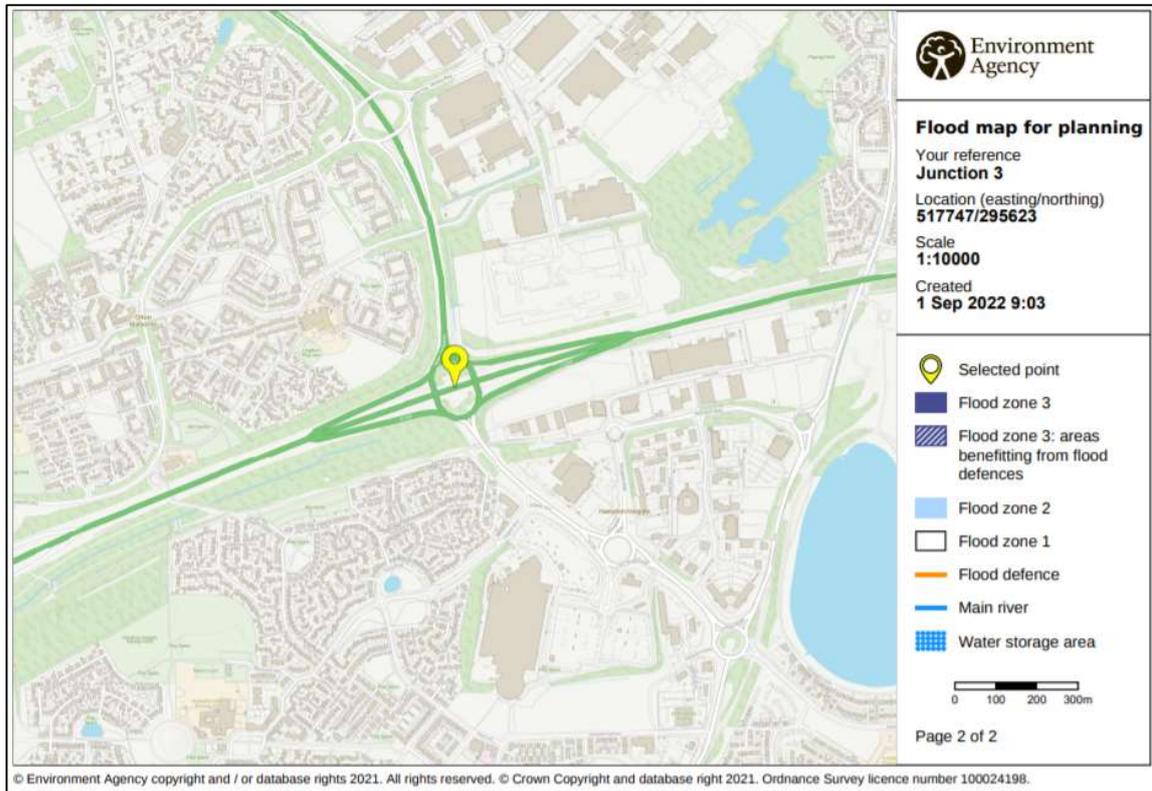


Figure 3.7: Environment Agency Flood Map for Planning

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

Personal Security Impacts

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

Severance Impacts

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

3.9.53 Severance is classified as follows:

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

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

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

Accessibility Impacts

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

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

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

3.10 Summary of Benefits and Costs

- 3.10.1 The Junction 3 Improvement Scheme has a Present Value of Cost of £7,543,000 and a Present Value of Benefit of £48,991,640 resulting in a Net Present Value of £41,448,640 and a BCR of 6.49 offering Very High Value for Money.
- 3.10.2 Sensitivity testing has demonstrated that the scheme would still offer Very High Value for Money in most eventualities, although removing potential accident benefits could see the scheme move into the “High” Value for Money category.

4. Financial Dimension

4.1 Introduction

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

4.2 Scheme Costs

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

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

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

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

Table 4.1: Implementation Timeline

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

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

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

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

4.3 Scheme Cost Estimate

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

Table 4.2: Financial Dimension Scheme Cost Estimate

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

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

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

Base Investment Cost

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

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

Table 4.3: Base Investment Cost (2022 Prices)

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

- 4.3.6 The scheme Base Investment Cost is £9,380,364, this includes £7,246,282 of Construction related costs, £1,430,731 of Preparation and Supervision costs and £713,249 of Other costs.
- 4.3.7 The Preparation costs relate to the remaining design tasks associated with pre-construction works (such as procuring TTROs and environmental permits) and design support throughout the construction phase. The Supervision costs include site supervision during mobilisation, construction, and demobilisation, as well as environmental and archaeological monitoring throughout the programme.
- 4.3.8 The 'Other' costs relate to procurement and post scheme monitoring. An allowance of £10,000 has been made in 2025 for post scheme monitoring which is due to be undertaken at one and five year intervals following completion of the scheme in 2024. Further details of the post scheme monitoring are provided in the Monitoring and Evaluation Plan detailed in the Management Dimension (Chapter 6).
- 4.3.9 There are no 'land or property' costs associated with this scheme.
- 4.3.10 A breakdown of the Base Investment Cost by individual scheme is shown in Table 4.4. overleaf.

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

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

Risk Adjusted Base Cost

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

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

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

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

Table 4.5: Risk Adjusted Base Cost (2022 Prices)

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

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

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

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

Inflated Risk Adjusted Cost (Outturn Cost)

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

Construction Industry Inflation / Annual GDP Factor

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

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

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

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

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

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

4.3.20 Note that £518,988 of the Outturn Cost was approved for release at the CPCA Board Meeting on October 19th 2022³⁰, and therefore the remaining Outturn Cost required is £10,992,324.

²⁹ [Turner & Townsend raises inflation forecast to 8.5% \(theconstructionindex.co.uk\)](https://www.theconstructionindex.co.uk)

Inflated Risk Adjusted Cost Including Whole Life Costs

- 4.3.21 Maintenance costs have also been calculated within the 60-year assessment period taking account of inflation. Maintenance costs have been applied from 2034 onwards (ten years after construction completion) which is considered the point at which meaningful maintenance measures would be required.
- 4.3.22 Maintenance costs have been included for the introduction of additional traffic signals at Junction 3 (on both A1260 approaches), as well as the additional carriageway added for the increased number of lanes on these approaches. Maintenance costs have also been included for the additional footpath and cycleway associated with the Malborne Way and Shrewsbury Avenue active travel schemes.
- 4.3.23 A maintenance cost of £78,472 applied every fifteen years has been assumed based on recent traffic signal and highway maintenance costs. These costs have been applied at fifteen year intervals for the years 2034 to 2084.
- 4.3.24 A breakdown of the maintenance costs by asset type is provided in Table 4.8 beneath.

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

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

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

Table 4.9: Calculation of Annual Maintenance Costs

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

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

Table 4.10: Inflated Risk Adjusted Cost Including Whole Life Costs

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

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

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

4.4 Budgets and Funding Cover

Developer S106 Contribution

4.4.1 A developer contribution of £50,000 has been secured from a recently approved planning application for the nearby former MARS Petcare Site. The contribution was secured to help deliver the Junction 3 Improvement Schemes, including the active travel improvements to the Shrewsbury Avenue Cycleway. Details on the agreement can be found on Peterborough City Council's online planning portal under planning reference 21/01772/FUL³¹.

CPCA Allocation

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

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

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

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

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

Funding Breakdown

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

Table 4.11: Funding Profile by Source

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

- 4.4.7 The value in the 2022 / 23 financial year (shown in grey) has already been approved and released for construction. This is to cover the cost of the active travel schemes being constructed in the current financial year.
- 4.4.8 Therefore, this Full Business Case requests the release of the remaining CPCA allocation of £10,992,324 to enable delivery of the Junction 3 Improvement Schemes.

5. Commercial Dimension

5.1 Introduction

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

5.2 Output Based Specification

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

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

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

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

1. Outcome 1: Reduced delay at Junction 3.

Objective 1: Tackle congestion and improve journey times.

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

Objective 2: Support Peterborough's growth agenda.

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

Objective 3: Protect and improve biodiversity.

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

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

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

Objective 5: Improve road safety.

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

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

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

5.3 Procurement Strategy

- 5.3.1 Delivery and supervision of the Junction 3 Improvement Schemes will be delivered in house by Peterborough Highway Services (PHS), building upon the development and design work that has been undertaken to date.
- 5.3.2 PHS is a ten-year NEC3 Term Service Contract between Peterborough City Council and Milestone Infrastructure, with responsibility for improving and maintaining Peterborough's highway network. The collaboration began in 2013 and runs until 2028.
- 5.3.3 The contract is built upon a collaborative and multi-disciplined team capable of developing schemes from policy concept right through to design and construction, and then maintaining them.
- 5.3.4 The existing subcontractor supply chain is appropriate for undertaking the work associated with the Junction 3 Improvement Schemes, which will be delivered within the contract's lifespan (before 2028).
- 5.3.5 Procuring the scheme directly through the PHS contract enables PCC to appoint a contractor to construct the scheme (Milestone Infrastructure) in an efficient manner. Using PHS' in-house delivery capability offers the following benefits over alternative procurement routes:
- PHS is reliable and has a **proven track record** of delivering major schemes successfully, and this serves as a positive indicator of future performance.
 - The scheme can be procured **far quicker** than would be the case with alternative procurement routes. As well as reducing the procurement costs for the procuring authority, the project benefits will be realised sooner.
 - The integrated delivery model creates a **single point of responsibility** and encourages more **effective collaboration** between client, designer, and contractor to reduce costs. As the scheme has been identified, planned, and designed within PHS, continuity can be assured through to construction, and any issues identified on site can be quickly resolved by the design team.
 - A well-established supply chain is already in place which provides **Value for Money**. All subcontract packages will be competitively tendered to ensure best value and will be put to a minimum of three tenderers where possible.
 - Strong performance is **highly incentivised** as all schemes delivered within the PHS contract contribute to a suite of KPIs which impacts on the term of the contract. Consistent good performance is rewarded with contract term extensions whereas consistently poor performance would see a reduction in the contract term.
 - The contract duration and **strong collaborative relationship** encourages both parties to work towards long term gain rather than short term commercial gain.

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

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

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

5.4 Market Maturity

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

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

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

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

5.5 Sourcing Options

- 5.5.1 The scheme will be delivered by PHS, using sub-contractors to assist with the delivery of the scheme.
- 5.5.2 A pool of pre-qualified sub-contractors for the provision of key work streams will be selected based on a considered selection criteria including:
- Technical Competence
 - Financial Health
 - Robustness of HSEQ Management and Risk Management Systems
 - Previous Performance
 - Ethical Standards
 - Collaborative Behaviours
 - Commitment to Inclusion
 - Diversity and Equality
 - Commitment to Community Investment and Social Value.
- 5.5.3 Supply chain partners are regularly reviewed, including through the undertaking of joint KPI performance reviews, to ensure that PHS has the right supply chain in place to provide healthy competition and delivery resilience for our forward pipeline of work.
- 5.5.4 For larger projects, such as the Junction 3 Improvement Scheme, individual packages of work are competitively tendered, and quotations are obtained from a minimum of 3 sub-contractors. These quotations are then subjected to a structured tender adjudication with a balanced assessment including, but not limited to, cost, programme, quality, experience and performance to inform selection.
- 5.5.5 Sub-contracts are let on a NEC Framework contract and individual packages of work awarded under Task Orders, with the use of sub-contractors must be approved prior to appointment.
- 5.5.6 This process has been used on a number of CPCA funded major transport projects over recent years in Peterborough, including the Junction 15 Scheme which is currently under construction, and has enabled schemes to be delivered successfully and to a high standard. Crucially, management and supervision of the construction works by PHS staff will provide consistency with earlier phases of the project as the Major Projects team (responsible for construction) have been actively involved in the project since the Preliminary Design phase and fully understand the scheme objectives and required outputs.

5.6 Contract and Payment Mechanisms

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

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

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

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

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

5.7 Pricing Framework / Charging Mechanisms

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

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

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

5.8 Risk Allocation and Management

- 5.8.1 Because the PHS contract is already established there is limited opportunity to modify the allocation of risk, however the contract does include inherent features that encourage effective risk management and mitigation, such as:
- Each party is required notify each other of any matter which could affect the cost, completion, progress or quality of the project through Early Warning Notices. This is to promote early intervention which could reduce the impact of any potential risk.
 - In the case of Option C (Target Price) both parties are incentivised to reduced cost through the pain / gain mechanism.
- 5.8.2 The above will also be supplemented with good project management practices during the delivery of the scheme. Both parties will maintain a shared Risk Register (Appendix A), which will be reviewed regularly at project progress meetings. Further details on the management of risk are provided in the Management Dimension.
- 5.8.3 Detail about the allocation of project risk between the CPCA and PCC, and the responsibilities for managing this, can be found within Chapter 6 of the CPCA's Assurance Framework³²
- 5.8.4 However, in summary, risk is allocated to the CPCA by default, but the CPCA reserve the right to reallocate this risk to PCC in the event that the risk has not been managed appropriately. The signed Funding Agreement, and Project Initiation Document, will be used to determine whether PCC has managed the project risk appropriately, and therefore where the risk should be allocated.

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

5.9 Contract Length

- 5.9.1 The PHS contract runs until 2028 and has the relevant skills and competencies to deliver the Junction 3 Improvement Schemes, which will be fully completed within the lifespan of the contract.
- 5.9.2 The construction programme spans between November 2022 (advanced construction of the active travel schemes) through to March 2024. Construction of the active travel schemes is expected to be complete by April 2023. Construction Programmes for the two schemes due to be built in the 2023 / 2024 financial year are included in Appendix L.
- 5.9.3 An overview of the project timescales is provided in Table 5.1 beneath. Note that timescales for construction assume CPCA approval and the availability of funding.

Table 5.1: Project Implementation Timescales

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

5.10 Contract Management

- 5.10.1 Project progress meetings and existing governance arrangements such as the Peterborough Highways Project Board have been used to date and has monitored the delivery of the scheme and all commercial arrangements relating to this. The PHS Project Board meets on a monthly basis to discuss progress and matters relating to live and upcoming schemes.
- 5.10.2 A Project Manager has been appointed by PCC, to oversee the project and take responsibility of the delivery of the scheme. This individual will work closely with the delivery team during the construction of the scheme.
- 5.10.3 Governance between PCC and the CPCA will be managed through progress meetings and monthly Highlight Reports in line with the CPCA's Assurance Framework. Further details of how PHS will manage the contract are set out within the Management Dimension (Chapter 6).

6. Management Dimension

6.1 Introduction

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

6.2 Evidence of Similar Projects

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

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

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

6.2.3 This scheme was constructed between summer 2016 and spring 2017 and involved fully 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 pinch point and to enable nearby housing growth.

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

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

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



Figure 6.1: Junction 20 Improvement (Post Scheme)

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

- 6.2.7 This scheme was constructed between spring 2014 and summer 2015 and involved the widening of the A1139 Fletton Parkway from two to three lanes, between the A1 (M) and Junction 2 in Peterborough to provide significant and critically needed capacity improvements.
- 6.2.8 The total cost of the scheme was £18m and it was funded through the Greater Cambridgeshire and Greater Peterborough Local Enterprise Partnership, Developer Funding and Council Capital Funding.
- 6.2.9 The scheme successfully delivered a major upgrade to Peterborough's Parkway network. Despite extensive ground investigations during the design phase, abnormally high levels of soil contamination were discovered during construction throughout the site, and significant volumes of soil had to be sent for specialist treatment and disposal. However, through careful management and collaborative working amongst all partners, there was minimal impact on the scheme delivery programme, and additional funding was provided by the DfT due to the severity of the contamination which had not been detected despite all of the industry standard Waste and Contamination (WAC) tests being undertaken.



Figure 6.2: Junction 17 Improvement (Post Scheme)

Active Travel Schemes – Various

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

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



Figure 6.3: Haddon Cycleway Improvement

6.3 Programme / Project Dependencies

6.3.1 The scheme programme considers the following key dependencies:

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

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

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

6.4 Governance, Organisational Structures and Roles

- 6.4.1 The CPCA are the organisation ultimately responsible for the delivery of the Junction 3 Scheme, and PCC are nominated as the delivery partner.
- 6.4.2 Delivery of the scheme to date has been managed by the PCC Project Manager and wider Project Team, consisting of key project delivery partners. The Project Team have been responsible for the daily running of the project, coordinating with all key stakeholders, and managing the delivery programme.
- 6.4.3 The existing PHS Project Board will be used to oversee the continued development and delivery of the scheme by the Project Team, and to make key decisions relating to the delivery of the project. The Project Board will be supported by technical specialists, and key stakeholders will be invited to attend as necessary.

Project Management Team

- 6.4.4 The Project Management Team will report to the Project Board, and ultimately to the CPCA Board.
- 6.4.5 The Project Team have been responsible for the day-to-day management of the scheme and the coordination of inputs from technical advisors responsible for the delivery of key work streams within an agreed programme, including:
- Stakeholder Engagement
 - Design Development
 - Transport Modelling
 - Environmental Assessment
 - Business Case Development
 - Scheme delivery.
- 6.4.6 The key roles and lines of accountability for the development and delivery of the scheme are shown beneath in Figure 6.4.
- 6.4.7 The team has successfully developed and delivered multiple highway schemes around Peterborough since the beginning of the contract in 2013, including several CPCA schemes. PHS has been responsible for all planning and design work undertaken on the Junction 3 Scheme to date. All skills and competencies to deliver this scheme are available within the local PHS contract.



Figure 6.4: Key Project Roles and Responsibilities

6.5 Programme / Project Reporting

- 6.5.1 The Project Manager is responsible for reporting project performance against the project objectives and key milestones, using established finance and programme management tools such as Verto, with updates reported on a regular basis to the Project Board.
- 6.5.2 Every month the Project Manager will also submit a Highlight Report alongside Finance Management Reports to the CPCA recording what progress has been made and whether there are any new risks that could impact the scheme.
- 6.5.3 Financial progress will be reported to the PHS Dashboard, which monitors the progress of work delivered through the PHS contract, and approval for any key decisions is made by the Project Board.
- 6.5.4 Regular Project Progress Meetings have been held throughout the duration of the scheme, to allow key staff to discuss important issues that could affect the delivery of the scheme. Delivery of the scheme through the PHS Framework contract ensures that all stages of work are conducted in-house, ensuring a smooth transition of information and communication between the different delivery teams.

6.6 Programme / Project Plan

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

Table 6.1: Project Implementation Timeline

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

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

6.7 Assurance and Approvals

- 6.7.1 The project has been managed by the Council in line with their existing assurance and approvals process. The daily running of the project has been under the responsibility of the Project Manager, and any approvals required have been provided by the Project Board.
- 6.7.2 The Cambridgeshire and Peterborough Combined Authority Assurance Framework sets out the fundamental principles in relation to the use and administration of the Cambridgeshire and Peterborough Investment and outlines a culture underpinned by processes, practices and procedures. The Assurance Framework sits alongside a number of other Cambridgeshire and Peterborough Combined Authority documents including the Constitution and Devolution Deal.
- 6.7.3 Further to the above, the Combined Authority has developed the 10 Point Guide which outlines project management governance requirements which should be followed throughout the life cycle of the project. It details the requirements at project initiation including, establishing a Project Board with the Combined Authority and delivery partners. The purpose of the Project Board is to provide oversight to the project, ensure appropriate governance, risk management and to provide assurance in accordance with the scope, budget and programme. The Project Board should be attended by the Combined Authority's head of Transport and Transport Programme Manager, PCC's Project Manager and by the Group Manager for Highways and Transport. The Project Board should also establish a RACI chart, a copy of the RACI template is in the Combined Authority's 10 Point Guide.
- 6.7.4 Technical Assurance has also been provided by the CPCA's Assurance Framework, with each stage of the project being reviewed by the CPCA's independent technical reviewer. Once the independent technical reviewer is satisfied, a recommendation is made to the CPCA Board to approve funding for further stages of the project, including construction.

6.8 Communications and Stakeholder Management

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

Project Liaison Officer

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

Stakeholders

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

Stakeholder Consultation

- 6.8.4 Stakeholder consultations were undertaken by the Project Team following the approval of the OBC. All key stakeholders were consulted via email or letter for comments on the Preferred scheme design.
- 6.8.5 Responses to the consultation primarily focused on the environment, including drainage in relation to the close proximity to the Orton Pit SSSI and SAC, biodiversity as Junction 3 is located in a Red Zone for the protected species of Great Crested Newts, as well as the need for wider improvements to active travel.
- 6.8.6 The environment and biodiversity were discussed with Natural England. As the statutory regulator for the adjacent SSSI and SAC, Natural England were provided with a series of scheme drawings (in March 2022), including vegetation clearance, groundworks, and drainage designs.
- 6.8.7 Initial concerns set forward by Natural England focused on drainage and the potential of pollution to the sites water courses and soil. As a result of the construction and operation of the Junction 3 works. If pollution were to occur, it would negatively impact the sensitive water chemistry present within the confines of the Orton Pit SSSI and SAC. The recommendation from Natural England was that a Habitat Regulation Assessment (HRA) screening is to be undertaken to further assess if the design is likely to have significant effect on the SSSI and SAC. This has been done, and results from the HRA will be submitted to Natural England and authorisation secured.
- 6.8.8 Additional comments from Natural England were received in relation to Great Crested Newts, as extensive populations are known within the immediate vicinity of Junction 3. The species are afforded protected status under the Wildlife and Countryside Act 1981 (schedule 5 and 8) and the Conservation of Habitats and Species Regulations 2017 (as amended), and it was advised that the appropriate licences are required prior to construction along with a Precautionary Method of Working (PMoW) for GCN'S. The PMoW states that works will be programmed during GCN active season (March – September) and that any habitat manipulation will be carried out under the supervision of a suitably qualified Ecologist, who either holds a low-class impact licence or a surveying and handling licence for the species.
- 6.8.9 Stakeholder consultation with active travel groups also emphasised the opportunities to improve active travel connections around Junction 3, and this resulted in the addition of the Malborne Way and Shrewsbury Avenue active travel schemes.

Public Consultation

- 6.8.10 Public consultation on the concept of a scheme at Junction 3 was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan³³ that was adopted in January 2020. This consultation made residents of the City aware that Junction 3 had been identified as a location for improvements. It should be noted that no details on the form of the scheme were provided at the time of the consultation and that no objections relating to the principle of improvements to Junction 3 were received.
- 6.8.11 Public perceptions of the Preferred Scheme were then assessed following the approval of the OBC (July 2020) and prior to the commencement of Detailed Design. The online consultation featured on the PCC website and social media for a six-week period (between the 21st October – 4th December 2020), and presented the scheme identified at OBC and Preliminary Design.
- 6.8.12 In addition to the online consultation exercise, 62 individual properties located within close proximity to Junction 3 (including Hedda Drive and Buckthorn Road in Hampton Hargate) were contacted via letter during the consultation period. The letter provided residents with details of the online consultation and invited them to comment.
- 6.8.13 One comment was received during the consultation period in relation to the 3rd lane on the A1260 The Serpentine northbound approach, north of Hargate Way', voicing concerns about difficulties faced when exiting Hargate Way, and how proposed changes along the A1260 The Serpentine may impact drivers from the residential area further.
- 6.8.14 Design changes were made during Detailed Design and the extension of the existing flare on the A1260 is now unlikely to impact the operation of the A1260 The Serpentine / Hargate Way junction as vehicles exiting will experience no change to conditions.
- 6.8.15 Monitoring of the junction will be undertaken at regular intervals and is included with the scheme monitoring and evaluation plan. If the monitoring identifies an issue at the junction, then further consideration will be given to potential improvements.
- 6.8.16 It should be noted that the public consultation outlined above did not include the final design for the Phorpres Way active travel improvements, nor did it include the Malborne Way and Shrewsbury Avenue improvements. This was due to design for Phorpres Way being developed during later phases of the design work, and additional active travel improvements being identified as the project has progressed to FBC phase. This is in line with the greater emphasis placed on active travel improvements by both the Council and the CPCA.
- 6.8.17 Regular communication will be undertaken with residents throughout the construction phase to ensure that residents remain informed of the construction programme and any temporary impacts. Where feedback is provided, both the PLO and PCC Project Manager will work closely with individuals to mitigate any issues raised.

6.9 Risk Management Strategy

- 6.9.1 A Risk Register was produced during project initiation to identify potential risks and to evaluate factors that could have a detrimental effect on the project.
- 6.9.2 The Risk Register has been a live document throughout the project and has been used to identify and catalogue any potential risks, consider the impact they may have, the likelihood of them occurring and the measures that can be taken to provide mitigation.
- 6.9.3 The Risk Register has been reviewed regularly during progress meetings, with updates reported to the CPCA through the monthly Highlight Reports. A copy of the Risk Register has been provided within Appendix A.
- 6.9.4 In addition to the project Risk Register a construction Risk Register has been produced (also included in Appendix A). This Risk Register is also a live document and will be regularly updated throughout the construction period.

6.10 Scheme Evaluation

- 6.10.1 The Scheme Evaluation Plan is detailed in Appendix K. This has been prepared in line with the CPCA Assurance Framework and DfT guidance and will follow 'standard monitoring³⁴ principles.
- 6.10.2 The Scheme Evaluation Report has been prepared prior to construction and comprises of both the Benefits Realisation Plan and the Monitoring and Evaluation Plan to avoid any duplication of information.
- 6.10.3 The purpose of the Scheme Evaluation Plan is to determine whether the scheme has been delivered as planned, provides the expected benefits and therefore justifies its investment. Where outcomes are seen to differ from those expected, data collected during the monitoring and evaluation phases will provide an evidence base that will assist in understanding the reasons for this and the lessons that can be learnt.

Benefits Realisation Plan

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

³³ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>.

³⁴ [Major Scheme Business Cases: Evaluation Guidance for Local Authority Major Schemes \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/428887/major-scheme-business-cases-evaluation-guidance-for-local-authority-major-schemes.pdf).

Table 6.2: Scheme Benefits Realisation Plan Summary

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Benefit Owners	Benefit Enablers
<p>Tackle congestion and improve journey time reliability: Tackle congestion and address journey time reliability on the primary approaches to the junction (A1260 Nene Parkway and (The Serpentine approaches)</p>	<ul style="list-style-type: none"> Creation of 4th lane at the A1260 Nene Parkway SB stop line Creation of 4th lane on the north-eastern corner of the circulatory, between the A1260 Nene Parkway approach and the A1139 eastbound on-slip exit Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 Creation of a 4th lane at the A1260 The Serpentine NB stop line, including a flare extension on the left-hand lane Creation of 3rd lane on the southern half of the circulatory, between the A1260 The Serpentine exit / approach 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased operational efficiency of the Junction and wider network Reduction in stationary / rolling traffic resulting in air quality improvement More efficient entrance to a major residential / employment sector to the south of the City 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Visitors to the City 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Monitoring of network performance
<p>Support Peterborough's Growth Agenda and encourage homes and jobs: Ensure that the planned employment and housing growth across Peterborough is promoted whilst providing for future demand</p>	<ul style="list-style-type: none"> Creation of 4th lane on the south-western corner of the circulatory, between the A1260 The Serpentine approach and the A1139 WB on-slip exit 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased network capacity and operational efficiency Increased attraction of the Hampton Township area, encouraging the retainment of existing businesses and support of prospective future investment 	<ul style="list-style-type: none"> PCC in regard to fulfilment of the Local Plan Business within the Hampton Township Residents / Local Community 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Promotion of the Hampton Township / Business sector and wider City Area
<p>Create wider economic benefits: Provide conditions that encourage inward investment in higher value employment sectors across Peterborough and utilise available employment space</p>		<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased attraction of the Thorpe Wood Business park Increased attraction of the Hampton Township area, encouraging the retainment of existing businesses and support of prospective future investment 	<ul style="list-style-type: none"> PCC in regard to fulfilment of the Local Plan Business within the Hampton Township Residents / Local Community 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Promotion of the Hampton Township / Business sector and wider City Area
<p>Protect and improve the biodiversity value within the study area: Mitigate any adverse impact of a scheme and enhance biodiversity net gain within the Study Area</p>	<ul style="list-style-type: none"> Implementation of environmental / biodiversity scheme elements Additional planting / compensation planting mitigating the loss of tree coverage associated with construction 	<ul style="list-style-type: none"> Achievement of minimum 20% biodiversity net gain Protection of identified species / sites of interest across the study area 	<ul style="list-style-type: none"> PCC / CPCA in regard to environment and biodiversity Commuters Local residents 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme / soft landscaping designs Gaining of the necessary licences Biodiversity Net Gain Calculation
<p>Positively impact traffic conditions on the wider network: Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as Malborne Way</p>	<ul style="list-style-type: none"> Creation of 4th lane at the A1260 Nene Parkway SB stop line Creation of 4th lane on the north-eastern corner of the circulatory, between the A1260 Nene Parkway approach and the A1139 eastbound on-slip exit Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 Creation of a 4th lane at the A1260 The Serpentine NB stop line, including a flare extension on the left-hand lane Creation of 3rd lane on the southern half of the circulatory, between the A1260 The Serpentine exit / approach Creation of 4th lane on the south-western corner of the circulatory, between the A1260 The Serpentine approach and the A1139 WB on-slip exit 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased operational efficiency of the Junction and wider network Increased quality of life for residents of Orton Malborne 	<ul style="list-style-type: none"> Commuters / Business trips Local residents 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Monitoring of network performance
<p>Improve road safety: Reduce personal injury accidents and improve personal security amongst all travellers around the junction</p>	<ul style="list-style-type: none"> Signalisation of the remaining approaches including both the A1260 Nene Parkway and The Serpentine approaches to Junction 3 Creation of a footpath between the Medeswell / Saltmarsh junction Upgrading the walking / cycling facilities on Phorpres Way / Close 	<ul style="list-style-type: none"> Fewer accidents involving rear end shunts on main approaches Fewer casualties Increased sense of safety and security on walking and cycling facilities 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Visitors to the City Active Mode users 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme including walking and cycling elements Road safety audit Monitoring of accidents
<p>Mitigate the impact of air quality on the local environment: Maintain or improve air quality within the study area as a result of minimising stationary / queuing traffic</p>	<ul style="list-style-type: none"> Creation of 4th lane at the A1260 Nene Parkway SB stop line Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 Creation of a 4th lane at the A1260 The Serpentine NB stop line, including a flare extension on the left-hand lane 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Reduced stationary / queuing traffic 	<ul style="list-style-type: none"> Commuters / Business trips Local residents / wider community PCC / CPCA in regard to air quality control and policy goals 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Air quality monitoring

Monitoring and Evaluation Delivery

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

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

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

Table 6.3: Scheme Monitoring and Evaluation Timescales

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

- 6.10.7 Table 6.5 overleaf summaries the monitoring and evaluation approach for the Junction 3 Scheme, detailing how the objectives will be measured, the data sources to be collected and the timescales for reporting findings of the monitoring and evaluation.
- 6.10.8 Full details of the Scheme Evaluation Plan are provided in Appendix K.

Table 6.4: Scheme Evaluation Summary

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

6.11 Scheme Logic Map

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

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

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

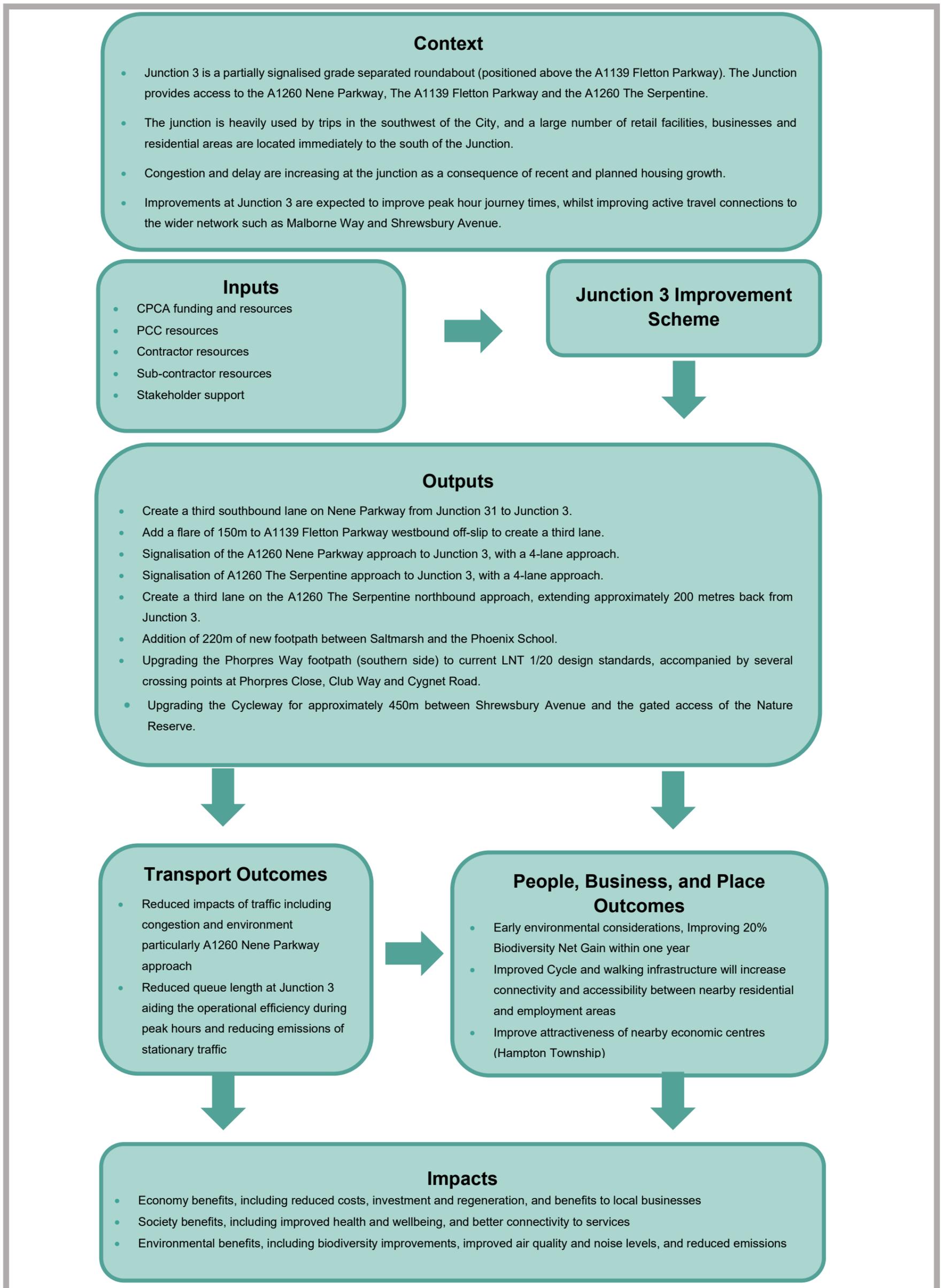


Figure 6.5: Junction 3 Logic Map

Appendices

Appendix A – Risk Registers

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

0

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

Appendix B – Sensitivity Testing Technical Note

Technical Note

Description: Junction 3 FBC Economic
Sensitivity Testing

To:

Reference:

From: Steven Percy

Date:

25/11/2022

cc:

Richard Jones

Introduction

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

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

The sensitivity tests can be summarised as follows:

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

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

Cost Sensitivity

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

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

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

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

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

High and Low Growth Scenarios

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

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

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

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

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

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

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

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

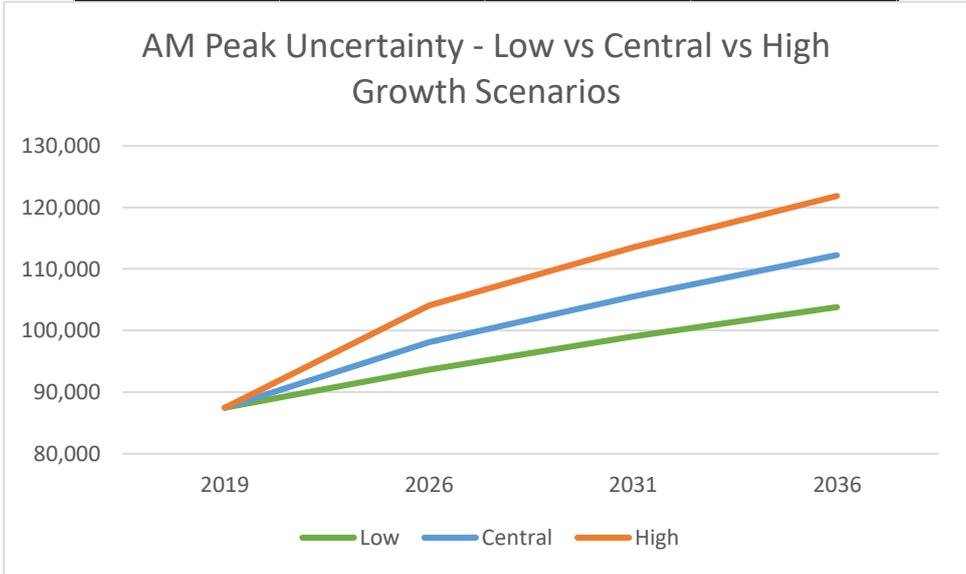


Figure 1: AM Peak Hour: Total Number of Trips in Model

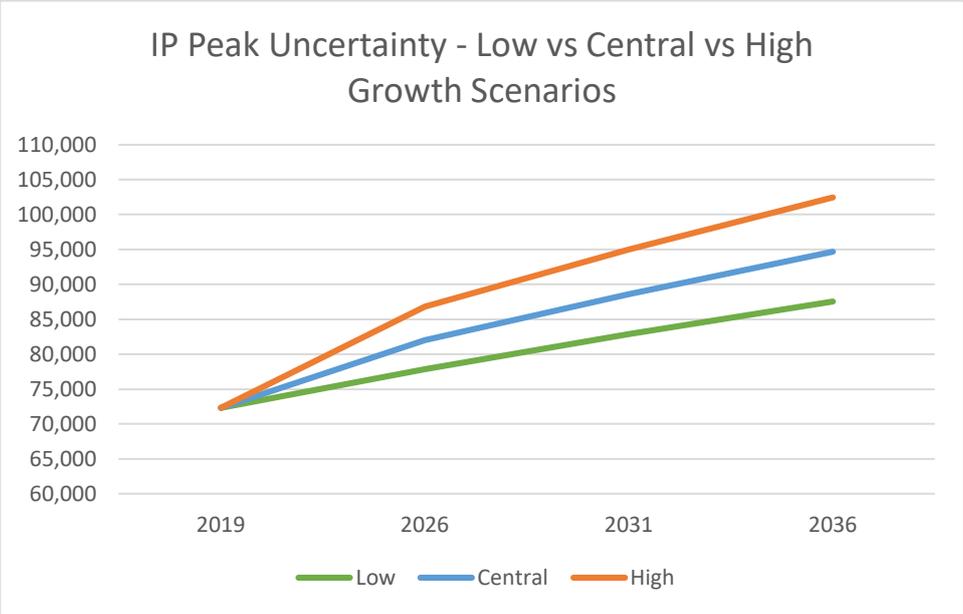


Figure 2: Inter-Peak Hour: Total Number of Trips in Model

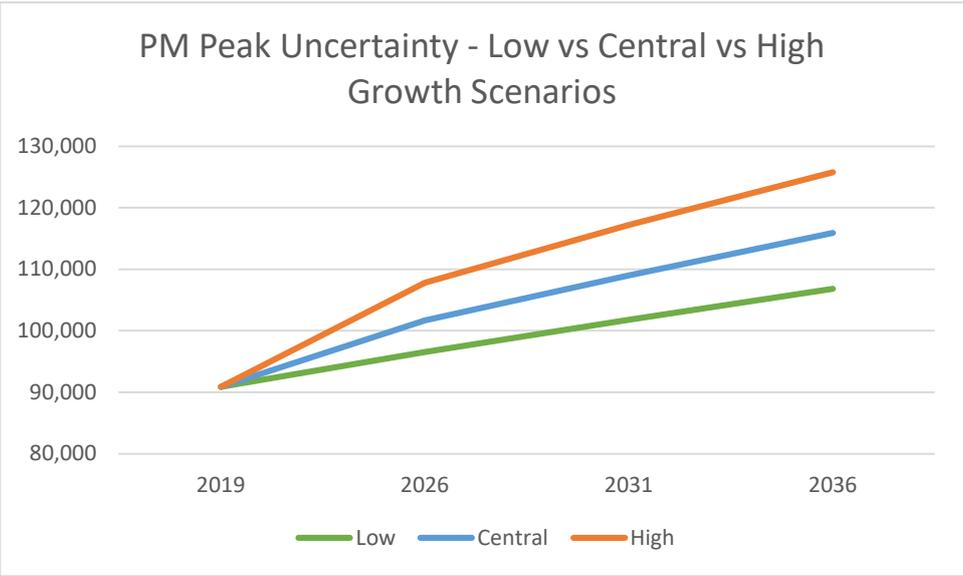


Figure 3: PM Peak Hour: Total Number of Trips in Model

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

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

Table 1: Changes in Benefits under Different Growth Scenarios

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

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

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

Accident Benefits reduced or removed

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

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

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

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

Table 4: Changes in Benefits under Different Growth Scenarios

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

High and Low Active Travel Uptake

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

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

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

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

Table 5: Active Travel trips used in Sensitivity Tests

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

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

Table 6: Changes in Benefits under Active Travel Uptake Scenarios

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

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

Active Mode Appraisal Period

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

Reducing and increasing the appraisal period demonstrates the value of the scheme over different numbers of years. The results can indicate the value of the scheme should the built infrastructure have a reduced or increased life.

Table 7 below demonstrates how the active mode benefits and costs change over reduced appraisal periods of 10 and 30 years.

Table 7: Active Mode Appraisal Period Sensitivity test outputs

Active Mode Appraisal Benefits	PVB (£,000s)		
	10 Years	20 Years (Core)	30 Years
Malborne Way	67	141	207
Shrewsbury Avenue	386	821	1,209
Phorpres Way	461	973	1,430
Total	914	1,935	2,846
BCR	6.360	6.495	6.616

The reduced appraisal period test demonstrates that the scheme would still provide at least very high value for money in the short-term with a BCR of 6.36. The increased appraisal period test demonstrates that the scheme would provide very high value for money in the longer term with a BCR of 6.62.

Both BCRs remain in the Very High Value for Money category and demonstrate that the scheme is robust even if the life of the active mode infrastructure is reduced.

Environmental Values Sensitivity Test

A sensitivity test has been undertaken to demonstrate how robust the BCR is against varying values of changes in Air Quality.

The High and Low values are provided by the DfT's Air Quality Valuation Workbook (Updated 30th May 2022), in addition to the core output.

The Air Quality Valuation Workbook estimates an Upper net present value of change in air quality of £642,370, and a Lower net present value of change in air quality of £21,910.

These result in a BCR of 6.56 for the higher air quality change values scenario and a BCR of 6.47 for the lower air quality change values scenario. Both BCRs fall into the High Value for Money category.

Summary of Sensitivity Tests

Figure 4 below demonstrates the range of BCRs indicated by the sensitivity tests.

The figure demonstrates that the Junction 3 Improvement Schemes offer at least High Value for Money in all scenarios assessed, and that there is a strong cluster of BCR values in the 6.0 - 7.0 range, confirming that the Value for Money of the schemes is robust.

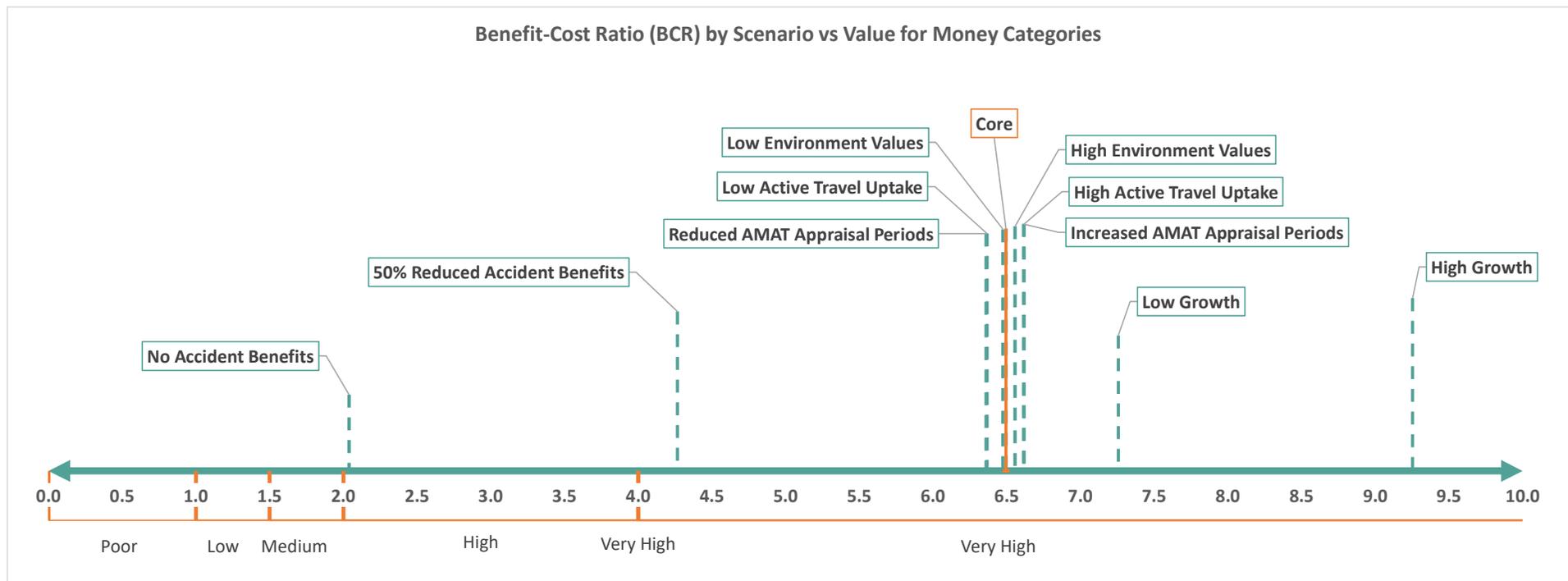
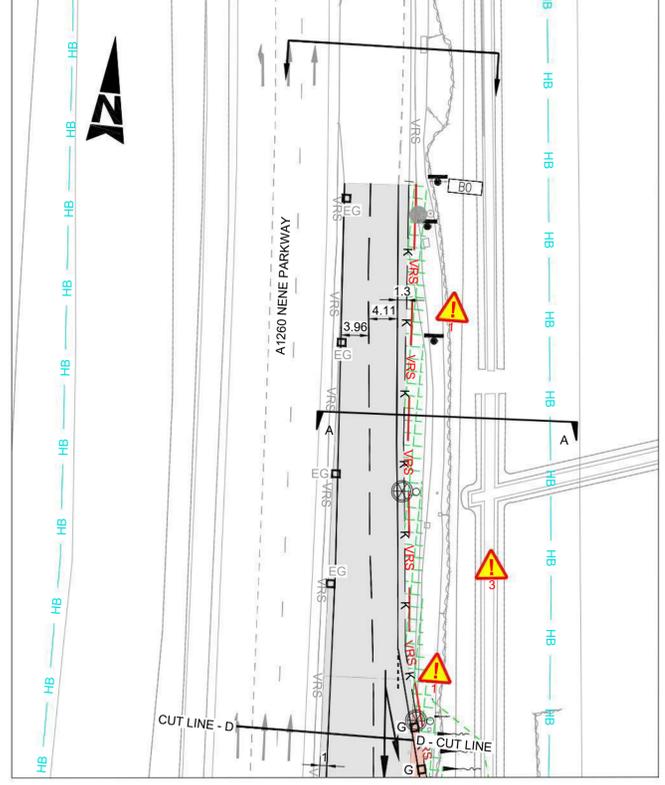
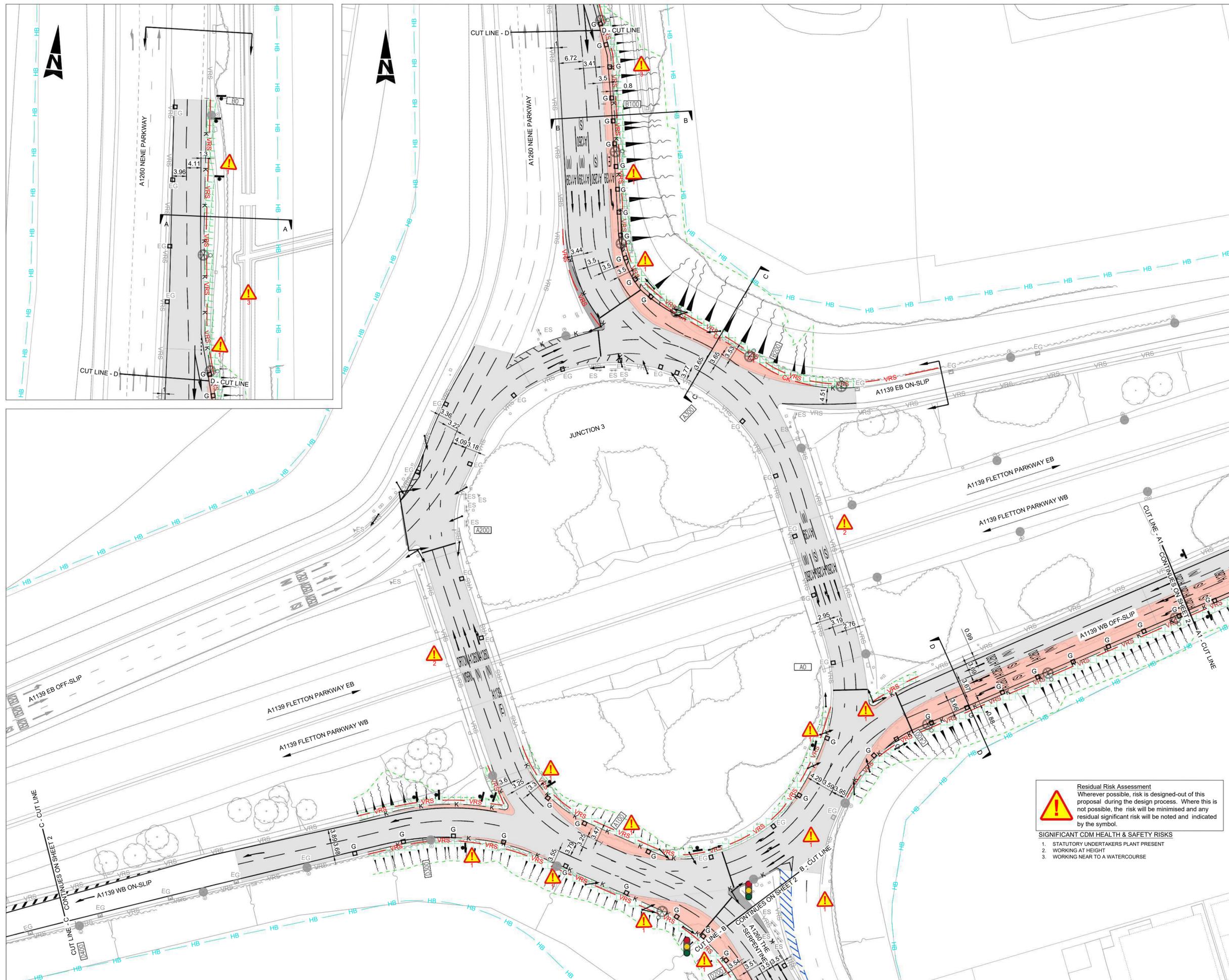


Figure 4: Sensitivity Testing BCR Range

Appendix C – General Arrangement Drawings



- KEY:**
- PROPOSED CARRIAGEWAY RESURFACING (SEE NOTE 9)
 - PROPOSED FULL DEPTH CARRIAGEWAY WIDENING / CONSTRUCTION / KERBED ISLAND REMOVAL (SEE NOTE 9)
 - PROPOSED TRAFFIC ISLAND/HARDENED AREA (WIDENING) (SEE NOTE 10)
 - PROPOSED VERGE
 - PROPOSED SAFETY BARRIER (SEE NOTE 7)
 - PROPOSED COMBINED KERB DRAINAGE (SEE NOTE 8)
 - PROPOSED KERB (SEE NOTE 10)
 - PROPOSED ROAD MARKING (SEE NOTE 11)
 - EXISTING ROAD MARKINGS TO BE REFRESHED (SEE NOTE 11)
 - PROPOSED SIGNS (SEE NOTE 11)
 - PROPOSED TRAFFIC SIGNAL (SEE NOTE 12)
 - PROPOSED LIGHTING COLUMN (SEE NOTE 13)
 - PROPOSED EMBANKMENT
 - PROPOSED GULLY (SEE NOTE 8)
 - EXISTING GULLY TO REMAIN
 - EXISTING LIGHTING COLUMN TO REMAIN (SEE NOTE 13)
 - EXISTING SAFETY BARRIER TO REMAIN
 - EXISTING BRIDGE PARAPET TO REMAIN
 - EXISTING ROAD MARKING TO REMAIN
 - EXISTING SIGN TO REMAIN
 - HIGHWAY BOUNDARY
 - SCHEME EXTENTS
 - CROSS SECTION. REFER TO 5101127-MIL-HGN-ZZ-CH-0109

- NOTES:**
1. DO NOT SCALE FROM THIS DRAWING.
 2. SITE VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
 3. REPORT ALL DISCREPANCIES TO THE DRAWING ORIGINATOR IMMEDIATELY.
 4. CHAINAGE A0 IS LOCATED 24m PRIOR TO END OF KERBED SEPARATION BETWEEN A1260 NENE PARKWAY & ENTRY SLIP FROM MORLEY WAY. CHAINAGE B0 IS LOCATED PERPENDICULAR TO START OF KERBING TO ENTRY SLIP ONTO A1139. CHAINAGE C0 IS LOCATED 33m BEYOND SIGN DIAG. No. 825 (100 YARDS TO EXIT SLIP). CHAINAGE D0 IS LOCATED 57m BEYOND NORTHERN TIP OF TRAFFIC ISLAND AT JUNCTION WITH HARGATE WAY & A1260 THE SERPENTINE.
 5. STATUTORY UNDERTAKERS APPARATUS HAS NOT BEEN SHOWN FOR CLARITY. REFER TO STATUTORY UNDERTAKERS PLAN (5101127-SKA-VUT-ZZ-DR-CH-0107 TO 0108), C2 RETURNS AND GPR PLANS.
 6. FOR DETAILS OF SITE CLEARANCE REFER TO DRAWING 5101127-MIL-HSC-ZZ-DR-CH-0201-0202.
 7. FOR DETAILS OF PROPOSED VRS REFER TO DRAWING 5101127-MIL-HRR-ZZ-DR-CH-0401 TO 0402.
 8. FOR DETAILS OF PROPOSED DRAINAGE REFER TO DRAWING 5101127-MIL-HDC-ZZ-DR-CH-0501 TO 0502.
 9. FOR DETAILS OF PROPOSED PAVEMENT REFER TO DRAWING 5101127-MIL-HPV-ZZ-DR-CH-0701 TO 0702.
 10. FOR DETAILS OF PROPOSED KERBING AND ISLANDS REFER TO DRAWING 5101127-MIL-HPV-ZZ-DR-CH-1101 TO 1102.
 11. FOR DETAILS OF PROPOSED ROAD MARKINGS AND SIGNS REFER TO DRAWING 5101127-MIL-HMK-ZZ-DR-CH-1201 TO 1205.
 12. FOR SIGNAL DESIGN REFER TO DRAWING 20-00-39-001.
 13. FOR STREET LIGHTING DESIGN REFER TO 5080752-MIL-HLG-OR-DR-EO-1301 TO 1302.
 14. ALL DIMENSIONS ARE IN METRE UNLESS OTHERWISE STATED.

P01	FIRST ISSUE				
Rev	Date	Description	Dm	Crkd	App
Revisions					

Drawing Originator

Peterborough Highway Services

Delivered by **EMPS** **PETERBOROUGH CITY COUNCIL**

Drawing Status
DETAILED DESIGN

Project Name
FLETTON PARKWAY J3 IMPROVEMENTS

Title
GENERAL ARRANGEMENT SHEET 1 OF 2

DRAFT

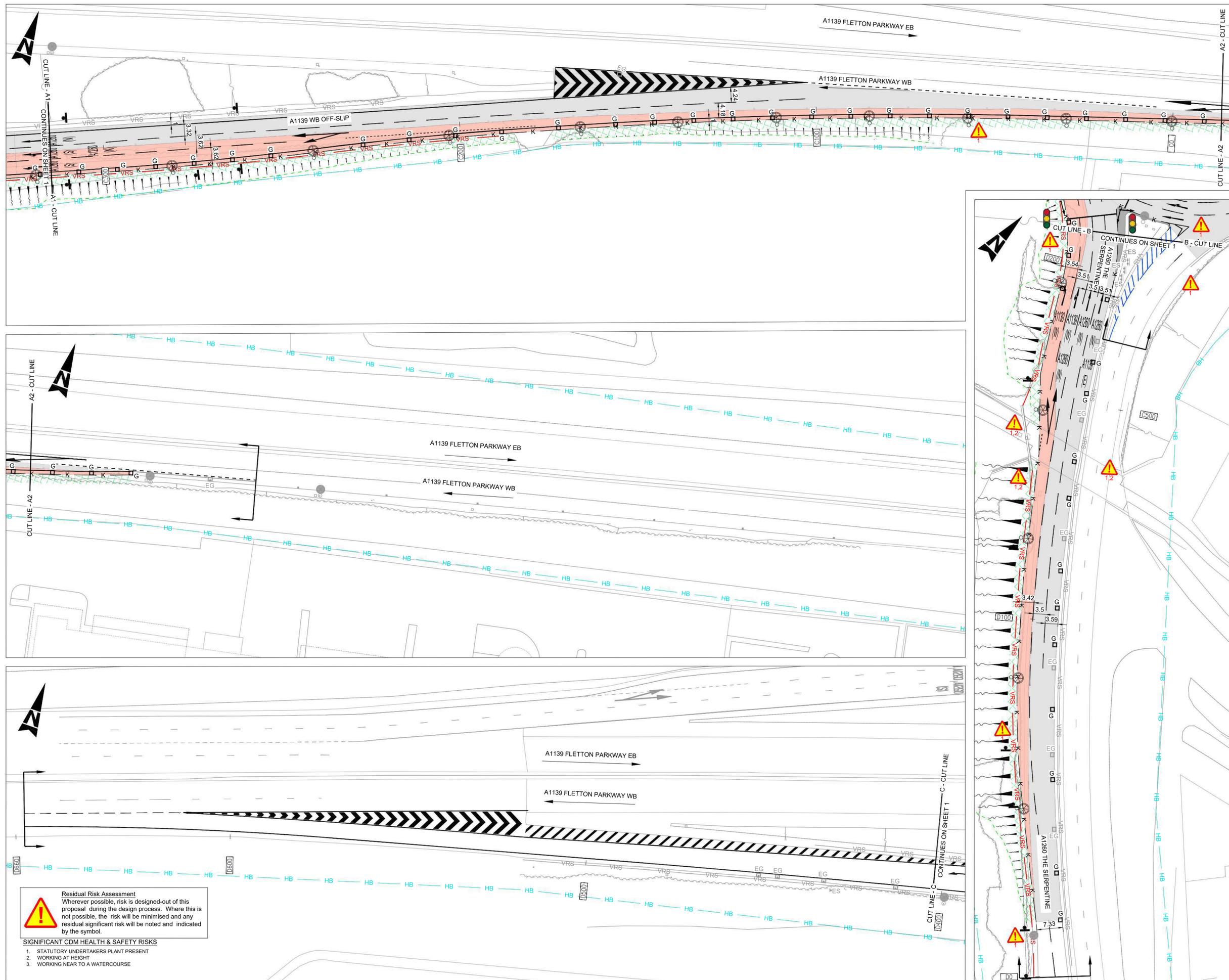
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Drawing Number	Status	Rev
5101127-MIL-HGN-ZZ-DR-CH-0101	S2	P01

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
2. WORKING AT HEIGHT
3. WORKING NEAR TO A WATERCOURSE



- KEY:**
- PROPOSED CARRIAGEWAY RESURFACING (SEE NOTE 9)
 - PROPOSED FULL DEPTH CARRIAGEWAY WIDENING / CONSTRUCTION / KERBED ISLAND REMOVAL (SEE NOTE 9)
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 - EXISTING SIGN TO REMAIN
 - HIGHWAY BOUNDARY
 - SCHEME EXTENTS
 - CROSS SECTION. REFER TO 5101127-MIL-HGN-ZZ-CH-0109

- NOTES:**
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 6. FOR DETAILS OF SITE CLEARANCE REFER TO DRAWING 5101127-MIL-HSC-ZZ-DR-CH-0201-0202.
 7. FOR DETAILS OF PROPOSED VRS REFER TO DRAWING 5101127-MIL-HRR-ZZ-DR-CH-0401 TO 0402.
 8. FOR DETAILS OF PROPOSED DRAINAGE REFER TO DRAWING 5101127-MIL-HDC-ZZ-DR-CH-0501 TO 0502.
 9. FOR DETAILS OF PROPOSED PAVEMENT REFER TO DRAWING 5101127-MIL-HPV-ZZ-DR-CH-0701 TO 0702.
 10. FOR DETAILS OF PROPOSED KERBING AND ISLANDS REFER TO DRAWING 5101127-MIL-HPV-ZZ-DR-CH-1101 TO 1102.
 11. FOR DETAILS OF PROPOSED ROAD MARKINGS AND SIGNS REFER TO DRAWING 5101127-MIL-HMK-ZZ-DR-CH-1201 TO 1205.
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P01	FIRST ISSUE			
Rev	Date	Description	Dwn	Crkd
Revisions				

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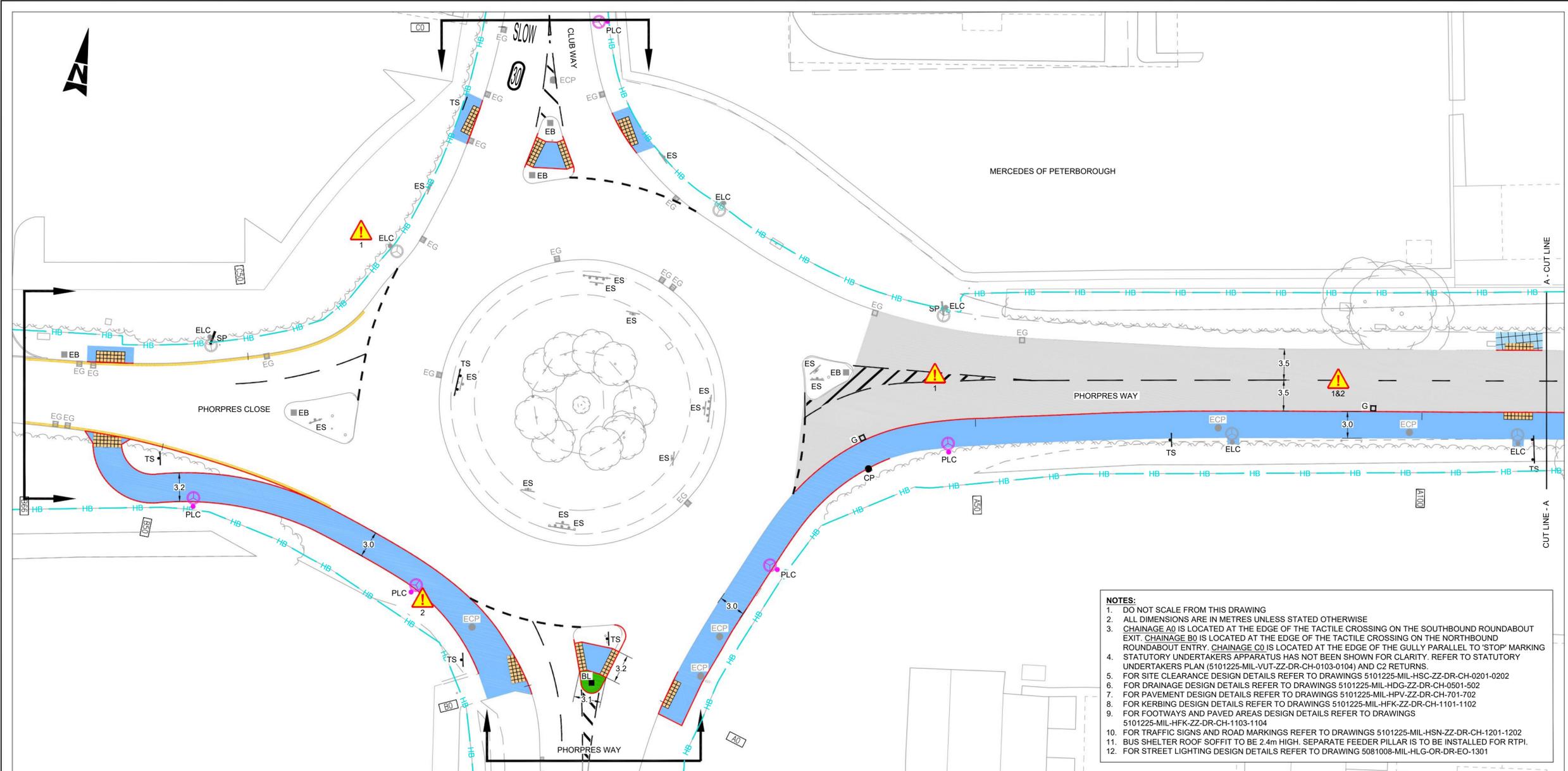
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GENERAL ARRANGEMENT SHEET 2 OF 2

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A1	1:500			
Drawn Date	Checked Date	Approved Date		

Drawing Number	Status	Rev
5101127-MIL-HGN-ZZ-DR-CH-0102	S2	P01



- KEY:**
- PROPOSED TACTILE PAVING (SEE NOTE 8 & 9)
 - PROPOSED KERB/EDGING KERB ALIGNMENTS (SEE NOTE 8)
 - PROPOSED CYCLEWAY FACILITY (SEE NOTE 8 & 9)
 - PROPOSED FOOTPATH FACILITY (SEE NOTE 8 & 9)
 - PROPOSED SHARED USE FACILITY (SEE NOTE 8 & 9)
 - PROPOSED CARRIAGEWAY RESURFACING (SEE NOTE 7)
 - PROPOSED TRAFFIC ISLAND CONSTRUCTION (SEE NOTE 9)
 - PROPOSED RTPI ENABLED LITTLETHORPE ASHKIRK BUS SHELTER (SEE NOTE 11)
 - G PROPOSED GULLY (SEE NOTE 6)
 - CP PROPOSED CATCHPIT (SEE NOTE 6)
 - TS PROPOSED TRAFFIC SIGN (SEE NOTE 10)
 - SP PROPOSED TRAFFIC SIGN PLATE (SEE NOTE 10)
 - BL PROPOSED BOLLARD (SEE NOTE 10)
 - BB PROPOSED BELISHA BEACON (SEE NOTE 10)
 - PLC PROPOSED LIGHTING COLUMN (SEE NOTE 12)
 - ELC EXISTING LIGHTING COLUMN TO REMAIN (SEE NOTE 12)
 - PROPOSED/EXISTING ROAD MARKINGS (SEE NOTE 10)
 - ECP EXISTING CATCHPIT TO REMAIN
 - EG EXISTING GULLY TO REMAIN
 - EK EXISTING KERB GULLY TO REMAIN
 - ES EXISTING SIGN TO REMAIN
 - EXISTING ROAD MARKINGS
 - EB EXISTING BOLLARD TO REMAIN
 - EGR EXISTING GUARD RAIL TO REMAIN
 - EXISTING TRAMLINE/LADDER TACTILE PAVING TO REMAIN
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 - EXISTING HEDGES TO REMAIN
 - HB HIGHWAY BOUNDARY
 - SCHEME EXTENTS

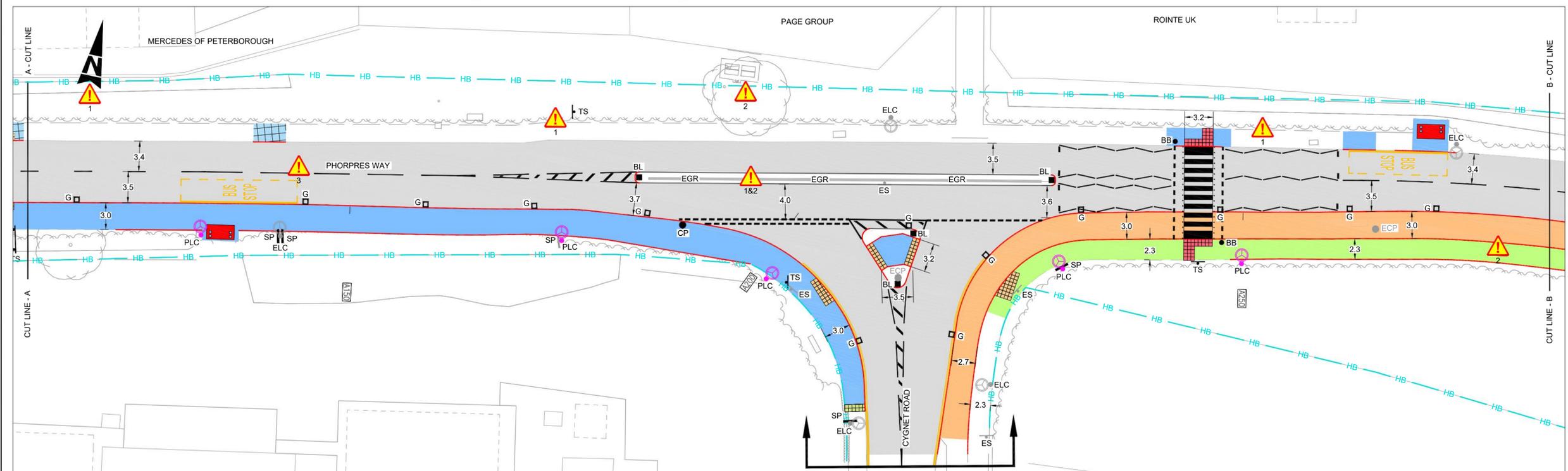
NOTES:

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- STATUTORY UNDERTAKERS APPARATUS HAS NOT BEEN SHOWN FOR CLARITY. REFER TO STATUTORY UNDERTAKERS PLAN (5101225-MIL-VUT-ZZ-DR-CH-0103-0104) AND C2 RETURNS.
- FOR SITE CLEARANCE DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HSC-ZZ-DR-CH-0201-0202
- FOR DRAINAGE DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HDG-ZZ-DR-CH-0501-502
- FOR PAVEMENT DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HPV-ZZ-DR-CH-701-702
- FOR KERBING DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HFK-ZZ-DR-CH-1101-1102
- FOR FOOTWAYS AND PAVED AREAS DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HFK-ZZ-DR-CH-1103-1104
- FOR TRAFFIC SIGNS AND ROAD MARKINGS REFER TO DRAWINGS 5101225-MIL-HSN-ZZ-DR-CH-1201-1202
- BUS SHELTER ROOF SOFFIT TO BE 2.4m HIGH. SEPARATE FEEDER PILLAR IS TO BE INSTALLED FOR RTPI.
- FOR STREET LIGHTING DESIGN DETAILS REFER TO DRAWING 5081008-MIL-HLG-OR-DR-EO-1301

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

SIGNIFICANT CDM HEALTH & SAFETY RISKS

- HIGH VOLTAGE ELECTRIC
- HIGH PRESSURE GAS
- BT OVERHEAD



P02	14/10/2022	UPDATED IN-LINE WITH RSA 1 AND CLIENT COMMENTS	HC	JC	ARPT
P01	-	FIRST ISSUE	-	-	-
Rev	Date	Description	Drn	Crkd	App
Revisions					

Drawing Originator

Peterborough Highway Services

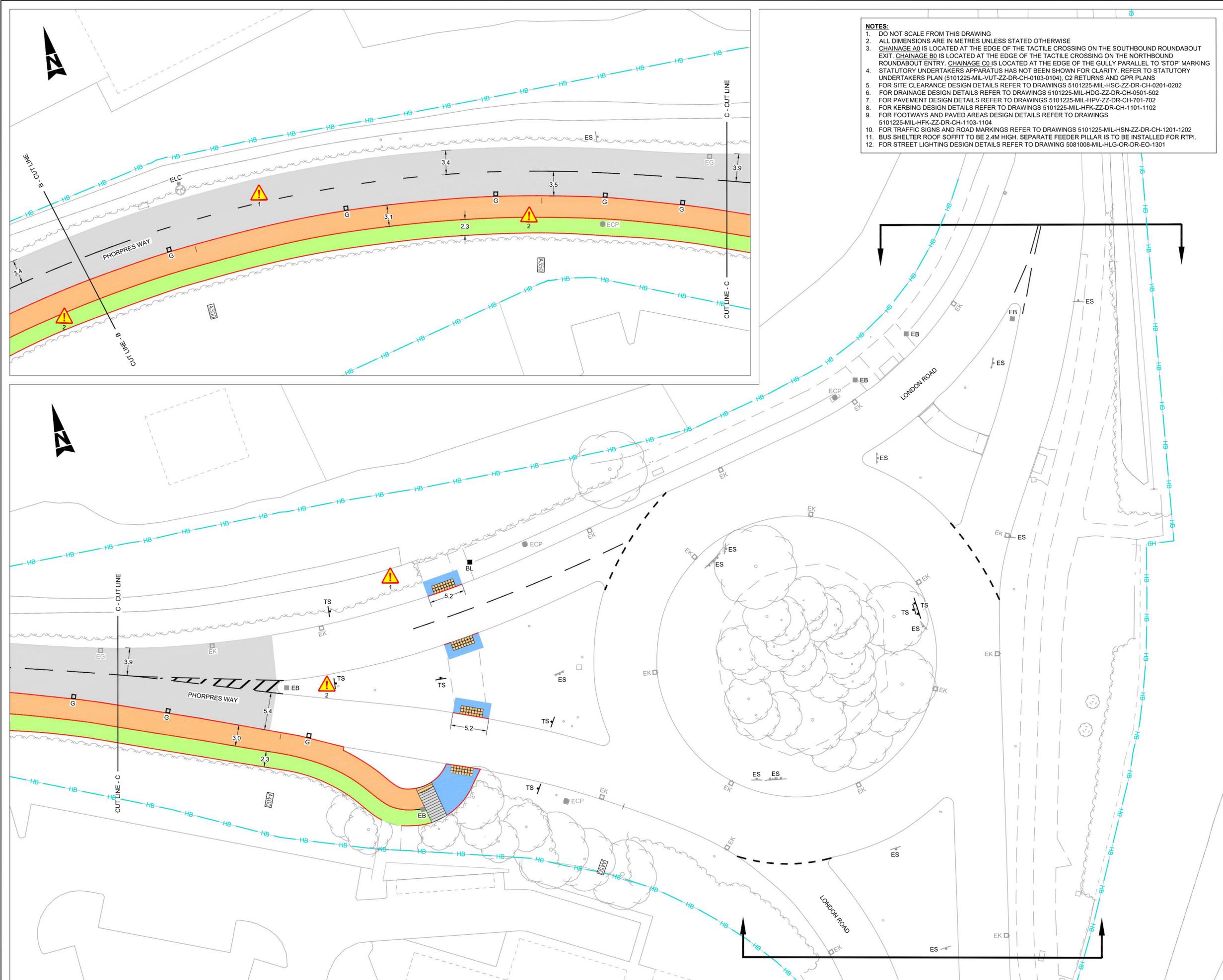
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Drawing Status
PRELIMINARY DESIGN

Project Name
PHORPRES WAY
FOOTWAY/CYCLEWAY IMPROVEMENTS

Title
**GENERAL ARRANGEMENT
SHEET 1 OF 2**

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 - FOR SITE CLEARANCE DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HSC-ZZ-DR-CH-0201-0202
 - FOR DRAINAGE DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HDS-ZZ-DR-CH-0501-0502
 - FOR PAVEMENT DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HPV-ZZ-DR-CH-701-702
 - FOR KERBING DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HFK-ZZ-DR-CH-1101-1102
 - FOR FOOTWAYS AND PAVED AREAS DESIGN DETAILS REFER TO DRAWINGS 5101225-MIL-HFK-ZZ-DR-CH-1103-1104
 - FOR TRAFFIC SIGNS AND ROAD MARKINGS REFER TO DRAWINGS 5101225-MIL-HSN-ZZ-DR-CH-1201-1202
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- KEY:**
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 - TS PROPOSED TRAFFIC SIGN (SEE NOTE 10)
 - SP PROPOSED TRAFFIC SIGN PLATE (SEE NOTE 10)
 - BL PROPOSED BOLLARD (SEE NOTE 10)
 - BB PROPOSED BELISHA BEACON (SEE NOTE 10)
 - PLC PROPOSED LIGHTING COLUMN (SEE NOTE 12)
 - ELC EXISTING LIGHTING COLUMN TO REMAIN (SEE NOTE 12)
 - PROPOSED/EXISTING ROAD MARKINGS (SEE NOTE 10)
 - ECP EXISTING CATCHPIT TO REMAIN
 - EG EXISTING GULLY TO REMAIN
 - EK EXISTING KERB GULLY TO REMAIN
 - ES EXISTING SIGN TO REMAIN
 - EXISTING ROAD MARKINGS
 - EB EXISTING BOLLARD TO REMAIN
 - EGR EXISTING GUARD RAIL TO REMAIN
 - EXISTING TRAMLINE/LADDER TACTILE PAVING TO REMAIN
 - EXISTING TREES/SHRUBS TO REMAIN
 - EXISTING HEDGES TO REMAIN
 - HB HIGHWAY BOUNDARY
 - SCHEME EXTENTS

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

- SIGNIFICANT CDM HEALTH & SAFETY RISKS**
- HIGH VOLTAGE ELECTRIC
 - HIGH PRESSURE GAS
 - BT OVERHEAD

P02	14/10/2022	UPDATED IN-LINE WITH RSA 1 AND CLIENT COMMENTS	HC	JC	ARPT
P01	-	FIRST ISSUE	-	-	-
Rev	Date	Description	Drm	Chkd	App
Revisions					

Drawing Originator

Peterborough Highway Services

Delivered by **MILSTONE** PETERBOROUGH CITY COUNCIL

Drawing Status: **PRELIMINARY DESIGN**

Project Name: **PHORPRES WAY FOOTWAY/CYCLEWAY IMPROVEMENTS**

Title: **GENERAL ARRANGEMENT SHEET 2 OF 2**

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:250	HC	JC	ARPT
Drawn Date	Checked Date	Approved Date		
19/08/22	19/08/22	19/08/22		
Drawing Number		Status	Rev	
5101225-MIL-HGN-ZZ-DR-CH-0102		S2	P02	

Appendix D – 60 Year Cost Profile: Economic Dimension

Junction 3 - Do Something Scheme Costs in 2010 Market Prices for Input into Economic Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)						(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Risk Adjusted Base Cost (2022 Prices)		(4) Total Contribution of Optimism Bias		(5) Rebased to 2010 Price Base	(6) Discounted to 2010 Prices			(7) Adjusted to Market Prices
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Quantified Risk Adjustment	Risk Adjusted Cost	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£114,958	£0	£0	£35,459	£0	£150,418	0.000	£0.00	£150,418	£0	£150,418	£30,084	£180,501	£141,495	1.035	0.662	£93,639	£111,430.52
2023	2	£5,249,195	£0	£0	£1,026,812	£518,727	£6,794,734	1.060	£406,913.52	£7,201,648	£0	£7,201,648	£1,440,330	£8,641,977	£6,774,463	1.035	0.639	£4,331,620	£5,154,627.24
2024	3	£1,882,229	£0	£0	£348,460	£194,523	£2,425,212	1.146	£353,345.92	£2,778,558	£0	£2,778,558	£555,712	£3,334,270	£2,613,740	1.035	0.618	£1,614,721	£1,921,518.29
2025	4	£0	£0	£0	£10,000	£0	£10,000	1.234	£2,341.26	£12,341	£0	£12,341	£2,468	£14,810	£11,609	1.035	0.597	£6,929	£8,246.02
2026	5	£0	£0	£0	£0	£0	£0	1.273	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.577	£0	£0.00
2027	6	£0	£0	£0	£0	£0	£0	1.315	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.557	£0	£0.00
2028	7	£0	£0	£0	£0	£0	£0	1.357	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.538	£0	£0.00
2029	8	£0	£0	£0	£0	£0	£0	1.401	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.520	£0	£0.00
2030	9	£0	£0	£0	£0	£0	£0	1.446	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.503	£0	£0.00
2031	10	£0	£0	£0	£0	£0	£0	1.494	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.486	£0	£0.00
2032	11	£0	£0	£0	£0	£0	£0	1.543	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.469	£0	£0.00
2033	12	£0	£0	£0	£0	£0	£0	1.595	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.453	£0	£0.00
2034	13	£0	£0	£0	£0	£0	£0	1.649	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.438	£0	£0.00
2035	14	£0	£0	£0	£0	£0	£0	1.705	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.423	£0	£0.00
2036	15	£0	£0	£0	£0	£0	£0	1.763	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.409	£0	£0.00
2037	16	£0	£0	£0	£0	£0	£0	1.822	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.395	£0	£0.00
2038	17	£0	£0	£0	£0	£0	£0	1.882	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.382	£0	£0.00
2039	18	£0	£0	£0	£0	£0	£0	1.944	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.369	£0	£0.00
2040	19	£0	£0	£0	£0	£0	£0	2.009	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.356	£0	£0.00
2041	20	£0	£0	£0	£0	£0	£0	2.077	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.344	£0	£0.00
2042	21	£0	£0	£0	£0	£0	£0	2.147	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.333	£0	£0.00
2043	22	£0	£0	£0	£0	£0	£0	2.221	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.321	£0	£0.00
2044	23	£0	£0	£0	£0	£0	£0	2.297	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.310	£0	£0.00
2045	24	£0	£0	£0	£0	£0	£0	2.377	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.300	£0	£0.00
2046	25	£0	£0	£0	£0	£0	£0	2.460	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.290	£0	£0.00
2047	26	£0	£0	£0	£0	£0	£0	2.546	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.280	£0	£0.00
2048	27	£0	£0	£0	£0	£0	£0	2.637	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.271	£0	£0.00
2049	28	£0	£0	£0	£0	£0	£0	2.731	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.261	£0	£0.00
2050	29	£0	£0	£0	£0	£0	£0	2.828	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.253	£0	£0.00
2051	30	£0	£0	£0	£0	£0	£0	2.930	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.244	£0	£0.00
2052	31	£0	£0	£0	£0	£0	£0	3.035	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.289	£0	£0.00
2053	32	£0	£0	£0	£0	£0	£0	3.143	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.281	£0	£0.00
2054	33	£0	£0	£0	£0	£0	£0	3.256	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.272	£0	£0.00
2055	34	£0	£0	£0	£0	£0	£0	3.373	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.264	£0	£0.00
2056	35	£0	£0	£0	£0	£0	£0	3.493	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.257	£0	£0.00
2057	36	£0	£0	£0	£0	£0	£0	3.618	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.249	£0	£0.00
2058	37	£0	£0	£0	£0	£0	£0	3.747	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.242	£0	£0.00
2059	38	£0	£0	£0	£0	£0	£0	3.880	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.235	£0	£0.00
2060	39	£0	£0	£0	£0	£0	£0	4.018	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.228	£0	£0.00
2061	40	£0	£0	£0	£0	£0	£0	4.160	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.221	£0	£0.00
2062	41	£0	£0	£0	£0	£0	£0	4.306	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.215	£0	£0.00
2063	42	£0	£0	£0	£0	£0	£0	4.457	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.209	£0	£0.00
2064	43	£0	£0	£0	£0	£0	£0	4.612	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.203	£0	£0.00
2065	44	£0	£0	£0	£0	£0	£0	4.772	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.197	£0	£0.00
2066	45	£0	£0	£0	£0	£0	£0	4.937	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.191	£0	£0.00
2067	46	£0	£0	£0	£0	£0	£0	5.104	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.185	£0	£0.00
2068	47	£0	£0	£0	£0	£0	£0	5.273	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.180	£0	£0.00
2069	48	£0	£0	£0	£0	£0	£0	5.451	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.175	£0	£0.00
2070	49	£0	£0	£0	£0	£0	£0	5.636	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.170	£0	£0.00
2071	50	£0	£0	£0	£0	£0	£0	5.828	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.165	£0	£0.00
2072	51	£0	£0	£0	£0	£0	£0	6.025	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.160	£0	£0.00
2073	52	£0	£0	£0	£0	£0	£0	6.232	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.155	£0	£0.00
2074	53	£0	£0	£0	£0	£0	£0	6.448	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.151	£0	£0.00
2075	54	£0	£0	£0	£0	£0	£0	6.677	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.146	£0	£0.00
2076	55	£0	£0	£0	£0	£0	£0	6.917	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.142	£0	£0.00
2077	56	£0	£0	£0	£0	£0	£0	7.169	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.138	£0	£0.00
2078	57	£0	£0	£0	£0	£0	£0	7.430	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.134	£0	£0.00
2079	58	£0	£0	£0	£0	£0	£0	7.702	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.130	£0	£0.00
2080	59	£0	£0	£0	£0	£0	£0	7.987	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.126	£0	£0.00
2081	60	£0	£0	£0	£0	£0	£0	8.285	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.123	£0	£0.00
2082	61	£0	£0	£0	£0	£0	£0	8.590	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.119	£0	£0.00
2083	62	£0	£0	£0	£0	£0	£0	8.902	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.116	£0	£0.00
2084	63	£0	£0	£0	£0	£0	£0	9.225	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.112	£0	£0.00
2085	64	£0	£0	£0	£0	£0	£0	9.559	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.109	£0	£0.00
Total		£7,246,383	£0	£0	£1,420,731	£713,249	£9,380,364		£762,601	£10,142,965	£0	£10,142,965	£2,028,593	£12,171,558	£9,541,307			£6,046,909	£7,084,392

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2021 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£9,380,364
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£10,142,965
(3)	Following the real cost adjustment a quantified risk contribution has been applied.	£10,142,965
(4)	The next stage is to apply optimism bias.	£12,171,558
(5)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	£9,541,307
(6)	Costs have been discounted to 2010 present values by applying a discount rate of 3.5% per year for 30 years and 3.0% thereafter (WebTAG A1.2).	£6,046,909
(7)	The final stage in preparing the scheme costs is to convert them from the factor cost to the market price unit of account using the indirect tax correction factor of 1.19	£7,084,392

Junction 3 - Do Something Scheme Costs in 2010 Market Prices for Input into Economic Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)		(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Risk Adjusted Base Cost (2022 Prices)		(4) Total Contribution of Optimism Bias		(5) Rebased to 2010 Price Base	(6) Discounted to 2010 Prices			(7) Adjusted to Market Prices
		Maintenance Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Quantified Risk Adjustment	Risk Adjusted Cost	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£0	£0	0.000	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.662	£0	£0.00
2023	2	£0	£0	1.100	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.639	£0	£0.00
2024	3	£0	£0	1.210	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.618	£0	£0.00
2025	4	£0	£0	1.331	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.597	£0	£0.00
2026	5	£0	£0	1.398	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.577	£0	£0.00
2027	6	£0	£0	1.467	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.557	£0	£0.00
2028	7	£0	£0	1.541	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.538	£0	£0.00
2029	8	£0	£0	1.618	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.520	£0	£0.00
2030	9	£0	£0	1.699	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.503	£0	£0.00
2031	10	£0	£0	1.784	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.486	£0	£0.00
2032	11	£0	£0	1.873	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.469	£0	£0.00
2033	12	£0	£0	1.966	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.453	£0	£0.00
2034	13	£78,472	£78,472	2.065	£83,558.39	£162,030	£0	£162,030	£0	£162,030	£127,016	1.035	0.438	£55,628	£66,196.76
2035	14	£0	£0	2.168	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.423	£0	£0.00
2036	15	£0	£0	2.276	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.409	£0	£0.00
2037	16	£0	£0	2.390	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.395	£0	£0.00
2038	17	£0	£0	2.510	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.382	£0	£0.00
2039	18	£0	£0	2.635	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.369	£0	£0.00
2040	19	£0	£0	2.767	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.356	£0	£0.00
2041	20	£0	£0	2.905	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.344	£0	£0.00
2042	21	£0	£0	3.051	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.333	£0	£0.00
2043	22	£0	£0	3.203	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.321	£0	£0.00
2044	23	£0	£0	3.363	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.310	£0	£0.00
2045	24	£0	£0	3.532	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.300	£0	£0.00
2046	25	£0	£0	3.708	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.290	£0	£0.00
2047	26	£0	£0	3.894	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.280	£0	£0.00
2048	27	£78,472	£78,472	4.088	£242,337.08	£320,809	£0	£320,809	£0	£320,809	£251,483	1.035	0.271	£68,042	£80,969.61
2049	28	£0	£0	4.293	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.261	£0	£0.00
2050	29	£0	£0	4.507	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.253	£0	£0.00
2051	30	£0	£0	4.733	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.244	£0	£0.00
2052	31	£0	£0	4.969	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.289	£0	£0.00
2053	32	£0	£0	5.218	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.281	£0	£0.00
2054	33	£0	£0	5.479	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.272	£0	£0.00
2055	34	£0	£0	5.753	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.264	£0	£0.00
2056	35	£0	£0	6.040	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.257	£0	£0.00
2057	36	£0	£0	6.342	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.249	£0	£0.00
2058	37	£0	£0	6.659	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.242	£0	£0.00
2059	38	£0	£0	6.992	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.235	£0	£0.00
2060	39	£0	£0	7.342	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.228	£0	£0.00
2061	40	£0	£0	7.709	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.221	£0	£0.00
2062	41	£78,472	£78,472	8.094	£556,708.04	£635,180	£0	£635,180	£0	£635,180	£497,919	1.030	0.215	£107,059	£127,400.12
2063	42	£0	£0	8.499	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.209	£0	£0.00
2064	43	£0	£0	8.924	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.203	£0	£0.00
2065	44	£0	£0	9.370	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.197	£0	£0.00
2066	45	£0	£0	9.839	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.191	£0	£0.00
2067	46	£0	£0	10.331	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.185	£0	£0.00
2068	47	£0	£0	10.847	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.180	£0	£0.00
2069	48	£0	£0	11.390	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.175	£0	£0.00
2070	49	£0	£0	11.959	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.170	£0	£0.00
2071	50	£0	£0	12.557	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.165	£0	£0.00
2072	51	£0	£0	13.185	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.160	£0	£0.00
2073	52	£0	£0	13.844	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.155	£0	£0.00
2074	53	£0	£0	14.536	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.151	£0	£0.00
2075	54	£0	£0	15.263	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.146	£0	£0.00
2076	55	£78,472	£78,472	16.026	£1,179,141.03	£1,257,613	£0	£1,257,613	£0	£1,257,613	£985,845	1.030	0.142	£140,137	£166,762.69
2077	56	£0	£0	16.828	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.138	£0	£0.00
2078	57	£0	£0	17.669	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.134	£0	£0.00
2079	58	£0	£0	18.552	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.130	£0	£0.00
2080	59	£0	£0	19.480	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.126	£0	£0.00
2081	60	£0	£0	20.454	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.123	£0	£0.00
2082	61	£0	£0	21.477	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.119	£0	£0.00
2083	62	£0	£0	22.551	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.116	£0	£0.00
2084	63	£0	£0	23.678	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.112	£0	£0.00
2085	64	£0	£0	24.862	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.109	£0	£0.00
Total		£313,888	£313,888		£2,061,745	£2,375,633	£0	£2,375,633	£0	£2,375,633	£1,862,263			£370,865	£441,329

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2021 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£313,888
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£2,375,633
(3)	Following the real cost adjustment a quantified risk contribution has been applied.	£2,375,633
(4)	The next stage is to apply optimism bias.	£2,375,633
(5)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	£1,862,263
(6)	Costs have been discounted to 2010 present values by applying a discount rate of 3.5% per year for 30 years and 3.0% thereafter (WebTAG A1.2).	£370,865
(7)	The final stage in preparing the scheme costs is to convert them from the factor cost to the market price unit of account using the indirect tax correction factor of 1.19	£441,329

Appendix E – TAG Worksheets

Air Quality Valuation Workbook - Worksheet 3

Scheme Name: J3 Peterborough

Present Value Base Year:

Current Year:

Proposal Opening year:

Project (Road/Rail or Road and Rail):

Overall Assessment Score:

Damage Costs Approach (Emissions)

Present value of change in NOx emissions (£):

Present value of change in PM2.5 emissions (£):

OR

Present value of change in PM10 emissions (£):

Impact Pathways Approach (Concentrations)

Present value of change in NO2 concentrations (£):

Of which:

Concentration costs:

Other impacts:

Present value of change in PM2.5 concentrations (£):

Of which:

Concentration costs:

Other impacts:

Total Change

Total value of change in air quality (£):

*positive value reflects a net benefit (i.e. air quality improvement)

Quantitative Assessment:

Impact Pathways Approach (Concentrations)

Change in NO2 assessment scores over 60 year appraisal period:
(between 'with scheme' and 'without scheme' scenarios)

Change in PM2.5 assessment scores over 60 year appraisal period:
(between 'with scheme' and 'without scheme' scenarios)

Damage Costs Approach (Emissions)

Change in NOx emissions over 60 year appraisal period (tonnes):
(between 'with scheme' and 'without scheme' scenarios)

Change in PM2.5 emissions over 60 year appraisal period (tonnes):
(between 'with scheme' and 'without scheme' scenarios)

OR

Change in PM10 emissions over 60 year appraisal period (tonnes):
(between 'with scheme' and 'without scheme' scenarios)

Qualitative Comments:

Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):

Lower estimate net present value of change in air quality (£):

Data Sources:

Noise Workbook - Worksheet 1

Proposal Name: Fletton Parkway Junction 3 Improvements

Present Value Base Year

Current Year

Proposal Opening year:

Project (Road, Rail or Aviation):

Net present value of change in noise (£):

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

Net present value of impact on sleep disturbance (£):

Net present value of impact on amenity (£):

Net present value of impact on AMI (£):

Net present value of impact on stroke (£):

Net present value of impact on dementia (£):

Quantitative results

Households experiencing increased daytime noise in forecast year:

Households experiencing reduced daytime noise in forecast year:

Households experiencing increased night time noise in forecast year:

Households experiencing reduced night time noise in forecast year:

Qualitative Comments:

The Do-Something results do not include the effects of the noise fence 1.8m high and 160m long tested in the "Fletton Parkway Junction 3 Improvements, GH006692-GLH-R-NV-001 P02 Noise Impact Assessment" for the enhancement of the Noise Important Area NIA 5371. In case that the proposed fence was included in the design, this worksheet should be replaced by the Do-Something results with the fence.

Data Sources:

Road traffic model produced by Capita.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Orton Pit SSSI, SAC	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	International	High - Great crested newt, charophyte species (stonewort)	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	Very high	Neutral - Likely Significant Effects (LSE) report concluded that the development works will not have a likely significant effect on the interest features or condition of any of the designated site providing: •A conservatory/precautionary approach is adopted in respect to protected species, particularly GCN and nesting. This will be captured within a Precautionary Method of Working (PMW). •Suitable noise mitigation measures are incorporated into the Construction Environmental Management Plan (CEMP). •Additional testing is undertaken to fully understand the extent of any contaminated land so that suitable soil, surface water and dust control measures can be incorporated into the CEMP.	Neutral
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High	Neutral - This site is not within the area where works are proposed and is located approx. 3km north-east of the proposed development site. No identified connectivity between this site and the area of proposed works.	Neutral
Great Crested Newt (GCN)	Protected Species	International	Very High - european protected species which covers great crested newts, their eggs, breeding sites and resting places	Great crested newt are protected by the Wildlife and Countryside Act (1981) (as amended) and the Conservation of Habitats and Species Regulations (2017) (as amended).	Very high	Neutral - GCN should not be affected by works given the distance (>1km) from suitable ponds with know presence of GCN. Nonetheless, vegetation and ground clearance will be undertaken under a PMW to further mitigate this risk. Ground clearance of root systems will be avoided outside the period March-October inclusive.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral
Reptiles	Protected Species	National	High - national protection from intentional killing, injury or sale	All British reptiles are protected from intentional killing, injuring and sale under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)	High	Neutral - Reptiles should not be affected by works as vegetation and ground clearance will be undertaken under a PMW. Such works will also be undertaken during the active season (April to mid-October inclusive) to further mitigate this risk.	Neutral

Reference Sources

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

Summary Assessment Score

Neutral

Qualitative Comments

Potential impacts on Orton Pit SSSI/SAC will be mitigated by implementing a PMW and other industry best practice control measures to manage both direct and indirect impacts. Pre-start checks will also be undertaken for other protected species and PMWs implemented as appropriate to further mitigate the risk of disturbance and/or harm.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Orton Pit SSSI, SAC	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	International	High - Great crested newt, charophyte species (stonewort)	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	Very high	Neutral - There is no connectivity between the development site and Orton Pit SSSI/SAC, especially considering the intervening development.	Neutral
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High	Neutral - This site is not within the area where works are proposed and is located approx. 3km north-east of the proposed development site. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

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

Summary Assessment Score

Neutral

Qualitative Comments

Potential direct and indirect impacts on protected species will be mitigated by implementing a PMW and other industry best practice control measures. Designated sites are located too far away for there to be any impacts. There is also intervening infrastructure disrupting any connectivity between the proposed development and these receptors.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Orton Pit SSSI, SAC	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	International	High - Great crested newt, charophyte species (stonewort)	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	Very high	Neutral - There is no connectivity between the development site and Orton Pit SSSI/SAC, especially considering the intervening A1139 Fletton Parkway and other development.	Neutral
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High	Neutral - This site is not within the area where works are proposed and is located approx. 3km north-east of the proposed development site. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

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

Summary Assessment Score

Neutral

Qualitative Comments

Potential direct and indirect impacts on protected species will be mitigated by implementing a PMW and other industry best practice control measures. Designated sites are located too far away for there to be any impacts. There is also intervening infrastructure disrupting any connectivity between the proposed development and these receptors.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Orton Pit SSSI, SAC	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	International	High - Great crested newt, charophyte species (stonewort)	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	Very high	Neutral - There is no connectivity between the development site and Orton Pit SSSI/SAC, especially considering the intervening A1139 Fletton Parkway and other development.	Neutral
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High	Neutral - This site is not within the area where works are proposed and is located approx. 3km north-east of the proposed development site. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

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

Summary Assessment Score

Neutral

Qualitative Comments

Potential direct and indirect impacts on protected species will be mitigated by implementing a PMW and other industry best practice control measures. Designated sites are located too far away for there to be any impacts. There is also intervening infrastructure disrupting any connectivity between the proposed development and these receptors.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	<p>Scheduled Monument (NHLE 1006833) "Romano-British Settlement SE of Orton Longueville" - This site is located directly underneath the current junction's roundabout and an area heading westwards from the junction. This site was scheduled following the archaeological excavations which were undertaken in the 1970s prior to the construction of the Fletton Parkway. The excavation revealed the remains of a building, with ceramic building material such as flue tile suggesting a high-status Roman building. The pottery dated the structure to the 2nd to 3rd century. The site identified that the medieval furrows across the area were extensive and had impacted much of the earlier (Roman) remains. It is unclear what archaeological remains may survive within the area following the construction of the parkway.</p> <p>Other archaeological remains - more recent archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.</p>				
Survival	<p>When considering the known heritage assets within the study area, there is a high potential for archaeological remains to be present within the region of the proposed works. This would be in areas which have not previously been disturbed by post-medieval to modern quarrying or modern development. However, previous archaeological work has shown that the historic land-use of the area (the brickworks and their associated clay pits) may have significantly impacted any potential archaeological remains that could have been present. Similarly, the construction of Fletton Parkway and Nene Parkway themselves would likely have impacted buried archaeological remains which were not excavated as part of the 1970s pre-construction excavations.</p>			Romano-British Settlement SE of Orton Longueville Scheduled Monument - The current archaeological baseline	
Condition	<p>Romano-British Settlement SE of Orton Longueville Scheduled Monument - estimate general condition as 'Poor' = <40% remains due to disturbance/removal from previous land use and development.</p> <p>Other archaeological remains - estimate general condition as 'Poor' = <40% remains due to disturbance/removal from previous land use and development.</p>	Romano-British Settlement SE of Orton Longueville Scheduled Monument - National: This monument is scheduled under the Ancient Monuments and Archaeological Areas Act 1979 as amended as it appears to the Secretary of State to be of national importance.	Romano-British Settlement SE of Orton Longueville Scheduled Monument - the Scheduled Monument designation is evidence for highly significant archaeological remains, particularly from the Roman period.	suggests that the area has been well settled since late prehistory, with numerous finds and features being recorded within the PHER. Similarly, the Scheduled Monuments (NHLE 1006833 and 1006860) are both evidence for potentially high-status Romano-British settlement and military activity within the vicinity south of the River Nene.	Neutral - The current setting of this Scheduled Monument is a busy highways interchange which will not change as a result of the scheme. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument's heritage significance, which is based upon its archaeological interest. The scheme is unlikely to impact on previously undisturbed land, particularly considering the impact of previous development and land use. Engagement with the PCC Archaeologist is on-going to provide additional design information and confirm mitigation requirements. A Scheduled Monument Consent will need to be obtained for the works regardless due to the proximity of the underlying feature.
Complexity	<p>Scheduled Monument (NHLE 1006833) "Romano-British Settlement SE of Orton Longueville" - Previous archaeological excavation revealed the remains of a building, with ceramic building material such as flue tile suggesting a high-status Roman building. The pottery dated the structure to the 2nd to 3rd century. The site identified that the medieval furrows across the area were extensive and had impacted much of the earlier (Roman) remains. It is unclear what archaeological remains may survive within the area following the construction of the parkway.</p> <p>Other archaeological remains - more recent archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.</p>	Other archaeological remains - considered likely to be of local or regional importance.	Other archaeological remains - Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.		
Context	<p>The current setting of this Scheduled Monument is dominated by a busy highways interchange with residential properties to the north-west and south-west and industrial/commercial facilities to the north-east and south-east. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument's heritage significance, which is based upon its archaeological interest.</p>			Other archaeological remains - It is anticipated that most finds are likely to be relatively 'common' for the region.	
Period	<p>Scheduled Monument (NHLE 1006833) "Romano-British Settlement SE of Orton Longueville" - Roman.</p> <p>Other archaeological remains - PHER records indicate artefacts from Medieval, Roman, Neolithic, Iron Age.</p>				

Reference Sources

Peterborough City Historic Environment Record
 National Record of the Historic Environment
 National Heritage List for England (online)
 Historic Ordnance Survey maps & photographs (online)
 Royal HaskoningDHV 2020 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The current setting of this Scheduled Monument is a busy highways interchange which will not change as a result of the scheme. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument's heritage significance, which is based upon its archaeological interest.

The scheme is unlikely to impact on previously undisturbed land, particularly considering the impact of previous development and land use. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). Engagement with the PCC Archaeologist is on-going to provide additional design information and confirm mitigation requirements.

A Scheduled Monument Consent will need to be obtained for the works regardless due to the proximity of the underlying feature.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Survival	Unknown - previous archaeological work has shown that the historic land-use of the area (the brickworks and their associated clay pits) may have significantly impacted any potential archaeological remains that could have been present. Similarly, construction of Phorpres Way and the surrounding development would likely have impacted buried archaeological remains which were not excavated as part of any mitigation works.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.				
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	Other archaeological remains - PHER records indicate artefacts from Medieval, Roman, Neolithic, Iron Age.				

Reference Sources

Peterborough City Historic Environment Record
 National Record of the Historic Environment
 National Heritage List for England (online)
 Historic Ordnance Survey maps & photographs (online)
 Royal HaskoningDHV 2020 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways boundary, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Survival	Unknown - previous archaeological work has shown that the historic land-use of the area (the brickworks and their associated clay pits) may have significantly impacted any potential archaeological remains that could have been present. Similarly, construction of Malborne Way and the surrounding development would likely have impacted buried archaeological remains which were not excavated as part of any mitigation works.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.				
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	Other archaeological remains - PHER records indicate artefacts from Medieval, Roman, Neolithic, Iron Age.				

Reference Sources

Peterborough City Historic Environment Record
 National Record of the Historic Environment
 National Heritage List for England (online)
 Historic Ordnance Survey maps & photographs (online)
 Royal HaskoningDHV 2020 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways boundary, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Survival	Unknown - previous archaeological work has shown that the historic land-use of the area (the brickworks and their associated clay pits) may have significantly impacted any potential archaeological remains that could have been present. Similarly, construction of the existing footpath and the surrounding development would likely have impacted buried archaeological remains which were not excavated as part of any mitigation works.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.				
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	Other archaeological remains - PHER records indicate artefacts from Medieval, Roman, Neolithic, Iron Age.				

Reference Sources

Peterborough City Historic Environment Record
 National Record of the Historic Environment
 National Heritage List for England (online)
 Historic Ordnance Survey maps & photographs (online)
 Royal HaskoningDHV 2020 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways boundary, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Landscape Impacts Worksheet

Features	Step 2	Step 3				Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	This area is defined by its position south of the city centre, surrounded by residential properties to the north-west and south-west, and a predominance of commercial/industrial facilities to the north-east and south-east. There are woodland belts of mature vegetation surrounding the Hampton Roundabout (A1139, Fletton Parkway) and its approaches. Trees are also present within the centre of the roundabout and island sites between the slip roads and main dual carriageway.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - mature tree belts will have to be removed to accommodate the embankments on the north-east and south-west sides of the roundabout. There will also be an impact on mature trees between the A1139 westbound onslip and the main carriageway, south of the A1139 westbound offslip, and within the central island area. The receptors directly impacted from a landscape perspective are residential receptors to the south-west, and industrial/commercial facilities in other areas. This will reduce screening of the existing road highways infrastructure. Options for replacement planting on site are also being explored and other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Consultation with local stakeholders will also be undertaken.
Tranquillity	Low - this is a busy highways interchange surrounded by commercial and light industrial facilities.	Local	Common	Low	Substitutable	Neutral - the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There is a Scheduled Ancient Monument (Romano-British settlement SE of Orton Longueville) located immediately beneath the Hampton Roundabout (A1139, Junction 3).	National	Rare	High	Not substitutable	Neutral - the current setting of this Scheduled Monument is dominated by a busy highways interchange with residential properties to the north-west and south-west and industrial/commercial facilities to the north-east and south-east. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument's heritage significance, which is based upon its archaeological interest.
Landcover	Woodland belts of mature vegetation surrounding the Hampton Roundabout (A1139, Fletton Parkway) and its approaches. Trees are also present within the centre of the roundabout and island sites between the slip roads and main dual carriageway.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - mature tree belts will have to be removed to accommodate the embankments on the north-east and south-west sides of the roundabout. There will also be an impact on mature trees between the A1139 westbound onslip and the main carriageway, south of the A1139 westbound offslip, and within the central island area. The receptors directly impacted from a landscape perspective are residential receptors to the south-west, and industrial/commercial facilities in other areas. This will reduce screening of the existing road highways infrastructure. Options for replacement planting on site are also being explored and other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Consultation with local stakeholders will also be undertaken.
Summary of character	This area is defined by its position south of the city centre, surrounded by residential properties to the north-west and south-west, and a predominance of commercial/industrial facilities to the north-east and south-east. There are woodland belts of mature vegetation surrounding the Hampton Roundabout (A1139, Fletton Parkway) and its approaches. Trees are also present within the centre of the roundabout and island sites between the slip roads and main dual carriageway. These woodland belts and trees provide an important screening function for residential properties, specifically to the south-west of the junction.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - The proposed scheme will result in the loss of 16 semi-mature and mature trees in addition to 4 very minor saplings. However, from a landscape perspective, the receptors directly impacted are commercial and light industrial facilities which are less likely to be concerned by such losses. Other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Replacement planting is being carefully planned to provide further mitigation. The essential character of the area will be maintained in the long term and the setting of the nearby Flag Fen Bronze Centre Scheduled Monument will remain unaffected.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Slight adverse (negative) effect

Qualitative Comments

The proposed scheme will result in the loss of significant woodland belts within the immediate areas surrounding the junction. The impact is more significant from a landscape perspective to the south-west side of the junction where residential properties are situated. Other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Replacement planting is being carefully planned to provide further mitigation. The essential character of the area will be maintained in the long term and the setting of the Scheduled Ancient Monument beneath the junction will remain unaffected.

TAG Landscape Impacts Worksheet

Features	Step 2	Step 3				Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	The proposed scheme footprint is set within an urban commercial/industrial area. There is a relatively dense population of commercial buildings to the south with larger commercial and industrial facilities requiring more space to the north. There are existing woodland belts both sides of Phorpres Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Tranquillity	Low - Phorpres Way is an existing road with activity linked to the commercial and industrial facilities.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	There is a relatively dense population of commercial buildings to the south with larger commercial and industrial facilities requiring more space to the north. There are existing woodland belts both sides of Phorpres Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Summary of character	The character of this area is commercial and light industrial with no residential properties in the immediate vicinity. There are existing woodland belts both sides of Phorpres Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

TAG Landscape Impacts Worksheet

Features	Step 2	Step 3				Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	The proposed scheme footprint is set within a residential area to the north of the A1139 Fletton Parkway. There is a school at the southern extent of the scheme (Lime Academy Orton). There is evidence that the existing eastern grass verge where the new footway is proposed is already used informally as an active travel route. There are woodland belts on both sides of Malborne Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a new footway in the eastern verge. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Tranquillity	Low - Malborne Way is an existing road with surrounding residential properties and the A1139 Fletton Parkway located immediately south.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	There is a relatively dense population of residential buildings east, west and north of the scheme footprint, and the A1139 Fletton Parkway located immediately south. There are existing woodland belts both sides of Malborne Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a new footway in the eastern verge. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Summary of character	The character of this area is residential. There are existing woodland belts both sides of Malborne Way. The A1139 Fletton Parkway is located immediately south.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a the new footway in the eastern verge. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a new footway in the eastern verge. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

TAG Landscape Impacts Worksheet

Features	Step 2	Step 3			Step 4	
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	The proposed scheme footprint is bound by the A1139 Fletton Parkway to the south, Stillwell Nature Reserve to the east, and industrial/commercial facilities to the north and west. The area of the former Mars Pet Care site is currently used for storage of shipping containers and lorries. There is an existing footway running from the south-west corner of Stillwells Nature Reserve, along the eastern and northern boundaries of the former Mars Pet Care site, before tying in with the southern end of Shrewsbury Avenue. This footway is lined with trees and hedgerows on both sides.	Local and Regional	Moderate	High	Trees and hedgerows - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a shared use facility. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Tranquillity	Low - the area is characterised by commercial and industrial activity with the A1139 Fletton Parkway located immediately south.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	The proposed scheme footprint is bound by the A1139 Fletton Parkway to the south, Stillwell Nature Reserve to the east, and industrial/commercial facilities to the north and west. There is an existing footway running from the south-west corner of Stillwells Nature Reserve, along the eastern and northern boundaries of the former Mars Pet Care site, before tying in with the southern end of Shrewsbury Avenue. This footway is lined with trees and hedgerows on both sides.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a shared use facility. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Summary of character	The character of this area is commercial and light industrial with no residential properties in the immediate vicinity. There are existing woodland belts both sides of the existing footway.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a shared use facility. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a shared use facility. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

TAG Townscape Impacts Worksheet

Features	Step 2	Step 3					Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	This area is a busy interchange where Junction 3 of the A1139 Fletton Parkway links with both the A1260 Nene Parkway to the north, and A1260 The Serpentine to the South. There is a relatively high density of residential properties to the north-west and south-west of the junction, set back from the woodland vegetation in the immediate area surrounding the junction. Conversely, land to the north-east and south-east is dominated by commercial and industrial land uses. There is an existing active travel route (Phorpres Lane) which passes under the A1260 where it meets the Hampton Roundabout (A1139, Junction 3) to the south.	Local	Common	Low	Substitutable - no significant material changes as part of the proposed scheme.	No impact - existing active travel routes will also be maintained and improved in the wider townscape to the north-east, north-west, and south-east of the A1139, Junction 3.	Neutral – the scheme will maintain the existing townscape as a busy, urban highways interchange with the intention of alleviating congestion and improving active travel routes within the wider townscape.
Density and mix	Immediate surrounding area dominated by residential (north-west and south-west) and commercial / light industrial facilities (north-east and south-east). The main townscape is set back from the immediate surroundings of the junction which is dominated by woodland, shrubs and grassland areas.	Local	Common	Low	Substitutable - no significant material changes as part of the proposed scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works, which is limited to increasing the capacity of the existing highways infrastructure.
Scale	The junction is already elevated within the townscape but surrounded by woodland trees and shrubs which provide an important screening function. The embankment works required to accommodate additional lanes will expose more of the highways infrastructure to the surrounding townscape which could mean it is perceived as a more dominant feature.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will require removal of woodland trees and shrubs which could make the highways infrastructure be perceived as a more prominent feature in the surrounding townscape, particularly to the south-west of the junction. Replacement tree planting will be undertaken but this will take long time periods to re-establish existing baseline conditions. However, this has been assessed as a landscape impact and will not affect the actual townscape character.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will increase the footprint and prominence of highways infrastructure within the wider townscape, but new assets will match existing character.	Local	Common	Low	Substitutable - no significant material changes as part of the proposed scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering that new highways assets will match the existing character of the surrounding townscape.
Human interaction	There is an existing active travel route (Phorpres Lane) which passes under the A1260 where it meets the Hampton Roundabout (A1139, Junction 3) to the south. The proposed scheme will retain this provision and provide improvements to active travel routes within the wider townscape to the north-east, north-west, and south-east.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There is a Scheduled Ancient Monument (Romano-British settlement SE of Orton Longueville) located immediately beneath the Hampton Roundabout (A1139, Junction 3).	National	Rare	High	Not substitutable	No impact	Neutral - the current setting of this Scheduled Monument is dominated by a busy highways interchange with residential properties to the north-west and south-west and industrial/commercial facilities to the north-east and south-east. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument's heritage significance, which is based upon its archaeological interest.
Land use	Busy, urban highways interchange with a relatively high density of residential properties to the north-west and south-west of the junction, set back from the woodland vegetation in the immediate area surrounding the junction. Conversely, land to the north-east and south-east is dominated by commercial and industrial land uses.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will maintain the existing townscape as a busy, urban highways interchange with the intention of alleviating congestion and improving active travel routes within the wider townscape.
Summary of character	The location is a busy, urban highways interchange which is surrounded by residential, industrial and commercial land uses. There is an existing active travel route which will be retained as part of the scheme, with improvements to the footway/cycleway network within the wider townscape proposed.	Local	Common	Low	Substitutable - no significant material changes to townscape as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS
 Fengate Access Improvements - Heritage Appraisal Report (for cultural townscape aspects)

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The dominant townscape character as a busy, urban highways interchange will be maintained as part of the scheme. Although highways infrastructure may become more prominent within the wider townscape, this has been assessed as a landscape impact and will not affect the townscape character. Retention of existing active travel routes and improvements within the wider area will improve human interaction with the townscape.

TAG Townscape Impacts Worksheet

Features	Step 2	Step 3					Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	The proposed scheme footprint is set within an urban, commercial and light industrial area south of the A1139 Fletton Parkway. There is a relatively dense population of commercial buildings to the south with larger commercial and industrial facilities requiring more space to the north.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by commercial and light industrial buildings.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Phorpres Way is lined by trees on both sides of the carriageway. Adjacent buildings protrude much higher into the surrounding townscape than any assets associated with the proposed improvements, which will primarily entail groundworks.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	There are existing footpaths on both sides of Phorpres Way. The proposed scheme will improve this provision by upgrading sections to shared use facilities. Connectivity and safety will also be improved by enhancing existing crossing points and providing new ones.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	Existing road and adjacent footpaths surrounding by commercial and light industrial facilities. Existing active travel routes will be improved as part of the proposed works. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	The character of this area is commercial and light industrial with no residential properties in the immediate vicinity. Existing trees will largely be retained as part of the proposed scheme with only minor pruning and very localised clearance required to accommodate new assets which will improve interaction with the townscape.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Slight beneficial (positive) effect

Qualitative Comments

The dominant townscape character as an urban highway surrounded by commercial and industrial facilities will be maintained as part of the scheme. Improvements to existing active travel routes will improve human interaction with the townscape, albeit on a relatively small scale. Any impacts associated with very localised vegetation clearance has been assessed as a landscape impact.

TAG Townscape Impacts Worksheet

Features	Step 2	Step 3				Step 4	
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	The proposed scheme footprint is set within a residential area to the north of the A1139 Fletton Parkway. There is a school at the southern extent of the scheme (Lime Academy Orton). There is evidence that the existing eastern verge where the new footway is proposed is already used informally as an active travel route.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by residential buildings.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Malborne Way is lined by trees on both sides of the carriageway. Adjacent buildings protrude much higher into the surrounding townscape than any assets associated with the proposed improvements, which will primarily entail groundworks.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	The proposed scheme will improve footpath provision along the eastern verge of Malborne Way. There is evidence that the existing grassed verge is used informally by pedestrians and cyclists but this scheme will provide a purpose built footpath to make this a safer and more formal arrangement, encouraging active travel.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	Existing road surrounded by residential buildings. Existing active travel routes will be improved as part of the proposed works. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	The character of this area is residential. Existing trees will largely be retained as part of the proposed scheme with only minor pruning and very localised clearance required to accommodate new assets which will improve interaction with the townscape.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Slight beneficial (positive) effect

Qualitative Comments

The dominant townscape character as an urban highway surrounded by residential buildings will be maintained as part of the scheme. Improvements to existing active travel routes will improve human interaction with the townscape, albeit on a relatively small scale. Any impacts associated with very localised vegetation clearance has been assessed as a landscape impact.

TAG Townscape Impacts Worksheet

Features	Step 2	Step 3					Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	The proposed scheme footprint is bound by the A1139 Fletton Parkway to the south, Stillwells Nature Reserve to the east, and industrial/commercial facilities to the north and west. The area of the former Mars Pet Care site is currently used for storage of shipping containers and lorries. There is an existing footway running from the south-west corner of Stillwells Nature Reserve, along the eastern and northern boundaries of the former Mars Pet Care site, before tying in with the southern end of Shrewsbury Avenue.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by industrial/commercial buildings to the north and west, with Stillwells Nature Reserve to the east, and the A1139 Fletton Parkway to the south. The area of the former Mars Pet Care site is currently used for storage of shipping containers and lorries.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	The existing footpath is lined by trees, hedgerows and shrubs on both sides. Adjacent buildings protrude much higher into the surrounding townscape than any assets associated with the proposed improvements, which will primarily entail groundworks.	Local and Regional	Rare	High	Trees and hedgerows - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	The proposed scheme will upgrade the existing footpath to a shared use facility, encouraging active travel.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	Existing footpath surrounded by industrial/commercial buildings and Stillwells Nature Reserve. Existing active travel routes will be improved as part of the proposed works. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	The existing footpath denotes the boundary between an urban industrial/commercial area in the west, and a more rural setting in the east with the presence of Stillwells Nature Reserve. Existing trees will largely be retained as part of the proposed scheme with only minor pruning and very localised clearance required to accommodate new assets which will improve interaction with the townscape.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Slight beneficial (positive) effect

Qualitative Comments

The dominant townscape character will be maintained as part of the scheme. Upgrading the existing footpath to a shared use facility will improve human interaction with the townscape, albeit on a relatively small scale, and provide an important active travel connection between the industrial/commercial area of Shrewsbury Avenue and residential properties east of Stillwells Nature Reserve. Any impacts associated with very localised vegetation clearance has been assessed as a landscape impact.

Appendix F – Appraisal Summary Table (AST)

Appraisal Summary Table		Date produced:	28/11/2022		Contact:				
Name of scheme:	Junction 3 Improvement Scheme				Name	Lewis Banks			
Description of scheme:	Full signalisation of Junction 3, including additional lanes and flares, as well as active travel infrastructure in the vicinity.				Organisation	Peterborough City Council			
				Role	PCC Promoter				
Impacts	Summary of key impacts	Assessment							
		Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp		
Economy	Business users & transport providers	The Scheme will result in a net reduction in journey times for business users and transport providers over a 60-year appraisal period for all time periods. However, the time savings generally fall into the 0 to 2 minute range, with journey time changes greater than 2 being net negative.			Net journey time savings (£,000s)		-	£3,573,000	
	Reliability impact on Business users	Not Assessed			-	-	-	-	-
	Regeneration	Not Assessed			-	-	-	-	-
Wider Impacts	Not Assessed			-	-	-	-	-	
Environmental	Noise	The Junction 3 Improvements have been assessed as having a net disbenefit of -£198,892 linked to operational increases in noise levels over the 60-year appraisal period. This is linked to both daytime and nighttime increases in noise levels for some receptors, likely due to the increased capacity of the improved junction increasing travel speeds through the junction and projected increases in traffic levels. An additional assessment was also undertaken to assess the benefit of strategically installing a 1.8m high and 160m long noise barrier as part of the proposed works, which generated a net benefit of +£223,351 over the 60-year appraisal period. This is linked to the enhancement of the Noise Important Area (NIA) 5371, however, the option of installing such a barrier has been discounted. No receptors have been assessed as experiencing noise levels in excess of 69dB LAeq 16h and no properties qualify for insulation under the Noise Insulation Regulations 1975.			Households experiencing increased daytime noise in forecast year: 36 Households experiencing reduced daytime noise in forecast year: 0 Households experiencing increased night time noise in forecast year: 35 Households experiencing reduced night time noise in forecast year: 0		-	Net present value of change in noise (£): -£198,892	
	Air Quality	The Junction 3 Improvements have been assessed as having a net benefit of +£176,649 linked to operational reductions in emission levels over the 60-year appraisal period. This is based on the 'Damage Costs Approach' and is likely due to the increased capacity of the improved junction reducing congestion and idling traffic. The DEFRA emission factor toolkit does not predict emissions for any year after 2030. Emissions are unlikely to increase beyond this time period due to use of alternative energy vehicles (Hydrogen and Electric) and increased engine efficiency. As a result, the future 2036 has been modelled as 2030. The proposed scheme does not lie within an Air Quality Management Area.			Change in NOx emissions over 60 year appraisal period (tonnes): -33 (between 'with scheme' and 'without scheme' scenarios) Change in PM2.5 emissions over 60 year appraisal period (tonnes): -1 (between 'with scheme' and 'without scheme' scenarios)		-	Net present values of changes (£): +£176,649 This can be broken down as follows: NOx emissions: +£129,618 PM2.5 emissions: +£47,031	
	Greenhouse gases	The Scheme will result in a reduction in non-traded carbon and traded carbon dioxide emissions over a 60-year appraisal period. An additional £5,650 GHG saving is identified in the AMATs for a 20 year appraisal period.			Change in non-traded carbon over 60y (CO2e)	1,711	-	£149,000	
					Change in traded carbon over 60y (CO2e)	-7			
	Landscape	The Junction 3 Improvements have been assessed as having a slight adverse (negative) effect on the surrounding landscape. Mature tree belts will have to be removed to accommodate the increased junction capacity and associated construction works. From a landscape perspective, these trees provide an important screening function for residential receptors to the south-west. The increased exposure of the highways infrastructure is also likely to lead to a perceived increase in noise levels and reduced tranquility. Options for retaining more trees/vegetation and replacement planting on site are being carefully explored. Other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Consultation with local stakeholders will also be undertaken.					Slight adverse (negative) effect	-	
	Townscape	The Junction 3 Improvements have been assessed as having a slight beneficial (positive) impact on the surrounding townscape. The townscape character is a busy, active and urban highways interchange to the south of the city centre. Typically, there is a presence of significant development within the surrounding area consisting of residential, commercial, and/or light industrial buildings and facilities. The proposed schemes (including Phorpres Way, Malborne Way, and Shrewsbury Avenue) will retain the essential townscape character of the area whilst promoting active travel by expanding the pedestrian and cycleway network and improving safety and connectivity.					Slight beneficial (positive) effect	-	
	Historic Environment	The Junction 3 Improvements have been assessed as having a neutral impact on the historic environment. The greatest risks of adverse effects are linked to the underlying Scheduled Monument beneath the junction. The Heritage Impact Appraisal for the scheme concluded that the proposed development would not impact on the setting of the Scheduled Monument, especially considering that this does not contribute to its heritage significance. Buried archaeological remains associated with the Scheduled Monument are not expected to fall within the footprint of the proposed scheme (location or depth) considering they would most likely have been removed by previous pre-development archaeological mitigation, or due to the original construction of the A1139 Fletton Parkway. A Scheduled Monument Consent will need to be obtained for the works regardless due to the proximity of the underlying feature. More recent archaeological investigations in the immediate areas surrounding the scheme have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east which revealed Roman artefacts and finds. Engagement with the PCC Archaeologist is on-going to provide additional design information and confirm mitigation requirements.					Neutral	-	
Biodiversity	The Junction 3 Improvements have been assessed as having a neutral impact on biodiversity. The nearest designated site is Orton Pit SSSI/SAC which is located circa 60m west of Junction 3. A Likely Significant Effects (LSE) assessment has been undertaken and concluded that there will be no significant effects on the interest features or condition providing suitable Precautionary Methods of Working are implemented. Assent will also be obtained from Natural England, prior to the start of works. Potential protected species which may be encountered include nesting birds, great crested newts, and reptiles. Precautionary Methods of Working have been developed with further pre-works checks planned to enable any additional mitigation measures to be implemented as required. Suitable stakeholder engagement and planning will be undertaken to achieve 20% net gain in biodiversity through on-site and off-site habitat management initiatives, but this will be subject to agreement and suitable provision of land from PCC.					Neutral	-		
Water Environment	The Junction 3 Improvements have been assessed as having a neutral impact on the water environment. The scheme footprints are generally underlaid by an unproductive 'Secondary A' aquifer which is low risk. Groundwater vulnerability is mostly low with some small pockets of medium-high sensitivity, but this will be managed through standard control measures implemented through the Construction Environmental Management Plan (CEMP). Although there is potential for existing watercourses and waterbodies to be impacted, these are generally artificial drainage ditches and attenuation ponds with low geomorphological value. Existing water quality within nearby surface water features is generally poor based on current WFD status. Nonetheless, pollution prevention measures have been incorporated into the design from an operational perspective, and will be implemented through the CEMP during the construction phase. The risk of flooding during both construction and operational phases is low considering. The whole area is outside Flood Zones 2 and 3 and increased runoff associated with larger areas of hardstanding will be accounted for in the finalised drainage design.					Neutral	-		
Social	Commuting and Other users	The scheme will result in a net reduction in journey times for Commuting and Other users across all time periods for the 60 year appraisal period.			Net journey time changes (£,000s)		-	£9,607,000	
	Reliability impact on Commuting and Other users	Not Assessed			-	-	-	-	-
	Physical activity	Positive Impact identified in AMAT			-	-	Positive	1,571,370	
	Journey quality	Positive Impact identified in AMAT			-	-	Positive	£227,330	
	Accidents	Accident savings have been assessed in COBALT for the study area using default accident rate values and modelled 24 Hr AADT flows. The scheme has been estimated to reduce the number of Personal Injury Accidents			Reduction of 975.7 accidents over 60-year appraisal period, equating to a reduction of 2.1 fatal, 82.6 serious and 1204.0 slight casualties.		Positive	£33,607,900	
	Security	Not Assessed			-	-	-	-	-
	Access to services	Not Assessed			-	-	-	-	-
	Affordability	Not Assessed			-	-	-	-	-
	Severance	Positive Impact likely as a result of new footways on desire lines.			-	-	Positive	-	-
Option and non-use values	Not Assessed			-	-	-	-	-	
Public Account	Cost to Broad Transport Budget	The Scheme PVC has been identified as £7,543,000. The BCR is 6.49.					-	£7,543,000	
	Indirect Tax Revenues	Indirect taxes values from TUBA and AMAT.					-	-£170,000	

Appendix G – Environment Impact Assessment Report

REPORT

A1139 Junction 3 - Environmental Screening Report

Client: Milestone Infrastructure Ltd

Reference: PB2649-ZZ-XX-RP-Z-0001

Status: S0/P01.01

Date: 15 September 2021

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Document title: A1139 Junction 3 - Environmental Screening Report

Document short title:

Reference: PB2649-ZZ-XX-RP-Z-0001

Status: P01.01/S0

Date: 15 September 2021

Project name:

Project number: PB2649

Author(s): Claire Smith

Drafted by: Claire Smith

Checked by: Carina Agnew

Date: 15/09/2021

Approved by: Claire Smith

Date: 16/09/2021

Classification

Project related

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Table of Contents

1	Introduction	1
2	Requirement of EIA	1
3	Site description	2
4	Proposed development	2
5	Screening Assessment	3
5.1	Schedule 1 Projects	3
5.2	Schedule 2 Projects	3
5.3	Schedule 3 Projects	4
5.4	Consideration of cumulative effects	4
5.5	Outcome of Screening Assessment	5
6	Conclusion	15

Table of Tables

Table 1 – Summary of Screening Assessment	6
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Appendices

A1	Site Location Plan
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1 Introduction

This report has been prepared on behalf of Milestone Infrastructure Ltd ('the Applicant') and accompanies a request to Peterborough City Council to provide a screening opinion to determine whether the proposed development constitutes an Environmental Impact Assessment (EIA) development.

This report reflects the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended (the 'EIA Regulations') and in accordance with Regulation 6 of the EIA Regulations, this report contains:

- A plan sufficient to identify the site.
- A description of the proposed development, including in particular:
 - A description of the physical characteristics of the development.
 - A description of the location of the proposed development, including reference to any environmental sensitivity of the areas likely to be affected.
- A description of the aspects of the environment likely to be significantly affected by the proposed development.
- To the extent the information is available, a description of any likely significant effects of the proposed development on the environment resulting from:
 - The expected residues and emissions and the production of waste, where relevant.
 - The use of natural resources, in particular soil, land, water and biodiversity.
- Any other information or representations as the person making the request may wish to provide or make, including any features of the proposed development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment.

2 Requirement of EIA

In order to determine whether the proposed development is considered an 'EIA development', considerations of the EIA Regulations and supporting Planning Practice Guidance (PPG) must be made.

EIA development is defined by the EIA Regulations as development: *"likely to have significant effects on the environment by virtue of factors such as its nature, size or location"*.

EIA development falls into two Schedules of the EIA Regulations. EIA is mandatory for developments listed within Schedule 1. Schedule 2 development require EIA if they would lead to likely significant effects on the environment.

In deciding whether a Schedule 2 development is EIA development, Regulation 5(4) states: *"Where a relevant planning authority....has to decide under these Regulations whether Schedule 2 development is EIA development, the relevant planning authority....must take into account in making that decision (a) any information provided by the applicant; (b) the results of any relevant EU environmental assessment which are reasonably available to relevant planning authority...; and (c) such of the selection criteria set out in Schedule 3 as are relevant to the development"*.

To enable Peterborough City Council to determine the need for EIA, this report provides a description of the site and proposed development, a review of the EIA Screening Criteria based on the EIA Regulations, a completed EIA Screening Checklist and a site location plan.

3 Site description

The proposed development is located on Junction 3 of the A1139 in Peterborough, Cambridgeshire. The central Ordnance Survey (OS) grid reference is TL 1774 9562. A site location plan is provided in **Appendix A1**.

The proposed development comprises a grade-separated junction formed by the uninterrupted ground level roadway of Fletton Parkway running west to east, and a raised roundabout interchange overhead which is fed by slip roads from Fletton Parkway, the Nene Parkway to the north and The Serpentine to the south.

The proposed development is not located within, or within proximity of, an Area of Outstanding Natural Beauty (AONB). The interchange is characterized by linear groups of screening trees and modest embankments along parts of Fletton Parkway and the northbound side of the Nene Parkway; and ornamental planting to the South toward the commercial areas around the Serpentine Green Shopping Centre. The landscape to the South of the junction is typical of the road infrastructure setting in areas of commercial activity. Long shelterbelts of mature trees serving a screening function are also typical of the roadside landscape in Peterborough.

There are no statutory designated nature conservation sites within the proposed development boundaries; however, Orton Pit Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) is approximately 60m at its closest point to the proposed development. This site is afforded protection for its population of great crested newt, network of meso-eutrophic standing water and nationally rare and scarce stonewort plant species.

The closest designated heritage asset is a Scheduled Monument, located directly under the western side of the proposed development. Approximately 750m to the north-west of the proposed development is Orton Longueville's Conservation Area. A total of twelve Listed Buildings are located within the Conservation Area which falls within 1km of the proposed development. Of these, one is Grade I listed; the Church of the Holy Trinity (NHLE 1166191). There are no Listed Heritage Parks and Gardens within the proposed development boundaries.

The proposed development is not located within an Air Quality Management Area (AQMA).

4 Proposed development

Junction 3 is a partially signalised grade separated roundabout (positioned above the A1139 Fletton Parkway), which is situated on the southern edge of Peterborough's urban area. The junction provides access to the A1260 Nene Parkway, A1139 Fletton Parkway, and A1260 The Serpentine. It is heavily used by trips in the southwest of Peterborough, and a large number of facilities, businesses, and residences are immediately to the south of the junction.

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

The proposed development will provide the necessary increase in highway capacity to unlock congestion and significantly reduce delay at Junction 3, which is a major pinch-point on the network. This will improve

the capacity and operational performance of the Peterborough Parkway system which is crucial to supporting further growth.

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

The proposed development comprises:

- Add a flare to A1260 Nene Parkway approach to Junction 3 to create a 4-lane approach;
- Add a 4th lane to the north east circulatory between A1260 Nene Parkway southbound approach and A1139 Fletton Parkway eastbound exit;
- Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a 3rd lane;
- Add a 3rd lane to circulatory between A1260 The Serpentine southbound exit and A1260 The Serpentine northbound approach;
- Add a 3rd lane on the A1260 The Serpentine northbound approach, to the north of Hargate Way;
- Add a flare to the A1260 The Serpentine northbound approach to create a 4-lane approach;
- Add a 4th lane to circulatory between A1260 The Serpentine northbound approach and A1139 Fletton Parkway westbound on-slip;
- Install traffic signals on the A1260 Nene Parkway southbound approach to Junction 3;
- Install traffic signals on the A1260 The Serpentine approach to Junction 3; and
- Create an off-road cycle way on Phorpres Close and Phorpres Way.

5 Screening Assessment

In determining whether a proposed development constitutes EIA development, consideration should be had to the following:

- If the proposed development is of a type listed in Schedule 1;
- If not, whether it is listed in Schedule 2;
- Is it located within a sensitive area;
- It meets any of the relevant thresholds and criteria set out in Schedule 2; and/or
- Would it lead to likely significant effects on the environment.

5.1 Schedule 1 Projects

EIA is mandatory for projects listed in Schedule 1 of the EIA Regulations. Schedule 1 developments are large scale projects for which significant effects are predicted and typically comprise developments such as new airports and power stations. The proposed development is not of a type listed in Schedule 1.

5.2 Schedule 2 Projects

EIA is discretionary for projects listed in Schedule 2. If the proposed development is of a type listed in Schedule 2, it may be classified as EIA development depending on its location (i.e. it is within a sensitive area) and/or whether it meets any of the relevant thresholds or criteria detailed in Column 2.

Sensitive areas are defined in the EIA Regulations as:

- Sites of Special Scientific Interest (SSSI) and European designated sites.
- National Parks, the Broads and AONBs.
- World Heritage Sites and Scheduled Monuments.

The proposed development falls within category 10 of Schedule 2, 'Infrastructure Projects', sub section (f) 'construction of roads'. The site is not located within a sensitive area and therefore the thresholds should be applied. The threshold for the construction of roads category is "the area of works exceeds 1 hectare". The

proposed development does exceed 1 hectare. Accordingly, this screen assessment has been prepared to determine whether the proposed development would be likely to result in significant environmental effects. To achieve this, Schedule 3 of the EIA Regulations need to be considered, as presented below.

5.3 Schedule 3 Projects

Schedule 3 of the EIA Regulations sets out criteria that requires considerations, such as but not limited to the characteristics of the development, the location of the proposed development and the characteristics of the potential impact. These factors should be considered as part of the screening process and include:

- Characteristics:
 - The size and design of the entire development.
 - Cumulation with other existing development and/or approved developments.
 - The use of natural resources, in particular land, soil, water and biodiversity.
 - The production of waste.
 - Pollution and nuisances.
 - The risk of major accidents and/or disasters relevant to the development concerned, including those caused by climate change, in accordance with scientific knowledge.
 - The risks to human health (e.g. water contamination or air pollution).
- Location:
 - The existing and approved land use.
 - The relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground.
 - The absorption capacity of the natural environment.
- Potential impact:
 - The magnitude and spatial extent of the impact.
 - The nature of the impact.
 - The transboundary nature of the impact.
 - The intensity and complexity of the impact.
 - The likelihood of the impact.
 - The predicted duration, frequency and reversibility of the impact.
 - The cumulation of the impact with the impact of other existing and/or approved development.
 - The potential to reduce the impact.

5.4 Consideration of cumulative effects

Schedule 4 of the EIA Regulations requires consideration of a proposed development cumulatively with other existing and/or approved development. Guidance on the consideration of cumulative effects in the EIA screening process is set out in the PPG which states:

“each application (or request for a screening opinion) should be considered on its own merits. There are occasions where other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a Proposed Development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development.”

A check of the Peterborough City Council planning portal has been undertaken and where proposed or consented developments within or adjacent to the proposed development have been identified, these have been considered in the EIA screening assessment of the proposed development detailed in **Table 1**.

5.5 Outcome of Screening Assessment

Table 1 presents the outcome of the screening assessment of the proposed development against the EIA screening criteria.

Table 1 – Summary of Screening Assessment

Screening criteria	Yes/No or N/A	Is a significant effect likely?
1. Natural Resources		
1.1 Will construction, operation or decommissioning of the project involve actions which will cause physical changes in the topography of the area?	No	<p>The existing land use of the proposed development is hardstanding associated with the current road network. The land use will not change from existing as a result of the proposed development given that the proposed development is to improve the existing road network. Therefore, there will be no material change to topography.</p> <p>The proposed construction and operational phases of the proposed development will use resources such as land, water and energy. The Applicant will include measures in a Construction Environmental Management Plan (CEMP) to minimise the consumption of natural resources wherever possible to do so, particularly those which are non-renewable.</p>
1.2 Will construction or operation of the project use natural resources above or below ground such as land, soil, water, materials/minerals or energy which are non-renewable or in short supply?	Yes	
1.3 Are there any areas on/around the location which contain important, high quality or scarce resources which could be affected by the project, e.g. forestry, agriculture, water?	No	
2. Waste		
2.1 Will the project produce solid wastes during construction or operation or decommissioning?	Yes	<p>The proposed development will require excavations to be undertaken. The material within these locations have been tested for their waste classification and has been classified as non-hazardous material.</p> <p>The proposed development will result in the generation of waste materials. Construction waste (i.e. soils) will be reused and recycled wherever possible. Significant quantities of construction waste are not anticipated as a result of the proposed development. Construction waste will be managed in accordance with all relevant legislation and disposed of in line with industry accepted guidance, requirements of which will be included (and enforced) within the CEMP. No waste is anticipated during the operational phase of the proposed development.</p>



Project related

Screening criteria	Yes/No or N/A	Is a significant effect likely?
3. Pollution and nuisances		
3.1 Will the project release pollutants or any hazardous, toxic or noxious substances to air?	Yes (dust generation and emissions)	<p>During the construction phase of the proposed development, dust will be generated. Dust generation will be managed in accordance with industry guidance, with good practice measures being enforced through the implementation of a CEMP. Through the adoption of these measures and the CEMP, it is anticipated that dust generated will not result in significant adverse effects.</p> <p>There will be emissions associated with site machinery and vehicles during the construction phase of the proposed development. Appropriate measures to manage the access and egress of site vehicles, deliveries etc will be included within the CEMP that will subsequently be implemented during the proposed development.</p> <p>As the proposed development is a road improvements scheme, there will be emissions associated with the operational phase of the proposed development. These emissions will be associated with the number of vehicles using the road network. A transport assessment has been undertaken as part of the Business Case for the proposed development for which no significant effects are anticipated.</p> <p>No hazardous substances or toxic emissions to air are anticipated. In addition, there is no requirement to store large volumes of hazardous materials on site. However, if required, these would be stored and handled in accordance with the relevant and most up-to-date legislation.</p>
3.2 Will the project cause noise and vibration or release of light, heat, energy or electromagnetic radiation?	Yes (limited to noise and vibration only)	<p>It is likely that during the construction phase of the proposed development there will be noise and vibration effects. A noise and vibration monitoring assessment has been undertaken and the findings of which used to inform the mitigation measures that will be implemented (and secured through the CEMP) as part of the proposed development.</p> <p>The nearest sensitive receptors are those properties within the adjacent Hampton and Orton Malborne suburbs. It is anticipated that the majority of these residential properties will experience negligible increased noise levels and no</p>



Project related

Screening criteria	Yes/No or N/A	Is a significant effect likely?
		<p>significant residual operational effects have been identified. All construction works associated with the proposed development will be undertaken during daylight hours and no night-time working will be required.</p> <p>All construction effects will be managed in accordance with industry accepted guidance and implemented through the adoption of a noise and vibration management plan that will form part of the CEMP. Consequently, it is anticipated that any noise and/or vibration effects will not be significant.</p> <p>During the construction and operational phases of the proposed development, the potential exists for light pollution. A Preliminary Ecological Appraisal (PEA) has been undertaken and no evidence or potential evidence of protected species sensitive to light (e.g. bats) has been recorded. However, all lighting that is required for the proposed development will be designed in accordance with the relevant British Standards and Institute of Lighting Professionals.</p> <p>No electromagnetic radiation, heat or energy releases are expected. However, if any releases do occur, they would be controlled appropriately using current legislation and controls.</p>
<p>3.3 Will the project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal waters or the sea?</p>	<p>Yes</p>	<p>There are no significant surface waters within or adjacent to the proposed development. There are a number of ponds within the Hampton suburb to the south of the proposed development. However, given their distance from the proposed development it is unlikely effects on these will occur. The proposed development will affect the existing road drainage ditches and consent from the Local Planning Authority will be sought where identified as being required.</p>
<p>3.4 Are there any areas on or around the location which are already subject to pollution or environmental damage, e.g. where existing legal environmental standards are exceeded, which could be affected by the project?</p>	<p>No</p>	<p>The proposed development is not underlain by an area designated as a Principal Aquifer and is not located within a Source Protection Zone (SPZ) and no effects to controlled waters are anticipated.</p> <p>Surface water run-off and drainage will be managed on site during the construction and operational phases. If required,</p>



Project related

Screening criteria	Yes/No or N/A	Is a significant effect likely?
		<p>a flood risk assessment will be undertaken and provided to the Local Planning Authority.</p> <p>Hydrocarbons including vehicle fuel and lubricants will be used during the construction phase. These will be stored and used in accordance with the appropriate guidance and measures included in the CEMP to manage and minimise potential releases of pollutants.</p> <p>Appropriate measures in accordance with industry guidance will be incorporated into the proposed development to prevent accidental spillages of contaminants during the construction of the proposed development. The land uses within and adjacent to the proposed development are unlikely to be contaminated. Consequently, the proposed development is considered unlikely to result in any significant adverse effects to land or water related to contamination.</p>
4. Population and human health		
4.1 Will there be any risk of major accidents (including those caused by climate change, in accordance with scientific knowledge) during construction, operation or decommissioning?	No	<p>The proposed development is not located within an Air Quality Management Area (AQMA). Dust and emissions generated during the construction phase of the proposed development would be minimised and managed in accordance with industry accepted guidance, enforced through the CEMP, although they are not anticipated to generate adverse effects to human health.</p> <p>The CEMP will also set out the guidelines to ensure that construction workers adopt good practice measures to prevent land and water contamination, as well as effects on themselves.</p> <p>No significant risk of water contamination as a result of the proposed development has been identified. The land use within the proposed development is not contaminated and therefore it is not expected that there is a high risk of contaminants being released into the environment. Consequently, the proposed development is considered unlikely to result in any significant adverse effects on the local population and/or human health.</p>
4.2 Will the project present a risk to the population (having regard to population density) and their human health during construction, operation or decommissioning?	No	



Project related

Screening criteria	Yes/No or N/A	Is a significant effect likely?
5. Water resources		
5.1 Are there any water resources including surface waters, e.g. rivers, lakes/ponds, coastal or underground waters on or around the location which could be affected by the project, particularly in terms of their volume and flood risk?	Yes	<p>There are no significant surface waters within or adjacent to the proposed development; however, the proposed development will affect existing road drainage ditches and consent from the Local Planning Authority will be sought where identified as being required.</p> <p>The proposed development is not underlain by an area designated as a Principal Aquifer and is not located within a Source Protection Zone (SPZ) and no effects to controlled waters are anticipated.</p> <p>Surface water run-off and drainage will be managed on site during the construction and operational phases. If required, a flood risk assessment will be undertaken and provided to the Local Planning Authority.</p>
6. Biodiversity (species and habitats)		
6.1 Are there any protected areas which are designated or classified for their terrestrial, avian and marine ecological value, or any non-designated / non-classified areas which are important or sensitive for reasons of their terrestrial, avian and marine ecological value, located on or around the location and which could be affected by the project? (e.g. wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests or woodlands, undesignated nature reserves or parks. (Where designated indicate level of designation (international, national, regional or local))).	Yes	<p>A Preliminary Ecological Appraisal of the proposed development has been undertaken. The majority of the proposed development is within areas of hardstanding (roads and associated infrastructure). The roadside verges are typically poor semi-improved and/or amenity grassland, with areas of plantation woodland and scrub.</p> <p>No designated sites are within the proposed development and the closest non-statutory designated site is the Orton Pits SAC and SSSI which is approximately 60m from its boundaries at the closest point.</p>
6.2 Could any protected, important or sensitive species of flora or fauna which use areas on or around the site, e.g. for breeding, nesting, foraging, resting, over-wintering, or migration, be affected by the project?	Yes	<p>The trees and areas of scrub were noted as providing potential habitat for nesting birds and therefore vegetation clearance works will be programmed to be undertaken outside of the nesting bird season (which is typically between March-September).</p> <p>The proposed development is assessed as providing limited opportunities to support common reptile species, although given the presence of suitable habitat (i.e. areas of dense</p>



Project related

Screening criteria	Yes/No or N/A	Is a significant effect likely?
		<p>scrub adjacent to areas of open grassland), there does remain the possibility that they could be encountered. Therefore, it is recommended that the proposed development is undertaken during the reptile active season (which is typically between March to September). However, should this not be possible, it is recommended that habitat manipulation works (i.e. removal of any areas of loose debris and scrub root systems) is removed during the reptile active season, in accordance with a reptile precautionary method of working.</p> <p>No waterbodies will be lost as a result of the proposed development; however, works will be required within terrestrial habitat for which great crested newts may use. Given the nature of the proposed development, a great crested newt precautionary method of work will be prepared and subsequently implemented during the works. All works associated with the proposed development will be programmed to be undertaken during the great crested newt active season (typically between March and September) but where this is not possible, similarly to reptiles, habitat manipulation works will be undertaken to ensure the proposed development area is unsuitable for great crested newts prior to the commencement of any construction related works. This approach will be undertaken under the supervision of a suitably qualified ecologist who either holds a low-class impact licence or a surveying and handling licence for great crested newts.</p> <p>No evidence or suitable habitat for legally protected and/or notable species was noted during the survey and therefore no further surveys and/or mitigation measures, other than those for nesting birds, reptiles and great crested newts have been identified.</p> <p>The mitigation measures in respect to nesting birds, reptiles and great crested newts will be included within the CEMP and adopted during the proposed development to ensure the legal protection afforded to birds is not infringed. Consequently, the proposed development is considered</p>



Project related

Screening criteria	Yes/No or N/A	Is a significant effect likely?
		unlikely to result in any significant adverse effects on ecological receptors (habitats and/or species).
7. Landscape and visual		
7.1 Are there any areas or features on or around the location which are protected for their landscape and scenic value, and/or any non-designated / nonclassified areas or features of high landscape or scenic value on or around the location which could be affected by the project? Where designated indicate level of designation (international, national, regional or local).	No	The proposed development is not located within a statutory or non-statutory designated site for landscape character or quality. The potential for local views of the proposed development exists from adjacent and nearby roads and residential properties. There are no longer distance views likely to be affected. Consequently, the proposed development is considered unlikely to result in any significant adverse effects on the landscape and visual amenity value of the local area.
7.2 Is the project in a location where it is likely to be highly visible to many people? (If so, from where, what direction, and what distance?)	No	
8. Cultural heritage/archaeology		
8.1 Are there any areas or features which are protected for their cultural heritage or archaeological value, or any non-designated / classified areas and/or features of cultural heritage or archaeological importance on or around the location which could be affected by the project (including potential impacts on setting, and views to, from and within)? Where designated indicate level of designation (international, national, regional or local).	Yes	<p>There are no Registered Parks and Gardens within the proposed development.</p> <p>The closest designated heritage asset is a Scheduled Monument, located directly under the western side of the proposed development. The proposed development is not located within a Conservation Area, nor are there any listed buildings within the boundaries of the proposed development.</p> <p>The land take required for the proposed development is within previously developed and disturbed land, therefore the potential to discover archaeological features is unlikely. Consequently, the proposed development is considered unlikely to result in any significant adverse effects on the cultural heritage/archaeology of the local area.</p>
9. Transport and access		
9.1 Are there any routes on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	Yes	During construction of the proposed development, a CEMP will be implemented that will ensure all vehicle movements



Project related

Screening criteria	Yes/No or N/A	Is a significant effect likely?
9.2 Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?	No	<p>will be via agreed and designated routes to manage and minimise any disruption to local routes or nearby facilities.</p> <p>Appropriate measures to ensure public safety during the construction phase of the proposed development will be identified and detailed within the CEMP. Consequently, the proposed development is considered unlikely to result in any significant adverse effects on the local transport network and/or recreational users.</p>
10. Land use		
10.1 Are there existing land uses or community facilities on or around the location which could be affected by the project? E.g. housing, densely populated areas, industry / commerce, farm/agricultural holdings, forestry, tourism, mining, quarrying, facilities relating to health, education, places of worship, leisure /sports / recreation.	No	<p>The proposed development is located within an area of existing hardstanding associated with the existing road network. There are no areas of agricultural land within or adjacent to the proposed development. As such, the proposed development will not result in the loss of agricultural land and therefore no significant effects are considered likely.</p>
10.2 Are there any plans for future land uses on or around the location which could be affected by the project?	No	
11. Land stability and climate		
11.1 Is the location susceptible to earthquakes, subsidence, landslides, erosion, or extreme /adverse climatic conditions, e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	No	<p>The proposed development is located within Flood Zone 1 and is at low risk of flooding.</p> <p>The proposed development is not located within a groundwater SPZ.</p> <p>No significant effects on land stability are anticipated as a result of the proposed development.</p>
12. Cumulative effects		
12.1 Could this project together with existing and/or approved development result in cumulation of impacts together during the construction/operation phase?	No	<p>It is considered unlikely that there would be potentially significant cumulative impacts during the construction phase of the proposed development when mitigation measures, implemented through the CEMP are in place. It is also considered unlikely that there would be a significant cumulative impact once the proposed development is operational.</p>

Project related



Screening criteria	Yes/No or N/A	Is a significant effect likely?
13. Transboundary effects		
13.1 Is the project likely to lead to transboundary effects?	No	All works associated with the proposed development will be contained within its boundaries and appropriate mitigation measures, implemented through the CEMP will be adopted. Consequently, it is unlikely that there would be any mechanism for transboundary effects to occur.

6 Conclusion

The EIA screening assessment has considered whether the proposed development is likely to give rise to significant effects on the environment.

The proposed development falls within Schedule 2, 10(f) of the EIA Regulations as a construction of roads development project. The proposed development is not located within a sensitive area as defined by the EIA Regulations, but it does fall above the screening threshold as being over 1 hectare in area. The proposed development would be in keeping with the existing nature and scale of the surrounding area and would not result in significant effects.

The EIA screening assessment has identified that no significant effects on the environment are considered likely either alone or in combination with other developments. The proposed development would be of a sufficiently limited scale that effects could be managed in accordance with industry guidance and standards. The proposed development is therefore not considered to require a formal EIA development as defined by the EIA Regulations.

The design of the proposed development has been informed by a suite of environmental appraisals and the findings of which have informed the required mitigation measures. These mitigation measures will be included within a CEMP that will be implemented throughout the construction and operational phases of the proposed development. Consequently, it is considered that through the implementation of the CEMP, there would be no significant effects on environmental receptors as a result of the proposed development.



A1 Site Location Plan

Appendix H – Ecology Surveys

Ecology Constraints Report

Scheme Name: A1139 Fletton Parkway, Junction 3 Improvements		Site Address: Junction 3, Peterborough, Cambridgeshire, PE7 3LA	
Milestone Reference: AS-MIL-ENV-ECO_CONSTRAINTS -001		Milestone Project Code: TP0020/9990021	
Survey Dates: 28 th February, 11 th March & 17 th May 2022		Surveyor/s: Ann Sherwood	Title and Qualifications: Principal Ecologist BSc (Hons) MCIEEM
Date of Report: 18 July 2022 2022			
Author: Ann Sherwood MCIEEM 		Peer Reviewer: Jackson Smith MEnv (Hons) PIEMA REnvP 	
Quality Assurance/Authorised by: Oliver Beech PIEMA 			
Date of Issue: 26/07/2022			
Revision Number: 02			

Summary of potential ecological constraints & recommendations

Potential ecological constraints identified include the following:

- Great crested newts
- Nesting birds
- Common reptiles

The following recommendations are made:

Great crested newts

It has been concluded that the proposed works are unlikely to impact great crested newts given the distance (more than 1km) from suitable ponds with known presence of high populations of newts in Orton Pit SAC. However, given the sensitivity of the site, it is recommended that vegetation removal should be undertaken under a Precautionary Method of Working (PMW) under a separate bespoke method statement.

This is likely to include phased vegetation removal and hand searches. The works must be overseen by a suitably qualified Ecological Clerk of Works who holds either a Low Impact Class licence or a Surveying and Handling licence for great crested newts.

If tree removal is undertaken during the winter period, which also have the benefit of minimising nesting bird risk, stumps/root systems should be left in-situ until the spring when most newts are expected to be in ponds breeding.

Ground level vegetation and stump removal should be removed during the newt active season (usually March to October) and where possible this should be timed when peak numbers of newts can be expected to be in ponds (usually between **April and May**).

These two activities should be included in the construction programmes as separate items.

The approach to minimise risk to great crested newts should also be discussed and agreed with Natural England and this should be led by a suitably qualified ecologist.

Nesting Birds

Vegetation clearance i.e. the bramble scrub and any tree removal should be undertaken over the winter period (October-February inclusive) to avoid the main bird nesting season.

If this is not possible, then vegetation clearance should be preceded by a nesting bird check undertaken by a suitable qualified ecologist immediately before clearance works take place. If nesting birds are found, then active nests must be left undisturbed with a minimum of a 5m buffer around them, where possible, until the chicks have fledged, and the nest is no longer in use.

The habitats adjacent to the road infrastructure are unlikely to support birds listed under Schedule 1 of the Wildlife and Countryside Act (1981 (as amended) and no special measures are considered necessary.

Common reptiles

There is a low risk of encountering common lizards anywhere in the grassy / scrub vegetation in and adjacent to the works footprint. The PMW that will be in place for great crested newts will also cover common reptiles.

The following recommendations are provided for habitats on the northwest side of Junction 3 or other areas;

- Ground cover vegetation should be strimmed in phases during the active season (April to potentially mid-October) ensuring that vegetation is cut to no lower than 150mm initially. This should be left for a few days to allow reptiles, if present, to move away into uncut vegetation. The vegetation can then be cut to 50mm and maintained as short vegetation, until it is stripped off.
- Strimming should ideally be undertaken in sunny conditions and with temperatures above 12°C.
- The vegetation should be directionally strimmed towards uncut vegetation/cover that is outside the works footprint.
- All arisings should be removed out of the works footprint. The arisings can be left in situ provided it is placed outside the works footprint in heaps that would provide habitat for grass snakes to use as egg-laying sites, should these be present, although there is no evidence to support this.

Background

Works are proposed on Junction 3 on the A1139 (Fletton Parkway) to improve the flow and capacity of traffic at the junction.

An initial field survey was conducted by Royal Haskoning on 23rd March 2021. This survey is now out of date and this report is an updated assessment of the current ecological status of the site.

In addition to the field survey, a desk study was undertaken to identify designated nature conservation sites (national and international sites) and Priority Habitats within 2km from Magic <https://magic.defra.gov.uk/MagicMap.aspx>.

Biological records from the Cambridgeshire and Peterborough Environmental Records (CPERC) office were obtained but these had not been provided in full by Royal Haskoning.

Therefore, a data search was conducted using information available through the National Biodiversity Network (NBN) <https://nbn.org.uk>.

A 500m search for ponds and other suitable waterbodies to assess potential constraints in respect of great crested newts was undertaken using web-based Ordnance Survey map sites such as 'Where's the Path' <https://wtp2.appspot.com/wheresthepath.htm>

Proposed works (if known)

The proposed development comprises of a grade-separated junction formed by the uninterrupted ground level roadway of Fletton Parkway running west to east, and a raised roundabout interchange overhead which is fed by slip roads from Fletton Parkway A1139, the Nene Parkway A1260 to the north, and The Serpentine A1260 to the south.

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

Key improvements to the existing junction include:

- Adding a flare to A1260 Nene Parkway approach to Junction 3 to create a 4-lane approach;
- Adding a 4th lane to the north east circulatory between A1260 Nene Parkway southbound approach and A1139 Fletton Parkway eastbound exit;
- Adding a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a 3rd lane;
- Adding a 3rd lane to circulatory between A1260 The Serpentine southbound exit and A1260 The Serpentine northbound approach;
- Adding a 3rd lane on the A1260 The Serpentine northbound approach, to the north of Hargate Way;
- Adding a flare to the A1260 The Serpentine northbound approach to create a 4-lane approach;
- Adding a 4th lane to circulatory between A1260 The Serpentine northbound approach and A1139 Fletton Parkway westbound on-slip;
- Installing traffic signals on the A1260 Nene Parkway southbound approach to Junction 3;
- Installing traffic signals on the A1260 The Serpentine approach to Junction 3.

The general design arrangement is shown in 5101127-MIL-HEW-ZZ-DR-CH-0605_PO1_S2 in Appendix 1.

There will also be a requirement to clear vegetation and re-profile embankments within the Highway boundary to enable the construction works to commence, as shown in drawing 5101127-MIL-HSC-ZZ-DR-CH-0201-0202_PO1-S2 and shown in Appendix 2.

Site Description

The site is located on and immediately adjacent to Junction 3 of the A1139 in Peterborough, Cambridgeshire. The central Ordnance Survey (OS) grid reference is TL 1774 9562, as shown in Figure 1 below.

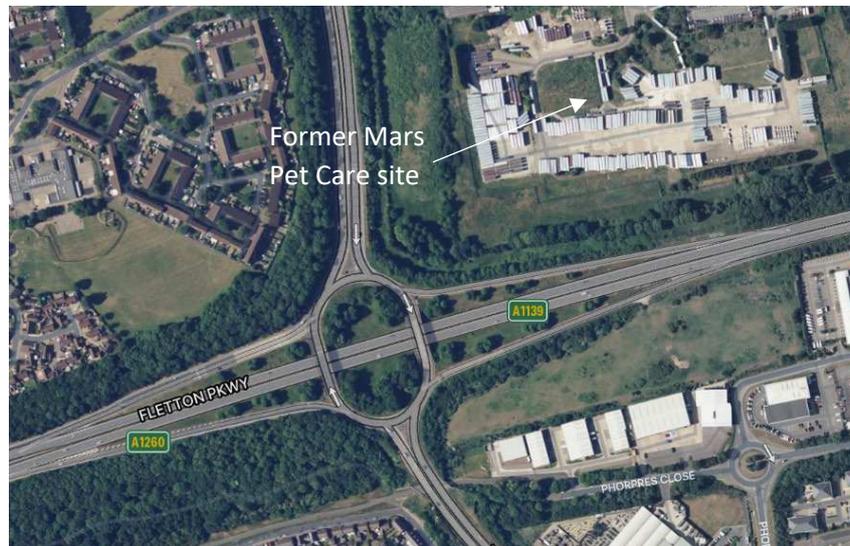


Figure 1. Location of the proposed works and surrounding landscape (Ref: Google maps).

Survey Constraints

Access was available to all areas where works are proposed, except for an area of scrub located on the northeast corner of the roundabout, and the southeast corner of the roundabout. However, these could be viewed visually from a distance.

Desk Study Results

Statutory designated sites

The site lies within 60m east of the boundary of Orton Pit SAC (Special Area for Conservation) & SSSI (Site of Special Scientific Interest).

This site is designated for its high populations of Annex II species great crested newt *Triturus cristatus* and a population of Annex I Habitat, namely a network of mesotrophic standing water and nationally rare and scarce plants which include stoneworts *Chara* spp.

In addition, the Nene Washes Special Protection Area (SPA), SAC, Ramsar site and SSSI lies approximately 3km north-east of the proposed development site.

It supports seasonally flooded wet grassland (washland) of importance for international and national populations of wintering waders and wildfowl. It has also been used in summer as a breeding area for several nationally important migratory species. The site is also notable for the diversity of plant and animal life associated with its network of dykes. The SAC is designated for the presence of the Annex II species spined loach *Cobitis taenia*.

It is unlikely that the proposed works will significantly impact the Nene Washes SAC given its distance from the proposed works.

Woodston Ponds LNR lies 2.3km north of the proposed works. The site (8.94 ha) supports old sugar beet settling ponds that have developed into wildlife rich ponds and reedbeds. It is separated from the proposed works by residential and industrial units and therefore will not be impacted by the proposed works.

It is also considered unlikely that the proposed works will significantly impact the special feature interests of Orton Pit SAC/SSSI given that works are highly localised and lie outside the boundary of the site. Although within 60m, the proposed development is unlikely to affect waterbodies where the feature interests are likely to be concentrated.

Non-statutory designated sites

There are six County Wildlife sites within 2km of the proposed works:

- Fletton Lake CWS 1.0 km east
- Nene Park CWS 1.4 km north-west
- Nene Valley Railway CWS 1.4 km north-west
- River Nene CWS 1.9 km north-west
- Stanground Newt Ponds CWS 1.7 km north-west
- Woodston Ponds CWS 2.3 km east

Stillwell's Nature Reserve and Stillwell's Lake lie to the northeast of the roundabout and the proposed works, although it is not clear where the boundary of the nature reserve is. This site has no formal nature conservation designation at national or county level but is designated as a Semi-Natural Open Green Space.

None of the non-statutory sites are likely to be impacted by the proposed works.

Protected Species

Bats

There were three records of common pipistrelle *Pipistrellus pipistrellus* bats from NBN centred around Junction 3 of the proposed works. Other species of bat have also been recorded within 2km of the former Mars Pet Care Site (Swift Ecology Ltd 2020) shown on Figure 1. These included soprano pipistrelle *P. pygmaeus*, noctule *Nyctalus noctula* and brown long-eared bat *Plecotus auritus*, as well as records of indeterminate species.

Great crested newt

Great crested newts *Triturus cristatus* are known to be present in high numbers within Orton Pit SAC west of the proposed works. According to the District Level Licensing (DLL) risk map, the site falls within the red risk zone for great crested newts, suggesting that there is a risk of encountering great crested newts within the works footprint (**Figure 2**).



Figure 2. Great crested newts risk zone from DLL.

There was one pond located within 500m of the proposed works. However, given the known high populations of great crested newts in Peterborough, particularly around Hampton Vale and Orton, other ponds/waterbodies were also considered in the assessment beyond 500m.

One pond (P7 – Appendix 3) was located on the 500m boundary (**Figure 3**).

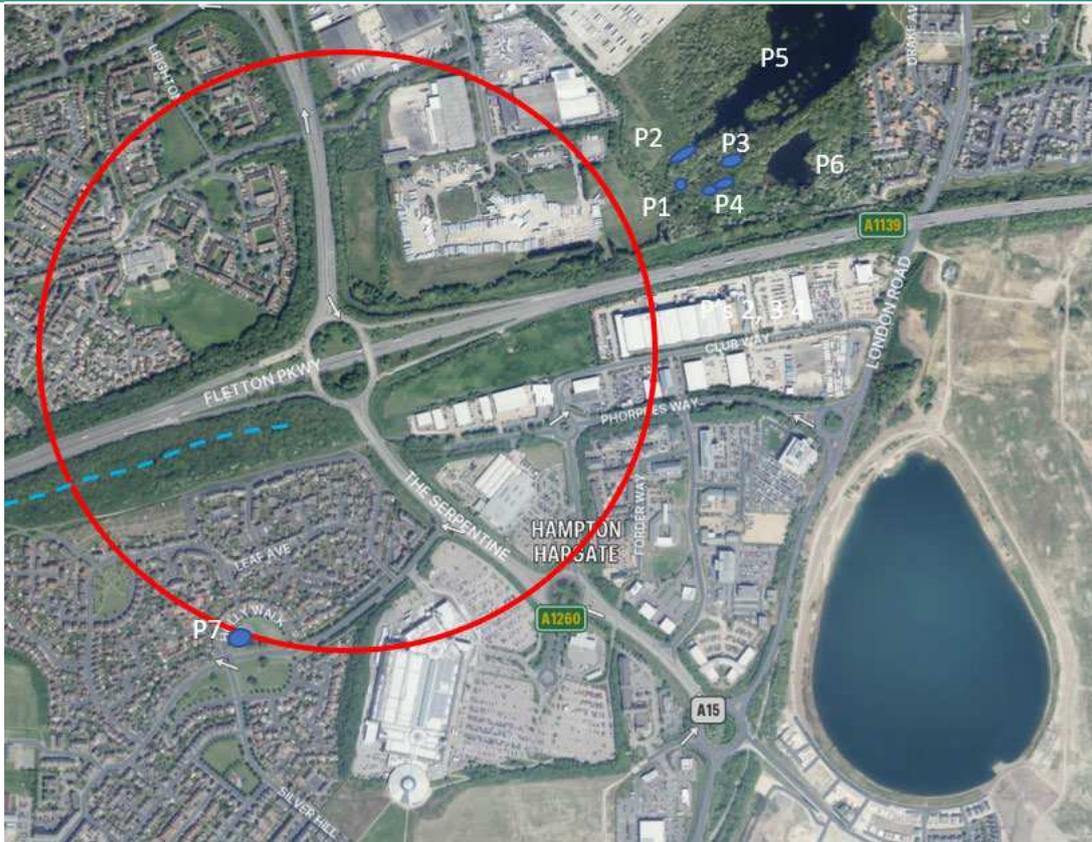


Figure 3. Ponds located within 500m of the works area
Dry Ditch - - - -

There were 11 records of great crested newts from NBN and GCN licence returns, and pond survey results between 2015 and 2019 from Magic. These were located 1.1km northwest of the proposed works. A further record of a survey located 944m northwest from the proposed works indicated that great crested newts were absent in 2019. GCN licence returns data is shown in Figure 4 below.

The closest known record of great crested newts was recorded over 800m southeast of the proposed works on the opposite side of the A15. This population is separated from the proposed works by industrial and residential development and a busy road network, which is a significant barrier to dispersal.

A further six ponds (P1- P6 Appendix 3) were considered in the assessment. Ponds 2-7 were subjected to a Habitat Suitability Index (HSI) assessment (Appendix 4). Pond 1 was scoped out due to its very large size, considering populations of waterfowl and likely presence of fish.



Figure 4. GCN Licence returns ● and pond surveys 2017-2019 (present = ● absent = ● inconclusive = ●)

Swift Ecology undertook a great crested newt HSI and eDNA water sample survey of four ponds in Stillwell’s Nature Reserve in August 2020. Three of the samples were tested for eDNA. The results indicated that these were negative for great crested newts, and one was indeterminate. These were sampled in August which is outside the recommended survey season. However, where ponds support great crested newts, it is still possible to find DNA in waterbodies even up to October provided there is a reasonable population of newts. The HSI assessment conducted by Swift Ecology classified the ponds as having poor suitability for newts ranging between 0.46 and 0.48 suggesting that they are unsuitable for breeding newts.

The results of the eDNA surveys support these findings.

Otters and Water voles

There was one record of otter *Lutra lutra* from NBN dated 2022. No grid reference was provided but likely to be associated with the River Nene.

Aerial maps indicate that there are no habitats on and immediately adjacent to the site that could support otter or water vole *Arvicola amphibius*. Otter could utilise the larger waterbodies (P5 & P6) on Stillwells Nature Reserve but these are over 700m from the proposed works and there are no obvious watercourses nearby suggesting that access to the site is limited. Therefore, these species are not considered further in this report.

Badgers

There were no records of badger *Meles meles* from NBN within 1km of the proposed works.

Common reptiles

There was one record of a grass snake *Natrix helvetica* from NBN. Reptile surveys were conducted by Swift Ecology in 2020 on the former Mars Pet Care Site located in suitable

habitats within 122m of the proposed works on the northeast side of the junction. A low population of common lizard *Zootoca vivipara* were recorded. There are good connective habitats between this site and the proposed works.

Birds

There were 12 records of bird species reported on NBN within 1km of the proposed works. Records of Cetti's Warbler *Cettia cetti*, barn owl *Tyto tyto* and kingfisher *Alcedo atthis*, all Schedule 1 species, were returned. None were recorded within the proposed works area. Other records included several Principal Species of Conservation Concern including house sparrow, tree sparrow and song thrush which all could be found within the trees and shrubs recorded on site.

Other protected species

The habitats within proposed works area do not provide potential for species such as hazel dormouse *Muscardinus avellanarius* or white clawed crayfish *Austropotamobius pallipes*. Hazel dormice are only known to be present in one site in Cambridgeshire.

Field Survey Results

Habitats

The habitats on site largely comprised mature plantation broadleaved woodland (UK Habs W1f7) dominated by Ash *Fraxinus excelsior* to the west of The Serpentine which forms part of Orton Pit SAC, hard surfaces comprising the main road network (UK Habs U1b), poor semi-improved grassland verges (UK Habs G3, 80, 161), and dense scrub (UK Habs h3a6).

The woodland had very little in the way of a shrub layer or ground layer with only thin layers of loose leaves and bare ground throughout (Photo 1, Appendix 3). Towards the road network on the embankment, tree and shrub species including hawthorn *Crataegus monogyna*, field maple *Acer campestre*, lime *Tilia* sp, sycamore *Acer pseudoplatanus*, Alder *Alnus glutinosa* and hazel *Corylus avellana* were present. There were also groups of landscaping shrubs on the embankment adjacent to the residential area which included species such as Pyracantha and Laurustinus *Viburnum tinus*.

The dry ditch did not have any evidence of wetland vegetation suggesting it remains dry throughout much of the year (Photo 2, Appendix 3).

Grassland was restricted to narrow strips of coarse grassland verges alongside the main road networks (Photos 3 and 4, Appendix 3).

Some areas of dense blackthorn scrub (H3a6 -UkHabs) were present on the northeast side of Junction 3 (Photo 5, Appendix 3).

Mixed scrub 9h3h -UK Habs) and young trees typical of former landscaping schemes were also present (Photos 6 & 7, Appendix 3)

Protected Species

Bats

Numerous trees are to be removed within the Highways boundary to accommodate the works and the arboricultural assessment report classified most of the trees as in reasonable condition or good condition which suggests there are limited opportunities for roosting bats. A single ash tree in Group J on the A1139 west bound off-slip had heart rot and has been recommended for removal. This may require further checks for potential opportunities for roosting bats prior to removal.

A daytime assessment carried out by Royal Haskoning in March 2021 within the survey area classified trees as having negligible potential to support roosting bats. However, it is not clear whether trees in some areas such as the on-and off-slips could be accessed.

Bats may forage along the tree lines, but the site is considered to have low suitability for bats generally given the nature of the site and the presence of lighting along the Highway network.

Bats are therefore unlikely to be a constraint to the works and are not considered further in this assessment.

Great crested newts

Habitat Suitability Index (HSI) Assessment

The area around Hampton Vale and Orton supports high populations of great crested newts. However, there are no suitable ponds or any waterbodies within 250m of the proposed works. Since the area is known for its high population of newts and much of the area is designated as a red risk zone, ponds identified beyond 250m were included in the assessment.

In total seven waterbodies were considered in the assessment. The full results of the Habitat Suitability Index assessment are presented in Appendix 4.

The formal HSI Assessment method (Oldham et al. (2000)) is promoted by the Statutory Nature Conservation Organisations as a statistical method of assessing habitat suitability for supporting great crested newts. Assessments using this method are required to be used for Licence applications for developments affecting great crested newts.

The following HSI scores define the corresponding pond suitability for great crested newts:

HSI Pond suitability

- <0.5 = poor
- 0.5 – 0.59 = below average
- 0.6 – 0.69 = average
- 0.7 – 0.79 = good
- 0.8 = excellent

Descriptions of the waterbodies are shown below along with their respective HSI assessment scores.

Pond 1 was a small, shaded pond with shallow water in woodland on Stillwell's Nature Reserve located at approximately NGR: TL 18349 95945 (Figure 3, Photo 8, Appendix 3). It had no aquatic or marginal vegetation and water quality looked poor. The HSI assessment classified the pond as poor for great crested newts (HSI = 0.33, Appendix 4).

Pond 2 was a tributary of Stillwell's Lake located approximately at NGR: TL 18343 95998 at the southwest end of the lake (Figure 3, Photo 9, Appendix 4) which potentially provided some shelter from fish and waterfowl. It supported some marginal vegetation providing some cover for newts. The HSI assessment classified the pond as below average for newts (HSI = 0.51, Appendix 4).

Pond 3 was also a tributary of Stillwell's Lake as above but not as obviously linked to the lake located at approximately NGR: TL 18364 96002 (Figure 3, Photo 10, Appendix 3). There was no marginal or aquatic vegetation in this waterbody. The HSI assessment classified this pond as poor for newts (HSI = 0.48, Appendix 4).

Pond 4 was a shaded hour-glass shaped pond with shallow water located at approximately NGR: TL 18363 95983 (Figure 3, Photo 11, Appendix 3). No aquatic or marginal vegetation was present. The HSI assessment classified this pond as poor for newts (HSI = 0.33, Appendix 4).

Pond 5 was a very large lake in Stillwell's Nature Reserve located at NGR:TL 18535 96207 (Figure 3, Photo 12, Appendix 3) which was also scoped out for further assessment given its size, populations of waterfowl and likely presence of fish.

Pond 6 was a moderately large fishing lake in Stillwell's Nature Reserve located at NGR: TL 18515 95979 (Figure 3, Photo 13, Appendix 3). There was little marginal or aquatic vegetation with only a small area of common reed *Phragmites australis* located at the southern end of the lake.

Pond 7 lies within 500m (Figure 3, Photo 14, Appendix 3) located at NGR:TL 17592 95143. The HSI assessment classified the pond as having poor suitability for great crested newts (HSI = 0.40, Appendix 4). It was located within a residential area surrounded by regularly mown amenity grassland (UK Habs G4 -modified grassland), concrete edges and no aquatic or emergent vegetation. The pond was scoped out for further assessment.

Similarly, Pond 6 was also scoped out as this was also a large lake supporting fish with very limited emergent vegetation present and shaded around the whole of the water's edge.

eDNA assessment

The purpose of the survey is to test for Environmental DNA (eDNA) in suitable waterbodies. Four ponds were selected for eDNA water sampling located in Stillwell's Nature Reserve. Two ponds were scoped out due to size and likely moderate/large populations of waterfowl and/or and fish. One ditch was also present linked to Stillwell's Lake, but water was too shallow to sample and overall the ditch was considered unsuitable for great crested newt. This was also confirmed by Swift Ecology who also scoped out the ditch which was dry when they assessed the site.

eDNA is a highly sensitive technique and is a nationally accepted method for the determination of GCN presence or absence within a waterbody. Twenty water samples evenly spaced along or around each waterbody were taken following standard methodology and procedures. The 20 samples were added together and thoroughly mixed before taking 50ml sub-samples which were added to ethanol in each of the 6 sample tubes and then mixed thoroughly.

The water samples were collected from each of the waterbodies on 17 May 2022. The samples were sent to ADAS, a certified laboratory, for analysis.

The results of the eDNA analysis are shown In Appendix 5.

Common reptiles

There are suitable habitats within the scheme footprint that could support populations of common reptiles such as the grassland verges and mosaics of grass and scrub especially on the northeast side of the roundabout near Stillwell's Nature Reserve.

However, Swift Ecology conducted extensive surveys for common reptiles in the former Mars Pet Care Site only 122m from the proposed works and only a low population of common lizard was recorded.

Overall, reptiles are unlikely to be a significant constraint to the works, however, there is potential for them to turn up on site in suitable habitats and this will need to be considered.

Badger

There were no records of badger from NBN.

A large active main badger sett was recorded in the broadleaved woodland west of the proposed works during and extended survey beyond the works footprint (Photo 15, Appendix 3). This comprised at least 14 active holes at approximately NGR: TL17382 953729 (Appendix 3). The main sett was located on the southern boundary of the woodland adjacent to open grassland along Phorpes Lane.

In addition, 11 disused holes were recorded in the dry ditch in a long section of the ditch opposite the main sett. The closest of these to the proposed works was located approximately 188m from the proposed works at NGR: TL 17564 95492 (Photo 16, Appendix 3).

No evidence of badger activity was recorded in the embankment immediately adjacent to The Serpentine and in the proposed works footprint. No setts were present and no other signs such as latrines or foraging were observed.

Currently, badgers are not a constraint to the works, but this could change and the embankment provides a suitable habitat for digging new setts.

Nesting birds

Nesting birds are likely to be a constraint to the works when tree, shrub and scrub removal takes place if undertaken during the main bird nesting season usually considered to be March to August inclusive.

Other protected species

There was no habitat in or immediately adjacent to the works footprint that could support hazel dormouse *Muscardinus avellanarius*. The watercourse does not provide suitable habitat for white-clawed crayfish *Austropotamobius pallipes*.

Invasive Species

No non-native invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were noted during the walk-over survey.

Potential Ecological Constraints

Great crested newts

There were several ponds and waterbodies in the area, mainly associated with Orton Pit SAC but these were all 500m or more from the proposed works, with those in Orton Pit more than 1km away. Ponds and waterbodies on the northeast side of Junction 3 were generally considered poor for great crested newts or below average and some eDNA analysis tests were negative for this species although this could not be confirmed when re-tested in 2022.

Given the above, it is considered unlikely that great crested newts are a constraint to the works. However, given the location and the proximity of Orton Pit SAC which is designated for its high population of great crested newts, the works should still be conducted under a Precautionary Method of Working (PMW).

Nesting birds

Nesting birds are highly likely to utilise the trees and scrub within the scheme footprint during spring and summer (March to August inclusive) and are therefore a potential constraint to the works if vegetation clearance is carried out during this period.

Common reptiles

Reptiles are known to be present in habitats associated with the former Mars Pet Care site, namely common lizard. The habitats surrounding and within the proposed works footprint form a continuous area of habitat to this site and therefore they could support common lizard but only likely at low populations (as shown from surveys conducted on the former Mars Pet Care site).

Common reptiles are therefore a potential constraint, although low risk as low populations can be expected, this can be managed through habitat manipulation.

Relevant Legislation

Great crested newts

Great crested newts are protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017 and (EU Exit) amendments 2020 and under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

It is an offence to:

- Intentionally or deliberately capture or kill, or intentionally injure great crested newts.
- Deliberately disturb great crested newts or intentionally or recklessly disturb them in a place used for shelter or protection,
- Damage or destroy a breeding site or resting place,
- Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection,
- Possess a great crested newt, or any part of it, unless acquired lawfully,
- Sell, barter, exchange or transport or offer for sale great crested newts or parts of them.

Nesting birds

Nesting birds are protected under the Wildlife & Countryside Act 1981 (as amended). This applies to all wild birds where it is an offence:

- to kill, injure or take any wild bird (subject to certain exceptions).
- to take, damage or destroy a nest whilst it is in use or being built.
- to take or destroy the egg of any wild bird.

NB. Some species are afforded additional protection under this Act where it is also an offence to disturb any wild bird listed on Schedule 1.

It is considered unlikely that any Schedule 1 species would be present in the scheme footprint or immediately adjacent.

Common reptiles

There are six-native species of reptile found in the UK. These are common lizard *Zootoca vivipara*, slow worm *Anguis fragilis*, sand lizard *Lacerta agilis*, grass snake, adder *Vipera berus* and smooth snake *Coronella austriaca*.

All species are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), making it an offence to intentionally or recklessly kill or injure any reptile species. Sand lizard and smooth snake are afforded additional protection, but these species are not present in Cambridgeshire.

Conclusions and Recommendations

Great crested newts

The proposed works are highly localised being confined to largely hard surfaces and narrow roadside verges. However, removal of trees and scrub is required within the Highway boundary. It is likely that some embankment areas will also need to be reprofiled to accommodate the works.

There are no ponds within 250m of the proposed works, and the ditch that runs through the woodland block and Orton Pit SAC/SSSI was dry in March and did not support any aquatic vegetation suggesting that it remains dry most of the time particularly during the critical breeding season for newts (Figures 3 & 4).

However, the habitats beyond 500m especially in relation to Orton Pit SAC/SSSI do provide some connectivity to waterbodies with known populations of great crested newt, albeit over 1km away. There was one pond (P7) located on the west side of the junction located 500m from the proposed works, and a further six ponds/waterbodies within 750m on the northeast side of the junction in Stillwell's Nature Reserve.

No records of great crested newts have been recorded within 500m of the proposed works and eDNA surveys of some waterbodies in Stillwell's Nature Reserve conducted in 2020 did not identify presence, albeit water samples were taken outside the sampling period.

Further eDNA samples were taken in May 2022 from four waterbodies in Stillwell's Nature Reserve and two of these were taken from the same ponds sampled in 2020 (Ponds 3 and 4), but these proved to be indeterminate. Given that the HSI results generally indicated poor or below average suitability in 2020 and 2022, it is reasonable to assume that great crested newts are not present in the waterbodies in Stillwell's Nature Reserve and therefore not a constraint to the works, particularly northeast side of Junction 3.

The population of great crested newts in Orton Pit SAC are generally likely to be confined to ponds and surrounding habitat surrounding located over 1km away from the proposed works area. Habitats immediately adjacent to the works and within the works footprint, while potentially suitable for great crested newts, are small in area and not optimal.

As stated in Natural England's mitigation licence advice, *newts tend to be present at increasingly low densities the further one looks from ponds. Further from ponds there is also a corresponding reduction in the scale of impact on populations. The probability of an offence outside the core breeding and resting places is often rather small, and even if an offence takes place, the effect on the population may be negligible.*

The Natural England Rapid Risk Assessment Tool was used to determine the likelihood of committing an offence. The results suggest that an offence is highly unlikely even with relatively large areas of land are lost assuming that newts are highly unlikely to be present in the habitats to be damaged / lost in this case given its significant distance from known populations of newts.

Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	No effect	0
Land >250m from any breeding pond(s)	1 - 5 ha lost or damaged	0.04
Individual great crested newts	No effect	0
	Maximum:	0.04
Rapid risk assessment result:	GREEN: OFFENCE HIGHLY UNLIKELY	

Figure 5. Risk Assessment Results

Therefore, it is concluded that a mitigation licence will not be required.

However, it is recommended that the works are undertaken under a PMW to reduce any likelihood of killing, injuring or disturbing newts in the unlikely event that a newt is encountered. This is likely to require phased habitat removal carried out under the supervision of a suitably qualified ecologist who either holds a low-class impact licence or a surveying and handling licence for great crested newts.

It is also recommended that any proposed works should be programmed to be undertaken outside the great crested newt active season (the active season is typically between March to September). Ideally, if ground level vegetation can be removed during the period **April to May**, this reduces the risk further since peak numbers of adult newts will be in ponds breeding, and in this case, a significant distance from the proposed works.

Should works be unable to be undertaken during the great crested newt active season, i.e. their hibernation season, it is recommended that any areas of loose debris/tall ruderals are removed during their active season (i.e. March to September) and under ecological supervision.

In addition, where trees and shrubs are to be removed, these should be cut down in the winter period (to avoid the bird nesting season), but roots and stumps must not be removed at this time.

A PMW should be prepared as a separate working document.

This approach (along with the proposed mitigation measures) may need to be discussed and agreed with Natural England given the proximity of the Orton Pits SAC and SSSI to the proposed works. This should be undertaken by a suitably qualified ecologist.

Nesting birds

Nesting birds are a potential constraint to the works. The following recommendations are provided:

- Vegetation clearance, siding up, cutting back etc. including works affecting trees and scrub should only be undertaken outside the main bird nesting season i.e., autumn and winter.
- If this is not possible and vegetation clearance is undertaken in the main bird nesting season, usually considered to be March to August inclusive, then a nesting bird check must be conducted immediately prior to vegetation removal by a suitably qualified ecologist. If an active nest is discovered, then this must be left undisturbed with at least a 5m buffer around the nest until the chicks have fledged and the nest is no longer in use.

Common Reptiles

The PMW that will be put in place to ensure that great crested newts are not impacted southwest of the Junction adjacent to Orton Pit SAC will also cover common reptiles, at least on this side of Junction 3.

In the habitats northwest of Junction 3, then habitat manipulation should be undertaken as follows;

- Ground cover vegetation should be strimmed in phases during the active season (April to potentially mid-October) ensuring that vegetation is cut to no lower than 150mm initially. This should be left for a few days to allow reptiles, if present, to move away into uncut vegetation. The vegetation can be cut to 50mm and maintained as short vegetation, until it is stripped off.
- Strimming should ideally be undertaken in sunny conditions and with temperatures above 12°C.
- The vegetation should be directionally strimmed towards uncut vegetation/cover that is outside the works footprint.

All arisings should be removed out of the works footprint. The arisings can be left in situ provided it is placed outside the works footprint in heaps that would provide habitat for grass snakes to use as egg-laying sites, should these be present, although there is no evidence to support this.

Appendix 1. General Design Arrangement (5101127-MIL-HEW-ZZ-DR-CH-0605_PO1_S2).

Appendix 2. Earthworks Design (5101127-MIL-HSC-ZZ-DR-CH-0201-0202_P01-S2).

Appendix 3. Photo References



Photo 1. Ash dominated woodland with loose leaf litter and bare ground - February 2022. Potential for nesting birds in the trees. Low potential for great crested newts due to lack of cover.



Photo 2. Dry ditch in woodland block.



Photo 3. Tall, tussocky unmanaged species-poor grassland on verge, March 2022. Potential for reptiles and nesting birds in adjacent scrub. March 2022.



Photo 4. Tall, tussocky, unmanaged species-poor grassland adjacent to The Serpentine (A1260). Potential for reptiles.



Photo 5. Dense blackthorn scrub and coarse grassland adjacent to The Serpentine (A1260) looking north. Potential for nesting birds and reptiles.



Photo 6. Low scrub and occasional young trees with coarse grass verges adjacent to the Serpentine (A1260)



Photo 7. Scrub on the off-slip off the A1139 Fletton Parkway. Potential for nesting birds.



Photo 8. Pond 1 Stillwell's Nature Reserve HSI = 0.33

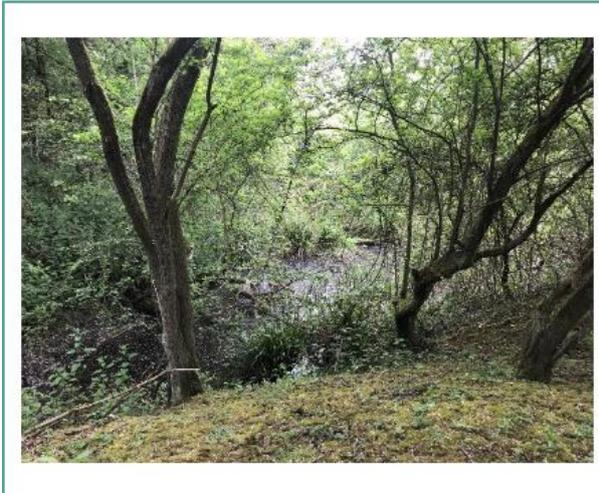


Photo 9. Pond 2 Stillwell's Nature Reserve, Tributary of Stillwell's Lake HSI = 0.51

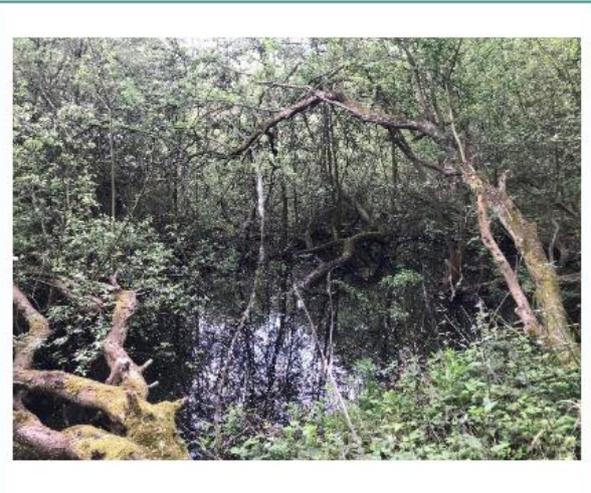


Photo 10. Pond 3, Tributary of Stillwell's Lake HSI= 0.48



Photo 11. Pond 4, Stillwell's Nature Reserve HSI = 0.33 Poor



Photo 12. Pond 5. Stillwell's Lake - scoped out for any further assessments



Pond 13. Stillwell's Lake- HSI = 0.47 scoped out for eDNA.



Pond 14. Man-made pond in housing development. HSI = 0.13 Poor, scoped out for eDNA.



Photo 15. Active main sett.



Photo 16. Old disused sett entrances in dry ditch.

Appendix 4. Habitat Suitability Index Assessment Results 17-5-22

HSI Suitability Index						
Criteria	Pond 1	Pond 2	Pond 3	Pond 4	Pond 6	Pond 7
Geographic location	1.0	1.0	1.0	1.0	1.0	1.0
Pond area	0.01	0.3	0.4	0.1	0.8	0.9
Pond permanence	0.5	0.9	0.9	0.9	1.0	0.9
Water quality	0.33	0.67	1.0	0.67	1.0	0.33
Shade	0.2	0.2	0.2	0.2	0.4	1
Waterfowl impact	1.0	0.67	0.67	1.0	0.67	0.01
Fish presence	1.0	0.33	0.1	1.0	0.01	0.67
Pond density	0.72	0.72	0.72	0.72	0.72	0.01
Terrestrial habitat	0.67	0.67	0.67	0.67	0.67	0.01
Macrophyte cover	0.1	0.3	0.3	0.01	0.35	0.01
HSI Score	0.33	0.51	0.48	0.33	0.47	0.13
Pond suitability	Poor	Below average	Poor	Poor	Poor	Poor

Appendix 5. EDNA Analysis Results - ADAS

Client: John Birkenhead,
Milestone Infrastructure



ADAS
Spring Lodge
172 Chester Road
Helsby
WAS GAR

Tel: 01159 229249
Email: Helen.Rees@adas.co.uk

www.adas.uk

Sample ID: ADAS-4789 Condition on Receipt: White Precipitate Volume: Passed
Client Identifier: Pond 3 Stillwells Description: pond water samples in preservative
Date of Receipt: 25/05/2022 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	26/05/2022
Degradation Control [‡]	Evidence of degradation	Real Time PCR	26/05/2022
Great Crested Newt*	Indeterminate	Real Time PCR	26/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [‡]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:  Signed: 

Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 26/05/2022 Date of issue: 26/05/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

* If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[‡] No degradation is expected within time frame of kit preparation, sample collection and analysis.

*Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Client: John Birkenhead,
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Sample ID: ADAS-4790 Condition on Receipt: White Precipitate Volume: Passed

Client Identifier: Pond 2 Stillwells Description: pond water samples in preservative

Date of Receipt: 25/05/2022 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	26/05/2022
Degradation Control [‡]	Evidence of degradation	Real Time PCR	26/05/2022
Great Crested Newt*	Indeterminate	Real Time PCR	26/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [‡]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

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Director: Biotechnology

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MD: Biotechnology

Date of preparation:

26/05/2022

Date of issue:

26/05/2022

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** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

† Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

‡ No degradation is expected within time frame of kit preparation, sample collection and analysis.

‡ Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

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Sample ID: ADAS-4792 Condition on Receipt: White Precipitate Volume: Passed
Client Identifier: Pond 1 Stillwells Description: pond water samples in preservative
Date of Receipt: 25/05/2022 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	26/05/2022
Degradation Control [‡]	Evidence of degradation	Real Time PCR	26/05/2022
Great Crested Newt*	Indeterminate	Real Time PCR	26/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [‡]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:  Signed: 

Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 26/05/2022 Date of issue: 26/05/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

† Recorded as the number of positive replicate reactions at expected C_i value. If the expected C_i value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

‡ No degradation is expected within time frame of kit preparation, sample collection and analysis.

**Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.*

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Sample ID: ADAS-4793 Condition on Receipt: White Precipitate Volume: Passed

Client Identifier: Pond 4 Stillwells Description: pond water samples in preservative

Date of Receipt: 25/05/2022 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	26/05/2022
Degradation Control [§]	Evidence of degradation	Real Time PCR	26/05/2022
Great Crested Newt*	Indeterminate	Real Time PCR	26/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:  Signed: 

Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 26/05/2022 Date of issue: 26/05/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

† Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

§ No degradation is expected within time frame of kit preparation, sample collection and analysis.

#Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix I – Technical Note For Early Release of Funding

Technical Note

Description: Junction 3 Active Travel Early Funding Release **To:** Nathan Bunting, Emma White

Reference: **From:** Ross Percy-Jones

Date: 23/08/2022 **cc:** Lewis Banks, Richard Jones, Tamara Lanoix, Sally Savage

Introduction

Peterborough City Council (PCC) is requesting the early release of part of the construction funding for the Junction 3 Improvement Scheme from the Cambridgeshire and Peterborough Combined Authority (CPCA).

This is to accelerate the construction of two active travel schemes, which form part of the Junction 3 project, ahead of the main highways works which are scheduled to commence in Spring 2023 (subject to CPCA Board approval in January 2023). The schemes identified for accelerated delivery are:

- Malborne Way Footpath
- Shrewsbury Avenue Cycleway.

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

Including the Junction 3 project, there is approximately £17m of TCF funded transport infrastructure to deliver in the 2023 / 2024 financial year in Peterborough. Bringing forward some of the active travel schemes for delivery into the third and fourth quarters of the 2022 / 2023 financial year will reduce the pressure on the wider construction programme, and specifically reduce the risk to funding availability caused by any programme delays.

A Full Business Case (FBC) is required for the approval of construction funding by the CPCA Board. The Junction 3 Improvement Scheme FBC is due to be submitted in December 2022, ahead of the January 2023 Board meeting. This technical note provides a summary of the business case dimensions in relation to the two active travel schemes introduced above and demonstrates that the schemes offer very high value for money, and there is a strong strategic case for investment as well as the necessary measures in place to successfully deliver the schemes.

As stated in the Department for Transport (DfT) Cycle Infrastructure Design Local Transport Note 1/20 (LTN 1/20), funding for local highways investment where the main element is not cycling or walking will be provided where schemes deliver or improve cycling infrastructure to the standards in LTN 1/20.

Schemes

The Junction 3 active travel schemes are designed and are ready to be delivered.

The Malborne Way Footpath scheme, which completes a missing link along an existing route, consists of the following:

- 1.6m wide dropped crossing over the Saltmarsh approach to the Malborne Way / Saltmarsh priority junction
- 2.5m wide footway for 220m between the Malborne Way / Saltmarsh priority junction in the north and the footpath ramp adjacent to the Lime Academy Orton access junction.
- 1.2m wide dropped crossing over the Lime Academy Orton access junction.

The Shrewsbury Avenue Cycleway scheme consists of the following:

- A 3.5m wide cycleway for 450m from the southernmost point of Shrewsbury Avenue to the south-west corner of Stillwells Nature Reserve.
- Resurfacing to make the existing route more attractive, comfortable, and safer.

The scheme drawings for each scheme are available upon request.

Figure 1 overleaf shows the location of the schemes in the Junction 3 study area, which is situated between the Ortons and Hampton areas in the south of Peterborough.

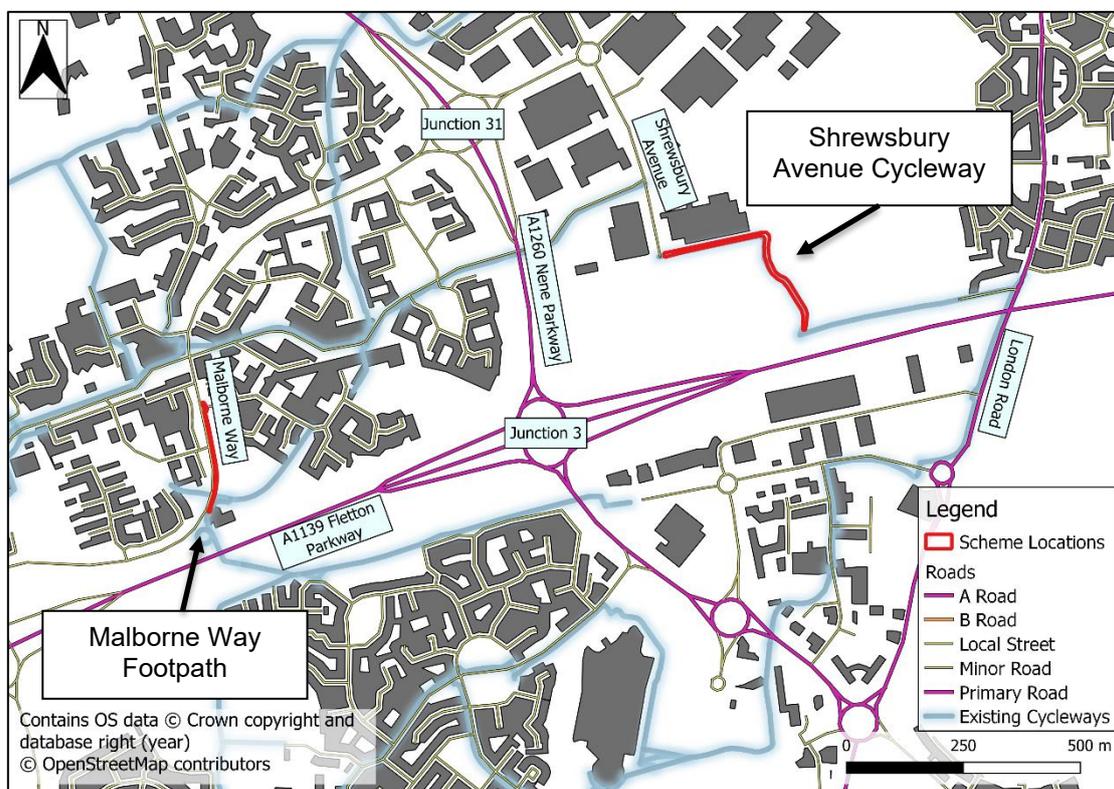


Figure 1: Junction 3 Active Travel Scheme Locations

Strategic Dimension

The Strategic Dimension considers the policy context in which the schemes have been developed. As well as policy, the need for intervention is explained, which includes the requirement to overcome the peak hour congestion and delay that compromises local growth aspirations.

Policy Context

A policy review of the following, in conjunction with a review of existing and future issues, has been undertaken as part of the Junction 3 FBC to identify scheme objectives:

- National:
 - Department for Transport Single Departmental Plan (June 2019)
 - Department for Transport Gear Change: One Year On (November 2020)
 - Department for Transport Cycle Infrastructure Design Local Transport Note 1/20 (LTN 1/20) (July 2020)
 - The Environment Act 2021
- Regional:
 - Combined Authority Annual Report & Business Plan 2021 / 22
 - Cambridgeshire and Peterborough Independent Economic Review (CPIER) (September 2018)
 - Mayor's Growth Ambition Strategy
 - Cambridgeshire and Peterborough Local Industrial Strategy (June 2019)
 - Cambridgeshire and Peterborough Combined Authority Local Transport Plan (January 2020)
 - Forthcoming Cambridgeshire and Peterborough Combined Authority Local Transport and Connectivity Plan
 - Natural Cambridgeshire Doubling Nature Vision
 - Cambridgeshire and Peterborough Independent Commission on Climate – Fairness, Nature and Communities: Addressing Climate Change in Cambridgeshire and Peterborough (October 2021)
- Local:
 - Peterborough City Council Strategic Priorities
 - Peterborough City Council Local Plan (July 2019)
 - Peterborough City Council – Trees and Woodland Strategy (2018)

Existing and Future Conditions

Evidence of existing and future conditions demonstrates the following issues that need to be overcome for growth to be realised:

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

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

A non-motorised user (NMU) audit was conducted as part of the Junction 3 FBC to inform active travel scheme designs. The audit included a review of the quality of the walking and cycling facilities present at Junction 3 and the wider study area and identified any improvements that could be made alongside construction of the Junction 3 highway scheme. During the audit the following points were considered:

- Quality of the pedestrian / cycle footpaths
- Location of crossing points and the ease of crossing
- Extent of street lighting
- Perceived safety of the underpass.

Wider pedestrian and cycle facilities within the study area, such as the Malborne Way and Shrewsbury Avenue schemes, would help facilitate north-south active user trips across the A1139 Fletton Parkway.

It is expected that providing improved active travel infrastructure will encourage residents to travel by foot or bicycle instead of by car, and therefore help reduce existing and future year peak hour congestion and delay.

Local employment areas to the north, south, and east of Junctions 31 and 3 are particularly car-dependent, as shown in Figure 2 below. However, car availability for residents is lower in the Ortons and Hampton, where the schemes are located, than other areas of Peterborough as shown in Figure 3 overleaf. Improving the quality of strategic active travel corridors such as Malborne Way and the Shrewsbury Avenue Cycleway is expected to reduce the need to travel by car to local employment sites and increase the appeal of active travel.

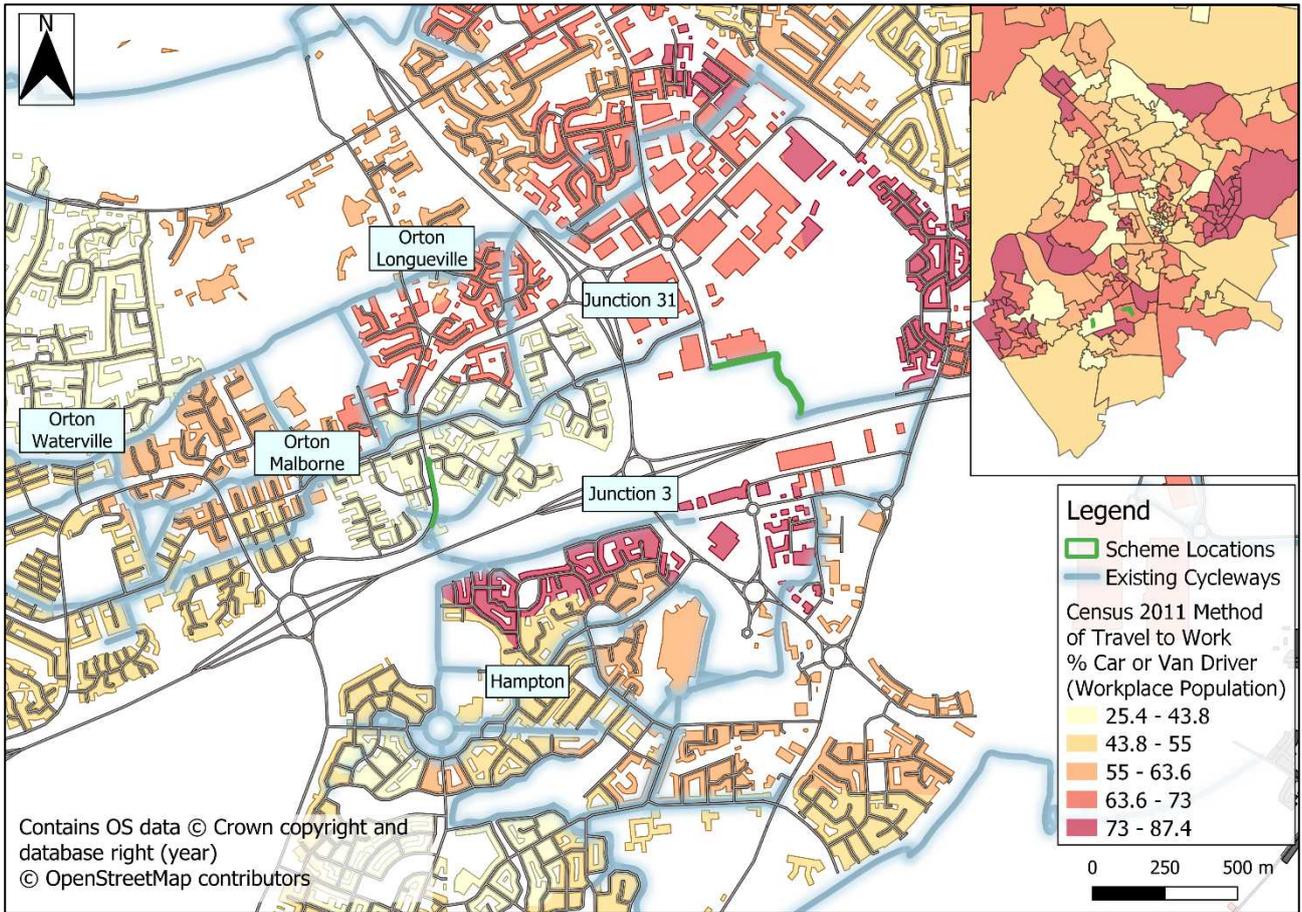


Figure 2: Census 2011 Method of Travel to Work – Percentage Car or Van Driver within Workplace Population

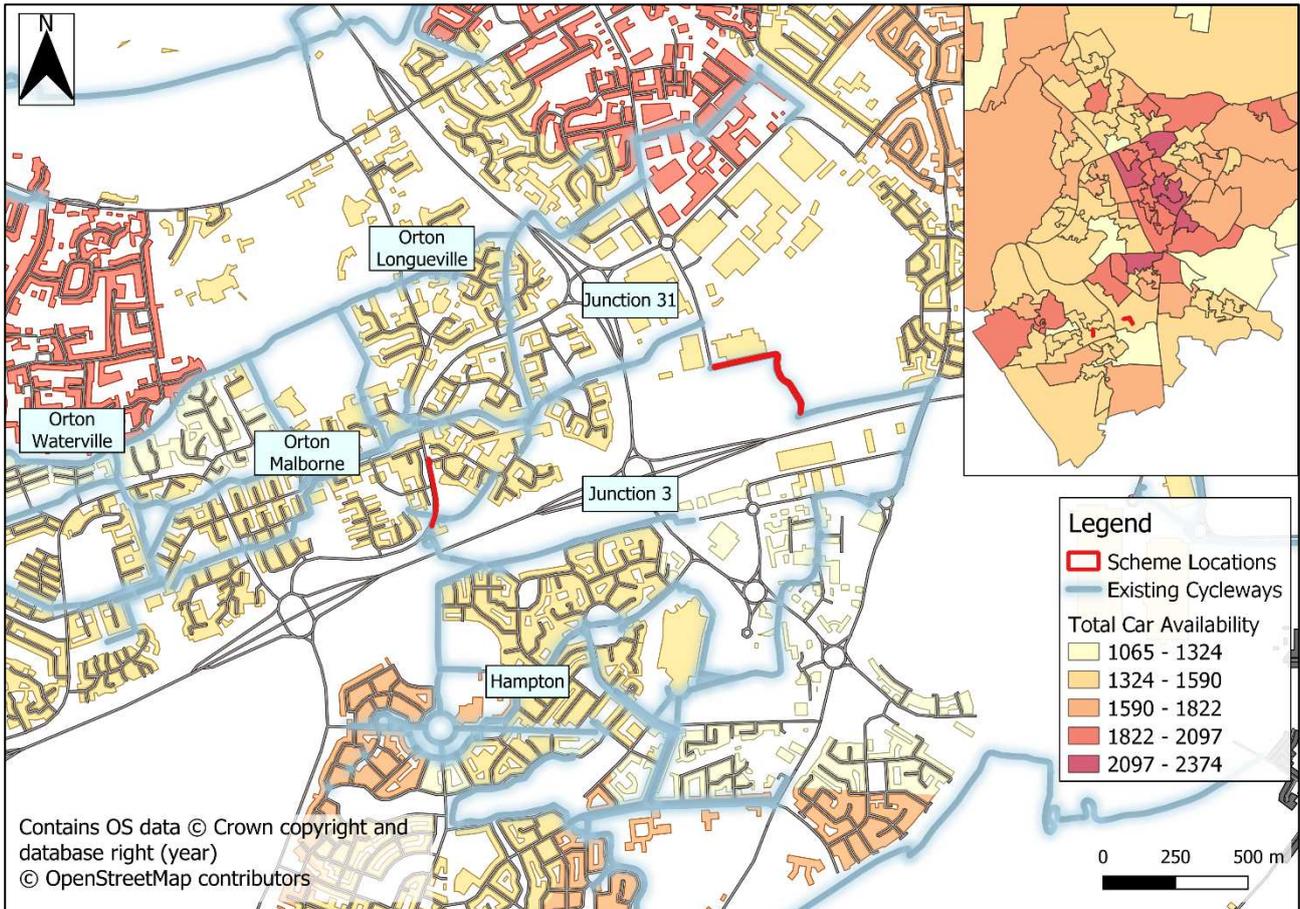


Figure 3: Census 2011 Total Car Availability by LSOA

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

Figure 4 shows the ratio of the local propensity to cycle under the Government Target Equality scenario of the Propensity to Cycle Tool (PCT) to Census 2011 cycle commuting levels.

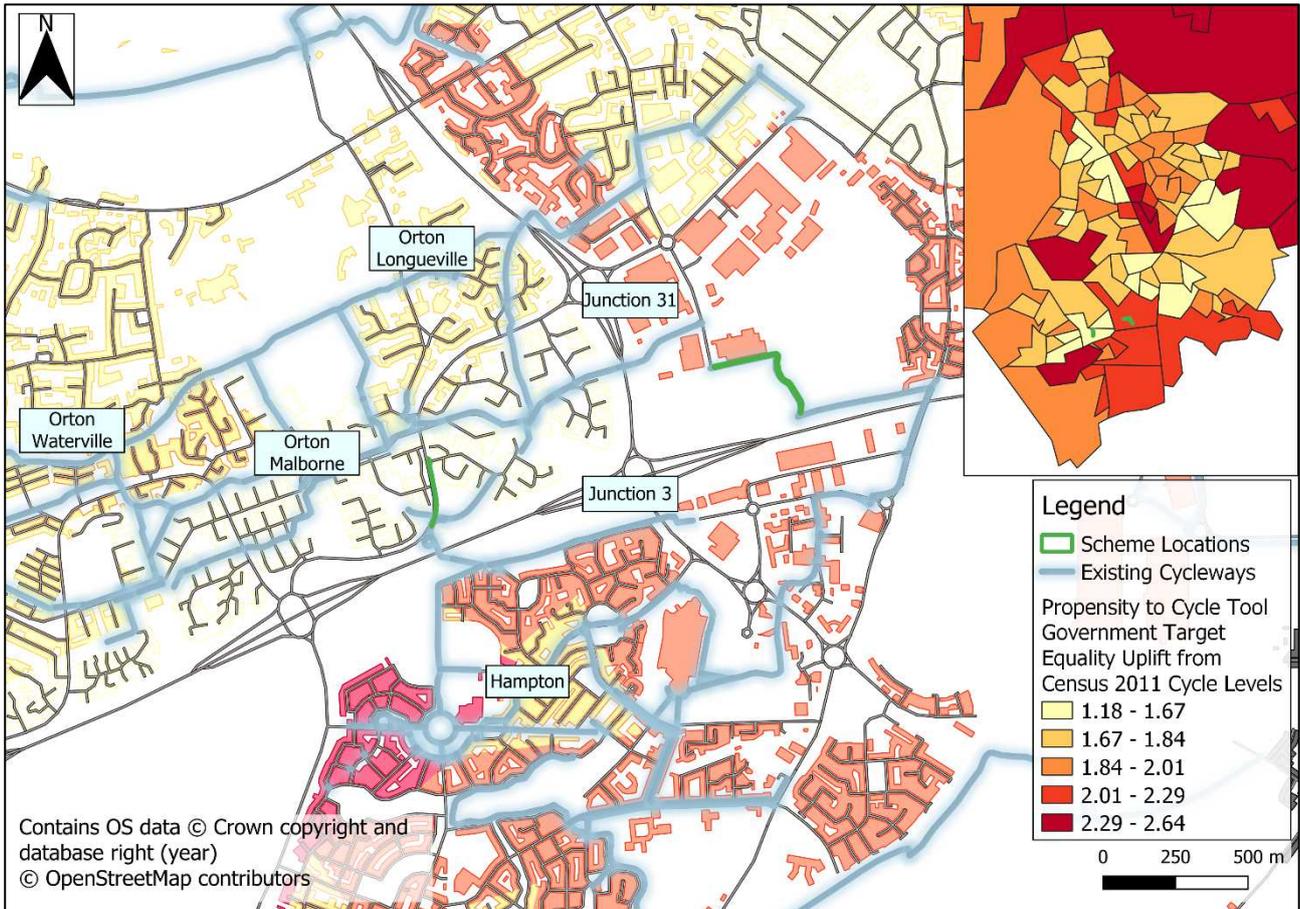


Figure 4: Ratio of Propensity to Cycle Tool Government Target Equality to Census 2011 Cycle Commuting Trips

There is the potential to uplift cycling from Census 2011 levels as follows:

- In the Ortons to the west of Junction 31 by a factor of between 1.18 and 1.67
- In Hampton by a minimum factor of 1.67 and a maximum factor of 2.64
- In the Ortons to the east of Junction 41 by a factor of between 2.01 and 2.29.

The Census 2011 Method of Travel to Work data has also been analysed to identify the number of car driver trips that are undertaken within a walkable distance through the study area and could feasibly use the routes that would be improved as shown in Figure 5 overleaf.



Figure 5: Census 2011 Method of Travel to Work - Car or Van Driver Trips Undertaken Over a Walkable Distance

There are 353 daily car or van driver home to work trips in 2011 that are undertaken within a walkable distance through the study area. If 10% of these car or van trips shifted to walking, the number of local home to work walking trips would increase to about 94 from 59 which equates to a ratio of 1.60. If 25% of these car or van trips shifted to walking, the number of local home to work walking trips would increase to about 147 which equates to a ratio of 2.50.

Without an improvement in active travel infrastructure, the study area will remain a car-dependent destination with untapped potential for walking and cycling.

Local Growth Aspirations

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

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

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

Junction 3, London Road, and the A1139 Fletton Parkway footbridge are gateways to a large residential and employment area known as Hampton. The Hampton Township has been developed over the past 25 years and is identified for a significant proportion of residential and employment growth in the Local Plan for the next 15 years.

Table 1 shows the developments by land use that are proposed for the Hampton area, respectively.

Table 1: Development in the Hampton Area

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

Local residential and employment growth will be compromised if no changes are made to existing congestion and delay. An increase in local active travel within the Junction 3 study area and a reduction in car travel will alleviate congestion and delay.

The October 2021 Cambridgeshire and Peterborough Independent Commission on Climate report recommends a reduction in car miles driven by 15% to 2030 relative to baseline levels to help the region mitigate and adapt to the impacts of climate change. The schemes will provide quality active travel infrastructure that would encourage walking and cycling as a more sustainable alternative to car travel.

Scheme Objectives

The project scope is to construct schemes within the Junction 3 study area that achieve each of the primary objectives of the Junction 3 FBC.

The primary scheme objectives, as outlined in the Junction 3 FBC, are as follows:

- Tackle congestion and improve journey time reliability
- Support Peterborough's Growth Agenda
- Create wider economic benefits
- Protect and improve the biodiversity value within the study area
- Reduce dependence on car travel and increase travel by healthier, more sustainable modes.

The secondary scheme objectives, as outlined in the Junction 3 FBC, are as follows:

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

The Junction 3 FBC schemes were developed and shortlisted against the scheme objectives using the DfT's Early Assessment and Sifting Tool (EAST) assessment. An option development workshop was held on 4th December 2018 and attended by representatives from various disciplines within Peterborough Highway Services (PHS). The workshop used EAST to review existing and future issues at Junction 3 and the surrounding network.

As stated in the Department for Transport (DfT) Cycle Infrastructure Design Local Transport Note 1/20 (LTN 1/20), funding for local highways investment where the main element is not cycling or walking will be provided where schemes deliver or improve cycling infrastructure to the standards in LTN 1/20.

The Benefits Realisation Plan for the Junction 3 FBC will measure the success of the schemes against the scheme objectives.

Key Risks

A project Risk Register is available as part of the Junction 3 FBC that identifies each of the key risks and mitigation measures. The Risk Register is a live document, which is managed by PCC and is reviewed regularly by the CPCA in monthly Project Board meetings.

A construction Risk Register for each scheme has been produced and is available upon request. The Risk Register is a live document and will be regularly updated throughout the ten-week construction period.

Economic Dimension

The Economic Dimension provides evidence of how the proposed improvements are predicted to perform in relation to the stated objectives, identified problems, and targeted outcomes. The Economic Dimension determines whether the proposed improvements are likely to provide good value for money, with benefits outweighing its costs.

This section sets out the approach taken to initially assess the Economic Dimension for the Junction 3 Active Travel schemes and demonstrates that the proposed schemes would offer Very High Value for Money.

The scheme appraisal in this report focuses on the impacts that can be monetised and these include:

- Mode Shift
- Health
- Journey Quality.

A full appraisal of other economic, environmental, social and distributional impacts that cannot be monetised will be assessed quantitatively and qualitatively within the FBC going to the CPCA January Board.

Present Value of Benefits

The active travel Present Value of Benefits (PVB) of each scheme has been assessed using the Active Mode Appraisal Toolkit (AMAT).

AMAT requires the following intervention-specific details for calculating active travel benefits:

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

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

It was estimated in the Strategic Dimension that there is a potential for walking commuter trips to increase by a factor of 1.600 if 10% of short distance car or van driver trips that could use the proposed infrastructure made the switch to walking. However, the Transport for Quality of Life Overview of Evidence on Increasing Active Travel report (September 2019) identified that improvements to network and flagship routes could generate 18% new walking / cycling trips after only one year, which equates to an uplift factor of 1.180.

A separate exercise has been undertaken to estimate the potential uplift in walking trips from improving walking connectivity in an area such as Fengate where there is low footpath provision to match the level of provision along Shrewsbury Avenue in Orton Longueville. This was achieved by calculating the ratio of walking mode share along Shrewsbury Avenue to the walking mode share in Fengate. Shrewsbury Avenue was found to have a travel to work by walking mode share of 5.33%, whereas Fengate had a mode share of 4.45%. The uplift factor for walking would therefore be 1.198, which is similar to the new trip generation factor observed in the Transport for Quality of Life report.

An uplift factor of 1.198 has therefore been used as the core assumption to provide a conservative estimate of the number of walking trips with the proposed interventions.

A sensitivity test has also been undertaken that assesses the impact of using the Strategic Dimension uplift factor of 1.600.

The number of cycling trips with the proposed improvements to the Shrewsbury Avenue Cycleway has been calculated by:

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

Government Target (Equality) is the most conservative of all PCT scenarios and is representative of the Department for Transport's Cycling Delivery Plan (October 2014) target of doubling cycling from 2013 levels nationally. Nearly all PCT scenarios are calculated using a function based on trip distance and hilliness. Not all areas experience the same trip distances and hilliness, and this therefore results in increases that can be below or above a doubling of cycling nationally.

PCT is a measure of cycling potential and not an exact estimate of the impact of a specific scheme or intervention. However, a site visit to the Shrewsbury Avenue Cycleway has shown that the scheme is integral to delivering a better-connected network that improves safety and journey quality for cycling. Without any infrastructure improvements, the study area would not be appropriate for increased cycling.

TEMPro v8.0 Core Scenario 2019 to 2023 walk and cycle growth factors for Peterborough have been applied to the average weekday trips for all scenarios.

Table 2 overleaf shows the number of walking and cycling trips by scenario for each scheme.

Table 2: Do Nothing and Do Something Daily Walking Trips by Scheme

Scheme	Daily Walking Trips			Daily Cycling Trips		
	Without Scheme (2023)	With Scheme – Core (2023)	With Scheme – Sensitivity Test (2023)	Without Scheme (2023)	With Scheme – Core (2023)	With Scheme – Sensitivity Test (2023)
Shrewsbury Avenue Cycleway	156	186	249	159	266	
Malborne Way Footpath	233	280	376			

Table 4 below summarises the benefits for each scheme for the Core Scenario.

Table 3: Summary of Benefits by Scheme – Core Scenario

Benefit Type	Benefit Item	Benefits ('000s)		
		Shrewsbury Avenue Cycleway	Malborne Way Footpath	Total
Mode Shift	Congestion Benefit	£32.45	£2.98	£41.59
	Infrastructure Maintenance	£0.18	£0.02	£0.23
	Accident	£5.58	£0.51	£7.15
	Local Air Quality	£0.79	£0.07	£1.01
	Noise	£0.37	£0.03	£0.47
	Greenhouse Gases	£2.65	£0.24	£3.4
Health	Reduced Risk of Premature Death	£688.73	£108.29	£1,020.67
	Absenteeism	£91.56	£22.53	£160.62
Journey Quality	Journey Ambience	£2.24	£6.60	£10.06
Indirect Taxation	Indirect Taxation	£-3.33	£-0.31	£-4.27
Total		£790.00	£140.96	£930.96

The benefits over a 20-year appraisal period for the Shrewsbury Avenue and Malborne Way schemes are £790,000 and £140,960, respectively. Health forms most of the benefits for the Shrewsbury Avenue and Malborne Way schemes, with 95.0% and 92.8%, respectively.

Table 4 below summarises the benefits for each scheme for the Sensitivity Test.

Table 4: Summary of Benefits by Scheme – Sensitivity Test

Benefit Type	Benefit Item	Benefits ('000s)		
		Shrewsbury Avenue Cycleway	Malborne Way Footpath	Total
Mode Shift	Congestion Benefit	£36.53	£9.14	£45.67
	Infrastructure Maintenance	£0.21	£0.05	£0.26
	Accident	£6.28	£1.57	£7.85
	Local Air Quality	£0.89	£0.22	£1.11
	Noise	£0.42	£0.10	£0.52
	Greenhouse Gases	£2.98	£0.75	£3.73
Health	Reduced Risk of Premature Death	£837.04	£331.94	£1,168.98
	Absenteeism	£122.41	£69.06	£191.48
Journey Quality	Journey Ambience	£2.65	£7.82	£10.47
Indirect Taxation	Indirect Taxation	-£3.75	-£0.94	-£4.69
Total		£977.35	£419.66	£1,397.01

The benefits over a 20-year appraisal period for the Shrewsbury Avenue and Malborne Way schemes are £977,350 and £419,660, respectively. Health forms most of the benefits for the Shrewsbury Avenue and Malborne Way schemes, with 95.4% and 95.5%, respectively.

Present Value of Costs

The Present Value of Costs (PVC) used within the economic assessment are based on initial base investment costs and Optimism Bias (OB) that have been rebased and discounted to 2010 prices and adjusted to market prices using AMAT. No inflation has been applied because the scheme costs will be incurred within the same price year. A developer contribution of £50,000 for the Shrewsbury Avenue Cycleway has been included within the Economic Dimension costs.

The OB rate has been sourced from TAG Unit A1.2 Scheme Costs (May 2022) and uses the Stage 3 Road OB of 20% to reflect the final stage (FBC) that the Junction 3 Business Case is currently at.

The conversion to market prices is undertaken by applying a market price factor of 1.19 to the discounted costs.

Table 5 below shows the scheme costs used within the economic assessment.

Table 5: Economic Dimension Costs

Cost Type	Shrewsbury Avenue Cycleway	Malborne Way Footpath	Total
Base Investment Cost	£223,948	£227,305	£451,253
Base Cost and Optimism Bias	£268,738	£272,766	£541,504
Rebased and Discounted to 2010, and Adjusted to Market Prices (PVC)	£135,547	£169,237	£304,784

Net Present Value and Benefit Cost Ratio

The Net Present Value (NPV) has been calculated by subtracting the PVC from the PVB.

The Benefit Cost Ratio (BCR) has been calculated by dividing the PVB by the PVC.

The BCR is used to determine the Value for Money category that each scheme falls within, as shown in Table 6 overleaf. The Value for Money categories have been sourced from the Department for Transport Value for Money Framework: Moving Britain Ahead (2017) document.

Table 6: Value for Money Categories

Value for Money Category	Benefit Cost Ratio (BCR) Range
Very Poor	$BCR \leq 0.0$
Poor	$1.0 < BCR > 0.0$
Low	$1.5 < BCR \geq 1.0$
Medium	$2.0 < BCR \geq 1.5$
High	$4.0 < BCR \geq 2.0$
Very High	$BCR \geq 4.0$

The scheme should provide a BCR of at least 1.5 (Medium Value for Money) to be considered of good value for money. It should be noted that the CPCA state in its Local Assurance Framework (2021) that a scheme with a BCR less favourable than other alternatives but best delivers on a project's strategic objectives may be the best value way of delivering a project. However, it is for the CPCA Board to judge whether the achievement of the strategic objectives is worth the cost to the CPCA.

Table 7 provides the Analysis of Monetised Costs and Benefits (AMCB) Table.

Table 7: Analysis of Monetised Costs and Benefits Table – Core Scenario

Benefit Item	Value (£'000s)		
	Shrewsbury Avenue	Malborne Way	Total
Noise	0.37	0.03	0.40
Local Air Quality	0.79	0.07	0.86
Greenhouse Gases	2.65	0.24	2.89
Journey Quality	2.24	6.60	8.84
Physical Activity (Health)	780.29	130.82	911.11
Accidents	5.58	0.51	6.09
Congestion Benefit	32.45	2.98	35.43
Infrastructure Maintenance	0.18	0.02	0.20
Indirect Taxation	-3.33	-0.31	-3.64
Present Value of Benefits (PVB)	790.00	140.96	930.96
Broad Transport Budget	135.55	169.24	304.79
Present Value of Costs (PVC)	135.55	169.24	304.79
Net Present Value (NPV)	654.45	-28.28	626.17
Initial Benefit to Cost Ratio (BCR)	5.83	0.83	3.05

The Shrewsbury Avenue scheme provides a PVB of £790,000, NPV of £654,450, and a BCR of 5.83, which equates to Very High Value for Money.

The Malborne Way scheme provides a PVB of £140,960, NPV of £-28,280, and a BCR of 0.83, which equates to Poor Value for Money.

Combining both schemes together provide a PVB of £930,960, NPV of £626,170, and a BCR of 3.05, which equates to High Value for Money.

A sensitivity test has also been undertaken that assesses the impact of using the Strategic Dimension uplift factor of 1.600. Applying the high uplift resulted in a combined PVB of £1,397,010, NPV of £1,092,280, and a BCR of 4.58, which equates to Very High Value for Money.

The most significant difference in the sensitivity test is that Malborne Way scheme goes from a BCR of 0.83 to 2.48, which is High Value for Money.

Non-monetised Impacts

Impacts that have not been monetised for active travel include:

- Journey time savings for active users (Social and Economy)
- Security (Social)
- Personal Affordability (Social)
- Accessibility (Social).

The distributional impacts of security and personal affordability have been quantitatively assessed. Accessibility has not been assessed on the basis that the guidance within TAG Unit A4.2 focuses solely on public transport.

The following environmental impacts are to be considered in full within the Junction 3 FBC:

- Landscape
- Townscape
- Historic Environment
- Biodiversity
- Water Environment.

Security

Security impact appraisal is recommended for road users, public transport passengers or freight, or a combination of these as stated in TAG Unit A4.1 Social Impact Appraisal. Whilst there is no specific guidance for the security of active mode users, the process as outlined within TAG Unit A4.2 Distributional Impact Appraisal has been used. Indicators such as surveillance, lighting and visibility, and landscaping were noted during site visits and used to inform the appraisal.

The security distributional impact appraisal found that each scheme would not deliver any change in terms of security for older people, females, or young people.

Personal Affordability

Personal Affordability appraisal considers how the monetary costs of travel can be a major barrier to mobility for certain groups of people and their ability to access key destinations. The more deprived groups of society typically spend less money on travel, but the cost of travel will account for a greater proportion of their income.

The most significant impacts of the costs of travel are on younger and older groups, and low-income households.

Figures 5 and 6 show the distribution of younger (0 to 15) and older (65 plus) age groups across Peterborough in relation to key services that would likely be used, respectively.

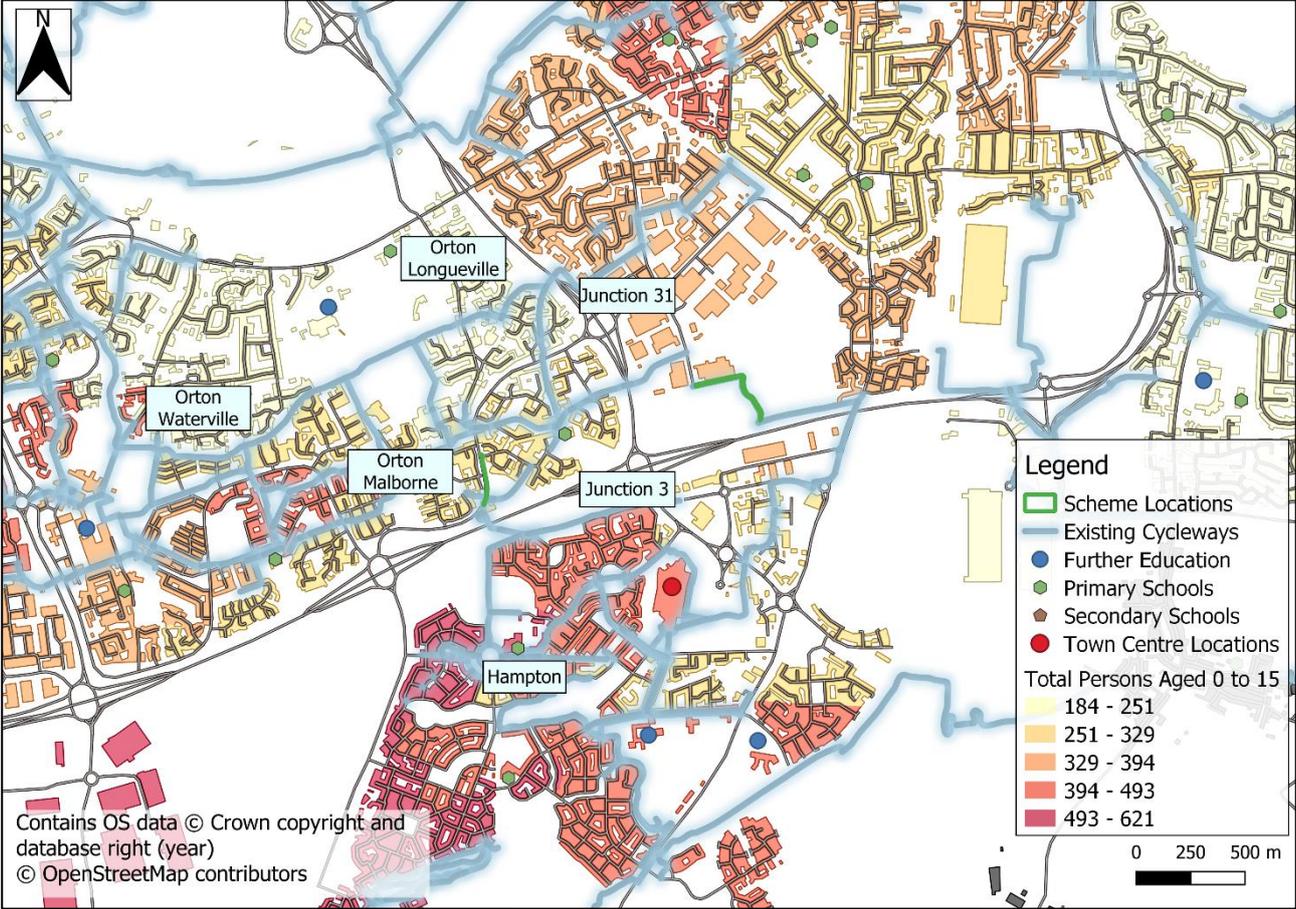


Figure 6: Number of Persons Aged 0 to 15 at LSOA Level across Peterborough in Relation to Key Services

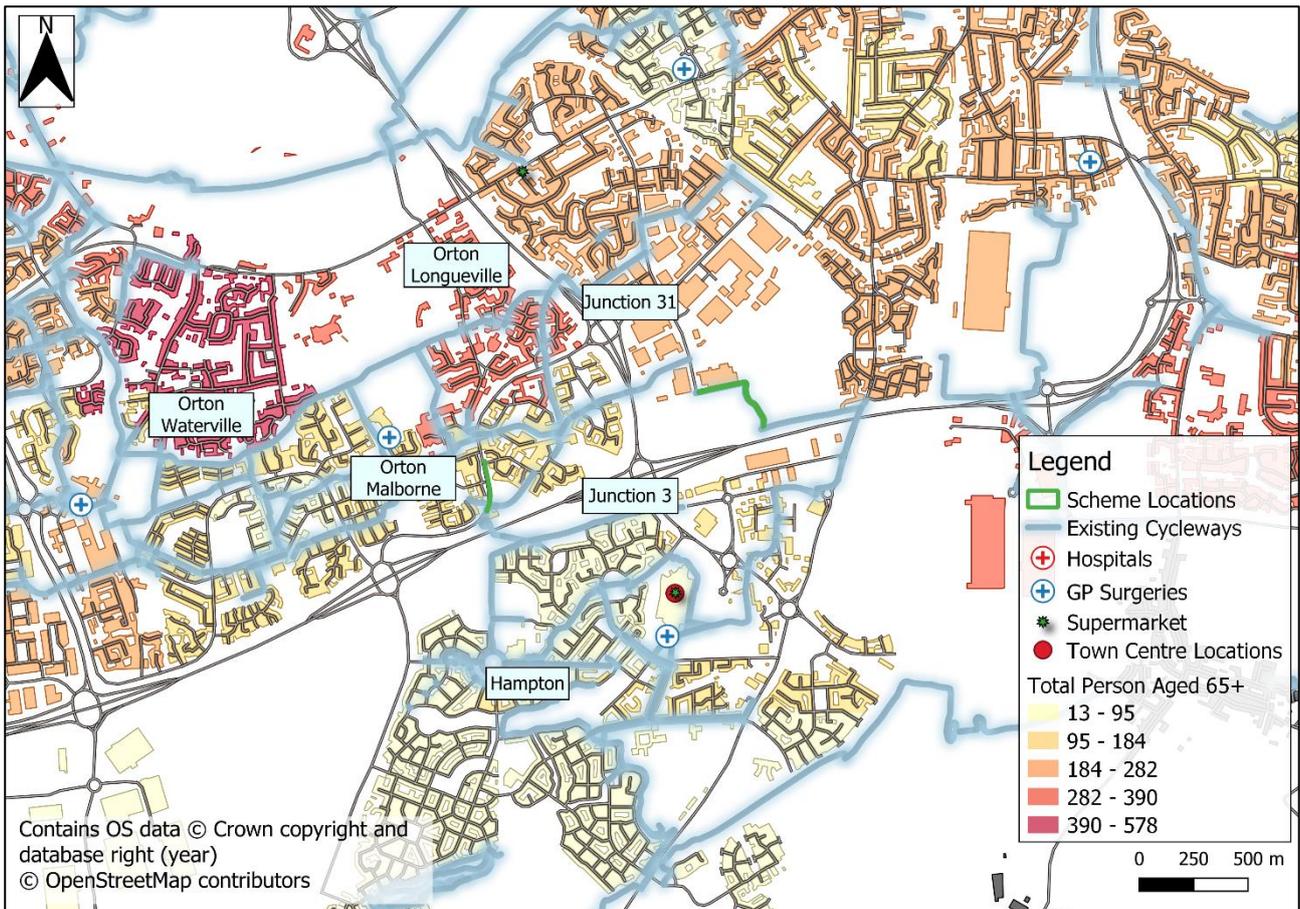


Figure 7: Number of Persons Aged 65+ at LSOA Level in Relation to Key Services

The Malborne Way Footpath will likely be used by young people travelling to Nene Park Academy and St. Botolph's C of E Primary School from residential areas in Orton Malborne and Hampton. There is a particularly high number of persons aged 0 to 15 in Hampton and would likely represent the greatest proportion of young people using the footpath. There is currently no marked footpath that connects the footbridge over Fletton Parkway and the footpath north of Saltmarsh. Without a footpath, the north-south route between Hampton and the schools in Orton Longueville will not be considered desirable for walking to school and will therefore encourage more costly escort education car driver trips.

The Malborne Way Footpath will likely be used by people aged 65 and above living in the Ortons and Hampton to and above travelling to GP surgeries in Orton Malborne and Hampton, and the retail outlets at Serpentine Green in Hampton. Whilst bus travel is free for senior citizens, there is no suitable bus between Hampton and

Orton Longueville or Orton Malborne. The lack of a quality footpath will make walking to local key services less desirable for senior citizens and overall travel less affordable.

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

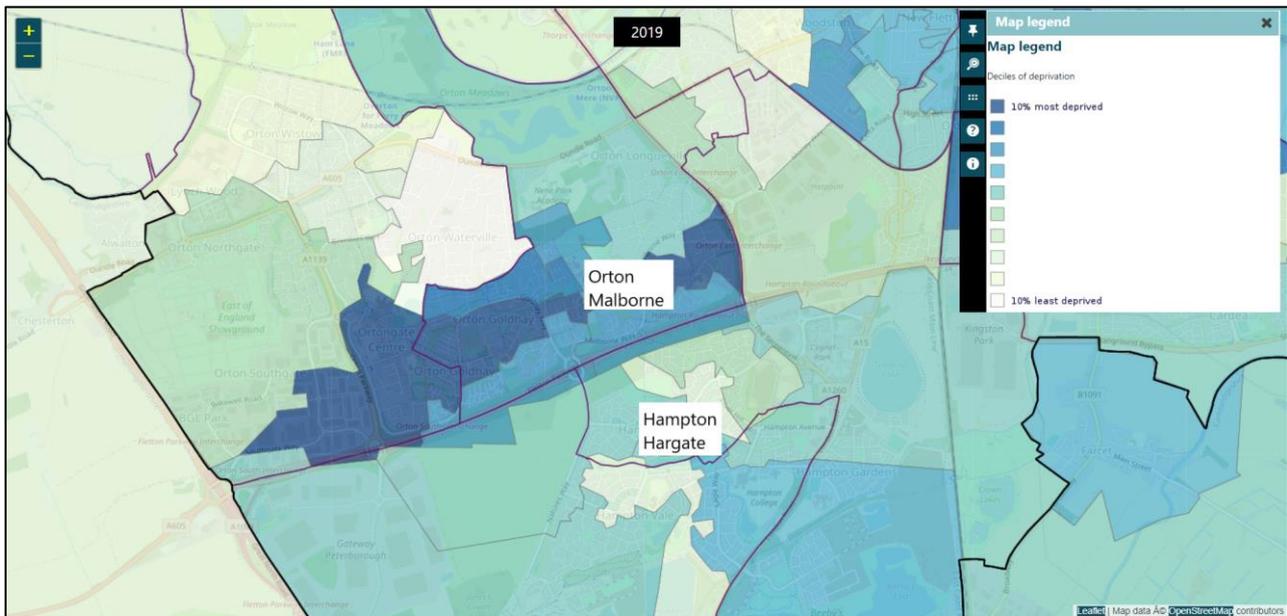


Figure 8: Income Deprivation Domain by LSOA

The Malborne Way and Shrewsbury Avenue study areas have LSOAs within the 10% most deprived deciles for England. An improvement in the walking and cycling infrastructure within the study area would help make walking to work or other local key services a more realistic alternative to car and bus travel for those in income deprived areas that are more greatly affected by the cost of travel for reaching work.

Areas along Malborne Way and Shrewsbury Avenue, and in Hampton are particularly car-dependent employment destinations, as previously shown in Figure 2 of the Strategic Dimension, and there is potential to improve the local walking and cycling network to a higher standard.

The average car travel to work mode share for the Ortons and Hampton is 62%, whereas the whole of Peterborough is 61%. Whilst local car driver levels to workplaces are representative of overall Peterborough levels and local car availability is lower than the rest of the city, there is still potential to reduce car driver trips from local residential areas and increase the number of walking and cycling commuter trips. This is particularly important in residential areas suffering with high income deprivation levels where residents will be struggling with the costs of travel.

Without an improvement in active travel infrastructure, the study area will remain a car dependent destination that is less accessible for those who cannot afford to travel by car.

Value for Money Statement

Delivering the Shrewsbury Avenue Cycleway and Malborne Way Footpath active travel schemes together will provide an overall PVB of £961,980, NPV of £626,170, and a BCR of 3.05 (High Value for Money) based on physical activity, journey quality, accidents, noise, local air quality, greenhouse gases, and congestion benefits in the core scenario.

The schemes are not expected to deliver any change in security impacts for vulnerable active travel users.

The removal of a barrier to travel along Malborne Way is expected to make walking a more realistic and affordable alternative to car travel to key services within the study area for groups most affected by personal affordability. The schemes would also benefit nearby residential areas that are currently in the top 10% most income deprived deciles for England.

Financial Dimension

The Financial Dimension focuses on the affordability of the proposed schemes, funding arrangements, and technical accounting issues.

The scheme cost estimates for the Financial Dimension have been prepared in line with guidance set out in TAG Unit A1.2 Scheme Costs (May 2022).

The estimates have been costed based on a bill of quantities produced from the preliminary designs and a schedule of construction activities. These costs have been peer reviewed, and include:

- Detailed design costs and additional surveys where required
- Land acquisition and planning costs
- Ecology surveys, and specialist environmental advice
- Staff and legal fees, including local overheads and consultation costs
- Third party costs
- Construction costs, including mobilisation, supervision, and costs associated with statutory undertakers works
- Risk Allowance.

It should be noted that Optimism Bias is not applied within the Financial Dimension and is only for use within the Economic Dimension.

Project costs incurred to date have been omitted from the costs presented in this section as “sunk costs”, which is in line with TAG Unit A1.2.

The cost profile is based upon the milestone activities set out in the Management Dimension, and the dates used to calculate the scheme costs, including the application of inflation, are shown in Table 8.

Table 8: Milestone Activities

Timescale	Activity
August 2022	Present Active Travel Schemes Business Case Technical Note to CPCA
September 2022	CPCA Sponsors present papers to CPCA Board to request approval of funding. Raising Work Orders and mobilising works
October 2022 – December 2022	Malborne Way scheme construction undertaken
October 2022 – November 2022	Shrewsbury Avenue scheme construction undertaken
January 2023	CPCA Board to make funding decision for the main Junction 3 project. This was the original CPCA Board date for the Junction 3 active travel schemes.

Table 9 below shows the Financial Dimension Scheme Cost Estimates.

Table 9: Financial Dimension Scheme Cost Estimates

Description of Cost Type	Shrewsbury Avenue	Malborne Way
Base Investment Cost	£223,948	£227,305
Risk Adjusted Base Cost	£255,958	£263,029
Risk Adjusted Base Cost with Industry Inflation (Outturn Cost)	£255,959	£263,029
Inflated Risk Adjusted Costs Incorporating Whole Life Costs (60-year assessment period).	£255,958	£263,029

The costs calculated for use within the Economic Assessment are presented in the Economic Dimension.

The Outturn cost represents the amount required to deliver the scheme, and is the amount requested for early release.

The schemes will be delivered within the same year as the cost estimates and therefore inflation has not been applied. Therefore, the outturn costs for Shrewsbury Avenue and Malborne Way are £255,959 and £263,029, respectively.

Budgets and Funding Cover

It is anticipated that the full combined Outturn Cost of £518,988 will be funded from the Transforming Cities Fund (TCF). The TCF is time limited and must be spent by 31st March 2024.

A £50,000 developer contribution has been secured as a contribution towards the Shrewsbury Avenue Cycleway and must be paid prior first occupation of the development (currently under construction). Once received, this contribution will be used in the delivery of the Junction 3 project (which includes the Shrewsbury Avenue Cycleway scheme).

There are not known to be any financial constraints beyond the availability of funding from the TCF, which is currently considered adequate to cover the scheme costs.

Commercial Dimension

The Commercial Dimension serves to demonstrate that the Junction 3 active travel schemes can be reliably procured and implemented through existing channels whilst ensuring value for money in delivery of the scheme.

Construction and site supervision will be delivered by Peterborough Highway Services (PHS). All skills and competencies to deliver this scheme are available within the PHS contract and its supply chain.

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

Management Dimension

The Management Dimension demonstrates that the Council, through the PHS Framework, has the necessary experience and governance structure to successfully manage the delivery of the Junction 3 active travel schemes.

PHS has successfully delivered the following active travel schemes in recent years:

- Pop-up cycleways:
 - Between Midland Road and Bourges Boulevard along Thorpe Road on the eastbound carriageway. Installed during the first COVID-19 lockdown in 2020.
 - Along the southbound side of Priestgate. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by 'Rediweld One Piece Wand Orca' units. Cones were taken down in 2022.
 - Between St. Johns Street and Cattle Market Road along City Road. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by 'Rediweld One Piece Wand Orca' units. Cones were taken down in 2022.
 - Westbound between the Junction 39 roundabout and Cattle Market Road. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by 'Rediweld One Piece Wand Orca' units. Cones were taken down in 2022.
 - In both directions along Broadway. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by 'Rediweld One Piece Wand Orca' units. Cones were taken down in 2022.
- Haddon Cycleway. Designed in 2021 and constructed in 2022, the scheme improved the footway / cycleway connection between Haddon Hill and Orton Goldhay.
- Toucan Crossings:

- Bishop’s Road toucan crossing upgraded in 2019 to allow for cycle use.
- Oundle Road toucan crossing by Peterborough High School
- Lincoln Road / Manor House Road crossing improved to a toucan crossing between 2021 and 2022.

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

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

Key project milestones for progressing to scheme delivery are outlined in Table 10.

Table 10: Key Project Milestones

Timescale	Activity
August 2022	Present Active Travel Schemes Business Case Technical Note to CPCA
September 2022	CPCA Sponsors present papers to CPCA Board to request approval of funding. Raising Work Orders and mobilising works
October 2022 – December 2022	Malborne Way scheme construction undertaken
October 2022 – November 2022	Shrewsbury Avenue scheme construction undertaken
January 2023	CPCA Board to make funding decision for the main Junction 3 project. This was the original CPCA Board date for the Junction 3 active travel schemes.

Stakeholder engagement was undertaken by the Project Team following approval of the SOC and were in line with the timings of the Public Consultation (October 2020 to November 2020). All stakeholders were consulted via email or letter for comments on the Preferred Scheme of the Junction 3 business case prior to the completion of the designs.

Communication with stakeholders was maintained throughout the project and feedback from stakeholders largely centred on the environment, biodiversity, and sustainable travel elements of the Junction 3 preferred scheme. All feedback has been incorporated into the Detailed Design where appropriate.

A construction Risk Register for each scheme has been produced and is available upon request. The Risk Register is a live document and will be regularly updated throughout the ten-week construction period.

The schemes will be monitored and evaluated in line with the CPCA Assurance Framework and DfT guidance. The monitoring and evaluation will include a range of qualitative and quantitative data collection methods that will be undertaken one year and five years post scheme completion.

Outputs from the monitoring and evaluation stage will be summarised within a Scheme Evaluation Report to determine whether the schemes have been delivered as planned and justify the investment. Where outcomes differ from what is expected, data collected during the monitoring and evaluation phases will be used to form an evidence base that will assist in understanding the reasons for this and any lessons that can be learnt.

Appendix J – 60 Year Cost Profile: Financial Dimension

Junction 3 - Do Something Scheme Costs for Input into Financial Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate 2022 Prices						(2) Risk Adjusted Cost		(3) Risk Adjusted Cost Estimate Including Construction Price Inflation			(4) Inflated Risk Adjusted Cost Including Whole Life Costs		
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Quantified Risk Adjustment	Risk Adjusted Cost	Inflation Rate	Cost of Inflation	Total (Including Inflation)	Whole Life Costs	Inflated Whole Life Costs	Total (Including Whole Life Costs)
2022	1	£114,958	£0	£0	£35,459	£0	£150,418	£22,578	£172,996	0.000	£0.00	£172,996	£0	£0	£172,996
2023	2	£5,249,195	£0	£0	£1,026,812	£518,727	£6,794,734	£602,917	£7,397,651	1.100	£739,765.08	£8,137,416	£0	£0	£8,137,416
2024	3	£1,882,229	£0	£0	£348,460	£194,523	£2,425,212	£209,160	£2,634,372	1.210	£553,218.16	£3,187,590	£0	£0	£3,187,590
2025	4	£0	£0	£0	£10,000	£0	£10,000	£0	£10,000	1.331	£3,310.00	£13,310	£0	£0	£13,310
2026	5	£0	£0	£0	£0	£0	£0	£0	£0	1.398	£0.00	£0	£0	£0	£0
2027	6	£0	£0	£0	£0	£0	£0	£0	£0	1.467	£0.00	£0	£0	£0	£0
2028	7	£0	£0	£0	£0	£0	£0	£0	£0	1.541	£0.00	£0	£0	£0	£0
2029	8	£0	£0	£0	£0	£0	£0	£0	£0	1.618	£0.00	£0	£0	£0	£0
2030	9	£0	£0	£0	£0	£0	£0	£0	£0	1.699	£0.00	£0	£0	£0	£0
2031	10	£0	£0	£0	£0	£0	£0	£0	£0	1.784	£0.00	£0	£0	£0	£0
2032	11	£0	£0	£0	£0	£0	£0	£0	£0	1.873	£0.00	£0	£0	£0	£0
2033	12	£0	£0	£0	£0	£0	£0	£0	£0	1.966	£0.00	£0	£0	£0	£0
2034	13	£0	£0	£0	£0	£0	£0	£0	£0	2.065	£0.00	£0	£78,472	£162,030	£162,030
2035	14	£0	£0	£0	£0	£0	£0	£0	£0	2.168	£0.00	£0	£0	£0	£0
2036	15	£0	£0	£0	£0	£0	£0	£0	£0	2.276	£0.00	£0	£0	£0	£0
2037	16	£0	£0	£0	£0	£0	£0	£0	£0	2.390	£0.00	£0	£0	£0	£0
2038	17	£0	£0	£0	£0	£0	£0	£0	£0	2.510	£0.00	£0	£0	£0	£0
2039	18	£0	£0	£0	£0	£0	£0	£0	£0	2.635	£0.00	£0	£0	£0	£0
2040	19	£0	£0	£0	£0	£0	£0	£0	£0	2.767	£0.00	£0	£0	£0	£0
2041	20	£0	£0	£0	£0	£0	£0	£0	£0	2.905	£0.00	£0	£0	£0	£0
2042	21	£0	£0	£0	£0	£0	£0	£0	£0	3.051	£0.00	£0	£0	£0	£0
2043	22	£0	£0	£0	£0	£0	£0	£0	£0	3.203	£0.00	£0	£0	£0	£0
2044	23	£0	£0	£0	£0	£0	£0	£0	£0	3.363	£0.00	£0	£0	£0	£0
2045	24	£0	£0	£0	£0	£0	£0	£0	£0	3.532	£0.00	£0	£0	£0	£0
2046	25	£0	£0	£0	£0	£0	£0	£0	£0	3.708	£0.00	£0	£0	£0	£0
2047	26	£0	£0	£0	£0	£0	£0	£0	£0	3.894	£0.00	£0	£0	£0	£0
2048	27	£0	£0	£0	£0	£0	£0	£0	£0	4.088	£0.00	£0	£78,472	£320,809	£320,809
2049	28	£0	£0	£0	£0	£0	£0	£0	£0	4.293	£0.00	£0	£0	£0	£0
2050	29	£0	£0	£0	£0	£0	£0	£0	£0	4.507	£0.00	£0	£0	£0	£0
2051	30	£0	£0	£0	£0	£0	£0	£0	£0	4.733	£0.00	£0	£0	£0	£0
2052	31	£0	£0	£0	£0	£0	£0	£0	£0	4.969	£0.00	£0	£0	£0	£0
2053	32	£0	£0	£0	£0	£0	£0	£0	£0	5.218	£0.00	£0	£0	£0	£0
2054	33	£0	£0	£0	£0	£0	£0	£0	£0	5.479	£0.00	£0	£0	£0	£0
2055	34	£0	£0	£0	£0	£0	£0	£0	£0	5.753	£0.00	£0	£0	£0	£0
2056	35	£0	£0	£0	£0	£0	£0	£0	£0	6.040	£0.00	£0	£0	£0	£0
2057	36	£0	£0	£0	£0	£0	£0	£0	£0	6.342	£0.00	£0	£0	£0	£0
2058	37	£0	£0	£0	£0	£0	£0	£0	£0	6.659	£0.00	£0	£0	£0	£0
2059	38	£0	£0	£0	£0	£0	£0	£0	£0	6.992	£0.00	£0	£0	£0	£0
2060	39	£0	£0	£0	£0	£0	£0	£0	£0	7.342	£0.00	£0	£0	£0	£0
2061	40	£0	£0	£0	£0	£0	£0	£0	£0	7.709	£0.00	£0	£0	£0	£0
2062	41	£0	£0	£0	£0	£0	£0	£0	£0	8.094	£0.00	£0	£78,472	£635,180	£635,180
2063	42	£0	£0	£0	£0	£0	£0	£0	£0	8.499	£0.00	£0	£0	£0	£0
2064	43	£0	£0	£0	£0	£0	£0	£0	£0	8.924	£0.00	£0	£0	£0	£0
2065	44	£0	£0	£0	£0	£0	£0	£0	£0	9.370	£0.00	£0	£0	£0	£0
2066	45	£0	£0	£0	£0	£0	£0	£0	£0	9.839	£0.00	£0	£0	£0	£0
2067	46	£0	£0	£0	£0	£0	£0	£0	£0	10.331	£0.00	£0	£0	£0	£0
2068	47	£0	£0	£0	£0	£0	£0	£0	£0	10.847	£0.00	£0	£0	£0	£0
2069	48	£0	£0	£0	£0	£0	£0	£0	£0	11.390	£0.00	£0	£0	£0	£0
2070	49	£0	£0	£0	£0	£0	£0	£0	£0	11.959	£0.00	£0	£0	£0	£0
2071	50	£0	£0	£0	£0	£0	£0	£0	£0	12.557	£0.00	£0	£0	£0	£0
2072	51	£0	£0	£0	£0	£0	£0	£0	£0	13.185	£0.00	£0	£0	£0	£0
2073	52	£0	£0	£0	£0	£0	£0	£0	£0	13.844	£0.00	£0	£0	£0	£0
2074	53	£0	£0	£0	£0	£0	£0	£0	£0	14.536	£0.00	£0	£0	£0	£0
2075	54	£0	£0	£0	£0	£0	£0	£0	£0	15.263	£0.00	£0	£0	£0	£0
2076	55	£0	£0	£0	£0	£0	£0	£0	£0	16.026	£0.00	£0	£78,472	£1,257,613	£1,257,613
2077	56	£0	£0	£0	£0	£0	£0	£0	£0	16.828	£0.00	£0	£0	£0	£0
2078	57	£0	£0	£0	£0	£0	£0	£0	£0	17.669	£0.00	£0	£0	£0	£0
2079	58	£0	£0	£0	£0	£0	£0	£0	£0	18.552	£0.00	£0	£0	£0	£0
2080	59	£0	£0	£0	£0	£0	£0	£0	£0	19.480	£0.00	£0	£0	£0	£0
2081	60	£0	£0	£0	£0	£0	£0	£0	£0	20.454	£0.00	£0	£0	£0	£0
2082	61	£0	£0	£0	£0	£0	£0	£0	£0	21.477	£0.00	£0	£0	£0	£0
2083	62	£0	£0	£0	£0	£0	£0	£0	£0	22.551	£0.00	£0	£0	£0	£0
2084	63	£0	£0	£0	£0	£0	£0	£0	£0	23.678	£0.00	£0	£0	£0	£0
2085	64	£0	£0	£0	£0	£0	£0	£0	£0	24.862	£0.00	£0	£0	£0	£0
Total		£7,246,383	£0	£0	£1,420,731	£713,249	£9,380,364	£834,655	£10,215,019	£1,296,293	£11,511,312	£313,888	£2,375,633	£13,886,945	

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is	£9,380,364
(2)	The base costs have been adjusted to incorporate risk.	£10,215,019
(3)	The risk adjusted costs have been adjusted to incorporate increases in construction costs.	£11,511,312
(4)	The inflated risk adjusted costs have been adjusted to incorporate whole life costs.	£13,886,945

Appendix K – Scheme Evaluation Plan



Junction 3 Improvement Scheme

Scheme Evaluation Plan

Document Control

Job Number: 5080646						
Document ref: Junction 3 Scheme Evaluation Plan					Authorisation	
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
1.0	FBC Issue	NP	SP	RMJ	RMJ	25.11.2022

Contents

1.	Introduction.....	1
1.2	Monitoring and Evaluation Guidance.....	1
1.3	Report Structure.....	2
2.	Scheme Background and Context.....	3
2.1	Scheme Location.....	3
2.2	Scheme Description.....	4
2.3	Scheme Costs and Funding.....	7
2.4	Delivery and Timeframes.....	7
3.	Scheme Objectives and Outcomes.....	8
3.1	Scheme Objectives.....	8
3.2	Scheme Outcomes.....	10
3.3	Scheme Logic Map.....	10
4.	Benefits Realisation Plan.....	12
4.1	Benefits Realisation Strategy.....	12
5.	Monitoring and Evaluation Approach.....	14
5.2	Types of Measures.....	14
5.3	Stages of Monitoring and Evaluation.....	14
5.4	Measures to be Monitored.....	15
6.	Data Requirements and Collection Methods.....	17
6.2	Data Collection.....	19
7.	Evaluation Resource and Governance.....	22
7.1	Monitoring and Evaluation Plan Costs.....	22
7.2	Governance.....	24
7.3	Quality Assurance.....	26
7.4	Risk Management.....	26
8.	Dissemination Plan.....	28
8.2	Dissemination Reporting.....	28
8.3	Stakeholder Engagement.....	28
8.4	Lessons Learnt.....	28

Figures

Figure 2.1: Junction 3 Location	3
Figure 2.2: Junction 3 Final Scheme	6
Figure 3.1: Junction 3 Logic Map	11
Figure 6.1: Monitoring and Evaluation Survey Locations.....	20
Figure 6.2: Monitoring and Evaluation Journey Time Routes	21
Figure 7.1: Organisational Governance Structure	25

Tables

Table 2.1: Key Project Milestones	7
Table 4.1: Benefits Realisation Strategy	13
Table 5.1: Monitoring and Evaluation Timescales	15
Table 5.2: Standard Monitoring Measures.....	16
Table 6.1: Monitoring and Evaluation Data Requirements.....	18
Table 7.1: Monitoring and Evaluation Data Requirements.....	23
Table 7.1: Monitoring and Evaluation Data Requirements.....	27

1. Introduction

- 1.1.1 This document is the Scheme Evaluation Plan for the proposed Junction 3 Improvement Scheme. The report has been produced in conjunction with the Junction 3 Full Business Case (FBC) submitted to the Cambridge and Peterborough Combined Authority (CPCA).
- 1.1.2 To avoid duplication of information, this report includes both a Benefits Realisation Plan and the Monitoring and Evaluation Plan.
- 1.1.3 The aim of this report is to provide context of the Junction 3 Improvement Scheme, whilst setting out the expected benefits and outcomes alongside the methods in which will be used to monitor and evaluate these both pre and post construction.

1.2 Monitoring and Evaluation Guidance

- 1.2.1 The CPCA Assurance Framework¹ sets out the fundamental principles in relation to the use and administration of funding from the CPCA and their proposed approach to monitoring and evaluation of projects.
- 1.2.2 The Assurance Framework states that all transport schemes (over £5m) will follow the DfT Monitoring and Evaluation Guidance for Local Authority Major Schemes. The DfT Monitoring and Evaluation Guidance (2012)² identifies three tiers of Monitoring and Evaluation:
- **Standard Monitoring** – schemes are required to be monitor and reported on a standard set of measures
 - **Enhanced Monitoring** – for schemes costing more than £50m or are anticipated to have a significant impact on particular indicators
 - **Fuller Evaluation** – for DfT- specified selection of schemes.
- 1.2.3 The cost of the Junction 3 Improvement Scheme is significantly less than £50m and the study has not been specified for Fuller Evaluation, resulting in Junction 3 falling under the Standard Monitoring tier.

¹ [Local-Assurance-Framework-.pdf](#).

² [Major Scheme Business Cases: Evaluation Guidance for Local Authority Major Schemes \(publishing.service.gov.uk\)](#)

1.3 Report Structure

- Chapter 2: Scheme Background and Context
- Chapter 3: Scheme Objectives and Outcomes
- Chapter 4: Benefits Realisation Plan
- Chapter 5: Monitoring and Evaluation Approach
- Chapter 6: Data Requirements and Collection Methods
- Chapter 7: Evaluation Resources and Governance
- Chapter 8: Dissemination Plan

2. Scheme Background and Context

2.1 Scheme Location

- 2.1.1 Junction 3 is a large, grade separated junction between two of Peterborough's busiest strategic roads. The junction is a crucial cornerstone of the Parkway Network, connecting the A1139 Fletton Parkway and A1260 Nene Parkway, thus providing the majority of access to south-west Peterborough.
- 2.1.2 The junction provides access to the A1260 Nene Parkway and The Serpentine, providing access to nearby residential areas and a major employment / leisure centre (Serpentine Green). The junction is used by vehicles from across the Peterborough area, and accommodates a large number of peak hour commuter trips to and from this location.
- 2.1.3 Figure 2.1 beneath highlights the location of Junction 3 in relation to the Parkway Network and Peterborough City Centre.

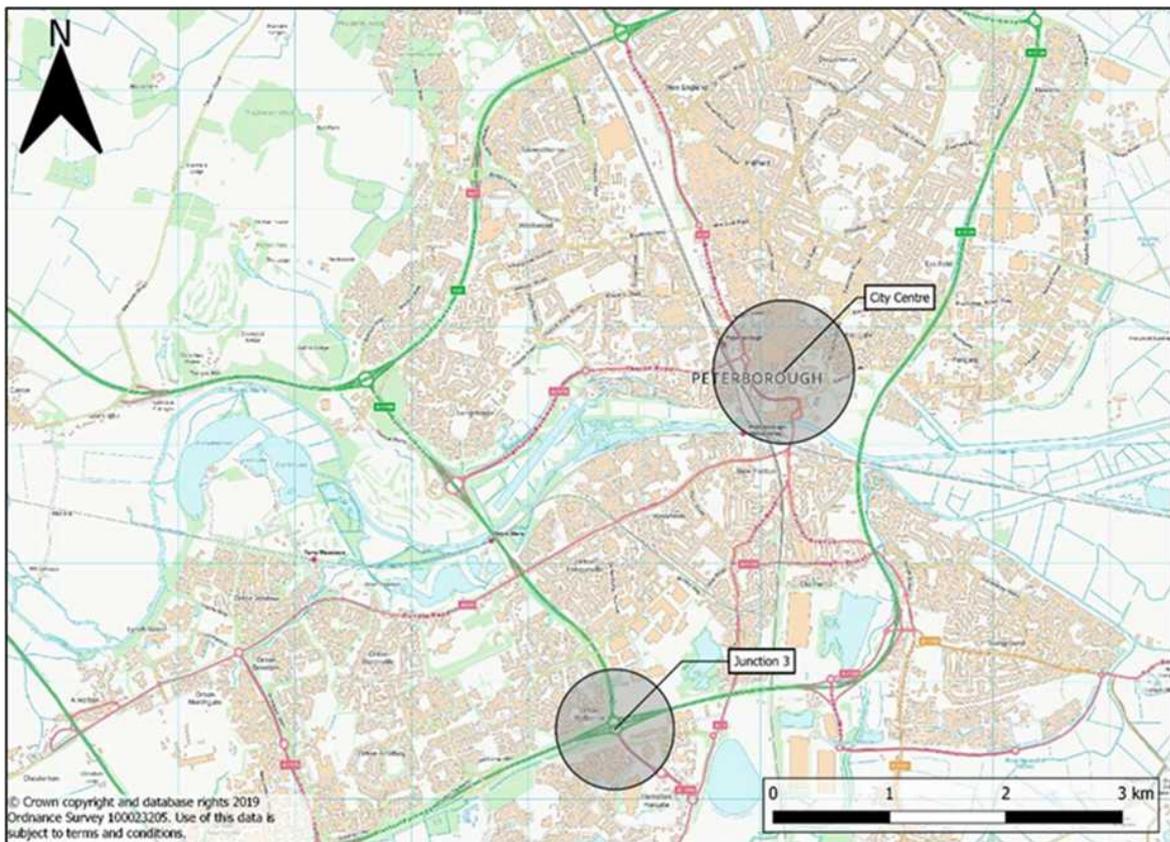


Figure 2.1: Junction 3 Location

- 2.1.4 On average 56,000 vehicles pass through Junction 3 on a typical weekday, of which 5% are classified as commercial vehicles³. The junction is used by trips from all over the Peterborough area, and experiences significant peak hour congestion particularly southbound on the A1260 Nene Parkway, where queues regularly extend back to Junction 31 during the PM peak hour, as well as along the A1260 The Serpentine where queues exceed 500m reaching the Tesco roundabout. Such issues currently compromise the surrounding road network.
- 2.1.5 To date Peterborough's transport network has served the City well, which was fundamentally redesigned in the 1970s to accommodate the then Peterborough New Town. However, as a consequence of recent and planned housing and employment growth, capacity issues are now emerging on the road network, resulting in congestion and delay. As congestion increases on the Parkway Network, and queues form at key junctions, the potential for delivering new homes and jobs in the area will become increasingly constrained.
- 2.1.6 The proposed scheme will address severe levels of congestion and delay that are currently compromising the operational efficiency of junction 3 and surrounding road network. By addressing existing issues, and building in additional capacity, the scheme is expected to unlock the wider network and assist in delivering growth aspirations for the City.

2.2 Scheme Description

- 2.2.1 Construction of the scheme will address significant issues of congestion and delay at a crucial cornerstone of Peterborough's Parkway Network, providing much needed capacity for Peterborough City Council (PCC) and the CPCA to meet their agenda for growth in Peterborough.
- 2.2.2 A breakdown of the scheme components are detailed overleaf.

³ Manual Traffic Survey Data: November 2018

2.2.3 Scheme elements include:

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

2.2.4 Figure 2.2 overleaf highlights the final Junction 3 scheme.

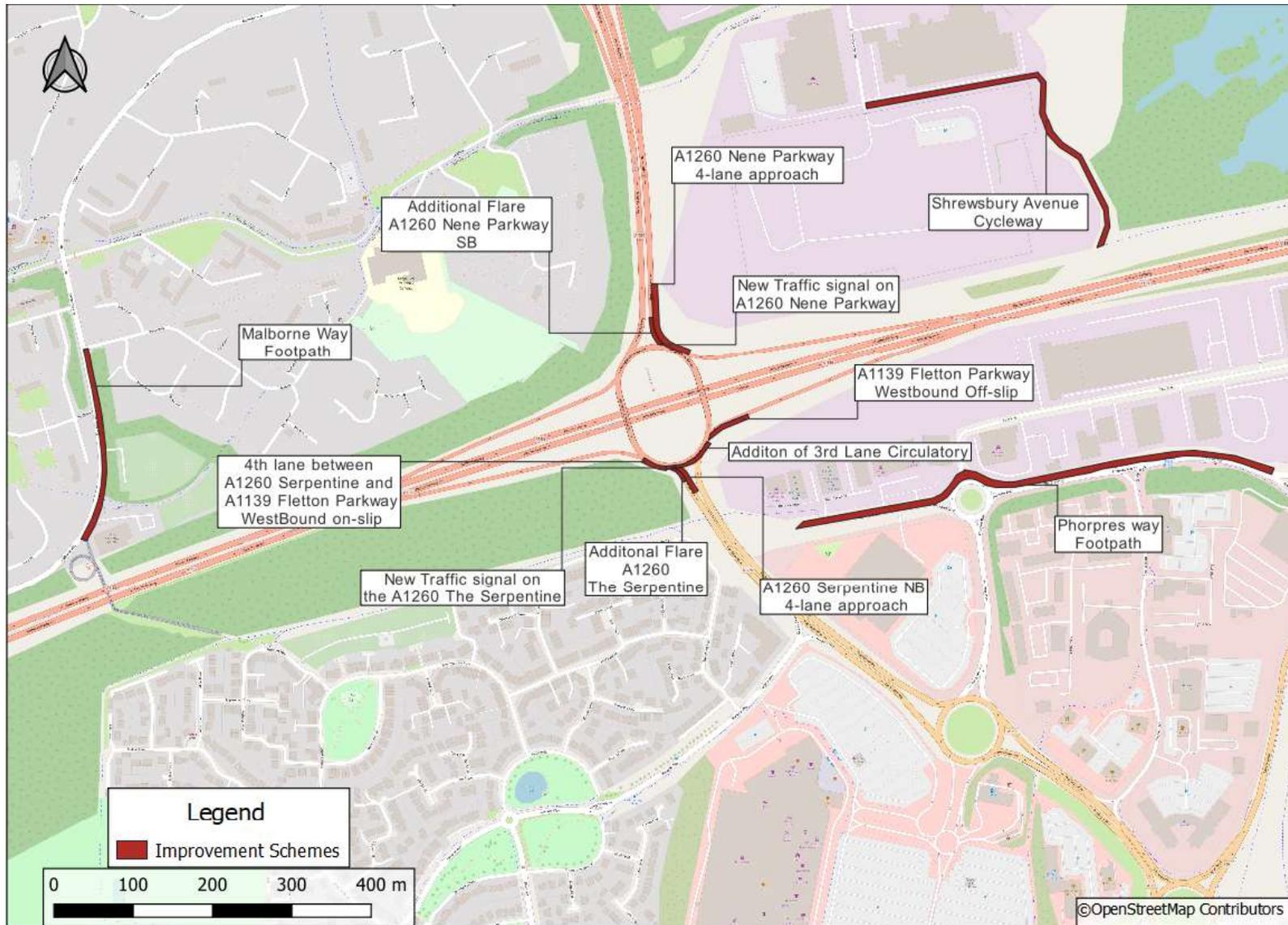


Figure 2.2: Junction 3 Final Scheme

2.3 Scheme Costs and Funding

2.3.1 The forecast Outturn cost of the scheme is £11,511,312.

2.3.2 The scheme is to be funded by the CPCA, with funding already identified within the Transforming Cities Fund (TCF), and through a £50,000 developer contribution.

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

• Base Investment Cost	=	£9,380,364
• Risk Adjusted Base Cost	=	£10,215,019
• Risk Adjusted Base Cost with Inflation (Outturn Cost)	=	£11,511,312

2.4 Delivery and Timeframes

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

Table 2.1: Key Project Milestones

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

3. Scheme Objectives and Outcomes

3.1 Scheme Objectives

- 3.1.1 A transport scheme can have both primary and secondary objectives. The primary objectives are the fundamental outputs required from the scheme and therefore must be achieved. Secondary objectives are other outputs that may be achieved but are not necessary to the success of the scheme.
- 3.1.2 The objectives for the Junction 3 Improvement Schemes were developed ahead of the option development workshop to provide a framework for participants of the workshop, through which the relative benefits and disadvantages of the proposed options could be discussed. The objectives are based on the goals and outcomes from local policy documents such as the Peterborough Local Plan.
- 3.1.3 Although these objectives pre-date those of the CPCA as previously discussed in this chapter, work has been undertaken to build upon the objectives and ensure they align with those of the CPCA. The primary and secondary objectives for the Junction 3 scheme are listed beneath.

Primary objectives include:

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

Secondary objectives include:

6. **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as the A1260 Nene Parkway and Malborne Way

3.1.4 The Junction 3 Improvement Scheme will aim to satisfy all primary objectives and as many of the secondary.

SMART Objectives

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

3.1.6 The Primary SMART objectives are:

1. **Tackle congestion and improve journey times:** To ensure that non-transient delay at Junction 3 remains beneath following 30 seconds on both A1260 approaches within the monitoring period (to 2029).
2. **Support Peterborough's growth agenda:** to provide sufficient highway capacity at Junction 3 (determined by a Degree of Saturation (DoS) of less than 90%) to support the creation of 7,400 dwellings across the Hamptons within the current Local Plan period (to 2036).
3. **Protect and improve the biodiversity value within the study area:** To deliver a 20% Biodiversity Net Gain Mitigate through the delivery of the scheme.
4. **Improve Road Safety:** to achieve a 50% per year reduction in personal injury accidents at the A1260 Nene Parkway and A1260 The Serpentine approaches following completion of the scheme.
5. **Improve road safety:** to achieve a 50% per year reduction in personal injury accidents at the A1260 Nene Parkway and A1260 The Serpentine approaches following completion of the scheme.

3.1.7 Secondary objectives include:

6. **Positively impact traffic conditions on the wider network:** To ensure that peak hour traffic flows along Malborne Way remain beneath 500 vehicles per hour peak within the monitoring period (to 2029).

3.4 Scheme Outcomes

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

- It will create additional highway capacity, resulting in reduced congestion and delay, more reliable journey times for road users, particularly on the A1260 Nene Parkway and The Serpentine approaches
- It will reduce queuing at the junction in the AM and PM peak periods, reducing emissions of stationary traffic, and aiding the operational efficiency of the City and improving air quality
- It will address conflicts between movements at the Junction, aiding the reduction in accident rates
- It will introduce cycle and pedestrian facilities increasing connectivity and accessibility between nearby residential areas to areas of employment
- It will reduce congestion and delay at a cornerstone Junction, helping the visitor and retail economy
- It will incorporate environment elements into the scheme from an early stage, achieving the required minimum 10% net gain calculation

3.5 Scheme Logic Map

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

- Changes in traffic flow and journey time reliability, at Junction 3 and the wider network
- Changes in safety including the number and severity of road traffic accidents
- Monitoring whether environmental mitigation measures and improvements to biodiversity have been implemented as in the approved scheme design
- Whether increased capacity on the Parkway Network has improved Council Aspirations

3.5.2 The Logic Map in Figure 3.2 highlights the links between the context, inputs, outputs, outcomes and impacts of the scheme and gives a visual representation of process by which the desired outcomes of the scheme objectives are to be achieved.

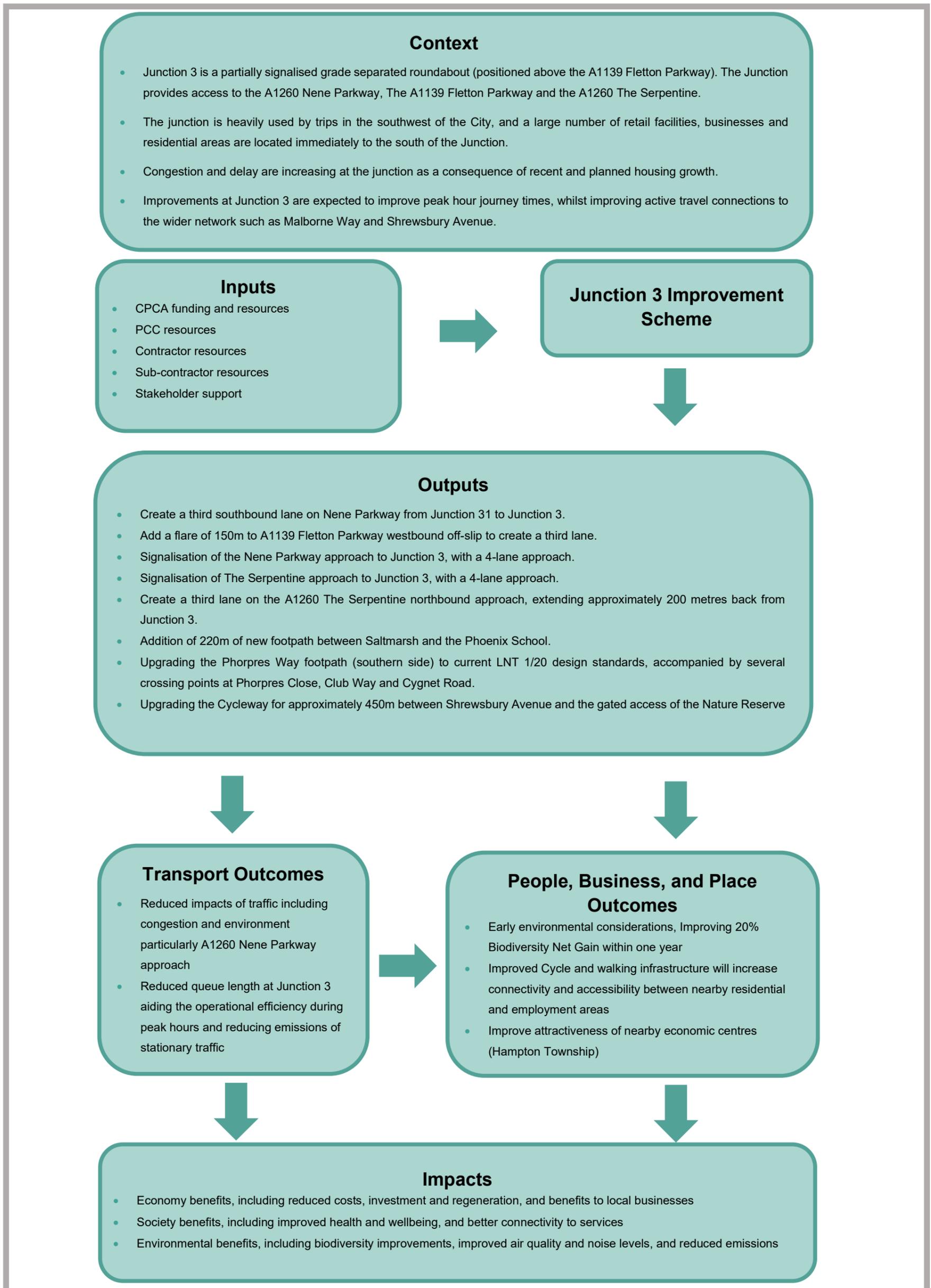


Figure 3.1: Junction 3 Logic Map

4. Benefits Realisation Plan

4.1 Benefits Realisation Strategy

4.1.1 Table 4.1 provides the framework against which the anticipated benefits will be planned for, tracked and realised. It sets out the key activities needed to manage the successful realisation of the benefits in the short, medium and long term, together with the timescales and who is responsible for each activity.

4.1.2 The strategy starts with the scheme objectives and follows a logical progression:

- **Scheme objectives** – as set out in the Strategic Case of the FBC
- **Enabling changes** – what the scheme will deliver in order to achieve each objective
- **Benefits experienced** – the benefits that will occur as a result of successful delivery of change
- **Key beneficiaries** – who will experience the benefits
- **Benefit owners** – who has responsibility for delivering the benefits
- **Benefit enablers** - an outline of actions to be taken, and additional actions which could be taken to help achieve the benefits.

Table 4.1: Benefits Realisation Strategy

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Benefit Owners	Benefit Enablers
<p>Tackle congestion and improve journey time reliability:</p> <p>Tackle congestion and address journey time reliability on the primary approaches to the junction (A1260 Nene Parkway and The Serpentine approaches)</p>	<ul style="list-style-type: none"> Creation of 4th lane at the A1260 Nene Parkway SB stop line Creation of 4th lane on the north-eastern corner of the circulatory, between the A1260 Nene Parkway approach and the A1139 eastbound on-slip exit Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 Creation of a 4th lane at the A1260 Serpentine NB stop line, including a flare extension on the left-hand lane Creation of 3rd lane on the southern half of the circulatory, between the A1260 Serpentine exit / approach Creation of 4th lane on the south-western corner of the circulatory, between the A1260 Serpentine approach and the A1139 WB on-slip exit 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased operational efficiency of the Junction and wider network Reduction in stationary / rolling traffic resulting in air quality improvement More efficient entrance to a major residential / employment sector to the south of the City 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Visitors to the City 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Monitoring of network performance
<p>Support Peterborough's Growth Agenda and encourage homes and jobs:</p> <p>Ensure that the planned employment and housing growth across Peterborough is promoted whilst providing for future demand</p>		<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased network capacity and operational efficiency Increased attraction of the Hampton Township area, encouraging the retainment of existing businesses and support of prospective future investment 	<ul style="list-style-type: none"> PCC in regard to fulfilment of the Local Plan Business within the Hampton Township Residents / Local Community 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Promotion of the Hampton Township / Business sector and wider City Area
<p>Create wider economic benefits:</p> <p>Provide conditions that encourage inward investment in higher value employment sectors across Peterborough and utilise available employment space</p>		<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased attraction of the Thorpe Wood Business park Increased attraction of the Hampton Township area, encouraging the retainment of existing businesses and support of prospective future investment 	<ul style="list-style-type: none"> PCC in regard to fulfilment of the Local Plan Business within the Hampton Township Residents / Local Community 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Promotion of the Hampton Township / Business sector and wider City Area
<p>Protect and improve the biodiversity value within the study area:</p> <p>Mitigate any adverse impact of a scheme and enhance biodiversity net gain within the Study Area</p>	<ul style="list-style-type: none"> Implementation of environmental / biodiversity scheme elements Additional planting / compensation planting mitigating the loss of tree coverage associated with construction 	<ul style="list-style-type: none"> Achievement of minimum 20% biodiversity net gain Protection of identified species / sites of interest across the study area 	<ul style="list-style-type: none"> PCC / CPCA in regard to environment and biodiversity Commuters Local residents 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme / soft landscaping designs Gaining of the necessary licences Biodiversity Net Gain Calculation
<p>Positively impact traffic conditions on the wider network:</p> <p>Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as Malborne Way</p>	<ul style="list-style-type: none"> Creation of 4th lane at the A1260 Nene Parkway SB stop line Creation of 4th lane on the north-eastern corner of the circulatory, between the A1260 Nene Parkway approach and the A1139 eastbound on-slip exit Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 Creation of a 4th lane at the A1260 Serpentine NB stop line, including a flare extension on the left-hand lane Creation of 3rd lane on the southern half of the circulatory, between the A1260 Serpentine exit / approach Creation of 4th lane on the south-western corner of the circulatory, between the A1260 Serpentine approach and the A1139 WB on-slip exit 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased operational efficiency of the Junction and wider network Increased quality of life for residents of Orton Malborne 	<ul style="list-style-type: none"> Commuters / Business trips Local residents 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Monitoring of network performance
<p>Improve road safety:</p> <p>Reduce personal injury accidents and improve personal security amongst all travellers around the junction</p>	<ul style="list-style-type: none"> Signalisation of the remaining approaches including both the A1260 Nene Parkway and The Serpentine approaches to Junction 3 Creation of a footpath between the Medeswell / Saltmarsh junction Upgrading the walking / cycling facilities on Phorpres Way / Close 	<ul style="list-style-type: none"> Fewer accidents involving rear end shunts on main approaches Fewer casualties Increased sense of safety and security on walking and cycling facilities 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Visitors to the City Active Mode users 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme including walking and cycling elements Road safety audit Monitoring of accidents
<p>Mitigate the impact of air quality on the local environment:</p> <p>Maintain or improve air quality within the study area as a result of minimising stationary / queuing traffic</p>	<ul style="list-style-type: none"> Creation of 4th lane at the A1260 Nene Parkway SB stop line Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 Creation of a 4th lane at the A1260 Serpentine NB stop line, including a flare extension on the left-hand lane 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Reduced stationary / queuing traffic 	<ul style="list-style-type: none"> Commuters / Business trips Local residents / wider community PCC / CPCA in regard to air quality control and policy goals 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the scheme Air quality monitoring

5. Monitoring and Evaluation Approach

5.1.1 The Monitoring and Evaluation Plan for the Junction 3 Improvement Scheme takes a proportionate and targeted approach and aims to demonstrate how the scheme has performed in relation to its objectives and intended outcomes.

5.1.2 The monitoring plan is designed to determine whether the Junction 3 Improvement Scheme:

- Has been designed and delivered efficiently and effectively
- Has met the requirements of the stated scheme objectives
- Has achieved the desired outcomes and impacts
- Represents value for money
- Resulted in any unintended outcomes and impacts (both positive and negative)

5.2 Types of Measures

5.2.1 The following types of measure will be monitored, as defined in the DfT framework:

- Inputs – what is being invested to deliver the Scheme
- Outputs – what has been delivered, and how it is being used
- Outcomes – intermediate effects of the Scheme, such as changes in traffic flow
- Impacts – longer-term effects on wider social and economic outcomes, such as economic growth

5.3 Stages of Monitoring and Evaluation

5.3.1 Monitoring and Evaluation is required both during the development and construction, as well as in the years following implementation of the improvement scheme, in order to meet the stated evaluation objectives and effectively assess any scheme outcomes and impacts.

5.3.2 As per the DfT standard monitoring guidance, the monitoring process will be split into three stages:

- **Pre-construction and during delivery (monitoring)**
 - Baseline data is 2018 surveys, limited surveys / assessments to be undertaken in 2022 before scheme construction commences as part of FBC
 - Data to monitor scheme delivery will be collected during construction

- **One-year after (Monitoring and Evaluation)**
 - Data to monitor scheme performance will be collected at least one year (but less than two years) after scheme opening.
 - An initial “One Year After” report will be published within two years of scheme opening, focusing on the scheme’s outcomes

- **Five-years after (Monitoring and Evaluation)**
 - Further data will be collected up to approximately five years after scheme opening
 - A final “Five Years After” report will be published within six years of scheme opening, based on analysis of all the data available, including an assessment of the wider impacts of the scheme

5.3.3 Monitoring timescales for Junction 3 are summarised in Table 5.1 beneath.

Table 5.1: Monitoring and Evaluation Timescales

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

5.4 Measures to be Monitored

5.4.1 The measures which will be monitored for evaluation of the scheme, as stated within the DfT standard monitoring guidance, are set out in Table 5.2 overleaf.

Table 5.2: Standard Monitoring Measures

Item	Type of Measure	Data Collection Timing	Rationale
Scheme Build	Input	During Delivery	Knowledge
Delivered Scheme	Output	During Delivery Post Opening (1 Year)	Accountability
Scheme Costs	Input	During Delivery Post Opening (1 Year)	Accountability
Scheme Objectives	Output / Outcome / Impact	Pre-Delivery Post Opening (up to 5 years)	Accountability
Travel Demand	Outcome	Pre-Delivery Post Opening (1 year and up to 5 Years)	Accountability / Knowledge
Travel Time and Reliability	Outcome	Pre-Delivery Post Opening (1 year and up to 5 Years)	Accountability / Knowledge
Impact on Economy	Impact	Pre-Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge
Impact on Local Environment / air quality	Impact	Pre-Delivery During Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge
Carbon	Impact	Pre-Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge

- 5.4.2 In addition, an assessment will be undertaken to determine the extent to which the Junction 3 Improvement Scheme has delivered the Value for Money (VfM) that was anticipated in the appraisal set out in the FBC. This will be done by re-calculating the benefit-cost ratio (BCR) in both the “One Year After” and “Five Years After” reports and comparing it to the BCR calculated in the FBC.
- 5.4.3 The following chapter describes how data will be collected and analysed to monitor the scheme’s performance in each of these areas.

6. Data Requirements and Collection Methods

- 6.1.1 Data collection for the scheme is required at various stages through scheme development to ensure effective monitoring and evaluation takes place.
- 6.1.2 Table 6.1 beneath sets out the data that will be collected to monitor and evaluate the Junction 3 Improvement Scheme, along with the rational for its inclusion, the proposed data collection method, and the proposed frequency of data collection.

Table 6.1: Monitoring and Evaluation Data Requirements

Measure	Data to be used	Rationale for inclusion	Data Collection Method	Frequency of Data Collection
Scheme Build	<ul style="list-style-type: none"> Progress of construction against key milestones Qualitative feedback from the Project Team Information from the Risk Register Project programme / disruptions to delivery 	To gain knowledge and understanding of the level of effectiveness of the scheme build processes and to learn lessons for future projects.	<ul style="list-style-type: none"> Analysis of key project documents by the scheme's Project Team, including Risk Register, Review of Early Warnings etc, Interviews with key staff 	On-going throughout the construction and delivery of the scheme, reporting on monthly basis
Delivered Scheme	<ul style="list-style-type: none"> Scheme definition at full funding approval Scheme design drawings Logged design iterations Information from project change control log 	To assess the impact of change during construction, and realisation of scheme objectives.	<ul style="list-style-type: none"> Desk study / site visits Analysis of key project documents by the schemes Project Board 	During construction and 1 year after scheme opening
Scheme Costs	<ul style="list-style-type: none"> Forecast scheme costs at time of funding approval (FBC) Actual outturn costs once scheme is completed 	Cost analysis enables 'performance to budget' to be monitored and corrective actions to be implemented. Lessons Learnt to be realised and implemented for other similar projects, alongside having potential to refine contractual arrangements where necessary.	<ul style="list-style-type: none"> Financial monitoring of the scheme costs from approval to scheme completion Project Manager's monthly reports to Project Board Interviews with key staff 	On going throughout construction and delivery of the scheme, reporting on a monthly basis.
Travel Demand	<ul style="list-style-type: none"> Daily traffic flows classified into vehicle types and by movement 	To monitor changes in traffic flows at Junction 3, more specifically the volume of traffic on key approaches	<ul style="list-style-type: none"> Desk study / site visits Collated data from 12 hour manual classified counts 	Baseline 2018 before scheme completion, 1 year after scheme opening and 5 year after scheme opening. ATC - continuous monitoring
Travel times and reliability	<ul style="list-style-type: none"> TomTom or Traffic Master data 	To monitor changes in travel times and queuing at Junction 3 on key approaches	<ul style="list-style-type: none"> Desk study / site visits Survey footage review Journey time dataset for a month period 	Baseline 2018 before scheme completion, 1 year after scheme opening and 5 year after scheme opening.
Impact on Economy	<ul style="list-style-type: none"> Local employment statistics 	To assess the economic impact of the scheme on the wider City	<ul style="list-style-type: none"> Desk Study of economic data provided by PCC Review of Local Plan goals for economic growth 	Baseline 2018, before scheme completion, 1 year after scheme opening and 5 year after scheme opening
Impact on the Local Environment / Air Quality	<ul style="list-style-type: none"> Carbon emission workshops / calculations Biodiversity calculations – completed scheme maps 	To monitor and assess the emissions as a result of the Junction 3 scheme and any impact on the environment	<ul style="list-style-type: none"> Desk study / site visits Analysis of key project documents by the schemes Project Board 	Baseline 2018, during construction, before scheme completion, 1 year after scheme opening and 5 year after scheme opening
Carbon	<ul style="list-style-type: none"> Carbon emission workshops / calculations Traffic flows and speeds within the Junction 15 study area 	To monitor carbon emission within the Junction 3 study area as a result of the scheme	<ul style="list-style-type: none"> Desk Study analysis FBC calculation for carbon Analysis of key project documents by the schemes Project Board 	Baseline 2018, before scheme completion, 1 year after scheme opening and 5 year after scheme opening

6.2 Data Collection

6.2.1 Data collection for the measures of 'travel demand' and 'journey times and reliability' as stated in Table 6.1 includes:

- Manual Classified Counts (MCC)
- Satellite Navigation Data

6.2.2 Survey data collected as part of the scheme monitoring and evaluation will be a replication of data collected in the original 2018 baseline dataset, enabling a direct comparison to be made.

Manual Classified Turning Counts / Queue Length Data

6.2.3 MCC's will be used to monitor changes in traffic demand at Junction 3 at both 1 year and 5 years after scheme completion.

6.2.4 MCC surveys will include the five locations listed below and data will be classified into Car, Light Goods Vehicles (LGV), Other Goods Vehicles (OGV1 and OGV2), Bus, and Motorcycle classifications. Surveys will cover a 12-hour period between 07:00 and 19:00 and should be conducted in November reflecting the collection period of the baseline data.

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

1. A1260 Nene Parkway / Malborne Way / Morley Way roundabout (Junction 31)
2. A1260 Nene Parkway / A1139 Fletton Parkway / A1260 The Serpentine roundabout (Junction 3)
3. A1260 The Serpentine / Phorpres Way / Serpentine Green roundabout
4. A1260 The Serpentine / Hargate Way (left-in, left-out)
5. A1139 Fletton Parkway / Natures Way / Goldhay Way / Malborne Way roundabout (Junction 2)

6.2.6 An ATC survey will also be conducted at the following location as per the baseline dataset:

- Malborne Way 20m south of Bodesway in both a northbound and southbound direction

6.2.7 The ATC survey will be conducted for a 2 week period, including the day of the MCC sites above.

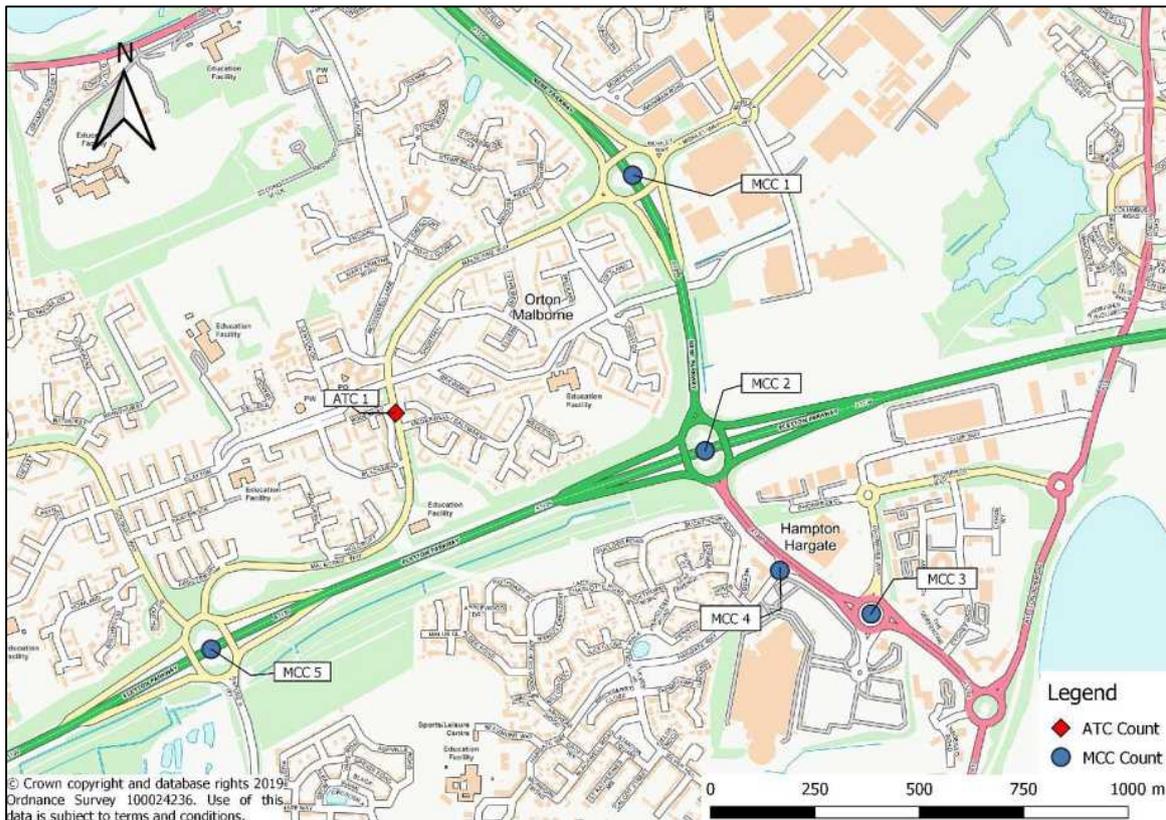


Figure 6.1: Monitoring and Evaluation Survey Locations

Satellite Navigation / Journey Time Data

- 6.2.8 Satellite Navigation data will be used to monitor changes in journey times at Junction 3 at both 1 year and 5 years after scheme completion.
- 6.2.9 Journey time data will be obtained for a month period (Oct / Nov) for the routes shown in Figure 6.2 which were used in the original 2018 baseline data set. Survey data will be collected for the AM (08:00 – 09:00) and PM (17:00 – 18:00) peak hours and the month period should exclude non-neutral days such as weekends, holidays, and any period relating to major roadworks / incidents.
- 6.2.10 Journey time routes which will be covered in the dataset include:
- A1260 Nene Parkway Northbound / Southbound
 - Malborne Way Northbound / Southbound
 - The Serpentine Northbound / Southbound
 - Junction 3 to A1139 Fletton Parkway Eastbound / Westbound
 - A1139 Fletton Parkway to Junction 3 Eastbound / Westbound
 - A1139 Fletton Parkway Eastbound / Fletton Parkway Westbound.



Figure 6.2: Monitoring and Evaluation Journey Time Routes

7. Evaluation Resource and Governance

7.1 Monitoring and Evaluation Plan Costs

- 7.1.1 Table 7.1 overleaf provides a summary of the monitoring and evaluation plan for Junction 3, highlighting data collection, reporting programme and indicative costs.
- 7.1.2 The necessary monitoring and evaluation budget is estimated to be £25,500, based on survey data, analysis and reporting. A breakdown of costs is provided beneath in Table 7.1 beneath.

Table 7.1: Monitoring and Evaluation Plan

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

7.2 Governance

- 7.2.1 The CPCA have the responsibility for ensuring Value for Money from the Junction 3 Improvement Scheme. Under the CPCA, PCC will be responsible for ensuring the Scheme Evaluation Plan is undertaken as outlined within this report.
- 7.2.2 Monitoring during construction and post scheme opening is likely to be undertaken by PHS under commission from CPCA and PCC. However, owners for each monitoring task should be defined following the approval of the FBC.
- 7.2.3 To ensure the successful delivery of the scheme throughout construction, the following resource used to date will continue:
- Project Delivery Team
 - PHS Project Board
- 7.2.4 Delivery of the scheme to date has been managed by the PCC Project Manager and wider Project Team, consisting of key project delivery partners. The Project Team have been responsible for the daily running of the project, and will continue to meet on a monthly basis throughout the construction period. The main responsibilities being to:
- 7.2.5 The delivery team will continue to meet on a monthly basis throughout the construction phase of the project. Its main responsibilities are to:
- Comment on delivery and ensure sufficient resource is allocated to scheme delivery
 - Monitor overall delivery against programme to ensure key activities / milestones are completed
 - Consider project costs and risks and review and advise on any impacts to project delivery
 - Provide governance for the project and initiate corrective action where necessary
 - Provide updates, including written progress reports
- 7.2.6 The existing PHS Project Board will be used to oversee the continued delivery of the scheme by the Project Team, and to make key decisions relating to the delivery of the project. The Project Board will be continue to meet on a monthly basis until the scheme is completed. After which arrangements will be agreed for the on-going resource / schedule for reporting associated with the monitoring and evaluation plan of the scheme.
- 7.2.7 Figure 7.1 provides an outline of the overall governance structure highlighting key roles and lines of accountability for the development and delivery of the scheme.



Figure 7.1: Organisational Governance Structure

7.3 Quality Assurance

- 7.3.1 The project to date has been managed by PCC in line with their existing assurance and approvals processes, namely the CPCA Assurance Framework. The CPCA Assurance Framework sits alongside a number of Combined Authority documents including the '10-point guide' mentioned above and details the fundamental principles in relation to the use, administration and evaluation of Cambridgeshire and Peterborough Investments.
- 7.3.2 Under the management of The Council, a Project Manager was assigned and has been responsible for the daily running of the project. In instances where approval was required, the Project Manager would be advised and then provided by the Project Board.
- 7.3.3 The Project Manager will also be responsible for quality assurance for the MEP. Development and ongoing maintenance of the scheme evaluation plan will ensure that it reflects the programme and key milestones.
- 7.3.4 The Project Manager will also:
- Arrange for the undertaking of quality checks by internal peer review to ensure high quality
 - Record proceedings at meetings with the project board, project team and technical specialists, and reporting them in the form of meeting minutes including a clear record of actions and action dates
 - Ensure compliance with the consistency in approach / assessment / presentation of documents and output
 - Contribute to project close out and post project appraisal exercises for the task.

7.4 Risk Management

- 7.4.1 The risk management strategy for the evaluation process is in line with the strategy for the project delivery. Risk areas identified in relation to evaluation of the project are:
- **Baseline data** – transport data issues (completeness, correctness, accuracy and relevance), impacting on processing.
 - **Baseline data collection** – unable to collect data before site opens e.g. weather or resourcing constraints.
 - **Data processing** – inaccuracy of data analysis, impacting on evaluation.
 - **Future year data** – funding issues prevent future data survey collection.
 - **Evaluation** – post analysis realisation that baseline data will be insufficient for purpose or potential newly identified factors.

7.4.2 Table 7.2 below highlights the calculated likelihood and severity of the risk identified for the project evaluation, as well as mitigation measures that can be taken.

Table 7.2: Monitoring and Evaluation Data Requirements

Risk	Likelihood Score (1-5)	Impact Score (1-5)	RAG Score (Likelihood x Impact)	Mitigations
Baseline Data Accuracy	1	2	2	Baseline data has been used throughout the business case lifespan of the project. Baseline data has been reassessed in preparation for the required monitoring and evaluation, and is sufficient for future data comparisons.
Baseline Data Collection	3	2	6	Construction programme is known, careful planning / weather monitoring to be undertaken when arranging surveys.
Data Processing	1	1	2	Once data is received from survey companies, rigorous reviewing to be undertaken to highlight any inconsistencies / issues at the earliest point.
Future Year Data	2	5	10	Funding required for the monitoring and evaluation of the project has been costed prior to construction and will be received with the construction funding (approval January 2023). Funding will be separated for future use.
Evaluation	1	2	2	See above comments.

8. Dissemination Plan

- 8.1.1 This Scheme Evaluation Plan will be agreed with PCC and CPCA prior to the submission of the FBC. Costs for monitoring and Evaluation will be included within the final funding request from the CPCA for construction costs.

8.2 Dissemination Reporting

- 8.2.1 Monitoring will be undertaken before and during construction, and after the opening of the Scheme. A “One Year After” evaluation report will be produced within two years of the Scheme opening, followed by a “Five Years After” report within six years of the Scheme opening. The reports associated with this Monitoring and Evaluation will be published on the PCC website.

8.3 Stakeholder Engagement

- 8.3.1 PCC and the Project Team have engaged with key stakeholders throughout the development of the Scheme, and this will continue during the delivery phase. The list of stakeholders who received communication regarding the scheme can be found in the Strategic Case of the FBC.
- 8.3.2 Communication with stakeholders throughout the delivery phase will be via email or letter (as per previous communications) as well as via the scheme PLO who will keep stakeholders informed with the progression of the scheme build throughout the construction phase.
- 8.3.3 Stakeholders where necessary will also be invited to the continue project team monthly meetings and receive the formal reporting associated with the Scheme Evaluation Plan.

8.4 Lessons Learnt

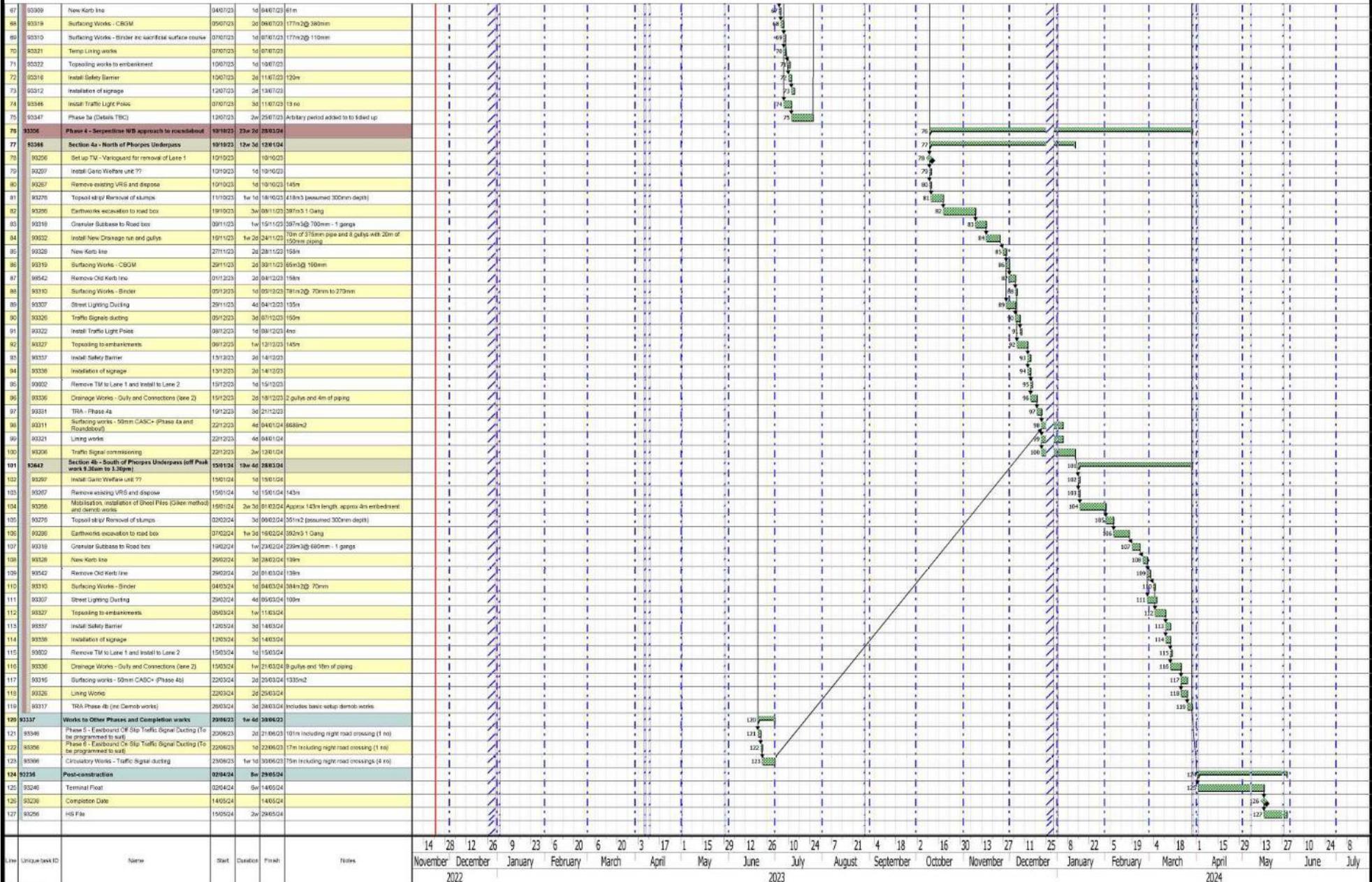
- 8.4.1 The Scheme will represent a significant investment of public money for the City by the CPCA. Monitoring and evaluation is therefore essential, not only to demonstrate that the scheme investment has been delivered as planned with the desired impacts, but also to inform and enlighten future decision makers, both locally and nationally. In this way, future investment can be targeted, to provide the best value for money.

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

- **Delivery:** Has the Scheme been delivered as intended and to the expected timetable? If any internal and external factors affected delivery, what impact did these have? Could they have been foreseen or avoided? What went well and what went less well?
- **Cost:** How accurate were the cost estimates? If out-turn costs were different from expectations, why was this, and what actions were taken? Were the allowances for quantified risk and optimism bias reasonable, or should a different approach be taken in future?
- **Traffic / Journey Reliability:** Has the scheme produced the expected changes to congestion and journey time reliability at and surrounding Junction 3, and were there any unintended changes? If not, what are the reasons? If there are differences, are they due to Scheme specific, or external factors affecting traffic demand. Are there implications for similar schemes in future?
- **Economy:** Has the Scheme enhanced the position of Peterborough in relation to policies and growth aspirations? Has it altered the perception of the City as a place to work, better attracting new investors as a place of opportunity? Have there been any unintended consequences?
- **Value for money:** Did the traffic model provide a realistic forecast of future growth and the effects of the Scheme? If there are differences, are they enough to raise questions about the VfM category attributed to the Scheme?
- **Environment:** Were the environmental impacts of the Scheme in line with expectations? Is mitigation perceived to have been effective? Have there been any unintended impacts, and, if so, how might they have been foreseen, or avoided with future schemes?

Appendix L – Construction Programmes

Junction 3 - Nov 22 Pre Tender Programme Rev D1 inc Phase 4 Off Peak



Link Categories: Default
 Symbols: Start Alter
 Milestone Appearances: Diamond

Drawn By: Gohar Hayat
 Print Date: 22/11/2022

construction

Filter: None
 Page No: 2



Fengate Access Study - Eastern Industries Access - Phase 1

To:	Transport and Infrastructure Committee
Meeting Date:	18 th January 2023
Public report:	Yes
Lead Member:	Cllr Anna Smith, Chair of Transport and Infrastructure Committee
From:	Emma White, Transport Programme Manager
Key decision:	N/A
Forward Plan ref:	N/A
Recommendations:	<p>The Transport and Infrastructure Committee is recommended to:</p> <ul style="list-style-type: none">a) Note the completed Fengate Phase 1 Full Business Case;b) Recommend to the Combined Authority Board to approve the drawdown of £6,665,696 to construct the Fengate Access Study Improvement Schemes; andc) Recommend that the Combined Authority delegate authority to the Interim Head of Transport in consultation with the Chief Finance Officer and Monitoring Officer to enter into Grant Funding Agreements with Peterborough City Council.
Voting arrangements:	<p>For recommendations b) a vote in favour by at least two thirds of all Members (or their Substitute Members) appointed by the Constituent Councils who are present and voting, to include the Members appointed by Cambridgeshire County Council and Peterborough City Council, or their Substitute Members</p> <p>For recommendation c) A simple majority of all Members present and voting.</p> <p>To be carried, the vote must include the vote of the Mayor, or the Deputy Mayor when acting in place of the Mayor.</p>

1 Purpose

- 1.1 This report summarises the completed Fengate Phase 1 Business Case (FBC) and recommends to the Combined Authority Board to approve the drawdown of £6,665,696 for construction costs of the scheme.

2 Background

- 2.1 Peterborough City Council's (PCC) Local Plan (adopted July 2019) sets out the overall vision, priorities, and objectives for Peterborough up to 2036. The updated strategy identifies the required delivery of 19,440 new homes and 17,600 new jobs by 2036.
- 2.2 The largest employment allocation within Fengate is the Red Brick Farm site which covers 12.6 hectares. This is likely to be a mixture of B8 (Storage and Distribution) units and B2 (General Industry) units with ancillary B1 office space.
- 2.3 The Fengate Access Study Area focuses on the north of Fengate, where the Red Brick Farm site is located. The study considers Junction 7 and Junction 8 of the A1139 Fletton Parkway (key access to / from the parkway system), access routes into Fengate such as Parnwell Way and Oxney Road, and internal roads within Fengate such as Edgerley Drain Road and Storey's Bar Road.
- 2.4 At the Combined Authority Board in August 2020 the Strategic Outline Business Case (SOBC) and commencement of the Full Business Case (FBC) and detailed design stage were approved. At the Combined Authority Board in December 2021 a further £150,000 was approved to complete the FBC. Since the development of the schemes from Strategic Outline Business Case to Full Business Case there has been the addition of active travel schemes in the package.
- 2.5 The Fengate Access Study Improvement Schemes include:
 1. Traffic signal improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road, on the Vicarage Farm Road and Storey's Bar Road northbound approaches.
 2. Traffic signal improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road).
 3. Creation of a mini roundabout at Oxney Road / Newark Road.
 4. Improvements to Newark Road footpath.
 5. Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.
- 2.6 At the Combined Authority Board in October 2022 approval was given for £550,424 to accelerate the active travel elements of the scheme and £315,000 to accelerate utility C4 costs ahead of construction.

Full Business Case

- 2.7 The Full Business Case is split into 5 dimensions. Each dimension is summarised below for the Fengate Access Study Improvement Scheme:

Strategic Dimension

- 2.8 The Strategic Dimension considered the policy context in which the scheme has been

developed as well as the need for intervention. A number of challenges are needed to be overcome that will compromise local growth aspirations if left unaddressed including:

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

Economic Dimension

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

Financial Dimension

2.10 The Financial Dimension demonstrates that the scheme has been robustly costed and fits with the funding allocation available. The scheme Outturn Cost is £7,531,120 which includes risk allowance and inflation costs through to the end of construction in 2024 (with post scheme monitoring to begin in 2025).

Commercial Dimension

2.11 The Commercial Dimension demonstrates that the Fengate Access Study Improvement Schemes can be reliably procured and implemented through existing channels whilst ensuring value for money. Delivery and supervision will be delivered by Peterborough Highway Services (PHS).

Management Dimension

2.12 The Management Dimension demonstrates that PCC, through the PHS Framework, has the necessary experience and governance structure to successfully manage the delivery of the Fengate Access Study Improvement Schemes. Construction is due to be completed by March 2024.

3 Significant Implications

3.1 N/A.

4 Financial Implications

4.1 The total scheme cost equates to £7,531,120; however, this paper seeks the approval of a drawdown £6,665,696 from the the Medium-Term Financial Strategy (MTFS) to support delivery of this scheme. In the October 2022 Transport and Infrastructure Committee and subsequent Combined Authority Board meetings approval was given for 550,424 to accelerate the active travel elements of the scheme and £315,000 to accelerate utility C4 costs ahead of construction.

4.2 The scheme funding is from Transforming Cities Funding (TCF).

5 Legal Implications

5.1 N/A.

6 Public Health Implications

6.1 The Fengate Access Study has a positive implication for public health. The Fengate Access Study Improvement Schemes improves the air quality index, public health, and quality of life by improving sustainable modes of travel. The scheme will also improve road safety through better junction design, including removal of opposed right turns, and enhanced active travel provision

7 Environmental and Climate Change Implications

7.1 The Fengate Access Study Improvement Scheme will have a positive implication for the environment and climate change. The environmental impact of all schemes has been assessed and benefits include biodiversity improvements, improved air quality and noise levels, and reduced emissions. Also, a 20% biodiversity net gain will be delivered as part of the scheme.

8 Other Significant Implications

8.1 N/A.

9 Appendices

9.1 Appendix 1 – Fengate Access Study Improvement Scheme Full Business Case

10 Background Papers

[Combined Authority Board report 19 October 2022](#)



Fengate Access Study

Full Business Case

Document Control

Job Number: 5081031						
Document ref: Fengate Access Study Full Business Case					Authorisation	
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
2.0	First Issue	SP	RPJ	RMJ	RMJ	17.11.2022
3.0	Second Issue – Amended Scope	SP	RPJ	RMJ	RMJ	01.12.2022
4.0	Final Issue – Post ITE	SP	RPJ	RMJ	RMJ	15.12.2022

Contents

Executive Summary	i
1. Introduction	1
1.1 Background	1
1.2 Study Area.....	1
1.3 Fengate Context.....	2
1.4 Document Structure	6
2. The Strategic Dimension	7
2.1 Introduction.....	7
2.2 Business Strategy	8
2.3 Fit within the Wider Policy Context.....	18
2.4 The Need for Change.....	22
2.5 Impact of Not Changing	31
2.6 Internal Drivers for Change	35
2.7 External Drivers for Change.....	38
2.8 Scheme Objectives	38
2.9 Measures of Success	42
2.10 Constraints, Powers and Approvals	44
2.11 Scope	46
2.12 Interdependencies.....	46
2.13 Key Risks	46
2.14 Stakeholders	49
2.15 Scheme Development.....	50
2.16 Preferred Option Development	56
2.17 Carbon Assessment.....	67
3. The Economic Dimension	74
3.1 Introduction.....	74
3.2 Options Appraised.....	75
3.3 Economic Assessment.....	75
3.4 Present Value of Costs	76
3.5 Present Value Benefits.....	78
3.6 Benefit Cost Ratio	89
3.7 Key Risks, Sensitivities and Uncertainties	90
3.8 Distributional Impacts.....	97
3.9 Additional Qualitative Assessments.....	98
3.10 Summary of Benefits and Costs.....	100

4.	The Financial Dimension	101
4.1	Introduction.....	101
4.2	Scheme Costing.....	101
4.3	Scheme Cost Estimates.....	103
4.4	Budgets and Funding Cover	111
5.	The Commercial Dimension	112
5.1	Introduction.....	112
5.2	Output Based Specification.....	112
5.3	Procurement Strategy	114
5.4	Market Maturity.....	115
5.5	Sourcing Options.....	116
5.6	Contract and Payment Mechanisms	117
5.7	Pricing Framework / Charging Mechanisms	117
5.8	Risk Allocation and Management	118
5.9	Contract Length.....	118
5.10	Contract Management.....	120
6.	The Management Dimension	121
6.1	Introduction.....	121
6.2	Evidence of Similar Projects	121
6.3	Programme / Project Dependencies	125
6.4	Governance, Organisational Structures and Roles.....	126
6.5	Programme / Project Reporting.....	128
6.6	Programme / Project Plan	129
6.7	Assurance and Approvals	130
6.8	Communications and Stakeholder Management.....	130
6.9	Risk Management Strategy	132
6.10	Scheme Evaluation	133
6.11	Scheme Logic Map	138
	Appendices	140
	Appendix A – Project and Construction Risk Registers.....	141
	Appendix B – General Arrangement Drawings	142
	Appendix C – Sensitivity Testing Technical Note	143
	Appendix D – Appraisal Summary Table (AST).....	144
	Appendix E – TAG Worksheets	145
	Appendix F – Early Release of Funding Technical Note	146
	Appendix G – 60 Year Financial Dimension Cost Schedule.....	147
	Appendix H – 60 Year Economic Dimension Cost Schedule (Construction and Maintenance).....	148
	Appendix I – Monitoring and Evaluation Plan	149
	Appendix J – Construction Programmes	150
	Appendix K – Junction 15 Contractors (PHS Procurement Example).....	151

Figures

Figure 1.1: Fengate Access Study Area	2
Figure 1.2: Location of Fengate within Peterborough.....	3
Figure 1.4: Red Brick Farm Site (looking north from the Edgerley Drain Road / Storeys Bar Road / Vicarage Farm Road Junction)	5
Figure 2.2: AM Peak Hour Congestion within Fengate (Google Average Tuesday Traffic).....	23
Figure 2.4: Journey Times for Edgerley Drain Road / Storey’s Bar Road / Vicarage Road Junction...26	
Figure 2.5: Journey Time Data for Junction 7	27
Figure 2.6: Personal Injury Accidents by Severity	28
Figure 2.7: Existing Cycle Infrastructure In Fengate Study Area.....	29
Figure 2.8: View of Northbound Approach to Junction 7, Showing Poor Cycle Provision Crossing Traffic Lanes (Google, 2022).	30
Figure 2.9: Alternate View of Northbound Approach to Junction 7, Showing Poor Cycle Provision Crossing Traffic Lanes (Google, 2022).	30
Figure 2.10: AM Peak Hour Delay, 2036 Do-Minimum Scenario (PTM3)	33
Figure 2.11: PM Peak Hour Delay, 2036 Do-Minimum Scenario (PTM3)	33
Figure 2.12: 2019 Index of Multiple Deprivation (Consumer Data Research Centre).....	37
Figure 2.15: General Arrangement of the Edgerley Drain Road / Storey’s Bar Road / Vicarage Farm Road Scheme	59
Figure 2.17: Fengate Access Study Improvement Schemes – Final Package.....	64
Figure 2.18: Relationship between Work Stages, Assessment Accuracy, and Ability to Influence Whole Life Cycle Carbon. <i>Source: Green Construction Board</i>	67
Figure 2.19: Fengate Access Scheme - Detailed Design Carbon Footprint by Work Activity 'Series'	68
Figure 2.20: Fengate Access Schemes - Detailed Design Carbon Footprint by Work 'Category'.....	71
Figure 2.21: Relationship between Work Stages and Carbon Reduction Potential	73
Figure 2.22: Relationship between Work Stages and Carbon Reduction Potential	73
Figure 3.1: Development Related Infrastructure Changes	94
Figure 3.2: Sensitivity Test BCR Ranges.....	96
Figure 6.1: Junction 20 Improvement (Post Scheme)	122
Figure 6.2: A605 / B1095 Junction improvement scheme	123
Figure 6.3: Staniland Way Junction Improvement	123
Figure 6.4: Haddon Cycleway Improvement.....	124
Figure 6.5: Key Project Roles and Responsibility	127
Figure 6.6: Fengate Access Study Logic Model	139

Tables

Table 2.1: Wider Policy Context and Impact of the Schemes.....	19
Table 2.2: Policy Context in Relation to Environment.....	21
Table 2.3: Residential Development Proposed for Fengate	36
Table 2.4: Employment Development Proposed for Fengate.....	36
Table 2.5: Alignment of Scheme of Objectives to Local Policy Documents	40
Table 2.6: Measures of Success.....	43
Table 2.7: Constraints and Mitigations.....	44
Table 2.8: Table of Required Powers and Approvals	45
Table 2.9: Long List of Options	51
Table 2.10: Scheme Objectives	52
Table 2.11: Modelled Package of Schemes	53
Table 2.12: Amendments to Preferred Package Since SOBC	57
Table 2.13: With / Without A15 Lane Gain Sensitivity Test Results	62
Table 2.14: Review of Strategic Fit.....	66
Table 2.15: Carbon Footprints at Preliminary and Detailed Design Stages	69
Table 2.16: Fengate Access Schemes - Detailed Design Carbon Footprint by Work 'Activity'	70
Table 3.1: Base Investment Cost (2022 prices).....	76
Table 3.2: Economic Dimension Scheme Cost Estimate	77
Table 3.3: TUBA Annualisation Factors.....	79
Table 3.4: TUBA Benefits Breakdown	80
Table 3.5: Non-Monetised Time Benefits by Time Saving.....	80
Table 3.6: Transport User Benefits by Time Period.....	81
Table 3.7: Non-Monetised Time Benefits by Distance.....	81
Table 3.8: Do Nothing and Do Something Daily Active Travel Trips by Scheme	86
Table 3.9: Summary of Active Mode Appraisal Toolkit Benefits By Scheme	87
Table 3.10: Transport User, Active Mode, and Accident Benefits Summary.....	88
Table 3.11: DfT VfM Categories	89

Table 3.12: Fengate Access Study Improvements AMCB Table.....	89
Table 3.13: Value for Money Categories and the Associated Present Value of Costs (£,000s)	91
Table 3.14: Sensitivity Test Summary	95
Table 3.15: Distributional Impact Appraisal	97
Table 4.1: Key Activity Timeline	102
Table 4.2: Financial Dimension Scheme Cost Estimates	103
Table 4.3: Base Investment Cost (2022 Prices)	104
Table 4.4: Base Investment Cost (2022 Prices) by Scheme	105
Table 4.5: Risk Adjusted Base Cost (2022 Prices).....	106
Table 4.6: Risk Allocation by Scheme (2022 Prices).....	106
Table 4.7: Inflation Increases on Construction Costs (2023 – 25).....	107
Table 4.8: Application of Maintenance Costs by Scheme	109
Table 4.9: Calculation of Whole Life Maintenance Costs	110
Table 4.10: Inflated Risk Adjusted Cost Including Whole Life Costs.....	110
Table 6.1:Key Project Milestones	129
Table 6.2: Benefits Realisation Strategy.....	134
Table 6.3: Monitoring and Evaluation Timescales	135

Executive Summary

This Full Business Case (FBC) demonstrates that there is a strong strategic and economic case for investment in the Fengate Access Improvement Schemes. The improvements consist of a balanced mix of highway and active travel schemes and will provide Very High Value for Money with a benefit to cost ratio (BCR) of 4.95 whilst facilitating further growth in the Fengate area.

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

Strategic Dimension

The Strategic Dimension has considered the policy context in which the scheme has been developed. As well as policy, the need for intervention is explained, which includes the requirement to overcome the following challenges which will compromise local growth aspirations if left unaddressed:

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

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

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

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

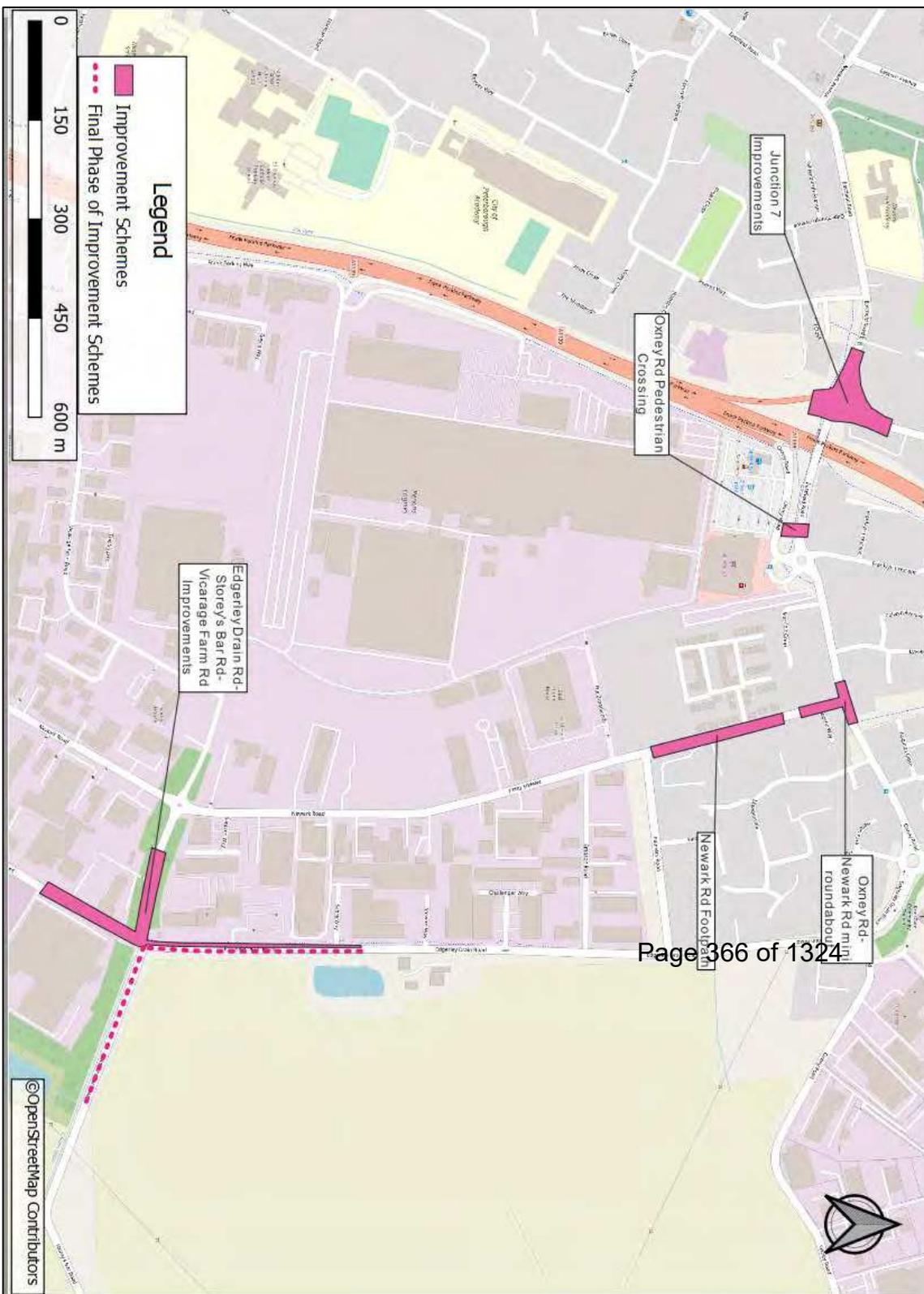
In addition to the above, secondary objectives were identified and are set out within the Strategic Dimension.

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

The Fengate Access Study Improvement Schemes include:

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

The scheme locations are shown in the Figure beneath.



Economic Dimension

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

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

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

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

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

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

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

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

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

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

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

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

Financial Dimension

The Financial Dimension demonstrates that the scheme has been robustly costed and fits with the funding allocation available. The cost estimates for the scheme are summarised in the table beneath.

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

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

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

The Inflated Risk Adjusted Costs incorporating Whole Life Costs (£8,376,966) includes inflated maintenance costs over the sixty-year assessment period, but the additional cost beyond the Outturn Cost is not required as part of the scheme funding and is purely calculated for the economic assessment to ensure that the scheme will continue to provide value for money with post construction costs considered.

The CPCA currently have an allocation of £11,000,000 in the Medium-Term Financial Strategy (MTFS) to support delivery of this scheme, which exceeds the required scheme Outturn Cost.

Commercial Dimension

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

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

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

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

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

Management Dimension

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

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

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

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

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

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

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

Public consultation on the concept of a scheme at Fengate was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan¹ that was adopted in January 2020. A further round of public consultation took place between February and March 2021 based on the concept designs. No comments were received relating the scheme designs themselves, however some feedback was received regarding the poor level of pedestrian infrastructure currently within Fengate. Two additional schemes were included in the package of works to address this.

¹ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>.

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

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

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

1. Introduction

1.1 Background

- 1.1.1 This document sets out the Full Business Case for the Fengate Access Study Improvement Schemes in Peterborough.
- 1.1.2 The package of schemes will improve active travel connections across Fengate, and add highway capacity to unlock congestion at several critical junctions within the study area. Addressing existing issues and building in additional capacity at appropriate locations will allow the package of schemes to facilitate imminent planned employment growth within the Fengate area, and improve sustainable travel options for those that live and work in Fengate.
- 1.1.3 This Full Business Case is the final stage of the decision-making process based on HM Treasury's 5 Case Model. The level of detail provided within the Business Case continually builds as the project progresses from Strategic Outline Business Case (SOBC) to Outline Business Case (OBC), and then onto Full Business Case (FBC). This reflects the greater level of detail that becomes available as the list of potential schemes is refined, and a Preferred Scheme is identified.
- 1.1.4 An SOBC and an Optional Appraisal Report (OAR) were approved by the Cambridgeshire and Peterborough Combined Authority (CPCA) in October 2020. At the time that the SOBC was approved, planning for a large development site within Fengate (known as Red Brick Farm) was progressing at pace, and the decision was made by the CPCA to deliver the Preliminary Design and Detailed Design tasks in a single phase to accelerate the scheme designs and provide the developers with greater certainty of the councils infrastructure plans in the area. Consequently, there is now the package of schemes is now developed enough to progress from SOBC to FBC, and this document is based on the final Detailed Designs and Target Costs.

1.2 Study Area

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

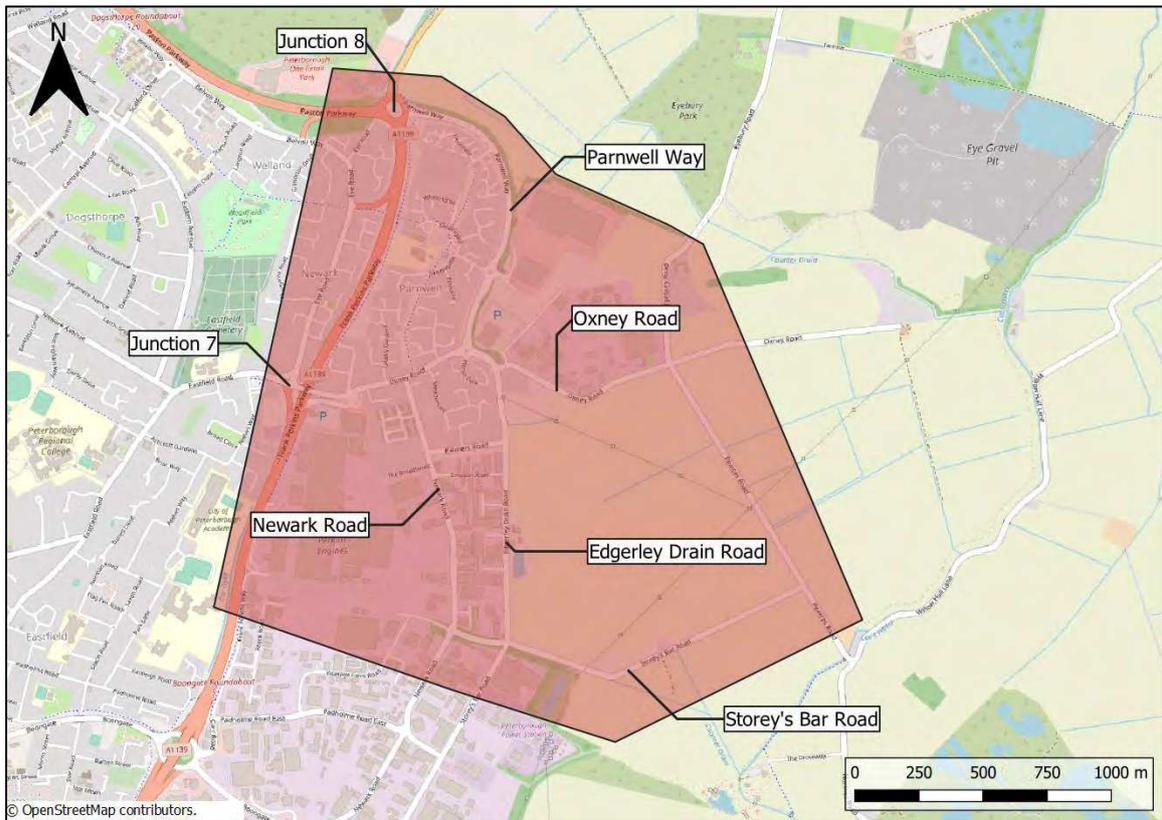


Figure 1.1: Fengate Access Study Area

1.3 Fengate Context

Landuse and Access

- 1.3.1 Fengate is a large, predominantly industrial area to the east of Peterborough, it is bordered to the west by the A1139 Frank Perkins Parkway, and to the east by the Fens.
- 1.3.2 It is predominantly industrial at the southern end and residential at the northern end. The eastern part of the study area currently consists of agricultural fields; however, these are due to be developed, and outline planning permission has been granted for the Red Brick Farm site which will convert the land use here to office, industrial and logistical use².
- 1.3.3 The industrial area has a wide variety of businesses ranging from Small to Medium Enterprises (SME's) to large national retail chains. Perkins Engines is also based in the area and has its own access junction from the A1139 Frank Perkins Parkway.

² Planning Reference 18/00080/OUT

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

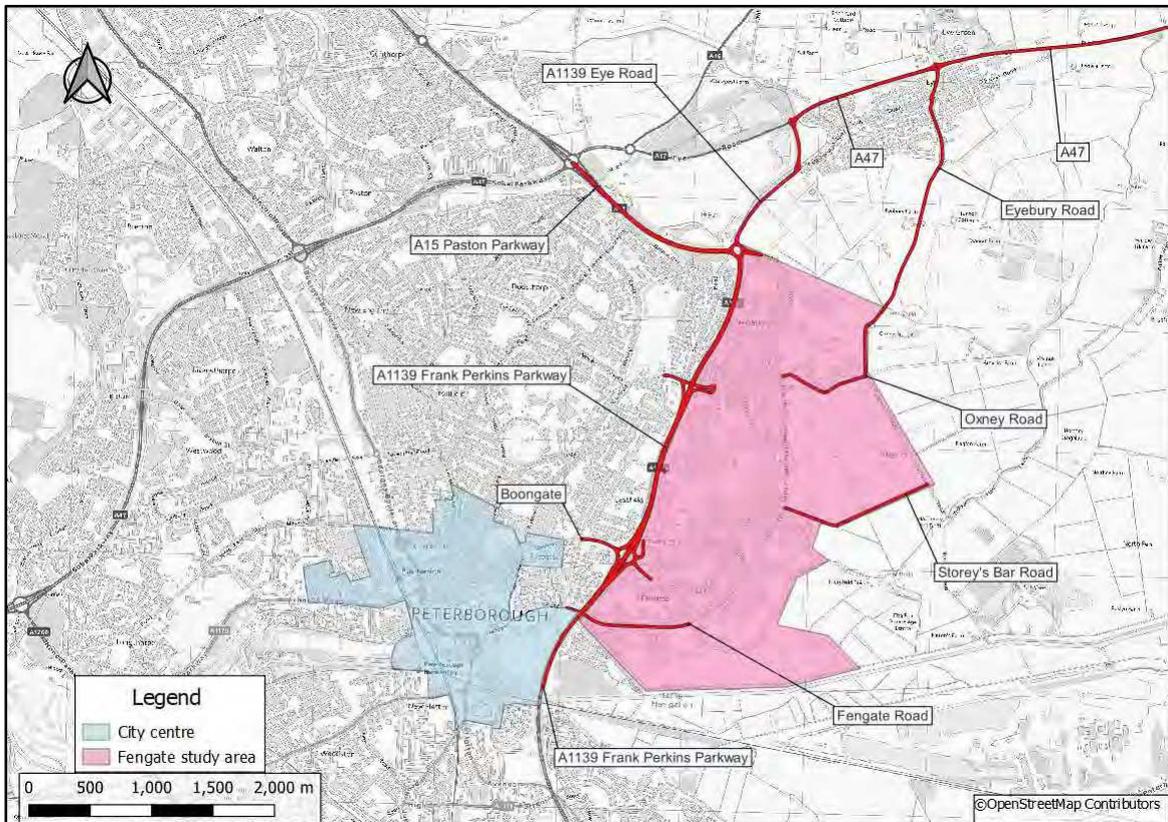


Figure 1.2: Location of Fengate within Peterborough

- 1.3.5 The main entry points to Fengate are via Junction 5 and Junction 8 of the A1139 Frank Perkins Parkway. At peak times these junctions are particularly busy. Alternative routes to access Fengate include Bishops Road, Eastfield Road, Oxney Road and Storey's Bar Road. Although these routes are less congested than Junctions 5 and 8, they still become very busy and experience peak hour delay.
- 1.3.6 Improvements for Junction 5 of the A1139 and Fengate (road) are being developed and delivered through the CPCA funded University Access Study, for which an Outline Business Case is due in Autumn 2023.
- 1.3.7 There are also crucial junctions within Fengate that experience peak hour congestion and are forecast to go over capacity with future year growth, including the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road junction and the Oxney Road / Edgerley Drain Road junction.
- 1.3.8 Beyond existing and forecast highway capacity issues, pedestrian and cyclist connectivity throughout Fengate requires improvement to ensure that the planned growth can be sustainable.

Growth and Development

- 1.3.9 The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities, and objectives for Peterborough up to 2036. The updated strategy identifies the required delivery of 21,315 new homes and 17,600 new jobs between 2016 and 2036³.
- 1.3.10 Within the Local Plan Fengate is identified as an area of employment growth for the City, with proposed growth ranging between 18ha and 48ha of employment land. This is expected to generate over 3,000 jobs in the area. Investment (beyond developer contributions) is needed into the transport network to support these development aspirations.
- 1.3.11 The Fengate area is an important employment area for Peterborough, with many small and medium sized businesses located there, alongside large employers like Perkins Engines. The Local Plan seeks to build upon the existing industry in the area and has several allocations within the area for employment development.
- 1.3.12 Figure 1.3 shows a plan of the allocated sites within Fengate, the largest employment allocation being the Red Brick Farm site which covers 126,600 square metres.

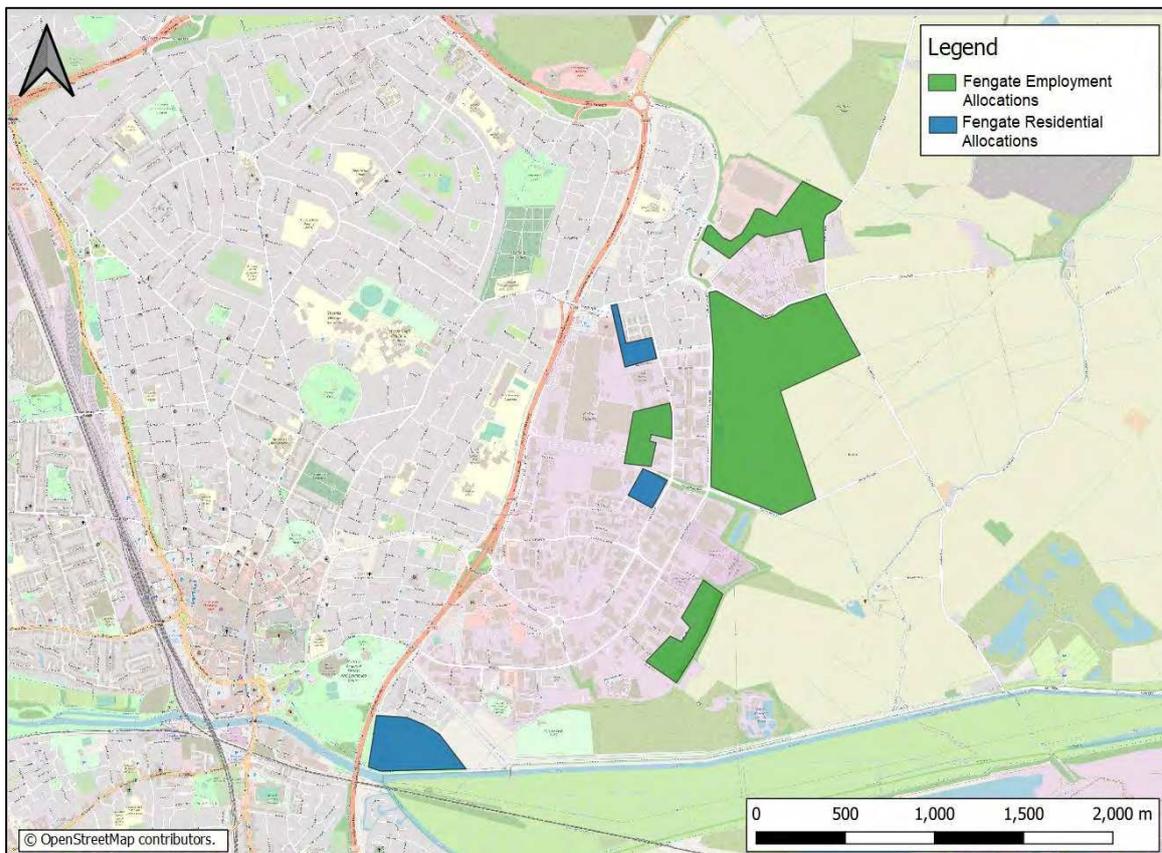


Figure 1.3: Allocated Sites for Fengate within Peterborough's Local Plan

³ Peterborough Local Plan, 24th July 2019



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

- 1.3.13 The current proposed land use, under reference 18/00080/OUT, consists of 72,678m² of B8 (Storage and Distribution), 47,088m² of B2 (General Industry), and 6,835m² of B1c/B2 (Office Space).
- 1.3.14 Another notable nearby development within the study area is the Peterborough Renewable Energy Limited (PREL) which received planning permission in October 2018.
- 1.3.15 PREL will convert biomass slurry waste into solid fuel. The site will also include a research and development visitor centre to host schools, universities, and other interested parties to educate on the process of turning waste in to fuel, rather than landfill.
- 1.3.16 As part of the planning permission, the following highway improvements are proposed:

⁴ Google Earth, 2022

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

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

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

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

1.4 Document Structure

1.4.1 The remainder of this document is structured as follows:

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

2. The Strategic Dimension

2.1 Introduction

- 2.1.1 This chapter sets out the Strategic Dimension for the Fengate Access Study Improvement Schemes and demonstrates why improvements are needed in this area and how they will fit with local, regional and national policy, and enable Peterborough to deliver its planned growth.
- 2.1.2 Fengate has been a key part of Peterborough's economy for many years, and thousands of residents are employed here across multiple sectors, such as engineering, manufacturing and retail. There is now further significant growth planned within Fengate, which will add further employment opportunities, and investment in the transport infrastructure is required to support this growth. Individual developments will identify and deliver schemes, or make financial contributions, to mitigate their own impact on the transport network, however a broader investment is required to address existing issues such as poor active travel connectivity and localised congestion, which are barriers to sustainable growth.

Growth and Development

- 2.1.3 Peterborough is forecast to experience significant employment and population growth over the next few decades, reflecting a continuation of past trends. The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities, and objectives for Peterborough for the period up to 2036. The updated strategy identified the required delivery of 19,440 new homes and 17,600 jobs.
- 2.1.4 Peterborough has a requirement for 76 hectares of employment land to be developed between 2015 and 2036. Three strategic employment allocation sites are identified within the Local Plan that cover a total of 136.53 hectares, of which Red Brick Farm (LP44.3 & LP45) in Fengate accounts for 30 hectares or 39% of the local requirement for new employment land.
- 2.1.5 Local Plan Policy LP45: Red Brick Farm states that planning permission will only be granted once appropriate and deliverable solutions are demonstrated for issues such as transport. Specifically, the impact of proposed development on the local and wider road network needs to be considered.
- 2.1.6 Local Plan Policy LP46: Employment Allocations also outlines a further three allocation sites for B1, B2, and B8 development within Fengate. Oxney Road Site C (LP46.1), Perkins South (LP46.2), and Land off Third Drove and Front Fengate (LP46.3) equate to a total area of 17.38 hectares. The delivery of these three employment sites, along with Red Brick Farm would account for about 62% of the local requirement for new employment land between 2015 and 2036.

2.2 Business Strategy

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

Department for Transport Single Departmental Plan

2.2.2 The Single Departmental Plan published in June 2019⁵ sets out the DfT's objectives and the plans for achieving them.

2.2.3 The objectives are:

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

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

Cambridgeshire and Peterborough Combined Authority

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

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

- 2.2.6 The focus of the CPCA is on strategic issues (such as housing, transport and infrastructure demand) which cross council borders and span the entire Cambridgeshire and Peterborough area. The Devolution Deal for Cambridgeshire and Peterborough runs for 30 years and sets out key ambitions for the CPCA as well as including a list of specific projects, which the CPCA and its member councils will support over that time.
- 2.2.7 To help achieve these ambitions and provide the requisite support, the CPCA Policy Framework (Figure 2.1 shown overleaf) has been developed to provide a clear pathway to delivering on the ambitious and transformational agenda for Cambridgeshire and Peterborough. The alignment of the Fengate Access Study Improvement Schemes to each of these components is discussed beyond the figure.

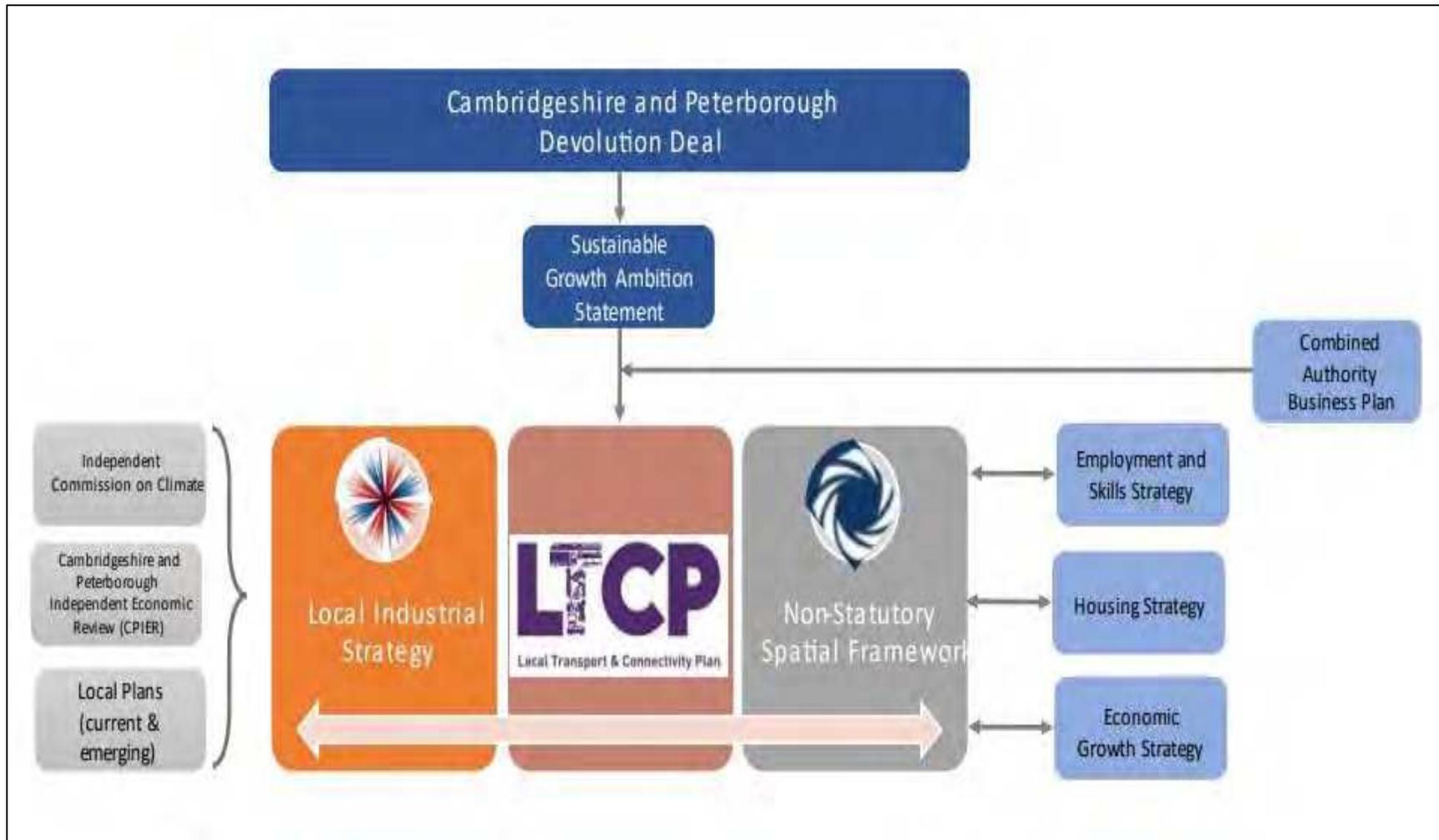


Figure 2.1: CPCA Policy Framework

Cambridgeshire and Peterborough Sustainable Growth Ambition Statement

- 2.2.8 The CPCA Mayor's Growth Ambition Statement sets out the regions priorities for achieving ambitious levels of inclusive growth and meeting the commitments of the Devolution Deal. The Statement's six themes⁶ for achieving regional growth focus on:
- People
 - Climate and Nature
 - Infrastructure
 - Innovation
 - Reducing inequalities
 - Financial and systems.
- 2.2.9 The statement is underpinned by work undertaken by the Cambridgeshire and Peterborough Independent Economic Review (CPIER)⁷. The assessment makes a number of recommendations for the CPCA to take forward over the short, medium and long-term.
- 2.2.10 The success of Cambridgeshire and Peterborough as a project of national importance is highlighted in the CPIER. This is because the area contains some of the most important companies and institutions in the country, much of the country's high value agricultural land, and the cities and towns that continue to support both.
- 2.2.11 The CPIER identifies Peterborough as a City with a dynamic business environment, built on its history of industry including brickmaking and manufacturing. It is an attractive place for business due to its position on the A1 and East Coast Main Line, as well as for aspirational workers who want easy access to London, the Midlands and the North. The significance of Peterborough as a growing employment hub is demonstrated by the decision to relocate 1,000 civil servants from the Passport Office and Department for Environment, Food and Rural Affairs (DEFRA) to newly built offices in Fletton Quays in late 2022⁸.
- 2.2.12 The Fengate Access Study Improvements Schemes will help to achieve the ambition set out within the CPIER for 'Peterborough to become a leading place to live, learn and work' by 2030. The package of schemes will remove congestions hotspots which currently impact on Fengate's ability to accommodate further growth and provide improved active travel connections that will help to reduce inequalities associated with travel to work whilst supporting the climate and nature by encouraging travel by sustainable modes, and through the delivery of biodiversity net Enhancement designed into the package of schemes.

⁶ <https://cambridgeshirepeterboroughcagov.cmis.uk.com>.

⁷ <https://www.cpier.org.uk>.

⁸ <https://www.gov.uk/government/news/work-begins-on-a-major-new-government-hub-in-peterborough>

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

Cambridgeshire and Peterborough Independent Commission on Climate

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

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

2.2.16 Recommendations featured within the October 2021 report⁹ specifically relating to transport and most relevant to major schemes funded by the CPCA include:

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

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

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

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

Local Industrial Strategy

- 2.2.19 The Local Industrial Strategy¹⁰ sets out the economic strategy for Cambridgeshire and Peterborough, taking a lead role in implementing the business growth, productivity and skills, all elements of the Growth Ambitions Statement.
- 2.2.20 In response to the findings of the CPIER, the Local Industrial Strategy focuses on the three sub-economies of:
- Greater Cambridge
 - Greater Peterborough
 - The Fens.
- 2.2.21 The CPCA Assurance Framework¹¹ states that investments will only be made if they can demonstrate that they will support the delivery of the Growth Ambitions Statement and the Local Industrial Strategies, as well as the more detailed place and sector strategies.
- 2.2.22 This has a direct implication for the Fengate Access Study, with a need to ensure it supports the CPCA growth ambitions and aligns with the Local Industrial Strategy. As stated above Peterborough is identified as one of the three sub-economies and providing an efficient and reliable local transport network within the City is crucial to ensuring the continued success of the local economy in line with the CPCA Growth Ambition Statement. The Fengate Access Study will provide improvements that will directly benefit growth in the Fengate area by improving active travel accessibility and unlocking localised congestion, providing a platform for future growth including that identified at Red Brick Farm.

Local Transport Plan

- 2.2.23 In January 2020, the CPCA adopted a Local Transport Plan for Cambridgeshire and Peterborough¹² and it replaces the interim Local Transport Plan published in 2017. The plan describes how transport interventions can be used to address current and future challenges and opportunities for Cambridgeshire and Peterborough and sets out the policies and strategies needed to secure growth and ensure that planned large-scale development can take place in the county in a sustainable way.

¹⁰

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

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

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

- 2.2.24 The Local Transport Plan is split in to two main parts: The 'Local Transport Plan' which sets out the vision, goals and objectives and the policies designed to deliver the objectives, and the 'Transport Delivery Plan' (2019 to 2035) which explains how the Local Transport Plan strategy will be delivered. It details programmes for delivery of improvements to the transport network and for its day-to-day management and maintenance.
- 2.2.25 The development of the Local Transport Plan was undertaken concurrently with the CPIER and the Growth Ambition Statement which enabled the challenges and opportunities detailed in these documents to be reflected within the Local Transport Plan. The Local Transport Plan completes the suite of documents which articulates the Combined Authority's response to the CPIER.
- 2.2.26 The vision for the Local Transport Plan is:
- 'To deliver a world-class transport network for Cambridgeshire and Peterborough that supports sustainable growth and opportunity for all'.*
- 2.2.27 The goals of the Local Transport Plan outline the wider outcomes the transport network in Cambridgeshire and Peterborough will aim to achieve. They are:
- **Economy** – Deliver economic growth and opportunity for all communities
 - **Society** – Provide accessible transport system so everyone can thrive and be healthy
 - **Environment** – Protect and enhance our environment and tackle climate change.
- 2.2.28 The objectives of the Local Transport Plan underpin the delivery of the goals for an improvement within the Fengate Access Study area, and form the basis against which scheme, initiatives and policies will be assessed. The initial scheme objectives for The Fengate Access Study were devised at the beginning of the study and pre-date the objectives of the Local Transport Plan.
- 2.2.29 Since the introduction of the CPCA's Local Transport Plan, these initial scheme objectives have been refined to ensure they meet those objectives both locally (for Peterborough) and regionally (for the CPCA). The scheme objectives for Fengate Access Study are set out later in this chapter, however the package of schemes strongly align to the Local Transport Plan's Economy, Society and Environment goals.

2.2.30 The objectives of the CPCA Local Transport Plan are:

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

2.2.31 The Fengate area is identified within the Local Transport Plan as a corridor in need of improvement to relieve congestion and support growth¹³.

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

Emerging CPCA Local Transport and Connectivity Plan (LTCP)

- 2.2.32 The CPCA has drafted a new LTCP which sets out the transport strategy to meet the new challenges and opportunities faced within the region. The LTCP is expected to be finalised in late 2022 and will supersede the current Local Transport Plan (described above) which was adopted in January 2020.
- 2.2.33 The new LTCP for the region follows the election of a new Mayor (May 2021), and reflects updated priorities for the combined authority, acknowledging the shifting demands on transport (at a national and local scale) following the COVID-19 pandemic, better aligning with recent national strategies for decarbonising transport set forward by government, and reflecting climate change aspirations put forward by the Cambridgeshire and Peterborough Independent Panel of Climate Change.
- 2.2.34 The vision, aims and objectives set forward within the draft LTCP focus on areas of; improved public health, accelerated carbon reduction, protection of the environment, reduced inequalities, and making growth in housing, employment, and the economy more sustainable by investing in better transport infrastructure. Future transport projects for the Cambridgeshire and Peterborough region will be guided by the LTCP.
- 2.2.35 Consultation was undertaken on the draft LTCP between May and August multiple platforms. Feedback from the consultation has been received and will be incorporated into the final version of the LTCP, which will be subject to approval by the CPCA Board in 2023.

Mayoral Ambition

- 2.2.36 The CPCA Mayoral Election on the 6th of May 2021 resulted in a new Labour Mayor (Dr Nik Johnson) being elected, replacing the incumbent Conservative Mayor who had held office since 2017.
- 2.2.37 The new Mayor vision is that future policies and actions will be driven by inclusivity and the '3 C's' of Compassion, Co-operation, and Community, and have a stronger 'greenprint' running through strategy aiding the acceleration in carbon reduction by 2050¹⁴.
- 2.2.38 In July 2021, the Combined Authority Board agreed to produce an updated Local Transport Plan. In September 2021, it was announced that the Local Transport Plan would become the Local Transport and Connectivity Plan (LTCP), to reflect the growing dependence on digital infrastructure. The LTCP will be finalised in Spring 2023.
- 2.2.39 Despite the Fengate Access Study being developed before the new Mayors visions and publication of the LTCP, the scheme does provide strong connections to the 3'Cs:

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

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

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

2.2.40 The Council adopted the Local Transport Note 1/20: Cycle Infrastructure Design (LTN 1/20) guidance in October 2020. The guidance sets out five core principles¹⁵ for which new cycle infrastructure implemented by local authorities should comply to secure funding from government. Core principles set out within the guidance include routes that are:

- Coherent
- Direct
- Safe
- Comfortable
- Attractive.

2.2.41 The above LTN 1/20 core principles are embedded within the wider DfT Gear Change Policy, adopted in 2020¹⁶, which sets out the vision to transform our future transport systems to a point where active travel becomes the 'natural first choice' for journeys by 2030, and is prioritised within policy and local transport schemes.

¹⁵ [Cycle Infrastructure Design \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

¹⁶ [Gear change: a bold vision for cycling and walking \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

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

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

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

2.3 Fit within the Wider Policy Context

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

Table 2.1: Wider Policy Context and Impact of the Schemes

Policy Framework	Policy Function	Objectives	Fengate Access Study Policy Fit
Department for Transport Single Departmental Plan	Sets out the DfT's objectives and the plans for achieving them	<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 within the Fengate Area 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.
Cambridgeshire and Peterborough Combined Authority Local Transport Plan	Describes how transport interventions can be used to address current and future challenges and opportunities. Sets out policies and strategies needed to secure growth and ensure planned large-scale development can take place in the county in a sustainable way. The Local Transport Plan completes the suite of documents which articulates the Combined Authority's response to the CPIER	<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 into all planning and transport operations to achieve Vision Zero (zero fatalities or serious injuries) Accessibility – promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all Health and Well-being – provide 'healthy streets' and high-quality public realm that puts people first and promotes active lifestyles Air quality – ensure transport initiatives improve air quality across the region to exceed good practice standards Environment – deliver a transport network that protects and enhances our natural, historic and built environments Climate Change – reduce emissions to as close to zero as possible to minimise the impact of transport and travel on climate change. 	<p>Improvements within the Fengate Area 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 Improve the sustainable transport provisions within this section of the network Protect and enhance the environment
Peterborough City Council Strategic Priorities	The Council's priorities to help meet its vision to 'create a bigger and better Peterborough that grows the right way, and through truly sustainable growth	<ul style="list-style-type: none"> Drive growth, regeneration and economic development Improve educational attainment and skills Safeguard vulnerable children and adults Implement the Environmental Capital Agenda Support Peterborough's culture and leisure trust Vivacity Keep all our communities safe, cohesive and healthy Achieve the best health and wellbeing for the city 	<p>Improvements within the Fengate Area 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.
Peterborough City Council Local Plan	Updates the 2011 Core Strategy and looks to deliver 20,112 homes and 17,600 jobs by 2036		

Fit Within Wider Environmental Policy

- 2.3.2 Alongside the overarching policies outlined in Table 2.1, local policy has strong emphasis on integrating environmental improvements into the development of new infrastructure at an early stage to minimise disruption on the environment during scheme design, construction, and ongoing operation.
- 2.3.3 Table 2.2 below outlines the policy context in relation to the environment, documenting policy objectives and how the proposed scheme will support and facilitate each objective. Environmental considerations within the scheme will be explored further within the latter stages of this chapter.

Table 2.2: Policy Context in Relation to Environment

Policy Framework	Policy Description / Function	Objectives	Fengate Access Study Policy Fit
Cambridgeshire and Peterborough Combined Authority Local Transport Plan	Objective 9: Deliver a transport network that protects and enhances our natural, historic and built environment. Ensuring scheme improve rather than damage the environment based on DEFRA, Environment Agency and Natural England guidance.	<ul style="list-style-type: none"> Protection and enhancement of the natural environment Improving sustainable access to the natural environment Delivering green infrastructure 	<p>Improvements within the Fengate Area will:</p> <ul style="list-style-type: none"> Support Green infrastructure by creating more cycle ways. Protect the environment reducing vehicle usage and travel time.
Peterborough City Council Local Plan	Policy LP29: Any development should be prepared based on the overriding principle that; the existing tree and woodland cover is maintained, improved and expanded; and opportunities for expanding woodland are actively considered, and implemented where practical and appropriate to do so.	<ul style="list-style-type: none"> Where the proposal will result in the loss of tree or woodland the Council will expect the retainment of trees that make a significant contribution to the landscape or biodiversity value of the area, provided this can be done without compromising the achievement of good design for the site. Where it is appropriate for higher value tree(s) (category A or B trees) and/or woodland to be lost, then appropriate mitigation via compensatory tree planting will be required. Such planting should meet the five Tree Planting Principles Where appropriate and practical, opportunities for new tree planting should be explored as part of all development (in addition to any necessary compensatory tree provision). 	<p>Improvements within the Fengate Area will:</p> <ul style="list-style-type: none"> Mitigate the loss of bio-diversity value of the area. Replace any loss of tree and woodland to other sites in the city
Peterborough City Council – Trees and Woodland Strategy (2018)	The strategy sets out the benefits provided by trees and woodlands, how the Council aim to maintain, improve and expand tree cover, as well as the wider management of the City's tree stock in regards to development.	<ul style="list-style-type: none"> To maintain and enhance the tree population of the city To increase the tree canopy cover across the city with particular reference to areas with low canopy cover. To maintain and maximise the ecosystem services provided by the Council's trees. To promote biodiversity and conserve tree and woodland ecosystems. To conserve and protect ancient woodland and ancient trees with significant ecological, historical and amenity value. To work with partners to expand the woodland cover through sustainable external funding. 	<p>Improvements within the Fengate Area will:</p> <ul style="list-style-type: none"> Mitigate the loss of bio-diversity value of the area. Replace any loss of tree and woodland to other sites in the city
DfT proposed Environment Bill (Nature and Conservation Covenants) 2020	The Environment Bill will use a localised action approach to help contribute to the recovery of our natural environment, improving biodiversity and protecting urban street trees.	<ul style="list-style-type: none"> 10% biodiversity net enhancement requirement on new development / schemes A strengthened biodiversity duty on public authorities Local Nature Recovery Strategies (LNRSs) Species Conservation Strategies and Protected Sites Strategies Targeted measures to protect existing trees 	<p>Improvements within the Fengate Area will:</p> <ul style="list-style-type: none"> Mitigate the loss of bio-diversity value of the area. Replace any loss of tree and woodland to other sites in the city
CPCA / PCC endorsed Natural Cambridgeshire Doubling Nature Vision	By doubling the area of rich wildlife habitats and natural green-space, Cambridgeshire and Peterborough will become a world-class environment where nature and people thrive, and businesses prosper.	<ul style="list-style-type: none"> Access to green space for communities Air Quality, quality of life and public health Long term financial gains Ownership of the vision and growth agenda by local communities through an enhanced 'sense of place' Increasing tree cover and the network of woodlands, hedgerows, within and around our towns and cities Expanding the flower-rich grasslands on the limestone plateau west of Peterborough Ensuring that at least 90% of our richest wildlife areas are in good ecological condition. 	<p>Improvements within the Fengate Area will:</p> <ul style="list-style-type: none"> Improve Air Quality index, public health and quality of life by improving sustainable modes of travel. Create long term financial gains with accident benefits and infrastructure growth. Replace any loss of tree and woodland to other sites in the city.

2.4 The Need for Change

- 2.4.1 This section discusses the need for change which sets the requirement for the Fengate Access Study Improvement Schemes.
- 2.4.2 There is a very clear and compelling case for change within Fengate. The Local Plan allocates a significant proportion of employment growth within the Fengate area. The Red Brick Farm site is the largest of these growth allocations and is currently progressing through the planning process with the intention of developing the site in 2023. The timing of this development, and the employment that it will create, will provide Peterborough with crucial economic resilience in the wake of the COVID-19 Pandemic, and the subsequent impact that is being felt on the economy.
- 2.4.3 Evidence of existing and future conditions demonstrates that there are significant issues that need to be overcome to enable broader growth to be realised within the area, particularly the poor active travel connections and localised congestion.
- 2.4.4 It should be noted that the impact of specific developments on the network, such as Red Brick Farm, will be assessed and mitigation provided by the developer. The problems identified beneath, and which underpin the need for transport investment in Fengate, relate to existing conditions and general area wide growth. It is expected the package of schemes identified within the Fengate Access Study will be complimented by developer delivered schemes as future growth occurs throughout the area.

Problems Identified

- 2.4.5 The following problems have been identified within the Study area. The Fengate Access Study Improvement Schemes will address these challenges:
- Congestion and Delay
 - Accident Rates
 - Poor Active Travel Infrastructure
 - Asset Condition (Junction 7)
- 2.4.6 If not resolved, these issues will compromise the City's growth aspirations, as well as The Council's objectives to remain a pleasant place to live and work.

Existing Congestion and Delay

Area Wide

- 2.4.7 High levels of congestion and delay are experienced across the study area in both the AM and PM peak hours. Note that these issues were identified before the COVID-19 pandemic but have been reverified in 2022, following the lifting of all restrictions. Further information on the impact of COVID-19 on Peterborough's traffic levels can be found in section 2.12 'Key Risks'.
- 2.4.8 Figures 2.2 and 2.3 overleaf show the typical traffic conditions across the study area on an average weekday according to Google traffic, for the AM and PM peaks respectively.

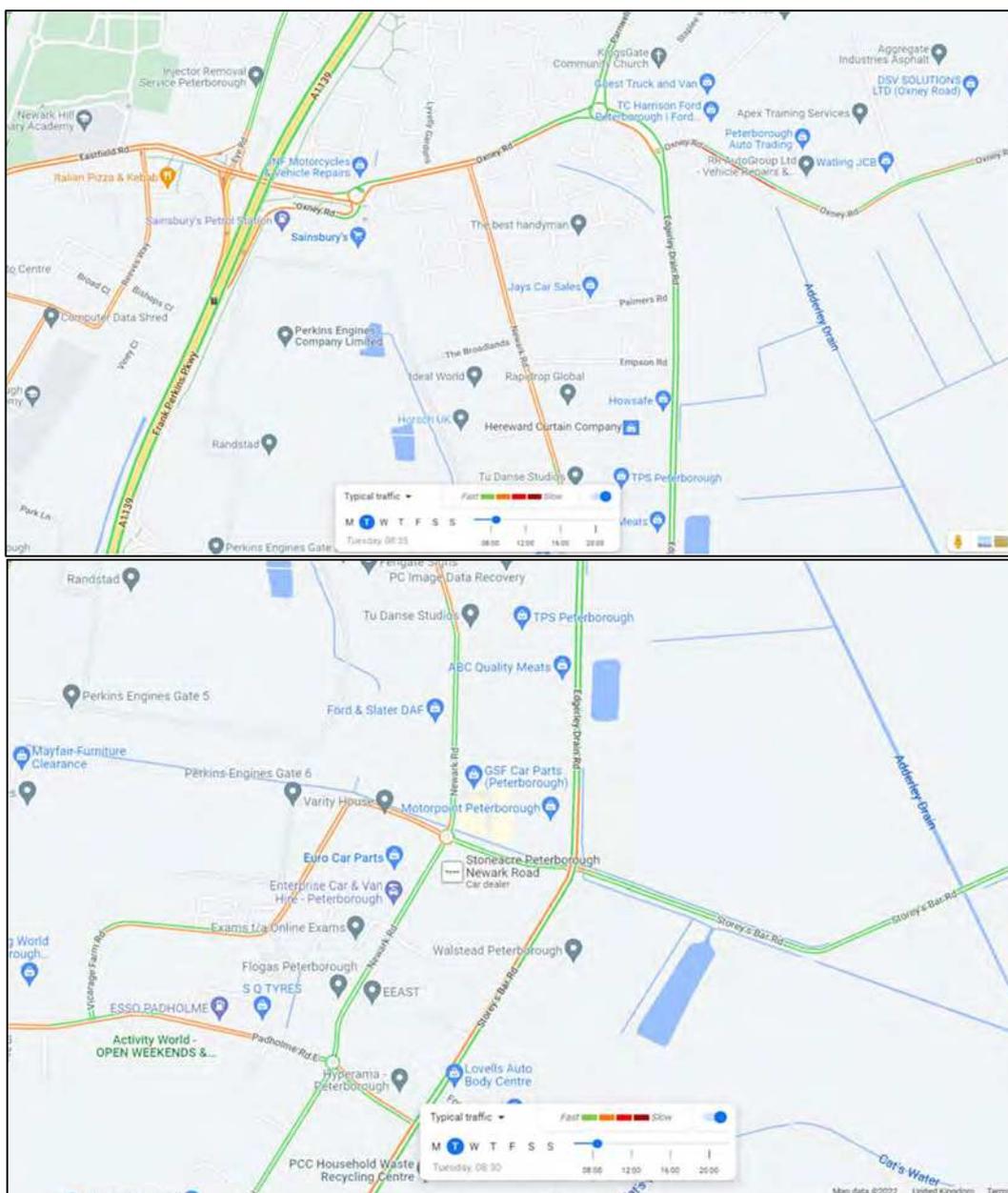


Figure 2.2: AM Peak Hour Congestion within Fengate (Google Average Tuesday Traffic)

- 2.4.9 Delay within Fengate is particularly common along Storey's Bar Road during the AM peak hour, particularly when travelling northbound towards Edgerley Drain Road, which is a consequence of the signalised junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road. The delay on Storey's Bar Road from the signalised junction can extend back 0.7 miles impacting the operation of the Fengate / Boongate Junction.
- 2.4.10 The Newark Road northbound approach to Oxney road also shows a large amount of delay, indicating queues of around 600 metres. The Eastfield Road approach to Junction 7 also suffers from delays, which often extend back 800m to the Peterborough Regional College (University Centre) site. Junction 7 generally experiences delay on all arms.
- 2.4.11 Figure 2.3 below shows the typical traffic conditions across the area on an average weekday halfway through the PM peak hour.

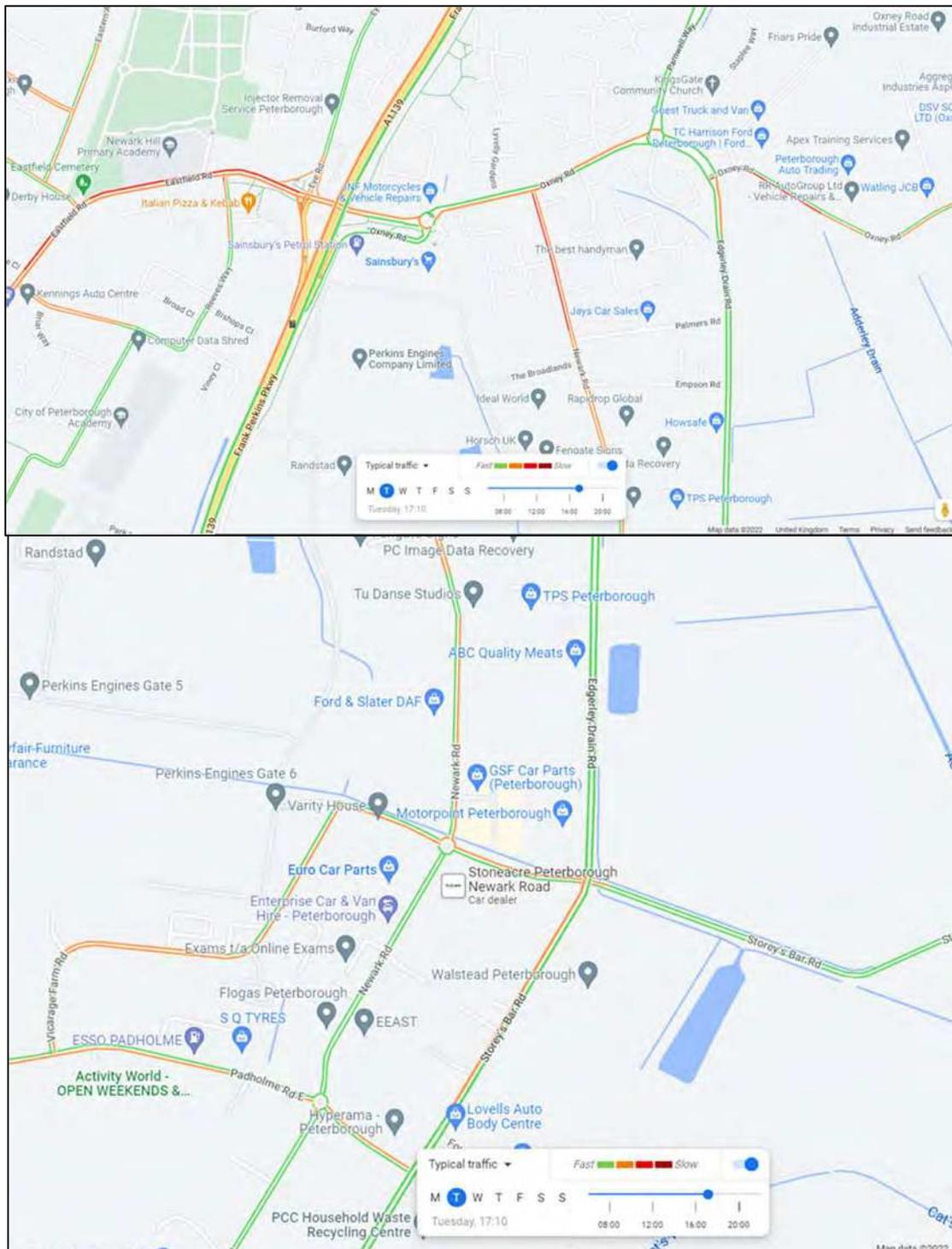


Figure 2.3: PM Peak Hour Congestion within Fengate, January 2022 (Google Live Traffic)

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

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

- 2.4.13 Satellite Navigation data has been used to assess journey times and delay at the key junctions within the study area. The data provided is for the period from the 15th of November 2017 to 13th December 2017. The dataset was selected to avoid major roadworks scheduled for 2018 / 2019 that would have influenced the journey times, and the impact of the COVID-19 Pandemic from Spring 2020 to Spring 2022.
- 2.4.14 Figure 2.4 displays the journey times for vehicles on the approaches to Edgerley Drain Road / Storey’s Bar Road / Vicarage Farm Road Junctions, for the following time periods:
- Free Flow (FF) (00:00 – 05:00)
 - AM peak hour (08:00-09:00)
 - PM peak hour (17:00 – 18:00).

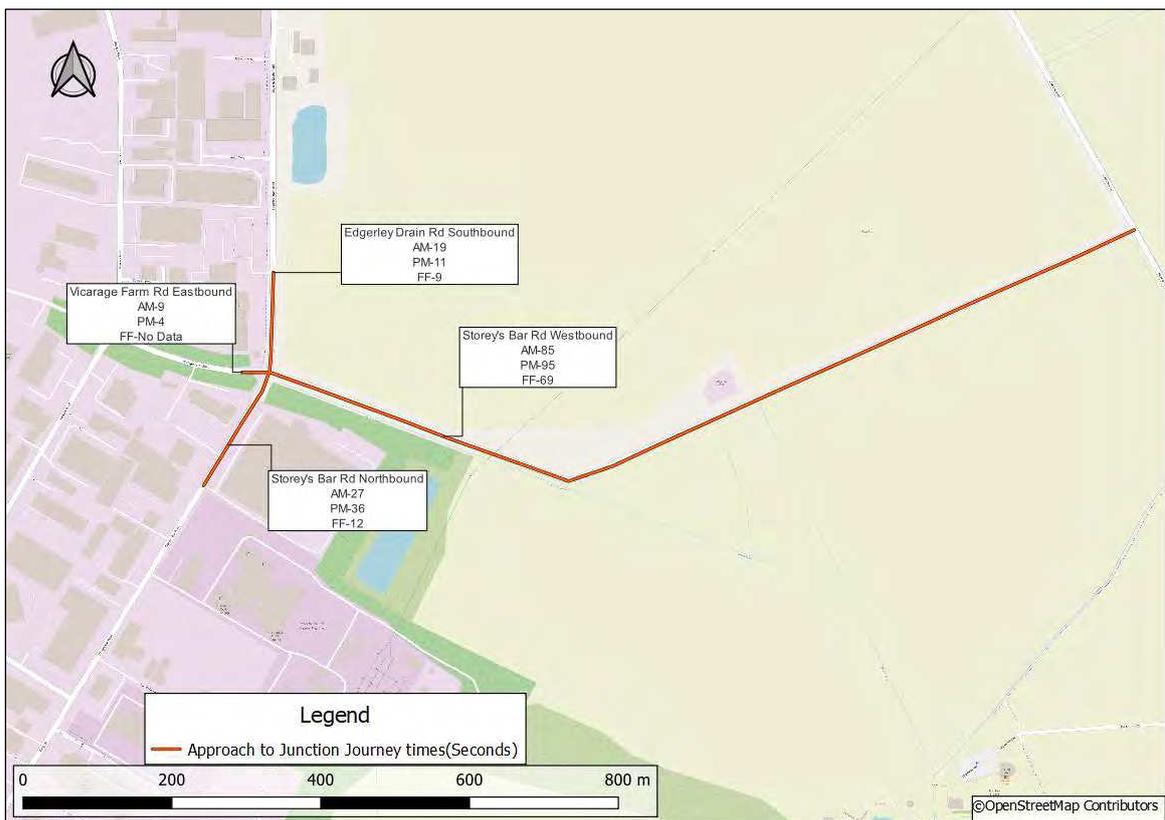


Figure 2.4: Journey Times for Edgerley Drain Road / Storey’s Bar Road / Vicarage Road Junction

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

Junction Specific – Junction 7

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

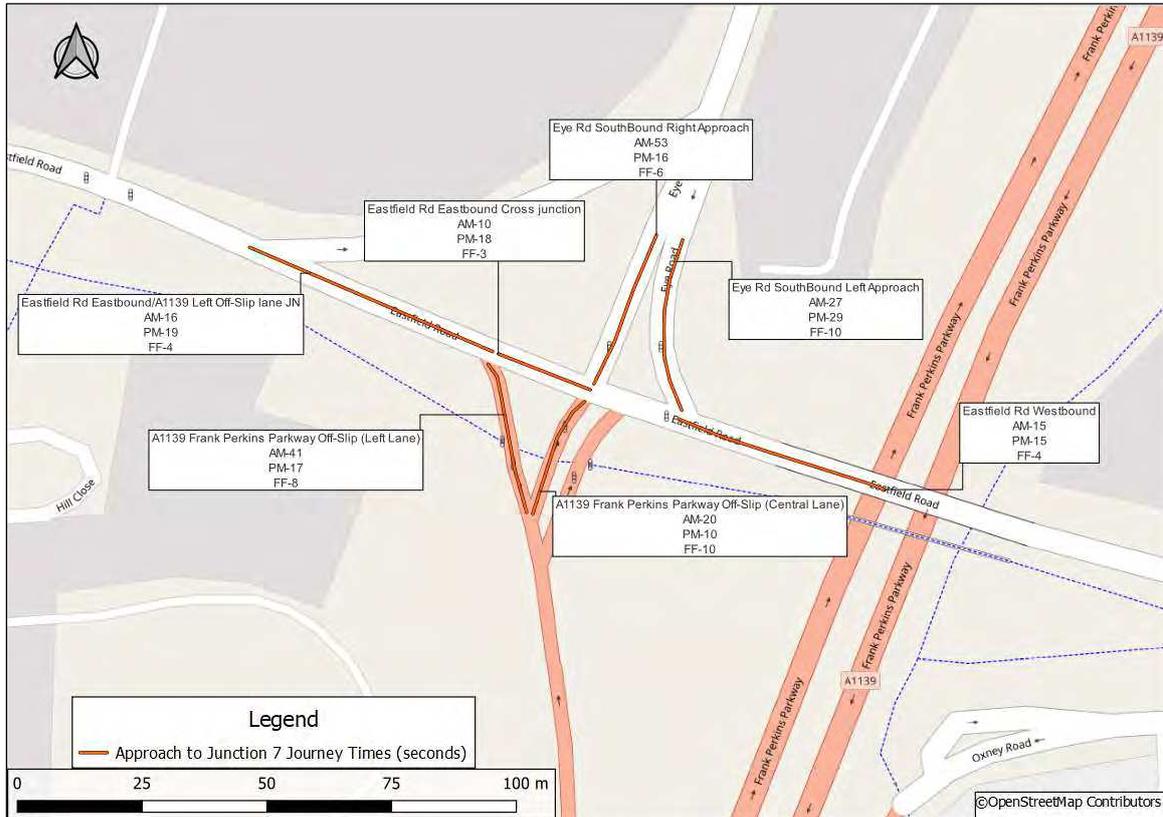


Figure 2.5: Journey Time Data for Junction 7

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

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

Accident Rates

- 2.4.19 Personal Injury Accident (PIA) data was also collected for the purposes of COBALT assessment, for a 5-year period covering 2015 to 2019.
- 2.4.20 Figure 2.6 below shows a map of accidents in the Fengate study area, coloured by severity.



Figure 2.6: Personal Injury Accidents by Severity

- 2.4.21 Figure 2.6 shows 33 total accidents, comprised of 0 “Fatal”, 9 “Serious”, and 24 “Slight”. Seven of these occurred at the Edgerley Drain Road / Storey’s Bar Road / Vicarage Farm Road Junction, and 6 on Newark Road. Of the 33 accidents, there were 40 casualties, including 2 pedestrians, 11 cyclists, 3 powered two wheelers, 5 OAPs and 1 child.
- 2.4.22 In all, 73% of the total accidents were classified as slight while the remaining 27% were serious. It is also worth noting that 44.4% of the serious accidents occurred at night the junction was lit by streetlights, suggesting opportunities to improve street lighting as part of scheme designs at these locations.

Poor Active Travel Infrastructure

- 2.4.23 The existing Active Travel infrastructure in Fengate area is either poor in both quality and quantity, or completely non-existent. This harms the area's connectivity and discourages the uptake of active travel journeys, compromising the potential for sustainable development in this area.
- 2.4.24 Figure 2.7 below shows the relative density of existing cycleway provision in the Fengate area. Higher levels of provision are represented by the darker coloured cells.

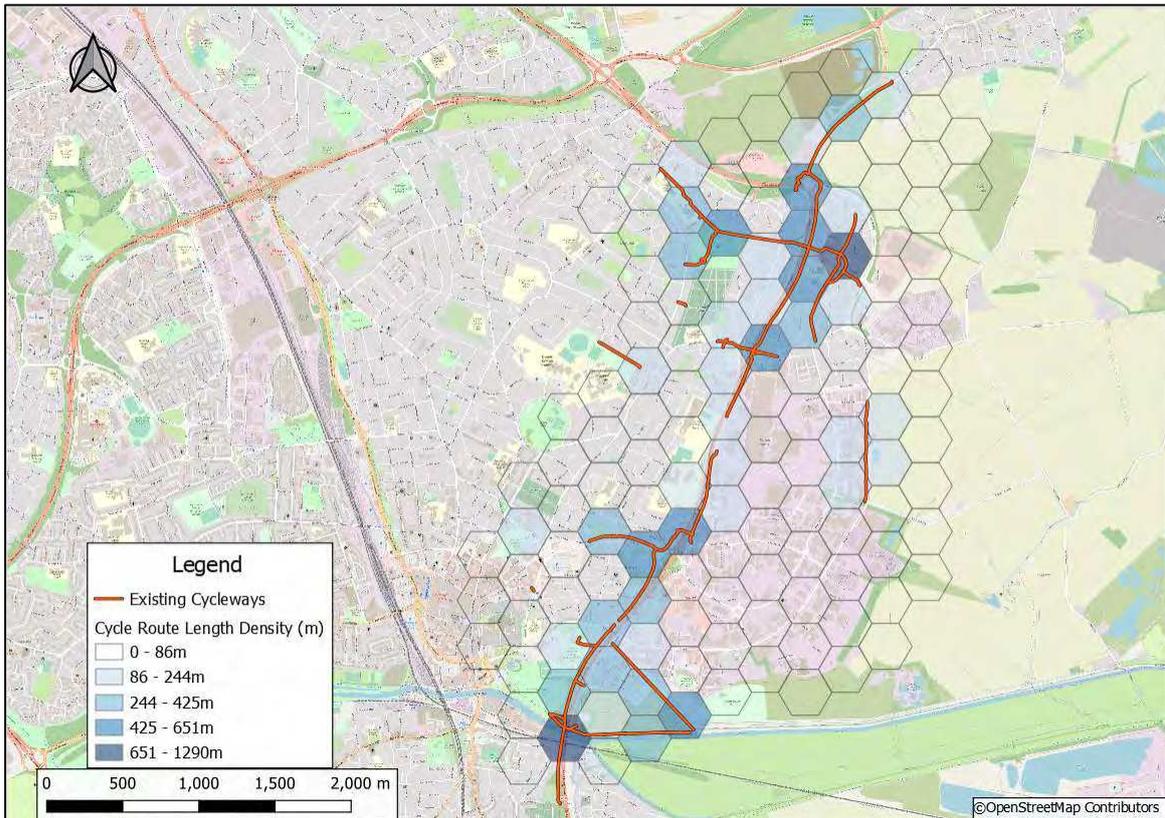


Figure 2.7: Existing Cycle Infrastructure In Fengate Study Area

- 2.4.25 Figure 2.7 shows that there is a clear lack of cycling infrastructure in the Fengate area, with a few scattered areas of connectivity that do not provide an acceptable level of sustainable access into the Fengate area.
- 2.4.26 In addition to the lack of cycling infrastructure in many parts of Fengate there are also areas with very poor existing provision. The current layout at Junction 7 includes segmented, cluttered, and confusing cycling provision which is not inviting to users. Figure 2.8 below shows the pedestrian and cycle areas crossing the A1139 Frank Perkins Parkway northbound approach to Junction 7, and Figure 2.9 shows the same crossing from Eastfield Road.



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



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

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

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

Asset Condition (Junction 7)

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

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

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

2.5 Impact of Not Changing

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

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

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

Worsening Congestion, Delay and Poor Journey Times

- 2.5.3 The Peterborough Transportation Model (PTM3) has been used to assess conditions within Fengate should the growth occur without any broader highway improvements (Do Minimum Scenario).
- 2.5.4 PTM3 was developed using SATURN (v11.4.07H), which is a suite of network analysis programs. SATURN allows the user to model baseline and future year traffic conditions, such as traffic volumes, capacities, and delays, at a strategic level and analyse the impact of potential road-investment schemes.
- 2.5.5 The model has been constructed to represent the morning (08:00 - 09:00), Inter (14:00 - 15:00) and evening (17:00 - 18:00) peak hours, to reflect the most congested time periods across Peterborough's network, and it models cars, LGVs, HGVs and buses. The base model was validated using traffic count and travel time data from 2019.
- 2.5.6 The PTM3 forecast models use the base model and applies traffic growth sourced from the Department for Transport's Trip End Model Presentation Program (TEMPro v7.2), National Road Traffic Forecasts (NRTF) and trip rates for local developments. Forecast growth has been calculated for 2026, 2031 and 2036 to align with the Local Plan.

Do Minimum Model Results

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

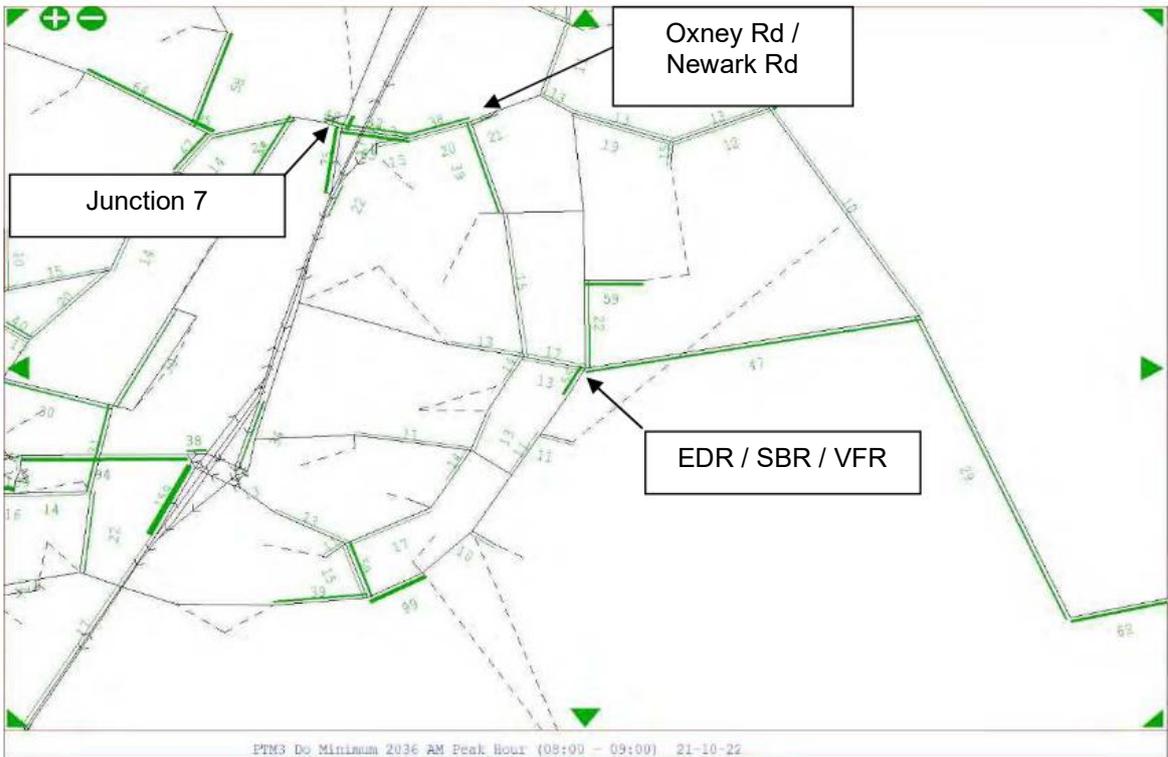


Figure 2.10: AM Peak Hour Delay, 2036 Do-Minimum Scenario (PTM3)

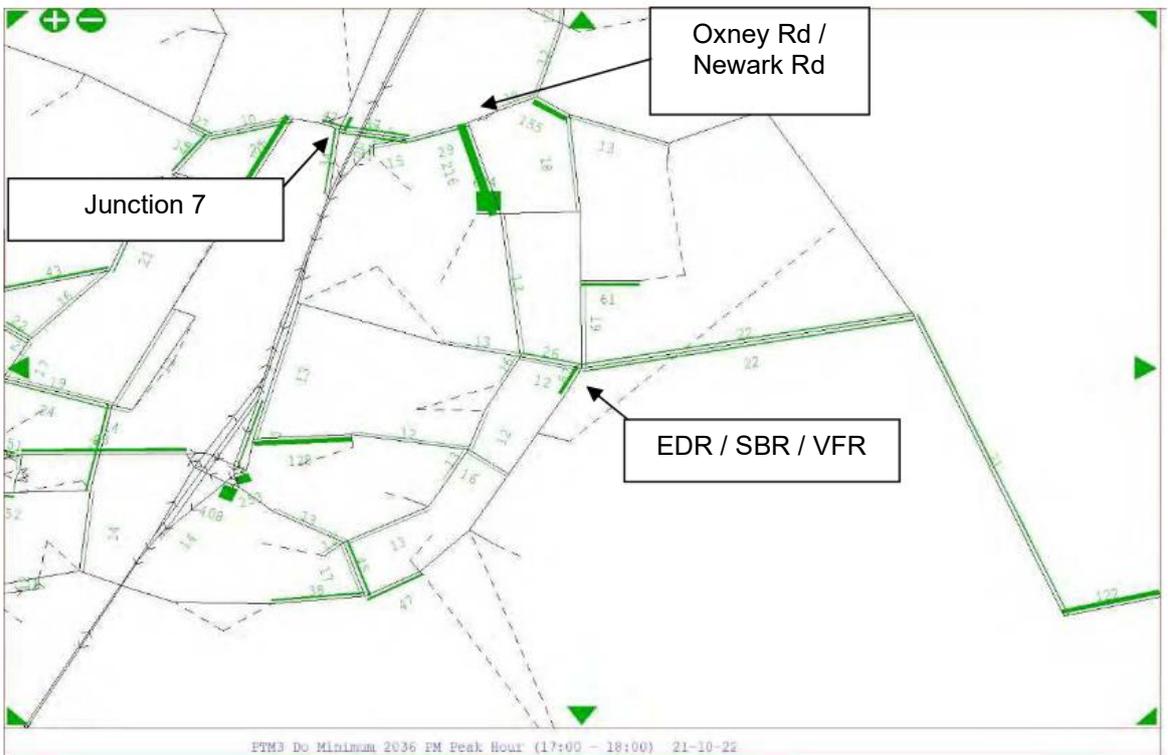


Figure 2.11: PM Peak Hour Delay, 2036 Do-Minimum Scenario (PTM3)

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

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

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

Accident Rates

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

Active Travel Provision

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

Asset Condition (Junction 7)

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

2.6 Internal Drivers for Change

- 2.6.1 Internal drivers for change are factors that are driving the need for change, and come from the scheme promoter, such as aspirations for growth, or to increase network resilience. In this instance the scheme promoters are the CPCA and Peterborough City Council.
- 2.6.2 The internal drivers for improvements to access Fengate come from local growth aspirations in an area that has some of Peterborough's highest deprivation levels, and from the structured framework of support provided by the CPCA to enable this growth to be realised.

Local Growth Aspirations

- 2.6.3 Peterborough is forecast to experience significant employment and population growth over the next few decades, reflecting a continuation of past trends. The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities, and objectives for Peterborough for the period up to 2036. The updated strategy identifies the required delivery of 19,440 new homes and 17,600 new jobs by 2036¹⁷. This level of growth will in turn further strengthen the City's economy, contribute to regional growth, and increase the demand for travel on the local network.
- 2.6.4 Peterborough strives to become a 'destination of choice', to be continually recognised as a regional centre and economic partner with Cambridge. With the attractiveness of the city set to increase as a place to live, work and travel, this in turn creates pressure in relation to housing and employment growth, which in turn increases the strain on the transport infrastructure. Improving the transport infrastructure to enable Peterborough's strong history of growth to continue is the main internal driver for improving access to the key employment area of Fengate.
- 2.6.5 Table 2.3 and Table 2.4 below show the breakdown of the allocated sites by location and the timescale in which they are expected to come forward. There are 488 dwellings proposed within Fengate, however 350 of these are proposed at Fengate South, which lays beyond the Fengate Access Study area.
- 2.6.6 The largest employment allocation is Red Brick Farm at 126,600 sqm, which is likely to be a mixture of B8 (Storage and Distribution) units and B2 (General Industry) unit with ancillary B1 office space. The remaining allocated land takes the form of smaller sites across Fengate which are likely to be B1 or B2 uses.

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

Table 2.3: Residential Development Proposed for Fengate

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

Table 2.4: Employment Development Proposed for Fengate

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

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

Index of Deprivation

- 2.6.8 Peterborough's population has grown considerably over recent years, with levels of growth being significantly higher than the national average and other counties within the region.
- 2.6.9 Despite high population growth, the socio-economic growth of the city has not grown at an equal rate, resulting in the city being reported as one of the 'most deprived' areas within the country and CPCA region¹⁸, in relation to income deprivation and income disparity¹⁹.
- 2.6.10 Figure 2.12 overleaf shows residential areas of the city by Index of Multiple Deprivation (2019)²⁰. Areas in dark red are amongst the top 10% most deprived in England and areas of dark green are amongst the 10% least deprived.

¹⁸ [Peterborough.pdf \(cambridgeshireinsight.org.uk\)](#)

¹⁹ Office of National Statistics, English indices of deprivation 2019

²⁰ [CDRC Mapmaker: Deprivation Indices \(IMD\) \(English 2019 IMD \(E19\)\)](#)

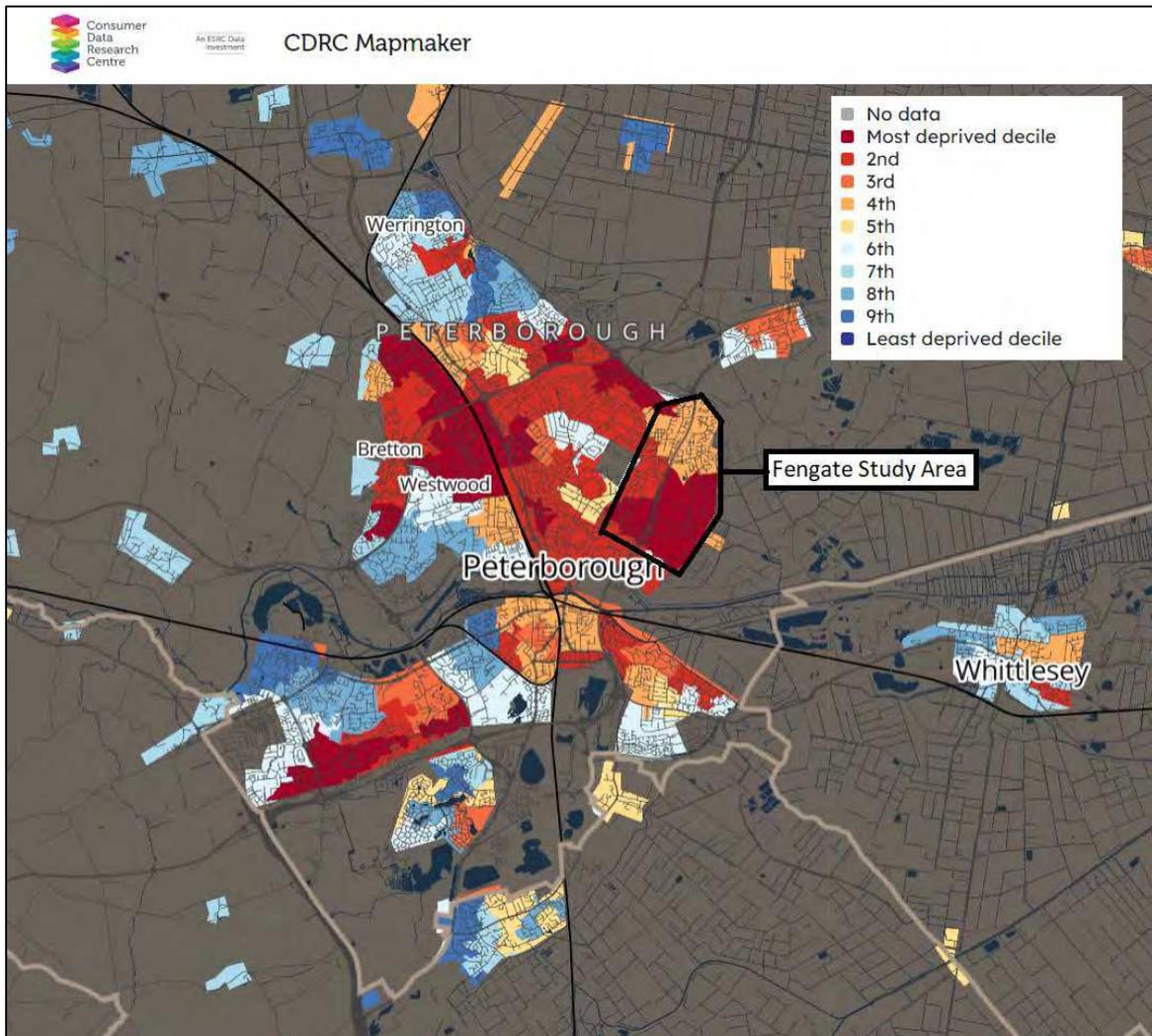


Figure 2.12: 2019 Index of Multiple Deprivation (Consumer Data Research Centre)

- 2.6.11 As highlighted in Figure 2.12, residential areas surrounding the City Centre rank amongst the top 40% of the most deprived in the country, whilst residential areas surrounding the study area are shown to vary from the top 10% - 30% most deprived within Peterborough.
- 2.6.12 The deprivation issues of Peterborough have been acknowledged by government with the city being categorised as a 'Priority One Area' within the context of the Levelling Up Agenda. This allocation demonstrates investment is required within the city to tackle economic differences and drive prosperity, enabling socio-economic opportunities to be realised. The £4.8 billion Levelling Up Fund will allow Peterborough and other Priority One areas to be prioritised for investment into local infrastructure, essentially 'levelling up' left behind regions of the UK.

Combined Authority Support

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

2.7 External Drivers for Change

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

2.8 Scheme Objectives

- 2.8.1 A transport scheme can have both primary and secondary objectives. The primary objectives are the fundamental outputs required from the scheme and therefore must be achieved. Secondary objectives are other outputs that may be achieved but are not necessary to the success of the scheme. Secondary objectives tend to be delivered because of the primary objectives, as a causal chain effect.
- 2.8.2 The objectives for the Fengate Access Study were originally developed ahead of the option development workshop to provide a framework for participants of the workshop, through which the relative benefits and disadvantages of the proposed options could be discussed. The objectives were based on the goals and outcomes from local policy documents at the time, such as the Peterborough Local Plan.
- 2.8.3 Although the original objectives pre-date those of the CPCA, work has been undertaken to ensure they align with the problems identified in Section 2.4 and the most recent CPCA, PCC and transport objectives. The primary and secondary objectives for the Fengate Access Study are listed beneath.

2.8.4 The primary objectives include:

1. **Tackle congestion and reduce delay:** Traffic signal improvements at key pinch points in Junction 7 of the A1139 Frank Perkins Parkway will tackle congestion and reduce delay.
2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** Help to bring about the planned employment growth at Red Brick Farm.
3. **Protect the local environment and improve biodiversity:** Environmental improvements will achieve 20% biodiversity net enhancement within one year in the study area.
4. **Improve Road Safety:** Reduce personal injury accidents and improve personal security amongst all users by making traffic signal improvements in Junction 7 and creation of mini roundabout at the junction of Oxney Road / Newark Road.
5. **Improve Active Travel Provision with Fengate:** Improve active travel provision by creating a new pedestrian crossing over Oxney Road and making improvements to Newark Road footpath.

2.8.5 Secondary objectives include:

6. **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes affected by the traffic and congestion by making traffic signal improvements at junction 7 and junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Road as well as creating a mini roundabout at the junction of Oxney Road/Newark Road.
7. **Reduce Severance for Active Travel Users:** Reduce severance caused to active travel users by the road network by creating a new pedestrian crossing between Junction 7 and Oxney road/Sainsburys roundabout and improvements to Newark Road Footpath
8. **Upgrade Junction 7:** Upgrade the junction by making traffic signal improvements to overcome maintenance and safety concerns.

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

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

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

Scheme Objective	CPCA Local Transport Plan Objectives
Tackle congestion and reduce delay	<ul style="list-style-type: none"> • Resilience – Build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability
Support Peterborough’s Growth Agenda and facilitate the development of the Red Brick Farm site	<ul style="list-style-type: none"> • Housing – Support new housing and development to accommodate a growing population and workforce, and address housing affordability issues • Employment – Connect all new and existing communities sustainably so all residents can easily access a good job within 30 minutes by public transport, spreading the region’s prosperity
Protect the local environment and improve biodiversity	<ul style="list-style-type: none"> • Environment – Deliver a transport network that protects and enhances our natural, historic and built environments
Improve Road Safety	<ul style="list-style-type: none"> • Safety – Embed a safe systems approach into all planning and transport operations to achieve a Vision Zero – zero fatalities or serious injuries
Improve Active Travel Provision within Fengate	<ul style="list-style-type: none"> • Health and Wellbeing – Provide ‘Healthy Streets’ and high-quality public realm that puts people first and promotes active lifestyles
Positively impact traffic conditions on the wider network	<ul style="list-style-type: none"> • Resilience – Build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability
Reduce Severance for Active Travel Users	<ul style="list-style-type: none"> • Health and Wellbeing – Provide ‘Healthy Streets’ and high-quality public realm that puts people first and promotes active lifestyles • Accessibility – Promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all
Upgrade Junction 7	<ul style="list-style-type: none"> • Resilience – Build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability

SMART Objectives

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

2.8.9 The Primary SMART objectives are:

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

2.8.10 Secondary SMART objectives include:

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

2.9 Measures of Success

2.9.1 Table 2.5 beneath sets out the measures for success which the scheme should be monitored against. The primary objectives are shown in white, and the secondary objectives are highlighted in green. These measures have been incorporated into the Benefits Realisation Plan which is discussed within the Management Dimension (Chapter 6).

Table 2.6: Measures of Success

Objective	Scheme Outcome	Measure of Assessment
Tackle congestion and reduce delay	<ul style="list-style-type: none"> Reduce delay and journey times at key pinch points within Fengate and access into the area 	<ul style="list-style-type: none"> Traffic surveys to be conducted at major junctions within the study area Comparison of existing and future journey times for key routes within the study area
Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site	<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 	<ul style="list-style-type: none"> Preferred scheme to be assessed against future traffic growth Monitor quantum of development at Red Brick Farm against agreed development profile.
Protect the local environment and improve biodiversity	<ul style="list-style-type: none"> Ensure a 20% biodiversity net enhancement within the study area 	<ul style="list-style-type: none"> Post scheme review of biodiversity gain compared to pre-scheme situation
Improve Road Safety	<ul style="list-style-type: none"> Improve personal security and reduce personal injury accidents amongst all travellers. 	<ul style="list-style-type: none"> Review the existing accident statistics for the study area, then compare this against future data post construction
Improve Active Travel Provision within Fengate	<ul style="list-style-type: none"> Improve active travel provision with the Fengate Access Study area. 	<ul style="list-style-type: none"> Post scheme audit of active travel provision.
Positively impact traffic conditions on the wider network	<ul style="list-style-type: none"> Reduce delay and journey times on the surrounding network, positively impacting traffic flows through the Fengate area. 	<ul style="list-style-type: none"> Traffic surveys at major junctions within the study area Comparison of existing and future journey times for routes within the study area
Reduce Severance for Active Travel Users	<ul style="list-style-type: none"> Reduce severance caused to active travel users by the road network. 	<ul style="list-style-type: none"> Review the existing accident statistics for the study area, then compare this against future data post construction
Upgrade Junction 7	<ul style="list-style-type: none"> Overcome Maintenance and safety concerns with the current study area. Increase biodiversity through planting and landscaping within the scheme elements. 	<ul style="list-style-type: none"> Traffic modelling and satellite navigation data at major junctions before and after completion of the preferred scheme Post scheme review of biodiversity gain compared to pre-scheme situation.

2.10 Constraints, Powers and Approvals

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

Table 2.7: Constraints and Mitigations

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

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

Table 2.8: Table of Required Powers and Approvals

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

2.11 Scope

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

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

2.12 Interdependencies

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

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

2.13 Key Risks

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

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

- Land acquisition
- COVID-19 (legacy).

Land Acquisition

- 2.13.3 The initial scheme design for the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction required the acquisition of four individually owned parcels of land, totalling 6,243m², adjacent to the existing highway.
- 2.13.4 Discussions with these landowners began during the Preliminary Design phase of the project and continued throughout the Detailed Design stage, however progress has been limited.
- 2.13.5 This posed the single largest risk to delivery of the scheme as delays in agreeing land acquisition could compromise the TCF funding availability which is time limited. The TCF funding must be spent by March 31st 2024, and the risk of land acquisition delaying construction beyond this point was considered to be increasingly significant, and as a result of this the scope of the scheme design was amended to remove the components requiring third party land (Edgerley Drain Road southbound and Storey's Bar Road westbound approaches).
- 2.13.6 The scheme now only includes improvements to the Vicarage Farm Road and Storey's Bar Road northbound approaches, along with active travel improvements along Edgerley Drain Road, all of which is within PCC land. The remaining components will be delivered at a future date via a different project / Business Case. The economic assessment included in this FBC has been updated to reflect the alteration to scope at this junction.

COVID-19 (Legacy)

- 2.13.7 There is a risk that the legacy of COVID-19 on travel patterns could undermine the need for schemes should traffic levels remain significantly below those observed when the schemes were identified and developed prior to the pandemic.
- 2.13.8 Constant monitoring of traffic levels has been in place across Peterborough throughout the COVID-19 pandemic and has been used to assess the impact of the pandemic on traffic levels on Peterborough's highway network.
- 2.13.9 Figure 2.13 overleaf shows traffic levels from a permanent monitoring site from the beginning of the pandemic in March 2020 until November 2022. The figure shows that traffic levels have remained consistent and stable for much of 2022, and there is now little fluctuation due to the pandemic.

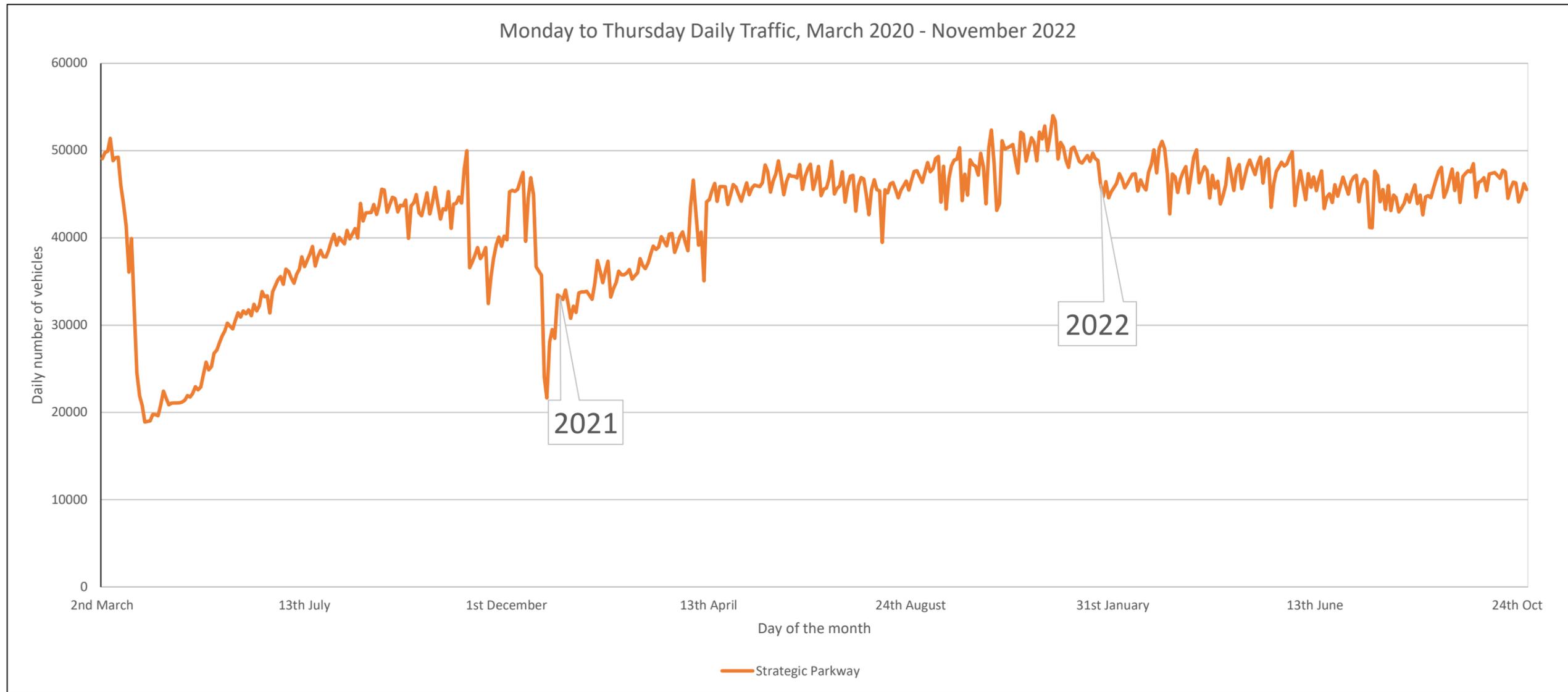


Figure 2.13: Peterborough COVID-19 Traffic Level Monitoring

2.13.10 Appendix A contains the Project Risk Register which identifies all other project risks and considers mitigation measures. The Risk Register is a live document which is managed by Peterborough City Council and is reviewed regularly by the CPCA in monthly Project Board meetings.

2.14 Stakeholders

2.14.1 The key stakeholders have been identified as:

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

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

Stakeholder Consultation

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

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

Public Consultation

- 2.14.5 Public consultation on the concept of a scheme at Fengate was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan²¹ that was adopted in January 2020. This consultation made residents aware that Fengate had been identified as a location for improvements. It should be noted that no details on the form of the scheme were provided at the time of the consultation, and that no objections relating to the principle of improvements were received.
- 2.14.6 A further round of public consultation took place between February and March 2021 using the concept designs. No comments were received relating the scheme designs themselves, however some feedback was received regarding the poor level of pedestrian infrastructure currently within Fengate. Two additional schemes were included in the package of works to address this (further information is provided in Section 2.16 beneath).

2.15 Scheme Development

- 2.15.1 This section discusses the process followed for developing options and shortlisting those against the scheme objectives using the DfT's Early Assessment and Sifting Tool (EAST) assessment. This section also explains the technical work undertaken to assess the shortlisted options and identify a Preferred Option. Further information on this is included within the Fengate Access Study Option Assessment Report (OAR), which was submitted along with the SOBC in November 2020. Subsequent changes to the package of options made since submission of the SOBC are discussed at the end of this section.
- 2.15.2 An option development workshop was held on the 15th of May 2018 and attended by representatives from various disciplines within PHS. The workshop reviewed the existing conditions and future issues surrounding access to Fengate, explored its relationship with the surrounding road network and discussed the various constraints at the site. The purpose of the workshop was to develop a long list of potential improvement options to be considered by this study.
- 2.15.3 A total of twenty-four options were considered in the workshop, with potential schemes ranging widely in estimated cost and level of impact on the network. The twenty-four initial options formed the Long List which is shown in Table 2.8 beneath.

²¹ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>.

Table 2.9: Long List of Options

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

EAST Assessment

- 2.15.4 The EAST assessment was used to assess the Long List of options against the scheme objectives and to refine this to a Short List of options that were taken forward for technical assessment as described in the OAR.
- 2.15.5 The options were scored against the following CPCA and PCC objectives using the EAST framework. Scores were based on the discussion and collective opinion of the workshop delegates. The objectives against which the options were scored are shown in Table 2.9 beneath.

Table 2.10: Scheme Objectives

Strategic Objectives
Ability to reduce congestion
Ability to reduce journey times
Ability to improve air quality and reduce emissions
Ability to support the local growth agenda, including housing and employment growth
Economic Objectives
Affordability (Value for Money)
Scale of impact on local environment
Management / Deliverability Objectives
Project risk
Stakeholder support and public acceptability

- 2.15.6 The EAST Scoring Assessment is reported within the OAR. Scores were given in relation to the proportion of the expected impact on the entire junction and not just the section of road it occurs on. A neutral score was given when the score against an objective is uncertain, or there is a comparable negative and a positive element associated with the scheme.
- 2.15.7 Shortly after the EAST assessment had been undertaken, the scale of development planned for Red Brick Farm was significantly reduced from the original expectations. Initial proposals for the development meant that it was expected to generate around 6,000 vehicle trips per day, however the proposed land use mix was changed, and based on the current proposals, there are now expected to be approximately 600 additional vehicle trips per day.

Shortlisting Summary

- 2.15.8 Due to the reduced impact of the development on the highway network, the large strategic schemes being considered, such as bypasses and grade separated junctions, were removed from the list of potential options, and the smaller, more localised improvement schemes which scored well in the EAST assessment were taken forward for further assessment.
- 2.15.9 Table 2.10 details the options taken forward for further assessment, including traffic modelling.

Table 2.11: Modelled Package of Schemes

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

Technical Assessment

- 2.15.10 The technical assessment of shortlisted options was undertaken using the PTM3 model. PTM3 has been developed using SATURN (Version 11.4.07H), a traffic and assignment model which can be used to evaluate potential traffic schemes. Saturn focuses on whether a defined network can cope with a defined vehicle demand in a defined time period.
- 2.15.11 The Saturn traffic model has been constructed to represent the morning (AM) peak hour from 08:00 to 09:00, and an evening (PM) peak hour from 17:00 to 18:00, to represent the most congested time periods. In addition, an Inter-Peak (14:00 to 15:00) model has also been constructed to understand the impact of any improvements outside of the congested periods of the day.

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

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

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

Option Packaging

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

2.15.16 The three packages tested were:

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

2.15.17 The package locations are shown in Figure 2.14 overleaf.

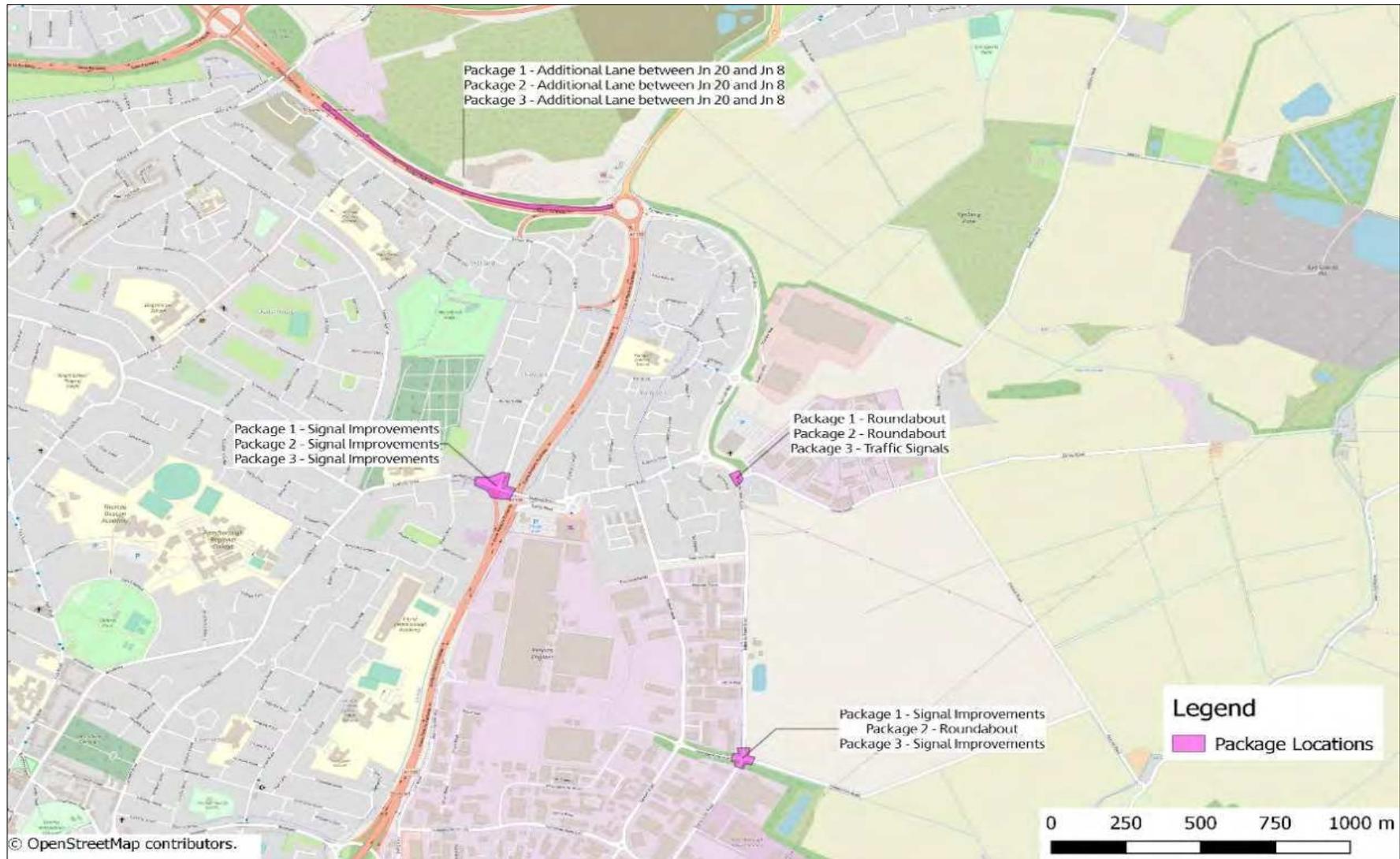


Figure 2.14: Fengate Access Study Package Locations

Preferred Package

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

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

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

2.16 Preferred Option Development

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

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

Table 2.12: Amendments to Preferred Package Since SOBC

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

Oxney Road / Edgerley Drain Road Roundabout

- 2.16.3 This scheme consisted of converting the existing priority junction at Oxney Road / Edgerley Drain Road into a roundabout to reduce delay on the Oxney Road westbound approach. High levels of delay already occur here during peak hours, and these are expected to increase as growth occurs across Fengate and the Red Brick Farm site is developed.
- 2.16.4 The planning application for the Red Brick Farm site has progressed since the submission of the SOBC, and a commitment to deliver this scheme has been secured through a S106 agreement with the developer. This scheme has therefore been removed from the scope of the Fengate Access Study, but very much remains a part of the transport vision for the Fengate area.

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

- 2.16.5 This scheme remains as part of the preferred package; however, it has been significantly enhanced to incorporate pedestrian and cycle infrastructure, specifically:
- Creation of a shared used cycleway along the western side of Edgerley Drain Road, providing a direct cycle route from the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road junction to the western access into the Red Brick Farm development.
 - Creation of a pedestrian footpath along the northern side of Storey's Bar Road, connecting the junction with the future PREL site and a potential access into the southern end of the Red Brick Farm site.
- 2.16.6 Figure 2.15 overleaf shows the General Arrangement drawing, and the addition of active travel infrastructure to the highway scheme.
- 2.16.7 The SOBC also referenced a SMART Junctions trial at this location. Funding for this was secured as part of the SOBC approval in December 2020; however, a more suitable location was found for the trial. The trial has instead been conducted at the junction of London Road / Fletton Avenue / Glebe Road junction and has assessed the ability to use Artificial Intelligence (AI) to operate the traffic signal controls rather than the existing MOVA controller. The trial has been largely successful to date, confirming that the junction can operate under AI, and is now comparing the performance of AI operation over MOVA.
- 2.16.8 Note that only improvements to the Vicarage Farm Road and Storey's Bar Road northbound approaches, along with the active travel improvements along Edgerley Drain Road, will be delivered as part of this FBC. This is to remove the risk associated with land acquisition timescales on the other two approaches compromising the availability of TCF funding.



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

Junction 7 Improvements

- 2.16.9 This scheme also remains as part of the preferred package; however, it has again been significantly enhanced to incorporate pedestrian and cycle infrastructure. A segregated east-west cycle route has been incorporated into the junction, providing cyclists with a safe route along Oxney Road and onto Eastfield Road.
- 2.16.10 The General Arrangement drawing for this scheme is shown in Figure 2.16 beneath.



Figure 2.16: General Arrangement of the Junction 7 Scheme

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

- 2.16.11 This scheme has been removed from the original package due to several factors.
- 2.16.12 Updated cost estimates were prepared following completion of Preliminary Design earlier in 2022, and the cost of this scheme had increased significantly since the SOBC. The increase was largely due to changes in design standards since the scheme was originally designed in 2013/14, especially in relation to drainage and vehicle restraint systems.
- 2.16.13 The preliminary design work also identified that significant tree loss would be required along the eastern side of the carriage to accommodate the signage and roadside furniture which would be relocated as part of the widening.
- 2.16.14 Both factors would have a bearing on the fiscal and environmental cost of the scheme, and an impact on the economic assessment. In light of this, and a shift in transport policy away from conventional large scale road improvement schemes, sensitivity testing was undertaken to understand the impact of removing this scheme from the package of Fengate Access Study schemes.
- 2.16.15 The sensitivity test demonstrated the benefit to cost ratio (BCR) of the original package (as reported at SOBC) was significantly reduced due to the increased cost estimate following Preliminary Design. The revised costs reduced the package BCR to 1.09. Removing the A15 Lane Gain Scheme, with its associated cost from the economic assessment significantly improved the package BCR to 2.46 because of the costs nearly halving. The results from the sensitivity test are shown in Table 2.12 beneath.

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

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

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

Oxney Road / Newark Road Mini Roundabout

- 2.16.17 This scheme was added following ongoing technical assessment which identified that improvements to Junction 7 as well as developer led improvements to the Oxney Road / Edgerley Drain Road Junction would improve traffic flow along Oxney Road, resulting in an increase in delay on Newark Road as joining from the side road becomes more difficult.
- 2.16.18 To alleviate this issue, a mini roundabout has been designed for this location, and transport modelling has demonstrated that it provides clear benefits by reducing queues and delay on Newark Road without causing a significant increase in delay to the dominant flow along Oxney Road (as would be caused by a traffic signal-controlled junction).

Newark Road Footpath

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

New Pedestrian Crossing over Oxney Road

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

Revised Package of Improvements

- 2.16.21 As a result of these changes, the package of schemes identified for delivery now consists of the:
1. Traffic signal improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road, on the Vicarage Farm Road and Storey's Bar Road northbound approaches, and active travel improvements to Edgerley Drain Road.
 2. Traffic signal improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road)
 3. Creation of a mini roundabout at Oxney Road / Newark Road
 4. Improvements to Newark Road footpath.
 5. Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.

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

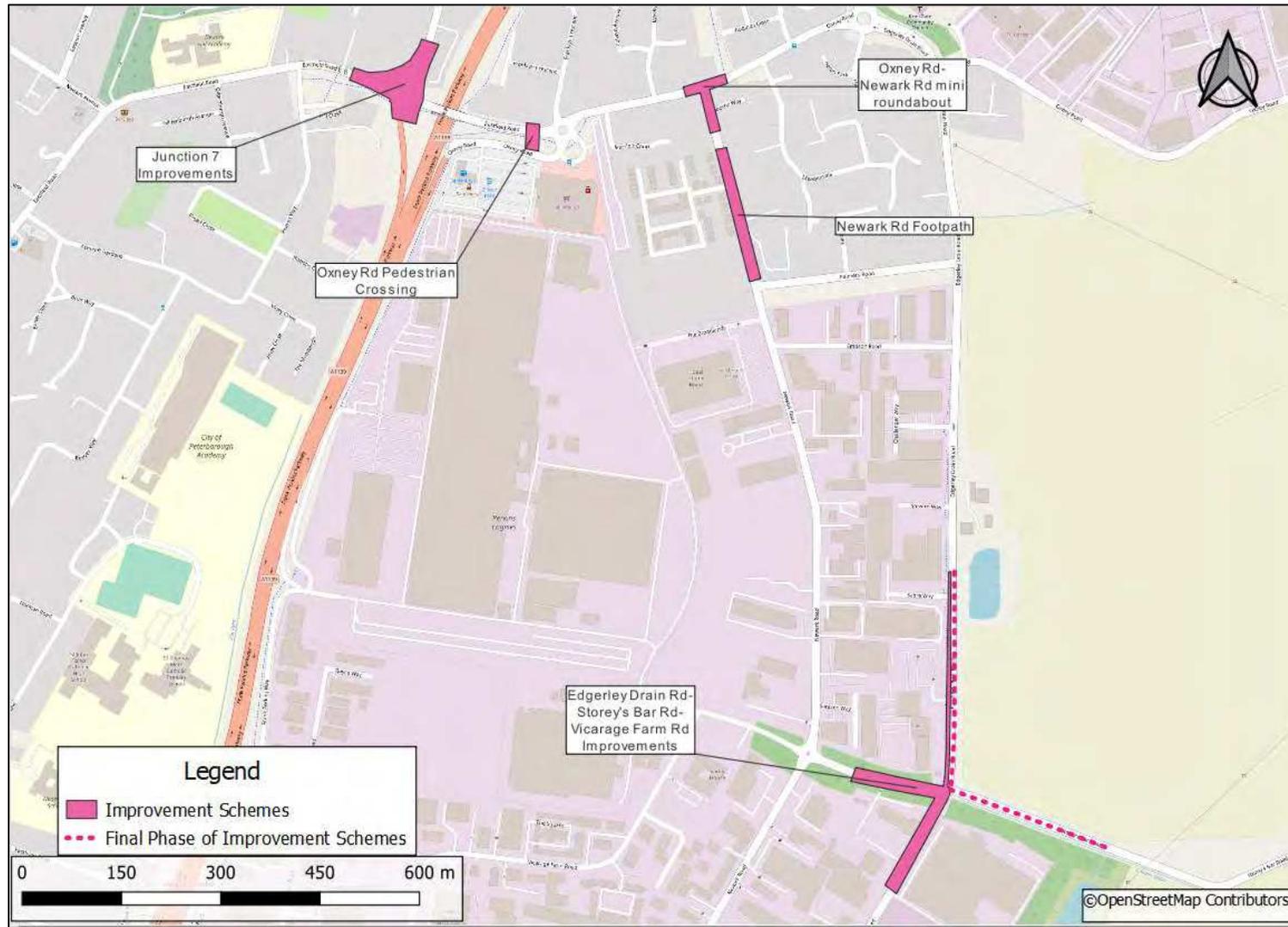


Figure 2.17: Fengate Access Study Improvement Schemes – Final Package

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

Confirmation of Strategic Fit

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

Table 2.14: Review of Strategic Fit

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

2.17 Carbon Assessment

- 2.17.1 CPCA and PCC have committed to combat climate change and PCC aim to achieve 'Net Zero' carbon emissions by 2030. Preliminary and Detailed Design Carbon Assessments have been undertaken for the Fengate Access Schemes in accordance with the following commitment from the Council's Carbon Management Action Plan (Council CMAP) 2021: "Develop detailed carbon assessments for major highway projects and use the information to influence the final design."
- 2.17.2 The purpose of the preliminary design carbon assessment was to baseline the construction carbon cost of the schemes early in the design process and highlight 'hotspot' areas where carbon reduction efforts needed to be focused. The detailed design carbon assessment was undertaken to highlight carbon reductions achieved primarily through value engineering and using less carbon intensive materials. It has also provided an updated carbon footprint to demonstrate where construction phase carbon reduction initiatives need to be focused.
- 2.17.3 The preliminary design baseline carbon cost of the Fengate Access Schemes was **1,186 tCO₂e**, which is equivalent to 379 return flights from London to Sydney. This was reduced to **1,182 tCO₂e** after completion of detailed design. Although this represents a relatively small carbon reduction of 4 tCO₂e (-0.2%), more significant carbon reductions were achieved on individual schemes (see section 2.17.6 below). It is also worth noting that some increases in carbon output for the detailed design phase assessments can be attributed to having more information available for carbon accounting. Although this can mask the impacts of certain carbon reduction initiatives, it does increase the accuracy of the assessment and ensures efforts are focused in the correct areas during future stages (Figure 2.18).

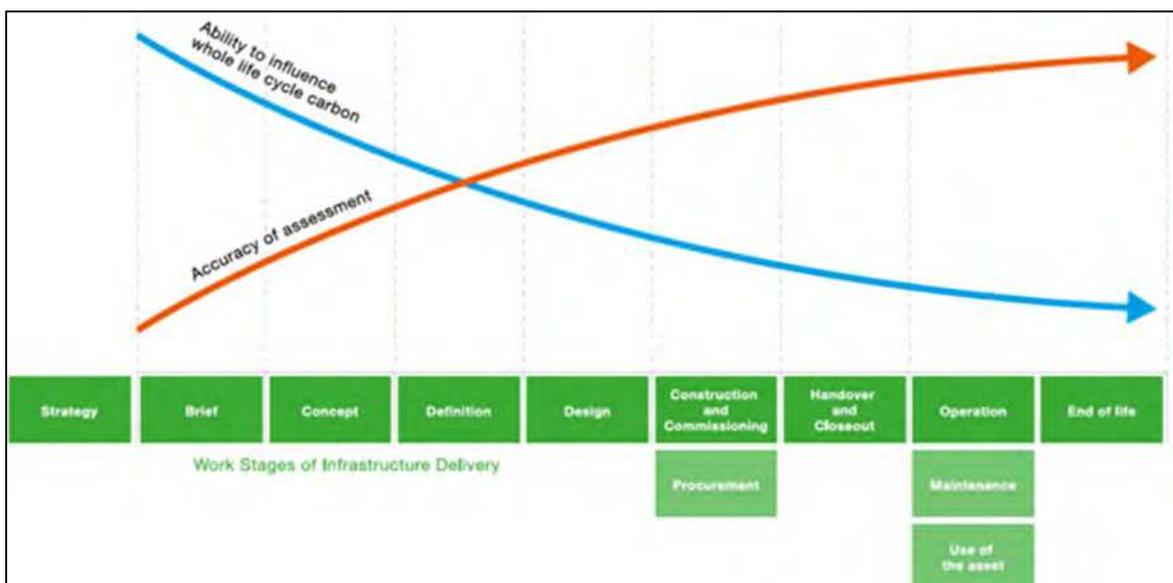


Figure 2.18: Relationship between Work Stages, Assessment Accuracy, and Ability to Influence Whole Life Cycle Carbon. Source: Green Construction Board

2.17.4 Carbon calculations were undertaken using the Milestone Infrastructure Carbon Tool supplemented by manual calculations to estimate carbon emissions using spend data. The assessment is based on the Bill of Quantities (BoQ) provided for both the preliminary and detailed design phases. Figure 2.19 below shows the breakdown of the detailed design carbon footprint for the Fengate Access schemes based on work activity 'series'.

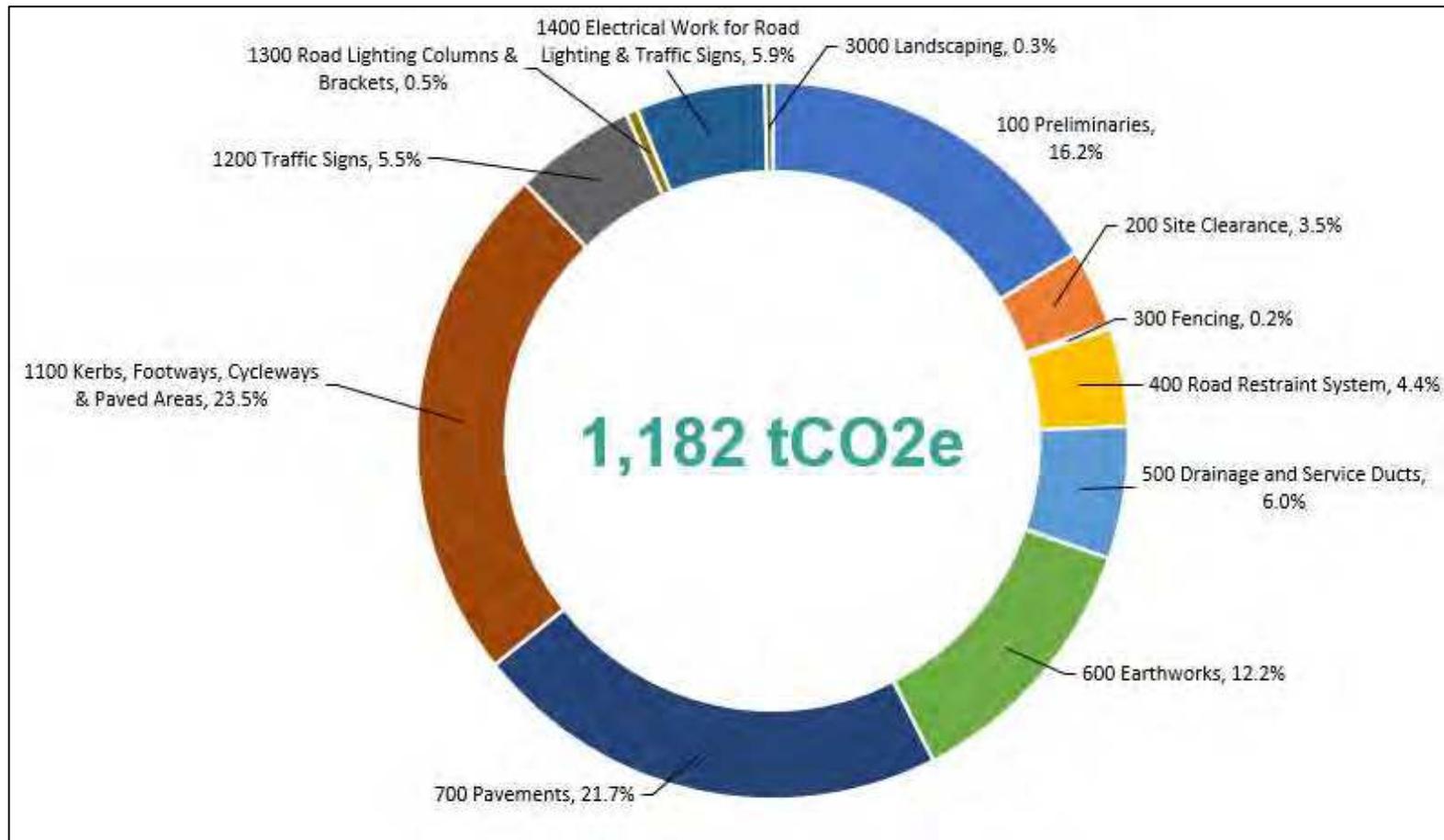


Figure 2.19: Fengate Access Scheme - Detailed Design Carbon Footprint by Work Activity 'Series'

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

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

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

Table 2.15: Carbon Footprints at Preliminary and Detailed Design Stages

Scheme	Preliminary (tCO ₂ e)	Detailed (tCO ₂ e)	% change	Carbon Reduction Measures
Junction 7 Eastfield	141	143	0.5%	Grasscrete maintenance layby to reduce asphalt use and retain drainage
Newark Road Footpath	88	87	-0.3%	Value engineering to reduce scope, tegula blocks for vehicle overrun
Newark-Oxney Road Roundabout	94	90	-2.4%	Value engineering to reduce scope
Oxney Road Sainsburys Crossing	93	80	-7.5%	Retention of existing safety barrier
Storeys Bar Road	771	783	0.8%	Retention of existing drainage and footpath, re-use of excavated material
Total	1186	1182	-0.2%	Use of warm mix asphalt across all schemes

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

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

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

Activity	Carbon Output (tCO ₂ e)	Potential Carbon Reduction Measures
Contractors General Prelim Construction	154	<ul style="list-style-type: none"> • Mains power connection for welfare • On-site renewable energy solutions
Full depth carriageway construction (Assumed 990mm depth) Carriageway Widening	143	<ul style="list-style-type: none"> • Use of Cold Recycled Bound Materials • Use of asphalt with higher RAP content
TM	117	<ul style="list-style-type: none"> • Electric vehicle alternatives • Use of HVO fuel
AC14 CLOSE SURF Binder course 100/150 90mm	111	<ul style="list-style-type: none"> • Use of 'SuperLow' asphalt • Use of asphalt with higher RAP content
Disposal of unacceptable material Class U1A	110	<ul style="list-style-type: none"> • Re-use for landscaping on site • Export for re-processing to allow re-use
Full depth carriageway construction (Assumed 990mm depth) Carriageway Reconstruction	66	<ul style="list-style-type: none"> • Use of Cold Recycled Bound Materials • Use of recycled aggregates for sub-base
Sub-base 350 mm thick	66	<ul style="list-style-type: none"> • Use of recycled aggregate • Use of geotextiles to reduce thickness
Marshalls Beany Drain (Combined kerb Drain)	65	<ul style="list-style-type: none"> • Use of Durakerb products • Use of concrete with higher GGBS content
Full depth carriageway construction (Assumed 1105mm depth) Carriageway Reconstruction	64	<ul style="list-style-type: none"> • Use of Cold Recycled Bound Materials • Use of recycled aggregates for sub-base
50mm S/c 65 PSV	56	<ul style="list-style-type: none"> • Use of 'SuperLow' asphalt • Use of asphalt with higher RAP content
AC14 CLOSE SURF Binder course 100/150 90mm	45	<ul style="list-style-type: none"> • Use of Cold Recycled Bound Materials • Use of asphalt with higher RAP content
Sub-Contractors General Prelim Construction	45	<ul style="list-style-type: none"> • Sustainable travel plan • Explore opportunities to reduce programme
Full depth carriageway construction (Assumed 1105mm depth) Carriageway Widening	45	<ul style="list-style-type: none"> • Use of Cold Recycled Bound Materials • Use of recycled aggregates for sub-base
Imported topsoil Class 5B	44	<ul style="list-style-type: none"> • Retain/re-use excavated material on site • Identify closest approved supplier(s)
VRS	43	<ul style="list-style-type: none"> • Retain/re-use existing barrier • Use of steel with higher recycled content

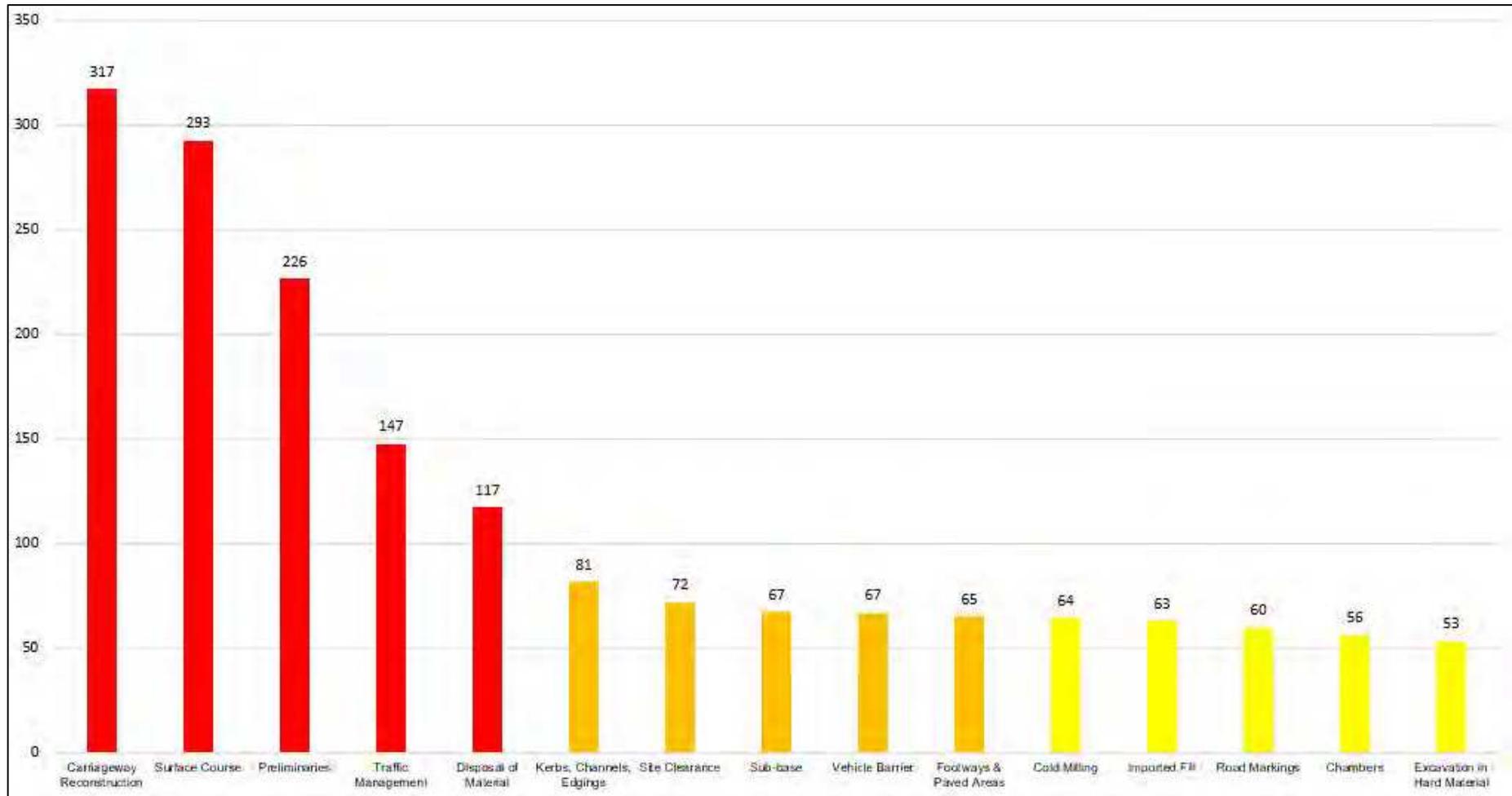


Figure 2.20: Fengate Access Schemes - Detailed Design Carbon Footprint by Work 'Category'

- 2.17.9 To date, no carbon reduction workshops have been undertaken to help collaboratively identify initiatives which could be considered for implementation. It is recommended that this is coordinated at the earliest opportunity with representation from client, design, principal contractor, and supply chain organisations. The workshop should focus on construction phase carbon reduction initiatives related to the carbon 'hotspots' identified above. This will provide an opportunity to develop a carbon reduction plan for the scheme incorporating clear actions, responsibilities, and deadlines to ensure effective implementation of carbon reduction measures which also deliver cost savings. Construction will prioritise non-hazardous, reused, refurbished, recycled, and recyclable equipment and materials within specification, and those made from renewable sources with low(er) embodied energy, carbon footprint and water footprint.
- 2.17.10 The principles of 'Build Less' and 'Build Clever' should always be embedded within the design development of a scheme to help drive the most significant carbon reductions possible, as shown in Figure 2.21 below. In the interest of continuous improvement, this reinforces the importance of undertaking the initial carbon assessment and workshop at the earliest opportunity when there is sufficient information available (i.e. BoQ). It should also be noted that there are operational phase carbon savings associated with the Fengate Access Schemes which have not yet been quantified related to:
- Reducing congestion and idling traffic.
 - Promoting active travel instead of driving.
 - Using sockets for signs and traffic signals to improve the efficiency of future repairs.
 - Dismantling traffic signal equipment for future maintenance re-use.
- 2.17.11 The intention is to quantify these aspects more effectively in the future as suitable carbon accounting methods are developed and agreed.

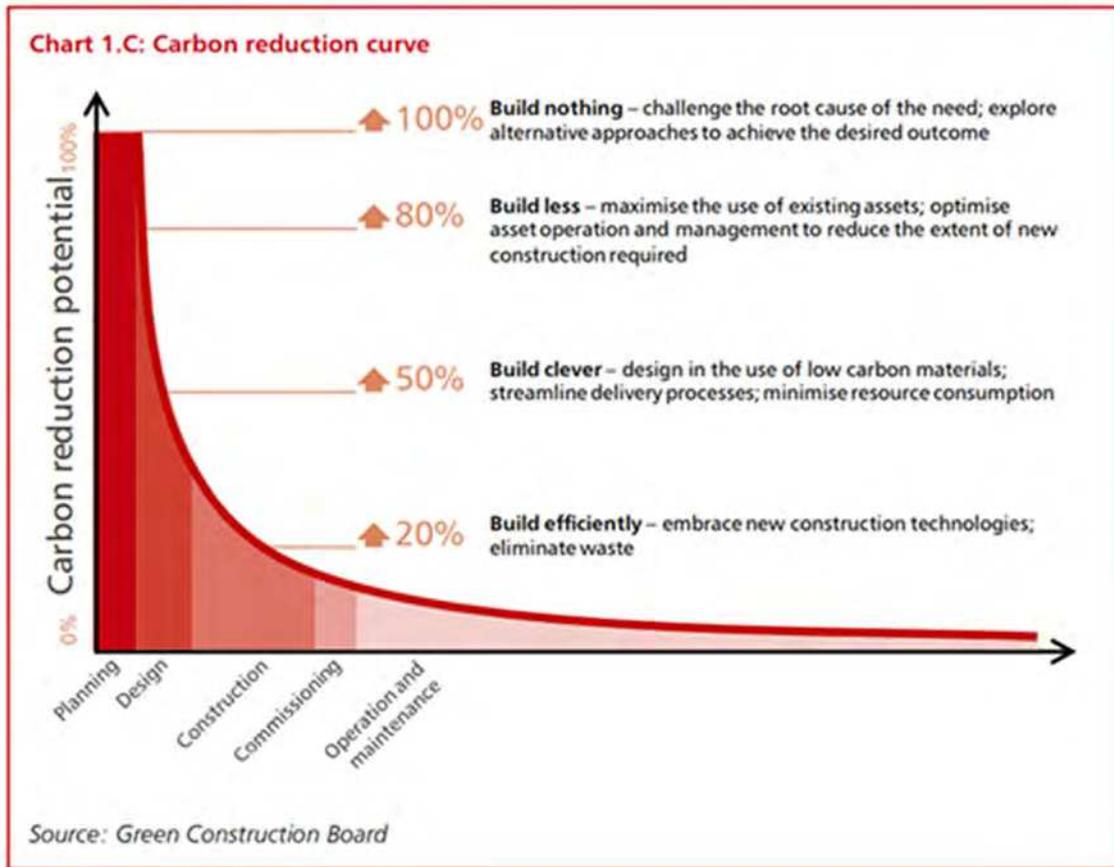


Figure 2.21: Relationship between Work Stages and Carbon Reduction Potential

2.17.12 This carbon assessment should also be updated when the as-built BoQ are available to confirm the final carbon output associated with the Fengate Access Schemes and highlight carbon reductions achieved throughout the whole project lifecycle. This will require effective data collection during the construction phase. A final ‘as-built’ carbon footprint will be calculated for the scheme to highlight any further carbon reductions through the construction phase. It is envisaged that this will provide another case study for future PCC and CPCA projects to replicate and build on adopting the approach summarised in Figure 2.22 below.



Figure 2.22: Relationship between Work Stages and Carbon Reduction Potential

3. The Economic Dimension

3.1 Introduction

3.1.1 This chapter sets out the approach taken to assess the Economic Dimension for the Fengate Access Improvement Scheme and demonstrates that the scheme offers Very High Value for Money.

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

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

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

3.2 Options Appraised

- 3.2.1 The technical assessment documented in the Option Appraisal Report (September 2020) identified Option 1 as the Preferred Option.
- 3.2.2 Three packages of schemes were identified in the report. Package 2 closely resembled package 1, with the difference being the conversion of the Edgerley Drain / Storey's Bar / Vicarage Farm Road signalised junction into a roundabout. This package was not taken forward following an initial design review due to engineering and safety concerns over providing a roundabout at this location. These are documented in the OAR.
- 3.2.3 Package 3 included the signalisation of the Oxney Road / Edgerley Drain road junction. This was not taken forward as it still presented capacity issues at the improved junction.
- 3.2.4 The components included in Package 1 are listed beneath:
1. Traffic signal improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road, on the Vicarage Farm Road and Storey's Bar Road northbound approaches, and active travel improvements to Edgerley Drain Road.
 2. Traffic signal improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road)
 3. Creation of a mini roundabout at Oxney Road / Newark Road
 4. Improvements to Newark Road footpath.
 5. Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.
- 3.2.5 The General Arrangements for each of the schemes are provided in Appendix B.

3.3 Economic Assessment

Approach to Appraisal

- 3.3.1 The Economic Dimension for the scheme is focused on:
- Assessing the monetised direct, localised, and economic efficiency benefits of the scheme
 - Qualitative appraisal of wider scheme benefits, such as environmental, social, and enablement of planned development
 - Distributional Impacts
 - Offsetting identified benefits against the scheme costs to provide a Benefit to Cost (BCR) ratio.

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

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

3.4 Present Value of Costs

3.4.1 A robust scheme cost estimate has been produced based on Detailed Designs produced between 2021 and 2022. The Base Investment Costs are detailed in Table 3.3 below, and the subsequent steps taken to calculate the Present Value Costs (PVC) are described beneath.

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

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

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

Table 3.1: Base Investment Cost (2022 prices)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Total Base Investment Cost (£)
2022	390,689		61,400	19,385	471,474
2023	3,606,198		700,415	138,477	4,445,090
2024	683,336		135,919	11,330	830,584
2025				25,000	25,000
Total	4,680,223		897,733	194,192	5,772,149

3.4.5 The PVC has been calculated as followed:

- Real Cost increases were calculated based on the Base Investment Cost spend profile. The Base Cost adjustment factor was calculated by dividing the Construction Industry Inflation Rate (10% to 2024 / 2025, and then 5%²² thereafter) by the Annual GDP Factor derived from the TAG Databook (May 2022) for each of the years within the assessment period. The inflation rate was derived from construction output price indices as well as

²² [Turner & Townsend raises inflation forecast to 8.5% \(theconstructionindex.co.uk\)](https://www.theconstructionindex.co.uk)

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

- Optimism Bias was then applied in line with guidance provided in TAG unit A1.2 (May 2022). An Optimism Bias rate of 20% was applied to represent the maturity of the design (Stage 3: Detailed Design). The total Optimism Bias applied was £1,233,043.
- Costs were then rebased back to 2010 using factors derived from the TAG Databook (May 2022) GDP Deflator.
- Costs were then discounted to 2010 in line with guidance provided in TAG unit A1.2
- Finally, costs were converted to 2010 Market Prices using a factor of 1.19.

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

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

Table 3.2: Economic Dimension Scheme Cost Estimate

Description of Cost Type	Construction Cost (£)	Maintenance Cost Over 60 Years (£)
Base Investment Cost	5,772,149	100,000
Base Cost with Real Cost Increases	6,165,217	845,846
Base Cost with Real Cost Increases and Optimism Bias	7,398,260	845,846
Rebased to 2010 Price Year	5,799,510	663,061
Discounted to 2010 Prices	3,697,567	122,455
Adjusted to Market Prices	4,400,105	145,722

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

3.5 Present Value Benefits

3.5.1 The economic assessment of the Fengate Access Study Improvement Schemes has considered the following:

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

Transport User Benefits

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

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

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

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

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

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

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

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

3.5.9 The annualisation factors shown below in Table 3.3 were used within TUBA to calculate the likely annual transport user benefits for the AM, Inter, and PM peak hours. The figures have been derived using data from nearby National Highways (formerly Highways England) WebTRIS data and local ATC data from 2017, compared against the survey data. It was found that the 16:00 – 17:00 hour flows closely resembled the total flows observed within the modelled PM peak hour. PM annualisation factors have therefore been calculated that convert the single peak hour demand to annual peak period demand.

Table 3.3: TUBA Annualisation Factors

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

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

3.5.11 This identifies the Present Value Benefits (PVB) to be £18,527,000. A breakdown of the TUBA benefits can be seen in Table 3.4 beneath.

Table 3.4: TUBA Benefits Breakdown

Benefits (£'000s), 2010 prices	
Greenhouse Gases	326
Consumer Users (Commuting)	9,687
Consumer Users (Other)	3,924
Business Users / Providers	4,930
Indirect Taxes	-340
Present Value of Benefits (PVB)	18,527

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

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

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

Table 3.5: Non-Monetised Time Benefits by Time Saving

Non Monetised Time Benefits By Time Saving					
Time Benefits (thousands of person hrs) by size of time saving					
< -5 mins	-5 to -2 mins	-2 to 0 mins	0 to 2 mins	2 to 5 mins	> 5 mins
0	-5	-6,280	6,911	124	4,475

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

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

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

Table 3.6: Transport User Benefits by Time Period

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

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

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

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

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

Table 3.7: Non-Monetised Time Benefits by Distance

Non Monetised Time Benefits By Distance									
Time Benefits (thousands of person hrs) by distance									
Vehicle type	Purpose	< 1 kms	1 to 5 kms	5 to 10 kms	10 to 25 kms	25 to 50 kms	50 to 100 kms	100 to 200 kms	>200kms
Car	Business	6	103	174	129	37	-9	5	-8
Car	Commuting	18	355	897	782	266	-17	16	1
Car	Other	28	975	848	296	-25	-185	17	-4
LGV	Business	3	74	126	181	65	-3	2	0
HGV	Business	0	10	20	23	23	5	5	-16

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

Accident Benefits

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

- 3.5.24 The total accident savings in 2010 values and prices is £1,606,600. COBALT estimates the scheme would result in a reduction of 41.7 accidents over a 60-year appraisal period. There would be a reduction of 0.3 fatal, 4.3 serious and 52.4 slight casualties.
- 3.5.25 A sensitivity test has been undertaken to estimate the total accident savings in 2010 values and prices based on local accident values as opposed to the COBALT defaults. The test demonstrates how accident savings based on local statistics differ from the average and is reported as a sensitivity test in section 3.7 beneath. Note that local accident rates are typically only required where there exceptional evidence that they should be used.

Environment Benefits

- 3.5.26 Changes in greenhouse gas emissions, air quality, and noise have been quantitatively assessed and monetised, with and without scheme.
- 3.5.27 The TUBA assessment estimated £326,000 benefits relating to a reduction of 4,150 tonnes of untraded CO₂ emissions and 18 tonnes of traded CO₂ emissions across all three modelled time periods over a 60-year appraisal period.
- 3.5.28 The combined AMATs estimated £4,310 benefits relating to Greenhouse Gas Reductions over the 20-year appraisal period of the active travel improvements, and £610 of Noise benefits.
- 3.5.29 Air quality and noise impact assessments had also been undertaken and the quantitative results of which had been used within the Air Quality Valuation and Noise Workbooks. The air quality and noise impact assessments used 24-hour AADT and 18-hour AAWT total vehicular flow, % HGV, and speed data extracted from the SATURN models as input.
- 3.5.30 Baseline noise surveys were undertaken in line with the Calculation of Road Traffic Noise (CRTN) using the 1988 Shortened Measurement method. All surveys have been carried out by suitably qualified acousticians.
- 3.5.31 Road traffic noise calculations have been carried out in accordance with the methodology set out in the Department for Transport's Memorandum 'Calculation of Road Traffic Noise' using SoundPLAN noise modelling software.
- 3.5.32 Existing receptor locations have been considered and used to establish the change in the daytime LA_{10,16h} noise levels. As per TAG Unit A3, the results have been converted to LA_{eq} 16h (07:00 to 23:00 hours) to avoid overlap with the L_{night} period (23:00 to 07:00). Predictions were generated for the following scenarios:
- Short Term Assessment – Do Minimum scenario in the opening year against the Do Something scenario in the opening year (2026).

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

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

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

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

3.5.35 The following scenarios have been assessed:

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

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

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

3.5.38 The total air quality benefits in 2010 values and prices are £266,119 over a 60-year appraisal period. It was estimated that the scheme would result in an increase of NO₂ emissions and decrease of PM_{2.5} emissions of 3 tonnes and -2 tonnes, respectively.

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

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

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

Active Travel

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

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

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

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

- 3.5.44 The number of walking and cycling trips without the proposed interventions have been sourced from Strava Metro, Census 2011 Method of Travel to Work, Vivacity AI sensors, and historic Automatic Traffic Counts (ATC).
- 3.5.45 The number of walking trips with the proposed intervention has been calculated by:
- Identifying a comparable location within Peterborough that has a higher walking mode share (based on the Census 2011) and better walking infrastructure.
 - Identifying the walking mode share for the scheme location based on the Census 2011.
 - Calculating an uplift factor that increases the scheme location walking mode share to the levels of the comparable location.
 - Applying the resultant uplift factor to the number of walking trips without the proposed interventions.
- 3.5.46 The number of cycling trips with the proposed interventions has been calculated by:
- Identifying the PCT Government Target (Equality) Ratio (Scenario / Baseline) for the existing route at the scheme location.
 - Applying the ratio as an uplift factor to the number of cycling trips without the proposed interventions.
- 3.5.47 A comparison between Shrewsbury Avenue in Orton Longueville, which is a comparable land use, and Fengate was undertaken to understand the potential for travel to work by walking and cycling. The assessment identified that Shrewsbury Avenue had a travel to work mode share of 5.33% for walking and 8.17% for cycling, whereas Fengate had mode shares of 4.45% for walking and 6.27% for cycling. The uplift factors would therefore be 1.198 for walking and 1.303 for cycling.
- 3.5.48 Table 3.8 below shows the number of walking and cycling trips by scenario for each scheme. Note that no cycling trips have been assumed for the Newark Road footway scheme as the scheme is intended for pedestrian use only.

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

Scheme	Daily Walking Trips		Daily Cycling Trips	
	Do Nothing	Do Something	Do Nothing	Do Something
Eastfield Road Ped Crossing / Junction 7 improvements	1,862	2,231	107	139
Newark Road Footway	773	926	-	-
Edgerley Drain / Storey's Bar Improvements	153	183	100	130

- 3.5.49 The UCL Tool to Value Reductions in Community Severance Caused by Roads (Anciaes and Jones, 2020) is a spreadsheet used to estimate the value of interventions that reduce the barrier effect caused by roads, including changes to road design, traffic, and crossing facilities. This tool is referred to as the “Severance Tool” within this report.
- 3.5.50 Severance is calculated at each point along a road. The Severance Tool assumes that severance originates from the road conditions at a particular point and the possibility of walking along the road to cross in a place with better road conditions or crossing facilities.
- 3.5.51 The Severance Tool has only been used for the Oxney Road / Eastfield Road Pedestrian Crossing scheme and it requires the following intervention-specific details for calculating active travel benefits:
- Length of road segment (100 – 5,000m)
 - Total potential demand for walking trips crossing the road (minimum of 1,000 trips per day)
 - Percentage of each age group in the demand
 - Average walking speed by age group
 - Journey purpose of each age group
 - Percentage of demand at each crossing location along the road segment
 - Lifetime of the project (maximum of 10 years)
 - Road conditions including the number of lanes in each direction, central reservation (wide, narrow, or none), traffic density (low, medium, or high), and traffic speed (10, 20, 30, or 40mph).
 - Crossing facilities available at the extreme and middle points of the road segment. Options include pedestrian refuge, straight pelican, staggered pelican, footbridge, or underpass.
 - Waiting time (0 to 5 minutes).

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

3.5.53 Table 3.9 beneath summarises the benefits for each scheme.

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

Benefit Item	Benefits (£,000s)			
	Eastfield Rd & Junction 7	Newark Road	Edgerley Drain / Storey's Bar	Total
Congestion Benefit	33.03	9.91	10.38	53.33
Infrastructure Maintenance	0.19	0.06	0.06	0.30
Accident	5.68	1.70	1.77	9.16
Local Air Quality	0.80	0.24	0.24	1.29
Noise	0.38	0.11	0.12	0.61
Greenhouse Gases	2.70	0.81	0.81	4.31
Physical Activity (Health)	1,053.55	360.19	240.32	1,654.06
Journey Ambience	203.72	74.94	35.54	314.20
Absenteeism	4.79	33.77	33.62	72.17
Indirect Taxes	-3.39	-1.02	-0.99	-5.40
Total	1,301.25	480.66	321.82	2,103.73

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

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

Benefits Summary

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

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

Type	Description	Value (£,000s)
TUBA	Greenhouse Gases	326
	Consumer Users (Commuting)	9,687
	Consumer Users (Other)	3,924
	Business Users / Providers	4,930
	Indirect Taxes	-340
	Total TUBA PVB	18,527
Active Mode Appraisal	Congestion Benefit	53.3
	Infrastructure Maintenance	0.3
	Accident	9.2
	Local Air Quality	1.3
	Noise	0.6
	Greenhouse Gases	4.3
	Physical Activity (Health)	1,654
	Journey Ambience	314
	Absenteeism	72
	Indirect Taxes	-5
	Total AMAT PVB	2,104
Environment	Noise	36.5
	Air Quality	266.1
COBALT	Accident Benefit	1,607
Benefits Summary	<i>Active Mode Appraisal PVB</i>	<i>2,104</i>
	<i>TUBA PVB</i>	<i>18,527</i>
	<i>Environment PVB</i>	<i>303</i>
	<i>COBALT PVB</i>	<i>1,607</i>
	Total PVB	22,540

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

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

3.6 Benefit Cost Ratio

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

Table 3.11: DfT VfM Categories

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

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

Table 3.12: Fengate Access Study Improvements AMCB Table

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

Value for Money Statement

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

3.7 Key Risks, Sensitivities and Uncertainties

Risks

- 3.7.1 Sensitivity tests have been undertaken to understand the robustness of the Fengate Access Study Improvement Schemes BCR against key risks and common DfT sensitivity scenarios.
- 3.7.2 A full record of the risks associated with this project are captured in the Project and Construction Risk Registers included in Appendix A.
- 3.7.3 The key risks identified for this project include failure of the nearby development to deliver infrastructure associated with that development, programme delays which affect the availability of funding (TCF funding is time limited) and lower levels of growth than expected materialising within Fengate (thereby reducing the benefits associated with the schemes).

Sensitivity Testing

- 3.7.4 Sensitivity tests have been undertaken to confirm the robustness of the business case in a number of eventualities. These eventualities can affect the benefits (such as changes to forecast trips from high and low levels of growth) or the costs (such as a greater proportion of risk being realised).
- 3.7.5 A summary of each of the sensitivity tests undertaken is provided beneath along with the resultant BCRs, and full details on the sensitivity tests undertaken are provided in the Fengate Access Study Sensitivity Testing Technical Note which is included in Appendix C.

Cost Sensitivity Test

- 3.7.6 Table 3.13 below demonstrates the VFM category that various PVCs would result in. The current core scenario PVC of £4,551,000 falls into the "Very High" category, and could increase by £1,084,000 before it falls into the "High" Value for Money Category.

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

VfM Category	Description	PVB	PVC required to achieve VfM statement
Poor	BCR between 0 and 1	£ 22,540	>=£22,540
Low	BCR between 1 and 1.5	£ 22,540	£22,540 to £15,027
Medium	BCR between 1.5 and 2	£ 22,540	£15,027 to £11,270
High	BCR between 2 and 4	£ 22,540	£11,270 to £5,635
Very High	BCR greater than or equal to 4	£ 22,540	<=£5,635

Low Growth

- 3.7.7 The Low Growth sensitivity test assesses the impact of a reduced number of forecast motor vehicle trips in the SATURN forecast mode.
- 3.7.8 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would still offer High Value for Money in a Low Growth scenario with a BCR of 3.244.

High Growth

- 3.7.9 The High Growth sensitivity test assesses the impact of an increased number of forecast motor vehicle trips in the SATURN forecast model.
- 3.7.10 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money in a High Growth scenario with a BCR of 5.047.
- 3.7.11 Usually a more significant increase in benefits would be expected from the High growth scenario, due to the increased forecast traffic and associated increase in delay. The small increase in benefits estimated here most likely arises from the additional traffic being restricted from entering the study area (and thus experiencing the improvements) due to issues in the wider network.
- 3.7.12 Interrogation of the High growth model reveals such delays at Junction 5, along Eastfield Road, and at the junction of Fengate / Boongate. Improvements to these areas are within the scope of the University Access Study, and the level of certainty around these is not great enough for them to be included within this project. However, these issues offer an explanation as to why the High growth scenario is not achieving it's full potential.

Local COBALT Accident Rates

- 3.7.13 The Local COBALT Accident Rates sensitivity test assesses the impact on the PVB of using local accident rates rather than the default values provided in COBALT.
- 3.7.14 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 4.464 when local accident values are used in the economic assessment.

Low Active Travel Uptake

- 3.7.15 The Low Active Travel Uptake sensitivity test assesses the impact of reducing the number of new active travel users assumed in the Active Mode Appraisal Toolkit.
- 3.7.16 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 4.729 should the actual uptake in active travel be less than forecast in core scenario.

High Active Travel Uptake

- 3.7.17 The High Active Travel Update sensitivity test assesses the impact of increasing the number of new active travel users assumed in the Active Model Appraisal Toolkit.
- 3.7.18 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 5.177 should the actual uptake in active travel be greater than forecast in core scenario.

Reduced AMAT Appraisal Periods

- 3.7.19 The Reduced AMAT Appraisal Periods sensitivity test assesses the impact of reducing the number of years included in the AMAT assessments, reflecting reduced longevity of the scheme.
- 3.7.20 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 4.710 should the AMAT appraisal period be reduced.

Increased AMAT Appraisal Periods

- 3.7.21 The Increased AMAT Appraisal Periods sensitivity test assesses the impact of increasing the number of years included in the AMAT assessments, reflecting increased longevity of the scheme.
- 3.7.22 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 5.169 should the AMAT appraisal period be increased.

Low Environment Values

- 3.7.23 The Low Environment Values sensitivity test assesses the impact of reducing the estimated NPV of Air Quality benefits.
- 3.7.24 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 4.907 should the values associated with air quality reduce.

High Environment Values

- 3.7.25 The High Environment Values sensitivity test assesses the impact of increasing the estimated NPV of Air Quality benefits.
- 3.7.26 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 5.072 should the values associated with air quality increase.

Reduced PM Peak Annualisation

- 3.7.27 The Reduced PM Peak Annualisation sensitivity test assesses the impact of reducing the annualisation factor applied to the PM Peak transport user benefits.
- 3.7.28 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer High Value for Money with a BCR of 3.611 should the PM Peak delay not occur over the expected time period.

Absent Developer Scheme Scenario

- 3.7.29 Another Sensitivity test was undertaken on the core scenario transport user benefits to determine how the transport user benefits are affected should the developer-led scheme at Oxney Road / Edgerley Drain Road be undelivered. The scheme currently involves converting the Oxney Road / Edgerley Drain Road T-Junction into a roundabout.
- 3.7.30 The location of the developer-led scheme, as well as the proposed development accesses, are shown in Figure 3.1 below.

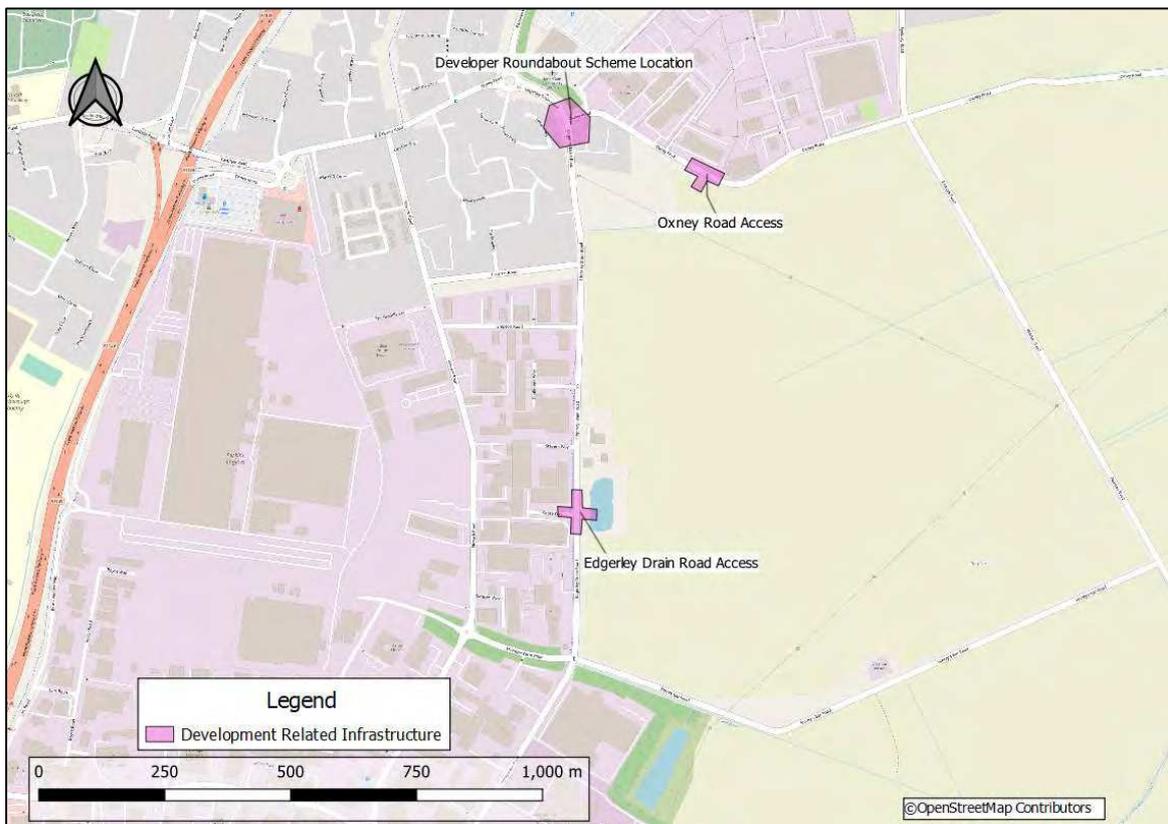


Figure 3.1: Development Related Infrastructure Changes

- 3.7.31 The Do-Minimum and Do-Something scheme were re-run with the Oxney Road / Edgerley Drain Road improvements missing. These results were then fed into TUBA and COBALT programmes as per the core assessment.
- 3.7.32 The resultant Transport User PVB is £39,203,940 and the resultant accident savings PVB is £1,827,600. The PVB indicated by this test is greater than that of the core scenario, so there is no risk to the benefits of the scheme if the developer led scheme does not come forward. This would result in a BCR of 8.614, which falls into the Very High Value for Money category.

Sensitivity Test Summary

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

Table 3.14: Sensitivity Test Summary

Sensitivity Test	PVB (£,000)	PVC (£,000)	NPV (£,000)	BCR	VfM
Core	22,540	4,551	17,989	4.95	Very High
Low Growth	14,763	4,551	10,212	3.24	High
High Growth	22,969	4,551	18,418	5.05	Very High
Local Accident Values (COBALT)	20,316	4,551	15,765	4.46	Very High
Low Active Travel Uptake	21,523	4,551	16,972	4.73	Very High
High Active Travel Uptake	23,563	4,551	19,012	5.18	Very High
Reduced AMAT Appraisal Period	21,435	4,551	16,884	4.71	Very High
Increased AMAT Appraisal Period	23,525	4,551	18,974	5.17	Very High
Low Environment Values	22,332	4,551	17,781	4.91	Very High
High Environment Values	23,081	4,551	18,530	5.07	Very High
Reduced PM Peak Appraisal Period	16,432	4,551	15,765	3.61	High
Absent Developer Scheme	39,204	4,551	34,653	8.61	Very High

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

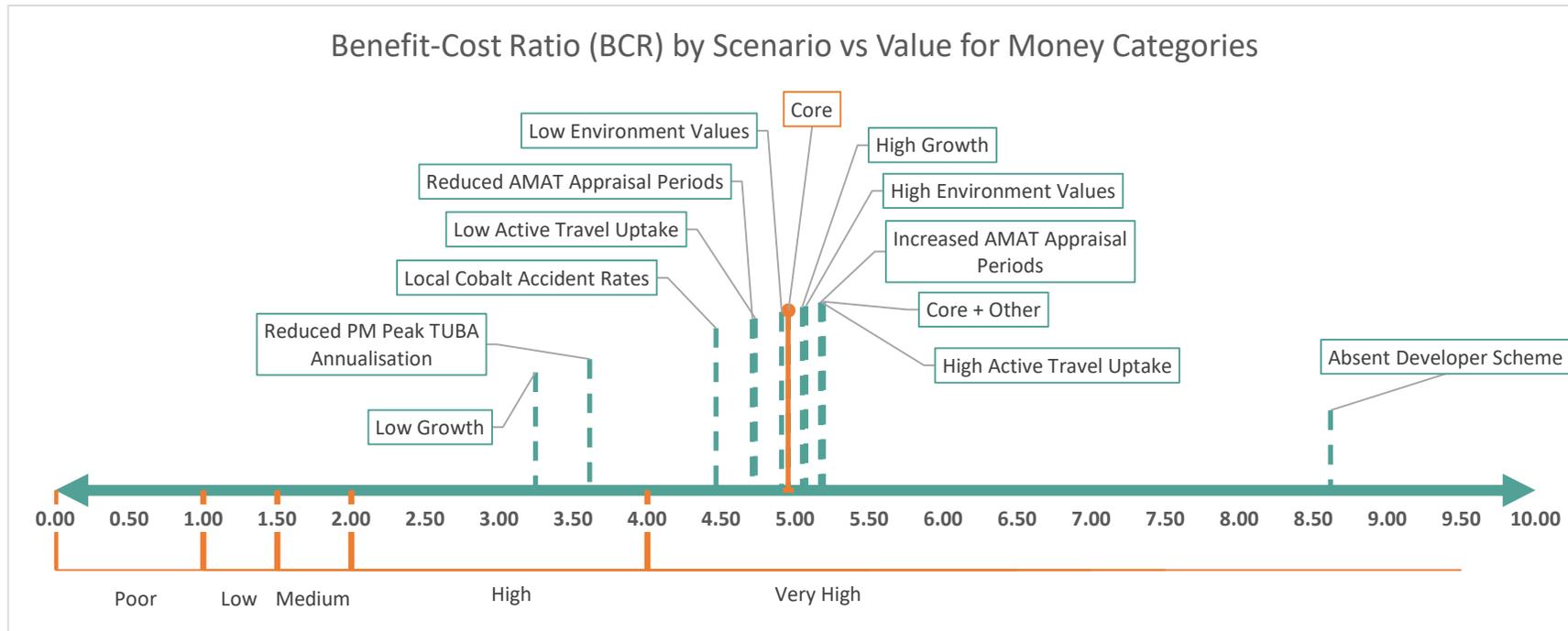


Figure 3.2: Sensitivity Test BCR Ranges

3.8 Distributional Impacts

- 3.8.1 The quantitative distributional impacts of the package have been considered to understand the variance of transport user benefits across social groups using grading outlined in TAG Unit A4.2 Distributional Impact Appraisal.
- 3.8.2 The transport user benefits have been assessed against the Income Deprivation domain from the latest English Indices of Multiple Deprivation (IMD 2019), as shown in Table 3.15 below.

Table 3.15: Distributional Impact Appraisal

Distributional Assessment	Most deprived areas ← → Least deprived areas				
	0%-20%	20%-40%	40%-60%	60%-80%	80%-100%
Total Benefits (£,000s)	5,403	2,984	2,036	2,501	679
Share of User Benefits	40%	22%	15%	18%	5%
Population	59,233	45,540	35,836	32,873	10,972
Share of Population	32%	25%	19%	18%	6%
Assessment	✓ ✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓

- 3.8.3 The assessment shows that all IMD 2019 quintiles benefit from the intervention and there are no net disbenefits. The 0% to 20% IMD quintiles would receive the greatest proportion (40%) of the transport user benefits for the greatest proportion of the Peterborough population (32%) and are therefore better off in relative terms.
- 3.8.4 This assessment demonstrates that the scheme supports the Levelling up agenda by generating the greatest proportion of benefits to the most deprived areas of Peterborough.

3.9 Additional Qualitative Assessments

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

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

Landscape Impacts

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

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

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

Townscape Impacts

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

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

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

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

Historic Environment Impacts

- 3.9.10 The Fengate Access Improvement schemes have been assessed as having a Neutral impact on the Historic Environment following completion of an appraisal for each of the five schemes.
- 3.9.11 The Storey's Bar Road scheme presents the greatest risk of adverse effects considering the proximity to the Flag Fen Bronze Centre Scheduled Monument site. However, a hydrogeological assessment has been undertaken in consultation with Historic England which concluded the proposed scheme would have insignificant impacts on this receptor.
- 3.9.12 Previous archaeological investigations in the area have revealed significant remains of local and regional importance, but the PCC Archaeologist has already been consulted and adequate mitigation has been specified.
- 3.9.13 The risk of encountering and damaging archaeological remains is further reduced by considering the scale of modern development within the vicinity and scope of the proposed works in terms of land take and depth of excavation.

Biodiversity Impacts

- 3.9.14 The Fengate Access Study Improvement Schemes have been assessed as having a neutral impact on Biodiversity following completion of an appraisal for each of the five schemes.
- 3.9.15 Each site is located more than 1km away from designated sites with no connectivity identified and the scope of works limiting any potential for indirect impacts linked to discharges, emissions, noise and lighting.
- 3.9.16 Potential protected species which may be encountered include nesting birds, water voles and bats. A majority of the proposed works are confined to areas of existing hardstanding and initial surveys have been undertaken with further pre-works check planned to enable suitable mitigation measures to be implemented.
- 3.9.17 One of the primary objectives of the Fengate Access Study Improvement Schemes is to achieve a 20% enhancement in Biodiversity. This is not possible to achieve within the footprint of the scheme due to land constraints, however engagement is underway with the relevant stakeholders at PCC to determine how best to achieve the 20% enhancement, and this will be agreed ahead of construction and reported on in the one-year post scheme monitoring report.
- 3.9.18 Where it is not possible to provide biodiversity enhancements within the footprint of a scheme, PCC's preferred course of action is to identify a nearby site/s (within several kilometres) where the improvements can instead be made. The current engagement with PCC's environmental stakeholders is to identify suitable sites close to Fengate.

Water Environment Impacts

- 3.9.19 The Fengate Access Study Improvement Schemes have been assessed as having a neutral impact on the Water Environment following completion of an appraisal for each of the five schemes.
- 3.9.20 The Water Environment includes environmental resources such as rivers / canals, floodplains, groundwater, sea and estuaries, and stillwater (lakes and ponds).
- 3.9.21 Most of the scheme footprints are located above an aquifer which has high vulnerability to pollutants. However, the proposed works are relatively confined to shallower strata meaning there are very limited pathways for significant impacts to occur, especially when further mitigation measures which will be implemented throughout the Construction Environment Management Plan (CEMP) are considered.
- 3.9.22 Although there is potential for existing watercourses to be impacted, these are generally artificial drains with low geomorphological value. Existing water quality within nearby surface water features is generally poor based on current status. Nonetheless, pollution prevention measures have been incorporated into the design from an operational perspective and will be implemented through the CEMP during the construction phase.
- 3.9.23 Storey's Bar road presents the highest risk from a flooding perspective, but the design has incorporated flood mitigation measures. The additional areas of hardstanding have been assessed as having an insignificant impact on flooding at this location and there is an existing attenuation feature locally.
- 3.9.24 All other schemes are outside Flood Zones 2 and 3.

3.10 Summary of Benefits and Costs

- 3.10.1 The Fengate Access Improvement Scheme has a Present Value of Cost of £4,587,000 and a Present Value of Benefit of £22,539,000 resulting in a Net Present Value of £17,952,940 and a BCR of **4.91**, offering **Very High Value for Money**.
- 3.10.2 Sensitivity testing has demonstrated that the Fengate Access Improvement Schemes would still offer at least High Value for Money in multiple sensitivity test scenarios, which demonstrates that the scheme's value for money is robust.

4. The Financial Dimension

4.1 Introduction

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

4.2 Scheme Costing

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

4.2.2 The schemes have been target costed through the Peterborough Highway Services (PHS) contract based on the design pack, construction schedule and full bill of quantities. The estimates include a risk allowance based on a Quantified Risk Assessment (QRA) and inflation, as well as non construction related costs associated with scheme delivery, such as project management, land and legal costs. The scheme cost estimates were prepared between May and October 2022.

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

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

Table 4.1: Key Activity Timeline

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

4.2.5 Note that the CPCA authorised the early release of construction funding for the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes, along with the costs required to undertake preparatory works relating to statutory undertakers diversions for all schemes. The purpose of this was to bring the as much of the Transforming Cities Funding (TCF) spend as possible into the 2022 / 23 financial year to reduce the amount of construction required in the 2023 / 24 financial year, thereby reducing the risk of scheme delays jeopardising the availability of approved funding as TCF funding is time limited and must be spent by the end of the 2023 / 24 Financial Year.

4.2.6 The decision to release a portion of the scheme construction costs early was supported by a value for money assessment undertaken in August 2022. The purpose of this assessment was to

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

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

4.3 Scheme Cost Estimates

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

Table 4.2: Financial Dimension Scheme Cost Estimates

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

- 4.3.2 Note that the costs calculated for use within the Economic Assessment are presented in the Economic Dimension (Chapter 3).
- 4.3.3 A full 60-year schedule showing how the costs have been calculated is presented in Appendix G.

Base Investment Cost

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

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

Table 4.3: Base Investment Cost (2022 Prices)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Total Base Investment Cost (£)
2022	390,689		61,400	19,385	471,474
2023	3,606,198		700,415	138,477	4,445,090
2024	683,336		135,919	11,330	830,584
2025				25,000	25,000
2026					
2027					
Total	4,680,223		897,733	194,192	5,772,149

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

4.3.7 The Supervision costs include site supervision during mobilisation, construction, and demobilisation, as well as environmental and archaeological monitoring throughout the programme.

4.3.8 The 'Other' costs refer to procurement and Project Management fees and include a value of £25,000 in 2025 for post scheme monitoring which is due to be undertaken at one, and five year intervals following completion of the schemes in 2024. Further details of the post scheme monitoring are provided in the Monitoring and Evaluation Plan detailed in the Management Dimension (Chapter 6).

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

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

Scheme		Construction	Supervision	Land	Design	Other	Scheme Total
1	Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction	£ 2,505,564.87	£ 377,673.88	£ -	£ 58,500.00	£ 96,541.69	£ 3,038,280.45
2	Junction 7	£ 1,024,972.42	£ 143,635.14	£ -	£ 43,500.00	£ 40,968.54	£ 1,253,076.10
3	Oxney Road / Newark Road Junction	£ 368,306.98	£ 56,124.62	£ -	£ 33,500.00	£ 17,911.60	£ 475,843.19
4	Newark Road Footpath	£ 293,366.97	£ 49,152.39	£ -	£ 30,500.00	£ 15,963.97	£ 388,983.33
5	Oxney Road Pedestrian Crossing	£ 488,011.85	£ 73,647.36	£ -	£ 31,500.00	£ 22,806.40	£ 615,965.61
Total		£ 4,680,223.10	£ 700,233.39	£ -	£ 197,500.00	£ 194,192.19	£ 5,772,148.68

Risk Adjusted Base Cost

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

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

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

Table 4.5: Risk Adjusted Base Cost (2022 Prices)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Risk Allowance (£)	Risk Adjusted Base Cost (£)
2022	390,689		61,400	19,385	79,292	550,766
2023	3,606,198		700,415	138,477	761,686	5,206,776
2024	683,336		135,919	11,330	177,370	1,007,954
2025				25,000		25,000
2026						
2027						
Total	4,680,223		897,733	194,192	1,018,348	6,790,497

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

Table 4.6: Risk Allocation by Scheme (2022 Prices)

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

Inflated Risk Adjusted Cost (Outturn Cost)

- 4.3.13 The Inflated Risk Adjusted Cost, or Outturn Cost, is the Risk Adjusted Base Cost with construction inflation applied.
- 4.3.14 This construction industry inflation has been calculated using forecast indices from the BCIS General Civil Engineering Cost Index (October 2022). An inflation rate of 10% has been used for calculating the Inflated Risk Adjusted Base Cost for the years 2022 – 2024, and then a reduced rate of 5%²³ has been applied to all costs incurred from 2025 onwards (applying to maintenance costs in the Economic Assessment).
- 4.3.15 Inflation has been applied in line with the profile shown in the Management Dimension (Chapter 6) and the cost of this is presented in Table 4.7 below.

Table 4.7: Inflation Increases on Construction Costs (2023 – 25)

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

- 4.3.16 The cost of inflation is £740,497 which is accrued between 2023 and 2025, by when all investment costs have been incurred. The application of inflation brings the Scheme Outturn Cost to £7,531,120. The Outturn Cost represents the amount required by PCC to deliver the scheme.
- 4.3.17 Note that £865,424 of the Outturn Cost was approved for release at the CPCA Board Meeting on October 19th 2022²⁴, and therefore Peterborough City Council request the balance of £6,665,696 subject to the approval of this FBC.

²³ [Turner & Townsend raises inflation forecast to 8.5% \(theconstructionindex.co.uk\)](https://www.theconstructionindex.co.uk)

Inflated Risk Adjusted Cost Including Whole Life Costs

- 4.3.18 Maintenance costs have also been calculated within the 60-year assessment period taking account of inflation. Maintenance costs have been applied from 2034 onwards (ten years after construction completion) which is considered the point at which meaningful maintenance measures would be required.
- 4.3.19 Maintenance costs have been included for the introduction of a traffic signals at the Oxney Road Pedestrian Crossing as this is additional infrastructure which represents an increased maintenance burden.
- 4.3.20 A maintenance cost of £25,000 each fifteen years has been assumed based on recent traffic signal maintenance costs. These costs have been applied from 2034 onwards.
- 4.3.21 Note that no other maintenance allowance has been included. The rationale for this is set out in Table 4.8 overleaf.

Table 4.8: Application of Maintenance Costs by Scheme

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

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

Table 4.9: Calculation of Whole Life Maintenance Costs

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

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

Table 4.10: Inflated Risk Adjusted Cost Including Whole Life Costs

Inflated Risk Adjusted Cost Including Whole Life Costs	Calendar Years of Cost	Cost (£)
Risk Adjusted Base Cost with Construction Industry Inflation (Outturn Cost)	2022 - 2025	7,531,120
Inflated Whole Life Costs	2026 - 2085	845,846
Inflated Risk Adjusted Cost Including Whole Life Costs	2022 - 2085	8,376,966

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

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

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

4.4 Budgets and Funding Cover

Funding Cover

4.4.1 The CPCA have an infrastructure delivery budget of £20 million per year, allocated for the next 30 years. This funding is held within the CPCA's Single Investment Fund and is invested to boost growth within the region. This funding pot is then supplemented by further capital budgets.

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

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

4.4.3 The TCF funding is time limited, and construction must begin in the 2022 / 2023 financial year and be complete by the of the 2023 / 2024 financial year (31st March 2024) to satisfy the funding requirements. The construction programme for the Fengate Access Study Improvement Schemes has been developed to fit within this timeframe.

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

5. The Commercial Dimension

5.1 Introduction

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

5.2 Output Based Specification

5.2.1 Delivery of the scheme will produce the following outputs:

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

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

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

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

Objective 1: Tackle congestion and reduce delay.

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

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

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

Objective 3: Protect the local environment and improve biodiversity.

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

Objective 4: Improve Road Safety.

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

Objective 5: Improved Active Travel Provision with Fengate.

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

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

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

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

5.3 Procurement Strategy

- 5.3.1 Delivery and supervision of the Fengate Access Improvement Schemes will be delivered in house by Peterborough Highway Services (PHS), building upon the development and design work that has been undertaken to date.
- 5.3.2 PHS is a ten-year NEC3 Term Service Contract between Peterborough City Council and Milestone Infrastructure, with responsibility for improving and maintaining Peterborough's highway network. The collaboration began in 2013 and runs until 2028.
- 5.3.3 The contract is built upon a collaborative and multi-disciplined team capable of developing schemes from policy concept right through to design and construction, and then maintaining them.
- 5.3.4 The existing subcontractor supply chain is appropriate for undertaking the work associated with the Fengate Access Improvement Schemes, which will be delivered within the contract's lifespan (before 2028).
- 5.3.5 Procuring the scheme directly through the PHS contract enables PCC to appoint a contractor to construct the scheme (Milestone Infrastructure) in an efficient manner. Using PHS' in-house delivery capability offers the following benefits over alternative procurement routes:
- PHS is reliable and has a **proven track record** of delivering major schemes successfully, and this serves as a positive indicator of future performance.
 - The scheme can be procured **far quicker** than would be the case with alternative procurement routes. As well as reducing the procurement costs for the procuring authority, the project benefits will be realised sooner.
 - The integrated delivery model creates a **single point of responsibility** and encourages more **effective collaboration** between client, designer, and contractor to reduce costs. As the scheme has been identified, planned, and designed within PHS, continuity can be assured through to construction, and any issues identified on site can be quickly resolved by the design team.
 - A well-established supply chain is already in place which provides **Value for Money**. All subcontract packages will be competitively tendered to ensure best value and will be put to a minimum of three tenderers where possible.
 - Strong performance is **highly incentivised** as all schemes delivered within the PHS contract contribute to a suite of KPIs which impacts on the term of the contract. Consistent good performance is rewarded with contract term extensions whereas consistently poor performance would see a reduction in the contract term.
 - The contract duration and **strong collaborative relationship** encourages both parties to work towards long term gain rather than short term commercial gain.

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

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

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

5.4 Market Maturity

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

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

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

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

5.5 Sourcing Options

- 5.5.1 The scheme will be delivered by PHS, who will use local sub-contractors to assist with delivery of the scheme various improvements.
- 5.5.2 A pool of pre-qualified sub-contractors will be selected for delivery of the schemes, based on the following selection criteria:
- Technical Competence
 - Financial Health
 - Robustness of HSEQ Management and Risk Management Systems
 - Previous Performance
 - Ethical Standards
 - Collaborative Behaviours
 - Commitment to Inclusion
 - Diversity and Equality
 - Commitment to Community Investment and Social Value.
- 5.5.3 Supply chain partners are regularly reviewed through the undertaking of joint KPI performance reviews, to ensure that PHS has the right supply chain in place to provide healthy competition and delivery resilience for our forward pipeline of work.
- 5.5.4 For larger projects, such as this, individual packages of work are competitively tendered, and quotations are obtained from a minimum of 3 sub-contractors. These quotations are then subjected to a structured tender adjudication with a balanced assessment including, but not limited to, cost, programme, quality, experience and performance to inform selection.
- 5.5.5 Sub-contracts are let on a NEC Framework contract and individual packages of work awarded under Task Orders, with the use of sub-contractors must be approved prior to appointment.
- 5.5.6 This process has been used on a number of CPCA funded major transport projects over recent years in Peterborough and has enabled schemes to be delivered successfully and to a high standard. Crucially, management and supervision of the construction works by PHS staff will provide consistency with earlier phases of the project as the Major Projects team (responsible for construction) have been actively involved in the project since the Preliminary Design phase and fully understand the scheme objectives and required outputs.
- 5.5.7 PHS recently used this procurement model in Spring 2022 to procure a range of contractors to deliver the CPCA funded Junction 15 Improvement Scheme in Peterborough. The procurement exercise successfully secured the services of twelve different contractors including civils, traffic management, street lighting and piling specialists. A full list of these is provided in Appendix K.

5.6 Contract and Payment Mechanisms

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

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

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

- Option A (Schedule of Rates) will be used for design and planning activities (such as designer support during construction)
- Option C (Target Cost) will be used for construction of the scheme. This incentivises both parties (PCC and Milestone Infrastructure) to work together to reduce cost through a pain / gain mechanism, which is tapered to ensure that neither party experiences excessive pain nor gain.

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

5.7 Pricing Framework / Charging Mechanisms

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

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

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

5.8 Risk Allocation and Management

- 5.8.1 Because the PHS contract is already established there is limited opportunity to modify the allocation of risk, however the contract does include inherent features that encourage effective risk management and mitigation, such as:
- Each party is required to notify each other of any matter which could affect the cost, completion, progress or quality of the project through Early Warning Notices. This is to promote early intervention which could reduce the impact of any potential risk
 - In the case of Option C (Target Price) both parties are incentivised to reduced cost through the pain / gain mechanism.
- 5.8.2 The above will also be supplemented with good project management practices during the delivery of the scheme. Both parties will maintain a shared Risk Register which will be reviewed regularly at project progress meetings. Further details on the management of risk are provided in the Management Dimension.
- 5.8.3 Detail about the allocation of project risk between the CPCA and PCC, and the responsibilities for managing this, can be found within Chapter 6 of the CPCA's Assurance Framework²⁵.
- 5.8.4 In summary, risk is allocated to the CPCA by default, but the CPCA reserve the right to reallocate this risk to PCC if the risk has not been managed appropriately. The signed Funding Agreement, and Project Initiation Document, will be used to determine whether PCC has managed the project risk appropriately, and therefore where the risk should be allocated.

5.9 Contract Length

- 5.9.1 The PHS contract runs until 2028 and has the relevant skills and competencies to deliver the Fengate Access Improvement Schemes, which will be fully completed within the lifespan of the contract.
- 5.9.2 The construction programme spans between November 2022 (advanced construction of the active travel schemes) through to March 2024. Construction of four of the five schemes in the package is expected to be complete by September 2023. Construction Programmes for the three schemes due to be built in the 2023 / 2024 financial year are included in Appendix J.

²⁵ <https://cambridgeshirepeterborough-ca.gov.uk/wp-content/uploads/documents/combined-authority-board/committee-papers-and-minutes/Cambridgeshire-and-Peterborough-Combined-Authority-Assurance-Frameworkv3final-002.pdf>

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

Table 5.1: Project Delivery Timescales

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

5.10 Contract Management

- 5.10.1 Development and delivery of the scheme has been monitored and managed to date through fortnightly project progress meetings consisting of the Project Team, and at Project Board meetings. The PHS Project Board meets on a monthly basis to discuss progress and matters relating to live and upcoming schemes.
- 5.10.2 A Project Manager has been appointed by PCC, to oversee the project and take responsibility for the delivery of the scheme. This individual has had consistent involvement in the project since the early phases of design, and will work closely with the delivery team during the construction of the scheme.
- 5.10.3 Governance between PCC and the CPCA is managed through progress meetings and monthly Highlight Reports in line with the CPCA's Assurance Framework. Further details of how PHS will manage the contract are set out within the Management Dimension (Chapter 6).

6. The Management Dimension

6.1 Introduction

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

6.2 Evidence of Similar Projects

- 6.2.1 Peterborough has a long history of significant growth spanning back to its designation as a New Town in 1967, and consequently the City is used to managing and delivering large highway infrastructure projects.
- 6.2.2 The Council, through PHS, has completed the following highway improvement schemes in recent years. These schemes are located at strategically sensitive locations and demonstrate PHS' ability to successfully manage and deliver highway schemes of this scale..

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

- 6.2.3 This scheme was constructed between summer 2016 and spring 2017 and involved fully 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 pinch point and to enable nearby housing growth.
- 6.2.4 Since completion, the scheme has met its objectives and reduced congestion and journey times at a crucial section of the network. It has also provided additional network capacity, enabling the developments of Norwood and Paston Reserve to be progressed.
- 6.2.5 Junction 20 is a major interchange on Peterborough's network, and at the time of construction up to 4,500 vehicles an hour passed through it. With such a high traffic demand, the careful planning and implementation of the traffic management required to construct the scheme was crucial. Close collaboration between all delivery partners meant that this was achieved with limited disruption to the highway network.
- 6.2.6 The Junction 20 scheme was completed on time and within the £5.7m budget. Funding for the scheme was secured from the Greater Cambridgeshire and Greater Peterborough Local Enterprise Partnership.



Figure 6.1: Junction 20 Improvement (Post Scheme)

A605 / B1095 Junction Improvement Scheme - £2.2m

- 6.2.7 This scheme was constructed between September 2020 and July 2021 with the objective of alleviating traffic delays on the A605 for traffic exiting the south-east of Peterborough, towards Pondersbridge. The total cost of the scheme was £2.2m.
- 6.2.8 The scheme successfully delivered improvements to the existing T-junction. The improvements involved widening an existing bridge with a 4 metre wide, 12.4 meter span extension to the south, and installation of a 66 metre retaining wall. Care was taken to keep traffic management delays to a minimum, with the A605 bridge and junction only closed during the carriageway surfacing at the end of the project. The construction also had to work around and with major utility diversions concerning the “shelling” of a high pressure gas main plus 600m of BT apparatus diversions, and all operations were carried out at the height of the COVID-19 pandemic with appropriate working practices.
- 6.2.9 Innovations in this project included the use of SmartRaft VRS foundations, removing the requirement for deep excavation around the gas main, a one-way traffic management system, which allowed the junction to remain open during construction, and an agreed joint construction programme and shared welfare facilities developed with Cadent Gas to prevent compromising the critical path of the project.



Figure 6.2: A605 / B1095 Junction improvement scheme

Staniland Way Junction Improvement - £0.5m

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



Figure 6.3: Staniland Way Junction Improvement

Active Travel Schemes – Various

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

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



Figure 6.4: Haddon Cycleway Improvement

6.3 Programme / Project Dependencies

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

- **Red Brick Farm Development Programme:** Design and delivery of the package of schemes should be coordinated with the development proposals for the Red Brick Farm site to ensure that any highway improvement works do not hold back the planned growth, and creation of employment opportunities, in Fengate or cause unacceptable disruption to the network.
- **Programme Constraints:** The construction programme will need to carefully consider any other infrastructure works that may be underway on the highway network during the same period. The programme will be planned to avoid works that may compound the disruption caused to road users because of the Fengate schemes, although this will be limited through the careful planning of traffic management arrangements.
- **Construction Disruption:** The Council have significant recent experience of undertaking maintenance and delivering improvements on its highway network and is proficient in mitigating the impact of this.
- **Utility Diversions:** Initial stats searches have identified some utilities within the area of the proposed scheme that will be impacted by the works. The design has taken account of these utilities, and any necessary diversions have been included within the scheme cost estimates and Risk Register. Early engagement with the relevant utility companies began during the Detailed Design phase to ensure that these diversions are factored into the construction programme to mitigate any delay to the delivery of the scheme.

6.4 Governance, Organisational Structures and Roles

- 6.4.1 The CPCA are the organisation ultimately responsible for the delivery of the Fengate Access Study, and PCC are nominated as the delivery partner.
- 6.4.2 Delivery of the scheme to date has been managed by the PCC Project Manager and wider Project Team, consisting of key project delivery partners. The Project Team have been responsible for the daily running of the project, coordinating with all key stakeholders, and managing the delivery programme.
- 6.4.3 The existing PHS Project Board will be used to oversee the continued development and delivery of the scheme by the Project Team, and to make key decisions relating to the delivery of the project. The Project Board will be supported by technical specialists, and key stakeholders will be invited to attend as necessary.

Project Management Team

- 6.4.4 The Project Management Team will report to the Project Board, and ultimately to the CPCA Board.
- 6.4.5 The Project Team have been responsible for the day-to-day management of the scheme and the coordination of inputs from technical advisors responsible for the delivery of key work streams within an agreed programme, including:
- Stakeholder Engagement
 - Design Development
 - Transport Modelling
 - Environmental Assessment
 - Business Case Development
 - Scheme delivery.
- 6.4.6 The key roles and lines of accountability for the development and delivery of the scheme are shown beneath in Figure 6.5.
- 6.4.7 The team has successfully developed and delivered multiple highway schemes around Peterborough since the beginning of the contract in 2013, including several CPCA schemes. PHS has been responsible for all planning and design work undertaken on the Fengate Schemes to date. All skills and competencies to deliver this scheme are available within the local PHS contract.



Figure 6.5: Key Project Roles and Responsibility

6.5 Programme / Project Reporting

- 6.5.1 The Project Manager is responsible for reporting project performance against the project objectives and key milestones, using established finance and programme management tools such as Verto, with updates reported on a regular basis to the Project Board.
- 6.5.2 Every month the Project Manager will also submit a Highlight Report alongside Finance Management Reports to the CPCA, recording what progress has been made and whether there are any new risks that could impact the scheme.
- 6.5.3 Financial progress will be reported to the PHS Dashboard, which monitors the progress of work delivered through the PHS contract, and approval for any key decisions is made by the Project Board.
- 6.5.4 Regular Project Progress Meetings have been held throughout the duration of the scheme, to allow key staff to discuss important issues that could affect the delivery of the scheme. Delivery of the scheme through the PHS Framework contract ensures that all stages of work are conducted in-house, ensuring a smooth transition of information and communication between the different delivery teams.

6.6 Programme / Project Plan

6.6.1 Key project milestones for progressing scheme delivery are outlined in Table 6.1 beneath:

Table 6.1:Key Project Milestones

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

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

6.7 Assurance and Approvals

- 6.7.1 The project has been managed by The Council in line with their existing assurance and approvals process. The daily running of the project has been under the responsibility of the Project Manager, and any approvals required have been provided by the Project Board.
- 6.7.2 The Cambridgeshire and Peterborough Combined Authority Assurance Framework sets out the fundamental principles in relation to the use and administration of the Cambridgeshire and Peterborough Investment and outlines a culture underpinned by processes, practices and procedures. The Assurance Framework sits alongside a number of other Cambridgeshire and Peterborough Combined Authority documents including the Constitution and Devolution Deal.
- 6.7.3 Further to the above, the Combined Authority has developed the 10 Point Guide which outlines project management governance requirements which should be followed throughout the life cycle of the project. It details the requirements at project initiation including, establishing a Project Board with the Combined Authority and delivery partners. The purpose of the Project Board is to provide oversight to the project, ensure appropriate governance, risk management and to provide assurance in accordance with the scope, budget and programme. The Project Board should be attended by the Combined Authority's head of Transport and Transport Programme Manager, PCC's Project Manager and by the Group Manager for Highways and Transport. The Project Board should also establish a RACI chart, a copy of the RACI template is in the Combined Authority's 10 Point Guide.
- 6.7.4 Technical Assurance has also been provided by the CPCA's Assurance Framework, with each stage of the project being reviewed by the CPCA's independent technical reviewer. Once the independent technical reviewer is satisfied, a recommendation is made to the CPCA Board to approve funding for further stages of the project, including construction.

6.8 Communications and Stakeholder Management

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

Project Liaison Officer

- 6.8.2 A designated Project Liaison Officer (PLO) was assigned to the scheme throughout the public consultation period and will continue to be available during construction. The PLO will act as a single point of contact for outgoing and incoming communication and will be attached to the scheme delivery team. The PLO will contact residents and stakeholders via letter several months ahead of construction to provide final details on the scheme and the construction delivery programme, creating a two way communication channel between the scheme delivery team and residents and stakeholders.
- 6.8.3 The PLO will also be responsible for providing regular updates via email and social media and will be the first point of contact for queries, suggestions and complaints, and will coordinate responses to members of the public and key stakeholders when these queries are received.

Stakeholders

- 6.8.4 The stakeholders include:
- CPCA as the Local Transport Authority and funding body for the scheme.
 - The Council as the Local Highway Authority.
 - Natural England, as the organisation responsible for conserving, enhancing, and managing the natural environment.
 - Environment Agency as the public body responsible for protecting and improving the environment.
 - Statutory Undertakers, including Anglia Water, Utilities and Telecommunications Companies, who have infrastructure within the vicinity of the proposed schemes.
 - The North Level District Internal Drainage Board (IDB) as the organisation responsible for managing water levels.
 - Businesses and residents situated in Fengate that are within the vicinity of the scheme / s including the developers for the Red Brick Farm site.
- 6.8.5 Stakeholder consultations were undertaken by the Project Team following approval of the SOBC and at the time of the Public Consultation (February 2021 – March 2021). All stakeholders were consulted via email or letter for comments on the Preferred scheme prior to the completion of Detailed Design.
- 6.8.6 Communication with key stakeholders has been maintained throughout the project and there has been no adverse response to the scheme presented. Stakeholder discussions have predominantly focused on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme, and specifically it's interaction with the Red Brick Farm site and nearby drainage infrastructure.

Public Consultation

- 6.8.7 Public consultation on the concept of a scheme at Fengate was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan²⁶ that was adopted in January 2020. This consultation made residents aware that Fengate had been identified as a location for improvements. It should be noted that no details on the form of the scheme were provided at the time of the consultation, and that no objections relating to the principle of improvements were received.
- 6.8.8 A further round of public consultation took place between February and March 2021 using the concept designs. No comments were received relating the scheme designs themselves, however some feedback was received regarding the poor level of pedestrian infrastructure currently within Fengate. Two additional schemes were included in the package of works to address this (further information is provided in Section 2.16 of the Strategic Case).

6.9 Risk Management Strategy

- 6.9.1 A Risk Register was produced during project initiation to identify potential risks and to evaluate factors that could have a detrimental effect on the project.
- 6.9.2 The Risk Register has been a live document throughout the project and has been used to identify and catalogue any potential risks, consider the impact they may have, the likelihood of them occurring and the measures that can be taken to provide mitigation.
- 6.9.3 The Risk Register has been reviewed regularly during progress meetings, with updates reported to the CPCA through the monthly Highlight Reports. A copy of the Risk Register has been provided within Appendix A.
- 6.9.4 In addition to the project Risk Register a construction Risk Register has been produced (also included in Appendix A). This Risk Register is also a live document and will be regularly updated throughout the construction period.

²⁶ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>

6.10 Scheme Evaluation

- 6.10.1 The Scheme Evaluation Plan for the Fengate Access Study is detailed in Appendix I. This has been prepared in line with the CPCA Assurance Framework and DfT guidance, and will follow 'standard monitoring'²⁷ principles.
- 6.10.2 The Scheme Evaluation Plan was prepared prior to construction and comprises of both the Benefits Realisation Plan and the Monitoring and Evaluation Plan to avoid any duplication of information.
- 6.10.3 The purpose of the Scheme Evaluation Plan is to determine whether the scheme has been delivered as planned and therefore justifies its investment. Where outcomes are seen to differ from those expected, data collected during the monitoring and evaluation phases will provide an evidence base that will assist in understanding the reasons for this and the lessons that can be learnt.

Benefits Realisation Plan

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

²⁷ [Major Scheme Business Cases: Evaluation Guidance for Local Authority Major Schemes \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/).

Table 6.2: Benefits Realisation Strategy

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Data Collection Method	Benefit Owners	Benefit Enablers
<p>Tackle congestion and improve journey time reliability: Tackle congestion at key pinch points across the Study Area and reduce delay in to the Fengate area.</p>	<ul style="list-style-type: none"> Traffic Signal Improvements at Junction 7 Creation of a mini roundabout at the junction of Oxney/Newark Road Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased operational efficiency of the road network Reduction in stationary / rolling traffic resulting in air quality improvement Increased attractiveness of the Fengate area 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Visitors to the City 	<ul style="list-style-type: none"> Desk study / site visits Survey footage review Journey time dataset for a month period 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance
<p>Support Peterborough's Growth Agenda and facilitate the development of Red Brick Farm site: Ensure that the planned employment growth at Red Brick Farm can be accommodated.</p>	<ul style="list-style-type: none"> Traffic Signal Improvements at Junction 7 Creation of a mini roundabout at the junction of Oxney/Newark Road Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Increased network capacity and operational efficiency Increased attractiveness of the Fengate area 	<ul style="list-style-type: none"> PCC in regard to fulfilment of the Local Plan Businesses in Fengate Residents / Local Community 	<ul style="list-style-type: none"> Desk Study of economic data provided by PCC Review of Local Plan goals for economic growth 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of Fengate businesses and wider City Area
<p>Protect the local environment and improve biodiversity: Ensure a 20% biodiversity net enhancement within the study area.</p>	<ul style="list-style-type: none"> Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Increased attractiveness of the Fengate area Achievement of 20% biodiversity net enhancement 	<ul style="list-style-type: none"> PCC / CPCA in regard to environment and biodiversity Businesses in Fengate area Residents / Local Community 	<ul style="list-style-type: none"> Desk Study analysis FBC calculation for carbon Analysis of key project documents by the schemes Project Board 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of Fengate businesses and wider City Area Biodiversity Net Enhancement Calculation Air quality monitoring
<p>Improve Road Safety: Reduce personal injury accidents and improve personal security amongst all travellers.</p>	<ul style="list-style-type: none"> Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout Improvements to Newark Road footpath Traffic Signal Improvements at Junction 7 Creation of a mini roundabout at the junction of Oxney/Newark Road 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Increased operational efficiency of the Fengate network Fewer casualties Fewer accidents involving rear end shunts on main approaches 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Bus Operators 	<ul style="list-style-type: none"> Desk study / site visits Collated data from 12-hour manual classified counts Survey footage review Journey time dataset for a month period 	CPCA / PCC	<ul style="list-style-type: none"> Monitoring of network performance Completion of the schemes including walking and cycling elements Road safety audit Monitoring / investigation of accidents
<p>Improve Active Travel Provision with Fengate: Improve active travel provision with the Fengate Access Study area.</p>	<ul style="list-style-type: none"> Improvements to Newark Road footpath Creation of a mini roundabout at the junction of Oxney/Newark Road Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout 	<ul style="list-style-type: none"> Fewer accidents involving rear end shunts on main approaches Reduced peak hour congestion for journeys leading to more reliable journey times Increased attractiveness of the Fengate area 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Visitors to the City Active Mode users Fengate business users 	<ul style="list-style-type: none"> Desk study / site visits Survey footage review 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes including walking and cycling elements Road safety audit Monitoring / investigation of accidents
<p>Positively impact traffic conditions on the wider network: Positively impact the performance of local routes impacted by the traffic and congestion in and around Fengate</p>	<ul style="list-style-type: none"> Traffic Signal Improvements at Junction 7 Creation of a mini roundabout at the junction of Oxney/Newark Road Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Reduced stationary / queuing traffic 	<ul style="list-style-type: none"> Commuters / Business trips Local residents / wider community PCC / CPCA in regard to air quality control and policy goals 	<ul style="list-style-type: none"> Desk study / site visits Collated data from 12-hour manual classified counts Journey time dataset for a month period 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance
<p>Reduce Severance for Active Travel Users: Reduce severance caused to active travel users by the road network</p>	<ul style="list-style-type: none"> Improvements to Newark Road footpath Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Fewer accidents involving rear end shunts on main approaches 	<ul style="list-style-type: none"> Commuters Local residents Visitors to the City 	<ul style="list-style-type: none"> Desk study / site visits Survey footage review Journey time dataset for a month period 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance
<p>Upgrade Junction 7: Upgrade the junction to overcome maintenance and safety concerns with the current asset.</p>	<ul style="list-style-type: none"> Traffic Signal Improvements at Junction 7 Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Increased attractiveness of the Fengate area 	<ul style="list-style-type: none"> Commuters Local residents Visitors to the City Bus Operators 	<ul style="list-style-type: none"> Desk study / site visits Analysis of key project documents by the schemes Project Board Survey footage review 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance

Monitoring and Evaluation Delivery

6.10.5 The monitoring and evaluation of the Fengate Access Study Improvement Schemes will be completed at the following stages:

- Pre-construction and during delivery (monitoring)
 - Baseline data is 2019 surveys, limited surveys / assessments to be undertaken in 2023 before scheme construction commences.
 - Data to monitor scheme delivery will be collected during construction
- One-year after (Monitoring and Evaluation)
 - Data to monitor scheme performance will be collected at least one year (but less than two years) after scheme opening.
 - An initial “One Year After” report will be published within two years of scheme opening, focusing on the scheme’s outcomes
- Five-years after (Monitoring and Evaluation)
 - Further data will be collected up to approximately five years after scheme opening
 - A final “Five Years After” report will be published within six years of scheme opening, based on analysis of all the data available, including an assessment of the wider impacts of the scheme

6.10.6 Based on the above stages, the monitoring and evaluation timescales for the Fengate Access Study Improvement Schemes are as follows:

Table 6.3: Monitoring and Evaluation Timescales

Monitoring Activity	Timescale
Prior to scheme build (Baseline)	2019
During Construction	2023
Scheme Opening	2024
One year post scheme opening	2025
Five years post scheme opening	2029

- 6.10.7 Table 6.4 overleaf summaries the monitoring and evaluation approach for the Fengate Access Study Improvement Schemes, detailing how the objectives will be measured, the data sources to be collected and the timescales for when monitoring and evaluation of the scheme will be reported.
- 6.10.8 Full details of the Monitoring and Evaluation Plan are provided in Appendix I.

Table 6.4: Monitoring Summary

	Measure	Measure of Success	Data Source	Data Collection / Reporting Programme			Ownership	Indicative Cost Estimate
				Baseline	Delivery	Post Completion		
Inputs-	Scheme Costs	CPCA Funding	CPCA Funding submission Final Scheme Cost Data	Planned	October 2022 – January 2023	-	CPCA / PCC	-
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Inspection On-Site	December 2022	November 2022 – March 2024	2025	CPCA / PCC	£1,500
Objectives	Outcomes							
1 / 4 / 5 / 8	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage	October 2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
		Enhanced Network Performance for Public Transport, namely for the Citi 4 and 37 Service	Local Bus Company Punctuality Data	2019 / 2022	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
		New Infrastructure for Sustainable Modes	Site Inspection / Usage Data	2021 / 2022	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
		Reduce the number of accidents at Junction 7 and Edgerley Drain Road / Storey's Bar Road Junction	Peterborough Database of Road Traffic Records	Dataset 2015 - 2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
4 / 5 / 6 / 7	Travel Demand	Enhanced Network Performance, Junction 7 and Edgerley Drain Road/Storey's Bar road/Vicarage Farm Road junction	Classified Turning Counts / Site Visits / Video Survey Footage	October 2019	-	April 2025 / April 2029	CPCA / PCC	£3,750 for count surveys and £500 for data analysis at both 1 year and 5-year reporting Total = £7,500
2 / 3	Impact on Economy	Employment Growth Ambitions in Fengate	PCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
3	Impact on the Local Environment	Ensure a Net Gain of Biodiversity across the Study Area	Biodiversity Calculation / Site Survey and Desk Based Assessment	October 2022	-	April 2025 / April 2029	CPCA / PCC	£1000 for site inspections and data analysis at both 1 year and 5-year reporting Total = £2,000
1 / 6	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / PCC Air Quality Monitoring Sites / Future traffic demand data	October 2022	-	April 2025 / April 2029	CPCA / PCC	£1000 data analysis at both 1 year and 5-year reporting Total = £2,000
Reporting	Year 1 reports summarising the outcomes of the monitoring and evaluation work			-	-	2025	CPCA / PCC	£3,000
	Year 5 report summarising local economic growth, scheme impacts and development figures prior and post opening of the scheme			-	-	2029	CPCA / PCC	£3,000
Total Monitoring and Evaluation Budget								£25,000

6.11 Scheme Logic Map

6.11.1 Based on the objectives set for the scheme, the evaluation process will measure outcomes relating to:

- Changes in traffic flow and journey time reliability, in the Fengate Access study area
- Changes in safety including the number and severity of road traffic accidents
- Monitoring whether environmental mitigation measures and improvements to biodiversity have been implemented as in the approved scheme design
- Whether increased capacity on the road network has supported Council growth aspirations
- Changes to the level of active travel provision within the Fengate Access study area.

6.11.2 The Logic Map in Figure 6.6 highlights the links between the context, inputs, outputs, outcomes and impacts of the scheme and gives a visual representation of the process by which the desired outcomes of the scheme objectives are to be achieved.

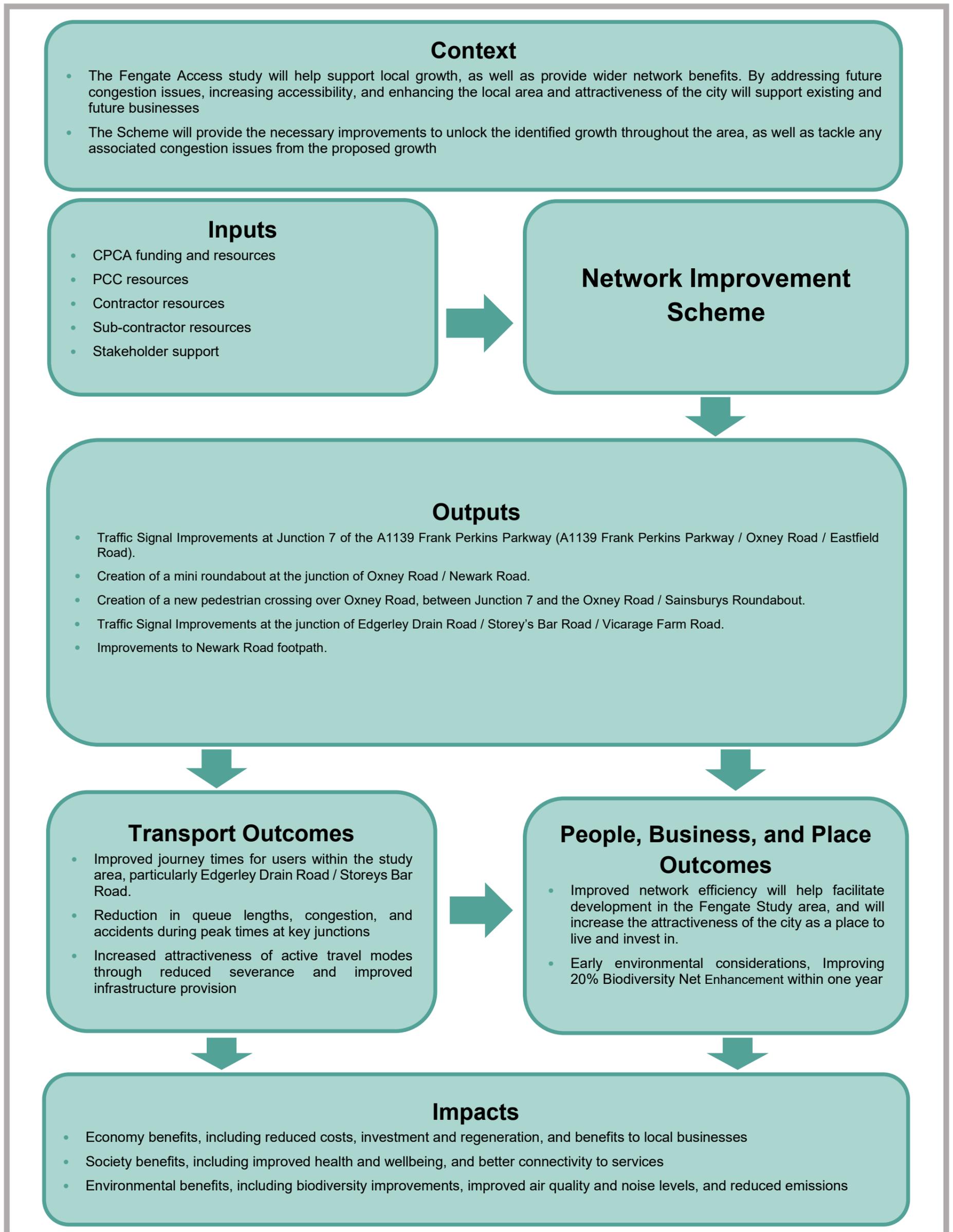


Figure 6.6: Fengate Access Study Logic Model

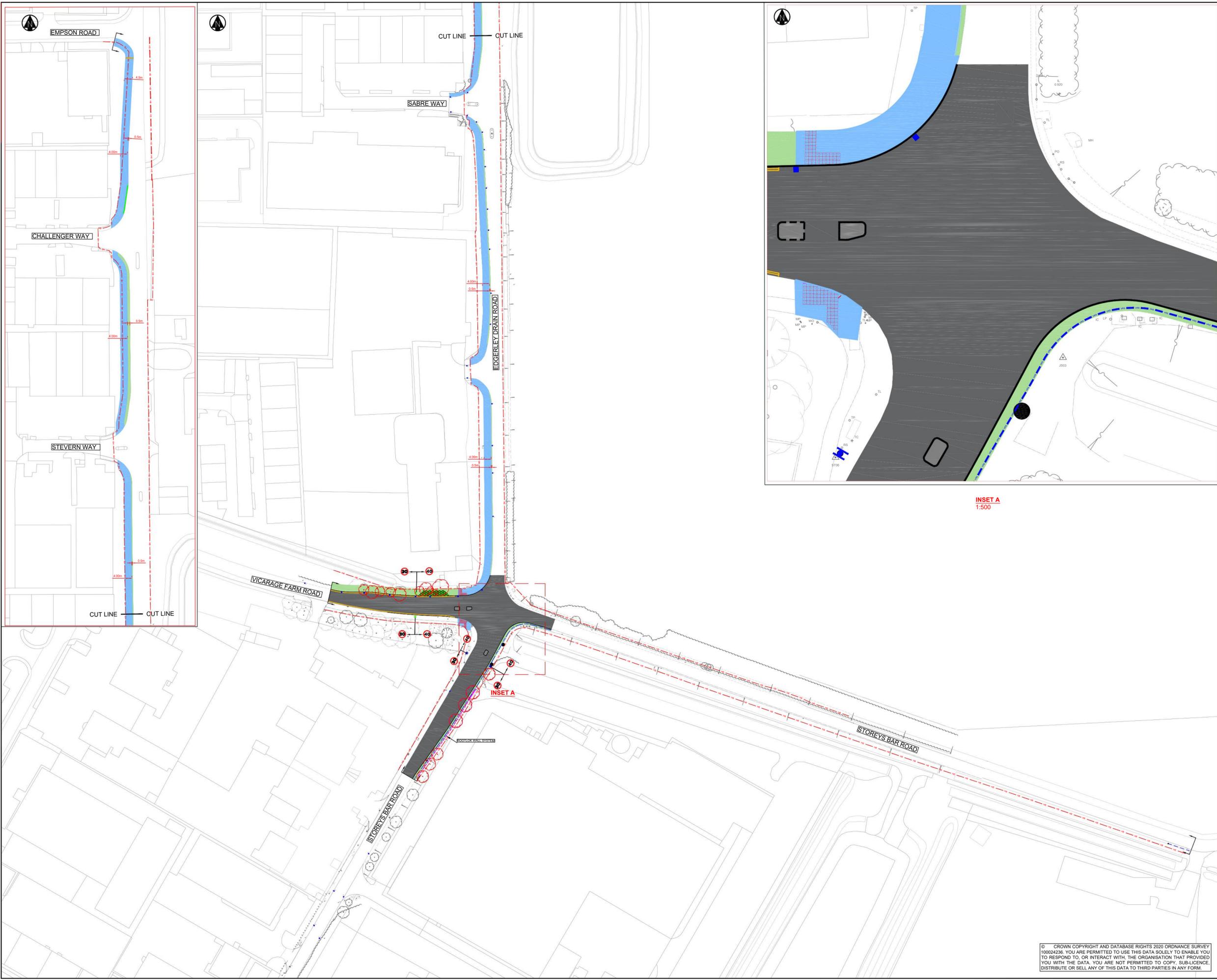
Appendices

Appendix A – Project and Construction Risk Registers

No:	Risk Description	Likelihood	Minimum Cost (£)	Most Likely Cost (£)	Maximum Cost (£)	Project Impact	Comments	Likelihood (%) x Most Likely Cost (£)	Mitigation	Risk Category	Owner
1	Public issues/Access issues	90%	£500	£1,000	£2,500	Operational	Risk with PCC, a Provision is made in Target against so that the there will be regular updates and meeting with public .	£ 900.00	Resident/ business letter drop & advanced warning sign displayed 2 weeks prior to starting.	High	Milestone/ PCC
2	Weather delays affecting operations	50%	£1,500	£3,000	£7,500	Operational	Risk with Client if weather is over 1 in 10- Normal 1 In 10 Weather conditions and related possible restrictions/ idle time and cancellations etc are allowed in this risk.	£ 1,500.00	Check forecasts, manage sites accordingly From weather. Possible stand-down allowed 5 shifts TM/ maintenance.	Low	Milestone/ PCC
3	Materials delivery issues	50%	£250	£1,000	£2,500	Operational	Sub-contractors to manage risk. Lost time TM & supervision/ welfare costs.	£ 500.00	Sub-contractors to manage risk. Alternative procurement options to be available.	Low	Milestone
4	Underground utilities and condition	95%	£1,200	£7,000	£14,000	Operational	Extensive underground utilities present.	£ 6,650.00	Provision of vacuum excavator.	High	Milestone
5	Take off errors	15%	£1,500	£3,000	£5,000	Operational		£ 450.00		Low	Milestone
6	Damages	60%	£200	£500	£5,000	Operational	Works location in close proximity to known high crime area.	£ 300.00	Plant/ materials to be stored securely and locked. CCTV/ security on site	High	Milestone
7	Price increase of materials - Steel and other construction materials	95%	£100	£150	£200	Operational	Inflation is a client risk	£ 142.50	EWN to be issued to client where material prices rise above that submitted in the TC.	High	PCC
8	No availability of materials- steel and other construction materials	70%	£100	£300	£1,000	Operational	Sub-contractors to manage risk.	£ 210.00	Sub-contractors to manage risk. Alternative procurement options to be available.	High	Milestone/ PCC
9	Traffic signal works are sourced by client - traffic signal works under Milestone TM and programme provision	30%	£750	£1,500	£3,750	Operational		£ 450.00	TM/ supervision costs for delays.	Medium	PCC
10	Welfare location, cost and its reinstatement	75%	£500	£750	£1,500	Operational		£ 562.50	Aragon to reinstate compound area	Low	Milestone
11	Overhead utilities	100%	£100	£200	£300	Operational	BT overhead cables within works area.	£ 200.00	Provision of signage/ blue cones	Low	Milestone
12	Hazardous substance during excavation - asphalt/ soil	60%	£700	£1,400	£7,000	Operational	Contaminated soil/ planings identified. Segregation & specialist disposal required	£ 840.00	Testing to be carried out prior to works starting.	Low	Milestone
13	DNO pot ends - TS equipment removal	60%	£900	£1,500	£2,400	Operational	Electrical disconnections not specified on the drawing.	£ 900.00	TBC before works start on site.	High	Milestone
14	Works adjacent to mature trees. Tree roots in excavation area.	50%	£1,200	£1,400	£7,000	Operational		£ 700.00	Provision of vacuum excavator.	High	Milestone
15	Works on bus route	100%	£2,500	£5,000	£10,000	Operational		£ 5,000.00	Restricted hours working	High	Milestone
								£ -			Milestone
	Total							£ 19,305.00			
											0

Risk Ref	Risk Title	Risk Information										Cause & Effect		Inherent Score			Risk Control		Residual Score		Action required			Risk cost		Target Score		Date Closed
		Date Identified	Risk type	Proximity	Risk Status	Risk Owner	Risk Lead	Latest Review Date	Last Reviewed By	Last Review Comments	Cause	Effect	Inherent Risk Score	Likelihood Score	Impact Score	Control (mitigation action)	Control Owner	Residual Risk Score	Action	Person responsible	Date to be implemented by	Cost of risk/control (€K)	Escalation Required?	Target Risk Score				
19	Projects funded by TCF funding are required to commence their construction by 31 March 2023. There is a risk that the Fengate project will likely be impacted by this.	Apr-22	Financial	Imminent	Open	Lewis Banks		Oct-22	Lewis Banks	Start construction of all TCF funded projects by March 2023	Risk of losing funding	9	1	5	A review will take place of all projects that are to be impacted by their spending requirement. Furthermore, clarification will be sought from the DfT whether funding deadline can be extended into 2023/24.	Lewis Banks	9	Not at the moment.				No	7					
21	Potential for redesign work to be undertaken on the Storey's Bar scheme of the Package.	Apr-22	External	Imminent	Open	Lewis Banks		Oct-22	Lewis Banks	Developers for Red Brick Farm have recently resubmitted their proposals for the site, which may alter future trips expected within the area.	Potential redesign work, delay to programme, increased cost etc.	10	5	2	Undertake sensitivity tests within AIMSUN with the new future trip proposals, to understand the impact on scheme design and package BCR should amendments to the scheme be needed.	Lewis Banks	6	Not at the moment.				No	6					
13	Land ownership issues Small amount of land is required for the Ederly Drain / Storey Bar scheme. Redline plans have been drawn up with proposed area required and sent to developers to aid this process."	Apr-21	Legal or Procurement	Close	Open	Lewis Banks		Oct-22	Lewis Banks	Very high risk if land is not required in time of construction that TCF funding will not be claimed as planned.	Land ownership "Delay to completion of detailed design. Risk of unknown stats that could impact scheme"	10	5	2	Mitigation is for designers, PCC planning to maintain strong communication with developers.	Lewis Banks	10	Not at the moment.				No	7					
24	Board Sept 2022 - advance TCF for walking and cycling	Aug-22	Financial	Close	Open	PCC/CPA		Oct-22	Emma White	Due to TCF deadlines of March 2024 request has been made to advance funding before completion of FBC to progress construction of active travel	De-risk programme and TCF spend	5	1	5	T and I Committee and CA board Sept 2022	Emma White	5					No	5					
20	Scheme construction cost may increase significantly following rise in inflation of raw materials.	Apr-22	Financial	Imminent	Open	Lewis Banks		Oct-22	Lewis Banks	Rise in inflation	More funding than previously identified would be required	2	1	2	This will be regularly monitored. One of the options considered could be to procure raw materials early.	Lewis Banks	2	Not at the moment.				No	2					
22	Challenges on biodiversity net gain being achieved within the study footprint due to limited opportunity for replanting etc. Consequence of this is that it replanting may have to be offset across the City area.	Apr-22	Planning or Environmental	Imminent	Open	Lewis Banks		Oct-22	Lewis Banks	Biodiversity Net Enhancement and limited land availability within the study footprint	Replanting may have to be outside the study footprint, in order to meet PCC/CA policy objectives for Major schemes.	6	3	2	Talks to be held with PCC / CA on this matter, for both parties to understand constraints within the study area, and what opportunities can be taken to best achieve net gain.	Lewis Banks	5	Not at the moment.				No	5					
14	Loss of trees during construction of scheme There is a risk that there may be some trees that will need removing for highway improvement works."	Jul-21	Planning or Environmental	Close	Open	Lewis Banks		Oct-22	Lewis Banks	Tree loss	Bad publicity	10	5	2	To mitigate with the loss of trees, additional trees will be planted as part of the scheme. This will be covered as part of the environmental assessment.	Lewis Banks	4	Not at the moment.				No	4					
18	Difficulty in achieving Biodiversity Net Gain objectives currently set for project.	Mar-22	Planning or Environmental	Approaching	Open	Lewis Banks		Oct-22	Lewis Banks	Biodiversity Net Gain	Risk of not meeting standards set by DEFRA.	3	1	3	PCC and Milestone will hold a meeting with CPCA to discuss this further. If Biodiversity Net Gain cannot be achieved there will still be a number of environmental enhancements delivered as part of this scheme.	Lewis Banks	3	Not at the moment.				No	3					
4	No signed grant agreement There is risk due to the uncertainty with the project may result in the grant agreement also being put on hold until agreement is reached with the developer."	Jul-19	External	Imminent	Open	Lewis Banks		Oct-22	Lewis Banks	Delay in sign off of grant agreement	No signed grant agreement	9	1	5	The CPCA will be informed with regular updates so when an agreement is reached a grant agreement can be issued.	Lewis Banks	3	Not at the moment.				No	3					
6	Delay to obtaining planning approval The developer is to submit a planning application which is scheduled to be reviewed at the Planning Committee meeting on June 2020. This decision will determine what changes will be required to the scope of the business case."	Feb-20	Strategic	Approaching	Closed	Lewis Banks		Oct-22	Lewis Banks	Delay to decision on scope of scheme	Unable to obtain sign off of SOBC and OAR Unable to request for approval to commence start of next stage - OBC"	20			The CPCA will be kept updated and will be informed of outcome. The SOBC will be completed with all options being considered and when the next stage will commence it is hoped a decision will have been made concerning the planning application. Therefore the OBC will be prepared looking at the aspects that would be delivered by PCC.	Lewis Banks	5					Yes (Programme)	5		Apr-21			
9	Consultation There is a risk that schemes identified may receive objections from local residents and stakeholders."	Feb-21	Political	Imminent	Closed	Lewis Banks		Oct-22	Lewis Banks	Public and stakeholder objections	Likely effect is that a delay would be caused to FBC and detailed design.	12			Early consultation/notification as deemed necessary by PCC. Develop publicity strategy and liaise with businesses/residents affected by the works and scheme mobilisation.	Lewis Banks	5					No	5		Apr-21			
2	Scheme on hold due to change There is a risk the scheme could be on hold for longer than expected due to not being able to come to an agreement with the developer on what highway schemes identified in the study could be funded/delivered by the developer."	Jul-19	External	Imminent	Closed	Lewis Banks		Oct-22	Lewis Banks	Not coming to an agreement with developer	Unable to make changes to current SOBC and OAR	10			The council will look to hold regular meetings with the developer in order to come to an agreement of which schemes they will deliver.	Lewis Banks	5					No	5		Aug-20			
7	Delay to start of the next stage Due to SOBC and OAR not being approved, the next stage cannot be started."	Jul-19	External	Imminent	Closed	Lewis Banks		Oct-22	Lewis Banks	Delay in obtaining approval to commence the next stage	"Unable to obtain sign off of SOBC and OAR Unable to request for approval to commence start of next stage."	10			Arrange for necessary processes to be in place so when approval is granted there is no further delay and the next stage can commence	Lewis Banks	5					Yes (Programme)	5		Dec-20			
16	Project to go on hold if additional funding not approved	Sep-21	External	Imminent	Closed	EW		Oct-22	Lewis Banks	Extra £150,000 needed to complete FBC	delay to tasks planned	7			PCC funding is close to being fully spent, additional funding from the CPCA is required to complete the FBC. Decision to be confirmed at the January CPCA Board meeting. Without this funding the project would have to go on hold.	Emma White	4					No	4		Feb-22			
1	Budget unlikely to be fully spent Due to the project being on hold longer than expected, it is unlikely the budget will be fully spent this year."	Jul-19	External	Imminent	Closed	Lewis Banks		Oct-22	Lewis Banks	Project progress on hold	"Unable to obtain sign off of SOBC and OAR Unable to request for approval to commence start of next stage - OBC"	7			When it is clear that the budget will not be fully spent then inform the relevant parties (Internal and CPCA) so that the necessary procedures are followed.	Lewis Banks	4					Yes (Programme)	4		Feb-21			
8	Delay to start of OBC Current supplier, Skanska is in the process of selling part of its business to M Group Services. This includes highway services. There is a possible risk that transfer of resource may result in delay of project delivery. The consequences of which could impact progress."	Jan-21	External	Imminent	Closed	Lewis Banks		Oct-22	Lewis Banks	Change of supplier	Likely effect is that a delay would be caused	7			Regular communication will be maintained and programme will be revised should there be a need.	Lewis Banks	3					No	3		May-21			
3	Changes to SOBC and OAR There is a risk that the study undertaken will need to be updated to reflect the changes proposed by the developer. The programme planned will need to be adjusted.	Jul-19	Internal	Close	Closed	Lewis Banks		Oct-22	Lewis Banks	Not coming to an agreement with developer	"Unable to obtain sign off of SOBC and OAR Unable to request for approval to commence start of next stage - OBC"	7			The Council Transport Planning team will hold regular progress meetings with the Skanska Project Team, so they are able to identify what the changes will be and include these in the project programme.	Lewis Banks	3					No	3		Sep-20			
12	Delay to completion of FBC Due to delay of developer led scheme, the FBC will be not completed as planned."	Mar-21	External	Close	Closed	Lewis Banks		Oct-22	Lewis Banks	Delay to developer planned works	"Delay to completion of FBC Delay to start of construction works"	8			The Project Team has been advised of a 9-month delay to the Developer programme, which will have a knock-on impact on the programme. The reprofiling of the programme is currently underway and will be submitted to CPCA for agreement. At present its likely that the FBC submission will be spring 2022 with construction anticipated to be Jun 2022 onwards.	Lewis Banks	4	Not at the moment.				No	4		Oct-22			
10	Delay to programme Delay to project programme resulting from slower developer programme. If the developers are further delayed on their side, there will be a knock-on impact for PHS in terms of construction."	Feb-21	External	Approaching	Closed	Lewis Banks		Oct-22	Lewis Banks	Delay to developer planned works	Delay to tasks planned	8			Mitigation is to have ongoing discussions with developers to understand their programme and any further delay.	Lewis Banks	4	Not at the moment.				No	4		Oct-22			
5	Coronavirus outbreak There is risk that with the rise of coronavirus cases that some of the staff working on the project may become infected and would have to self isolate."	Mar-20	Internal	Imminent	Closed	Lewis Banks		Oct-22	Lewis Banks	Delay to project	Likely effect is that a delay would be caused	10			Government guidance would be followed. Any member of staff or their family do become unwell, they would be recommended to work from home for a 10 day period/self isolate.	Lewis Banks	5	Not at the moment.				Yes	5		Mar-22			
11	Delay to detailed design Delay to programme resulting from slow return from STAT information which are provided by third parties."	Feb-21	External	Imminent	Closed	Lewis Banks		Oct-22	Lewis Banks	Delay to stat companies providing plans	"Delay to completion of detailed design. Risk of unknown stats that could impact scheme"	10			Mitigation is to continue to chase for information required.	Lewis Banks	5	Not at the moment.				No	5		Oct-22			
17	Review is needed to ensure all of the designs are to LTN/20 standards.	Feb-22	Legal or Procurement	Imminent	Closed	Lewis Banks		Oct-22	Lewis Banks	Compliance of scheme design with LTN 1/20	"Additional design costs Further changes maybe required to scheme in order to ensure compliance"	11			On-going discussions with the design team.	Lewis Banks	5	Not at the moment.				No	5		Dec-22			
15	Advance stat payments The number of stat diversions required for the individual schemes will result in significant C4 budget costs. "	Aug-21	Financial	Approaching	Closed	Lewis Banks		Oct-22	Lewis Banks	Stat costs	Delay to start of construction works	15			The construction budget will be used to cover the C4 stat payments. A request could be made to use part of the construction budget early in order to make advance payment to stat companies.	Lewis Banks	5	Not at the moment.				No	5		Oct-22			
23	J20-J8 Lane/Gain scheme to expensive Risk that due to the cost of the scheme it may be decided to not proceed with it as part of the package of schemes proposed for Fengate.	24-Jun	Financial	Approaching	Closed	Lewis Banks		Oct-22	Lewis Banks	Sensitivity testing has confirmed this to be removed. This removes the funding risk associated with the project, as the outturn cost is now expected to be within the funding secured (subject to TCF constraints)	Improvement works required are estimated to cost significantly more than the other schemes Additional budget required	15			Once all of the schemes planned for Fengate have been costed a decision will be made whether to include J20-J8 scheme or deliver it as a separate scheme if it cannot be covered within the budget available.	Lewis Banks	7	Not at the moment.				No	7		Jul-22			

Appendix B – General Arrangement Drawings



INSET A
1:500

- KEY**
- PROPOSED VERGE (WIDTH VARIES)
 - PROPOSED CARRIAGEWAY (SEE NOTE 4 a)
 - PROPOSED TRAFFIC ISLANDS
 - PROPOSED SHARED USE PATH
 - VEHICLE HARD STANDING
 - HB EXISTING INDICATIVE HIGHWAY BOUNDARY
 - PROPOSED SPEED LIMIT CHANGE (SEE NOTE 4e)
 - SCHEME EXTENTS
 - PROPOSED ROAD MARKINGS (SEE NOTE 4g)
 - PROPOSED TACTILE PAVING (SEE NOTE 4b)
 - ROOTLOK WALL SYSTEM WITH CLASS 61 STONE BACKFILL (SEE NOTE 4i)
 - PROPOSED VRS FENCING (SEE NOTE 4d)
 - WOODEN THREE POST FENCE
 - EXISTING TREE TO BE REMOVED (SEE NOTE 4n)
 - PROPOSED CORDUROY PAVING (SEE NOTE 4b)

- Notes:**
1. Do not scale from this drawing.
 2. Site verify all dimensions prior to construction
 3. Report all discrepancies to the Drawing Originator immediately
 4. This drawing is to be read in conjunction with all relevant documents and drawings.
- a) Pavement design; 5080845-MIL-HPV-SBR-DR-CH-0701
 - b) Proposed Kerbing; 5080845-MIL-HKF-SBR-DR-CH-1101
 - c) Proposed Drainage; 5080845-PCC-HDG-ZZ-DR-CH-0500
 - d) Proposed VRS; 5080845-MIL-HRR-SBR-DR-CH-400 & 402
 - e) Proposed Signs; 5080845-MIL-HSN-SBR-DR-CH-1251
 - f) Proposed Earthworks; 5080845-MIL-HEW-SBR-DR-CH-601
 - g) Proposed Road markings; 5080845-MIL-HMK-SBR-DR-CH-1201
 - 5080845-MIL-HMK-SBR-DR-CH-1201
 - h) Proposed Site Clearance; 5080845-PCC-HSC-DR-CH-0201
 - i) Estimate GE2734 Rev A

Rev	Date	Description	Drn	CHK'd	App
P03	21/10/22	REDUCED SCOPE DUE TO CPO	MU	CH	CH
P02	05/09/22	GW5 DETAILED DESIGN	CAT	CH	CH
P01	01/07/22	GW5 SAFETY AUDIT	CAT	MU	CH

Revisions

Drawing Originator



Drawing Status
GW5 DETAILED DESIGN

Project Name
**FENGATE ACCESS
STOREYS BAR ROAD**

Title
GENERAL ARRANGEMENT

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:1000	CAT	MU	CH
		Drawn Date	Checked Date	Approved Date
		01/07/22	01/07/22	01/07/22

Drawing Number	Status	Rev
5080845-MIL-HGN-SBR-DR-CH-0101	S2	P03

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KEY:

	CYCLE LANE (SEE NOTE 7)
	CARRIAGEWAY RESURFACING (SEE NOTE 5)
	ROAD MARKINGS (SEE NOTE 8)
	FOOTWAY OR CYCLE TRACK (SEE NOTE 7)
	REFUGE ISLAND (SEE NOTE 12)
	BLOCK PAVING (SEE NOTE 7)
	MAINTENANCE LAYBY (SEE NOTE 7)
	TOP SOILING & GRASS SEEDING (SEE NOTE 7)
	CORDUROY PAVING (SEE NOTE 7)
	TACTILE PAVING (SEE NOTE 7)

- NOTES:**
- DO NOT SCALE FROM THIS DRAWING.
 - SITE VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION
 - REPORT ALL DISCREPANCIES TO THE DRAWING ORIGINATOR IMMEDIATELY
 - FOR SITE CLEARANCE DETAIL REFER TO DRAWINGS: 5080601/PCC/HSC/DR/CH/200 & 201.
 - FOR PAVEMENT DETAIL REFER TO DRAWING: 5080601/PCC/HPV/DR/CH/0700.
 - FOR KERBING DETAIL REFER TO DRAWINGS: 5080601/PCC/HKF/DR/CH/1100 & 1101.
 - FOR FOOTWAYS, PAVED AREAS, LANDSCAPING, MAINTENANCE LAYBY AND DUCTING DETAIL REFER TO DRAWINGS: 5080601/PCC/HKF/DR/CH/1102-1105 & 1108.
 - FOR ROAD MARKINGS DETAIL REFER TO DRAWING: 5080601/PCC/HMK/DR/CH/1200.
 - TRAFFIC SIGNS NOT SHOWN FOR CLARITY, FOR DETAIL REFER TO DRAWING: 5080601/PCC/HSN/DR/CH/1201-1203.
 - TRAFFIC SIGNALS NOT SHOWN FOR CLARITY, FOR DETAIL REFER TO DRAWING: 17099-103B
 - STREET LIGHTING NOT SHOWN FOR CLARITY, FOR DETAIL REFER TO DRAWINGS 5080601-SKA-HLG-DR-EO-1301
 - FOR REFUGE ISLAND DETAIL REFER TO DRAWING: 5080601-PCC-HFE-J7-DR-CH-0300

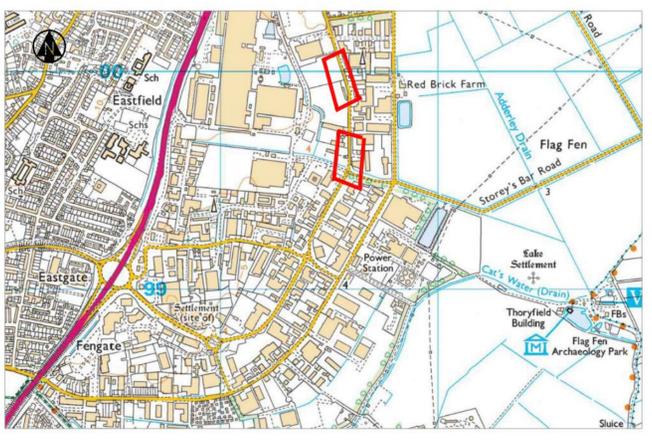
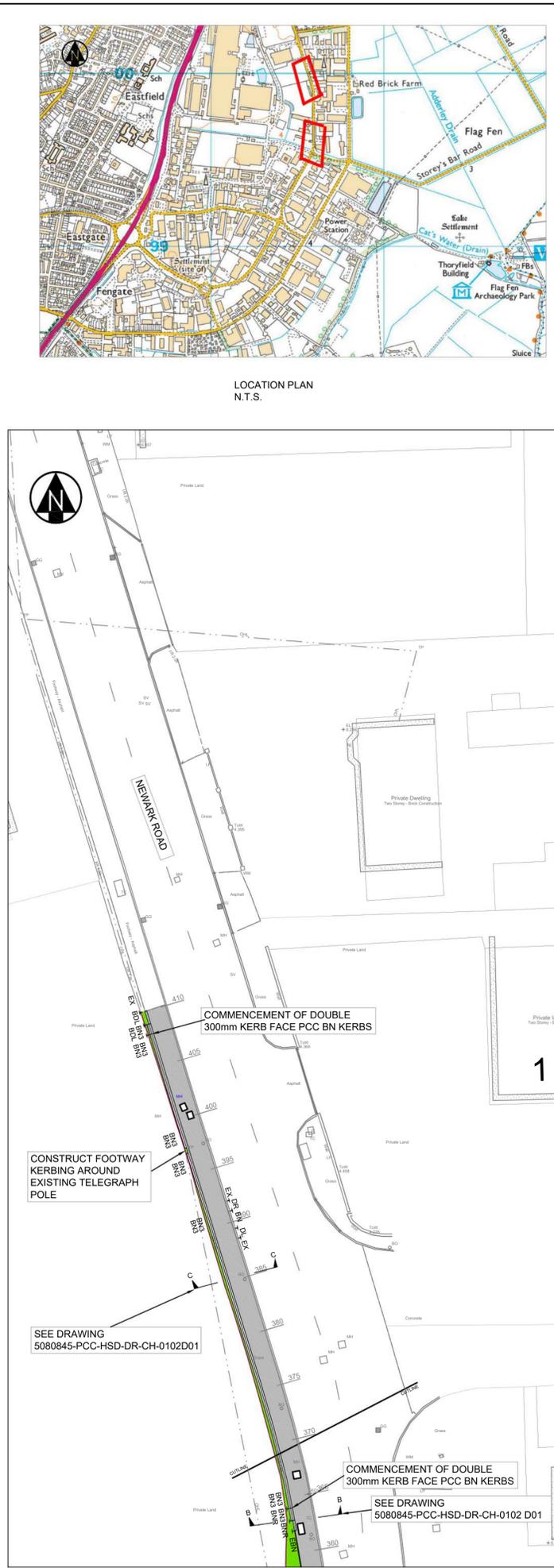
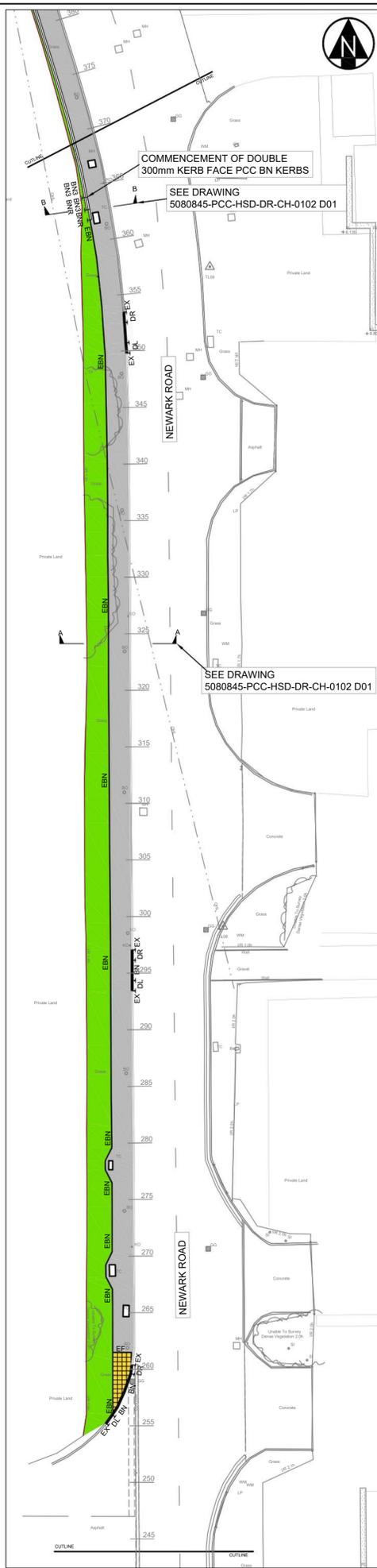
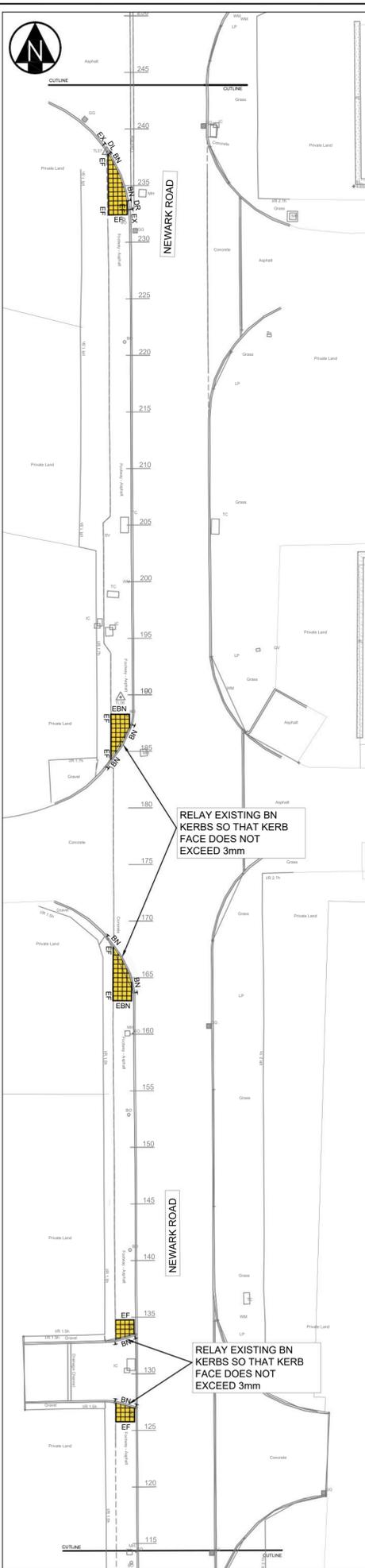
P02	10.11.22	General amendments	CAT	CH	
P01	26.02.21	First issue	PS	SM	
Rev		Date	Description	Dwn	Chkd
Revisions:					
Client:					

Peterborough Highway Services
 Delivered by

Drawing Status: Preliminary
 Project Name: Eastfield Road-Oxney Road Junction 7 Traffic Signal Refurbishment
 Title: Original drawing sheet is A1

General Arrangement

Scale	Drawn by PS	Checked by SM	Approved by SM
1 : 250	Drawn Date 25/02/21	Checked Date 26/02/21	Approved Date 26/02/21
Drawing Number: 5080601-PCC-HGN-J7-CH-0100-D1			Revision: P02



LOCATION PLAN
N.T.S.

- NOTES:**
- DO NOT SCALE FROM THIS DRAWING.
 - REPORT ALL DISCREPANCIES TO THE DRAWING ORIGINATOR IMMEDIATELY
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTS AND DRAWINGS. ALL APPROACH LANES ARE 3.2m WIDE.
 - KEY**
- HB2 Half battered kerb with 125mm upstand.
 - BN Bullnose dropped kerb with 0 to 3mm upstand.
 - BN3 PCC 300mm Kerfaced BN kerb
 - BN L/R PCC 300mm Kerfaced BN dropped kerb
 - DL Half battered left hand drop kerb.
 - DR Half battered right hand drop kerb.
 - EF Flat topped PCC edging.
 - EBN Bull nosed topped PCC edging
- EXISTING LIGHTING COLUMN INCLUDING BRACKET ARM AND LUMINAIRE TO REMAIN
 - PROPOSED 8m GALVANISED STEEL LIGHTING COLUMN WITH PLANTED ROOT 0.5M OUTREACH BRACKET FITTED WITH LUMINAIRE AND TELENZA TELECELL FROM ADJACENT EXISTING COLUMN BEING REMOVED - **1No.**
 - PROPOSED 10m GALVANISED STEEL LIGHTING COLUMN WITH PLANTED ROOT 0.5M OUTREACH BRACKET FITTED WITH LUMINAIRE AND TELENZA TELECELL FROM ADJACENT EXISTING COLUMN BEING REMOVED - **2No.**
- 473.5m² FOOTWAY - FULL DEPTH CONSTRUCTION (CLAUSE 18.10)**
SEE DRAWING 5080845-PCC-HSD-02-CH-01001-D01 FOR CONSTRUCTION DETAIL AND DEPTHS.
 - 25m² CARRIAGEWAY RESURFACING**
PLANE OUT TO A DEPTH OF 30mm EXISTING SURFACING AND REPLACE WITH 30mm THK SMA 6 SURF 100/150 (PROPRIETARY DRIVEWAY/INDUSTRIAL MIX TO CLAUSE 18.5.1 OF THE PERCS
 - ROOT PROTECTION ZONE - BELOW TREE CANOPY HAND DIG ONLY
 - REPROFILE VERGE 150mm OF TOPSOIL AND GRASS SEED
 - BUFF COLOURED TEGULA BLOCKS 80mm (h) x 200mm (l) x 100mm, ON A 30mm COMPACTED SAND LAYING BED.
 - 25m² FOOTWAY - TACTILE PAVING**
 - SURFACE COURSE 65mm THICK 400x400 BUFF COLOURED FIBRE REINFORCED BLISTER TACTILE PAVING SLABS TO BS EN 1339: 2003
 - BEDDING COURSE 35mm THICK MORTAR OR EQUIVALENT TO BE USED TO BED TACTILE PAVING
 - BINDER COURSE - LOWER LAYERS TO MATCH ADJOINING FOOTWAY CONSTRUCTION
 - SUB-BASE - LOWER LAYERS TO MATCH ADJOINING FOOTWAY CONSTRUCTION

Rev	Date	Description	Dm	Chkd	App
C02	07/11/22	FOR INFORMATION	CAT		
C01	26/08/21	FOR CONSTRUCTION	CAT	RB	RB

Revisions

Drawing Originator



Drawing Status
FOR CONSTRUCTION

Project Name
NEWARK ROAD FOOTWAY

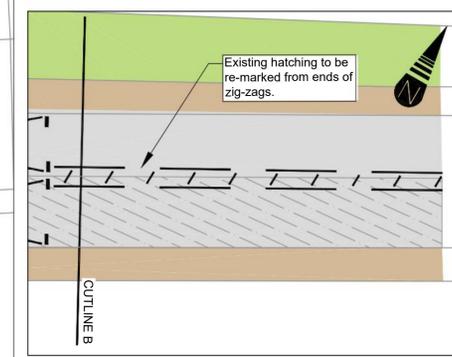
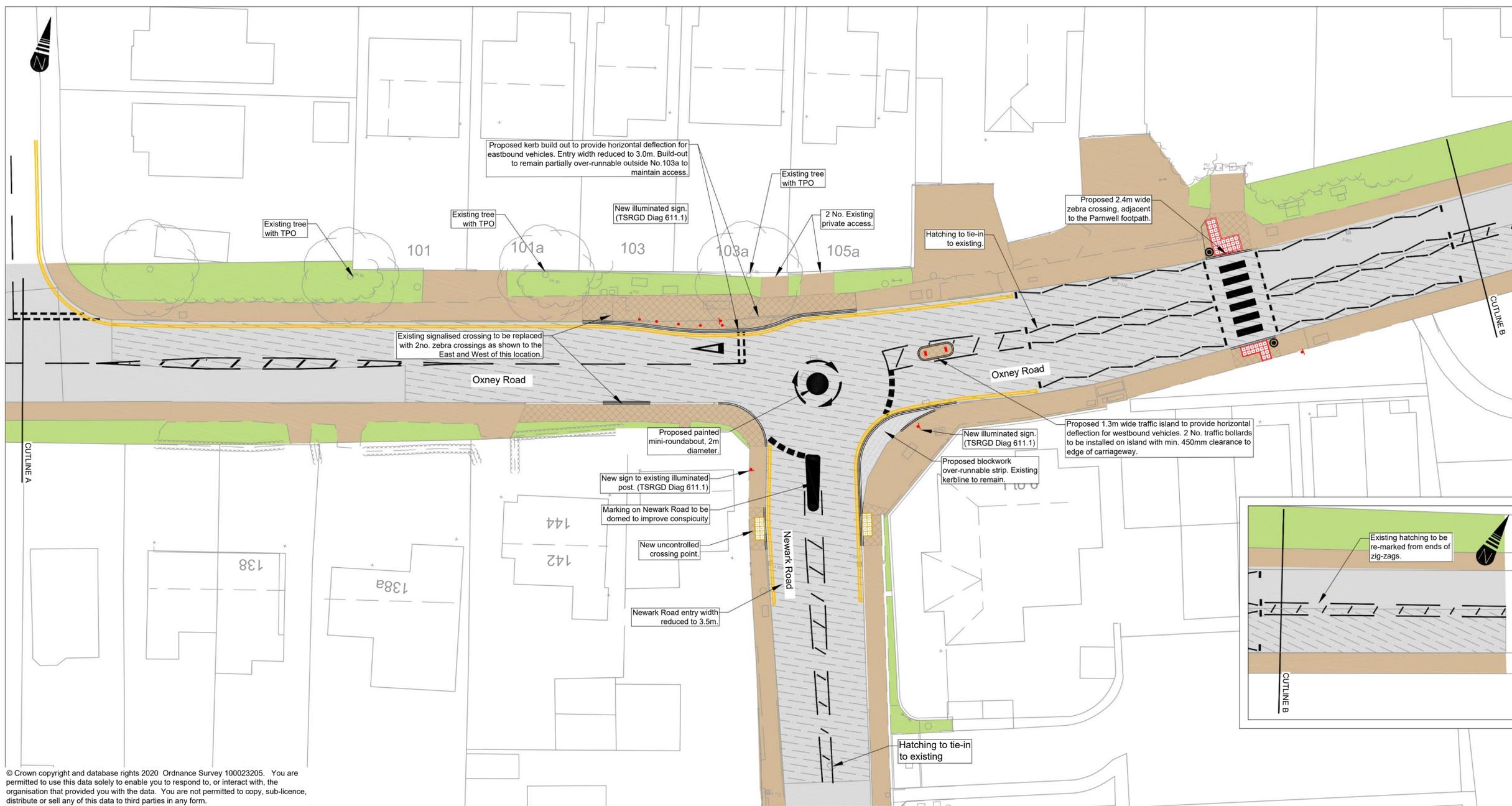
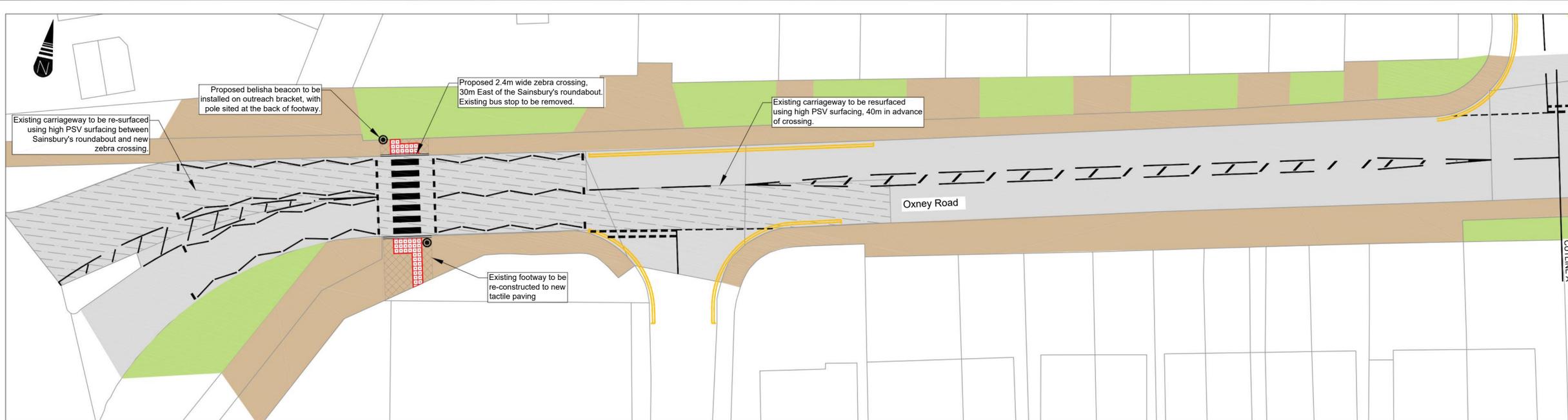
Title

PAVEMENT AND KERB DESIGN

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:2500	CAT	RB	RB
		Drawn Date	Checked Date	Approved Date
		11.02.2021	25.05.2021	25.05.2021

Drawing Number	Status	Rev
5080845-PCC-02-HGEN-DR-CH-0101	FI	C02

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- Notes:
1. Do not scale from this drawing.
 2. Site verify all dimensions prior to construction
 3. Report all discrepancies to the Drawing Originator immediately
 4. This drawing is to be read in conjunction with all relevant documents and drawings

- Key:
- Footway to remain as existing
 - Footway to be re-surfaced
 - Carriageway to remain as existing
 - Carriageway to be re-surfaced
 - Existing Verge
 - Blockwork over-rideable strip
 - Proposed traffic sign
 - Glasdon Hazardmaster reflective marker post (or other similar approved).
 - Belisha Beacon

Residual Risk Assessment
 Wherever possible, risk is designed-out of this proposal during the design process. Where this is not possible the risk is indicated by this symbol. 
SIGNIFICANT CDM HEALTH & SAFETY RISKS

1. Significant underground services

CO1	08/2021	First Issue	STE	RLB	AE
Rev	Date	Description	Dm	Chkd	App
Revisions					

Drawing Originator

Peterborough Highway Services
 Delivered by


Drawing Status
DETAILED DESIGN

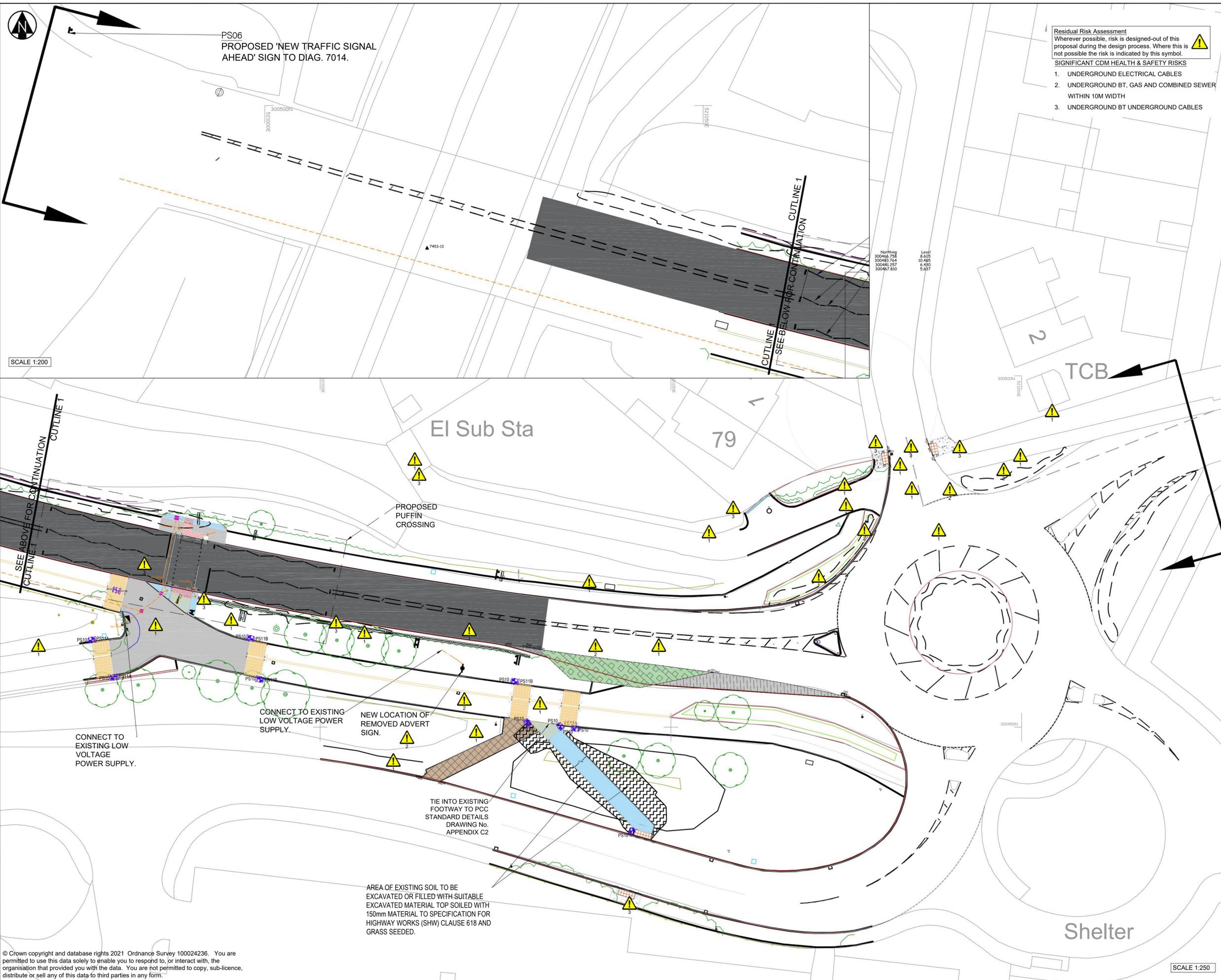
Project Name
**FENGATE ACCESS
 NEWARK ROAD & OXNEY ROAD JUNCTION**

Title
**GENERAL ARRANGEMENT
 (SHEET 1 OF 1)**

Sheet Size A1	Scale 1:200	Drawn by STE	Checked by RLB	Approved by AE
		Drawn Date 00-00-00	Checked Date 08/2021	Approved Date 08/2021

Drawing Number	Status	Rev
5080845-MIN-HGN-OR-DR-CH-0102	S2	C01

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SCALE 1:200

SCALE 1:250

Residual Risk Assessment
Wherever possible, risk is designed-out of this proposal during the design process. Where this is not possible the risk is indicated by this symbol.

SIGNIFICANT CDM HEALTH & SAFETY RISKS

1. UNDERGROUND ELECTRICAL CABLES
2. UNDERGROUND BT, GAS AND COMBINED SEWER WITHIN 10M WIDTH
3. UNDERGROUND BT UNDERGROUND CABLES

- Notes:
1. Do not scale from this drawing.
 2. Site verify all dimensions prior to construction
 3. Report all discrepancies to the Drawing Originator immediately
 4. This drawing is to be read in conjunction Utility Drawing 5080845-PH-VUT-ZZ-DR-CH-0101.dwg
- KEY:
- BUFF-COLOURED TACTILE PAVING
 - RED-COLOURED TACTILE PAVING
 - BUFF COLORED THICK LADDER PATTERN TACTILE PAVING
 - BUFF COLOURED TRAMLINE PATTERN TACTILE PAVING
 - BN1 BULLNOSE KERBS INSTALLED AS DROPPED KERB
 - BN2 BULLNOSE KERBS INSTALLED AS FULL HEIGHT KERB. KERB FACE TO MATCH EXISTING.
 - DL DROPPED KERB LEFT HAND
 - DR DROPPER KERB RIGHT HAND
 - EF KERB EDGING
 - HB2 HALF-BATTERED KERBS
 - SP1 SPLAY KERBS
 - TR1 SPLAY TO HALF-BATTERED PROFILE TRANSITION KERBS
 - PROPOSED GRASSCRETE CELLULAR GRASS PAVING OR SIMILAR
 - PROPOSED GRASS SEED TO REPLACE EXISTING PAVEMENT
 - PLANE 40MM AND INLAY WITH WITH NEW ASPHALT.
 - BREAK UP EXISTING FOOTWAY AND REPLACE WITH PROPOSED GRASS SEED
 - FOOTWAY RESURFACING.
 - NEW FOOTWAY
 - EXISTING SAFETY BARRIER TO BE RETAINED.
 - EXISTING GIVE WAY LINES TO BE RENEWED
 - EXISTING UNLIT SIGN TO BE REMOVED
 - EXISTING ILLUMINATED SIGN TO BE REMOVED
 - PROPOSED SIGN
 - PROPOSED 1 X 100mm Ø ORANGE DUCT 6M² 3-CORE PVC CABLE.
 - PROPOSED 2 X 100mm Ø ORANGE DUCT 6M² 3-CORE PVC CABLE.
 - PROPOSED 4 X 100mm Ø ORANGE DUCT 6M² 3-CORE PVC CABLE.
 - PROPOSED 1 X 50mm Ø BLACK ELECTRICITY DUCT.
 - CTL NEW TRAFFIC SIGNAL CONTROLLER TO BE INSTALLED BY OTHERSON A PROVIDED RS115DF NAL RETENTION SOCKET, 600mm DEEP.
 - FP NEW HALDO E2 210 HINGED FEEDER PILLAR WITH CAMLOCKS TO BE INSTALLED AND CONNECTED TO UKPN SUPPLY. FEEDER PILLAR TO BE CONNECTED TO THE NEW CONTROLLER USING 50mm DIAMETER SMOOTH SIDED BLACK ELECTRICAL DUCT.
 - PROPOSED 600 x 600mm HIGHWAYS APPROVED TRAFFIC SIGNAL INSPECTION CHAMBER TO MANUFACTURER'S STANDARD DETAILS AND SPECIFICATIONS. PROPOSED COVER AND FRAME TO BE D250 STANDARD.
 - RS115DF NAL RETENTION SOCKET, 600mm DEEP. TO BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.

P03	07.11.22	FOR INFORMATION	MD	AE	AE
P02	14.9.22	SIGN RELOCATED	CAT	AE	AE
P01	27.7.22	FOR TARGET COSTING	CAT	AE	AE
Rev	Date	Description	Dwn	Chkd	App

Drawing Originator

Defined by PETERBOROUGH CITY COUNCIL

Drawing Status: FOR TARGET COSTING

Project Name: OXNEY ROAD CROSSING - SAINSBURY

Title: GENERAL ARRANGEMENT

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	AS SHOWN	MD	AE	AE
		Drawn Date	Checked Date	Approved Date
		07/11/22	07/11/22	07/11/22

Drawing Number	Status	Rev
5080845-PCC-HGN-OXN-DR-CH-0100	S2	P03

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Appendix C – Sensitivity Testing Technical Note

Technical Note

Description: Fengate FBC Economic
Sensitivity Testing

To:

Reference:

From: Steven Percy

Date: 07/11/2022

cc: Richard Jones

Introduction

The Economic Dimension for the Fengate Access Study FBC includes several sensitivity tests that have been recorded in full detail here.

Sensitivity tests have been undertaken to confirm the robustness of the business case in a number of eventualities. These eventualities can affect the benefits (such as changes to forecast trips from high and low levels of growth), or the costs (such as a greater proportion of risk being realised).

The sensitivity tests can be summarised as follows:

- Absent Developer Scheme Scenario
- Cost Sensitivity
- Low Growth Scenario
- High Growth Scenario
- Local Accident Rates in COBALT
- Low Active Travel Uptake
- High Active Travel Uptake
- Reduced AMAT Appraisal Periods
- Increased AMAT Appraisal Periods
- Low Environment Values
- High Environment Values
- Reduced PM Peak Appraisal Period

The rest of this document describes the details of the sensitivity tests.

Absent Developer Scheme Scenario

A sensitivity test was undertaken on the transport user benefits to determine how the transport user benefits are affected should the developer-led scheme at Oxney Road / Edgerley Drain Road be undelivered. The scheme currently involves converting the Oxney Road / Edgerley Drain Road T-Junction into a roundabout.

The location of the developer-led scheme, as well as the proposed development accesses, are shown in Figure 1 below.

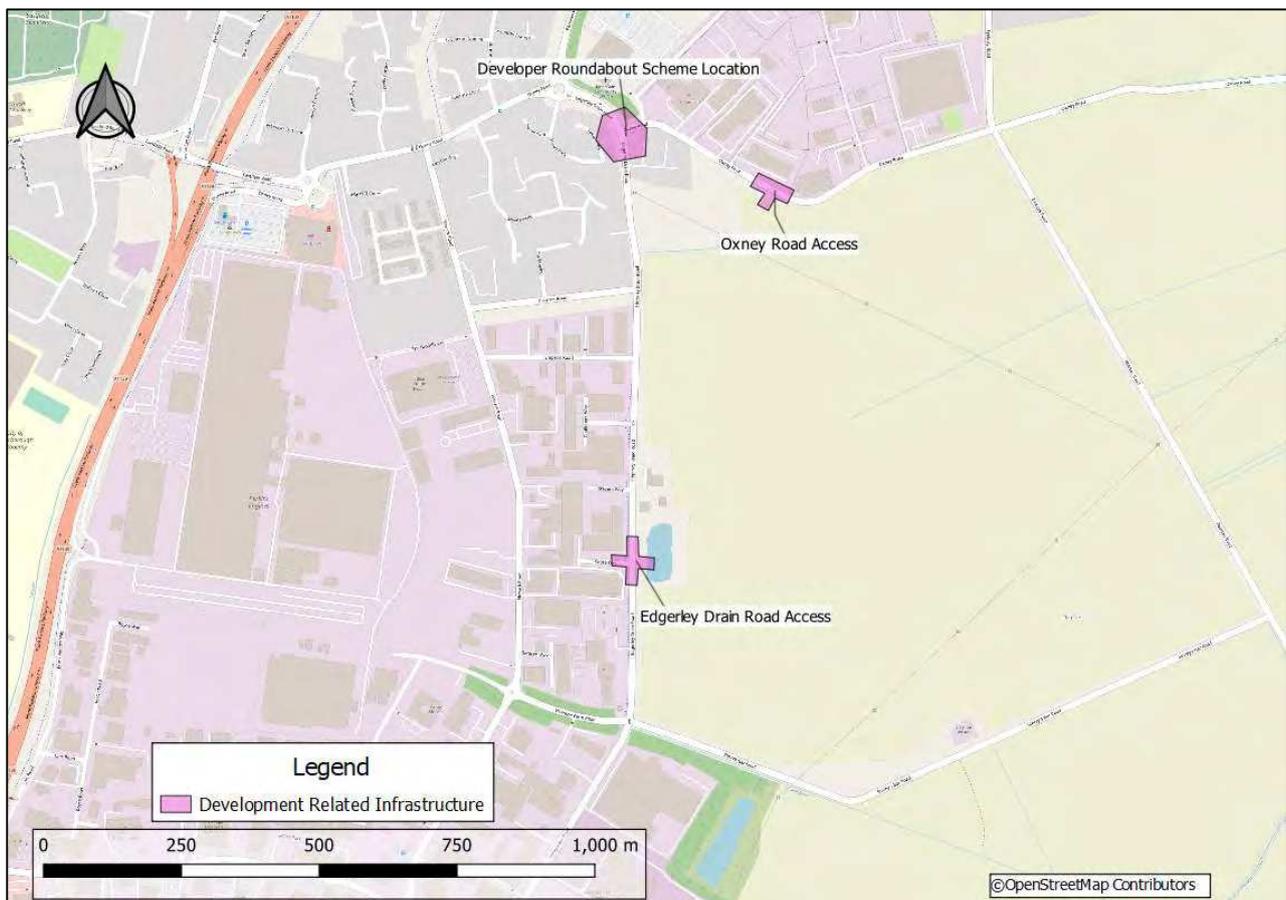


Figure 1: Development Related Infrastructure Changes

The Do-Minimum and Do-Something scenarios were re-run in SATURN with the Oxney Road / Edgerley Drain Road improvements missing. The results were then fed into TUBA as per the core assessment.

The resultant Transport User PVB is £39,203,940 and the resultant accident savings PVB is £1,827,600. The PVB indicated by this test is greater than that of the core scenario, so there is no risk to the benefits of the scheme if the developer led scheme does not come forward. This would result in a BCR of 8.614, which would fall into the Very High Value for Money category.

Cost Sensitivity

Table 1 below demonstrates the VFM category that various PVCs would result in.

The current core scenario PVC of £4,551,000 falls into the “Very High” category and could increase by £1,084,000 before it falls into the “High” Value for Money Category.

Table 1: Value for Money Categories and the Associated Present Value of Costs (£,000s)

VfM Category	Description	PVB	PVC required to achieve VfM statement
Poor	BCR between 0 and 1	£ 22,540	\geq £22,540
Low	BCR between 1 and 1.5	£ 22,540	£22,540 to £15,027
Medium	BCR between 1.5 and 2	£ 22,540	£15,027 to £11,270
High	BCR between 2 and 4	£ 22,540	£11,270 to £5,635
Very High	BCR greater than or equal to 4	£ 22,540	\leq £5,635

This test demonstrates that the Fengate Access Improvement schemes will still offer value for money in the event of large cost increases.

High and Low Growth Scenarios

Sensitivity testing has been undertaken to determine whether or not the proposed scheme could still achieve a High Value for Money if the expected road traffic growth differs from current predictions. High and Low Growth scenarios have been developed in line with TAG Unit M4 (August 2022)

The process of generating high and low growth scenarios is as follows:

- Calculate the proportion of base year demand to be added based on parameter p , which varies by mode. For one year after the base year (2019), proportion p of base year demand is added to the core scenario. For 36 or more years after the base year, proportion $6p$ of base year demand is added to the core scenario. Between one and 36 years after the base year, the proportion of base year demand rises from p to $6p$ in proportion with the square root of the years. For example, 16 years after the base year the proportion is $4p$.
- The value of p is set to 2.5% for highway demand, which reflects uncertainty around annual forecasts from the National Transport Model (NTM).
- The core scenario matrix is adjusted on a cell-by-cell basis by taking the appropriate proportion of the model base year matrix and adding it or subtracting it from the future year core scenario matrix.
- The low growth should be based on the same ranges below the core scenario as the high growth scenario is above it.

- Local growth assumptions have been accounted for within the high and low growth scenarios. The most likely sources of growth (Reasonably Foreseeable) that had not been included in the core scenario have been included within the high growth scenario. The less likely sources of growth (More than Likely) that had been included in the core scenario have been excluded from the low growth scenario. Total growth has been constrained to the levels calculated in the previous steps.
- No additional adjustments have been made to account for the effects of the COVID-19 pandemic on traffic volumes, as local evidence from permanent Automatic Traffic Counts show that traffic has returned to the levels seen prior to the pandemic. TAG guidance currently suggests that the low growth scenario can be used as a reasonable proxy test for the long-term effects of COVID.
- Local assumptions about supply have not been changed from the core scenario, with the exception of access roads to additional developments that have been included and minor changes to the core scenario network needed to accommodate growth in demand.

Table 2 below shows the AM Peak, Inter-Peak, and PM peak hour matrix sizes for the High and Low growth scenarios compared to the Central growth assumption. These are also represented in line graph Figure 2 to Figure 4 below.

Table 2: Matrix sizes for High, Low and Central growth scenarios

Total number of trips by Scenario (PCUs)			
AM	Low	Central	High
2019	87,476	87,476	87,476
2026	93,640	98,089	104,049
2031	99,027	105,496	113,508
2036	103,797	112,234	121,848
IP	Low	Central	High
2019	72,308	72,308	72,308
2026	77,840	81,984	86,817
2031	82,881	88,555	95,014
2036	87,528	94,701	102,456
PM	Low	Central	High
2019	90,937	90,937	90,937
2026	96,587	101,691	107,788
2031	101,805	109,032	117,205
2036	106,811	115,924	125,765

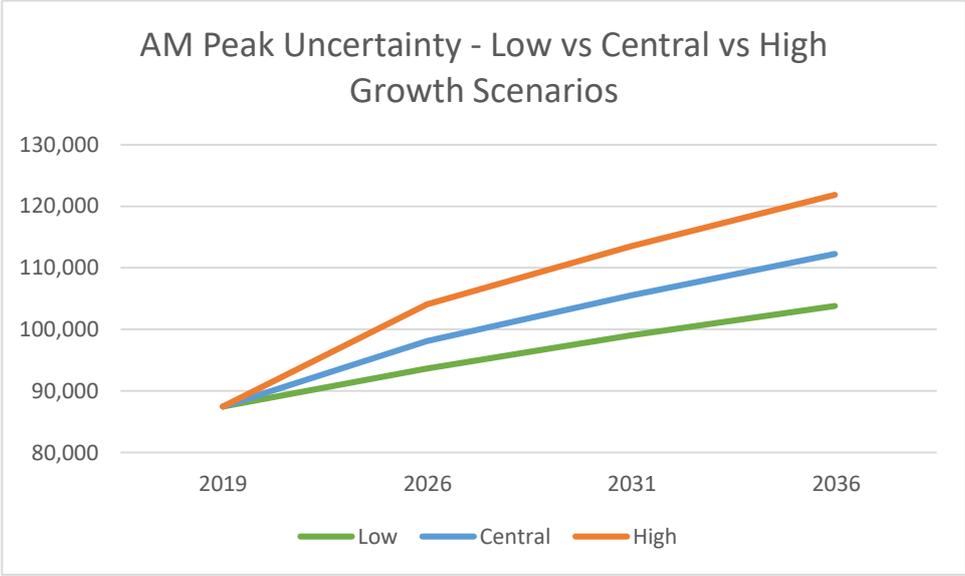


Figure 2: AM Peak Hour: Total Number of Trips in Model

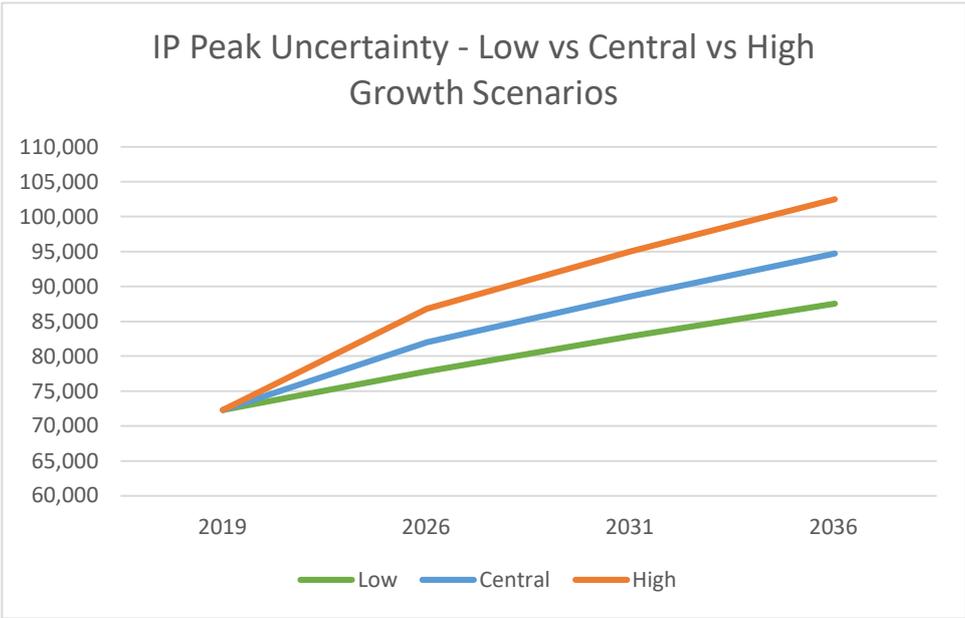


Figure 3: Inter-Peak Hour: Total Number of Trips in Model

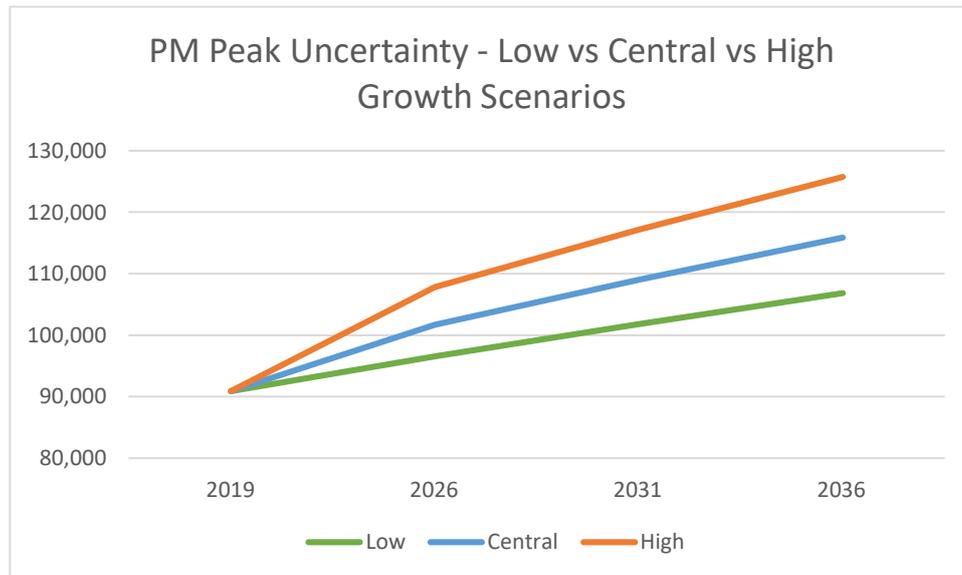


Figure 4: PM Peak Hour: Total Number of Trips in Model

Once the low and high growth scenarios had been assigned within the SATURN model, the outputs were used within TUBA and COBALT to determine if the scheme would still operate well and offer value for money if lower or higher than anticipated traffic growth occurred.

A summary of the benefits for each of the growth ranges used in the sensitivity test is presented in Table 3 beneath.

Table 1: Changes in Benefits under Different Growth Scenarios

Software	Benefit Type	Low	Core	High
TUBA (£,000s)	Greenhouse Gases	220	326	374
	Consumer Users (Commuting)	3,701	9,687	7,831
	Consumer Users (Other)	4,258	3,924	6,505
	Business Users / Providers	2,871	4,930	5,360
	Indirect Taxes	-222	-340	-397
	Present Value of Benefits (PVB)	10,828	18,527	19,673
COBALT (£,000s)	Accident Benefits	1,529.00	1,606.60	889.30
Summary	Total (£,000s)	12,357	20,134	20,562
	BCR	3.24	4.95	5.05

The results from the sensitivity test show that the scheme would still offer High Value for Money in a low growth scenario and would offer Very High Value for Money in a high growth scenario.

This demonstrates the robustness of the scheme against varying traffic growth assumptions.

Local Accident Rates in COBALT

A sensitivity test was undertaken to demonstrate how robust the BCR is when using local accident data instead of default accident values in COBALT.

Personal Injury Accident (PIA) data covering a 5-year period from 2015 – 2019 for the scheme area was entered into COBALT.

Figure 5 below shows a map of the PIA data, symbolised by severity.



Figure 5: Personal Injury Accident data in the Fengate Study Area

Figure 5 shows 33 total accidents, comprised of 0 “Fatal”, 9 “Serious”, and 24 “Slight”. Seven of these occurred at the Edgerley Drain Road / Storey’s Bar Road / Vicarage Farm Road Junction, and 6 on Newark Road.

Using local accident numbers indicates that the COBALT PVB decreases from £1,606,600 to £-617,300. This results in a BCR of 4.464, which represents Very High Value for Money.

The negative benefits figure indicates that the current accident rate in the study area is low compared to the defaults used within COBALT.

High and Low Active Travel Uptake

A sensitivity test was undertaken to demonstrate how robust the BCR is against varied levels of Active Travel Uptake that comes about as a result of the schemes.

The core Active Travel Uptake has been predicted using Census 2011 Method of Travel to Work data, by finding a similar Land Use LSOA with better active travel infrastructure and applying the Walking and Cycling mode share of the similar zone to the scheme relevant zones.

The High and Low active travel uptake sensitivity tests increase and reduce this change in trips by 50%.

The predicted daily future trips in each of the scenarios is outlined in Table 4 below.

Table 4: Active Travel trips used in Sensitivity Tests

Walking			
Scheme Location	Trips		
	Low	Core	High
Newark Road	850	926	1,003
Junction 7 / Oxney Road	2,047	2,231	2,416
Edgerley Drain Road	168	183	198
Total	3,065	3,340	3,617
Cycling			
Scheme Location	Trips		
	Low	Core	High
Newark Road	-	-	-
Junction 7 / Oxney Road	123	139	155
Edgerley Drain Road	115	130	145
Total	238	269	300

Table 5 below shows the benefits and resultant BCRs that come about as a result of the changes in trips.

Table 5: Changes in Benefits under Active Travel Uptake Scenarios

Active Mode Appraisal Benefits	PVB (£,000s)		
	Low	Core	High
Newark Road	257	481	707
Junction 7 / Oxney Road	654	1,301	1,951
Edgerley Drain Road	176	322	468
Total	1,087	2,104	3,126
BCR	4.73	4.95	5.18

Table 5 demonstrates that the scheme BCR varies from 4.73 to 5.18 under the different Active Mode Uptake assumptions. These are categorised as Very High Value for Money.

Active Mode Appraisal Period

A sensitivity test has been undertaken to demonstrate how robust the BCR is against a reduced active mode appraisal period.

Reducing and increasing the appraisal period demonstrates the value of the scheme over different numbers of years. The results can indicate the value of the scheme should the built infrastructure have a reduced or increased life.

Table 6 below demonstrates how the active mode benefits and costs change over reduced appraisal periods of 10 and 30 years.

Table 6: Active Mode Appraisal Period Sensitivity test outputs

Active Mode Appraisal Benefits	PVB (£,000s)		
	10 Years	20 Years (Core)	30 Years
Newark Road	229	481	704
Junction 7 / Oxney Road	616	1,301	1,913
Edgerley Drain Road	154	322	471
Total	999	2,104	3,088
BCR	4.71	4.95	5.17

The reduced appraisal period test demonstrates that the scheme would still provide at least very high value for money in the short-term with a BCR of 4.71. The increased appraisal period test demonstrates that the scheme would provide very high value for money in the longer term with a BCR of 5.17.

Both of these BCRs remain in the Very High Value for Money category, and demonstrate that the scheme is robust even if the life of the active mode infrastructure is reduced.

Environmental Values Sensitivity Test

A sensitivity test has been undertaken to demonstrate how robust the BCR is against varying values of changes in Air Quality.

The High and Low values are provided by the DfT's Air Quality Valuation Workbook (Updated 30th May, 2022), in addition to the core output.

The Air Quality Valuation Workbook estimates an Upper net present value of change in air quality of £806,761, and a Lower net present value of change in air quality of £57,887.

These result in a BCR of 5.072 for the higher air quality change values scenario and a BCR of 4.907 for the lower air quality change values scenario. Both of these BCRs fall into the Very High Value for Money category.

Reduced PM Peak Annualisation Period

A sensitivity test has been undertaken to demonstrate how robust the BCR is against a reduced annualisation factor for the PM peak period. The annualisation factor is intended to represent how often the modelled delay

occurs over each year, and the core scenario currently assumes that the PM peak period covers the 16:00 – 18:00 period.

A reduced annualisation factor of 267 was used, which represents the 17:00 – 18:00 peak period as opposed to the core scenario representation of 16:00 – 18:00.

This results in Transport User Benefits of £16,431,940, and a BCR of 3.611, which represents Very High Value for Money.

.

Summary of Sensitivity Tests

Figure 6 below demonstrates the range of BCRs indicated by the sensitivity tests.

The figure demonstrates that the Fengate Access Study Improvement Schemes offer at least High Value for Money in all scenarios assessed, and that there is a strong cluster of BCR values in the 4.0 - 5.5 range, confirming that the Value for Money of the schemes is robust.

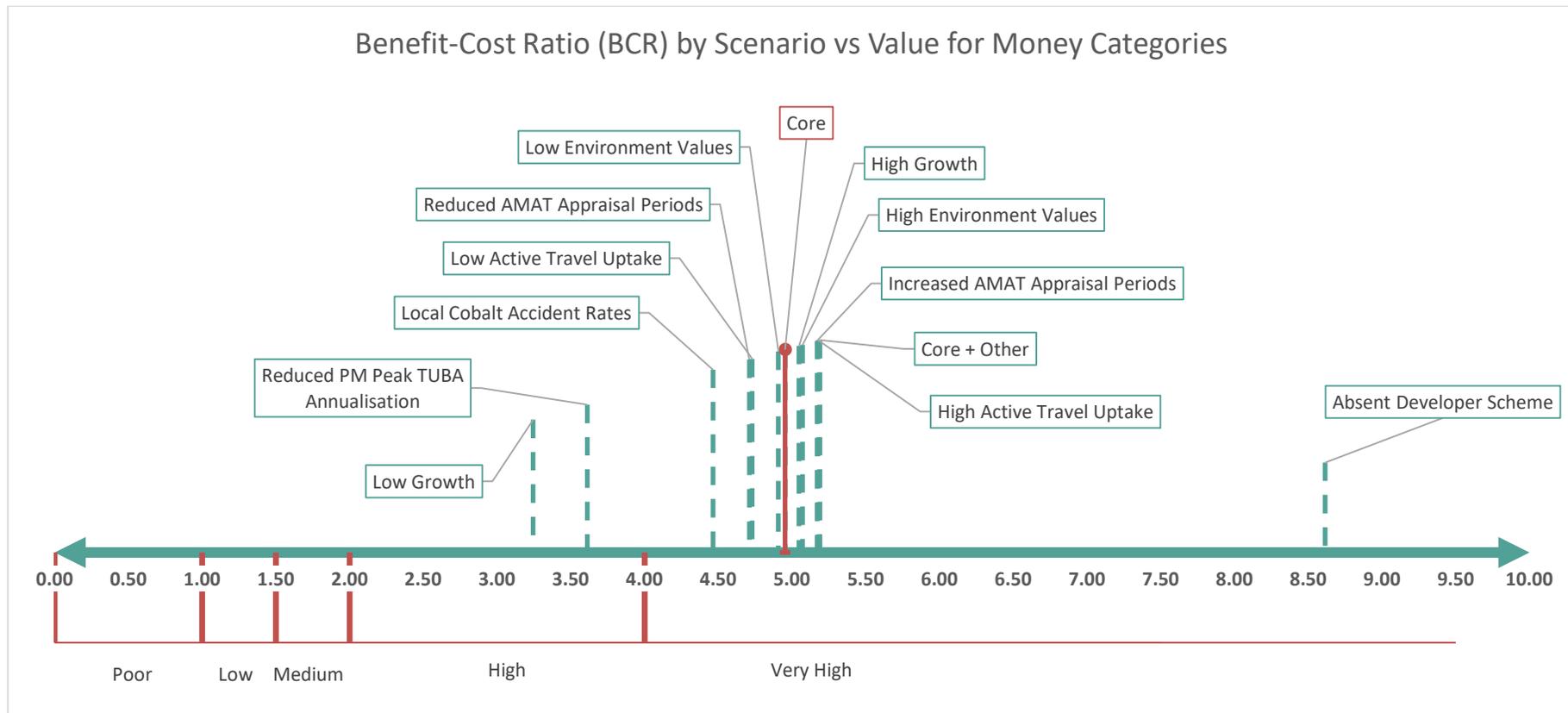


Figure 6: Sensitivity Testing BCR Range

Appendix D – Appraisal Summary Table (AST)

Appraisal Summary Table		Date produced:	15/12/2022		Contact:				
Name of scheme:	Fengate Access Improvement Scheme				Name	Lewis Banks			
Description of scheme:	Improvements to Junction 7, Oxney Road / Newark Road and Edgerley Drain Road / Storeys Bar Road / Vicarage Farm Road Junction. Active travel schemes on Newark Road, Junction 7 and Edgerley Drain Road.				Organisation	Peterborough City Council			
				Role	Promoter/Official				
Impacts	Summary of key impacts	Assessment							
		Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp		
Economy	Business users & transport providers	The Scheme will result in a net reduction in journey times for business users and transport providers over a 60-year appraisal period for all time periods. The most significant benefits are experienced for journey changes greater than 5 minutes, followed by those between 0 and 2 minutes.			Net Journey time benefits (£,000s)		Not Assessed	£960,000	Not Assessed
	Reliability impact on Business users	Not Assessed			Not Assessed		Not Assessed	Not Assessed	
	Regeneration	Not Assessed			Not Assessed		Not Assessed	Not Assessed	
	Wider Impacts	Not Assessed			Not Assessed		Not Assessed	Not Assessed	
Environmental	Noise	Scheme results in Net reduction of 29 households experiencing daytime Noise			Sleep Disturbance: -£2,387, Amenity £28,235, Acute Myocardial Infarction: -£7,076, Stroke £7,045, Dementia £10,675		Neutral	£364,892	Not Assessed
	Air Quality	The scheme produces overall benefit, likely as a result of reduction in congestion despite the schemes collectively drawing more traffic onto the network.			Change in NOX emissions over 60 year appraisal period: 3 tonnes Change in PM2.5 emissions over a 60-year appraisal period: -2 tonnes		Positive	£266,199	Not Assessed
	Greenhouse gases	The Scheme will result in a reduction in non-traded carbon and traded carbon dioxide emissions over a 60-year appraisal period. An additional £4,310 is identified by the AMATs.			Change in non-traded carbon over 60y (CO2e)	-4,150	Not Assessed	£330,000	
				Change in traded carbon over 60y (CO2e)	-18				
	Landscape	The Fengate Access Road Improvements have been assessed as having a Neutral impact on the Landscape following completion of an appraisal for each of the 5 schemes. The Storey's Bar Road scheme presents the greatest risks of adverse effects considering the loss of 16 semi-mature and mature trees. However, the receptors directly impacted are commercial and light industrial facilities which are less sensitive to such changes and replacement planting is being carefully planned to provide further mitigation. There is also an elevated risk associated with the Newark - Oxney Road Roundabout scheme considering the close proximity of valuable mature trees subject to Tree Preservation Orders. However, these trees, and all other retained vegetation across the schemes, will be managed and protected in accordance with the Arboricultural Method Statements.			Not Assessed		Neutral	-	
	Townscape	The Fengate Access Road Improvements have been assessed as having a Neutral impact on the Townscape following completion of an appraisal for each of the 5 schemes. The Townscape characters of all the schemes are busy, active and typically urban in nature, with presence of significant development within the surrounding area consisting of residential, commercial, and/or light industrial buildings. The proposed schemes will retain the essential townscape character of these areas and involve replacement of existing highways assets on a like-for-like basis with associated improvements. The proposed schemes will also promote active travel by improving safety and connectivity between pedestrian and cycleway routes through the highways network. The war memorial present within the scheme footprint of the Junction 7 Eastfield Scheme is expected to be of significant local importance to residents and stakeholders and will not be directly impacted by the works. Standard mitigation measures will be implemented to protect this feature.			Not Assessed		Neutral	-	
	Historic Environment	The Fengate Access Road Improvements have been assessed as having a Neutral impact on the Historic Environment following completion of an appraisal for each of the 5 schemes. The Storey's Bar Road scheme presents the greatest risks of adverse effects considering the proximity to the Flag Fen Bronze Centre Scheduled Monument site. However, a Hydrogeological assessment has been undertaken in consultation with Historic England which concluded that the proposed scheme would have insignificant impacts on this receptor. Previous archaeological investigations in the area have revealed significant remains of local and regional importance, but the PCC Archaeologist has already been consulted and adequate mitigation has been specified. The risk of encountering and damaging archaeological remains is further reduced considering the scale of modern development within the vicinity and scope of the proposed works in terms of land take and depth of excavation.			Not Assessed		Neutral	-	
	Biodiversity	The Fengate Access Road Improvements have been assessed as having a neutral impact on Biodiversity following completion of an appraisal for each of the 5 schemes. Each site is located more than 1km away from designated sites with no connectivity identified and the scope of works limiting any potential for indirect impacts linked to discharges, emissions, noise and lighting. Potential protected species which may be encountered include nesting birds, water voles and bats. A majority of the proposed works are confined to areas of existing hardstanding and initial surveys have been undertaken with further pre-works checks planned to enable suitable mitigation measures to be implemented. Suitable stakeholder engagement and planning will be undertaken to achieve 20% net gain in Biodiversity through on-site and off-site landscaping initiatives, but this will be subject to agreement and suitable provision of land from			Not Assessed		Neutral	-	
Water Environment	The Fengate Access Road Improvements have been assessed as having a neutral impact on the Water Environment following completion of an appraisal for each of the 5 schemes. A majority of the scheme footprints are located above an aquifer which has high vulnerability to pollutants. However, the proposed works are relatively confined to shallower strata meaning there are very limited pathways for significant impacts to occur, especially when further mitigation measures which will be implemented through the Construction Environmental Management Plan (CEMP) are considered. Although there is potential for existing watercourses to be impacted, these are generally artificial drains with low geomorphological value. Existing water quality within nearby surface water features is generally poor based on current status. Nonetheless, pollution prevention measures have been incorporated into the design from an operational perspective, and will be implemented through the CEMP during the construction phase. Storey's Bar Road presents the highest risks from a flooding perspective, but the design has incorporated flood mitigation measures. The additional areas of hardstanding have been assessed as having an insignificant impact on flooding at this location and there is an existing attenuation feature locally. All other schemes are outside Flood Zones 2 and 3.			Not Assessed		Neutral	-		
Social	Commuting and Other users	The Scheme will result in a net reduction in journey times for commuting users and other users across all time periods for the 60 year appraisal period. The most significant journey time benefits are experienced by journey changes greater than 5 minutes, followed by those between 0 and 2 minutes.			Net Journey time benefits (£,000s)		Not Assessed	£4,275,000	Not Assessed
	Reliability impact on Commuting and Other users	Not Assessed			Not Assessed		Not Assessed	Not Assessed	
	Physical activity	Positive Impact identified in AMAT			Not Assessed		Not Assessed	£1,654,060	
	Journey quality	Positive Impact identified in AMAT			Not Assessed		Not Assessed	£314,200	
	Accidents	Accident savings have been assessed in COBALT for the study area using default accident rate values and modelled 24 Hr AADT flows. The scheme has been estimated to reduce the number of Personal Injury Accidents			COBALT estimated the scheme will result in a reduction of 41.7 accidents over the 60 year appraisal period, equating to 0.3 fatal, 4.3 serious, and 52.4 slight casualties.		Not Assessed	£1,606,600	Not Assessed
	Security	Not Assessed			Not Assessed		Not Assessed	Not Assessed	Not Assessed
	Access to services	Not Assessed			Not Assessed		Not Assessed	Not Assessed	Not Assessed
	Affordability	Not Assessed			Not Assessed		Not Assessed	Not Assessed	Not Assessed
	Severance	The Active Travel Schemes around Junction 7 / Eastfield Road introduce new crossing facilities that reduce severance			Not Assessed		Not Assessed	£1,073,428	Not Assessed
	Option and non-use values	Not Assessed			Not Assessed		Not Assessed	Not Assessed	
Public Accounts	Cost to Broad Transport Budget	The Scheme PVC has been identified as £4,551,000. The BCR is 4.95.						£4,551,000	
	Indirect Tax Revenues	Indirect taxes values from TUBA						-£345,400	

Appendix E – TAG Worksheets

Air Quality Valuation Workbook - Worksheet 3

Scheme Name: Fengate Access Scheme

Present Value Base Year:

Current Year:

Proposal Opening year:

Project (Road/Rail or Road and Rail):

Overall Assessment Score:

Damage Costs Approach (Emissions)

Present value of change in NOx emissions (£):

Present value of change in PM2.5 emissions (£):

OR

Present value of change in PM10 emissions (£):

Impact Pathways Approach (Concentrations)

Present value of change in NO2 concentrations (£):

Of which:

Concentration costs:

Other impacts:

Present value of change in PM2.5 concentrations (£):

Of which:

Concentration costs:

Other impacts:

Total Change

Total value of change in air quality (£):

*positive value reflects a net benefit (i.e. air quality improvement)

Quantitative Assessment:

Impact Pathways Approach (Concentrations)

Change in NO2 assessment scores over 60 year appraisal period:
(between 'with scheme' and 'without scheme' scenarios)

Change in PM2.5 assessment scores over 60 year appraisal period:
(between 'with scheme' and 'without scheme' scenarios)

Damage Costs Approach (Emissions)

Change in NOX emissions over 60 year appraisal period (tonnes):
(between 'with scheme' and 'without scheme' scenarios)

Change in PM2.5 emissions over 60 year appraisal period (tonnes):
(between 'with scheme' and 'without scheme' scenarios)

OR

Change in PM10 emissions over 60 year appraisal period (tonnes):
(between 'with scheme' and 'without scheme' scenarios)

Qualitative Comments:

The total NPV is predicted to be £266,119 as a result of the scheme presenting a benefit. This is likely due to a overall reduction in congestion despite the schemes collectively drawing more traffic onto the network.

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Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):	£806,761
Lower estimate net present value of change in air quality (£):	£57,887

Data Sources:

DEFRA Emission Factor Toolkit version 11.0 Traffic data was provided from Milestone Infra, Nov 2022
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TAG Biodiversity Impacts Worksheet

Scheme: **Storeys Bar Rd**

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species.	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High - internationally designated site with wildfowl, waders and associated botanical species. Ramar Site, SPA & SSSI.	Neutral - This site is not within the area where works are proposed and is located approx. 1.4km south. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance.	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High - nationally protected species.	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral
Water voles	Protected species	National	High - national protection for water voles and their habitats from direct harm and disturbance under The Wildlife and Countryside Act 1981 (as amended).	Water voles are also listed as rare and most threatened species under Section 41 of the Natural Environment and Rural Communities Act (2006).	High - nationally protected species.	Neutral - The Edgerley Drain ditch (containing water) is assessed as suitable to support water voles. However, no evidence of water vole activity was observed during 2021 or 2022 surveys. A further pre-works check will also be undertaken to mitigate any potential impacts.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
 MAGIC website
 OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

The Nene Washes SPA/SSSI/Ramsar site is located 1.4km south of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered. The proposed works will require the removal of habitat that is suitable for both breeding birds and water voles. However, surveys undertaken to date have not identified any activity associated with these protected species and further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species.	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High - internationally designated site with wildfowl, waders and associated botanical species. Ramar Site, SPA & SSSI.	Neutral - This site is not within the area where works are proposed and is located approx. 1.1km south. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance.	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High - nationally protected species.	Neutral - Areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
 MAGIC website
 OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

The Nene Washes SPA/SSSI/Ramsar site is located 1.4km south of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered. The proposed works will require the removal of habitat that is suitable for breeding birds. However, further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

TAG Biodiversity Impacts Worksheet

Scheme: Newark-Oxney Rd Roundabout

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Dogsthorpe Star Pit SSSI and LNR	This site is afforded protection for its variety of habitats and invertebrate/botanical species.	National (SSSI) Regional / Local (LNR)	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Dogsthorpe Star Pit SSSI and Local Nature Reserve (LNR) contains a variety of habitats supporting nationally and regionally scarce plant and animal species.	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Neutral - This site is not within the area where works are proposed and is located approx. 1.9km north. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance.	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High - nationally protected species.	Neutral - Areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
 MAGIC website
 OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

Dogsthorpe Star Pit SSSI and LNR is located 1.9km north of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered. The proposed works will require the removal of habitat that is suitable for breeding birds. However, further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

TAG Biodiversity Impacts Worksheet

Scheme: Oxney Rd Crossing

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Dogsthorpe Star Pit SSSI and LNR	This site is afforded protection for its variety of habitats and invertebrate/botanical species.	National (SSSI) Regional / Local (LNR)	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Dogsthorpe Star Pit SSSI and Local Nature Reserve (LNR) contains a variety of habitats supporting nationally and regionally scarce plant and animal species.	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Neutral - This site is not within the area where works are proposed and is located approx. 1.9km north. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance.	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High - nationally protected species.	Neutral - Areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
 MAGIC website
 OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

Dogsthorpe Star Pit SSSI and LNR is located 1.9km north of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered. The proposed works will require the removal of habitat that is suitable for breeding birds. However, further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Dogsthorpe Star Pit SSSI and LNR	This site is afforded protection for its variety of habitats and invertebrate/botanical species.	National (SSSI) Regional / Local (LNR)	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Dogsthorpe Star Pit SSSI and Local Nature Reserve (LNR) contains a variety of habitats supporting nationally and regionally scarce plant and animal species.	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Neutral - This site is not within the area where works are proposed and is located approx. 1.8km north. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance.	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High - nationally protected species.	Neutral - Areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral
Bats	Protected species	International & National	Very High - bats and their habitats are afforded protection at an international level.	All bat species are protected by the Wildlife and Countryside Act (1981) (as amended) and the Conservation of Habitats and Species Regulations (2017) (as amended).	Very High - bats and their habitats are afforded protection at an international level.	Neutral - Some trees requiring removal have been assessed as having low to moderate potential for roosting bats. However, pre-works surveys have been programmed to ensure appropriate mitigation measures are implemented.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
 MAGIC website
 OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

Dogsthorpe Star Pit SSSI and LNR is located 1.8km north of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered. The proposed works will require the removal of habitat that is suitable for breeding birds and bats. However, further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

TAG Historic Environment Impacts Worksheet

Scheme: **Storeys Bar Rd**

Feature	Step 2 Description	Scale it matters	Step 3 Significance	Rarity	Step 4 Impact
Form	<p>Flag Fen Bronze Centre Scheduled Monument - Bronze Age post alignment and timber platform at Flag Fen and associated Bronze Age and later field systems and settlement to either side of the Northey Road.</p> <p>Other archaeological remains - previous archaeological investigations in the immediate areas surrounding the scheme have produced significant evidence for Neolithic, Bronze Age, Iron Age and Roman activity characterised by agricultural, domestic, funerary, and ritual use of the landscape.</p>				
Survival	<p>Flag Fen Bronze Centre Scheduled Monument - the survival of timbers and artefacts within the wet conditions of the Flag Fen basin is outstanding, while the survival of features on the dry gravels to the east is good, and their condition apparently stable.</p> <p>Other archaeological remains - unknown, but likely to have been impacted previously by the original construction of road network and other development in the area.</p>				
Condition	<p>Flag Fen Bronze Centre Scheduled Monument - estimate general condition as 'Good' => >70% remains intact due to conditions.</p> <p>Other archaeological remains - estimate general condition as 'Poor' =< 40% remains intact due to previous road works and other development.</p>	<p>Flag Fen Bronze Centre Scheduled Monument - National. This monument is scheduled under the Ancient Monuments and Archaeological Areas Act 1979 as amended as it appears to the Secretary of State to be of national importance.</p> <p>Other archaeological remains - considered likely to be of local or regional importance.</p>	<p>Flag Fen Bronze Centre Scheduled Monument - the Scheduled Monument designation is evidence for highly significant Bronze Age settlement within the area surrounding the River Nene.</p> <p>Other archaeological remains - Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.</p>	<p>Flag Fen Bronze Centre Scheduled Monument - The post alignment and timber platform at Flag Fen represent a class of monument where relatively few examples survive and are well documented. Amongst these it is unique for its scale, completeness, longevity and complexity.</p> <p>Other archaeological remains - It is anticipated that most finds are likely to be relatively 'common' for the region (i.e. ditches and pits of prehistoric to medieval date), but peat deposits could preserve rarer remains under waterlogged conditions.</p>	<p>Slight adverse effect - Hydrogeological assessment undertaken to confirm that the proposed scheme would have insignificant impacts on groundwater levels at the Scheduled Monument site located circa 350m south-east of the development. This is important to ensure nationally significant remains are suitably preserved. The current setting of this Scheduled Monument is a mixture of modern road infrastructure and residential areas to the west, and rural agricultural lands to the north, east and south.</p> <p>Programme of pre-construction trenching / field evaluation agreed with PCC Archaeologist to assess on-site remains which have been assessed as most likely having local or regional importance.</p>
Complexity	<p>Flag Fen Bronze Centre Scheduled Monument - Bronze Age post alignment and timber platform at Flag Fen and associated Bronze Age and later field systems and settlement to either side of the Northey Road.</p> <p>Other archaeological remains - previous archaeological investigations in the immediate areas surrounding the scheme have produced significant evidence for Neolithic, Bronze Age, Iron Age and Roman activity characterised by agricultural, domestic, funerary, and ritual use of the landscape.</p>				
Context	<p>As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of the Scheduled Monument and/or other archaeological remains will be negligible.</p>				
Period	<p>Flag Fen Bronze Centre Scheduled Monument - Bronze Age.</p> <p>Other archaeological remains - previous archaeological investigations in the immediate areas surrounding the scheme have produced significant evidence for Neolithic, Bronze Age, Iron Age and Roman activity characterised by agricultural, domestic, funerary, and ritual use of the landscape.</p>				

Reference Sources

Peterborough City Historic Environment Record
 National Record of the Historic Environment
 National Heritage List for England (online)
 Historic Ordnance Survey maps & photographs (online)
 Royal HaskoningDHV 2021 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Slight adverse (negative) effect

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains for which adequate mitigation has been specified in consultation with the PCC Archaeologist. The archaeological potential of the surrounding area is high but this is in part reduced due to the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a (relatively) minor scale in terms of land take and depth of excavation, it is considered that the potential to impact any potential buried archaeological remains (if they are indeed present) is low, with the previous construction works for the highway itself having likely removed any archaeological remains. Historic England have been consulted in relation to the Flag Fen Bronze Scheduled Monument located circa 350m south-east of the development. Hydrogeological assessment undertaken to confirm that the proposed scheme would have insignificant impacts on groundwater levels at the site to ensure preservation of nationally significant remains. No significant impacts on the setting of the Scheduled Monument anticipated.

TAG Historic Environment Impacts Worksheet

Scheme: Newark Rd Footpath

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	Previous archaeological investigations to the north of the proposed scheme have produced archaeological remains dating from Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation undertaken as part of previous investigations also discovered archaeological remains dating to the Bronze Age. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches.				
Survival	Unknown, but likely to have been impacted previously by the original construction of road network and other development in the area.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations to the north of the proposed scheme have produced archaeological remains dating from Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation undertaken as part of previous investigations also discovered archaeological remains dating to the Bronze Age. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	Previous archaeological investigations to the north of the proposed scheme have produced archaeological remains dating from Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation undertaken as part of previous investigations also discovered archaeological remains dating to the Bronze Age. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches.				

Reference Sources

Peterborough City Historic Environment Record
 National Record of the Historic Environment
 National Heritage List for England (online)
 Historic Ordnance Survey maps & photographs (online)
 Royal HaskoningDHV 2011 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways infrastructure footprint, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Historic Environment Impacts Worksheet

Scheme: Newark-Oxney Rd Roundabout

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	Previous archaeological investigations to the south of the proposed scheme have produced archaeological remains dating from the Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation discovered archaeological remains dating to the Bronze Age in the form of a rectilinear field system, alongside a pit with the cremated remains of one individual, and another field system complete with ditches, postholes and a number of tree throws. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits overlain by a network of field boundary ditches. Two pits, one containing animal bone, alongside shallow linear features thought to represent the truncated remains of plough furrows rather than ditches were also revealed. Although undated, the features are thought to be medieval in date.				
Survival	Unknown, but likely to have been impacted previously by the original construction of road network and other development in the area.				
Condition	Estimate general condition as 'Poor' =<40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations to the south of the proposed scheme have produced archaeological remains dating from the Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation discovered archaeological remains dating to the Bronze Age in the form of a rectilinear field system, alongside a pit with the cremated remains of one individual, and another field system complete with ditches, postholes and a number of tree throws. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits overlain by a network of field boundary ditches. Two pits, one containing animal bone, alongside shallow linear features thought to represent the truncated remains of plough furrows rather than ditches were also revealed. Although undated, the features are thought to be medieval in date.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Context	As the proposed schemes are improvements to already established highway infrastructure it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	Previous archaeological investigations to the south of the proposed scheme have produced archaeological remains dating from the Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation discovered archaeological remains dating to the Bronze Age in the form of a rectilinear field system, alongside a pit with the cremated remains of one individual, and another field system complete with ditches, postholes and a number of tree throws. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches. Two pits, one containing animal bone, alongside shallow linear features thought to represent the truncated remains of plough furrows rather than ditches were also revealed. Although undated, the features are thought to be medieval in date.				

Reference Sources

Peterborough City Historic Environment Record
 National Record of the Historic Environment
 National Heritage List for England (online)
 Historic Ordnance Survey maps & photographs (online)
 Royal HaskoningDHV 2021 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways infrastructure footprint, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Historic Environment Impacts Worksheet

Scheme: **J7-Eastfield Rd Traffic Signals**

Step 2		Step 3				Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact	
Form	<p>The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations to the west of the proposed scheme near Newark Hill Primary Academy produced extensive Iron Age to Roman features.</p> <p>There is also a War Memorial located within the centre of the triangular island within the centre of the site footprint.</p>					
Survival	<p>Unknown, but likely to have been impacted previously by the original construction of road network and other development in the area.</p> <p>It is expected that the war memorial was installed or relocated as part of the original road construction.</p>					
Condition	<p>Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.</p> <p>The War Memorial appears to be in 'Good' condition.</p>	<p>Any potential archaeological remains are considered likely to be of local or regional importance.</p>	<p>Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.</p>	<p>It is anticipated that most finds are likely to be relatively 'common' for the region.</p>	<p>Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works. Simple and standard mitigation measures can be implemented to protect these features.</p>	
Complexity	<p>The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations to the west of the proposed scheme near Newark Hill Primary Academy produced extensive Iron Age to Roman features.</p>	<p>The War Memorial is a feature of local importance.</p>	<p>Although not designated, the War Memorial is expected to be of significant interest to local stakeholders.</p>	<p>War Memorials are relatively common across the UK, but it is suspected this feature has remained in-situ for a relatively long time.</p>		
Context	<p>As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.</p>					
Period	<p>The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations to the west of the proposed scheme near Newark Hill Primary Academy produced extensive Iron Age to Roman features.</p>					

Reference Sources

[Pleatonburgh City Historic Environment Record](#)
[National Record of the Historic Environment](#)
[National Heritage List for England \(online\)](#)
[Historic Ordnance Survey maps & photographs \(online\)](#)
[Royal HaskoningDHV 2021 Heritage Impact Appraisal Report](#)

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways infrastructure footprint, it is considered that the potential to impact any buried archaeological remains is very low. Simple and standard mitigation measures can be implemented to protect the war memorial and the scheme will not cause any significant changes in setting.

TAG Historic Environment Impacts Worksheet

Scheme: Newark_OxneyRd Sainsburys

Feature	Step 2		Step 3		Step 4 Impact
	Description	Scale it matters	Significance	Rarity	
Form	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations in relatively close proximity to the scheme produced Roman and Medieval pottery.				
Survival	Unknown, but likely to have been impacted previously by the original construction of road network and other development in the area.				
Condition	Estimate general condition as 'Poor' - <40% remains intact due to previous road works and other development.				
Complexity	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations in relatively close proximity to the scheme produced Roman and Medieval pottery.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations in relatively close proximity to the scheme produced Roman and Medieval pottery.				

Reference Sources

Peterborough City Historic Environment Record
 National Record of the Historic Environment
 National Heritage List for England (online)
 Historic Ordnance Survey maps & photographs (online)
 Royal HaskoningDHV 2021 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The archaeological potential of the surrounding area is high but this is in part reduced due to the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a (relatively) minor scale in terms of land take and depth of excavation, it is considered that the potential to impact any potential buried archaeological remains (if they are indeed present) is low, with the previous construction works for the highway itself having likely removed any archaeological remains.

TAG Landscape Impacts Worksheet

Scheme: Storeys Bar Rd

Features	Step 2		Step 3			Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	This area is defined by its position on the very eastern edge of the town, with a lack of residential properties and a predominance of commercial and industrial land uses to the northwest, west and south. Conversely, land to the northeast and east features agricultural fields, introducing a far more open, rural character in those directions. Woodland belt vegetation along both sides of Vicarage Farm Road and surrounding Peterborough Power Station.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - 9 trees will be removed on the north-western side of the junction. 7 trees will have to be removed from the south-eastern side of the junction. These trees are a mix of semi-mature and mature trees which have both landscape and biodiversity value. 4 very minor tree saplings will also have to be removed from the north-eastern side of the junction. The receptors directly impacted from a landscape perspective are commercial facilities. This will reduce screening of the existing road and other commercial facilities but there are already some relatively large gaps in the existing tree belts. Options for replacement planting on site are also being explored and other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Consultation with local stakeholders will also be undertaken.
Tranquillity	Low - this is a busy road junction surrounding by commercial and light industrial facilities.	Local	Common	Low	Substitutable	Neutral - the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	Flag Fen Bronze Centre Scheduled Monument is located circa 350m south-east of the proposed scheme at the closest point.	National	Rare	High	Not substitutable	Neutral - the current setting of this Scheduled Monument is a mixture of modern road infrastructure and residential areas to the west, and rural agricultural lands to the north, east and south. The proposed scheme will not impact this setting.
Landcover	Woodland belts flank both sides of Vicarage Farm Road in the west. There is another woodland belt to the south side of Storey's Bar Road in the east, which thins out and extends south along the boundary of the Walsstead commercial printing facility.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - 9 trees will be removed on the north-western side of the junction. 7 trees will have to be removed from the south-eastern side of the junction. These trees are a mix of semi-mature and mature trees which have both landscape and biodiversity value. 4 very minor tree saplings will also have to be removed from the north-eastern side of the junction. The receptors directly impacted from a landscape perspective are commercial facilities. This will reduce screening of the existing road and other commercial facilities but there are already some relatively large gaps in the existing tree belts. Options for replacement planting on site are also being explored and other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Consultation with local stakeholders will also be undertaken.
Summary of character	The location is where the more open, rural character of agricultural land to the northeast and east meets the more urban, developed character of the commercial and industrial facilities to the north-west, west and south. Vegetation is prominent within the roadside verges along the boundaries of the commercial and industrial facilities which helps to integrate the area into the landscape.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - The proposed scheme will result in the loss of 16 semi-mature and mature trees in addition to 4 very minor saplings. However, from a landscape perspective, the receptors directly impacted are commercial and light industrial facilities which are less likely to be concerned by such losses. Other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Replacement planting is being carefully planned to provide further mitigation. The essential character of the area will be maintained in the long term and the setting of the nearby Flag Fen Bronze Centre Scheduled Monument will remain unaffected.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Slight adverse (negative) effect

Qualitative Comments

The proposed scheme will result in the loss of 16 semi-mature and mature trees in addition to 4 very minor saplings. However, from a landscape perspective, the receptors directly impacted are commercial and light industrial facilities which are less likely to be concerned by such losses. Other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Replacement planting is being carefully planned to provide further mitigation. The essential character of the area will be maintained in the long term and the setting of the nearby Flag Fen Bronze Centre Scheduled Monument will remain unaffected.

TAG Landscape Impacts Worksheet

Scheme: Newark Rd Footpath

Features	Step 2	Step 3				Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	The proposed scheme footprint is set within an urban commercial area. Looser pattern of built development associated with commercial and industrial facilities that require more space, including car parking and loading / circulation areas.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the character of this area considering the scope of works.
Tranquillity	Low - Newark Road is an existing road with high levels of activity linked to the commercial and industrial facilities.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	Woodland belts flank both sides of Vicarage Farm Road. Sporadic grass verges along Newark Road with some shrubs, hedgerows and trees linked to commercial and industrial premises.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral - no trees will be removed as part of the proposed works and measures will be implemented to ensure their protection, particularly where there are potential interfaces with root protection areas.
Summary of character	The character of this area is commercial and light industrial with no residential properties in the immediate vicinity and limited green urban areas.	Local	Common	Low	Substitutable	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing highways footprint.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the landscape character of this area. Vegetation works will be limited to pruning / trimming to achieve the necessary clearances for road users. The mature trees located on the north-west side of the junction between Newark Road and East Vicarage Farm Road, which are the most valuable landscape features in the vicinity, will be retained. Tree protection measures will be implemented in accordance with current industry standards and agreed Arboricultural Method Statement. There are also opportunities to reseed the reprofiled verges with a more diverse mix.

TAG Landscape Impacts Worksheet

Scheme: Newark-Oxney Rd Roundabout

Step 2		Step 3				Step 4
Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	This proposed scheme area is set within an established residential area with minor roads leading off the main Oxney Road heading in a broad southwest to northeast direction. The residential pattern is relatively tightly arranged, with a mix of detached and semi-detached properties along with apartment blocks on both sides of the carriageway. Mature trees are present in places, along with roadside hedgerows and vegetation belts, softening the urban grain of built development. 4 of these trees on the north side of the existing carriageway are subject to Tree Preservation Orders.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the character of this area considering the scope of works.
Tranquillity	Low - Oxney Road is a busy road corridor with high levels of activity.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	Mature trees along the northern side of Oxney Road in close proximity to the junction, 4 of which are subject to Tree Preservation Orders. Roadside hedgerow vegetation further to the northeast, including a triangle of grassland on corner with Meadenvale. Some hedgerow vegetation associated with front gardens along the southern side of Oxney Road.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	Neutral - no trees will be removed as part of the proposed works and measures will be implemented to ensure their protection, particularly where there are potential interfaces with root protection areas.
Summary of character	Active and urban character associated with a busy road and extensive built development along both sides of Oxney Road and extending southwards down Newark Road.	Local	Common	Low	Substitutable	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing highways footprint.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the landscape of this area considering the scope of works. Vegetation works will be limited to pruning / trimming to achieve the necessary clearances for road users. The mature trees, including those subject to Tree Preservation Orders, will be retained which are the most valuable landscape features in the vicinity. Tree protection measures will be implemented in accordance with current industry standards and agreed Arboricultural Method Statement.

TAG Landscape Impacts Worksheet

Scheme: Oxney Rd Crossing

Step 2		Step 3				Step 4
Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	Scheme footprint is bounded to the north by residential dwellings although somewhat screened from them by intervening roadside vegetation. To the south is a very large Sainsbury's car park beyond which is a large commercial facility, with associated car parking. To the east is more residential development while land to the west is defined by the A1139 Frank Perkins Parkway. The pattern therefore is mixed use urban.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the character of this area considering the scope of works.
Tranquillity	Low - Eastfield Road and Oxney Road are busy road corridors with high levels of activity.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	The northern side of Eastfield Road features a tree belt which provides a screen between the road and residential properties. The 'island' area between Eastfield Road and the car park access road to the south is grassed with individual trees in linear patterns. The larger of the two roundabouts immediately east features trees while the smaller one is vegetated with scrubby shrubs.	Local and Regional	Moderate	Medium	Trees - not substitutable over short timeframes.	Neutral - no trees will be removed as part of the proposed works and measures will be implemented to ensure their protection. There are opportunities to re-seed new soft landscaping areas with more diverse mixes and plant the 'island' area between Eastfield Road and Oxney Road.
Summary of character	Active, urban landscape dominated character associated with a busy road and roundabout junction. Trees within urban grain help to soften the built development.	Local	Common	Low	Substitutable	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing highways footprint.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the landscape of this area considering the scope of works. Vegetation works will be limited to pruning / trimming to achieve the necessary clearances for road users. The mature trees within the 'island' between the two roads will be retained which are the most valuable landscape features in the vicinity. Tree protection measures will be implemented in accordance with current industry standards. There may be opportunities to seed new soft landscaping areas with more diverse mixes and plant the 'island' area between Eastfield Road and Oxney Road.

TAG Landscape Impacts Worksheet

Scheme: **J7-Eastfield Rd Traffic Signals**

Features	Step 2	Step 3				Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	Scheme footprint is set within a wider residential part of Peterborough. There is a grassland area between Eastfield Road and Hill Close, a triangular shaped junction and pedestrian island, and larger areas of woodland surrounding the junction. However, the character is still evidently urban in nature.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the character of this area considering the scope of works.
Tranquillity	Low - Eastfield Road and Eye Road are busy carriageways with high levels of vehicle and pedestrian activity.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no designated cultural or historic features in close proximity to this location, but there is a war memorial in the triangular island.	Local	Common	High for local residents and stakeholders.	Limited substitutability considering the likely time it has been located in its current location.	Neutral - the war memorial will be retained as part of the proposed work and standard mitigation measures will be implemented to protect this feature.
Landcover	Mature tree belts along the southern side of Eastfield Road and especially flanking both sides of the slip road from the A1139. Tree belts within land between Eye Road and the A1139. Grassland areas within the 'triangle' shaped pedestrian island at the junction of Eastfield Road and Eye Road, along with individual mature trees. Large open grassland area with some trees to the south of Eastfield Road, west of the junction.	Trees - Local & Regional Grassland - Local	Trees - Reasonably common Grassland - Very common	Trees - High Grassland - Low	Trees - not substitutable over short timeframes. Grassland - Substitutable	Trees - slight adverse (negative) effect - one of the trees within the triangular island area will be removed and other trees/vegetation within the development area will be cut back. However, this is unlikely to have a significant impact on the landscape and mitigation measures will be implemented to prevent damage to other retained trees/vegetation. Grassland - Neutral - areas of grassland will be disturbed as part of the proposed works but will be reseeded with an appropriate mix.
Summary of character	Active and urban dominated character associated with a busy road junction surrounded by extensive built development.	Local	Common	Low	Substitutable	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing road network footprint.

Reference Sources

Site visit & desktop study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing road network footprint. Existing trees/vegetation will be trimmed back as required, and the scheme will only require removal of a single semi-mature tree which will not have any significant impact on the surrounding landscape. Disturbed grassland areas will be reseeded with an appropriate mix.

Noise Workbook - Worksheet 1

Proposal Name: Fengate Access Study

Present Value Base Year

Current Year

Proposal Opening year:

Project (Road, Rail or Aviation):

Net present value of change in noise (£):

£36,492
<small>positive value reflects a net benefit (i.e. a reduction in noise)</small>

Net present value of impact on sleep disturbance (£):

-£2,387

Net present value of impact on amenity (£):

£28,235

Net present value of impact on AMI (£):

-£7,076

Net present value of impact on stroke (£):

£7,045

Net present value of impact on dementia (£):

£10,675

Quantitative results

Households experiencing increased daytime noise in forecast year:

59

Households experiencing reduced daytime noise in forecast year:

98

Households experiencing increased night time noise in forecast year:

n/a

Households experiencing reduced night time noise in forecast year:

n/a

Qualitative Comments:

Night-time results estimated from daytime traffic data based on national averages of the differences between daytime and night-time flows.

The overall effects of the scheme can be classified as neutral in terms of noise effects.

Data Sources:

Road traffic model provided by MilestoneInfra on 26/10/2022.

Dwellings within 300 metres of the road traffic model links (PTM3_FengateDM&DS_Links) identified through Ordnance Survey (OS) AddressBase Premium as provided by Peterborough City Council on 01/11/2022.

TAG Townscape Impacts Worksheet

Scheme: Storeys Bar Rd

Features	Step 2	Step 3				Step 4	
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	This area is defined by its position on the very eastern edge of the town, with a lack of residential properties and a predominance of commercial and industrial land uses to the northwest, west and south. Conversely, land to the northeast and east features agricultural fields, introducing a far more open, rural character in those directions.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by commercial and light industrial buildings, with more rural, open agricultural land to the north-east and east.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Buildings and trees surrounding the proposed scheme are at a relatively consistent height and protrude much higher than any assets associated with the proposed improvements, which will primarily entail groundworks. The dominant feature in the landscape here is Peterborough Power Station.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	There is an existing footpath along the western side of Storey's Bar Road in the south which extends up Edgerley Drain Road to the north. The proposed scheme will improve this provision by upgrading this to a combined cycleway / footway route as well as an additional cycleway and safer signalised crossing points.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	Flag Fen Bronze Centre Scheduled Monument is located circa 350m south-east of the proposed scheme at the closest point.	National	Rare	High	Not substitutable	No impact	Neutral - the current setting of this Scheduled Monument is a mixture of modern road infrastructure and residential areas to the west, and rural agricultural lands to the north, east and south. The proposed scheme will not impact this setting.
Land use	Existing crossroads junction surrounded by commercial and light industrial facilities in addition to agricultural land. There is an existing footpath along the western side of Storey's Bar Road in the south which extends up Edgerley Drain Road to the north. Existing active travel routes will be upgraded as part of the proposed scheme. Land use within the scheme footprint and surrounding areas will not change.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	The location is where the more open, rural character of agricultural land to the northeast and east meets the more urban, developed character of the commercial and industrial facilities to the north-west, west and south.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is primarily commercial and light industrial in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes.

TAG Townscape Impacts Worksheet

Scheme: Newark Rd Footpath

Features	Step 2	Step 3				Step 4	
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	The proposed scheme footprint is set within an urban commercial area. Looser pattern of built development associated with commercial and industrial facilities that require more space, including car parking and loading / circulation areas.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by commercial and light industrial buildings.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Buildings surrounding the proposed scheme are at a relatively consistent height and protrude much higher than any assets associated with the proposed improvements, which will primarily entail groundworks.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works. No trees will be removed as part of the proposed works and measures will be implemented to ensure their protection, particularly where there are potential interfaces with root protection areas.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	There is an existing footpath along the western side of Newark Road but this is unfavourable for cyclists and overgrown in places. The proposed scheme will improve this provision by improving connectivity and safety.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	Existing road and adjacent footpath surrounding by commercial and light industrial facilities. Existing pedestrian routes in the area will be improved as part of the proposed works in terms of safety and connectivity. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	The character of this area is commercial and light industrial with no residential properties in the immediate vicinity and limited green urban areas.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is commercial and light industrial in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes.

TAG Townscape Impacts Worksheet

Scheme: Newark-Oxney Rd Roundabout

Features	Step 2		Step 3				Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	This proposed scheme area is set within an established residential area with minor roads leading off the main Oxney Road heading in a broad southwest to northeast direction. The residential pattern is relatively tightly arranged, with a mix of detached and semi-detached properties along with apartment blocks on both sides of the carriageway. At the existing junction, the Parnwell cycleway route connects Oxney Road in the south with Henshaw Road in the north.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by residential buildings.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Buildings surrounding the proposed junction improvements are at a relatively consistent height. There are no features associated with the proposed works which will impact on this. The 4 large trees immediately north-east of the existing junction are subject to Tree Preservation Orders and represent an important townscape features along Oxney Road.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works. No trees will be removed as part of the proposed works and measures will be implemented to ensure their protection, particularly where there are potential interfaces with root protection areas.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	There are existing active travel routes linking Eastfield Road and Oxney Road but the proposed scheme will improve this provision by improving connectivity and safety. At the existing junction, the Parnwell cycleway route connects Oxney Road in the south with Henshaw Road in the north.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	There are already busy road and active travel routes in the area which will be improved as part of the works routes in terms of safety and connectivity. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	Active and urban character associated with a busy road and extensive built development along both sides of Oxney Road and extending southwards down Newark Road.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is busy, active and typically urban in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes and establishing additional safe crossing points.

TAG Townscape Impacts Worksheet

Scheme: Oxney Rd Crossing

Features	Step 2	Step 3				Step 4	
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	Scheme footprint is a busy road network with connecting pedestrian and cycleway routes. It is set within a wider residential part of Peterborough interspersed with small urban green spaces including trees and grassland areas. There are large commercial buildings located immediately south of the site. The A1139 Frank Perkins Parkway is located immediately west.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by residential and commercial buildings. A1139 Frank Perkins Parkway located immediately adjacent to the junction improvements (west).	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Buildings and tree cover surrounding the proposed junction improvements are at a relatively consistent height. There are no features associated with the proposed works which will impact on this.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	There are existing active travel routes linking Eastfield Road and Oxney Road but the proposed scheme will improve this provision by improving connectivity and safety.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	There are already busy road and active travel routes in the area which will be improved as part of the proposed works in terms of safety and connectivity. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	Active, urban landscape dominated character associated with a busy road and roundabout junction.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is busy, active and typically urban in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes and establishing safer signalled crossing point.

TAG Townscape Impacts Worksheet

Scheme: J7-Eastfield Traffic Signals

Features	Step 2	Step 3				Step 4	
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	Scheme footprint is a busy road junction set within a wider residential part of Peterborough interspersed with small urban green spaces including trees and grassland areas.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by residential buildings with some commercial buildings. A1139 Frank Perkins Parkway located immediately adjacent to the junction improvements (east).	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Buildings and tree cover surrounding the proposed junction improvements are at a relatively consistent height. There are no features associated with the proposed works which will impact on this.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	There are existing active travel routes which pass through the junction but the proposed scheme will improve this provision by improving connectivity and safety.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no designated cultural or historic features in close proximity to this location, but there is a war memorial in the triangular island.	Local	Common	High for local residents and stakeholders.	Limited substitutability considering the likely time it has been located in its current location.	No impact	Neutral - the war memorial will be retained as part of the proposed work and standard mitigation measures will be implemented to protect this feature.
Land use	There is already an existing busy junction and the proposed works will improve active travel routes through the area and overall safety. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	Active and urban dominated character associated with a busy road junction surrounded by extensive built development.	Local	Common	Low	Substitutable - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & Baseline Study
 Google and OS mapping
 MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is busy, active and typically urban in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes through the junction and establishing safer signalled crossing points.

TAG Water Environment Impacts Worksheet

Scheme: **J7-Eastfield Traffic Signals**

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Junction 7 Eastfield Road / Oxney Road Junction									
The scheme is located off Junction 7 of the A1139 on Eastfield Road / Oxney Road. There is one small reach of open watercourse south of the site which has connection to a small pond and flows to the south. Part of the site lies within a Secondary A aquifer and an area of 'High' groundwater vulnerability. No designated sites are within the study area.									
Potential impacts									
Surface water									
Construction - Increased sediment supply to watercourse (e.g. clays, fine silts, sands) from construction works.	Rivers: Unnamed drain within 500m.	Conveyance of flow and material	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Alteration to flow characteristics during construction works could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the watercourse.		Conveyance of flow and material	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to watercourses by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Groundwater									
Construction - Pollution to Secondary A aquifer (Bedrock) underlying the study area.	Groundwater Secondary A aquifer (Bedrock) underlying the study area. The study area is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater vulnerability	High groundwater vulnerability.	Local	Common	Not substitutable	Medium	Negligible	Insignificant

Reference Sources

Environment Agency Catchment Data Explorer
 Defra MAGIC Map
 Environment Agency Flood Map for Planning
 Royal Haskoning Water Report

Summary Assessment Score

Neutral

Qualitative Comments

Risk to the small watercourse identified in the study area is very low due to the disconnection from the site. While the aquifer at depth is at high vulnerability, the proposed activities are confined to surface strata and as such there is limited connectivity and no pathway for significant impact to occur. Furthermore, a Construction Environmental Management Plan (CEMP) will be implemented during the construction phase to manage the potential impacts on surface and groundwater. This will include best practice measures to control the release of sediment and contaminants from construction activities. The scheme does not lie within Flood Zone 2 or 3 and is not likely to increase flood risk.

TAG Water Environment Impacts Worksheet

Scheme: Newark Rd Footpath

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Newark Road Footpath									
The scheme is located on Newark Road within Fengate Industrial Park. The site is within 500m of a minor unnamed watercourse which is not designated as a main river. To the west of the site, part of this drain within the study area flows within a culvert. It emerges from the culverted section and flows in an easterly direction adjacent to Vicarage Farm Road. An unnamed pond to the east of the site surface water feature within the study area. There are no designated sites within the study area.									
Potential impacts									
Construction - Increased sediment supply to watercourses (e.g. clays, fine silts, sands) from footpath construction.	Rivers: Unnamed drains within 500m.	Conveyance of flow and material	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Alteration to flow characteristics during construction of the footpath on Newark Road could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the watercourses.		Conveyance of flow and material	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to watercourses by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Increased sediment supply and/or release of pollutants impacting upon water quality of the unnamed pond off Edgerley Drain road.		Stillwaters (lakes and Ponds) Unnamed pond off Edgerley Drain Road	Biodiversity	Low - pond has limited conservation value and is not designated.	Local	Common	High	Low	Negligible
Groundwater									
Construction - Pollution to Secondary A aquifer (Bedrock) underlying the study area.	Groundwater Secondary A aquifer (Bedrock) underlying the study area. The study area is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater vulnerability	Medium The groundwater has high vulnerability to pollutants. WFD GW status - Good	Local	Common	Not feasible	Low	Negligible	Insignificant
Reference Sources									
Environment Agency Catchment Data Explorer Defra MAGIC Map Environment Agency Flood Map for Planning Royal Haskoning Water Report									
Summary Assessment Score									
Neutral									
Qualitative Comments									
Risk to the identified small watercourse is very low due to the disconnection from the site. The site does not lie within Flood Zone 2 or 3 and there is no expected increase in flood risk from the construction or operation of this scheme. While the aquifer at depth is at high vulnerability, the proposed activities are confined to surface strata and as such there is limited connectivity and no pathway for significant impact to occur. The Construction Environmental Management Plan will be implemented throughout the construction phase to further reduce risk of impacts to groundwater and surface water.									

TAG Water Environment Impacts Worksheet

Scheme: Newark-Oxney Rd Roundabout

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Newark Road / Oxney Road Roundabout									
The scheme is located on the junction of Newark Road and Oxney Road. There is one minor watercourse within 500m of the works. No other key water environment receptors are located within the study area.									
Potential impacts									
Surface water									
Construction - Increased sediment supply to watercourse (e.g. clays, fine silts, sands) from construction works.	Rivers: Unnamed drains within 500m.	Conveyance of flow and material	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Alteration to flow characteristics during construction works could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the watercourse.		Conveyance of flow and material	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to watercourses by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant

Reference Sources

Environment Agency Catchment Data Explorer
 Defra MAGIC Map
 Environment Agency Flood Map for Planning
 Royal Haskoning Water Report

Summary Assessment Score

Neutral

Qualitative Comments

Construction Environmental Management Plan (CEMP) will be implemented to manage the potential impacts during the construction phase. This will include best practice measures to control the release of sediment and contaminants from construction activities. The site does not lie within Flood Zone 2 or 3 and there is no expected increase in flood risk from the construction or operation of this scheme. Operational drainage designed to ensure there will be no additional flood or pollution risk from surface water runoff.

TAG Water Environment Impacts Worksheet

Scheme: Oxney Rd Crossing

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Oxney Road Sainsburys Crossing									
The scheme is located outside Sainsburys on Oxney Road. There is one small reach of open watercourse south of the site which has connection to a small pond and flows to the south. Part of the site lies within a Secondary A aquifer and an area of 'High' groundwater vulnerability. No designated sites are within the study area.									
Potential impacts									
Surface water									
Construction - Increased sediment supply to watercourse (e.g. clays, fine silts, sands) from construction works.	Rivers: Unnamed drain within 500m.	Conveyance of flow and material	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats	Local	Common	High	Low	Negligible	Insignificant
Construction - Alteration to flow characteristics during construction works could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the watercourse.		Conveyance of flow and material	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to watercourses by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats	Local	Common	High	Low	Negligible	Insignificant
Groundwater									
Construction - Pollution to Secondary A aquifer (Bedrock) underlying the study area.	Groundwater Secondary A aquifer (Bedrock) underlying the study area. The scheme is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater vulnerability	High groundwater vulnerability.	Local	Common	Not feasible	Medium	Negligible	Insignificant

Reference Sources

Environment Agency Catchment Data Explorer
 Defra MAGIC Map
 Environment Agency Flood Map for Planning
 Royal Haskoning Water Report

Summary Assessment Score

Neutral

Qualitative Comments

Risk to the identified small watercourse is very low due to the disconnection from the site. The site does not lie within Flood Zone 2 or 3 and there is no expected increase in flood risk from the construction or operation of this scheme. While the aquifer at depth is at high vulnerability, the proposed activities are confined to surface strata and as such there is limited connectivity and no pathway for significant impact to occur. The Construction Environmental Management Plan will be implemented throughout the construction phase to further reduce the risk to the highly vulnerable aquifer.

TAG Water Environment Impacts Worksheet										
Scheme: Storey's Bar Road										
Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance	
Study Area: Storey's Bar Road / Ederley Drain Road										
The scheme is located at the crossroad junction of Storey's Bar Road and Ederley Drain Road. The study area is on the eastern edge of an urban area, with low-lying agricultural land to the east. Key surface water features within 0.5km are two unamed drains which flow alongside Storey's Bar Road and Ederley Drain Road. The drain on the south side of Storey's Bar Road is designated as a main river. Both drains on this road join Ederley Drain to the east. A food storage area is connected to the southern unnamed drain on Storey's Bar Road and a pond is located to the north of the scheme off Ederley Drain Road. The proposed scheme lies within the Artificial WFD river water body North Level Pumped Areas 2 and 3 (GB205032050385). There are no designated sites within the study area.										
Potential impacts										
Surface water quality										
Construction - Proposed realignment of existing drain on Ederley Drain Road and Storey's Bar Road will cause permanent alteration of the bed and banks. Construction works will change flow characteristics of the drain which will alter erosion, deposition and sediment transport processes. These works could also impact upon the receiving Adderley Drain less than 500m downstream of the works.	Rivers: Surrounding unamed drains and Adderley Drain.	Conveyance of flow and material	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition. There are also no designated sites in the study area.	Local	Common	High	Low	Negligible	Insignificant	
Construction - Site preparation, cycle way/footpath construction, road improvement works and vegetation removal could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the surrounding drains on Ederley Road and Storey's Bar Road, and the connecting Adderley Drain (within 500m of the construction site) that may affect channel erosion and deposition processes.		Conveyance of flow and material	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition. There are also no designated sites in the study area.	Local	Common	High	Low	Negligible	Insignificant	
Construction - Increased sediment supply (e.g. clays, fine silts, sands) from earthworks associated with drain realignment, footpath construction, vegetation removal and road improvement works. Increased sediment input would increase turbidity levels and increase fine sediment deposition on the bed. This could also impact on the receiving Adderley Drain (within 500m of construction site).		The proposed scheme lies within the Artificial WFD river water body North Level Pumped Areas 2 and 3 Water Body	Biodiversity	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition.	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to drains on Ederley Road and Storey's Bar Road and the connecting Adderley Drain by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.	Waterbody ID: GB205032050385 Moderate Ecological Status	Biodiversity	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition. There are also no designated sites in the study area.	Local	Common	High	Low	Negligible	Insignificant	
Operation - Increased sediment supply (e.g. clay, fine silts, sands) Changes to the current infrastructure through operation of a footpath/cycleway adjacent to the drain. This increase in hard-standing area could increase runoff of fine sediments and pollutant input into the drain.		Conveyance of food flows	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition. There are also no designated sites in the study area.	Local	Common	High	Low	Negligible	Insignificant	
Construction - Increased sediment supply and/or release of pollutants impacting upon water quality of pond.	Stillwaters (lakes and Ponds)	Biodiversity	Low - pond has limited conservation value and is not designated.	Local	Common	High	Low	Negligible	Insignificant	
Flood Risk										
Construction - Flood risk Site preparation, construction of the realigned channel, road improvement works, cycle way/footpath construction and vegetation removal may increase surface water runoff due to alterations in surface drainage patterns and surface water flows. Infiltration rates could be reduced during construction of cycle way/footpath.	Floodplain	Conveyance of food flows	Medium - Part of the study area is within Flood Zones 2 and 3. The drains on either side of Storey's Bar Road currently present a medium flood risk to a small number of commercial properties surrounding the study area.	Local	Common	High	Low	Negligible	Insignificant	
Operation - Flood risk New realigned channel on the northern side of Storey's Bar Road could potentially impact on flood risk.	Floodplain	Conveyance of food flows	Medium - Part of the study area is within Flood Zone 3 and 2. The drains on either side of Storey's Bar Road currently present a medium flood risk to a small number of commercial properties surrounding the study area. The capacity of the realigned channel will remain the same to avoid impacts on flood risk.	Local	Common	Not substitutable	Low	Negligible	Insignificant	
Operation - Flood risk Changes to the current infrastructure with an increase in hard standing area on Storey's Bar Road and Ederley Drain Road through operation of a footpath/cycleway which could increase flood risk.	Floodplain	Conveyance of food flows	Medium - Part of the study area is within Flood Zone 3 and 2. The drains on either side of Storey's Bar Road currently present a medium flood risk to a small number of commercial properties surrounding the study area.	Local	Common	Not substitutable	Low	Negligible	Insignificant	
Groundwater										
Construction - Pollution to Secondary A aquifer (Bedrock) underlying the study area. The study area is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater Secondary A aquifer (Bedrock) underlying the study area. The study area is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater vulnerability	Medium - The groundwater is at medium to high vulnerability to pollutants. Nene Mid Lower Jurassic Unit WFD GW status - Good	Local	Common	Not substitutable	Medium	Negligible	Insignificant	
Construction & Operation - Impact on groundwater levels in the surrounding area which is of particular concern for the Flag Fen Bronze Centre Scheduled Monument located circa 300m south-east of the proposed scheme.	Groundwater	Groundwater vulnerability	The survival of timbers and artefacts within the wet conditions of the Flag Fen basin is outstanding. The post alignment and timber platform at Flag Fen represent a class of monument where relatively few examples survive and are well documented. Waterlogged deposits and artefacts are vulnerable to changes in water levels and to the effects of encroaching industrial development. Hydrogeological Assessment has been undertaken to confirm that the proposed scheme will have no significant impact upon groundwater levels within the vicinity of the Scheduled Monument.	National	Rare	Not substitutable	High	Negligible	Insignificant	
Reference Sources										
Environment Agency Catchment Data Explorer Delta MAGIC Map Environment Agency Flood Map for Planning Royal Haskoning Water Report										
Summary Assessment Score										
Neutral										
Qualitative Comments										
The risk to water quality and biodiversity of the surrounding surface water features is low. All watercourses are artificial drains and have low geomorphological and ecological value. The construction activities and the new scheme in operation are considered to have an insignificant impact on these features. Despite a medium flood risk in the study area, there is no increased flood risk anticipated from these construction activities or operation of the new cycleway/footpath due to their small scale and the presence of a food storage area on the southern side of Storey's Bar Road. Although the aquifer at depth is in an area of medium-high groundwater vulnerability, proposed activities are confined to surface strata and as such there is limited connectivity and no pathway for significant risk to occur. Mitigation measures outlined within the Construction Environmental Management Plan will further prevent any adverse impact on key features. This will include best practice measures to control the release of sediment and contaminants from construction activities. Operational drainage will be designed to ensure there will be no additional flood or pollution risk from surface water runoff.										

Appendix F – Early Release of Funding Technical Note

Technical Note

Description: Fengate Active Travel Early Funding Release **To:** Emma White

Reference: **From:** Ross Percy-Jones

Date: 23/08/2022 **cc:** Lewis Banks, Richard Jones, Tamara Lanoix, Sally Savage

Introduction

Peterborough City Council (PCC) is requesting the early release of part of the construction funding for the Fengate Access Study from the Cambridgeshire and Peterborough Combined Authority (CPCA).

This is to accelerate the construction of two active travel schemes, which form part of the Fengate Access Study project, ahead of the main highways works which are scheduled to commence in Spring 2023 (subject to CPCA Board approval in January 2023). The schemes identified for accelerated delivery are:

- Newark Road Footpath
- Oxney Road Pedestrian Crossing.

Peterborough City Council and the CPCA have been considering opportunities to accelerate scheme delivery as the project is funded by the Transforming Cities Fund (TCF). The TCF is time limited and must be spent by 31st March 2024.

Including the Fengate Access Study project, there is approximately £17m of TCF funded transport infrastructure to deliver in Peterborough in the 2023 / 2024 financial year. Bringing forward some of the active travel schemes for delivery into the third and fourth quarters of the 2022 / 2023 financial year will reduce the pressure on the wider construction programme, and specifically reduce the risk to funding availability caused by any programme delays.

A Full Business Case (FBC) is required for the approval of construction funding by the CPCA Board. The Fengate Access Study FBC is due to be submitted in December 2022, ahead of the January 2023 Board meeting. This technical note provides a summary of the business case dimensions in relation to the two active travel schemes introduced above and demonstrates that the schemes offer very high value for money, and that there is a strong strategic case for investment as well as the necessary measures in place to successfully deliver the schemes.

Schemes

The Fengate active travel schemes are designed and ready to be delivered.

The Newark Road Footway scheme consists of the following:

- 473.5 sqm of footway from the south of Newark Road
- 25.0 sqm of tactile paving positioned either side of:
 - The East Vicarage Farm Road arm of the Newark Road / East Vicarage Farm Road Roundabout
 - The Newark Road north arm of the Newark Road / East Vicarage Farm Road Roundabout
 - Access junctions along the entire footway length on the western side of Newark Road.
- 25.0 sqm of carriageway resurfacing.

The Oxney Road Pedestrian Crossing scheme consists of the following:

- A new puffin crossing over Eastfield Road, west of Oxney Road.
- Red tactile paving on each side of the crossing.
- A total green time of 5.0 seconds for pedestrians, with up to 18.0 seconds of red time for motorised vehicles.
- A 2.4m wide footpath between Oxney Road (north of Sainsbury's) and Eastfield Road
- Break up of existing footway between Oxney Road (north of Sainsbury's) and Eastfield Road
- Buff-coloured tactile paving on each side of Oxney Road, where the proposed footpath meets.
- Buff-coloured tactile paving on each side of the Franklyn Crescent arm of the Oxney Road / Eastfield Road / Franklyn Crescent Roundabout.
- Footway resurfacing on the south side of the puffin crossing.

The scheme drawings for each scheme can be provided upon request.

Figure 1 overleaf shows the location of the schemes in Fengate.

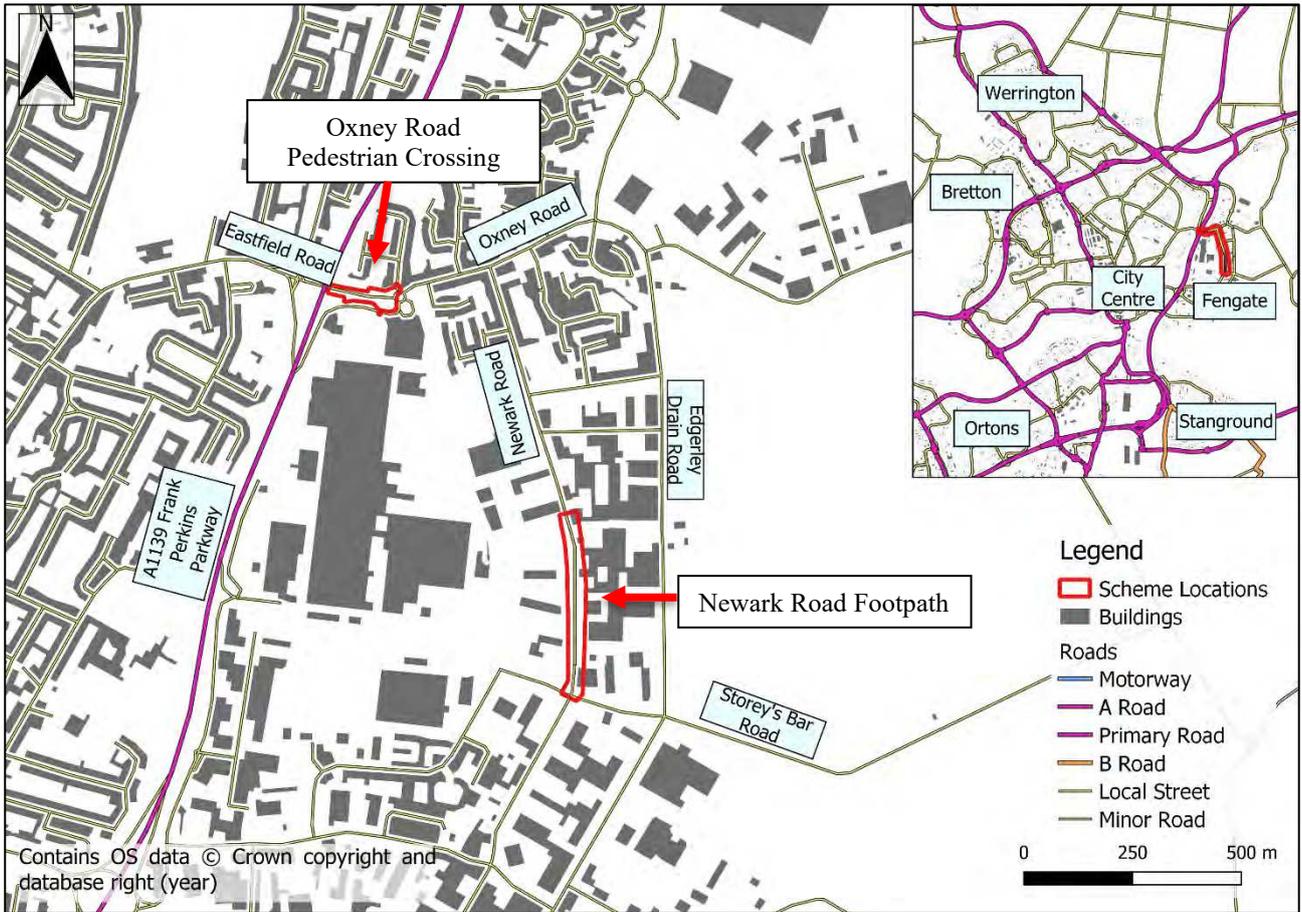


Figure 1: Fengate Active Travel Scheme Locations

Strategic Dimension

The Strategic Dimension considers the policy context in which the schemes have been developed. As well as policy, the need for intervention is explained, which includes the requirement to overcome the peak hour congestion and delay that compromises local growth aspirations.

Policy Context

A policy review of the following, in conjunction with a review of existing and future issues, has been undertaken as part of the Fengate FBC to identify scheme objectives:

- National:
 - Department for Transport Single Departmental Plan (June 2019)
 - Department for Transport Gear Change: One Year On (November 2020)
 - Department for Transport Cycle Infrastructure Design Local Transport Note 1/20 (LTN 1/20) (July 2020)
 - The Environment Act 2021
- Regional:
 - Combined Authority Annual Report & Business Plan 2021 / 22
 - Cambridgeshire and Peterborough Independent Economic Review (CPIER) (September 2018)
 - Mayor's Growth Ambition Strategy
 - Cambridgeshire and Peterborough Local Industrial Strategy (June 2019)
 - Cambridgeshire and Peterborough Combined Authority Local Transport Plan (January 2020)
 - Forthcoming Cambridgeshire and Peterborough Combined Authority Local Transport and Connectivity Plan
 - Natural Cambridgeshire Doubling Nature Vision
 - Cambridgeshire and Peterborough Independent Commission on Climate – Fairness, Nature and Communities: Addressing Climate Change in Cambridgeshire and Peterborough (October 2021)
- Local:
 - Peterborough City Council Strategic Priorities
 - Peterborough City Council Local Plan (July 2019)
 - Peterborough City Council – Trees and Woodland Strategy (2018)

Existing and Future Conditions

Trafficmaster Satellite Navigation data (November 2017) has been used to assess baseline vehicular journey times and delay within the study area for the free flow (00:00 – 05:00), AM peak hour (08:00 – 09:00), and PM peak hour (17:00 – 18:00) periods. The approaches of the following junctions have been considered within the Fengate FBC:

- Oxney Road / Edgerley Drain Road priority junction
- Edgerley Drain / Storey's Bar Road / Vicarage Road signalised junction
- Junction 8 signalised junction.

Significant delay was observed at all of these junctions in the AM and PM peak hours when compared to the free flow period.

An assessment of future year highway conditions was undertaken using the Peterborough Transportation Model (PTM3) and large increases in delay per vehicle are forecast to take place at all three junctions.

It is expected that providing improved active travel infrastructure will encourage residents to travel by foot or bicycle instead of by car, and therefore help reduce existing and future year peak hour congestion and delay.

Fengate is a particularly car-dependent employment destination, as shown in Figure 2 below, and the quality of the active travel infrastructure is of a lower quality compared to other areas of Peterborough. The density of cycleways per one square kilometre is also lower than other areas of the city as shown in Figure 3 overleaf.

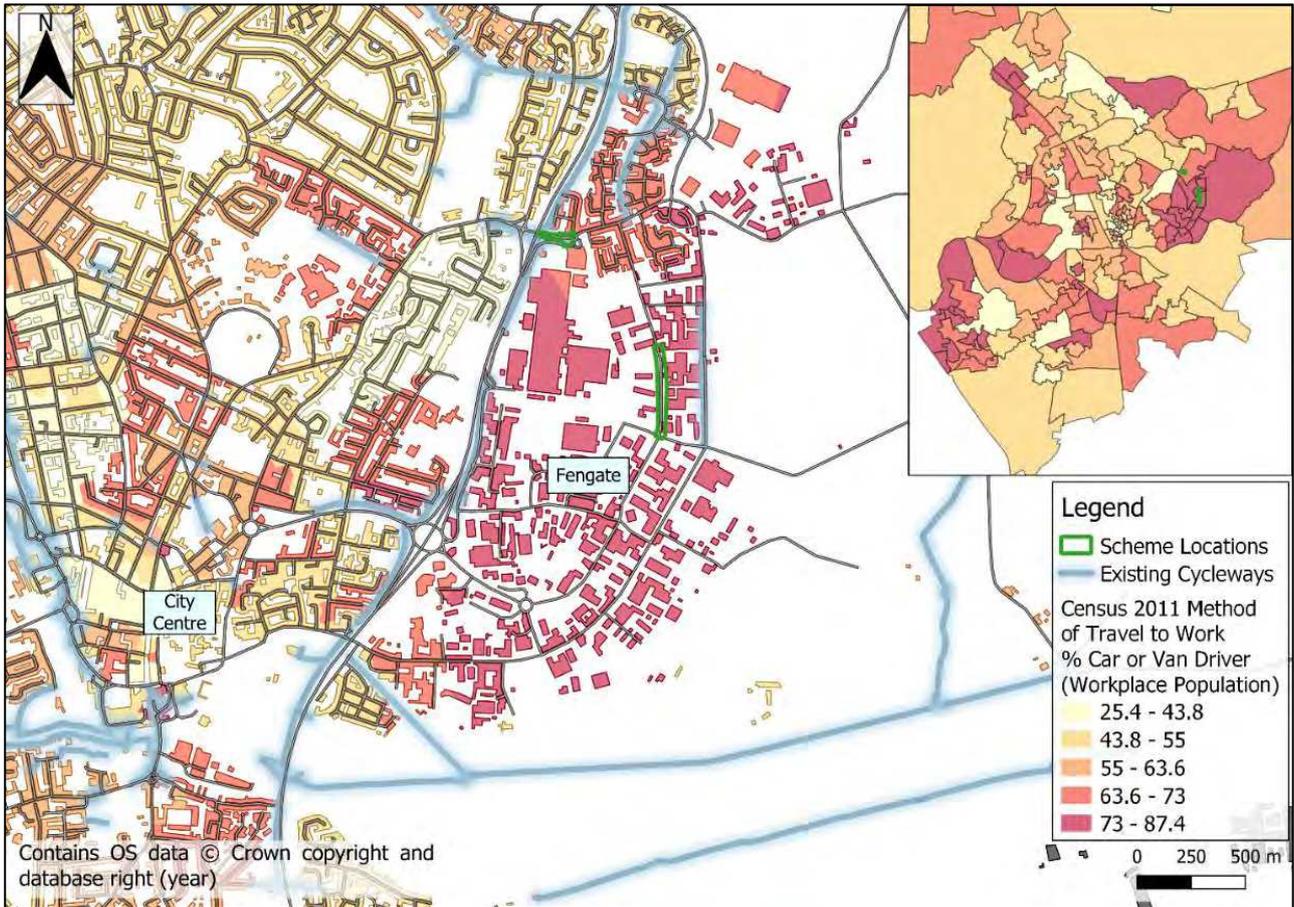


Figure 2: Census 2011 Method of Travel to Work – Percentage Car or Van Driver within Workplace Population



Figure 3: Total Length of Existing Cycleway per One Square Kilometre

The average car travel to work mode share for Fengate is 79%, whereas the whole of Peterborough is 61%. In contrast, Fengate has a low walking travel to work mode share of 3%, as shown in Figure 4 overleaf. The whole of Peterborough has a walking mode share of 8%, which is almost triple of the mode share in Fengate. Without an improvement in active travel infrastructure, Fengate will remain a car-dependent destination that is less accessible for those able to travel by foot or cycle.

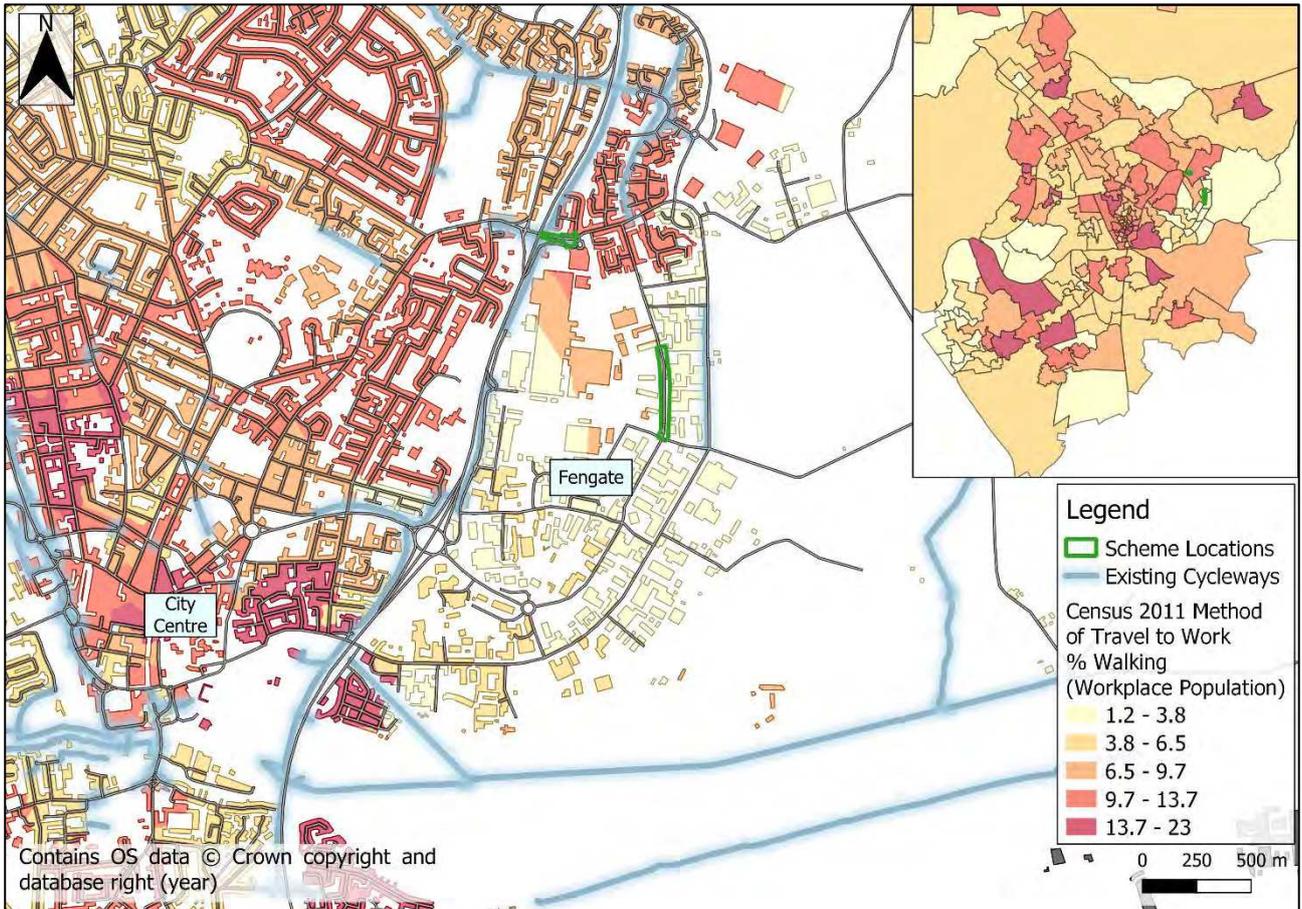


Figure 4: Census 2011 Method of Travel to Work – Percentage Walking within Workplace Population

Local Growth Aspirations

Peterborough is forecast to experience significant employment and population growth over the next few decades, reflecting a continuation of past trends. The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities and objectives for Peterborough for the period up to 2036. The updated strategy identifies the required delivery of 19,440 new homes and 17,600 new jobs by 2036. This level of growth will in turn further strengthen the City's economy, contribute to regional growth, and increase the demand for travel on the local network.

Peterborough strives to become a 'destination of choice', to be continually recognised as a regional centre and economic partner with Cambridge. With the attractiveness of the city set to increase as a place to live, work and travel, this in turn creates pressure in relation to housing and employment growth, which in turn increases the strain on the transport infrastructure. Improving the transport infrastructure to enable Peterborough's strong history of growth to continue is the main internal driver for improving access to the key employment area of Fengate.

Tables 1 and 2 show the breakdown of the residential and employment developments that are proposed for Fengate, respectively.

Table 1: Residential Development Proposed for Fengate

Local Plan Development	Residential Developments (Units)				
	Up to 2019	2019-2026	2026-2031	2031-2036	Total Units
Potters Way Fengate	0	18	0	0	18
Fengate South	0	0	150	200	350
Former Perkins Engines Site Newark Road	0	104	0	0	104
Tanholt Farm, Eyesbury Road	0	3	0	0	3
Rear of 83 Oxney Road	0	5	0	0	5
105 Oxney Road	0	8	0	0	8

Table 2: Employment Development Proposed for Fengate

Mixed Commercial Developments (sq.m)						
Local Plan Development	Land Use Class	Up to 2019	2019 -2026	2026 -2031	2031 -2036	Total Size (sq.m)
Red Brick Farm	Employment	0	0	126,600	0	126,600
Oxney Road Site C	Employment	0	0	34,825	0	34,825
Perkins South	Employment	0	0	14,700	0	14,700
Land of Third Drove and fronting Fengate	Employment	0	0	5,950	0	5,950

Local residential and employment growth in Fengate will be compromised if no changes are made to existing congestion and delay. An increase in active travel within Fengate and a reduction in car travel will alleviate congestion and delay.

The October 2021 Cambridgeshire and Peterborough Independent Commission on Climate report recommends a reduction in car miles driven by 15% to 2030 relative to baseline levels to help the region mitigate and adapt to the impacts of climate change. The schemes will provide quality walking infrastructure that would encourage walking to work within Fengate as a more sustainable alternative to car travel.

Scheme Objectives

The project scope is to construct schemes within Fengate that achieve each of the primary objectives of the Fengate FBC.

The primary scheme objectives, as outlined in the Fengate FBC, are as follows:

- Tackle congestion and reduce delay
- Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site
- Protect the local environment and improve biodiversity.
- Reduce dependence on car travel and increase travel by healthier, more sustainable modes.

The secondary scheme objectives, as outlined in the Fengate FBC, are as follows:

- Positively impact traffic conditions on the wider network
- Improve road safety.

The Fengate FBC schemes were developed and shortlisted against the scheme objectives using the DfT's Early Assessment and Sifting Tool (EAST) assessment. An option development workshop was held on 15th May 2018 and attended by representatives from various disciplines within Peterborough Highway Services (PHS). The workshop used EAST to review existing and future issues relating to access to Fengate and site constraints.

As stated in the Department for Transport (DfT) Cycle Infrastructure Design Local Transport Note 1/20 (LTN 1/20), funding for local highways investment where the main element is not cycling or walking will be provided where schemes deliver or improve cycling infrastructure to the standards in LTN 1/20.

The Benefits Realisation Plan for the Fengate FBC will measure the success of the schemes against the scheme objectives.

Key Risks

A project Risk Register is available as part of the Fengate FBC that identifies each of the key risks and mitigation measures. The Risk Register is a live document, which is managed by PCC and is reviewed regularly by the CPCA in monthly Project Board meetings.

A construction Risk Register for each scheme has been produced and can be provided upon request. The Risk Register is a live document and will be regularly updated throughout the ten-week construction period.

Economic Dimension

The Economic Dimension provides evidence of how the proposed improvements are predicted to perform in relation to the stated objectives, identified problems, and targeted outcomes. The Economic Dimension determines whether the proposed improvements are likely to provide good value for money, with benefits outweighing its costs.

This section sets out the approach taken to initially assess the Economic Dimension for the Fengate Active Travel schemes and demonstrates that the proposed schemes would offer Very High Value for Money.

The scheme appraisal in this report focuses on the impacts that can be monetised and these include:

- Mode Shift
- Health
- Journey Quality
- Severance.

A full appraisal of other economic, environmental, social and distributional impacts that cannot be monetised will be assessed quantitatively and qualitatively within the FBC going to the CPCA January Board.

Present Value of Benefits

The active travel and severance Present Value of Benefits (PVB) of each scheme has been assessed using the Active Mode Appraisal Toolkit (AMAT) and the University College London (UCL) Tool to Value Reductions in Community Severance Caused by Roads, respectively.

AMAT requires the following intervention-specific details for calculating active travel benefits:

- Appraisal year – 2022
- Intervention opening year – 2023
- Final year of funding – 2023
- Appraisal period – 20 years
- Area type – Other Urban
- Number of daily walking and / or cycling trips without the proposed intervention
- Number of daily walking and / or cycling trips with the proposed intervention
- Percentage of an average walking or cycling trip that will use the intervention
- Current walking and cycling infrastructure for the route
- Proposed walking and cycling infrastructure for the route.

The number of walking and cycling trips without the proposed interventions have been sourced from Strava Metro, Census 2011 Method of Travel to Work, Vivacity AI sensors, and historic Automatic Traffic Counts (ATC).

The number of walking trips with the proposed interventions has been calculated by:

- Identifying a comparable location within Peterborough that has a higher walking mode share (based on the Census 2011) and better walking infrastructure
- Identifying the walking mode share for the scheme location based on the Census 2011
- Calculating an uplift factor based on the ratio of Shrewsbury Avenue to Fengate walk trips.
- Applying the resultant uplift factor to the number of walking trips without the proposed interventions.

A comparison between Shrewsbury Avenue in Orton Longueville, which is a comparable land use, and Fengate was undertaken to understand the potential for travel to work by walking. The assessment identified that Shrewsbury Avenue had a travel to work by walking mode share of 5.33%, whereas Fengate had a mode share of 4.45%. The uplift factor for walking would therefore be 1.198.

The number of cycling trips with the proposed interventions has been calculated by:

- Identifying the PCT Government Target (Equality) Ratio (Scenario / Baseline) for the existing route at the scheme location
- Applying the ratio as an uplift factor to the number of cycling trips without the proposed interventions.

Government Target (Equality) is the most conservative of all PCT scenarios and is representative of the Department for Transport's Cycling Delivery Plan (October 2014) target of doubling cycling from 2013 levels nationally. Nearly all PCT scenarios are calculated using a function based on trip distance and hilliness. Not all areas experience the same trip distances and hilliness, and this therefore results in increases that can be below or above a doubling of cycling nationally.

PCT is a measure of cycling potential and not an exact estimate of the impact of a specific scheme or intervention. However, site visits to each scheme location have shown that each scheme is integral to delivering a better-connected network that reduces severance and improves safety and journey quality for cycling. Without any infrastructure improvements, the study area would not be appropriate for increased cycling.

Table 3 below shows the number of walking trips by scenario for each scheme.

Table 3: Do Nothing and Do Something Daily Walking Trips by Scheme

Scheme	Daily Walking Trips	
	Do Nothing	Do Something
Oxney Road Pedestrian Crossing	1,701	2,038
Newark Road Footway	773	926

The UCL Tool to Value Reductions in Community Severance Caused by Roads (Anciaes and Jones, 2020) is a spreadsheet used to estimate the value of interventions that reduce the barrier effect caused by roads, including changes to road design, traffic, and crossing facilities. This tool is referred to as the “Severance Tool” within this report.

Severance is calculated at each point along a road. The Severance Tool assumes that severance originates from the road conditions at a particular point and the possibility of walking along the road to cross in a place with better road conditions or crossing facilities.

The Severance Tool has only been used for the Oxney Road Pedestrian Crossing scheme and it requires the following intervention-specific details for calculating active travel benefits:

- Length of road segment (100 – 5,000m)
- Total potential demand for walking trips crossing the road (minimum of 1,000 trips per day)
- Percentage of each age group in the demand
- Average walking speed by age group
- Journey purpose of each age group
- Percentage of demand at each crossing location along the road segment
- Lifetime of the project (maximum of 10 years)
- Road conditions including the number of lanes in each direction, central reservation (wide, narrow, or none), traffic density (low, medium, or high), and traffic speed (10, 20, 30, or 40mph).
- Crossing facilities available at the extreme and middle points of the road segment. Options include pedestrian refuge, straight pelican, staggered pelican, footbridge, or underpass.
- Waiting time (0 to 5 minutes).

It has been assumed that the scheme will generate an increase in walking trips and therefore the rule of half must be applied to the benefits associated with the increase.

Table 4 overleaf summarises the benefits for each scheme.

Table 4: Summary of Benefits by Scheme

Benefit Type	Benefit Item	Benefits ('000s)		
		Oxney Road	Newark Road	Total
Mode Shift	Congestion Benefit	21.84	9.91	31.75
	Infrastructure Maintenance	0.12	0.06	0.18
	Accident	3.75	1.70	5.46
	Local Air Quality	0.53	0.24	0.77
	Noise	0.25	0.11	0.36
	Greenhouse Gases	1.78	0.81	2.59
Health	Reduced Risk of Premature Death	793.36	360.19	1,153.55
	Absenteeism	165.06	74.94	240.00
Journey Quality	Journey Ambience	17.40	33.77	35.51
Severance (Indicative Monetised Impact)	Reduced Community Severance Caused by Roads	948.70	Not assessed	948.70
Indirect Taxation	Indirect Taxation	-2.24	-1.02	-3.26
Total		1,950.43	480.66	2,431.09

The benefits over a 20-year appraisal period for the Oxney Road and Newark Road schemes are £1,950,430 and £480,660, respectively. Health (49%) and Severance (49%) form most of the benefits for the Oxney Road scheme, whereas Health (90%) accounts for nearly all the benefits for the Newark Road scheme alone.

Present Value of Costs

The Present Value of Costs (PVC) used within the economic assessment are based on initial base investment costs and Optimism Bias (OB) that have been rebased and discounted to 2010 prices and adjusted to market prices using AMAT. Inflation has not been applied to the scheme costs because the costs are to be incurred during the 2022 price year.

Real Cost Increase (inflation) has been applied to the Base Investment Costs for the Oxney Road scheme only for 2022 to 2023 using TAG Data Book May 2022 Annual GDP and BCIS General Civil Engineering Cost Index (2022) values. The inflation factor applied (1.061) has been calculated by dividing the BCIS inflation factor of 1.080 (8.0%) by the TAG GDP factor of 1.018 (1.8%).

The OB rate has been sourced from TAG Unit A1.2 Scheme Costs (May 2022) and uses the Stage 3 Road OB of 20% to reflect the final stage (FBC) that the Fengate Business Case is currently at.

The conversion to market prices is undertaken by applying a market price factor of 1.19 to the discounted costs.

Table 5 below shows the scheme costs used within the economic assessment.

Table 5: Economic Dimension Costs

Cost Type	Oxney Road Pedestrian Crossing	Newark Road Footway	Total
Base Investment Cost	£253,526	£203,237	£456,763
Base Cost with Real Cost Increases	£269,070	£203,237	£472,307
Base Cost with Real Cost Increases and Optimism Bias	£322,883	£243,885	£566,768
Rebased and Discounted to 2010, and Adjusted to Market Prices (PVC)	£187,560	£151,277	£338,837

Net Present Value and Benefit Cost Ratio

The Net Present Value (NPV) has been calculated by subtracting the PVC from the PVB.

The Benefit Cost Ratio (BCR) has been calculated by dividing the PVB by the PVC.

The BCR is used to determine the Value for Money category that each scheme falls within, as shown in Table 6 below. The Value for Money categories have been sourced from the Department for Transport Value for Money Framework: Moving Britain Ahead (2017) document.

Table 6: Value for Money Categories

Value for Money Category	Benefit Cost Ratio (BCR) Range
Very Poor	$BCR \leq 0.0$
Poor	$1.0 < BCR > 0.0$
Low	$1.5 < BCR \leq 1.0$
Medium	$2.0 < BCR \leq 1.5$
High	$4.0 < BCR \leq 2.0$
Very High	$BCR \geq 4.0$

The scheme should provide a BCR of at least 1.5 (Medium Value for Money) to be considered of good value for money. It should be noted that the CPCA state in its Local Assurance Framework (2021) that a scheme with a BCR less favourable than other alternatives but best delivers on a project's strategic objectives may be the best value way of delivering a project. However, it is for the CPCA Board to judge whether the achievement of the strategic objectives is worth the cost to the CPCA.

Table 7 overleaf provides the Analysis of Monetised Costs and Benefits (AMCB) Table.

Table 7: Analysis of Monetised Costs and Benefits Table

Benefit Item	Value (£'000s)		
	Oxney Road	Newark Road	Total
Noise	0.25	0.11	0.36
Local Air Quality	0.53	0.24	0.77
Greenhouse Gases	1.78	0.81	2.59
Journey Quality	1.74	33.77	35.51
Physical Activity (Health)	958.42	435.13	1,393.55
Accidents	3.75	1.70	5.46
Congestion Benefit	21.84	9.91	31.75
Infrastructure Maintenance	0.12	0.06	0.18
Indirect Taxation	-2.24	-1.02	-3.26
Present Value of Benefits (PVB)	1,001.72	480.66	1,482.38
Broad Transport Budget	187.56	151.28	338.84
Present Value of Costs (PVC)	187.56	151.28	338.84
Net Present Value (NPV)	814.17	329.38	1,143.55
Initial Benefit to Cost Ratio (BCR)	5.34	3.18	4.37

Severance is not currently considered as an Established Monetised Impact within TAG or the Value for Money Framework. However, it could be considered an Indicative Monetised Impact that when combined with the core benefits reported within the AMCB Table would demonstrate an indicative PVB.

Without severance impacts in the economic assessment of the Oxney Road scheme would provide a PVB of £1,001,720, NPV of £814,170, and a BCR of 5.34 which equates to Very High Value for Money. Including severance impacts increases the BCR from 5.34 to 10.39.

The Newark Road scheme provides a PVB of £480,660, NPV of £329,380, and a BCR of 3.18, which equates to High Value for Money.

Combining both schemes together (without severance) provide a PVB of £1,482,380, NPV of £1,143,550, and a BCR of 4.37, which equates to Very High Value for Money. Including severance impacts increases the overall BCR from 4.37 to 7.17.

Non-monetised Impacts

Impacts that have not been monetised for active travel include:

- Journey time savings for active users (Social and Economy)
- Security (Social)
- Personal Affordability (Social)
- Accessibility (Social).

The distributional impacts of security and personal affordability have been quantitatively assessed. Accessibility has not been assessed on the basis that the guidance within TAG Unit A4.2 focuses solely on public transport.

The following non-monetised environmental impacts have been considered in full within the Fengate FBC:

- Landscape
- Townscape
- Historic Environment
- Biodiversity
- Water Environment.

Security

Security impact appraisal is recommended for road users, public transport passengers or freight, or a combination of these as stated in TAG Unit A4.1 Social Impact Appraisal. Whilst there is no specific guidance for the security of active mode users, the process as outlined within TAG Unit A4.2 Distributional Impact Appraisal has been used. Indicators such as surveillance, lighting and visibility, and landscaping were noted during site visits and used to inform the appraisal.

The security distributional impact appraisal found that each scheme would not deliver any change in terms of security for older people, females, or young people.

Personal Affordability

Personal Affordability appraisal considers how the monetary costs of travel can be a major barrier to mobility for certain groups of people and their ability to access key destinations. The more deprived groups of society typically spend less money on travel, but the cost of travel will account for a greater proportion of their income. The most significant impacts of the costs of travel are on younger and older groups, and low-income households.

Figures 5 and 6 show the distribution of younger (0 to 15) and older (65 plus) age groups across Peterborough in relation to key services that would likely be used, respectively.

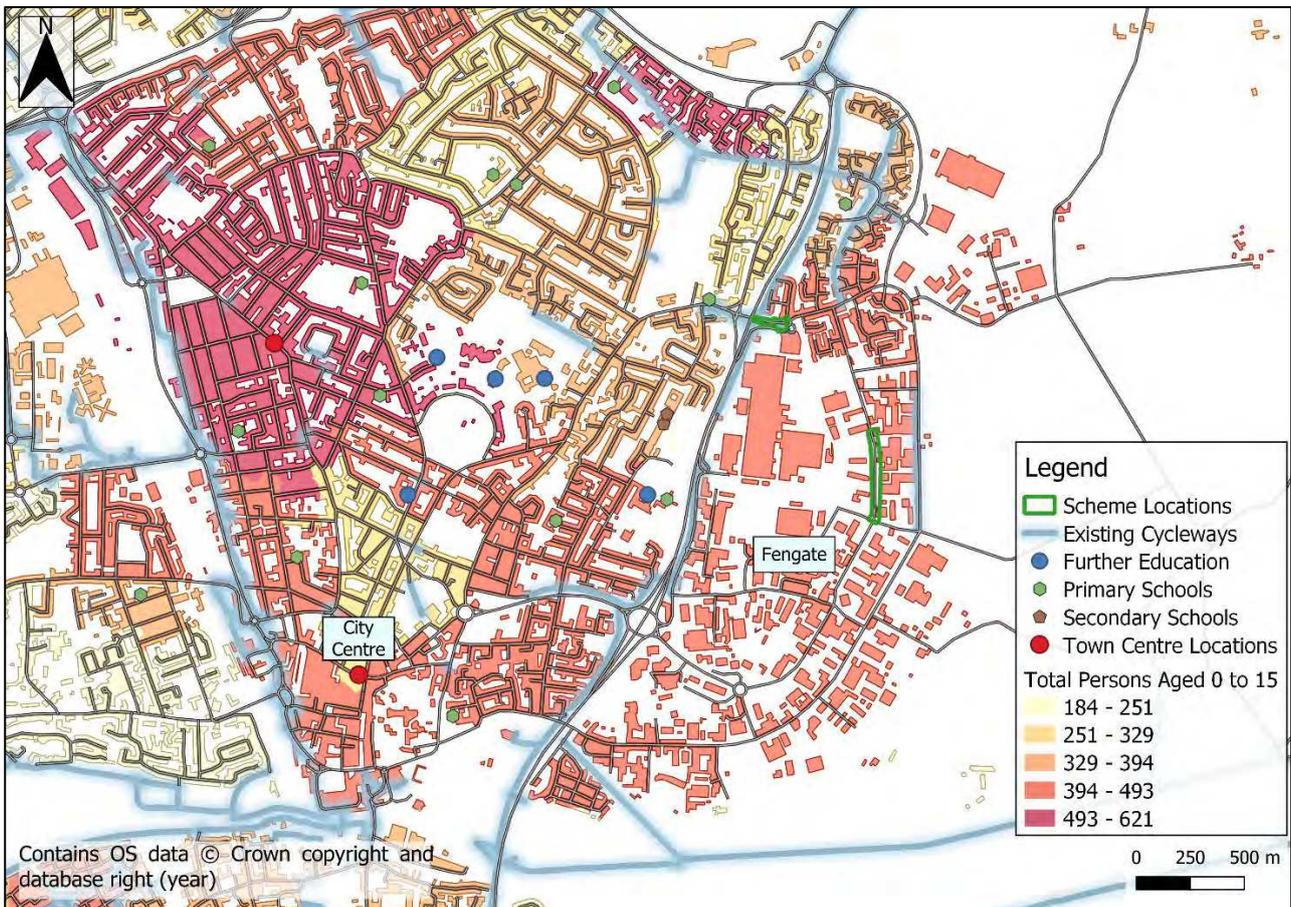


Figure 5: Number of Persons Aged 0 to 15 at LSOA Level across Peterborough in Relation to Key Services

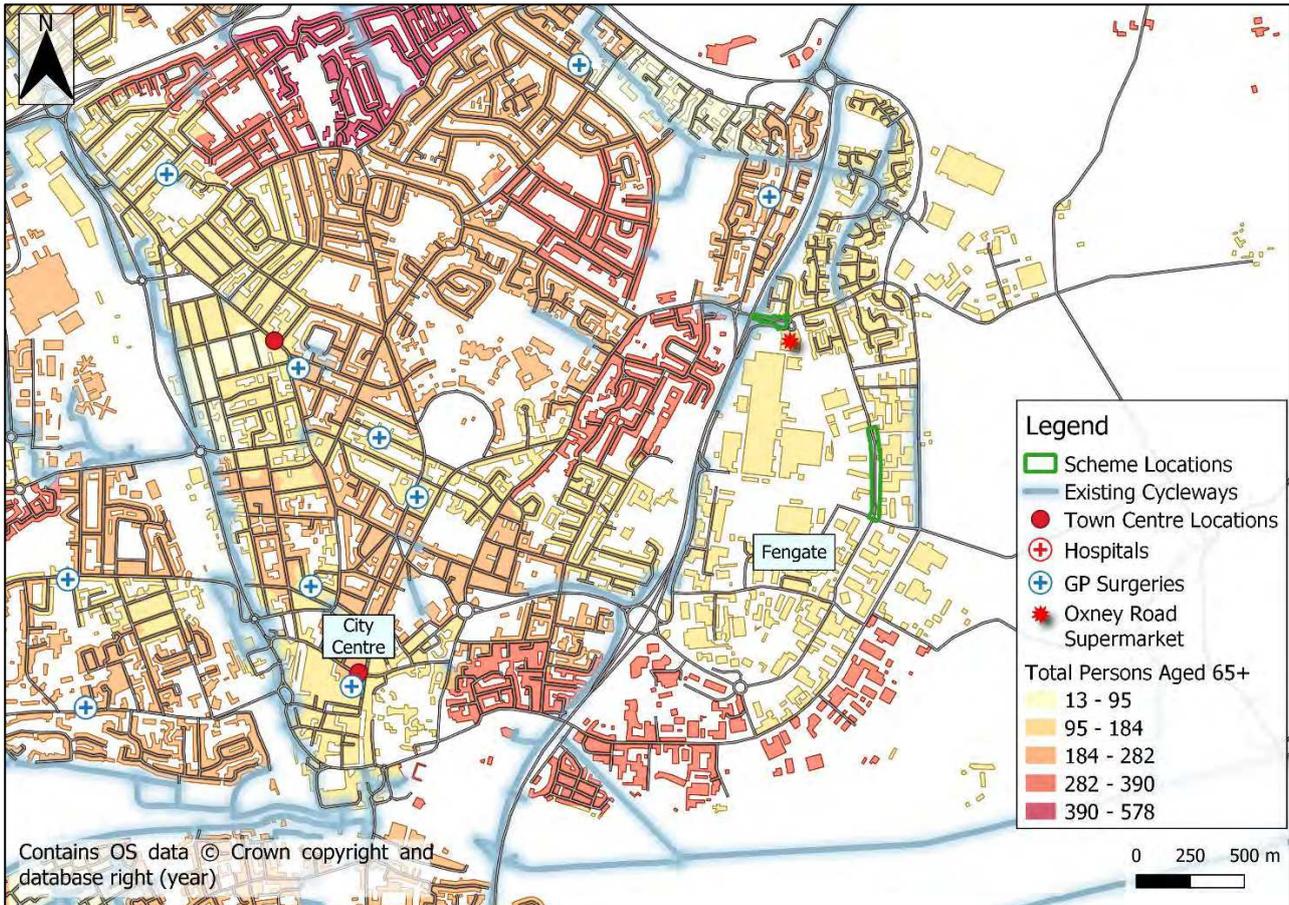


Figure 6: Number of Persons Aged 65+ at LSOA Level in Relation to Key Services

There is a particularly high number of persons aged 0 to 15 that live along Oxney Road and north-east of the nearest secondary schools that would be currently disadvantaged by the lack of a direct crossing point along Eastfield Road. Young people walking to school would have to wait for a gap in the traffic on Eastfield Road to cross or travel further west to find a suitable crossing and even then, they would have to cross the Eye Road Approach and Exit arms of the Eastfield Road / Eye Road Signalised Junction. Without the proposed crossing, it is expected younger people choosing to walk to school are currently experiencing increased journey times and therefore an increased cost of travel.

There is a significant number of persons aged 65 and above to the west of the Oxney Road Supermarket that would be currently disadvantaged by the lack of a direct crossing point along Eastfield Road. Whilst bus travel is free for senior citizens and there is a bus stop at the Oxney Road Supermarket, travelling by bus does not offer the same health benefits as those associated with active travel. The lack of a direct crossing point would increase journey times and the cost of travel for those wanting to walk.

Figure 7 shows the Income Deprivation Domain of the English Indices of Multiple Deprivation dataset for the study area.

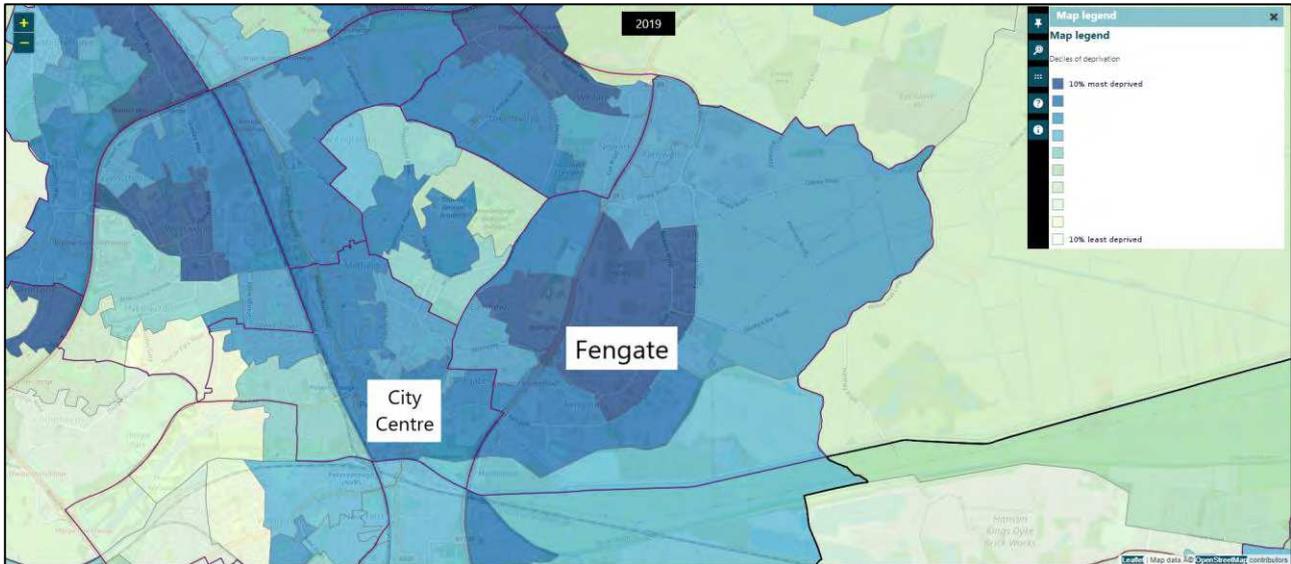


Figure 7: Income Deprivation Domain by LSOA

The LSOAs in and surrounding Fengate are in the top 30% most income deprived deciles for England. An improvement in the walking infrastructure of Fengate would help make walking to work or other local key services a more realistic alternative to car and bus travel for those in income deprived areas that are more greatly affected by the cost of travel for reaching work.

Fengate is a particularly car-dependent employment destination, as previously shown in Figures 2 to 4 of the Strategic Dimension, and the quality of the active travel infrastructure is of a lower quality compared to other areas of Peterborough.

The average car travel to work mode share for Fengate is 79%, whereas the whole of Peterborough is 61%. In contrast, Fengate has a low walking travel to work mode share of 3%, as shown in Figure 6. The whole of Peterborough has a walking mode share of 8%, which is almost triple of the mode share in Fengate. Without an improvement in active travel infrastructure, Fengate will remain a car dependent destination that is less accessible for those who cannot afford to travel by car.

Value for Money Statement

Delivering the Oxney Road Pedestrian Crossing and Newark Road Footway active travel schemes together will provide a PVB of £1,466,780 overall, with a BCR of 4.37 (Very High Value for Money) based on physical activity, journey quality, accidents, noise, local air quality, greenhouse gases, and congestion benefits. Including severance benefits increases the overall PVB to £2,415,600, with a BCR of 7.17.

The schemes are not expected to deliver any change in security impacts for vulnerable active travel users.

The removal of a barrier to travel along Eastfield Road and the provision of a new footway on Newark Road is expected to make walking a more realistic and affordable alternative to car travel to key services in and around Fengate. The schemes would also benefit nearby residential areas that are currently in the top 30% most income deprived deciles for England.

Financial Dimension

The Financial Dimension focuses on the affordability of the proposed schemes, funding arrangements, and technical accounting issues.

The scheme cost estimates for the Financial Dimension have been prepared in line with guidance set out in TAG Unit A1.2 Scheme Costs (May 2022).

The estimates have been costed based on a bill of quantities produced from the preliminary designs and a schedule of construction activities. These costs have been peer reviewed, and include:

- Detailed design costs and additional surveys where required
- Land acquisition and planning costs
- Ecology surveys, and specialist environmental advice
- Staff and legal fees, including local overheads and consultation costs
- Third party costs
- Construction costs, including mobilisation, supervision, and costs associated with statutory undertakers works
- Risk Allowance.

It should be noted that Optimism Bias is not applied within the Financial Dimension and is only for use within the Economic Dimension.

Project costs incurred to date have been omitted from the costs presented in this section as “sunk costs”, which is in line with TAG Unit A1.2.

The cost profile is based upon the milestone activities set out in the Management Dimension, and the dates used to calculate the scheme costs, including the application of inflation, are shown in Table 8.

Table 8: Milestone Activities

Timescale	Activity
August 2022	Present Active Travel Schemes Business Case Technical Note to CPCA
September 2022	CPCA Sponsors present papers to CPCA Board to request approval of funding. Raising Work Orders and mobilising works
October 2022 – December 2022	Newark Road scheme construction undertaken
January 2023 – March 2023	Oxney Road scheme construction undertaken
January 2023	CPCA Board to make funding decision for the main Fengate project. This was the original CPCA Board date for the Fengate active travel schemes.

Table 9 below shows the Financial Dimension Scheme Cost Estimates. The costs calculated for use within the Economic Assessment are presented in the Economic Dimension.

Table 9: Financial Dimension Scheme Cost Estimates

Description of Cost Type	Oxney Road	Newark Road
Base Investment Cost	253,526	203,237
Risk Adjusted Base Cost	275,960	252,387
Risk Adjusted Base Cost with Industry Inflation (Outturn Cost)	298,037	252,387

The Outturn cost represents the amount required to deliver the scheme, and is the amount requested for early release.

The schemes will be delivered within the same year as the cost estimates and therefore inflation has not been applied. Therefore, the outturn costs for Oxney Road Pedestrian Crossing and Newark Road Footpath are £298,037 and £252,387, respectively.

Budgets and Funding Cover

It is anticipated that the full combined Outturn Cost of £550,424 will be funded from the Transforming Cities Fund (TCF). The TCF is time limited and must be spent by 31st March 2024.

There are not known to be any financial constraints beyond the availability of funding from the TCF, which is currently considered adequate to cover the scheme costs.

Commercial Dimension

The Commercial Dimension serves to demonstrate that the Fengate active travel schemes can be reliably procured and implemented through existing channels whilst ensuring value for money in delivery of the scheme.

All phases to date and future phases of construction and site supervision will be delivered by Peterborough Highway Services (PHS). All skills and competencies to deliver this scheme are available within the PHS contract and its supply chain.

The scheme construction will be procured using a Target Cost payment mechanism. This incentivises both parties to work together to reduce cost through a pain / gain mechanism. To ensure that the procurement remains commercially competitive and offers value for money, all subcontract packages will be subject to competitive tendering.

Management Dimension

The Management Dimension demonstrates that the Council, through the PHS Framework, has the necessary experience and governance structure to successfully manage the delivery of the Fengate active travel schemes.

PHS has successfully delivered the following active travel schemes in recent years:

- Pop-up cycleways:
 - Between Midland Road and Bourges Boulevard along Thorpe Road on the eastbound carriageway. Installed during the first COVID-19 lockdown in 2020.
 - Along the southbound side of Priestgate. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by 'Rediweld One Piece Wand Orca' units. Cones were taken down in 2022.
 - Between St. Johns Street and Cattle Market Road along City Road. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by 'Rediweld One Piece Wand Orca' units. Cones were taken down in 2022.
 - Westbound between the Junction 39 roundabout and Cattle Market Road. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by 'Rediweld One Piece Wand Orca' units. Cones were taken down in 2022.

- In both directions along Broadway. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by 'Rediweld One Piece Wand Orca' units. Cones were taken down in 2022.
- Haddon Cycleway. Designed in 2021 and constructed in 2022, the scheme improved the footway / cycleway connection between Haddon Hill and Orton Goldhay.
- Toucan Crossings:
 - Bishop's Road toucan crossing upgraded in 2019 to allow for cycle use.
 - Oundle Road toucan crossing by Peterborough High School
 - Lincoln Road / Manor House Road crossing improved to a toucan crossing between 2021 and 2022.

To date, the delivery of the scheme has been managed by a Project Team, led by a PCC Project Manager. The Project Team consists of all the key project delivery partners and has been responsible for the daily running of the project. The Project Team includes key stakeholders such as the CPCA.

The existing PHS Project Board has overseen the continued development and delivery of the schemes to date by the Project Team and has made key decisions relating to the delivery of the project. The Project Board has been supported by technical specialists, with key stakeholders invited to attend as necessary.

Key project milestones for progressing to scheme delivery are outlined in Table 10.

Table 10: Key Project Milestones

Timescale	Activity
August 2022	Present Active Travel Schemes Business Case Technical Note to CPCA
September 2022	CPCA Sponsors present papers to CPCA Board to request approval of funding. Raising Work Orders and mobilising works
October 2022 – December 2022	Newark Road scheme construction undertaken
January 2023 – March 2023	Oxney Road scheme construction undertaken
January 2023	CPCA Board to make funding decision for the main Fengate project. This was the original CPCA Board date for the Fengate active travel schemes.
March 2024	One-year post-scheme monitoring undertaken
March 2028	Five-year post-scheme monitoring undertaken

Stakeholder engagement was undertaken by the Project Team following approval of the SOC and were in line with the timings of the Public Consultation (February 2021 – March 2021). All stakeholders were consulted via email or letter for comments on the Preferred Scheme of the Fengate Access Study prior to the completion of Detailed Design.

Communication with stakeholders was maintained throughout the project and feedback from stakeholders largely centred on the environment, biodiversity, and sustainable travel elements of the Fengate Access Study preferred scheme. All feedback has been incorporated into the Detailed Design where appropriate.

A construction Risk Register for each scheme has been produced and can be provided upon request. The Risk Register is a live document and will be regularly updated throughout the ten-week construction period.

The schemes will be monitored and evaluated in line with the CPCA Assurance Framework and DfT guidance. The monitoring and evaluation will include a range of qualitative and quantitative data collection methods that will be undertaken one year and five years post scheme completion.

Outputs from the monitoring and evaluation stage will be summarised within a Scheme Evaluation Report to determine whether the schemes have been delivered as planned and justify the investment. Where outcomes differ from what is expected, data collected during the monitoring and evaluation phases will be used to form an evidence base that will assist in understanding the reasons for this and any lessons that can be learnt.

Appendix G – 60 Year Financial Dimension Cost Schedule

Fengate Access Study - Do Something Scheme Costs for Input into Financial Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate 2022 Prices						(2) Risk Adjusted Cost		(3) Risk Adjusted Cost Estimate Including Construction Price Inflation			(4) Inflated Risk Adjusted Cost Including Whole Life Costs		
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Quantified Risk Adjustment	Risk Adjusted Cost	Inflation Rate	Cost of Inflation	Total (Including Inflation)	Whole Life Costs	Inflated Whole Life Costs	Total (Including Whole Life Costs)
2022	1	£390,689	£0	£0	£61,400	£19,385	£471,474	£79,292	£550,766	0.000	£0.00	£550,766	£0	£0	£550,766
2023	2	£3,606,198	£0	£0	£700,415	£138,477	£4,445,090	£761,686	£5,206,776	1.100	£520,677.65	£5,727,454	£0	£0	£5,727,454
2024	3	£683,336	£0	£0	£135,919	£11,330	£830,584	£177,370	£1,007,954	1.210	£211,670.33	£1,219,624	£0	£0	£1,219,624
2025	4	£0	£0	£0	£0	£25,000	£25,000	£0	£25,000	1.331	£8,275.00	£33,275	£0	£0	£33,275
2026	5	£0	£0	£0	£0	£0	£0	£0	£0	1.398	£0.00	£0	£0	£0	£0
2027	6	£0	£0	£0	£0	£0	£0	£0	£0	1.467	£0.00	£0	£0	£0	£0
2028	7	£0	£0	£0	£0	£0	£0	£0	£0	1.541	£0.00	£0	£0	£0	£0
2029	8	£0	£0	£0	£0	£0	£0	£0	£0	1.618	£0.00	£0	£0	£0	£0
2030	9	£0	£0	£0	£0	£0	£0	£0	£0	1.699	£0.00	£0	£0	£0	£0
2031	10	£0	£0	£0	£0	£0	£0	£0	£0	1.784	£0.00	£0	£0	£0	£0
2032	11	£0	£0	£0	£0	£0	£0	£0	£0	1.873	£0.00	£0	£0	£0	£0
2033	12	£0	£0	£0	£0	£0	£0	£0	£0	1.966	£0.00	£0	£0	£0	£0
2034	13	£0	£0	£0	£0	£0	£0	£0	£0	2.065	£0.00	£0	£25,000	£51,620	£51,620
2035	14	£0	£0	£0	£0	£0	£0	£0	£0	2.168	£0.00	£0	£0	£0	£0
2036	15	£0	£0	£0	£0	£0	£0	£0	£0	2.276	£0.00	£0	£0	£0	£0
2037	16	£0	£0	£0	£0	£0	£0	£0	£0	2.390	£0.00	£0	£0	£0	£0
2038	17	£0	£0	£0	£0	£0	£0	£0	£0	2.510	£0.00	£0	£0	£0	£0
2039	18	£0	£0	£0	£0	£0	£0	£0	£0	2.635	£0.00	£0	£0	£0	£0
2040	19	£0	£0	£0	£0	£0	£0	£0	£0	2.767	£0.00	£0	£0	£0	£0
2041	20	£0	£0	£0	£0	£0	£0	£0	£0	2.905	£0.00	£0	£0	£0	£0
2042	21	£0	£0	£0	£0	£0	£0	£0	£0	3.051	£0.00	£0	£0	£0	£0
2043	22	£0	£0	£0	£0	£0	£0	£0	£0	3.203	£0.00	£0	£0	£0	£0
2044	23	£0	£0	£0	£0	£0	£0	£0	£0	3.363	£0.00	£0	£0	£0	£0
2045	24	£0	£0	£0	£0	£0	£0	£0	£0	3.532	£0.00	£0	£0	£0	£0
2046	25	£0	£0	£0	£0	£0	£0	£0	£0	3.708	£0.00	£0	£0	£0	£0
2047	26	£0	£0	£0	£0	£0	£0	£0	£0	3.894	£0.00	£0	£0	£0	£0
2048	27	£0	£0	£0	£0	£0	£0	£0	£0	4.088	£0.00	£0	£0	£0	£0
2049	28	£0	£0	£0	£0	£0	£0	£0	£0	4.293	£0.00	£0	£25,000	£107,315	£107,315
2050	29	£0	£0	£0	£0	£0	£0	£0	£0	4.507	£0.00	£0	£0	£0	£0
2051	30	£0	£0	£0	£0	£0	£0	£0	£0	4.733	£0.00	£0	£0	£0	£0
2052	31	£0	£0	£0	£0	£0	£0	£0	£0	4.969	£0.00	£0	£0	£0	£0
2053	32	£0	£0	£0	£0	£0	£0	£0	£0	5.218	£0.00	£0	£0	£0	£0
2054	33	£0	£0	£0	£0	£0	£0	£0	£0	5.479	£0.00	£0	£0	£0	£0
2055	34	£0	£0	£0	£0	£0	£0	£0	£0	5.753	£0.00	£0	£0	£0	£0
2056	35	£0	£0	£0	£0	£0	£0	£0	£0	6.040	£0.00	£0	£0	£0	£0
2057	36	£0	£0	£0	£0	£0	£0	£0	£0	6.342	£0.00	£0	£0	£0	£0
2058	37	£0	£0	£0	£0	£0	£0	£0	£0	6.659	£0.00	£0	£0	£0	£0
2059	38	£0	£0	£0	£0	£0	£0	£0	£0	6.992	£0.00	£0	£0	£0	£0
2060	39	£0	£0	£0	£0	£0	£0	£0	£0	7.342	£0.00	£0	£0	£0	£0
2061	40	£0	£0	£0	£0	£0	£0	£0	£0	7.709	£0.00	£0	£0	£0	£0
2062	41	£0	£0	£0	£0	£0	£0	£0	£0	8.094	£0.00	£0	£0	£0	£0
2063	42	£0	£0	£0	£0	£0	£0	£0	£0	8.499	£0.00	£0	£0	£0	£0
2064	43	£0	£0	£0	£0	£0	£0	£0	£0	8.924	£0.00	£0	£25,000	£223,101	£223,101
2065	44	£0	£0	£0	£0	£0	£0	£0	£0	9.370	£0.00	£0	£0	£0	£0
2066	45	£0	£0	£0	£0	£0	£0	£0	£0	9.839	£0.00	£0	£0	£0	£0
2067	46	£0	£0	£0	£0	£0	£0	£0	£0	10.331	£0.00	£0	£0	£0	£0
2068	47	£0	£0	£0	£0	£0	£0	£0	£0	10.847	£0.00	£0	£0	£0	£0
2069	48	£0	£0	£0	£0	£0	£0	£0	£0	11.390	£0.00	£0	£0	£0	£0
2070	49	£0	£0	£0	£0	£0	£0	£0	£0	11.959	£0.00	£0	£0	£0	£0
2071	50	£0	£0	£0	£0	£0	£0	£0	£0	12.557	£0.00	£0	£0	£0	£0
2072	51	£0	£0	£0	£0	£0	£0	£0	£0	13.185	£0.00	£0	£0	£0	£0
2073	52	£0	£0	£0	£0	£0	£0	£0	£0	13.844	£0.00	£0	£0	£0	£0
2074	53	£0	£0	£0	£0	£0	£0	£0	£0	14.536	£0.00	£0	£0	£0	£0
2075	54	£0	£0	£0	£0	£0	£0	£0	£0	15.263	£0.00	£0	£0	£0	£0
2076	55	£0	£0	£0	£0	£0	£0	£0	£0	16.026	£0.00	£0	£0	£0	£0
2077	56	£0	£0	£0	£0	£0	£0	£0	£0	16.828	£0.00	£0	£0	£0	£0
2078	57	£0	£0	£0	£0	£0	£0	£0	£0	17.669	£0.00	£0	£0	£0	£0
2079	58	£0	£0	£0	£0	£0	£0	£0	£0	18.552	£0.00	£0	£25,000	£463,810	£463,810
2080	59	£0	£0	£0	£0	£0	£0	£0	£0	19.480	£0.00	£0	£0	£0	£0
2081	60	£0	£0	£0	£0	£0	£0	£0	£0	20.454	£0.00	£0	£0	£0	£0
2082	61	£0	£0	£0	£0	£0	£0	£0	£0	21.477	£0.00	£0	£0	£0	£0
2083	62	£0	£0	£0	£0	£0	£0	£0	£0	22.551	£0.00	£0	£0	£0	£0
2084	63	£0	£0	£0	£0	£0	£0	£0	£0	23.678	£0.00	£0	£0	£0	£0
2085	64	£0	£0	£0	£0	£0	£0	£0	£0	24.862	£0.00	£0	£0	£0	£0
Total		£4,680,223	£0	£0	£897,733	£194,192	£5,772,149	£1,018,348	£6,790,497		£740,623	£7,531,120	£100,000	£845,846	£8,376,966

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2022 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2023 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£5,772,149
(2)	The base costs have been adjusted to incorporate risk.	£6,790,497
(3)	The risk adjusted costs have been adjusted to incorporate increases in construction costs.	£7,531,120
(4)	The inflated risk adjusted costs have been adjusted to incorporate whole life costs.	£8,376,966

Appendix H – 60 Year Economic Dimension Cost Schedule (Construction and Maintenance)

Fengate Access Study - Do Something Scheme Costs in 2010 Market Prices for Input into Economic Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)						(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Total Contribution of Optimism Bias		(4) Rebased to 2010 Price Base	(5) Discounted to 2010 Prices			(6) Adjusted to Market Prices
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£390,689	£0	£0	£61,400	£19,385	£471,474	0.000	£0.00	£471,474	£94,295	£565,769	£443,508	1.035	0.662	£293,506	£349,272.12
2023	2	£3,606,198	£0	£0	£700,415	£138,477	£4,445,090	1.060	£266,201.33	£4,711,291	£942,258	£5,653,550	£4,431,828	1.035	0.639	£2,833,730	£3,372,138.16
2024	3	£683,336	£0	£0	£135,919	£11,330	£830,584	1.146	£121,013.53	£951,598	£190,320	£1,141,917	£895,151	1.035	0.618	£553,008	£658,079.51
2025	4	£0	£0	£0	£25,000	£0	£25,000	1.234	£5,853.15	£30,853	£6,171	£37,024	£29,023	1.035	0.597	£17,324	£20,615.04
2026	5	£0	£0	£0	£0	£0	£0	1.273	£0.00	£0	£0	£0	£0	1.035	0.577	£0	£0.00
2027	6	£0	£0	£0	£0	£0	£0	1.315	£0.00	£0	£0	£0	£0	1.035	0.557	£0	£0.00
2028	7	£0	£0	£0	£0	£0	£0	1.357	£0.00	£0	£0	£0	£0	1.035	0.538	£0	£0.00
2029	8	£0	£0	£0	£0	£0	£0	1.401	£0.00	£0	£0	£0	£0	1.035	0.520	£0	£0.00
2030	9	£0	£0	£0	£0	£0	£0	1.446	£0.00	£0	£0	£0	£0	1.035	0.503	£0	£0.00
2031	10	£0	£0	£0	£0	£0	£0	1.494	£0.00	£0	£0	£0	£0	1.035	0.486	£0	£0.00
2032	11	£0	£0	£0	£0	£0	£0	1.543	£0.00	£0	£0	£0	£0	1.035	0.469	£0	£0.00
2033	12	£0	£0	£0	£0	£0	£0	1.595	£0.00	£0	£0	£0	£0	1.035	0.453	£0	£0.00
2034	13	£0	£0	£0	£0	£0	£0	1.649	£0.00	£0	£0	£0	£0	1.035	0.438	£0	£0.00
2035	14	£0	£0	£0	£0	£0	£0	1.705	£0.00	£0	£0	£0	£0	1.035	0.423	£0	£0.00
2036	15	£0	£0	£0	£0	£0	£0	1.763	£0.00	£0	£0	£0	£0	1.035	0.409	£0	£0.00
2037	16	£0	£0	£0	£0	£0	£0	1.822	£0.00	£0	£0	£0	£0	1.035	0.395	£0	£0.00
2038	17	£0	£0	£0	£0	£0	£0	1.882	£0.00	£0	£0	£0	£0	1.035	0.382	£0	£0.00
2039	18	£0	£0	£0	£0	£0	£0	1.944	£0.00	£0	£0	£0	£0	1.035	0.369	£0	£0.00
2040	19	£0	£0	£0	£0	£0	£0	2.009	£0.00	£0	£0	£0	£0	1.035	0.356	£0	£0.00
2041	20	£0	£0	£0	£0	£0	£0	2.077	£0.00	£0	£0	£0	£0	1.035	0.344	£0	£0.00
2042	21	£0	£0	£0	£0	£0	£0	2.147	£0.00	£0	£0	£0	£0	1.035	0.333	£0	£0.00
2043	22	£0	£0	£0	£0	£0	£0	2.221	£0.00	£0	£0	£0	£0	1.035	0.321	£0	£0.00
2044	23	£0	£0	£0	£0	£0	£0	2.297	£0.00	£0	£0	£0	£0	1.035	0.310	£0	£0.00
2045	24	£0	£0	£0	£0	£0	£0	2.377	£0.00	£0	£0	£0	£0	1.035	0.300	£0	£0.00
2046	25	£0	£0	£0	£0	£0	£0	2.460	£0.00	£0	£0	£0	£0	1.035	0.290	£0	£0.00
2047	26	£0	£0	£0	£0	£0	£0	2.546	£0.00	£0	£0	£0	£0	1.035	0.280	£0	£0.00
2048	27	£0	£0	£0	£0	£0	£0	2.637	£0.00	£0	£0	£0	£0	1.035	0.271	£0	£0.00
2049	28	£0	£0	£0	£0	£0	£0	2.731	£0.00	£0	£0	£0	£0	1.035	0.261	£0	£0.00
2050	29	£0	£0	£0	£0	£0	£0	2.828	£0.00	£0	£0	£0	£0	1.035	0.253	£0	£0.00
2051	30	£0	£0	£0	£0	£0	£0	2.930	£0.00	£0	£0	£0	£0	1.035	0.244	£0	£0.00
2052	31	£0	£0	£0	£0	£0	£0	3.035	£0.00	£0	£0	£0	£0	1.030	0.289	£0	£0.00
2053	32	£0	£0	£0	£0	£0	£0	3.143	£0.00	£0	£0	£0	£0	1.030	0.281	£0	£0.00
2054	33	£0	£0	£0	£0	£0	£0	3.256	£0.00	£0	£0	£0	£0	1.030	0.272	£0	£0.00
2055	34	£0	£0	£0	£0	£0	£0	3.373	£0.00	£0	£0	£0	£0	1.030	0.264	£0	£0.00
2056	35	£0	£0	£0	£0	£0	£0	3.493	£0.00	£0	£0	£0	£0	1.030	0.257	£0	£0.00
2057	36	£0	£0	£0	£0	£0	£0	3.618	£0.00	£0	£0	£0	£0	1.030	0.249	£0	£0.00
2058	37	£0	£0	£0	£0	£0	£0	3.747	£0.00	£0	£0	£0	£0	1.030	0.242	£0	£0.00
2059	38	£0	£0	£0	£0	£0	£0	3.880	£0.00	£0	£0	£0	£0	1.030	0.235	£0	£0.00
2060	39	£0	£0	£0	£0	£0	£0	4.018	£0.00	£0	£0	£0	£0	1.030	0.228	£0	£0.00
2061	40	£0	£0	£0	£0	£0	£0	4.160	£0.00	£0	£0	£0	£0	1.030	0.221	£0	£0.00
2062	41	£0	£0	£0	£0	£0	£0	4.306	£0.00	£0	£0	£0	£0	1.030	0.215	£0	£0.00
2063	42	£0	£0	£0	£0	£0	£0	4.457	£0.00	£0	£0	£0	£0	1.030	0.209	£0	£0.00
2064	43	£0	£0	£0	£0	£0	£0	4.612	£0.00	£0	£0	£0	£0	1.030	0.203	£0	£0.00
2065	44	£0	£0	£0	£0	£0	£0	4.772	£0.00	£0	£0	£0	£0	1.030	0.197	£0	£0.00
2066	45	£0	£0	£0	£0	£0	£0	4.937	£0.00	£0	£0	£0	£0	1.030	0.191	£0	£0.00
2067	46	£0	£0	£0	£0	£0	£0	5.104	£0.00	£0	£0	£0	£0	1.030	0.185	£0	£0.00
2068	47	£0	£0	£0	£0	£0	£0	5.273	£0.00	£0	£0	£0	£0	1.030	0.180	£0	£0.00
2069	48	£0	£0	£0	£0	£0	£0	5.451	£0.00	£0	£0	£0	£0	1.030	0.175	£0	£0.00
2070	49	£0	£0	£0	£0	£0	£0	5.636	£0.00	£0	£0	£0	£0	1.030	0.170	£0	£0.00
2071	50	£0	£0	£0	£0	£0	£0	5.828	£0.00	£0	£0	£0	£0	1.030	0.165	£0	£0.00
2072	51	£0	£0	£0	£0	£0	£0	6.025	£0.00	£0	£0	£0	£0	1.030	0.160	£0	£0.00
2073	52	£0	£0	£0	£0	£0	£0	6.232	£0.00	£0	£0	£0	£0	1.030	0.155	£0	£0.00
2074	53	£0	£0	£0	£0	£0	£0	6.448	£0.00	£0	£0	£0	£0	1.030	0.151	£0	£0.00
2075	54	£0	£0	£0	£0	£0	£0	6.677	£0.00	£0	£0	£0	£0	1.030	0.146	£0	£0.00
2076	55	£0	£0	£0	£0	£0	£0	6.917	£0.00	£0	£0	£0	£0	1.030	0.142	£0	£0.00
2077	56	£0	£0	£0	£0	£0	£0	7.169	£0.00	£0	£0	£0	£0	1.030	0.138	£0	£0.00
2078	57	£0	£0	£0	£0	£0	£0	7.430	£0.00	£0	£0	£0	£0	1.030	0.134	£0	£0.00
2079	58	£0	£0	£0	£0	£0	£0	7.702	£0.00	£0	£0	£0	£0	1.030	0.130	£0	£0.00
2080	59	£0	£0	£0	£0	£0	£0	7.987	£0.00	£0	£0	£0	£0	1.030	0.126	£0	£0.00
2081	60	£0	£0	£0	£0	£0	£0	8.285	£0.00	£0	£0	£0	£0	1.030	0.123	£0	£0.00
2082	61	£0	£0	£0	£0	£0	£0	8.590	£0.00	£0	£0	£0	£0	1.030	0.119	£0	£0.00
2083	62	£0	£0	£0	£0	£0	£0	8.902	£0.00	£0	£0	£0	£0	1.030	0.116	£0	£0.00
2084	63	£0	£0	£0	£0	£0	£0	9.225	£0.00	£0	£0	£0	£0	1.030	0.112	£0	£0.00
2085	64	£0	£0	£0	£0	£0	£0	9.559	£0.00	£0	£0	£0	£0	1.030	0.109	£0	£0.00
Total		£4,680,223	£0	£0	£897,733	£194,192	£5,772,149		£393,068	£6,165,217	£1,233,043	£7,398,260	£5,799,510			£3,697,567	£4,400,105

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2022 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2023 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£5,772,149
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£6,165,217
(4)	The next stage is to apply optimism bias.	£7,398,260
(5)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	£5,799,510
(6)	Costs have been discounted to 2010 present values by applying a discount rate of 3.5% per year for 30 years and 3.0% thereafter (WebTAG A1.2).	£3,697,567
(7)	The final stage in preparing the scheme costs is to convert them from the factor cost to the market price unit of account using the indirect tax correction factor of 1.19	£4,400,105

Fenitgate Access Study - Do Something Scheme Costs in 2010 Market Prices for Input into Economic Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)		(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Total Contribution of Optimism Bias		(4) Rebased to 2010 Price Base	(5) Discounted to 2010 Prices			(6) Adjusted to Market Prices
		Maintenance Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£0	£0	0.000	£0.00	£0	£0.00	£0	£0	1.035	0.662	£0	£0.00
2023	2	£0	£0	1.100	£0.00	£0	£0.00	£0	£0	1.035	0.639	£0	£0.00
2024	3	£0	£0	1.210	£0.00	£0	£0.00	£0	£0	1.035	0.618	£0	£0.00
2025	4	£0	£0	1.331	£0.00	£0	£0.00	£0	£0	1.035	0.597	£0	£0.00
2026	5	£0	£0	1.398	£0.00	£0	£0.00	£0	£0	1.035	0.577	£0	£0.00
2027	6	£0	£0	1.467	£0.00	£0	£0.00	£0	£0	1.035	0.557	£0	£0.00
2028	7	£0	£0	1.541	£0.00	£0	£0.00	£0	£0	1.035	0.538	£0	£0.00
2029	8	£0	£0	1.618	£0.00	£0	£0.00	£0	£0	1.035	0.520	£0	£0.00
2030	9	£0	£0	1.699	£0.00	£0	£0.00	£0	£0	1.035	0.503	£0	£0.00
2031	10	£0	£0	1.784	£0.00	£0	£0.00	£0	£0	1.035	0.486	£0	£0.00
2032	11	£0	£0	1.873	£0.00	£0	£0.00	£0	£0	1.035	0.469	£0	£0.00
2033	12	£0	£0	1.966	£0.00	£0	£0.00	£0	£0	1.035	0.453	£0	£0.00
2034	13	£25,000	£25,000	2.065	£26,620.45	£51,620	£0.00	£51,620	£40,465	1.035	0.438	£17,722	£21,089.29
2035	14	£0	£0	2.168	£0.00	£0	£0.00	£0	£0	1.035	0.423	£0	£0.00
2036	15	£0	£0	2.276	£0.00	£0	£0.00	£0	£0	1.035	0.409	£0	£0.00
2037	16	£0	£0	2.390	£0.00	£0	£0.00	£0	£0	1.035	0.395	£0	£0.00
2038	17	£0	£0	2.510	£0.00	£0	£0.00	£0	£0	1.035	0.382	£0	£0.00
2039	18	£0	£0	2.635	£0.00	£0	£0.00	£0	£0	1.035	0.369	£0	£0.00
2040	19	£0	£0	2.767	£0.00	£0	£0.00	£0	£0	1.035	0.356	£0	£0.00
2041	20	£0	£0	2.905	£0.00	£0	£0.00	£0	£0	1.035	0.344	£0	£0.00
2042	21	£0	£0	3.051	£0.00	£0	£0.00	£0	£0	1.035	0.333	£0	£0.00
2043	22	£0	£0	3.203	£0.00	£0	£0.00	£0	£0	1.035	0.321	£0	£0.00
2044	23	£0	£0	3.363	£0.00	£0	£0.00	£0	£0	1.035	0.310	£0	£0.00
2045	24	£0	£0	3.532	£0.00	£0	£0.00	£0	£0	1.035	0.300	£0	£0.00
2046	25	£0	£0	3.708	£0.00	£0	£0.00	£0	£0	1.035	0.290	£0	£0.00
2047	26	£0	£0	3.894	£0.00	£0	£0.00	£0	£0	1.035	0.280	£0	£0.00
2048	27	£0	£0	4.088	£0.00	£0	£0.00	£0	£0	1.035	0.271	£0	£0.00
2049	28	£25,000	£25,000	4.293	£82,315.20	£107,315	£0.00	£107,315	£84,125	1.035	0.261	£21,991	£26,169.55
2050	29	£0	£0	4.507	£0.00	£0	£0.00	£0	£0	1.035	0.253	£0	£0.00
2051	30	£0	£0	4.733	£0.00	£0	£0.00	£0	£0	1.035	0.244	£0	£0.00
2052	31	£0	£0	4.969	£0.00	£0	£0.00	£0	£0	1.030	0.289	£0	£0.00
2053	32	£0	£0	5.218	£0.00	£0	£0.00	£0	£0	1.030	0.281	£0	£0.00
2054	33	£0	£0	5.479	£0.00	£0	£0.00	£0	£0	1.030	0.272	£0	£0.00
2055	34	£0	£0	5.753	£0.00	£0	£0.00	£0	£0	1.030	0.264	£0	£0.00
2056	35	£0	£0	6.040	£0.00	£0	£0.00	£0	£0	1.030	0.257	£0	£0.00
2057	36	£0	£0	6.342	£0.00	£0	£0.00	£0	£0	1.030	0.249	£0	£0.00
2058	37	£0	£0	6.659	£0.00	£0	£0.00	£0	£0	1.030	0.242	£0	£0.00
2059	38	£0	£0	6.992	£0.00	£0	£0.00	£0	£0	1.030	0.235	£0	£0.00
2060	39	£0	£0	7.342	£0.00	£0	£0.00	£0	£0	1.030	0.228	£0	£0.00
2061	40	£0	£0	7.709	£0.00	£0	£0.00	£0	£0	1.030	0.221	£0	£0.00
2062	41	£0	£0	8.094	£0.00	£0	£0.00	£0	£0	1.030	0.215	£0	£0.00
2063	42	£0	£0	8.499	£0.00	£0	£0.00	£0	£0	1.030	0.209	£0	£0.00
2064	43	£25,000	£25,000	8.924	£198,100.59	£223,101	£0.00	£223,101	£174,889	1.030	0.203	£35,445	£42,179.29
2065	44	£0	£0	9.370	£0.00	£0	£0.00	£0	£0	1.030	0.197	£0	£0.00
2066	45	£0	£0	9.839	£0.00	£0	£0.00	£0	£0	1.030	0.191	£0	£0.00
2067	46	£0	£0	10.331	£0.00	£0	£0.00	£0	£0	1.030	0.185	£0	£0.00
2068	47	£0	£0	10.847	£0.00	£0	£0.00	£0	£0	1.030	0.180	£0	£0.00
2069	48	£0	£0	11.390	£0.00	£0	£0.00	£0	£0	1.030	0.175	£0	£0.00
2070	49	£0	£0	11.959	£0.00	£0	£0.00	£0	£0	1.030	0.170	£0	£0.00
2071	50	£0	£0	12.557	£0.00	£0	£0.00	£0	£0	1.030	0.165	£0	£0.00
2072	51	£0	£0	13.185	£0.00	£0	£0.00	£0	£0	1.030	0.160	£0	£0.00
2073	52	£0	£0	13.844	£0.00	£0	£0.00	£0	£0	1.030	0.155	£0	£0.00
2074	53	£0	£0	14.536	£0.00	£0	£0.00	£0	£0	1.030	0.151	£0	£0.00
2075	54	£0	£0	15.263	£0.00	£0	£0.00	£0	£0	1.030	0.146	£0	£0.00
2076	55	£0	£0	16.026	£0.00	£0	£0.00	£0	£0	1.030	0.142	£0	£0.00
2077	56	£0	£0	16.828	£0.00	£0	£0.00	£0	£0	1.030	0.138	£0	£0.00
2078	57	£0	£0	17.669	£0.00	£0	£0.00	£0	£0	1.030	0.134	£0	£0.00
2079	58	£25,000	£25,000	18.552	£438,810.11	£463,810	£0.00	£463,810	£363,582	1.030	0.130	£47,297	£56,283.41
2080	59	£0	£0	19.480	£0.00	£0	£0.00	£0	£0	1.030	0.126	£0	£0.00
2081	60	£0	£0	20.454	£0.00	£0	£0.00	£0	£0	1.030	0.123	£0	£0.00
2082	61	£0	£0	21.477	£0.00	£0	£0.00	£0	£0	1.030	0.119	£0	£0.00
2083	62	£0	£0	22.551	£0.00	£0	£0.00	£0	£0	1.030	0.116	£0	£0.00
2084	63	£0	£0	23.678	£0.00	£0	£0.00	£0	£0	1.030	0.112	£0	£0.00
2085	64	£0	£0	24.862	£0.00	£0	£0.00	£0	£0	1.030	0.109	£0	£0.00
Total		£100,000	£100,000		£745,846	£845,846	£0	£845,846	£663,061			£122,455	£145,722

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2022 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2023 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£100,000
(2)	The base costs have been adjusted to incorporate real cost increases (TAG A1.2) in construction costs.	£845,846
(4)	The next stage is to apply optimism bias.	£845,846
(5)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (TAG A1.2).	£663,061
(6)	Costs have been discounted to 2010 present values by applying a discount rate of 3.5% per year for 30 years and 3.0% thereafter (TAG A1.2).	£122,455
(7)	The final stage in preparing the scheme costs is to convert them from the factor cost to the market price unit of account using the indirect tax correction factor of 1.19	£145,722

Appendix I – Monitoring and Evaluation Plan



Fengate Access Study

Scheme Monitoring and Evaluation Plan

Page 600 of 1324

Document Control

Document ref: Fengate Access Study Monitoring and Evaluation Plan					Authorisation	
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
1.0	First Issue	SP	NP	RMJ	RMJ	07.11.2022
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Contents

1.	Introduction.....	1
1.2	Monitoring and Evaluation Guidance	1
1.3	Report Structure	2
2.	Scheme Background and Context.....	3
2.1	Scheme Location	3
2.2	Scheme Description	5
2.3	Scheme Costs and Funding.....	7
2.4	Delivery and Timeframes	8
3.	Scheme Objectives and Outcomes	9
3.1	Scheme Objectives	9
3.2	SMART Objectives	10
3.3	Scheme Outcomes.....	11
3.4	Scheme Logic Map	12
4.	Benefits Realisation Plan	14
4.1	Benefits Realisation Strategy	14
5.	Monitoring and Evaluation Approach	16
5.2	Types of Measures.....	16
5.3	Stages of Monitoring and Evaluation	16
5.4	Measures to be Monitored	18
6.	Data Requirements and Collection Methods.....	19
6.2	Data Collection	21
7.	Evaluation Resource and Governance.....	24
7.1	Monitoring and Evaluation Plan costs	24
7.2	Governance.....	26
7.3	Quality Assurance	28
7.4	Risk Management	28
8.	Dissemination Plan.....	30
8.2	Dissemination Reporting	30
8.3	Stakeholder Engagement.....	30
8.4	Lessons Learnt.....	30

Figures

Figure 2.1: Fengate Access Study Area	3
Figure 2.2: Location of Fengate area within Peterborough.....	4
Figure 2.3: Fengate Access Study Improvement Package.....	6
Figure 3.1: Fengate Access Study Logic Model	13
Figure 6.1: Monitoring and Evaluation Survey Locations	22
Figure 6.2: Monitoring and Evaluation Journey Time Routes.....	23

Tables

Table 2.1: Key Project Milestones	8
Table 4.1: Benefits Realisation Strategy.....	15
Table 5.1: Monitoring and Evaluation Timescales	17
Table 5.2: Standard Monitoring Measures.....	18
Table 6.1: Monitoring and Evaluation Data Requirements	20
Table 7.1: Monitoring and Evaluation Plan	25
Table 7.2: Risk Matrix and Mitigations	29

1. Introduction

- 1.1.1 This document is the Scheme Evaluation Plan for the proposed Fengate Access Study package of schemes. The report has been produced in conjunction with the Fengate Access Study Full Business Case (FBC) submitted to the Cambridge and Peterborough Combined Authority (CPCA).
- 1.1.2 To avoid duplication of information, this report includes both a Benefits Realisation Plan and the Monitoring and Evaluation Plan.
- 1.1.3 The aim of this report is to provide context of the Fengate Access Study package of schemes, whilst setting out the expected benefits and outcomes alongside the methods which will be used to monitor and evaluate these both pre and post construction.

1.2 Monitoring and Evaluation Guidance

- 1.2.1 The Cambridgeshire and Peterborough Combined Authority (CPCA) Assurance Framework¹ sets out the fundamental principles in relation to the use and administration of funding from the CPCA and their proposed approach to monitoring and evaluation of projects.
- 1.2.2 The Assurance Framework states that all transport schemes (over £5m) will follow the DfT Monitoring and Evaluation Guidance for Local Authority Major Schemes. The DfT Monitoring and Evaluation Guidance (2012)² identifies three tiers of Monitoring and Evaluation:
- **Standard Monitoring** – schemes are required to be monitor and reported on a standard set of measures
 - **Enhanced Monitoring** – for schemes costing more than £50m or are anticipated to have a significant impact on particular indicators
 - **Fuller Evaluation** – for DfT- specified selection of schemes.
- 1.2.3 The cost of the Fengate Access Study package of schemes is less than £50m and the study has not been specified for Fuller Evaluation, resulting in the Fengate Access Study falling under the Standard Monitoring tier.

¹ [Local-Assurance-Framework-.pdf](#).

² [Major Scheme Business Cases: Evaluation Guidance for Local Authority Major Schemes \(publishing.service.gov.uk\)](#)

1.3 Report Structure

- Chapter 2: Scheme Background and Context
- Chapter 3: Scheme Objectives and Outcomes
- Chapter 4: Benefits Realisation Plan
- Chapter 5: Monitoring and Evaluation Approach
- Chapter 6: Data Requirements and Collection Methods
- Chapter 7: Evaluation Resources and Governance
- Chapter 8: Dissemination Plan

2. Scheme Background and Context

2.1 Scheme Location

2.1.1 The Fengate Access Study area focuses on the north of Fengate. The scheme location is shown in Figure 1.1 beneath and includes Junction 7 and Junction 8 of the A1139 Fletton Parkway (key access to / from the parkway system for Fengate), access routes into Fengate such as Parnwell Way and Oxney Road, and internal roads and footways within Fengate such as Edgerley Drain Road and Storeys Bar Road.

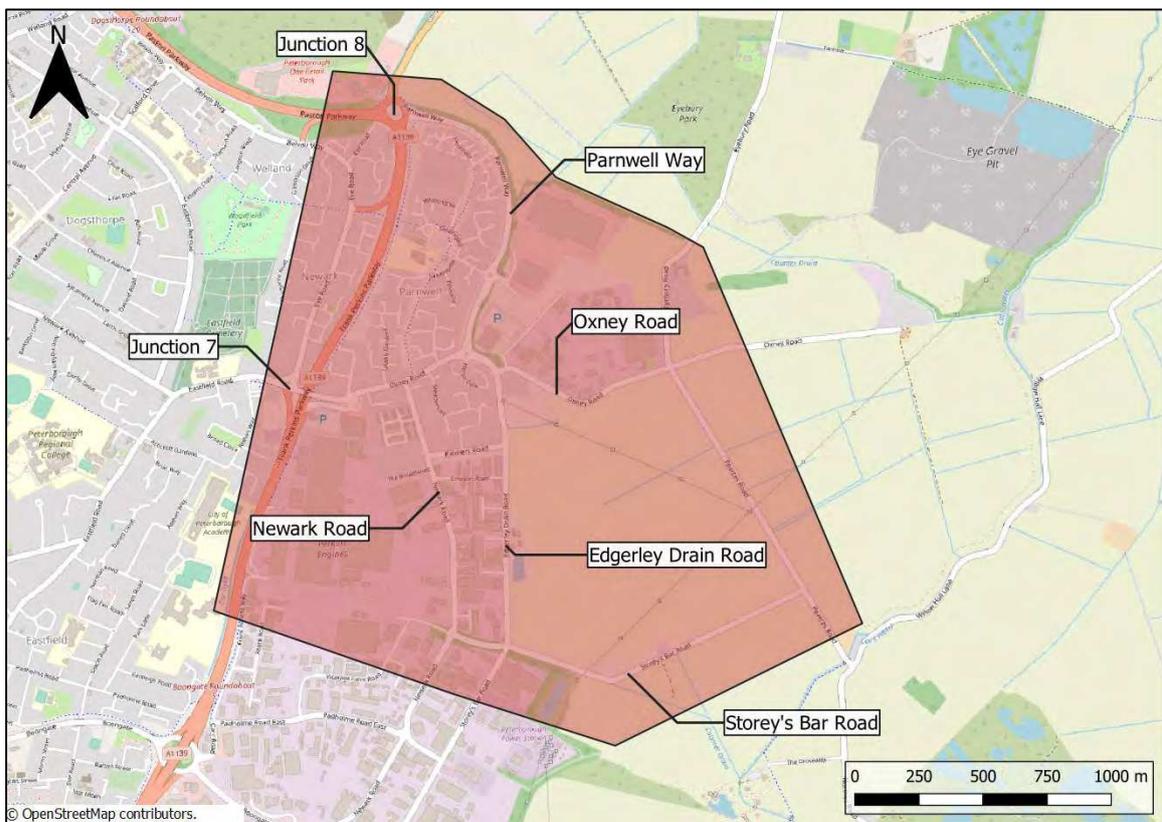


Figure 2.1: Fengate Access Study Area

2.1.2 The study area covers a mix of land uses. It is predominantly industrial at the southern end and residential at the northern end. The eastern part of the study area currently consists of agricultural fields; however, these are due to be developed, and outline planning permission has been granted for the Red Brick Farm site which will convert this to office, industrial and logistical use³.

³ Planning Reference 18/00080/OUT

2.1.3 Figure 2.1 beneath highlights the Fengate area in relation to the Parkway network and City Centre.

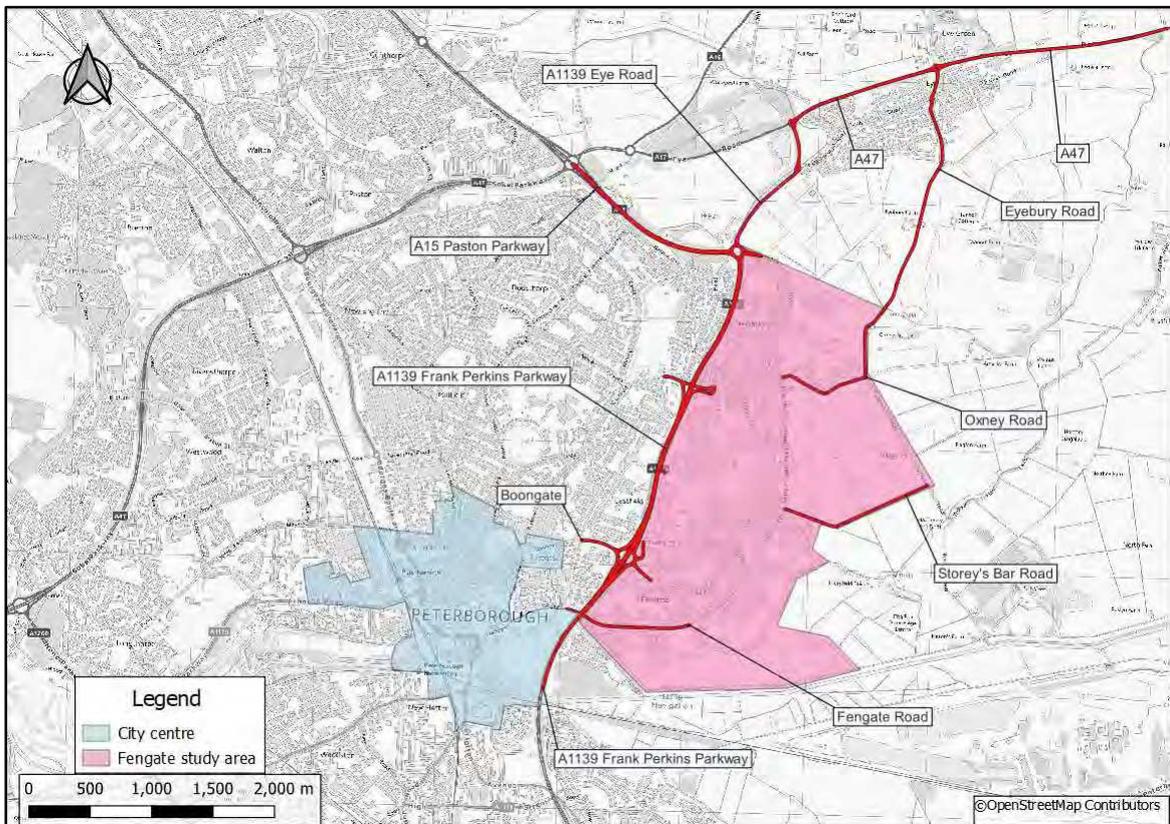


Figure 2.2: Location of Fengate area within Peterborough

- 2.1.4 The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities and objectives for Peterborough up to 2036. The updated strategy identifies the required delivery of 21,315 new homes and 17,600 new jobs between 2016 and 2036.
- 2.1.5 Within the Local Plan Fengate is identified as an area of employment growth for the City, with proposed growth ranging between 18ha and 48ha of employment land. This is expected to generate over 3,000 jobs in the area. Investment (beyond developer contributions) is needed into the transport network to support these development aspirations.
- 2.1.6 The Fengate area is an important employment area for Peterborough, with many small and medium sized businesses located there, alongside large employers like Perkins Engines. The Local Plan seeks to build upon the existing industry in the area and has a number of allocations within the area for employment development.

2.1.7 The proposed scheme will address high levels of congestion and delay that are currently compromising the operational efficiency of the Fengate area road network. By addressing existing issues, and thus unlocking additional capacity, the scheme is expected to relieve the wider network and assist in delivering growth aspirations for the City.

2.2 Scheme Description

2.2.1 The Fengate Access Study Improvement schemes will be delivered in two phases. The first phase will deliver the Newark Road Footpath and the Oxney Road Pedestrian Crossing between November 2022 and March 2023, whilst the second phase will deliver the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road, Junction 7 and the Newark Road / Oxney Road Scheme between May 2023 and March 2024.

2.2.2 Construction of the scheme will address significant issues of congestion and delay in a vital industrial growth area, providing much needed capacity for Peterborough City Council (PCC) and the Cambridgeshire and Peterborough Combined Authority (CPCA) to meet their agenda for growth in Peterborough. They will also address safety concerns at the junctions and improve much needed active travel provision within the Fengate area.

2.2.3 The package consists of the following schemes:

- Traffic Signal Improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road).
- Creation of a mini roundabout at the junction of Oxney Road / Newark Road.
- Creation of a new pedestrian crossing over Eastfield Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.
- Traffic Signal Improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road.
- Improvements to Newark Road footpath.

2.2.4 Figure 2.2 Overleaf highlights the final Fengate Access Study scheme.

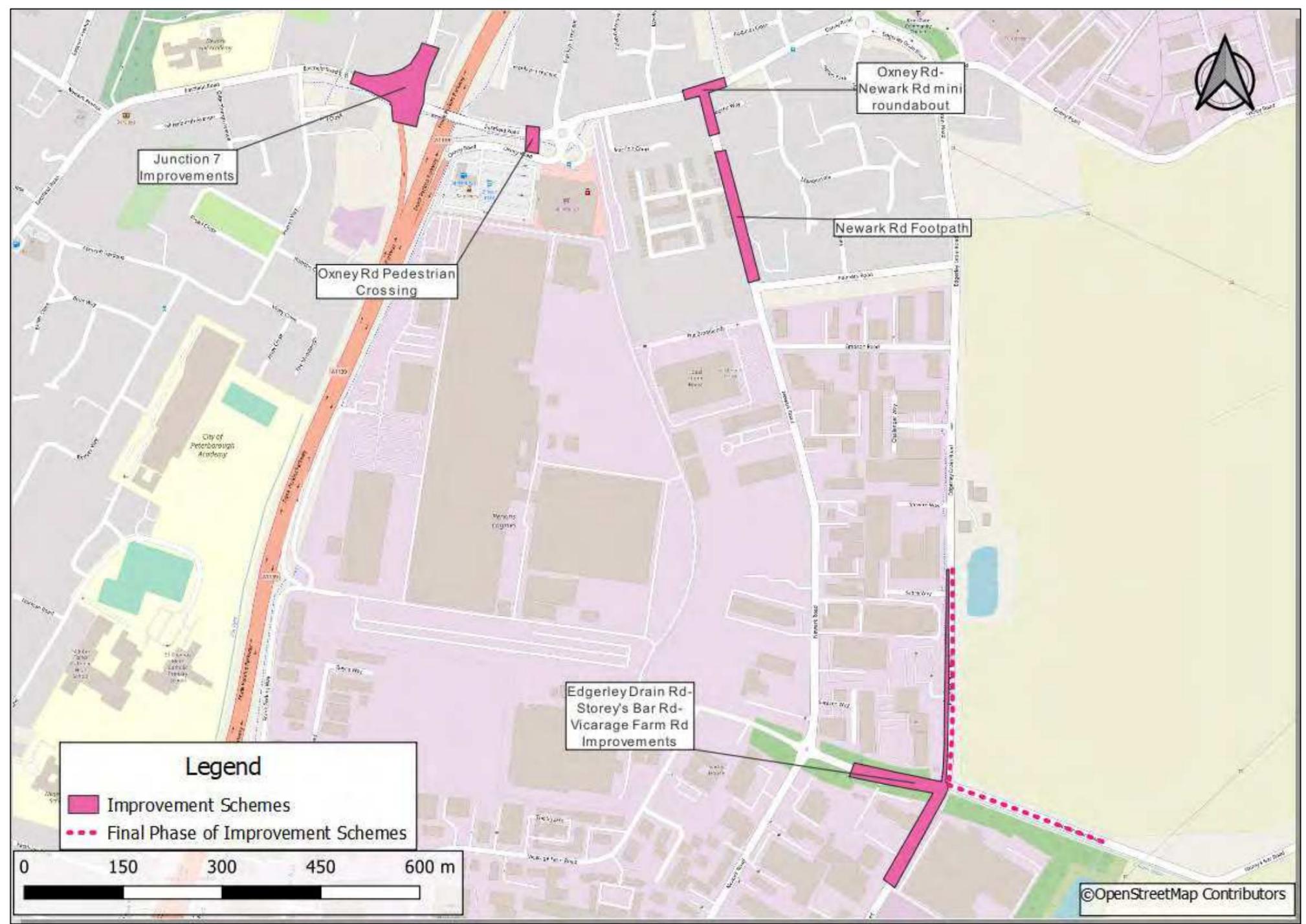


Figure 2.3: Fengate Access Study Improvement Package

2.3 Scheme Costs and Funding

2.3.1 The forecast Outturn cost of the scheme is £7,531,120.

2.3.2 The CPCA currently have an allocation of £11,000,000 in the Medium-term Financial Strategy (MTFS) to support delivery of this scheme.

2.3.3 The scheme costs (excluding operating costs) can be summarised as:

• Base Investment Cost	=	£5,772,149
• Risk Adjusted Base Cost	=	£6,790,497
• Risk Adjusted Base Cost with Inflation (Outturn Cost)	=	£7,531,120

2.4 Delivery and Timeframes

2.4.1 Key project milestones to scheme delivery are outlined in the Table 2.1 beneath.

Table 2.1: Key Project Milestones

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Newark Road Footpath and Eastfield Road Pedestrian Crossing)
November 2022	Construction commences on the Newark Road Footpath and Eastfield Road Pedestrian Crossing schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Newark Road Footpath and Eastfield Road Pedestrian Crossing schemes. Advance works begin for construction of the remaining three schemes, including vegetation clearance and STATS diversions.
May 2023	Construction starts on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road and Junction 7 schemes.
July 2023	Construction finishes on the Junction 7 scheme. Construction starts on the Oxney Road / Newark Road scheme.
September 2023	Construction finishes on the Oxney Road / Newark Road scheme.
March 2024	Construction finishes on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

2.4.2 It should be noted that the dates shown in Table 2.1 are dependent on approval for the release of construction funding at the CPCA's Board Meeting in January 2023.

3. Scheme Objectives and Outcomes

3.1 Scheme Objectives

- 3.1.1 A transport scheme can have both primary and secondary objectives. The primary objectives are the fundamental outputs required from the scheme and therefore must be achieved. Secondary objectives are other outputs that may be achieved but are not necessary to the success of the scheme. Secondary objectives tend to be delivered as a result of the primary objectives, as a causal chain effect.
- 3.1.2 The objectives for the Fengate Access Study were developed based on goals and outcomes from key local policy documents and align with the CPCA objectives, and therefore consider both the extent of existing conditions and future highway concerns alongside objectives to be delivered at the national, regional and local level (not necessarily in the scheme area).
- 3.1.1 Although the original objectives pre-date those of the CPCA, work has been undertaken to ensure they align with the problems identified in Section 2.4 and the most recent CPCA, PCC and transport objectives. The primary and secondary objectives for the Fengate Access Study are listed beneath.
- 3.1.2 The primary objectives include:
1. **Tackle congestion and reduce delay:** Tackle congestion at key pinch points across the Study Area and reduce delay in to the Fengate area
 2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** Ensure that the planned employment growth at Red Brick Farm can be accommodated
 3. **Protect the local environment and improve biodiversity:** Ensure a 20% biodiversity net enhancement within the study area.
 4. **Improve Road Safety:** Reduce personal injury accidents and improve personal security amongst all travellers.
 5. **Improve Active Travel Provision within Fengate:** Improve active travel provision within the Fengate Access Study area.

3.1.3 Secondary objectives include:

6. **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around Fengate
7. **Reduce Severance for Active Travel Users:** Reduce severance caused to active travel users by the road network
8. **Upgrade Junction 7:** Upgrade the junction to overcome maintenance and safety concerns with the current asset.

3.1.4 The Fengate Access Study package of schemes will aim to satisfy all primary objectives and as many of the secondary.

3.2 SMART Objectives

3.2.1 The Primary SMART objectives are:

1. **Tackle congestion and reduce delay:** To ensure that non-transient delay on all approaches remains below the following thresholds by 2026:
 - Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road – 30 seconds in both peak hours on any approach.
 - Junction 7 – 30 seconds in both peak hours on any approach.
2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** to provide sufficient highway capacity at the following junctions (determined by a Degree of Saturation (DoS) of less than 90%) to support the development of the Red Brick Farm site within the current Local Plan period (to 2036).
 - Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road
 - Junction 7.
3. **Protect the local environment and improve biodiversity:**
 - To provide a 20% Biodiversity net enhancement within one year of scheme completion.
4. **Improve Road Safety:** to achieve the following per year reductions in personal injury accidents following scheme completion:

- Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road – 50% per year reduction in all personal injury accidents
 - Junction 7 – 50% per year reduction in all personal injury accidents, and 75% per year reduction in personal injury accidents involving cyclists.
 - Oxney Road / Newark Road - 75% per year reduction in personal injury accidents involving pedestrians and cyclists.
5. **Improve Active Travel Provision with Fengate:** to directly link the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction to the western Red Brick Farm access with new cycle infrastructure and provide an upgraded pedestrian route along Newark Road between Oxney Road and Palmer's Road.

3.2.2 Secondary SMART objectives include:

- 6. **Positively impact traffic conditions on the wider network:** to ensure that highway junctions within the study area to do not exceed an RFC of 0.85 / DoS of 90% because of growth from the Red Brick Farm site within the current Local Plan period (to 2036).
- 7. **Reduce Severance for Active Travel Users:** to provide an additional signalised crossing over Oxney Road between Junction 7 and the Oxney Road / Newark Road junction.
- 8. **Upgrade Junction 7:** to renew the assets twenty-year life expectancy and avoid all reactive maintenance costs for the traffic signal infrastructure at Junction 7 for five years following scheme completion (except for in the event of RTAs).

3.3 Scheme Outcomes

3.3.1 The proposed scheme is expected to achieve its objectives in the following ways:

- Reduce delay and journey times at key pinch points within Fengate and access into the area
- Ensure successful delivery of committed and statutory development across Peterborough, through increasing capacity on the road network, in order to cater for existing and future traffic demand
- Ensure a 20% biodiversity net Enhancement within the study area
- Improve personal security and reduce personal injury accidents amongst all travellers.
- Improve active travel provision with the Fengate Access Study area.
- Reduce delay and journey times on the surrounding network, positively impacting traffic flows through Junction 8 to the north of Fengate
- Reduce severance caused to active travel users by the road network.
- Overcome Maintenance and safety concerns with the current study area.
- Increase biodiversity through planting and landscaping within the scheme elements.

3.4 Scheme Logic Map

3.4.1 Based on the objectives set for the scheme, the evaluation process will measure outcomes relating to:

- Changes in traffic flow and journey time reliability, in the Fengate Access study area
- Changes in safety including the number and severity of road traffic accidents
- Monitoring whether environmental mitigation measures and improvements to biodiversity have been implemented as in the approved scheme design
- Whether increased capacity on the road network has improved Council Aspirations

3.4.2 The Logic Map in Figure 2.3 highlights the links between the context, inputs, outputs, outcomes and impacts of the scheme and gives a visual representation of process by which the desired outcomes of the scheme objectives are to be achieved.

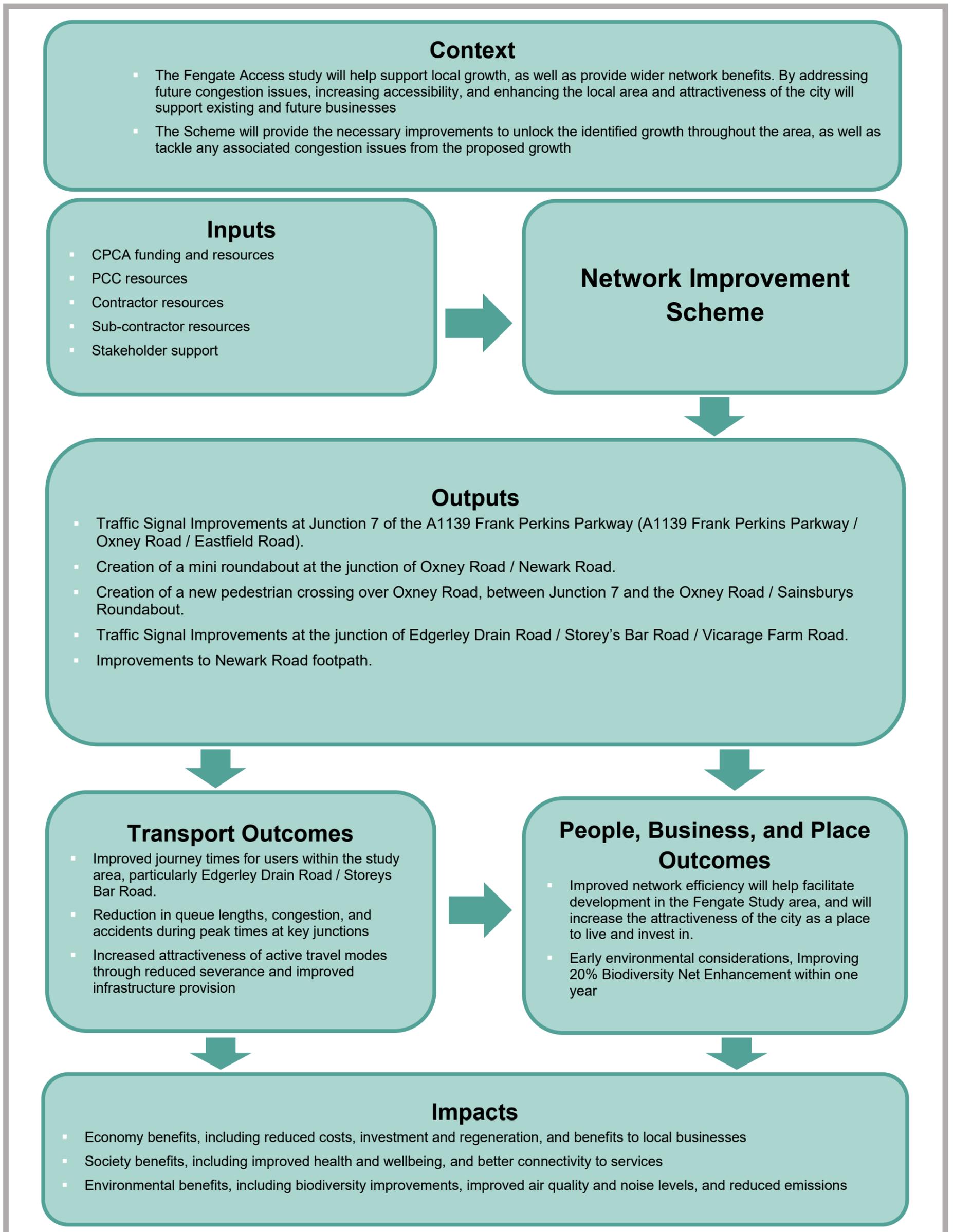


Figure 3.1: Fengate Access Study Logic Model

4. Benefits Realisation Plan

4.1 Benefits Realisation Strategy

4.1.1 Table 4.1 provides the framework against which the anticipated benefits will be planned for, tracked and realised. It sets out the key activities needed to manage the successful realisation of the benefits in the short, medium, and long term, together with the timescales and who is responsible for each activity.

4.1.2 The strategy starts with the scheme objectives and follows a logical progression:

- **Scheme objectives** – as set out in the Strategic Case of the FBC
- **Enabling changes** – what the scheme needs to deliver in order to achieve each objective
- **Benefits experienced** – the benefits that will occur as a result of successful delivery of change
- **Key beneficiaries** – who will experience the benefits
- **Benefit owners** – who has responsibility for delivering the benefits
- **Benefit enablers** - an outline of actions to be taken, and additional actions which could be taken to help achieve the benefits.

Table 4.1: Benefits Realisation Strategy

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Data Collection Method	Benefit Owners	Benefit Enablers
<p>Tackle congestion and improve journey time reliability: Tackle congestion at key pinch points across the Study Area and reduce delay in to the Fengate area.</p>	<ul style="list-style-type: none"> Traffic Signal Improvements at Junction 7 Creation of a mini roundabout at the junction of Oxney/Newark Road Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road 	<ul style="list-style-type: none"> Reduced peak hour congestion for motorists leading to more reliable journey times Increased operational efficiency of the road network Reduction in stationary / rolling traffic resulting in air quality improvement Increased attractiveness of the Fengate area 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Visitors to the City 	<ul style="list-style-type: none"> Desk study / site visits Survey footage review Journey time dataset for a month period 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance
<p>Support Peterborough's Growth Agenda and facilitate the development of Red Brick Farm site: Ensure that the planned employment growth at Red Brick Farm can be accommodated.</p>	<ul style="list-style-type: none"> Traffic Signal Improvements at Junction 7 Creation of a mini roundabout at the junction of Oxney/Newark Road Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Increased network capacity and operational efficiency Increased attractiveness of the Fengate area 	<ul style="list-style-type: none"> PCC in regard to fulfilment of the Local Plan Businesses in Fengate Residents / Local Community 	<ul style="list-style-type: none"> Desk Study of economic data provided by PCC Review of Local Plan goals for economic growth 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of Fengate businesses and wider City Area
<p>Protect the local environment and improve biodiversity: Ensure a 20% biodiversity net enhancement within the study area.</p>	<ul style="list-style-type: none"> Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Increased attractiveness of the Fengate area Achievement of 20% biodiversity net enhancement 	<ul style="list-style-type: none"> PCC / CPCA in regard to environment and biodiversity Businesses in Fengate area Residents / Local Community 	<ul style="list-style-type: none"> Desk Study analysis FBC calculation for carbon Analysis of key project documents by the schemes Project Board 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of Fengate businesses and wider City Area Biodiversity Net Enhancement Calculation Air quality monitoring
<p>Improve Road Safety: Reduce personal injury accidents and improve personal security amongst all travellers.</p>	<ul style="list-style-type: none"> Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout Improvements to Newark Road footpath Traffic Signal Improvements at Junction 7 Creation of a mini roundabout at the junction of Oxney/Newark Road 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Increased operational efficiency of the Fengate network Fewer casualties Fewer accidents involving rear end shunts on main approaches 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Bus Operators 	<ul style="list-style-type: none"> Desk study / site visits Collated data from 12-hour manual classified counts Survey footage review Journey time dataset for a month period 	CPCA / PCC	<ul style="list-style-type: none"> Monitoring of network performance Completion of the schemes including walking and cycling elements Road safety audit Monitoring / investigation of accidents
<p>Improve Active Travel Provision with Fengate: Improve active travel provision with the Fengate Access Study area.</p>	<ul style="list-style-type: none"> Improvements to Newark Road footpath Creation of a mini roundabout at the junction of Oxney/Newark Road Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout 	<ul style="list-style-type: none"> Fewer accidents involving rear end shunts on main approaches Reduced peak hour congestion for journeys leading to more reliable journey times Increased attractiveness of the Fengate area 	<ul style="list-style-type: none"> Commuters / Business trips Local residents Visitors to the City Active Mode users Fengate business users 	<ul style="list-style-type: none"> Desk study / site visits Survey footage review 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes including walking and cycling elements Road safety audit Monitoring / investigation of accidents
<p>Positively impact traffic conditions on the wider network: Positively impact the performance of local routes impacted by the traffic and congestion in and around Fengate</p>	<ul style="list-style-type: none"> Traffic Signal Improvements at Junction 7 Creation of a mini roundabout at the junction of Oxney/Newark Road Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Reduced stationary / queuing traffic 	<ul style="list-style-type: none"> Commuters / Business trips Local residents / wider community PCC / CPCA in regard to air quality control and policy goals 	<ul style="list-style-type: none"> Desk study / site visits Collated data from 12-hour manual classified counts Journey time dataset for a month period 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance
<p>Reduce Severance for Active Travel Users: Reduce severance caused to active travel users by the road network</p>	<ul style="list-style-type: none"> Improvements to Newark Road footpath Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Fewer accidents involving rear end shunts on main approaches 	<ul style="list-style-type: none"> Commuters Local residents Visitors to the City 	<ul style="list-style-type: none"> Desk study / site visits Survey footage review Journey time dataset for a month period 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance
<p>Upgrade Junction 7: Upgrade the junction to overcome maintenance and safety concerns with the current asset.</p>	<ul style="list-style-type: none"> Traffic Signal Improvements at Junction 7 Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout 	<ul style="list-style-type: none"> Reduced peak hour congestion for journeys leading to more reliable journey times Increased attractiveness of the Fengate area 	<ul style="list-style-type: none"> Commuters Local residents Visitors to the City Bus Operators 	<ul style="list-style-type: none"> Desk study / site visits Analysis of key project documents by the schemes Project Board Survey footage review 	CPCA / PCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance

5. Monitoring and Evaluation Approach

5.1.1 The Monitoring and Evaluation Plan for the Fengate Access Study package of improvements takes a proportionate and targeted approach and aims to demonstrate how the package of schemes has performed in relation to its objectives and intended outcomes.

5.1.2 The monitoring plan is designed to determine whether the Fengate Access Study package of improvements:

- Has been designed and delivered efficiently and effectively
- Has met the requirements of the stated scheme objectives
- Has achieved the desired outcomes and impacts
- Represents value for money
- Resulted in any unintended outcomes and impacts (both positive and negative)

5.2 Types of Measures

5.2.1 The following types of measure will be monitored, as defined in the DfT framework:

- Inputs – what is being invested to deliver the Package of Schemes
- Outputs – what has been delivered, and how it is being used
- Outcomes – intermediate effects of the Package of Schemes, such as changes in traffic flow
- Impacts – longer-term effects on wider social and economic outcomes, such as economic growth

5.3 Stages of Monitoring and Evaluation

5.3.1 Monitoring and Evaluation is required both during the development and construction, as well as in the years following implementation of the improvement scheme, to meet the stated evaluation objectives and effectively assess any scheme outcomes and impacts.

5.3.2 As per the DfT standard monitoring guidance, the monitoring process will be split into three stages:

- **Pre-construction and during delivery (monitoring)**
 - Baseline data is 2019 surveys, limited surveys / assessments to be undertaken in 2023 before scheme construction commences as part of FBC
 - Data to monitor scheme delivery will be collected during construction

- **One-year after (Monitoring and Evaluation)**
 - Data to monitor scheme performance will be collected at least one year (but less than two years) after scheme opening.
 - An initial “One Year After” report will be published within two years of scheme opening, focusing on the scheme’s outcomes

- **Five-years after (Monitoring and Evaluation)**
 - Further data will be collected up to approximately five years after scheme opening
 - A final “Five Years After” report will be published within six years of scheme opening, based on analysis of all the data available, including an assessment of the wider impacts of the scheme

5.3.3 Monitoring timescales for the Fengate Access Study are summarised in Table 5.1 beneath.

Table 5.1: Monitoring and Evaluation Timescales

Monitoring Activity	Timescale
Prior to scheme build (Baseline)	2019
During Construction	2023
Scheme Opening	2024
One year post scheme opening	2025
Five years post scheme opening	2029

5.4 Measures to be Monitored

5.4.1 The measures which will be monitored for evaluation of the scheme, as stated within the DfT standard monitoring guidance, are set out in Table 5.2 overleaf.

Table 5.2: Standard Monitoring Measures

Item	Type of Measure	Data Collection Timing	Rationale
Scheme Build	Input	During Delivery	Knowledge
Delivered Scheme	Output	During Delivery Post Opening (1 Year)	Accountability
Scheme Costs	Input	During Delivery Post Opening (1 Year)	Accountability
Scheme Objectives	Output / Outcome / Impact	Pre-Delivery Post Opening (up to 5 years)	Accountability
Travel Demand	Outcome	Pre-Delivery Post Opening (1 year and up to 5 Years)	Accountability / Knowledge
Travel Time and Reliability	Outcome	Pre-Delivery Post Opening (1 year and up to 5 Years)	Accountability / Knowledge
Impact on Economy	Impact	Pre-Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge
Impact on Local Environment / air quality	Impact	Pre-Delivery During Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge
Carbon	Impact	Pre-Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge

5.4.2 In addition, an assessment will be undertaken to determine the extent to which the Fengate Access Study package of schemes has delivered the Value for Money (VfM) that was anticipated in the appraisal set out in the FBC. This will be done by re-calculating the benefit-cost ratio (BCR) in both the “One Year After” and “Five Years After” reports and comparing it to the BCR calculated in the FBC.

5.4.3 The following chapter describes how data will be collected and analysed to monitor the scheme’s performance in each of these areas.

6. Data Requirements and Collection Methods

- 6.1.1 Data collection for the package of schemes is required at various stages through scheme development to ensure effective monitoring and evaluation takes place.
- 6.1.2 Table 6.1 beneath sets out the data that will be collected to monitor and evaluate the Fengate Access Study package of schemes, along with the rationale for its inclusion, the proposed data collection method, and the proposed frequency of data collection.

Table 6.1: Monitoring and Evaluation Data Requirements

Measure	Data to be used	Rationale for inclusion	Data Collection Method	Frequency of Data Collection
Scheme Build	<ul style="list-style-type: none"> Progress of construction against key milestones Qualitative feedback from the Project Team Information from the Risk Register Project programme / disruptions to delivery 	To gain knowledge and understanding of the level of effectiveness of the scheme build processes and to learn lessons for future projects.	<ul style="list-style-type: none"> Analysis of key project documents by the scheme's Project Team, including Risk Register, Review of Early Warnings etc, Interviews with key staff 	On-going throughout the construction and delivery of the schemes, reporting on monthly basis
Delivered Scheme	<ul style="list-style-type: none"> Scheme definition at full funding approval Scheme design drawings Logged design iterations Information from project change control log 	To assess the impact of change during construction, and realisation of scheme objectives.	<ul style="list-style-type: none"> Desk study / site visits Analysis of key project documents by the schemes Project Board 	During construction and 1 year after scheme opening
Scheme Costs	<ul style="list-style-type: none"> Forecast scheme costs at time of funding approval (FBC) Actual outturn costs once scheme is completed 	Cost analysis enables 'performance to budget' to be monitored and corrective actions to be implemented. Lessons Learnt to be realised and implemented for other similar projects, alongside having potential to refine contractual arrangements where necessary.	<ul style="list-style-type: none"> Financial monitoring of the scheme costs from approval to scheme completion Project Manager's monthly reports to Project Board Interviews with key staff 	On going throughout construction and delivery of the scheme, reporting on a monthly basis.
Travel Demand	<ul style="list-style-type: none"> Daily traffic flows classified into vehicle types and by movement 	To monitor changes in traffic flows in the Fengate area, more specifically the volume of traffic on key approaches	<ul style="list-style-type: none"> Desk study / site visits Collated data from 12 hour manual classified counts 	Baseline 2019 before scheme completion, 1 year after scheme opening and 5 year after scheme opening. ATC - continuous monitoring
Travel times and reliability	<ul style="list-style-type: none"> TomTom or Traffic Master data 	To monitor changes in travel times and queuing on key routes in the Fengate area	<ul style="list-style-type: none"> Desk study / site visits Survey footage review Journey time dataset for a month period 	Baseline 2019 before scheme completion, 1 year after scheme opening and 5 years after scheme opening.
Impact on Economy	<ul style="list-style-type: none"> Local employment statistics 	To assess the economic impact of the scheme on the wider City	<ul style="list-style-type: none"> Desk Study of economic data provided by PCC Review of Local Plan goals for economic growth 	Baseline 2019, before scheme completion, 1 year after scheme opening and 5 years after scheme opening
Impact on the Local Environment / Air Quality	<ul style="list-style-type: none"> Carbon emission workshops / calculations Biodiversity calculations – completed scheme maps 	To monitor and assess the emissions as a result of the Fengate Access Study schemes and any impact on the environment	<ul style="list-style-type: none"> Desk study / site visits Analysis of key project documents by the schemes Project Board 	Baseline 2019, during construction, before scheme completion, 1 year after scheme opening and 5 years after scheme opening
Carbon	<ul style="list-style-type: none"> Carbon emission workshops / calculations Traffic flows and speeds within the Fengate area 	To monitor carbon emission within the Fengate Access study area as a result of the scheme	<ul style="list-style-type: none"> Desk Study analysis FBC calculation for carbon Analysis of key project documents by the schemes Project Board 	Baseline 2019, before scheme completion, 1 year after scheme opening and 5 years after scheme opening

6.2 Data Collection

6.2.1 Data collection for the measures of 'travel demand' and 'journey times and reliability' as stated in Table 6.1 includes:

- Classified Turning Counts (CTCs)
- Automatic Traffic Counts (ATCs)
- Satellite Navigation Data

6.2.2 Survey data collected as part of the scheme monitoring and evaluation will be a replication of data collected in the original 2019 baseline dataset, enabling a direct comparison to be made.

Manual Classified Turning Counts

6.2.3 CTCs will be used to monitor changes in traffic demand in the Fengate area at both 1 year and 5 years after scheme completion.

6.2.4 CTC surveys will include the seven locations listed below and data will be classified into Car, Light Goods Vehicles (LGV), Other Goods Vehicles (OGV1 and OGV2), Bus, and Motorcycle classifications. Surveys will cover a 12-hour period between 07:00 and 19:00 and should be conducted in September/October, reflecting the collection period of the baseline data.

6.2.5 CTC and ATC survey locations are detailed below and shown in Figure 6.1 overleaf:

1. CTC 1 - Junction 7
2. CTC 2 - Junction of Oxney road / Newark Road
3. CTC 3 - Edgerley Drain Road / Storey's Bar road / Vicarage Road signalised junction
4. ATC 1 - Eastfield Road, between Junction 7 and Oxney Road / Sainsbury's roundabout
5. ATC 2 - Edgerley Drain Road, between Storey's Bar road and Stevern Way



Figure 6.1: Monitoring and Evaluation Survey Locations

Satellite Navigation Data / Journey Times

- 6.2.6 Satellite Navigation data will be used to monitor changes in journey times in the Fengate area at both 1 year and 5 years after scheme completion.
- 6.2.7 Journey time data will be obtained for a month period (Oct / Nov) for the routes shown in Figure 6.2 which were used in the original 2019 baseline data set. Survey data will be collected for the AM (08:00 – 09:00), PM (17:00 – 18:00) and Interpeak (10:00-14:00) peak periods and the month period should exclude non-neutral days such as weekends, holidays, and any period relating to major roadworks / incidents.

6.2.8 Journey time routes which will be covered in the dataset include:

- A1139 Frank Perkins Parkway Off-slip Northbound
- Eastfield Road Westbound approach to Junction 7
- Eastfield Road Eastbound approach to Junction 7
- Edgerley Drain Road Southbound
- Eye Road Southbound approach to Junction 7
- Newark Road Northbound
- Oxney Road Eastbound
- Oxney Road Westbound
- Storey's Bar Road Northbound
- Storey's Bar Road Westbound
- Vicarage Farm Road Eastbound

6.2.9 Journey time routes are displayed in Figure 6.2 below.

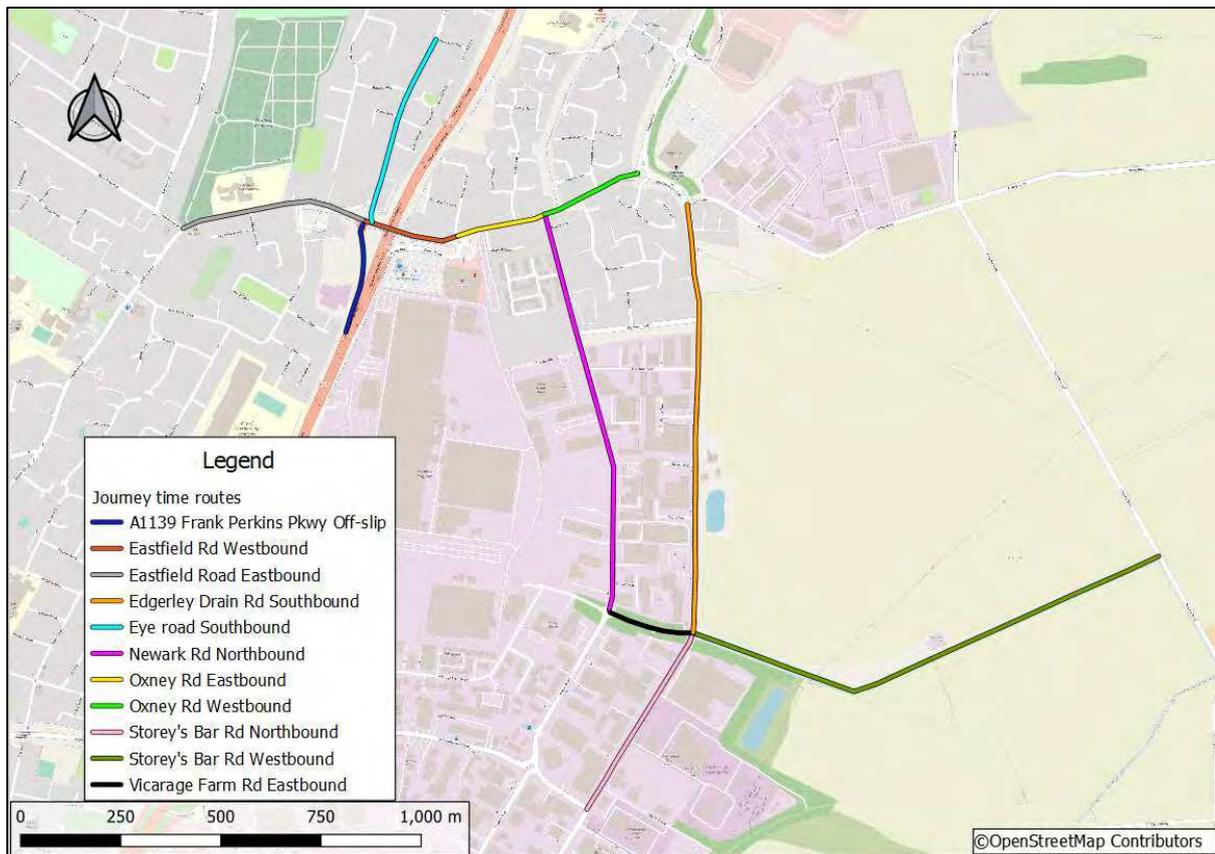


Figure 6.2: Monitoring and Evaluation Journey Time Routes

7. Evaluation Resource and Governance

7.1 Monitoring and Evaluation Plan costs

- 7.1.1 Table 7.1 overleaf provides a summary of the monitoring and evaluation plan for the Fengate Access Study, highlighting data collection, reporting programme and indicative costs.
- 7.1.2 The necessary monitoring and evaluation budget is estimated to be £25,000, based on survey data, analysis, and reporting. A breakdown of costs is provided beneath in Table 7.1 beneath.

Table 7.1: Monitoring and Evaluation Plan

	Measure	Measure of Success	Data Source	Data Collection / Reporting Programme			Ownership	Indicative Cost Estimate
				Baseline	Delivery	Post Completion		
Inputs-	Scheme Costs	CPCA Funding	CPCA Funding submission Final Scheme Cost Data	Planned	October 2022 – January 2023	-	CPCA / PCC	-
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Inspection On-Site	December 2022	November 2022 – March 2024	2025	CPCA / PCC	£1500
Objectives	Outcomes							
1 / 4 / 5 / 8	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage	Octoberber 2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		Enhanced Network Performance for Public Transport, namely for the Citi 4 and 37 Service	Local Bus Company Punctuality Data	2019 / 2022	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		New Infrastructure for Sustainable Modes	Site Inspection / Usage Data	2021 / 2022	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		Reduce the number of accidents at Junction 7 and Edergerley Drain Road / Storey's Bar Road Junction	Peterborough Database of Road Traffic Records	Dataset 2015 - 2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
4/5/6/7	Travel Demand	Enhanced Network Performance, Junction 7 and Edergerly Drain road/Storey's Bar road/Vicarage Farm road junction	Classified Turning Counts / Site Visits / Video Survey Footage	October 2019	-	April 2025 / April 2029	CPCA / PCC	£3,750 for count surveys and £500 for data analysis at both 1 year and 5 year reporting Total = £8,500
2 / 3	Impact on Economy	Employment Growth Ambitions in Fengate	PCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
3	Impact on the Local Environment	Ensure a Net Gain of Biodiversity across the Study Area	Biodiversity Calculation / Site Survey and Desk Based Assessment	October 2022	-	April 2025 / April 2029	CPCA / PCC	£1000 for site inspections and data analysis at both 1 year and 5 year reporting Total = £2000
1/6	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / PCC Air Quality Monitoring Sites / Future traffic demand data	October 2022	-	April 2025 / April 2029	CPCA / PCC	£1000 data analysis at both 1 year and 5 year reporting Total = £2000
Reporting	Year 1 reports summarising the outcomes of the monitoring and evaluation work			-	-	2025	CPCA / PCC	£3,000
	Year 5 report summarising local economic growth, scheme impacts and development figures prior and post opening of the scheme			-	-	2029	CPCA / PCC	£3,000
Total Monitoring and Evaluation Budget								£25,000

7.2 Governance

- 7.2.1 The CPCA have the responsibility for ensuring Value for Money from the Fengate Access Study package of schemes. Under the CPCA, PCC will be responsible for ensuring the Scheme Evaluation Plan is undertaken as outlined within this report.
- 7.2.2 Monitoring during construction and post scheme opening is likely to be undertaken by PHS under commission from CPCA and PCC. However, owners for each monitoring task should be defined following the approval of the FBC.
- 7.2.3 To ensure the successful delivery of the scheme throughout construction, the following resource used to date will continue:
- Project Delivery Team
 - PHS Project Board
- 7.2.4 Delivery of the scheme to date has been managed by the PCC Project Manager and wider Project Team, consisting of key project delivery partners. The Project Team have been responsible for the daily running of the project and will continue to meet on a monthly basis throughout the construction period. The main responsibilities being to:
- 7.2.5 The delivery team will continue to meet monthly throughout the construction phase of the project. Its main responsibilities are to:
- Comment on delivery and ensure sufficient resource is allocated to scheme delivery
 - Monitor overall delivery against programme to ensure key activities / milestones are completed
 - Consider project costs and risks and review and advise on any impacts to project delivery
 - Provide governance for the project and initiate corrective action where necessary
 - Provide updates, including written progress reports
- 7.2.6 The existing PHS Project Board will be used to oversee the continued delivery of the scheme by the Project Team, and to make key decisions relating to the delivery of the project. The Project Board will be continuing to meet on a monthly basis until the scheme is complete. Arrangements will then be agreed for the on-going resource / schedule for reporting associated with the monitoring and evaluation plan of the scheme.
- 7.2.7 Figure 7.1 provides an outline of the overall governance structure highlighting key roles and lines of accountability for the development and delivery of the scheme.

Figure 7.1: Organisational and Governance Structure



7.3 Quality Assurance

- 7.3.1 The project to date has been managed by PCC in line with their existing assurance and approvals processes, namely the CPCA Assurance Framework. The CPCA Assurance Framework sits alongside a number of Combined Authority documents including the '10-point guide' mentioned above and details the fundamental principles in relation to the use, administration and evaluation of Cambridgeshire and Peterborough Investments.
- 7.3.2 Under the management of The Council, a Project Manager was assigned and has been responsible for the daily running of the project. In instances where approval was required, the Project Manager would be advised and then provided by the Project Board.
- 7.3.3 The Project Manager will also be responsible for quality assurance for the MEP. Development and ongoing maintenance of the scheme evaluation plan will ensure that it reflects the programme and key milestones.
- 7.3.4 The Project Manager will also:
- Arrange for the undertaking of quality checks by internal peer review to ensure high quality
 - Record proceedings at meetings with the project board, project team and technical specialists, and reporting them in the form of meeting minutes including a clear record of actions and action dates
 - Ensure compliance with the consistency in approach / assessment / presentation of documents and output
 - Contribute to project close out and post project appraisal exercises for the task.

7.4 Risk Management

- 7.4.1 The risk management strategy for the evaluation process is in line with the strategy for the project delivery. Risk areas identified in relation to evaluation of the project are:
- **Baseline data** – transport data issues (completeness, correctness, accuracy, and relevance), impacting on processing.
 - **Baseline data collection** – unable to collect data before site opens e.g., weather, or resourcing constraints.
 - **Data processing** – inaccuracy of data analysis, impacting on evaluation.
 - **Future year data** – funding issues prevent future data survey collection.
 - **Evaluation** – post analysis realisation that baseline data will be insufficient for purpose or potential newly identified factors.

7.4.2 Table 7.2 below highlights the calculated likelihood and severity of the risk identified for the project evaluation, as well as mitigation measures that can be taken.

Table 7.2: Risk Matrix and Mitigations

Risk	Likelihood Score (1-5)	Impact Score (1-5)	RAG Score (Likelihood x Impact)	Mitigations
Baseline Data Accuracy Accuracy lost because of programming or processing errors.	1	2	2	Baseline data has been used throughout the business case lifespan of the project. Baseline data has been reassessed in preparation for the required monitoring and evaluation, and is sufficient for future data comparisons.
Baseline Data Collection Incorrect data due to road works, weather etc	3	2	6	Construction programme is known, careful planning / weather monitoring to be undertaken when arranging surveys.
Data Processing Data recieved can be incosistent due to machine malfunction, Weather etc	1	1	2	Once data is recieved from survey companies, rigourous reviewing to be undertaken to highlight any inconsistencies / issues at the earliest point.
Future Year Data Lack of funding for future year data collection	2	5	10	Funding required for the monitoring and evaluation of the project has been costed prior to construction and will be recieved with the construction funding (approval January 2023). Funding will be separated for future use.
Evaluation Lack of funding for evaluation process.	1	2	2	See above comments.

8. Dissemination Plan

- 8.1.1 This Scheme Evaluation Plan will be agreed with PCC and CPCA prior to the submission of the FBC. Costs for monitoring and evaluation will be included within the final funding request from the CPCA for construction costs.

8.2 Dissemination Reporting

- 8.2.1 Monitoring will be undertaken before and during construction, and after the opening of the Scheme. A “One Year After” evaluation report will be produced within two years of the Scheme opening, followed by a “Five Years After” report within six years of the Scheme opening. The reports associated with this Monitoring and Evaluation will be published on the PCC website.

8.3 Stakeholder Engagement

- 8.3.1 PCC and the Project Team have engaged with key stakeholders throughout the development of the Scheme, and this will continue during the delivery phase. The list of stakeholders who received communication regarding the scheme can be found in the Strategic Case of the FBC.
- 8.3.2 Communication with stakeholders throughout the delivery phase will be via email or letter (as per previous communications) as well as via the scheme PLO who will keep stakeholders informed with the progression of the scheme build throughout the construction phase.
- 8.3.3 Stakeholders where necessary will also be invited to the continued project team monthly meetings and receive the formal reporting associated with the Scheme Evaluation Plan.

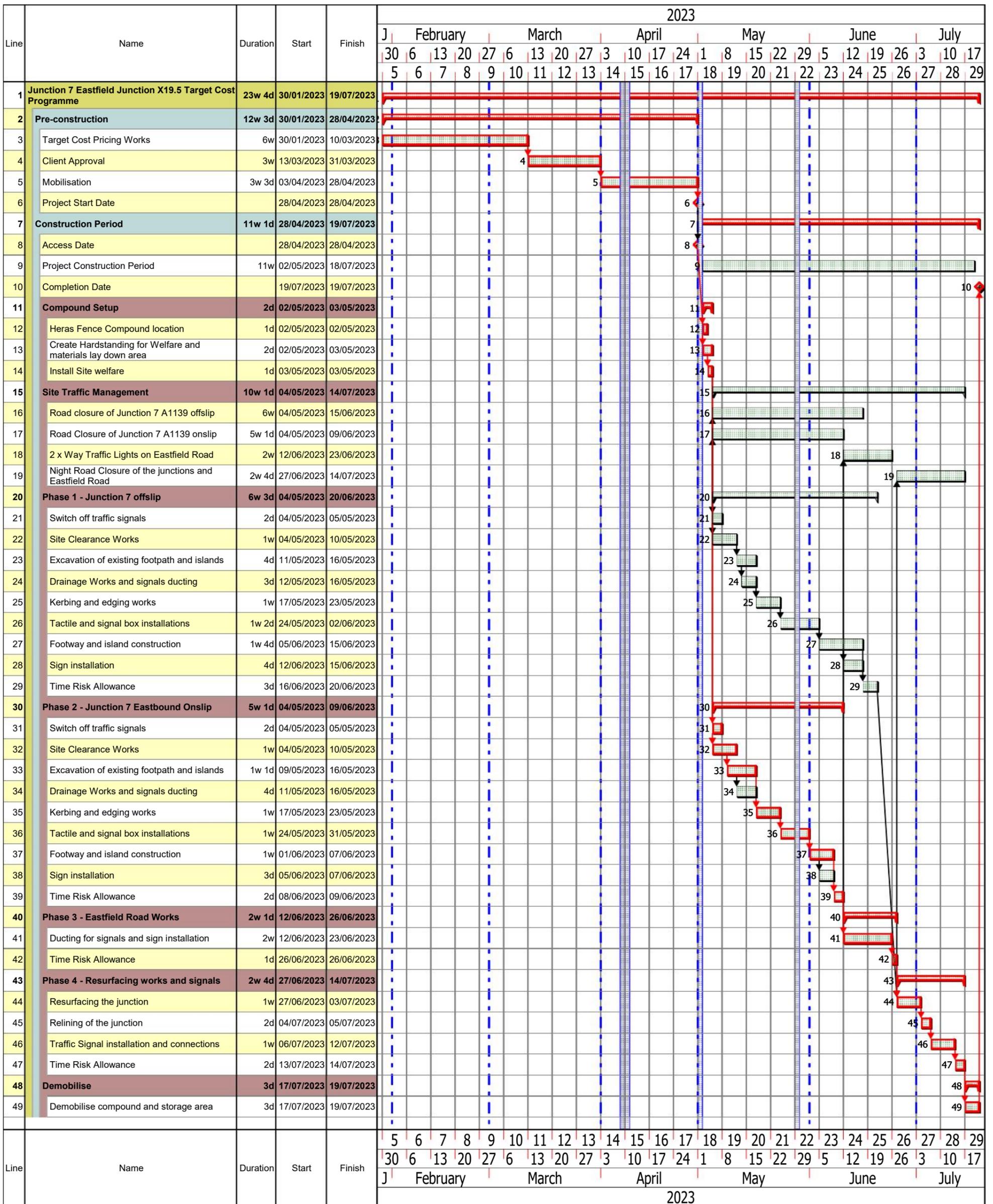
8.4 Lessons Learnt

- 8.4.1 The Package of schemes will represent a significant investment of public money for the city by the CPCA. Monitoring and evaluation is therefore essential, not only to demonstrate that the schemes have been delivered as planned with the desired impacts, but also to inform and enlighten future decision makers, both locally and nationally. In this way, future investment can be targeted to provide the best value for money.

8.4.2 Lessons will be learnt by seeking answers to the following research questions

- **Delivery:** Has the Scheme been delivered as intended and to the expected timetable? If any internal and external factors affected delivery, what impact did these have? Could they have been foreseen or avoided? What went well and what went less well?
- **Cost:** How accurate were the cost estimates? If outturn costs were different from expectations, why was this, and what actions were taken? Were the allowances for quantified risk and optimism bias reasonable, or should a different approach be taken in future?
- **Traffic / Journey Reliability:** Has the scheme produced the expected changes to congestion and journey time reliability in the Fengate area, and were there any unintended changes? If not, what are the reasons? If there are differences, are they due to Scheme specific, or external factors affecting traffic demand? Are there implications for similar schemes in the future?
- **Economy:** Has the Package of schemes enhanced the position of Peterborough in relation to policies and growth aspirations? Has it altered the perception of the City as a place to work, better attracting new investors as a place of opportunity? Have there been any unintended consequences?
- **Value for money:** Did the traffic model provide a realistic forecast of future growth and the effects of the Schemes? If there are differences, are they enough to raise questions about the VfM category attributed to the Scheme?
- **Environment:** Were the environmental impacts of the Scheme in line with expectations? Is mitigation perceived to have been effective? Have there been any unintended impacts, and, if so, how might they have been foreseen, or avoided with future schemes?

Appendix J – Construction Programmes



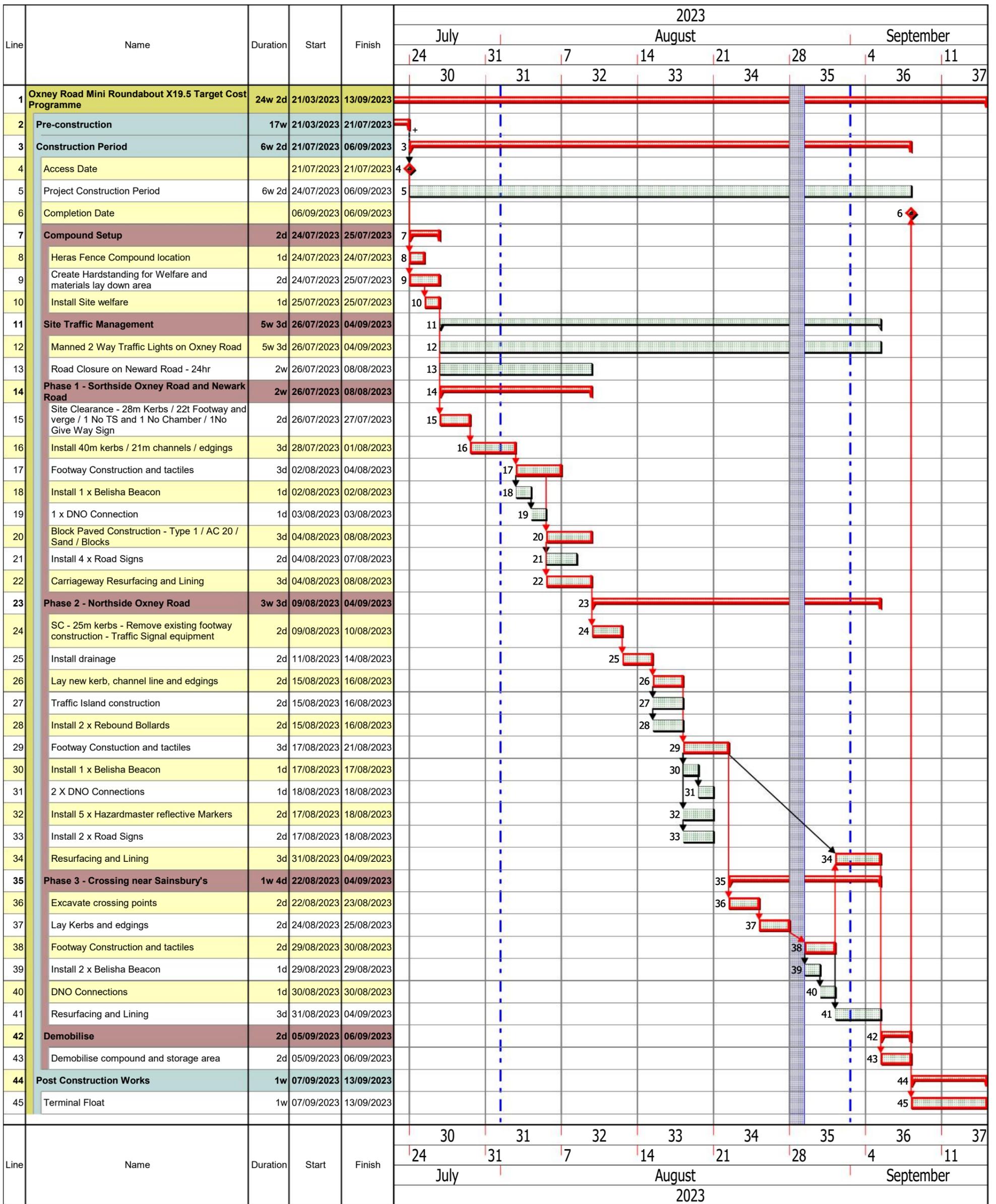
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Milestone Appearances
 Diamond

Programme No : Revision No : A Issue Date : 21/10/2022 Drawn by : Scott Blackburn		Eastfield Road Junction 7 Business Case Programme	Filter:- None Page No:- 1	
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File Ref: Peterborough - PCC Construction Programmes



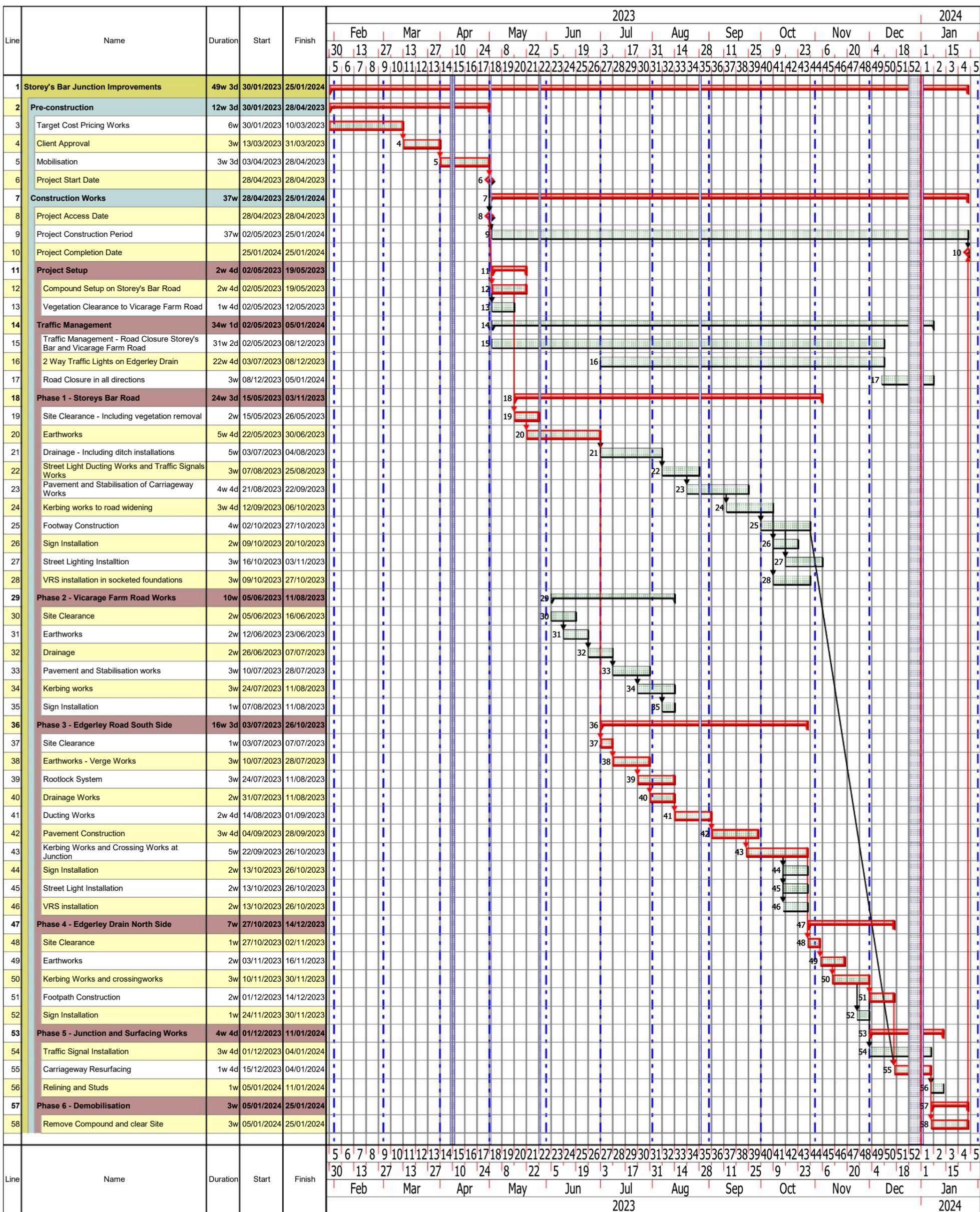
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Milestone Appearances
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Programme No : Revision No : A Issue Date : 13/09/2022 Drawn by : Scott Blackburn		Oxney Road Mini Roundabout TC Programme	Filter:- None Page No:- 1	
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Programme No : Revision No : A Issue Date : 01/11/2022 Drawn by : Scott Blackburn		Storey's Bar Road Junction Improvements	Filter:- None Page No:- 1	
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File Ref: Peterborough - PCC Construction Programmes

Appendix K – Junction 15 Contractors (PHS Procurement Example)

Junction 15 Improvement Scheme (2022 - 2023)	
Contractor	Service
HW Martins	Traffic Management
PGR	Enabling & Civils Works
CD Fencing	Safety Fencing
Toppesfield	Resurfacing
MSF Ltd	Signage
Wilson & Scott Ltd	Lining / Studs / Anti-skid
Milestone	Street Lighting
Centregreat	Footbridge Structure
Bell Formwork	Structural Concrete
Ivor King	Piling
Anglian Tree	Landscaping
JF Hunt	Demolition



Local Transport & Connectivity Plan

To:	Transport and Infrastructure Committee
Meeting Date:	18 th January 2023
Public report:	Yes
Lead Member:	Cllr Anna Smith, Chair of Transport and Infrastructure Committee
From:	Emma White, Transport Programme Manager
Key decision:	N/A
Forward Plan ref:	N/A
Recommendations:	<p>The Transport and Infrastructure Committee is recommended to:</p> <ul style="list-style-type: none">a) Take note on the progress toward the Local Transport and Connectivity Plan including the delay in the overarching programme for the finalisation of the strategy document;b) Take note and comment on the Draft Digital Policy document; andc) Recommend to the Combined Authority Board to approve the drawdown of £100,000 of STA funding, and the application of a £178.5k ringfenced grant received from DfT, to undertake the next stages of the LTCP.
Voting arrangements:	For recommendations c) a vote in favour by at least two thirds of all Members (or their Substitute Members) appointed by the Constituent Councils who are present and voting, to include the Members appointed by Cambridgeshire County Council and Peterborough City Council, or their Substitute Members

1 Purpose

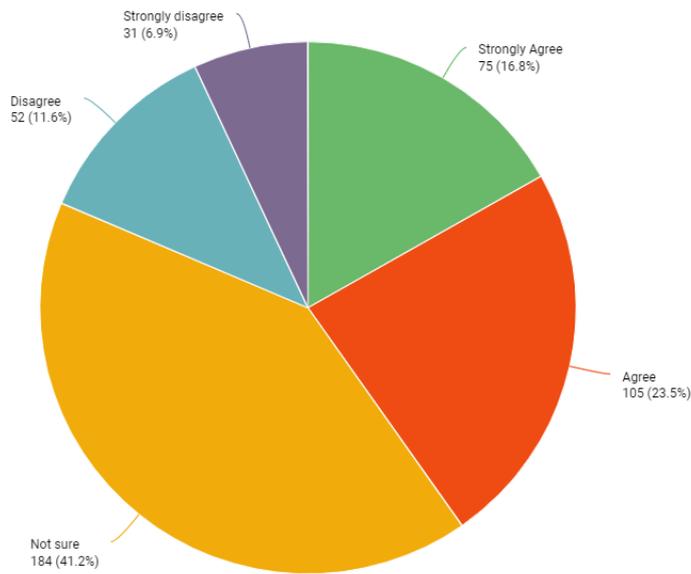
- 1.1 This paper provides an update on the Local Transport and Connectivity Plan (LTCP) specifically in relation to the DfT guideline deadlines and progress to date. The paper also includes the draft Digital Policy for Cambridgeshire and Peterborough.

2 Background

- 2.1 The future of local transport planning for the Cambridgeshire and Peterborough area has and continues to undergo rapid change. Since the publication of the Local Transport Plan (LTP) in early 2020 there have been significant changes that have directly and indirectly impacted on the current transport network and the appropriateness of the overarching strategy.
- 2.2 The draft LTCP describes how transport and digital interventions can be used to address current and future challenges and opportunities for the region. It will set out the revised policies and strategies needed to secure growth and ensure that planned developments can take place in the county in a sustainable way.
- 2.3 The purpose of a LTP is to:
- Outline the current baseline regarding transport, accessibility, and pollution;
 - Set out challenging, but achievable, objectives;
 - Set out the timeline for achieving these objectives; and
 - Outline 'bids' for funding from the DfT.
- 2.4 The development of a transport strategy is a key component of the Combined Authority's Improvement Plan. The aim of Workstream C of the Improvement Plan has been and continues to be development, implementation, and approval of the Plan in 2023. As part of our continual improvement and development of the plan, this will include a peer review and challenge from West Midlands Combined Authority. Central government are yet to publish their LTP guidance that was due in September, and this remains a significant risk to the programme. However, officers are continuing to minimise this risk through ongoing liaison and engagement with central government and the consultants that are drafting the guidance.
- 2.5 The Interim Head of Transport has been invited by the Department for Transport (DfT) to be actively involved in the development of number of strategies and pilots. This will allow for the Combined Authority to influence the direction of travel of central government's policy and may result in some of these developments being piloted within Cambridgeshire and Peterborough.
- 2.6 On receipt of the LTP guidance from central government, the Combined Authority will need to thoroughly review it to ensure a golden thread between requirements of central government with the LTCP, whilst addressing any overarching concerns that may impact on resource requirements to fully meet the necessary expectations. This assessment will thereby ensure that the Plan meets the expectations of central government as well as local stakeholders, Transport and Infrastructure Committee and Lead Members and the people of Cambridgeshire and Peterborough. This is important as the LTCP will form the basis of future funding bids for schemes across the region – without the relevant hooks and clear alignment with the LTP guidance it will adversely impact the Authority's ability to secure additional funding.

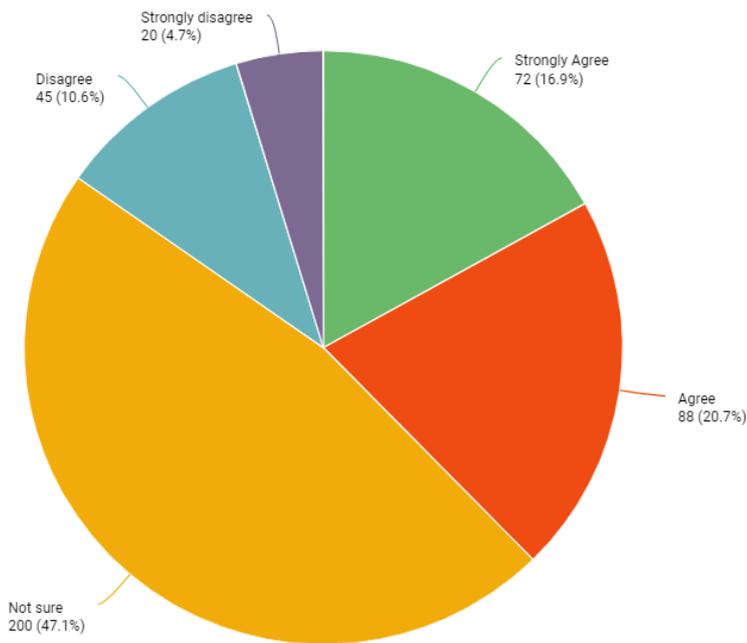
Consultation

- 2.7 In November 2021, an initial 4-week public engagement exercise was held to ask the public and stakeholders what they thought of the main Vision and Goals of the developing LTCP. The public and stakeholders were also asked what they thought our priorities for transport were, including better public transport, cycling, and walking, pollution, and air quality, and protecting the environment. The public could also talk about specific transport issues. A total of 569 feedback form were submitted during this consultation period. Key findings from this initial engagement period included the following:
- 97% of the public understood why a new vision for transport was needed.
 - 57% of the public either strongly agreed or mostly agreed that the updated vision is the right future for transport in the region.
 - Bus routes and frequency were the highest priority in Cambridgeshire and Peterborough, except for Cambridge, where reducing congestion in the city was the priority.
 - More ambitious carbon net zero targets, more transport infrastructure and affordability were other top priorities.
- 2.8 The LTCP consultation closed on 4th August after 12 weeks. The Combined Authority received 928 submissions in total. Feedback was also given direct on the website as well as by post, email and through attendance at in-person consultation events. Stakeholder feedback was also collated and processed alongside responses from key stakeholders, including Highways Authorities and Local Authorities. The Draft Consultation Report document is in Appendix A.
- 2.9 The feedback form provided the opportunity for respondents to comment on the Vision, Goals and Objectives of the draft LTCP, in which following feedback was received:
- 92% understood why the Combined Authority are making a new LTCP.
 - 65% either strongly agreed or agreed with the proposed LTCP vision.
 - When asked about the proposed LTCP goals, 51% strongly agreed with climate, followed by 50% for the environment, and 49% who strongly agreed that improved health outcomes should be a key goal.
 - When asked about the proposed LTCP objectives, 54% strongly agreed that this should include improvements to air quality. This was followed by 53% who strongly agreed with climate change, followed by 52% who strongly agreed with improved accessibility.
 - When asked about whether there were any further comments on the LTCP's vision, goals, and objectives, more ambitious net zero targets were the prevailing comment. This was followed by improved rural connectivity for transport services with additional information needed about the emerging LTCP (16).
 - 56% either strongly agreed or agreed with the proposed strategy for transport in Cambridgeshire and Peterborough, with improved cycling and pedestrian links and the creation of new bus routes the prevailing comments.
 - 66% either strongly agreed or agreed with the proposal to cut the number of miles driven on roads by 15%. The prevailing comment was that this target should look to be more ambitious.
- 2.10 Respondents were also given the opportunity to comment on the Local Area Strategies for their area. In terms of whether respondents agreed with the proposed area strategies and also summaries of extra comments were provided. The following feedback was received:



40% of responses for East Cambridgeshire either strongly agreed or agreed with the proposed local area strategy. The top three issues mentioned were about providing improved cycling and pedestrian links, followed by improved rural connectivity, as well as the provision of new train stations and lines.

Figure 1 - East Cambridgeshire



38% of responses either strongly agreed or agreed with the proposed local area strategy for Fenland. The key recurring comments here concerned improving rural connectivity, improvements needed to overall transport infrastructure as well as the need for new train stations and lines.

Figure 2- Fenland

45% of responses for Greater Cambridge either strongly agreed or agreed with the proposed local area strategy. Key themes here included new train stations and lines followed by improved cycling and pedestrian links. The third most recurring comment included the need to improve connectivity of transport services in rural areas as well as the need for an improved overall transport infrastructure

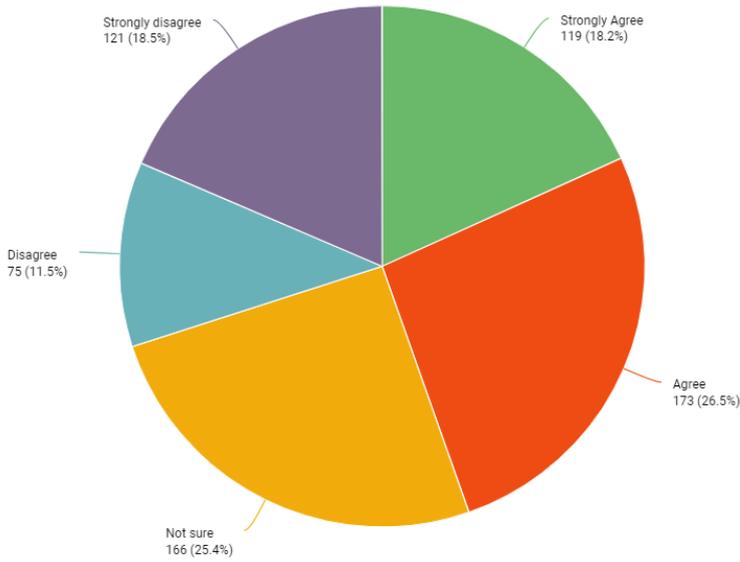


Figure 3 - Greater Cambridge

40% of responses for Huntingdonshire either strongly agreed or agreed with the proposed strategy. In relation to the local area transport strategy for Huntingdonshire, the need for need for further cycle and pedestrian links was most commonly cited, this was followed by a desire to see new bus routes, as well as the need to improve service frequency.

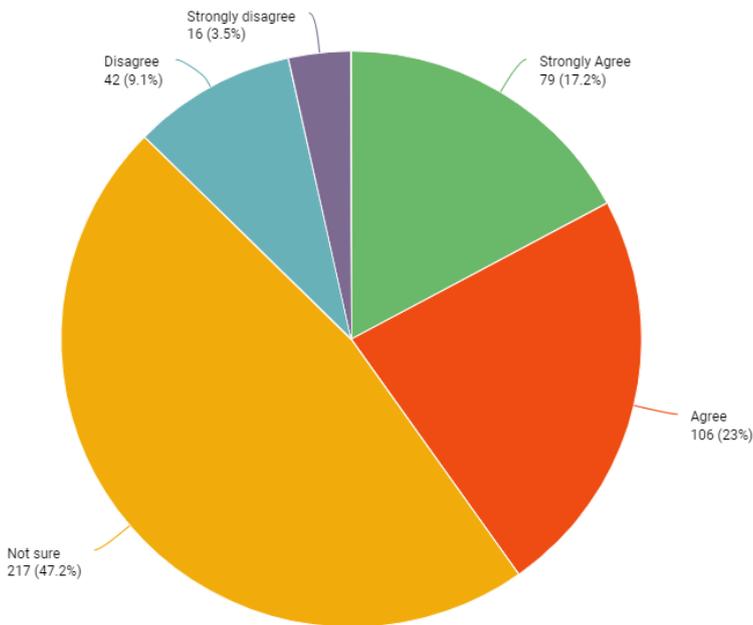
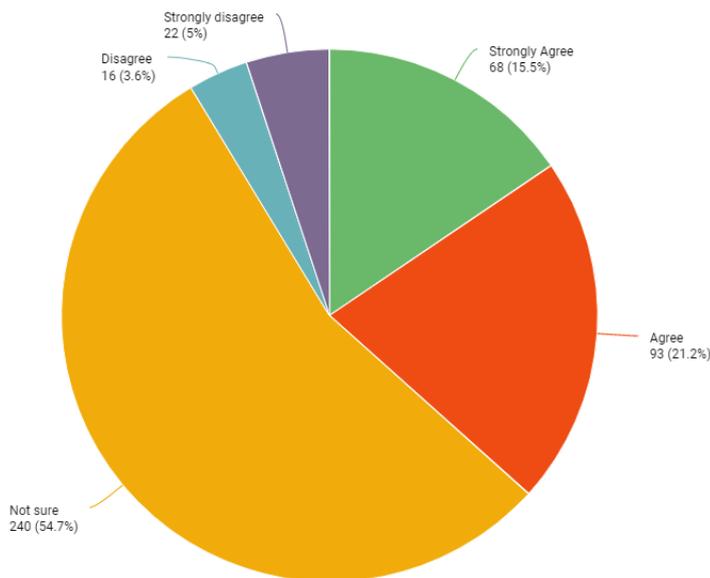


Figure 4 – Huntingdonshire



37% of responses for Peterborough either strongly agreed or agreed with the area strategy. In relation to the local area transport strategy for Peterborough, the need for need for further cycle and pedestrian links was most commonly cited, this was followed by a desire to see new train station and lines, as well as the need to improve service frequency and reduced car usage.

Figure 5 - Peterborough

- 2.11 Respondents were also given the opportunity to provide more general comments relating to transport and/or the draft LTCP. The key themes were as follows:
- Comments regarding the need for improved cycling and pedestrian links.
 - Comments regarding the need to reduce car usage.
 - Comments regarding the need to improve the frequency of transport services.
 - Comments regarding the need to improve rural transport services.
 - Suggestions regarding the need for new train stations and lines in specific locations.
 - Suggestions regarding the need for new bus routes in specific locations.
- 2.12 The draft LTCP Consultation report will be utilised and address in the next drafting of the LTCP.
- 2.13 During the 12-week public consultation, the LTCP team directly engaged over 90 stakeholders from across the region (and indirectly many more – through established stakeholder networks), focusing on rural areas as well as more urban centres. These stakeholders were a mix of organisations, including local businesses (SMEs and large corporate firms), educational institutions (schools, colleges, and universities), healthcare institutions, campaign and representative groups, and charities.
- 2.14 During the consultation period, stakeholders commented on the draft LTCP. Appendix 2 shows the “You Said We Did” document. This document drafts comments raised and plan on how these will be address in the next drafting of the Local Transport and Connectivity Plan.

Programme

- 2.15 With central government yet to publish their LTP guidance that was due in September, and this remains a key risk to the programme. As a consequence, a revised programme has been developed to take into account the delay of the guidance – this may also have an impact on the overall budget. The below table shows a proposed high-level programme.

Nov - Dec 2022	Final LTCP Consultation report completed
	Updating LTCP following consultation feedback
	6-week AFS consultation until 22nd Dec
	"You said We did" document
	Engagement with constituent councils on local strategy sections
	Updates to Evidence section
Jan 2023 Transport and Infrastructure Committee (TIC)	LTCP Update including Consultation and Digital Policy
Jan - Feb 2023	Completion of Decarbonisation Work including engagement on findings and way forward. Progress Quantifiable Carbon Reduction (QCR) work - part of the Local Transport Plan new guidance
	Finalising LTCP from engagement and consultation
	Updating LTCP following DFT guidance once available
	Updating all sections of LTCP including engagement
	Collating LTCP into one document
	Completion of Integrated Impact Assessment
Update to Alternative Fuel Strategy following consultation	
March 2023 Transport and Infrastructure Committee (TIC)	Draft LTCP including Alternative Fuel Strategy
April 2023	Update LTCP following TIC including further engagement if needed.
May/June 2023 Transport and Infrastructure Committee (TIC) and Combined Authority Board	Final LTCP for approval – publish (following pre-election period and local elections)

- 2.16 Following receipt of the draft guidance, an assessment of the LTCP against the requirements will have to be made. This will include a mapping exercise that will compare our LTCP with the draft guidance (including a gap analysis and links to further work if required). Government have outlined that if schemes, initiatives, and transport planning tools are not included within the document then future funding opportunities will be limited. It is therefore imperative that this mapping is undertaken alongside an outline of the key schemes and initiatives within the documentation suite.
- 2.17 The outcome of this mapping exercise will be provided to constituent Councils and officers will collaborate on how best to take forward particular elements and requirements to meet any gaps identified. The Transport and Infrastructure Committee will be kept informed as to whether this additional work can be accommodated into the timeline outlined above and within the budget allocated.
- 2.18 The strategic section will be updated with constituent Councils. A detailed Implementation Plan being developed following the agreement of the overarching strategy and align to the budgetary work being undertaken.
- 2.19 Throughout the update process we will be working with constituent Councils to update the

LTCP including the localised sections and overall strategy.

- 2.20 The Carbon Assessment work will enable us to have a better understanding of where emissions are coming from, such that we can tailor interventions more effectively to addressing them and ultimately use modelling to test the impact of different interventions accordingly. The work will also seek to quantify the predicted carbon impact of the LTCP schemes that have already been identified and undertaken a best practice review to inform the type of schemes that it might be necessary to consider in order to plug the gap that remains.
- 2.21 The Cambridgeshire and Peterborough Combined Authority have been in productive discussions with the DfT on both the LTP guidance and QCR. DfT are keen to work with Combined Authority as a pilot with the new guidance and include examples of our work within their guidance.
- 2.22 The Cambridgeshire and Peterborough Combined Authority are planning on putting the LTCP forward for the Chartered Institute of Highways and Transport (CIHT) 2023 Awards - Collaboration Award. Submission for this award opens on the 9th January.

Alternative Fuel Strategy

- 2.23 The Alternative Fuel Strategy was out for consultation for 6 weeks until the 21st December 2022. Following this consultation, the feedback is being analysed and the Strategy will be updated if needed. The next step will be to take the Strategy to the Cambridgeshire and Peterborough Combined Authority Board for sign off planned for March 2022. Following this, the document will become part of the suite of documents to compliment the LTCP.
- 2.24 In parallel, to this work the Electric Vehicle Implementation work is being undertaken on with the aim to access the Local Electric Vehicle Infrastructure (LEVI) funding that should be available in 2023.

Cambridgeshire and Peterborough Digital Policy

- 2.25 Appendix 3 contains the draft Digital Policy for Cambridgeshire and Peterborough. This document is part of the suite of documents to compliment the LTCP. Much has already been achieved in enhancing digital connectivity in Cambridgeshire and Peterborough, in particular the success in making superfast broadband nearly ubiquitously available across the Combined Authority. However, this is a rapidly moving area, driven by exponential improvements in technology. With the ongoing rollouts of new technologies such as full-fibre broadband and 5G mobile infrastructure, it is vital that Cambridgeshire and Peterborough remain at the forefront of digital connectivity in terms of:
- Fixed broadband connectivity;
 - Mobile connectivity;
 - Smart infrastructure; and
 - Digital exploitation, access, and inclusion.
- 2.26 Based on the Cambridgeshire and Peterborough Digital Connectivity Strategy for 2021-2025, the Digital Policy for the Local Transport and Connectivity Plan sets out the following commitments:
- 2.27 In fixed broadband connectivity we will continue to:
- Facilitate industry investment in fixed broadband infrastructure;
 - Work with government to deliver public funded fixed broadband solutions where commercial coverage is not viable; and

- Integrate fibre ducting in transport and other infrastructure schemes and exploit this asset.

2.28 In mobile connectivity we will continue to:

- Identify areas of inadequate mobile coverage/capacity;
- Facilitate mobile infrastructure delivery;
- Enable the use of council assets for hosting mobile infrastructure;
- Explore with operators and with Government the options for minimising adverse impacts of mobile infrastructure on our streetscapes; and
- Support the deployment of innovative mobile technologies and use cases.

2.29 In smart infrastructure we will continue to:

- Support the roll-out of Low Power Wide Area Network (LPWAN) infrastructure for Internet of Things applications;
- Facilitate the sharing of data from IoT applications;
- Support trials and pilots of promising new smart technologies; and
- Support the implementation of proven smart technologies at scale, to improve the sustainability of the transport system.

2.30 In digital exploitation, access, and inclusion we will continue to:

- Raise awareness of digital inclusion opportunities;
- Extend the availability of public access WiFi;
- Work with stakeholders to improve digital connectivity in social housing;
- Work with partners to minimise disruption associated with PSTN switch-off, and the proposed withdrawal of 3G mobile services; and
- Support SMEs' exploitation of digital technology.

3 Significant Implications

3.1 Central government are yet to publish their LTP guidance that was due in September, and this remains a key risk to the programme and budget.

4 Financial Implications

4.1 To support the continued delivery of the LTCP, the Board are requested to approve the allocation of £278,571 to undertake the next stages of the LTCP: £100,000 already allocated as subject to approval and £178,571 of DfT money for the LTP development across two financial years as set out below.

Financial Year	2022-23	2023-24	Total
Budget allocation	£220,000	£58,571	£278,571

5 Legal Implications

5.1 N/A.

6 Public Health Implications

6.1 The report recommendations have a positive implication for public health. One of the

objectives of the LTCP is improved health and well-being enabled through better connectivity, greater access to healthier journeys and lifestyles and delivering stronger, fairer, more resilient communities.

7 Environmental and Climate Change Implications

- 7.1 The report recommendations have a positive implication for the environment and climate change. Both Climate and Environment are objectives of the LTCP including successfully and fairly reducing emissions to net zero by 2050 and protecting and improving our green spaces and improving nature with a well-planned and good quality transport network.

8 Other Significant Implications

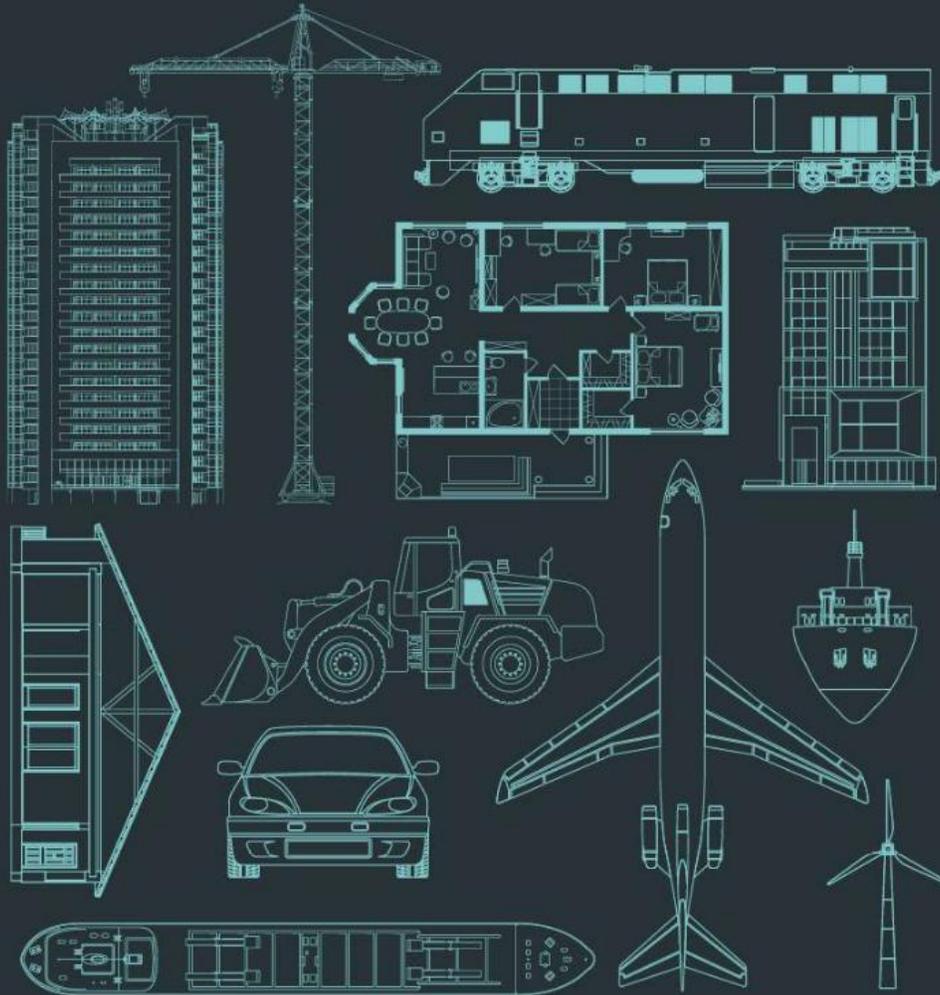
- 8.1 N/A.

9 Appendices

- 9.1 Appendix 1 – Draft LTCP Consultation Report
- 9.2 Appendix 2 – You Said We Did
- 9.3 Appendix 3 – Draft Digital Policy

10 Background Papers

[Combined Authority Board reports 12 January 2022](#)



Consultation Report

Local Transport & Connectivity Plan (LTCP)

Prepared for Cambridgeshire & Peterborough Combined Authority

November 2022

Contents Page

Contents Page	2
Executive Summary	3
1. Introduction.....	5
1.1 The Local Transport & Connectivity Plan	5
1.2 Initial engagement period (November 2021).....	5
2. Summary of Engagement	7
2.1 Formal engagement period	7
2.2 Engagement methods	7
2.3 Awareness raising and social media.....	7
2.4 Newspaper advertisement	7
2.5 Public consultation events	8
2.6 Website	10
2.7 Deposit locations.....	12
2.8 Project email address	13
2.9 Post-paid and 0800 comment facility	13
2.10 Stakeholder engagement.....	14
3. Summary of Respondents	15
3.1 Method of responses	15
3.2 Location of respondents.....	15
3.3 Age ranges of respondents	16
3.4 Gender of respondents	17
3.5 Ethnicity of respondents	18
3.7 Disability of respondents.....	19
4. Summary of Public Feedback	20
4.1 Summary of feedback forms	20
5 Summary of Stakeholder Feedback	58
5.1 Feedback from political & community stakeholders	58
Stakeholder/Organization	59
Feedback Summary	59
Appendices	65

Executive Summary

The Cambridgeshire & Peterborough Combined Authority is engaging with the local community and stakeholders regarding the development of its new Local Transport and Connectivity Plan (LTCP).

In November 2021, an initial 4-week public engagement exercise was held to ask the public and stakeholders what they thought of the main Vision and Goals of the developing LTCP. The public and stakeholders were also asked what they thought our priorities for transport should be, including better public transport, cycling, and walking, pollution and air quality, and protecting the environment. The public could also talk about specific transport issues. A total of 569 feedback forms were submitted during this engagement period. The goal of the exercise was to get early feedback to better inform the development of the full draft LTCP.

Key findings from this initial engagement period included the following:

- 97% of the public understanding why a new vision for transport was needed.
- 57% of the public either strongly agreeing or mostly agreeing that the updated vision is the right future for transport in the region.
- Bus routes and frequency were the highest priority in Cambridgeshire and Peterborough, except for Cambridge, where reducing congestion in the city was the priority.
- More ambitious carbon net zero targets, more transport infrastructure and affordability were other top priorities.

In May 2022, a 12-week public consultation was launched to allow members of the public and stakeholders to comment on the draft LTCP. The public consultation ran from Thursday 12th May until Thursday 4th August 2022.

The aim was to test the draft LTCP with the public and a variety of stakeholders from across the region, and to generate good quality feedback, from a range of perspectives, which could be used to improve the final LTCP. The consultation was promoted widely including through media, social media, advertising, and by asking stakeholders to share information with their own networks.

The public and stakeholders could give feedback on the draft LTCP via a range of channels. A website, freephone information line and dedicated email address were available throughout the public consultation to receive further details and to provide comments.

The public could also attend any of the 14 in-person consultation events held at venues across Cambridgeshire and Peterborough. These events were advertised in local newspapers and via social media and provided an opportunity for the public to meet members of the LTCP team and ask questions. Printed copies of the consultation brochure and feedback forms were available at six deposit locations across the region and were available throughout the consultation on request.

Complementing this public consultation, extensive engagement was carried out with local businesses, health and educational organisations, campaign groups, and charities, to raise awareness of the LTCP and to understand views towards it. Efforts were also made to identify those who could support the LTCP and those who could share information on the consultation through their networks.

Engagement took the form of written communications, telephone conversations, one-to-one briefings, group briefings and attendance at regular stakeholder meetings.

During the 12-week public consultation, **928** responses were received via a range of channels. Taken together with the 4-week engagement period in November 2021, **1,497** responses to the draft LTCP have been submitted.

During the 12-week public consultation, the feedback form provided the opportunity for respondents to comment on the Vision, Goals and Objectives of the draft LTCP, in which the following feedback was received:

- **92%** understood why the Combined Authority are making a new LTCP.

- **65%** either strongly agreed or agreed with the proposed LTCP vision.
- When asked about the proposed LTCP goals, **51%** strongly agreed with climate, followed by **50%** for the environment, and **49%** who strongly agreed that improved health outcomes should be a key goal.
- When asked about the proposed LTCP objectives, **54%** strongly agreed that this should include improvements to air quality. This was followed by **53%** who strongly agreed with climate change, followed by **52%** who strongly agreed with improved accessibility.
- When asked about whether there were any further comments on the LTCP's vision, goals, and objectives, more ambitious net zero targets was the prevailing comment. This was followed by improved rural connectivity for transport services, with additional information needed about the emerging LTCP.
- **56%** either strongly agreed or agreed with the proposed strategy for transport in Cambridgeshire and Peterborough, with improved cycling and pedestrian links and the creation of new bus routes the prevailing comments.
- **66%** either strongly agreed or agreed with the proposal to cut the number of miles driven on roads by 15%. The prevailing comment was that this target should look to be even more ambitious.

Respondents were also given the opportunity to comment on the Local Area Strategies for their area. The following feedback was received:

- **40%** of responses for East Cambridgeshire either strongly agreed or agreed with the proposed local area strategy. The top three issues mentioned were about providing improved cycling and pedestrian links, followed by improved rural connectivity, as well as the provision of new train stations and lines.
- **38%** of responses either strongly agreed or agreed with the proposed local area strategy for Fenland. The key recurring comments here concerned improving rural connectivity, improvements needed to overall transport infrastructure as well as the need for new train stations and lines.
- **48%** of responses for Greater Cambridge either strongly agreed or agreed with the proposed local area strategy. Key themes here included new train stations and lines, followed by improved cycling and pedestrian links, as well as the need to improve rural connectivity.
- **40%** of responses for Huntingdonshire either strongly agreed or agreed with the proposed strategy, with improved cycling and pedestrian links, the provision of new bus routes and the need to improve service frequency, the key themes mentioned.
- **38%** of responses for Peterborough either strongly agreed or agreed with the area strategy. Improving cycling and pedestrian links, followed by new train stations and lines, and the need to improve service frequency, the top issues cited.

Respondents were also given the opportunity to provide more general comments relating to transport and/or the draft LTCP. The key themes and issues were as follows:

- The need for improved cycling and pedestrian links.
- The need to reduce car usage.
- The need to improve the frequency of transport services.
- The need to improve rural transport services.
- The need for new train stations and lines in specific locations.
- Suggestions for new bus routes in specific locations.

Where feedback was received that was of a more technical nature, this was passed onto the relevant member of the project team to respond. The project team has carefully reviewed all the feedback received to date, and this will be used to help shape the final LTCP.

1. Introduction

1.1 The Local Transport & Connectivity Plan

- 1.1.1 The Cambridgeshire & Peterborough Combined Authority (the Combined Authority) is required by law to make and maintain a Local Transport Plan for the region.
- 1.1.2 The current Local Transport Plan was adopted in January 2020. Since then, significant changes have taken place, which have subsequently meant it is now in need of an overhaul.
- 1.1.3 The Local Transport and Connectivity Plan (LTCP) is the Combined Authority's long-term strategy to improve transport in Cambridgeshire and Peterborough. It is therefore essential that a new plan is in place that seeks to ensure transport is made better, faster, safer and more reliable.
- 1.1.4 The Combined Authority has incorporated the word 'connectivity' in the name of the plan, due to how the internet has changed the way people travel. For example, many more people work or learn from home. There is more online shopping, and more leisure and entertainment is now offered digitally, resulting in fewer journeys. Others use their phones and other devices to buy tickets and check travel information on the go.
- 1.1.5 To provide people with an early opportunity to have their say about transport within the region, the Combined Authority conducted a public engagement exercise in November 2021, to ensure that early feedback received is used to help shape the plan ahead of the public consultation.
- 1.1.6 This document summarises the feedback received from the 12-week public engagement exercise held from the Thursday 12th May until Thursday 4th August 2022.
- 1.1.7 In order to assist with the public engagement, the Combined Authority appointed BECG, a specialist communications consultancy, to form part of its wider project team for the development of the LTCP. The Combined Authority also appointed Infrastructure Matters (IM), a bespoke consultancy, to assist with the engagement of a range of institutions, organisations other groups across the region with the aim of generating a variety of feedback.
- 1.1.8 All feedback received is accounted for and represented within this document.

1.2 Initial engagement period (November 2021)

- 1.2.1 In November 2021, an initial 4-week public engagement exercise was held to ask the public and stakeholders what they thought of the main Vision and Goals of the developing LTCP. The public and stakeholders were also asked what they thought our priorities for transport were, including better public transport, cycling, and walking, pollution and air quality, and protecting the environment. The public could also talk about specific transport issues.
- 1.2.2 A total of 569 feedback form were submitted during this consultation period.
- 1.2.3 Key findings from this initial engagement period included the following:
 - 97% of the public understood why a new vision for transport was needed.
 - 57% of the public either strongly agreed or mostly agreed that the updated vision is the right future for transport in the region.
 - Bus routes and frequency were the highest priority in Cambridgeshire and Peterborough, except for Cambridge, where reducing congestion in the city was the priority.

- More ambitious carbon net zero targets, more transport infrastructure and affordability were other top priorities.

- 1.1.1 Members of the public were able to provide their feedback, about their priorities for the LTCP.
- 1.1.2 The project team also organised an LTCP Stakeholder Briefing with the Mayor and a range of stakeholders in the region to highlight the early key objectives and vision of the LTCP and to get their feedback on proposals to help inform the full draft document.
- 1.1.3 All feedback submitted as part of this engagement will continue to be considered in the development of the LTCP.

2. Summary of Engagement

2.1 Formal engagement period

2.1.1 Following the initial engagement period described above, a 12-week public consultation was undertaken between May and August 2022, as described in the following sections.

2.2 Engagement methods

2.2.1 Respondents were able to provide their feedback through a number of different channels. A dedicated LTCP public engagement website was established (www.yourltcp.co.uk), which included an online feedback form.

2.2.2 A hard-copy brochure containing all of the information on the website, alongside a hard-copy feedback form, was also available on request via the post, and at the deposit locations listed in Section 2.7.

2.2.3 Stakeholders and members of the public could also provide feedback or ask questions via a dedicated project email address (contact@your-ltcp.co.uk).

2.2.4 A freephone information line (0808 258 3225) was also in operation Monday-Friday, 9am-5:30pm for individuals to discuss the available information, request hard copies of materials and provide their feedback.

2.3 Awareness raising and social media

2.3.1 During the initial four-week consultation period, a social media campaign was run to provide insight into the efficacy of various methods, to ensure we take account of what worked and what didn't for the upcoming consultation period.

2.3.2 Insights from this initial period enable us to launch a successful social media and digital advertising campaign, designed to invite users to take part in the survey and attend the in-person events, presenting adverts to a variety of audience via a targeted campaign.

2.3.3 The messages were designed to invite users via presenting local visuals and contextually relevant adverts, as well as using issue led adverts to provoke a response.

2.3.4 The consultation was also advertised throughout the Combined Authority area at 800 real time bus stop displays.

2.3.5 Several press releases were issued before and during the consultation period to inform more people about the consultation and the various ways to take part. Hundreds of people also signed up to a mailing list from November 2021 onwards, to be kept informed of the development of the LTCP. They were contacted to invite them to take part in the consultation.

2.4 Newspaper advertisement

2.4.1 The Combined Authority issued two runs of newspaper advertisements in May and June to publicise the public consultation.

2.4.2 Newspaper adverts in local newspapers were considered by the Combined Authority an accessible method of reaching people outside of the social media campaigns, including those who did not use the internet.

2.4.3 The adverts appeared in the following publications:

- Hunts Post
- Ely Standard
- Peterborough Telegraph
- Cambridge Independent
- Cambs Times
- Wisbech Standard
- Fenland Citizen

HAVE YOUR SAY ON OUR TRANSPORT FUTURE

Cambridgeshire & Peterborough Local Transport and Connectivity Plan




The Combined Authority is developing a plan for better transport in Cambridgeshire and Peterborough.

The Local Transport and Connectivity Plan (LTCP) will shape the future of transport in our region.

To gather feedback on the draft plan, we are hosting a public consultation from 12 May to 4 August 2022. It's easy to take part and your views will help shape the final LTCP.

HAVE YOUR SAY

You can have your say on the draft LTCP at yourltcp.co.uk or by attending one of the consultation events listed below.

You can request a copy of the consultation materials by calling 0808 258 3225.

WHAT IS THE LTCP?

The LTCP is the Combined Authority's long-term strategy to improve transport in the region.

The plan will make our transport better, faster and more reliable. It will address the big issues like climate change, pollution, inequality and public health.

CONSULTATION EVENTS

Venue & Address	Date	Time
March Community Centre, 34 Station Road, March PE15 8LE	Friday 20 May 2022	14.00 – 18.00
Priory Centre, Priory Lane, Saint Neots PE19 2BH	Tuesday 24 May 2022	12.00 – 18.00
Lion Yard Shopping Centre, St Tibbs Row, Cambridge CB2 3ET	Wednesday 25 May 2022	11.00 – 17.00
St John the Baptist Church, Church Street, Cathedral Square, Peterborough PE1 1XB	Tuesday 31 May 2022	14.00 – 19.00
Ramsey Community Centre, 14-16 Stocking Fen Road, Ramsey, PE26 2UR	Wednesday 1 June 2022	14.00 – 19.00
Queen Mary Centre, Queens Road, Wisbech PE13 2PE	Tuesday 14 June 2022	15.00 – 19.00
The Lighthouse Centre, 13 Lynn Road, Ely, CB7 4EG	Thursday 23 June 2022	12.00 – 17.00
Camboorne Church Centre, Jeavons Lane, Great Camboorne CB23 6AF	Saturday 25 June 2022	14.00 – 18.00
Queensgate Shopping Centre, Long Causeway, Peterborough PE1 1NT	Saturday 2 July 2022	10.00 – 15.00
Huntingdon Town Hall, 53 High Street, Huntingdon PE29 3AQ	Tuesday 5 July 2022	14.00 – 19.00
The Grafton Centre, 6 Grafton Centre, Cambridge CB1 1PS	Wednesday 6 July 2022	12.00 – 18.00
Spicers Pavilion, Spicers Sports Field, Cambridge Road, Sawston, Cambridge CB22 3DG	Thursday 14 July 2022	14.00 – 18.00
St. Andrew's Church, Fountain Lane, Soham, Ely CB7 5ED	Friday 15 July 2022	14.00 – 18.00

ANY QUESTIONS?

You can contact us via: Website yourltcp.co.uk Email contact@yourltcp.co.uk or call 0808 258 3225. Post **YOUR LTCP** (no stamp required)

An example of a newspaper advert

2.5 Public consultation events

2.5.1 To provide an opportunity for the public to ask question for members of the project team in person, discuss any concerns / feedback and collect consultation materials, the Combined Authority arranged 14 public consultations, in a variety of districts and a one-off pop-up event in the Serpentine Green Shopping Centre. The following locations were used:

Venue & Address	Date	Time
March Community Centre, 34 Station Road, March PE15 8LE	Friday 20 May 2022	14.00 – 18.00
Priory Centre, Priory Lane, St Neots PE19 2BH	Tuesday 24 May 2022	12.00 – 18.00
Lion Yard Shopping Centre, St Tibbs Row, Cambridge CB2 3ET	Wednesday 25 May 2022	11.00 – 17.00
St John the Baptist Church, Church Street, Cathedral Square, Peterborough PE1 1XB	Tuesday 31 May 2022	14.30 – 19.00
Ramsey Community Centre, 14-18 Stocking Fen Road, Ramsey PE26 2UR	Wednesday 1 June 2022	14.00 – 19.00
Queen Mary Centre, Queens Road, Wisbech PE13 2PE	Tuesday 14 June 2022	15.00 – 19.00
The Lighthouse Centre, 13 Lynn Road, Ely CB7 4EG	Thursday 23 June 2022	12.00 – 17.00
Cambourne Church Centre, Jeavons Lane, Great Cambourne CB23 6AF	Saturday 25 June 2022	14.00 – 18.00
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Spicers Pavilion, Spicers Sports Field, Cambridge Road, Sawston, CB22 3DG	Thursday 14 July 2022	14.00 – 19.00
St. Andrew's Church, Fountain Lane, Soham, Ely CB7 5ED	Friday 15 July 2022	14.00 – 18.00
Serpentine Green Shopping, Hargate Way, Peterborough PE7 8BE	Friday 29 th July 2022	11.00-15.00

2.5.2 The public consultation events were well attended with approximately 400 members of the public spread across all 14 events.



St. Andrew's Church, Soham



The Lion Yard, Cambridge

2.5.3 Members of the project team were on hand to assist members of the public with any queries or feedback. Copies of the engagement brochure, feedback form and pre-paid envelopes were made available at each of these events, for members of the public to gain further information, and to provide feedback.

2.6 Website

2.6.1 A dedicated website provided further information about the LTCP and detailed how the community could have their say about transport within the region. The website is hosted at: www.yourltcp.co.uk



The homepage of the LTCP website

2.6.2 The website includes information on:

- What is the LTCP?
- Our vision and priorities
- About the Combined Authority
- FAQs
- Contact Us
- Have Your Say

2.6.3 The website was viewed by approximately **10,913 individuals** and feedback provided by **826 respondents** during the consultation period.

2.7 Deposit locations

2.7.1 To ensure the public engagement exercise was accessible to all members of the community, the Combined Authority displayed the engagement materials in six deposit locations, in each of the six districts of the Combined Authority. The following locations were used:

Deposit Location	Address	Opening Hours
Peterborough Central Library	Broadway, Peterborough PE1 1RX	Mon – Fri: 10.00 - 17.00 Sat: 9.00 – 15.00 Sun: Closed
Aldi Huntingdon	4 Edison Bell Way, Huntingdon PE29 3HG	Mon – Sat: 8.00 – 22.00 Sun: 10.00 – 16.00
Co-op Sawston	29-31 High Street, Sawston, Cambridge, CB22 3BG	Mon – Sat: 7.00 – 22.00
Cambridge Central Library	7 Lion Yard, Cambridge, CB2 3QD	Mon – Fri: 9.30 – 18.00 Sat: 10.00 – 18.00 Sun: 12.00 – 16.00
Ely Library	6 The Cloisters, Ely CB7 4ZH	Mon: 9.30 – 13.00 Tues, Wed, Fri: 9.30-17.00 Thurs: 9.30-19.00 Sat: 9.30 – 16.00 Sun: Closed
Wisbech Library	Ely Place, Wisbech, PE13 1EU	Mon: 9.30 – 13.00 Tues: 9.30 – 19.00 Wed – Fri: 9.30 – 17.00 Sat: 9.30 – 16.00 Sun: Closed



Co-op Sawston



Wisbech Library



Peterborough Central Library



Aldi – Huntingdon

2.7.2 Copies of the engagement brochure, feedback form and pre-paid envelopes were made available at each of these locations, for members of the public to gain further information, and to provide feedback.

2.7.3 The project team regularly liaised with each deposit location and arranged for materials to be replenished where necessary. During the consultation period, popular locations such as the Cambridge Central Library were replenished during the engagement period.

2.8 Project email address

2.8.1 A specific project email address was set up to receive feedback and answer any queries both during and after the engagement period. The email address was: contact@yourltcp.co.uk

2.9 Post-paid and 0800 comment facility

2.9.1 During and after the public engagement, access to a freephone telephone information line was offered to those who wished to find out more about the proposals, or to register their comments via the telephone.

2.9.2 The telephone number used (**0808 258 3225**) was in operation Monday – Friday between the hours of 9.00am and 5.30pm.

2.9.3 Information was given to callers where possible, and if questions were of a technical nature, these were passed on to project team members.

2.9.4 A freepost address was set up, 'Your LTCP,' alongside paper copies of the brochure and feedback form, which were available upon request.

2.10 Stakeholder engagement

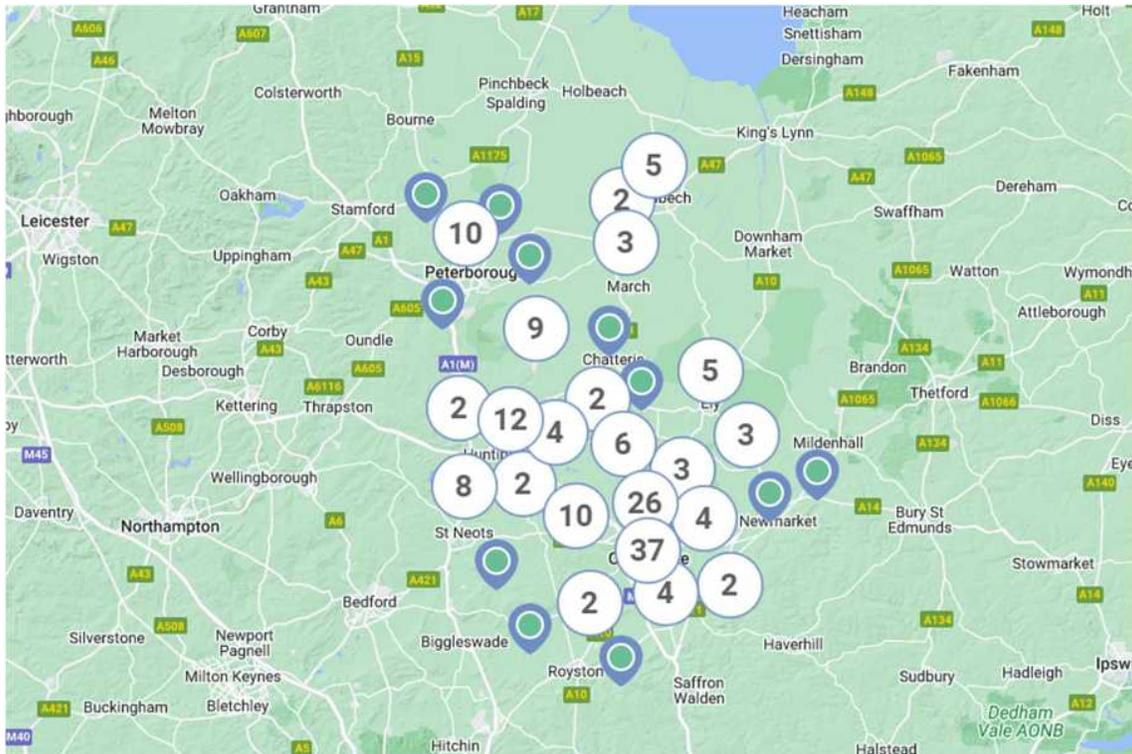
- 2.10.1 During the 12-week public consultation, the LTCP team directly engaged **over 90** stakeholders from across the region (and indirectly many more – through established stakeholder networks), focusing on rural areas as well as more urban centres. These stakeholders were a mix of organisations, including local businesses (SMEs and large corporate firms), educational institutions (schools, colleges, and universities), healthcare institutions, campaign and representative groups, and charities.
- 2.10.2 The LTCP team also had **10** separate one-to-one briefings with individual organisations, carefully selected to ensure that the region's diverse range of organisations located in rural and urban areas referenced above were represented. These 30-minute briefings gave the LTCP team a chance to give each stakeholder a detailed overview of the draft LTCP and allowed them to ask questions.
- 2.10.3 In July, the LTCP team arranged two virtual business briefings to provide organisations with a detailed overview of the draft LTCP and included a dedicated Q&A session at the end for questions. Nearly **40** organisations from across Cambridgeshire & Peterborough attended, representing sectors including secondary and higher education, healthcare, life sciences, agriculture, construction, and representative and campaign groups.
- 2.10.4 The LTCP team also attended several pre-scheduled meetings with representative bodies across business, transport and healthcare to amplify the consultation message amongst a wider set of organisations.
- 2.10.5 During the consultation period, stakeholders commented on the draft LTCP. Some of the key themes and questions were as follows:
- How will transport projects get prioritised in the final LTCP?
 - The current public transport provision and link to the region's ability to attract talent.
 - Inclusion of education & skills is essential within the final LTCP.
 - Bus service improvements are required.
 - LTCP and link to funding.
 - Has freight, logistics, and last mile deliveries been fully considered in the LTCP?
 - The need for an even greater emphasis on active travel.
 - Combined Authority and net zero carbon?
 - Expanded digital capabilities are needed to enhance the region's competitiveness.
 - The final LTCP should be more explicitly linked to boosting the region's economic growth and productivity.
 - Expanding electric vehicle charging provision is needed to reduce the region's carbon emissions.
- 2.10.6 By 4th August, the LTCP team had received written submissions from **48** organisations, providing an important representation of the views from organisations within Cambridgeshire & Peterborough.

3. Summary of Respondents

3.1 Method of responses

- 3.1.1 During the consultation period, the vast majority of respondents chose to respond via the online feedback form, with 826 of the 928 total responses being submitted this way, while the remainder were either posted or scanned and emailed to the project email address.

3.2 Location of respondents

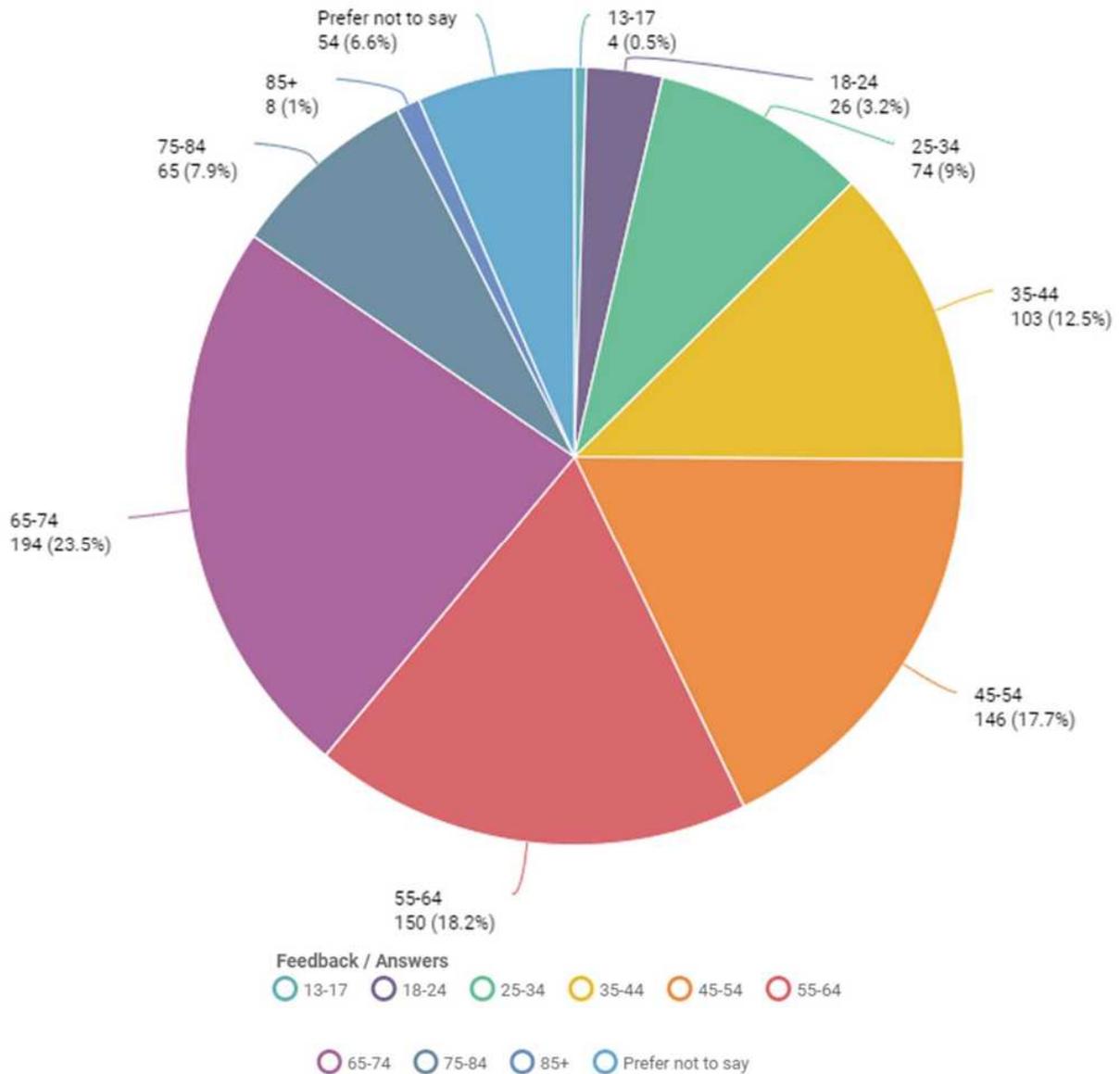


An illustrative map depicting the location of respondents

- 3.2.1 As shown 180 respondents provided us with their location. Of these, there is a good range of responses from across the region, despite the fact that the majority of responses have been provided by those living in Cambridge, Peterborough, and Huntingdonshire. This also included 4 responses from London.
- 3.2.2 Outside of the larger urban areas Ramsey had the highest proportion of feedback submissions, highlighting an enhanced level of awareness in this town. This is consistent with the initial, four-week consultation period.

3.3 Age ranges of respondents

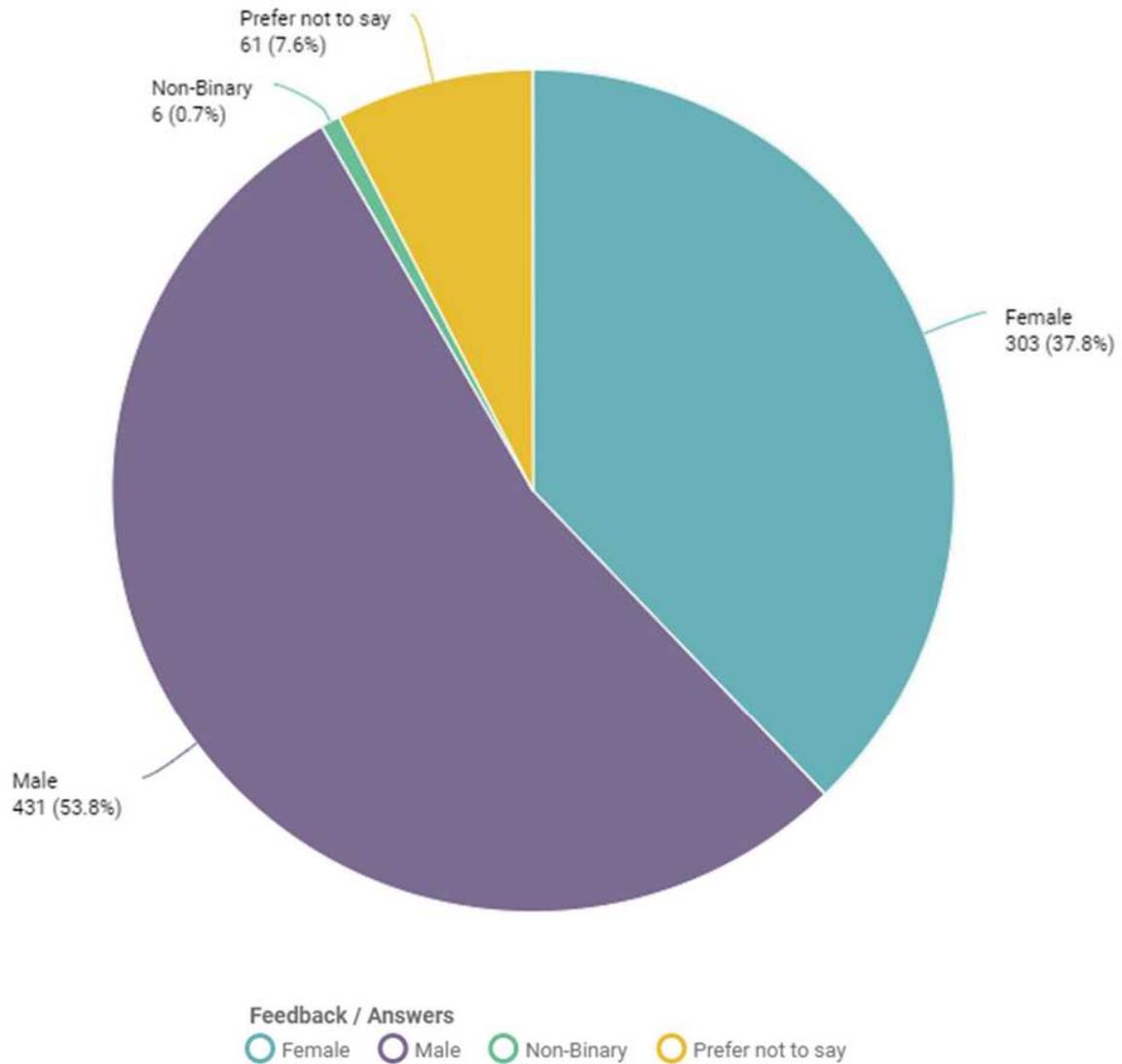
- 3.3.1 824 respondents provided their age group. Of these, the 65-74 age group have been the most likely to provide feedback at 23.5%. This was followed by the 55-64 age group (18.2%), and the 45-54 age group (17.7%).
- 3.3.2 This remains broadly consistent with the consultation conducted in 2021 and highlights that those who responded to this consultation tend to older age groups.
- 3.3.3 Efforts were made by the Combined Authority to improve the age balance in respondents through a targeted social media campaign.



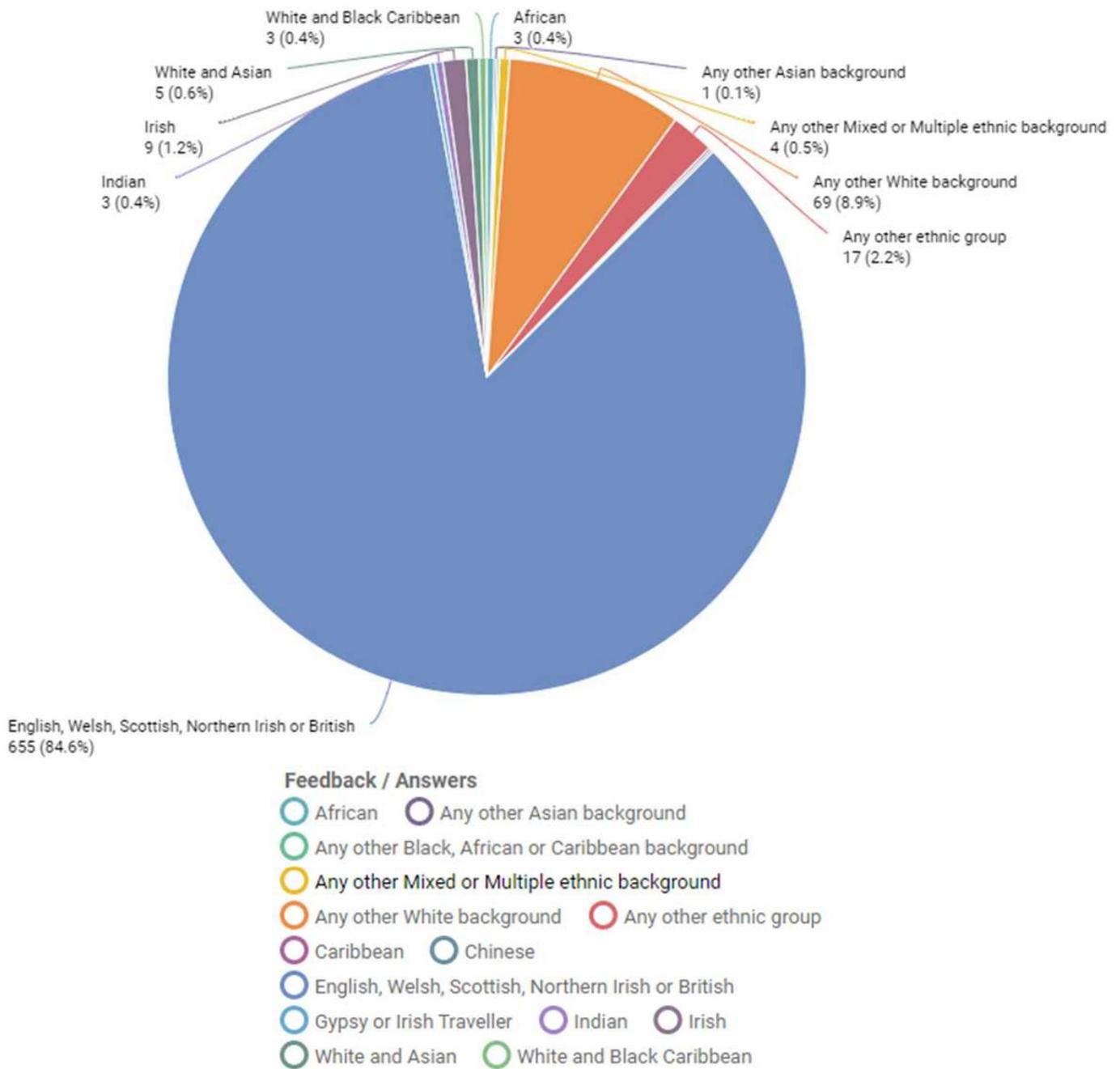
3.4 Gender of respondents

3.4.1 801 respondents provided an answer as to their sex. 53.8% of forms have been submitted by males, with 37.8% by females, whilst 7.6% preferred not to disclose their gender identity, with 0.7% identifying as non-binary. There was a significantly larger proportion of male respondents when compared with female respondents.

3.4.2 Once again, these sex proportions remain consistent with the previous consultation period.

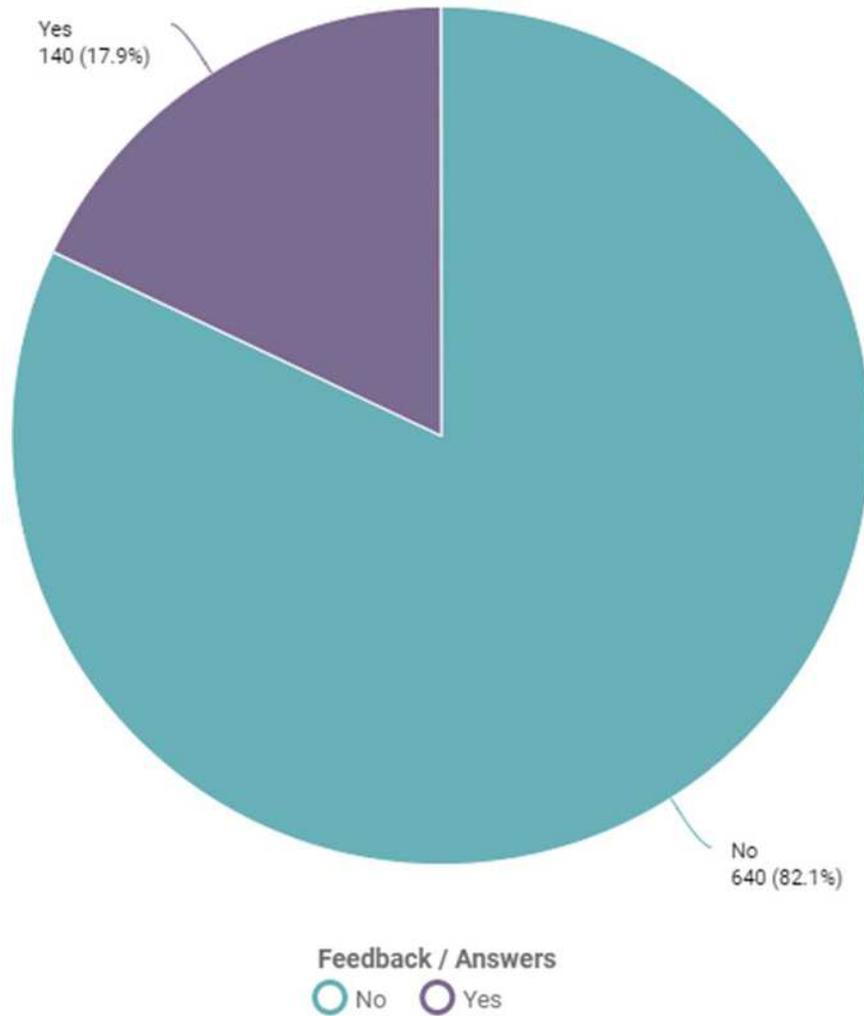


3.5 Ethnicity of respondents



3.6 The majority of respondents have been from British backgrounds (84.6%), with a further 8.9% from other White backgrounds. The remaining responses (totalling 6.5%) have been provided by a mix of those from Indian, White, and Asian, White and Black Caribbean, African, Irish and any other ethnic background.

3.7 Disability of respondents



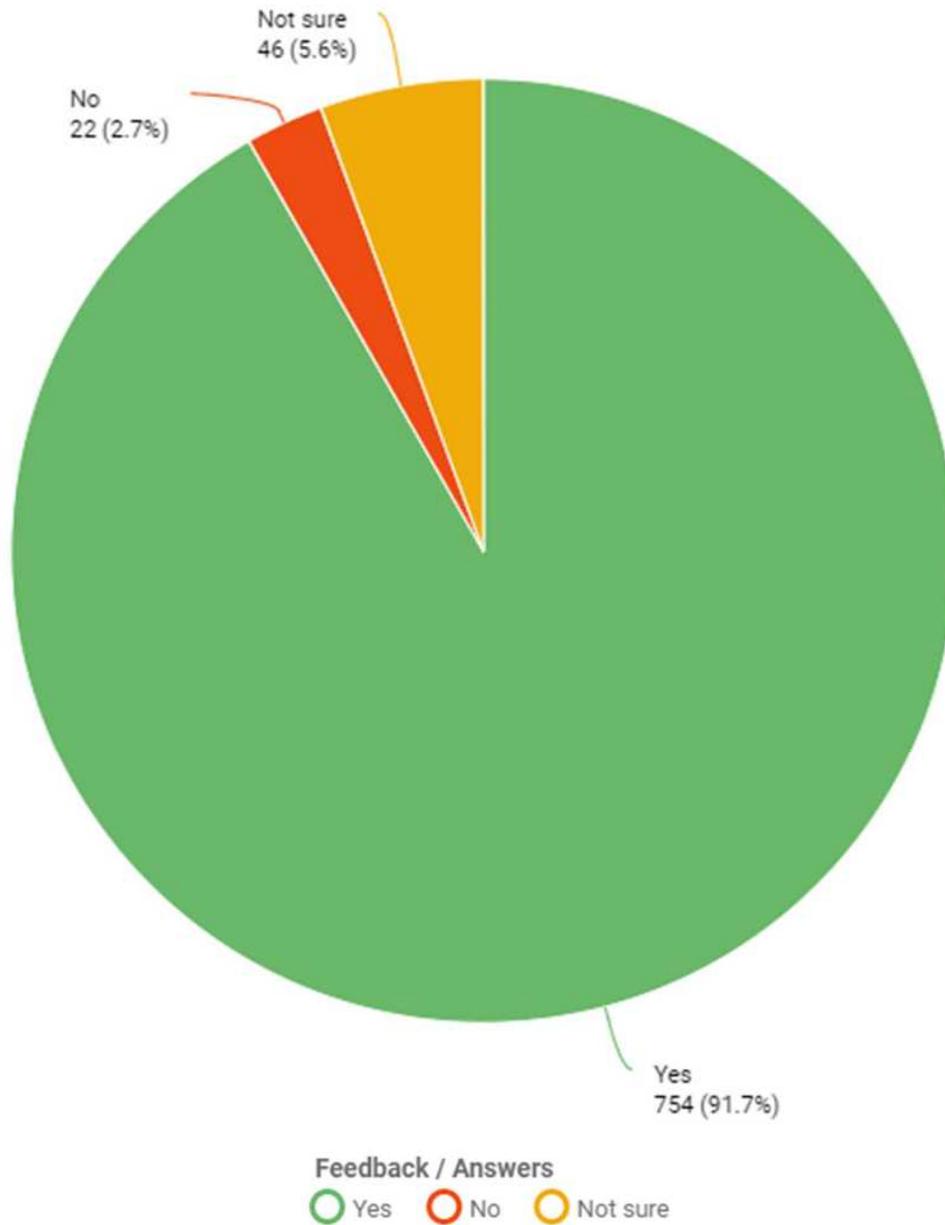
3.7.1 Overall, 140 respondents (17.9%) have identified as having a disability, with the remaining 82.1% noting that they do not have a disability.

4. Summary of Public Feedback

4.1 Summary of feedback forms

- 4.1.1 The following analysis covers the data and responses received up to (and including) Thursday 4th August 2022.
- 4.1.2 A total of 826 feedback forms were received by the online deadline of Thursday 4th August 2022, and the postal deadline of Monday 8th August 2022.
- 4.1.3 Responses were recorded for each of the nine questions asked, and the data is presented within this report along with the issues that were raised by respondents.

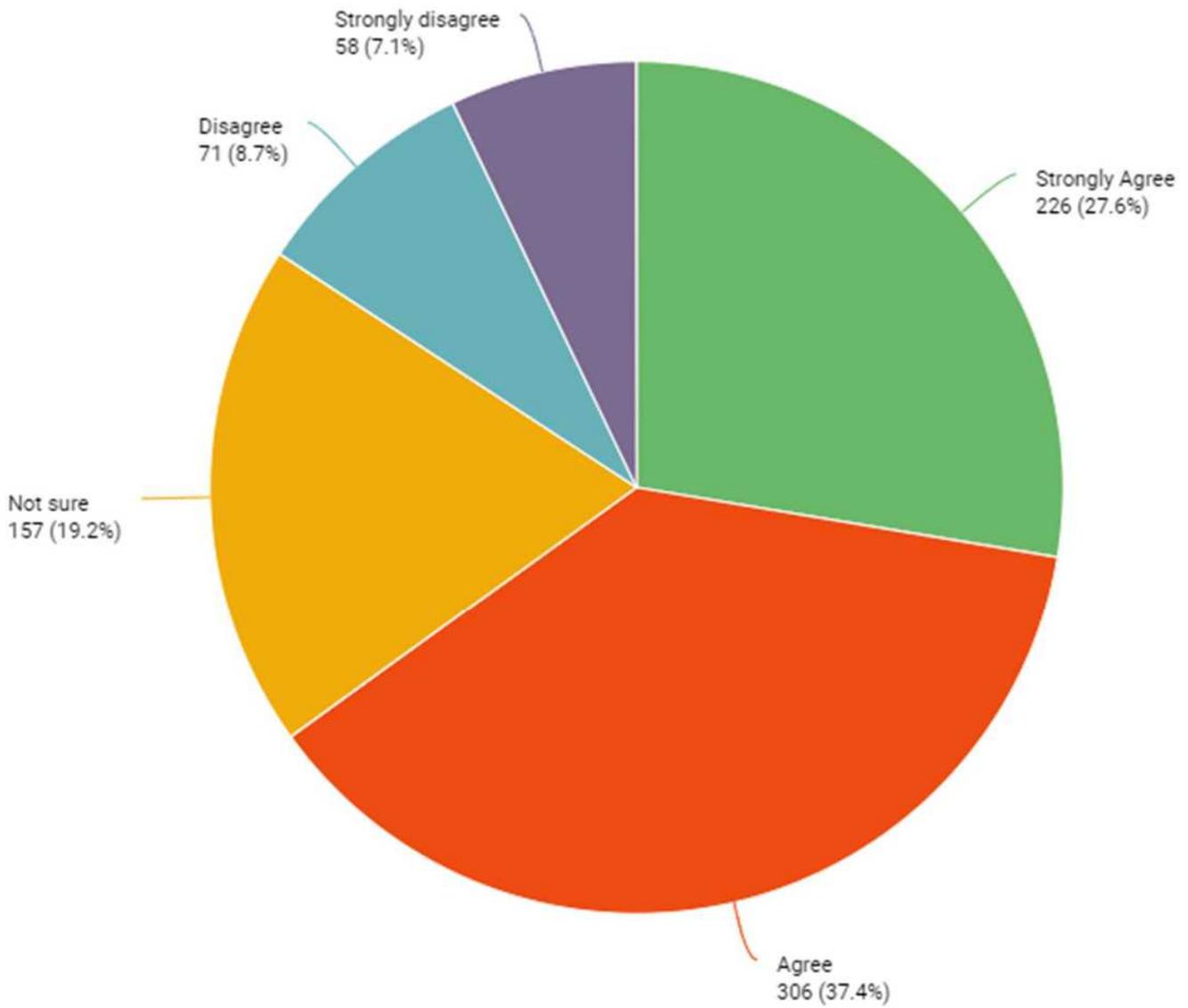
Q1: Do you understand why we are making a new Local Transport and Connectivity Plan (LTCP)?



4.1.4 Overall, 754 feedback forms (91.7%) answered 'Yes' to the first question, confirming that they understood why the Combined Authority is producing an updated Local Transport and Connectivity Plan.

4.1.5 22 responses (2.7%) answered 'No' to this question. This first question did not ask respondents to provide further comments. An additional 46 (5.6%) answered 'Not Sure' to this question, with a further four responses that did not provide an answer.

Q2: To what extent do you agree with the proposed LTCP vision?



Feedback / Answers

Strongly Agree Agree Not sure

Disagree Strongly disagree

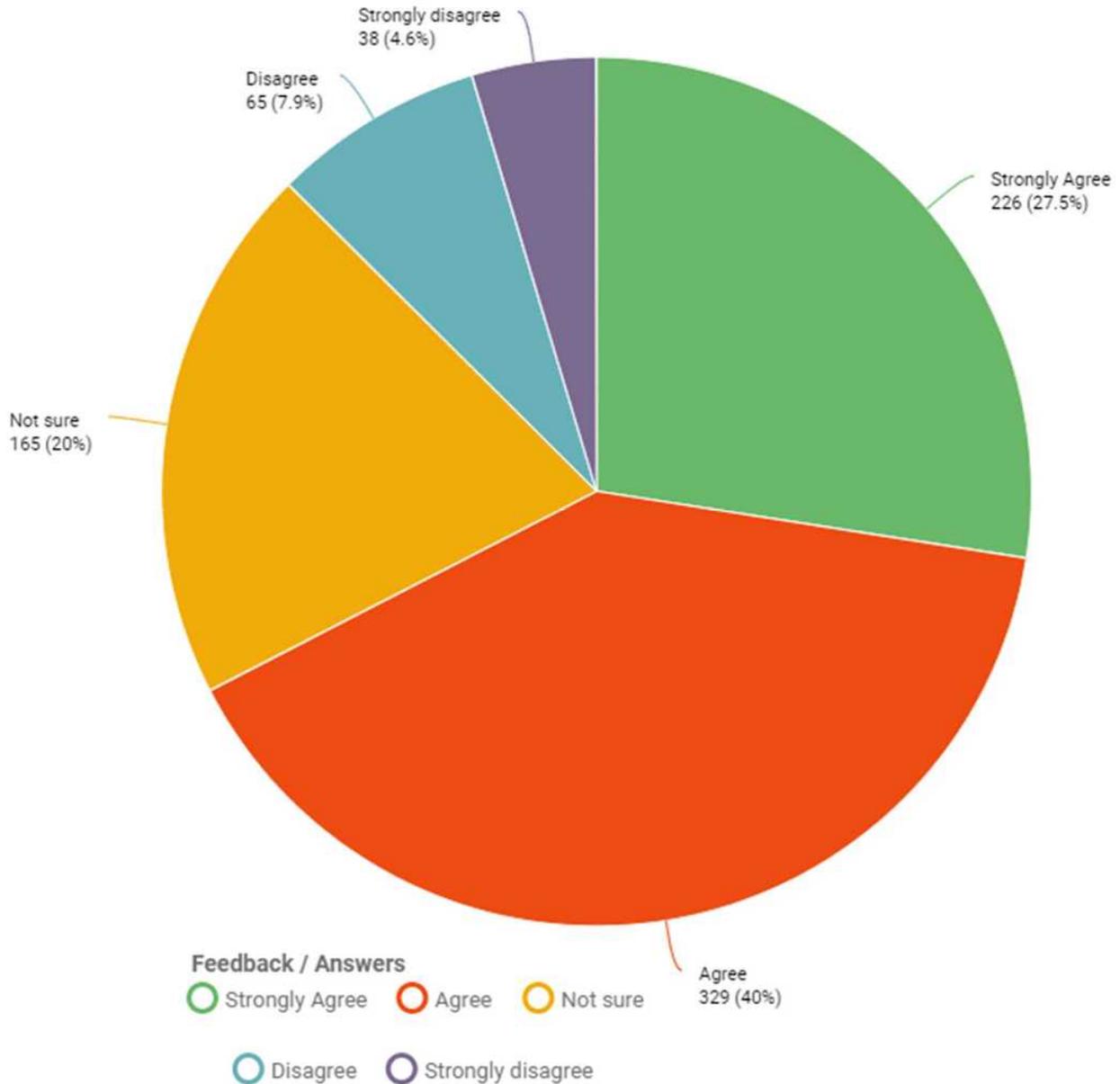
4.1.6 Of the responses received with the vision set out by the Combined Authority.

4.1.7 7.1% of responses strongly disagreed with the vision laid out by the Combined Authority, with a further 8.7% who selected disagree. A further 19.2% of responses selected that they were not sure.

Q3: To what extent do you agree with the proposed LTCP goals?

4.1.8 This question asked respondents to select whether they agreed with the six LTCP goals. Therefore, each goal is analysed in turn.

Goal 1 – Productivity

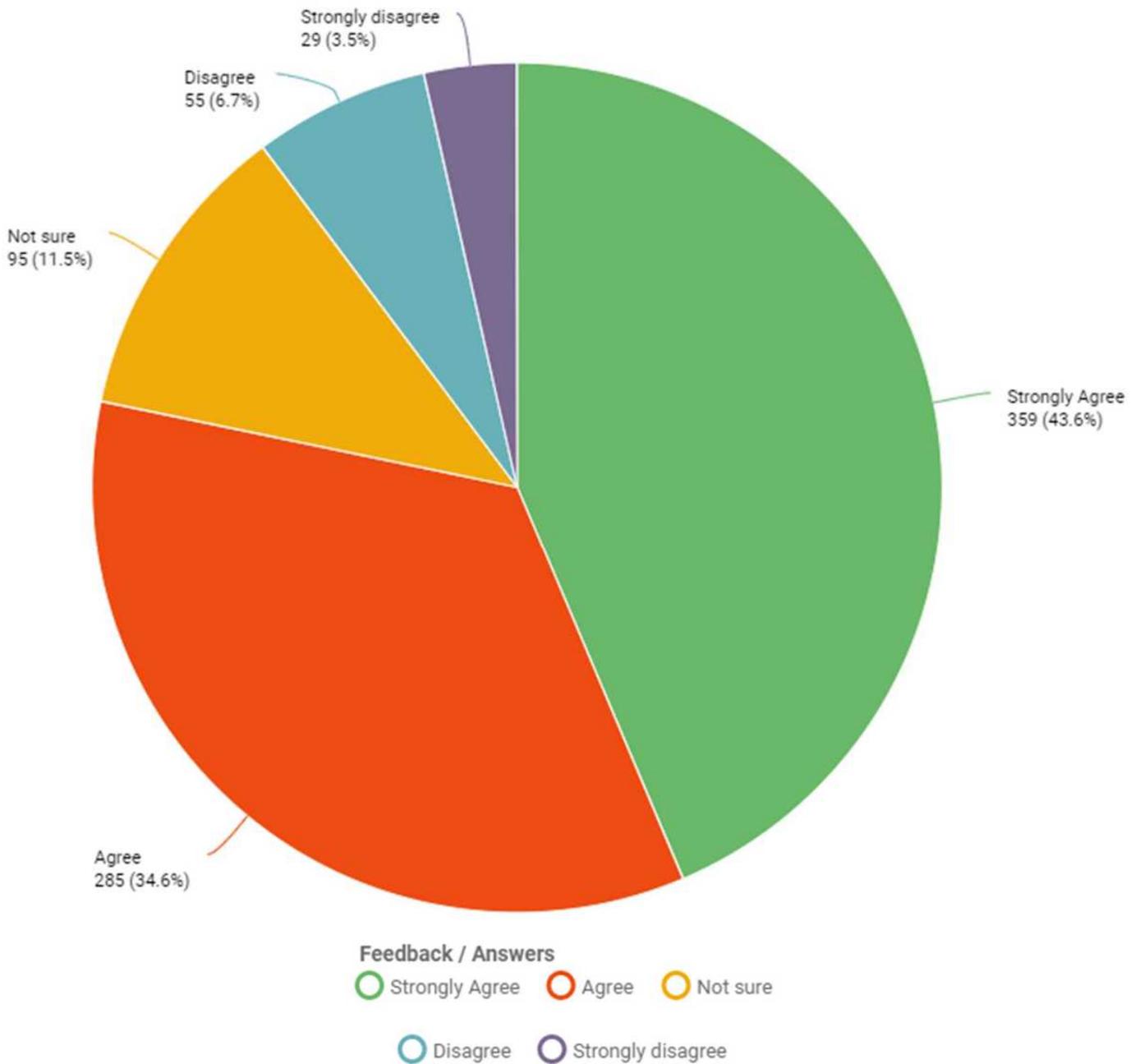


4.1.9 A total of 823 feedback submissions provided an answer, when asked to what extent they agreed that productivity should be a goal within the LTCP.

4.1.10 67% of responses either strongly agreed or agreed that productivity should be included as a goal within the LTCP.

4.1.11 A further 7.9% selected disagree, with 4.6% of responses who strongly disagreed. 20% of responses were unsure.

Goal 2 – Connectivity

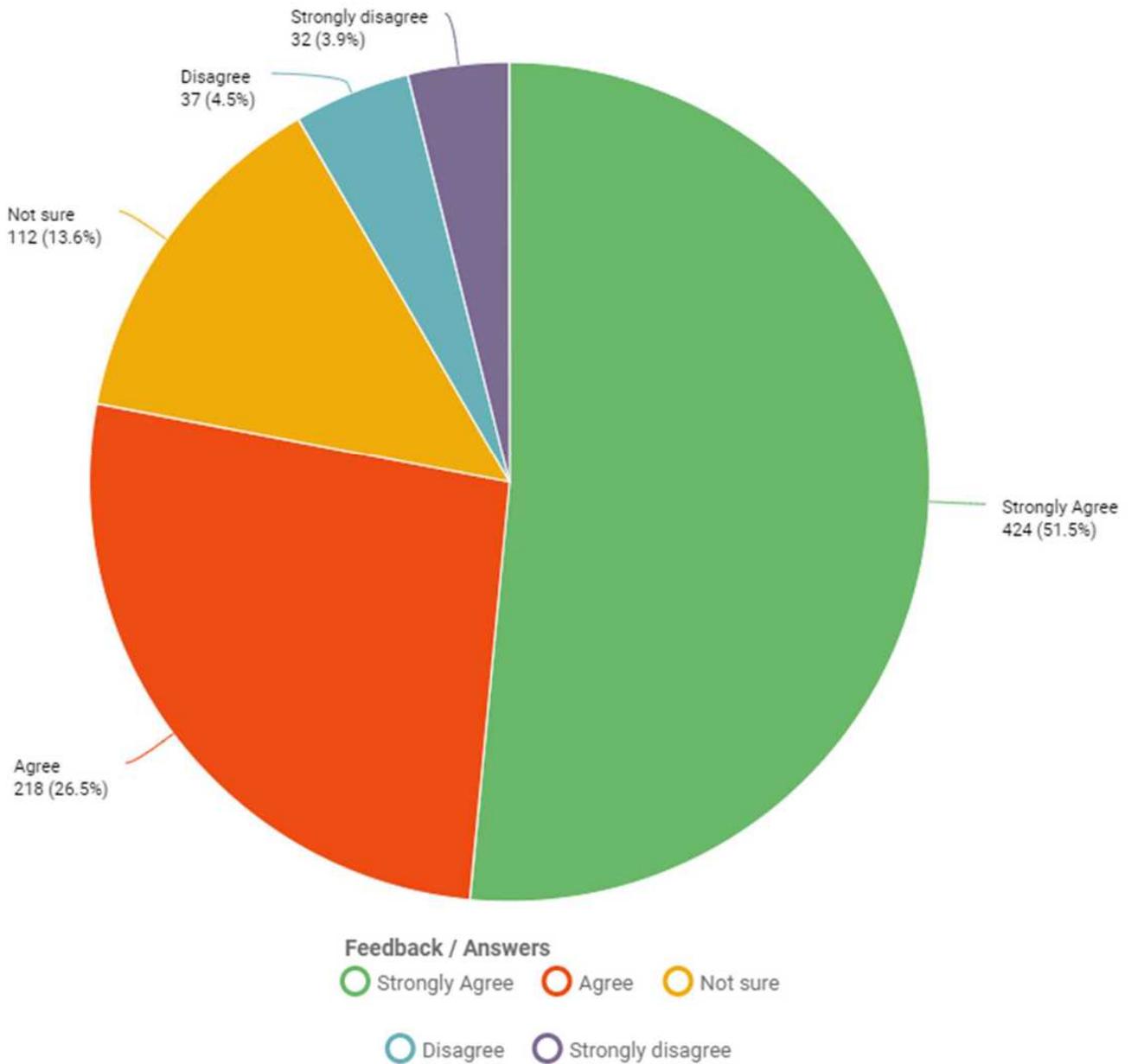


4.1.12 A total of 823 feedback submissions provided an answer, when asked to what extent they agreed that connectivity should be a goal within the LTCP.

4.1.13 78.2% of responses either strongly agreed or agreed that connectivity should be included as a goal within the LTCP.

4.1.14 A further 6.7% selected disagree, with 3.5% of responses who strongly disagreed. 11.5% of responses were unsure.

Goal 3 – Climate

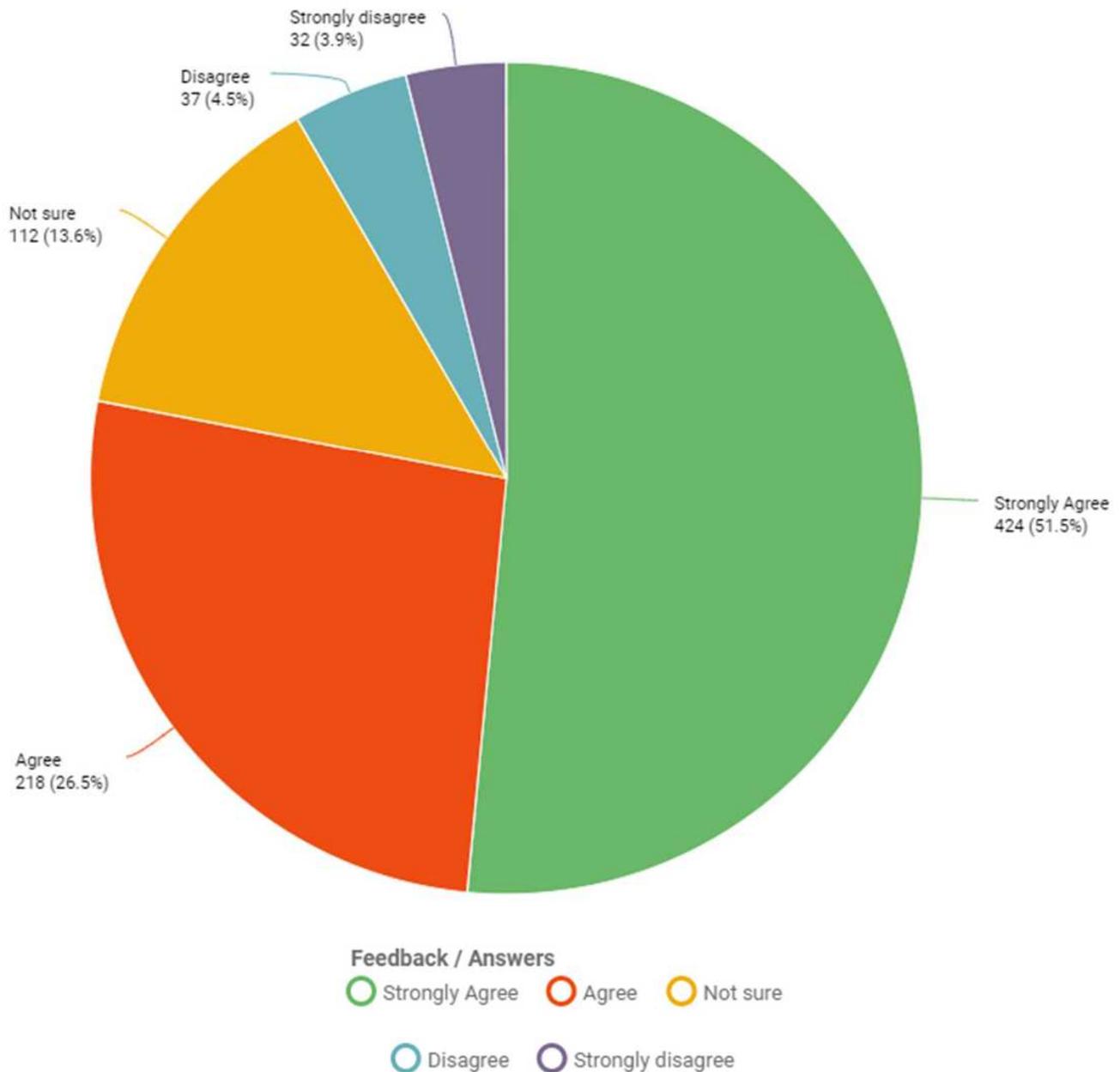


4.1.15 A total of 823 feedback submissions provided an answer, when asked to what extent they agreed that climate should be a goal within the LTCP.

4.1.16 78% of responses either strongly agreed or agreed that climate should be included as a goal within the LTCP.

4.1.17 A further 4.5% selected disagreed, with 3.9% of responses who strongly disagreed. 13.6% of responses were unsure.

Goal 4 – Environment

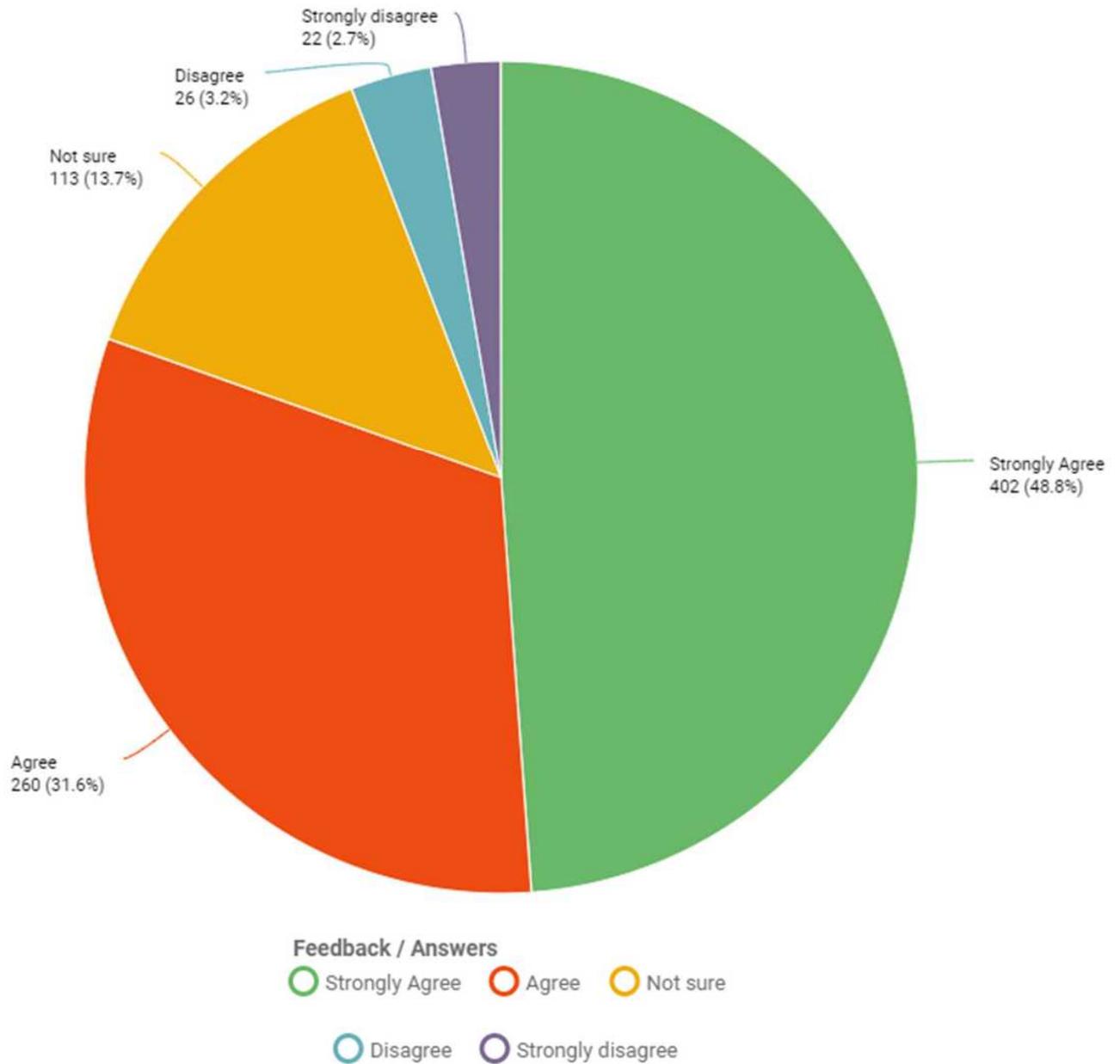


4.1.18 A total of 823 feedback submissions provided an answer, when asked to what extent they agreed that the environment should be a goal within the LTCP.

4.1.19 79.7% of responses either strongly agreed or agreed that the environment should be included as goal within the LTCP.

4.1.20 A further 3.5% selected disagree, with 4% of responses who strongly disagreed. 12.8% of responses were unsure.

Goal 5 – Health

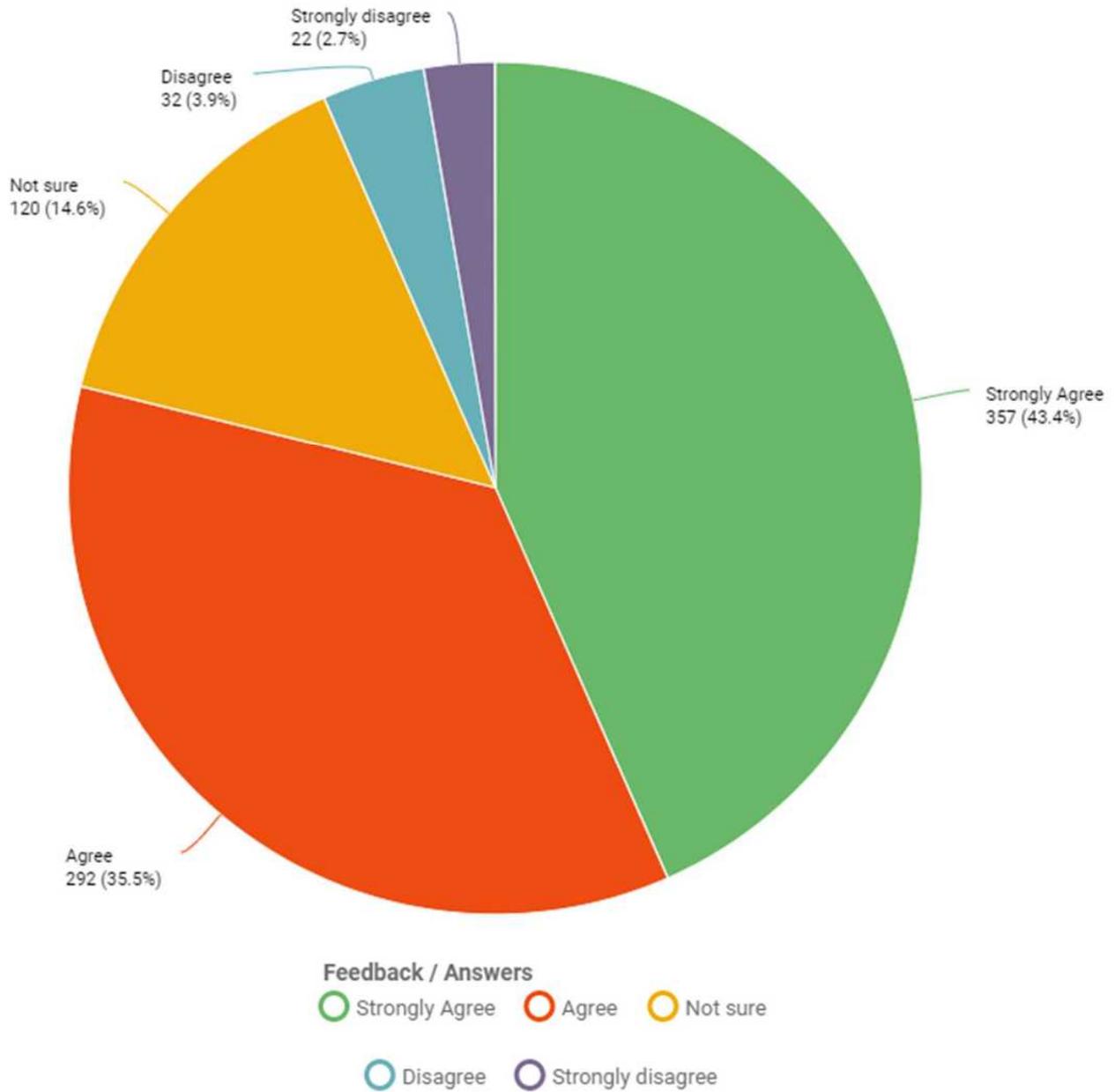


4.1.21 A total of 823 feedback submissions provided an answer, when asked to what extent they agreed that health should be a goal within the LTCP.

4.1.22 80.4% of responses either strongly agreed or agreed that health should be included as a goal within the LTCP.

4.1.23 A further 3.2% selected disagree, with 2.7% of responses who strongly disagreed. 13.7% of responses were unsure.

Goal 6 – Safety



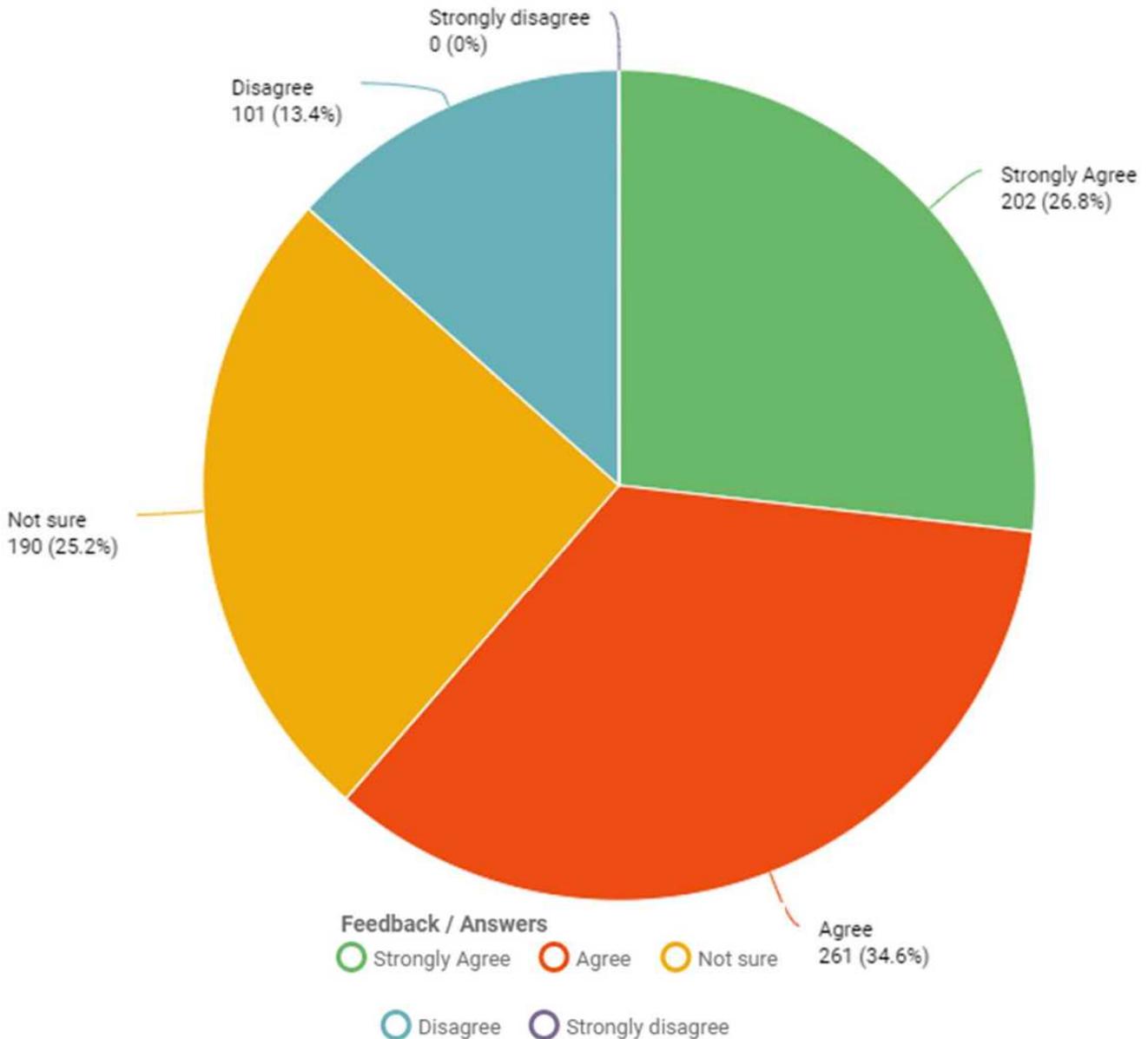
- 4.1.24 A total of 823 feedback submissions provided an answer, when asked to what extent they agreed that safety should be a goal within the LTCP.
- 4.1.25 78.9% of responses either strongly agreed or agreed that safety should be included as a goal within the LTCP.
- 4.1.26 A further 3.9% selected disagree, with 2.7% of responses who strongly disagreed. A further 14.6% of responses were unsure.

Q4: To what extent do you agree with the proposed LTCP objectives?

4.1.27 This question asked respondents to select from eleven LTCP objectives and determine whether they agreed with the proposed LTCP objectives.

4.1.28 Therefore, each of the eleven objectives is analysed in turn below.

Objective 1 – Housing

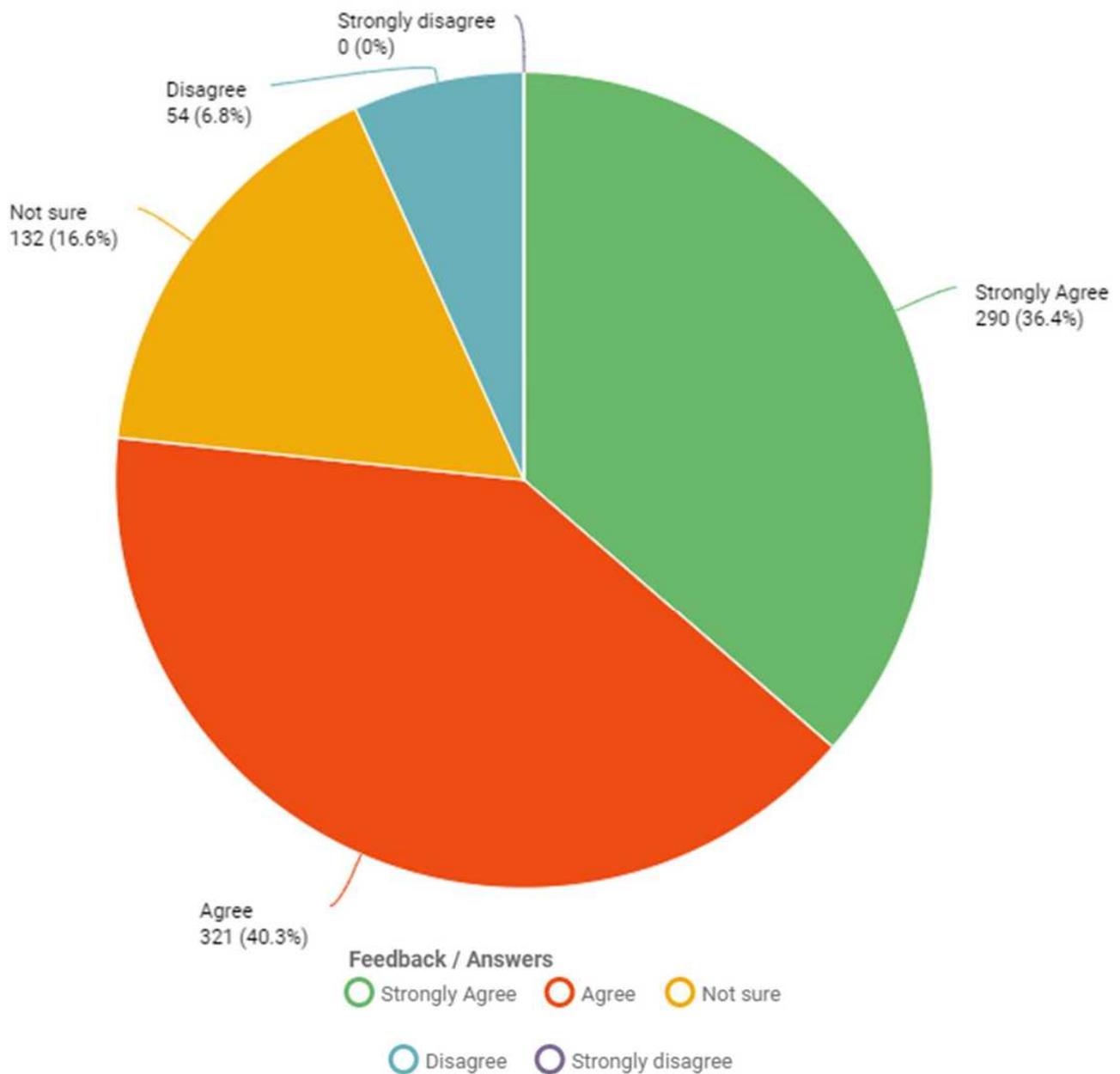


4.1.29 A total of 754 feedback submissions provided an answer, when asked to what extent they agreed the housing should be an objective within the LTCP.

4.1.30 61.4% of responses either strongly agreed or agreed that housing should be included as an objective within the LTCP.

4.1.31 A further 13.4% selected disagree, with 25.2% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 2 – Employment

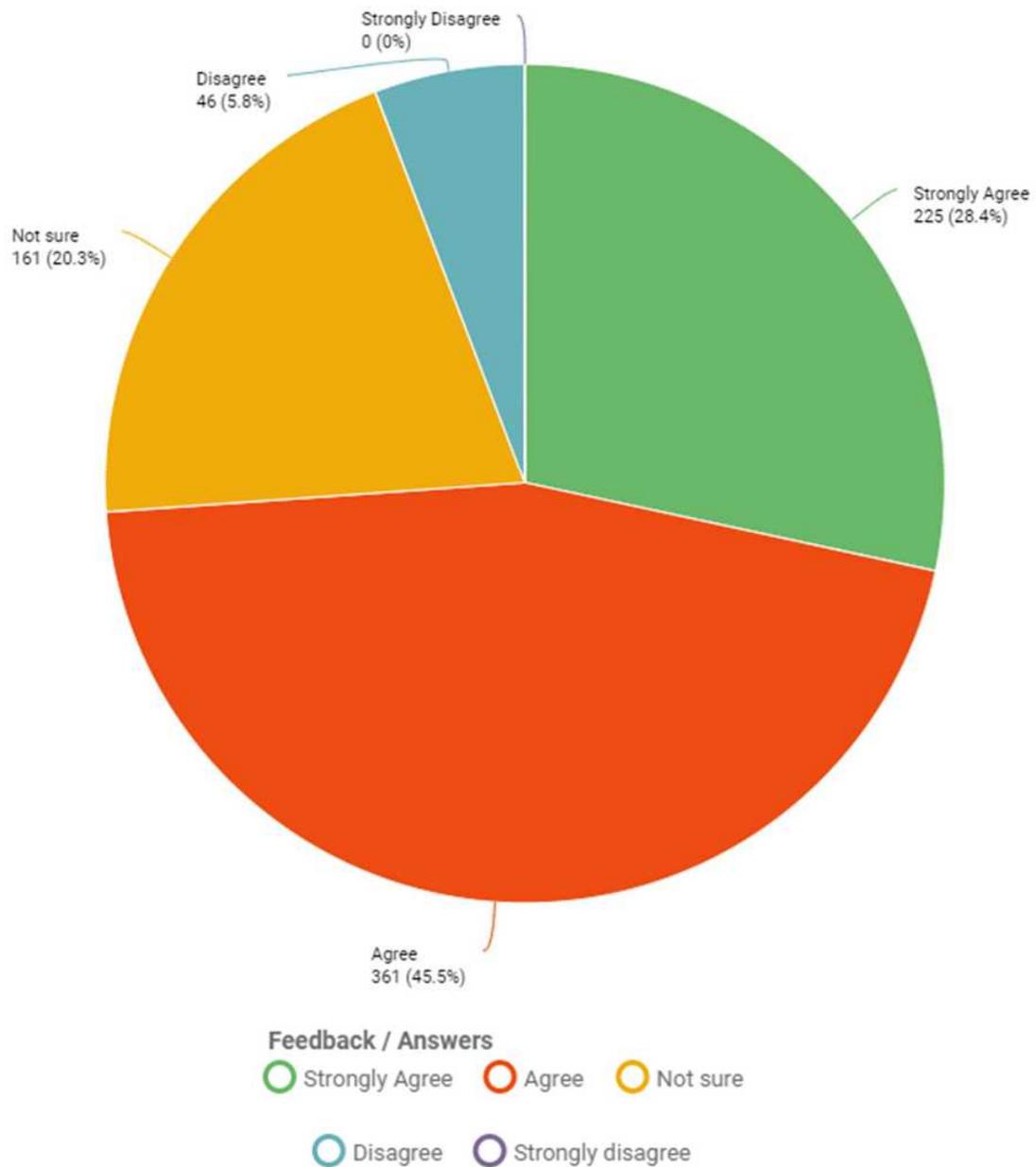


4.1.32 A total of 797 feedback submissions provided an answer, when asked to what extent they agreed that employment should be included as an objective within the LTCP.

4.1.33 76.7% of responses either strongly agreed or agreed that employment should be included as an objective within the LTCP.

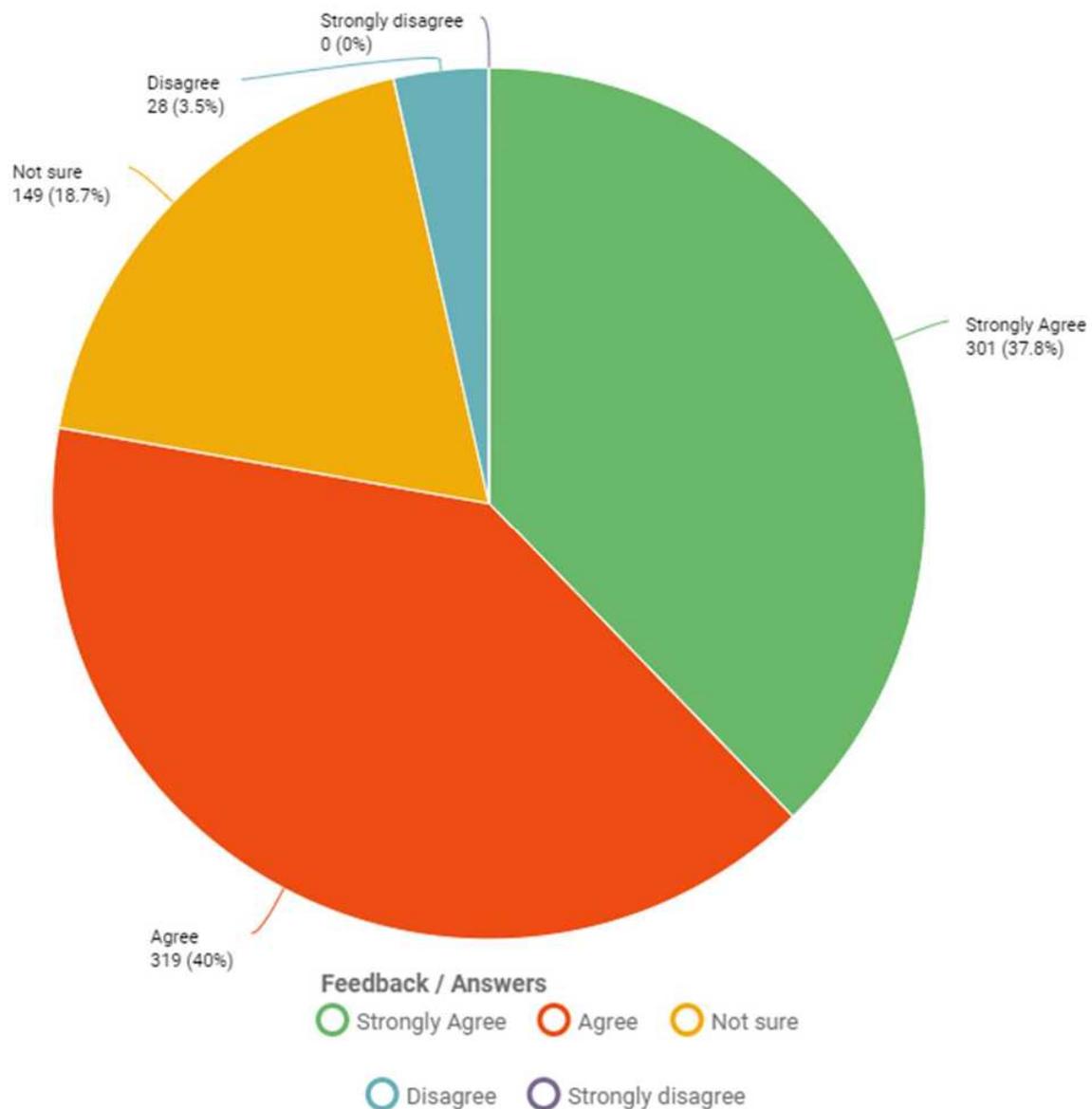
4.1.34 A further 6.8% selected disagree, with 16.6% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 3 – Business and Tourism



- 4.1.35 A total of 793 feedback submissions provided an answer, when asked to what extent they agreed that business and tourism should be included as an objective within the LTCP.
- 4.1.36 73.9% of responses either strongly agreed or agreed that business and tourism should be included as an objective within the LTCP.
- 4.1.37 A further 5.8% selected disagree, with 20.3% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 4 – Resilience

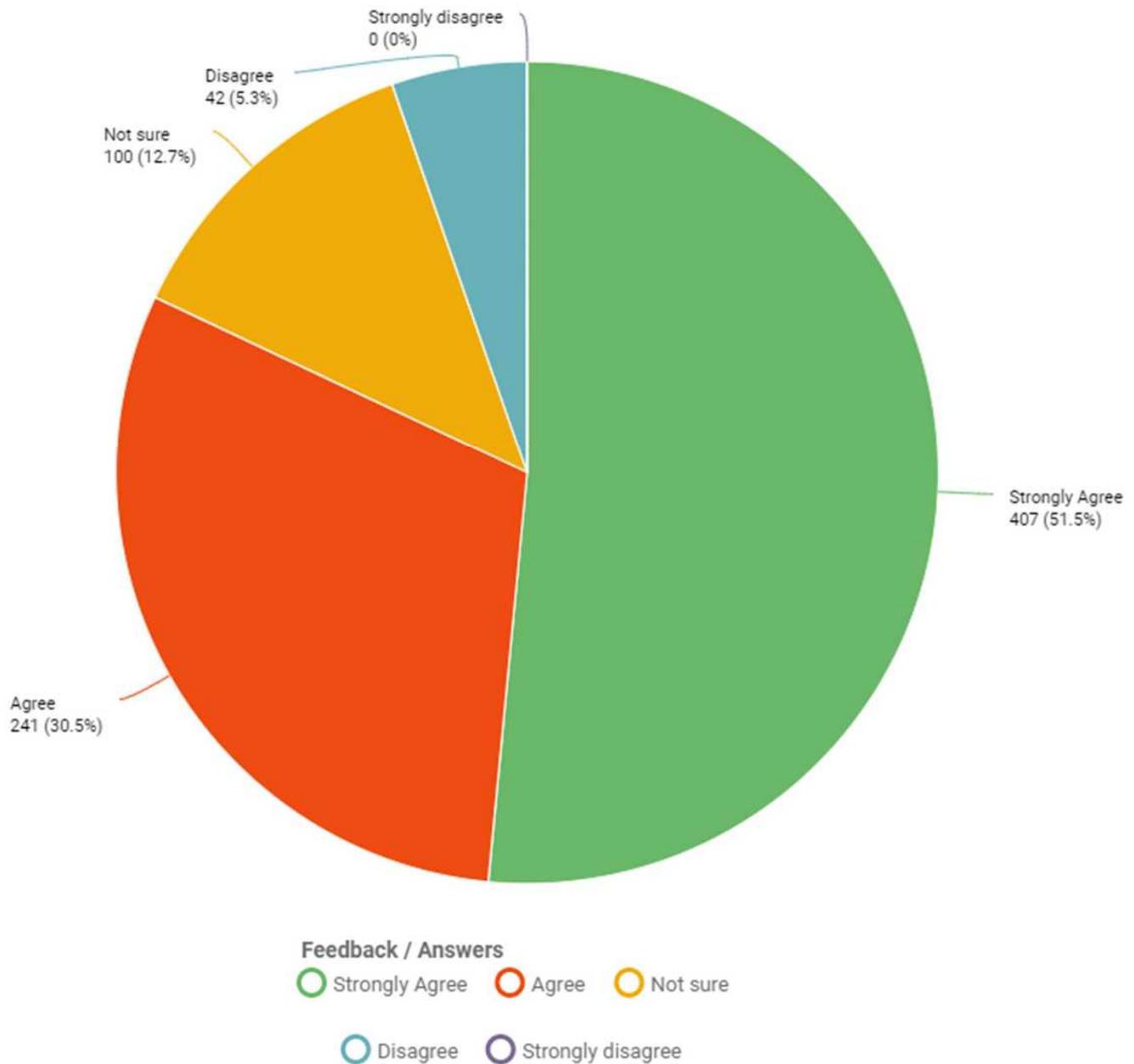


4.1.38 A total of 797 feedback submissions provided an answer, when asked to what extent they agreed that resilience should be an objective within the LTCP.

4.1.39 77.8% of responses either strongly agreed or agreed that resilience should be included as an objective within the LTCP.

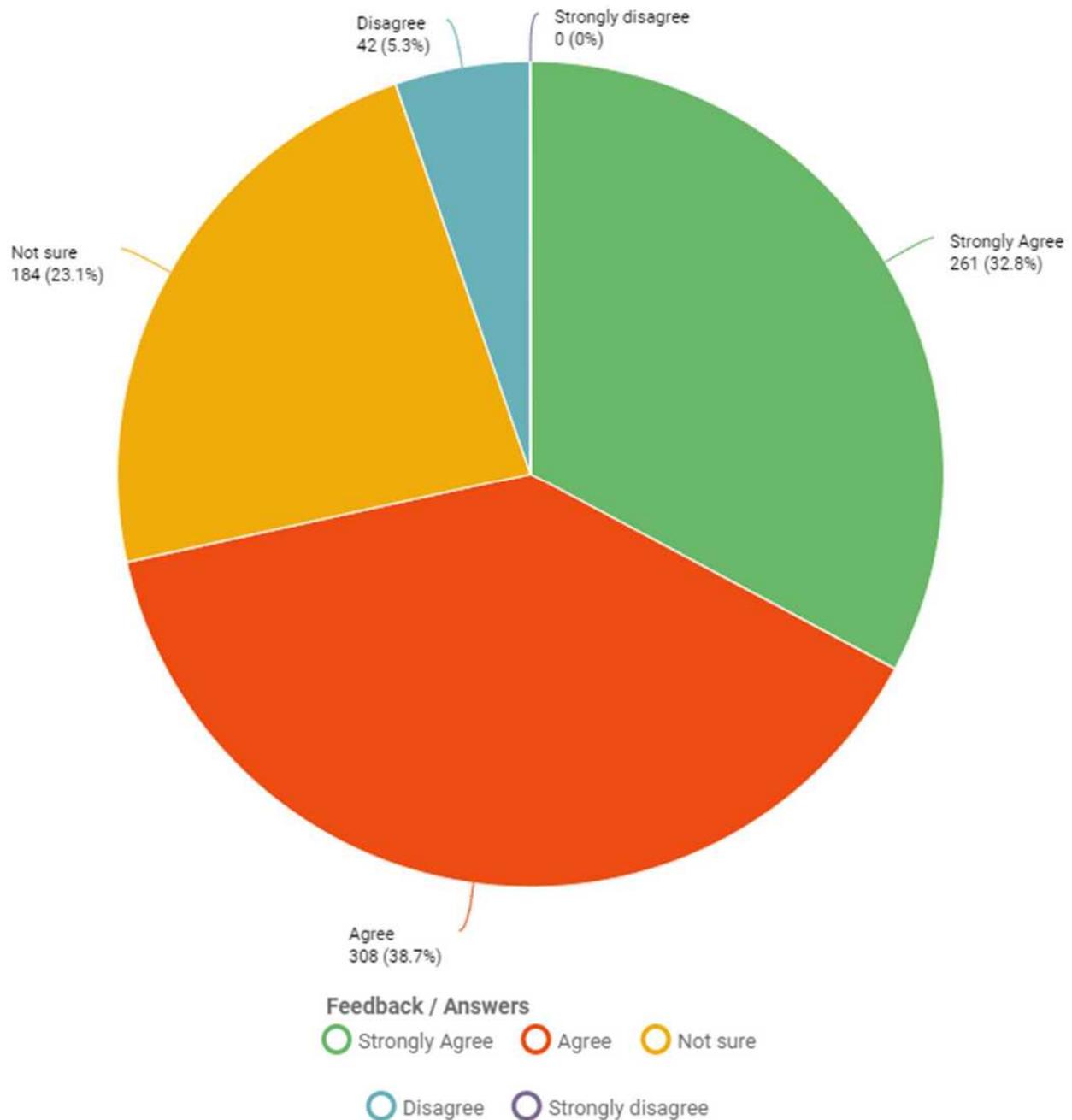
4.1.40 A further 3.5% selected disagree, with 18.7% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 5 – Accessibility



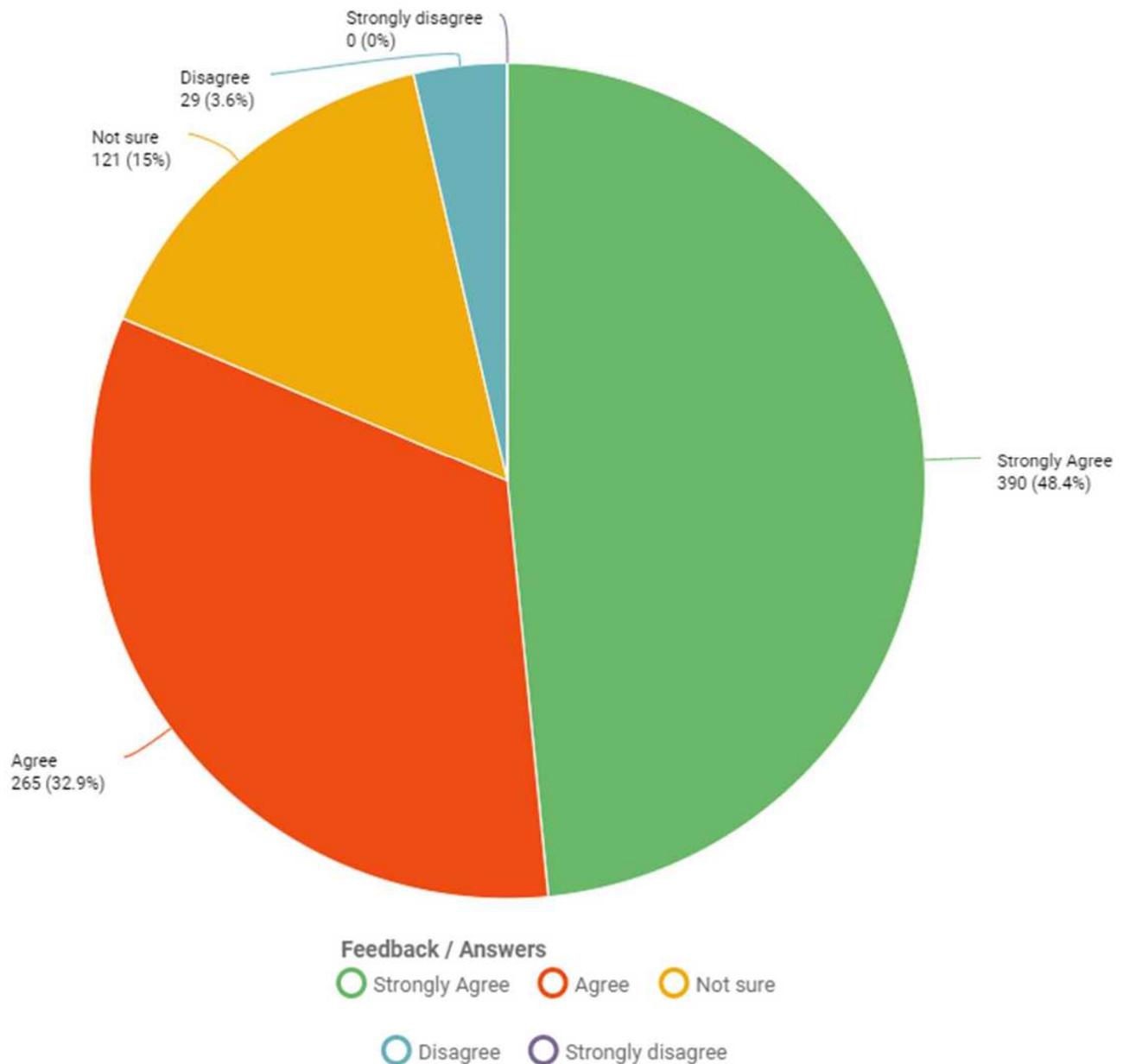
- 4.1.41 A total of 790 feedback submissions provided an answer, when asked to what extent they agreed that accessibility should be an objective within the LTCP.
- 4.1.42 82% of responses either strongly agreed or agreed that accessibility should be included as an objective within the LTCP.
- 4.1.43 A further 5.3% selected disagree, with 12.7% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 6 – Digital



- 4.1.44 A total of 795 feedback submissions provided an answer, when asked to what extent they agreed that digital should be an objective within the LTCP.
- 4.1.45 71.5% of responses either strongly agreed or agreed that digital should be included as an objective within the LTCP.
- 4.1.46 A further 5.3% selected disagree, with 23.1% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 7 – Health and Wellbeing

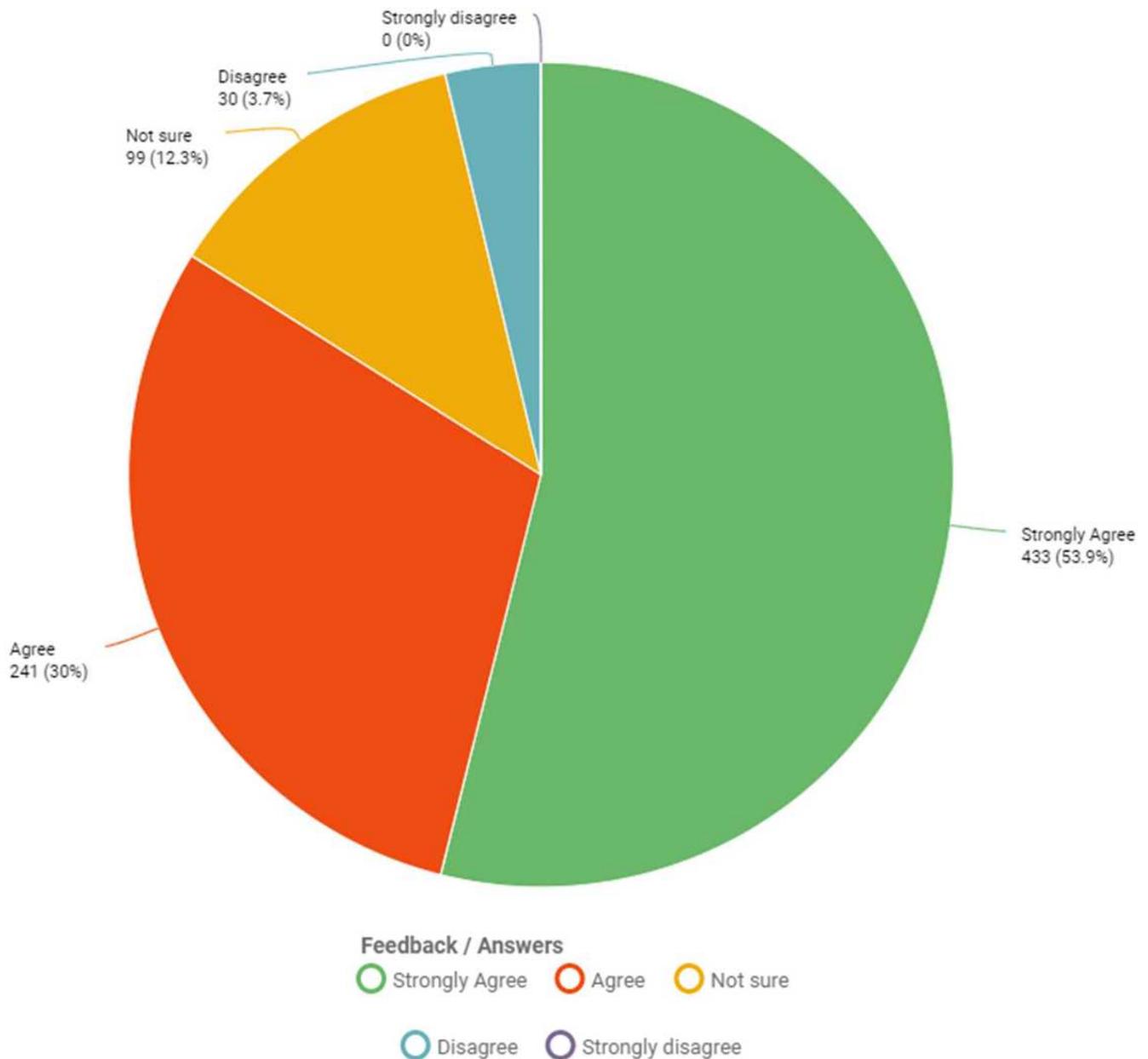


4.1.47 A total of 805 feedback submissions provided an answer, when asked to what extent they agreed that health and wellbeing should be an objective within the LTCP.

4.1.48 81.3% of responses either strongly agreed or agreed that health and wellbeing should be included as an objective within the LTCP.

4.1.49 A further 3.6% selected disagree, with 15% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 8 – Air Quality

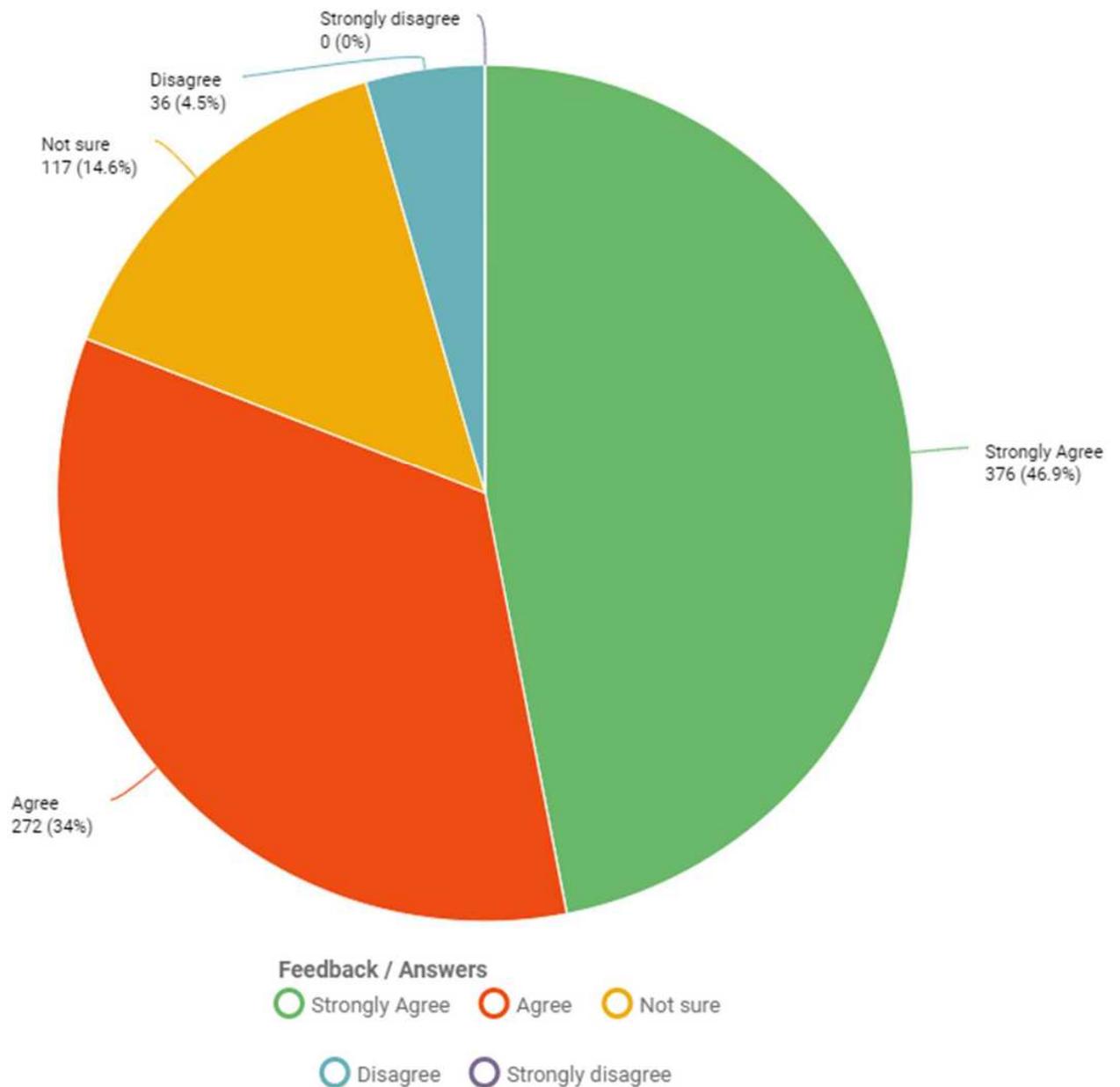


4.1.50 A total of 803 feedback submissions provided an answer, when asked to what extent they agreed that air quality should be an objective within the LTCP.

4.1.51 83.9% of responses either strongly agreed or agreed that air quality should be included as an objective within the LTCP.

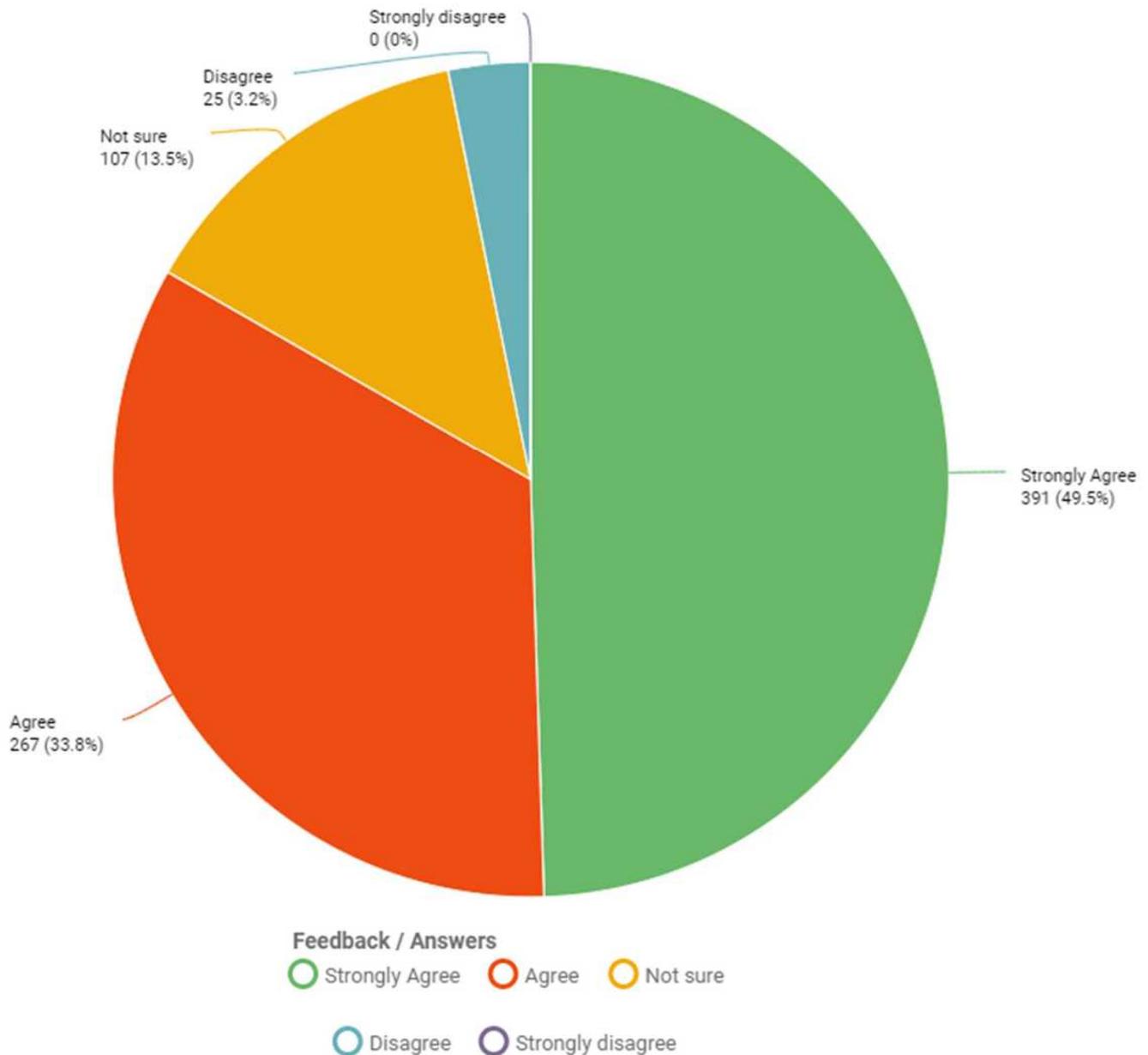
4.1.52 A further 3.7% selected disagree, with 12.3% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 9 – Safety



- 4.1.53 A total of 801 feedback submissions provided an answer, when asked to what extent they agreed that safety should be an objective within the LTCP.
- 4.1.54 80.9% of responses either strongly agreed or agreed that safety should be included as an objective within the LTCP.
- 4.1.55 A further 4.5% selected disagree, with 14.6% of responses that were unsure. No feedback responses selected strongly disagree.

Objective 10 – Environment

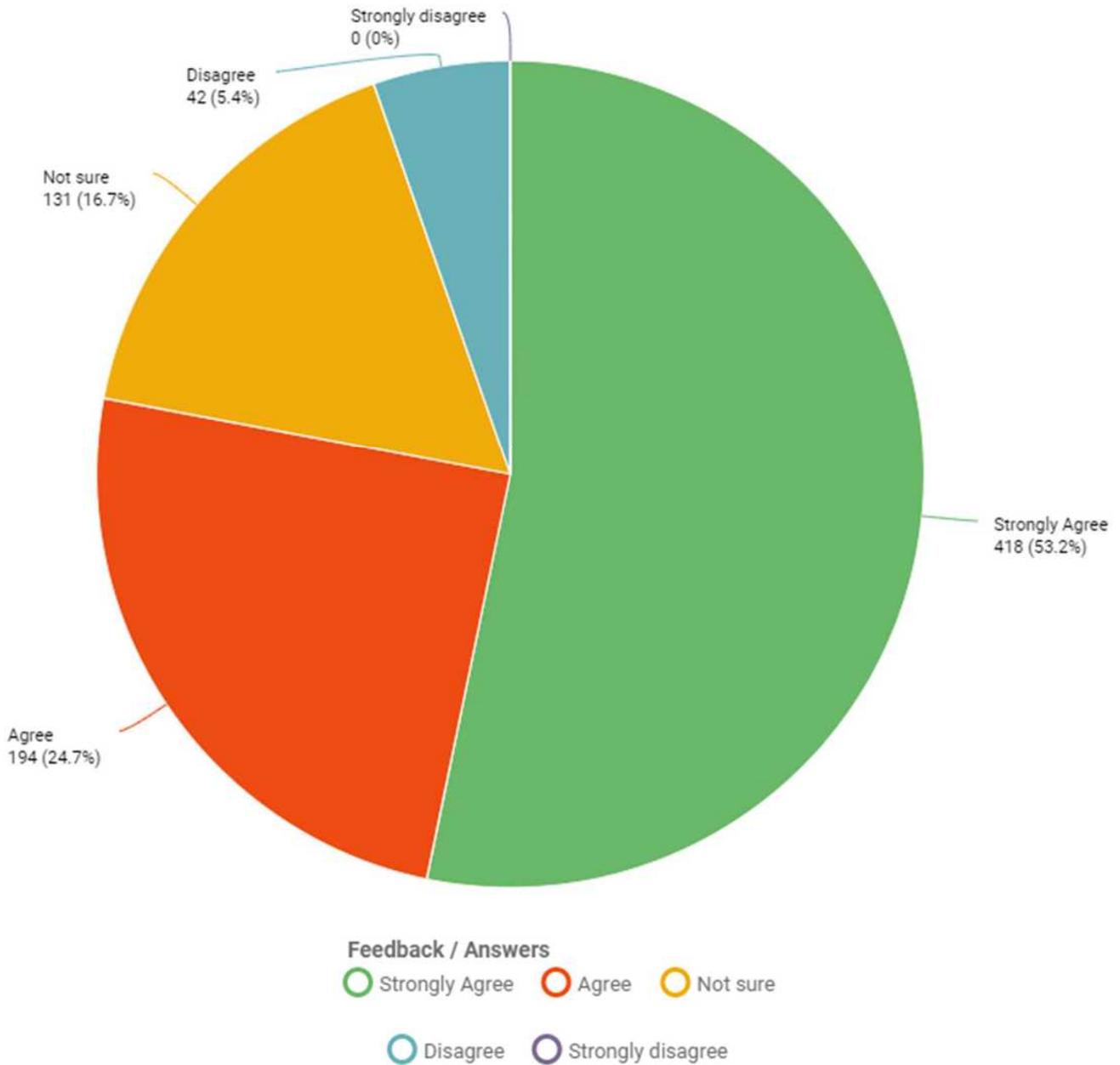


4.1.56 A total of 790 feedback submissions provided an answer when asked to what extent they agreed that the environment should be an objective within the LTCP.

4.1.57 83.3% of responses either strongly agreed or agreed that the environment should be included as an objective within the LTCP.

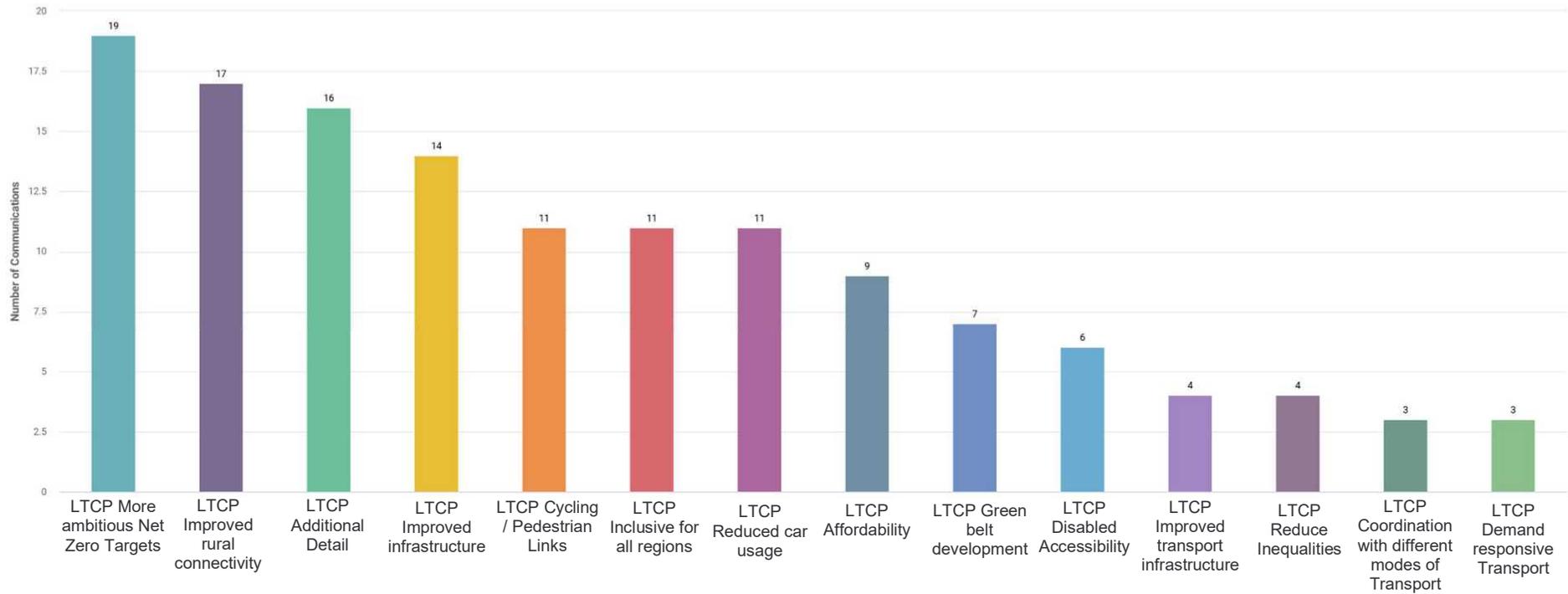
4.1.58 A further 3.2% selected disagree, with 13.5% that were unsure. No feedback responses selected strongly disagree.

Objective 11 – Climate Change



- 4.1.59 A total of 785 feedback submissions provided an answer when asked to what extent they agreed that climate change should be an objective within the LTCP.
- 4.1.60 77.9% of responses either strongly agreed or agreed that climate change should be included as an objective within the LTCP.
- 4.1.61 A further 5.4% selected disagree, with 16.7% that were unsure. No feedback responses selected strongly disagree.

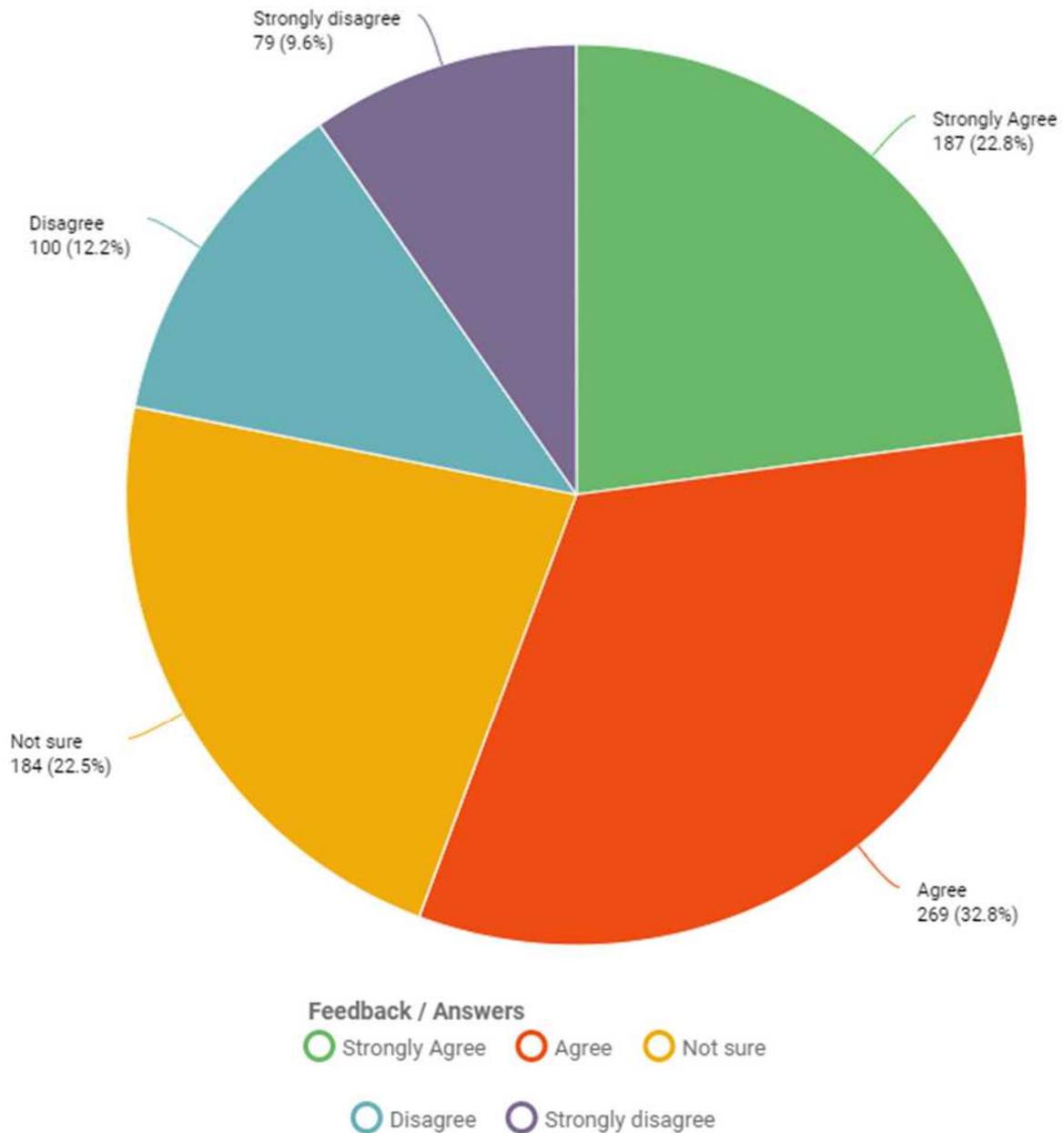
Q5: Please add any further comments you have about the LTCP vision, goals and objective



4.1.62 The most frequent comment, when asked whether there were any further comments to add on the vision, goal and objectives for the LTCP, was a desire to see the Combined Authority adopt more ambitious Net Zero targets, which was cited by 19 respondents.

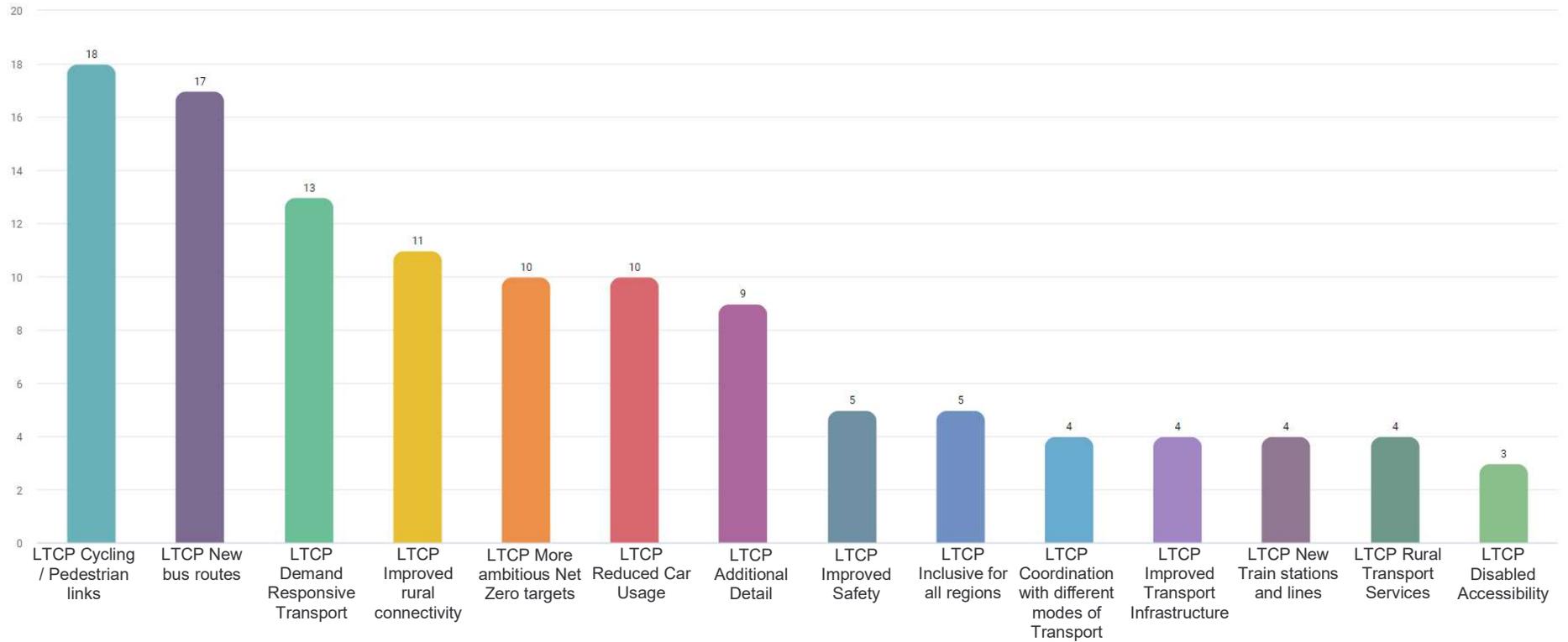
4.1.63 Other topics that individuals felt should be addressed within the vision, goals and objectives of the plan included improving rural connectivity; as well as a need to further information to be provided about the vision, goals and objectives, together with the need to improve overall infrastructure within the region.

Q6: To what extent do you agree with the proposed strategy for transport in Cambridgeshire & Peterborough?



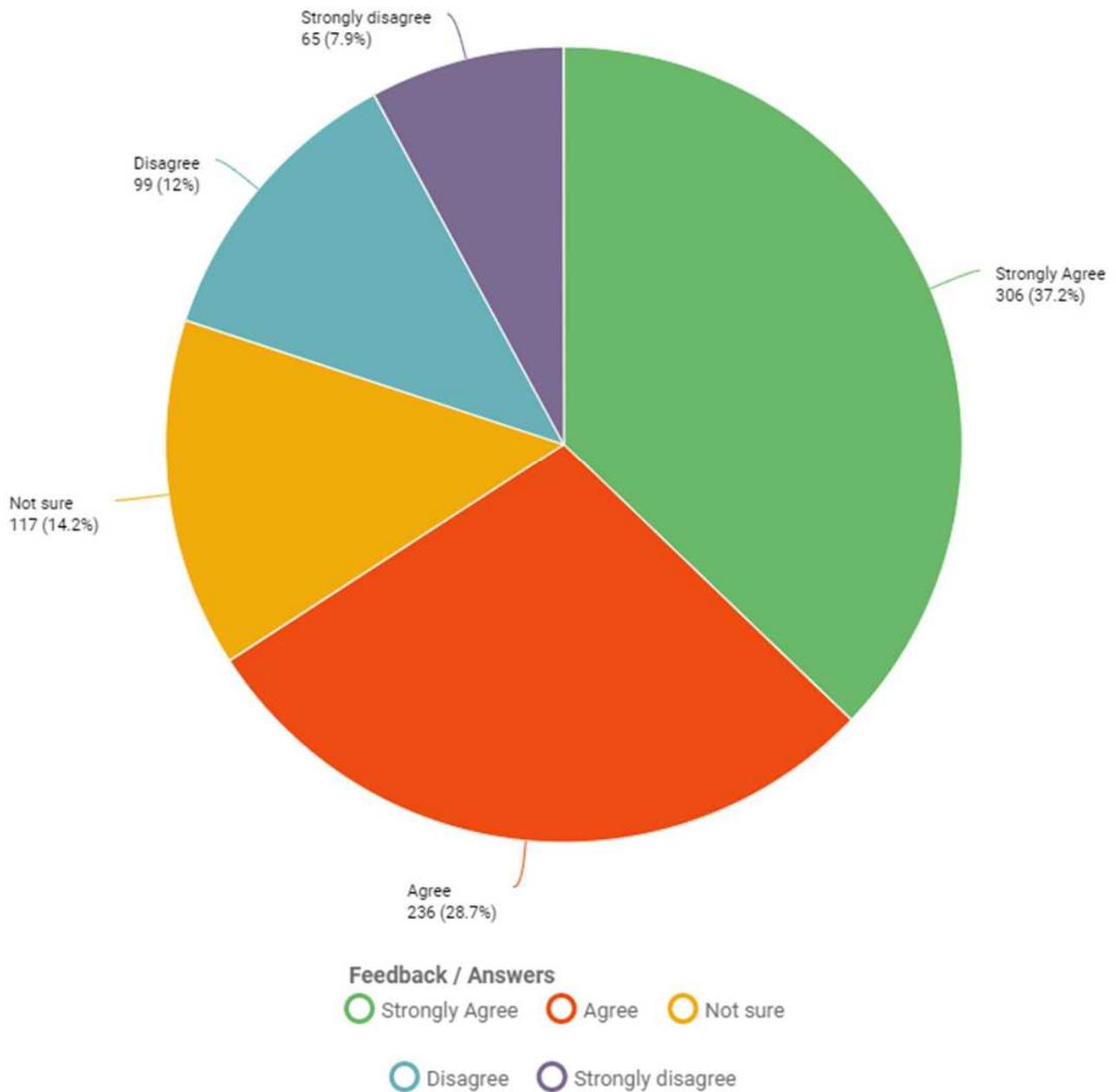
4.1.64 The following question asked respondents whether they agreed with the proposed strategy for transport in Cambridge and Peterborough. A total of 819 responses were received to this question.

4.1.65 55.6% of responses either strongly agreed or agree with the proposed strategy for transport in Cambridgeshire and Peterborough. A further 12.2% selected disagree, with 9.6% who strongly disagreed with the proposed strategy. A further 22.5% of responses selected unsure.



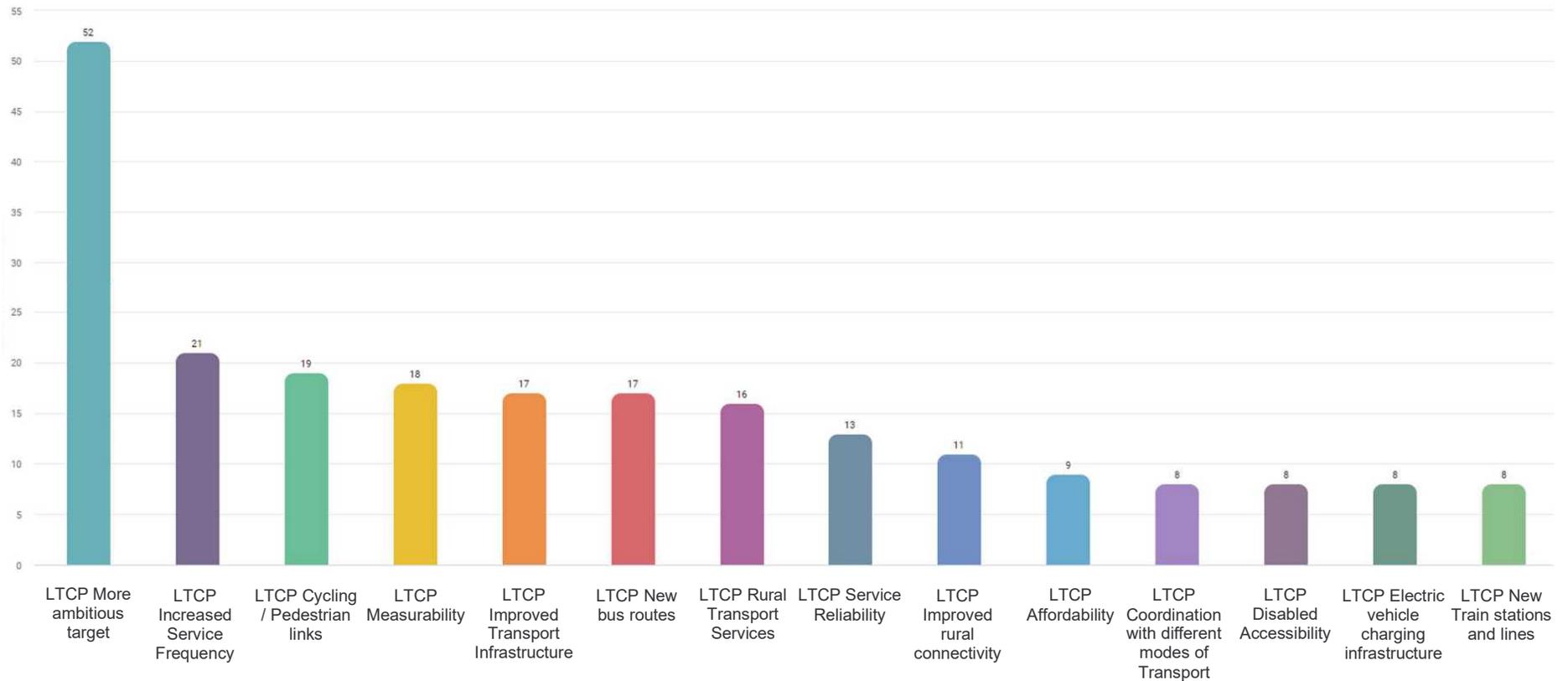
4.1.66 When asked whether there were any further comments regarding the proposed strategy, the need to ensure that further cycle and pedestrian links are included in the strategy was cited 18 times. This was followed by the need to provide new bus routes (17), followed by the desire to see demand responsive transport included within the strategy (13).

Q7: To what extent do you agree with the proposal to cut the number of miles driven on our roads by 15%?



4.1.67 The following question asked respondents to what extent they agreed with the proposal to cut the number of miles driven on the regions roads by 15%. A total of 823 responses were received to this question.

4.1.68 65.9% either strongly agreed or agreed with the proposal to cut car usage by 15%. A further 12% of responses selected disagree, with 7.9% that strongly disagreed with the proposal. An additional 14.2% of responses were unsure.

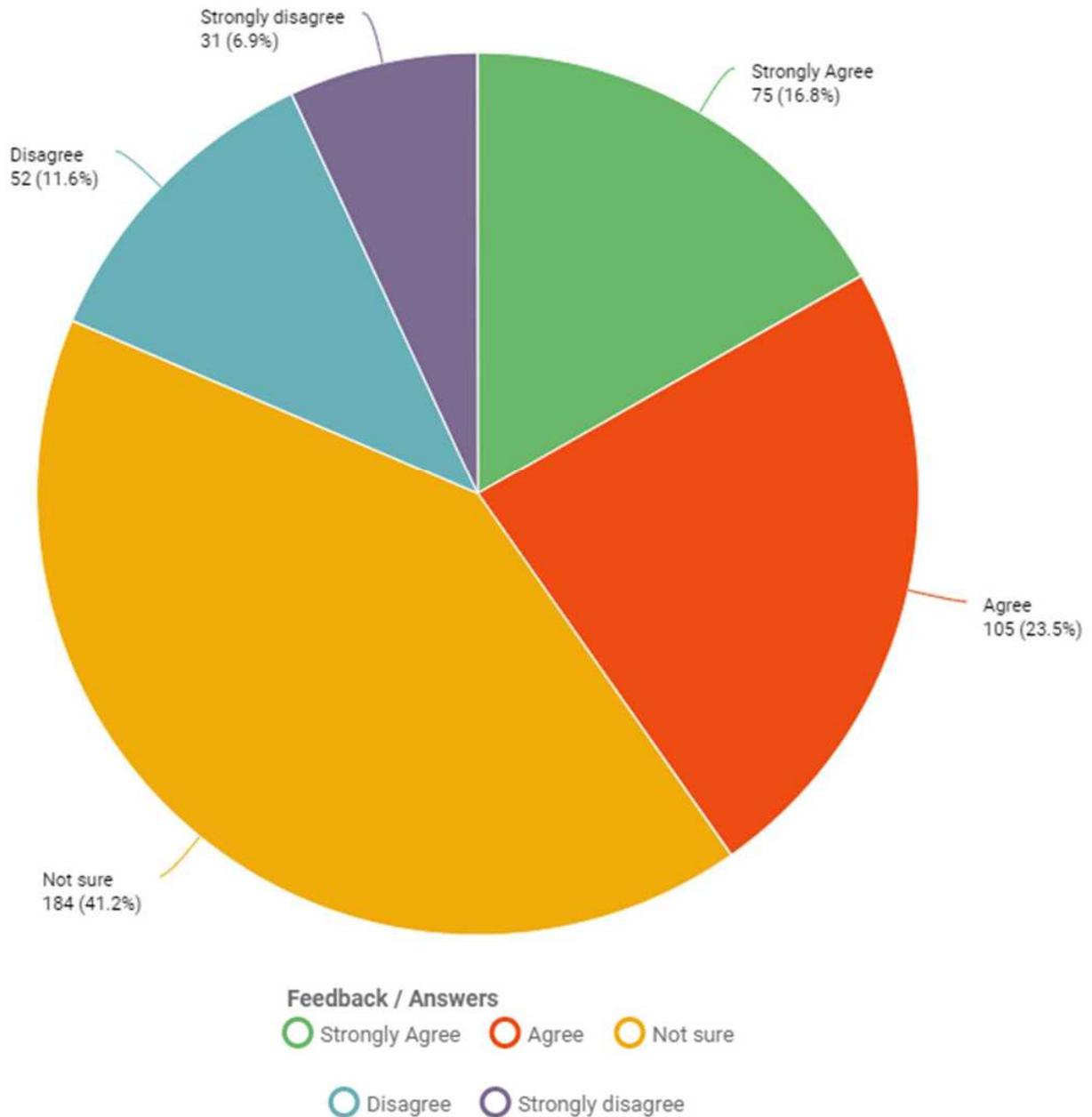


4.1.69 When asked whether there were any further comments regarding the proposal to cut the number of miles driven by 15%, the need to have a more ambitious target was the prevailing theme that was mentioned in 52 responses. Other recurring comments included the need to improve service frequency (21), followed by the need to provide enhanced cycling and pedestrian routes (19)

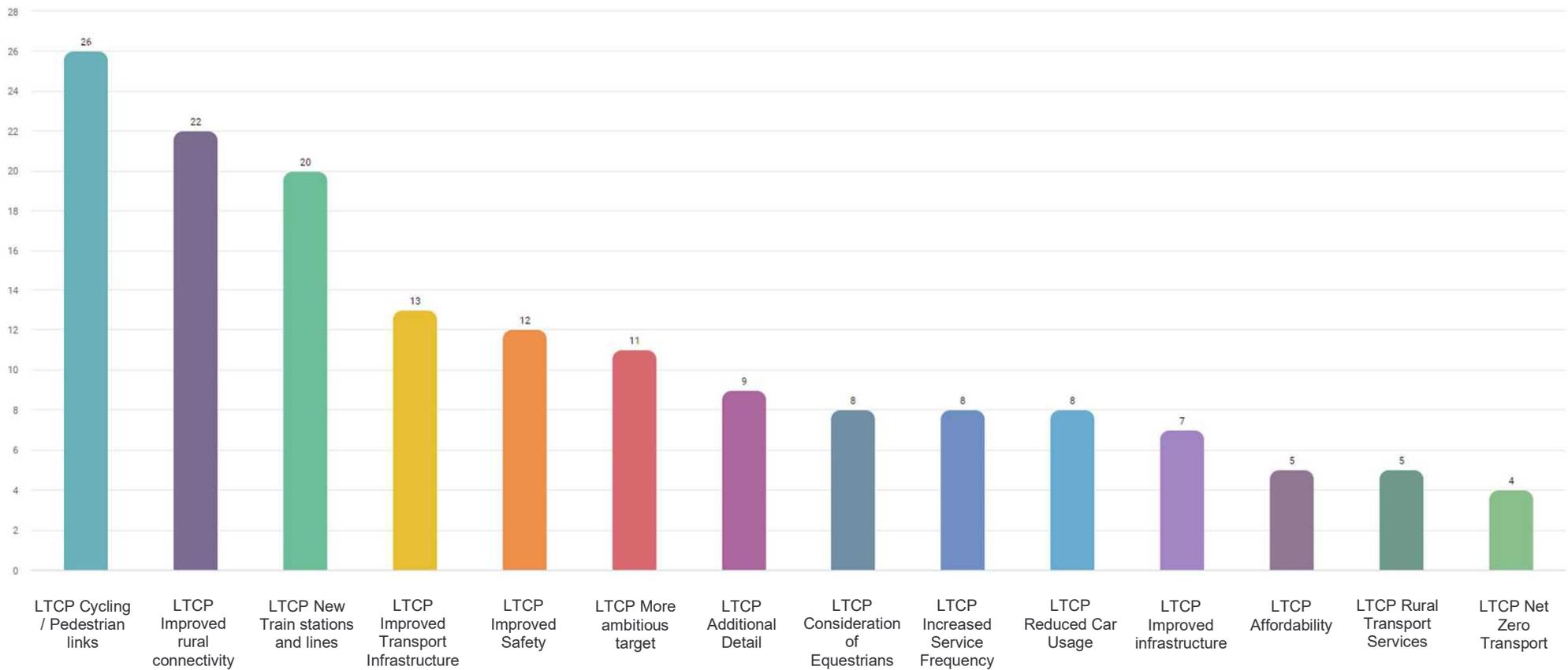
Q8: To what extent do you agree with the proposed local area strategies?

- 4.1.70 Question eight asked respondents whether they agreed with the proposed area strategy in the respective five regions within the Combined Authority.
- 4.1.71 Respondents were given the opportunity to comment upon five local council areas (East Cambridgeshire, Fenland, Greater Cambridgeshire, Huntingdonshire, Peterborough), in which respondents could provide their views on as many or as few regions as they'd felt necessary. Therefore, a breakdown of each of the most important transport problems and opportunities for each region, has been summarised below.

East Cambridgeshire

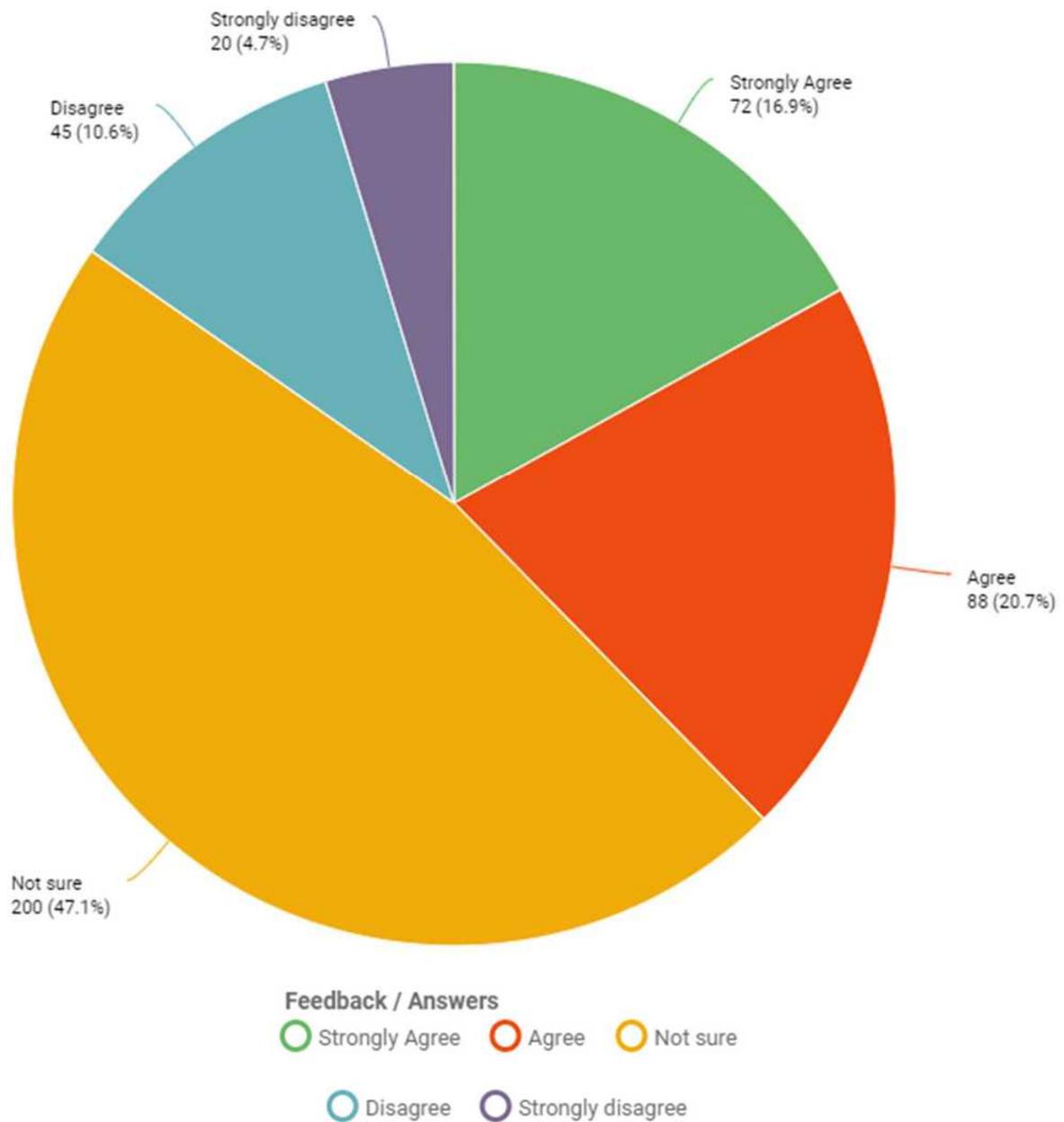


- 4.1.72 A total of 447 responses were received, in relation to whether respondents agreed with the proposed local area strategy for East Cambridgeshire.
- 4.1.73 40.3% of responses either strongly agreed or agreed with the proposed local area transport strategy for East Cambridgeshire. 11.6% selected disagree, with a further 6.9% who strongly disagreed. 41.2% of responses were unsure.



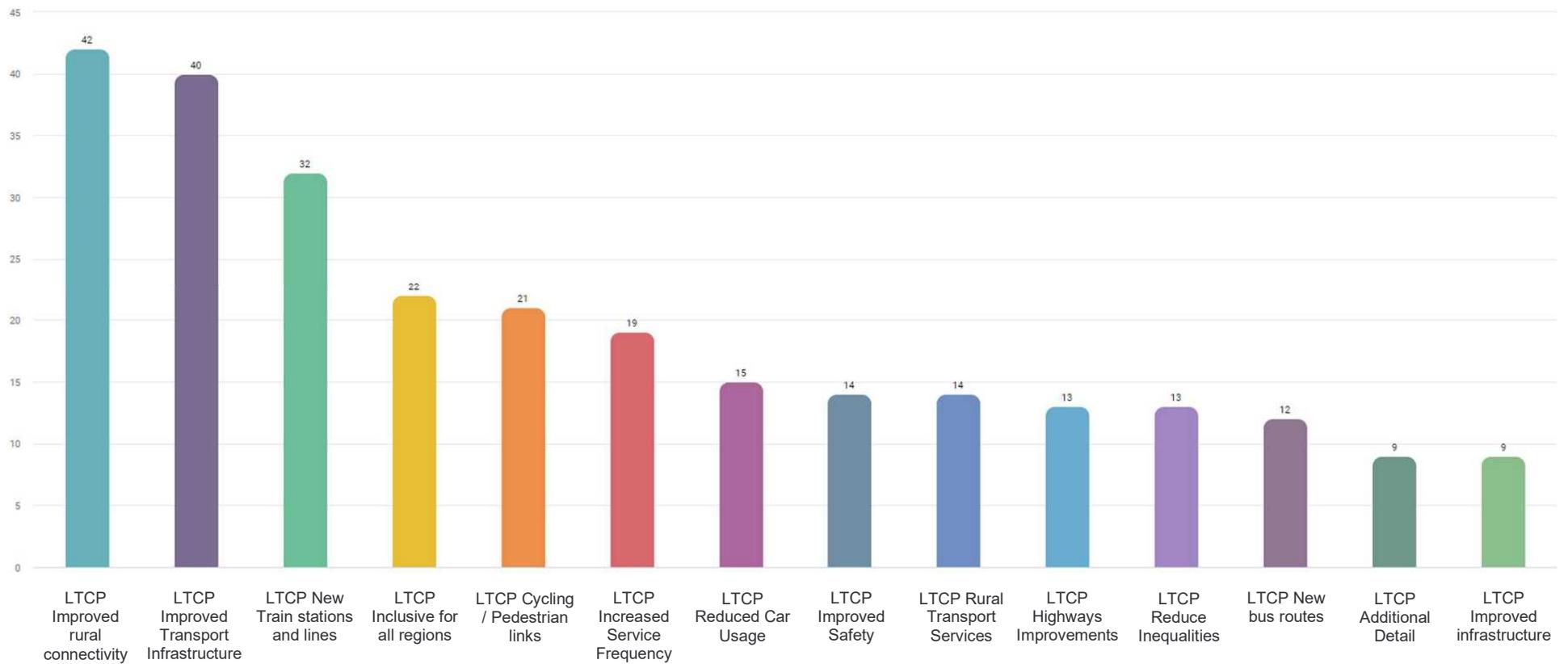
4.1.74 When asked whether there were any further comments, in relation to the local area transport strategy for East Cambridgeshire, the need for improved cycle and pedestrian links was most commonly cited (26), followed by the need for improved connectivity of transport services in rural areas (22), as well as the need to new train stations and lines (20).

Fenland



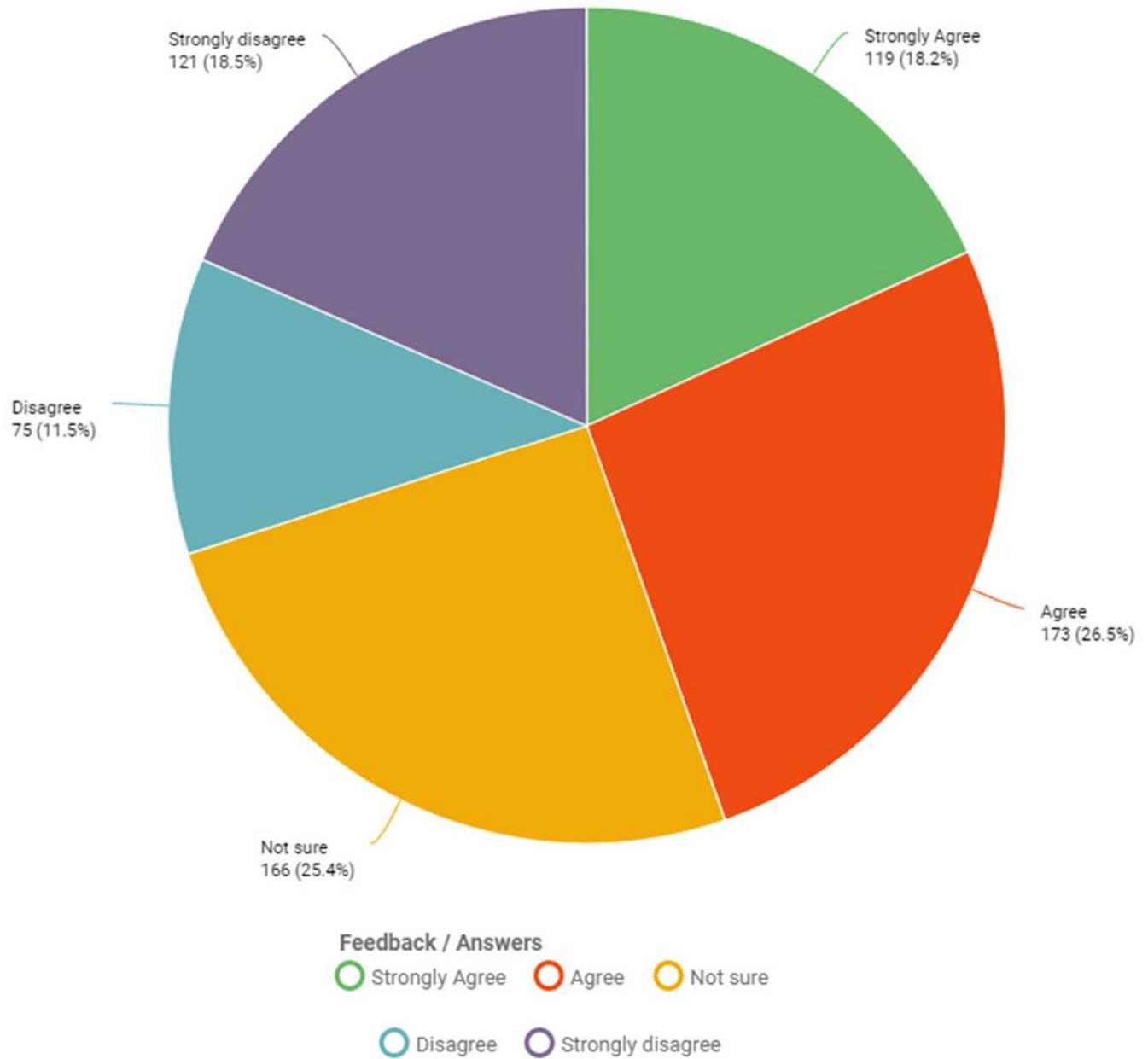
4.1.75 A total of 425 responses were received, in relation to whether respondents agreed with the proposed local area strategy for Fenland.

4.1.76 37.6% of responses either strongly agreed or agreed with the proposed local area transport strategy for Fenland. 10.6% selected disagree, with a further 4.7% who strongly disagreed. 47.1% of responses were unsure.



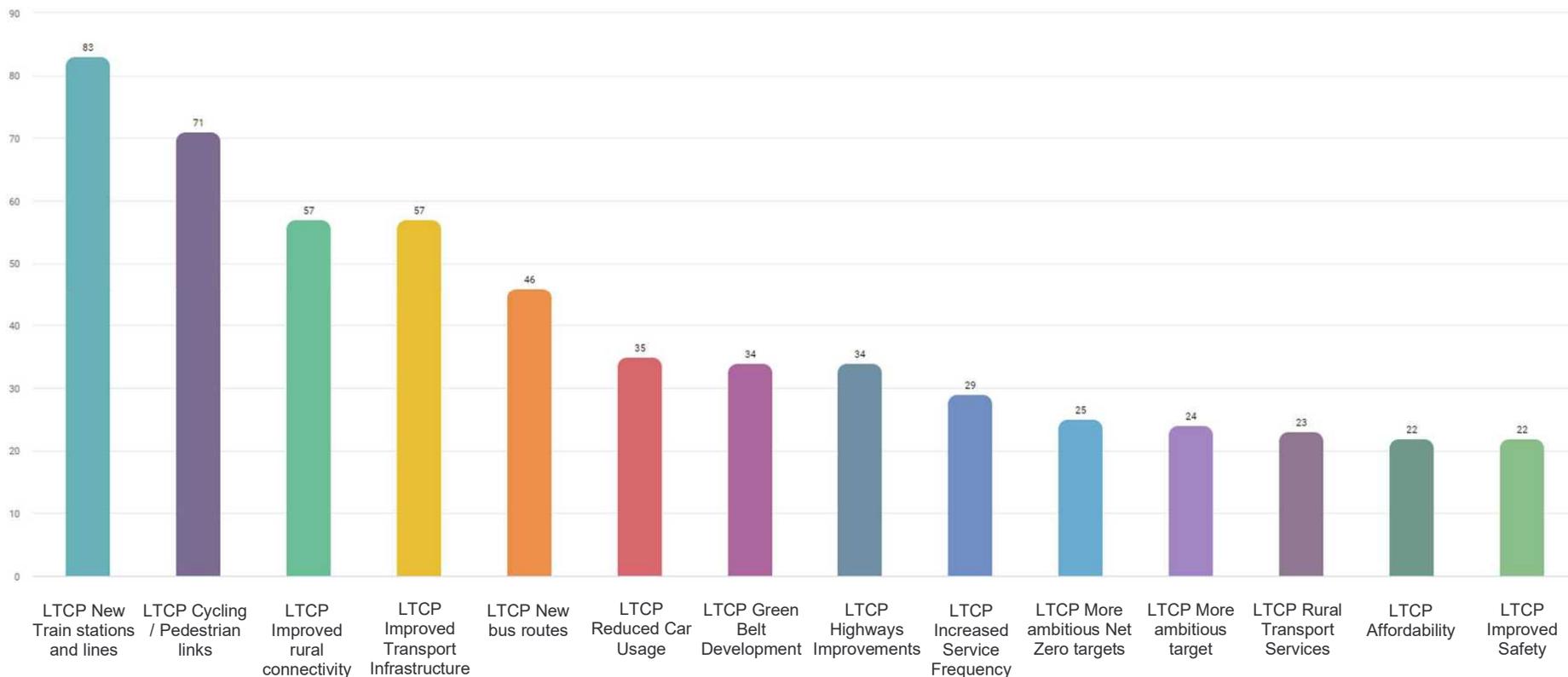
4.1.77 When asked whether there were any further comments, in relation to the local area transport strategy for Fenland, the need for improved connectivity of transport services in rural areas (42) was most commonly cited, followed by the need for improved transport infrastructure (40), and the desire to see new train stations and lines (32).

Greater Cambridgeshire



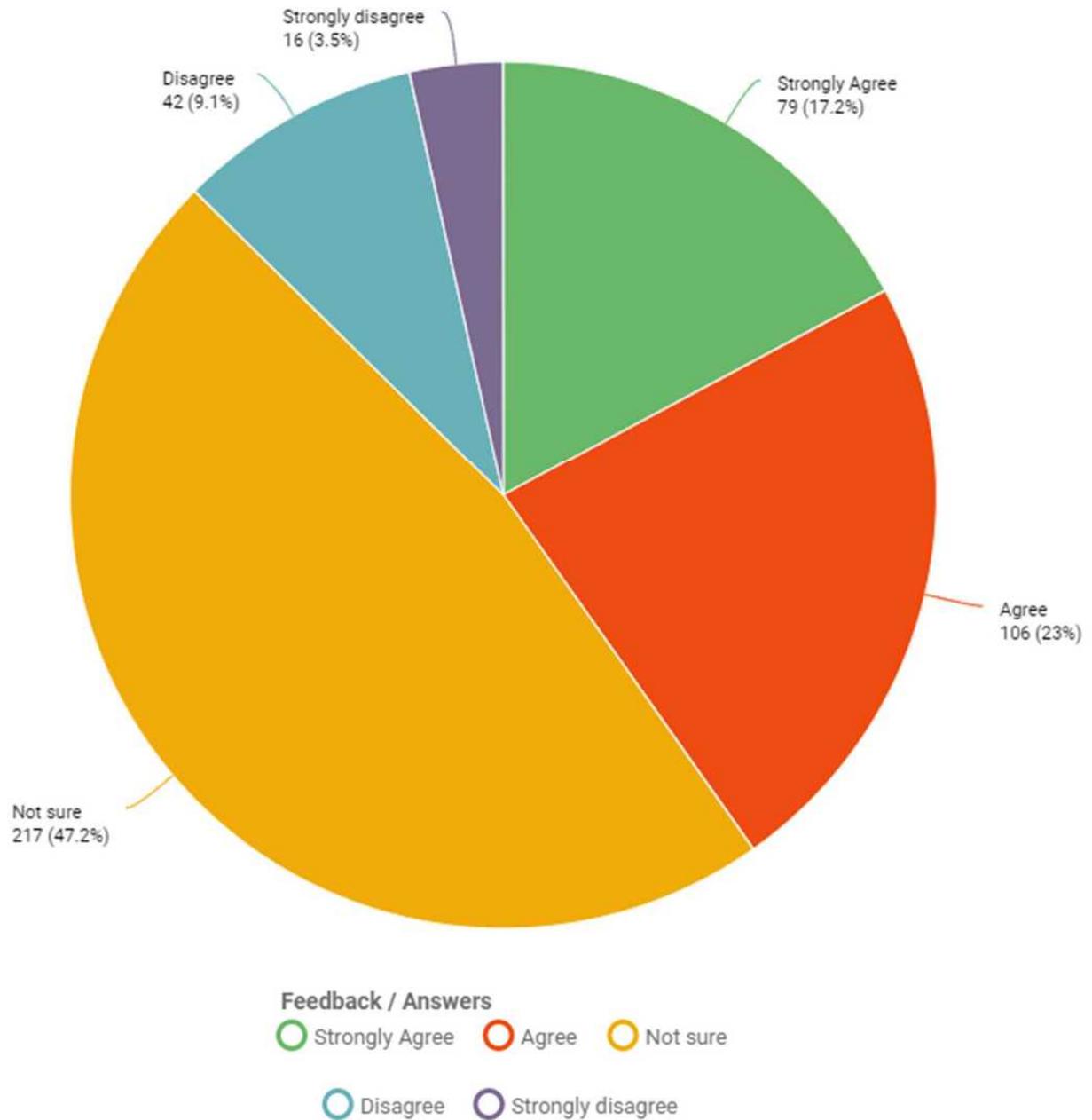
4.1.78 A total of 654 responses were received, in relation to whether respondents agreed with the proposed local area strategy for Greater Cambridgeshire.

4.1.79 44.7% of responses either strongly agreed or agreed with the proposed local area transport strategy for Greater Cambridgeshire. 11.5% selected disagree, with a further 18.5% who strongly disagreed. 25.4% of responses were unsure.



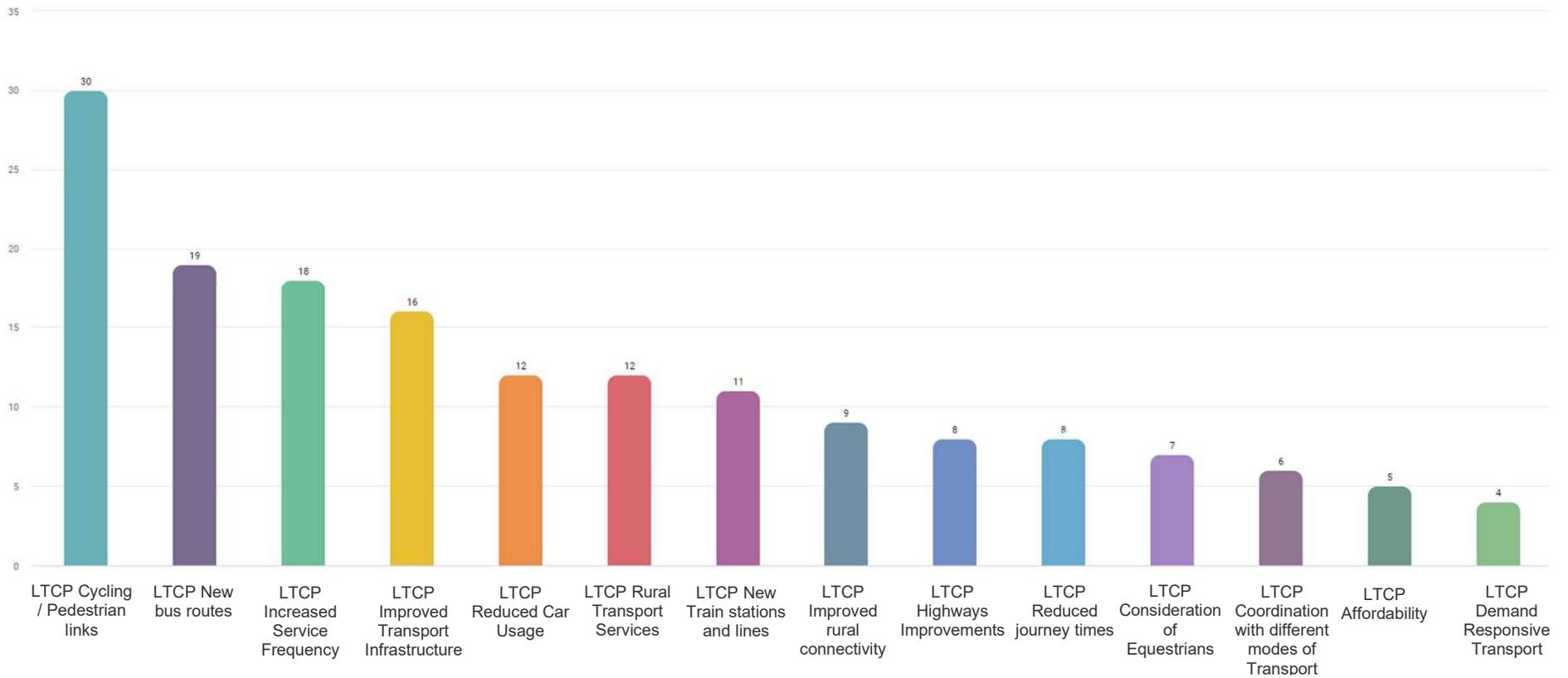
4.1.80 When asked whether there were any further comments, in relation to the local area transport strategy for Greater Cambridgeshire, the need for need for new train stations and lines was most commonly cited (83), followed by the need for improved cycle and pedestrian links (71). The third most recurring comment, that was mentioned in 57 responses, included the need to improve connectivity of transport services in rural areas as well as the need for an improved overall transport infrastructure.

Huntingdonshire



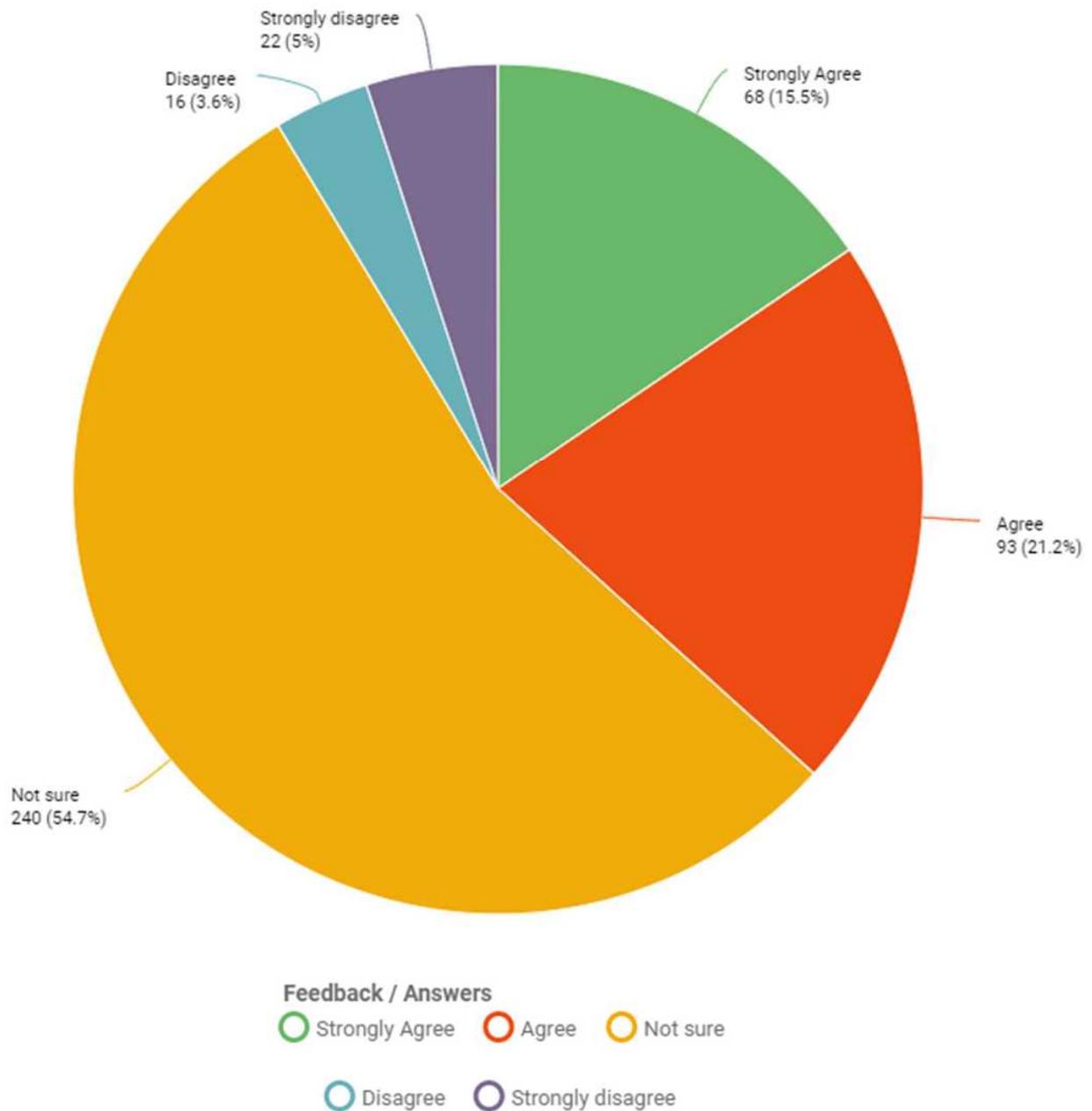
4.1.1 A total of 460 responses were received, in relation to whether respondents agreed with the proposed local area strategy for Huntingdonshire.

4.1.2 40.2% of responses either strongly agreed or agreed with the proposed local area transport strategy for Huntingdonshire. 9.1% selected disagree, with a further 3.5% who strongly disagreed. 47.2% of responses were unsure.



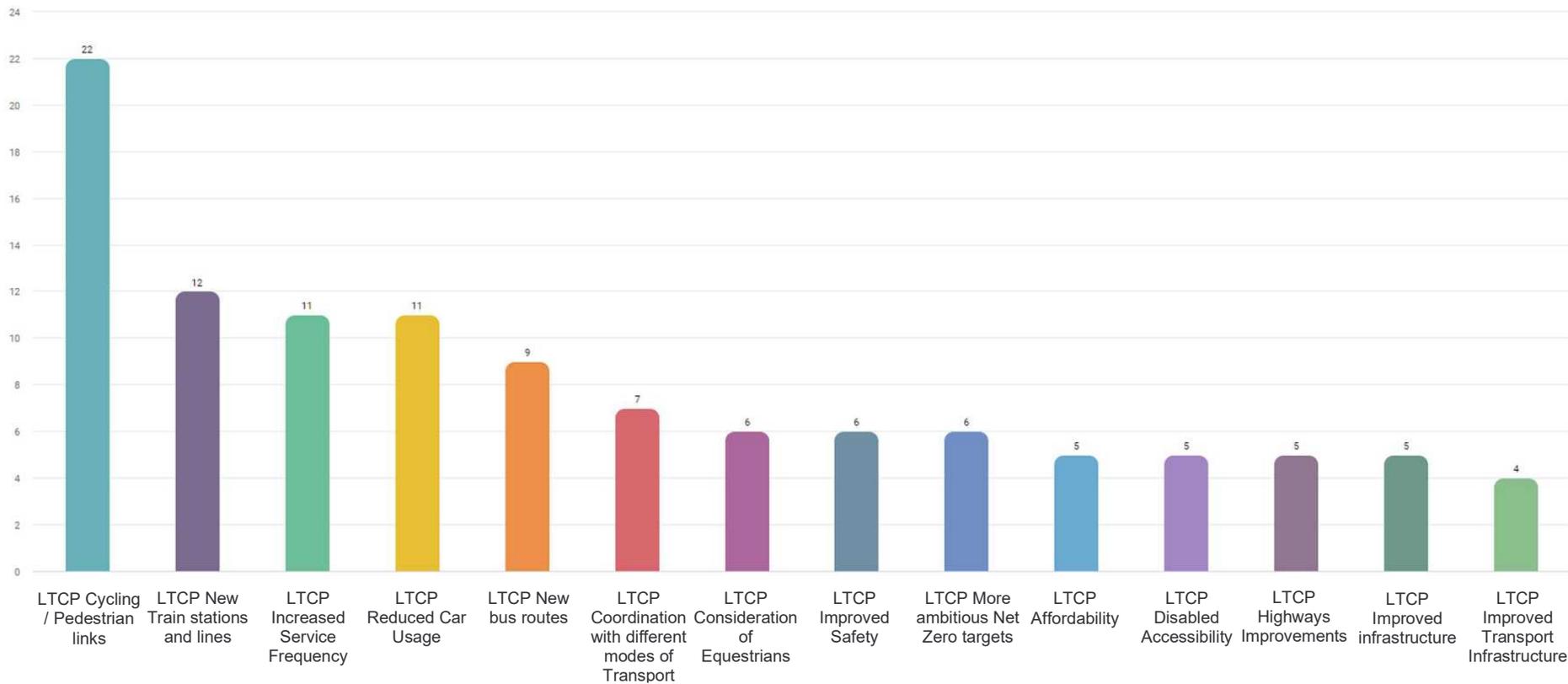
4.1.3 When asked whether there were any further comments, in relation to the local area transport strategy for Huntingdonshire, the need for need for further cycle and pedestrian links was most commonly cited (30), this was followed by a desire to see new bus routes (19), as well as the need to improve service frequency (18).

4.1.4 Peterborough



4.1.5 A total of 439 responses were received, in relation to whether respondents agreed with the proposed local area strategy for Peterborough.

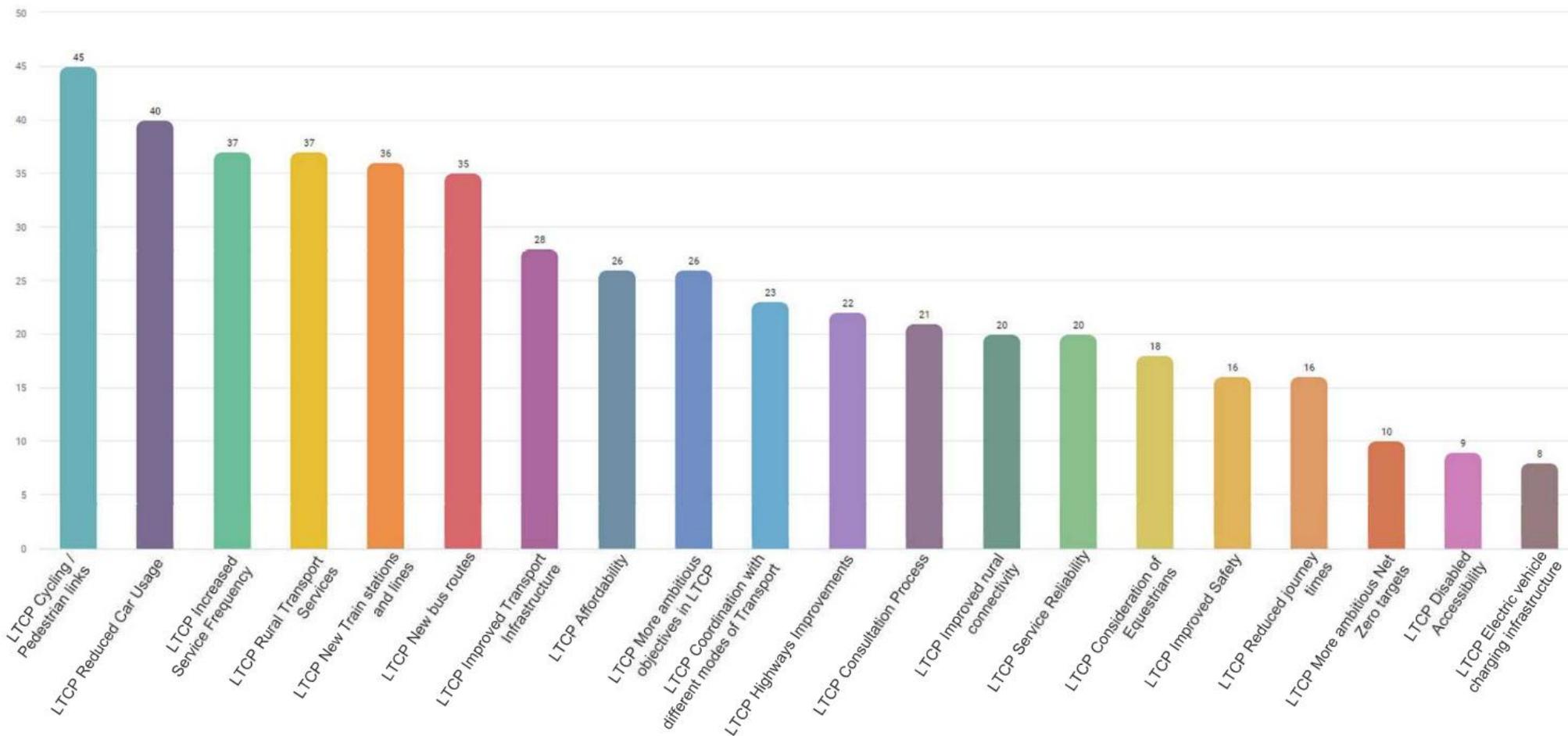
4.1.6 36.7% of responses either strongly agreed or agreed with the proposed local area transport strategy for Peterborough. 3.6% selected disagree, with a further 5% who strongly disagreed. 54.7% of responses were unsure.



4.1.7 When asked whether there were any further comments, in relation to the local area transport strategy for Peterborough, the need for further cycle and pedestrian links was most commonly cited (22), this was followed by a desire to see new train station and lines (12), as well as the need to improve service frequency and reduced car usage, that were both cited eleven times.

Q9: Do you have any other comments about any part of the draft LTCP? Or do you have anything further to say about transport in Cambridgeshire and Peterborough in general?

4.1.8 Question 9 asked respondents whether they had any further comments to add, as part of the draft LTCP.



- 4.1.9 The prevailing comment here concerned the need to provide new cycle and pedestrian links (45), this was followed by the need to reduce car use (40), with several responses noting that the 15% reduction target should look to be more ambitious.
- 4.1.10 Other key issues that were mentioned more than 30 times, included a desire to see increased service frequency, as well as the need to improve rural transport services, these were both mentioned in 37 responses. A desire for new train stations and line was also cited in 36 responses, as well as the need for new bus routes (35).

4.2 Summary of email and telephone feedback

- 4.2.1 During and after the public engagement, access to a freephone telephone information line was offered to those who wished to find out more about the proposals, or to register their comments via the telephone.
- 4.2.2 The telephone number used (0808 258 3225) was in operation Monday – Friday between the hours of 9.00am and 5.30pm.
- 4.2.3 Information was given to callers where possible, and if questions were of a technical nature, these were passed on to project team members.
- 4.2.4 A freepost address was set up, 'Your LTCP,' alongside paper copies of the brochure and feedback form, which were available upon request.

5 Summary of Stakeholder Feedback

5.1 Feedback from political & community stakeholders

5.1.1 A mix of local and regional governing bodies, residents association and special interest groups submitted responses to the LTCP. Representations from these groups were broadly supportive of the overarching LTCP visions & goals including:

- West Suffolk Council
- Central Bedfordshire Council
- East Cambridgeshire District Council
- Fenland District Council
- Huntingdonshire District Council
- Cambridge City Council and South Cambridgeshire District Council
- South and East Lincolnshire Councils Partnership (Boston Borough Council, East Lindsey District Council and South Holland District Council)
- Peterborough City Council
- Willingham Parish Council
- Great and Little Eversden Parish Council
- Croxton Parish Council
- Northstowe Town Council
- Stapleford Parish Council
- Chatteris Town Council
- Barton Parish Council
- Buckden Parish Council
- Meldreth Parish Council
- Haslingfield Parish Council
- Gamlingay Parish Council
- Witchford Parish Council
- Shepreth Parish Council
- Winwick Parish Council
- Southoe and Midloe Parish council
- Bythorn and Keyston Parish Council
- Cambridge County Council
- Coton Parish Council

5.1.2 Written submissions are detailed, and stakeholders responded on a wide range of issues of relevance to them.

5.1.3 It is possible to pick out several themes that emerged throughout the written submissions:

- The LTCP should provide more clarity on how its goals and ambitions are to be realised in practise.
- A greater ambition for net zero targets should be established, including the need to reduce car usage.
- A stronger link is required between the LTCP transport plans and the development plans produced by constituent local authorities and bordering local authorities, where cross boarders transport solutions are vital.

6.1.2 Top line analysis of each of the submissions enables us to capture, at a glance, the issues across the full collection of views. Some submissions have had names redacted to preserve anonymity.

Stakeholder/Organization	Feedback Summary
Cambridge City Council and South Cambridgeshire District Council	<ul style="list-style-type: none"> • CCC and SCDC indicate broad support for the goals, objectives and vision of the LTCP but keen on greater ambition with regards to climate change. • The CCC and SCDC offer the below summary of their comments: <i>"We are strongly supportive of the overall direction of the LTCP, including its vision, goals and guiding principles, encompassing a broader range of priorities than the adopted LTP. These align with the Councils' own respective corporate priorities, the emerging Greater Cambridge Local Plan themes, and the Greater Cambridge City Deal programme. We would suggest that the LTCP could show greater ambition for the natural environment as part of providing new and enhanced transport schemes, to reflect the Combined Authority's aim of doubling nature."</i>
Cambridge County Council	<ul style="list-style-type: none"> • CCC is generally supportive of the goals and ambitions of the LTCP but would like to see more 'clear, tangible priorities.' • CCC would like to see a more ambitious net zero target, in line with the councils own Climate Change and Environment strategy. CCC also feels that the LTCP is too car-centric and would like to see a strong focus on reducing the number of cars on the roads with a robust public transport system. •
Peterborough City Council	<ul style="list-style-type: none"> • Overall, PCC indicated support for the objectives and vision of the LTCP. However, PCC felt further information could be presented on the economic benefits transport brings to the CPCA area. PCC would like to see further focus on sustainable transport, i.e., cycling and walking.
Fenland District Council	<ul style="list-style-type: none"> • FDC supported the vision of the LTCP but are concerned at the lack of concrete strategies outlining costs, phasing and funding sources, given the magnitude of transport issues in Fenland.
East Cambridgeshire District Council's	<ul style="list-style-type: none"> • ECDC offered support for the visions and goals of the LTCP, highlighting that these are in agreement with the Council's own strategies and welcoming the inclusion of connectivity in the plan. The Council highlighted a series of measures and strategies to help achieve the goals set out in the LTCP.
Huntingdonshire District Council	<ul style="list-style-type: none"> • HDC agreed with all the LTCP's visions, goals, and objectives. • HDC believes the LTCP would benefit from more detail on how specific schemes are funded and would like to see more clarity on how the objectives are to be delivered.

Cambridge City Council and South Cambridgeshire District Council	<ul style="list-style-type: none"> Cambridge City Council & SCCDC were broadly supportive of the goals and objectives of the LTCP. Cambridge City Council & SCCDC noted that they would like to see greater ambition with regards to climate strategy and the natural environment as part of providing new and enhanced transport schemes.
Office of the Police and Crime Commissioner for Cambridgeshire and Peterborough	<ul style="list-style-type: none"> The Office of the Police and Crime Commissioner for Cambridgeshire and Peterborough supported the vision of the LTCP and the ambition to create safer transport in the region, adding that further opportunities exist to increase transport safety, such as protecting cycleways with barriers and enhancing lighting and security measure at bus stops.
Chatteris Town Council	<ul style="list-style-type: none"> The CTC indicate support across the range of goals and objectives in the LTCP. The CTC offers the following feedback: <i>“Public transport will need to be greatly improved to cut car mileage in the Fens.... What is proposed for Chatteris? There has been no investment in cycling or walking, there is a poor, infrequent bus service and there is no direct access to rail stations. The Town Council would definitely support more frequent bus services, an accessibility plan and a direct bus service to Manea and March rail stations. While public transport remains so poor it will be difficult to persuade people not to use their cars.”</i>
Northstowe Town Council	<ul style="list-style-type: none"> NTC raises the following points; <ul style="list-style-type: none"> <i>“The LTCP generally said little of substance.”</i> <i>“In it there is nothing around how bus connectivity from local villages to Northstowe is being considered. Villages in general are very badly considered for public transport.”</i> <i>“CPCA should be working with Homes England on the town centre, to develop it as a hub for public transport access and reduce the number of cars clogging up Northstowe whilst improving access to the Cambridgeshire Guided Busway.”</i> <i>“Cycleway provision also needs to be well connected; this is not currently the case.”</i>

Willingham Parish Council	<ul style="list-style-type: none"> • WPC focused their response on the plan for Greater Cambridge, indicating that they strongly disagree with the plan. The WPC stated that while they believe the overall goals and objectives are excellent, they believe that the localised strategy is flawed. • The WPC stated: “<i>The only way to reduce car use in accessing work, education etc, is a much better public transport link to the Busway – either some buses leaving the busway to take in Willingham or a regular frequent feeder service – and to Cottenham. There must also be through-ticketing and lower fares. We also need new cycleways to the east to Rampton and on to the village college at Cottenham (an existing byroad could be improved), to the north to Earith and into the Fens (as part of the improvements to the B1050, or by upgrading an existing bridleway) and west to Over as there is much connectivity between Willingham and Over.</i>”
West Suffolk Council	<ul style="list-style-type: none"> • WSC would like to see a greater effort for coordination on cross boundary issues, with regards to the LTCP, given the number of rail, bus and road connections between the two authorities.
Central Bedfordshire Council	<ul style="list-style-type: none"> • CBC submitted a strategy for On-Street Parking Management, as a method to mitigate climate change and encourage more sustainable travel supporting the goals of the LTCP.
South and East Lincolnshire Councils Partnership (Boston Borough Council, East Lindsey District Council and South Holland District Council)	<ul style="list-style-type: none"> • The group would like to see more coordination on cross border transport and in areas where the CPCA’s policy can affect the group and vice versa. The group views greater coordination as a means to achieve the vision of the LTCP. • The group also submitted its route strategies Submission to Highways England to the consultation, to highlight their policies and preference for transport in the region.
Great and Little Eversden Parish Council	<ul style="list-style-type: none"> • Great and Little Eversden Parish Council indicate that they support the notion behind the objectives but believe the delivery is flawed. They also offer concerns that development will be too focused on Cambridge. • Great and Little Eversden Parish Council also voice concerns over what is described as policies “so high level to be meaningless in reality”, amongst other concerns over the delivery of the plans objectives.
Croxtton Parish Council	<ul style="list-style-type: none"> • CPC indicated that they largely agree with the goals, objectives and aspirations of the LTCP. The CPC did not agree with the goals with regards to housing, commenting “We do need to have better public transport links between towns and rural communities, but we need to preserve the character of those communities and not bespoil them within the counties ambitious housing targets.”

Stapleford Parish Council	<ul style="list-style-type: none"> • SPC indicates that they broadly agree with the goals, objectives and visions of the LTCP. However, they oppose development on greenbelt land. The SPC offers the following: <i>“building tarmac roads for buses through open countryside is the wrong solution in a climate emergency. Short term there should be a comprehensive scheme for bus priority measures on existing roads that link communities. Long term there needs to be a strategic plan for light rail.”</i>
Barton Parish Council	<ul style="list-style-type: none"> • BPC agreed with the goals, objectives and vision of the LTCP across the board. Indicating that they would like to see a greater cut in car usage than the suggested 15%. • The group offered the follow comments: <i>“Agree that transport and infrastructure needs to be addressed, but not sure if the detail is correct. Our main concern in Barton is lack of infrastructure between A428 and M11 so vehicles leak through the villages when travelling to south Cambridge.”</i> <i>“We do need to build transport before building new development. There are over 7,500 house planned for Bourne airfield and 4,500 for Cambourne West. Many travel in to Cambridge from St Neots new developments. Even with changes in work patterns with COVID, people will still need to go to hospitals (South Cambridge), travel to schools in the city, provide hospitality for tourist industry. So there will always be a need to travel into Cambridge and North and South Cambridge.”</i>
Buckden Parish Council	<ul style="list-style-type: none"> • BPC agrees with the goals, objectives and vision of the LTCP across the board. However, the BPC do note that the LTCP is light in detail in some areas and offer some suggestions for Huntingdonshire. Including footway repairs, dropped kerbs, better local connections etc.
Meldreth Parish Council	<ul style="list-style-type: none"> • MPC agree with the LTCP’s goals, objectives, and vision. The MPC did not offer additional comments beyond the basic feedback from questions.
Haslingfield Parish Council	<ul style="list-style-type: none"> • HPC agreed with all the goals, objectives, and visions of the LTCP, other than the local strategy for Cambridge and Peterborough. The HPC took serious issue with the ‘proposals for East West Rail’, arguing that there are far more appropriate alternative routes, and this proposal will do too much damage to the countryside. • HPC wanted more information on funding and financing of new infrastructure.
Gamlingay Parish Council	<ul style="list-style-type: none"> • GPC agree with the goals and vision of the LTCP, disagreeing with the local area strategies. The GPC comments: <i>“how they are applied by region/by area is less satisfactory, as it does not address huge gaps in public transport provision and access to public transport provision (bus/train/bike) in certain areas of Cambridgeshire. In fact there are huge areas with no active or relevant policies at all.”</i>

Witchford Parish Council	<ul style="list-style-type: none"> WPC indicates that they are unsure about all goal, objectives and vision of the LTCP. To explain this position the WPC commented: <i>"The Parish Council wishes to see practical results on the ground rather than more consultations and strategy documents."</i> The WPC requested a <i>"safe grade-separated crossing for pedestrians and cyclists is needed at the A10/A142 junction"</i>.
Shepreth Parish Council	<ul style="list-style-type: none"> SPC agreed with the LTCP objectives across the board. The SPC indicated that they would like to see more rural inclusion in the schemes to reduce dependency on cars.
Winwick Parish Council	<ul style="list-style-type: none"> WP agreed with all goals, objectives and vision of the LTCP, commenting only that: <i>"It is all good, but nothing much for those to the West of the A1(M)."</i>
Southoe and Midloe Parish Council	<ul style="list-style-type: none"> SMPC agreed with all goals, objectives and vision of the LTCP. SMPC offered the following comment: <i>"The A1 upgrade to modern standards would help traffic flow and new junctions are desperately needed at Southoe, Diddington and Buckden. This as safety is most important, then pollution at all these existing places is way over the acceptable limits. St Neots needs a bus station away from the Market Square."</i>
Bythorn and Keyston Parish Council	<ul style="list-style-type: none"> B&KPC commented that the A14 Junction at Keyston Bythorn, together with similar in the stretch of A14 between Titchmarsh and Ellington, is hazardous. A situation the PC would like to see rectified in any emerging transport plan. B&KPC offered several mitigation measures that could increase road safety in the area: <ol style="list-style-type: none"> Speed restrictions – to include average speed checks. Better signage – current signs simply do not warn transiting A14 traffic of the crossing hazards. Better vegetation management to improve 'line of sight'
Coton Parish Council	<ul style="list-style-type: none"> CPC recognised the importance of improved public transport but took issue with the inclusion of the C2C project as part of the LTCP, arguing that this scheme faced sizeable local opposition and alternative should be considered.

A range of bridleways associations, residents' groups and neighbourhood watch groups submitted feedback, these have been anonymised and summarised below.

Bridleways associations generally agreed with the goals and objectives of the LTCP but would have liked to have seen more consideration made for equestrians, as part of the active travel element of the objectives. These considerations include route surfacing and more of a focus on equestrian safety.

Residents' groups and neighbourhood watch associations focused on specific traffic issues in neighbourhoods, increased better walking facilities, more focus on pedestrian access and safety, including stronger consideration of pedestrians when designing roadways and paths and the reduction of HGVs along smaller roads.

Appendices

- Copy of engagement brochure
- Copy of feedback form

Comment Number	Chapter	Theme	You said	Response
1	Chapter 1	Goals	Need to ensure that recommendation that GVA being doubled isn't at the detriment of the environment or society. Trumpington suffers from impacts of this type of goal (high growth) and as a consequence has suffered loss of green belt, congestion, pollution, resources being strained, social inequality, exclusion etc. strongly recommend that the Authority's Growth Ambition Statement is reviewed and amended to ensure that it is truly sustainable in environmental and climate change terms and that in the meantime its endorsement in the LTCP is qualified.	The CPCA Growth Ambition Statement is not subject to consultation at this time and growth proposals are the responsibility of the District and City Council's as part of their Local Plan processes. Nevertheless, the LTCP supports ambitions for improving GVA and also protecting and enhancing the environment. No change required.
2	Chapter 1	Goals	Move 2050 net zero date forward	Linked to the work of WSP on the 15% reduction in car mileage and reflects the aspirations of our constituent Councils
3	Chapter 1	Goals	Level of housing proposed is too linked to economic growth/additional employment, which is out of LP process control. Mears houses are too expensive and often end up being rented, driving prices up further. Action to address these issues required.	Noted, this is primarily an issue for the local plans. No change required.
4	Chapter 1	Objectives	(Employment) Need to ensure that recommendation that GVA being doubled isn't at the detriment of the environment or society. Trumpington suffers from impacts of this type of goal (high growth) and as a consequence has suffered loss of green belt, congestion, pollution, resources being strained, social inequality, exclusion etc. strongly recommend that the Authority's Growth Ambition Statement is reviewed and amended to ensure that it is truly sustainable in environmental and climate change terms and that in the meantime its endorsement in the LTCP is qualified.	The CPCA Growth Ambition Statement is not subject to consultation at this time and growth proposals are the responsibility of the District and City Council's as part of their Local Plan processes. Nevertheless, the LTCP supports ambitions for improving GVA and also protecting and enhancing the environment. No change required.
5	Chapter 1	Goals	Bring 2050 net zero goal forward	Linked to the work of WSP on the 15% reduction in car mileage and reflects the aspirations of our constituent Councils
6	Chapter 2: Our strategy	Productivity	As per the answer for 'Goal 1' above: due to the draft LTCP's unquestioning acceptance of the target set in its Growth Ambition Statement. Please refer to our answer above to Question 3, Goal 1: Productivity. Without further rigorous assessment and consequent amendment, TRA believe that the Growth Ambition Statement's target is not compatible with the environment and climate change goals integral to the effective delivery of the transport strategy.	The CPCA Growth Ambition Statement is not subject to consultation at this time and growth proposals are the responsibility of the District and City Council's as part of their Local Plan processes. Nevertheless, the LTCP supports ambitions for improving GVA and also protecting and enhancing the environment. No change required.
7	Chapter 2: Our strategy	Targets and indicators	Support 15% traffic reduction in Cams and Peterborough - but should be 25% in Greater Cambridge as per GCP targets	LTCP supports 15% reduction across the CPCA area. Will work with partners, inc. GCP, to add detail s to how/what targets should be locally. These will likely form part of local strategies.
8	Chapter 3: Greater Cambridge	Bus	Support the proposals in the LTCP for Greater Cambridge, particularly City Access etc. but want these measures to happen more quickly. Issues are present and real in Trumpington already. Need relief now. Too much delay so far.	Support noted. The GCP are progressing the Making Connections scheme and a large consultation is running during Autumn 2022. In order to allow due processes to be completed, should the scheme get approval then improvements to bus services could begin from mid-2023 followed by lower fares in 2024. The charging zone would only be introduced after improvements have been made to the bus network and could be phased in over a period of time. No change to plan.
9	Chapter 3: Greater Cambridge	Active Travel	Walking doesn't seem to get afforded the same priority in the LTCP as cycling	Walking is at the top of the hierarchy of modes within the LTCP. No change
10	Chapter 3: Greater Cambridge	Bus	No recognition in the LTCP of the Cambridge South West Travel Hub (CSWTH) as the fifth segregated transport corridor planned by the GCP. [Pages 16, 29, 30 & 32 of the draft LTCP which refer to "four segregated corridor schemes"]. Please rectify this.	The south west travel hub won't be segregated in the same way that the other four corridors are, hence the reference to four segregated corridors. No change to plan.
11	Chapter 3: Greater Cambridge	Rail	Request references to EWR removed from the proposed Greater Cambridge Local Area Strategy. It is not affordable or deliverable and is environmentally very damaging in number of ways.	EWR remains an important scheme to improve sustainable transport connectivity to our region and is supported by the CPCA. The CPCA will continue to closely engage with the EWR Co. as the scheme is progressed to ensure that the needs of our area are fully considered. No change to plan.
12	Chapter 5: Monitoring and performance	Targets and indicators	Improvements are required on the monitoring of the plan. Feels preliminary at the moment.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
13	Chapter 5: Monitoring and performance	Targets and indicators	Productivity' only has one indicator and three targets - additions to which should include bus reliability, timeliness / delay and affordability.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
14	Chapter 1	Climate	Climate Change and Environment where additions should include targets recommended by the Independent Commission on Climate (pages 10&11), the percentage of zero emission buses and taxis, exclusion of diesel vans and trucks from urban centres by 2030 (page 25) and levels of toxic particle pollution	Noted. WSP work to help answer this. Targets and indicators to align with the work of WSP
15	Chapter 1	Safety	Safety has no targets, not even the Road Safety Partnership's Zero Strategy target - all the casualty measures being under indicators	Safety section to be improved in our strategy section. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
16	Chapter 1	Health	Health does not appear to include reductions in the number of early deaths attributable to air pollution which is prominent in the evidence sections - unless this is the same as "% of deaths attributed to air pollution"	% of deaths attributed to air pollution is the same as early deaths attributed to air pollution
17	Chapter 1	Active Travel	No walking indicators or targets?	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies. An active travel strategy is being developed separately and any active travel indicators and targets will need to be consistent across both strategies.
18	Chapter 1	Evidence	One way to tackle this is to use monitoring of performance to help turn the Authority outwards through a wide-ranging set of measures and the engagement of a Citizens' Assembly, or a succession of them over time, to participate in the development and monitoring of performance measures which emphasize outcomes rather than inputs and processes, and are not fearful of including dependent performers. We recommend this approach to the Combined Authority, recognizing that it goes wider than the Transport & Connectivity Plan alone.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
19	Chapter 1	Climate	Place climate change as an overarching goal	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
20	Chapter 1	Goals	LTCP should give details of how car mileage will be reduced and the balance of reduction across districts and cities	LTCP supports 15% reduction across the CPCA area. Will work with partners, inc. GCP, to add detail s to how/what targets should be locally. These will likely form part of local strategies.
21	Chapter 1	Active Travel	LTCP should use avoid-shift-improve model to put journey reduction and active travel at top of hierarchy	Active travel is at the top of the hierarchy
22	Chapter 1	Climate	LTCP should set out how it will implement all recommendations from CPCC (note - may need to expand to include points?)	WSP work looking at this

23	Chapter 1	Active Travel	LTCP must have increasing levels of active travel as core objective with 20% of budget spent on cycling walking	Noted. Active travel is intended to be front and centre of this LTCP
24	Chapter 2: Our strategy	Active Travel	Some of detail on active travel has disappeared from last LTP	Much of the detail for Active Travel will be contained within child docs such as LCWIP and the AT Strategy
25	Chapter 1	Active Travel	Active travel should be strongly and clearly stated in the LTCP's vision	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
26	Chapter 4: Policies	Active Travel	active travel should be strong theme throughout document and including the district schemes	Active travel is at the top of the hierarchy and plays a big part in the LTCP. Each district section being updated to reflect importance of AT
27	Chapter 1	Active Travel	20% of transport budget should be spent on active travel, include targets and timelines for low cost priority schemes eg low traffic neighbourhoods and school streets in every district	Noted. LTCP won't be stating spending and budget priorities in such detail
28	Chapter 2: Our strategy	Active Travel	Programme of low cost experimental transport schemes trialled is part of active travel strategy for LTCP, across districts	Noted
29	Chapter 4: Policies	Policies	LTCP contains no specific policies, just policy themes - contrary to DfT guidance	Any new policies will form part of a child doc to the LTCP and therefore be subject to a separate consultation. The suite of documents includes policies, such as the digital policy that has been developed. The LTCP will align with the revised LTP guidance (mapping will be undertaken and evidence provided). Current suite of policies remain as previously agreed and adopted - any changes or new policies will be appropriately consulted on
30	Chapter 2: Our strategy	Active Travel	Behaviour change will be an important part of the transition to a sustainable transport system (comments on consultation approach taken)	Behaviour change is important, agreed. To be included as a separate section within the 'our strategy' chapter
31	Chapter 1	Targets and indicators	The overall strategy of the LTCP should apply to all areas, with targets and schemes adjusted as appropriate for districts	Noted
32	Chapter 1	Active Travel	Increasing number of children who actively travel to school should be target for all districts	Noted
33	Chapter 2: Our strategy	Related documents	LCWIP and BSP should be used to guide measures in each district to achieve modal shift, restrictions on motor vehicle access will be needed.	Noted. Child docs like these are intended to do this
34	Chapter 5: Monitoring and performance	Targets and indicators	LTCP must include specific goals, measures of success and trigger points for a review of the strategy or specific schemes	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
35	Chapter 3: East Cambs	Goals	Mention of 15% car mile reduction but no indication how this will be achieved. Makes suggestions for for other schemes to be included.	The document refers to the various measures which will assist in achieving the target of a 15% reduction
36	Chapter 1	Goals	Strategy and approach needs to follow user hierarchy.	Noted. LTCP does this
37	Chapter 2: Our strategy	Highways	Too much reference to capacity improvements to improve congestion and journey times, will induce more traffic	Noted. Road capacity improvements are at the bottom of the hierarchy and only proposed where no credible alternative is available. Where they are proposed, concurrent AT and PT measures will be delivered alongside them
38	Chapter 3: Greater Cambridge	Active Travel	GCP recognised but great need to deliver faster action through school streets, low traffic neighbourhoods and experimental schemes. Aim should be to rapidly reallocate roadspace to active travel and public transport	Noted. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf)
39	Chapter 3: Greater Cambridge	Active Travel	Links needed between Greenways and should be planned in now	Noted. AT strategy and LCWIP intended to fill these blanks
40	Chapter 3: Hunts	Active Travel	All green links removed from map since previous LTP. Too much use of active travel as an add-on to capacity schemes. Needs more detail on high quality active travel infrastructure	Cycling schemes of the appropriate size and stature to be added to major schemes map.
41	Chapter 3: Peterborough	Active Travel	Some conflict between aspirations eg design for increasing vehicle flow likely to create adverse conditions for active travel	Noted. User hierarchy places active travel higher than cars. Local sections and child docs to cover specific schemes and any interface between modes
42	Chapter 3: Greater Cambridge	Bus	Willingham been left off of major bus routes. CGB too far (1.5miles) so people drive as distance excludes elderly and vulnerable. Buses that do stop in the village are irregular and expensive.	Noted. GCP looking into improved bus provision in Gr Cambridge area. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf)
43	Chapter 3: Greater Cambridge	Bus	Suggestions: shuttle buses to Longstanton, one of CGB buses comes off guideway and goes through Willingham and Over; and happy to help with other ideas and suggestions	Noted. GCP looking into improved bus provision in Gr Cambridge area. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf)
44	Chapter 1	Vision	Overall support for direction of the LTCP and vision for decarbonising, overcoming barriers to travel, supporting economy and improving health and well being	Support noted.
45	Chapter 3: Hunts	Micromobility	To support sustainable growth in the area, it needs to be connected to all modes of travel such HQPT, active travel routes etc. and be future proofed for new and emerging modes	Noted

46	Chapter 3: Hunts	Highways	An area overlooked in the LTCP is connecting the market towns in Hunts: St Neots, St Ives and Huntingdon. Should be a focus on using existing and proposed new infrastructure to connect these towns to help mode switch, which can radiate out to Ramsey and rest of District.	Noted. Local strategy and BSP to look at more local PT connectivity.
47	Chapter 3: Hunts	Bus	Ways of achieving the above is reallocation of road space in numerous areas: along the A1307 between A14 junction 24 and Huntingdon and on the A141 around the northern arc of Huntingdon. Putting active modes and then PT first in these instances could help Climate Change Commission goals and unlock growth.	Noted. The local strategy will consider individual schemes for Hunts
48	Chapter 3: Hunts	Active Travel	Support the delivery of mobility hubs and multi-modal interchanges to help ensure that active and sustainable modes of transport become the natural choice for local journeys.	Support noted.
49	Chapter 3: Hunts	Bus	Note that a new location for the bus station is being sought within Huntingdon, they are concerned that a golden opportunity to co-locate the bus and rail services outside the rail station has been missed which could have significant repercussions for years to come, in relation to the public's perception of the importance of modal shift and the climate change targets. We therefore encourage the Combined Authority to reassess this opportunity in light of our suggestion to reallocate road space on the A1307, to ensure that the decisions which are taken now do not stifle opportunities further down the line.	The LTCP strongly supports the promotion of modal interchange improvements, especially between key modes such as bus and rail. The CPCA will work with HDC in their role as planning authority and the County Council as highways authority to investigate the best possible locations for a new bus station. The role of the Hunts local strategy and the BSP will be key in this too. No change to current LTCP required.
50	Chapter 3: Fenland	Cross border issues	Wisbech is in a pocket of Cambridgeshire which is surrounded by Norfolk and Lincolnshire. Many of the villages bordering on Wisbech look to it as their nearest market town. Any plans to improve connectivity need to involve the neighbouring authorities	Agree. Fenland section to be strengthened on this to inc. links to Norfolk and Lincs, and partnership working in general.
51	Chapter 3: Fenland	Climate	Making the link between the various elements in your proposal and climate change is a big ask.	Noted
52	Chapter 3: Fenland	Safety	20mph zones for safety of pedestrians and cyclists would be a good idea and help switch away from cars, particularly an issue with school traffic	Noted. LTCP placing heavy focus on safety and 'vision zero'. low speed neighbourhoods a part of this. Safer section to be strengthened in 'our strategy' section. No change to local section.
53	Chapter 3: Fenland	Active Travel	Wisbech market place is currently undergoing a makeover which will make it largely traffic free. Attention needs to be devoted to taking this opportunity to making signage of Sustrans route 1 more intelligible. We need to capitalise on the fact that a major national cycle route passes through the centre of town and into Norfolk. Opportunity to enhance this route too	Noted and agreed. Fenland local strategy and the Active Travel strategy to pick this up.
54	Chapter 3: Fenland	Active Travel	Promote cycling tourism	Noted and agreed. Add wording in Fenland section or in main strategy (AT section?) which promotes this
55	Chapter 1	Vision	We support the statement that the Vision will be achieved by investing in a 'properly joined up, net zero carbon transport system'. We agree that planning for a net zero carbon future should be integral to the LTCP and should emphasise the importance of effective use of spatial planning and place based solutions in achieving this. Every opportunity should be taken to integrate spatial planning and transport planning	Support noted
56	Chapter 1	Vision	Support these in general, but there needs to be a clear mechanism in place to ensure that individual projects do deliver on the goals and objectives of the LTCP. At present it is unclear how this will be secured. We would expect that planning applications that are made to bring forward transport projects that are identified in the LTCP will need to clearly demonstrate that they deliver against the LTCP's Vision and achieve the LTCP's goals and objectives.	General support noted. Individual projects will be assessed on a case by case basis and will be required to follow LTCP policy direction
57	Chapter 1	Public Realm	Support place making and public realm as a key guiding principle. Especially support 20 min neighbourhoods. Should apply this principle to each proposal within the LTCP - a particular opportunity in the proposed travel hubs such as Foxton.	Support noted.
58	Chapter 5: Monitoring and performance	Targets and indicators	Support integration of spatial planning and transport - especially in carbon and climate and safety goals	Support noted.
59	Chapter 3: Greater Cambridge	Bus	Support the principle of the Foxton Travel Hub, and support its inclusion in the LTCP, however we have concerns that the current approach to its delivery is demonstrably falling significantly short of achieving the goals and objectives of the LTCP, the draft LTCP should be strengthened to ensure that the delivery of identified projects are indeed achieving the ambitious goals and objectives that it has set out. There needs to be a clear mechanism to ensure that the laudable aims presented in the draft LTCP do not become empty rhetoric.	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com) . No change to plan.
60	Chapter 3: Greater Cambridge	Interchange	Submitted alternative proposals for Foxton Travel Hub to GCP. LTCP should scrutinise all proposals included including Foxton Travel Hub and help steer to more innovative proposals	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com) . No change to plan.
61	Chapter 3: Greater Cambridge	Rail	LTCP should inc. more on closing level crossings which improve safety and reduce congestion - Foxton prime example of this	Noted. Level crossings are primarily a Network Rail issue. LTCP supports safety improvements across network and will work with NR where required.
62	Chapter 3: Greater Cambridge	Related documents	LTCP should align with GC Local Plan emerging strategy	Noted. Already does this.
63	Chapter 1	Safety	Strongly support. Safer routes and more reliable and efficient PT would aid more walking, cycling and PT	Support noted.
64	Chapter 3: Greater Cambridge	Specific scheme	Strong support for inclusion of Cambridge South Station but may be underspecified for potential passenger numbers. Also concern for ped and cycle safety at eastern access due to numbers of taxis, buses and vehicles	Support noted. This scheme is being progressed by Network Rail and a Public Inquiry was held in summer 2022. It is anticipated that a decision could be received by the Secretary of State by the end of 2022. The CPCA will continue to work with Network Rail and other partners as more detailed plans are forthcoming. No change to plan.
65	Chapter 3: Greater Cambridge	Specific scheme	East West Rail - should go where it serves planned development. Not much planned in this area.	East West Rail is being progressed by the EWR Co. The route has been selected based on a range of criteria. This is a key scheme to improve sustainable connectivity to our region and the CPCA will continue to engage closely with the EWR Co as the scheme progresses. No change to plan.
66	Chapter 3: Greater Cambridge	Specific scheme	Support Melbourn Greenway but should go further and link all villages on A10(s) corridor.	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com) . There will be an opportunity for further links to be explored through the forthcoming refresh of the Transport Strategy for Cambridge and South Cambridgeshire. No change to plan.
67	Chapter 3: Greater Cambridge	Rail	LTCP needs to focus on all 3 stations in area and not just Foxton (via GCP's travel hub). Community Rail Partnership published a Local Rail improvements plan in 2020 which contains proposals.	Comment noted. Make greater reference in the Greater Cambridge section to importance of the rural stations in South Cams. Make reference to the MSF CRP and signpost to rail improvements plan.
68	Chapter 3: Greater Cambridge	Rail	LTCP should recognise access issues at all 3 rural stations and address these in similar way to Fenland Stations Regeneration Scheme	Comment noted. Make greater reference in the Greater Cambridge section to importance of the rural stations in South Cams. Make reference to the MSF CRP and signpost to rail improvements plan.

69	Chapter 3: Greater Cambridge	Rail	Should restore weekday semi-fast services to London and half-hourly weekend services	Comment noted. The CPCA will continue to lobby the TOCs to press for more regular services to serve the needs of the rural stations. Also amend text to make reference in a new general section on partnership working.
70	Chapter 3: Greater Cambridge	Rail	Foxton (INC. Travel Hub): support principal of it but question scale of development and access to station. Should inc. options for extending platform (8 car trains), widening platforms, ticket machines on Cambridge side and improving footpath to station from the village (compete with lighting and paving etc.)	Comment noted. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
71	Chapter 3: Greater Cambridge	Rail	Shepreth: improve capacity on north side, inc. cycle parking, step free access between platforms, refurb station building, extend platform (8 car trains).	Comment noted. Amend wording in Greater Cambridge section to acknowledge improvements needed at station. The refresh of the Transport Strategy for Cambridge and South Cambridgeshire will be the more appropriate place for more detail. The CPCA will continue to work with Network Rail to press for improvements to local stations.
72	Chapter 3: Greater Cambridge	Rail	Meldreth: provide step free ramp to Melbourn footpath, step free access between platforms and extend platforms.	Comment noted. Amend wording in Greater Cambridge section to acknowledge improvements needed at station. The refresh of the Transport Strategy for Cambridge and South Cambridgeshire will be the more appropriate place for more detail. The CPCA will continue to work with Network Rail to press for improvements to local stations.
73	Chapter 3: Hunts	Specific scheme	The Combined Authority supports improvements to the A1 corridor to be delivered by National Highways. Vistry consider that any schemes should consider all modes.	Noted
74	Chapter 3: Hunts	Specific scheme	A14 improvements relieved a major bottleneck on the SRN between Cambridge and P'boro. Removal of traffic from Hunts viaduct also improved environment in town	Noted
75	Chapter 3: Hunts	Highways	CPCA currently bidding for National Highways Legacy Funds to support a Highways Academy in Huntingdonshire. This should reduce barrier to those wishing to access education - something the CPCA recognises as a key issue	Noted.
76	Chapter 3: Hunts	EV and alternate fuels	More rollout of EV charging points in rural Hunts req. as currently well below national average.	Noted. EV and alternative fuels strategy/policy to follow
77	Chapter 3: Hunts	Active Travel	recognise that Huntingdon already boasts connected, dedicated, high-quality walking and cycling infrastructure, but this should be extended to promote the use of active modes.	Noted. Additional detail on A1 in local section
78	Chapter 3: Hunts	Bus	There should be a more comprehensive bus network strategy focussing on core inter-urban routes including Huntingdon.	Noted. BSP to cover bus routing in local areas
79	Chapter 3: Hunts	Micromobility	Focus on Mobility as a Service (MaaS) to promote alternative modes such as e-scooters and e-bikes where the user can access the service digitally.	Noted. Micromobility policy to follow.
80	Chapter 3: Hunts	Bus	LTPC should focus on Demand Responsive Transport (DRT) in rural areas, such as the Stagecoach TING service currently being trialled in west Huntingdonshire. This service employs four small single deck buses from Stagecoach East to provide bus services on demand across 360km2 of the region. Passenger levels have continued to increase significantly, and as a result the six-month trial has been extended for a further three months, with the potential for a revised service to commence in July 2022	Noted. Local section to be amended to emphasise rural PT requirements
81	Chapter 3: Hunts	Specific scheme	Sustainable alternative travel modes will be key to Huntingdonshire however the need remains to invest in targeted highway networks, such as the A141 and St Ives Improvements that will address issues for all users (including active travel and public transport users). The A141 and St Ives Improvements project will be accelerated to reduce congestion and improve reliability across the study area to facilitate sustainable growth, improve public realm, as well as connectivity through active travel modes, walking and cycling.	CPCA committed to developing A141 to OBC and to deliver project as part of long term plan
82	Chapter 3: Hunts	Highways	There is a need to invest in targeted highway networks, particularly the A141 corridor, and this should address issues for all users including active travel and public transport users. A greater emphasis on how active travel modes can be supported in highway improvements is required.	CPCA committed to developing A141 to OBC and to deliver project as part of long term plan
83	Chapter 3: Hunts	Evidence	We note the various constraints identified for Huntingdonshire.	Noted
84	Chapter 1	Active Travel	Whilst road space re-allocation is briefly mentioned, we would suggest that a more serious proposal is provided to deliver the hard choices around reducing private car use for the existing communities.	Noted
85	Chapter 2: Our strategy	Specific scheme	More explicit support for the East West rail project to provide a strong evidence base to Government – reinforcing the Region wide support for the project given current the challenges to the project.	East West Rail is being progressed by the EWR Co. The route has been selected based on a range of criteria. This is a key scheme to improve sustainable connectivity to our region and the CPCA will continue to engage closely with the EWR Co as the scheme progresses.
86	Chapter 3: Greater Cambridge	Productivity	To help facilitate the growth there should be more focus on how cross city (n/s / e-w) transport corridors are delivered to facilitate this spatial vision.	GCP are looking at proposals for this type of thing. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
87	Chapter 3: Greater Cambridge	Productivity	May be a need to use public funds to help facilitate infrastructure, e.g. by purchasing land	Noted. This is an option to CPCA as transport authority and CCC as highways authority already.
88	Chapter 3: Greater Cambridge	Productivity	It would be useful to see more detail in the Plan on the expected funding proposals behind the initiatives outlined - to demonstrate the funding assumptions behind them and to provide robustness and credibility to the Plan. Willingness to be involved in process of reviewing and exploring funding options	Noted. Delivery plan and local strategies to focus more on funding and delivery
89	Chapter 3: Greater Cambridge	EV and alternate fuels	Innovations in new transport modes, transport tech and fuels are moving very quickly, and we would suggest more focus on this to guarantee the Plan is forward looking and future proofed.	Noted. Further policy and detail on alternative fuels and EV to follow
90	Introduction	Partnership	1.Unclear CPCA, Local Authorities (LAs), Department for Transport (DfT) roles in delivering the LTPC	CPCA are responsible for delivering this LTPC. DfT sets guidance on LTP's. Other LA's are partners and consultees
91	Chapter 1	Objectives	Mismatch in priorities. Key objectives around the environment, air quality and climate change are at odds with the funded/approved schemes on A-roads but vague	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required to these.

92	Chapter 1	Climate	In the current LTCP there is no detail on specific measures targeted at reducing emissions from LGVs and HGVs: no clear plan on how to coordinate efforts local to national, nor who decides which are the priorities when funding becomes available. If there is a real drive for alternative fuelled LGVs and HGVs, then careful planning needs to be designed to allow space for hydrogen refuelling stations for hydrogen fuel cell electric vehicles, or new multi-user logistics depots in central urban areas and mobile city hubs and micro-consolidation distribution centres (where smaller couriers collect their parcels from mobile hubs and then make deliveries using bicycles, or on foot).	Noted. The section on freight (and HGV/LGV) will be updated in the our strategy section. This will include promoting alternative fuels (and modes) for movement of goods where possible. In terms of emissions, the WSP work is investigating how carbon and traffic reduction can be better assessed within the LTCP
93	Chapter 5: Monitoring and performance	Targets and indicators	No clear policies to drive reduction in private car mileage: Whilst there is a mention of reducing car usage by 15% in the region in line with the recommendations from the Independent Climate Commission, there is no articulated plan on how the CPCA or IAs could drive this reduction in car usage.	WSP work looking at the impact of the various major schemes. Local strategies, delivery plan (to follow) and child docs will add detail on how schemes, policies and aims can be delivered.
94	Chapter 3: Greater Cambridge	Connectivity	Urge the CPCA to ensure the LTCP acknowledge and put in place the policy hooks for enhanced and potentially segregated cross city connectivity within which we can then look to develop our proposals further with partners.	GCP are looking at various schemes for Greater Cambridge. This and the local strategy will include detail on specific movements and proposals for Cambridge. LTCP strongly supports GCP programme of works and proposals that will emerge through the updated local strategies.
95	Chapter 3: Greater Cambridge	Suggested scheme	Suggest wording that better reflects the following potential options is included: A northeast orbital connection which connects Cambridge East to the Cambridge Northern Fringe Area. The route would connect from a relocated Newmarket Road P&R to a point in the northern fringe having bridged the River Cam and the railway corridor and would connect into the existing St Ives to Cambridge Busway and the proposed Waterbeach to Cambridge public transport corridor	GCP are looking at various schemes for Gr Cambridge. This and the local strategy will include detail on specific movements and proposals for Cambridge. LTCP strongly supports GCP programme of works and proposals that will emerge through the updated local strategies
96	Chapter 3: Greater Cambridge	Rail	Suggest wording that better reflects the following potential options is included: A southern route from Cambridge East to the southern busway network via Davey Road and the Clifton Industrial Estate. At the western end of Davey Road the public transport route could provide access to a new eastern access into Cambridge Railway Station delivered in combination with the new island platforms needed to support east West Rail.	GCP are looking at various schemes for Gr Cambridge. This and the local strategy will include detail on specific movements and proposals for Cambridge. LTCP strongly supports GCP programme of works and proposals that will emerge through the updated local strategies
97	Chapter 3: Greater Cambridge	Related documents	Support reference to Cambourne to Cambridge Better Public Transport and Active Travel Project, as well as specific reference to Scotland Farm in providing a new Travel Hub	support noted
98	Chapter 3: Fenland	Bus	Improvements in public transport around our start and finish times (7.30-8am & 4.30-4.45pm) along with improved public transport in the evenings and weekends for leisure purposes would provide an incentive for current and / or future employee's. Improvements in weekday daytime services would also help customers / suppliers who are wishing to utilise public transport.	Noted and agreed. Covered by changes to Fenland section. Additional detail, more sub headings to bring out key points.
99	Chapter 3: Fenland	Bus	Having rapid, predictable public transport to local train stations such as March and/or Ely that are timed to coincide with train timetables would also help particularly in early mornings, late afternoon, evenings and weekends. Improvements to more frequent, earlier and later trains from Manea station along with a connection from Chatteris to Manea would also be helpful.	Noted and agreed. Covered by changes to Fenland section. Additional detail, more sub headings to bring out key points.
100	Chapter 3: Fenland	Bus	Accessibility to the North Cambridgeshire Training Centre via regular public transport is going to be significant in our impact to improving local skills within Fenland and the surrounding areas. Learners from Chatteris will be able to cycle or walk to the centre to attend their training classes but there is currently a lack of transport options from outside of the town. With a large proportion of our learners being 16-18, many are unable to drive or afford to own and run their own vehicle in the current cost of living and therefore they rely heavily on the public transport sector to access their education, and even workplace.	Noted and agreed. Covered by changes to Fenland section. Additional detail, more sub headings to bring out key points.
101	Chapter 3: Fenland	Highways	A range of agricultural vehicles are required on farm and need to use roads to access property (both land and buildings) in a range of locations which are often isolated. There can be peaks and troughs in the use of these vehicles and their access requirements. Road schemes must allow for practical access along their entire length for permitted road vehicles, including agricultural vehicles.	Noted and agreed. Local design for road schemes to deal with this on a case by case basis.
102	Chapter 3: Fenland	Bus	Transport links also help to ensure employees can access work opportunities and reduce social and economic isolation which can be particularly acute in rural areas. Those working on farms, orchards, glass houses, pack houses, or in the supply chain, can live in a variety of locations from on farm, to local villages and towns, or travel in for seasonal work. The families of workers who live in rural areas need sustainable access options too. Rural isolation can lead to a range of associated issues including poor mental health and wellbeing, as well as lower skills and education attainment levels.	Noted and agreed. Covered by changes to Fenland section. Additional detail, more sub headings to bring out key points. Inc. social inclusion attainment levels.
103	Chapter 3: Fenland	Productivity	The strategy needs to consider the long term needs of the region, including potential population growth, as well as integrate the requirements determined by policies from national government departments.	Noted and agreed. No change required. LTP looks long term and is aligned with local growth and national policy
104	Chapter 1	Goals	Supports CPCA's encouragement of integrated planning approaches for guiding the investment in transport infrastructure	support noted
105	Chapter 1	Vision	The CPCA should go further in this LTCP to emphasise the importance of a fully integrated, high quality, reliable, convenient, affordable, safe and accessible transport network for all. The LTCP should acknowledge the need to ensure growth is focused around high quality transport corridors, which is referenced in the body of the document but not specifically within the vision, goals or objectives.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required to these.
106	Chapter 4: Policies	Targets and indicators	Welcome the proposal to reduce vehicle miles but in order for this to be realised infrastructure such as park and ride, must be properly and appropriately considered before plans are taken forward to deliver it.	Noted
107	Chapter 3: Greater Cambridge	Specific scheme	Significant concerns that the proposed siting of park and ride at Scotland Farm is not best placed to deliver either a travel hub, or to intercept vehicle traffic as best it can. Thus, the current proposals of the GCP are not aligned to the aspirations of this LTCP and should be revised accordingly.	Comment noted. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets/library/about/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cms.uk.com)
108	Chapter 3: Greater Cambridge	Related documents	Welcome the reference in the Plan to the emerging Local Plans for Cambridgeshire and South Cambridgeshire which seek to define the development needs for homes and jobs to 2041.	Noted
109	Chapter 3: Greater Cambridge	Bus	Support proposals for integrated travel hubs which combine multiple modes with park and ride to offer viable alternatives to the private car and can truly facilitate sustainable housing and employment growth.	Support noted
110	Chapter 3: Greater Cambridge	Specific scheme	LTCP does not accord with the current approach being undertaken by the GCP towards park and ride associated with C2C, which is instead pushing delivery of park and ride at Scotland Farm in respect of C2C east of Cambourne, in a location that offers an inferior and less connected alternative to that promoted by MGH at Land North of Cambourne.	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets/library/about/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cms.uk.com)
111	Chapter 1	Highways	Supportive of the LTCP, views all existing projects and look forward to collaboration on projects within Cambridgeshire and all Highway matters relating to the Strategic Road Network	Support noted
112	Chapter 2: Our strategy	Cross border issues	Lincolnshire is not mentioned at all. Spalding is mentioned just once, and Lincoln and Boston are not mentioned at all. Other counties, cities and towns are mentioned.	Noted. Fenland and Peterborough local section to be updated to inc. importance of Lincolnshire as travel location to/from Fenland. Also proposed is more clear statement on partnership working with neighbouring authorities. Statement on neighbouring authorities priorities to be added too, without specific reference to schemes
113	Chapter 3: Fenland	Cross border issues	The LTCP needs to clearly recognise how important transport connectivity between Peterborough and Fenland to South East Lincolnshire is to both areas. We are concerned that the current draft LTCP does not reflect the importance of connectivity to Lincolnshire and the 'on the ground' reality and functional economic geography, with South East Lincolnshire being one of the main trading partners for Peterborough and Fenland.	Noted. Fenland and Peterborough local section to be updated to inc. importance of Lincolnshire as travel location to/from Fenland. Also proposed is more clear statement on partnership working with neighbouring authorities. Statement on neighbouring authorities priorities to be added too, without specific reference to schemes
114	Chapter 3: Fenland	Cross border issues	The current draft Cambridgeshire and Peterborough LTCP focuses heavily on links to other areas within the sub-national transport body area in which CPCA sits (EHE) and also to Norfolk and Suffolk (Transport East), but this does not fully reflect the needs of Peterborough, Fenland and the areas they interact with in South East Lincolnshire. It is vital for CPCA and South East Lincolnshire to work together to ensure that the transport needs in this area informs all three sub-national transport plans.	Noted. Fenland and Peterborough local section to be updated to inc. importance of Lincolnshire as travel location to/from Fenland. Also proposed is more clear statement on partnership working with neighbouring authorities. Statement on neighbouring authorities priorities to be added too, without specific reference to schemes

115	Chapter 3: Peterborough	Cross border issues	South East Lincolnshire proposes that two key routes are added to the A47 route study area to reflect the way in which this route supports the economy of South East Lincolnshire in addition to Cambridgeshire and Peterborough. The Eye (Peterborough) to Boston section of the A16 to encompass this key route for the food industry; link to the Port of Boston and its growth; and to address congestion on the A16/A47 junction. This would build on the current proposals for the A16/A47 Norwood junction as recognised in the LTCP. The A17/A16 corridors which connect with and interact with Fenland and Peterborough via the A1101 to Wisbech and the A17/A47 at Kings Lynn (as well as the A16).	Noted Fenland and Peterborough local section to be updated to inc. importance of Lincolnshire as travel location to/from Fenland. Also proposed is more clear statement on partnership working with neighbouring authorities. Statement on neighbouring authorities priorities to be added too, without specific reference to schemes
116	Chapter 3: Peterborough	Rail	Peterborough is the hub through which the rail lines which serve Spalding, Boston and Skegness primarily connect to the national rail network. This route is important for freight (especially for the Port of Boston), access to services, travel to work and supports our ambitions, as reflected in the Boston and Skegness Town Deals, to make more use of rail connectivity to support sustainable growth of the East Coast visitor economy. We would welcome a conversation with CPCA on how we can use continued economic growth in South East Lincolnshire to support the case to Network Rail for investment in these routes for rail freight and passengers.	Noted. CPCA to carry out dialogue with SELC
117	Chapter 3: Peterborough	Highways	South East Lincolnshire is pleased to see the reference in 3.24 to dualing the route between Spalding and Horwood and is keen to work with CPCA to make the case for this. Any dualing on the A16 must go at least as far as Spalding, but we would argue for this study to look at options to dual all the way to Boston.	Noted Fenland and Peterborough local section to be updated to inc. importance of Lincolnshire as travel location to/from Fenland. Also proposed is more clear statement on partnership working with neighbouring authorities. Statement on neighbouring authorities priorities to be added too, without specific reference to schemes
118	Chapter 3: Peterborough	Cross border issues	As well as an increase in commuting trips originating in areas to the West of Peterborough, continued and planned growth in South East Lincolnshire will create increased travel to work flows between Peterborough and South East Lincolnshire which need to be reflected in this part of the LTCP.	Noted Fenland and Peterborough local section to be updated to inc. importance of Lincolnshire as travel location to/from Fenland. Also proposed is more clear statement on partnership working with neighbouring authorities. Statement on neighbouring authorities priorities to be added too, without specific reference to schemes
119	Chapter 3: Peterborough	Specific scheme	Can we also please note that the map on page 47 does not have the A16 on it, instead referring to the A1073 which was replaced with the new A16 in 2011 - this clearly needs to be rectified.	Noted. Update as appropriate
120	Chapter 3: Peterborough	Specific scheme	South East Lincolnshire endorses these assessments of the strategic importance of the A47 to the area, but all of these statements fail to recognise that the A47 corridor is also critical to South East Lincolnshire, which accesses the A47 via the A1175 and A15 to the north of Peterborough; the A16 at Eye; the A1101 at Wisbech; and, the A17 at Kings Lynn. The case for dualing of the A47, particularly from the A1 at Wansford to Peterborough and from Peterborough to Walton Highway near Wisbech, would be significantly strengthened by working with South East Lincolnshire to make the existing and future economic growth case.	Noted Fenland and Peterborough local section to be updated to inc. importance of Lincolnshire as travel location to/from Fenland. Also proposed is more clear statement on partnership working with neighbouring authorities. Statement on neighbouring authorities priorities to be added too, without specific reference to schemes
121	Chapter 2: Our strategy	EV and alternate fuels	The plan is successfully in line with the UK's goal reaching net zero by 2050. A key factor which must be considered is the rise in electric vehicles, to sustainably plan for the future it is essential to build on the EV infrastructure, especially in rural communities.	noted
122	Chapter 2: Our strategy	Freight	Although the draft report has extensive goals and aims, it is important that the final version of the plan considers neighbouring authorities and how the LTCP can work with them. This is essential for both the movement of passengers and freight which will be essential for connecting the East of England region as a whole to the rest of the UK.	Noted. It is proposed (that a more clear statement on partnership working with neighbouring authorities is made within 'our strategy' section.
123	Chapter 1	Partnership	Urge the CA to work with others in the wider East region on this objective	Noted. Commitment to more partnership working
124	Chapter 1	Goals	Support this LTCP and agree with the objectives and goals set out	Support noted
125	Chapter 1	Active Travel	Concerned about the change of surfacing rendering many paths unsuitable for trotting and cantering, would prefer that they aren't tarmacked over for cyclists. Environmental benefits to retaining soft surfaces	Noted. Active Travel strategy and ROWIP have key role in individual schemes and routes. LTCP is clear equestrians remain an important mode of travel that should be catered for.
126	Chapter 1	Targets and indicators	Ask that qualitative information is also considered as well as surveys	Noted. Active travel strategy is clear that each scheme is looked at on a case by case basis and qualitative evidence will be welcomed at this time.
127	Chapter 3: Greater Cambridge	Suggested scheme	We think that the long-term future of transport around Cambridge should be based on a network of light rail lines supported by bus services.	CPCA has a range of proposals looking at future transport around Cambridge. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets/libraries/Assurance/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cms.uk.com). No change.
128	Chapter 3: Greater Cambridge	Rail	Buses on the present guided busway have to make their way into the city on the existing road system, which substantially increases their journey times as well as adding to congestion. It would appear that the proposed "segregated public transport" corridors would do exactly the same and would lead to greater congestion in the city.	Comment noted. The Making Connections package of measures specifically addresses the point made about congestion through the introduction of a congestion charge and the reallocation of road space to enable better reliability of buses. No change to plan.
129	Chapter 3: Greater Cambridge	EV and alternate fuels	There would also be increased air pollution as electric buses, although advertised as "zero emission", produce significant non-exhaust emissions (NEEs) from tyre and road surface wear, more even than diesel buses, due to the extra weight of the batteries.	Comment noted. It is acknowledged that electric vehicles produce pollutants from tyre and road surface wear. No change to plan.
130	Chapter 3: Greater Cambridge	Connectivity	The GCP proposals do not appear to address the problem of cross-city connectivity, connecting for example residential developments to the west of Cambridge to the Bio-medical campus or those to the south east to the West Cambridge Campus.	Comment noted. Add in additional text in the Greater Cambridge section to strengthen the narrative on need for cross city connectivity.
131	Chapter 3: Greater Cambridge	Safety	Raises a number of very local issues facing the Greenlands Estate in Cambridge regarding the wider issues of CUH/CBC success having unintended negative consequences on its residential neighbours. Issues include littering and misuse of communal greens, obstruction of highway and communal driveways, maintenance of communal driveways, speeding and motor cycle use, personal safety, street and communal driveways	This is an issue for local strategy and not really an LTCP issue.
132	Chapter 1	Vision	The Combined Authority's proposed vision reflecting the need to respond to climate change, protect the environment, and support sustainable economic growth is strongly supported. The six overarching goals for the LTCP in relation to productivity, connectivity, climate, environment, health and safety are supported.	Support noted
133	Chapter 3: Greater Cambridge	Active Travel	Generally supports the proposed transport measures identified in the draft LTCP in relation to Waterbeach Barracks. Placing a greater emphasis on active travel, sustainable modes, and Sustainable Travel Hub is a fundamental part of the Waterbeach Barracks design and it is therefore strongly supported as a priority for the Cambridge network hierarchy expressed in the draft LTCP (Page 74).	Support noted
134	Chapter 3: Greater Cambridge	Bus	U&C generally supports the proposed approach for South Cambridgeshire within the draft LTCP, including the four new public transport corridors and also the recognition to create a 'world class bus network'. Further detail on this would however be welcomed in terms of what it would entail specifically for individual areas.	Support noted. Updated local strategy (child doc) will provide detail
135	Chapter 3: Greater Cambridge	Bus	The principle of Travel Hubs is supported and the proposals for the Wellcome Genome Campus will seek to align with and support the approach within the draft LTCP.	Support noted

136	Chapter 3: Greater Cambridge	Highways	It seems that there is generally a coordinated response to key areas of growth, including both employment and residential destinations. However, the Wellcome Genome Campus and its connectivity along the A1301 corridor and with the wider area, appears to be a significant omission from the current planned and emerging transport strategies and schemes. U&C and Wellcome are concerned about this oversight and the potential impact this could have on both the success of the Campus, its ability to achieve its ambitions in terms of sustainability and world class transport and on the wider movement network if WGC, as a key destination, is not embedded within the LTCP. We strongly consider that the status and importance of the WGC needs to be elevated and a more coordinated transport approach is required to ensure the Campus benefits from excellent connections if it is to continue to compete in the international arena.	Noted. The GCP have proposals for PT and AT schemes in this area and CCC/CPCA are discussing the possibility of the Royton to Granta Park study progressing to SOBC.
137	Chapter 3: Hunts	Rail	U&C strongly believe planned growth to the east of St Neots represents a positive and sustainable strategic location which can benefit from potential connection into the proposed East-West Rail route to enable sustainable travel patterns. This could unlock additional growth in this location, supported by both existing and planned infrastructure. U&C therefore support the draft LTCP support of East West Rail from Cambridge to Oxford, including the potential for a new station south of St Neots at Tempsford.	Support noted
138	Chapter 3: Hunts	Highways	The Huntingdon area plan on page 89 would benefit from the labelling of the St Neots Strategic Expansion Location, which includes Wintringham.	Noted. Agreed - simple map addition
139	Chapter 3: Hunts	Specific scheme	The draft LTCP references the potential A141 improvements around Huntingdon (and linking to St Ives) on pages and 84, 86, 87. Whilst there has been a degree of uncertainty regarding this route which has hindered sustainable development, it is absolutely crucial that any interventions to key road corridors are not delivered at the expense of better walking, cycling and public transport connectivity, as highlighted on page 86. The intention to place a greater emphasis on how active travel modes can be supported in highway improvements (as specified on pages 84 and 85) is therefore strongly supported.	Support noted
140	Chapter 3: Hunts	Shared Mobility	From a broader perspective, the draft LTCP should therefore further consider the potential for strategic scale sustainable transport linkages, including potential for bus or priority mass transit options to St Ives and Cambridge from Alconbury Weald.	Noted. Use wording in Hunts LP - https://www.huntingdonshire.gov.uk/media/3872/190516-final-adopted-local-plan-to-2036.pdf - pg138
141	Chapter 3: Hunts	Related documents	The reference on page 83 to Huntingdonshire's Local Plan (and that development will be focussed in four spatial planning areas) should additionally note that sustainable growth in Huntingdon is also focussed on two Strategic Expansion Locations, at Alconbury Weald and St Neots East.	No change required. Current explanation is sufficient (checked with HDC).
142	Chapter 3: Hunts	Rail	The draft LTCP reference on page 84 to a new rail station at Alconbury (Weald) is supported. As a sustainable form of transport, the draft LTCP should advocate more strongly for the new railway station, and the benefits this potential modal shift would provide, including within the 'Alconbury' section on page 87.	Support noted. -USE WORDING IN HUNTS LP - https://www.huntingdonshire.gov.uk/media/3872/190516-final-adopted-local-plan-to-2036.pdf pg138
143	Chapter 3: Hunts	Rail	The Huntingdon area plan on page 89 would be improved by illustrating the route of the East Coast railway line. Furthermore, the potential new Alconbury Railway Station should be illustrated on the east side of Alconbury Weald development rather than as currently illustrated on the A1 Road. To further aid clarity, the Alconbury Weald development should be more accurately labelled (the position of the text is currently shown to the west of the A1).	Agree addition of ECML is useful. AGREE THAT SHOWING ECML IS FINE AND DO INDICATIVE BLOB FOR STATION ON MAP
144	Chapter 5: Monitoring and performance	Goals	The CA should consider more metrics to measure productivity that tie into their strategic objectives, eg no of residential dwellings within the region that fall within a 30 minute sustainable commute to an employment hub, or the number of public transport routes that improve journey to home, education, employment, and leisure to within 30 mins.	This is tied to Local Plan and planning issues. Local strategies will consider such data.
145	Chapter 1	Health	The draft plan does not go into detail as to how it is going to achieve a public transport network that will promote 'social inclusion' via the four factors highlighted, 'available, accessible, affordable and appropriate'. In particular 'affordability and 'appropriateness' should consider are not fully considered.	The LTCP is setting the vision and policy direction for PT and includes a number of 'major' PT schemes. The local strategies and the BSIP will tackle specific issues such as accessibility for specific places. The CPCA is also investigating ways in which the bus and PT network can be better delivered, through frameworks and investigating the viability of funding the network in a different way
146	Chapter 1	EV and alternate fuels	The plan needs to be more specific to actively encourage non fossil fuel (electric, hydrogen) solutions in transport.	noted. alternative fuels inc. EV to be promoted further in LTCP child doc
147	General	Interchange	The new transport network needs to be considered holistically so that conflicts between alternative modes of transport are eliminated as best as possible	noted.
148	Chapter 1	Connectivity	Promotes idea of 15-min city and broadening out to consider how this could work in more rural settings. Key to unlocking this is mapping of amenities to population centres and applying a catchment principle to provide policy direction shown gaps in connectivity.	additional discussion on rural areas and connectivity to and within them is being made, both in main strategy and in local sections
149	Chapter 2: Our strategy	Freight	Acknowledgement in the draft LTCP that the potential the rail network has for greater freight movements is noted, however suggest going further by transitioning the vast majority of freight movements from currently congested roads to underutilised railways.	Comment noted. It is recognised that the LTCP needs a stronger reference to freight movements. The suggested approach needs significant central government support to facilitate.
150	Chapter 2: Our strategy	Freight	The 'secure freight consolidation centres' identified could be located on the rail network	Comment noted. It is recognised that the LTCP needs a stronger reference to freight movements. The suggested approach needs significant central government support to facilitate.
151	Chapter 3: Fenland	Rail	Suggest considering extending the Wisbech Rail link to King's Lynn, creating an alternative to the A47	Noted. LTCP supports Wisbech rail link but details on its specifics are not for the LTCP.
152	Chapter 3: Fenland	Connectivity	Market town connectivity will be improved so that parts of our region are not left out from future opportunities. We need to do this by considering viable 15-minute communities or neighbourhood hubs	Noted. LTCP supports 20 min neighbourhoods
153	Chapter 2: Our strategy	DRT	DRT has a big role to play in the future, interlinking with 15-minute communities to provide greater connectivity outside of these areas.	Noted and agreed. Covered in LTCP
154	General	Wider policy areas	Strong governance needs to be applied, together with policy around how new developments are delivered.	Noted however this is something which should be addressed by the local plan
155	Chapter 1	Connectivity	Digital connectivity should be available to all, including those in more rural areas within our region	Noted. Digital policy to follow
156	Chapter 2: Our strategy	Freight	Freight movement should be transitioned away from the road network thus reducing emissions	Noted. LTCP to be improved on freight and HGV.
157	Chapter 1	Environment	Biodiversity measures should be considered holistically across the region and linked to a 'green vision' for the region as a whole.	Noted.

158	Chapter 1	Active Travel	Transition to more sustainable travel modes should come with benefits to public health - reduced congestion leading to better air quality and increased physical activity through active travel	Noted. Public health and AQ key aspects to LTCP
159	Chapter 1	Safety	The safety of the transport modes should be considered from both physical safety through the prevention of accidents as well as personal safety in terms of individual passengers feeling safe in their surroundings.	Noted and agreed. Safety section to be improved and can check this
160	Chapter 1	DRT	Review of the benefits of the TING trial, with further expansion of that initiative if proved successful	Noted.
161	Chapter 2: Our strategy	Targets and indicators	Revamp our approach to Planning Policy in the region to facilitate integration of development proposals for the regions so that they are intrinsically linked to the LTCP to enable progress to net-zero.	Noted however this is something which should be addressed by the Local plan
162	Chapter 1	Safety	Conscious that the plan will drive investment decision making and plans for the future so we welcome your commitment to considering and improving the safety of our transport network, whilst ensuring actual and perceived barriers are addressed and minimised. We would like to ensure partners are actively considering road and community safety issues in their plans and bids for transport projects.	noted. LTCP to improve safety section and commit to working with partners.
163	Chapter 1	Safety	We welcome the links made to road safety and Vision Zero. The Commissioner will continue to support the partnership's ambition to achieve a zero road deaths or serious injuries in Cambridgeshire by 2040, supporting the county's Vision Zero Partnership. The new Local Transport and Connectivity Plan provides an opportunity to enshrine your commitment into future planning.	Support noted. No change to plan.
164	Chapter 1	Safety	Within the framework for achieving the ambitions set out in the draft plan, we would also like to highlight the opportunity to enhance the broader safety focus of the plan in terms of crime prevention. Improving people's feelings of safety should help them to make more sustainable travel choices.	Noted and agreed. To be included in new safety section
165	Chapter 1	Safety	Your new Local Transport and Connectivity Plan provides an opportunity to highlight the need more broadly in transport projects, to design out and prevent crime from the outset. It would be helpful for wider partners to consider these issues as part of their project design.	Noted
166	Chapter 3: East Cambs	Rail	Support for the CA's efforts with Network Rail to deliver capacity improvements through the Ely area and for lobbying Network Rail for the doubling of track capacity between Newmarket and Cambridge and Soham and Ely to facilitate the reinstating of Snailwell Loop.	Support noted. No change to plan.
167	Chapter 3: East Cambs	Rail	Keen to see delivery of hourly Ipswich to Peterborough service and the implementation of EWR Central Section which would support extension of services to Newmarket, Bury St Edmunds and Ipswich.	Support noted. No change to plan.
168	Chapter 3: Greater Cambridge	Bus	Stress the need for fast, frequent and reliable public transport improvements on the Haverhill to Cambridge corridor including mass rapid transit and express services.	Noted. GCP looking at improvements for part of this corridor through its CSETS work. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
169	Chapter 3: Greater Cambridge	Bus	Interested to know more about the proposed rollout of demand responsive transport services across East Cambridgeshire and to what extent they may interact with rail stations at Kennett and Newmarket.	Noted. CPCA to liaise with WSC.
170	Chapter 3: East Cambs	Partnership	Suggest establishing a formal arrangement between CPCA and West Suffolk Council whereby can work together on cross-boundary issues such as bus service improvements, DRT schemes, A142 study and A14/A11 junction	A new section is to be added to strengthen intention for partnership working. CPCA to liaise with WSC.
171	Chapter 3: Greater Cambridge	Partnership	Welcome consideration of additional public transport to links from Newmarket Rd P&R to the employment centres of Milton Science Park and Cambridge Biomedical Campus	Support noted. No change to plan.
172	Chapter 3: Greater Cambridge	Specific scheme	Regarding the A11/A1307 junction new travel hub we would like to understand if the new A11 transport hub will include electric bus charging infrastructure.	Noted. GCP delivering this. GCP looking at improvements for part of this corridor through its CSETS work. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). Suggest WSC liaise with GCP
173	Chapter 3: East Cambs	Specific scheme	Support the inclusion of the A142 capacity study and the commitment to work with partners to assess and develop further improvements to the A14/A142 Junction 37. Also support the reference to Junction 38 where the A14 meets the A11.	Support noted. No change to plan.
174	Chapter 3: Greater Cambridge	Bus	Requesting more affordable public transport and a management system similar to TIL which would act as an umbrella organisation overseeing transport in Cambridgeshire.	CPCA investigating ways in which buses can be delivered. GCP also doing similar for Gtr Cambridge
175	Chapter 2: Our strategy	Bus	Draft LTCP lacks a regional plan to replace conventional rural bus services by a regional busway network to take the lead in the development of the region's transport infrastructure as a whole.	Noted. The BSP is aiming to deal with improvements to the wider bus network
176	Chapter 2: Our strategy	EV and alternate fuels	Long-term effect of Covid restrictions, spiralling energy and fuel costs, cost of switching to EV vehicles could provide opportunity for an innovative review of traditional modes of bus travel to and from places of work and business around the region, avoiding reliance on private vehicles to fill the deficiencies in transport supply.	Noted. The BSP is aiming to deal with improvements to the wider bus network
177	Chapter 2: Our strategy	Bus	Makes suggestions around how bus services could be reviewed. This includes: looking at speed and ease of traffic flow, identifying existing key strategic routes between principal urban centres, establishing express inter-city busway network.	Noted. The BSP is aiming to deal with improvements to the wider bus network
178	Chapter 2: Our strategy	DRT	An integrated transport network across the CA area could be established on three levels, namely rail services, interurban primary busway routes and DRT bus services serving small communities and feeding into busway routes.	Noted.
179	Chapter 2: Our strategy	Bus	Suggests three levels of travel hub, namely interchange service hubs, urban hubs and mini hubs.	noted.
180	Chapter 3: East Cambs	Partnership	Would welcome the opportunity for further and continued engagement to ensure cross boundary considerations are embedded into project development and delivery, and to optimise outcomes for our respective regions.	Noted. Further dialogue welcomed

181	Chapter 3: East Cambs	Connectivity	Improved connectivity for rural communities, providing faster and more frequent connections will improve access to jobs and education and CPCA's ambitions to achieve a 15% reduction in car mileage and strategic proposals, such as North to South and East to West rail and road improvements (Ely, Soham and Newmarket rail improvements, and improvements on the A10, A14, A142, and A47 road corridors), which support these aspirations are welcomed.	Support noted. No change to plan.
182	Chapter 2: Our strategy	Targets and Indicators	Support the principle of the LTCP's commitment to a reduction in car mileage by 15% by 2030, using a 2019 baseline, across the region, drawing on the recommendations outlined in the Cambridgeshire and Peterborough Independent Commission on Climate Report. We note that the practical application of this commitment and therefore its specific impacts remain to be determined and we would welcome further engagement on this as it develops.	Noted. Further dialogue welcomed
183	Chapter 3: East Cambs	Highways	Proposals to continue developing the capacity study of the A142, and to work with partners to assess and develop potential solutions to junction capacity constraints of the A14/142, are welcomed and would go some way to supporting improvements of our cross-country key movement corridor as identified in our IDP, which is considered a vital transport investment opportunity for our region. The A14 (particularly at J37 (A142)) remains very vulnerable to further growth in East Cambridgeshire and we welcome the opportunity for further engagement and partnership working.	Support noted. No change to plan.
184	Chapter 3: East Cambs	Specific scheme	We would welcome an opportunity for further engagement to ensure consideration is focused on improvements to local connectivity along the A1307 corridor, including east of the A11, that better accommodate such movements.	Noted. Further dialogue welcomed
185	Chapter 3: East Cambs	Cross border issues	We would welcome further engagement with CPCA and regional partners to investigate opportunities to improve access to Stansted Airport, in particular supporting growth through sustainable transport improvements	Noted. Further dialogue welcomed
186	Chapter 3: East Cambs	Cross border issues	We would welcome discussions, along with partners, on potential cross-boundary transport improvements, including active travel.	Noted. Further dialogue welcomed
187	Chapter 3: Greater Cambridge	Specific scheme	Strongly object to CA's endorsement of the GCP Cambourne to Cambridge scheme, on grounds of environmental damage and low BCR. Wish to engage with the Mayor on the C2C off road route.	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
188	Chapter 3: Greater Cambridge	Specific scheme	Strongly object to CA's endorsement of the GCP Cambourne to Cambridge scheme, on grounds of environmental damage, cost and low BCR.	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
189	Chapter 1	Goals	There is little distinction between the wording of the goals and those of the objectives. The goals should be the longer-term outcome while the objectives define the measurable actions to achieve an overall goal.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
190	Chapter 1	Goals	It is not clear how the proposed objectives will be achieved. Instead of the traditional pyramid of responsibility, the figure on page 10 of the consultation document betrays the fact that the responsibility to achieve these objectives is split between several authorities with no single authority with the power to oversee and co-ordinate their efforts. In short, the strategy cries out for the setting up of a single body with the powers, responsibilities and resources to deliver it.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
191	Chapter 1	Goals	Within the goals and objectives, the message relating to the Environment is muddled – sometimes titling it "Environment" and other times "Natural Environment". For example, on page 20 of the draft Plan, the environment goals and objectives are much more than just Natural Environment. They should be titled Environment and the supporting text refer to natural, historic and built environments.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
192	Chapter 1	Environment	The Environment goal only refers to "protecting and improving our green spaces and improving nature". The environmental goal should be expanded to include protecting and improving "historic and built space" alongside protecting and improving green space. The environment objective should set out the actions to achieve this goal. We would suggest that these should include avoiding loss of natural and historic environments; minimising visual intrusion in the landscape and obfuscate, and minimising light and noise pollution.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
193	Chapter 2: Our strategy	Environment	The narrative of this chapter is hard to follow. The guiding principles are listed on page 30 but the following pages headed up "Guiding Principles" do not match the bullet pointed list but deal with strategy topics. The strategy essentially repeats the goals and objectives, many several times over, in various forms of words, with some additional justification and explanation. The 7th bullet point is "Greening our transport infrastructure and enabling access to our high quality green open spaces". Further clarification is needed on this guiding principle. It is unclear whether "greening" is referring to reducing greenhouse gas emissions or improved landscaping. It is important that you clarify what is meant by "high quality green open spaces" and how the provision of transport infrastructure is going to deliver it. We would be very concerned if this refers to narrow strips of landscaping beside transport infrastructure rather than substantial open areas which can be managed to be of benefit to nature and people.	Noted. Structural changes to this chapter are proposed
194	Chapter 2: Our strategy	Public Realm	There is very little effective intervention on this element of the strategy. Reference is only made to Low Traffic Neighbourhoods and 20-minute neighbourhoods.	Noted. Potential for some beefing up of these elements in the our strategy chapter
195	Chapter 2: Our strategy	Climate	The commitment to a target of net zero carbon by 2050 is not referenced at all within the bullet points on page 30. Climate change appears towards the end of the section on "Overall Strategy". Surely, tackling climate change should be the priority of the plan and the driving force behind the strategy? The plan must be more ambitious than achieving Zero Carbon by 2050 and must be sufficiently flexible to allow for subsequent changes, so that the policies can evolve to cope with the changes that are being brought about by global warming and the loss of natural diversity. There is little substantive detail on the interventions to tackle climate change.	Noted. WSP work to address
196	Chapter 2: Our strategy	Environment	This only refers to causing minimal destruction to the environment during construction and operation and achieving biodiversity net gain. The strategy should state that infrastructure will be planned to avoid destruction of the natural and historic environment. To meet national and local policy 2 requirements, the delivery of transport infrastructure needs to show how the hierarchy of mitigation measures (Avoid, Mitigate, Compensate) has been embedded into the design of the development. Throughout the Plan, the vision, goals and strategy/guiding principles, reference is made to a commitment to biodiversity net gain. However, no mention is made of the percentage of net gain and the Plan must firmly commit to a minimum 20% net gain to meet the aspirations of the local Councils.	Noted. Needs CPCA review and updated accordingly - biodiversity net gain work to be included. Other examples to be integrated wherever possible.
197	Chapter 4: Policies	Policies	We are very disappointed that the draft LTCP does not include the policies for us to comment on. Therefore, we consider that the draft LTCP is not ready for public consultation and a further public consultation on the policies will be required before the LTCP may be adopted.	Any new policies will form part of a child doc to the LTCP and therefore be subject to a separate consultation. Current policies remain as previously consulted on and published - new ones will be subjected to the appropriate consultation process
198	Chapter 3: Greater Cambridge	Specific scheme	We support the need to encourage more people to access the city on public transport or by active modes. However we object to the strategy of achieving this through building new roads through open countryside, to be used by buses and supported by giant car parks. These new roads, car parks and their associated infrastructure will destroy habitats and damage the landscape, countryside and green belt.	Noted. The LTCP is clear that there is a hierarchy of modes and that alternatives to road building and facilitating private car use will be promoted in the first instance. Where a scheme is proposed by the GCP, the GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
199	Chapter 3: Greater Cambridge	Specific scheme	We object to the GCP's preferred route for the Cambourne to Cambridge Bypass. In short, the Local Transport strategy proposes interventions which are destructive of the environment, and there is no evidence that the objectives cannot be achieved by other less damaging means.	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
200	Chapter 3: Greater Cambridge	Specific scheme	We object to the GCP's preferred route for the Cambridge South East Bypass. In short, the Local Transport strategy proposes interventions which are destructive of the environment, and there is no evidence that the objectives cannot be achieved by other less damaging means.	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
201	Chapter 3: Greater Cambridge	Specific scheme	The proposed bypasses include the provision of new park and ride sites. These result in more tarmac, buildings, and light pollution in the green belt countryside. Encouraging more people to drive to a park and ride site also undermines the investment to improve the coverage and quality of bus services from surrounding villages and towns	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)
202	Chapter 3: Greater Cambridge	Specific scheme	We support the provision of a network of Greenways. We are working with the GCP to try and ensure that the routing and infrastructure for these is delivered in ways that minimise their impact on the natural and historic environment. However, we are concerned that there is a duplication of infrastructure in close proximity, such as an active travel route beside a busway as well as Greenway and a pavement. This is caused by a lack of strategic planning and could result in an unnecessary loss of countryside. It must be remembered that all infrastructure generates carbon emissions and has negative environmental impacts.	The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com)

203	Chapter 1	Vision	East Cambridgeshire District Council supports the draft Local Transport and Connectivity Plan (LTCP) vision, and the aims and objectives presented.	Support noted. No change to plan.
204	Chapter 1	Vision	The Council welcomes the inclusion of a specific reference to rural areas in the vision, but would like to understand the vision for transport in Cambridgeshire and Peterborough over the short, medium and long term. What will the transport network look like in 5 years, 20 years and 50 years?	The delivery plan will detail future proposals and reference to EC Transport Strategy, to be delivered for local schemes. Also add section child documents, local strategies and their role.
205	Chapter 1	Environment	ECDC supports the objectives relating to climate change, carbon emissions and energy reduction and protecting and enhancing the environment. The District Council has declared a Climate Emergency and providing alternatives to the private car is essential to improve air quality and achieving our carbon neutral goals.	Support noted. No change to plan.
206	Chapter 3: East Cambs	Partnership	The Council welcomes the inclusion of 'connectivity' in the Plan as it recognises the environmental and social benefits of being able to work from home and access services online. The Council is keen to work with the CPCA to deliver improved broadband coverage and speeds in East Cambridgeshire and to improve and mobile phone reception across the district.	Support noted. New partnership paragraph/section in plan to be added
207	Chapter 3: East Cambs	Active Travel	Would welcome reference being made to ECDC's own Cycling and Walking Routes Strategy. A list of priority routes has already been identified and feasibility studies already undertaken. This information will be used to seek funding from external sources to enable delivery of the schemes.	Agree. Amend plan to reflect this strategy in local section as well as reference in potential new section in overall strategy on partnership working/related documents
208	Chapter 3: East Cambs	Active Travel	Due to the nature of the roads and the traffic using them, freeing up road space for active travel schemes is challenging and whilst the draft LTCP refers to the fact that within East Cambridgeshire it will be difficult to adhere to government guidelines, it would be useful if information about how this could be overcome was also included in the document. The District has lost out on funding from previous active travel funding rounds so it is essential that this is addressed.	Amendments will be made to tighten up in main strategy regarding rural areas not missing out just because they are rural. This will tie into active travel more strongly. Rural accessibility will be strengthened in the document
209	Chapter 3: East Cambs	Partnership	Would welcome working with the CPCA and other partners on issues such as safe crossings as an integral part of a cycle/walking project, disrepair on existing paths, promotion of existing routes, and funding opportunities.	Support noted. New partnership paragraph/section in plan to be added. Please also refer to CCC district transport strategies and action plan
210	Chapter 3: East Cambs	Bus	Highlights the issues with bus services in East Cambs, They are not direct or convenient due to long journey times and do not provide a viable alternative to the private car. Some communities have no bus service at all. Low population density and longer distances to travel make practical and commercially sustainable public transport difficult in rural areas.	Agree. BSP looks to address this. No change to plan.
211	Chapter 3: East Cambs	Bus	Funding for bus services continues to be reduced and this has led to services in East Cambridgeshire being withdrawn or reduced so that the areas, days and times of operation do not meet the needs of residents. The Council requests urgent financial support from the CPCA for this service. Also keen to understand how the CPCA will address the issue of providing ongoing revenue funding for bus services, particularly rural services which typically require the greatest level of subsidy, if franchising won't provide this. The Council believes it is important to get the balance of subsidised bus fares and subsidised routes correct. Subsidising rural routes must be a priority and must not be forfeited in favour of subsidising fares for additional groups of people – the effect of this would be to see more and more people travelling for free or at low cost in the urban centres.	Comment noted. The BSIP will take the aims of the LTCP and add detail on bus networks. Any CPCA funding will be subject to the business planning cycle. CPCA looking at long term viability for buses and bus frameworks. No change.
212	Chapter 3: East Cambs	Bus	East Cambridgeshire District Council is seeking funding from the Cambridgeshire and Peterborough Combined Authority to trial new bus services identified in its 'New Bus Service Proposals for East Cambridgeshire' Prospectus to allow them to become established and viable. These services will also need support in terms of promotion, information provision, ticketing and infrastructure to increase their viability.	Noted. Any CPCA funding will be subject to the business planning cycle. CPCA looking at long term viability for buses and bus frameworks.
213	Chapter 3: East Cambs	Partnership	The LTCP should include a commitment to work with local authorities and other stakeholders to improve rail connectivity and services across the area.	Comment noted. New partnership paragraph/section in plan to be added
214	Chapter 3: East Cambs	Rail	Support the Ely area capacity enhancement (EACE) programme proposals to upgrade the railway to allow more trains to run through Ely as long as it includes a road solution at Queen Adelaide. Oppose any measures that restrict traffic flow across the level crossings in Queen Adelaide to the detriment of residents and local businesses until alternative solutions are put in place. Accessibility must be retained for MMBs and it is vital that the EACE scheme delivers sufficient additional capacity to meet future demand by delivering train paths to cater for services above and beyond the outstanding franchise commitments.	Support noted. Will look to strengthen text in document to reflect concerns that rail industry do not fully take account of local growth plans.
215	Chapter 3: East Cambs	Rail	The Council will support the CPCA and other stakeholders in lobbying DfT to ensure the EACE project goes ahead.	Support noted. No change to plan.
216	Chapter 3: East Cambs	Rail	The Council would like to see the LTCP promote the importance of the Queen Adelaide Road Improvement Scheme whilst maximising the rail connectivity network for the district and wider area.	LTCP local section to include as part of the EACE improvements it will be necessary to address the local concerns along Queen Adelaide
217	Chapter 3: East Cambs	Rail	The Council welcomes the commitment in the draft LTCP to doubling the track all the way to Soham, which would increase capacity for both freight and passenger services and enable a second platform at Soham Station to become operational and an hourly service to run from Ipswich to Peterborough, and to reinstating the Snailwell loop, which would provide a direct service between Ely, Soham, Newmarket and Cambridge, bringing further benefits to passenger and freight services.	Support noted. No change to plan.
218	Chapter 3: East Cambs	Rail	East Cambridgeshire District Council supports the East West Rail Link eastern section proposals and supports the southern approach because of the benefits it will bring to residents in our district.	Support noted. No change to plan.
219	Chapter 3: East Cambs	Active Travel	Any major improvements to roads and junctions proposed in the LTCP should seek to make better provision for pedestrians, cyclists and equestrians.	Agreed we will strengthen wording around this in overall strategy.
220	Chapter 3: East Cambs	Specific scheme	For the residents and businesses of East Cambridgeshire, dualing the A10 all the way to the BP garage at Ely and improving the junctions along it is an absolute priority. The Preliminary Strategic Outline Business Case work, undertaken by Matt Macdonald in 2018, suggested building a new road to the North West of Ely, which would divert non-local traffic away from the two Ely roundabouts. The Council requests that the Combined Authority investigates this proposal fully before making any decisions about preferred route options. How the A10 is dealt with at the A14 junction also must be considered.	Noted. An issue for the business case work rather than any change to the plan
221	Chapter 3: East Cambs	Specific scheme	The Council supports the provision of infrastructure for active travel that will tie into existing routes and the planned additions, which will provide a continuous route from Cambridge to Ely. We urge the Combined Authority to ensure that the proposed segregated cycle route from Cambridge to Ely is an off-road cycle path and that separate provision for pedestrians and cyclists is provided, not a shared-use path, as set out in the Preliminary Strategic Outline Business Case. Protection for active travel users like cyclists, walkers, and horse riders and safe crossing points at these junctions is essential. Keen to understand provision at the A10 BP roundabout.	Agreed we will strengthen wording around this in overall strategy.
222	Chapter 3: East Cambs	Partnership	The Council welcomes the reference to working with Suffolk County Council regarding the A14/A142 junction in the LTCP document. The LTCP should commit to assess demand and options for an upgrade to junction 38, including an all-movements junction to facilitate freight and help remove HGVs from unsuitable roads.	Support noted. New partnership paragraph/section in plan to be added
223	Chapter 3: East Cambs	Highways	The Council supports the reclassification of the A1323 (A1421) to a B road as it would provide a number of key advantages and opportunities for the East Cambs villages of Haddenham, Stretham, Wicken and Wilburton.	Support noted. No change to plan
224	Chapter 3: East Cambs	Highways	An A142 capacity and safety improvements scheme to deliver local capacity and safety improvements on the A142 between Newmarket and Chatteris is referred to in both the current LTP and the draft Plan. This project should be progressed urgently as capacity is limiting both housing and economic growth in the district.	Noted. No change to plan.

225	Chapter 3: East Cambs	EV and alternate fuels	The Council welcomes the commitment the roll out of electric vehicle charging infrastructure particularly in those districts with low provision such as East Cambridgeshire. The Council is working on a scheme currently to install charging points in some of its car parks but more are urgently needed. There are electricity grid capacity issues regarding this and the Council would like to understand how the grid improvements that are required will be delivered.	Support noted. Grid issue also raised by other Authorities. Will aim to strengthen reference in overall strategy.
226	Chapter 3: East Cambs	EV and alternate fuels	The Council is keen to continue to work with the CPCA and other stakeholders to deliver the actions from the East Anglian Alternative Fuels Strategy across East Cambridgeshire.	Support noted. No change to plan.
227	Chapter 3: East Cambs	Rail	The Council supports improvements to rail infrastructure and signalling enhancements to increase rail freight capacity, thereby taking freight off the road network and moving it across the region more sustainably.	Support noted. No change to plan.
228	Chapter 3: East Cambs	Freight	The LTCP can help manage the movement of freight by: <ul style="list-style-type: none"> Encouraging HCVs to use the Cambridgeshire County Council's advisory freight routes, which were developed to balance the needs of local communities and the requirements of lorry operators. Encouraging HCVs to use the Cambridgeshire County Council's advisory freight routes, which were developed to balance the needs of local communities and the requirements of lorry operators. Ensuring Cambridgeshire County Council changes its advisory freight map to re-route HCVs using north Ely as a through route to divert HCVs onto more modern capable roads (to delete Dowtham Road, Egmont Street, Newnham Street and Prickwillow Road, and re-route HCVs to the more capable roads of Cam Drive, Lynn Road, Kings Avenue). Providing clear advice to local planning authorities in respect of highways and freight implications of new development proposals. Encouraging a shift from road-borne freight to less environmentally damaging modes such as rail. Working with delivery/logistics operators to integrate first-mile pickup and last-mile deliveries. Supporting the formation of Quality Partnerships between interested parties. Monitoring changes in HCV and LCV activity to inform possible solutions which reconcile the need of access for goods and services with local environment and social concerns. Supporting improvements in HCV provision in the county, including overnight parking, in appropriate locations. Utilising traffic management powers, where appropriate to do so, to manage access and egress from specific locations. 	First 3 points, please refer to CCC strategy. We will strengthen the section on freight and include sub sections in relevant areas.
229	Chapter 3: East Cambs	Specific scheme	East Cambridgeshire District Council opposes any road user or increased parking charges on vehicle access to the city before credible alternatives are in place and it has been demonstrated that they are effective and serve the needs of the residents of East Cambridgeshire	Noted. No change to plan. This refers to the GCP Making Connections work. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/press-library/About-Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (mcs.uk.com).
230	Chapter 1	Goals	The Council is keen to understand how the 15% cut in car mileage will be achieved across the CPCA area.	The document refers to the various measures which will assist in achieving the target of a 15% reduction
231	Chapter 3: East Cambs	Partnership	The CPCA should work with the Greater Cambridge Partnership (GCP) to ensure that projects that could benefit a wider area, such as the Greenways, Cambridge Eastern Access and Waterbeach projects are not limited by, and are potentially delivered beyond, the City Deal geographical boundary.	Comment noted. New partnership paragraph/section in plan to be added to strengthen and reflect the partnership work that the CPCA is involved in.
232	Chapter 3: East Cambs	Related documents	Clarity is needed regarding how the CPCA will decide which supporting documents to adopt as 'child' documents, particularly those produced by other organisations.	Agreed, a section is to be added regarding the child documents
233	Chapter 4: Policies	Related documents	It is essential that a delivery plan for the LTCP be produced at the earliest opportunity. This should include details of how and when schemes identified will be progressed and delivered. The Council has concerns regarding how the schemes in the Plan will be supported, funded and delivered by the CPCA, but is keen to work with the CPCA to achieve our joint ambitions for East Cambridgeshire.	Noted. Delivery plan intended to follow LTCP adoption
234	Chapter 2: Our strategy	Health	Reference to relevant health-related policies and strategies such as the Joint Strategic Needs Assessment (JSNA) or the emerging Health and Wellbeing Strategy	Noted. Agree these need adding to relevant section on public health
235	Chapter 3: Greater Cambridge	Specific scheme	Development of place based local strategies consistent with the policy framework set out in the LTCP and in government guidance, informed by local engagement and consultation. These strategies would then inform investment decisions by the CPCA that reference to additional M11 capacity is deleted as our understanding is that there is no currently planned proposal to provide such capacity <ul style="list-style-type: none"> What the GCP's Whittlesford Transport Masterplanning Exercise is added to the Strategic Projects and the Regional Initiatives diagram, and that reference is made to the proposed improved rail services from the north which should be unlocked by the Ely Area Capacity Enhancement programme and other related rail proposals 	Noted. Agreed.
236	Chapter 2: Our strategy	Related documents	Reference to be made more explicitly to these strategies, perhaps in its own section within the LTCP so that a clear mandate for developing these can be established	Noted. Section in 'our strategy' which defines clearly the role of and importance of child docs (and other LTP suite of docs) to be added
237	Chapter 3: Greater Cambridge	Specific scheme	It is vitally important that the LTCP recognises and supports the forthcoming proposals of the Making Connections consultation	Comment noted. Review text in Greater Cambridge section to ensure that it reflects how this project has developed since the draft LTCP. Also review where reference can be made in overall strategy section.
238	Chapter 1	Shared Mobility	It would be helpful to include a behaviour change section which mentions in more detail Mobility as a Service (MaaS) and Journey Planning.	Suggestion noted. Agree that a strengthened section covering behaviour change would be beneficial. Additional text will be inserted in an appropriate section, possibly the "Future of Mobility" section in Chapter 1 - tba.
239	Chapter 1	Evidence	Review post covid traffic data	Comment noted. Review and update text in Evidence Base on latest post-Covid data if available.
240	Chapter 2: Our strategy	Specific scheme	Inclusion of cycling schemes on the major schemes map	Noted. To include if appropriate
241	Chapter 2: Our strategy	Related documents	Inclusion of the CCC pipeline of schemes being included on any future iteration of the diagrams, as these emerge from the Companion ("child") Documents	Noted. Child docs to be defined and discussed in our strategy section more clearly
242	Chapter 2: Our strategy	Climate	promote linking major schemes with low carbon or low emission modes as a way of supplanting and interfacing with 6 new infrastructure in order to maximise carbon benefits	Noted. WSP work to cover this
243	Chapter 2: Our strategy	Rail	There is a good opportunity for new railway stations, such as Cambridge South, to promote interchange with active, electric or low emission modes.	Comment noted. Look to strengthen wording in text around interchange between active, electric or low emission modes of transport.
244	Chapter 1	Vision	The first paragraph in the Vision section appears to focus on reducing journey times by a few minutes, which somewhat underpins the perceived need to remove bottlenecks in the road network catering for car drivers as opposed to encouraging mode shift. This is not compatible with the renewed focus on active travel, public health, safety and Climate Change goals, which should be more front and centre.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.

245	Chapter 1	Active Travel	Overall stronger emphasis on active travel. Inclusion of the connection of high-quality public realm with high levels of walking and cycling being an attractor to businesses, and therefore part of the economic growth agenda	Noted. Some wording in AT section about businesses doing well where high levels of walking and cycling are present. Would be useful to back up with evidence source...
246	Chapter 1	Active Travel	Why are walking and cycling, particularly cycling, not a high priority for spaces with a high movement function where communities are within reasonable distances for such modes? Consideration will be given' is vague and should be strengthened to give the Council a better policy basis for negotiating for provision as part of major schemes delivered by other bodies, such as National Highways and Network Rail.	Agree. Change wording to reflect that cycling provision is vital for areas of high movement function and should be considered as part of any infrastructure scheme from the outset where this is appropriate.
247	Chapter 1	Active Travel	Active travel needs to be prioritised to and from new developments	Noted. Planning issue.
248	Chapter 1	Active Travel	clear on the need for continued maintenance of new active travel infrastructure, which is a major issue for the safe use of any new infrastructure and therefore the uptake in usage over time	Noted. Can add wording to maintenance section which states the importance of cycle infrastructure being maintained.
249	Chapter 1	Active Travel	Recognition that good lighting can promote walking and cycling	Noted. Safety section to be reworded and brought more to the forefront within our strategy section. To include personal safety, recognise need for new interventions, lighting etc.
250	Chapter 5: Monitoring and performance	Targets and indicators	It would be useful for the LTCP, as the overarching strategic transport plan for the area, to set some specific and measurable targets for active travel (walking and cycling) for each District. These need to be considered, realistic and tailored to suit the individual circumstances for each area.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
251	Chapter 2: Our strategy	Climate	To improve the goals, the LTCP could include a more ambitious target of achieving net zero by 2045 or sooner. Better consideration to be given to embodied carbon with the construction of transport projects. Including whole lifecycle carbon assessments and the cost of carbon removal	Noted. WSP work to consider this.
252	Chapter 2: Our strategy	Climate	Include annual carbon budgets and detail the trajectory for transport emissions towards Net Zero	Noted. WSP work to consider this.
253	Chapter 2: Our strategy	Climate	to consider the transport programme contained within the LTCP and whether it will achieve the necessary trajectory of CO2e emissions reductions, and what further measures will be needed to meet the trajectory.	Noted. WSP work to consider this.
254	Chapter 2: Our strategy	Climate	Climate/ environment to be given a higher priority than productivity in hierarchy of goals. Climate change and net zero goals need to be embedded into every theme, as economic growth and productivity is	Noted. WSP work to consider this.
255	Chapter 2: Our strategy	Climate	For Carbon assessments robust methodologies should be agreed that use suitably robust carbon data and transport modelling to understand the true climate impact of proposed schemes. Similarly, carbon valuation could be incorporated into this process to understand the future costs of removing emitted carbon in the future	Noted. WSP work to consider this.
256	Chapter 2: Our strategy	Environment	to be clearer on the separate issues of emissions (particularly of Nitrogen Oxides and fine particles) causing poor air quality and therefore the immediate risk to health, and the issue of emissions causing longer term impacts in relation to the climate due to Greenhouse Gas emissions	Noted. AQ section to be separated more from general emissions section
257	Chapter 2: Our strategy	Highways	Consideration given to materials used to ensure that embodied carbon is minimised and that schemes are built to the highest possible standard in terms of sustainability and safety.	Noted. WSP work to consider this.
258	Chapter 2: Our strategy	Highways	LTCP should state that high quality pedestrian and cycle facilities will be implemented to promote alternatives to car travel, consistent with the standards set out in Local Transport Note 1/20	Noted. LTN120 an important factor for AT. LTCP to make this clearer in relevant AT section
259	Chapter 2: Our strategy	EV and alternate fuels	The need to accelerate delivery of new grid capacity to underpin decarbonisation of both private and public transport across the area, alongside provision of E-charging infrastructure.	Noted. Wording on grid capacity and need to work with national grid for this to be added. Alternative fuel and EV policy/strategy to follow
260	Chapter 2: Our strategy	EV and alternate fuels	Consideration needs to be given to residents who do not have access to off road parking.	noted. Alternative fuel and EV policy/strategy to follow
261	Chapter 2: Our strategy	EV and alternate fuels	Additional details is required on alternative fuels	Alternative fuel and EV policy/strategy to follow
262	Chapter 1	Safety	A clearer vision on how we can create infrastructure which reduces the reliance on the motor vehicle for marginalised groups who might feel the car is their only option.	Alternative fuel and EV policy/strategy to follow
263	Chapter 2: Our strategy	Highways	The LTCP needs to take account of the Highway Authority's statutory asset management requirements. Suggested text to be inserted on pages 44-46: "We will collaborate with stakeholders in Cambridgeshire County Council's Highway Asset Management Team to ensure: what scheme design is considered of the existing highway network, its status and extent, and any associated constraints or prerequisites, and what new or amended highway infrastructure is developed and recorded in accordance with the operational requirements and statutory asset management duties of the Local Highway Authority."	Noted. Agreed wording changes.
264	Chapter 1	Safety	•A change in priority placing road safety ahead of economic growth •Additional funding for road safety interventions •Vision zero could be conflated with net-zero •Consideration to accessibility as a road safety issue, inclusion of personal safety.	Noted. Safety section to be reworded and brought more to the forefront within our strategy section. To include personal safety, recognise need for new interventions etc.
265	Chapter 2: Our strategy	Related documents	• Integrate new development into the Public Rights of Way network without damaging the countryside • Make available accessible, high quality, definitive information, maps, and records of on the network • Ensure the highway and rights of way network is complete to meet the needs of today's users and land managers Comment: This is still important as the majority of PROW and many new transport schemes will run over or affect third party land, and they are critical stakeholders • Support better land and waterway management	Agreed. add to ROW section, possibly p42 'Attractive Alternatives'?
266	Chapter 2: Our strategy	Related documents	The Plan also needs recognise the critical role of the LHA in respect of its statutory functions: 1. to advise on, process and legally determine proposed changes to the highway and rights of way network; and 2. to be responsible for the ongoing maintenance and asset management of the new and improved rights of way, cycle tracks and other highways that will result from the OPCA LTP that will have to be incorporated into the existing network.	agreed. Add a more general paragraph on roles and responsibilities in introduction

267	Chapter 2: Our strategy	Highways	<ul style="list-style-type: none"> Encouraging HGVs to use the advisory route network. Providing clear advice to local planning authorities in respect of highways and freight implications of new development proposals. Encouraging a shift from road-borne freight to less environmentally damaging modes such as rail. Supporting the formation of Quality Partnerships between interested parties. Monitoring changes in HGV and LGV activity to inform possible solutions which reconcile the need of access for goods and services with local environment and social concerns. Supporting improvements in HGV provision in the county, including overnight parking, in appropriate locations. Utilising traffic management powers, where appropriate to do so, to manage access and egress from specific locations. Investigate and promote 'last mile' delivery, especially in urban areas, including the use of last mile delivery/logistics hubs 	LTCP to improve section on freight and HGV, including referencing CCC HGV policy document.
268	Chapter 2: Our strategy	Wider policy areas	There is little reference to flood risk despite large areas in Cambridgeshire being susceptible to flooding.	Add something within environment section of main LTCP a specific idea to reduce flood risk through transport?
269	Chapter 1	Micromobility	<ul style="list-style-type: none"> Reflection on E-scooters as an emerging transport mode with the ability to replace short car journeys to a more sustainable micro mobility mode of transport. To recognise more firmly the role of Ebikes in allowing journeys by bicycle to be longer than previously considered viable and the provision on the highways network that may need to be carved out for their safe use. 	Noted. CPCA supporting e-scooter and e-bike trials locally. Awaiting government guidance on legality of wider role put. LTCP will have micromobility policy that covers these issues.
270	Chapter 1	Vision	Economic growth should not be included in vision as this is not necessarily a good measure or driver of well being. Should seek social justice instead	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
271	Chapter 1	Highways	Investing in road infrastructure (A47, A428 etc) actively works against the stated aims of the strategy. It is contradictory and uneconomic to continue to increase road capacity while working to reducing car use. They also have huge environmental disbenefits.	Noted. The LTCP has a stated hierarchy of modes and makes it clear that alternatives to road building and the private car will be considered first
272	Chapter 1	Highways	Only road investment should be repairs and safety interventions	Point of view noted.
273	Chapter 1	Vision	Spreading growth is not the best way to solve inequality. Already issues with water supply, prior to the growth proposed.	Point of view noted.
274	Chapter 2: Our strategy	Climate	Growth causes inequality. It drives up house prices, reduces green space, impacts on biodiversity and green space. Instead, policies should focus on allowing people to prosper without spreading carbon footprint.	Point of view noted.
275	Chapter 1	Connectivity	One of the aims listed under 'Connectivity' is supporting the growth strategies set out in Local Plans. This aim is strongly at odds with elements of the LTCP vision and objectives (particularly those relating to climate and environment) and we do not think this should be an aim of the LTCP	Noted. The LTCP is developed alongside the various Local Plans, which are subject to their own laws and requirements. It is not for the LTCP to state what growth should or should not happen.
276	Chapter 1	Connectivity	Welcome the focus on providing good internet connectivity to all to tackle inequality. It would be useful to elaborate on how this provision of digital infrastructure will be supported by other initiatives such as the free Connecting Cambridgeshire to ensure that it genuinely addresses digital exclusion (e.g. helping people with broadband charges, supporting adult IT literacy)	Noted. Digital policy proposed to follow
277	Chapter 2: Our strategy	Environment	The wording on the natural environment is extremely weak. Need a firm commitment to protecting existing green space, with full environmental impact assessments before going ahead with potentially damaging projects. Any loss of the Green Belt must be properly compensated by new Green Belt land replacement.	Comment noted. Agree that more work is needed on this topic and strengthening of the text to take place in due course.
278	Chapter 2: Our strategy	Environment	The strategy would be greatly strengthened by more explicit references to the need to reduce overall car use and how this would contribute to the aims and objectives	This is quite explicit in the LTCP already, reflected by 15% reduction target
279	Chapter 2: Our strategy	Shared Mobility	A way to help people move away from private car ownership would be active promotion of car sharing schemes and car clubs	Agreed. This is covered in the LTCP, but can bring this out more as part of main strategy
280	Chapter 2: Our strategy	Climate	Welcome the reference to the Cambridgeshire and Peterborough Independent Commission on Climate recommendation for a 15% cut in car mileage, but call on the Combined Authority to commit to an even more ambitious goal. The reduction in mileage should be an explicit objective of the strategy	WSP work to cover carbon and 15%
281	Chapter 1	Objectives	We agree with the listed 'key transport challenges' and strongly welcome the recognition that further planned growth will exacerbate all of these	Noted
282	Chapter 2: Our strategy	Highways	Oppose the Camboorne-Cambridge and Waterbeach-Cambridge busways. Smarter Cambridge Transport have comprehensively demonstrated that investing in existing active and public transport infrastructure would achieve far more to reduce car use, at far less financial and environmental cost	Noted. This is a GCP proposal. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council -> Committees -> Greater Cambridge Partnership Executive Board (cmis.uk.com)
283	Chapter 3: Greater Cambridge	Related documents	Welcome and support the focus on cutting car use through improving public and active transport but would like to see an equal focus on Travel Demand Management measures (such as congestion charging) in the plan	Noted. This is a GCP proposal. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council -> Committees -> Greater Cambridge Partnership Executive Board (cmis.uk.com)
284	Chapter 3: Greater Cambridge	Specific scheme	We support in principle the Greater Cambridge Partnership (GCP) proposals to fund improvements to public transport through a fair and transparent charging mechanism. We favour a Workplace Parking Levy in the immediate term and would support a congestion or pollution charge if properly researched.	Noted. This is a GCP proposal. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council -> Committees -> Greater Cambridge Partnership Executive Board (cmis.uk.com)
285	Chapter 3: Greater Cambridge	Bus	It is not clear what is meant by 'capacity enhancements to Park and Ride' or 'additional Travel Hub spaces'. We would strongly oppose any increase in car parking space provision, if that is what is meant. We support Travel Hubs in the sense of Smarter Cambridge Transport's description of locations	Noted. This is a GCP proposal. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council -> Committees -> Greater Cambridge Partnership Executive Board (cmis.uk.com)
286	Chapter 1	Vision	<ul style="list-style-type: none"> HDC would like to see the LTCP vision acknowledge that the private car will be needed in rural areas for some time to come as the current vision indicates that investment in a connected transport system could take some time to be implemented therefore reliance on the car is inevitable until transformation is achieved. Significant and ongoing revenue funding to support bus services/community transport Delivery of the Ely Area Capacity Enhancements on the railway to facilitate more passenger services stopping at the railway stations in Fenland. 	Noted and agreed. Covered by changes to Fenland section. Additional detail, more sub headings to bring out key points.
287	Chapter 3: Fenland	Rail	<ul style="list-style-type: none"> We would like to see the LTCP also recognise the need to provide access to other key destinations such as education facilities and hospitals within the 30-minute period. We would also like to see a commitment in the LTCP to recognise (and lobby for) improvements to rail services to allow trains via March, Whittlesey and Manea to stop directly at North Cambridge Station to cut journey times to this important employment hub It is now essential that future economic growth is supported through this LTCP with the delivery of new infrastructure across all modes to support economic growth The continued development of the Wisbech Access Strategy (medium- and long-term schemes) along with proposals for the A47 is also essential 	Noted and agreed. Covered by changes to Fenland section. Additional detail, more sub headings to bring out key points.

288	Chapter 3: Fenland	Bus	<ul style="list-style-type: none"> Improved public transport and especially bus services are an essential part of addressing inequality in Fenland. A new approach for public transport is essential for Fenland. The draft LTCP has a strong focus on transporting people between towns and cities; however, the needs of older people may not be to travel between towns and cities but to travel within them. We would like to see a much stronger focus on addressing the rural transport needs of the region. Clear, precise, and costed proposals that can deliver real transformation. 	Noted and agreed. Covered by changes to Fenland section. Additional detail, more sub headings to bring out key points.
289	Chapter 2: Our strategy	Targets and indicators	<ul style="list-style-type: none"> The LTCP needs to facilitate improved air quality monitoring relating to transport so that effects can be better understood. Transport interventions to provide cleaner air can then be identified and implemented with more certainty 	Air Quality plays a big part of this LTCP. It is a key issue, especially with regards transport. No change required.
290	Chapter 2: Our strategy	Goals	<ul style="list-style-type: none"> The type of transformation required in Fenland to deliver a transport network for the future is going to be very significant. There are concerns about the cost and the time required to achieve such change. In the time between now and then a strong reliance on the car is likely. FDC wants to see such challenges, impacts and phasing of an approach better acknowledged within the LTCP. Acknowledgement of transport poverty in Fenland needs to be addressed, this could be even more prohibitive with the cost of alternative more environmentally friendly alternatives. 	Noted. Our strategy section and 15% targets section to acknowledge different pace of achieving goals for certain areas.
291	Chapter 2: Our strategy	Active Travel	<ul style="list-style-type: none"> An aspiration and commitment in the LTCP to support funding for all school pupils in the CPCA area to ensure all have passed their bikeability test before leaving school. 	Noted. Active Travel strategy will focus on improving take up of AT modes.
292	Chapter 3: Fenland	Bus	<ul style="list-style-type: none"> It is of fundamental importance for Fenland that proposals to better integrate and improve bus services are taken forward. This should be alongside district wide proposals for cycling and walking improvements, the introduction of rural travel hubs and improved community transport. Whilst references are made to such matters there is currently no specific detail. FDC is keen to support such proposals and work with the CPCA to ensure successful delivery of these projects in Fenland The Fenland Chapter must make reference to and deliver the Whittlesea multi modal access strategy. A robust and evidence-based project like those already underway for March and Wisbech, is needed to ensure that congestion and other transport matters in Whittlesey are addressed. Consideration to the Whittlesey bypass 	Noted and agreed. Covered by changes to Fenland section. Additional detail, more sub headings to bring out key points.
293	Chapter 1	Targets and indicators	Use of smart targets for the objectives would aid in monitoring progress towards achieving the LTCP's aims and allow development of more specific targeted actions and interventions to support its delivery	Monitoring section of the plan, including indicators, being worked on to make these more SMART.
294	Chapter 1	Climate	Net zero should be brought forward to 2040	Comment noted. WSP work will inform strengthening of text around this.
295	Chapter 3: Hunts	Structure and formatting	The Huntingdonshire section of the strategy would be more accessible if it were more clearly structured relating regional or town specific elements. Where statistics are used, the addition of references to data sources is essential.	Local section to be reworked, adding in more sub headings and bringing out key focus areas. Agree re: data sources.
296	Chapter 3: Hunts	Evidence	The local area strategy would be improved by including more specific details on how projects will be funded	Local Strategy - section to be added in the 'our strategy' chapter to clarify exactly what LTCP Local Strategies will cover, inc. funding etc.
297	Chapter 2: Our strategy	Structure and formatting	Clarity of the LTCP's messages would be improved by rationalisation of the strategy elements and inclusion of more specific evidence, detailed intentions and realistic aspirations being set out in a phased manner identifying how elements of the strategy will be delivered	On Delivery - the delivery plan is intended to do this. This is to follow the LTCP
298	Chapter 2: Our strategy	Structure and formatting	Structure of our strategy section is not well ordered and hard to follow	Noted. Our strategy section to be addressed and reworked.
299	Chapter 3: Hunts	Connectivity	Insufficient attention to rural areas and villages.	Noted. Local section to be updated to include more sub headings to bring out key focus areas, including rural areas
300	Chapter 3: Hunts	Active Travel	Needs more firm commitment to the role of active travel for rural areas.	Noted. Local section to be updated to include more sub headings to bring out key focus areas, inc. active travel and rural areas
301	Chapter 3: Hunts	Evidence	Amend population in text to 180,800	Noted. Agreed, simple addition.
302	Chapter 3: Hunts	Specific scheme	Need to really affirm the importance of the A141 for Hunts growth aspirations. Need LTCP to be clear on funding certainty.	Additional text to be added in the local section around importance of the A141 improvements for growth. As for funding, the CPCA is clear that the A141 is funded to OBC and is committed to delivering the project however funding beyond OBC is not yet confirmed.
303	Chapter 3: Hunts	Related documents	Need to signpost clearly to key supporting/linked docs like the Hunts Local Plan.	Noted and agreed. Simple addition
304	Chapter 3: Hunts	Structure and formatting	Reference District Council being a CL charging authority.	Noted and agreed. Simple addition
305	Chapter 4: Policies	Policies	Absence of policies from consultation makes it hard to respond - what weighting is attached to them? Need to define what you mean by policy	Noted. Any new policies will be consulted upon as part of child docs to follow. Make clear in policy chapter
306	Chapter 1	Vision	The proposed vision is jumbled. It needs to be crystal clear.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
307	Chapter 1	Vision	Suggested new wording for a vision	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
308	Chapter 1	Objectives	The top-level goals proposed in the draft LTCP are not actually goals, but rather general objectives that flow from the vision	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
309	Chapter 1	Productivity	What does "making [people] more efficient" mean? Employers and people do not share the same goals, needs, motivations or risks	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
310	Chapter 1	Vision	The sense of this would be clearer if it were expressed in the context of Triple Access Planning	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.

311	Chapter 1	Goals	Should climate not be the number one goal? No other goal is a response to a declared "emergency"	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
312	Chapter 1	Climate	2050 is far beyond the life of this plan. Achieving decarbonisation milestones is far more important at this point in time than achieving net zero in 2050. The UK's statutory and international commitments are to reduce emissions relative to 1990 levels by: ● 68% by 2030 and ● 78% by 2035. Relative to 2019 levels, those commitments equate to: ● 43% by 2030 (i.e. within 8 years and the scope of this LTCP) and ● 61% by 2035	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. WSP work on Climate and target???
313	Chapter 1	Climate	LTCP should follow International Panel on CC by aiming to halve emissions by 2030	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. WSP work on Climate and target???
314	Chapter 1	Climate	policies to respond to climate change should be framed in terms of a finite carbon budget that is drawn down each year. A budget should be allocated to surface transport in the CPCA region, and should cover both embodied and operational carbon emissions	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. WSP work on Climate and target???
315	Chapter 1	Climate	The term "baseline" in the third CPICC goal needs to be defined. The year chosen should be no later than 2019.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. WSP work on Climate and target???
316	Chapter 1	Vision	How does a "well-planned and good quality transport network" protect and improve green spaces and nature?	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
317	Chapter 1	Climate	There is no mention of air pollution or mental health. How does a transport plan deliver "stronger, fairer, more resilient communities"? This requires the joint effort of the planning authority, transport authorities, central government, landowners, developers, urban and transport planners, housebuilders and other stakeholders. Including "wellbeing" in the title would better communicate the breadth of ambition here.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. Air quality already included within the LTCP. Can add some wording in public health section to include importance of mental health.
318	Chapter 1	Goals	It is an unrealistic goal to "prevent all harm". Setting an achievable target is more likely to lead to an effective plan	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
319	Chapter 1	Objectives	How does making climate and the environment two separate objectives give them "greater focus", as suggested in the consultation narrative? Surely it is the effectiveness and urgency of the policies that will focus people's attention and ensure meaningful action?	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
320	Chapter 1	Objectives	3 more suggested: Personal Prosperity, Wellbeing of Future Generations, and Economy	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
321	Chapter 1	Objectives	What are currently termed 'objectives' would therefore be better termed 'policy themes'	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
322	Chapter 1	Goals	Support for "new housing and development" needs to be qualified. The location, design and promotion of new housing must be consistent with the Key Goals	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
323	Chapter 1	Active Travel	Connect ... sustainably" should be expressed unambiguously as "Connect ... by convenient public transport and safe active travel routes, so that ..."	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
324	Chapter 1	Bus	"connected sustainably" should be expressed unambiguously as "well connected by convenient public transport and safe active travel routes"	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
325	Chapter 1	Active Travel	What does "resilient and adaptive" actually look like? There is a risk that this will justify creating additional capacity and connections in the road network at the cost of investing in active travel and public transport	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
326	Chapter 1	Climate	What are "good practice standards"? There are legal standards and there are WHO guidelines. The plan must meet legal standards, and should aim to meet WHO Global Air Quality Guidelines, but over what period of time?	Noted. Agreed change wording to 'the required legal standards'
327	Chapter 1	Environment	This simply reiterates in different words the Environment key goal. It is entirely unclear how transport infrastructure or services "protect and enhance" the environment. Not building transport infrastructure will protect nature, but that is not being proposed.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
328	Chapter 1	Climate	This also reiterates the Climate key goal. What is the objective during the life of this plan? How will it be achieved?	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
329	Chapter 1	Targets and Indicators	The LTCP contains no goals that are SMART. Numerous suggestions for SMART goal examples made	Tie in to updated monitoring section - the monitoring section and associated targets and indicators to be SMART - goals and objectives are longer term aspirations (how delivered and monitored within the updated monitoring section)
330	Chapter 2: Our strategy	Shared Mobility	The only effective interventions are: Better public transport; More cycling and walking paths and lanes; and Shared e-bike scheme	Noted. No change.
331	Chapter 2: Our strategy	EV and alternate fuels	There are no other interventions proposed to support references in the draft plan to 'better alternatives to using the car, electric vehicles, zero emission transport, alternative fuels, reduced congestion, doubling nature, improving public health and good internet connectivity.	Noted. Where these are not already identified in the major schemes section of the plan, the child documents (inc. local strategies, BSIP) and the delivery plan to follow the LTCP will aim to specify schemes and interventions which will deliver the LTCP goals and objectives.
332	Chapter 2: Our strategy	Bus	The "better public transport" will be delivered by reforming bus services, but work on how best to achieve this is "ongoing". So, there are no specific proposals, nor even specific strategies	Noted. Where these are not already identified in the major schemes section of the plan, the child documents (inc. local strategies, BSIP) and the delivery plan to follow the LTCP will aim to specify schemes and interventions which will deliver the LTCP goals and objectives.
333	Chapter 2: Our strategy	Shared Mobility	The suggestion of using shared e-bikes to move between one's home and a local bus stop is impractical, inefficient and unlikely to be affordable at scale	No change required. E-bike trials and provision tends to come from private operator or will be funded and tested prior to take up. Probably more appropriate in some locations than others, granted.

334	Chapter 1	Highways	The draft plan introduces the concept of "travel demand management" (TDM), but explicitly states that "No specific TDM schemes are in the draft LTCP"	Noted. Where these are not already identified in the major schemes section of the plan, the child documents (inc. local strategies, BSIP) and the delivery plan to follow the LTCP will aim to specify schemes and interventions which will deliver the LTCP goals and objectives.
335	Chapter 1	Goals	Target of reducing car miles driven by 15%, as recommended by the CPCC is only "supported" by this plan. It is not actually a target. Development of TDM needs to start now due to the years it takes to implement.	Noted. The LTCP is clear that it supports the 15% target and is working with partners in order to achieve this
336	General	Partnership	A new social contract has to be struck now in order to achieve the scale of change required. CPCA need to lead on this	Noted.
337	Chapter 2: Our strategy	Evidence	Policies also create strategic justification for projects, business cases and funding	Noted.
338	Chapter 2: Our strategy	Related documents	Policies underpin planning requirements in development management	Noted.
339	Chapter 2: Our strategy	Objectives	Policies are therefore most important part of the LTCP	Noted.
340	Chapter 2: Our strategy	Objectives	The draft plan contains no specific policies, just some policy themes. As such, it is not yet an LTP within the meaning of the Local Transport Act 2000 - 108 (1)	Any new policies will form part of a child doc to the LTCP and therefore be subject to a separate consultation. The suite of documents includes policies, such as the digital policy that has been developed. The LTCP will align with the revised LTP guidance (mapping will be undertaken and evidence provided). Current suite of policies remain as previously agreed and adopted - any changes or new policies will be appropriately consulted on
341	General	Policies	This therefore means that the draft LTCP is not ready for public consultation, and a further full public consultation on the policies will be required before the LTCP may be adopted. Two good references for policies to include in the Cambridgeshire and Peterborough LTCP are the draft Oxfordshire LTCP (January 2022) and the Hertfordshire Local Transport Plan, adopted in 2018	Any new policies will form part of a child doc to the LTCP and therefore be subject to a separate consultation. The suite of documents includes policies, such as the digital policy that has been developed. The LTCP will align with the revised LTP guidance (mapping will be undertaken and evidence provided). Current suite of policies remain as previously agreed and adopted - any changes or new policies will be appropriately consulted on
342	Chapter 2: Our strategy	Demand management	The draft LTCP remains entirely noncommittal on travel demand management. The caveats set out on LTCP pages 43-44 constitute a fail-safe recipe for inaction	Travel demand management measures will be assessed and considered on a local basis, as per what is appropriate. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
343	Chapter 1	Bus	Shifting incentives from driving to active travel, public and shared transport must be a central objective of the Plan to achieve reductions in carbon emissions, air pollution, deaths and injuries in urban areas, and delays to buses	Noted.
344	Chapter 2: Our strategy	Evidence	Numerous suggestions for how TDM can be achieved/complemented made	Noted
345	Chapter 3: Greater Cambridge	Related documents	Attempting to introduce a congestion charge in Cambridge (or Peterborough) is politically and practically risky. It may be wiser to wait until the government introduces a national road user charge to replace fuel duty, and ensure that local authorities are able to apply and receive a local premium to fund local public transport. This approach avoids the local authority having to cover the capital investment, and costs of administering and enforcing charge collection. In the meantime, other demand management tools can be applied gradually to reduce traffic and increase revenues to the local authorities to invest in local public transport	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com).
346	Chapter 3: Greater Cambridge	Specific scheme	Within the Greater Cambridge region, the draft LTCP defers unquestioningly to the Greater Cambridge Partnership (GCP) programme plus East West Rail, Cambridge South station, relocating Waterbeach station, the A428 upgrade west of Cambourne, and the A10 upgrade north of Cambridge. These are often outdated ideas.	The CPCA does not operate in isolation and the LTCP needs to reflect the reality of other plans and schemes that are being delivered by other bodies in the area. No change to plan.
347	Chapter 3: Greater Cambridge	Highways	The A10 upgrade retains an aspiration to increase road capacity, but this is now couched in the vaguest possible language: "investment to improve journey time reliability for drivers and freight movements"	Comment noted. No change to plan
348	Chapter 3: Greater Cambridge	Vision	Ideas lack vision for Greater Cambridge.	The GCP's Making Connections consultation makes a once-in-a-generation package of measures to develop a comprehensive bus network and tackle congestion in the city through a congestion charge and overhauling bus services and fares. Further detail can be found at https://www.greatercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
349	Chapter 3: Greater Cambridge	Suggested scheme	Numerous suggestions for interventions in Greater Cambridge are made.	N/A
350	Chapter 3: Greater Cambridge	Suggested scheme	Re-route buses through Cambridge to create capacity for more buses whilst creating a more people-friendly space in the city centre (more detail on Smarter Cambridge Transport Website)	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
351	Chapter 3: Greater Cambridge	Suggested scheme	Flat-rate single fares to use any local (all stops) services, with free interchanging, irrespective of bus operator	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
352	Chapter 3: Greater Cambridge	Suggested scheme	50% discount on all rail and bus services within Cambridgeshire and Peterborough for all residents aged under 18, job-seeking or registered disabled	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
353	Chapter 3: Greater Cambridge	Suggested scheme	24-hour helpline to arrange free transport (by DRT bus or taxi) if a bus service is cancelled or delayed for more than an hour, and the next service is not due for over an hour.	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
354	Chapter 3: Greater Cambridge	Suggested scheme	Express (inter-urban, limited-stop) bus services available between all towns and large villages in the region, running every day and at least every 20 minutes between 7am and 7pm.	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.

355	Chapter 3: Greater Cambridge	Suggested scheme	Simple, zone-based fare system for all express bus and rail services in the region, with free interchanges between bus and rail, and between different bus operators	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board [cms.uk.com]. For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
356	Chapter 3: Greater Cambridge	Suggested scheme	Travel hubs (bus stations plus other locally appropriate amenities) in every large village, served by rail and/or express bus services to Cambridge, nearby railway stations, and other major destinations	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board [cms.uk.com]. For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
357	Chapter 3: Greater Cambridge	Suggested scheme	Rapid transit system (e.g. light rail) linking key locations in Cambridge: city centre, Cambridge station, Biomedical Campus, railway stations, bus stations, coach station, visitor transfer hub(s).	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board [cms.uk.com]. For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
358	Chapter 3: Greater Cambridge	Suggested scheme	A regional travel hub at the Girton Interchange, with a coach station, visitor parking, an exhibition hall and a rapid transit link into the city	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board [cms.uk.com]. For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
359	Chapter 3: Greater Cambridge	Suggested scheme	A reinstated heavy railway and/or a light railway between Haverhill and Cambridge via Stapleford and/or Audley End via Saffron Walden	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board [cms.uk.com]. For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
360	Chapter 3: Greater Cambridge	Suggested scheme	Rolling programme of bus stop upgrades to include shelters, lighting, secure cycle parking, real-time information displays and free WiFi	Noted. The BSP and the local strategies will cover these issues. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board [cms.uk.com]. For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
361	Chapter 3: Greater Cambridge	Suggested scheme	Ten-year plan to build a dense network of protected cycle tracks/lanes between all towns, villages and major destinations, including railway stations, schools, shops, business parks, sports grounds, leisure/cultural venues	Noted. The Active Travel strategy and the LWIP are dealing with cycle scheme proposals. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board [cms.uk.com]. For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
362	Chapter 3: Greater Cambridge	Suggested scheme	Rolling programme to upgrade all existing cycle tracks/lanes to be upgraded to comply with Local Transport Note 1/20, making them safe for people of all ages to use, riding all types of cycles, e-scooters and mobility scooters	Noted. The Active Travel strategy and the LWIP are dealing with cycle scheme proposals. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board [cms.uk.com]. For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
363	Chapter 3: Greater Cambridge	Suggested scheme	Regional freight distribution and consolidation centre at the Girton Interchange	Noted. Agreed that freight and HGV issues need addressing further in LTCP. Section in our strategy to be improved and brought out more clearly. With regards to individual suggestions, these will need to be made on a local, case by case basis. CCC, as highway authority, also has a HGV policy which needs to be adhered to: https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/roads-and-pathways/heavy-or-abnormal-loads-on-the-highway/heavy-goods-vehicle-hgv-policy
364	Chapter 3: Greater Cambridge	Suggested scheme	A hierarchy of freight distribution and consolidation centres throughout the region with high capacity EV charging infrastructure, rented out to logistics companies	Noted. Agreed that freight and HGV issues need addressing further in LTCP. Section in our strategy to be improved and brought out more clearly. With regards to individual suggestions, these will need to be made on a local, case by case basis. CCC, as highway authority, also has a HGV policy which needs to be adhered to: https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/roads-and-pathways/heavy-or-abnormal-loads-on-the-highway/heavy-goods-vehicle-hgv-policy
365	Chapter 3: Greater Cambridge	Suggested scheme	All developments to provide secure cycle parking for residents at a ratio of one per resident	Noted. Predominantly a Local Plan issue.
366	Chapter 3: Greater Cambridge	Suggested scheme	All dwellings likely to be occupied by a family or disabled person to have access to a secure space to park a cargo, adapted or trailer cycle, or a mobility scooter	Noted. Predominantly a Local Plan issue.
367	Chapter 3: Greater Cambridge	Suggested scheme	All cycle parking to be accessible on the level or via gently sloped ramps	Noted. Local plans should have cycle parking standards for new developments.
368	Chapter 3: Greater Cambridge	Suggested scheme	All planning applications for 50 or more dwellings to include a travel plan and Section 106 funding for measures to maximise sustainable travel choices by residents from first occupation, e.g. personalised travel planning, free travel cards, discounts on public transport, free membership of a club car, et al	Noted. The NPPF currently states that a full TP is only required for developments of 250+ dwellings, this policy is set at a national level and could not be changed by the LTCP.
369	Chapter 3: Greater Cambridge	Suggested scheme	All planning applications for more than 500 sq.m of office space to include a travel plan and Section 106 funding for measures to maximise sustainable travel choices by workers from first occupation, e.g. personalised travel planning, free travel cards, discounts on public transport, pool or club EV car for business travel, enrolment to a lift-sharing scheme, et al	Noted. The NPPF currently states travel plan requirement thresholds for floor space, this policy is set at a national level and could not be changed by the LTCP.
370	Chapter 3: Greater Cambridge	Suggested scheme	All planning applications for schools to include a travel plan and Section 106 funding for measures to maximise sustainable travel choices by pupils from first occupation, e.g. personalised travel planning, walking bus, additional school-time bus services, et al.	Noted. NPPF already requires schools to have travel plans.
371	Chapter 3: Greater Cambridge	Suggested scheme	All active travel routes and connections in a development to be delivered before first occupation, and remain open throughout build-out. Controlled crossings for construction traffic and short temporary diversions will be acceptable	Noted. Predominantly a Local Plan issue.
372	Chapter 3: Greater Cambridge	Suggested scheme	All developments to provide at least one EV club car parking bay, with at least an 11kW chargepoint, per 100 dwellings, rounded to the nearest 100 (i.e. 51 to 149 dwellings rounds to 100)	Noted. Predominantly a Local Plan issue. T
373	Chapter 3: Greater Cambridge	Suggested scheme	All developments to include loading/delivery bays, distributed so that every dwelling entrance is no more than a 50-metre walk from a loading bay	Noted. Predominantly a Local Plan issue.

374	Chapter 3: Greater Cambridge	Suggested scheme	Planning authorities will be expected to adopt Supplementary Planning Documents referencing the Local Transport Plan standards as superseding existing local planning standards where these are lower	Noted. Local standards will be a planning issue. All SPDs and Local Plans will be worked up in conjunction with the LTCP policy direction, but it will be for local plans and their supporting documents to set local standards appropriate to their area.
375	Chapter 3: Greater Cambridge	Suggested scheme	Weight limits on freight vehicles in every city and town centre, requiring logistics operators to use smaller vehicles for last-mile deliveries and first-mile collections, operating from local freight distribution and consolidation centres	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
376	Chapter 3: Greater Cambridge	Suggested scheme	Zero emission zones in every city and town centre	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
377	Chapter 3: Greater Cambridge	Suggested scheme	Rapid phase-in of ultra-low and zero-emission taxis (hackney and private hire) licensed anywhere in the region	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
378	Chapter 3: Greater Cambridge	Suggested scheme	Workplace Parking Levies in every town, with net revenue directly funding local public transport services	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
379	Chapter 3: Greater Cambridge	Suggested scheme	Charging or 20-minute wait-limits for all car parking in towns and large villages, with net revenue directly funding local public transport services	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
380	Chapter 3: Greater Cambridge	Suggested scheme	Civil enforcement of all parking and yellow line infractions	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
381	Chapter 3: Greater Cambridge	Suggested scheme	Gradual reduction each year in the number of public car parking spaces available in every ward. Which spaces and how they should be re-purposed (e.g. to a delivery bay, demand responsive bus service stop, club car parking, cycle parking, a bench, a tree, planting, bin storage, etc) to be nominated by ward councillors in consultation with their residents	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
382	Chapter 3: Greater Cambridge	Suggested scheme	Phased repurposing of multi-storey car parks, e.g. for cycle parking, residents' car storage, urban farms, rooftop dining, skateparks, energy storage, flood protection cisterns, et al.	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
383	Chapter 3: Greater Cambridge	Suggested scheme	Gradual roll-out of electric club cars to every town and large village, in residential areas and at railway stations	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
384	Chapter 3: Greater Cambridge	Suggested scheme	Rentable bikes/e-bikes/scooters available at every railway station and bus station	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
385	Chapter 3: Greater Cambridge	Suggested scheme	Rolling programme of personalised travel planning, with delivery teams focusing on areas where there has been a recent improvement to public transport or provision for active travel.	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
386	Chapter 3: Greater Cambridge	Suggested scheme	Bikeability training provided free to all Year 6 pupils at all schools, including private, in Cambridgeshire and Peterborough	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
387	Chapter 3: Greater Cambridge	Suggested scheme	Free Bikeability training and e-bike testing available to all residents at any age	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
388	Chapter 3: Greater Cambridge	Suggested scheme	Workplace Parking levy discounts available to organisations that set and achieve targets for modal shift	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.

389	Chapter 1	Evidence	There is no mention of induced demand in the draft LTCP, yet it is fundamental to a full understanding of transport demand and how it can be met sustainably, and without limiting people's economic opportunities or businesses' productivity	Noted.
390	Chapter 2: Our strategy	Climate	Investment in road capacity undermines investment in active travel, public transport, shared transport and digital connectivity. It increases car dependency, discriminating against those who cannot drive or cannot afford to own a car. And it increases carbon emissions, air pollution and ecological damage.	Noted. LTCP has a hierarchy of modes with car/road building below more sustainable modes, but must also recognise that in some cases road capacity improvements or safety interventions are still required. Where this is the case, providing for more sustainable modes alongside these is prioritised.
391	Chapter 1	Vision	Strongly supportive of the overall direction of the LTCP, including its vision, goals and guiding principles, encompassing a broader range of priorities than the adopted LTP. Suggest that the LTCP could show greater ambition for the natural environment as part of providing new and enhanced transport schemes, to reflect the Combined Authority's aim of doubling nature.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required to these.
392	Chapter 2: Our strategy	Evidence	Suggest that consideration of impacts may be more nuanced than currently presented. We would suggest that the final LTCP should reflect on potentially differing COVID impacts at different locations and growth sites, and that it should recognise current evidence suggesting that in certain locations within Greater Cambridge car traffic is now at pre-pandemic levels.	Noted. Will add a section early on our strategy section talking about Covid-19 impacts
393	Chapter 2: Our strategy	Goals	Support the principle of the LTCP's commitment to a reduction in car mileage by 15%, using a 2019 baseline, across the region.	Support noted.
394	Chapter 3: Greater Cambridge	Specific scheme	Supportive of all the content included in the Greater Cambridge section, including in particular the inclusion of the GCP programme which underpins delivery of the current local plans and will help achieve sustainable transport goals. Within this, we strongly support the inclusion of forthcoming proposals following the GCP Making Connections consultation.	Support noted. No change to plan needed.
395	Chapter 3: Greater Cambridge	Related documents	Strongly support the Combined Authority's intention to work with relevant partners to prepare a Transport Strategy for Cambridge and South Cambridgeshire to support the emerging Greater Cambridge Local Plan as a child document to the LTCP. Within this, we also strongly welcome the support for policy measures such as trip budgets where considered appropriate.	Support noted. No change to plan needed.
396	Chapter 3: Greater Cambridge	Bus	Welcome the proposals to transform the Greater Cambridge bus network, but strongly suggest that reference is added to the need to significantly increase bus depot provision in the Greater Cambridge area to support this.	Comment noted. Agree that reference should be made to need for bus depot provision in appropriate place tba.
397	Chapter 1	EV and alternate fuels	Suggest that to support the shift towards electric vehicles, the Combined Authority commits to working with government and relevant partners to accelerate delivery of new grid capacity to underpin decarbonisation of both private and public transport across the area. Strong links must be made between the deliverables of the LTCP and work to develop a Local Area Energy Plan for Cambridgeshire, which will need to consider electrification of transport and the additional grid infrastructure requirements to support this.	Comment noted. Add wording on this in an appropriate place and ensure link to Local Area Energy Plan for Cambridgeshire is included.
398	Chapter 2: Our strategy	Objectives	We note that the policies are structured by the objectives, but the performance framework is structured to measure delivery of the goals. We support the intention of these various elements but suggest that additional consideration is required, including potentially rationalising some of this content, to clarify exactly what ambitions schemes will be prioritised and assessed against.	Noted. Our strategy section to be revisited and re-structured where appropriate
399	Chapter 2: Our strategy	Objectives	Note that the National Industrial Strategy referred to here no longer exists. This has been transitioned to the UK's 'Plan for Growth'. We note England's Economic Heartland's Regional Transport Strategy, and suggest that this LTCP section references that document.	Noted. amend as appropriate
400	Chapter 1	Vision	Support the content of the proposed vision which encompasses a broader range of issues than the adopted LTP. On specific wording points, we would suggest that the phrasing regarding the natural environment is amended to read "protect and enhance our environment", noting Cambridgeshire and Peterborough's doubling nature ambition, and Greater Cambridge's 20% Biodiversity Net Gain aims. We would also suggest removing "very" from the phrase "very rural areas" so as to encompass the full range of locations including better connected rural areas.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required to these.
401	Chapter 1	Goals	Support the goals referenced. Under productivity or connectivity we would suggest that reference should be made to modal shift and potentially also to reducing congestion as key priorities for the LTCP. Under health, we would suggest adding reference to active travel.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required to these.
402	Chapter 1	Objectives	Support the comprehensive objectives including the addition of digital connectivity. We'd suggest that there is an opportunity to quantify the natural environment objective, potentially via referencing the doubling nature ambition in a similar way to the climate objective referring to net zero emissions by 2050.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required to these.
403	Chapter 1	Evidence	We support recognition of the key social, environmental and economic issues raised by the LTCP's evidence base.	Support noted
404	Chapter 1	Freight	Support this guiding principle, especially use of trip budgets and focus on freight.	Support noted
405	Chapter 1	Bus	Support the aspirations of the Bus Service Improvement Plan. We would highlight that the location of bus depots and layover facilities are important for productivity.	Noted and agreed. To be added in our strategy section
406	Chapter 1	Connectivity	Support the focus on digital connectivity for all, and the intention to explore demand responsive transport for more rural areas, noting the digital connectivity and public transport accessibility challenges faced by our more rural communities. We would suggest that further consideration could be given to how rural centres and nearby villages can sustain themselves as networks and connect effectively into other larger centres and more strategic transport options.	Noted. Each local section to get a section focussing on rural issues with PT and AT
407	Chapter 1	Health	We support the content on health. We would note that additional reference could be made to: <ul style="list-style-type: none"> initiatives for adults to bring them back to cycling as well as encourage their children building greater links with schools to promote benefits to pupils of walking and cycling and forming healthy habits/behaviours early the safety of walking routes, which needs to be addressed to encourage use by all users. The Cambridgeshire and Peterborough Health and Wellbeing Strategy 2020-24, and the emerging Active Travel Strategy 	Noted. References to key docs to be added
408	Chapter 2: Our strategy	Related documents	Support the approach to integrating spatial and transport planning and intention to prepare Transport Strategy for Cambridge and South Cambridgeshire.	Support noted
409	Chapter 2: Our strategy	Safety	Support content on safety.	Support noted
410	Chapter 2: Our strategy	Climate	Support: <ul style="list-style-type: none"> the intention to consider embedded carbon within transport scheme assessment the reference to the Cambridge City Council Air Quality Action Plan (AQAP) 2018-23, which will be reviewed in 2022/23. A reference to compliance with future AQAP should be included in the final LTCP. We welcome the LTCP's support for the key actions identified in the AQAP. 	Support noted
411	Chapter 2: Our strategy	Connectivity	Following current content regarding the Intelligent City Platform, we would ask that the following wording is added: "In addition the Smart Cambridge programme has been using real time public transport data to provide clear information for travellers across the County through both an app-based interface and travel screens, helping to provide real time information to travellers and local authorities about the functioning of the transport network".	Noted. Agreed.

412	Chapter 2: Our strategy	Environment	We support the aims set out. As per our comments elsewhere, we would suggest that the LTCP could be more specific in its ambition for the natural environment, potentially adopting the Greater Cambridge ambition such that transport schemes would seek to deliver 20% Biodiversity Net Gain.	Further work needed on biodiversity net gain and this will be integrated into the narrative of the LTCP - examples of the biodiversity and sustainability elsewhere circulated - need to update the LTCP to align (policies remain as previous, but the strategy price to be updated)
413	Chapter 2: Our strategy	Active Travel	Support the focus on active travel. We would suggest this principle needs to acknowledge the importance of considering all users, including those who may struggle with walking.	Support noted
414	Chapter 2: Our strategy	Evidence	Strongly support the application of travel demand management tools in appropriate locations	Support noted
415	Chapter 2: Our strategy	Evidence	Support assessing transport schemes against a wide range of indicators going beyond GVA to encompass environmental and social priorities. Equally, to ensure delivery against LTCP ambitions, as per our comments on the introductory section we suggest that additional consideration is required, including potentially rethinking some of this content, to clarify exactly what emissions schemes will be prioritised and assessed against.	Noted. Our Strategy section to be revisited.
416	Chapter 2: Our strategy	Micromobility	Note that no reference is made within the user hierarchy to e-scooters, and suggest that the LTCP needs to be flexible and forward looking to account for emerging transport modes of travel, including within the user hierarchy.	Noted. Awaiting government guidance
417	Chapter 3: East Cambs	Highways	Support the intention to address A10 capacity issues and provision of a new Park and Ride at Waterbeach, which are requirements to support full development at Waterbeach New Town.	Support noted
418	Chapter 3: East Cambs	Rail	EACE provides only limited additional future rail capacity. Ongoing engagement with Network Rail and local partners is required to ensure that there is sufficient rail capacity to cater for all planned growth to 2040 and beyond, including accounting for the increasing proportion of journeys being taken by rail. Also included in our response to the EACE consultation, we also note the pressing need to address exclusion of the community severed by the Chesterton Fen Road crossing caused by the existing and forecast increases in barrier down time.	Noted. Issue of future demand and train paths above and beyond outstanding commitments will be picked up more generally in the plan as a concern in other locations along the line (eg Fen Rd).
419	Chapter 3: Greater Cambridge	Environment	We'd suggest that the text on page 68 could be clarified to note that the environmental and social impact of journeys being made by private vehicles are current and not solely related to future planned growth, as is expressed later in the same paragraph. In relation to air pollution we would note the negative impacts of particulate matter from transport within Cambridge, in addition to the impacts of nitrogen dioxide (NO2) already noted.	Noted, agreed. Make change.
420	Chapter 1	EV and alternate fuels	Recognise the transport challenges identified. We'd note the additional challenges not mentioned in this section of: <ul style="list-style-type: none"> Meeting the growing demand for fast deliveries of goods and services in a way that avoids negative impacts. Numerous vehicles pulling up at the kerb to make deliveries has an impact on the public realm, public safety (conflict with pedestrians and cyclists) and the quality of life of people living and working in the area, adding unnecessarily high levels of congestion, pollution and environmental impacts. The Government's drive towards phasing out petrol and diesel vehicles, which will see a shift to electric vehicles. Electrical grid distribution and connection, already a key challenge within Greater Cambridge as explored by GCP, will need to be enhanced to support this shift together with jobs and housing growth. In addition, public charging infrastructure needs to keep pace and will need to accommodate a wider range of vehicles including mobility scooters, electric cycles and electrification of the bus fleet. Poorly located and designed e-charging infrastructure could cause conflicts, for example with pedestrian and cyclist routes. 	Noted. Updated freight section to cover delivery services and agree that grid capacity/distribution is an issue that needs mentioning in LTCP.
421	Chapter 3: Greater Cambridge	Related documents	Supportive of all the content included in this section, including in particular the inclusion of the GCP programme which underpins delivery of the current local plans and will help achieve sustainable transport goals. Within this, we strongly support: <ul style="list-style-type: none"> Inclusion of forthcoming proposals following the GCP Making Connections consultation that seek to improve public transport and air quality and reduce congestion and pollution in Cambridge. Delivery of these proposals is expected to achieve the modal shift required to address existing issues and support development identified in the adopted plans and emerging local plans. The 'decide and provide' policy approach, as per our comments on the Productivity guiding principle. 	Support noted
422	Chapter 3: Greater Cambridge	Bus	Strongly suggest that reference is added to the need to significantly increase bus depot provision in the Greater Cambridge area to support the proposed increases in bus services. The location of new depots and their potential impacts will require thorough consideration.	Agreed. Insert reference in text.
423	Chapter 2: Our strategy	EV and alternate fuels	Strongly suggest that to support the shift towards electric vehicles, the Combined Authority commits to working with government and relevant partners to accelerate delivery of new grid capacity to underpin decarbonisation of both private and public transport across the area, as well as e-charging infrastructure to support the shift towards electric vehicles, as per our comments regarding transport challenges.	Agreed. wording to be added on this and alternative fuel and EV policy to follow
424	Chapter 2: Our strategy	EV and alternate fuels	Suggest making additional reference to meeting the growing demand for fast deliveries of goods and services, including first/last mile delivery, as per our comments regarding transport challenges	Noted. Section on freight to be added
425	Chapter 2: Our strategy	Shared Mobility	Suggest making greater reference to future mobility and Mobility as a Service (MaaS) to support the work being undertaken by Smart Cambridge on these topics, noting that MaaS could be transformative for many journeys, not just for first/last mile journeys as currently suggested by the draft LTCP.	Noted. Micromobility policy to follow
426	Chapter 2: Our strategy	Rail	Supportive of the work with public sector partners exploring potential enhancements to the railway east of Cambridge, but note the early stage of this work such that its scope and delivery is uncertain. As such we would recommend that the reference to this project is amended to read: "We shall continue to work with partners in the rail sector to explore options for upgrading the railway and services between Cambridge and locations to the east".	Noted.
427	Chapter 3: Greater Cambridge	Freight	Strongly supportive of the identification of transport schemes and policy approaches required to address existing and future transport challenges in Greater Cambridge. We would request the following changes to references to the identified schemes to ensure factual accuracy, and that the relative status and certainty of schemes is correctly referenced: <ul style="list-style-type: none"> schemes identified as required to support the adopted Cambridge and South Cambridgeshire Local Plans: This list includes schemes that are coming forward but were not identified as required to support the adopted plans. We support reference to these schemes in the Greater Cambridge section, but request that the list of schemes identified as required to support the adopted plans is amended to include only the following schemes: Greater Cambridge Partnership (GCP) schemes: <ul style="list-style-type: none"> Cambridge to Cambridge Cambridge South East Transport Study Cambridge South West Travel Hub Waterbeach to North East Cambridge Cambridge Eastern Access Phase A City Access GCP Cycle Schemes Waterbeach station relocation oA10 (Waterbeach to Cambridge) highway improvements Drawing on the above, we support reference in the LTCP Greater Cambridge section to the following schemes that are being developed but are not specifically required in the adopted plans, including: <ul style="list-style-type: none"> oFoston Rural Travel Hub oA10 (Ely to Cambridge) highway improvements oA428 Black Cat to Caxton Gibbet Cambridge South Station Our understanding is that there is no firm planned scheme to enhance M11 capacity, and as such would recommend deletion of this reference. 	Noted and agreed. Amend text as per suggestion
428	Chapter 3: Greater Cambridge	Related documents	Strongly supportive of the identification of transport schemes and policy approaches required to address existing and future transport challenges in Greater Cambridge. We would request the following changes to references to the identified schemes to ensure factual accuracy, and that the relative status and certainty of schemes is correctly referenced: Schemes identified as required to support the emerging Greater Cambridge Local Plan (GCLP): <ul style="list-style-type: none"> These schemes are identified in GCLP First Proposals transport evidence, but relate to draft allocations which could be subject to change. We suggest replacing this text with "Further potential transport schemes were identified as required to mitigate the transport impacts of draft allocations included in the 2021 Greater Cambridge Local Plan First Proposals consultation. The revised Transport Strategy for Cambridge and South Cambridgeshire child document to this LTCP will be prepared to support later stages of the GCLP. This will confirm the transport infrastructure and policies required to mitigate the proposed sites, once the development strategy is confirmed". 	Noted and agreed. Amend text as per suggestion

429	Chapter 3: Greater Cambridge	Rail	<p>o6chemes not currently referenced:</p> <p>•We'd suggest that CCC's Whiteheadford Transport Masterplanning Exercise is added to the Strategic Projects and the Regional Initiatives diagram</p> <p>•We'd suggest that reference is made to the proposed improved rail services from the north which should be unlocked by the Ely Catchment Capacity Area work and other related rail proposals.</p>	Noted and agreed. Amend text as per suggestion
430	Chapter 3: Greater Cambridge	Related documents	Would welcome the opportunity to discuss the potential alignment of LTCP and GCP measures, and beyond that to share understanding and intelligence as the LTCP is rolled out so that we can evidence impact collectively.	Noted
431	Chapter 2: Our strategy	Rail	Note that Cambourne to Cambridge Public Transport Scheme is assessed in the HRA for the draft LTCP as a scheme that is new to the LTCP (ie not included in the LTP 2020). We note that this is incorrect: page 51 of the HRA accompanying the LTP 2020 identified Cambridge to Cambourne and St Neots.	Noted. Change
432	Chapter 1	Goals	Keen to see the plan expanded further – with a long term vision with steps supporting plans toward 2050.	Noted.
433	Chapter 1	Goals	There could be strengthening of the specificity of the goals described within the plan – each being clear about the deliverables which will address the sustainability agenda.	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
434	Chapter 1	Goals	Given the climate emergency, the high level goal of net zero by 2050, is welcomed, however consider it needs to be further defined and developed.	Linked to the work of WSP on the 15% reduction in car mileage and reflects the aspirations of our constituent Councils
435	Chapter 1	Goals	CUJH would also be pleased to see other areas considered, such as: <ul style="list-style-type: none"> Green and blue infrastructure in delivering environmental resilience and social value. Circular economy to reduce waste and enable efficient use of resources Renewable energy generation and grid capacity investments to deliver decarbonisation of transport and the wider built environment. Accessibility (time/distance) of services and facilities 	Noted. Comments taken on board but the vision, goals and objectives have been consulted upon twice now and no major issues identified. No change required.
436	Chapter 1	Evidence	Concerns as to how the proposed 15% reduction in miles driven is to be delivered in the short term and would challenge to ask if this target is sufficient.	Concern noted.
437	Chapter 2: Our strategy	Active Travel	The updated LTCP makes mention of increasing active travel and public transport, however the Trust would be keen to see targets made which are robust enough to deliver the step change required to realise a future transformative transport system.	Noted. Each area within the LTCP will have different specific targets/achievements. Probably not for the LTCP to state overall targets for each mode due to this
438	Chapter 2: Our strategy	Active Travel	Active travel in the region should continue to build on the investment we have seen in recent years. Cambridge and the surrounding area should be an exemplar cycling city, not just in the UK but globally. To achieve this we must continue to be ambitious and expand the existing high levels of cycling both within the city, supporting safer cross city cycling, and out across the rest of the county. Enabling safe cycling routes on roads and between villages and market towns which would further support multimodal journeys.	Noted. The Active Travel strategy and the LCWIP will look to promote active travel across the region.
439	Chapter 2: Our strategy	Active Travel	Consideration should also be made to the increased and growing usage of cargo cycles and other larger non-motorised transport.	Noted. Micromobility policy being developed.
440	Chapter 2: Our strategy	Micromobility	New micro mobility technologies are growing in popularity and offer the opportunity to significantly lengthen the distance many are willing to travel by bicycle. CUJH is already seeing this uptake growing on campus, but consider that further appropriate infrastructure is required and developed to support future growth. Micro mobility users have similar concerns to those found in active travel modes - such as road safety, lighting and security. We strongly emphasise this need and support for the forthcoming Cambridge County Council Active Travel Strategy, which needs to be bold in grasping this opportunity and would be keen to see that reflected in the LTCP.	Noted. Micromobility policy being developed.
441	Chapter 2: Our strategy	Shared Mobility	Welcome the 20-minute neighbourhood thinking, but have concerns for a significant proportion of the population who do not live and work within close proximity to their place of work. Would be of value for the LTCP to create a strategic map identifying key living and employment sites in order to consider how sustainable transportation can most effectively link them up. In this we would encourage the development of multimodal travel hubs and a mass transit system in order to make 20-minute neighbourhoods a reality.	Noted. Major schemes map included will show how all proposed schemes are to link up. Local Plans for each district will plot key employment and residential areas/development.
442	Chapter 2: Our strategy	Rail	The removal of the Cambridge Autonomous Metro (CAM), without a significant alternative solution to the population growth and related travel is of significant concern to CUJH and the wider CBC. We need a clear picture of what the anticipated growth in trips and also what the gap in provision will be in order to inform delivery across the region as a whole. The draft document goes some way to articulate this but it is not explicit enough to respond to the magnitude of change required. Whilst the LTCP recognises the significant economic and population growth, and the need to ensure that this growth is sustainable, it is currently lacking in robust evidence to show where the supply and demand of travel and transport will meet this over a longer period (such as up to 2050).	Noted. LTCP will in time include a raft of updated local strategies, which will be linked to the key growth aspirations in the Local Plans. These will form part of the evidence base for these and will include detail on economic and population growth and how this can be accommodated.
443	Chapter 2: Our strategy	Bus	The LTCP sets out a plan for providing for greater public transport and active travel but does not provide the detail on how the supply of energy needed to decarbonise motorised travel (including freight and delivery) is to be achieved. Further work is required to understand the full energy requirements for transport, moving beyond the installation of charging points. This should include specific reference to realistic plans and proposals for both meeting the decarbonisation demand and creating a more robust and renewably powered grid supply network.	Noted. Agreed. LTCP to be made clearer that work needs to be undertaken with regards grid capacity. WSP work looking into carbon impacts.
444	Chapter 1	Targets and Indicators	The strongest statement within the draft LTCP is the commitment to reduce motor vehicle miles by 15% by 2030, against a fixed 2019 baseline. However, this is not front and centre, only Greater Cambridge reference anything like the interventions required, and arguably they can't do much more of this heavy lifting, when a third of their residents already cycle five or more times a week. All other areas (Districts and PCC) need to reference this 15% reduction commitment and start to explain what this will entail.	To be reflected within the whole of the document – all areas making a contribution. Outputs from the WSP work to be integrated into the strategic and local sections to demonstrate all are on the path and working with ATE etc on rural connectivity
445	Chapter 4: Policies	Related documents	LCWIPs are referenced, but there isn't enough on delivery or funding – the LTCP should give an indication of the pace, funds, and scale of change required.	LTCP references funding and delivery where this is known. Local strategies, delivery plan and the LCWIP will add some of the detail required
446	Chapter 2: Our strategy	Active Travel	Needs to be more of an acknowledgement that building to LTN1/20 compliance will need a complete rethink about how we design and build, road space reallocation away from motor vehicles needs to become the norm.	Noted. Sentence to acknowledge this to be added in relevant section where LTN1/20 first mentioned
447	Chapter 1	Active Travel	There is no mention of Gear Change – and the Central Government's ambition for half of all trips in our towns and cities to be made by foot or by bike in 2030. This should be acknowledged within the main narrative, as well as the Districts' area responses (especially outside of CCC and SDCB).	Noted. Agree this should be included in chapter 1
448	Chapter 1	Partnership	No mention of Active Travel England, who are going to have more and more influence during the timescales of the LTCP i.e., you need to explain how the landscape has changed since the last LTP, with specific regards to active travel, Transport Decarbonisation Plan, CWS2 etc.	Noted. Section on partnership working to be improved and agree ATE should be included as partner referenced along with LA partners, DfT, NR etc.
449	Chapter 2: Our strategy	Highways	In the preamble at the recent presentation, which a colleague of mine attended, it talked about the need for faster connections. In the overall text I cannot find this, but the idea of faster connections being essential is dangerous. It will be used as a justification for road building, which will lead to more traffic. The main text talks about the need for restraint so I don't know where the faster bit came from.	Noted.
450	Chapter 3: East Cambs	Related documents	There is a tension in the difference between the introductory text and the separate texts for each District. There seems no relation between the two. East Cambridgeshire talks about the road network and the A10 – no reference to the need to address the very low levels of cycling and walking in Ely, Soham, and the villages. Cambridge City looks a bit better, but still refers to roadbuilding.	Noted. Local section being updated.
451	Chapter 3: Peterborough	Specific scheme	Peterborough section is worrying and includes the statement that the new Fletton Quays bridge is for university access. Does that mean that they expect students to be living at Fletton Quays, because there is no onward route. Peterborough again talks about the need for more Parkway capacity to ease growth, it does not really mention the need to transform the way people travel.	Noted. Peterborough section being updated

452	Chapter 2: Our strategy	Bus	Generally, there is an acknowledgment about the difficulties for buses particularly in rural areas. If the Market Towns were transformed so that walking and cycling levels were high and it was hard to drive around that would bring a big boost to rural buses.	Noted. BSP looking into bus travel throughout region and local sections being updated to reflect rural bus issues
453	Chapter 2: Our strategy	Active Travel	The last mile and freight delivery is a big issue and should be based on local centres and cargo bikes. This means that the cycling infrastructure has to be really good and have good wide provision.	Noted. Section on freight being updated to include last mile
454	Chapter 1	Objectives	Overall the LTCP feels extremely unambitious and lacks innovation. The Goals and Objectives are nebulous statements without any real measures (Objectives at least should be SMART). Some of the goals feel either unachievable (zero fatalities or serious injuries – no detail behind what this really means) or unambitious (net zero by 2050 – which is 28 years away!). Reading the full document there is very little in the way of a tangible plan. The included strategies seem to move from a statistics view to a solution without an explanation on what or how the solution will solve an issue. In the main document there is a statement under the guiding principles that states "Integrating spatial planning and reducing the need to travel" – as a statement this seems to be contradictory to the LTCP goals and objectives.	Point of view noted. Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
455	Chapter 1	Bus	Fully support the aims and objectives of the LTCP. There are many schemes identified within the LTCP that will positively contribute towards meeting the objectives, but we believe there needs to be a stronger focus on improving public transport accessibility in more rural areas.	Support noted
456	Chapter 2: Our strategy	Specific scheme	A number of very detailed points are made relating to each objective as to why RAF Wyton should be brought forward as a development site.	Noted. This is a local plan issue.
457	Chapter 3: Peterborough	Climate	Peterborough City Council has set a target of getting the city to net zero carbon by 2030 (twenty years ahead of the national target of 2050) but there seems to be no recognition of this in the plan.	WSP work on carbon to cover this
458	Chapter 3: Peterborough	Objectives	There are some good aims and objectives in the early part of the plan and it states that in transport planning the needs of pedestrians, cyclists and public transport users should be given priority. Inclusion of this "Transport User Hierarchy" is welcome and it was a feature of several of Peterborough's local transport plans from 1998 onwards. We must also see a commitment to delivery of this policy. Too often in Peterborough in recent years we have seen large road building and road widening schemes, with just a small element of sustainable transport added on around the fringes. This needs to change and, as the city grows, the emphasis must be on encouraging walking, cycling and public transport and discouraging car travel.	Noted
459	Chapter 3: Peterborough	Goals	There is an aim stated in the plan to reduce car usage by 15% but little detail on how this will be achieved particularly in Peterborough, which is the largest and fastest growing city in the CPCA area.	Noted. LTCP will be updated to recognise that each area needs to reach 15% in its own appropriate timing. Delivery plan and local strategies will aid with adding detail as to how each area will hit its target. Acknowledge more work is required to assess how and when this target will be achieved. WSP work looking in to this too.
460	Chapter 3: Peterborough	Rail	The plan has no long term vision for Peterborough. With a population of 215,000, we should be planning now for medium to long term options like a tram or light rail system. The original blueprint for expansion of Peterborough, the Harcourt Report, in the mid 1960s contained an outline proposal for a tramway system in Peterborough but this was dropped from later proposals.	Noted. The LTCP has a vision for the entire CPCA area. The local strategies which form a suite of child documents under the umbrella of the LTCP will focus this vision for each specific area
461	Chapter 3: Peterborough	Rail	A tram or light rail system could also form the basis for a park and ride system, like that which operates in Nottingham. It is disappointing that the plan contains no proposals for any form of park and ride in Peterborough. Nor does it say much about how pricing and control of parking in the city centre could be used as a tool to encourage a modal shift away from car travel.	P&R not a priority for Peterborough. City Centre Transport Vision referred to in strategy sets out plans for future of City Centre.
462	Chapter 3: Peterborough	Rail	Would like to see track capacity increased to enable additional stations serving Peterborough to be built.	Noted. LTCP places high priority on rail travel and improving this going forward. CPCA committed to working with partners at NR to help deliver improvements regionally.
463	Chapter 3: Peterborough	Rail	Would like to see increased frequencies on services between Peterborough and Leicester, Birmingham, Cambridge, Stansted Airport and Ipswich and Nottingham.	Noted. LTCP places high priority on rail travel and improving this going forward. CPCA committed to working with partners at NR to help deliver improvements regionally.
464	Chapter 3: Peterborough	Bus	Nothing is being proposed in the LTCP to improve Peterborough's dire public transport links into Northamptonshire. There is a rail link between Oakham and Corby which only has one train a day running on it at present. Greater usage of this link would have the potential to open up more journeys from Peterborough to Corby and/or Kettering and to other parts of Northamptonshire, Leicestershire etc.	Noted. Peterborough strategy already refers to connections to neighbouring authorities, no change made. Our strategy section being updated to commit to stronger partnership working and tackling cross border issues
465	Chapter 3: Peterborough	Bus	The Mayor's commitment to the principle of bus franchising is welcome but it needs to result in some delivery as soon as possible, so as to ensure that bus services work for local people and not for the profits of shareholders in large multi national bus companies. Stagecoach have steadfastly refused to integrate their ticketing with other local bus operators or to introduce electric and/or hybrid buses in Peterborough or to consider more orbital bus routes, so franchising is urgently needed to enable these things to happen. Would like to see consideration given to simple flat rate fares across the bus network so as to encourage an increase in bus usage: in the longer term I would favour fares free bus travel in urban areas.	Funding via the CPCA is subject to the CPCA's business planning cycle. As such, through this process the CPCA is looking at the long term viability for financing bus services and frameworks and is investigating various methods for improving the way buses are run and procured in the mayoral area. no change to plan required.
466	Chapter 3: Peterborough	Bus	I would like to see the plan address how people in rural parts of Peterborough are to be given better access to the bus network. This is partly about giving people in rural areas better access to Peterborough City Centre and the urban townships for shopping, leisure, medical facilities etc. But done imaginatively rural bus services could also be promoted to urban residents as a means of enabling them to get out into the countryside for walks and contact with nature etc.	Noted. This will be reflected in the updated local section
467	Chapter 3: Peterborough	Active Travel	We have lots of cycle lanes in parts of the city but they are poorly connected and maintained and cycle usage is abysmal compared to other parts of the county. The Council took Government funding (via the CPCA) for temporary cycle lanes but terminated the schemes when the money ran out, which has meant that future funding for cycling has been curtailed. One of the temporary lanes which was much needed and much used was the one over Crescent Bridge into the City Centre: this needs to be restored urgently and yet I do not see any reference to it in the LTCP.	Noted, this scheme is linked to the Peterborough Station Quarter which is referenced in the strategy. No change made
468	Chapter 3: Peterborough	Suggested scheme	There is no mention anywhere in the plan of the River Nene and its potential for use as a transport corridor for a variety of purposes.	Noted. Will make reference to the River Nene in the updated local section
469	Chapter 3: Peterborough	Climate	Most of the major projects proposed in the LTCP for Peterborough seem to be about road building and road widening which is precisely the opposite of what we should be doing in a climate emergency. We may have to build some new roads to serve new housing developments but these should be designed to encourage active travel and public transport usage.	Noted. LTCP has a user hierarchy and roads and car use is below more sustainable modes such as AT and PT. Where there is a need to improve road capacity, this will be included but with provision for other more sustainable modes at the forefront of design.
470	Chapter 1	Objectives	The vision, goals and objectives are welcomed, in particular the acknowledgement that the LTCP will need to enable new sustainable housing. The goals and objectives would be more robust if they included some form of measurable target, or reference as to how they could be met.	Support noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
471	Chapter 1	Bus	There is limited reference throughout the document to the Cambridgeshire Guided Busway, which is one of the county's greatest transport assets. It could be that the LTCP looks to maximise the guided busway by focusing development around it, which in turn would enable investment and improvement in its services.	Noted. The BSP is aiming to deal with improvements to the wider bus network. The LTCP will link modes and promote interchange where possible. Add section/sub section in main strategy to bring out interchange importance.
472	Chapter 1	Vision	Productivity - Education and training whilst mentioned within the document do not form part of the goals and objectives. Given the role of access to education and training for improving life chances it should be integrated within the objectives.	To be incorporated into the vision and within some of the underlying goals/objectives. Education [access to] is critical and needs to be stronger within the strategic section
473	Chapter 1	Environment	Environment – the Environmental goal is not explicit in its meaning and this should be expanded and enhanced to recognised: Use of and protection of natural resources, biodiversity as well as water quality and food resilience.	The vision, goals and objectives have been subject to two rounds of consultation. No major changes to these are considered required.
474	Chapter 1	Environment	Larifleet Group Limited (LGL) is ready to partner with the CA to deliver on the emerging Local Transport Connectivity Plan (LTCP) through advancing a world leading decarbonised mass transit system for the benefit of the City and Region's environment and the health of its residents.	Noted. No action required

475	Chapter 1	Safety	The draft LTCP mentions Vision Zero road safety partnership but includes only a non-binding commitment to nobody being killed or seriously injured (KSI) on our roads by 2040. Vision Zero includes an intermediate goal of reducing KSI on our roads by at least 50% by 2030. The LTCP must include intermediate goals such as this.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
476	Chapter 1	Active Travel	Active travel for leisure is important so must be called out in the LTCP. Its importance is made clear in our comments on the Transport Strategy. In this section, some recognition in the business and tourism objective would support its incorporation into strategy.	The vision, goals and objectives have been developed through ongoing dialogue with stakeholders and subject to two rounds of consultation. No major changes to these are considered required.
477	Chapter 1	Climate	Net zero by 2050 cannot be a key goal/objective in a plan with a horizon of 2030. We know that either carbon dioxide emissions be drastically reduced in the next couple of years or we spend a lot of money mitigating the climate emergency.	Targets will be contained within the monitoring section and we need to link to this throughout the document. The milestones will come from the WSP work and this needs to be reflected within the document and linkages made to the policy and strategy
478	Chapter 5: Monitoring and performance	Goals	Overall the LTCP feels extremely unambitious and lacks innovation. The Goals and Objectives are nebulous statements without any real measures (Objectives at least should be SMART). Some of the goals feel either unachievable (zero fatalities or serious injuries – no detail behind what this really means) or unambitious (net zero by 2050 – which is 28 years away!).	The vision, goals and objectives have been developed through ongoing dialogue with stakeholders and subject to two rounds of consultation. No major changes to these are considered required.
479	Chapter 2: Our strategy	Goals	In the main document there is a statement under the guiding principles that states "Integrating spatial planning and reducing the need to travel" – as a statement this seems to be contradictory to the LTCP goals and objectives.	Not clear why this is contradictory. No change to plan.
480	Chapter 1	Health	I think a greater emphasis should be put on accessibility. Disabled people are most affected by not being able to get around and also they are more likely to be digitally excluded. A lack of accessible transport and poor quality infrastructure has a disproportionate affect on disabled people and needs to have solutions worked out that involve disabled people in the planning process. Co-production is vital for longer term change.	Agree that it is important for users, especially disabled people to be involved in the detailed design of infrastructure and services. No change to plan.
481	Chapter 1	Vision	While broadly along the right lines. The vision statement is far too vague and a vision for net zero by 2050 is meaningless without clear interim targets.	Targets will be contained within the monitoring section and we need to link to this throughout the document. The milestones will come from the WSP work and this needs to be reflected within the document and linkages made to the policy and strategy
482	Chapter 1	Vision	It would have been nice to see within the vision statement a clear reference to active travel, a reduction in private vehicle use and electrification of all motorised transport by specific time periods.	The vision, goals and objectives have been developed through ongoing dialogue with stakeholders and subject to two rounds of consultation. No major changes to these are considered required. Please also see the Cambridgeshire Active Travel Strategy.
483	Chapter 3: East Cambs	Highways	Connectivity can have multiple meanings. It is important that we improve connectivity of public transport and cycle networks but there should not be construction of new roads like the proposed A10 dualling.	"The A10 Ely to A14 Improvements Outline Business Case Study has begun with the initial stage aimed to revisit the existing short list of options to ensure compliance with recent changes to national policies and standards as well as local targets specially on active travel and decarbonisation. This process will consider both road-based and non-road-based (Carbon-lev) improvements to establish a revised short list of options."
484	Chapter 5: Monitoring and performance	Targets and indicators	<ul style="list-style-type: none"> Drawdown on pre-set carbon budgets, including embodied (construction) and operational greenhouse gas emissions Maximum and average concentrations of air pollutants Number of cars owned per household Number of club cars available per 1,000 households Passenger miles travelled by walking, cycling, e-scooter, bus, coach, train and car. KEV miles versus ICEV miles for passenger vehicles. 	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
485	General	Related documents	I strongly disagree with tarmacking of rural public rights of way, particularly bridleways and restricted byways.	Please refer to the emerging active travel strategy and design guides
486	Chapter 1	Bus	Very ambitious objectives, but right now there are no timelines, no prioritisation of the objectives so it is hard to know how the public will visualise and benefit from these objectives. How and what does it actually mean for the public living in rural areas who do not have close access to public transport to get into the city or indeed to neighbouring villages that are not on the path directly into the city.	Please refer to the GCP's Making Connections package which will look to introduce a number of public transport improvements. https://www.gretercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
487	Chapter 2: Our strategy	Related documents	P30 talks about an efficient highway network that accommodates the needs of all users, that includes horse riders who are identified as vulnerable users in the new Highway Code and who should not be undertaken whilst on the highway. The simple fact is that if you a segregated safe corridor for walkers and cyclists then you need it for horse riders as well.	Please refer to the emerging active travel strategy and design guides
488	General	Active Travel	Whilst the document talks about the important of being able to travel to/from leisure activities, it seems to overlook that moving about e.g. walking, cycling, horse riding, is itself a leisure activity for many people	Noted, no action required
489	Chapter 2: Our strategy	Related documents	The reality is that what is happening already is the existing Public Rights of Way network is being trashed and covered with tarmac and other unsuitable surfaces in the name of active travel	Please refer to the emerging active travel strategy and design guides
490	Chapter 3: Peterborough	Active Travel	I remember back in the late 90s we were awarded the Millennium Prize – £6m to create the 'Green Wheel' – Great idea – but it was never really finished and improved or maintained properly	Noted
491	Chapter 1	Bus	Try to support more frequent buses that run later into the evenings on weekdays and weekends across S. Cambs too please.	Please refer to the GCP's Making Connections package which will look to introduce a number of public transport improvements. https://www.gretercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
492	Chapter 1	Rail	In the short term, we should have a dedicated COACH service between Oxford and Cambridge till such a time as the EWR has finally delivered heavy rail connecting the two cities (e.g. Cambridge-Bedford-MK/Oxford). At present, the best option is often to commute via London (by car or by public transport).	Comment noted. Specific coach routes are a matter for individual coach companies. East West Rail is being progressed by the EWR Co. This is a key scheme to improve sustainable connectivity to our region and the CPCA will continue to engage closely with the EWR Co as the scheme progresses.
493	General	Wider policy areas	We'll never get the economy out of it's current state of stagflation until we re-join the EU customs union and single market. This is essential for our local SME's to enable them to effortlessly export again to our nearest, and biggest market – the EU. An avalanche of admin, costs and delays are now associated with every single export. Yet on this enormous, even existential issue for the UK and thousands of SME's, you don't have a single policy	Not relevant to the LTCP. No action required
494	Chapter 1	Bus	The regional map must acknowledge the Cambridgeshire Guided Busway, which is more than just a typical bus service. Indeed Cambridgeshire County Council's website acknowledges it as a 'progressive transport link'. The strategy should focus on how the busway can enable new development to be located more sustainably and in turn support its improvement.	Please refer to the GCP's Making Connections package which will look to introduce a number of public transport improvements. https://www.gretercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
495	Chapter 1	Active Travel	The Cycling and Walking Tsar and the Mayor-led Active Travel Forum are essential to achieving the active travel components of the Transport Strategy. Neither is mentioned in the draft LTCP. The role of these two entities need to be defined in the Transport Strategy so must be featured in the document and priority (eg set a deadline) given to establishing both.	Please refer to the emerging active travel strategy and design guides
496	Chapter 1	Active Travel	The Cycling and Walking Tsar job description, the Active Travel Forum constitution, the Cambridgeshire Active Travel Strategy and the Cycling and the Local Cycling & Walking Infrastructure Plan need have consistent goals and all need to be consistent with various targets in the LTCP. The LTCP needs to state that subsidiary documents such as the Cambridgeshire Active Travel Strategy have compatible targets. The drafts of these documents have goals that are not aligned.	Noted, the partner organisations are working together to align the various strategies.
497	Chapter 2: Our strategy	Active Travel	Other than the various Greenways projects, public rights of way are not routinely considered in various active travel plans (eg LCWIP) that are subordinate to this LTCP. Therefore, this Plan must specify active travel away from the highway as a means to promote efficient travel. On a related note, the Transport Strategy must mention gaining permission from developers and landowners for building entirely new routes across their land.	Comment noted. Please refer to the emerging active travel strategy and design guides. The point regarding permission from land owners is possibly something for the local plan or the ROWIP to consider. No change needed

498	General	Active Travel	Many of those walking and cycling on P60W 76/24 - NCN11 south of Ely travel for utility, not leisure. Cambridgeshire declares active travel routes that they consider for leisure to be out of their remit. For example in the Cycling and Walking Infrastructure Plan (CWIP). Labeling routes for leisure is an arbitrary process. If routes are excluded from the CWIP, funding is compromised. Therefore the LTCP reference to the Active Travel Strategy and other subsidiary documents such as the Active Travel Forum the Cycling and Walking Year job description (both need to be referenced in the LTCP) must specify that active travel for leisure is part of the remit.	Comment noted. Acknowledge need for greater consistency across documents.
499	Chapter 1	Bus	All buses need to be accessible for disabled people and the uber type of transport would greatly benefit disabled people in the cities	Please refer to the GCP's Making Connections package which will look to introduce a number of public transport improvements. https://www.gretercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
500	Chapter 2: Our strategy	Active Travel	There seems to be a distinct lack of understanding with how education affects the strategy. Lack of public transport and safe cycle / walking routes add a massive number of vehicles on the roads at peak times, causing congestion, reduction in air quality, does not promote healthy lifestyles etc. Additionally, there is a distinct lack of choice for parents and students on where they can be educated (due to no transport). This not only limits ambition and achievement but does not help fill skills gaps	Please refer to AT 24: Promoting active travel in the Cambridgeshire active travel strategy which addresses this point
501	Chapter 3: Greater Cambridge	Specific scheme	I do not agree with the proposed dualling of the A10. I can not see how this is compatible with a reduction in car use.	The A10 Ely to A14 Improvements Outline Business Case Study has begun with the initial stage aimed to revisit the existing short list of options to ensure compliance with recent changes to national policies and standards as well as local targets specially on active travel and decarbonisation. This process will consider both road-based and non-road-based (Carbon-led) improvements to establish a revised short list of options. The narrative within the document may need to be changed to reflect our position (emerging) - improvements to (and removal of the dualling phase)
502	Chapter 1	Climate	2050 is far beyond the life of this plan. Achieving decarbonisation milestones is far more important at this point in time than achieving net zero in 2050. The UK's statutory and international commitments are to reduce emissions relative to 1990 levels by:	Linked to previous answers - the WSP work demonstrates our commitment and alignment with national, regional and local policy - going over and above. Demonstrating a clear pathway (section will need to be updated following the outputs from the WSP work)
503	Chapter 1	Bus	In areas where public transport is reduced to one bus a day and alternative transport has been sought, how can you accurately determine public demand?	Please refer to the GCP's Making Connections package which will look to introduce a number of public transport improvements. https://www.gretercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
504	Chapter 2: Our strategy	Micromobility	We must make sure people on these electric scooters - Have SOME Knowledge of road use - I have seen terrible road sense - Just NO Sense! And No idea how to act on the road or pavement! If not - More people are going to be killed and injured	Noted. E-scooters are an emerging mode of transport which are not yet legal anywhere but on private land, unless part of an approved pilot scheme, where users must have a driver's license. Policy around this area is in its infancy and is emerging as the results of the pilot schemes are observed.
505	Chapter 3: Greater Cambridge	Suggested scheme	I am not opposed to the CSET, nor the CAM, but I do think a tram/very light rail option should be taken seriously as a longer term alternative to maintaining a bus fleet to serve far-flung locations across S. Cambs - though in the near term the CSET is most feasible.	Noted. The GCP are considering a number of measures for City Centre and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.gretercambridge.org.uk/asset-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council - Committees > Greater Cambridge Partnership Executive Board (gms.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
506	Chapter 3: Hunts	Bus	Great Grandden is not served with any regular public transport. My nearest stop, Crow Tree Street (ironically right outside CPCA Mayor Nik Johnson's house) has ONE bus a week. I repeat, ONE bus per week (to St Neots - and who on earth wants to go there?).	Please refer to the GCP's Making Connections package which will look to introduce a number of public transport improvements. https://www.gretercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
507	Chapter 1	Targets and indicators	This is an ambitious target, which is necessary in order to provide a focus for improving public transport services.	Noted, no action required
508	Chapter 1	Goals	We have seen previous goals for motor traffic reduction (eg Cambridgeshire Local Transport Plan 2011-2031) unenforced and missed. The Transport Delivery Plans will summarise the projects over the lifetime of the LTCP	Noted, no action required
509	Chapter 5: Monitoring and performance	Targets and indicators	No mechanism appears to be in place to monitor vision, goals, objectives and ambitions. Metrics are needed in addition to the car miles driven by 15% and diesel vans and trucks to be excluded from urban centres by 2030. Near-term metrics would help avoid 'falling off a cliff' near the deadline for 2030 targets. We also recommend that the metrics for important aspects of travel be labelled as goals rather than ambitions. Ambition suggests lack of commitment.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
510	Chapter 5: Monitoring and performance	Targets and indicators	Besides car miles across the Combined Authority and diesel exclusion, SMART targets for cycling and walking in need to be added; the target needs to accommodate the differences between the settlements. For instance, each District would introduce local goals for all its urban centres by January 2024.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
511	Chapter 2: Our strategy	Targets and indicators	Cannot see how you would achieve a 15% reduction in car mileage until the rest of the transport system is in place, but how long would this take?	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies.
512	Chapter 1	Goals	Need but to develop clearly mass transit proposal(s) for the area.	Noted. The GCP are considering a number of measures for Greater Cambridge and the city centre area through its Making Connections consultation. https://www.gretercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
513	Chapter 1	Goals	We should be seeking greater reductions	Noted. Unclear what is being referred to. No action required
514	General	Safety	Where is the provision for disabled drivers? I am severely disabled and find it very difficult to use public transport. I need my car to work and go shopping.	The overall strategy makes mention of accessibility, the document also states Any such scheme will consider the accessibility needs of different groups of people, particularly disabled people. Please also refer to the EQA document. Look to strengthen text on this issue.
515	Chapter 2: Our strategy	Targets and indicators	Ambitious objective now that many are wfh after covid. For some mileage is already much reduced, intrigued how you believe it will be cut further when main trips are for grocery shopping (all those bags on a bus and then walked home) and visiting friends who may be outside the county and not en route to a city/town	Comment noted. Data shows that the number of trips is back to pre-covid levels, please also refer to the Active Travel Strategy for Cambridgeshire which provides further details on how we aim to reduce car journeys.
516	Chapter 2: Our strategy	Targets and indicators	Target should be higher e.g. 20%	The vision, goals and objectives have been developed through ongoing dialogue with stakeholders and subject to two rounds of consultation. No major changes to these are considered required.
517	Chapter 3: East Cambs	Related documents	The referenced East Cambridgeshire Cycling and Walking Strategy includes prioritisation of links to public transport to enable buses and trains to replace the car as an alternative for longer journeys. However, its priority routes do not include any that link to the railway stations (Ely, Littleport and Soham). The Local Area Strategy must mention prioritisation of links. As an example, the Section 106 gateway commitment to link north Ely with the centre of Ely is under threat yet the Local Transport Strategy does not mention the 2014 North Ely Supplementary Planning Document (SPD) requirement to link north Ely with key destinations such as the City of Ely College, City Centre, Rail Station and Hospital and to link with the National Cycleway Route 11. This Strategy needs to mention the importance of such links and in particular, reference the SPD.	The LTCP is a strategic document and as such cannot detail every individual scheme. A review of the East Cambridgeshire Transport Strategy is due and is the most appropriate place for this level of detail. Review East Cambridgeshire local section of this plan to strengthen links where appropriate.
518	Chapter 3: East Cambs	Active Travel	The draft Local Transport Strategy Challenges states that high-quality walking and cycling infrastructure, particularly outside of Ely, is extremely limited. We assume that this statement is based only on perceived safety. From the perspective of improving the environment and benefitting most people, the greatest benefit would come from improving cycling in Ely.	Noted
519	Chapter 3: East Cambs	Active Travel	Within this rural district it has been and will continue to be difficult to adhere to the government's guidelines (LTN122 [sic]) due to the nature of the infrastructure roads. There is no feature of the roads in East Cambridgeshire that is unique, so this comment is not appropriate in this section.	Comment noted. Review this section of the text and amend as appropriate.

520	Chapter 3: East Cambs	Highways	An increase in capacity on the Ely-Cambridge A10 will induce more motor traffic unless some kind of control measure is introduced. The Local Area Strategy must be internally consistent and consistent with the LTCP plan for an overall 15% reduction in car mileage.	Any increase in road capacity will need to be accompanied by additional capacity and infrastructure for active travel. Review section and check for consistency.
521	Chapter 3: East Cambs	Active Travel	The Department for Transport second Cycling and Walking Investment Strategy includes an ambition for walking and cycling to be the natural choices for shorter journeys, or as part of a longer journey by 2040 with half of all journeys in towns and cities being cycled or walked by 2030. East Cambridgeshire ought to adopt these central government ambitions as local goals. This is especially important for Ely with a projected 4,000 extra homes by 2030 that lack adequate cycling and walking connections to the centre of Ely, Ely Railway Station, the Princess of Wales Hospital, the Leisure Village and the Hive Leisure Centre.	This will be considered as part of the new East Cambridgeshire district transport strategy which is due to be developed in 2023 and will sit as a 'child document' of the LTCP.
522	Chapter 3: East Cambs	Bus	There is a specific issue with students from East Cambs having an extremely limited choice of schools, sixth forms and FE provision e.g. a lot of money has been invested in the North Cambridge Training Centre (Chatteris) but students from the local area cannot access it due to the lack of local transport.	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.
523	Chapter 3: East Cambs	Rail	There also must be a priority given to the much needed upgrading of the Ely North Junction (rail), this is a massive disrupter for both rail and freight from all parts of East Anglia. Railfuture has described Ely North as "the East of England's highest transport investment priority". The planned improvements would allow more freight to travel by rail (so reducing the number of HGV/LGV on roads) as well as cars. With the green light being given to Felstead as a Freight and Stewell C, freight and workers will need to access, due to the lack of capacity on the line currently all freight is rerouted via London. This is having a negative effect on the economy because of restricted growth while also creating unnecessary 'heat' in the Cambridge property market.	Comment noted. The CPCA will continue to lobby for an upgrade to this junction and will work with local partners and the rail industry to prioritise this.
524	Chapter 3: East Cambs	Active Travel	It is good to see walking and cycling highlighted. However, the plan does not specify how more walking and cycling will be enabled. We urgently need better cycle infrastructure to link up East Cambs villages with Ely and Ely with Littleport, Cambridge and Newmarket all of which are within cycling distance. Particularly with the advent of eBikes.	Comment noted. More detailed information on Active Travel schemes for East Cambridgeshire can be found in the emerging Cambridgeshire Active Travel Strategy, however the local section will be reviewed to strengthen the text around active travel in the district where possible.
525	Chapter 3: East Cambs	Shared Mobility	It would be good to have mention of car clubs.	A valid point, car clubs are an excellent way of reducing car ownership and car usage, especially when incorporated into new developments. Strengthen text on this in an appropriate place in the plan.
526	Chapter 3: East Cambs	Specific scheme	I strongly disagree with dualing the A10. This is not compatible with reducing car usage or cutting carbon emissions. The money should instead be invested in public transport, EV charging and cycle lanes.	The A10 Ely to A14 Improvements Outline Business Case Study has begun with the initial stage aimed to revisit the existing short list of options to ensure compliance with recent changes to national policies and standards as well as local targets specially on active travel and decarbonisation. This process will consider both road-based and non-road-based (Carbon-led) improvements to establish a revised short list of options.
527	Chapter 3: East Cambs	Specific scheme	P55 " in addition, the District Council has recently commissioned Sustrans to produce feasibility studies for a number of new cycle routes and to complete the Wickes to Soham cycle route." It should be noted that this proposed "cycway" will run on existing Public Rights of Way a Byway Open to All Traffic and a Bridleway. Tarmacing bridleways discriminates against the other lawful users who benefit from soft surfaces e.g. equestrians. Tarmacing reduces the suitability of the surface and experience indicates that when dual surfaces are introduced, it is disastrous all round.	Comment noted. The LTCP is a strategic document and as such is not able to include information on every scheme. More detail on active travel schemes can be found in the emerging Cambridgeshire Active Travel Strategy, however the point about surfacing is noted and the various organisations are trying to develop a consensus around this sensitive issue. Review/incorporate a section on equestrians and other non-motorised users.
528	Chapter 3: East Cambs	Specific scheme	The proposed cycle route between Ely and Soham should include equestrians in the planning.	Comment noted. The LTCP is a strategic document and as such is not able to include information on every scheme. More detail on active travel schemes can be found in the emerging Cambridgeshire Active Travel Strategy.
529	Chapter 3: East Cambs	Specific scheme	P55- Improvements to the highway network through a series of enhancements to junctions, such as to the A142/Lancaster Way roundabout and the A142/A10 'P' roundabouts, will help to support employment development; for example, at the Givernere and Lancaster Way Business Parks. As part of these works it will be essential to deliver the cycle/pedestrian crossing over the A10 near to the BP roundabout in order to make the Active Travel option attractive.	Comment noted. Active travel should be considered as part of any road scheme. Review text and strengthen text where appropriate.
530	Chapter 3: Greater Cambridge	Bus	There are no regular bus services in Great Gransden unless you consider one bus per week adequate - i don't. As normal with politicians, it's all consultation and big talk, in practice there is nothing delivered whatsoever.	Comment noted. Please refer to the GCP's Making Connections package which will look to introduce a number of public transport improvements. https://www.greatercambridge.org.uk/sustainable-transport-programme/city-access-programme/making-connections
531	Chapter 3: Peterborough	Equality	No mention of how the draft proposals with consider the need of disabled people who find it very difficult to use the present systems. Thought needs to be given on how to remove the barriers that prevent equality and travel in the city. Working with the local DPLAO (Disability Peterborough) would be a good first step to achieving co-production and getting better outcomes	Comment noted. The strategy is required to develop an Equality Impact Assessment to ensure that people with protected characteristics aren't disadvantaged by the strategy. Draw this out more strongly in the text.
532	Chapter 3: Greater Cambridge	Highways	Not convinced the East / West rail route will continue but the A428 upgrade is vital	Comment noted.
533	Chapter 3: Greater Cambridge	Active Travel	Safe walking and cycle routes from villages to towns and your envisaged transport hubs are essential for better quality living and attracting the skills we need to the area	Noted, please refer to the emerging active travel strategy and design guides
534	Chapter 3: Greater Cambridge	Suggested scheme	I believe that in the longer term, the suburbanisation strategy for Greater Cambridge would be best served by very light rail (VLR) connections rather than a bus fleet (guided or otherwise).	Improvements to the bus network will be delivered faster, more flexibly in the short-medium term. With the continued work on the appropriate framework for buses it is likely that the benefits envisaged by VLR can be delivered faster
535	Chapter 3: Hunts	Bus	It is welcomed that better buses is a focus for Huntingdonshire, particularly connectivity between Cambridge, Cambourne, Alconbury, Huntingdon and St Ives. The Cambridgeshire Guided Busway already does and can provide an even greater role in providing this connectivity. Improving the Guided Busway must therefore be a priority for the Combined Authority, this can be achieved by locating new development along the route	Comment noted. The location of development is a role for Local Plans rather than the LTCP.
536	Chapter 3: Hunts	Bus	Transport must keep up with the planned housing and jobs growth. Public transport and cycling and walking options need to improve to prevent increased congestion, pollution and environmental impacts.	Noted, please refer to the emerging active travel strategy and design guides and the GCP making connections project.
537	Chapter 1	Goals	We recognise that significant work has been undertaken to update the LTCP and to align it with the wider set of strategic documents however what this document doesn't do is to show how it will deliver against these wider ambitions and whether the targets identified such as 15% reduction in car miles is sufficient in the short term and how this 15% reduction will be achieved.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies. A delivery plan will be developed to demonstrate how the schemes and interventions will contribute to targets.
538	Chapter 1	Goals	Targets such as increase active travel and public transport are not robust targets in delivering a transformative transport system. We need a clearer understanding of what success looks like in terms of human impact.	Comment noted. It is acknowledged that further work is needed on the monitoring and performance section. Further work is being undertaken to ensure that a suite of indicators is developed that can be robustly monitored and are consistent across strategies. A delivery plan will be developed to demonstrate how the schemes and interventions will contribute to targets.
539	Chapter 1	Goals	Recognising the carbon and traffic reduction are not the only ambitions for the LTCP we would welcome further explanation of what the ambition is in terms of the broader sustainability agenda.	Work on the biodiversity net gain, carbon reductions, traffic reduction, use of sustainable material wherever possible in construction, air quality improvements (need a strong statement) - further work on the biodiversity piece required
540	Chapter 1	Micromobility	New micro mobility technologies offer the opportunity to significantly lengthen the distance many are willing to travel by bike but this will only happen if supported by appropriate infrastructure. We support and emphasise the need for the forthcoming Cambridgeshire County Council Active Travel Strategy to bold in grasping this opportunity.	Support noted, no change required.
541	Chapter 3: Greater Cambridge	Bus	In the Greater Cambridge area the removal of the Cambridge Autonomous Metro (CAM) without a significant alternative solution to the population growth and related travel is worrying.	Noted. The GCP are considering a number of measures for Gtr Cambridge and the city centre area through its Making Connections consultation. The GCP is managed in accordance with the agreed assurance framework which can be found here: https://www.greatercambridge.org.uk/assets-library/About/Governance/Governance-Assurance-Framework-2022.pdf . Decisions on individual schemes are taken by the Executive Board of the GCP, these are recorded and can be found here: Council and committee meetings - Cambridgeshire County Council > Committees > Greater Cambridge Partnership Executive Board (cmis.uk.com). For other areas in the county, the CPCA will be considering local schemes and interventions for each district through updated local strategies and a future delivery plan for the LTCP, which will be subject to their own consultation process and where suggestions for individual schemes can be made.

542	Chapter 3: Greater Cambridge	Evidence	We are already aware that growth figures for the CBC see a gap of 17k daily trips (resulting from the removal of the CAM) which need to be accommodated by non-car modes. We need a clear picture of what the anticipated growth in trips is, and what the gap in provision will be to inform delivery across the whole region. The document goes some way to expressing this but is not explicit in order to respond to the magnitude of change required in the region.	Comment noted. Explore what modelling data is held that could illustrate this.
543	Chapter 1	Active Travel	In our previous response (2019) the University asked for greater acknowledgement within the LTCP that building new roads is not the answer to our transport problems. Where projects are being proposed to increase road space that any additional space is reallocated to improve facilities for walking, cycling and public transport as well as enabling freight to move more efficiently.	Comment noted. Explore where text can be strengthened to reflect this.
544	Chapter 4	Active Travel	To this end the University recognise that improvements on the network are needed but would like reassurance that private car use is restricted to enable walking, cycling and public transport journeys to flow seamlessly.	Comment noted. Explore where text can be strengthened to reflect this.
545	Chapter 4	Evidence	Understanding of the number of trips that require to be accommodated by public transport and active travel modes against traffic reduction targets and anticipated population growth figures is imperative.	Comment noted. Explore what modelling data is held that could illustrate this.
546	Chapter 1	EV and alternate fuels	The LTCP sets out a plan for providing for greater public transport and active travel but what is not clear is how the supply of energy required to decarbonise motorised travel including freight and deliveries (whilst degasifying the wider built environment) can be achieved.	Comment noted. Agree that further work is needed to fully understand the full energy requirements of transport and this is being considered through other work streams with partners.
547	Chapter 1	EV and alternate fuels	Further work is required to understand the full energy requirements for transport and the development of a realistic plan for supplying the energy through a more robust grid system and from renewable sources. This needs to look to 2050 energy supply and demand ambitions to inform an action plan for today.	Comment noted. Agree that further work is needed to fully understand the full energy requirements of transport and this is being considered through other work streams with partners.
548	Chapter 5: Monitoring and performance	Evidence	Recognising the carbon and traffic reduction are not the only ambitions for the LTCP, we would welcome further explicit explanation of what the ambitions are in terms of the broader sustainability agenda. Key areas for consideration include: - Green and blue infrastructure in delivering environmental resilience and social value. - Circular economy to reduce waste and enable efficient use of resource - Renewable energy generation and grid capacity investments to deliver decarbonisation of transport and the wider built environment. - Accessibility (time/distance) of services and facilities	Comments noted. The response makes reference to wider policy areas which are picked up through other policy documents and strategies, such as Local Plans. No change to plan.
549	Chapter 3: Greater Cambridge	Equality	Disabled people who find using local transport services need to be involved with co-production to make sure that any solutions are fit for purpose and don't assume that planners know better than service users on what is required for more equal access.	Comment noted. The strategy is required to develop an Equality Impact Assessment to ensure that people with protected characteristics aren't disadvantaged by the strategy. Draw this out more strongly in the text.
550	Chapter 1	Highways	Please remember that most highway "improvements" to date have focused on car users and have often been to the extreme detriment and safety of other lawful road users including equestrians. You have an opportunity to change this - I hope you will.	Comment noted.

The Cambridgeshire and Peterborough Local Transport & Connectivity Plan: Digital Policy

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Contents

1	Enhance digital connectivity	5
	Policy theme X.1: Fixed broadband infrastructure	6
	Policy theme X.2: Mobile infrastructure	8
	Policy theme X.3: Smart infrastructure	11
	Policy theme X.4: Digital exploitation, access and inclusion.....	12

1 Enhance digital connectivity

Ensure the availability of high quality, affordable digital connectivity services and support the exploitation of digital technologies

Overview

- 1.1 The Cambridgeshire and Peterborough [Digital Connectivity Strategy for 2021-2025](#) forms the basis for this digital policy as part of the Local Transport and Connectivity Plan.
- 1.2 Digital connectivity plays an increasingly important role in providing access to jobs, and to services and experiences such as entertainment, social interaction, shopping, banking, education, and healthcare. During the Covid-19 pandemic lockdowns we were heavily dependent on digital connectivity for enabling people to work from home, students to attend online classes and lectures, and for keeping in touch with friends and family. Lockdowns necessitated various swift transformations that have endured: many more businesses now use collaborative software such as Zoom and Teams; many more people now work from home at least part of the week; retailers have boosted their ecommerce capabilities; and GPs make much more extensive use of remote consultations over the phone or online.
- 1.3 There are important interactions between our use of digital technologies and the transport system. Most obviously, digital connectivity enables more working from home and remote meetings, and this has significantly reduced travel for commuting and for business. Increased use of online shopping has also reduced the need for individuals to travel to and from shops, while increasing the numbers of light goods vehicles delivering orders. On public transport, mobile connectivity helps to make journeys more productive, interesting, and pleasant, whether accessing work applications or entertainment, and this is a factor influencing a modal shift away from cars. Furthermore, the transport system itself is of course already highly reliant on digital technology, for monitoring traffic and road conditions, controlling traffic lights, providing real-time passenger information, smart motorway signage etc; and new applications such as smart parking and AI-controlled road junctions offer the prospect of further improving the efficiency and sustainability of transport. Such considerations are behind the updated title of the plan: the Local Transport and Connectivity Plan - emphasising the importance attached to improving digital connectivity.
- 1.4 Much has already been achieved in this regard, in particular the success in making superfast broadband nearly ubiquitously available across the Combined Authority. However, this is a rapidly moving area, driven by exponential improvements in technology. Telecoms develops far more rapidly than any other type of infrastructure: for example, average monthly data usage on fixed broadband lines increased by 19% *per annum* in Cambridgeshire and Peterborough between 2018 and 2022. With the ongoing roll-outs of new technologies such as full-fibre broadband and 5G mobile infrastructure, it is vital that Cambridgeshire and Peterborough stays at the forefront of digital connectivity in terms of:
 - Fixed broadband connectivity;
 - Mobile connectivity;

- Smart infrastructure; and
- Digital exploitation, access, and inclusion.

Policy theme X.1: Fixed broadband infrastructure

Overview

- 1.5 There is now nearly ubiquitous coverage of superfast broadband services in Cambridgeshire and Peterborough: as at September 2022, 97.3% of premises could access services with download speeds of 30 Mbps or more, according to Ofcom¹. Only 0.7% of premises are now unable to obtain a service at 10 Mbps or more, and these are covered by a Universal Service Obligation whereby BT is obliged to provide a 10 Mbps+ service if requested (up to a cost threshold of £3,400 per premise). This progress has been achieved through a combination of private sector investment by the telecoms operators, plus public ‘gap-funding’ through the Connecting Cambridgeshire programme for areas where there were no plans for commercial superfast roll-outs.
- 1.6 The focus for industry players and policy-makers has now shifted to rolling out gigabit-capable (i.e. 1,000 Mbps+) and full-fibre infrastructure. Gigabit services are primarily delivered over Virgin Media’s cable network and through full-fibre networks being rolled out by operators such as BT Openreach, CityFibre, Hyperoptic, and OFNL. The UK Government has set targets for the proportion of UK premises covered by gigabit-capable networks: 85% by 2025, and 99% by 2030².
- 1.7 In Cambridgeshire and Peterborough, the coverage as of September 2022 stood at around 70% of premises for gigabit-capable networks and 49% for full-fibre, both of which were higher than the UK averages of about 68% and 41% respectively³. The Government’s expectation is that commercial gigabit roll-outs should achieve about 80% UK coverage without the need for any public subsidy.
- 1.8 Government has set a target of 85% gigabit-capable coverage for the UK by 2025; however, this is an average for the country and there is a danger that without a specific focus, as a predominantly rural area, we will no longer be at the leading edge and will not have the ubiquitous forward-facing infrastructure we need for our area to prosper. Therefore the Digital Connectivity Strategy has set a local target to meet at least 85% coverage by 2025. This will be met by a combination of coverage provided by commercial operators, investing their own funds to roll out infrastructure in our area, and by coverage provided on a ‘gap funded’ basis as part of the Government’s Project Gigabit procurement programme, of which Cambridgeshire and Peterborough is one of the first pilot areas. Project Gigabit will provide up to £68 million in public funding for the area, with procurements managed centrally by Building Digital UK, an executive agency of DCMS.

¹ Source: [Connected Nations 2022](#) (Ofcom, December 2022). Note: Connecting Cambridgeshire uses 24 Mbps rather than 30 Mbps to define ‘superfast’. The 24 Mbps metric is not regularly reported by Ofcom, but another source, [Thinkbroadband](#), estimates that 24 Mbps coverage was c. 98.6% in Cambridgeshire and Peterborough at December 2022.

² Source: [Levelling Up the United Kingdom](#) (DLUHC, February 2022)

³ Source: [Connected Nations 2022](#) (Ofcom, December 2022). [Thinkbroadband](#), estimates that gigabit coverage was c. 74% and full fibre coverage was 51% in Cambridgeshire and Peterborough at December 2022.

- 1.9 Cambridgeshire and Peterborough has a very dynamic commercial environment, with a number of active suppliers planning significant investments in gigabit-capable infrastructure. However the challenges involved in rolling out broadband infrastructure, particularly in rural areas, means that the operators need a supportive local environment in order to deliver successfully. We will continue to work closely with operators to support investment, remove barriers and facilitate coverage to ensure planned commercial investment is delivered.

Policy Summary

- 1.10 Connecting Cambridgeshire is the delivery body for the Combined Authority's digital infrastructure strategy covering Cambridgeshire and Peterborough⁴. To support the continuous improvement of fixed broadband infrastructure the Combined Authority will, with the Connecting Cambridgeshire programme, continue to:

- Facilitate industry investment in fixed broadband infrastructure;
- Work with government to deliver public funded fixed broadband solutions where commercial coverage is not viable; and
- Integrate fibre ducting in transport and other infrastructure schemes and exploit this asset.

Policy X.1.1 Facilitate industry investment in fixed broadband infrastructure

- 1.11 The Combined Authority will continue working with network operators and the councils to encourage investment and facilitate commercial coverage of improved fixed broadband infrastructure by:

- Establishing timely and constructive communications and relationships between the network operators' and the Local Highways Authorities' respective teams;
- Ensuring that street works permit schemes are proportionate and efficient, and in line with best UK practice; and
- Facilitating timely wayleave agreements with network operators for access to council-owned land and property.

Policy X.1.2 Work with government to deliver public funded fixed broadband solutions where commercial coverage is not viable

- 1.12 The Combined Authority will continue working with the UK Government to:

- Achieve the timely and successful implementation of the Project Gigabit programme's gap-funding procurements of gigabit-capable coverage; and
- Support and extend the national Gigabit Broadband Voucher Scheme, which provides government funded vouchers, with a local top-up where needed, for homes and businesses that will not be covered by commercial or gap-funded schemes.

Policy X.1.3 Integrate and exploit fibre ducting in transport and other infrastructure schemes

- 1.13 By ensuring that appropriate ducting is integrated into transport and other infrastructure schemes we are helping to speed up commercial deployment of fibre networks, minimise future disruption of roads and walkways, and reduce the carbon emissions associated with installing new ducting. The Combined Authority will continue working to:

⁴ In the remainder of this digital policy, statements saying that 'the Combined Authority will...' should be taken to mean that this will be delivered via the Connecting Cambridgeshire programme.

- Integrate the provision of fibre ducting into locally-managed transport and other infrastructure schemes;
- Lobby for fibre ducting to be included in nationally-managed transport and other infrastructure schemes involving Cambridgeshire and Peterborough; and
- Ensure that the fibre ducts owned by public authorities are comprehensively mapped, well managed and actively promoted for use by commercial network operators – for example through the Light Blue Fibre joint venture between Cambridgeshire County Council and the University of Cambridge.

Policy theme X.2: Mobile infrastructure

Overview

- 1.14 People of all ages increasingly rely on mobile internet access for socialising, shopping, home working, banking, digital payments, public service information, news, and entertainment. Mobile connectivity is also an important underpinning technology for the Combined Authority’s work to improve bus services: to be successful, Demand Responsive Transport and new travel hubs will need travellers to be able to book, track services and understand disruptions to give the best possible customer experience.
- 1.15 Cambridgeshire and Peterborough enjoys reasonably high overall levels of mobile 4G coverage: as of September 2022, 75% of premises could obtain an indoor signal from all four mobile networks, and 98% of the geographic area had outdoor coverage from all four operators⁵. However, the situation varies significantly across the Combined Authority area: for example, only 56% of premises in South Cambridgeshire could obtain an indoor signal from all four mobile networks as of September 2022. Whilst remaining gaps in 4G geographic coverage should be addressed through the Government’s Shared Rural Network programme, which entails £1 billion investment across the UK from the operators and the UK Government, little progress on partial not-spots has been seen to date across the region.
- 1.16 The latest generation of mobile technology, 5G, not only offers higher speeds than 4G but also provides lower latency (i.e. quicker response times), the ability to handle much higher densities of devices, improved energy efficiency, and greater flexibility in tailoring services to specific user needs. These features are expected to be useful for businesses in exploiting applications such as augmented reality, factory automation and asset monitoring – helping to boost productivity. 5G services are also likely to be crucial to support future plans for incorporating autonomous vehicles into public transport services, building on earlier feasibility and pilot projects in the Cambridge area.
- 1.17 Roll-outs of 5G are still at a relatively early stage in Cambridgeshire and Peterborough, and coverage varies markedly by operator. Connecting Cambridgeshire is facilitating multi-party discussions to facilitate operators’ 5G roll-out plans. Three, O2 and EE have some 5G coverage (though not city-wide) in both Cambridge and Peterborough, and Three is actively looking to expand into market towns such as Ely, Huntingdon and St Neots. Vodafone has very little 5G coverage currently in the region but has started to submit planning applications for 5G equipment in Cambridge.
- 1.18 Mobile infrastructure presents significant challenges from a planning perspective, especially in historic areas, given their potential adverse visual impacts and the effect on street clutter.

⁵ Source: [Connected Nations 2022](#) (Ofcom, December 2022)

Planners in Cambridgeshire and Peterborough have recently seen a surge in planning applications for new or replacement mobile masts to support 5G roll-outs. In the Greater Cambridge area more than half of such applications (submitted between September 2019 and August 2022) have been refused. There is a clear tension between the need to facilitate rapid roll-outs of new technologies, and the need to preserve the character of our streetscapes.

- 1.19 Current 5G roll-outs are focusing on expanding coverage as widely as possible through the large ‘macrocells’ served by tall masts or roof-top sites. However, many consider that the full benefits of 5G – in terms of speeds and latency - will only be realised with ‘network densification’, implementing networks of relatively closely packed ‘small cells’. These small cells will typically be located closer to ground level, and may be positioned on street furniture such as street lights and CCTV columns. For future roll-outs of small cells, there is a particular issue in Cambridgeshire in that the street lights are managed under a Private Finance Initiative (PFI) contract; this currently restricts the County Council’s ability to offer these assets for other purposes such as hosting mobile infrastructure.

Policy Summary

- 1.20 To facilitate the continuous improvement of mobile infrastructure across the Combined Authority we will continue to:
- Identify areas of inadequate mobile coverage/capacity;
 - Facilitate mobile infrastructure delivery;
 - Enable the use of council assets for hosting mobile infrastructure;
 - Explore with operators and with Government the options for minimising adverse impacts of mobile infrastructure on our streetscapes; and
 - Support the deployment of innovative mobile technologies and use cases.

Policy X.2.1 Identify areas of inadequate mobile coverage/capacity

- 1.21 While the Shared Rural Network initiative should fill remaining gaps in outdoor coverage of 4G, there are likely to remain pockets where it is not possible to obtain an indoor signal – particularly in South and East Cambridgeshire⁶. Furthermore, given the rapid growth in mobile data usage, capacity issues can cause connectivity problems in areas of particularly high demand density at certain times of day. Drive-testing commissioned by the Connecting Cambridgeshire programme has previously helped to identify such capacity issues – for example at Cambridge Station. The Combined Authority will continue to work with stakeholders to identify areas (including transport corridors) where poor coverage or capacity adversely affects businesses, communities, or travellers, and to liaise with operators to find solutions.

Policy X.2.2 Facilitate mobile infrastructure delivery

- 1.22 Working with operators and councils, the Combined Authority will continue to support work facilitating mobile infrastructure delivery, through:

⁶ As at September 2022, the proportion of premises able to obtain an indoor signal from all four operators was 92% in Cambridge, 90% in Peterborough, 71% in Huntingdonshire, 69% in Fenland, 65% in East Cambridgeshire, and 56% in South Cambridgeshire. Source: [Connected Nations 2022](#) (Ofcom, December 2022)

- Working with UK5G, Mobile UK and other bodies, continuing to make reliable expert information (from the UK Health Security Agency) readily available to residents and elected Members regarding concerns about health risks associated with 5G;
- Continued collaboration with and learning from other leading areas, such as the West Midlands Combined Authority's WM5G unit, to explore barriers to mobile connectivity in greater depth and to trial and test solutions;
- Specialist telecommunications planning resource to support deployment of both 4G and 5G; and
- Helping operators to find alternative solutions in cases where planning applications are refused (or are likely to be refused).

Policy X.2.3 Enable the use of council assets for hosting mobile infrastructure

1.23 By offering mobile operators the use of council-owned assets such as building roof-tops and street furniture we can both facilitate more rapid roll-outs of new mobile technology and minimise the adverse visual and street clutter impacts of new infrastructure. The Combined Authority will continue to support work to:

- Ensure that future management arrangements for street lights allow flexibility for these assets to be used for hosting mobile infrastructure;
- Work with the DCMS Digital Connectivity Infrastructure Accelerator (DCIA) pilots and learn lessons from these as to how best to make council-owned assets available for use by the mobile industry;
- Identify council-owned assets, qualify them for appropriateness for hosting mobile infrastructure, and maintain a well-structured database of these assets; and
- Develop the commercial model for offering the use of council-owned assets by mobile network operators at predictable and fair prices and terms.

Policy X.2.4 Explore with operators and with Government the options for minimising adverse impacts of mobile infrastructure on our streetscapes

1.24 We have recently seen a surge in demand for new masts in support of 5G roll-outs, and the implementation of small cells in the future could further increase the need for mobile infrastructure on our streets. We will seek to minimise the adverse impacts of mobile infrastructure on our streetscapes by supporting work to:

- Explore potential neutral host models through which multiple operators share infrastructure provided by a third party in certain areas;
- Encourage the use of Centralised Radio Access Network (C-RAN) architectures⁷;
- Develop standards with Government for multi-use 'Smart Poles' which can host a range of functions including street lighting, electric vehicle charging, environmental sensors, small cells and WiFi as well as micro energy generation; and
- Continue to collaborate, learn and share good practice with other UK historic cities in minimising the visual impacts of new mobile infrastructure.

⁷ C-RAN is concept whereby the data processing 'baseband unit' (BBU) functionality for a mobile base station is moved some distance, e.g. kilometres, away from the mast and its 'remote radio head' (RRH) and antennas. The BBU functionality is held in a central location and is connected to several masts by optical fibre 'fronthaul'. This gives cost savings through pooling BBU resources, provides greater flexibility in efficiently managing resources across multiple masts, simplifies intercell coordination, reduces the street clutter associated with base stations, and reduces the power required at cell sites.

Policy X.2.5 Support early deployments of innovative mobile technologies and use cases

1.25 The Combined Authority will support work to:

- Submit funding bids with operators and industry for trialling innovative mobile technologies such as small cells; and
- Encourage the development of private 5G networks, including those using ‘network slices’ of public networks⁸, working with businesses and campuses.

Policy theme X.3: Smart infrastructure

Overview

- 1.26 Advanced data techniques, sensor technology and digital connectivity are creating opportunities to enable the sustainable growth of local economies, create better places and to help address challenges such as moving towards net zero, climate change mitigation and adaptation, and the reduction in transport congestion and air pollution.
- 1.27 Examples of smart ‘Internet of Things’ (IoT) applications include: monitoring local air quality through a network of pollution sensors; monitoring movement (vehicle, cycling and pedestrian) conditions through sensors and cameras; monitoring flood risk levels through water level sensors; providing travellers with improved real-time public transport information through street signage and mobile apps; helping drivers to find available parking spaces efficiently through smart parking applications; identifying, monitoring and prioritising road potholes through the use of image recognition technology attached to bin lorries; and the use of image recognition and Artificial Intelligence technology to optimise traffic flow through road junctions and to prioritise sustainable travel modes.
- 1.28 Various types of connectivity are used to support such technologies. While fibre may be required in some cases, for example where real-time video information needs to be transferred, many types of sensors generate relatively small amounts of data and have only modest requirements for bandwidth and latency. For the latter, wireless-based low power wide area networks (LPWANs) can be a cost-effective solution – with wide coverage areas, and low power consumptions that allow batteries for remote sensors to last for ten years or more before being changed. Leading types of LPWAN include LoRa which uses unlicensed radio spectrum, and the technologies based on mobile network operators’ licensed spectrum: NB-IoT and LTE-M. Each type of LPWAN technology has its own pros and cons.
- 1.29 While sensors and connectivity can provide data, this only creates value when it is effectively *shared* with the people and organisations to which it is relevant. Where such information is intended for end users such as travellers, it is vital for it to be up-to-date, reliable and very easily accessible.

Policy Summary

- 1.30 To improve the exploitation of smart technologies across the Combined Authority we will continue work to:

⁸ ‘Network slicing’ will become available as mobile network operators implement 5G standards in their core networks, enabling end-to-end ‘5G standalone’ functionality. This allows multiple virtualised logical networks to be supported on the same physical network infrastructure. Each network slice is an end-to-end network tailored to meet the specific requirements for a particular application (e.g. for bandwidth, latency and service level guarantees).

- Support the roll-out of LPWAN infrastructure for IoT applications;
- Facilitate the sharing of data from IoT applications;
- Support trials and pilots of promising new smart technologies; and
- Support the implementation of proven smart technologies at scale, to improve the sustainability of the transport system.

Policy X.3.1 Support the roll-out of LPWAN infrastructure for IoT applications

- 1.31 LoRa networks using unlicensed spectrum have already been deployed in Cambridge, Ely, South Cambridgeshire and St Neots. LPWAN services are also available from mobile network operators, using their licensed spectrum, such as NB-IoT (Vodafone) and LTE-M (O2). The Combined Authority will support work with district councils to extend the coverage of the LoRa network, and will support the market in the roll out of LPWAN technologies.

Policy X.3.2 Facilitate the sharing of data from IoT applications

- 1.32 With councils and the Greater Cambridge Partnership we will support the development of a data hub which allows effective sharing of IoT data between public sector organisations and with businesses and communities.

Policy X.3.3 Support trials and pilots of promising new smart technologies

- 1.33 The Combined Authority will support work with councils, utilities, Highways England, businesses and educational institutions to obtain funding for and implement trials and pilots of promising smart technologies, including applications using the LoRa network, and applications for improving the sustainability of the transport system.

Policy X.3.4 Support the implementation of proven smart technologies at scale, to improve the sustainability of the transport system

- 1.34 Following trials and pilots we will work with partners to ensure that proven smart technologies are implemented at a scale that makes a material impact, in particular on the sustainability of the transport system. The initial focus will be on working with the Greater Cambridge Partnership to deliver its Smart Workstream, but the Combined Authority will support smart implementations throughout Cambridgeshire and Peterborough.

Policy theme X.4: Digital exploitation, access and inclusion

Overview

- 1.35 ONS reports⁹ that the proportion of UK households with internet access had reached 96% by early 2020, and the proportion of adults who had used the internet in the previous three months was 95%. With Covid-19 lockdowns prompting a surge in demand for laptop and tablet computers and much greater use of online video calls for keeping in touch with friends and family, it is likely that the levels of household internet penetration will have improved further over the last couple of years – an assumption supported by Ofcom data¹⁰ which shows that the total number of fixed broadband lines in Cambridgeshire and Peterborough increased by about 23,000 (8%) between 2019 and 2022.

⁹ Source: [Internet Access Households and Individuals](#) (ONS, August 2020)

¹⁰ Source: [Connected Nations 2019](#) and [Connected Nations 2022](#) (Ofcom, December 2019 and December 2022)

- 1.36 However, digital exclusion is still a real issue for a variety of reasons, and the pandemic brought this into sharp focus. For example, many schoolchildren in low-income households found it difficult to access online education during lockdowns – whether through a lack of appropriate devices, through a lack of appropriate workspace in the home, through a reluctance to use up mobile data (where the household only had mobile connectivity), through a lack of fixed or mobile connectivity at home, or through parents lacking the confidence or skills to help their children access online resources.
- 1.37 There are challenges around social housing. Historically, levels of internet access for social housing residents have been below average, largely due to lower household incomes. Furthermore, operators can face difficulties in reaching agreement with Registered Social Landlords (RSLs) for the physical installations required for gigabit-capable broadband services, leaving residents with a limited choice of broadband options. Issues include: wayleaves and access; complex ownership models; and the capacity of housing associations to engage in the technical and legal steps required. Telecommunications providers can also find it difficult to find an appropriate point of contact within RSLs, and Government-funded connectivity vouchers are oriented towards owner occupiers rather than tenants.
- 1.38 In health and social care, digital technology is becoming ever more important in reducing the stresses on the system. Telecare is helping to keep people living independently in their own homes for longer, and telehealth applications are increasingly used to help monitor and manage chronic conditions in an ageing population. There is a potential issue over the next few years as BT and Virgin Media are looking to migrate their voice services off the traditional Public Switched Telephone Network onto their digital platforms by December 2025 ('PSTN switch-off'). This brings a risk of service disruption and/or confusion or worry for some telecare users, as older types of equipment may need to be unplugged from the landline and reconnected via an adapter into a router. There are also some concerns over continuity of telecare and voice services in the event of a power cut (not an issue with traditional landlines as they are fed with remote power from the exchange).
- 1.39 To generate positive economic impacts from the availability of improved broadband and mobile infrastructure, it will be key for Cambridgeshire and Peterborough businesses to take up and effectively *exploit* applications enabled by this improved connectivity. This can be a struggle for SMEs, which sometimes lack the resources or expertise necessary to optimise their use of digital technology - for example, in setting up appropriate equipment for the hybrid meetings¹¹ that have become more common over the last couple of years.

Policy Summary

- 1.40 To help reduce digital exclusion and improve the exploitation of digital technology for socio-economic benefit the Combined Authority will support activity to:
- Raise awareness of digital inclusion opportunities;
 - Extend the availability of public access WiFi;
 - Work with stakeholders to improve digital connectivity in social housing;

¹¹ That is, meetings with some in-person attendees and some remote attendees. Making such meetings work effectively can be much more challenging than it is for meetings which are all-in-person or all-remote. The success or otherwise of hybrid meetings may have a material effect on the extent to which businesses continue to support remote working.

- Work with partners to minimise disruption associated with PSTN switch-off, and the proposed withdrawal of 3G mobile services; and
- Support SMEs' exploitation of digital technology.

Policy X.4.1 Raise awareness of digital inclusion opportunities

- 1.41 A variety of initiatives already exist to promote digital inclusion, such as the work of Cambridgeshire Digital Partnership, Cambridge Online, Good Things Foundation, and industry-led initiatives such as the cheaper 'social tariffs' offered by broadband providers to households in receipt of certain benefits. The Combined Authority will continue to support work with councils and other relevant stakeholders to ensure that people are signposted to relevant digital inclusion activities as appropriate.

Policy X.4.2 Extend the availability of public access WiFi

- 1.42 Free-to-use public WiFi can play an important role in helping to ensure that as many people as possible have access to digital connectivity, as well as supporting struggling high streets as part of the economic recovery from the Covid-19 pandemic. Working with councils we will support work to:

- Investigate opportunities and funding to further expand the CambWifi services into more locations across Cambridgeshire and Peterborough;
- Consolidate existing public access Wifi services by broadcasting CambWifi in as many locations as possible;
- Publicise logon information and the locations where CambWifi is available to ensure that as many people as possible benefit from the service; and
- Monitor the usage of CambWifi, and ensure that the service continues to provide a high quality service as user volumes and data traffic increase.

Policy X.4.3 Work with stakeholders to improve digital connectivity in social housing

- 1.43 Some local councils which operate their own housing stock have been able to address this issue for their properties. For example, Cambridge City Council has recently devised and implemented a standard 'bulk' wayleaves scheme for their properties, which has resulted in a marked increase in access to full-fibre provision for tenants. However, only a small proportion of social housing across Cambridgeshire and Peterborough is overseen directly by local councils and therefore a wider approach is needed to resolve the current issues. The Combined Authority will continue to support work with RSLs to explore the issues that affect digital connectivity for social housing, and to develop approaches to resolve these issues.

Policy X.4.4 Work with partners to minimise disruption associated with PSTN switch-off, and the proposed withdrawal of 3G mobile services which is expected to have a disproportionate impact on the more vulnerable and disadvantaged groups in the area

- 1.44 The Combined Authority will support work with councils, service providers and other stakeholders across the public, private and community sectors to:
- Ensure there is widespread awareness of the plans for the PSTN switch-off and 3G service withdrawal and an understanding of the impact for existing usage.
 - Ensure that users particularly affected by PSTN switch-off (e.g. those with devices such as telecare equipment or intruder alarms plugged into landlines) are provided with timely information on how to maintain their services; and

- Ensure that council-provided Lifeline services continue to work reliably for all users after PSTN switch-off, and that users are appropriately supported in making any changes necessary to their equipment's connectivity.

Policy X.4.5 Support SMEs' exploitation of digital technology

- 1.45 Recognising that successful implementation by businesses of digital technology has substantial impacts on productivity and on sustainability (including reducing the need to travel), the Combined Authority will work with partners to secure funding for programmes supporting digital exploitation by SMEs – building on the success of programmes such as the EPSRC-funded Digital Manufacturing on a Shoestring programme, and the ERDF-funded Digital Technology Grants.

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**CAMBRIDGESHIRE
& PETERBOROUGH**
COMBINED AUTHORITY

Agenda Item No: 2.4

Transport Modelling for Cambridgeshire and Peterborough

To: Transport and Infrastructure Committee

Meeting Date: 18th January 2023

Public report: Yes

Lead Member: Cllr Anna Smith, Chair of Transport and Infrastructure Committee

From: Michael Soper, Analysis and Evaluation Manager

Key decision: N/A

Forward Plan ref: N/A

Recommendations:

The Transport and Infrastructure Committee is recommended to:

- a) Note progress on the delivery of the Transport Model Project.
- b) Recommend the Combined Authority Board agree the full business case for the Transport Model including the timeline and future arrangements for the delivery of the Model.
- c) Recommend to the Combined Authority Board to approve the drawdown of £1.721m allocated within the Medium-Term Financial Plan for the delivery of the model.

Voting arrangements: b) and c) - A vote in favour by at least two thirds of all Members (or their Substitute Members) appointed by the Constituent Councils who are present and voting, to include the Members appointed by Cambridgeshire County Council and Peterborough City Council, or their Substitute Members

1. Purpose

- 1.1 The purpose of the report is to seek approval for the full business case for the Local Transport Model and to seek approval of the release of the 'subject to approval' funds as outlined in the Medium-Term Financial Plan (MTFP).
- 1.2 The Transport and Infrastructure Committee and the subsequent July 2022 Combined Authority Board have previously agreed to the release of £740k and now the remaining approx. £1.721m over the MTFP period requires approval to complete the project. As well as seeking financial approval, this paper provides an update on the work of the Transport Model Steering Group and associated consultants.

2. Background

- 2.1 During the assessment of recent transport studies, the DfT have suggested that the use of the existing suite of models will not be suitable going forward for use in scheme business cases due to the age of the data and the area of coverage. The issue of data age has been addressed by the recent creation of a '2019 Present Year Validation' which indicates that the model validates well within the core area of the model, but this does not address the issues with the coverage of the modelled area.
- 2.2 There is currently a significant number of CPCA and other organisation transport schemes either at the proposal stage or in early business case stage that require a valid transport model to test the scheme impact and benefits. The proposed new model of the whole CPCA area will enable the testing of multiple schemes for a wide range of end users, including (but not limited to):
 - CPCA;
 - Peterborough City Council
 - Cambridgeshire County Council (CCC);
 - Greater Cambridge Partnership;
 - District Council Local Plans, and
 - Developers.
- 2.3 Schemes that might benefit from the provision of the proposed model are listed in full in the appendices. There are several advantages from building a single model covering the whole of the CPCA area instead of a range of smaller scheme specific models, namely:
 - The larger model will be more efficient to build and use; and
 - Will ensure consistency of results across all schemes that would not be possible if the current model system continued.
- 2.4 In addition, the use of a single large model will enable the true level of benefits from a package of schemes to be assessed and will also enable an accurate assessment of where the benefits sit. It is important to note that without a fully TAG compliant model it will be harder for identified transport interventions to demonstrate their impact and benefits and gain government funding.
- 2.5 The proposed model will also facilitate the testing of the impact of a wide range of modes of Transport and will also facilitate the testing of the interchange between modes. Making a significant contribution to testing policies aimed at achieving change in mode share,

increasing sustainable modes of travel, and tackling climate change.

3 Delivering the model

- 3.1 The Combined Authority Board previously approved a £740k budget to commission a full business case for the transport model. Following this, CCC were appointed as lead commissioners with guidance being provided by a steering group that included representatives of Peterborough City Council and the Combined Authority.

After this, WSP-Atkins were appointed under the Cambridgeshire and Peterborough Joint Professional Services Framework (CPJPSF) to complete the Model Specification Report which has been received by the steering group, amended, and approved. Together with the financial section of this paper the Model Specification Report forms the full business case for the delivery of the model and is included within the appendices.

- 3.2 The core elements of the Specification Report cover:

- A review of existing models and confirmation that a renewal of modelling is required to meet the requirements of future infrastructure projects;
- A full review of available data that includes the recommendation that 2023 be used as the model's base line year, based on it being representative of the 'post-Covid' period;
- The scope of the model including geographical area, zoning, time-periods and mode types. These include cycling, walking, passenger transport (rail and bus) and Park and Ride;
- A full assessment of the software choices with the recommendation that PTV Visum be used for all elements of the model;
- Full exploration of the base modelling methodology. Including the incorporation of networks developed from existing models (with additional new work), modelling of trips and trip mode choice, journey times and quality assurance; and
- An explanation of the forecasting method including the assertion that 'Local Plan scenario' is to be the "default" forecast for future travel demand and supply with the ability to commission additional scenarios as needed.

- 3.3 Overall, the steering group has satisfied itself that the model as specified fully meets future requirements providing it is delivered in line with the Model Specification Report. Essentially, inputs of land use (employment and dwellings), trip generation and outputs of mode shares, distribution patterns, trip length distributions, down to detailed analysis of flows assigned to the modal networks and individual junction delays will be generated for each period modelled and available at the modelled level of segmentation and aggregated summaries. This information will then be available to inform a range of business cases.

- 3.4 To reflect the coverage of the model the steering group have agreed to call it the Cambridgeshire and Peterborough Combined Authority Model or CaP-CAM for short.

4. Financial Implications

- 4.1 The current budget profile for spending on transport modelling within the MTFP is shown below. The bulk of the 2022/23 funding allocation will need to be reprofiled into 2023-24. This is based on the decision to delay the data collection for the model to Spring 2023.

	2022-23	2023-24	2024-25	2025-26
	Delivery (see recommendation C)		Forecast Running Costs To be agreed	
Approved	£740k			
Subject to approval	£1.136m	£585k	£215k	£215k

4.2 This Committee and subsequently the Combined Authority Board are being asked to approve the further drawdown of funding to allow for the completion of the project in a timely manner. This is on the basis that a full model specification has been drawn up and a delivery plan has been developed and agreed by officers and the consultants delivering the model build. This plan is shown in detail as appendix three. The main milestones will be:

- Data collection report completed by end July 2023.
- Base model developed by end January 2024.
- Model development and validation report signed off by January 2024.
- Forecast model and forecast model report signed off by end April 2024.

4.3 It should be noted that the data collection cost of £800,000 is currently a high estimate (including a significant contingency) as the cost can vary depending on field conditions and successful collecting of 'typical' data. The total delivery cost provided by CCC is outlined as being £2,046m compared to an allocated delivery budget within the MTFP of £2,461m. The residue £415k is reserved to cover the additional costs to Peterborough City Council for integrating the Peterborough Transport Model into Cap-CAM. At present PCC forecast these costs as being £365k; this is currently being tested by CPCA project managers as part of due diligence.

4.4 The forecast running costs into years 2024-25 and beyond create an indicative cost pressure on the CPCAs revenue budget (the initial build costs being capital) and are based upon operation of the previous model by Cambridgeshire County Council. There is a precedent for aspects of the modelling to be run as a traded or chargeable service, e.g., modelling of the impact of large developments on transport being charged to the developer. The precise nature of this trading is being explored together with CCC so a present the committee / board is not being asked to approve the running cost aspect of the project until the cost is firmed up.

5. Legal Implications

5.1 N/A.

6. Public Health Implications

6.1 N/A.

7. Environmental and Climate Change Implications

7.1 N/A.

8. Other Significant Implications

8.1 N/A.

9. Appendices

9.1 Appendix 1 – Transport Schemes that will benefit from the model

9.2 Appendix 2 – Model Specification Report

9.3 Appendix 3 – Delivery plan and detailed cost estimate

Appendix One: Schemes Potentially Benefiting from Model Development

CPCA / CCC / PCC Potential Schemes

A1260 Nene Parkway Junction 15
A1260 Nene Parkway Junction 32-3
A16 Norwood Dualling
A47 Dualling
Cambridge South Station
Coldhams Lane roundabout improvements
Ely Area Capacity Enhancements
Fengate Access Study - Eastern Industries Access - Phase 1
Fengate Access Study - Eastern Industries Access - Phase 2 (University Access)
Local Transport Plan
Regeneration of Fenland Railway Stations
A141 SOBC
A10 OBC
Peterborough Station Quarter
A142 Chatteris to Snailwell
Development of Key Route Network
Harston Capacity Study
Segregated Cycling Holme to Sawtry
Fenland Stations
Buses Reform - Enhanced Partnership, franchising or BAU
Active Travel Strategy and Schemes
EV Charging Schemes and Outcomes from AFVS
Snailwell Loop
Demand Responsive Transport
Market Towns Programme
20 is plenty
First and last mile (including freight)
Heavy Vehicle Commercial Strategy
A14 Junction 37
A14 Junction 38
Queensgate Bus Interchange
City Centre Transport Vision - Peterborough
Second rail station at St Neots
Alternative bus station (HDC)
Ramsey improvements
Thorpe Wood cycleway
Junction 21 of the A15 Paston Parkway

GCP Schemes

Making Connections
CSET
Cambourne to Cambridge Bus Improvements
Cambridge Easter Access
Waterbeach to North East Cambridge

Other Schemes

A428 trunk road between the Black Cat roundabout on the A1
East / West Rail

Large Scale Strategic Developments

Alconbury Weald,
North-East Cambridge,
Northstowe,
Waterbeach, and
Cambridge Airport

Appendix Two: Model Specification Report

(See separate document)

**Appendix Three: Delivery plan and detailed cost estimate
(See separate document)**

Cambridgeshire and Peterborough Combined Authority Transport Model

Model Specification Report

Cambridgeshire and Peterborough Combined Authority

October 2022

Notice

This document and its contents have been prepared and are intended solely as information for Cambridgeshire and Peterborough Combined Authority and use in relation to Model Specification Report

Atkins Limited and WSP assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

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Client signoff

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Project	Cambridgeshire and Peterborough Combined Authority Transport Model
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Contents

Chapter	Page
1. Introduction	5
1.1. Background	5
1.2. Client group	5
1.3. Model suppliers	5
1.4. Model Name	6
2. Model requirements and functionality	7
2.1. Objectives	7
2.2. Model functionality	7
3. Existing models and data	9
3.1. Models	9
3.2. Data	14
4. Model scope	19
4.1. Model overview	19
4.2. Geographical coverage	21
4.3. Zoning	23
4.4. Model years	23
4.5. Time periods	24
4.6. Modes	24
5. Software choice	26
5.1. Evaluation framework	26
5.2. Software evaluation	28
5.3. Proposed software choice	31
6. Assignment models	32
6.1. Highway	32
6.2. Public transport	35
6.3. Other modes	38
6.4. Base year demand	38
6.5. Calibration and validation	42
7. Demand model	46
7.1. Model form	46
7.2. Segmentation	46
7.3. Choice structure	48
7.4. Approach to Park and Ride	48
7.5. Parking	50
7.6. Model integration	51
7.7. Generalised time	52
7.8. Calibration	53
7.9. Demand-supply convergence	54
7.10. Realism testing	54
8. Data requirements	56
8.1. Introduction	56
8.2. Overview of data sources and uses	56
8.3. Planning data and demand model	61
8.4. Trip Matrix and Distributional Data	63

8.5.	Network Data	63
8.6.	Highway model data	65
8.7.	Public Transport model data	65
9.	Forecasting	68
9.1.	Introduction	68
9.2.	Forecast scenarios	68
9.3.	Uncertainty and other assumptions	69
9.4.	Sensitivity Tests	71
10.	Outputs and analysis	72
10.1.	Standard analyses	72
10.2.	Appraisal requirements	72

Tables

Table 3-1 - Functionality options	13
Table 3-2 - Existing data sources	17
Table 4-1 – Geographical areas of coverage	21
Table 4-2 - Comparison of zones	23
Table 4-3 – MSOAs, LSOAs and Output Areas (OAs) in each local authority	23
Table 4-4 – Out and return time periods in VDM and assignment models (home-based trips)	24
Table 4-5 – Main modes and constituent modes by stage for access / egress	25
Table 5-1 – Main and sub-criteria of software evaluation	27
Table 5-2 – Relative capabilities of software packages	28
Table 6-1 – Link Flow and Turning Movement Validation Criterion and Acceptability Guidelines	42
Table 6-2 – Journey Time Validation Criterion and Acceptability Guidelines	43
Table 7-1 – VDM and NTEM trip purposes	47
Table 8-1 - Data Source Importance and Suitability RAG Status	56
Table 8-2 – Summary of data sources and purpose	57
Table 9-1 – Uncertainty log information	69
Table 9-2 - Sensitivity test summary	71

Figures

Figure 4-1 - Overview of core model components and structure	19
Figure 4-2 - Model coverage	21
Figure 7-1 - Indicative choice hierarchy	48
Figure 7–2 - Approach for Park and Ride modelling	49
Figure 7–3 - Components of Generalised Time	53
Figure 9–1 – DfT TAG Uncertainty Log definitions	70

1. Introduction

1.1. Background

The Cambridgeshire and Peterborough Combined Authority (CPCA) has a long-term strategy to improve transport in their area; and have recently consulted on an updated Local Transport and Connectivity Plan which sets out their vision and a framework to deliver a modern integrated transport system for the residents and businesses in Cambridgeshire and Peterborough.

According to the 2021 Census, the usual resident population for Cambridgeshire and Peterborough was 894,300 with the two main cities growing faster than other districts over the past ten years. The aspiration is to make future growth more sustainable and to improve the transport system to provide travellers with choice, making it easier to access opportunities across the region using alternatives to the car. This is a significant challenge as the region is diverse including the cities of Peterborough and Cambridge, many towns of varying size and rural areas focused on agriculture with a high reliance on car for travel between communities.

To successfully meet its vision and goals, CPCA is looking to deliver an integrated transport network which includes the following¹:

- Integrated and seamless interchanges between modes
- Accessible travel and spatial planning
- High-quality and effective digital connectivity through the region
- Investment in high quality public realm
- Safe and attractive walking and cycling infrastructure
- Efficient highway network that accommodates the needs of all users
- Accessible, affordable, reliable, and frequent public transport and
- Innovative new transport modes.

The CPCA recognises the importance of having an up to date and robust evidence base and tools to allow them to stress test future transport plans which support economic growth aspirations, while balancing environmental concerns across Cambridgeshire and Peterborough.

Two transport models currently provide coverage of most of the CPCA area:

- Cambridge Sub Regional model represents travel to / from and within four districts of Cambridgeshire
- Peterborough transport model (PTM) provides detailed representation of highway travel for Peterborough.

To achieve the aims of a “good growth” and balanced assessment across the wider region, CPCA have approved the development of a new regional transport model to assess transport projects across the whole of Cambridgeshire and Peterborough area using one tool.

The new model will replace the existing Cambridge Sub Regional Model (CSRМ), which is limited to four districts of Cambridgeshire, with a detailed model which covers the whole of the Cambridgeshire and Peterborough Combined Authority area. It will allow the costs and benefits of proposed transport schemes, and the transport impacts of new housing developments, to be fairly assessed for the whole area.

1.2. Client group

A Combined Authority working group has been set up to oversee the model development. This working group includes representatives from Cambridgeshire County Council, Peterborough City Council, and the Greater Cambridge Partnership.

1.3. Model suppliers

Atkins and WSP will collaborate and act as joint suppliers of the new transport model on the Cambridgeshire and Peterborough Joint Professional Services Framework. The management and governance of the supplier team, including our approach to quality assurance is provided in the Model Delivery Plan.

¹ Source: Draft Local Connectivity and Transport Plan: <https://yourltcp.co.uk/wp-content/uploads/2022/05/Draft-Regional-Section.pdf>

1.4. Model Name

The model is proposed to be formally named as CaPCAM, the **C**ambridge and **P**eterborough **C**ombined **A**uthority **M**odel. To avoid confusion, references to the regional model throughout this specification report refer to the new model.

2. Model requirements and functionality

2.1. Objectives

2.1.1. Background to the proposed model

Strategic transport modelling is central to developing the evidence base for spatial strategies, major scheme business cases, other transport improvements and policy changes. However, the current modelling / data approach across the region has been developed over a number of years, with different models and approaches and it has been some time since the last significant update of the strategic transport models within the region. This is now the right time to develop a new, consistent, evidence-based modelling tool for Cambridgeshire and Peterborough, with improved functionality which meets the objectives and requirements detailed in this chapter.

2.1.2. Model uses

The model is intended to be used to:

- Support local spatial and regional strategy development;
- Inform **local plans** and land-use policies/strategies;
- Allow testing of a wide range of **highway schemes** and input into more detailed operational studies;
- Provide inputs into **public transport** modal assessment studies, including rail projects and bus-based corridor studies;
- Support **business case** development and submission, including **major scheme bids** to central government;
- Highway Control and Planning – support on larger strategic growth sites;
- Support transport policy considerations;
- Provide **walk** and **cycle** modal share metrics to inform health and sustainability assessments;
- Test **Park and Ride** interventions and consider the importance of central area parking constraint and charges; and
- Provide outputs to other studies on **indirect transport issues** (e.g. carbon generation, operational assessments).

2.2. Model functionality

In order to meet these user requirements, the functionality of the model needs to include:

- Highway and public transport assignment models, and a variable demand model for personal travel with a robust **modal choice** decision process;
- Ability to reflect regional priorities around sustainable transport modes including: **guided bus, bus, rail**
- Ability to model the influence of both **walking and cycling**, both for access to other modes, and for entire trips;
- Ability to produce inputs into other **mode** assessments including rail projects and bus-based public transport corridors.
- representation of existing and future **Park and Ride** and replicate **parking costs and constraints** in strategic regions
- Representation of **active travel** (walking and cycling) including off road facilities and attractiveness of dedicated cycle facilities impacting users' perception of mode.
- Representation of **parking capacity** in addition to charges to better reflect constraints on car use.
- Road freight (**goods vehicles**) will be included in the highway assignment model to reflect the road space they use and their impact on congestion.

The model functionality aims to address all the study requirements but with the expected limitations of a model of this scale and nature.

2.2.1. Model structure

- CapCAM will be a full transport model for variable demand modelling (VDM) and both highway and public transport (PT) assignment that will be developed based on the latest government guidance (TAG) and values.
- The CaPCAM model will be based on primary (i.e. mobile network data (MND), counts, journey time data, etc) and secondary data (i.e. NTS, Census 2011 / 2021, mid-year population estimates, NTEM, NRTF, etc) collected during the same period(s) to ensure commonality between traffic flows and distributions between local and regional study areas.
- Local highway assignment models for testing small schemes could then be developed as required from the parent models by cordoning.
- It will be ensured that there is a connection between any existing local highway assignment models (costs and routing) and the new regional model demand model. This could be achieved by ensuring zone and network correspondence between the two models, and user class compatibility.
- If a finer zoning system is required in any local models the ability to disaggregate the regional model zone system to e.g. the PTM4 zone system would also be required. This would enable the PTM4 matrices to be used as a source of prior matrix demand data for the base year model if required.
- Full documentation of the regional model build to ensure uncertainties around assumptions are accounted for within local model builds and adequately reported within local transport studies or business cases.

2.2.2. Model standards and measures of success

Traditionally, transport models tend to measure success primarily on technical quality criteria as defined by the DfT Transport Analysis Guidance (TAG). Whilst we are proposing to maintain this technical quality, additional measures are also proposed:

1. DfT TAG technical “Quality” criteria.

- a. A wide range of quality tests defined in TAG for all the models will be utilised as standard.
- b. An extra “near” criteria based on the approach with National Highways Regional Traffic Models (RTMs). A similar approach of Red/Amber/Green system of validation can be developed and applied.

2. Proportionality, pragmatism and cost

- a. Building a transport model is time consuming and expensive. We recognise that CPCA seek to use budgets as efficiently as possible, and where possible, limit spending unless it delivers high value;
- b. Where there are decisions which might require a choice between high quality & cost vs medium quality & cost, we will not automatically advocate the higher quality option. We will seek to explain to CPCA the relative benefits of each approach and aim to recommend the option which is most efficient and provides the most value for money.
- c. By focusing on supporting strategic transport and planning requirements, time and cost is not wasted in building unnecessary functional capability which would add to appraisal times, file size and other complications. Rather the model would provide the platform for additional bespoke capability that could be rapidly added to applications of the whole, or part of the model, for business case evidence for all potential schemes throughout CPCA.

3. Appraisal time

- a. To reduce costs, we will seek to reduce the time the model needs to “run”.
- b. The “run-speed” of a model is not just how quickly the model “runs” or even its time to implement (although these are important considerations) the “model run” must include the time for a modeller to produce clear, transparent outputs through which they are able to interpret, appraise and assess if the outputs are plausible;
- c. Hence the success of this metric is to seek to reduce the whole “appraisal time” (i.e., the model set-up and implementation, the model run, and interpretations and appraisal of the outputs).

4. Ease of use, accessibility and transparency

- a. It is proposed that all model inputs and outputs will be easily accessible (on a web browser), fast, intelligible and map-based.
- b. This will help all users (including the modelling delivery team, independent reviewers, CPCA and stakeholders) to understand and influence the implications of any decisions.

We will seek to suitably “balance” all of these measures, i.e., we will neither seek to develop a technically excellent model which is expensive, slow to provide outputs and cannot be understood by key stakeholders nor develop a model which is quick and easy to use but is based on low levels of evidence.

3. Existing models and data

3.1. Models

3.1.1. Introduction

This section provides a brief overview of the range of existing modelling tools available to the stakeholders to answer these questions:

- What can existing models provide (data) that can be taken forward for the new model?
- Which features from existing models should be retained and any aspects to be dropped (more problematic than the value they add)?
- Where do the existing models fall short for foreseeable applications - gaps in existing model to be addressed by new model.
- How will / should the new model replace, complement and, if appropriate, interface with the existing model and implications for consistency.

The existing models considered in this section are as follows:

- Cambridge Sub Regional Model (CSRM2 F-series)
- Peterborough Transportation Model (PTM3)
- Wisbech Area Transport Model (SATURN and Vissim)
- March Area Transport Study Models (SATURN and Vissim)
- Ely Traffic Model – (SATURN)
- Regional Traffic Models (SATURN, National Highways)
- Cambridge CUBE PT assignment model; and
- Various microsimulation and local junction models within the Cambridgeshire and Peterborough area (Cambridge, Huntingdon and St Ives)

The section concludes by considering the questions posed above and highlights aspects to be addressed by CaPCAM.

3.1.2. Cambridge sub regional model (CSRM2 F-series)

The CSRM2 F-series model represents the demand for personal travel to, from and within the Cambridge sub region, defined as the four districts of Cambridge City, South Cambridgeshire, East Cambridgeshire and Huntingdonshire. CSRM2 comprises a variable demand model (VDM) integrated with assignment models for highway, public transport, walk and cycle modes.

The model has 313 zones for the four districts representing the internal model area and a further 161 external model zones. The zones are defined from the Middle layer Super Output Areas with some subdivisions relating to specific sites, eg separating major employment areas and to provide detail in the urban centres and some aggregation in rural areas.

The demand model is implemented for an average weekday and considers choices of mode, time period and destination. Travel demand is highly segmented to reflect travellers' education / working status, household income, size and car availability, as well as the trip purpose.

Highway matrices were developed for a 2015 base year from mobile phone data, 2011 Census data and synthetic matrices (from the VDM) for 12 user classes (8 purpose and income combinations, 4 goods vehicles to reflect restrictions in Huntingdon). The highway assignment model is implemented for the peak hours of 0800-0900 in the morning and 1700-1800 evening and an average hour (from 1000-1600) during the day.

The other assignment models operate for the morning, interpeak and evening periods of 0700-1000, 1000-1600 and 1600-1900 respectively and in each case the demand (trips) estimated by VDM is assigned.

Land use and trip end spreadsheet models are used to forecast personal travel demand based on land use activity (dwellings containing population, commercial development containing jobs). Trip rates for total travel derived from the National Travel Survey (NTS) akin to those used in DfT's NTEM dataset are applied to the forecast population to estimate future travel demand. Growth for goods vehicles and external (through) trips is derived from DfT's Road Traffic Forecasts.

The VDM estimates travel by mode in each time period. The base year highway matrices are updated by applying growth from the VDM (incremental approach). Matrices of light and heavy goods vehicle trips, and through trips are added to the car trips from the demand model.

The modelling system runs iteratively until demand estimates are in equilibrium with the levels highway congestion forecast.

CSRM F-series included a detailed representation of Park and Ride with car access to the city bus-based park and ride sites and the Cambridge Busway guided bus. Car access to rail is also explicitly modelled. The representation of cycling has been enhanced for the F-series, with varying perception of cycle facilities (on / off road) and modelling the ability to drive to Park and Ride sites then walk or cycle to the destination (Park and Active).

The model does not include any representation of public transport crowding (discomfort / delays to passengers due to standing / lack of capacity on the services). Parking costs are included, but no impacts of limited parking capacity on travellers' choices.

3.1.3. Peterborough Transportation Model (PTM3)

The current PTM3 model represents highway travel in the Peterborough Unitary Authority, with its detailed modelled area (simulation network) covering the City Council boundary bounded by the A1 in the west, Bourne and Yaxley to the north and south respectively, and to Guyhirn in the east. The model has 250 internal and 63 external zones. The zoning is based on Census Output Areas with additional zones to represent city car parks.

PTM3 is a three-stage model with trip generation and distribution for new developments carried out using spreadsheet models, and highway assignment in SATURN. An update to create PTM4 is being planned and will run in parallel with the new regional model development.

Highway matrices were developed for a 2019 base year from mobile phone data and synthetic matrices (from NTEM based trip ends and a gravity model) for 5 user classes (commute, business, other, LGV and HGV). The highway assignment model is implemented for the peak hours of 08:00-09:00, 14:00-15:00 and 17:00-18:00. Detailed networks represent the connectivity across the study area with signal timings provided by Peterborough City Council and checked against observed average timings. Level crossings are also included either as traffic signals based on observed barrier timings in the modelled hours, or link based time penalties.

Forecasts have been generated for the future years of 2026, 2031 and 2036. The trip generation spreadsheet model is used to forecast additional highway demand generated by developments in the modelled area. Trip rates derived from TRICS, count data and local studies are applied to land use units (dwellings, square metres of commercial floorspace). Background growth for car travel associated with existing land use activities, is determined from NTEM v7.2 applying alternative planning assumptions, and making allowance for changes in income and vehicle operating costs through time. Growth for HGVs and for through trips (external to external) is taken from the DfT's Road Traffic Forecasts.

3.1.4. Wisbech Area Transport Model

The Wisbech Area Transport model is a highway model that was updated for the Wisbech Area Transport Study in 2016/17 and has a base year of 2015. The model is implemented using the SATURN software and has a study area of Fenland district in Cambridgeshire and Kings Lynn and West Norfolk in Norfolk. Zones are defined from Output Areas with 34 zones representing Wisbech and its surrounds, and 61 external zones.

Highway matrices were developed for the 2015 base year from 2016 mobile phone data supplemented by earlier 2008 RSI data and information from SERTM. Matrices for HGV trips were derived from DfT's Base Year Freight Matrices (BYFM) for 2006 uplifted to 2015. The assignment model operates with 5 user classes (commute, business, other, LGV and HGV) and is implemented for the peak hours of 0800-0900 and 1700-1800, and an average interpeak hour (1000-1600).

Forecast highway matrices are developed using the same concepts as set out for PTM3. Growth in zones with developments is estimated using an Uncertainty Log with trip rates derived from TRICS data and distribution patterns taken from the existing zones. For zones without development, background growth is derived from NTEM forecasts with income and fuel adjustment factors applied. The final stage is constraining overall growth to NTEM levels.

Results from the strategic highway model were fed into a microsimulation model in Vissim for use in the Wisbech Access Study.

3.1.5. March Area Transport Study (MATS) Model

This strategic highway model was developed for the March Area Transport Study (MATS) to assess the impact of new developments on future traffic growth, and evaluate the impact and benefit of a number of proposed highway improvement schemes.

The MATS model is implemented in SATURN with two spreadsheet models to provide trip generation / land use and trip distribution modelling for developments, similar to the implementation of the current Peterborough transport model (PTM3). Outputs from the model are used with the DfT's Transport User Benefit Appraisal (TUBA) software for the cost-benefit analysis of highway schemes.

The study area focuses on the town of March and with network representation of connectivity to Wisbech in the North, Chatteris in the South and Whittlesey in the West. To the East the detailed modelling covers the area towards the A1101. The detailed modelling is focused on the town centre and the A141 to the west. Zoning in MATS is based on the Lower layer Super Output Areas (LSOAs) with some sub divisions to represent car parks in the town centre, and comprises 38 internal and 8 external zones.

The base year is 2018 with the highway demand matrices developed from automatic number plate recognition (ANPR) and car park surveys, allocated to journey purposes (commuting, business and other) using National Travel Survey, 2011 Census and the car park survey data. Three separate hours are modelled for an average weekday 08:00-09:00, 14:00-15:00 and 17:00-18:00. Signal timings were provided by Cambridgeshire County Council and checked against observations to provide best representation of dynamic signals under prevailing conditions. Four level crossings are included in the model and represented using traffic signals taking into account the time the barriers were closed during the one hour periods modelled.

Forecasts were generated for the years of 2026 and 2031. An uncertainty log was used to identify development sites to include, and trip rates derived from TRICS applied to the planned developments using the spreadsheet models. Background traffic growth is derived from DfT's NTEM and Road Traffic forecasts.

3.1.6. Ely Traffic Model

The Ely Traffic Model (ETM) is a highway assignment model developed originally for the AM and PM peak hours, using SATURN software with a 2009 base year. The model was built to allow tests to be conducted for the East Cambridgeshire District Council LDF proposals for Ely. The network covers the built-up area of Ely City and the local hinterland network enclosing Ely as far south as the A1123 from Soham to Stretham. Forecast years were established for 2017 and 2031. The forecasts were controlled to TEMPRO 6.2 levels of household and employment growth, although there was evidence that the employment growth in Ely anticipated by the local district council may be significantly higher than the reported TEMPRO 6.2 level.

The ETM was updated in 2021 using the 2031 Do Something network as it included the Southern Bypass which is now open and the 2017 matrix, with a Present Year Validation to 2019 data. A limited amount of manual matrix estimation was required and the inclusion of signals to represent level crossings, and an hgv ban added at the north end of Queen Adelaide Way where there is a height restriction. Calibration of link speeds and speed flow curves resulted in a good fit to 2019 count data, and further checks were carried out against routing and journey times for OD pairs against data derived from Google Maps.

3.1.7. Regional Traffic Models

National Highways have a suite of five regional traffic models (RTMs) covering the whole of England. The original development of the models in 2015 was to enable National Highways to progress schemes identified in the Road Investment Strategy (RIS). As the models were designed to provide the base for multiple highway schemes the geographical coverage is broad, with no one centre of focus. The suite of models were developed for a 2015 base year to a common design, with a consistent set of standards and utilised common datasets. The RTMs are currently being updated to a 2019 base year.

Cambridge and Peterborough are both within the area covered by the South East Regional Traffic model (SERTM), though Peterborough is fairly close to the edge. Peterborough is also in the area covered by the Midlands RTM, though Cambridge lies just outside.

The RTMs comprise a highway assignment model implemented in SATURN, and a variable demand model using DfT's DIADEM (Dynamic Integrated Assignment and Demand Modelling) software.

The primary data source for the development of the base year trip matrices was mobile phone data processed into the Trip Information System dataset, supplemented with information from Trafficmaster and DfT's Base Year Freight Matrices. Rail trip matrices are also developed for the base year to enable demand changes to / from rail when forecasting. Highway networks were developed from Ordnance Surveys ITN (Integrated Transport Network) again supplemented with traffic signal data and information from existing traffic models.

The assignment models operate for average hours in each of three time periods (morning, interpeak and evening peak) for an average weekday. Five user classes are defined for car commute, business and other trips and for light and heavy goods vehicles.

Forecast demand is developed using NTEM data for car growth and DfT's Road Traffic Forecasts for LGV and HGV trips. Specific development sites are not considered in these large-scale strategic models.

3.1.8. Cambridge CUBE PT assignment model

The Cambridge CUBE public transport assignment model is derived from the CSRM2 D-series public transport assignment model with some refinements related to specific GCP corridor schemes. The 2015 base year public transport matrices have been taken from CSRM2 base year and modified to improve the validation for the schemes being considered. The public transport network and service representation was taken largely from CSRM2, with improvements to zone connectors, non-transit legs utilising CUBE functionality.

The CUBE PT model does not include any specific forecasting functionality, with demand changes taken from CSRM2 forecasts and applied in CUBE.

CSRM2 has been updated to the F-series since this model was implemented. Many of the enhancements made for the CUBE PT model relating to zoning, highway detail for bus stops and routing, have been incorporated into the CSRM2 F-series networks.

3.1.9. Microsimulation and local junction models

For more detailed operational assessment relating to scheme proposals and design, micro simulation models are often used for smaller areas than the models outlined above. Junction specific models are also created for key locations. The main micro simulation modelling packaged used are Paramics, Aimsun and PTV Vissim. Several micro-simulation models exist for areas within Cambridgeshire and Peterborough including:

- Paramics based models for Cambridge, St Ives, A14 Huntingdon
- Aimsun – within Peterborough
- Vissim – Wisbech, March and corridors in Peterborough

Many of the micro simulation models were developed from the more strategic SATURN highway models, and thus provide similar network detail, though they could provide supplementary junction information where it is still up to date.

Detailed junction models are developed to provide operational assessments and look at specific details of scheme design. The focus of these models is very different to the proposed strategic model, however if sufficiently up to date, they could provide detailed junction geometry and signal phasing and timings. The transfer of such information already coded for the purposes of transport modelling will be considered should this be more efficient than collating the data from alternative sources.

3.1.10. What can existing models provide?

The models described above provide a large collection of information which could be utilised when developing the new model. However much of the data underlying the models is now quite dated, and hence the appropriateness of this data in terms of coverage and age will need to be considered. In particular, demand data from traffic surveys is pre Covid and hence its usefulness will be limited.

CSRM2, PTM3, MATS and the Wisbech area transport model provide coverage for most, if not all, of the study area being considered and could potentially provide highway network information for the new model.

The local microsimulation and junction models will be considered as a source for junction coding and signal timing, depending on the age of the data and whether junction changes mean the data is no longer valid.

In addition, these models could provide the basis for model zoning.

Recent data collated for forecast scenarios is also directly relevant. Uncertainty logs (where they exist) should be pooled, and form the basis for development and infrastructure logs for the wider area.

Public transport network data could be taken from CSRM, however contemporary PT modelling software (such as PTV Visum and CUBE Voyager) has functionality to process timetable information and hence this approach will be more efficient.

More importantly where existing models are expected to continue in use due to their more detailed, local coverage, consistency in definitions should be considered carefully to facilitate the sharing of data or transfer of information between modelling tools in the future.

For consistency, definitions should be the same or compatible wherever possible with simple one to one, many to one aggregations.

- Same highway assignment hours (including definition of average weekday)
- user classes – same or simple aggregations
- definition of modes – “car”, van and HGV – same or simple aggregations
- same price base
- zoning – nested across models
- Classification of road types

Network coding rules will be required for the new regional model, and these might be taken from an existing model, particularly where consistency is desirable between models in the longer term.

3.1.11. Shortcomings in existing models and functionality to adopt

Table 3 sets out some of the functionality in the existing models that has been identified as desirable for including in CaPCAM to provide the range of tools required for the likely scenario applications.

Table 3-1 - Functionality options

Existing Model	Desirable	Debatable (sufficient value added?)
CSRM	P&R modelling Cycle modelling LU / trip end growth based on local uncertainty logs or constrained to NTEM Representation of area licence for Cambridge City	Income segmentation - should be useful – but limited application to date Treatment of bus v guided bus (HQPT) – was useful – but more important now to differentiate off road dedicated track versus on road running Macro time of day choice – limited use to date, important for time period specific charging. Assigning walk (cycle is desirable).
PTM, MATS	Clarity of trip generation for future developments	Representation of individual car parks – too much detail for strategic model though data potentially useful.
SERTM	Goods vehicle demand Strategic road network	

The existing models provide a wide range of functionality across the CPCA area, particularly for highway modelling. The main shortcomings identified with the existing models are:

- Area of coverage and consistency across tools
- Demand data underpinning models are now quite dated (eg 2011 Census) and require updating to remain valid
- Multi modal modelling limited to Cambridge sub region only
- Limited / time consuming graphical outputs for presentation
- Bespoke and complex approach to represent Park and Ride
- Transparency of planning inputs
- Modelling constraints imposed on car travel by restricted parking capacity
- Changes in traveller behaviour due to emerging technology and post Covid

The proposed approach to developing CaPCAM seeks to address these shortcomings.

3.1.12. Interaction between CaPCAM and existing models

The outline specification of CaPCAM has highlighted some areas of consistency in terms of geographical building blocks for zone definitions, time periods and segmentation (user classes) across the existing models. Some of the definitions are slightly different (eg for the inter peak highway assignment hour). The definitions will be finalised for CaPCAM based on analysis of data and in discussion with the existing model owners to

maximise consistency in definition across the existing models which are expected to be used in future applications. The most relevant model is PTM where the proposed update provides the opportunity to align definitions with CaPCAM.

Having maximised consistency in definitions, some of the potential benefits of sharing information between modelling and assessment tools are as follows:

- Single maintained Uncertainty log for all developments across the CPCA area to maximise consistency in forecast growth assumptions for alternative scenarios;
- Derivation of modal (expected to be primarily highway) growth factors from CaPCAM for application in existing models in a variety of ways: as background growth, for longer distance movements not captured in the local model or to create a reference scenario;
- Single maintained Uncertainty log for potential transport schemes across the CPCA area;
- Sharing of scheme coding for potential highway schemes across relevant models – with adjustments required for appropriate level of detail in each application;
- Ability to develop new detailed assessment tools from CaPCAM, eg by cordoning the highway model, extracting a subset of the demand matrices for a local micro simulation, cycling or public transport and adding additional detail for local applications.

It must however be noted that each model or assessment tool will be focused on meeting specific objectives, with more local models intended to provide more detail than the strategic CaPCAM. While inconsistency can be minimised and information can be shared between the various tools, this does not ensure consistency in forecasts outputs. The most appropriate tool should be used for the relevant application and the validity of the tool confirmed at the outset.

3.2. Data

3.2.1. Introduction

This section briefly outlines existing data sources we are aware of, and in many cases have previously used for models and studies within the CPCA area. The datasets fall into two main groups:

- National datasets providing information for the CPCA area which are published or can be made available for applications such as transport modelling.
- Locally collected data collected regularly (e.g. annually) or as a one-off for a specific purpose.

The data requirements for the model development are covered in Chapter 8 of this report, covering both data which exists (as summarised here) and datasets which would need to be collected.

The following sections provide a brief summary of the existing data relating to the different components of the proposed model and stages of development.

3.2.2. Planning data and demand model

Planning statistics are published by the Local authorities on levels of development and growth in their area. Many of the development assumptions are already collated for the CSRM and PTM models. The existing data would need confirming with the relevant local authorities, with data expected to be available for 2022.

Statistics are published at least annually, by the Office for National Statistics, and freely available relating to population, households and employment at a district level and in some cases for more spatially disaggregate areas. Again data for 2022 is or will be available for use in the base year model development. Data is also collated by various government departments on housing developments (Live tables) and school places (School Census)

Commercial datasets such as the Ordnance Survey AddressBase relate postcodes to geographic locations and enable more spatial detail to be incorporated into models. This dataset, and some others, are freely available to public authorities. Where such data is required, we will request access to the data via the relevant client authority.

The Census of Population carried out every ten years provides a wealth of spatially detailed information on the population and households living in each area. Data from the 2021 Census is now being published, with more information due out by Spring 2023. The 2021 Census will provide an excellent dataset from which to derive 2023 segmented population data, with more aggregate growth statistics being applied.

Trip rates are required to determine the amount of travel made people living, working, shopping etc in the study area. Trip rates can be obtained from two sources:

- travel diaries recording every trip made by a set of individuals for a defined period (usually a day or a week).
- Counts at specific facilities (eg retail parks, science parks, specific development areas).

The National Travel Survey is an excellent source of information on travel behaviour and available for all recent years. The survey is however a very small sample of people, sampled across England and hence cannot be reliably applied for spatially detailed areas. It does however provide robust information on trends and can be used to provide statistics at a more aggregate spatial level (while ensuring sample sizes are sufficient). A limited amount of data is published and freely available. A licence can be obtained to access more detailed NTS data for specific purposes, such as transport modelling.

The TRICS database is a widely used system for trip generation analysis particularly in relation to Transport Assessments. The database provides access to a wide range of traffic and multi-modal transport surveys for different development types.

Changes in behaviour have also been monitored by ONS, with a variety of datasets collected from lifestyle surveys such as the Living Costs and Food survey, and Opinions and Lifestyle survey. These data are not specific to the study area, but can provide useful insights for the demand model on the factors influencing the ability / desire to work from home.

3.2.3. Base year trip matrix and distributional data

The Census of Population also records information on the usual workplaces and methods (mode) of travel to work for employed people, and has historically been widely used in transport modelling. This data is unlikely to be reliable for 2021 due to restrictions on movement imposed due to the Covid-19 pandemic at the time the Census was completed. Data from 2011 is available, but now very dated so of limited use meaning existing data on commuting patterns across the CPCA area is limited and will need to be addressed.

Public transport ticketing information can provide information on volumes and patterns of movement on public transport. Ticketing data from Stagecoach has been used for analysis of bus travel patterns for CSRM. Similar data is likely to be available from other bus operators, though restrictions are usually imposed to ensure the commercial sensitivity of patronage data is respected.

Annual rail ticketing data is available via LENNON which holds the vast majority of national rail tickets purchased in Great Britain. The MOIRA model makes extensive use LENNON to predict the number of people who travel on each service. MOIRA is the rail industry standard source of information on rail patronage and can provide information on station to station movements (based on ticket sales). There are limitations with the data particularly in major conurbations covered by travel cards which the stations used are not defined. Times of travel are not determined for some tickets, and it is not clear how accurately the MOIRA information reflects variations across the year and throughout the day at local stations.

Mobile phone or other mobile device data, collectively known as mobile network data (MND) can also be used to obtain information on patterns of movement. Mobile phone datasets have been used for CSRM, PTM and the Wisbech transport models. This data ranges from 2015 to 2019 and is sourced from different providers.

Various companies collate and sell information on vehicle movements through fleet tracking systems using GPS devices in a sample of vehicles. These include INRIX, Teletrac Navman and TomTom. The sample sizes for the data vary and the bias of the sample is not known. These datasets are often used to provide data for vans or heavy goods vehicles.

3.2.4. Network data

Many sources of geo-coded network data for alternative modes are widely available. Opensource datasets such as OpenStreetMap are available and provide some of the information required. Commercial datasets provide more attributes for the networks which can be valuable for transport modelling. OS Mastermap and HERE maps are examples of networks where additional detail can be purchased.

As outlined in Section 3.1, the existing models provide good coverage of the proposed CaPCAM study area and already contain detailed network information appropriate for modelling.

Signal timing information could be taken from existing models, but the age the data means it should be verified or updated with current information from the local authorities.

3.2.5. Highway model

The highway model development requires information on the volumes of traffic using the network, observed speeds of travel and journey time routes to calibrate and validate the model. Count data is used to help scale

and shape the matrices of demand with additional (independent) data then used to validate the resulting traffic flows across sets of links.

Ideally the data will be collected close to the date being used to validate the model. Adjustments can be made to the data to account for monthly variations due to seasonality, though the aim to represent travel for an average weekday during (school and university) term time.

National Highways continuously monitor traffic flows and speeds on the strategic road network and this data is available via WebTRIS. There are approximately 1,400 permanent traffic sensors on the strategic road network within Cambridgeshire and Peterborough. This dataset is expected to be key data source for the strategic road network, managed by National Highways.

The Department for Transport also collect data from 300 automatic traffic counters and approximately 8,000 manual classified traffic counts across the country each year. There are many sites in Cambridgeshire and Peterborough. Data is collected between 7am and 7pm between March and October excluding public and school holidays. Major roads are surveyed regularly with the interval between counts being 1, 2, 4 or 8 years depending on the traffic level. A sample of minor roads are counted each year. Traffic estimates are derived for all years based on the data collected.

Cambridgeshire County Council have a series of permanent sensors to provide count data and the annual traffic monitoring surveys (7am-7pm). The surveys include:

- Annual town monitoring sites in March, Wisbech, Chatteris, Whittlesey, Ely, Huntingdon, Ramsey, St Ives, and St Neots.
- Annual Cambridge radial sites on routes to / from Cambridge City.
- Annual Cambridge river screenline sites.

The annual town monitoring sites and Cambridge radial are one-day surveys in October / November counting pedestrians, cyclists and motorised vehicles by type at half hourly intervals. The same information is collected for the Cambridge river screenline during two-day counts carried out in April / May each year. Information on the surveys is geocoded with GIS layers of information on the counts available.

In addition to these regular counts, adhoc surveys are undertaken for individual projects with data potentially available to CCC. The relevance and availability of any such data will be investigated when defining the new data collection programme in collaboration with CCC.

To update the PTM model to a 2019 base year (PTM3), Peterborough resurveyed many of the earlier 2015 traffic count sites in September / October 2019 to provide link and turning count data. Weekly ATC counts were carried out for the links, with one day video surveys for classified turning counts. A further programme of traffic surveys is being planned for the update to PTM4 and should be available for CaPCAM.

As well as this more traditional data, both Cambridgeshire and Peterborough have a number of permanent Vivacity sensors counting pedestrians, cycles and motorised vehicles in 5-minute, 15-minute, hourly and daily intervals, with more sites proposed. Both authorities have been analysing data and comparing results with more traditional data forms to better understand the robustness and reliability of the data. We will engage with the relevant users of the data at Cambridgeshire and Peterborough to explore the extent this data can be reliably used to supplement traditional count data for model calibration and validation.

Journey time information is now typically derived from vehicle tracking devices and available from a number of providers as noted in Section 3.2.3 for GPS based distributional data. Historic journey time information has also been collated for the existing models, though this is now too dated to be relied on for CaPCAM. CCC have access to Trafficmaster journey time / speeds data pre-2021 and CTrack/Inrix data from 2021 onwards.

3.2.6. Public transport model

The Bus Open Data Service (BODS) is a portal providing access to bus timetable, vehicle location and fares data ([Bus Open Data Service \(data.gov.uk\)](https://data.gov.uk/dataset/bus-open-data-service)). Vehicle location information can be used to calculate speeds of travel and journey times. The data is in GTFS format (which can be now read by leading public transport modelling software packages). Rail timetable information can be obtained from the Associate of Train Operating Companies in the equivalent GTFS format.

The national public transport access nodes (**NaPTAN**) is a national dataset of all public transport 'stops' in England, Scotland and Wales.

These publicly available datasets are now national standards and widely used for transport modelling applications.

3.2.7. Park and ride

Passenger journeys using the Cambridge Park and Ride sites were counted annually as part of the CCC Rolling Count programme until the Covid-19 pandemic. From the induction loops on the entry and exit of each city P&R site it has historically been possible to obtain vehicle entry and exit counts for each site. Differences in data collection and the ability for travellers to park at the site and not use the bus, or walk or cycle to the site to access the bus services has made these two datasets difficult to combine.

Additional surveys carried out in November 2018 provided supplementary information on cycle parking, those arriving and leaving the site by active mode and interview surveys providing information on the ultimate origin and destination of the park and ride trips. This data is now dated, with major developments occurring in close proximity to some of the P&R sites making it less reliable for continued use.

3.2.8. Car parking

Daily car park usage data by length of stay is available from Cambridge City Council for the public multi-storey and surface access car parks in Cambridge. The multi-story car parks provide daily data by length of stay, while the surface access car parks provide monthly totals.

The availability of similar data for other districts, particularly Peterborough, will be investigated.

Information is also available from the internet for Cambridgeshire and Peterborough on the number of spaces at each car park and their usage charges.

3.2.9. Active modes

CCC carry out annual one-day surveys each April / May counting pedestrians and cycling at half-hourly intervals between 7am and 7pm on a set of Cycle routes.

Additional data collection is being planned as part of the Greenways count programme.

To calibrate the varying perception of different types of cycle facilities for CSRM F-series enhancements data on cycling was obtained from Strava. This data is a relatively small sample of data from “members” who tend to be focused on fitness / exercise. How well this data represents the range of cyclists across the study area is not known.

No existing data has been identified beyond the Cambridge area.

3.2.10. Summary of existing data sources

Table 3-2 provides a brief summary of the existing data sources identified and discussed in the previous sections.

Table 3-2 - Existing data sources

Associated model component	Identified existing datasets
Planning data and travel demand	<ul style="list-style-type: none"> Census of Population: 2021 and 2011 Local authority records of developments Government collated tabulations on dwellings, school places ONS statistics – mid year population estimates, Business register and employment survey AddressBase: geocoding of residential and commercial addresses Trip rates: National Travel Survey (NTS) and TRICS database Behavioural / lifestyle surveys: Living costs and food survey
Trip matrices / patterns	<ul style="list-style-type: none"> Census travel to work: 2011 (old), 2021 (unreliable due to Covid-19) Electronic ticketing data from bus operators LENNON / MOIRA station-to-station rail data Mobile phone data used for CSRM/PTM and Wisbech – old
Network data	<ul style="list-style-type: none"> Existing models Open source: OpenStreetMap Commercial data: OS Mastermap, HERE maps

Associated model component	Identified existing datasets
Highway model	CCC annual traffic monitoring 2019 data collection for PTM3 Data from Vivacity sensors for Cambridgeshire and Peterborough National Highways WebTRIS data DfT traffic counts
PT model	Bus Open Data System: timetables, fares, location (speeds / journey times) Rail timetables and fares (ATOC)
Park and Ride	Historic CCC rolling count programme P&R passenger counts P&R site vehicle entry / exit counts Interview surveys (November 2018)
Car parking	Cambridge City Council – multi-storey and surface car park usage records Car park capacities and charges from websites
Active modes	CCC annual cycle route monitoring surveys Strava data obtained for CSRM2 F-series

4. Model scope

4.1. Model overview

The proposed CaPCAM model will incorporate four main elements as follows:

- A trip generation model to estimate the demand for personal travel from land use activities;
- A variable demand model (VDM) to consider the choice of mode, macro time period and destination faced by travellers;
- A highway assignment model (HAM) with a representation of the road network; and
- A public transport assignment model (PTAM) representing bus and rail public transport services, and the ability to walk and cycle.

Multi-modal trips, for example park and ride (P&R) will be explicitly modelled, with the car and public transport legs of the journeys included in the relevant assignment model. The demand model would be implemented for an average weekday with assignment models for specific times of the day.

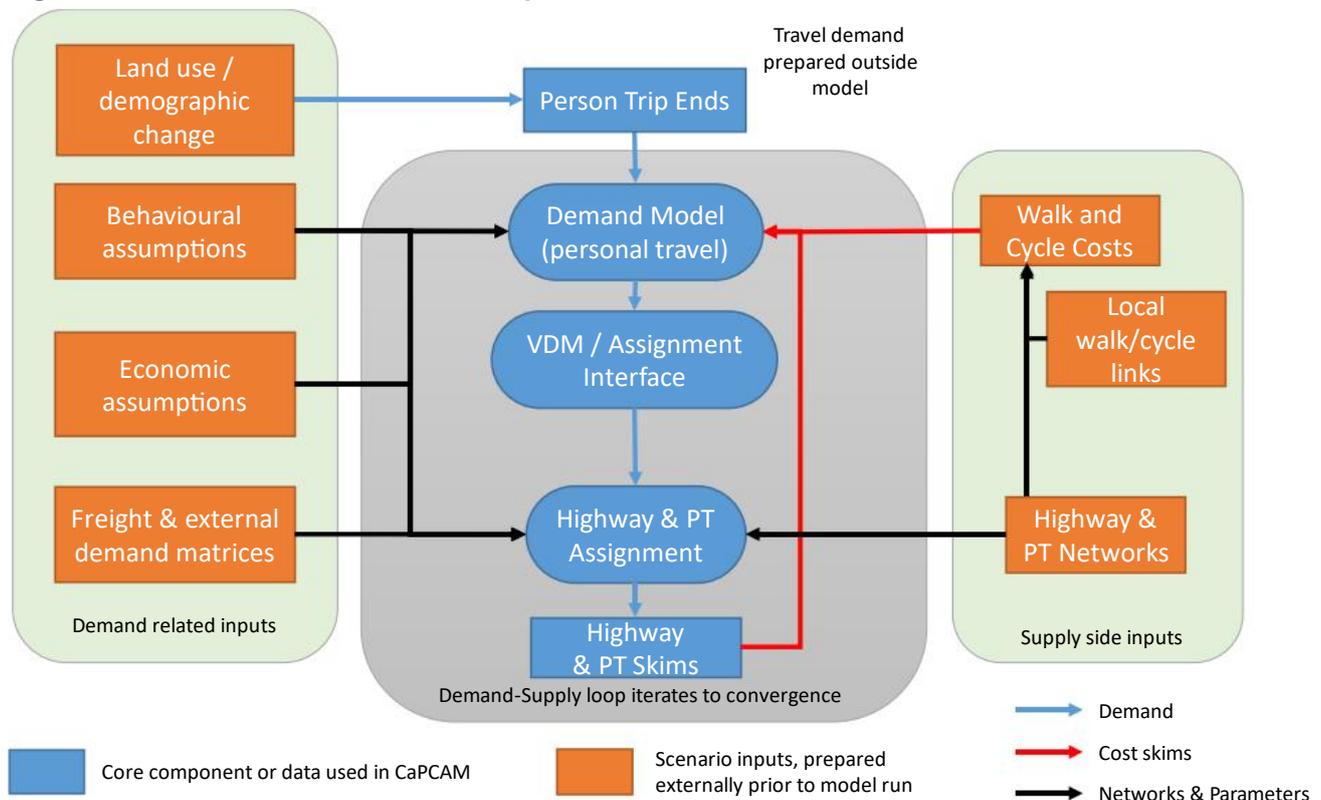
The attractiveness of car is heavily influenced by the availability and cost of parking which will be reflected in the model. The CaPCAM model will also be able to represent alternative road pricing policies such as the Making Connections package of measures currently under consideration by the Greater Cambridge Partnership.

The initial implementation of CaPCAM will not include real time modelling or be an activity-based model. The proposed design and implementation is intended to facilitate (not create obstacles to) additional functionality being added at a later stage if it becomes appropriate for the model applications.

4.1.1. Model structure

The design and structure of the model is intended to remain as close as practical to a conventional TAG design for a four-stage transport demand and assignment model. A simple summary of the structure proposed is shown in Figure 4-1.

Figure 4-1 - Overview of core model components and structure



There would be no difference between the structure used for 'Base' and 'Forecasting' model runs, with model forecasts or scenarios being created simply by altering the appropriate demand or supply-side inputs.

The basic structure and principles of the model can be summarised as follows:

- **Person trip ends:** In the Base Year model, trip productions and attractions by zone will be calculated, separated by trip purpose and person type. These trip ends are used as the basis for any model scenario tests, with changes input either as scalar growth or additive changes. These trip ends, and all the demand modelling, is carried out for a 24-hour weekday;
- **Demand model (VDM):** A logit based variable demand model (VDM) will be used to determine personal choices of travel mode and destination. These choices are informed by the generalised cost for each possible journey, calculated based on journey time, distance and money costs (red arrows);
- **VDM/assignment interface:** The “synthetic” personal travel information calculated by the VDM is converted into public transport passenger trips and highway vehicle trips by time period, and used to apply changes to the Base Year assignment matrices for each mode;
- **Freight and external matrices:** The highway assignment matrices include matrices of road freight (goods vehicles) trips in the Base Year. Similarly those trips which pass through the study area without stopping (eg on the A1, A14, A47 etc) are included as “external matrices”. Forecast growth or other changes in freight and external trips would be determined externally and applied within runs of the model;
- **Assignment models (HAM and PTAM):** Network assignment is carried out for highway and PT to determine routing and links flows, and to extract highway costs (distance, time and any toll charges) and PT costs (fares, journey times, wait times and interchange) for O-D zone pairs by time period;
- **Active mode costs:** Walk and cycle costs are estimated from travel distances extracted from the public transport network, which includes highway pavements and additional links where walk or cycle only links are known to exist. A fixed speed of walking and cycling is assumed.
- **Behaviour assumptions and economic assumptions:** These can be altered during scenario tests to determine the impact e.g. of changes in fuel costs or values of time; and
- **Model iteration:** For scenario testing the model includes a supply-demand loop which allows for iteration of VDM choices and highway congestion levels.

Additional features not shown in figure:

- **Highway / PT interaction:** The highway assignment network includes pre-loads of scheduled public transport services (bus and coach) based on the timetabled services, and on-road bus times responding to road congestion;
- **Parking Capacity Function (PCF):** parking penalties will be applied for “parking districts” in urban areas and park and ride sites where parking capacity is known to be limited. This will act to limit personal car trip destinations, and will not operate as a hard-constraint but as a deterrent function limiting growth in parking. The penalty will be calculated alongside the highway costs after each iteration and included in the generalised time for car mode).

Key components and features of the model are discussed in the following sections. The model system will be designed such that, to the greatest extent possible, information is coded only once and is available to all components which either directly or indirectly make use of it. For example, economic assumptions determining vehicle operating costs available to VDM and assignment models, and network information used by the HAM and PTAM.

Note that it will be possible to use the HAM, PTAM and VDM components independently from each other, for example to carry out fixed-demand assessments of infrastructure and service options.

4.1.2. Travel demand linkages

The travel demand in the model will at the highest level be derived via trip rates from the land use and economic activity assumptions, and act as an input to the demand model. The VDM and assignment models operate with different forms of demand: the VDM having what is termed a ‘synthetic 24-hour person matrix of productions and attractions’, and the assignment models requiring separate matrices of trips by time period on an origin-destination basis, which in the HAM are measured in vehicle trips not persons. To link these, the VDM / assignment model interface will comprise several data transformations carried out as part of a model run. These include:

- Transforming the 24-hour production-attraction person trips output by the VDM into matrices of origin-destination personal trips for the time periods represented in the assignment models;
- Conversion of VDM person car trips to vehicle trips via occupancy factors;

- Mapping of the VDM travel demand segments into assignment user classes;
- A 'pivot' process to adjust the base year assignment matrices based on forecast changes in personal trips from the VDM;
- Freight and external-external movements, calculated outside the main model, will be added to the pivoted vehicle matrices before assignment.

4.2. Geographical coverage

The geographic scope of the model is to focus on the two authorities making up the CPCA area (Cambridgeshire and Peterborough), and will cover all travel movements within, to and from the area shown in in Figure 4-2.

Figure 4-2 - Model coverage



Two factors require further consideration: the extent of the model coverage, and the spatial detail or granularity within each area. Note that the exact coverage and level of detail will be agreed early in model development in collaboration with CPCA through creation of a network topography in GIS.

The approach proposed is outlined in Table 4 with the definitions to be finalised early during model development. Analysis of the Census travel to work homes and workplaces and the patterns of travel in the proposed mobile network data will be carried out prior to finalising the definition of the different areas of coverage and associated levels of detail in the network and zoning.

Table 4-1 – Geographical areas of coverage

	Area type	Areas Covered	HAM	PTAM	Demand Model
Fully Modelled Area (FMA)	Area of Detailed Modelling (AODM)	Cambridge, South Cambridgeshire, Peterborough, A14/A1/A10 corridors (including Ely, Huntingdon, St	Coded with junction delay represented where significant. Network to include most roads (e.g. all motorways, trunk roads, primary, secondary roads) Tertiary and unclassified roads	PT network representing all rail and bus services routing through the areas.	Internal Area: Full trip representation across all modes.

	Area type	Areas Covered	HAM	PTAM	Demand Model
		Ives, March and Wisbech).	included where strategic routing occurs or where required for zone loading). Note, in rural areas, detail will be necessarily focussed on strategic (e.g. inter-urban and other important route) corridors.	Walk and cycle network to include primary, secondary, tertiary and unclassified roads which provide walk access from zones to wider network, as well as major walk/cycle only link such as off-road cycle routes.	
	Rest of Internal Area	Rest of Cambridgeshire plus Royston, Haverhill, Newmarket and Mildenhall	Motorway, trunk road, primary and secondary roads. Some tertiary roads where required for zone loading. Primarily speed flow curves on links but with key junctions coded in detail.		
External Area	Immediate External Area	Extending into Bedfordshire, Norfolk, Essex and Lincolnshire, precise detail to be agreed during network development.	Major routes (motorways and A roads) sufficient to join external zones into model. Link representation only with fixed speeds.	Rail services which pass through the CPCA region coded in full within region and simplified on external parts.	Representation of trips to/from the internal area, including mode choice
	Wider External Area	Rest of GB	Skeletal network of key motorways sufficient to link zones defined at the County or Regional level. Link representation only with fixed speeds.	Public transport trips passing through internal area included	

The terminology typically adopted varies for the different model components (demand and assignment), though a high level of consistency is required between the components for the modelling system as a whole.

For the demand model, coverage is split between trips produced (i.e. made by residents / employees) in internal and external areas, defined as follows:

- **Internal area:** All trip ends for person trips are included, and all travel choices within scope are determined in the model. This means that for each trip production in the internal area, the mode and distribution choice apply fully.
- **External area:** For these areas, only trips with production or attraction end in the internal area are considered in the demand model. This means that the model considers only a proportion of the trip productions and attractions in the external area, and moreover this proportion is determined as an input to the model.

These definitions have some implications for the application of the model and are therefore worth considering carefully. Key considerations are:

- While movements between external areas (external-external) will be included as exogenous assumptions in assignment matrices, and hence may re-route, they will not be variable within the demand model even where these cross the study area and are potentially influenced by travel conditions within the model. Growth in external-external highway movements will need to be input to the model for each assignment mode and segment.
- Internal to external movements, such as out-commuting to work and for shopping and leisure, will be subject to mode and destination choice in an identical manner to internal trips. As commuting is doubly-constrained (in line with guidance), the number of out-commuting trips to each external zone will need to be specified as an input to the model for each scenario;

- Conversely, for external-internal movements, the trip productions in each external zone will be input to the model, which corresponds (for example) to determining the number of workers in each external zone whose jobs are in the internal area and similarly how many people travel in to shop. The demand model will determine the travel mode and destination choice within the model area.

4.3. Zoning

It is important to consider the levels of spatial detail or granularity required within the model. A very large number of model zones will increase model running times and make the model unwieldy, whereas a lack of detail can limit the ability to represent walking and cycling, reflect where people board bus services, join the main road network and make the model less responsive to policy tests.

Table 4 shows the number of zones representing the internal area of the existing transport models. In comparison the Cambridgeshire and Peterborough area comprises approximately 2,500 Output areas which aggregate to 98 MSOAs as shown in Table 4.

Table 4-2 - Comparison of zones

Model / ONS	CSRM2-F	PTM3	WATS	MATS
Number of "internal" zones	304	250	38	34

Table 4-3 – MSOAs, LSOAs and Output Areas (OAs) in each local authority

Local Authority	MSOA	LSOA	OA
Peterborough	22	112	604
Cambridge	13	69	372
South Cambridgeshire	20	96	473
Huntingdonshire	22	105	537
East Cambridgeshire	10	50	265
Fenland	11	55	290
Cambridgeshire & Peterborough	98	487	2,541

A reasonable number of zones for a highway model of this type is in the range 500 to 800 including both internal and external areas. It may however be appropriate to better represent access to PT stops to use more detailed zoning for the PT assignment. For simplicity of operation, the zoning used in the demand and assignment models would be identical, so any additional zoning required for PT would ideally be included throughout the model. The levels of detail will be confirmed early in model development based on experimentation with model run times.

For demand modelling purposes, the basic units used for zoning should be taken from Census geography and administrative boundaries, and nest within these at all times. By preference this would mean model zones are grouped from output areas (OAs), lower super output areas (LSOAs), middle super output areas (MSOAs) and Local Authority Districts (LADs), and should nest within this hierarchy. It appears from the numbers of zones in Table 4 that a basic building block of LSOAs would be appropriate, with some aggregation and splitting to provide appropriate detail for the policy areas of interest.

Urban zoning will be determined by the granularity of the highway and PT networks, and the locations of bus stops and routing options to be considered. The existing CSRM and PTM3 model zoning will be used as a guide, but zone structure will be developed bottom-up from Census geography and bus stop catchment areas. The zone system will be reviewed with the client prior to adoption.

4.4. Model years

The model will be prepared with a base year of 2023, which means that all model inputs will be developed based on this year, including calibration of the highway and PT assignment models. The decision to use 2023 is based on the possibility of collecting data representative of the 'post-Covid' period.

As specified by TAG, the model will represent a neutral period during 2023, nominally a typical working weekday outside the school holidays. The precise time period will be determined following data collection and during base matrix building, guided by availability and quality of data.

It will be possible to implement CaPCAM for any forecast year after the 2023 base year, and potentially create historic years as a back-casting exercise. For the initial model development, we propose implementing three forecast years to demonstrate the operation of the model and provide a set of outputs. The proposed forecast years are 2041 (end of Local Plan period) and 2031, with an interim year of 2036. These years will then be consistent with PTM (which currently uses 2031 and 2036).

4.5. Time periods

The base year model will represent a 24-hour average weekday in a neutral period in 2023. The VDM will consider choices at the average weekday level. The HAM and PTAM will each be divided into AM, interpeak (IP) and PM models, representing the average conditions during those time periods, based on differences in travel demand, road congestion and service schedules.

Table 4 illustrates the out and return time period combinations which will be considered in the model. The VDM will produce 24-hour P/A which for home-based trips implicitly include all trips which travel out and back in a single 24-hour period. Hence any combination of trip travelling from home in the morning pre-peak period (midnight until the start of the AM period) and returning during a later period is included. This would include trips entirely within the pre-peak or post-peak.

The assignment models will include only trip legs in the defined AM, IP or PM periods, which will include return legs in those periods for journeys starting in the pre-peak, and outward legs of journeys ending in the post-peak.

The AM, IP and PM periods for highway and PT assignments will be considered and defined during the matrix build and data collation. The main choice will be whether the AM and PM peaks are represented as single peak hours (e.g. 8-9am and 5-6pm), or as full periods (e.g. 7-10am and 4-7pm). This will be dependent on the proposed linkages with existing models and their definitions, the profile of demand across the peaks, the variation in journey times, and for PT the variation in service schedules. Time period conversion factors will then be derived to allow the 24-hour VDM production/attraction trips to be split into the required assignment time periods. Both exercises will make use of NTS data and directly observed data sources including mobile network data, traffic counts and ridership numbers for PT where available.

Table 4-4 – Out and return time periods in VDM and assignment models (home-based trips)

		Return time period (same day)					Key
		Ante-peak	AM	IP	PM	Post-peak	
Outward Period	Ante-peak						<div style="background-color: #e0f2f7; padding: 2px;">VDM and Assignment</div> <div style="background-color: #e0f2f7; padding: 2px;">VDM only</div>
	AM						
	IP						
	PM						
	Post-peak						

4.6. Modes

Following designs previously adopted successfully, and in consideration of DfT guidance, the model would represent a full range of private, public and active travel modes. A 'main mode' choice would divide trips first between private car, public transport, walk and cycle trips. These four main modes represent very different trip lengths and characteristics and separating them initially improves the next step of destination choice.

The model would also include sub-mode choice covering bus, rail, bus park & ride and rail park & ride. The intention is to represent the improved quality of guided bus services through the coding associated with dedicated (off-road) infrastructure, rather than a separate mode (as is currently the case in CSRMS). Taxi travel may be included separately but is not currently considered a core requirement and would by default be assumed to be part of the car mode.

The main mode and sub-mode choice are determined explicitly within the VDM, determining a ‘dominant mode’ for each O-D trip as input to the assignment models. Within the assignment model the journey may be split into journey legs with interchanges modelled and access legs using appropriate access/egress modes. For example, a rail trip may include access/egress legs by walk, cycle and bus. The bus and rail modes will allow interchange between services, with appropriate interchange penalties to address the inconvenience of this.

Table 4-5 – Main modes and constituent modes by stage for access / egress

Demand Model		Assignment models			
Main mode	Sub-mode	Dominant mode	Access/Egress modes		
Car	Car	Car			
	Bus P&R	Car	Bus	Cycle*	Walk*
PT	Bus	Bus	Walk	Cycle*	
	Rail	Rail	Bus	Walk	Cycle
	Rail P&R/car access	Rail	Car	Bus*	Walk*
Walk	Walk	Walk			
Cycle	Cycle	Cycle			

* Park & Ride modes will allow egress to the final destinations by walk, cycle and bus as appropriate. Cycling should be an access mode to specific bus stops with designated cycle parking, though normally not an egress mode.

The model will aim to consider the most common set of mode choices for journeys, in a manner which is applicable to the travel trends and policy choices faced by CPCA. However, there are some travel combinations explicitly excluded or only implicitly included. These include:

- Return journeys where the outward and return legs use radically different modes, e.g. walk or bus in the morning, and then train home;
- Lift sharing will be represented via a car occupancy factor only, a fixed input by travel purpose derived from TAG databook or local data;
- Kiss & Ride will be considered as part of Park & Ride, with the onward journey by the driver not explicitly considered.

The Base Year model will not include any ‘new modes’ such as e-scooters, autonomous vehicles or mobility as a service. However, it is anticipated that these can be added as a future enhancement should the need arise and suitable definitions of the travel modes and their characteristics become available.

5. Software choice

As part of the considerations for creating a new CPCA model, WSP/Atkins have evaluated the currently available software in order to make recommendations on the most appropriate model platform. This will ensure efficiency and value for money, taking policy objectives into consideration. WSP/Atkins have considerable experience in a range of different strategic transport modelling software packages and are therefore well placed to provide guidance on the software to utilise.

The review needs to take into consideration a wide range of facets and characteristics of modelling software. Aside from specific client needs the criteria include:

- Software design and ease of use;
- Technical complexity of modelling solutions;
- Interface with data and downstream needs;
- Reporting capabilities;
- User knowledge base;
- Training and support and
- Software costs

Taking account of these elements of software utility ensures that the client's interests are considered in respect of the overall suitability of the software chosen. More specifically the evaluation considers the approaches that need to be adopted for the model update and determine whether a combination of two or more software products for different components of the model is the best option or whether a single, integrated platform is a better approach.

5.1. Evaluation framework

5.1.1. Evaluation criteria

The main criteria listed below have been considered as key in the choice of software platform for the development and application of models in previous projects.

They allow the evaluation to focus on ranking each technical aspect of the packages in order of capability an approach that makes clear distinctions about the best package in each area:

- Technical capabilities;
- Functionality/flexibility; and
- Management and housekeeping

Each of these main factors consists of several detailed factors, as summarised in Table 5.

These criteria are used to evaluate software by looking at the strengths and weakness against each criterion in a framework in Section 5.3. This provides a comprehensive assessment for key software used in the UK transport modelling market.

In Section 5.3 we will make our recommendation based on the collective strengths of the software for specific use in the creation of CaPCAM.

Table 5-1 – Main and sub-criteria of software evaluation

Main criteria	Sub-criteria
Technical Capabilities	Highway network modelling (highway path builders, junction modelling, urban applications, strategic application, etc) Public transport modelling (public transport path builders, public transport fares, crowded assignment, etc) Demand modelling Mode and sub-mode choice models Trip distribution Activity chain modelling Park and Ride (and other mixed mode trips)
Functionality / Flexibility	Matrix estimation Matrix manipulation Network calculation Function definitions Exports and Sub areas Integrated platform (highway and public transport networks and matrices) Integration with other packages (highway models involving junction modelling, micro-simulation, traffic analysis, and scheme evaluation packages)
Management and Housekeeping	Ease of use of the software Scenario management Application of individual model components Data management and interface Technical Support GIS and visualisation linkage

5.1.2. Software under consideration

As part of the initial review of options we have considered several leading software packages. These have been selected based on reputation and popularity within the UK market, based on the extent of skills available within the industry to develop and maintain such models.

The software platforms considered are

- PTV Visum;
- CUBE; and
- SATURN;

Based on the functionality of specific software suites it is recognised that a combination approach may be required and the analysis reflects this reality. SATURN is linked to highway assignment specifically.

Several software packages have been excluded, based on specific circumstances:

- MEPLAN. Used previously for CSRMS but no longer under development / being supported
- EMME. Reduced use in the UK and with the vendor (INRO) now taken over by the CUBE software vendor (Bentley);
- Transcad. Primarily a US based package with strength in GIS capabilities but minimal application and skills in UK or Europe; and
- Omnitrans. Dutch package with limited use in UK.

Other bespoke software such as that available from Immense solutions or similar open-source software such as MATSim have not been evaluated as there is limited experience and evidence of outcomes in submitting plausible transport models to national UK government agencies.

5.2. Software evaluation

5.2.1. Technical evaluation

Table 5 sets out the perceived market leader(s) against each detailed evaluation criteria, together with further comments on relative capabilities of the software packages.

Table 5-2 – Relative capabilities of software packages

Feature	Comments	Perceived leader(s)
Technical Capabilities		
Highway Network Modelling	<p>SATURN and PTV Visum are major tools for modelling of highway traffic and assignment capabilities in urban areas. They are able to model junctions of all types and take into account opposed flows and blocking back of traffic.</p> <p>SATURN provides tried and tested functionality as de-facto industry standard. Its junction modelling is still regarded as the best in congested urban area modelling.</p> <p>Visum and CUBE Voyager include built-in junction capabilities that can represent UK junction control methods to calculate delays that can be incorporated into the assignment run.</p> <p>Visum 2023 includes assignment with ICA (Intersection Capacity Analysis), which includes blocking-back.</p> <p>All packages are capable of multi-class multi-routing highway assignment based on users' equilibrium principle, and stochastic assignments.</p> <p>All packages are capable of representing road pricing, SATURN has more advanced treatment of area licencing impacts on route choice.</p>	SATURN
Public Transport Modelling	<p>Visum and CUBE Voyager provide similar capabilities for building of paths, modelling of fares and crowding effects.</p> <p>Visum can undertake multi-path PT assignment using headway or time-table based scheduling.</p> <p>Visum has a social distancing module in response to COVID-19</p> <p>CUBE Voyager has the ability to model a wide range of fare systems.</p>	Visum / CUBE
Demand Modelling	<p>CUBE Voyager and Visum both provide demand modelling capabilities. Both provide powerful and flexible set of tools for matrix manipulation to build demand models that suit local conditions.</p> <p>CUBE Voyager has an easier to see model structure since the Scenario Manager provides a graphical user interface such that applications & loops can be viewed on screen. In comparison, Visum demand model relationships are less visible to users.</p> <p>Visum provides a more extensive library of built-it functions for choice modelling, whereas users specify the functions to apply requiring more scripting ability or the transfer of functionality from one application to another.</p>	CUBE / Visum

Feature	Comments	Perceived leader(s)
Mode Choice	CUBE Voyager and Visum provide mode (and sub-mode) choice modelling capabilities. Visum and CUBE Voyager are similar in their ability and provide powerful and flexible matrix manipulation tools which can be used to develop a wide range of alternative model forms. Visum includes a built-in module to create logit functions.	Visum
Trip Distribution	CUBE Voyager and Visum both provide trip distribution capabilities. Visum has a number of built in trip distribution functions that can be selected by user. CUBE Voyager is not limited to specific functions but requires bespoke scripting. Both packages can handle both singly and doubly constrained distribution.	Visum
Activity Chain Modelling	Visum Activity chain modelling possible. This is an increasingly tried and tested aspect of the software. CUBE Voyager provides similar capabilities with scripting options.	Visum
Park and Ride	CUBE Voyager and PTV Visum provide facilities to model both bus and rail-based Park and Ride. Visum and Cube Voyager can reflect both legs of Park and Ride trips within the PT assignment.	Visum / CUBE
Functionality / Flexibility		
Matrix Estimation	CUBE Voyager, Visum and SATURN all provide facilities for highway matrix estimation, based on the maximum likelihood technique. Both Visum and CUBE Voyager also provide procedures for estimating PT matrices. The CUBE Voyager PT matrix estimation process is considered superior as it is fully integrated in the public transport assignment process.	Visum / CUBE
Matrix Manipulation	All packages have facilities which enable effective matrix manipulation. Visum and CUBE Voyager are all considered as market leaders in flexibility.	Visum / CUBE
Network Calculation	Visum and CUBE Voyager have facilities that enable network calculations. CUBE Voyager has recently improved its functionality with enhanced geodatabase capabilities. The interfaces, however, are slower than the simpler .net approach and require an experienced user and powerful hardware to produce information. Visum has a number of easy to use network calculation processes that are fully integrated with the GIS interface enabling easy disaggregation of zones, filters and redefining of link shapes. SATURN only provides facilities for highway network calculation but can be linked with Voyager for extra functionality	Visum
Function Definitions	Visum and CUBE Voyager provide similar levels of sophistication for highway and public transport assignment	Visum

Feature	Comments	Perceived leader(s)
	function definitions. Visum includes a number of built-in functions that can be selected for highway assignments.	
Exports and Sub Areas	<p>Visum is considered as the market leader due to built-in functions provided. In addition, Visum is fully interactive with the micro-simulation software Vissim.</p> <p>This is followed by CUBE Voyager, which also provides facility for path analysis. CUBE Voyager can also be linked to CUBE Avenue for micro simulation modelling.</p>	Visum
Integrated Platform Highway/PT/Matrices	CUBE Voyager and Visum are equal in flexibility due to their respective fully integrated highway and PT networks, and close connections between networks and matrices.	Visum / CUBE
Integration with Other Packages	<p>Visum is fully integrated with the micro-simulation model Vissim and can produce data for analysis by Synchro as an add-on feature.</p> <p>This is followed by CUBE Voyager due to its linkages to CUBE Avenue for micro-simulation and interface with Synchro.</p>	Visum / CUBE
Modelling Transport Policies / Options	All packages, i.e. CUBE Voyager/SATURN and Visum, are considered as market leaders due to their respective levels of flexibility. With facilities providing matrix manipulation and network calculation capabilities to model various relevant options and policies.	Visum / CUBE / SATURN
Management / Housekeeping		
Ease of Use	<p>Visum and CUBE Voyager provide user-friendly, easy to use modern graphic interfaces, although this can cause issues with automating running.</p> <p>SATURN can be menu driven or batch processed and provides excellent help functions.</p> <p>CUBE Voyager provides structured modules (or building blocks) with pre-defined parameters and input/output files to be specified by the users. A similar structure has been adopted in Visum</p>	Visum
Scenario Management	<p>CUBE Voyager provides user-friendly scenario management facilities.</p> <p>Visum adopts a different approach to scenario management with assignment procedures, networks and matrices loaded into separate version files. This provides a flexible approach. However, version files can be very large and slow to work with on large models.</p>	CUBE
Data Management	<p>Typically, CUBE Voyager modelling files are stored within Windows directories as defined by the model developer.</p> <p>Visum contains data in version files, and allows exporting, importing and merging data into / from Microsoft Access and Excel databases.</p>	CUBE
Technical Support	<p>Visum, SATURN and CUBE Voyager are all covered under their respective technical support and maintenance agreements.</p> <p>Training courses are provided by the developers of the three packages.</p>	CUBE / SATURN / Visum

Feature	Comments	Perceived leader(s)
GIS Linkages & Visualisations	<p>CUBE Voyager and Visum provide GIS linkages.</p> <p>CUBE Voyager has a fully integrated geodatabase in which network and zonal based data can be stored, extracted and displayed. This enables the creation of scenario networks from master networks and the integrated display of link, zone, and node information on any specified GIS background.</p> <p>Visum is also fully integrated with GIS and has many menus that facilitate the use of GIS databases.</p> <p>SATURN can be increasingly easily linked to GIS applications but has no built-in functionality</p>	Visum

It is clear that no single software is a clear winner however PTV Visum has a number of strongly positive features, as does CUBE - to a more limited extent. Whilst SATURN has been considered to provide an edge in terms of highway model representation, it is required to be combined with other software to ensure multi-modal and variable demand model assessments can be undertaken. It appears that Visum and CUBE are also investing more heavily in development to future-proof the software. For example, Visum already has an agent-based model (ABM) should this be required at any point.

5.3. Proposed software choice

WSP/Atkins recommend the adoption of PTV Visum for all elements of the new CPCA model.

The conversion tools within Visum would still enable the existing CSR and PTM SATURN models to be used as the basis of the new CPCA highway model, and help to ensure compatibility with PTM.

6. Assignment models

6.1. Highway

6.1.1. Networks

6.1.1.1. Source for coding

It is envisaged that the existing CSRSM and PTM3 SATURN networks will be utilised as the starting point for CaPCAM and converted to Visum software. The remaining coding will be undertaken using the other more local models (MATS, Wisbech, Ely) where appropriate and supplemented by online mapping and satellite imagery, with site visits if required.

6.1.1.2. Coding rules

A network coding manual will be developed (drawing on coding manuals for the identified existing models and the RTM coding manual) to ensure consistency in approach and coding of the highway assignment model component. The coding manual will set out guidance on the use of saturation flows at junctions for different junction types, speed flow curves (or volume-delay functions (VDFs) in Visum), protocol for gap acceptance and other general coding principles. The coding manual will make use of best practice from recent model applications to ensure that lessons learnt are applied back into model development.

Following completion of an initial highway network, independent manual coding and consistency checks will be completed throughout and initial uncongested journey time validation will take place against prescribed journey time routes through the fully modelled area. Initial assignment of prior matrices will be used to review any anomalous routing, and discrepancies between modelled and observed journey times. Necessary adjustments will be made to coding as appropriate.

6.1.1.3. Volume-delay functions / fixed speeds

In the fully modelled area, volume-delay functions (VDFs) will be used within the model for car and LGV based user classes where link delays are distinct and significantly in excess of junction delays. These will align with relationships provided in TAG Unit M3.1.

Cruise speeds should not necessarily directly relate to the speed limit on a given road. The speed limit will normally constitute a maximum for the coded cruise speed, but observed speeds may justify use of a different cruise speed, and this may on occasions be above the speed limit. The choice of the cruise speed is therefore open to a certain amount of interpretation and may need to be revisited during the course of model validation (e.g. high proportion of traffic using inappropriate local routes rather than primary / secondary roads) based on observed travel time information. Cruise speeds within urban areas may be refined to remove unrealistic routing and rat-running (routing on inappropriate routes e.g. with traffic calming where higher standard alternative is available).

Speeds in the external area will be taken from INRIX data to represent fixed speeds. The times will take account of both link travel time and junction delay. This approach is compatible with TAG Unit M3.1, 2.9.8, which states that: "Cruise speeds should not be based on speed limits but should reflect mean speeds on a link."

In order to represent the restricted maximum speed for HGVs on the highway network it is necessary to reduce the maximum (free flow) speed available to HGVs in the assignment model.

6.1.1.4. Junction modelling: Flow/delay relationships, signal timings, saturation flows

Each junction included in the FMA will require several parameters:

- Geometries
- Legs, lanes, and lane turns
- Junction control type (two-way stop, two-way yield, signalised, roundabout, uncontrolled)
- Turn types (Right turn; Straight ahead; Left turn; U-turn)
- Signal times, stages and phases
- Method of impedance at junctions.

All junctions within the AODM will be modelled in detail. Every junction in this area will use 'Node Impedance Calculation (ICA)' as the Method of Impedance at nodes. This is the PTV recommended method to be adopted on strategic models. ICA (Intersection Capacity Analysis) provides a model suitable for long term horizon planning with the added value that it can be used for operational planning. ICA will be used for calculating junction capacities and delays based on junction geometry and layout input into the model, and does not require the saturation flows to be input explicitly.

For junctions outside the AODM the less complex 'Turns Volume Delay Function (VDF)' Method of Impedance will be used. This requires entering saturation flow, free flow time (t_0) and turn type (e.g. left turn, right turn, straight ahead). The saturation flows will be derived from the existing CSRM and PTM3 SATURN networks.

6.1.1.5. Signal timings

Timings at all signal-controlled junctions will be coded based on signal timing data where available. However, experience suggests that average data are typically not held by local authorities and it is therefore envisaged that average green times will need to be calculated from the signal plans and timing sheets provided, using the maximum and minimum green times as upper bounds. Timing data from the existing SATURN models will be imported where available. If no signal data is provided or available from existing models, signal timings will be estimated (note that refinement may be required during calibration and validation, and the effort required at this stage will need to be assessed once all available signal data has been collated).

Level crossings will be treated as signalised junctions drawing on the approaches adopted in the CSRM2 and PTM3 models.

6.1.1.6. Centroid connectors

Centroid connectors are how demand (trips) from a zone loads onto the network. The location and coding of these locations can have a significant influence on the performance of the base year network against observed counts and journey times. The centroid zone connectors in the updated CaPCAM will be reviewed and refined to realistically represent the way in which traffic joins the road network. In the AODM, where the zoning system is fine, specific access roads from residential and commercial areas will be used as a basis for connecting zones to the network via centroid connectors. Zones in the External Area, which have a large geographical coverage and significant demand associated with them, will need to be connected to major routes to enter the network.

Connectors to access the modelled road network should include distance and time attributes, particularly for long connector links for example in external areas, to ensure the full journey costs are calculated for car travel in comparison with other modes.

6.1.1.7. Car parks / parking

The treatment of car parks and parking charges will be handled primarily by the VDM and an additional sub-module as set out in Section 7.5. The highway assignment model may include specific car parks as zones, particularly for P&R sites, though these would be best represented in the network with appropriate connectivity for trips to reach their ultimate destination on foot.

6.1.1.8. Restrictions (HGV bans, height / weight)

Part of the data collection exercise will be to ascertain the location of all HGV bans and/or weight and height restrictions around the network. Information will be sourced from existing models and confirmed. These will then be coded into the model network where applicable.

6.1.1.9. Checking

It is essential to ensure that the highway assignment model networks are robust and correct prior to undertaking any adjustment of the trip matrices (matrix estimation) to account for any deficiencies in the comparison of observed and modelled traffic volumes. Failure to ensure that the highway networks are appropriate could result in adjustments to the underlying demand data that are otherwise the result of deficiencies or misrepresentations of the highway networks.

Network calibration checks will be carried out across a range of different topographic features. There is an inbuilt procedure within Visum which undertakes checks on all elements of the network coding within the model and highlights any coding errors. Coding warnings that will have also resulted in change of software from SATURN to Visum will need to be reviewed. From the highway network perspective, the software will check:

- Isolated nodes, ensuring that all nodes in the model are connected to links;
- Ensuring that the network does not permit a turn on the highway network for which either the preceding or exiting link is not allowed (e.g. a car movement into a bus lane);

- Ensuring that appropriate priorities (major / minor road definitions) are given to each link where multiple turns exist on the approach to a node;
- Disconnected zones, to check all zones in the model are connected to the highway network via centroid connectors allowing trips access/egress for assignment;
- Dead-end roads, ensuring that there are no locations where trips can access but not leave (either through onward link connections or U-turns);
- Link capacity, to check that there are no permitted links with a capacity of zero allocated;
- Appropriateness of coding for junction representation, checking all signalised junctions have been appropriately assigned saturation flows and signal timings; and
- Network consistency checks, allowing for all OD pairs to be checked to ensure the networks is connected between all zones for all user classes (e.g. car, LGV, HGV).

Further manual checks through the use of Google and OS maps, site visits and aerial photograph will be completed on:

- Link lengths: Link lengths should match those derived from GIS software. The conversion to Visum from SATURN will import link lengths from the existing CSRM and PTM3 models, and these will be checked against the direct-distance of the link created in Visum. The link distances should be greater than or equal to the direct-distance, and any excessive deviations (e.g. greater than 10%) will be checked and verified;
- Link characteristics: Checks will be undertaken to ensure that one-way links are appropriately represented (including HGV bans) and to make sure that, where traffic count data exist, the capacity of the link exceeds or – at a minimum – is equal to the observed data;
- Speeds;
- Length and position of flares;
- Junction coding;
- Location of public transport routes;
- Access points.

Prior to matrix estimation being undertaken, checks will be undertaken on the network structure, coding and route choice to ensure that they represent an appropriate starting point and that adjustments to the trip matrices would not be made to account for errors in the network.

The validation of the out-turn trip matrices, following estimation will be reviewed using the TAG screenline acceptability guidelines for the detailed study areas and key routes in the wider area.

6.1.2. User classes

The choice of user classes for assignment in the HAM is dictated by three main factors:

- i. maintaining compatibility between CaPCAM and PTM3,
- ii. the availability of data on values of time and vehicle operating costs, and
- iii. the model assignment time. Given that the HAM requires the greatest computational 'load' within the overall model run process, it is advantageous to keep run times to a minimum. HAM run time will increase approximately linearly with the number of user classes chosen.

The TAG databook provides values of time as follows:

- Car Employer's Business
- Car Commuting
- Car Other (includes education)
- LGV work
- LGV non-work
- OGV 1
- OGV 2

These user classes will be taken as the starting definitions. CSRM2 also differentiates education trips, and further segments the non-business car trips by income band to better represent responses to pricing scenarios. An income segmentation (or similar) will be included should run times permit. Consideration will also be given to the merits of differentiating user classes for different driver characteristics (e.g. those with specific permits). User classes could be further differentiated by vehicle types (e.g. electric / low emission vehicles) however,

there are significant run time overheads of introducing this level of detail, so it is unlikely to add sufficient value to be worthwhile in the base year, but worth considering the ease of introduction for specific scenario tests.

6.1.3. Generalised cost formulation

In the case of highway trips, the principal components of generalised costs are values of time (VoT), vehicle operating cost (VOC), and to a limited extent, tolls. VoTs and VOCs will be derived from the version of the TAG databook current when the model implementation commences (forthcoming version 1.19 is expected to become definitive in November 2022). Toll will be based on the average charge for each vehicle class (where required).

The balance of the generalised costs for HGVs is heavily weighted towards distance, which can lead to shorter local routes being favoured over motorway and trunk routes. TAG unit M3-1 §7.2.4 suggests that adjustments may be considered such as the use of HGV specific maximum link speeds and the inclusion of HGV specific penalties. Furthermore, TAG unit M3-1 §2.8.8 notes that it is possible to apply an owner/operator factor of 2.0 to HGV VoTs to take account of the influence of owners on the routing of these vehicles. This may ensure more appropriate routing via motorways and trunk roads, as the ratio between VoTs and VOCs will be reduced.

Whilst it is not envisaged that this facility will be used at the start of the model development process, it may be necessary to introduce this factor if there are consistent issues in ensuring appropriate HGV routing via the motorways and trunk road network. During the model development process, we will also undertake checks to identify the percentage of HGVs on key routes. Checks will ensure that HGV percentages are not materially in excess of observed values (where available) or are too low. Percentages will be reported as part of the Highway Validation.

6.1.4. Assignment methodology

CaPCAM will use 'assignment with ICA' the latest assignment algorithm developed by PTV. It uses blocking back and volume-delay functions by lane and turn. These are permanently recalibrated taking into account lane geometry and interdependencies between the individual turns via a node. Within the 'assignment with ICA' procedure, the 'Equilibrium' assignment algorithm will be selected as the sub-assignment procedure, which distributes the demand according to Wardrop's first principle.

6.1.4.1. Convergence.

The advice on model convergence is set out in TAG Unit M3.1 (Table 4) and is reproduced below in Table 6-1.

Table 6-1 - Summary of Convergence Criteria

Convergence Measures	Type	Base Model Acceptable Values
Delta & %GAP	Proximity	Less than 0.1% or at least stable with convergence fully documented and all other criteria met
Percentage of links with flow change (P1) < 1%	Stability	Four consecutive iterations greater than 98%

Source: TAG Unit M 3.1 Table 4

Convergence will be reported against the thresholds given in Table 6-1, with model run times also monitored and reported separately for each modelled period.

6.2. Public transport

The methodologies proposed follow the guidance outlined in TAG unit M1-2 'Data sources and surveys' and unit M3-2 'Public Transport assignment modelling'.

Key features of the PTAM will include:

The PT model will be developed using Visum software.

- The PT model will represent bus and rail services in the model including guided bus.
- We anticipate that the sub-mode choice for PT will be determined within the demand model to allow for potential inclusion of exogenous factors such as journey quality etc. in trip choices, this is especially relevant when modelling new modes. The PTAM will therefore assign Bus and Rail demand separately.
- The model will not include a dynamic representation of the effects of PT crowding (see Section 6.2.5.2) as this would have a significant impact on model run times, and could limit use of public transport in forecast scenarios to the assumed timetable provision.

- The PTAM will be developed for three time periods representing AM, IP and PM periods. Following review of service data specific time periods will be defined that represent the varying levels of service across these periods. It is likely that average hours over the morning and evening peaks will be modelled to capture infrequent services that fall outside formal peak hour but provide key accessibility to/from locations.
- The operation of public transport during the off peak will be examined to determine the best inputs for an off-peak model from other modelled periods.

6.2.1. Networks

6.2.1.1. Structure

The PT network will be fully integrated with the highway network to allow multimodal assignment and data will be easily transferred between the two assignments (highway travel times to the PTAM and numbers of buses operating on each link to the HAM).

The CaPCAM PT network will include all rail services running within and through the FMA and all the main local bus services in Cambridgeshire and Peterborough as well as a number of inter-town routes. The information on the bus and rail routes and service frequencies used for the development of the base year network will be obtained from databases from published timetables. The bus cruise times will be linked to car journey times. The bus and rail services in Visum will have no restriction on capacity and therefore the model will not show instances of overcrowding. All the zones outside of the study area will be connected by centroid connectors to at least one railway station.

The off-road links in the walk and cycle network will include major off-road cycle routes and local walkways that provide accessibility to PT stops.

A rail network will be developed to enable all services operating to, from and within the study area to be represented. A skeleton external network will be used to represent services to major centres outside the study area and represent journeys to external zones. The rail network will use the walk and bus network for access between stations and ultimate trip origins and destinations.

6.2.2. User classes

The PTAM will differentiate bus, rail and park and ride, and assign a maximum of the following user classes:

- Bus - Commute
- Bus - Education
- Bus - Other
- Bus - Employers Business
- Rail - Commute
- Rail - Education
- Rail - Other
- Rail - Employers Business
- P&R - Commute
- P&R - Education
- P&R - Other
- P&R - Employers Business
- Walk
- Cycle

Assignment classes will not differentiate car availability. Likewise, PT assignment classes will not be disaggregated by fare type (full / concession) as there are limited price differentials between services within each mode (bus and rail) suggesting no significant difference in route choice between full and concessionary fare passengers. Differences in attractiveness of PT modes between full and concessionary fare passengers will be captured in the demand model.

The public transport legs of rail P&R will be added into rail matrices with origin or destination as appropriate set to rail station zone. The public transport legs of bus P&R will be included in separate 'P&R' user classes with origin or destination set as appropriate to the bus P&R site zone. These matrices will be assigned with access to bus and rail services so as to represent users accessing rail services via bus P&R.

Walk and cycle assignment user classes will include all trip purposes as there is no difference in route choice for users with different values of time.

6.2.3. Stops and services

The PT network will include all bus services operating within the FMA and all train services running within or through the area. Services will be taken from the timetables in place in Spring 2023.

The information on bus stop and rail station locations and bus and rail routes and service frequencies will be imported directly in General Transit Feed Specification (GTFS) format using Visum's in-built GTFS importer. Bus services outside the FMA that do not provide any connectivity to the study area will not be included in the model.

The routes imported from GTFS will be checked against published bus and rail route information; modelling software typically selects the shortest route between stops which can be different to the route actually taken. Exact routing between stops defines the travel time, so once the stopping patterns of routes have been established on the network it is necessary to manually check and edit where necessary the routing between stops.

Long distance coach services (including National Express and Megabus) within the FMA will be coded into the PTAM. The routes and timetables will be sourced from the National Coach Services Database (NCSD), which contains scheduled timetable data for coach and strategic bus services across Great Britain. A similar process will be undertaken to the bus and rail timetables where services outside the FMA area will be deleted.

Fare systems and charging rates will be obtained from internet reviews of tariffs offered by the bus and rail operators and where available coded for each service. Visum allows the use of a range of fare systems including distance based, cordons and flat fares. Operator data will be obtained to undertake an analysis of concessionary fares available and used so that fares charged represent typical average fares paid for each journey purpose.

6.2.4. Generalised cost formulation

Within Visum, movements are assigned to different public transport services routes on the basis of the relative attractiveness (defined by the generalised cost) of the possible options. The generalised cost is dependent on various aspects of the journey including access and egress time, waiting time, in-vehicle travel time, interchanges and fares. These elements are combined into a generalised cost expressed in minutes which takes the form

$$\text{GenCost} = (W_{\text{walk}} * t_{\text{walk}}) + (W_{\text{wait}} * t_{\text{wait}}) + t_{\text{ivt}} + (\text{fare}/\text{VoT}) + (W_{\text{interchange}} * \text{interchange})$$

Where

- t_{walk} , t_{wait} and t_{ivt} are the time spent walking, waiting and in-vehicle respectively
- W_{walk} , W_{wait} and $W_{\text{interchange}}$ are weights applied to walking and waiting time and to interchanging
- interchange is the number of changes of vehicle required for the journey
- VoT is the value of time for each user segment (from TAG databook)

Values for the weighting parameters would be set during the model calibration guided by typical parameters given in TAG unit M3.2.

6.2.5. Assignment

6.2.5.1. Method

PTV Visum allows two PT assignment approaches; timetable-based assignment which defines services based on individual route run timetable; and headway-based assignment which uses common stop to stop travel times for services within a time period and defined average interval between services. Both methods have strengths and weaknesses.

A timetable-based assignment approach has the following key benefits:

- Timetables provide a direct link to on-the-ground services and as such represent actual levels of service
- The model can be relatively simply updated to include revised real-world timetables which are readily available in required file formats for current / historic years

Whereas, a headway-based assignment approach (that defines service run time and frequency rather than specific timetable departures) has the benefits that runs are typically faster (according to PTV tests), and new

services in test scenarios are simpler to code as detailed timetable is not required. However, defining base year timetables requires simplification of often varying service run times and frequencies across a time period.

In the latest version of Visum (2023) it is possible to incorporate a hybrid PT assignment method (i.e. timetabled and headway-based). This will provide advantages in that the base year services can be modelled with the exact timetable information and forecast services, where exact timetables are not yet known, can be modelled using headway-based assignment. Since the HAM and PTAM will be integrated in one model, the link run times will be fed between highway and PT assignments meaning no manual transfer of this data is required.

6.2.5.2. Crowding

Crowding typically has differing effects on supply level of service across PT modes. For bus services higher passenger demand leading to excessive crowding usually results in additional service provision by operators as their operational model is often flexible enough to accommodate this although there may be parts of the network in the CPCA area where bus capacity and the need to balance high demand peak periods with quieter inter/off peak periods has resulted in bus crowding. Whereas for rail, service patterns and frequencies are determined centrally with very limited flexibility to change and as such some rail services in the region suffer from high levels of crowding in the base year. This is typically on AM and PM peak commuter services into Cambridge in particular.

Whilst a crowding model could, to some extent, represent the unattractiveness of congested bus and rail services the method typically significantly increases both run time of the PT assignment (which now needs to iterate to convergence) and the whole demand model where the PTAM must be run in each loop of the demand model. Bus and rail crowding will therefore not be included in the model.

6.3. Other modes

Walk and cycle will be assigned to a detailed network representation of the road and path network available to walk and cycle modes.

The varying perception of the safety / attractiveness of alternative cycling facilities will be included in the assignment model based on the "Propensity to Cycle" tool, similar to the approach applied in CSRM. It is likely that this special treatment of cycle is only relevant for Cambridge City, though wider application can be considered if sufficient data is available on existing cycle facilities (on road cycle lanes, dedicated off-road facilities).

6.4. Base year demand

6.4.1. Base year matrix development by mode for assignment

The time period assignment and demand model matrices will be aligned to the HAM, PTAM and VDM time periods.

The demand matrices will be developed to represent the following travel journey purposes:

- Home Based Work (from home) – HBWout
- Home Based Work (to home) - HBWto
- Home Based Education (from home) – HBEDout
- Home Based Education (to home) – HBEDto
- Home Based Employers Business (from home) – HBEBout
- Home Based Employers Business (to home) - HBEBto
- Home Based Other (from home) – HBOout
- Home Based Other (to home) - HBOto
- Non-Home Based Employers Business – NHBEB
- Non-Home Based Other – NHBO

For consistency throughout the model suite, it is expected that the travel demand matrices for motorised modes (highway, public transport) will be developed to represent the same time periods and trip purposes.

Freight demand (LGV goods and HGV traffic) will only be produced for highway travel, with freight by other modes not represent in the model.

The travel demand matrices will be developed as production-attraction (PA) trips for home-based purposes, and as origin-destination (OD) trips for non-home-based purposes and road freight. As part of the matrix development, “from-home” factors will be developed that allow home-based matrices to be converted to origin-destination level for assignment. Trip purposes will also be combined for assignment to give following assignment classes:

In the PTAM (public transport assignment model)

- Active modes
 - Cycle
 - Walk
- Bus
 - Bus Commute – HBWout + HBWto
 - Bus Education – HBEDout + HBEDto
 - Bus Other – HBOout + HBOto + NHBO +
 - Bus Employers Business – HBEBout + HBEBto + NHBEB
- Rail
 - Rail Commute – HBWout + HBWto
 - Rail Education – HBEDout + HBEDto
 - Rail Other – HBOout + HBOto + NHBO +
 - Rail Employers Business – HBEBout + HBEBto + NHBEB
- Bus based Park and Ride
 - P&R Commute – Element of ‘Bus Commute’ matrix using existing bus P&R sites
 - P&R Education – Element of ‘Bus Education’ matrix using existing bus P&R sites
 - P&R Other – Element of ‘Bus Other’ matrix using existing bus P&R sites
 - P&R Employers Business – Element of ‘Bus Employers Business’ matrix using existing bus P&R sites

In HAM (highway assignment model):

- Car
 - Commute – HBWout + HBWto + HBEDout + HBEDto
 - Other – HBOout + HBOto + NHBO
 - Employers Business – HBEBout + HBEBto + NHBEB
- Vans (freight, business and personal travel)
- HGV

6.4.2. Approach and data requirements for prior matrix development

The highway and public transport assignment models require trip matrices that represent demand patterns across the CPCA region in a neutral model period. Assignment models will represent origin destination trips disaggregated by time of day, mode / vehicle type and trip purpose. The variable demand model requires demand in Production Attraction format.

The list below summarises the intended initial approach to developing demand matrices. This approach is based on previous experience of developing regional model demand matrices from MND data and the known strengths and weaknesses of the available data sources. It is, however, expected that the detail of the approach will be refined based on the outcomes of the initial and ongoing verification exercises.

- c. Development of base year land use and associated trip end estimates by purpose and mode as required for the VDM.
- d. Verification of Mobile Network data (MND) – identify strengths and weaknesses that need addressing;
- e. Bias correction (as necessary);
- f. Development of Public Transport trip matrices;
- g. Extraction of Public Transport trips from MND to leave highway trips;
- h. Development of freight trip matrices;
- i. Extraction of observed LGV and HGV trips from MND to leave car trips;
- j. Development of synthetic car demand matrices by purpose;
- k. Infilling of missing short distance car trips in MND – using synthetic demand;

- l. Disaggregation of car trips by trip purpose – using synthetic demand.
- m. Conversion to assignment model zone system OD matrices and demand model zone system PA Matrices - Matrices will retain the disaggregation of 'to-home' and 'from-home' trips indicated in the MND data allowing creation of consistent PA matrices for demand modelling and OD matrices for assignment.
- n. Iterative repetition of verification; including, comparison against synthetic trip end estimates, NTS trip length distributions and purpose splits, to identify required adjustments to assumptions in earlier stages.

6.4.3. Public transport demand

Subject to our review of the suitability of MND processing of rail demand during the initial verification, we expect that for public transport the primary source of data will be ticket sales data in the form of LENNON ticket sales data for rail travel and Electronic Ticket Machine (ETM) data from the bus operators within the study area. As with the development of the highway travel demand matrices, these data will be supplemented with information from other data sources such as the National Travel Survey and spatially aggregate base year trip-end estimates.

LENNON rail ticket sales data are in principle a complete representation of annual rail demand, including information on the start and end stations of each ticket and the ticket type in question. Using assumptions on the number of trips generated by each ticket type (including season ticket / travel cards) annual station to station passenger demand can be estimated. Industry standard trip rates per ticket type are included in the LENNON "sales journey" data set which will be used as a basis for rail passenger OD demand. Similarly, ETM data from bus operators will be interpreted to provide information on the stop-to-stop movements for bus travel.

The ticketing data provide insight on the part of journeys between rail stations and bus stops. The access and egress stages of the complete zone to zone journey will be synthesised based on zonal planning data and access distance, using relationships estimated from the VDM, NTS or local public transport survey data (if available).

Depending on the number of bus operators within the study area who provide ETM data there may be services for which ETM data is not available. In this situation the travel demand for unobserved services will be synthesised based on information available from the comparable observed bus services in the study area, eg assuming similar bus occupancy rates.

Both sets of ticket data will lack some of the attributes required for the model, namely trip purpose, and the linkage of outbound and return home trips. The rail ticket data is also annual and will lack information on the time of day in which each journey was made. NTS and older local public transport interview survey data, will be reviewed to determine the approach to be adopted. This will include consideration of the scale and nature of any multi stage journeys where data records separate journey stages. .

Bus and rail matrices will be disaggregated by fare (adult / concession) using ETM data (if available) and/or zone demographic data.

The public transport matrices will provide assignment demand for base year PT model, and be used (by subtracting from MND data) to isolate Highway MND trips.

P&R demand will be split so that the car leg to/from the P&R site/station are included in highway assignment matrices and the PT leg is included in bus and rail matrices as appropriate for the P&R site location.

6.4.4. Freight Demand

Van trip patterns will be based on INRIX (formally TrafficMaster) OD data at a sector to sector level then distributed to zone level using trip end estimates. Van trip end estimates will be based on detailed zonal land use data and indicative trip rates by land use. Resultant matrices will be scaled to match broad corridor screenline counts for vans.

HGV MND data will be requested. This data will be verified against independent data sources such as DfT continuous survey of road goods transport (CSRGT) data and trip end estimates based on land use data and indicative trip rates for different land uses. HGV matrices will also be obtained from National Highways SERTM model and compared against the MND data. Dependent upon the findings from this analysis HGV demand will be based on most appropriate data source at different levels of aggregation. Methods may include:

- Use of MND HGV trip patterns if and where they are consistent with CSRGT data at an aggregate level and land use at a disaggregate level.
- Use of SERTM HGV trip patterns if data suggests these are more appropriate than MND data.

- Direct disaggregation of (CSRGT) data based on trip end estimates - CSRGT provides NUTS3² level estimates. In the CPCA region there are two NUTS3 regions (Cambridgeshire and Peterborough) meaning data is highly aggregate; but, does provide an indication of broad total HGV trip volumes in the region. HGV trips would need to be distributed to zone level using trip end estimates derived from zonal planning data and indicative HGV trip rates based on TRICS. The trip end estimates will therefore have a link back directly to zone land use and the variations in typical HGV trip rates for different types of land use. The resultant matrices will be assigned and scaled to match broad corridor screenline HGV counts

6.4.5. Use of Synthetic Data

A known limitation of MND is the representation of shorter distance trips, and other data sources will be required to estimate shorter distance movements, it is standard practice to use synthesised demand for this purpose. A synthetic highway travel demand matrix will be developed based on estimates of base year trip-ends and observed trip-length distributions.

These synthetic matrices will be used in several ways as part of the processing of MND, namely the infilling of shorter distance trips, the detailed allocation of MND trips to model zones, and the estimation of travel purpose.

The development of the synthetic trip matrices will be undertaken through a staged approach, using traditional methods of matrix building and following approaches recommended in TAG unit M2.2. The process will be run separately for each trip purpose, time period and direction (to/from home).

The primary tasks are likely to include:

- Adoption of trip end estimates developed from land use data by purpose and mode as part of demand model development;
- Development of OD cost matrix based on skim of link free flow times; and
- Application of preliminary demand model outputs, possibly supplemented with gravity models to distribute the trip-end data in accordance with observed (NTS) trip-cost distributions.

6.4.6. Active Modes

As with the highway and public transport travel demand matrices, it is intended that the travel demand matrices for active modes (walking and cycling) will be developed.

Active mode trips are generally short and dispersed in nature. MND datasets can include active travel trips as a disaggregated group; however, given the shorter typical trip distances by walk or cycle, the issue of under representation of short distance trips is likely to be pronounced. Active travel trips will therefore be derived synthetically

This matrix synthesis will be undertaken separately for walking and cycling demand reflecting the different trip-length profiles for these two sub-modes, using base year estimates of trip-ends and observed trip-length profiles derived from NTS data. Walking and cycling level of service will be based on distance skims taken from the walk and cycle networks developed in the public transport model, with travel time estimated through application of average speed assumptions.

6.4.7. Data Merging Process

Reflecting on the outcome of the verification exercise, a decision will be made on the suitability of the spatial resolution where the mobile phone OD data should be used. Once reasonable confidence is gained on the suitability of the MND data, supported by the verification against independent evidence, a process will be developed to segment the matrices of person trips by time period and trip purposes.

Findings from verification tests, and potential methods to address biases will be presented and discussed. The methods adopted, and pre/post verification test analysis providing evidence base for adopting methods will be described in the model validation report.

The sections below broadly set out principles of the disaggregation approach based on previous experience from several recent applications.

6.4.7.1. Disaggregation by Mode

The first step is to sub-divide the person trip matrices into constituent modes. The MND data specification states that the core requirement of MND mode definition is for trips to be classified as road, rail, or walk/cycle.

² NUTS3 regions typically correspond to counties, unitary authorities, or districts in England (some grouped).

The 'road' MND data should only include motorised road trips (i.e. car, bus, coach, motorcycle, LGV, and HGV). Prior experience has; however, indicated that often some rail trips are misallocated as road trips and may therefore be included in the data set. In the Cambridge area in particular, where road routes are particularly congested cycle trips could also be misallocated as road trips.

Subject to outcome of review of mode splits in the MND data set if it is necessary to address uncertainty in identification of rail trips, we will primarily make use of the 'all modes' MND data. We will then extract the observed rail matrices to give a revised 'fast mode road trip' data set.

Once we have a revised 'fast mode road trip' dataset, bus/coach trips will need to be separated from other trips. We will use the bus demand matrices prepared from ETM data to remove bus demand from the mobile data.

6.4.7.2. Segmentation

MND road trips will need to be segmented into the following user classes:

- Car Employers' Business;
- Car Commuting;
- Car Education
- Car Other;
- LGV,
- HGV.

If income segmentation is included, as mentioned in section 6.1.2, the MND would need further disaggregation accordingly. In principle, there are two key requirements of the segmentation method:

- The segmentation should ensure that purpose split at each origin / destination reflects the diversity in the land-use, trip rates, and planning data (this is at trip end level); and
- The segmented matrices should reflect the differences in trip length distribution by vehicle type and journey purpose, as supported by independent observed data (this is at trip distribution level).

To meet both these criteria, segmentation factors are needed that not only reflect purpose splits at trip-ends, but also vary by distance for each OD pair to reflect different trip length distributions by trip purpose. The segmentation method will therefore use matrices (synthetic and observed), created separately for each vehicle type / trip purpose that reflects variations in purpose/vehicle type splits across ODs:

- Van and HGV matrices will be based on observed data sets (DfT CSRGT & INRIX data); and
- Synthetic car purpose matrices will be developed using the VDM, so that they reflect observed trip length profiles (from NTS) and zonal trip-ends (based on a trip end model capturing local planning data: population and employment).

This will ensure purpose split factors are different for each OD pair depending on their trip-ends and distance. Segmentation factors will then be calculated for each OD for each vehicle type/trip purpose combination. These factors will be used to split the all-vehicle MND data into vehicle type/trip purpose matrices.

This method will retain the total zone to zone demand from the mobile data whilst ensuring the trip end distribution and trip length distribution are representative within each vehicle type and trip purpose segment.

6.5. Calibration and validation

6.5.1. Highway Assignment Model

6.5.1.1. Traffic Acceptability Guidelines

Assignments will be created following the latest TAG guidance. The acceptability guidelines outlined in TAG Unit M3.1 are shown in Table 6-1 and Table 6-2.

The observed flow and screenline flow criteria in the Table relate to total link flows, i.e., all vehicles, and should not be used when comparing partial link flows, e.g., heavy goods vehicles.

Table 6-1 – Link Flow and Turning Movement Validation Criterion and Acceptability Guidelines

Criteria		Acceptability Guideline
1	individual flows within 100 veh/h of counts for flows less than 700 veh/h	> 85% of cases

	Individual flows within 15% of counts for flows from 700 to 2,700 veh/h	> 85% of cases
	Individual flows within 400 veh/h of counts for flows more than 2,700 veh/h	> 85% of cases
2	GEH <5 for individual flows	> 85% of cases

Table 6-2 – Journey Time Validation Criterion and Acceptability Guidelines

Criteria	Acceptability Guideline
Modelled times along routes should be within 15% of observed times (or 1 minute if higher than 15%)	> 85% of routes

6.5.1.2. Highway Model Calibration and Validation

As part of the generation of a new 2023 base year highway model, it should be ensured a consistent level of flow and journey time calibration and validation is achieved across the CPCA area. However, given the large-scale area this covers it would provide time consuming and carries an increased cost if a high level of local calibration and validation is sought to be achieved across the whole area.

Discussions will be held with CPCA along with the definition of the detailed model area mentioned previously to agree specific study areas to be focused on as part of the highway model calibration and validation, ensuring these locations receive a greater and more proportionate level of focus to achieve a high level of calibration and validation.

A key objective of the updated highway model should be to ensure a close level of fit is achieved in terms of turning movements at key junctions, particular major strategic interchanges which interface with the SRN.

Current expectation is that there would be a maximum of 50 journey time routes and 25 screenlines/cordons.

The highway model calibration and validation stage will be divided into four processes:

- Network
- Route Choice
- Trip Matrix
- Assignment.

A series of basic pre-calibration checks will be undertaken prior this stage, which includes checking and rectifying network debugging errors and checking of key junctions and intersections to ensure they connect correctly to the network and that all destinations are reachable.

Network calibration and validation will be undertaken by assigning an initial estimate of the prior matrix onto the network. The calibration process will include ensuring the speeds and flows on network links and delays at junctions are as anticipated from observations.

Further checks such as flow to capacity ratio and network routing inspection, including the difference between routes taken by HGV and other vehicles, will also be undertaken.

Comparison of observed and modelled journey times on time/distance graphs will be included as part of the network validation process.

The plausibility of the modelled routes will be part of the route choice calibration and validation process. Modelled routes between selected origin and destinations on important centres of population and employment or key junctions will be examined. As observations of routes are not usually available, the checks will be based on web-based route planning tools, local knowledge and judgement. HGV routes will be investigated to ensure longer and faster routes such motorways and trunk roads appear more attractive.

The prior trip matrices will be validated by comparing total modelled flows and counts and assessed against TAG validation criteria by vehicle type and time period for screenlines and cordons as follows:

- Screenlines and cordons generated from MND data
- Screenlines and cordons earmarked for matrix estimation

- Screenlines held back for independent validation.

From the analysis it will indicate whether there is a requirement of matrix estimation (ME) although from our experience this is likely. The objective of ME is to refine the estimate of the OD trips which are not observed in surveys by synthetic matrices. We will monitor the changes brought by ME by comparing the prior and post ME matrices by scatter plots of matrix zonal cells and zonal trip ends, trip length distribution analysis and sector to sector level matrices analysis.

The benchmark criteria of changes brought by ME will be in accordance with TAG Unit M3.1. The validation of the post ME matrices will be similar to the prior matrices mentioned earlier. If the TAG criteria are not met for all or nearly all screenlines and cordons, remedial action will be considered.

Assignment calibration will be taken into consideration if the first three processes do not produce an acceptable validation of link flows and journey times. Further network improvements will be undertaken on those links and node junctions to meet TAG criteria. Assignment validation will include traffic flow links mentioned in the trip matrix validation section and comparison of modelled and observed journey time accordance to TAG criteria and guidelines for journey times.

A 'stress test' (by increasing the numbers of trips in the matrices by 10% or 20% and reassigning) will also be introduced as part of the process. This will reveal faults in the network, which previous checks may not have detected, such as junction performance with some junctions becoming over-loaded whilst others showing no queues despite the increased demands. Another test that could be considered is coding a 'dummy' highway scheme such as a bypass alternative to congested corridor or substantial change to highway standard in a corridor and review whether sensible and realistic outcomes from the model result. The comparison of assignment flows and journey times will be examples of outputs to be checked.

6.5.2. Public Transport Assignment Model

The PTAM will provide the following outputs covering:

Assignment of trips providing allocation of persons to bus, rail and mixed mode trips

Generalised cost skims of costs of travel for use within demand modelling

Interaction with highway mode on travel speeds i.e., congested travel times on the highway have an influence on bus travel times.

Details of the specific coding requirements, parameter derivations and assignment methods are stipulated in the relevant guidance from TAG (Unit M3) and this will be followed.

The level of accuracy associated with PT trips is necessarily lower than that of highway demands resultant from the lower market share associated with the former.

The DfT's recommendation is that across modelled screenlines, modelled flows should, in total, "be within 15% of the observed values. On individual links in the network, modelled flows should be within 25% of the counts, except where observed hourly flows are particularly low (less than 150 passengers per hour)".

6.5.2.1. Public Transport Model Validation

The following three types of validation criteria will be assessed to the public transport passenger assignment model

- Validation of the Trip Matrix
- Network Service Validation
- Assignment Validation.

The validation of the trip matrix involves comparisons of assigned and observed passengers across complete screenlines and cordons. The criteria states that 95% of the assigned and observed flows should be within +/- 15% of one another.

The validation of the network and service refers to the checking on the accuracy of the coded geometry and journey times of the services within the PT model. This also includes the comparison of the modelled flows of public transport vehicles with observed counts.

The assignment validation will be undertaken by comparing modelled and observed passenger flows across screenlines and cordons and boarding and alighting's at stops and station. The number and locations of validation sites will be agreed in discussion with CPCA. Fewer sites are anticipated than for the highway model and will be chosen based on the relative importance of public transport as a mode by location. The completion of these calibration and validation checks will demonstrate that the model is sufficiently robust in areas of detailed modelling to test known interventions and will demonstrate the extent to which model outputs in other

areas relating to other locations can be relied upon and the extent of further work required to improve further the model.

6.5.3. Realism and Sensitivity Testing

The purpose of developing CaPCAM is to have a model which can be used with confidence to examine how potential changes to the transport systems will change travel patterns and support economic prosperity. The base year model, once calibrated and validated, will be tested further to demonstrate that the three components: the demand model; highway model; and PT model, behave in a realistic manner.

The sensitivity of the model to several input assumptions will also be tested, again to demonstrate that the model is a robust and reliable starting point for forecasting. Change to transport conditions will, in principle, cause a change in demand and we will predict and quantify these changes. TAG states that if a model behaves realistically to changes in travel costs and time that it is more likely to be a good predictor of the demand responses to these changes.

We will run the tests, which are recommended in TAG, on the base year to identify how it performs and consider where changes in demand have occurred and whether these are within the expected magnitude of change. Where the model does not return results showing it is behaving in a manner which is consistent with guidance, we will adjust the parameter values controlling its responsiveness as recommended in the guidance until an acceptable response is achieved.

7. Demand model

7.1. Model form

The TAG unit M2.1 guidance recommends that integrated demand and supply models should operate incrementally. This means for forecasting a variable demand model (VDM) is used to provide incremental changes to validated base matrices. Two alternative approaches may be used to achieve this:

- an incremental pivot point model where the VDM only forecasts the change in demand;
- an absolute model applied incrementally where the VDM forecasts the total demand, with changes between two runs of the VDM (base and forecast) being applied to the validated base matrices.

There are advantages and disadvantages with each approach. The incremental pivot point model requires an additional step to handle new developments and new modes and requires base matrices for all modes to be assigned or where the analysis requires the total use of a mode not just the changes. The absolute model approach enables the base and forecast years to be handled in the same way, for developments to be treated consistently with other areas, and for outputs to be generated on the total travel by all modes included. However, this approach results in two sets of demand matrices: “synthetic” matrices from the demand model and the validated base matrices. It is important these two sets of matrices are sufficiently similar in the base year so forecast changes are not distorted by the process.

Due to the number of new development areas in the County, and to facilitate the creation of total travel demand for active modes for walk and cycle mode share metrics, the new VDM will take the form of an absolute model, applied incrementally (AMAI).

The majority of transport models in the UK use trip-based matrices. The guidance recommends P/A trips, or production/attraction modelling is adopted, as in CSRМ; where the direction from home to work (and back) is known and improves forecasting changes associated with changes in land use activity and developments. A “tour” is defined as any round trip, starting and finishing at home, and may contain stops at several different destinations. Journeys between non-home destinations are handled automatically in these models. Tour-based modelling is increasingly applied but still not widely used in the UK. Tour-based modelling is a natural step towards activity-based modelling.

The new model will consider the merits of adopting a simple tour-based model with a limited set of activity chains, should this be feasible in the timescales available without major household interview data collection exercise. The fallback position is using the CSRМ approach of P/A trip modelling with a linkage between home-based trip attractions and non-home-based trip generation (as also applied in DfT’s national trip end model, NTEM). To develop a robust tour based model would require local data on travel patterns / trip chains which could only be obtained from household interview surveys including travel diaries.

7.2. Segmentation

7.2.1. Overview

Travel demand segmentation will be used within the model to represent differences in travel behaviour by trip purpose and type of traveller. This is helpful both for representing travel choices, and to allow for forecasting different rates of future growth for different traveller types and trip purposes.

The travel demand is segmented in the VDM by trip purpose and traveller type and will be aggregated into assignment user classes which are used in the assignment models to represent differences in routing choices.

The sections below discuss the proposed segmentation at each stage and the relationship between them.

7.2.2. Trip purpose

TAG unit M2.1 states that there should be at least three categories of trip purpose (commuting, employer’s business and other) as “these categories are likely to have different elasticities and different distributions in both time and space, and substantially different values of time”.

The proposed VDM segmentation is based on DfT’s NTEM (National Trip End Model) dataset and hence the trip purpose definitions will be aggregations of those within NTEM. NTEM includes eight home-based (HB) and seven non-home-based purposes (NHB) as set out in Table 7 below.

This level of segmentation is not appropriate for demand modelling, hence some aggregation is proposed to manage the scale of the model while retaining sufficient segmentation to differentiate travelling to alternative types of activity. The existing local models operate at the level of segmentation set out in TAG of commuting

business and other. For the VDM model we propose to retain the CSRM definitions with the trip purposes from NTEM aggregated as follows:

1. HB Shopping and HB Personal Business;
2. HB Recreation / Social, HB Visiting friends & relatives and HB Holiday / Day Trip; and
3. NHB Work, NHB Education, NHB Shopping, NHB Personal Business, NHB Recreation / Social and NHB Holiday / Day trip.

This will give five home-based trip purposes and two non-home-based trip purposes in the VDM as shown in Table 7, which can be aggregated to the purpose definitions embedded in the existing models.

Table 7-1 – VDM and NTEM trip purposes

Home-based Purpose		Non-home-based Purpose	
DfT NTEM	Proposed VDM	DfT NTEM	Proposed VDM
HB Employers Business	HB Employers Business	NHB Employers Business	NHB Employers Business
HB Work	HB Work	NHB Work	NHB Other
HB Education	HB Education	NHB Education	
HB Shopping	HB Shopping and personal business	NHB Shopping	
HB Personal Business		NHB Personal Business	
HB Recreation / Social	HB Leisure	NHB Recreation / Social	
HB Visiting friends & relatives			
HB Holiday / Day trip		NHB Holiday / Day trip	

7.2.3. Traveller Types

Segmentation of traveller types is desirable to reflect their different travel behaviour in terms of:

- Numbers of trips made by purpose (trip generation)
- Where trips are going (workplaces / shops / schools etc)
- Opportunities / preferences on mode (levels of car ownership / availability)

The segmentation in NTEM has been designed to best capture variations in trip generation and consists of a combination of 11 person types based on gender, age and employment status, and 8 household types, based on household size and number of cars available. These combine to provide 88 combinations of person household types, which are termed traveller types.

Retaining much of the NTEM segmentation at the trip generation stage is desirable to maximise consistency with NTEM and enable the NTEM trip rates to be applied. We propose to exclude the gender segmentation from NTEM as there are relatively small differences in behaviour and trends over time suggest these will diminish rather than increase.

The generated trip ends will then be aggregated for input to the choice model which will operate with fewer traveller type segments for efficiency.

The existing CSRM2 choice model includes segmentation by socio-economic group / household income at different stages of the model. This level of segmentation is important when considering responses to pricing scenarios and the future model will look to retain some form of income segmentation akin to CSRM unless this proves prohibitive in terms of model scale or data requirements. Due to the nature and focus of the other existing models, they do not include additional traveller segmentation.

The proposed traveller type segmentation for the choice model is as follows:

- Retain age to differentiate those at school from adult population. Retaining an “elderly” population segment based on age will also be considered since the ageing population means this group become increasingly important when forecasting further into the future.
- Retain working status segmentation from NTEM for the adults (not for children and elderly): working full-time, working part-time, students (not working), other (not working / studying).

- Include income / socio-economic segmentation, maximum of three categories to reflect variations in willingness to pay (relating to road pricing), and/or ability to work from home.
- Household car availability to improve mode choice modelling, aggregate NTEM categories to three segments:
 - No Car (NC): No cars available in the household;
 - Partial Car (PC): Fewer than one car available per adult in the household;
 - Full Car (FC): One or more cars available per adult in the household.

This leads to a maximum of 18 person types (6 working status and age combinations, 3 income/socio economic) and three levels of car availability, and hence 54 traveller types. However, the model will consider only valid combinations of traveller type and trip purpose. The precise combinations allowed will be considered during the development stage of work. At this stage we envisage commuting and business trips will only be included for those in full and part time employment.

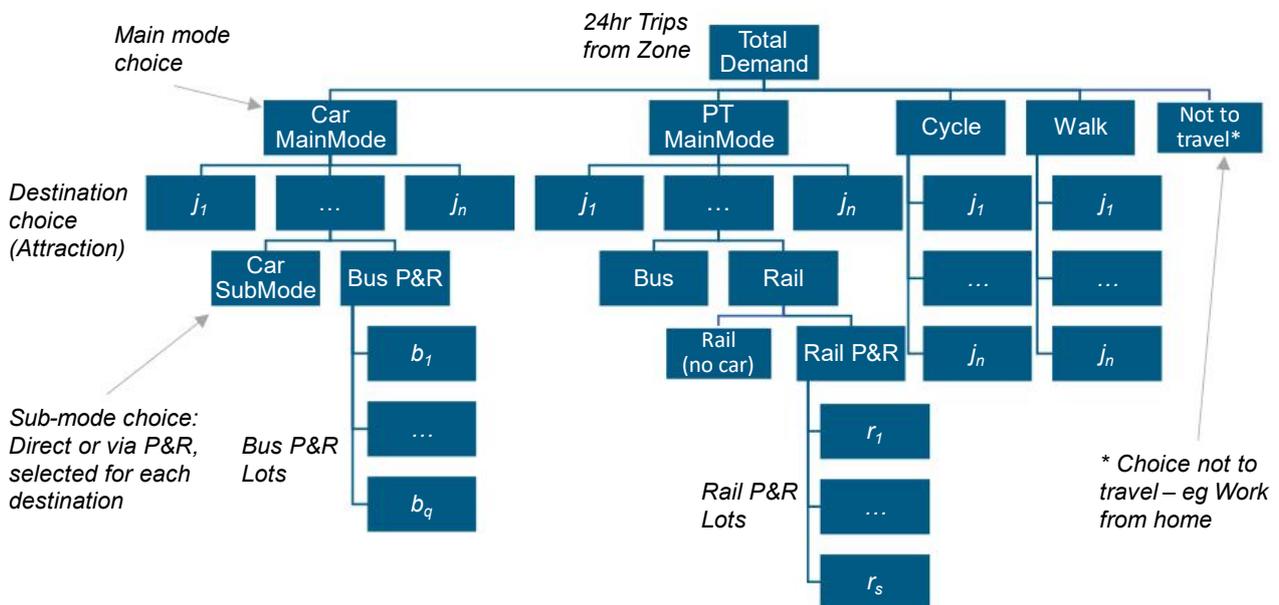
7.3. Choice structure

The VDM will include mode and destination choices. A macro time of day choice model could be included but our recommendation at this stage is to assume fixed time of day profiles by trip type, with the option to include time of day choice at a later stage.

In line with TAG guidance, it is assumed by default that the main mode choice is less sensitive than destination choice and hence is positioned above it in the choice hierarchy. Sub-mode choice is positioned below destination choice, with the lowest level choice being for choice of P&R site or station (see Section 7.4).

Working from home has become an increasingly important aspect for many employees. We propose including working from home as a choice in the VDM, but will start the task by reviewing the evidence and guidance emerging on post-Covid trends and the approaches typically being adopted in transport models in other parts of the UK.

Figure 7-1 - Indicative choice hierarchy



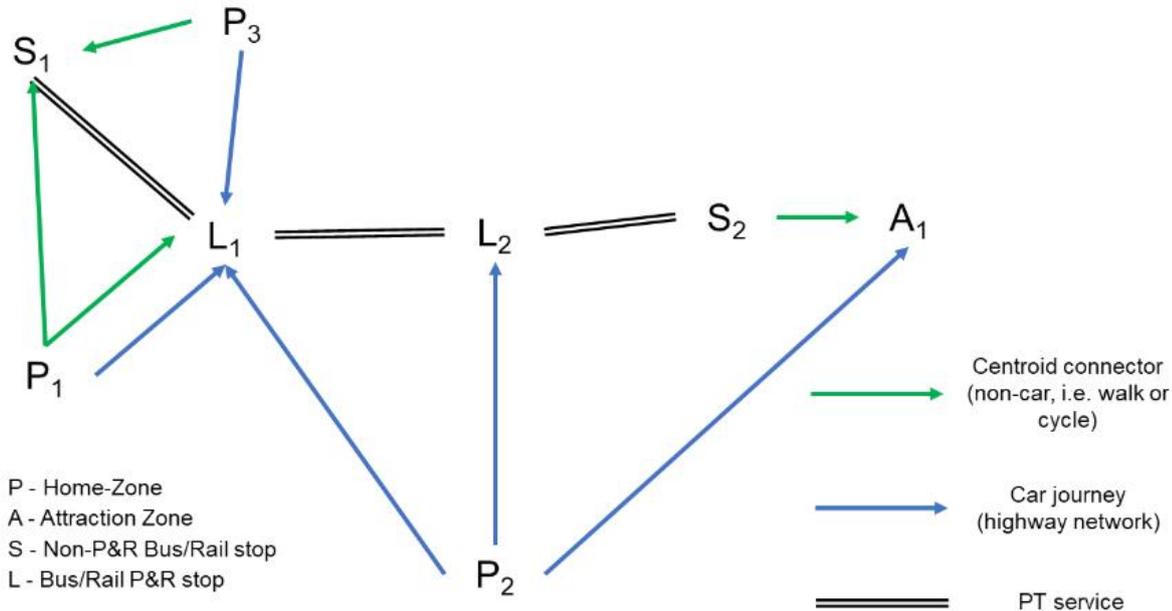
7.4. Approach to Park and Ride

The main software packages being considered (CUBE and PTV Visum) allow modelling of park and ride via 'Lots' in a similar (but more straightforward way) to the approach embedded in CSR. The approach described here is specific to Visum as the recommended software. Any PT boarding point can be designated as a P&R Lot, either bus or rail. Within the PT and highway assignment models, each P&R Lot is treated as a zone: the

drive leg to/from the P&R Lot and the PT leg between the P&R Lot and the destination are separated by Visum and can be incorporated with the other car and PT trips respectively for assignment. The option of using walk/cycle leg to access the PT boarding point remains where appropriate.

The functionality and connectivity that can therefore be provided in Visum is represented in Figure 7–2.

Figure 7–2 - Approach for Park and Ride modelling



7.4.1. Key elements of P&R approach

TAG Unit M5.1 sets out guidance on the treatment of park and ride trips within a VDM. It is advised that park and ride modes are treated as a sub-mode of either car or PT, depending on the relative length of each leg of the trip. Hence, bus P&R is treated as a sub-mode of car, whereas rail is treated as a sub-mode of rail. This separation will be implemented with main modes for car (comprising sub-modes for car only and bus P&R) and PT (comprising bus, rail and rail P&R sub-modes).

- The choice to use Park & Ride is determined in the VDM, as a sub-mode choice, rather than a routing choice (to ensure travellers return home from the same site they arrived and parked at);
- Both bus and rail have separate Park & Ride sub-modes, most likely bus as a sub-mode of car and rail as a sub-mode of PT;
- Each P&R Lot will be designated a zone number, most likely a high number with reserves for future P&R zones. This zone will not have any trip ends, and will not be specifically recognised by the VDM at all, but will be used by the HAM and PTAM (exactly as in CSRM2);
- The software used will create the generalised cost for each P&R sub-mode, by adding the costs of each leg (car and PT);
- The software will also split the P&R sub-mode demand into Home->Lot and Lot->Destination. This 24hr P/A movement will then be pivoted against the assignment.

Note that TAG unit M3.2 specifies modelling the use of car access to PT services in two general forms, namely:

- **Kiss and Ride:** public transport user is driven to station and picked up again on the return journey
- **Park and Ride:** which may involve either the use of a designated park-and-ride site, parking at stations, or informal parking in streets surrounding stations

The P&R function within the model will not differentiate these two modes, so that implicitly any P&R trip could be in the form of Kiss and Ride. The cost-sharing aspect of this is dealt with via occupancy factors in the generalised time equations. This also has implications for parking capacity at P&R sites. As with all escort trips within the model, the next leg of the driver trip (onward to a further destination or home) is not explicitly handled within the VDM, but is assumed to be represented in the validated HAM assignment matrices. Hence using the incremental approach, growth in trips to/from the P&R zone should deliver growth in the appropriate vehicle trips in the HAM.

7.4.2. P&R catchment areas

The structure of the P&R approach means that travellers have a choice between all P&R sites and can select the one with the lowest generalised time for their specific P/A trip. It is not therefore strictly necessary to define specific catchment areas for each P&R site. However, it may prove convenient to do so, to prevent odd/infeasible trip patterns or improve model stability. If required, this can be implemented during model calibration, but should be applied so as not to overly restrict changes in travel behaviour in future years.

7.5. Parking

The availability and price of parking, as well as the availability of alternative modes such as bus, influences people's decisions on whether to use the car for their journey and whether to interchange at a park and ride site. In CSRM2 the likely costs associated with parking in different urban areas are included, based on analysis of parking charges in Cambridge city and each of the towns within the model. The new model will also include a representation of parking charges which can be adjusted for forecast scenarios.

The new model will also include a parking capacity function. TAG unit M5.1 sets out two main reasons for modelling urban parking:

- to ensure that the forecasts of the demand for travel to the urban centre by car are consistent with the forecasts of the available parking spaces; and within that constraint
- to ensure that the car vehicle trips end at zones containing car parks as opposed to zones where the activities of the occupants take place and where there might be insufficient parking

The demand modelling element will address the first of these to limit overall demand by car to reflect the constraints associated with parking space. The second is a function of the assignment modelling approach.

To achieve this a parking sub-model will be developed for areas with limited capacity. Zones where parking charges or capacity limits apply will be grouped into:

- parking districts: contiguous sets of zones with identical charges and/or a single total parking capacity; and
- Park & Ride sites: single (assignment model) zones used to represent bus P&R sites or railway stations (see section 7.4 on Approach to P&R).

The costs and the locations of the associated car parks will be considered, and an approach developed to allow the most appropriate charges to be applied by parking district, time period and trip purpose taking into account the proportion of drivers expected to pay a charge. Parking districts will be defined for each urban centre (Huntingdon, St Neots, Ely etc) as a whole with two (possibly more) areas for Cambridge and Peterborough.

Parking costs relevant for specific bus Park & Ride sites (if any) and railway stations will also be sourced and treated in a similar manner, with the parking cost determined according to the expected length of stay by trip purpose (at a 24hr level).

7.5.1. Parking Capacity Function (PCF)

A parking capacity function (PCF) will be included in the model to represent cases where journey choices are impacted by the availability of parking space.

Most public car parks (general or P&R) have a known capacity, and this might be considered as a hard limit on the number of vehicles able to travel to those zones during a 24-hour period. However, these hard constraints may not in practice apply within the model, due to car park turnover rates throughout the day, escort/Kiss & Ride trips, and the potential for on-road parking to be also used. Furthermore, the capacity for parking in many areas will not be certain, due to the existence of private non-residential parking (eg at workplaces) and on-street parking (which will be partly occupied by residents' cars).

An early task will be defining how to measure parking capacity for each site / district taking into account the likely availability of space outside designated car parks and turnover rates. A pragmatic approach will be adopted considering parking capacities alongside evidence of car park occupancy where data on this can be obtained, and the total number of vehicle trips to each area in the base year. If parking is thought to be at or close to capacity across a wide area, then the latter may be the most appropriate measure of car park capacity.

A parking capacity function will be developed to represent an additional generalised cost (penalty) where parking capacity is limited. As outlined above, this will apply in specific parking districts and P&R sites. The function will be derived as a time penalty which is a function of the number of cars trips arriving in the previous iteration, and the defined capacity of the parking district or P&R site. This will count total 24-hour attractions for car (vehicle) trips.

The penalty will operate at a 24-hour level, so will not explicitly consider length of stay or turnover of parking, and residential parking (home-based production end) will not be considered. For this reason, the 'capacity'

must be a nominal one determined during calibration. The aim of the parking capacity function will be to apply a small penalty (parking search time) whilst car arrivals are below the defined capacity and increase rapidly at a threshold above which no further parking is judged to be feasible. The penalty derived by the PCF will be added to the car generalised time to represent the constraints and additional cost associated with limited parking capacity.

7.6. Model integration

7.6.1. Overview

Network skims will be available to the VDM from the highway and PT assignment models (HAM and PTAM). The skims will be provided by time period and Origin-Destination (O-D) pair, and hence relate to the individual out and return sections of a P/A trip. The method for producing P/A trips from the O-D skims is outlined in Section 7.7.

7.6.2. Car

The HAM skims will be available separately for distance, time and tolls of each O-D pair and period, skimmed directly from the HAM as a flow-weighted average across all paths between an OD pair, by AUC and time period. Functionality to pass tolls will be implemented for scenario testing.

Note whilst intrazonal skims provided by the HAM are typically zero (as these trips are not assigned to the network), these will be re-calculated for the VDM initially as half the zonal minimum row or column value for use in the VDM. This may be altered based on evidence during the calibration stage.

The HAM skims are refreshed in the VDM following each iteration between the assignment models and VDM, to allow for responses to highway congestion to be incorporated in the VDM.

7.6.3. Bus and Rail

Bus and rail skim information will be provided separately for each mode in the form of in-vehicle time, wait time, and number of interchanges for each origin-destination trip, by PTAM AUC. Where access/egress modes are used the time on these will need to be identified separately.

Given that alternate routes may exist, flow weighted averages will be calculated in the PTAM before passing values to the VDM. Fare information may come from the public transport assignment model, or may be input specifically for the VDM. This depends on primarily on the nature of the fare structure applied. A zone / matrix based fare structure independent of the services used has no impact on route choice, whereas a fare paid per boarding stage or varying by routes. In addition, the public transport assignment model is unlikely to include detailed segmentation by traveller type (detail not required for routing and would significantly increase model run time), hence variations in the fare paid will be applied for the demand model.

Intrazonal skims provided by the PT assignment model will also be zero. For most zones, intrazonal bus or rail movements will not be possible, so these will be set to an 'infinity' value or otherwise disallowed. Where intrazonal movements are judged to be possible, these will initially be re-calculated as half the zonal minimum row or column value for use in the VDM, though changes to this assumption may be made during calibration.

The PT skims may be calculated at each demand-assignment iteration, to take account of the impact of changing road congestion on on-road bus journey times, and also changes in the demand strata using PT, which can alter routing decisions and hence journey skims. However, this option may not be used in every run or every iteration, since it is likely to be more efficient to iterate the highway assignment and demand model each iteration, and update the public transport (and active mode) assignment at the start and end of a model run. This would not be possible if public transport crowding is included and one of the reasons PT crowding is not proposed for CaPCAM.

To summarise, the PTAM will pass skims to the VDM by time period at OD and PTAM AUC level, flow-weighted across routes, comprising the following components:

- access/egress time (total for all access/egress modes),
- in-vehicle time (dominant mode),
- total wait time (all journey stages),
- number of interchanges,
- total journey fare (all stages).

7.6.4. Walk and Cycle

For the walk and cycle main modes, walk and cycle networks will be prepared and weighted travel times skimmed from this prior to model running.

Walk and cycle access modes for PT will also be determined using the walk and cycle networks, and particular attention will be paid to the bus stop and railway station access routes.

Skims will be based on the shortest perceived travel time between each origin-destination pair and will not vary by time period.

Due to the size of the model, walking and cycling will not be relevant for many of the zone pairs. A cut-off distance will be considered to avoid O/D calculations being carried out should this significantly improve model performance.

7.6.5. O-D to P/A Conversion

The skims that are input to the VDM to derive the generalised times are mainly calculated during the assignment models and hence are defined for average hour O-D trips. For the VDM, 24hr P/A costs are required and hence a conversion must be carried out. For each home-based purpose, the typical P/A costs will be calculated by summing out and return O-D costs for relevant time periods.

7.7. Generalised time

7.7.1. Definition

TAG unit M2-1 states that *“all transport modelling should recognise that people’s travel choices depend upon the cost, in both time and money. It is important to combine time and money into a single disincentive to travel (“disutility”), so that demand can be assumed to rise or fall with reductions or increases in either. To do so, it is necessary to apply appropriate weights to the time and money components of this combined cost so that travellers can trade money for time, such as in choosing between a faster but more expensive mode or a slower but cheaper mode.”*

In transport models, the disincentive to travel is usually represented with a generalised cost or time. The new model will follow the recommendation that units of time are used. The VDM will work with generalised time in units of minutes combining the time components of a trip with the monetary costs, which are converted into time units using appropriate values of time (VoT). Additional constants will be required to reflect un-modelled attributes influencing travellers’ behaviour. These will be derived during model calibration to improve the ability of the model to reflect observed travel patterns and behaviour.

$$\text{Generalised Time} = \text{Total travel time} + \frac{\text{total cost}}{\text{value of time}} + \text{calibration constants}$$

7.7.2. Generalised Time Damping

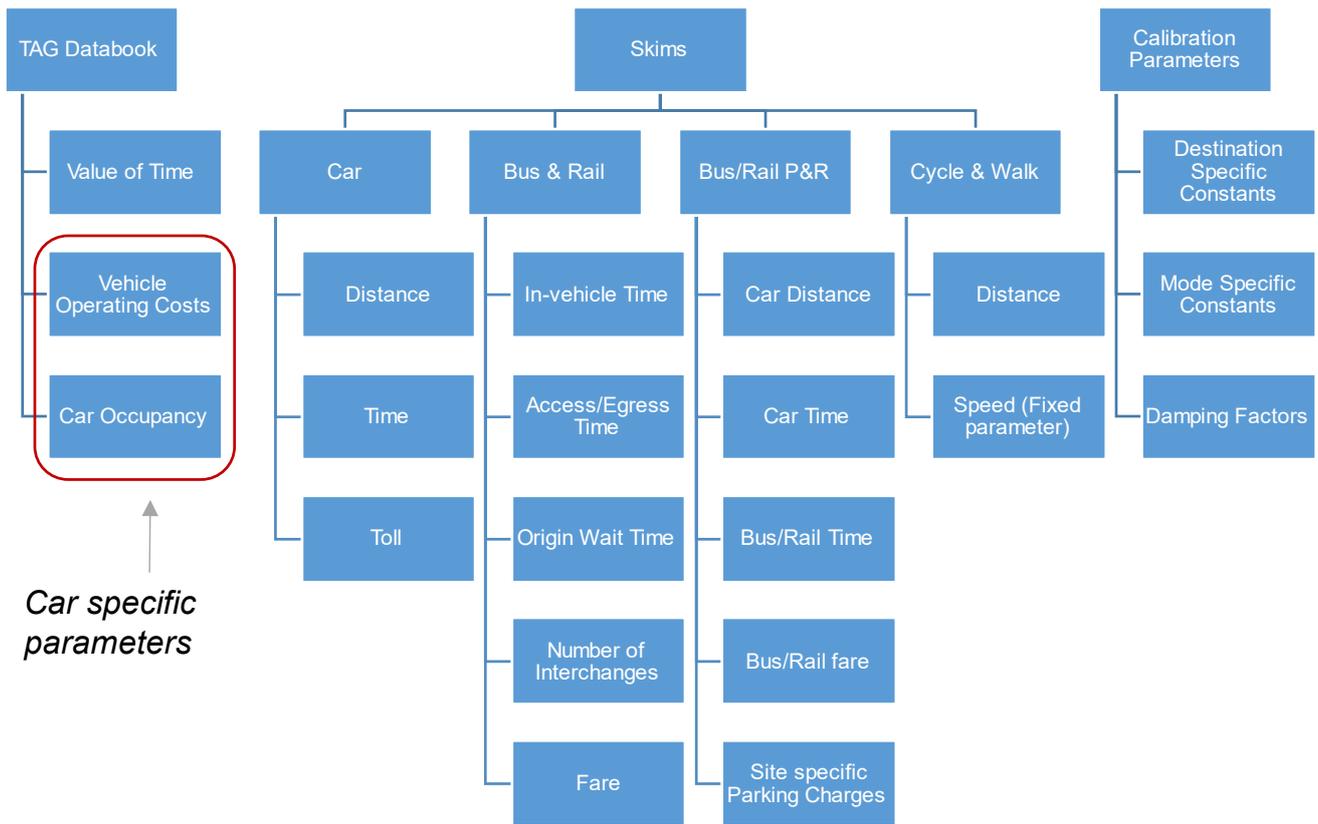
TAG unit M2-1 suggests that damping is considered as a means of representing the fact that demand responses become less strong as trip length increases. A variety of methods for damping are set out to either vary the VoT by distance or raise the generalised time to a power.

The need for damping will be reviewed as part of the model calibration.

7.7.3. Components

Figure 7–3 shows the various components likely to be used in generalised journey time formulation. The figure is categorized based on the data type or source. TAG databook and calibration parameters are more generic and apply across all the modes, except for car specific TAG values. Parking capacity and parking charges used in extracting network are derived from secondary sources, with the remainder of the attributes being obtained from the relevant assignment model by time period.

Figure 7-3 - Components of Generalised Time



The vehicle operating costs (VOCs) will be calculated for the VDM using the standard formulation set out in the TAG databook using the time and distance skims from the HAM, and values of time appropriate to the VDM traveller type segmentation. In line with guidance, fuel costs will be included for all trip purposes, whilst non-fuel costs will only be perceived by the employer’s business trips.

7.8. Calibration

The calibration of the VDM will be carried out in line with TAG unit M2-1 (Variable Demand Modelling). M2-1 advises that ideally local data should be used to calibrate the parameter values within the variable demand model, in order to produce a model which replicates observed base year data. However, no firm criteria are set for this, and it is noted that this is less of an issue for incremental models such as proposed here. The guidance also advises that effort should be proportionate to the quality and relevance of available data. Therefore, the aim will be to calibrate the model parameters to produce a reasonable match against observed local data, whilst also ensuring that the model responses in realism tests meet the advised standards.

An iterative process will be taken of reviewing the model outputs against observed data and using judgement to adjust model parameters to produce a better fit against independent data sources. The checks carried out and reported will include:

- Mode shares and trip length distributions will be compared against both local Census JTW and local NTS data;
- Origin-Destination distributions for HBW will be compared against the Census JTW;
- Car, bus and rail trips will be compared against validated HAM and PTAM assignment matrices;
- Where available, PT ridership and station usage data will be compared against observed totals;
- Where available, car destinations will be compared against parking occupancy data.

Calibration will take place through an iterative process involving a hierarchy of checks and adjustments as follows:

- Checks on the model inputs in terms of trip ends and network skims, to ensure these are not the cause of any differences to comparator data;
- Checks on the model implementation and processing;

- Adjustments to sensitivity parameters and cost damping, particularly to alter mode shares and trip lengths;
- Introduction of alternative specific constants for main and sub-modes, and specific areas;
- Calibration of the Parking Capacity Function and adjustments to P&R VDF function.

7.9. Demand-supply convergence

Each time the VDM is run, the difference to the VDM results from the previous iteration will be checked. Any differences will be caused by changes in highway congestion based on the revised VDM outputs. This is therefore termed the 'supply/demand convergence'.

The standard measure of supply/demand convergence known as %GAP will be applied as specified in TAG Unit M2.1 Section 6.3. This tests the cost-weighted difference between the current and previous VDM matrices at 24hr P/A level. The supply/demand process will be capable of terminating when a user specified threshold is reached, which is normally 0.1% but may be set as appropriate to the nature of the model scenario testing. Quicker runs can be completed with looser convergence for preliminary assessments, while scheme appraisal requires levels of convergence to be commensurate with scheme benefits and may require tighter convergence. Alternatively, a maximum number of iterations can be set, and the convergence achieved reported.

7.10. Realism testing

7.10.1. TAG requirements

Three standard realism tests are specified in the guidance to demonstrate that the responsiveness of the VDM to changes in costs and times meets the evidence available. The three tests are:

- Car fuel cost changes
- Public transport fare changes
- Car journey time changes

These three tests will be carried out as part of the calibration of the new VDM as set out below. Additional realism or sensitivity tests may also be carried out to demonstrate the plausibility of the model, although evidence of the level of response expected is widely available. Sensitivity tests on responses to parking cost or capacity changes will also be considered.

7.10.2. Car fuel cost elasticity

The car fuel cost elasticity required is the change in car vehicle-kilometres with respect to the change in fuel cost. The calculations should be carried out for a 10% or a 20% fuel cost increase. Car fuel cost elasticities are established using both matrix vehicle kilometres and network vehicle kilometres and are based on an iterated supply-demand model result in the base year. TAG unit indicates that the fuel cost elasticity **within the range of -0.25 to -0.35 (overall, across all purposes)** is acceptable and suggests to provide reasons if the elasticity is outside this range.

TAG states that target elasticities are considered more plausible if:

- the pattern of annual average elasticities shows values for employers' business trips near to -0.1, for discretionary trips near to -0.4, and for commuting and education somewhere near the average
- the pattern of all-purpose elasticities shows peak period elasticities which are lower than inter-peak elasticities which are lower than off-peak elasticities

7.10.3. Public transport fare elasticity

The public transport fare elasticity required is the change in public transport trips by all public transport modes with respect to the change in public transport fares. The calculations should be carried out for a 10% or a 20% public transport fare increase, applied to all public transport modes equally.

Public transport fare elasticities are calculated on a matrix basis, by time period and trip purpose. Elasticities of public transport trips with respect to public transport fares are expected to lie typically in the range **-0.2 to -0.9** for changes over a period longer than a year.

The elasticities are considered more plausible if:

- Discretionary purposes expected to have a stronger response than non-discretionary purposes
- Stronger response expected for trips with car available than those without a car available.

7.10.4. Journey time elasticity

The car journey time elasticity required is the change in car trips with respect to the change in journey time i.e., as travel time increases it is expected to have a reduction in trips. These journey time elasticities are calculated using a single run of the demand model. TAG states that:

“The output elasticities should be checked to ensure that model does not produce very high elasticities (no stronger than -2.0)”.

7.10.5. Parking constraint elasticity

An additional sensitivity test will be carried out during calibration on the impacts of limiting parking capacity and the scale of response achieved. While no evidence is likely to be available, it will be important to ensure the scale and nature of response is intuitively sensible.

8. Data requirements

8.1. Introduction

This chapter covers the data sources expected to be used for the model development along with the potential surveys and datasets for model calibration and validation.

8.2. Overview of data sources and uses

An overview of the data sources and their intended uses is provided in Table 8 including RAG ratings of both the importance of the data source and its suitability for use in model development as set out in Table 8. It discusses about both the primary and secondary data sources. Further details about the datasets are discussed in the subsequent sections of this chapter.

Table 8-1 - Data Source Importance and Suitability RAG Status

Importance		Suitability (Quality and Quantity of Data received)	
	Nice to have		Excellent / Very Good high sample rate and quality
	Preferred		Reasonable / Good enough
	Required		Some concerns / risks
	Critical		Very Low confidence / high risk
	-		Unknown at this stage (to be collected)

Table 8-2 – Summary of data sources and purpose

Data type	Sources	Importance	Year	Purpose	Suitability
Planning data and Demand model					
Travel Demand Data	National Travel Survey		2011-2019	Matrix build: Purpose splits by time period and trip length distribution by purpose and time period split by urban and rural locations VDM: calibration dataset for mode share and trip length distributions	
	NTEM v8 Trip Ends		2011-2061	Potential dataset for developing or constraining forecast trip ends	
	NTEM v8 Households & Population		2011-2061	Potential dataset for developing forecast trip productions	
	Census JTW		2011/2021	Understanding CPCA internal / external interactions; calibration dataset for mode share and trip distribution for the home-based work (HBW) purpose. Data from 2011 is expected to be used as Census day for 2021 dataset from March of 2021 likely to show high proportions of home working as the COVID-19 travel restrictions were in place.	
Productions (housing) Planning Data	AddressBase Data		2011-Latest	Observed data for spatially detailed internal housing growth 2011-2023	
	ONS Mid year population estimates and Annual Population Survey		2011-2020	Observed data for population estimates	
	Annual Monitoring Reports / LA reports / Gov Live Tables		2011-Latest	Observed data for CPCA internal housing growth 2011-2023	
Attractions (Employment) Planning Data	School Census		Latest available	Observed school capacity data to develop home-based education (HBEd) attractions	
	BRES Data		2011-Latest	Observed jobs data for home-based work (HBW) and employers' business purposes (HBEB, NHBEB)	
	NTEM v8 Jobs & Attractions		2011-2061	To undertake sense checks against locally available data	

Data type	Sources	Importance	Year	Purpose	Suitability
	Jobs data locally available with the districts		2023	Dataset for developing trip attractions for CaPCAM	
Trip matrix and Distributional data					
Car Matrix Data	Mobile network data		2023	Develop car prior matrices for CaPCAM	
LGV Matrix Data	INRIX OD data		2023	Develop van prior matrices for CaPCAM	
HGV Matrix Data	Mobile network data		2023	Develop HGV prior matrices for CaPCAM	
	CSRG		Latest available	Independent verification of HGV mobile network data. Although this dataset is available at a highly aggregated level and only HGVs registered in the UK.	
Bus Data	Operator bus ticket data		2023	Derive bus matrix demand and distribution. Limited information on alighting.	
	Face-to-face surveys		2023	Survey data to be used in conjunction to electronic ticketing machine data to understand the distribution pattern, mode of access to bus stop, trip purpose, time of travel and ticket type.	
Rail Data	LENNON/MOIRA		2023	Derive rail matrix demand and distribution at station level	
	National Rail Travel Survey (NRTS)		2004/2005	To understand the catchments, mode of access, trip purpose at rail stations. Although the dataset is rich in detail, it is outdated. Hence, needs to be used in conjunction with other complementary data sources for the recent years such as station travel plans, face-to-face surveys where available	
	Face-to-face surveys		2023	Survey data to understand the distribution pattern, mode of access to rail stop, trip purpose, time of travel and ticket type.	
Network data					
Highway Network Data	Existing Models described in chapter 3.1		Various	Starting point for defining the highway network	
	OS MasterMap Highways - Road		2023	Used to inform new network and check existing network	

Data type	Sources	Importance	Year	Purpose	Suitability
	Traffic Signals Specification		2023	Used to inform junction capacities in highway network assignments	
Parking Data	Local Authority Car Park Data		2023	Capacity and charging data to input to the demand model	
Public Transport Network Data	GTFS data		2023	Used to inform bus and rail scheduling data. Bus GTFS data will be sourced from Bus Open Data Service (BODS) portal. Rail GTFS data will be sourced from Association of Train Operating Companies (ATOC)	
	Fare data (BODS – NeTEx data, ATOC rail fare data)		2023	Development of fare models from NeTEx and ATOC for bus and rail respectively	
	OS MasterMap Rail		2023	To define the required rail network	
	NaPTAN		2014	Verify GTFS stop locations and infill missing coordinate data where required	
	Bus and Rail Timetables from operators		2023	Independent verification of bus and rail scheduling data from GTFS	
Supplementary Data	TAG Databook		Latest available	Provide generalised cost parameters	
Highway calibration and validation data					
Traffic Count Data	WebTRIS Counts		2023	National Highways traffic flows on motorways and link roads for model calibration and validation	
	ATC Counts		2023	To calibrate matrices and validate model. Use of both existing and newly commissioned.	
	MCC Counts		2023	To calibrate matrices and validate model. Use of both existing and newly commissioned.	
Journey Time Data	INRIX Journey Time Data		2023	Calibrate CPCA network speeds and validate the model	
Public Transport calibration and validation data					
Rail Calibration/Validation Data	MOIRA		2023	Rail station origin-destination data and boardings/alightings	
	ORR		Various – 2023	Validate rail usage – but only annual	

Data type	Sources	Importance	Year	Purpose	Suitability
	Entry/Exit surveys at major terminals	High	2023	Validate rail usage at key stations	High
	Station travel plans	High	Latest	Trip Purpose split, catchments and mode of access for rail stations where available	High
Bus Calibration/Validation Data	Bus ETM data	Low	2023	Validate bus boardings. Alighting information is accurately only for selected ticket types	Medium
	Entry/Exit surveys at major terminals	Low	2023	Validate bus boardings/alightings	High
	Occupancy surveys across cordons/screenlines	Low	2023	To calibrate and validate bus passenger flows	High
P&R Data	P&R Patronage Data	Low	2023	Calibrate P&R use in model. Use of both ticketing and parking sensor data.	High

8.3. Planning data and demand model

The National Trip End Model (NTEM) offers a valuable source of most of the data required to predict changes in trip ends, both trip productions based on household characteristics and trip attractions based on employment etc, as well as car availability forecasts. For planning and demand data, guidance states *“It is highly desirable that the planning data used should at some level be consistent with the DfT NTEM (National Trip End Model) projections.”*. As outlined in Section 7.2, the model will seek to maintain consistency of demand segmentation with NTEM.

NTEM will also be used as a starting point for the base year land use and planning assumptions, as it essentially provides an update to 2011 Census data taking into account projected trends in housing, employment and demographics. NTEM is however a high-level projection which is recently updated in 2022, and can be complemented and enhanced using the following datasets:

- Office for National Statistics mid-year population estimates: provides more detailed age breakdowns, to be used to differentiate children and elderly (see Section 7.2.3);
- The Business Register and Employment Survey (BRES) employment data and Annual Population Survey available via NOMIS website: estimates of employment, population and certain demographic/economic segments are available, and can be used to improve NTEM projections for 2023 in the study area;
- Ordnance Survey AddressBase data for land use information: provides address-based information on residential and commercial properties, which can be used to provide spatially precise information on development levels;
- Information from Local Authorities about the housing and employment development sites between 2021 census to 2023

The NTEM, Census (2011 or 2021 based on the availability) and ONS data are freely available though special licences are required for some BRES data, whilst AddressBase should be obtainable via CPCA. The datasets will be combined with information readily available from the Local Authorities to create the best possible estimate of land use and planning data for the base year.

Travel demand in the base year, in the form of trip productions, will then be calculated using trip rates from NTEM 8.0 or derived from NTS data.

School Census data for 2022 will be downloaded from the Government statistics website <https://www.gov.uk/government/statistics/> for maintained and independent schools to understand the distribution of education attractions within the internal area.

8.3.1. NOMIS statistics

NOMIS is a collection of population and labour market statistics maintained by the Office for National Statistics (ONS). The NOMIS website has been used to access:

- Population Estimates: Mid-year population estimates are the official source of population sizes in-between censuses, rolling forward the population found by the previous census, one year at a time by accounting for births, deaths, international migration and internal migration; to accomplish this multiple registration, survey and administrative data sources are used. It adopts census definition of people who are “usually resident” in the UK for 12 months, excluding short-term migrants, and counting students at their term-time addresses. It covers populations of local authorities, counties, regions and countries of the UK by age and sex. The estimates below LAD level are a bit drifting and therefore less reliable.
- Annual Population Survey (APS): The APS is a continuous household survey, covering the UK. The topics covered include employment and unemployment, as well as housing, ethnicity, religion, health and education. It provides the estimates of the number of people in employment or unemployed.
- Business Register and Employment Survey (BRES): The BRES is an annual employer survey of the number of jobs held, broken down by industry. It is the official source of employee and employment estimates by detailed geography and industry and can be used as an observed comparator dataset for the forecast jobs growth provided by other datasets e.g., NTEM. It should be noted however that BRES is a sample survey and subject to some variation between years which is understood to be due to sample size. Therefore, it is important to analyse and observe trends before using the data and to use the data at a suitably aggregate spatial level.
- Job density: The total number of jobs estimated by Job Density is a workplace-based measure and comprises employee jobs, self-employed, government-supported trainees and HM Forces.

Population Estimates as well as APS estimate population and their economic activities at residence end whilst BRES and Job density measure jobs and employees at workplace end.

These are useful in helping to understand the change in population (either residents or workplace population) since the 2011/2021 Census, as they are the only empirically based annual measures currently available and can be used to adjust both Census and NTEM data. It is important to note, however, that NOMIS statistics are estimated from samples of the population, and as such cannot be considered a definitive, or completely accurate representation of patterns (and less representative than a full census dataset).

8.3.2. National Travel Survey (NTS)

The NTS is an ongoing household interview and travel diary survey designed to provide regular, up-to-date data on personal travel and monitor changes in travel behaviour over time. The survey provides detailed information on different types of travel: where people travel from and to, distance, purpose and mode. The NTS records personal and socio-economic information to distinguish between different types of people, and the differences in the way they travel and how often they do so.

Available NTS data ranges from 2002 to 2021 and covers personal travel by residents of England travelling within Great Britain, from data collected via interviews and a seven-day travel diary.

The Special Licence version (SN 7553) contains more detailed travel, demographic and socio-economic data, and the geographic level is Local Authority/Unitary Authority. This licence will be requested and obtained so that NTS data related to the study area / similar areas may be used. The NTS data sample is very small and geographical breakdowns are particularly weak. Hence data will need to be aggregated across a wide area and multiple years to ensure an adequate sample size. NTS data would be used to provide:

- Trip rates by person type (if not using NTEM directly);
- Time of day profiles by purposes, mode and traveller type;
- Trip length profiles by purpose and mode; and
- Mode choice profiles by purpose and traveller type by home area type (urban / rural);

National data is published by the DfT online. Detailed analysis of the raw NTS dataset for CPCA will be conducted as part of model development. As noted the sample size within CPCA region will be limited. Accordingly, our use of the raw data will be limited to trip rates, mode shares, trip lengths and other useful aggregate measures.

8.3.3. Census data

Data from the 2011 Census still provides an extensive source of data on the breakdown of population in the county, and economic circumstances that inform travel patterns, though it is now very dated and unlikely to be representative of commuting patterns in areas which have undergone significant changes in the past ten years.

The Census 2011 Journey-to-work (JTW) data is a vital component of the base year model building and calibration. This data provides a complete picture of the home and work locations of employed people, as well as the method of travel to work, for 2011. It is noted that the data represents the home location, usual workplace and their usual mode of travel to work. No information is provided on actual daily individual trips. The total volume of people in the Census JTW data is greater than observed daily trips as not everyone goes to their usual workplace every day. These are compiled to allow calibration of mode share, trip lengths and patterns of travel in the demand model as well as being used as a comparator dataset during base matrix development. Census JTW data can be downloaded for each MSOA within England and Wales. This dataset details how individuals completing the 2011 Census stated that they travel to their regular place of work.

The first results of Census 2021 are now available and more data is expected to be released over the next year. Where feasible, an attempt will be made to use the 2021 data. However, as for the 2021 Census the COVID-19 travel restrictions/advice was still in place, the data is expected to show very high levels of home working.

8.3.4. AddressBase database (ABD)

AddressBase Data (ABD) provides a source of residential and commercial property data which allows identification of individual properties, including year of first occupancy or change of use. This can be used to understand the change in land use (from 2011 to the 2023 base year) at a spatially detailed level.

8.3.5. Annual Monitoring Reports (AMRs)

Annual Monitoring Reports (AMRs) are produced annually by local authorities to review progress against their latest adopted Local Plan. A range of measures are reported on, including the number of dwellings that have been built out or demolished over the course of the year within the local authority. These provide a clear record of the residential growth (and demolitions) the Local Authority is aware of within their district and can be used as a comparator dataset, along with the AddressBase data, to validate the NTEM household data.

AMRs for the historic years will be obtained for each of the local authorities within CPCA.

8.3.6. School capacity data

The school census is carried out each year and every school is required to submit information, including capacity data, to the Department for Education. School capacity data for the latest available year will be downloaded for all of England and then filtered to only include schools within CPCA.

8.4. Trip Matrix and Distributional Data

8.4.1. Base year demand

There is no single source of data which would provide all the information required for satisfactory trip matrices. It is therefore critical to maximise the quality of the trip matrices by integrating information from a range of data sources, including:

- Mobile network data (MND) for trips intercepting a cordon containing the study area (i.e. trips within, into, out of or through the study area for a neutral period in 2023). TAG advises to collect data over 3 months if day-to-day variability needs to be studied. The time period, days of the week, segmentation required will be agreed with CPCA before commissioning the data collection. A mobile network data (MND) provider will be chosen by competitive tender to provide demand data for a matrix of movements covering the study area (in detailed zones) and the rest of GB at a more aggregate level.
- Public transport ticket data from bus and rail companies;
- Face-to-face public transport surveys
- National Rail Travel Survey (NRTS) data
- INRIX (formerly Trafficmaster) LGV OD data;
- Continuing Survey of Road Goods Transport (CSRGT) for HGV;
- National Travel Survey (NTS) data;
- Planning data used to derive trip-end estimates;
- The DfT's National Trip-End Model (NTEM);
- Existing and new traffic counts for trunk and motorway networks and for local authority roads; and
- ANPR data available for the Cambridge Area from 2017.

If deemed suitable, 2011 Census data will be further used in matrix development and verification as follows:

- Census population totals and Journey to Work (JTW) totals to compare against MND trip ends
- Census JTW trip distributions

This data is provided by Office for National Statistics (ONS). Census Data Census journey to work data can be downloaded from the Government data website <http://data.gov.uk/> and also at <http://www.nomisweb.co.uk/>.

8.4.2. Time period profiles – NTS / traffic counts

Trip time of day profiles will be derived from existing and collected data sources, such as:

- National Travel Survey (NTS) data;
- Traffic counts for trunk and motorway networks and for local authority roads; and
- ANPR data available for the Cambridge Area from 2017.

8.5. Network Data

The following are the key data sources that will be utilised to develop the CPCA model network:

- Existing models described in chapter 3.1;
- OS MasterMap Highway Layer (available via DfT as part of licence for INRIX)
- Traffic signal specifications
- OpenStreetMap walk and cycle link data (from <https://www.openstreetmap.org>);
- National Rail network shapefile
- National Public Transport Access Nodes (NaPTAN);
- Bus and Rail timetables (BODS and ATOC):
- Basemap TRACC;
- MOIRA Rail timetables;
- Aerial photographs
- Online mapping and satellite imaging such as Google Maps and StreetMap

8.5.1. Signal timings

Data will be required for signal-controlled junctions. This will be based on staging plans provided by the local authorities where possible. Where average green time data exist, these data will be used in the model directly, with averages or assumptions required for some junctions. Intergreen times will be taken directly from signal timing sheets.

As level crossings will be modelled as a form of signalised junction, data will be required on barrier down times during the modelled periods and the impact on the flow of traffic.

8.5.2. Parking costs and supply

Car park data will focus on the following key areas for the internal model area. No parking information will be collated for the external model area.

- Railway station parking – capacity, occupancy counts (if available) and parking charge information;
- P&R sites – capacity, usage counts (if available) and parking charge information; and
- Area-wide parking charge information (with capacity information for major parking locations).

Requests for the above car park data will be sent to the Local Authorities. If no data can be provided, data will be trawled from the open source Parkopedia website: <https://en.parkopedia.co.uk/>

P&R usage data will be requested for Local Authority operators for all existing formal P&R sites. Usage and occupancy data for Major station car parks will be requested from Network Rail. This information will be used both to develop base year highway and PT matrices (so that they reflect both car and bus trips to and from the P&R sites) as well as in calibration of the base year P&R model choice model.

8.5.3. PT service information / timetables

The information on bus rail routes and service schedules will be obtained from Bus Open Data Service³ (BODS) in General Transit Feed Specification (GTFS) format to build the model network.

The primary dataset for rail schedules will be sourced from Association of Train Operating companies (ATOC) in GTFS format. Rail schedules will be checked against MOIRA and operator websites, particularly regarding routing and for services where possible.

Timetable data defines bus routes as a sequence of stops along the route but does not provide details of the route between stops. Modelling software typically selects the shortest/fastest route between stops which can be different to the route actually taken. Exact routing between stops don't define the travel time as it is based on scheduled information, but the route course will have an impact on bus vehicular flows transferred to highway assignment. So, once the stopping patterns of routes have been established on the network it is necessary to manually check and edit where necessary the routing between stops.

8.5.4. PT fares

Fare systems and charging rates will be obtained from BODS in NeTEx format and will be sense checked against the data available from the operator websites. Public transport assignment softwares typically allow a

³ <https://www.bus-data.dft.gov.uk/>

range of fare systems including distance based, station-station, cordons and flat fares. A detailed evaluation of different fare types available in the study area and appropriate fare systems will be used in the assignment model. We have automated processes to extract numerous station to station rail fares for different ticket types. Operator data will be obtained to undertake an analysis of concessionary fares available and used so that fares charged represent typical average fares paid for each journey purpose. Fares will be varied by time period and trip purpose (concessionary fare for education trips for example).

8.5.5. TAG databook – values of time, vehicle operating costs

VoTs and VOCs will be derived from the TAG databook current at the time of implementation, the forthcoming version of which is November 2022. The base year vehicle operating costs (VOCs) will be calculated using the standard formulation set out in the TAG databook. In line with guidance, fuel costs will be included for all trip purposes, whilst non-fuel costs will only be perceived by the employer's business trips.

8.6. Highway model data

8.6.1. Traffic count surveys

TAG recommends long-term count data to be used in model development due to the greater level of accuracy that such data provides compared to two-week automatic traffic count data or one-day manually observed counts for links and turns. However, traffic surveys are essential to fill the data gaps. Additionally, manual observed count surveys provide valuable information in terms of vehicle composition. Manual turning count surveys need more time and effort but are useful for validation of junction turn flows. Turning counts are carried out in the same manner as manual counts for each turn. The existing permanent counter data will be collated and mapped to understand the data gaps before commissioning these traffic surveys.

All survey data will be checked for bias due to any unusual events and investigated thoroughly for outliers.

8.6.2. Definition of set of screenlines and cordons for highway calibration and validation

All the available count data will be collated and mapped to design a series of screenlines and cordons to assist the model calibration and validation. Additional traffic data surveys will be commissioned to fill the gaps in designed screenline and cordons. These collections of counts, when aggregated to form boundaries along or around areas, provide useful measures of total volumes entering or leaving areas in the model. TAG unit M3.1 advises a minimum of 5 counts for each screenline with comparisons to be presented with and without motorway counts included for each screenline.

8.6.3. Highway journey time routes

It is not proposed that any form of travel time surveys will be undertaken as part of the primary data collection activities. Data from INRIX will be available for travel time across most roads derived from Global Positioning Systems (GPS) data from in-vehicle technology. This data will have much larger sample-sizes than any form of Moving Car Observer (MCO) based primary data collection that may otherwise be undertaken; however, this does not remove the requirement to review and understand the level of confidence in the data.

Checks will be undertaken on speeds within the proposed model time periods, against free flow speeds (off peak speeds as well as posted speed limit data) to ensure that the expected patterns of speed changes are observed between modelling time periods. INRIX data also provides confidence intervals around link travel times; this will be investigated and any data uncertainty reporting in the data collation report.

These INRIX travel times will be used to validate the modelled highway journey times in the model. The data will be interrogated on a link basis and the observations for a sequence of links making up a determined journey time route will be summed to provided junction-to-junction (model link) travel times.

8.7. Public Transport model data

8.7.1. Rail station usage data

The Office of Rail and Road (ORR) publishes rail statistics about rail performance, usage and safety on an annual basis. This data is publicly available via the ORR website (<http://orr.gov.uk/statistics>), with detailed data accessed via an online portal. Relevant data for Cambridgeshire area will be downloaded from the ORR website including station usage statistics and regional rail usage statistics, summarising the level and

distribution of annual passenger journey. The station usage data provides an estimate of annual railway station passenger entries/exits and interchanges for each financial year from 1997/98 to 2021/22 (except 2003/04).

8.7.2. Rail passenger data

Greater Anglia's (GA) version of MOIRA will be procured for this study. Both the demand (ticket sales) and supply (timetables) will be procured from the Rail Delivery Group for year 2022/23. Demand data is available as annual datasets of "Year to March" and "Year to September" and the timetables are available as summer and winter versions. Further, the ticketing data is split by ticket type (full, reduced and season). Wednesday, December 2019 train timetabling data from MOIRA is used to provide the profile of demand by time of day (AM peak, inter-peak, PM peak and evening/overnight).

MOIRA journeys data specific to the Greater Anglia's franchise area can be obtained. The dataset is commercially sensitive and will be used with permission from Rail Delivery Group, subject to following conditions.

- Journeys only, not revenue data, is provided;
- Data to be used for the CaPCAM model development current work only, and deleted once the work is complete;
- All outputs are treated confidentially and only aggregations are published.

8.7.3. National Rail Travel Survey (NRTS)

None of the rail ticketing datasets provide information about the true origin/destination (home or attraction end) of the trip as they all focus on the station-to-station travel patterns. However, it is helpful to understand the rail station catchments, mode of access/egress and purpose splits for the rail matrix development rather than relying entirely on synthesised results from the VDM.

National Rail Travel Survey (NRTS) data will be obtained from the DfT and reviewed to inform the rail station catchments and mode of access/egress to rail stations in CPCA area. This data is very old and based on a sample of passengers surveyed and hence will be of limited value particularly given the opening of Cambridge North station. The majority of the data was collected in 2001 from London Area Travel Survey (LATS) project, with newer national data collected between 2004 and 2005. The data represents weekday travel outside school holiday periods. Although the NRTS surveys were undertaken in 2000s, the dataset provides the most granular information for rail travel. Given that the data is old, care will be taken to ensure it is used sensibly for the rail matrix development. Also, necessary sense checks will be undertaken by comparing it with aggregate information available for the most recent years.

8.7.4. Bus Electronic Ticketing Machine (ETM) Data

Bus ETM data will be acquired from major bus operators in the study area. These datasets provide useful information about the boardings by route, time, ticket type and farestage (a small group of bus stops). It is to be noted that alighting fare stage is unavailable for significant proportion of ticket sales such as season ticket sales, day riders etc. and is only accurate for ticket types such as Single, Return tickets.

Data variability analysis will be undertaken to identify any unusual events and extreme outliers.

8.7.5. Public Transport Surveys

After discussions with the client, public transport surveys will be commissioned to facilitate a robust model build. It is essential understand travel patterns, mode of access/egress, station catchments and trip purpose to realistically represent the demand in the model. It is expected that the surveys will be commissioned at both rail and bus stations. Different types of public transport surveys that can be commissioned are listed below-

- Entry/Exit surveys
- Occupancy surveys
- On-board face-to-face/self-completion surveys
- At station face-to-face/self-completion surveys

Each of these surveys have their own advantages and disadvantages. TAG unit M1.2 advises about the preferred approach for the public transport surveys and due consideration will be given to this advice depending upon the other constraints. This survey data is expected to be used in conjunction with the ticketing machine data.

8.7.6. PT Screenlines/Cordons

Validation of public transport trip matrix involves comparison of assigned flows against passenger counts across complete screenlines and cordons. Bus occupancy surveys will be commissioned to arrive at passenger counts at service level aggregated to link level. Occupancy surveys can sometimes be combined with on-board surveys with enumerators recording the total passengers within the bus along with total boarders/alighters at each stop.

Estimates of passengers counts made by observers standing at the roadside are not generally accepted as they are not sufficiently accurate for modelling purposes, and it is essential to seek permission from operators to stop the service and enumerator records the total passengers by boarding the service at required cordon/screenline points. Screenlines and cordons will be designed to understand the total volumes entering and leaving key areas with due consideration for major public transport hubs and corridors.

8.7.7. P&R site usage – cars, bus passengers, other modes (park & cycle, walk & bus)

To robustly model park & ride sites, it is essential to understand the public transport ridership, the supply of parking and fares. Ticketing information from the operators will be acquired to understand the boardings at each P&R site. Information from electronic parking payment machines or vehicle loop detectors (where available) will be requested to understand the parking usage. Duration of stay by trip purpose and number of vehicles entering and leaving the P&R site for each modelled time period will be studied. If needed, interviews will be conducted to understand the mode of access, true origin/destination (catchment), trip purpose and duration. The information needed is similar for both bus P&R and rail stations.

8.7.8. Cycle counts – screenlines

CCC's annual cycle route monitoring sites provide pedestrian and cycle counts at key locations and the classified counts for the Cambridge radial cordon and river screenline provide data which can be use for active mode calibration and validation.

At this stage it is not anticipated that the walk and cycle assignment would be validated outside Cambridge. Should this be required, eg for Peterborough, additional data and resource would be required.

9. Forecasting

9.1. Introduction

This chapter summarises the plan for the forecasting and the treatment of uncertainty in relation to supply and demand changes. Our proposal is for two main scenarios to be built initially which are expected to act as the point of reference for scheme development and appraisal.

1. The Local Plan scenario
2. NTEM growth scenario

It also discusses about the potential sensitivity tests (section 9.4) that can be undertaken to understand the model behaviour ahead of using the model for scheme appraisal. These sensitivity tests are not included in the current scope of the work and could be commissioned post discussing with the client close to the completion of the base model build.

9.2. Forecast scenarios

9.2.1. Local Plan scenario

The Local Plan scenario is assumed to be the “default” forecast for future travel demand and supply for CaPCAM, including:

- Development sites and schemes in line with a managed Uncertainty log;
- Growth in employment, housing and population in CPCA authorities in line with locally agreed variants (e.g., Local Plan);
- Trends in demographics, car ownership, household size and types of employment in line with current NTEM;
- External development growth in line with the current NTEM forecasts, or variants agreed with neighbouring authorities where appropriate; and
- Economic inputs and cost parameters⁴ following ‘default’ TAG assumptions.

9.2.2. NTEM growth scenario

The NTEM growth scenario is based on the forecasts contained in the Department for Transport National Trip End Model (NTEM) dataset. The NTEM V8.0 Core Scenario growth trends will be used for this forecast scenario development. It is expected that the local plan scenario forecasts will form the patterns of growth for the NTEM Growth scenario where the growth will be constrained to NTEM forecast growth at either district level or for the modelled area (Cambridgeshire and Peterborough).

It is to be noted that NTEM V8.0 also provides several other scenarios such as low, high, behaviour change and a regional scenario. The proposed scope of work includes the assessment based on the NTEM Core scenario and if there is a need, forecast scenarios based on the other NTEM scenarios will be discussed with the client and commissioned as necessary.

9.2.3. Purpose of the scenarios

Depending on the context of the scheme appraisal, either the Local Plan scenario or the NTEM growth scenario is expected to act as a ‘Do Minimum’, though it is likely that some adjustment will normally be needed. The purpose of these scenarios is:

- To provide a common reference point from which other scenarios can be created, including Do Minimum cases for testing specific policies/schemes;
- To facilitate the creation of the necessary processes and logs to create and manage future CPCA scenarios; and
- to illustrate credible operation of the model, mainly in respect of its response to future demand drivers (changes in population and employment).

⁴ Vehicle operating costs and values of time based on national GDP growth assumptions

9.3. Uncertainty and other assumptions

9.3.1. Treatment of Uncertainty

The Local Plan Scenario would seek to represent a “Default” scenario which can act as the point of reference for investigation, scheme development and appraisal. As such, following TAG Unit M4 guidance it should look to include all developments and schemes either complete since the base year or classified as either ‘Near Certain’ or ‘More than Likely’ (as per definitions set out in TAG unit M4 Table A2). These known future changes would be compared against growth projections in the NTEM Version 8.0 dataset to understand the key differences. The aim would be to compare specific growth information available locally (e.g. developments in the Uncertainty Log, and any local projections of employment and demographics) with the information in NTEM.

As such, the Local Plan Scenario aims to be:

- Unbiased (as likely to be over or under achieved, given existing plans and evidence)
- Coherent and self-consistent (if X is unlikely to go ahead unless Y also goes ahead, then X should only be included if Y is also included); and
- Realistic and plausible.

In short, it will represent a scenario based on the most unbiased and realistic set of assumptions that will form the point of reference for further investigation (such as scheme appraisal, development of lane use strategy or analysis of behaviour change).

For the NTEM Growth Scenario, the Local Plan growth will be constrained in line with NTEM V8.0 core projections (as required for scheme appraisal work seeking funding from / approval by DfT). This would be agreed following the comparison of Uncertainty Log assumptions against overall projections within NTEM V8.0.

There is of course considerable uncertainty about how the transport system will evolve in the future, particularly with the potential for emerging trends in behaviour and technology to drive significant change over time. To ensure decision making is resilient to future uncertainty, decision makers need to understand how the outcomes of spending and policy proposals may differ under varying assumptions about the future. Analysis and presentation of uncertainty enables analysts, scheme promoters, and the decision makers they support, to better recognise and account for the uncertainty they face.

9.3.2. Uncertainty log

It is assumed that CCC and PCC will collate the information from the local authorities and provide us with an uncertainty log of committed local supply and demand changes. The Log should include all known developments regardless of their likelihood then categorised in line with TAG unit M4 definitions (set out in Figure 9–1). It is assumed that all committed “supply” scheme designs or model assumptions, and location and scale of demand (development) will be provided as well.

This work includes the provision of the Uncertainty Log, and selection / clarification of the developments and schemes to be included in the forecast scenarios with sufficient detail as per model needs. Processes for the management and upkeep of the Uncertainty Log are advisable but are not included here.

It is expected that uncertainty log provided below information shown in Table 9 to realistically represent them in the model. An example template will be shared with CCC and PCC.

Table 9-1 – Uncertainty log information

Type	Required Information
Housing development	Location, Number of dwellings, Opening year, Phasing schedule, Population (optional), Planning application status, Uncertainty
Employment/Retail development	Location, Number of jobs, Gross Floor Area, Type and classification of landuse, Opening year, Phasing schedule, Planning application status, Uncertainty
Schools	Location, number of school places, Primary/Secondary/Tertiary, Uncertainty
Road schemes	Opening year, Detailed Scheme Plan with lane allocation, Signal plans if available, Uncertainty for both local and national schemes
Car Parks	Location, number of spaces, fare, restrictions (if any), Uncertainty

Type	Required Information
Public Transport Schemes	Opening year, Detailed scheme plan, Dedicated right of way/ shared use, Service Frequency, Stopping frequency, travel times, Fare structure, Uncertainty for both local and national schemes
Park & Ride	Refer PT schemes + parking spaces, parking fee, restrictions or incentives for users (if any)
Cycle infrastructure	Opening year, Dedicated right of way/ shared use, Gradient, Crossings, Advanced stop lines

Figure 9–1 – DfT TAG Uncertainty Log definitions⁵

Probability of the Input	Status	Core Scenario Assumption
Near certain: The outcome will happen or there is a high probability that it will happen.	Intent announced by proponent to regulatory agencies. Approved development proposals. Projects under construction.	This should form part of the core scenario
More than likely: The outcome is likely to happen but there is some uncertainty.	Submission of planning or consent application imminent. Development application within the consent process.	This could form part of the core scenario [Refer to Section Developing the Core Scenario]
Reasonably foreseeable: The outcome may happen, but there is significant uncertainty	Identified within a development plan. Not directly associated with the transport strategy/scheme, but may occur if the strategy/scheme is implemented. Development conditional upon the transport strategy/scheme proceeding. Or, a committed policy goal, subject to tests (e.g. of deliverability) whose outcomes are subject to significant uncertainty	These should be excluded from the core scenario but may form part of the alternative scenarios
Hypothetical: There is considerable uncertainty whether the outcome will ever happen.	Conjecture based upon currently available information. Discussed on a conceptual basis. One of a number of possible inputs in an initial consultation process. Or, a policy aspiration	These should be excluded from the core scenario but may form part of the alternative scenarios

9.3.3. Forecast years

It is assumed that three forecast years will be included for both the Local Plan and NTEM Growth scenarios, this will be determined after discussing with CPCA. Based on the initial discussions, forecast years are expected to be 2031, 2036 and 2041.

9.3.4. Supply assumptions

We have assumed that there is a moderate amount of change from the base year in both the highway and public transport supply (network) changes. It is assumed that this might require coding up to 10 corridor changes. If schemes that require considerable time inputs are identified within the uncertainty log, scope and budget will be additionally agreed with CPCA.

9.3.5. National forecast parameter assumptions

The latest DfT TAG databook values will be assumed as the starting point for any data unless it is locally available. DfT NTEM8 “core” scenario is assumed as the basis for the NTEM Growth scenario. Any amendment will be clear and transparent and will be agreed with CPCA. The nature of changes which could be adjusted are presented in section 9.4 as part of one of the sensitivity tests.

⁵ Source: [TAG unit M4 - Forecasting and Uncertainty](#)

9.4. Sensitivity Tests

It is essential that there is a clear and well-managed process for creating alternative scenarios. It is envisaged that over time a variety of scenarios for development, demand, infrastructure, and other aspects will be created. These would preferably be available to re-use in whole or part for future studies, and the Local Plan Scenario itself will be expected to evolve over time.

To establish a robust process for scenario generation and understand the model behaviour in advance of the scheme testing, type of sensitivity tests that can be undertaken are set out in shown in Table 9. These tests will demonstrate how the model responds to user specified changes in inputs, model strengths/weaknesses and ensure that model responses are satisfactory. The sensitivity tests are intended as “softer” tests compared with the more rigorous validation and realism testing. These are not designed to exhaustively test all model functionality, or responses to all possible tests, but to demonstrate overall model functionality and responsiveness.

Additionally, the DfT Uncertainty Toolkit (published August 2022) states that analysis should not focus exclusively on a “Core Scenario” and the consideration of wider “what if” scenarios should be undertaken. It introduces the six Common Analytical Scenarios – which are central to how the DfT intends to approach uncertainty in transport analysis. This includes:

- High Economy
- Low Economy
- Regional
- Behavioural Change
- Technology
- Decarbonisation – Vehicle led
- Decarbonisation – Mode-balanced

The Toolkit sets out how these scenarios should be considered and when it is proportionate to do so. It is important to have an awareness of these requirements and to consider the need for these in future scheme appraisal. It may also be necessary therefore to consider whether tests of the Common Analytical Scenarios will be needed.

As well as ensuring that the model runs technically, it is important that the model is demonstrated to produce sensible results and that stakeholders understand, and are satisfied with, the way the model runs and the nature of the results produced.

Table 9-2 - Sensitivity test summary

Test and theme	Description
1 Demand growth	Growth in travel demand including changes in car ownership
2 Highway supply	Changes to highway infrastructure in some areas
3 PT changes	Changes to supply of bus or rail services in some areas
4 Targeted road user charging	Distance based charge on subset of the highway network
5 Urban area	Change to urban areas via speed limits and potentially parking charges, walk and cycle strategies.
6 NTEM Common analytical Scenarios	Wider “what if” scenarios as listed in the DfT Uncertainty toolkit

It is to be noted that the current scope of work doesn’t include these sensitivity tests and will be agreed additionally with CPCA close to the completion of the base model build.

10. Outputs and analysis

10.1. Standard analyses

A standard suite of analyses will be produced during the development of CaPCAM that can be used to rapidly analyse model runs and aid interpretation of results.

Inputs of land use (employment and dwellings), trip generation and outputs of mode shares, distribution patterns, trip length distributions, down to detailed analysis of flows assigned to the modal networks and individual junction delays will be generated for each time period modelled and available at the modelled level of segmentation and aggregated summaries.

A suite of standard sector systems with varying degrees of detail will be developed during model development for use in the analysis of model runs.

Where possible this standard set of analyses will be generated by automated processes to aid rapid understand of results.

10.1.1. Mapping

Mapping of model outputs will be central to the interpretation of CaPCAM runs and GIS software, Visum's built-in mapping functionality, and the Atkins Data Viz (ADV) tool will be used as appropriate to provide visualisation of model outputs at the node, link, zone and sector level.

There are various GIS packages available on the market. For ease of access, we recommend QGIS as it is open source, widely adopted, and provides all the necessary functionality.

The ADV tool will provide access to visualisation of model outputs via a modern web browser, without the need for specialist GIS or modelling software.

10.2. Appraisal requirements

CaPCAM is intended to be used to assess transport interventions using the DfT TAG process. Outputs from CaPCAM may also be required for separate downstream environmental, economic, social and operational assessments. These will typically comprise of standard outputs from the model, however the interface between them and CaPCAM is not included in this specification. It is recommended that CCC engage with the specialist teams who are likely to utilise the outputs and ensure the model will be able to meet their requirements.

10.2.1. Environmental assessment

CaPCAM will be capable of highlighting the impacts of changes at a strategic travel, which can be used for input to separate air quality and noise models for appraisal. The model will be capable of outputting actual and demand flow changes, average speeds, and indication as to the levels of congestion on a link-by-link basis. The model will be able to produce outputs in formats typically required by these teams (24-hour Annual Average Daily Traffic and 18-hour Annual Average Weekday Traffic).

In addition to this, the model will be capable of producing carbon emission statistics at the individual link and aggregate zone, sector, district or study area level. Note that the model will not provide embedded carbon values – these will need to be provided externally.

10.2.2. Economic appraisal

CaPCAM will be capable of producing outputs for use in typical economic assessment, such as input into the DfT's TUBA and WITA software. It will also be capable of producing outputs to inform COBALT accident assessments and a range of other typical economic appraisal packages.

10.2.3. Social impacts

CaPCAM will be capable of highlighting the impacts of changes in strategic travel on social measures. In particular, the visualisation and mapping outputs will provide data which can be used to visualise: speed change, severance, accessibility and distributional impacts.

The demand model will provide more segmented results enabling scenario impacts on modal shift or redistribution to be associated with particular categories of trip.

10.2.4. Operational assessment

CaPCAM will be able to act as a donor to local, operational models or cordon regions (such as micro-simulation (PTV Vissim, Paramics etc.) and local junction software including LinSig and ARCADY. Although CapCAM will donate information for more local models, more detailed validation will be required and local enhancements are likely to be required for application to schemes seeking funding.



This sheet summarises the spend profile for CaPCAM development against the project plan

Programme (copy of that on "Programme" worksheet)																				
Task		Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	
Inception																				
Data Collection																				
Setup tasks																				
Data Processing																				
Highway Network Development																				
Highway Matrix Development																				
PT Network Development																				
PT Matrix Development																				
Demand Model Development																				
HAM Cal/Val																				
PT Cal/Val																				
Integration of HAM, PTAM, VDM																				
Forecasting																				
Reporting																				
Project Management																				
Technical Review																				
Deliverables																				
Data Collection Report																				
Base Model																				
Model Development and Validation Report																				
Forecast Model																				
Forecasting Report																				
Forecast Costs		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Item	Description	Total	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
1	Software licensing costs	£ 65,559		£ 53,156												£ 12,403				
2	Data Collection (estimate)	£ 800,000	£ 114,286	£ 114,286	£ 114,286	£ 114,286	£ 114,286	£ 114,286	£ 114,284											
3	Atkins model development costs	£ 450,000	£ 9,000	£ 21,000	£ 30,000	£ 30,000	£ 30,000	£ 32,500	£ 32,500	£ 32,500	£ 32,500	£ 30,000	£ 32,500	£ 31,500	£ 31,500	£ 16,500	£ 16,500	£ 16,500	£ 16,500	£ 8,500
4	WSP model development costs	£ 450,000	£ 9,000	£ 21,000	£ 30,000	£ 30,000	£ 30,000	£ 32,500	£ 32,500	£ 32,500	£ 32,500	£ 30,000	£ 32,500	£ 31,500	£ 31,500	£ 16,500	£ 16,500	£ 16,500	£ 16,500	£ 8,500
5	CCC Staff costs	£ 281,006	£ 8,296	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042	£ 16,042
6	Total	£ 2,046,566	£ 140,582	£ 225,484	£ 190,328	£ 190,328	£ 190,328	£ 195,328	£ 195,326	£ 81,042	£ 81,042	£ 76,042	£ 81,042	£ 79,042	£ 79,042	£ 61,445	£ 49,042	£ 49,042	£ 49,042	£ 33,042
7	Cumulative Total		£ 140,582	£ 366,066	£ 556,394	£ 746,722	£ 937,049	£ 1,132,377	£ 1,327,703	£ 1,408,745	£ 1,489,786	£ 1,565,828	£ 1,646,870	£ 1,725,912	£ 1,804,954	£ 1,866,398	£ 1,915,440	£ 1,964,482	£ 2,013,524	£ 2,046,566



**CAMBRIDGESHIRE
& PETERBOROUGH**
COMBINED AUTHORITY

Agenda Item No: 2.5

March Area Transport Study (MATS)

To: Transport and Infrastructure Committee

Meeting Date: 18th January 2023

Public report: Yes

Lead Member: Cllr Anna Smith, Chair of Transport and Infrastructure Committee

From: Emma White, Transport Programme Manager

Key decision: N/A

Forward Plan ref: N/A

Recommendations: The Transport and Infrastructure Committee is recommended to:

- a) Note completion of the MATS Full Business Case 1 (FBC1);
- b) Recommend to the Combined Authority Board to approve the drawdown of £4,149,825 for the construction of MATS Broad Street;
- c) Recommend to the Combined Authority Board to approve the drawdown of £300,000 for the completion of the FBC 2; and
- d) Delegate authority to the Interim Head of Transport in consultation with the Chief Finance Officer and Monitoring Officer to enter into Grant Funding Agreements with Cambridgeshire County Council.

Voting arrangements: For recommendations b) and c) A vote in favour by at least two thirds of all Members (or their Substitute Members) appointed by the Constituent Councils who are present and voting, to include the Members appointed by Cambridgeshire County Council and Peterborough City Council, or their Substitute Members

For recommendation d) A simple majority of all Members present and voting

To be carried, the vote must include the vote of the Mayor, or the Deputy Mayor when acting in place of the Mayor.

1 Purpose

- 1.1 This report summarises the conclusion of the completed March Area Transport Study (MATS) Full Business Case 1 (FBC1) with the recommendation to the Transport and Infrastructure Committee to recommend to the Combined Authority Board to approve the drawdown of £300,000 to complete the Full Business Case 2 (FBC2) and £4,149,825 for the construction of MATS Broad Street Scheme.

2 Background

- 2.1 The MATS was first approved for inclusion in the Transport Programme at the March 2018 by the Combined Authority. Following this Cambridgeshire County Council (CCC) took forward the study to establish the issues and find potential solutions to address these in an efficient and effective manner.
- 2.2 Fenland District Council's vision for the area is outlined within its Local Plan published in 2014. The aim is '*to maximise the potential of the area and deliver jobs, skills, improved housing and new infrastructure*', and make the district '*a better place to live, work and visit*'. The Local Plan includes the delivery of 4,200 new homes in March as well 30 hectares of employment land to provide new jobs
- 2.3 The 2011 MATS Study provided the transport evidence base for the Local Plan and assessed the impact of traffic growth resulting from its implementation. In addition, it proposed measures to improve the towns transport network for both current and future traffic demand. The current MATS builds upon this work and assesses potential improvement options to deliver future economic and housing growth
- 2.4 The MATS Strategic Outline Business Case (SOBC) was submitted in October 2020 and the Outline Business Case (OBC) was tabled at the Combined Authority Board in November 2021 along with approval for the next stage of the MATS project including Full Business Case (FBC) and Detailed Design. This paper also outlined within its Other Significant Implications section that the Future High Street Fund (FHSF) scheme was reliant on the MATS Broad Street project undertaking detailed design and commencing construction.
- 2.5 In March 2022 it was approved to re-purpose £586,205 of the FHSF to undertake initial stages of the MATS Broad Street project. In October 2022 it was tabled that the Full Business Case process would be divided into phases to meet delivery deadlines of the MATS Broad Street scheme as well as approving the initial funding for FBC 2.
- 2.6 As part of the MATS study a package of minor schemes were approved for delivery in September 2020 which included nine schemes of which most are complete. In October 2022, the Combined Authority Board approved the commencement of the Walking and Cycling (Active Travel) Strategy.

Full Business Case 1 (FBC1)

- 2.7 The MATS FBC is presented in three phases, with each phase focusing on the delivery of different schemes from the overall MATS package. Each phase will present the case for investment for the whole MATS package, confirming the strategic benefits associated with delivering all five schemes, as well as demonstrating that the funding for each phase will still deliver value and benefits should future phases falter. FBC 1 focuses on the Broad Street

Scheme.

2.8 FBC 1 is split into five dimensions, each of which is summarised below.

Strategic Dimension

2.9 The Strategic Dimension considered the policy context in which the MATS schemes has been developed as well as the need for intervention. The recommended package of MATS Improvement Schemes strongly aligns with the vision and objectives of national, regional, and local policies and the need for interventions are summarised as:

- The need for regeneration in March Town Centre.
- The need to address existing traffic congestion and safety issues.
- The need to facilitate housing and employment growth across March.
- The need to improve local environmental conditions.

Economic Dimension

2.10 The Economic Dimension demonstrates that the MATS schemes achieve a Benefit to Cost Ratio of 2.23 and offers High Value for Money. The MATS Broad Street Scheme has a core BCR of 8.37, which equates to Very High Value for Money.

Financial Dimension

2.11 The Financial Dimension demonstrates that the scheme has been robustly costed and fits with the funding allocation available. The Broad Street Scheme Outturn Cost is £4,149,825 which includes risk allowance and inflation costs through to the end of construction in 2024. The Broad Street scheme is funded through the Transport Forming Cities Funding. The funding for the other schemes in MATS will be explored in FBC2.

Commercial Dimension

2.12 The Commercial Dimension demonstrates that the recommended package of MATS Improvement Schemes can be effectively procured commercially viable and confirms the procurement strategy for the MATS Broad Street Scheme which will be let via the Eastern Highways Alliance (EHA). The procurement for the other schemes in MATS will be explored in FBC2.

Management Dimension

2.13 The Management Dimension demonstrates that the recommended package of MATS Improvement Schemes is deliverable through governance, organisational structures and roles, lines of accountability and resourcing. Evidence of similar projects also compliments this dimension.

2.14 Throughout each design stages cycling, and pedestrian requirements have been considered and provisions included within the MATS Broad Street proposals. Appendix 2 details the March Broad Street Walking, Cycling, Horse Riding Assessment Report, and further information on the LTN 1/20 considerations can be found in Appendix 3.

Full Business Case 2 (FBC2)

- 2.15 For completion of Full Business Case 2 (FBC2) approval for £300,000 is required. This Business Case focuses on St Peters Road, Peas Hill, and Twenty Foot Road, with NILR remaining at an Outline Business Case level.

3 Significant Implications

- 3.1 The MATS Broad Street project and the March FHSF projects are intrinsically linked, and one cannot be successfully built without the other.

4 Financial Implications

- 4.1 MATS Broad Scheme is Transforming Cities funding (TCF) therefore construction needs to commence before March 2022 and be complete by March 2023.
- 4.2 Drawdown a total of £4,149,825 and £300,000 from the Medium-Term Financial Plan) to support delivery of this scheme.
- 4.3 The scheme funding is provided through the funding received for Transforming Cities Funds (TCF).

5 Legal Implications

- 5.1 N/A.

6 Public Health Implications

- 6.1 The MATS has a positive implication for public health. The scheme will deliver significant transport user, air quality, and accident benefits. The MATS Broad Street Scheme in particular will improve air quality by significantly reducing queues and idling traffic along Broad Street through the removal of the traffic signal-controlled junction.
- 6.2 The MATS Broad Street Scheme will reduce road space allocated to vehicles and provide an additional uncontrolled crossing on Broad Street, which will improve pedestrian accessibility aiming to improve sustainable modes of travel in the town centre promoting active travel and improving quality of life.

7 Environmental and Climate Change Implications

- 7.1 The MATS has a positive implication for the environment and climate change. The scheme will deliver significant noise, greenhouse gas and air quality benefits. Though the MATS Broad Street Scheme will have a Slight Adverse (Negative) Effect on March's biodiversity and water environment unless appropriate management and mitigation measures are taken.

8 Other Significant Implications

- 8.1 N/A.

9 Appendices

- 9.1 Appendix 1 – March Area Transport Study Full Business Case 1
- 9.2 Appendix 2 – March Broad Street Walking, Cycling, Horse Riding Assessment Report and Review Report
- 9.3 Appendix 3 – LTN 1/20 Compliance Broad Street

10 Background Papers

[Combined Authority Board reports 19 October 2022](#)



March Area Transport Study (MATS)

Full Business Case (FBC)

Document Control

Document ref: March Area Transport Study Full Business Case 1						
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
1.0	FBC1 – First Issue	RMJ	RPJ	RMJ	RMJ	08.12.2022
2.0	FBC1 – Post ITE Review	RMJ	RPJ	RMJ	RMJ	19.12.2022

Contents

Glossary	viii
Executive Summary	i
Introduction	i
Strategic Dimension	i
Economic Dimension	iii
Financial Dimension	iv
Commercial Dimension	v
Management Dimension	v
1. Introduction	1
1.1 Scope	1
1.2 Business Cases and The Five Cases Model	1
1.3 MATS FBC Structure	2
1.4 Context and Background	5
1.5 Document Structure	10
2. Strategic Dimension	11
2.1 Introduction	11
2.2 Business Strategy and Strategic Policy Context	11
2.3 Local Policy Context	19
2.4 Need for Change and Identified Issues	24
2.5 Internal Drivers for Change	31
2.6 External Drivers for Change	31
2.7 Scheme Constraints, Powers and Consents	32
2.8 Scheme Interdependencies	42
2.9 Stakeholder Identification	48
2.10 Scheme Objectives	49
2.11 Impact of Not Progressing	53
2.12 Measures of Success	56
2.13 Options Identification and Appraisal	58
2.14 Scheme Development During Detailed Design	65
2.15 Carbon Assessment	78

3.	Economic Dimension.....	88
3.1	Introduction.....	88
3.2	Identified Scheme Package	88
3.3	Economic Assessment.....	89
3.4	Present Value Costs	98
3.5	Present Value Benefits.....	102
3.6	Sensitivity Testing	111
3.7	Distributional Impacts.....	119
3.8	Qualitative Appraisal	122
3.9	Value for Money Statement.....	139
4.	Financial Dimension	140
4.1	Introduction.....	140
4.2	Scheme Costing.....	140
4.3	Funding and Budgets	153
5.	Commercial Dimension	155
5.1	Introduction.....	155
5.2	Output Based Specification.....	155
5.3	Procurement Strategy	156
5.4	Market Maturity.....	159
5.5	Sourcing Options.....	159
5.6	Payment Mechanisms	160
5.7	Pricing Framework and Charging Mechanisms	162
5.8	Risk Allocation and Transfer	163
5.9	Contract Length.....	164
5.10	Contract Management.....	165
6.	Management Dimension	166
6.1	Introduction.....	166
6.2	Evidence of Similar Projects	166
6.3	Scheme Constraints and Dependencies.....	168
6.4	Governance, Organisational Structures, Roles and Responsibilities	171
6.5	Project Plan: Project Delivery Milestones	176
6.6	Assurance and Approvals Plan.....	177
6.7	Communication and Stakeholder Engagement	178
6.8	Benefits Realisation Plan	181
6.9	Monitoring and Evaluation.....	181
6.10	Risk Management Strategy.....	182

Appendices	183
Appendix A: Stakeholder Engagement Strategy	184
Appendix B: General Arrangement (GA) Drawings	185
Appendix C: Design Review Considering LTN1/20 Guidance	186
Appendix D: Economic Dimension Cost Schedule (60 years)	187
Appendix E: Appraisal Summary Table (AST)	188
Appendix F: TAG Sheets	189
Appendix G: Financial Dimension Cost Schedule (60 years).....	190
Appendix H: Construction Risk Registers.....	191
Appendix I: Benefits Realisation Plan.....	192
Appendix J: Monitoring and Evaluation Plan	193
Appendix K: Project Risk Register	194
Appendix L: Procurement Strategy Rational	195

Figures

Figure 1.1: MATS FBC Phasing Structure	2
Figure 1.2: March Location Map	6
Figure 1.3: March 2019 IMD Data Map.....	7
Figure 1.4: March Area Transport Study Components	9
Figure 2.1: CPCA Policy Framework	16
Figure 2.2: LDP Strategic Allocations and Broad Locations for Growth	21
Figure 2.3: Collision Heatmap for March Pre-COVID-19 (2015 to 2019) and Including COVID-19 Impacts (2017 to 2021)	28
Figure 2.4: Extents of MATS and FHSF Broad Street Schemes	43
Figure 2.5: Overview of the Option Development, Modelling and Assessment Processes.....	58
Figure 2.6: Locations of Quick Wins	59
Figure 2.7: MATS Improvement Scheme Locations	64
Figure 2.8: MATS Broad Street Scheme General Arrangement.....	66
Figure 2.9: A141 / Peas Hill & A141 / Hostmoor Avenue Road Scheme General Arrangement.....	68
Figure 2.10: MATS High Street / St Peter's Road Scheme General Arrangement	69
Figure 2.11: MATS A141 / Twenty Foot Road Scheme General Arrangement.....	70
Figure 2.12: MATS NILR Scheme General Arrangement.....	71
Figure 2.13: Logic Map of MATS Options and Objectives	77
Figure 2.14: Relationship between Work Stages, Assessment Accuracy, and Ability to Influence Whole Life Cycle Carbon (<i>Green Construction Board</i>)	79
Figure 2.15: Broad Street Preliminary Design Carbon Footprint	80
Figure 2.16: NILR Preliminary Design Carbon Footprint	80
Figure 2.17: Peas Hill Detailed Design Carbon Footprint	81
Figure 2.18: St Peters Road Detailed Design Carbon Footprint.....	81
Figure 2.19: Twenty Foot Road Detailed Design Carbon Footprint.....	82
Figure 2.20: Broad Street – Work Activity Carbon Hotspots.....	85
Figure 2.21: NILR – Work Activity Carbon Hotspots.....	85
Figure 2.22: Peas Hill – Work Activity Carbon Hotspots.....	85
Figure 2.23: St Peters Road – Work Activity Carbon Hotspots	85
Figure 2.24: Twenty Foot Road – Work Activity Carbon Hotspots	85
Figure 2.25: Relationship between Work Stages and Carbon Reduction Potential	87
Figure 2.26: Key Carbon Management Processes Throughout the Project Lifecycle	87
Figure 3.1: 24-hour Total Two-Way Annual Average Weekday Flow.....	92
Figure 3.2: 24-hour Speed Profile by Direction at each ATC Site	93
Figure 3.3: National Transport Use – March 2020 to November 2022 (Department for Transport).....	96
Figure 3.4: Fenland Mobility Levels by Travel Purpose – February 2020 to October 2022 (Google) ..	97
Figure 3.5: AM Peak Hour – Total Number of Trips in Model.....	112

Figure 3.6: Inter Peak Hour – Total Number of Trips in Model	112
Figure 3.7: PM Peak Hour – Total Number of Trips in Model.....	113
Figure 3.8: Core and Sensitivity Test BCRs – Full Package	116
Figure 3.9: Core and Sensitivity Test BCRs – MATS Broad Street Scheme.....	117
Figure 3.10: Number of Key Services with a Mean Journey Time by Public Transport Longer than the National Average in 2017.....	137
Figure 3.11: Walk Distance (m) to Bus Stops in March	138
Figure 4.1: Additional Maintenance Liability on Northern Industrial Link Road	151
Figure 6.1: Ely Southern Bypass (Source: VolkerFitzpatrick).....	166
Figure 6.2: Kings Dyke (Source: Jones Brothers)	167
Figure 6.3: Project Management Structure	172
Figure 6.4: MATS Proposed Governance Structure Chart (FBC1 Stage)	174
Figure 6.5: MATS Online Public Consultation (May – June 2020)	179
Figure 6.6: MATS Public Engagement Event (September 2022)	180

Tables

Table 1.1: Relative Outbound Commuter Destinations	8
Table 2.1: Powers and Consents Table – MATS Broad Street Scheme	36
Table 2.2: Powers and Consents Table – MATS St Peter’s Road Scheme	37
Table 2.3: Powers and Consents Table – MATS Peas Hill Roundabout Schemes.....	38
Table 2.4: Powers and Consents Table – MATS Hostmoor Avenue Scheme	39
Table 2.5: Powers and Consents Table – MATS Twenty Foot Road Scheme.....	40
Table 2.6: Powers and Consents Table – MATS NILR Scheme	41
Table 2.7: Do Minimum 2018 vs 2031 AM Peak Hour Model Comparison	54
Table 2.8: Do Minimum 2018 vs 2031 PM Peak Hour Model Comparison	55
Table 2.9: Measures of Scheme Success	57
Table 2.10: MATS Quick Wins	59
Table 2.11: MATS Quick Wins	60
Table 2.12: EAST Assessment Summary.....	63
Table 2.13: Alignment of MATS Schemes with Policy Objectives	74
Table 2.14: MATS Schemes Carbon Footprint by Design Phase.....	78
Table 2.15: Peas Hill Carbon Footprint by Design Phase	79
Table 2.16: MATS Schemes Carbon Footprint by Work Category	83
Table 3.1: Value for Money Framework Impacts Assessed	91
Table 3.2: TUBA Annualisation Factors	92
Table 3.3: DfT Value for Money Categories.....	94
Table 3.4: Sensitivity Tests	95
Table 3.5: Base Investment Cost (2022 Prices) – Full Package	98
Table 3.6: Base Investment Cost (2022 Prices) – MATS Broad Street Scheme.....	99
Table 3.7: Application of Optimism Bias	100
Table 3.8: Economic Dimension Cost Estimates – Full Package	101
Table 3.9: Economic Dimension Cost Estimates – MATS Broad Street Scheme	101
Table 3.10: Full Package COBALT Results.....	103
Table 3.11: Broad Street COBALT Results	103
Table 3.12: Analysis of Monetised Costs and Benefits (Core – MATS Broad Street Scheme).....	107
Table 3.13: Analysis of Monetised Costs and Benefits (Core – Full Package)	108
Table 3.14: Non-Monetised Time Benefits by Time Saving (MATS Broad Street Scheme)	109
Table 3.15: Non-Monetised Time Benefits by Time Saving (Full Package)	109
Table 3.16: Non-Monetised Time Benefits by Distance (MATS Broad Street Scheme).....	110
Table 3.17: Non-Monetised Time Benefits by Distance (Full Package)	110
Table 3.18: User Benefits by Time Period (MATS Broad Street Scheme).....	111
Table 3.19: User Benefits by Time Period (Full Package).....	111
Table 3.20: Benefit-Cost Ratio Under Different Growth Scenarios (MATS Broad Street Scheme) ...	113
Table 3.21: Benefit-Cost Ratio Under Different Growth Scenarios (Full Package)	114
Table 3.22: Benefit-Cost Ratio under Different VOT Scenarios (Full Package)	115

Table 3.23: Benefit-Cost Ratio under Different VOT Scenarios (MATS Broad Street Scheme)	115
Table 3.24: Cost Change Required to Reduce Full Package BCR to Lower Value for Money Categories	118
Table 3.25: Associated P Values for Full Package	118
Table 3.26: Cost Change Required to Reduce MATS Broad Street Scheme BCR to Lower Value for Money Categories	119
Table 3.27: Associated P Values for MATS Broad Street Schemes	119
Table 3.28: Distributional Impact Appraisal of Non-Business User Benefits (Full Package).....	120
Table 3.29: Distributional Impact Appraisal of Non-Business User Benefits (MATS Broad Street Scheme).....	120
Table 3.30: Distributional Impact Appraisal of Non-Business Fuel and Non-Fuel Vehicle Operating Cost Benefits (Full Package).....	121
Table 3.31: Distributional Impact Appraisal of Non-Business Fuel and Non-Fuel Vehicle Operating Cost Benefits (MATS Broad Street Scheme).....	121
Table 3.32: Landscape Impact Assessment	124
Table 3.33: Townscape Impact Assessment	126
Table 3.34: Historic Environment Impact Assessment	129
Table 3.35: Biodiversity Impact Assessment	131
Table 3.36: Water Environment Impact Assessment.....	133
Table 3.37: Journey Quality Impact Assessment.....	134
Table 4.1: MATS Key Implementation Dates	142
Table 4.2: Financial Dimension Scheme Cost Estimates (2022 Price Base)	143
Table 4.3: Financial Dimension Scheme Cost Estimates (Broad Street)	143
Table 4.4: Base Investment Cost by Scheme (2022 Prices)	144
Table 4.5: Base Investment Cost (2022 Prices)	144
Table 4.6: Base Investment Cost (2022 Prices) (Broad Street).....	145
Table 4.7: Risk Adjusted Base Cost by Scheme (2022 Prices).....	146
Table 4.8: Risk Adjusted Base Cost by Year (2022 Prices)	146
Table 4.9: Risk Adjusted Base Cost (2022 Prices) (Broad Street)	147
Table 4.10: Construction Industry Inflation Forecasts (October 2022)	147
Table 4.11: Inflation Increases on Construction Costs 2023-28	148
Table 4.12: Inflated Risk Adjusted Cost (2022 Prices) (Broad Street Scheme)	148
Table 4.13: Calculation of Whole Life Maintenance Costs (2022 Prices).....	152
Table 4.14: Inflated Risk Adjusted Cost Including Whole Life Costs	152
Table 5.1: Comparison of Procurement Routes.....	157
Table 5.2: Examples of Payment Mechanisms.....	161
Table 5.3: Project Implementation Timescales	164
Table 6.1: Timescale for Project Milestones	176

Glossary

BCR – Benefit to Cost Ratio

CCC – Cambridgeshire County Council

CPCA – Cambridgeshire and Peterborough Combined Authority

CPIER – Cambridgeshire and Peterborough Independent Economic Review

CPO – Compulsory Purchase Order

DfT – Department for Transport

DM – Do Minimum

DS – Do Something

EAST – Early Assessment Sifting Tool

FBC – Full Business Case

FDC – Fenland District Council

FHSF – Future High Streets Fund

HMT – HM Treasury

ICD – Inscribed Circle Diameter

IMD – Indices of Multiple Deprivation

ITE – Independent Technical Evaluation

LMVR – Local Model Validation Report

LSOA – Lower Super Output Area

MATS – March Area Transport Study

MHCLG – Ministry of Housing, Communities and Local Government

MSG – Members' Steering Group

MTC – March Town Council

NILR – Northern Industrial Link Road

NPPF – National Planning Policy Framework

NPV – Net Present Value

OAR – Options Appraisal Report

OBC – Outline Business Case

PVB – Present Value of Benefits

PVC – Present Value of Costs

QRA – Quantified Risk Assessment (QRA)

SOBC – Strategic Outline Business Case

TAG – Transport Analysis Guidance

TCF – Transforming Cities Fund

VfM – Value for Money

Executive Summary

Introduction

This document sets out the Full Business Case (FBC) for the March Area Transport Study (MATS) Broad Street Scheme and updates the Outline Business Case (OBC) for the remaining MATS improvement schemes, namely the A141 / Peas Hill Roundabout, A141 / Hostmoor Avenue, A141 / Twenty Foot Road, B1101 High Street / St Peter's Road and the Northern Industrial Link Road.

The MATS FBC will be presented in three phases, with each focusing on the delivery of different schemes from the overall MATS package. Each phase will present the case for investment for the whole MATS package, confirming the strategic benefits associated with delivering all five schemes, as well as demonstrating (through sensitivity testing) that the funding for each phase will still deliver value and benefits should future phases falter.

The recommended package of MATS Improvement Schemes will address existing capacity and safety problems, while mitigating for future growth in travel demand resulting from housing and employment growth identified in the Fenland Local Plan (2014). In addition, the recommended package of schemes includes improvements to Broad Street, which seek to facilitate regeneration funded by the Future High Streets Fund (FHSF), and the wider regeneration of March Town Centre.

This Business Case is set out in compliance with the Department for Transport's (DfT's) The Transport Business Cases (2013) guidance and HM Treasury's (HMT's) Five Case Model.

Strategic Dimension

The **Strategic Dimension** demonstrates how the recommended package of MATS Improvement Schemes fits with wider public policy objectives and provides the case (or need) for change.

The recommended package of MATS Improvement Schemes strongly aligns with the vision and objectives of national, regional, and local bodies, including the DfT, the Cambridgeshire and Peterborough Combined Authority (CPCA), Fenland District Council (FDC), and March Town Council (MTC).

The Strategic Dimension identifies a clear need for change and the impacts of not progressing. The need for change can be summarised as follows:

- The need for regeneration in March Town Centre
- The need to address existing traffic congestion and safety issues
- The need to facilitate housing and employment growth across March
- The need to improve local environmental conditions.

The need for change is being driven internally, by local growth aspirations and support from local authority bodies, and externally, by the requirement to redesign Broad Street to facilitate regeneration funded by the FHSF.

Twelve scheme objectives, which remain unchanged since the SOBC, will be used to measure the success of the recommended package of MATS Improvement Schemes. These objectives reflect the themes identified in the need for change, and are as follows:

1. Regeneration of March Town Centre

- a. Deliver a transport scheme for Broad Street that is compatible with the FHSF scheme.
- b. Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience, and drive growth.
- c. Maximise public realm within Broad Street.
- d. Enhance pedestrian safety and accessibility around the town centre.

2. Address Existing Traffic Congestion and Safety Issues

- a. Address existing congestion issues within the town centre (Broad Street area).
- b. Address existing congestion issues along the A141 around Peas Hill roundabout.
- c. Improve pedestrian level of service around Broad Street.
- d. Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction.

3. Facilitate Housing and Employment Growth

- a. Support Local Plan development proposals.
- b. Ensure sustainable access to proposed Local Plan development.

4. Improve Local Environmental Conditions

- a. Improve air quality conditions around Broad Street.
- b. Facilitate the enhancement of heritage assets around Broad Street.

Finally, the options identification and appraisal work that has been undertaken to date is explained within the Strategic Dimension. Ultimately, the Strategic Dimension identifies Package 3a as the MATS Improvement Schemes to be progressed and explains how this has evolved through the Detailed Design phase.

Package 3a comprises the following MATS Improvement Schemes:

- A141 / Peas Hill Roundabout Upgrade (52m ICD), including the creation of an all-movement signalised junction at the A141 / Hostmoor Avenue Junction.
- A141 / Twenty Foot Road Signals.
- Broad Street / Dartford Road / Station Road Mini Roundabout, with one lane in each direction on Broad Street
- High Street / St Peter's Road Traffic Signal Improvements.
- Development of a Northern Industrial Link Road (NILR)

Economic Dimension

The **Economic Dimension** demonstrates that the recommended package of MATS Improvement Schemes offers value for money.

Package 3a has a core BCR of 2.23 based on transport user, noise, greenhouse gas, air quality, and accident benefits alone. This indicates that the core monetised benefits outweigh the scheme cost estimates and provide High Value for Money (VfM). The addition of journey time reliability benefits increases the BCR to 2.42, which still represents High VfM.

The MATS Broad Street Scheme has a core BCR of 8.37, which equates to Very High VfM. The addition of journey time reliability benefits increases the BCR to 8.90, which still represents Very High VfM.

The calculated BCRs are considered conservative as they are only based on the scheme benefits that can be monetised. Other benefits relating to improved townscape, severance, personal affordability for income deprived groups, and journey quality are anticipated for both Package 3a and the MATS Broad Street Scheme.

Both Package 3a and the MATS Broad Street Scheme are expected to have some Slight Adverse (Negative) Effects, which include impacts to the historic environment, biodiversity, and water environment.

Sensitivity testing has been undertaken to determine whether Package 3a and the MATS Broad Street Scheme could still achieve VfM if the expected value of time (VOT), travel behaviour, road traffic growth, air quality differs from current predictions.

The results from the sensitivity testing indicate that:

- Package 3a has a BCR of 0.44 in the Behavioural Change Growth Scenario, which represents Poor VfM
- Package 3a has a BCR of 1.10 in the Low Growth Scenario, which represents Low VfM
- Package 3a has a BCR of 2.24 in the Core Growth Scenario and 3.72 in the High Growth Scenario, which both represent High VfM
- Package 3a has a BCR of 1.41 in the Low VOT scenario, which represents Low VfM
- Package 3a has BCR of 2.24 and 2.76 for the Core and High VOT scenarios respectively, both of which represent High VfM.
- The MATS Broad Street Scheme has a BCR of 3.04 in the Behavioural Change Growth Scenario, which represents High VfM
- The MATS Broad Street Scheme has a BCR of 6.47 in the Low Growth Scenario, 9.24 in the Core Growth Scenario, and 14.35 in the High Growth Scenario, all of which represent Very High VfM
- The MATS Broad Street Scheme has BCRs ranging between 6.55 and 11.92 for all VOT scenarios, which represents Very High VfM in all instances.

Financial Dimension

The **Financial Dimension** demonstrates that the recommended package of MATS Improvement Schemes is financially affordable.

The scheme costs considered in the Financial Dimension include base investment cost, risk adjusted base cost, inflated risk adjusted cost (Outturn cost), and inflated risk adjusted cost including whole life costs. For Package 3a, the inflated risk adjusted cost including whole life costs over the 60-year assessment period, is £49,423,931 and the Outturn cost required to deliver it is £47,693,154. A full 60-year schedule (2023-83) showing how the costs have been calculated is included in Appendix G.

The Outturn cost for the MATS Broad Street Scheme is £4,149,825. The CPCA have confirmed that there is a sufficient TCF funding allocation in the 2023 / 2024 financial for construction of this scheme. This funding is time limited and must be spent by March 31st 2024.

Potential funding sources for the construction of the remaining MATS Improvement Schemes have been explored and include the CPCA Single Investment Fund and Developer Contributions. The funding strategy for delivering these schemes will be confirmed in FBC2 (and FBC3 for the NILR).

Commercial Dimension

The **Commercial Dimension** demonstrates that the recommended package of MATS Improvement Schemes can be effectively procured commercially viable and confirms the procurement strategy for the MATS Broad Street Scheme which will be let via the Eastern Highways Alliance (EHA).

The output-based specification identifies the five recommended MATS Improvement Schemes (included in Package 3a) as the key outputs to be delivered through the chosen procurement route. The success of these outputs will be measured using the scheme objectives, as detailed in the Benefits Realisation Plan and Monitoring and Evaluation sections of the Management Dimension.

Possible routes to procurement for the remaining MATS schemes include: Eastern Highways Alliance Framework 3; Standalone – ‘Find a Tender’ service; the existing Cambridgeshire Highways Services Contract; and the Cambridgeshire and Peterborough Joint Professional Services Framework (Professional Services support only). The procurement strategy for each of the remaining MATS schemes will be confirmed in the respective FBCs.

Possible sourcing options include: a traditional arrangement; a single-stage design and build contract; a two-stage design and build contract; early contractor involvement (ECI); and a private finance initiative (PFI). The scheme promotor will need to confirm its choice of contractor as each MATS scheme enters the FBC stage.

The remaining sections of the Commercial Dimension consider possible payment mechanisms, pricing framework and charging mechanisms, risk allocation and transfer, contract length, and contract management issues.

Management Dimension

The **Management Dimension** demonstrates that the recommended package of MATS Improvement Schemes is deliverable.

Evidence of the delivery of similar projects, which supports the recommended project approach, includes the Wisbech Access Study (WAS), Ely Southern Bypass, and King’s Dyke.

The Management Dimension provides information relating to the governance, organisation structure, and roles, and describes the key roles, lines of accountability and how they are resourced. The CPCA is the organisation that is ultimately responsible for the delivery of the MATS Improvement Schemes, with Cambridgeshire County Council (CCC) nominated as the delivery partner, with delegated authority.

The Management Dimension includes a project plan with delivery milestones, ranging from submission of this Business Case (FBC1) to the construction of the NILR (October 2026 – November 2027). It is important to note that the delivery of the MATS Broad Street scheme has been prioritised to align with the construction programme for the FHSF scheme, to meet the requirements of the FHSF.

The assurance and approvals plan states that the CPCA will manage the MATS in accordance with its existing assurance and approvals processes, as detailed in the CPCA Assurance Framework and Ten Point Guide. As part of the CPCA Assurance Framework process, an Independent Technical Evaluation (ITE) of each business case, including this document, will be undertaken at each stage of the project.

The identified approach to communication and stakeholder engagement requires the provision of regular updates to stakeholders, engagement with stakeholders, and ensuring that information is shared using appropriate methods of communication. To date, regular Members' Steering Group (MSG) meetings have been held throughout the development of the MATS. A Future March online consultation event was held between May 2020 and June 2020, and a public consultation exercise regarding the March Future High Street Fund proposals ran in May 2020. Further public engagement was also undertaken during September 2022, and responses have been considered where possible.

A Benefits Realisation Plan, which outlines the approach for managing the realisation of benefits of the recommended package of schemes, and a Monitoring Evaluation Plan, which outlines the arrangements for monitoring and evaluating the recommended package of schemes, have been prepared for the MATS and are included in Appendices I and J.

As part of the risk management strategy, a Project Risk Register and Construction Risk Registers have been prepared for the MATS and have informed scheme costings.

1. Introduction

1.1 Scope

- 1.1.1 This document sets out the Full Business Case (FBC) for the March Area Transport Study (MATS) Broad Street Scheme and updates the Outline Business Case (OBC) for the remaining MATS improvement schemes, namely the A141 / Peas Hill Roundabout, A141 / Hostmoor Avenue, A141 / Twenty Foot Road, B1101 High Street / St Peter's Road and the Northern Industrial Link Road (NILR). The rationale for this phased approach, which is required due to funding constraints, is set out in Section 1.3 beneath.
- 1.1.2 This hybrid Business Case updates and re-affirms the case for change, provides detailed economic and financial assessment of the preferred options and identifies procurement and management strategies for the successful delivery of the schemes. The level of detail provided for Broad Street is well advanced and reflects the intentions to begin construction in early 2023, in line with funding requirements. This includes completed Detailed Design and contractor target costs.
- 1.1.3 Milestone Infrastructure (formerly Skanska Infrastructure Services) have been commissioned by Cambridgeshire County Council (CCC) on behalf of the Cambridgeshire and Peterborough Combined Authority (CPCA), to produce this document.

1.2 Business Cases and The Five Cases Model

- 1.2.1 As set out in 'The Transport Business Cases' guidance published by the Department for Transport (DfT) in February 2022¹, this document follows DfT's three-phase approach (as adopted by the Cambridgeshire and Peterborough Combined Authority's Assurance Framework) for making major investment decisions:
- Phase 1 – Strategic Outline Business Case (SOBC)
 - Phase 2 – Outline Business Case (OBC)
 - Phase 3 – Full Business Case (FBC)
- 1.2.2 The MATS project has now entered Phase 3 following approval of the Outline Business Case in October 2021² and the subsequent Detailed Design and procurement work undertaken throughout 2022. This document represents the first of three editions of the Full Business Case. The phasing and rationale for this is described beneath.

¹ <https://www.gov.uk/government/publications/transport-business-case/transport-business-case-guidance>

² CPCA Board Meeting, 24th November 2021.

1.3 MATS FBC Structure

- 1.3.1 The MATS FBC will be presented in three phases, with each focusing on the delivery of different schemes from the overall MATS package. Each phase will present the case for investment for the whole MATS package, confirming the strategic benefits associated with delivering all five schemes, as well as demonstrating (through sensitivity testing) that the funding for each phase will still deliver value and benefits should future phases falter.
- 1.3.2 The FBC phasing is presented in Figure 1.1 beneath, with dark teal indicating when each scheme will reach full FBC status, and the light teal showing an update to the information presented in the OBC (but not fully developed to FBC).

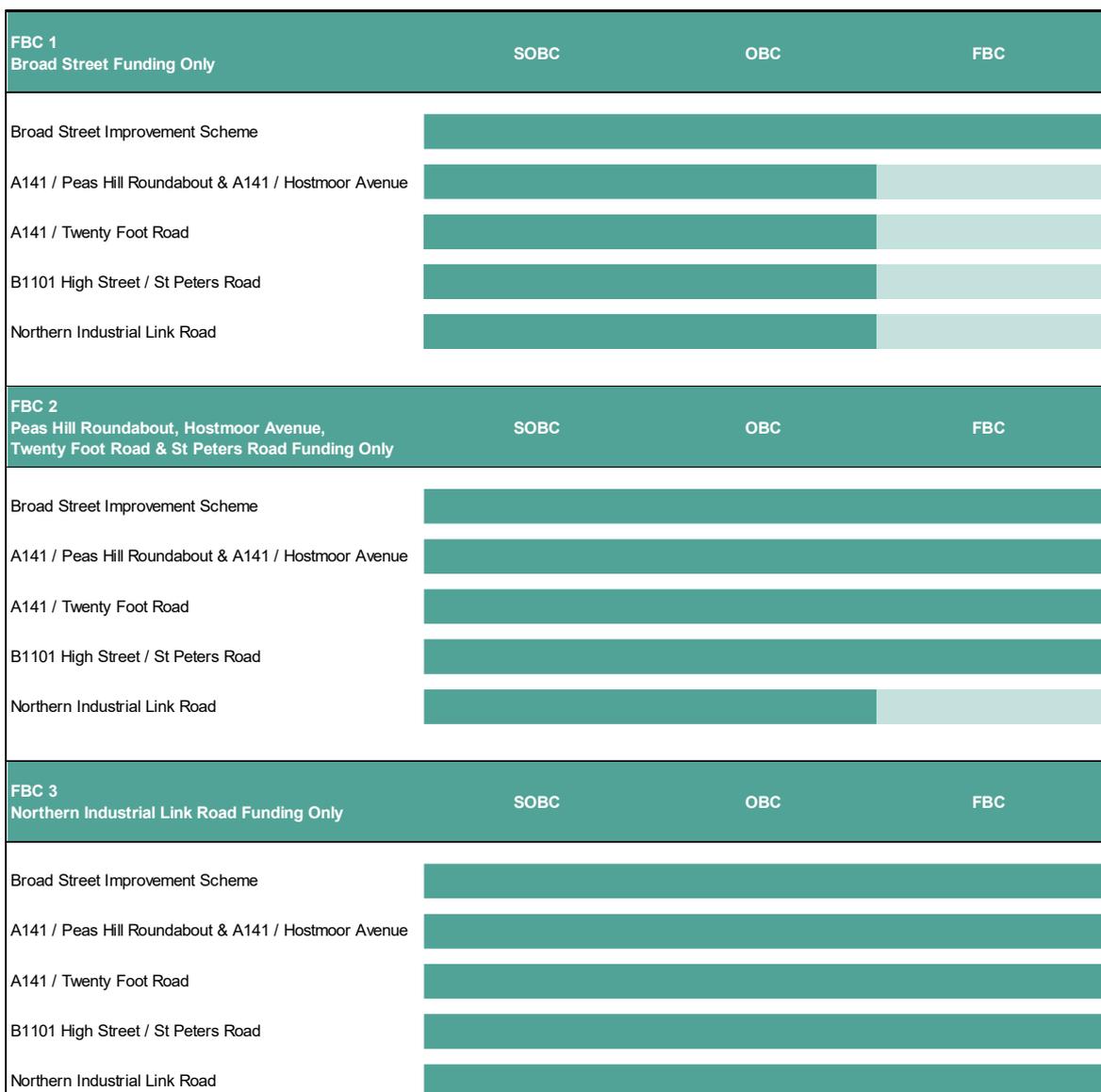


Figure 1.1: MATS FBC Phasing Structure

- 1.3.3 This approach has been developed to enable the delivery of the Broad Street Scheme to be accelerated ahead of the remaining schemes to support the adjacent Future High Street Fund (FHSF) scheme along Broad Street. For clarity, the MATS Broad Street Improvement Scheme will amend the transport infrastructure along Broad Street, whereas the FHSF project will improve the surrounding public realm. The FHSF is separately funded, and therefore not included within the MATS project, but delivery of both the MATS and FHSF schemes needs to be closely coordinated due to the physical interaction of both schemes. The FHSF funding requires the Broad Street improvements to be completed by March 31st, 2024, and accordingly the MATS Broad Street Scheme has been accelerated for delivery, therefore reducing the risk of delay associated with the remaining MATS schemes from compromising the FHSF programme (and funding).
- 1.3.4 This approach creates an FBC 1 (this document) which is focused on the delivery of the MATS Broad Street Scheme. This is effectively a hybrid FBC / OBC + as shown in Figure 1.1 which is referred to as FBC1 for the remainder of this document. The FBC components relate to the Broad Street Scheme, and the OBC+ components relate to the remaining four schemes which were included in the OBC presented to CPCA Board in November 2021 but have been updated within this submission following completion of the Detailed Designs (and Preliminary Design for the Northern Industrial Link Road).
- 1.3.5 For clarity, the information that relates specifically to the FBC for the Broad Street Scheme (FBC1) is presented within teal-coloured boxes as shown below, enabling the reader to distinguish clearly between information pertinent to the MATS Broad Street Scheme FBC1 and the OBC+ for the remaining MATS schemes.

Information that is pertinent to the MATS Broad Street Scheme (FBC1) is presented within these teal-coloured boxes).

- 1.3.6 It is anticipated that this document (FBC1) will be updated to FBC2 and presented to the CPCA in December 2023 to request the release of construction funding for the A141 / Peas Hill Roundabout and A141 / Hostmoor Avenue Junction, A141 / Twenty Foot Road and B1101 High Street / St Peter's Road schemes. Detailed Design on these schemes has been completed, and the remaining tasks required to produce FBC2, including procurement, Outline Planning and land engagement will be completed throughout 2023 (with Full Planning Permission and land acquisition to be completed in 2024 following approval of FBC2).

- 1.3.7 A third phase (FBC 3) will then present the case for investment for the Northern Industrial Link Road (NILR). The technical assessment undertaken in earlier phases of this study identified that the NILR is required in the medium-term future (by 2028) and has been separated from FBC 2 to ensure the necessary information for this scheme, including a confirmed procurement route and a scheme target cost, is current at the time of construction.
- 1.3.8 This document therefore begins the third phase of the three-phase decision making process. Each Business Case builds on the last, but the phased approach enables appropriate investment decisions to be made and reflects the greater level of detail that becomes available as the list of potential schemes is refined, and a preferred scheme is identified. Business Cases are developed in line with the HM Treasury's (HMT's) Green Book five case model:
- The case for change – The 'Strategic Dimension'
 - Value for Money – The 'Economic Dimension'
 - Commercially viable – The 'Commercial Dimension'
 - Financially affordable – The 'Financial Dimension'
 - Achievable – The 'Management Dimension'.
- 1.3.9 In summary, this document:
- Updates and reconfirms the strategic fit and the case for change, as established in the SOBC and OBC.
 - Provides detailed economic and financial assessment of the options, including a target cost for the Broad Street Scheme.
 - Identifies the most suitable procurement and management strategies for delivery, and specifically confirms the procurement route and contractual arrangements for the delivery of the Broad Street Improvements Scheme.
 - Provides details of the project's overall balance of benefits and costs against objectives.

1.4 Context and Background

Fenland

- 1.4.1 Fenland covers approximately 200 square miles within the county of Cambridgeshire. It is a rural and sparsely populated district with many diverse communities, each with very different needs. Geographically, Cambridge and the rest of Cambridgeshire are to the south, Peterborough to the west, Wisbech and King's Lynn to the north-east, and West Norfolk to the east. The sub-regional centres of Cambridge, Peterborough and King's Lynn have a considerable influence on various parts of the district in terms of employment, retail and health provision.
- 1.4.2 Although the district remains relatively sparsely populated, Fenland has experienced considerable housing and population growth in recent years, in line with growth across Cambridgeshire. According to the 2011 Census, Fenland had a population of approximately 95,300, compared to 83,700 in 2001 and 75,500 in 1991, and has continued to grow rapidly since 2011. In 2020, Fenland had an estimated total population of approximately 102,080³, which represents a 7% increase since 2011. This growth is expected to continue and needs to be positively planned for.
- 1.4.3 Growth in employment in Fenland has not matched workforce expansion and out-commuting is increasing. Currently, almost 40% of Fenland's working population commute out of the district for work. To meet the needs of a growing workforce, Fenland requires growth in employment land and business opportunities. To achieve this, infrastructure needs to be improved to retain and attract employers.
- 1.4.4 The population distribution of Fenland is characteristically rural, with the four market towns of Wisbech, March, Whittlesey and Chatteris forming the main population centres, each with their own distinct and individual character.

³ <https://cambridgeshireinsight.org.uk/population/report/view/f7de925f5608420c825c4c0691de5af2/E07000010/>

March

1.4.5 The location of March relative to surrounding areas is shown in Figure 1.2, below. March is a historic market town at the heart of The Fens with a population of approximately 22,980 as of 2011.⁴ It forms the administrative centre of Fenland and lies at the heart of the district’s ongoing economic function as a centre for agriculture, reflected in the number of food production businesses which are key employers in the town.

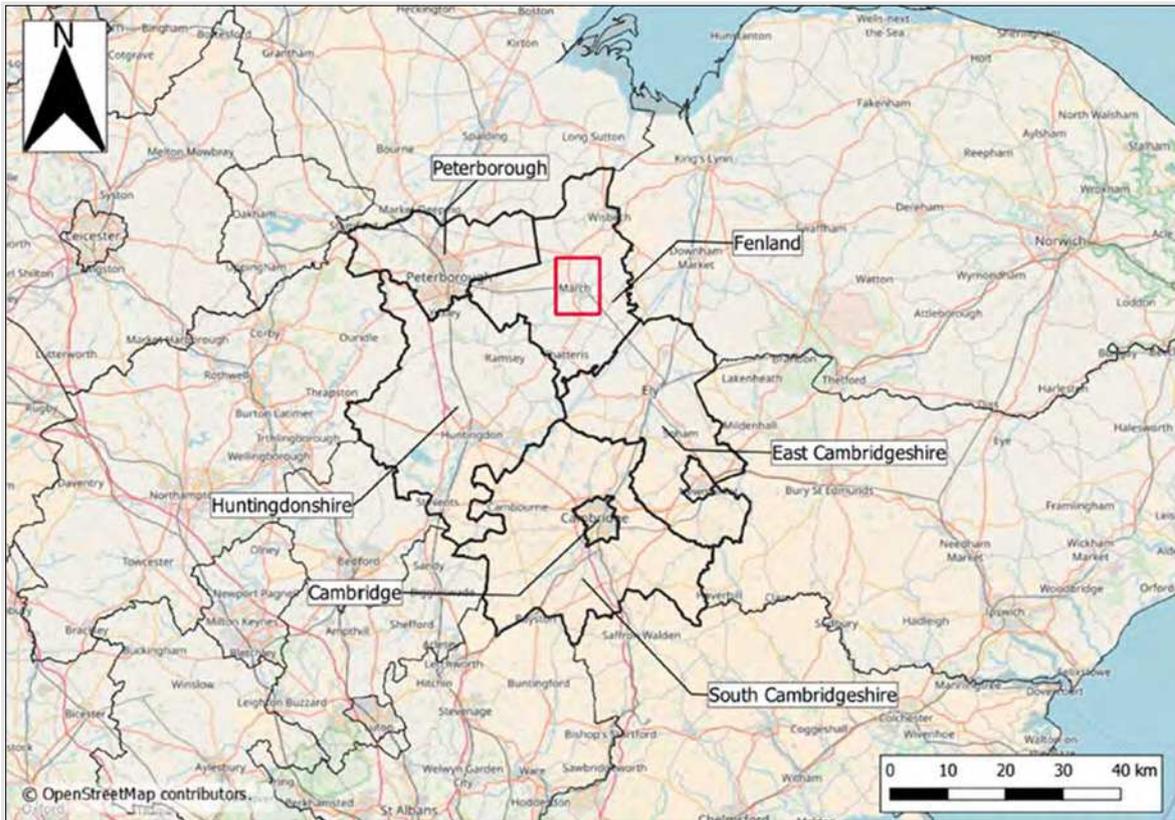


Figure 1.2: March Location Map

1.4.6 March is relatively well connected by road to other areas despite its rural setting and benefits from a railway station situated on the Stansted to Birmingham line. It has an established legacy as a trading centre. While the town also benefits from a historic urban form and attractive riverside setting, as well as a number of stable employers, March has an aging population and is home to some pockets of relatively severe deprivation, characterised by high unemployment and poor health.

⁴ https://www.fenland.gov.uk/media/16583/Fenland-Monitoring-Report-2018-2019/pdf/Fenland_Monitoring_Report_2018-2019.pdf?m=637261848570770000

- 1.4.7 The 2019 English Indices of Multiple Deprivation (IMD) data measures the proportion of the population in a given area experiencing deprivation across a number of different metrics, including income, employment and housing. This is measured at a Lower Super Output Area (LSOA) level of spatial aggregation, in line with census data. Different metrics are given a ranked score on a national scale with larger scores representing increasingly deprived areas. Total scores across the various metrics are divided into deciles to allow a simple comparison of relative levels of deprivation between areas. IMD data have been mapped across March and surrounding areas, including across Cambridgeshire and beyond, in Figure 1.3 below.

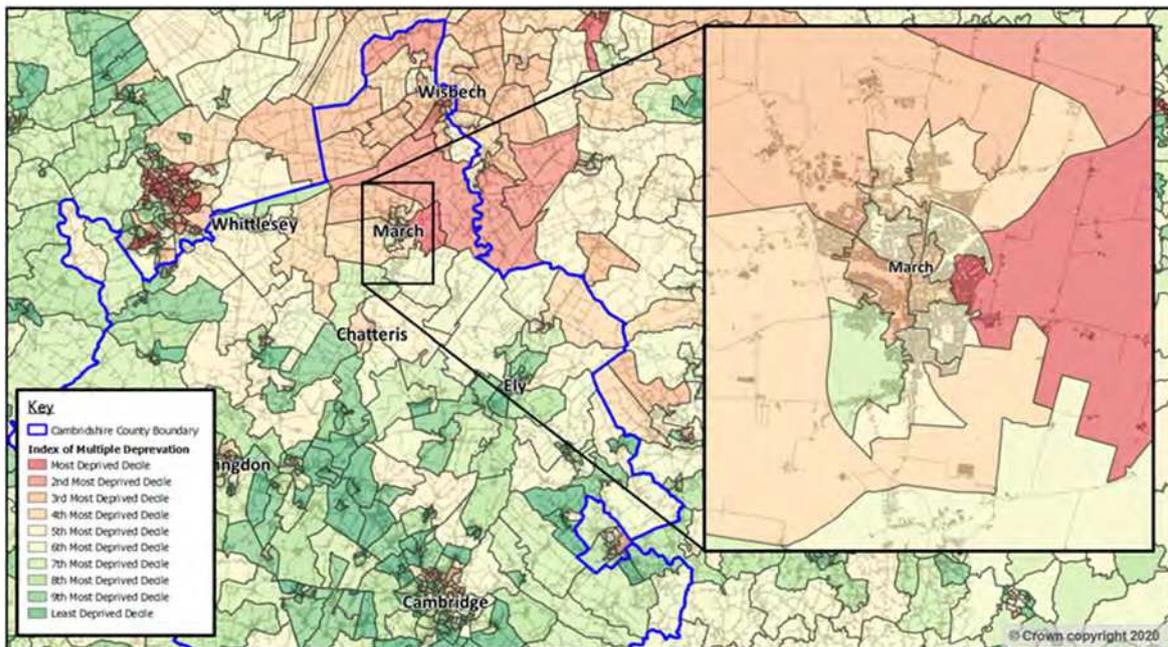


Figure 1.3: March 2019 IMD Data Map

- 1.4.8 Within Cambridgeshire, higher levels of deprivation are clustered to the north of the county around the Fenland towns of March and Wisbech. Figure 1.3 indicates a number of deprived areas in and around March, relative to other areas. Across March, many of the town's residential areas are in the third and fourth most deprived deciles of areas nationally, with areas to the east of March in the most deprived decile.
- 1.4.9 The population of March is predicted to grow by approximately one third by 2036, however the proportion of the working age population is set to decline from 62% to 56%⁵, with an increasing proportion of older residents. This represents a challenge for March in terms of ensuring an aging population has good access to local services and amenities.

⁵ https://www.fenland.gov.uk/media/16892/Growing-Fenland-March-Final-Report/pdf/Growing_Fenland_-_March_Final_Report.pdf?m=637272072374070000 (page 4).

- 1.4.10 A review of 2011 Census data revealed that approximately 61% of employed individuals both lived and worked in March, with approximately 39% commuting out of the town for work. The relative destinations of outbound commuters are detailed in Table 1.1 below, which highlights a varied distribution of destinations to surrounding areas.

Table 1.1: Relative Outbound Commuter Destinations

Outbound Commuter Destinations	Proportion
Wisbech	21%
Peterborough	18%
Chatteris	11%
Huntingdon and St Ives	10%
Wimblington and Doddington	9%
Ely	6%
Cambridge	6%
Whittlesey	4%
Other	15%
Total	100%

- 1.4.11 Investment in local transport infrastructure is central to ensuring the long-term economic prosperity of March as a thriving market town, by helping to revitalise the town centre, encourage inward investment and realise aspirational housing and employment growth ambitions.
- 1.4.12 The vision of Fenland District Council (FDC), the local authority for March, is set out within the adopted Local Plan (2014), which aims ‘to maximise the potential of the area and deliver jobs, skills, improved housing and new infrastructure’. The adopted Local Plan includes targets for the delivery of 4,200 new homes in March and 30 hectares of employment land, with the potential to provide over 2,000 new jobs. March is a focus for housing, employment and retail growth within the district.
- 1.4.13 The MATS Improvement Scheme options development and assessment work included in this business case process is based on realising adopted Local Plan growth to 2031, rather than emerging Local Plan growth.
- 1.4.14 FDC is currently preparing an emerging Local Plan to replace the adopted Local Plan (2014). The emerging Local Plan is expected to be adopted in 2025 and will cover the next 20-year period (to 2045).
- 1.4.15 A 2011 March Area Transport Study provided the transport evidence base for the adopted Local Plan, assessed the impact of traffic growth resulting from the growth indicated by the adopted Local Plan and proposed measures to improve the town’s transport network under current and future traffic demand. This Business Case stems from the most recent March Area Transport Study 2018 (MATS), which builds upon the historical work and assesses potential improvement packages to deliver the adopted Local Plan growth.

1.4.16 The CPCA, through CCC and FDC, agreed a brief for the most recent MATS in January 2018. The aim of this MATS is as follows:

‘To identify potential transport interventions in March to address existing capacity and safety problems whilst mitigating for future growth in the demand for travel resulting from increases in housing and employment opportunities identified in the Fenland Local Plan.’

1.4.17 In addition, the MATS Improvement Schemes have been developed to facilitate efforts to regenerate parts of March Town Centre. Specifically, options for Broad Street have been aligned with the design proposals included in the successful FHSF application, which was awarded £6.4 million funding by the Ministry of Housing, Communities and Local Government (MHCLG) and an additional £2 million match funding pledge from the CPCA in early 2021. Further details can be found in Section 2.8.

1.4.18 To specifically identify transport interventions that address the issues raised in section 2.4 of this Business Case, the MATS study has been split into three parts. These include:

- Stage 0 Audit / Scoping
- Stage 1 Option Testing
- Stage 2 Preferred Scheme Design.

1.4.19 There were a number of components and concluding reports throughout the project, defining different stages of the scheme development process. Figure 1.4 below shows how the different parts of the MATS fit together. The development of OBC and now FBC1 form part of Stage 2 and have closely followed the respective design stages.

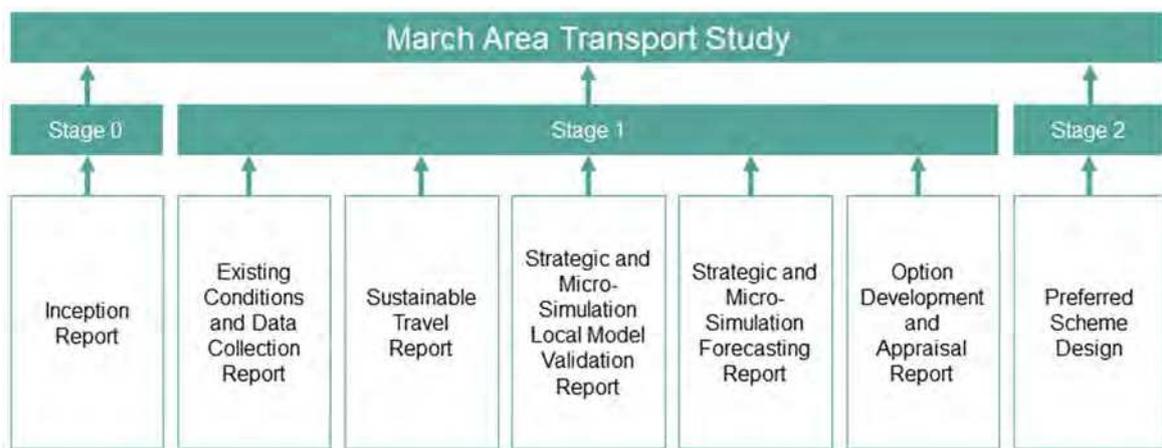


Figure 1.4: March Area Transport Study Components

1.4.20 MATS Stage 0 and Stage 1 are complete, and the production of FBCs to secure scheme funding will conclude Stage 2. The associated reports produced to date for Stage 0, Stage 1 and Stage 2 have been made available online via CCC's website⁶ and include the following:

- Existing Conditions and Data Collection Report
- March Sustainable Travel Report
- Pedestrian, Signage and Cycling Strategy
- SATURN Local Model Validation Report (LMVR)
- VISSIM LMVR
- March Forecasting Report
- March Options Appraisal Report (OAR)
- Options Consultation Report
- Strategic Outline Business Case (SOBC)
- Outline Business Case (OBC).

1.4.21 This FBC1 document is produced during Stage 2 of the MATS process and sets out the case for investment in the MATS Broad Street Scheme and lays the groundwork for the production of FBC2 and FBC3 for the remaining schemes.

1.5 Document Structure

1.5.1 The remainder of this document is structured as follows:

- Chapter 2: The Strategic Dimension provides an update and verification of the need for highway interventions across March, reconfirms policy fit and objectives.
- Chapter 3: The Economic Dimension provides detailed assessment of how the preferred package of options demonstrates relative value for money.
- Chapter 4: The Financial Dimension shows how the schemes have been robustly costed, and how funding needs to be profiled.
- Chapter 5: The Commercial Dimension sets out how CCC will procure in a way that delivers value for money.
- Chapter 6: The Management Dimension explains how delivery of the schemes will be managed.

⁶ <https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/transport-funding-bids-and-studies/march-transport-study>

2. Strategic Dimension

2.1 Introduction

2.1.1 This chapter sets out the Strategic Dimension for transport interventions across March, demonstrates why improvements are needed at various locations across the town, and how a scheme will fit with local, regional, and national policy, enabling March to meet its planned growth ambitions. The content of the Strategic Dimension was predominately established in the SOBC, and is verified, and updated where necessary, to strengthen the case in this FBC1.

2.2 Business Strategy and Strategic Policy Context

2.2.1 The Government's strategy for supporting regeneration and facilitating further economic growth requires the continued investment in transport infrastructure to enable businesses to invest in job creation and the provision of new residential developments. Achieving economic growth, improving living standards and the provision of new housing, are key Government objectives at national, regional, and local level. This section details how the MATS Improvement Schemes will contribute to achieving these strategic aims and policies.

Levelling Up

2.2.2 The Government's Levelling Up Agenda is focused on reducing regional disparities across the UK, by boosting economic productivity, skills and incomes to level up deprived areas, particularly as the nation begins to recover from the impact of the COVID-19 pandemic. The relevance of the Government's levelling up agenda for supporting MATS Improvement Schemes includes:

- Investing in the regeneration of town centres and high streets
- Improving local transport links and investing in local culture
- Giving local communities more control of local assets and how investment is made
- Levelling up skills using apprenticeships and a £3 billion National Skills Fund
- A review of HMT's Green Book on which DfT's Transport Analysis Guidance is based, including how the value of schemes are determined to assist Government in making informed funding decisions in support of levelling up.

2.2.3 In February 2022 the Government published The Levelling Up White Paper, articulating how new policy interventions will support regeneration, improve opportunity and incomes across the country, to facilitate the national economic recovery from the Covid-19 pandemic.⁷

⁷ <https://www.gov.uk/government/publications/levelling-up-the-united-kingdom>

Green Book Review 2020

- 2.2.4 HMT launched the Green Book Review in 2020 with the aim of ensuring the appraisal framework process for projects supports the delivery of the Government's strategic priorities, including the levelling up agenda and the net zero carbon emissions target. In November 2020, HMT published the findings and recommendations of the Green Book Review alongside an updated version of the Green Book guidance on appraisal and evaluation in central government.
- 2.2.5 The key changes to the Green Book resulting from the review, in relation to the content and assessment of business cases, includes:
- Clear objectives and success measures must be established for all interventions, with an objectively based logical process of change as part of the strategic appraisal. Strengthened guidance is provided on setting strategically relevant, appropriate, SMART objectives and a stronger requirement to establish clear objectives from the outset that must be the drivers of the policy development and appraisal process.
 - All options must be assessed against these objectives and only those that deliver them should be shortlisted. Options that do not deliver the objectives should not be considered value for money, regardless of the Benefit Cost Ratio (BCR).
 - The assessment of value for money should have broader emphasis than just focusing on the BCR alone, with analysis of all the relevant costs and benefits to society. Further guidance is provided on what factors must be taken into consideration for considering value for money, and how it is appraised. Only options with a strong Strategic Dimension should be short listed for detailed cost benefit analysis. The BCR will then only be calculated for options which pass this test.
 - Reviewers should be open to business cases for projects with a low BCR if, compared to options that have been appraised, that option is the best value for money way of delivering an intervention.
 - New guidance on the appraisal of transformational change and potential.
 - Updated guidance to improve the analysis of regional and local impacts, through place-based impacts, including where these are not the objective of the intervention. A new expectation is that appraisal must assess the likelihood and extent of differential place-based impacts where it appears likely to be significant, or else explain why it is unnecessary.

- New guidance clarifies how local employment effects can be considered in the appraisal and how the potential impact on surrounding areas should be assessed. When undertaking place-based analysis, appraisers will be able to use new employment multipliers to help estimate the local impact.
- Measures to improve analysis on differential impacts, including in assessments stemming from the Equality Act public sector equality duty, and under the Government's 'family test'.⁸

2.2.6 HMT is undertaking a review into the application of environmental valuation and discounting, with consideration given to using the same discount rate as currently applied to the valuation of life and health effects. This review will conclude in 2022 and any changes to discounting will be incorporated into future updates of the Green Book.

2.2.7 The Green Book changes summarised above make it a vital tool for progressing the Government's priority outcomes and wider public value agenda. A number of the priority outcomes are strongly focused on levelling up and will inform the allocation of spending in the 2022 Spending Review. They include:

- An outcome to raise productivity and empower places so that everyone can benefit from levelling up
- An outcome to level up education standards: so that children and young people in every part of the country are prepared with the knowledge, skills and qualifications they need
- Maximise employment across the country to aid economic recovery following Covid-19.

2.2.8 The Green Book Review has also revisited guidance on appraising environmental impacts, to strengthen the case for projects which will facilitate the delivery of the 25 Year Environmental Plan (2018) and the UK's legal requirement to achieve net zero carbon emissions by 2050.

2.2.9 Revisions to the Green Book have been taken into consideration through the development of the MATS Improvement Schemes. The content of this Business Case aligns with the latest Green Book guidance to ensure that the refinement of preferred schemes is undertaken as part of a balanced appraisal process, and not solely based on the BCR value.

⁸ <https://www.gov.uk/government/publications/family-test-assessing-the-impact-of-policies-on-families>

DfT Transport Appraisal Guidance Update

2.2.10 In May 2021, the DfT published the Transport Analysis Guidance (TAG) Update Report⁹ detailing proposed changes to its TAG, to reflect recent challenges and opportunities affecting the transport appraisal framework arising from:

- The Government's revised economic outlook forecast for significantly lower long-term growth in productivity and income
- Uncertainty around future travel behaviour and needs brought about by Covid-19
- A review of HMT's Green Book, on which the DfT's Transport Analysis Guidance is based, to ensure it helps the Government take informed decisions in support of levelling up (as referred to above)
- The UK's Net Zero greenhouse gas emission target by 2050, to ensure that impacts on carbon are appropriately assessed and valued through the Business Case process
- Reviewing the appropriate timescale to assess the benefits of transport projects and whether the full extent of the value of investments is being captured appropriately.

2.2.11 The Green Book Review, detailed above, highlighted several changes to the methodology and evidence base requirements for assessing proposals through the business case process. In response to this, the DfT confirmed the transport business case guidance would be updated to provide advice on developing both strategic and economic dimensions of the business case in line with the Green Book changes. The business case process for the MATS Improvement Schemes incorporates these guidance updates.

DfT Single Departmental Plan

2.2.12 The Single Departmental Plan published in June 2019¹⁰ sets out the DfT's objectives and the plan 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 DfT does.

⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/987768/appraisal-and-modelling-strategy-update-report.pdf

¹⁰ <https://www.gov.uk/government/publications/department-for-transport-single-departmental-plan>

2.2.13 The MATS Improvement Schemes are broadly aligned to these objectives and will ensure national level goals for enhanced connectivity, transport infrastructure and sustainable economic growth are achieved at a local level across March.

National Planning Policy Framework

2.2.14 The National Planning Policy Framework (NPPF)¹¹ sets out the Government's planning policies for England and how they are expected to be considered in the preparation of development plans.

2.2.15 As stated in the NPPF, 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. Sustainable development performs an economic, social and environmental role and involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life, including (but not limited to):

- Making it easier for jobs to be created in cities, towns and villages
- Moving from a net loss of biodiversity to achieving net gains for nature
- Replacing poor design with better design
- Improving the conditions in which people live, work, travel and take leisure and
- Widening the choice of high-quality homes.

2.2.16 At a strategic level, the MATS Improvement Schemes align with the principles outlined in the NPPF and aspire to remove local transport barriers that prevent the progression of development which positively contributes to the local environment and people's quality of life. As individual elements of the package of schemes are developed, care will be needed to ensure that any biodiversity issues are considered.

Cambridgeshire and Peterborough Combined Authority

2.2.17 The Cambridgeshire and Peterborough Combined Authority (CPCA) was formed in 2017, as a Mayoral Combined Authority. It comprises seven local authorities (CCC, Peterborough City Council, Huntingdonshire District Council, East Cambridgeshire District Council, Fenland District Council, Cambridge City Council and South Cambridgeshire District Council) and the Business Board (Local Enterprise Partnership).

2.2.18 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. Figure 2.1, below, sets out the CPCA Policy Framework.

¹¹ <https://www.gov.uk/government/publications/national-planning-policy-framework--2>



Figure 2.1: CPCA Policy Framework

- 2.2.19 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).
- 2.2.20 The CPIER¹² 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. The assessment makes a number of recommendations for the CPCA to take forward over the short, medium and long-term.
- 2.2.21 The success of Cambridgeshire and Peterborough as a project of national importance is highlighted in the CPIER. This is because the area contains some of the most important companies and institutions in the country, much of the country’s high value agricultural land, and the cities and towns that continue to support both.
- 2.2.22 The Local Industrial Strategy¹³ 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 Ambition 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.

¹² <https://www.cpier.org.uk/>

¹³

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/818886/Cambridge_SINGLE_PAGE.pdf

- 2.2.23 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.
- 2.2.24 The CPCA Assurance Framework states that investments will only be made if they can demonstrate that they will support the delivery of the Growth Ambition Statement and the Local Industrial Strategy, as well as the more detailed place and sector strategies.
- 2.2.25 This has direct implications for the MATS Improvement Schemes, with a need to ensure these support CPCA growth ambitions and align with the Local Industrial Strategy. March lies at the heart of 'The Fens' sub-economy, supporting industries and employers utilising the high value agricultural land surrounding the town. Providing an efficient and reliable local transport network in and around March is crucial to ensuring the continued success of the local economy in line with the CPCA Growth Ambition Statement.
- 2.2.26 In January 2020, the CPCA adopted a Local Transport Plan for Cambridgeshire and Peterborough¹⁴ and it replaced 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, setting out the policies and strategies needed to secure growth and ensuring that planned, large-scale development can take place in the county in a sustainable way.
- 2.2.27 The Local Transport Plan is split into 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, as well as for its day-to-day management and maintenance.
- 2.2.28 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 aligned. 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'.

¹⁴ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>

2.2.29 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, and
- **Environment** – Protect and enhance our environment and tackle climate change together.

2.2.30 The objectives of the Local Transport Plan underpin the delivery of these goals and form the basis against which schemes, initiatives and policies will be assessed. They 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 the region’s businesses and tourist attractions are connected sustainably to the 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 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 the natural, historic and built environments, and
- **Climate Change** – Reduce emissions to as close to zero as possible to minimise the impact of transport and travel on climate change.

2.2.31 The MATS Improvement Schemes aim to align directly with CPCA Local Transport Plan objectives, particularly in relation to Housing, Employment, Safety and Accessibility. The success of the MATS Improvement Schemes will be measured against similar outcomes to those defined in the CPCA Local Transport Plan.

- 2.2.32 The CPCA Mayoral Election on the 6th May 2021 resulted in a new Labour Mayor being elected, replacing the incumbent Conservative Mayor who had held office since 2017. At the time of drafting this FBC1, the content of the CPCA policy framework and Growth, Industrial and Transport Strategies, illustrated in Figure 2.1, and detailed in the subsequent text, above, remain the same.
- 2.2.33 It should be noted that the Combined Authority Board agreed to produce an updated Local Transport Plan during its meeting on 28th July 2021. This plan (The Local Transport and Connectivity Plan) was consulted on in summer 2022 and is currently being drafted. It is expected that this will be published in early 2023.

2.3 Local Policy Context

- 2.3.1 In relation to local planning, development, and transport policy, detailed below are a number of documents that define policies specific to March, setting out future growth ambitions and targets for the town, as well as a vision for March in future years. These represent local policy drivers influencing the MATS Improvement Schemes and define the specific aspirations of local authority bodies representing March town residents.

Fenland Local Plan

- 2.3.2 While FDC is currently preparing a new Local Plan, which 'will determine what the district will look like over the twenty-year period, between 2021 and 2041, and how it will become an even better place to live, work and visit'¹⁵, this business case considers the current iteration of the Fenland Local Plan, which was adopted by FDC in May 2014¹⁶. FDC is currently updating the Fenland Local Plan, however a revised document is not expected to be adopted until early 2025.
- 2.3.3 The adopted Local Plan vision for Fenland seeks to maximise the potential of the area and deliver jobs, skills, dynamic town centres, vibrant villages, improved housing, and new infrastructure.
- 2.3.4 In its Vision Statement, the Fenland Local Plan states that across the district there will be 11,000 new homes between 2011 and 2031, increased employment opportunities and a bolstered tourism economy. It also states that homes and jobs will be closely linked to each other, with new infrastructure, such as roads, planned and provided at the same time as new buildings.
- 2.3.5 In order to achieve the ambitions within the Vision Statement, the Fenland Local Plan defines a number of specific policies in relation to specific issues and locations across the district, setting out detailed targets and ambitions for addressing these.

¹⁵ <https://www.fenland.gov.uk/article/15170/Emerging-Local-Plan>

¹⁶ https://www.fenland.gov.uk/media/12064/Fenland-Local-Plan---Adopted-2014/pdf/Fenland_Local_Plan-Adopted_2014.pdf

2.3.6 These policies are guided by a number of specific objectives, one of which, relating to economic activity, states that FDC will:

'Support investment in people, places, communications and other infrastructure to improve the efficiency, competitiveness, vitality and adaptability of the local economy.'

2.3.7 In relation to housing, Policy LP4 sets a target of 4,200 new homes between 2011 and 2031 for March and surrounding areas.

2.3.8 In relation to *Employment, Tourism, Community Facilities and Retail*, Policy LP6 states that opportunities for jobs growth in the district will be maximised with the aim of achieving 7,200 net additional jobs over the period 2011 to 2031, with delivery of 85ha of new employment land to provide for business, industrial and distribution uses. In relation to March, Policy LP6 sets a target of 30ha for delivery of new employment land in and around the town.

2.3.9 Policy LP9 states that March is a focus for housing, employment and retail growth, and should enhance and make appropriate use of its heritage assets to benefit its regeneration and sense of place. Policy LP9 also defines support for development at a number of strategic allocations and broad locations for growth across the town, including:

- **South-east March** (Strategic Allocation): Approximately 600 dwellings
- **South-west March** (Broad Location for Growth): Approximately 500 dwellings
- **West March** (Strategic Allocation): Approximately 2,000 dwellings and some business uses
- **March Trading Estate** (Broad Location for Growth): Predominantly or entirely related to business uses.

2.3.10 These locations are shown in Figure 2.2 overleaf for context.¹⁷

¹⁷ Figure 2.2 is from page 44 of the adopted Fenland Local Plan.

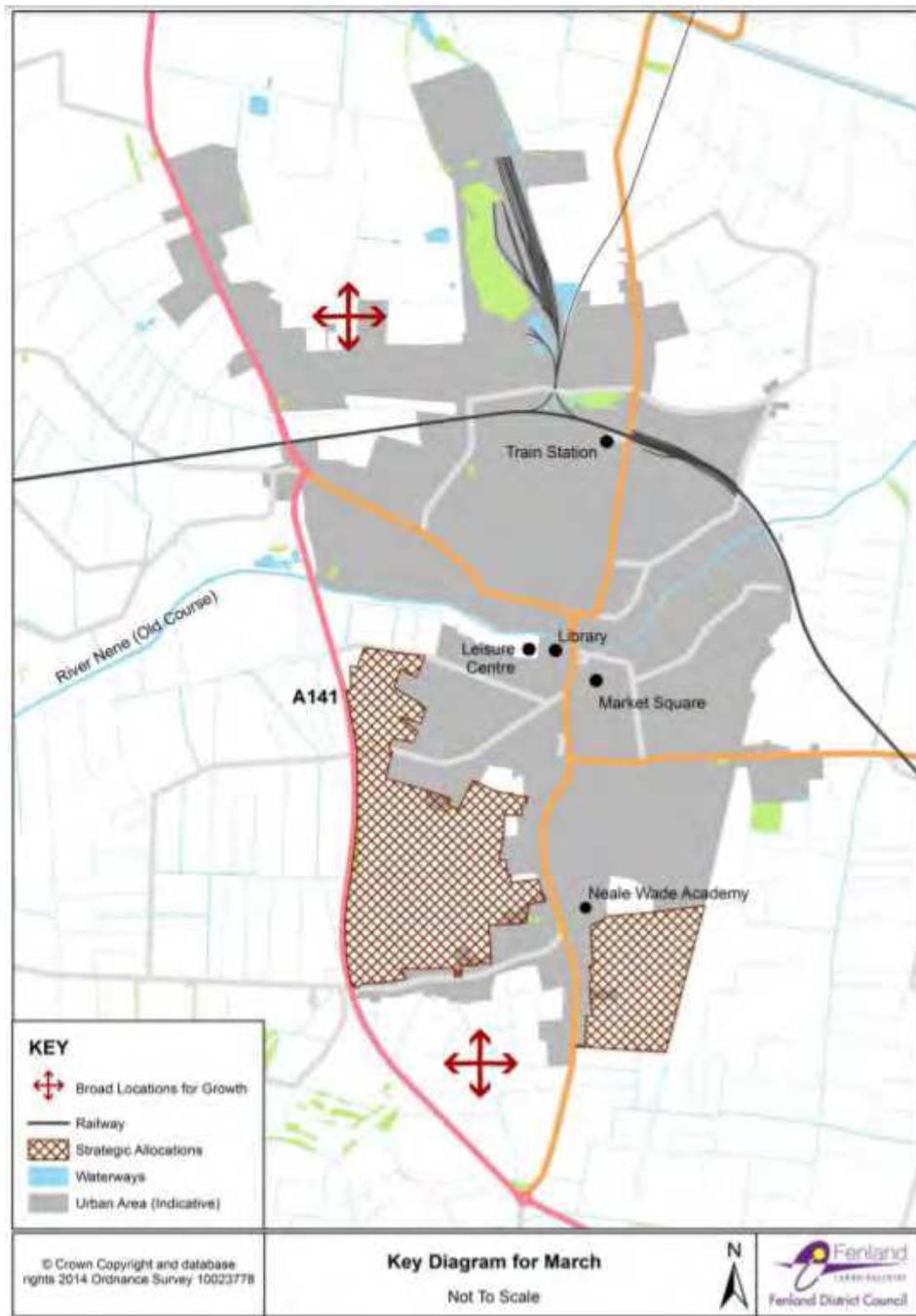


Figure 2.2: LDP Strategic Allocations and Broad Locations for Growth

- 2.3.11 In relation to *Supporting and Managing the Impact of a Growing District*, Policy LP13 states that all new development should be supported by and have good access to infrastructure. The MATS Improvement Schemes are aimed directly at improving transport infrastructure to support growth at specific, strategic locations on the network, enhancing the viability of development across the town.
- 2.3.12 In relation to *Facilitating the Creation of a More Sustainable Transport Network in Fenland*, Policy LP15 outlines its vision:

'The Council is seeking to deliver an integrated approach to transport in Fenland that is sustainable, facilitates growth, links town and country, encompasses cross boundary transport issues and improves accessibility for everyone by all modes of travel. An overarching aim of the Council is to reduce the need to travel, but, where travel is necessary, to minimise the distance needed to travel and increase the options available to undertake such journeys.'

- 2.3.13 The MATS Improvement Schemes are aligned with a vision for a sustainable transport network across Fenland, helping to facilitate growth and improve links between town and country. Facilitating the regeneration of and improving access to March Town Centre, will reduce the need for longer distance travel away from the town, encouraging people to live, work and visit March as a destination of choice.
- 2.3.14 The MATS Improvement Schemes are also supported by a range of sustainable travel measures as detailed in the Pedestrian, Signage and Cycling Strategy (2020) document, produced during Stage 1 of the MATS. Further feasibility work has since been commissioned to assess, group, and prioritise the identified schemes into deliverable projects for preliminary and detailed design.
- 2.3.15 Policy LP15 also states that delivering the right transport related infrastructure, in the right place, at the right time, is essential if the transport vision is to be achieved. Specifically, in relation to strategic transport infrastructure, LP15 aims to:
- Improve and better manage the strategic road transport infrastructure, including A47, A141, A142, A605 and A1101, to allow for a range of users and increased capacity where appropriate and viable.
 - Improve and better manage the wider road infrastructure to benefit local communities including rural roads, and key transport links in market towns and villages.
- 2.3.16 The MATS Improvement Schemes propose targeted interventions along several of these defined routes, aiming to provide improved road infrastructure and capacity for the benefit of local residents and businesses.

Growing Fenland

- 2.3.17 Growing Fenland is a project to create four separate 'Masterplans for Growth' for each of Fenland's market towns - March, Wisbech, Chatteris and Whittlesey. These aim to bring jobs, infrastructure, and growth to market towns, enabling each to become and remain 'vibrant and thriving places' whilst helping to boost the local and regional economy and maximising their regeneration.
- 2.3.18 Through the Growing Fenland project, the CPCA is committed to the future prosperity and success of every market town in Cambridgeshire and is providing capital investment to mobilise each town masterplan and to act as a funding catalyst to secure additional investment. This approach aims to give each town its own starting point and evidence base to tailor and customise interventions to meet the distinctive needs of each local economy.

2.3.19 In relation to March, the *Growing Fenland - March: Market Town Masterplan*¹⁸ was approved by the CPCA Board on 29th January 2020 and sets out a vision for March as follows:

'Our vision is that March will be a destination market town where people want to live and work. We will be a destination for shoppers and visitors looking to enjoy the revitalised high street. We will be a destination for employers looking for ambitious and highly skilled employees. We will be a destination for households looking for affordable homes in friendly, safe, attractive neighbourhoods.'

2.3.20 To achieve this vision, the March Market Town Masterplan sets out a number of key proposals for improving March and the town centre. These include:

- Improving the appearance of the town centre with targeted interventions to enhance the overall appeal of the High Street and town centre areas, including measures to improve signage around the High Street and shop frontage improvement schemes.
- Reducing traffic flow through the town centre, highlighting existing issues with slow traffic flow speeds, poor air quality and the dominance of traffic within the town centre.
- A small to medium enterprise development programme, to encourage and support the development of new business and employment opportunities across the town.
- Improving the availability of properties within the town, recognising a need to bring together landowners, developers, and the local councils to ensure that March can continue to deliver the range of properties that the town needs for future years.

2.3.21 The MATS Improvement Schemes are directly aimed at addressing a number of the key proposals defined within the Growing Fenland March Masterplan, particularly around improving the appearance of the town centre and improving traffic flow conditions.

March Neighbourhood Plan

2.3.22 The March Neighbourhood Plan was adopted by FDC on 2nd November 2017.¹⁹ It was produced by March Town Council in consultation with the community to help guide development in March in key areas in the period to 2030.

2.3.23 The plan does not replicate wider government policies such as the NPPF and the Fenland Local Plan but supports them by providing more clarity in a number of areas that the community considers to be important and necessary.

¹⁸ https://www.fenland.gov.uk/media/16601/Growing-Fenland---March-Final-Report/pdf/Growing_Fenland_-_March_Final_Report.pdf

¹⁹ https://www.marchtowncouncil.gov.uk/wp-content/uploads/March_Town_Neighbourhood_Plan_-_Referendum_Version_FINAL.pdf

2.3.24 The plan provides a vision for the future of the community and sets out clear policies to help realise this vision in line with other national and local planning policy. This vision is:

‘To improve the quality of life for people who live and/or work in March, including those who visit and depend on its services and facilities.’

2.3.25 The key aims of the March Neighbourhood Plan are:

- That growth within the town is accommodated sustainably, with an objective to provide more certainty about the sequence of development across the town and the delivery of infrastructure.
- That new housing creates and maintains healthy mixed communities, with an objective to secure an appropriate mix of new housing informed by housing need.
- That March Town Centre becomes a shopping destination of choice for residents, businesses and visitors, with an objective to secure the appropriate regeneration of the town centre, tackling long-standing issues around traffic, parking, retail offer and environment.
- That the quality of the built and natural environment is improved, with an objective to secure high-quality development in all new schemes.
- That the level of provision and quality of recreational land facilities is increased and improved, with an objective to safeguard and improve all land and facilities of community importance and secure the provision of new land and facilities.

2.3.26 The MATS Improvement Schemes directly address the aims of the March Neighbourhood Plan and have been devised with direct consideration of these throughout the scheme development process.

2.4 Need for Change and Identified Issues

Overall Need for Change

2.4.1 There is a need to identify specific challenges where transport issues present a barrier to progress across March when developing a clear set of targeted interventions and scheme objectives, to help the town maximise its future potential. This is set against a context of local planning and development policy to establish the overall need for change. Identified below are four broad themes that group the relative requirements for change and the associated issues into distinct categories. These are:

- The need for regeneration in March Town Centre
- The need to address existing traffic congestion and safety issues
- The need to facilitate housing and employment growth across March
- The need to improve local environmental conditions.

The MATS Broad Street Scheme will directly facilitate the regeneration of March Town Centre by re-configuring the existing transport infrastructure to provide more space for public realm and reduce existing congestion by replacing the traffic signal-controlled junction with a roundabout.

Regeneration in March Town Centre

- 2.4.2 There is both a pressing need and a strong local desire to encourage regeneration in and around March Town Centre. There are a number of areas within and close to the town centre in which it is felt that the quality of the built environment is having a detrimental effect on its attractiveness as a place to shop and visit, and that this is a disincentive for major retail chains to invest in the area.
- 2.4.3 Analysis has indicated that the retail vacancy rate for the area defined as March Town Centre was 3.3% in 2019, which has climbed steeply from 0.3% in 2015.²⁰ This compares unfavourably to a UK rate of 2.3% and is reflective of a significant decline. The impact of the COVID-19 lock downs during 2020 and 2021 will have had a further impact on retail vacancy rates with recent analysis, undertaken by the British Retail Consortium in May 2021, indicating that one in seven retail premises across Britain are now vacant, with vacancy rates of 14.1% in the East of England.²¹
- 2.4.4 In parallel to the MATS project, FDC's successful FHSF will fundamentally change the way in which March functions as a town centre. The MHCLG funding will deliver public realm improvements along Broad Street, the Riverside, and within the Market Square. This includes enhanced provision for pedestrians, changes to densification in use which will support a 24-hour economy, attracting businesses, and facilitating regeneration and resilience by opening up underused and derelict areas for commercial development. The purpose of this secured investment is to arrest the decline in March Town Centre and enable the area to make the most of its untapped potential. The changes proposed will facilitate economic growth and encourage further investment, as the town centre attracts more visitors.
- 2.4.5 The FHSF proposals have been designed to respond to local challenges and the wider strategic objectives of the FHSF programme. These include:
- **'Renew and Reshape Town Centres'** – the programme includes proposals which will fundamentally change the way in which March functions as a town centre. This includes improvements in Broad Street which will improve pedestrian flow and footfall, changes and densification in use which will support a 24-hour economy and support resilience,

²⁰ https://www.fenland.gov.uk/media/16892/Growing-Fenland-March-Final-Report/pdf/Growing_Fenland_-_March_Final_Report.pdf?m=637272072374070000 (page 6)

²¹ <https://www.bbc.co.uk/news/business-56925878>

and public realm improvements which will open up underused and derelict areas for commercial development.

- **'Improve Experience'** – the improvements to Broad Street, and the Market Square public realm will ensure that existing custom is retained, while providing a new offer to businesses and the wider community. These improvements will be visual, environmental and experiential.
- **'Drives Growth'** – the changes will tackle the existing financial viability gap and release new opportunities for the private sector to re-invigorate the town centre. The provision of mixed use and residential space will drive increases in footfall and dwell time, and help March capitalise on its unique historical and riverside assets.

2.4.6 Care has been taken to ensure that the proposed MATS intervention along Broad Street is aligned with the FHSF proposal, to ensure the boundaries of each scheme are integrated to reduce the dominance of traffic and parked vehicles, improve traffic flow conditions and maximise public realm. The FHSF proposals for Broad Street are dependent on the reallocation and realignment of carriageway in Broad Street, as proposed in the Broad Street MATS Improvement Scheme.

Again, the MATS Broad Street Scheme will directly facilitate the regeneration of March Town Centre by providing the transport infrastructure around which the FHSF proposals will be delivered.

Traffic Congestion and Safety Issues

- 2.4.7 There is an established need to address existing traffic congestion and road safety issues at a number of locations in and around March, as evidenced by historical studies of traffic and transport conditions within the town and work undertaken for the current MATS project. As part of the public engagement process to devise the March: Market Town Masterplan, residents consistently identified traffic congestion as one of the main issues in the town.
- 2.4.8 Existing traffic and travel conditions across March have been established in the Existing Conditions and Data Collection Report (2018) produced during Stage 1 of the MATS. This identified several specific locations and areas across March where traffic congestion was generating potential issues on the local highway network as described below.

- 2.4.9 A review of Satellite Navigation Data, supported by analysis of Automatic Number Plate Recognition (ANPR) data, provides an understanding of average vehicle speeds across March's road network during various daily time periods. During morning time periods between 08:00 and 09:00, areas within the town centre are shown to be congested, with a number of routes, including Broad Street, High Street, Station Road and Dartford Road, shown to have moderate and high levels of congestion. Slow traffic flow speeds and congestion is also observed at the Peas Hill Roundabout junction. A similar picture of congestion is shown during the evening (17:00 to 18:00) and inter-peak (14:00 to 15:00) time periods, with moderate and high levels of congestion observed across March Town Centre and along the A141 at the Peas Hill Roundabout junction.
- 2.4.10 A review of traffic survey queue length data at key junctions across March revealed that queue lengths were significantly higher within the town centre, particularly at the Broad Street / Station Road / Dartford Road junction, as well as along key routes into March (B1101 and A141).
- 2.4.11 Maximum queue length data indicate that B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction (188 metres), Peas Hill Roundabout (162 metres), and the Dartford Road / B1101 Broad Street / B1101 Station Road / Robingoodfellow's Lane junction (147 metres) experience some of the highest maximum queues in the study area during the AM peak in the base year. Queuing at these junctions is of a similarly severe nature during the PM peak in the base year.
- 2.4.12 Junction capacity (LOS) data indicate that the B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction is approaching capacity (LOS D in the AM and PM peaks) in the base year. It should also be noted that the Dartford Road / B1101 Broad Street / B1101 Station Road / Robingoodfellow's Lane junction performs at LOS C (in the AM and PM peaks) in the base year.

Without intervention, forecast growth is expected to exacerbate existing issues of congestion and queueing along Broad Street, having an adverse impact on residents and compromising the sustainability of further long-term growth in the town.

The strategic and micro simulation modelling reported in the OAR demonstrate that the replacement of the traffic signal-controlled junction with a roundabout is expected to significantly reduce delay and queueing in March Town Centre.

2.4.13 A review of traffic collision data for 2015 to 2019 (pre-COVID-19 impacts) and 2017 to 2021 (including COVID-19 impacts) within March and in surrounding areas revealed several cluster areas across the local highway network where collisions have occurred in high frequency, including:

- March Town Centre, particularly along B1101 Broad Street, B1099 and Market Place
- The A141 / Gaul Road junction
- Peas Hill Roundabout (A141)
- The A141 / Twenty Foot Road junction.

2.4.14 These collisions are shown on a heatmap in Figure 2.3 below.



Figure 2.3: Collision Heatmap for March Pre-COVID-19 (2015 to 2019) and Including COVID-19 Impacts (2017 to 2021)

2.4.15 The heatmaps show that the densest collision hotspot is in March Town Centre, where improvements are being made by the MATS schemes. The A141 / Twenty Foot Road junction, and Peas Hill Roundabout (A141) are also more prominent collision hotspots on the heatmap, demonstrating a need for intervention at these locations.

2.4.16 One fatal traffic collisions occurred on the A141 just north of the A141 / A605 signalised junction during the 2015 to 2019 and 2017 to 2021 periods.

- 2.4.17 A comparison of accidents before and during Covid-19 pandemic has shown that the frequency of collisions has not significantly changed in the study area; 44 collisions occurred between 1st March 2020 and 31st December 2020 (i.e., during the Covid-19 pandemic) and 45 collisions occurred between 1st March 2019 and 31st December 2019 (i.e., before the Covid-19 pandemic).

Without an intervention, the likelihood of incidents occurring on Broad Street will increase.

A COBALT assessment of the accident benefits associated with the MATS Broad Street Scheme has demonstrated that the scheme will result in 129 fewer personal injury accidents across March over a 60-year appraisal period. There will be a reduction of one fatal, 11 serious, and 174 slight casualties over the whole appraisal period. Further information on the COBALT assessment can be found in the Economic Dimension.

Housing and Employment Growth Aspirations

- 2.4.18 As defined in previous sections, significant housing and employment growth is proposed in and around March within the adopted Local Plan period to 2031. These developments will bring growth in traffic demand and additional vehicle trips onto the road network. Without a targeted intervention to address this, it would exacerbate the existing congestion issues across March (as defined above).
- 2.4.19 Future year traffic modelling and forecasting has been undertaken and is documented in the March Forecasting Report (2019) produced during Stage 1 of the MATS. It details the relative impact of housing and employment growth aspirations on the local highway network in future years. This revealed an increase in journey times and traffic flows above existing conditions, along key routes into and around March, notably along the B1101 and A141.
- 2.4.20 A review of the performance of individual junctions in future years (2026 and 2031) revealed an increase in average vehicle delay and traffic flow demand across March. The MATS has demonstrated that some form of highway intervention at these locations would be required to mitigate the impact of adopted Fenland Local Plan housing and employment growth aspirations for March.
- 2.4.21 Severe queueing is forecast at several junctions in the study area in 2031. For example, during the AM peak, Peas Hill Roundabout is forecast to experience the highest maximum queue lengths in the study area (965 metres) and the B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction is forecast to experience the second highest maximum queue lengths in the study area (598 metres). Without mitigation, the highways network in March will be unable to support the impact of adopted Fenland Local Plan housing and employment growth.

Without intervention, forecast growth is expected to exacerbate existing issues of congestion and queueing along Broad Street, having an adverse impact on residents and compromising the sustainability of further long-term growth in the town.

The MATS Broad Street Scheme will support the delivery of housing and employment growth across March by removing a key capacity constraint on a critical part of the town's transport network, whilst also contributing to the regeneration of Broad Street and the economic benefit that will bring.

Improving Local Environmental Conditions

- 2.4.22 There is a need to improve local environmental conditions across March, particularly in the town centre and Broad Street Area.
- 2.4.23 Analysis undertaken of local air quality monitoring stations revealed that the twelve-month average concentration of NO₂ on Broad Street for 2018 was 39.59 µg/m³, close to the current legal limit of 40.00 µg/m³.²² This is driven by congestion and slow-moving traffic in the Broad Street area, particularly around the Broad Street / Station Road / Dartford Road junction traffic signals. There is a pressing need to address air quality issues at this location to prevent a further deterioration of conditions in future years.
- 2.4.24 In addition, there is a strong local desire to revitalise the townscape and built environment across March and encourage town centre regeneration. The March: Market Town Masterplan notes that the town has a number of under-utilised natural and heritage assets overshadowed by highly visible derelict eyesores, such as the long-vacant Indoor Market, vacated shop frontages and dilapidated buildings at the top of Broad Street.
- 2.4.25 These factors are driving a pressing need to make better use of the towns-built environment and to ensure measures to improve the overall aesthetic of the town are brought forward and not limited by traffic and transport issues.

The MATS Broad Street Scheme will improve air quality by significantly reduce queues and idling traffic along Broad Street through the removal of the traffic signal-controlled junction. Section 3.5 of the Economic Dimension has demonstrated the MATS package will provide an air quality benefit.

²² Growing Fenland - March: A Destination Market Town, Market Town Masterplan (2019), page 15

2.5 Internal Drivers for Change

- 2.5.1 Internal drivers for change are factors that are driving the need for change, and come from the scheme promoter, such as aspirations for growth, or to increase network resilience.

Local Growth Aspirations

- 2.5.2 The overall need for change is being driven by local growth and development aspirations for March from various local and regional authority bodies as has been defined in Sections 2.2 and 2.3.

CCC / CPCA Support

- 2.5.3 The MATS Improvement Schemes are endorsed by various local authority bodies, including the CPCA, CCC and FDC.
- 2.5.4 The CPCA Mayoral and the CCC Local Government election results of 6th May 2021 have resulted in a change of political representation for both authorities, however, the CPCA, CCC and FDC remain unanimous in their support for the MATS Improvement Schemes.

The MATS Broad Street Scheme is being driven by local growth aspirations and the need to address existing issues associated with traffic congestion, personal injury incidents and air quality (specifically along Broad Street).

2.6 External Drivers for Change

- 2.6.1 External drivers for change come from outside the scheme promoter's organisation, and include factors such as public opinion, legislative changes or as a response to specific events.
- 2.6.2 Part of the requirement for change is being driven by a need to regenerate March Town Centre, with the successful FHSF funding allocation from MHCLG now approved. The FHSF funding will drive the requirement to redesign the transport and highway carriageway infrastructure alignment along Broad Street, to accommodate the FHSF proposals.

The award of FHSF for March Town Centre is an external driver for the MATS Broad Street Scheme and has played a significant part in shaping the final design. As its funding is time limited, the FHSF project is also driving the delivery programme for the MATS Broad Street Scheme and has necessitated the phased approach being taken towards the MATS FBCs.

- 2.6.3 While there are no specific external drivers for change associated with the MATS Improvement Schemes themselves, significant historic consultation with residents has identified clear support for addressing issues identified in Section 2.4.

2.7 Scheme Constraints, Powers and Consents

2.7.1 A number of potential constraints on the MATS Improvement Schemes have been identified that will need to be considered as part of the scheme's continued development and design. These include:

- **Funding:** Funding for the construction of the MATS Improvement Schemes requires identification and confirmation from the CPCA and CCC. Details of possible funding sources and mechanisms to secure these funds are provided in the Financial Dimension (section 4) of this FBC1. The schemes will need to compete with other transport infrastructure funding priorities which may exceed the CPCA's and CCC's core transport investment budget allocations.
- **Land Availability and Access:** The acquisition of land is likely to be required for interventions at three of the MATS locations which involve the development of new sections of highway or require an extension to the existing highway boundary. Additional land access may also be required during development and construction of a number of the proposed schemes. Specifically, option design refinement has identified the potential requirement for a small strip of land from a private landowner for the scheme proposals at Peas Hill Roundabout and the NILR. The requirement for land acquisition has also been identified on the A141 / Twenty Foot Road scheme. Permission to access Network Rail land is also being sought for Preliminary Design surveys relating to the NILR proposal. There is also a likely land requirement at the A141 / Hostmoor Avenue Junction. Further details are provided in the options development section in 2.13, below.
- **Planning:** Planning permission is likely to be required for any individual scheme elements that involve a change of land use and represent an extension or change to the existing highway boundary. CCC has commissioned a report to review the delivery of the MATS Improvement Schemes from a planning perspective.²³ The report provides recommendations in relation to planning risks and key technical document requirements for each of the MATS Improvement Schemes, which has been taken into full consideration throughout the development of the Detailed Designs and respective FBCs.
- **Spatial Constraints and the Built Environment:** Proposed interventions will need to be developed within the land available. A number of locations within the study area, notably around Broad Street and in the town centre, are constrained by the built environment as well as locally important historic structures which will need to be accounted for in scheme design. Consultation with Historic England and FDC's Conservation Officer has been undertaken during the Detailed Design phase (as part of the FHSF project) to ensure that such constraints are appropriately considered. The FHSF (and MATS by virtue of that) have the required support for the scheme.

²³ March Strategic Study Planning Report (Carter Jonas, July 2021)

- **Construction Programming:** Efforts will be made to minimise the overall impact on road users during scheme construction. Construction of various elements of the proposed schemes should be undertaken with consideration to other highway works across March to avoid a cumulative negative impact on road users. The delivery of the Broad Street MATS proposal will be aligned to the delivery of the FHSF Broad Street and Riverside proposals.
- **Stakeholder / Public Acceptability:** The schemes should be acceptable to and be supported by key stakeholders impacted by scheme proposals, as well as members of the public. Further details regarding stakeholder engagement are detailed below in Section 2.9.
- **Environmental Constraints:** Scheme design and delivery proposals will need to take account of local ecological receptors, protected land and Habitats of Principle Importance within the defined study area.

- **Funding:** Funding has been allocated for the MATS Broad Street Scheme subject to approval at CPCA Board. This funding is constrained by time limitations as described in the Financial Dimension and the construction programme and business case structure has been developed to reflect that.
- **Land availability of Access:** There is no land acquisition required for the MATS Broad Street Scheme.
- **Planning:** There are no planning requirements associated with the MATS Broad Street Scheme. As part of the FHSF Broad Street Scheme, a listed building consent and planning application have been submitted to allow for the relocation of the Grade II Listed, 110-year-old cast iron ornamental water fountain (NGR: TL4168196865) from its current location in the central carriageway island to the adjacent new public realm area. An application for consent will also be made as part of the FHSF Broad Street Scheme to remove two London Plane trees from Broad Street to Fenland District Council by mid December 2022. Eight new trees will be replaced as part of the March Future High Street Public Realm Scheme. Although these consents and approvals are beyond the scope of the MATS Broad Street Scheme, they clearly have the ability to impact on it. This has been identified as a project risk and will continue to be monitored and managed appropriately.
- **Spatial Constraints and Built Environment:** The MATS Broad Street Scheme will be built in a busy, complex and heavily constrained space. Careful consideration has been given to this during the Detailed Design phase and there has been the appropriate level of engagement with statutory and non-statutory stakeholders, including with those representing the businesses along Broad Street.
- **Construction Programming:** Efforts have been made to minimise the construction impacts through careful coordination of the MATS and FHSF delivery plans. Contractor commitments have been secured as part of procurement to maintain access to the shops and businesses throughout the construction period. Given the sensitivity of the location in March, and to avoid significant cumulative impacts, no other large-scale roadworks will occur in March whilst the MATS Broad Street Scheme is under construction.

1. **Stakeholder / Public Acceptability:** The MATS Broad Street Scheme has undergone multiple rounds of stakeholder and public engagement and is considered acceptable. Further information on the consultation undertaken to date is provided in Section 2.9 of the Strategic Dimension and Section 6.7 of the Management Dimension.
2. **Environmental Constraints:** The MATS Broad Street Scheme is not environmentally sensitive, and there are no environmental constraints limiting the construction of the scheme so long as appropriate management and mitigation measures are taken. The wider FHSF Broad Street Scheme does have environmental constraints, mostly relating to heritage assets flood risk and ecology (bats) and these will be carefully monitored as part of the FHSF project.

2.7.2 In addition to the constraints listed above, the following powers and consents are required to deliver the MATS schemes.

Table 2.1: Powers and Consents Table – MATS Broad Street Scheme

Type	Consent / Approval	Issuer	Description	Current Status
Highways	TTRO	Cambridgeshire County Council	Suspension of existing parking bays	PAA has gone in for the road space booking. TTRO 's submitted and advertised.
	PTRO	Cambridgeshire County Council	New Changes to the highway including parking ban, waiting restrictions and extension of the footway	Will be progressed in March 2023. Agreement in principal agreed with CCC/HA.
Environment	Archaeological Watching Brief & Supply of Geotechnical Survey Shapefiles		Geotech assessments undertaken for pavements and paved area. Full carriageway construction	Completed
	Bio Diversity Net Gain Assessment	Cambridgeshire County Council	Undertaken and delivering a BNG.	Completed
	Land Drainage Consent	Internal Drainage Board (IDB) and/or Lead Local Flood Authority (LLFA)	LLFA engaged throughout design process. Agreement in principle to proceed.	Consultation has been carried out with the LLFA who have reviewed the attenuation plans for the scheme and are satisfied with the mitigation measures proposed.
	Great Crested Newt (GCN) and/or Reptile Mitigation License	Natural England	Ecology Survey undertaken	No significant risk of impact. No evidence of GCN within site extent.
Design	RSA2	Cambridgeshire County Council	RSA 2 has been undertaken and designers response provided. No significant issues raised.	CCC to sign off.
	Drainage Consents	Statutory Undertakers	N/A. Drainage attenuation plans are geared to discharge into the Local river - Nene River. This has been reviewed by the Local flood authority and MLC.	Agreement in principle with both authorities in place. Final sign off progressing.
Governance	Cabinet Report	CCC	OBC and Preliminary design agreed at November 2021 H&T Committee to accept the development of detailed design and FBC phase. Update provided to April 2022 H&T Committee. Approval agreed to accept funding from CPCA to undertake construction work, enter into a GFA, engage in procurement process and award.	Complete
Other	Planning	FDC	Planning Consent to relocate historic water fountain on Broad Street	Planning application submitted. Decision due January 2023.
Other	Planning	FDC	Consent to remove trees from conservation area	Arborcultural Impact Assessment undertaken. Approval in principal agreed with FDC aborcultural officer.

Table 2.2: Powers and Consents Table – MATS St Peter’s Road Scheme

Type	Consent / Approval	Issuer	Description	Current Status
Highways	PTRO	Cambridgeshire County Council	Permanent Traffic Regulation Order allowing permanent restrictions to the road allowing the introductions of improvements	N/A
	TTRO	National Highways	Temporary Traffic Regulation Order allowing temporary restrictions to the road, enabling traffic management required for construction.	Will be sought prior to construction. Temporary road space booking to be confirmed once construction programme finalised.
Environment	Site of Specific Scientific Interest (SSSI)	Natural England	No protected site (SSSI) within the vicinity of the site	N/A
	Special Area of Conservation (SAC)	Natural England	No SAC site within vicinity of the site	N/A
	Screening for Likely Significant Effect (LSE) Assessment	Local Planning Authority	N/A	N/A
	Archaeological Watching Brief & Supply of Geotechnical Survey Shapefiles		N/A	N/A
	Consultation	The Wild Life Trust	N/A	N/A
	Bio Diversity Net Gain Assessment	Cambridgeshire County Council	No loss of vegetation as the site is wholly within an urban setting	N/A
	Great Crested Newt (GCN) or Reptile Mitigation license	Natural England	No impact on any GCN population	No further action required
	Land Drainage Consent	Internal Drainage Board (IDB) and/or Lead Local Flood Authority (LLFA)	Drainage design complete and reviewed by CCC flood authority	
Design	RSA2	Cambridgeshire County Council	Stage 1 completed. RSA 2 to be completed in detailed design in January 2023	RSA 2 to be completed in January 2023
	National Highways Technical Approval	National Highways	N/A	
	Drainage Consents	Statutory Undertakes	None required	
	Side Road Orders (SRO)	Cambridgeshire County Council	N/A	
Governance	Change in Equestrian Route	British Horse Society	N/A	
Governance	Cabinet Report		Initial Governance will be approval of FBC1 by Cambridge and Peterborough Joint Authority in March 2023	FBC 1 being prepared to feed into CPCA governance process in January 2023

Table 2.3: Powers and Consents Table – MATS Peas Hill Roundabout Schemes

Type	Consent / Approval	Issuer	Description	Current Status
Highways	TTRO	Cambridgeshire County Council	Temporary Traffic Regulation Order allowing temporary restrictions to the road, enabling traffic management required for construction.	Initial consultation already held with the CCC Traffic Orders team in October 2022 to clarify timescales and processes for temporary and permanent traffic orders. Temporary traffic orders to be sought before the start of construction.
	PTRO	National Highways	PTRO will be required to implement new speed limit. But the application will be made to the County council rather than National Highways	Consultation held with Cambridgeshire County Council Traffic Orders team in October 2022. Permanent traffic order requirements agreed - for any change of speed limit only
Environment	Site of Specific Scientific Interest (SSSI)	Natural England	There are no statutory sites located within 1km of the scheme and no non-statutory sites located within 500m of the scheme	Sites for conservation not considered to be a constraint to the scheme but a Habitat Regulation Assessment Screening report will be produced in FBC 2 as part of an Outline Planning Application
	Special Area of Conservation (SAC)	Natural England	There are no statutory sites located within 1km of the scheme and no non-statutory sites located within 500m of the scheme	Sites for conservation not considered to be a constraint to the scheme but a Habitat Regulation Assessment Screening report will be produced in FBC 2 as part of an Outline Planning Application
	Screening for Likely Significant Effect (LSE) Assessment	Local Planning Authority	Initial assessments indicate no significant effects	Further assessments to be done in the lead up to planning including a Habitat Regulation Assessment Screening report which will be produced in FBC 2 as part of an Outline Planning Application
	Archaeological Watching Brief & Supply of Geotechnical Survey Shapefiles	Cambridgeshire County Council	Archaeological assessments and any required surveys will be carried out in advance of submitting an outline planning application during FBC 2 in 2023. Geotechnical surveys already completed	CCC Archaeological team consulted and to be engaged in the pre-outline planning application process and subsequent construction period. Shapefile data for geotechnical surveys to be shared once available.
	Consultation	The Wild Life Trust	N/A	N/A
	Bio Diversity Net Gain Assessment	Cambridgeshire County Council	Consultation required with Cambridgeshire City Council upon completion of initial BNG Assessment to ensure that a 20% positive BNG is achieved in accordance with organisational targets.	Preliminary Ecological Assessment undertaken in September 2022 with some initial recommendations made for taking forward Biodiversity Net Gain. These will feed into the preparation of a BNG plan for the planning application in 2023 during FBC 2
	Great Crested Newt (GCN) or Reptile Mitigation license	Natural England	Initial surveys have identified 50 field drains and 2 ponds within 500m of the proposed scheme	Both ponds were dry during the survey carried out in August 2022. Further surveys will be required to identify the presence of GCN next year. Risk of GCN presence is regarded as low
Land Drainage Consent	Internal Drainage Board (IDB) and/or Lead Local Flood Authority (LLFA)	An initial flood risk assessment has been undertaken in August 2022. The River Nene (Old Course) flows approximately 500m to the south and the Twenty Foot river about 3km to the north. The proposed scheme is located mainly within Flood Zone 3a with small sections in flood zone 1 and 2. in an area benefitting from established EA defences. Fluvial and tidal flood risk is considered low. Certain locations are considered high risk due to topographical depressions around the north east of Peas Hill and Hotsmoor Ave. The drainage strategy utilises existing networks and new ones to offset these challenges and mitigate the consequent risks	Further assessments will be undertaken in the lead up to Planning in FBC 2 next year. Flood assessment has already been reviewed by the local Flood lead and will be continued in FBC 2	
Design	RSA2	Cambridgeshire County Council	RSA 2 is scheduled to be completed as part of the detailed design	RSA 2 is scheduled to be completed in January 2023
	CCC Highways Authority	National Highways	Design reviewed and approved by CCC technical leads	Design reviewed and approved by CCC technical leads
	Drainage Consents	Statutory Undertakes	Drainage design completed. Anglian water present	Further engagement with IDB to be undertaken in FBC 2 next year (2023)
	Side Road Orders (SRO)	Cambridgeshire County Council	Side Road orders might be required if accessways to private property are modified to improve buildability	Further details on possible accessways changes to emerge by the end of detailed design in early 2023
Governance	Change in Equestrian Route	British Horse Society	N/A	N/A
Governance	Cabinet Report	CPCA	Initial Governance will be approval of FBC1 by Cambridge and Peterborough Joint Authority in March 2023	FBC 1 being prepared to feed into CPCA governance process in January 2023

Table 2.4: Powers and Consents Table – MATS Hostmoor Avenue Scheme

Type	Consent / Approval	Issuer	Description	Current Status
Highways	TTRO	Cambridgeshire County Council	Temporary Traffic Regulation Order allowing temporary restrictions to the road, enabling traffic management required for construction.	Initial consultation already held with the CCC Traffic Orders team to clarify timescales and processes for temporary and permanent traffic orders. Temporary traffic orders to be sought before the start of construction. Permanent traffic orders will be required for speed limit changes, maintenance hardstanding and right turns.
	PTRO	National Highways	PTRO will be required to implement new speed limit. But the application will be made to the County council rather than National Highways	Consultation held with Cambridgeshire County Council Traffic Orders team in October 2022. Permanent traffic order requirements agreed - for any change of speed limit only and for the new maintenance bay for the traffic signals at Hotmoor
Environment	Site of Specific Scientific Interest (SSSI)	Natural England	There are no statutory sites located within 1km of the scheme and no non-statutory sites located within 500m of the scheme	Sites for conservation not considered to be a constraint to the scheme but a Habitat Regulation Assessment Screening report will be produced in FBC 2 as part of an Outline Planning Application
	Special Area of Conservation (SAC)	Natural England	There are no statutory sites located within 1km of the scheme and no non-statutory sites located within 500m of the scheme	Sites for conservation not considered to be a constraint to the scheme
	Screening for Likely Significant Effect (LSE) Assessment	Local Planning Authority	Initial assessments indicate no significant effects	Further assessments to be done in the lead up to planning including a Habitat Regulation Assessment Screening report will be produced in FBC 2 as part of an Outline Planning Application
	Archaeological Watching Brief & Supply of Geotechnical Survey Shapefiles	Cambridgeshire County Council	Archaeological assessments and any required surveys will be carried out in advance of submitting an outline planning application during FBC 2 in 2023. Geotechnical surveys already completed	CCC Archaeological team consulted and to be engaged in the pre-outline planning application process and subsequent construction period. Shapefile data for geotechnical surveys to be shared once available.
	Consultation	The Wild Life Trust	N/A	N/A
	Bio Diversity Net Gain Assessment	Cambridgeshire County Council	Consultation required with Cambridgeshire City Council upon completion of initial BNG Assessment to ensure that a 20% positive BNG is achieved in accordance with organisational targets.	Preliminary Ecological Assessment undertaken in September 2022 with some initial recommendations made for taking forward Biodiversity Net Gain. These will feed into the preparation of a BNG plan for the planning application in 2023
	Great Crested Newt (GCN) or Reptile Mitigation license	Natural England	Initial surveys have identified 50 field drains and 2 ponds within 500m of the proposed scheme	Further surveys expected in the lead up to planning, however risks remain low
	Land Drainage Consent	Internal Drainage Board (IDB) and/or Lead Local Flood Authority (LLFA)	An initial flood risk assessment has been undertaken in August 2022. The River Nene (Old Course) flows approximately 500m to the south and the Twenty Foot river about 3km to the north. The proposed scheme is located mainly within Flood Zone 3a with small sections in flood zone 1 and 2. in an area benefitting from established EA defences. Fluvial and tidal flood risk is considered low. Certain locations are considered high risk due to topographical depressions around the north east of Peas Hill and Hotmoor Ave. The drainage strategy utilises existing networks and new ones to offset these challenges and mitigate the consequent risks	Further assessments will be undertaken in the lead up to Planning in FBC 2 next year. Flood assessment has already been reviewed by the local Flood lead and will be continued in FBC 2
Design	RSA2	Cambridgeshire County Council	RSA 2 is scheduled to be completed as part of the detailed design	RSA 2 is scheduled to be completed in January 2023
	Design approval	CCC	Design reviewed and approved by CCC technical leads	Design reviewed and approved by CCC technical leads
	Drainage Consents	Statutory Undertakes	Drainage consents complete. Initial engagement with the CCC flood team and IDB raise no major issue	Further engagement with IDB to be undertaken in FBC 2 next year (2023)
	Side Road Orders (SRO)	Cambridgeshire County Council	Land take required. Side Roads Order	
Governance	Change in Equestrian Route	British Horse Society	N/A	
Governance	Cabinet Report	CPCA	Initial Governance will be approval of FBC1 by Cambridge and Peterborough Joint Authority in March 2023	FBC 1 being prepared to feed into CPCA governance process in January 2023

Table 2.5: Powers and Consents Table – MATS Twenty Foot Road Scheme

Type	Consent / Approval	Issuer	Description	Current Status
Highways	TTRO	Cambridgeshire County Council	Temporary Traffic Regulation Order allowing temporary restrictions to the road, enabling traffic management required for construction.	Initial consultation already held with the CCC Traffic Orders team to clarify timescales and processes for temporary and permanent traffic orders. Temporary traffic orders to be sought before the start of construction. Permanent traffic orders will be required for speed limit changes, maintenance hardstanding and right turns.
	PTRO	Cambridgeshire County Council	PTRO will be required to implement any new speed limit. But the application will be made to the County council rather than National Highways	Consultation held with Cambridgeshire County Council Traffic Orders team in October 2022. Permanent traffic order requirements agreed - for any change of speed limit and provision of signals maintenance bay on Twenty Foot Road
Environment	Site of Specific Scientific Interest (SSSI)	Natural England	Nene Washes which is an SSSI site lies within 1.2km of the site	The site appears to lay outside the 1km bandwidth for protected sites. However consultation with Natural England will still be undertaken in the lead up to planning
	Special Area of Conservation (SAC)	Natural England	Nene Washes which is an SSSI site lies within 1.2km of the site	The site appears to lay outside the 1km bandwidth for protected sites. However consultation with Natural England will still be undertaken in the lead up to planning
	Screening for Likely Significant Effect (LSE) Assessment	Local Planning Authority	Initial assessments indicate no significant effects. Rings End Local Nature Reserve is 690m to the NE of the site	Further assessments to be done in the lead up to planning Habitat Regulation Assessment Screening report will be produced in FBC 2 as part of an Outline Planning Application
	Archaeological Watching Brief & Supply of Geotechnical Survey Shapefiles	Cambridgeshire County Council	Archaeological assessments and any required surveys will be carried out in advance of submitting an outline planning application during FBC 2 in 2023. Geotechnical surveys already completed	CCC Archaeological team consulted and will be engaged in the pre-outline planning application process and subsequent construction period. Shapefile data for geotechnical surveys to be shared once available.
	Consultation	The Wild Life Trust	N/A	N/A
	Bio Diversity Net Gain Assessment	Cambridgeshire County Council	Consultation required with Cambridgeshire City Council upon completion of initial BNG Assessment to ensure that a 20% positive BNG is achieved in accordance with organisational targets.	Preliminary Ecological Assessment undertaken in September 2022 with some initial recommendations made for taking forward Biodiversity Net Gain. These will feed into the preparation of a BNG plan for the planning application in 2023
	Great Crested Newt (GCN) or Reptile Mitigation license	Natural England	Further surveys for great crested newts are not considered necessary. This is due to no GCN's having been detected. Further surveys not required due to an absence of suitable breeding ponds within 500m of the proposed scheme	No further Surveys required
	Land Drainage Consent	Internal Drainage Board (IDB) and/or Lead Local Flood Authority (LLFA)	The proposed scheme traverses Flood Zone 1, Zone 2 and Zone 3. The section of the scheme within Flood Zone 3 is part of an area benefitting from defences and will not require mitigation. Overall the proposed development site is considered to be at medium risk from fluvial flooding. Risk from surface water flooding is considered to be low	Further assessments will be undertaken in the lead up to Planning in FBC 2 next year. Flood assessment has already been reviewed by the local Flood lead and will be continued in FBC 2
Design	RSA2	Cambridgeshire County Council	RSA 2 is scheduled to be completed as part of the detailed design	RSA 2 is scheduled to be completed in January 2023
	Highway Design	CCC	Design reviewed and approved by CCC technical leads	Design reviewed and approved by CCC technical leads
	Drainage Consents	Statutory Undertakes	Drainage consents complete. Initial engagement with the CCC flood team and IDB raise no major issue	Further engagement with IDB to be undertaken in FBC 2 next year (2023)
	Side Road Orders (SRO)	Cambridgeshire County Council	Side Road order will be required to stop up section of Twenty Foot Road	Land agent to be engaged in FBC 2 to take acquisition and engagement forward with impacted parties
Governance	Change in Equestrian Route	British Horse Society	N/A	N/A
Governance	Cabinet Report	CPCA	Initial Governance will be approval of FBC1 by Cambridge and Peterborough Joint Authority in March 2023	FBC 1 being prepared to feed into CPCA governance process in January 2023

Table 2.6: Powers and Consents Table – MATS NILR Scheme

Type	Consent / Approval	Issuer	Description	Current Status
Highways	PTRO	Cambridgeshire County Council	A PTRO will be required to provide a cycle lane as proposed by the scheme	Initial discussions have been held with the CCC traffic orders team on the scope and schedule of the traffic orders process, pre-
	TTRO	Cambridgeshire County Council	TTRO will be required during the pre-construction stage.	Initial discussions have been held with the CCC traffic orders team on the scope and schedule of the traffic orders process, pre-construction
Environment	Site of Specific Scientific Interest (SSSI)	Natural England	Rings End Local Nature Reserve is located 1.6km from the proposed scheme	Sites for conservation not considered to be a constraint to the scheme
	Special Area of Conservation (SAC)	Natural England	Nene Washes which is an SSSI site lies within 3.6 km of the site	A Habitat Regulation Assessment Screening report will be produced in FBC 2 as part of an Outline Planning Application
	Screening for Likely Significant Effect (LSE) Assessment	Local Planning Authority	Initial assessments indicate no significant effects	Further assessments to be done in the lead up to planning including a Habitat Regulation Assessment Screening report will be produced in FBC 2 as part of an Outline Planning Application
	Archaeological Watching Brief & Supply of Geotechnical Survey Shapefiles	Cambridgeshire County Council	Archaeological assessments and any required surveys will be carried in advance of submitting an outline planning application during FBC 2 in 2023. Geotechnical surveys already completed	CCC Archaeological team consulted and to be engaged in the pre-outline planning application process and subsequent construction period. Shapefile data for geotechnical surveys to be shared once available.
	Consultation	The Wild Life Trust	N/A	N/A
	Bio Diversity Net Gain Assessment	Cambridgeshire County Council	Consultation required with Cambridgeshire City Council upon completion of initial BNG Assessment to ensure that a 20% positive BNG is achieved in accordance with organisational targets.	A BNG assessment should be undertaken using the Biodiversity Metric 3.1 published by Natural. This
	Great Crested Newt (GCN) or Reptile Mitigation license	Natural England	Desktop assessments have confirmed that great crested newts are present in four waterbodies within 500 m of the proposed scheme. Great crested newts have also been recorded northeast of the proposed scheme footprint at Norwood Farm. There are at least eight ponds within 250 m of the proposed works where no data is available with some ponds immediately adjacent to the proposed scheme	Surveys will be required to ascertain the presence of Newts around the site of the proposed schemes
	Land Drainage Consent	Internal Drainage Board (IDB) and/or Lead Local Flood Authority (LLFA)	a WFD Screening and Scoping assessment will be required to demonstrate that the design is compliant with WFD	Flood risk assessment completed and reviewed by Cambridgeshire Flood leads.
Design	RSA2	Cambridgeshire County Council	RSA 2 is scheduled to be completed as part of the detailed design	RSA 2 is scheduled to be completed in January 2023
	National Highways/Network Rail Technical Approval	Network Rail/CCC	Design reviewed and approved by CCC technical leads. BAPA agreed with Network Rail	Design reviewed and approved by CCC technical leads
	Drainage Consents	Internal Drainage Board (IDB) and/or Lead Local Flood Authority (LLFA)	The proposed scheme is located about 0.6 km from the Twenty Foot River and is within flood zone 1. The fluvial flood risk is adjudged as low. The surface flood risk is regarded as high on large sections of Longhill Road and Hundred Road, but low on the Elm Road section. The drainage design is calibrated to mitigate these risks with the use of enlarged drains and gullies to mitigate these risks	Initial flood risk assessment undertaken and reviewed by Cambridgeshire Flood authority. No major impact on flooding. Engagement with flood authority to continue during detailed design
	Side Road Orders (SRO)	Cambridgeshire County Council	Land will be required for the scheme which might need a full CPO process	CPO process and any associated Side Road Order will be progressed during detailed design
Governance	Change in Equestrian Route	British Horse Society	N/A	N/A
Governance	Cabinet Report	CPCA	Initial Governance will be approval of FBC1 by Cambridge and Peterborough Joint Authority in March 2023	FBC 1 being prepared to feed into CPCA governance process in January 2023

2.7.3 All of these powers and approvals can be obtained by Cambridgeshire County Council and do not represent a risk to delivery.

2.8 Scheme Interdependencies

2.8.1 In business case terms, an interdependency is defined as an internal or external factor upon which the successful delivery of a project is dependent. In addition to the constraints and factors influencing the proposed schemes mentioned in Section 3.7, a number of other planning, transport and town regeneration schemes are concurrently being developed for March, addressing specific transport related issues in different areas of the town. Further details of specific schemes are set out below, as is their relationship to the MATS project and the current schemes.

Hostmoor Avenue Planning Applications

2.8.2 There are several live and anticipated planning applications in the vicinity of the A141 / Hostmoor Avenue Junction which are expected to have a future impact on the junction's operation. These include two sites directly to the east of the junction (one for a food store and one for a fast-food restaurant) which have submitted live planning applications, and a site to the west of the junction which has permitted planning permission for a retail park²⁴.

2.8.3 Growth from each of these developments has been considered within the assessment undertaken by the MATS project, ensuring that the scheme design can accommodate future trips generated by these sites.

2.8.4 The MATS project itself is not dependent on these developments, and alternate junction forms have been tested and proven to operate at this location should the development sites not come forward. Further information on the relationship between the MATS schemes and any live or permitted planning applications within the vicinity of Hostmoor Avenue will be provided in FBC2 when details of the A141 / Peas Hill Roundabout and A141 / Hostmoor Avenue schemes are finalised.

Local Plan Growth Sites

2.8.5 The MATS Improvement Schemes have been developed to help support local housing and employment growth ambitions, with interventions tailored around specific Strategic Allocations and Broad Locations for Growth, as defined in the Adopted Fenland Local Plan (2014). A failure to partially or fully realise these growth ambitions has the potential to impact upon the overall viability and business case for specific highway interventions and the level of benefit realised post construction. This relationship has been explored through sensitivity testing undertaken as part of the Economic Dimension and is reported in Section 3.6.

²⁴ 1) F/YR19/1093/F - Erection of a A3 / A5 two-storey drive-thru restaurant / takeaway with associated parking and new access onto Hostmoor Avenue, 2) F/YR21/0885/F – Erection of a Class E(a) retail food store with associated parking and new access onto Hostmoor Avenue, 3) F/YR15/0640/F – Westry Retail Park.

Sensitivity testing has been undertaken to ascertain the impact of reduced levels of Local Plan growth on the MATS Broad Street Scheme and has demonstrated that the scheme would still return Very High Value for Money (BCR 5.87) if lower than expected levels of growth occurred.

Future High Street Fund Scheme

- 2.8.6 The FHSF proposals for March Town Centre include public realm proposals for Broad Street, the adjacent river frontage on the River Nene, the Market Square, and a town centre wide vacant unit's activation programme. These proposals will deliver significant public realm improvements to the Broad Street, Riverside and Market Square areas of the town centre, including enhanced provision for pedestrians.
- 2.8.7 The FHSF proposals and MATS Improvement Schemes have been developed in parallel, with regular dialogue between the two projects and the design of each intervention complementing the other. Strong synergies between both schemes will deliver the greatest impact along Broad Street, the Market Square and within March Town Centre.
- 2.8.8 The scope of the MATS and FHSF schemes is shown in Figure 2.4 beneath, with the extent of the MATS scheme shown in purple and the extents of the FHSF scheme shown in blue and green.



Figure 2.4: Extents of MATS and FHSF Broad Street Schemes

- 2.8.9 Following the successful FHSF funding award, the Detailed Design phase of both projects has been closely aligned and managed by CCC through a single reporting and governance process, resulting in a joint procurement exercise and combined construction plan. Further information on the procurement is provided in the Commercial Dimension.

The MATS Broad Street Scheme and the FHSF Broad Street proposals are mutually dependent on each other and have been developed in parallel. A single procurement exercise has been undertaken for both projects and these will be delivered as a single scheme by the same contractor to ensure consistency. Although the FHSF proposals are beyond the scope of this business case, which is only focused on the MATS schemes, the interdependency between the two has been carefully considered throughout.

March Railway Station Masterplan and CPCA Fenland Station Regeneration Project

- 2.8.10 The MATS Improvement Schemes will aim to complement proposals for the area around March Railway Station, identified through the March Railway Station Masterplan Strategy, 2006. The Masterplan, produced by FDC and the Hereward Community Rail Partnership, identified a range of improvements for the station and car park area to enhance access for passengers arriving or leaving March Railway Station by foot, cycle, bus and car. The status of these improvements is as follows:

- Refurbishing existing buildings and creating community use buildings. This was completed in 2022.
- Providing a new station car park. The existing car park was refurbished and remodelled in 2022. A large extension was also provided. The new station car park will now provide the short and medium term needs of March Station.
- Refurbishing the existing canopy on the disused platform, alongside an art project. This proposal is still to be progressed. Additional feasibility and survey work indicated that the canopy and the wall have deteriorated more than thought, and alternative funding is now being sought for this project which is larger and more substantial than previously considered.
- The provision of secure station cycle parking is now in place on the station platform, comprising of double height racks. This was completed in 2022.
- Improving pedestrian crossing facilities across Station Approach. This project is still to be progressed.
- Wayfinding signage improvements providing additional signage to March Railway Station from the town centre and from the industrial area, were installed in 2019 / 2020.
- Investigating options to improve interchange access to local bus services on Station Road (B1101), including the relocation of existing bus stop facilities. This was completed in 2022.

2.8.11 The Fenland Station Regeneration Project is a CPCA registered project with funding secured from the CPCA to progress the improvements listed above, including the new station car park and bus interchange access. Further details can be found at the link below.²⁵

2.8.12 While the proposals relating to the March Railway Station Masterplan are not critical to the MATS Improvement Schemes, successful delivery of both schemes will enhance the benefits realised by each and will aid both schemes in achieving their stated objectives.

March Pedestrian, Signage and Cycling Strategy

2.8.13 The MATS Improvement Schemes will be complimented by the proposals and recommendations of the March Pedestrian, Signage and Cycling Strategy, which has identified a range of costed improvements for pedestrian, signage and cycling provision across March, totalling over £1 million.

²⁵ <https://www.fenland.gov.uk/article/15122/Railway-Station-Masterplans>

2.8.14 The Strategy consists of three packages of work, as follows:

- Walking and cycling audits, providing improvement proposals for pedestrian and cycling provision on six key route corridors in March:
 - Broad Street, Grays Lane, Nene Parade
 - High Street, The Causeway, The Avenue (B1101)
 - Station Road (B1101)
 - Elwyn Road, St Peter's Road/Upwell Road (B1099), Eastwood Av, March Sconce
 - Burrowmoor Road and Gaul Road
 - Wisbech Road / Dartford Road (B1099).
- Safe routes to school audits, identifying recommendations for all five March schools:
 - Neale-Wade Academy
 - Burrowmoor Road Primary
 - All Saints Inter Church Primary
 - Westwood Primary and Maple Grove Community Pre-School
 - Cavalry Primary.
- Pedestrian and cycling signage audit and improvement proposals, connecting key routes and destinations in March, with a schedule of signage location recommendations and signage design options, including distance and journey time illustrations.

2.8.15 Feasibility work has since been undertaken to assess, group, and prioritise the range of schemes identified within the Strategy, to create a programme of deliverable projects for preliminary and detailed design, consultation, and construction.

2.8.16 Construction on the first package of schemes, consisting of signage and lining improvements, is due to commence imminently with the rest of the pedestrian and cycling improvements to be completed by March 2023.

2.8.17 While the proposals relating to the March Pedestrian, Signage and Cycling Strategy are not critical to the MATS Improvement Schemes, successful delivery of both schemes will enhance the benefits realised by each and will aid both schemes in achieving their stated objectives.

Remaining MATS Schemes

2.8.18 The five MATS schemes have been designed to work in conjunction with each other, and strategic modelling has demonstrated that there is a level of interdependency between the schemes. In summary, the key strategic dependencies between the MATS schemes are:

- A141 / Hostmoor Avenue & Peas Hill – the creation of an all-movement junction at Hostmoor Avenue will remove the current need for right turning vehicles (from Hostmoor Avenue) to U-turn at Peas Hill Roundabout. This will free up additional capacity at Peas Hill Roundabout by removing trips. U-turning trips are particularly detrimental to roundabout capacity as they impede the progress of vehicles on all other approaches.
- A141 / Hostmoor Avenue & Northern Industrial Link Road – improvements to the A141 / Hostmoor Avenue Junction (and particularly the creation of an all-movement junction) will further encourage trips to use the Northern Industrial Link Road as it will provide a better onward connection to the A141 corridor. This is expected to further reduce the number of vehicles passing through the Broad Street Junction (on an east-west route).

- Broad Street & A141 / Peas Hill – the reduction of capacity along Broad Street is paralleled by an increase along the A141 corridor, and particularly at Peas Hill Roundabout, encouraging trips onto the A141 and away from the Town Centre.
- Broad Street & Northern Industrial Link Road – the creation of a Northern Industrial Link Road opens up a new east – west route in the north of March which will reduce the number of trips passing through the Broad Street Junction (specially on the Station Road / Dartford Road route).

2.8.19 The interdependencies described above are not considered to be a risk on the operational performance of the schemes and sensitivity testing has been undertaken during the option development stage of the project to confirm that schemes can work independently of each other.

2.8.20 The strategic relationship between the five MATS schemes also carries through to the Economic Assessment as the models used to calculate scheme benefits have included all five MATS schemes (with phased implementation). Further details on this is provided in the Economic Dimension, however the relationship between schemes is not considered to be a risk to economic viability as demonstrated by the phased presentation of Scheme BCRs (FBC1 vs Full Package).

Economic Assessment of the MATS Broad Street Scheme has demonstrated that it is not dependent on the remaining MATS schemes for value for money. The MATS Broad Street Scheme returns an adjusted BCR of 9.82 independently of the remaining schemes.

2.9 Stakeholder Identification

2.9.1 Key stakeholders for the MATS Improvement Schemes include, but are not limited to, the following:

- The CPCA
- CCC
- FDC
- March Town Council
- People living, visiting and working in and around March
- Local businesses based in and around March
- Emergency services
- Bus service operators
- Network Rail (land requirement)
- HMP Whitemoor (land agreement)
- Anglian Water
- Historic England
- Middle Level Commissioners – waterways and flooding
- Landowners – CCC is undertaking all third-party landownership liaison and negotiations.

2.9.2 A summary of stakeholder consultation events undertaken and planned is provided in the Management Dimension (Chapter 6), and the Stakeholder Engagement Strategy is included in Appendix A.

2.10 Scheme Objectives

- 2.10.1 To provide focus for the MATS Improvement Schemes, a set of clear, specific objectives have been established which align with the strategic and local policy drivers and address the identified issues. Scheme objectives need to consider the key stakeholder views and opinions, as well as the scheme constraints and interdependencies with other projects, to address the identified issues.
- 2.10.2 In order to devise specific objectives for the MATS Improvement Schemes, an Objective Setting Workshop was held on 17th June 2020. This was attended by transport, planning and engineering representatives from key stakeholders, including:
- CPCA
 - CCC
 - FDC
 - Skanska (Milestone) / Capita.
- 2.10.3 Strategic and local policy drivers, scheme constraints and dependencies, identified transport issues and overall drivers for change, were discussed during the workshop. From this, a set of specific objectives were devised for the proposed schemes in line with the broad themes set out in section 2.4.
- 2.10.4 The objectives of the MATS Improvement Schemes, which were established at the SOBC stage, are defined as follows. Those objectives which are specific to the MATS Broad Street Scheme are shown in teal-green.

1. Regeneration of March Town Centre

- a. Deliver a transport scheme for Broad Street that is compatible with the FHSF scheme
- b. Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience, and drive growth
- c. Maximise public realm within Broad Street
- d. Enhance pedestrian safety and accessibility around the town centre

2. Address Existing Traffic Congestion and Safety Issues

- a. Address existing congestion issues within the town centre (Broad Street area)
- b. Address existing congestion issues along the A141 around Peas Hill roundabout
- c. Improve pedestrian level of service around Broad Street
- d. Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction

3. Facilitate Housing and Employment Growth

- a. Support Local Plan development proposals
- b. Ensure sustainable access to proposed Local Plan development

4. Improve Local Environmental Conditions

- a. Improve air quality conditions around Broad Street
- b. Facilitate the enhancement of heritage assets around Broad Street.

2.10.5 It is considered that the scheme objectives above meet HMT's updated Green Book Review requirements to develop "clear objectives and success measures... for all interventions" and do not need to be updated for this stage of work.

2.10.6 Monitoring of the objectives specific to the MATS Broad Street Scheme will be undertaken following completion of that scheme in 2024, and ahead of completion of the remaining four MATS schemes. Monitoring and evaluation of the remaining MATS schemes will be undertaken following completion of the NILR in 2027 as many of the remaining objectives refer to implementation of the full package of schemes. Further information on the strategy for monitoring and evaluation, and benefits realisation, are provided in the Management Dimension.

Almost all the objectives listed above either directly relate to, or are relevant to, the MATS Broad Street Scheme.

SMART Objectives

The following SMART Objectives have been developed to enable the success and benefits of the MATS Broad Street Scheme to be clearly and accurately measured through post scheme monitoring and evaluation. The SMART measure for each of the objectives is provided beneath in green.

1. Regeneration of March Town Centre

- a. Deliver a transport scheme for Broad Street that is compatible with the FHSF scheme: *Deliver an improvement at the B1101 Broad Street / B1099 Dartford Road / B1101 Station Road Junction which replaces the existing traffic signal-controlled junction with a roundabout and reduces Broad Street to a single lane in each direction.*
- b. Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience, and drive growth: *Deliver an improvement at the B1101 Broad Street / B1099 Dartford Road / B1101 Station Road Junction that enables the FHSF scheme design to be realised.*
- c. Maximise public realm within Broad Street: *Reduce the carriageway footprint to enable the creation of an additional 50% of Public Realm.*
- d. Enhance pedestrian safety and accessibility around the town centre: *Increase the number of pedestrian crossing locations at the B1101 Broad Street / B1099 Dartford Road / B1101 Station Road Junction and along Broad Street and reduce the B1101 Broad Street to a single lane in each direction.*

2. Address Existing Traffic Congestion and Safety Issues

- a. Address existing congestion issues within the town centre (Broad Street area): Reduce delay to less than 30 seconds (average per vehicle) on all approaches to the B1101 Broad Street / B1099 Dartford Road / B1101 Station Road Junction
- b. Address existing congestion issues along the A141 around Peas Hill roundabout: This objective does not relate to the MATS Broad Street Scheme, and a SMART objective will be developed for FBC2.
- c. Improve pedestrian level of service around Broad Street: Achieve an 80% increase in user satisfaction in the level and quality of pedestrian provision in post scheme surveys.
- d. Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction: This objective does not relate to the MATS Broad Street Scheme, and a SMART objective will be developed for FBC2.

3. Facilitate Housing and Employment Growth

- a. Support Local Plan development proposals. This objective does not directly relate to the MATS Broad Street Scheme, and a SMART objective will be developed for FBC2.
- b. Ensure sustainable access to proposed Local Plan development: This objective does not directly relate to the MATS Broad Street Scheme as there is no Local Plan development situated within the immediate vicinity of the town centre.

4. Improve Local Environmental Conditions

- a. Improve air quality conditions around Broad Street. Reduce NOx and PM2.5 emissions by 5% by 2026.
- b. Facilitate the enhancement of heritage assets around Broad Street: Enable the refurbishment and relocation of the March Town Centre Fountain as part of the MATS / FHSF Broad Street Scheme to enhance its position and enjoyment by local residents.

2.11 Impact of Not Progressing

- 2.11.1 There are clear implications of not progressing the proposed schemes and not acting on the identified issues.
- 2.11.2 In relation to March Town Centre, a failure to progress the proposed MATS Improvement Schemes will likely result in a further failure to bring about desired changes in the town centre to facilitate its regeneration. The successful delivery of the MHCLG funded FHSF scheme proposals for Broad Street and the adjacent river frontage, are reliant on the delivery of the MATS Improvement Scheme proposals for Broad Street. Reducing road space along Broad Street and maximising public realm, relies on wider highway changes in the Broad Street area to provide sufficient capacity for traffic in future years. A failure to progress the MATS Improvement Schemes would result in the continued prevalence of traffic and transport issues acting as a barrier to the town's regeneration, suppressing its potential and delaying efforts to bring about change.
- 2.11.3 It should also be noted that the case for progressing the proposed schemes to facilitate the regeneration of March Town Centre is even stronger in the wake of Covid-19. The Covid-19 pandemic has accelerated trends such as declining footfall and increasing internet retail sales²⁶ and as such poses a serious threat to the future vitality of town centres. It is envisaged that the likely impact of not progressing the proposed schemes in the challenging aftermath of Covid-19, is that March Town Centre will continue to decline. This would have a negative impact on local employment opportunities, access to services and deprivation levels.
- 2.11.4 In relation to traffic and safety issues, the issues associated with congestion, a lack of capacity and the dominance of traffic within the town centre are likely to persist, with a continued deterioration in future years. Issues around highway safety at specific locations across March will also go unaddressed.
- 2.11.5 Investment in local transport infrastructure is required to provide sufficient capacity for the level of forecast traffic growth in future years and to facilitate housing and employment growth ambitions defined in the adopted Fenland Local Plan.
- 2.11.6 The do minimum (DM) base year (2018) and 2031 AM peak model results for select junctions in March are presented in Table 2.7 overleaf. Note that this data has come from the MATS VISSIM model, and the full set of results for all the junctions is included in the OAR.

²⁶ <https://www.local.gov.uk/parliament/briefings-and-responses/future-high-street-house-commons-10-december-2020>

Table 2.7: Do Minimum 2018 vs 2031 AM Peak Hour Model Comparison

Junction Name	Max QL (m)		Average Delay (s)		LOS	
	Base	2031	Base	2031	Base	2031
A141 Wisbech Road / Twenty Foot Road	48	245	4.6	14.3	A	B
A141 Isle of Ely Way / A141 Wisbech Rd / B1099 Wisbech Rd / Whittlesey Road / Retail Park (Peas Hill Roundabout)	162	965	10.2	91.3	B	F
B1099 Dartford Road / B1101 Broad Street / B1101 Station Road / Robingoodfellow's Lane	147	159	26.3	33.1	C	C
B1101 The Causeway / B1101 High Street / B1099 St Peter's Road	188	598	42.7	156.3	D	F

2.11.7 The results in Table 2.7 suggest that, without intervention:

- The maximum queue length at all the junctions will increase by the 2031 AM peak, with substantial increases anticipated at the A141 Wisbech Road / Twenty Foot Road junction, Peas Hill Roundabout, and the B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction. Notably, the maximum queue length at Peas Hill Roundabout is anticipated to increase by 496% (803 metres) by the 2031 AM peak.
- The average delay at all the junctions will increase by the 2031 AM peak, with substantial increases anticipated at the A141 Wisbech Road / Twenty Foot Road junction, Peas Hill Roundabout, and the B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction. Notably, the average delay at Peas Hill Roundabout is anticipated to increase by 795% (81.1 seconds) by the 2031 AM peak.
- The level of service will decrease at three of the junctions by the 2031 AM peak compared to the base year. It is forecast that Peas Hill Roundabout and the B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction will be operating over capacity during the 2031 AM peak.

2.11.8 The DM base year (2018) and 2031 PM peak model results for select junctions in March are presented in Table 2.8 overleaf. Note that the full set of results for all the junctions is included in the OAR.

Table 2.8: Do Minimum 2018 vs 2031 PM Peak Hour Model Comparison

Junction Name	Max QL (m)		Average Delay (s)		LOS	
	Base	2031	Base	2031	Base	2031
A141 Wisbech Road / Twenty Foot Road	98	398	7.0	43.9	A	E
A141 Isle of Ely Way / A141 Wisbech Rd / B1099 Wisbech Rd / Whittlesey Road / Retail Park (Peas Hill Roundabout)	173	791	11.5	61.0	B	F
B1099 Dartford Road / B1101 Broad Street / B1101 Station Road / Robingoodfellow's Lane	156	159	33.6	39.2	C	D
B1101 The Causeway / B1101 High Street / B1099 St Peter's Road	265	566	40.1	123.5	D	F

2.11.9 The results in Table 2.8 suggest that, without intervention:

- The maximum queue length at all the junctions will increase by the 2031 PM peak, with substantial increases anticipated at the A141 Wisbech Road / Twenty Foot Road junction, Peas Hill Roundabout, and the B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction. Notably, the maximum queue length at Peas Hill Roundabout is anticipated to increase by 357% (618 metres) by the 2031 PM peak.
- The average delay at all the junctions will increase by the 2031 PM peak, with substantial increases anticipated at the A141 Wisbech Road / Twenty Foot Road junction, Peas Hill Roundabout, and the B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction. Notably, the average delay at Peas Hill Roundabout is anticipated to increase by 430% (49.5 seconds) by the 2031 PM peak.
- The level of service will decrease at all the junctions by the 2031 PM peak compared to the base year. It is forecast that Peas Hill Roundabout and the B1101 The Causeway / B1101 High Street / B1099 St Peter's Road junction will be operating over capacity during the 2031 PM peak, and that the A141 Wisbech Road / Twenty Foot Road will be approaching capacity.

2.11.10 The modelling results presented in Table 2.7 and Table 2.8 support the case for intervention, to mitigate forecast increases to queuing, delays, and junction capacity issues.

2.11.11 In relation to local environmental conditions, local air quality issues around Broad Street will not be addressed with a persistence of congestion and poor traffic flow conditions. March Town Centre, the local townscape, historic buildings and the riverfront setting, are likely to remain underutilised in future years, with a failure to make the most of the town's heritage assets.

The impact of not delivering the MATS Broad Street Scheme is that congestion and delay continue to rise along Broad Street as demonstrated by the modelling reported above.

Critically, the adjacent FHSF could not progress without the MATS Broad Street Scheme, and the funding associated with that scheme would be lost, and March would not realise the benefits associated with much need regeneration in the town centre.

2.12 Measures of Success

- 2.12.1 The measures of success were established at the SOBC stage. Overall performance of the schemes and their success will be monitored relative to its stated objectives. What constitutes successful delivery of the MATS Improvement Schemes relative to defined scheme objectives, can be found in Table 2.9 overleaf.

Table 2.9: Measures of Scheme Success

Objective Number	Scheme Objective	Measure of Success
Regeneration of March Town Centre		
1a	Deliver a Transport scheme for Broad Street that enables delivery of the FHSF scheme	Transport interventions across March that remove traffic and transport barriers to the proposed FHSF A redistribution of traffic away from the town centre onto alternative routes.
1b	Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience, and drive growth	A transport scheme for Broad Street that enables the proposed FHSF scheme to deliver on its stated objectives.
1c	Maximise public realm within Broad Street	A reduction in road space and an increase in space given over to pedestrian users of Broad Street.
1d	Enhance pedestrian safety and accessibility around the town centre	Transport schemes within the town centre which maximise pedestrian safety and ensures the town centre is accessible to all users
Address Existing Traffic Congestion and Safety Issues		
2a	Address existing congestion issues within the town centre (Broad Street area)	A reduction in congestion, queuing, and traffic delay in the Broad Street area. A redistribution of traffic away from the town centre onto alternative routes.
2b	Address existing congestion issues along the A141 around Peas Hill roundabout	A reduction in congestion, queuing, and traffic delay along the A141 around the Peas Hill Roundabout
2c	Improve pedestrian level of service around Broad Street	Enhanced provision for pedestrian users in the Broad Street area relative to existing condition measured through established metrics.
2d	Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction	A reduction in traffic collisions associated with the junctions in future years and delivery of highway infrastructure that is safe for all users.
Facilitate Housing and Employment Growth		
3a	Support local plan development proposals	Delivery of transport infrastructure across March that mitigates the overall impact of local plan housing and employment growth sites.
3b	Ensure sustainable access to proposed local plan development.	Delivery of transport infrastructure across March that mitigates the overall impact of local plan housing and employment growth sites.
Improve Local Environmental Conditions		
4a	Improve air quality conditions around Broad Street	An improvement in air quality in future years from existing levels at established air quality monitoring sites.
4b	Facilitate the enhancement of heritage assets around Broad Street	A transport scheme for Broad Street which facilitates a wider improvement in local environmental conditions in the Broad Street area. Enhanced pedestrian accessibility to key heritage assets along Broad Street.

2.13 Options Identification and Appraisal

2.13.1 An overview of the option development, modelling, and assessment processes through the pre-SOBC, SOBC, OBC and FBC1 stages is provided in Figure 2.5 below.

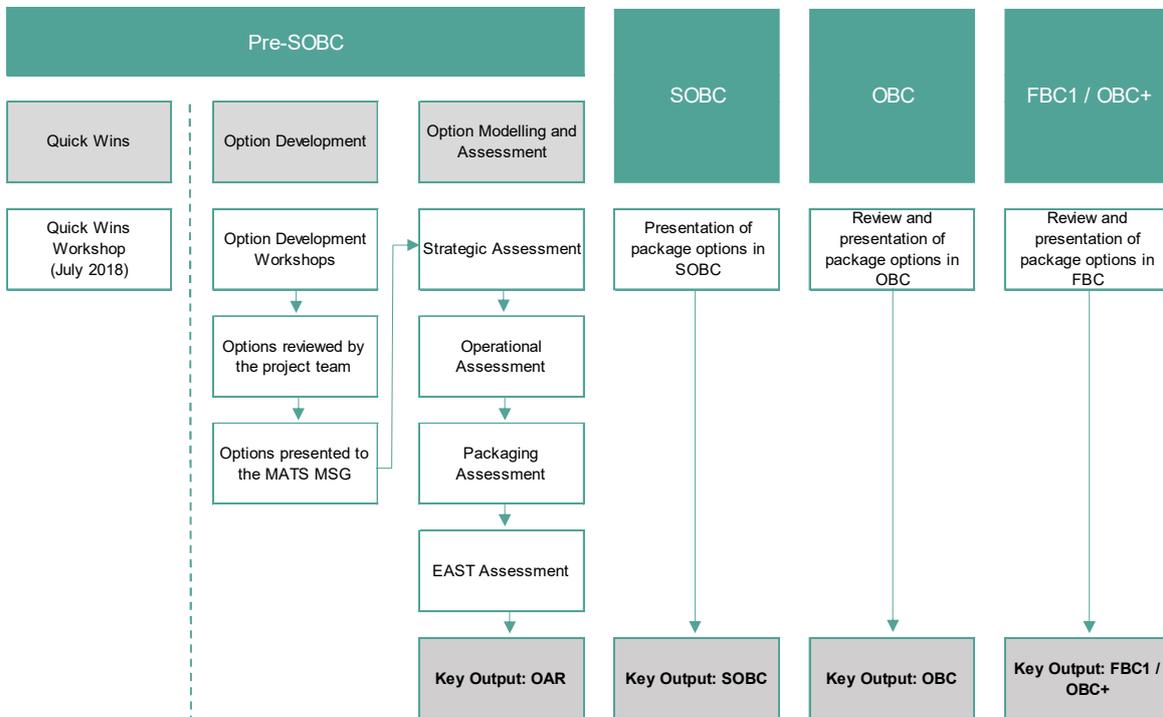


Figure 2.5: Overview of the Option Development, Modelling and Assessment Processes

2.13.2 These processes are discussed in more detail in the subsequent paragraphs.

Quick Wins

2.13.3 The quick wins were progressed as a separate workstream to the Option Development and Option Modelling and Assessment components, during the pre-SOBC stage of the MATS.

2.13.4 A Quick Wins Workshop for the MATS was held in July 2018. The purpose of the workshop was to identify any potential schemes and improvements that could be accelerated to design and construction ahead of the main study.

2.13.5 For context, an improvement or scheme was considered a quick win if it satisfied the following criteria:

- It is easily deliverable and has no known constraints (such as engineering, land ownership, or complex stakeholder engagement)
- It does not require complex assessment (traffic modelling or engineering)
- It can be designed and built within approximately two years
- It does not jeopardise other potential MATS schemes.

2.13.6 The quick wins identified during the Quick Wins Workshop are listed in Table 2.10 below.

Table 2.10: MATS Quick Wins

MATS Quick Wins	
1	A141 / Twenty Foot Road junction
1A	Station Road Zebra Crossing
2	Upwell Road / Cavalry Drive
9	Peas Hill Roundabout
11, 12, 13	Pedestrian and Cycling Strategy Proposal
15	St Peters Road / Elwyn Road / Eastwood Avenue
16	March wide HGV Signage Strategy
19	A141 Junctions Street Lighting
20	Revalidation of All Signal Timings Across March
21	Norwood Avenue Footpath
22	Norwood Road Traffic Calming
23	Hundred Road Footpath
24	Broad Street Stats

2.13.7 For context these quick wins are mapped in Figure 2.6 below.

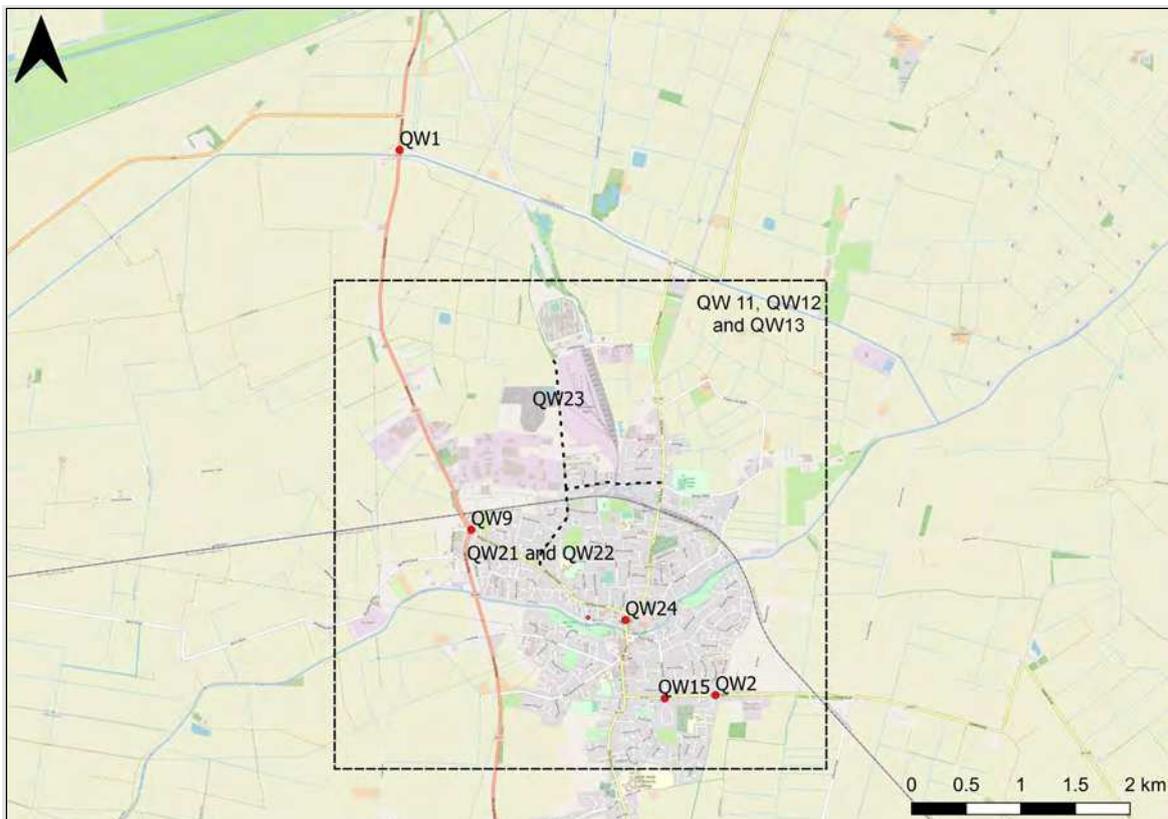


Figure 2.6: Locations of Quick Wins

2.13.8 Further assessment of the quick win proposals, listed in Table 2.10, above, has resulted in some of these proposals being dropped or put on hold. Table 2.11 below, provides an update on the delivery of the quick win proposals.

Table 2.11: MATS Quick Wins

MATS Quick Wins		
Quick Win Scheme		Details
1	A141 / Twenty Foot Road junction	No Construction. Project is now on hold awaiting the outcome of the main study and the impact of the Northern Link Road. This is one of the schemes in the business case.
1A	Station Road Zebra Crossing	Construction start: 03/2021 Scheme Complete
2	Upwell Road / Cavalry Drive	Construction start: 11/2021 Design includes speed limit gateway and traffic calming features. Scheme complete.
9	Peas Hill Roundabout	No Construction. Proposal suspended by MATS Improvement Scheme for Peas Hill Roundabout. This is one of the schemes in the business case
11, 12, 13	Pedestrian and Cycling Strategy	Pedestrian and Cycling Study completed in 2020. Recommendations fed into the main MATS study.
15	St Peters Road / Elwyn Road / Eastwood Avenue	Construction start: 11/2020 and now completed.
16	March wide HGV Signage Strategy	Construction start: 01/2021 and now completed.
19	A141 Junctions Street Lighting	No Construction Project was halted due to high possibility of affecting bats' habitat.
20	Revalidation of All Signal Timings Across March	Completed in July 2019
21	Norwood Avenue Footpath	Construction started August 2021 and now complete
22	Norwood Road Traffic Calming	Detailed design required. Construction estimated to commence in March 2021
23	Hundred Road Footpath	Construction started August 2021 and now complete
24	Broad Street Stats	Delivered May 2020.

Option Development, Modelling and Assessment at Pre-SOBC and SOBC Stages

Overview

- 2.13.9 To address the identified challenges across March and develop targeted interventions which meet the stated objectives, an extensive option development and review process was completed prior to the production of the SOBC.
- 2.13.10 The Options Appraisal Report (OAR), produced as part of the MATS project, set out the development process and assessment of transport improvement options across March, including traffic modelling and an initial economic assessment. The best performing options at specific locations were grouped into packages of schemes that could be implemented across March. The OAR concluded with a review of scheme packages and provided recommendations on the relative merits of progressing these further.

Option Development

- 2.13.11 As part of the options development process, a series of option development workshops were held to devise improvement options to be considered as part of the MATS. The workshops were attended by key stakeholders from various transport, engineering and environmental disciplines, including conservation officers, with delegates representing:
- CCC
 - FDC
 - Skanska (Milestone) / Capita.
- 2.13.12 During each workshop attendees developed and discussed a range of potential options for different locations across March.
- 2.13.13 Following the workshop, the options were reviewed by the project team and presented to the MATS Member Steering Group (MSG) for further discussion. The role of the MSG is to ensure that MATS delivers the best possible outcomes for the residents of March and maintains focus on its stated aims. It brings together key stakeholders from planning and engineering disciplines, local authority officers and elected members from:
- CCC
 - FDC
 - March Town Council (MTC).
- 2.13.14 Several options were discounted during this stage following a review by the MSG, with the remaining options taken forward for modelling and further assessment.

Option Modelling and Assessment

2.13.15 The assessment process used was broken down into three distinct phases, with each informing the next. The three phases were:

- Strategic Assessment
- Operational Assessment
- Packaging Assessment.

2.13.16 The Strategic Assessment, which was undertaken using a bespoke SATURN model developed for the MATS, considered larger infrastructure improvements, and was used for a number of purposes. Firstly, to understand the effects of traffic reassignment and re-routing because of specific interventions. Secondly, to undertake an economic assessment of the larger, more substantial options to determine at an early stage if they offer value for money. Finally, to generate different sets of traffic flows, which take account of traffic re-routing created by larger options, for use in the Operational Assessment. This process, including the performance of each component is detailed in the OAR which is provided as a supporting document.

2.13.17 The Operational Assessment was undertaken using a bespoke VISSIM micro-simulation model developed for the MATS. It provided a detailed assessment of how each of the options performed. The options that performed well within the Operational Assessment were then taken forward for use within the Packaging Assessment. Again, this is detailed in the OAR which is provided as a supporting document.

2.13.18 The Packaging Assessment took the best performing options from the Strategic and Operational Assessments and combined these into packages of schemes that could be implemented across March. This Packaging Assessment was undertaken using the MATS SATURN model. Multiple different packages have been assessed, representing different levels of impact within March.

2.13.19 The following packages were assessed:

- **Package 1** – Signalisation of the A141 / Twenty Foot Road, Peas Hill Roundabout improvements (in conjunction with the developer funded roundabout at A141 / Hostmoor Avenue) and High Street / St Peter's Road junction improvements.
- **Package 1a** – Package 1 plus development of a Northern Industrial Link Road.
- **Package 3** – Package 1 plus a scheme to reduce Broad Street to a single lane in each direction; and replacing the signalised junction at Dartford Road / Station Road with a mini roundabout (FHSF Option).
- **Package 3a** – Package 3 plus development of a Northern Industrial Link Road.
- **Package 4** – Package 3 plus the creation of a New River Crossing between Dartford Road and City Road.
- **Package 4a** – Package 4 plus development of a Northern Industrial Link Road.

- 2.13.20 The packaging assessment showed that all packages, in conjunction with the local plan mitigations, are expected to perform well to varying degrees.
- 2.13.21 The DfT's Early Assessment and Sifting Tool (EAST) has also been completed for each of the assessed option packages. The EAST is a decision support tool that summarises and presents evidence on potential options in a clear and consistent format. It provides decision makers with relevant, high-level information to help them form an early view of how options perform and compare.
- 2.13.22 A summary of the EAST assessment can be found in Table 2.12, below. The information presented in the EAST assessment has been considered during a review of potential option packages and used to inform a decision on a preferred package of schemes to be taken forward.

Table 2.12: EAST Assessment Summary

Option/Package	Scale of Impact	Fit with DfT Objectives	Fit with Scheme Objectives	Expected VfM Category	Public Acceptability	Practical Feasibility	Capital Cost
Package 1	2	3	2	High	3	5	~£5.5m
Package 1a	3	3	2	High	3	4	~£11.5m
Package 3	3	4	5	High	3	4	~£6.0m
Package 3a	4	4	5	High	3	3	~£12.5m
Package 4	5	4	5	Low	2	2	~£41.0m
Package 4a	5	4	5	Low	2	1	~£47.0m

- 2.13.23 Package 3a as defined above, formed the package of schemes which featured in the SOBC.
- 2.13.24 Packages 2 and 2a were developed, but not tested as part of the Packaging Assessment. These packages were based on Package 1 and 1a respectively, but also included improvements to Broad Street with an alternative traffic signal design. This option was dismissed following an engineering review which raised safety concerns over the proposed arrangement and because this was contrary to emerging FHSF aspirations to create public realm along Broad Street.
- 2.13.25 Packages 1 and 1a do not include any changes to Broad Street, whereas the remaining packages facilitate the creation of a significant public realm along Broad Street which is in line with FDC's FHSF aspirations for the regeneration of March Town Centre.
- 2.13.26 Packages 4 and 4a were shown to provide the greatest overall level of benefit relative to other packages, but also involve significant disruption (and cost) within the town centre. It was recommended that these packages were not considered any further within the parameters of the current scheme but could be revisited in future should further capacity enhancements be needed in March Town Centre.

2.13.27 Packages 3 and 3a are closely aligned to the FHSF proposals and have the highest Benefit to Cost Ratios (BCRs) relative to their counterpart packages. Package 3a builds upon Package 3 with the addition of the NILR. The addition of the NILR is considered to generate significant additional benefit to the scheme package overall, attracting additional trips away from the residential areas (particularly Norwood Road) and the Town Centre, and makes a significant contribution towards achieving the MATS scheme's stated objectives. The locations of specific interventions across March within Package 3a can be found in Figure 2.7 below.

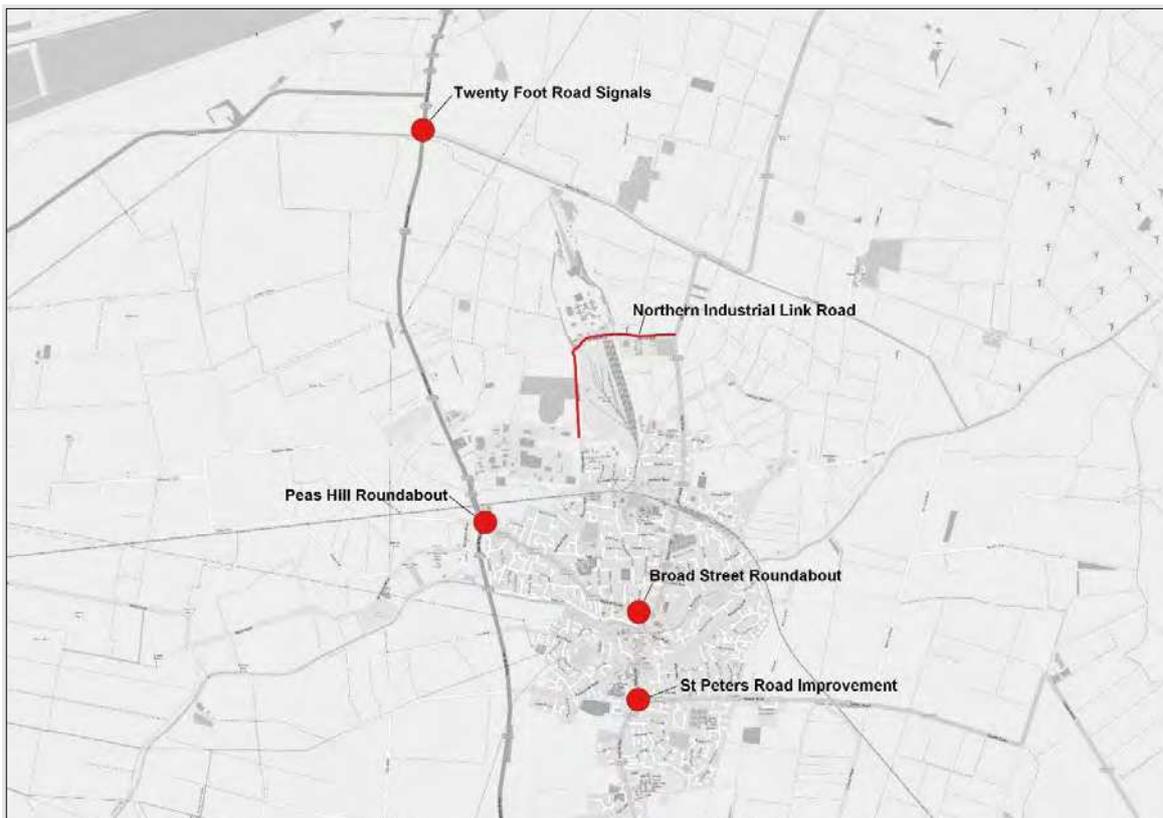


Figure 2.7: MATS Improvement Scheme Locations

Option Development, Modelling and Assessment at OBC Stage

2.13.28 Package 3a was subject to further development, modelling, and assessment at the Preliminary Design and OBC stage of the MATS, and any significant changes to design or scope that occurred during this stage are detailed beneath in the paragraphs below. Note that these changes were included in the MATS OBC that was submitted in October 2021.

Broad Street / Dartford Road / Station Road Mini Roundabout with Broad Street one lane in each direction

2.13.29 The scope of the Broad Street Roundabout scheme was extended to incorporate the highway down to the River Nene bridge and the north-bound bus stops on Broad Street.

Development of Northern Industrial Link Road

- 2.13.30 The scope of the Northern Industrial Link Road design was increased to include the provision of a segregated cycle facility along the length of the route.

A141 / Peas Hill Roundabout (60m ICD), in conjunction with development of a Hostmoor Avenue Roundabout

- 2.13.31 No significant amendments were made to the design of the A141 / Peas Hill Roundabout at OBC.

High Street / St Peter's Road Traffic Signal Improvements

- 2.13.32 No significant amendments were made to the design of the B1101 High Street / B1099 St Peters Road Scheme at OBC.

A141 / Twenty Foot Road Signals

- 2.13.33 No significant amendments were made to the design of the A141 / Twenty Foot Road Junction at OBC.

2.14 Scheme Development During Detailed Design

- 2.14.1 Further design led refinements have been made to several of the schemes during the Detailed Design and FBC1 phase of the project. These amendments are described beneath.
- 2.14.2 The latest scheme drawings for the MATS schemes are shown beneath and included in Appendix B.

Broad Street / Dartford Road / Station Road Mini Roundabout with Broad Street one lane in each direction

- 2.14.3 This scheme remains fundamentally unchanged since the OBC and is shown in Figure 2.8 overleaf.

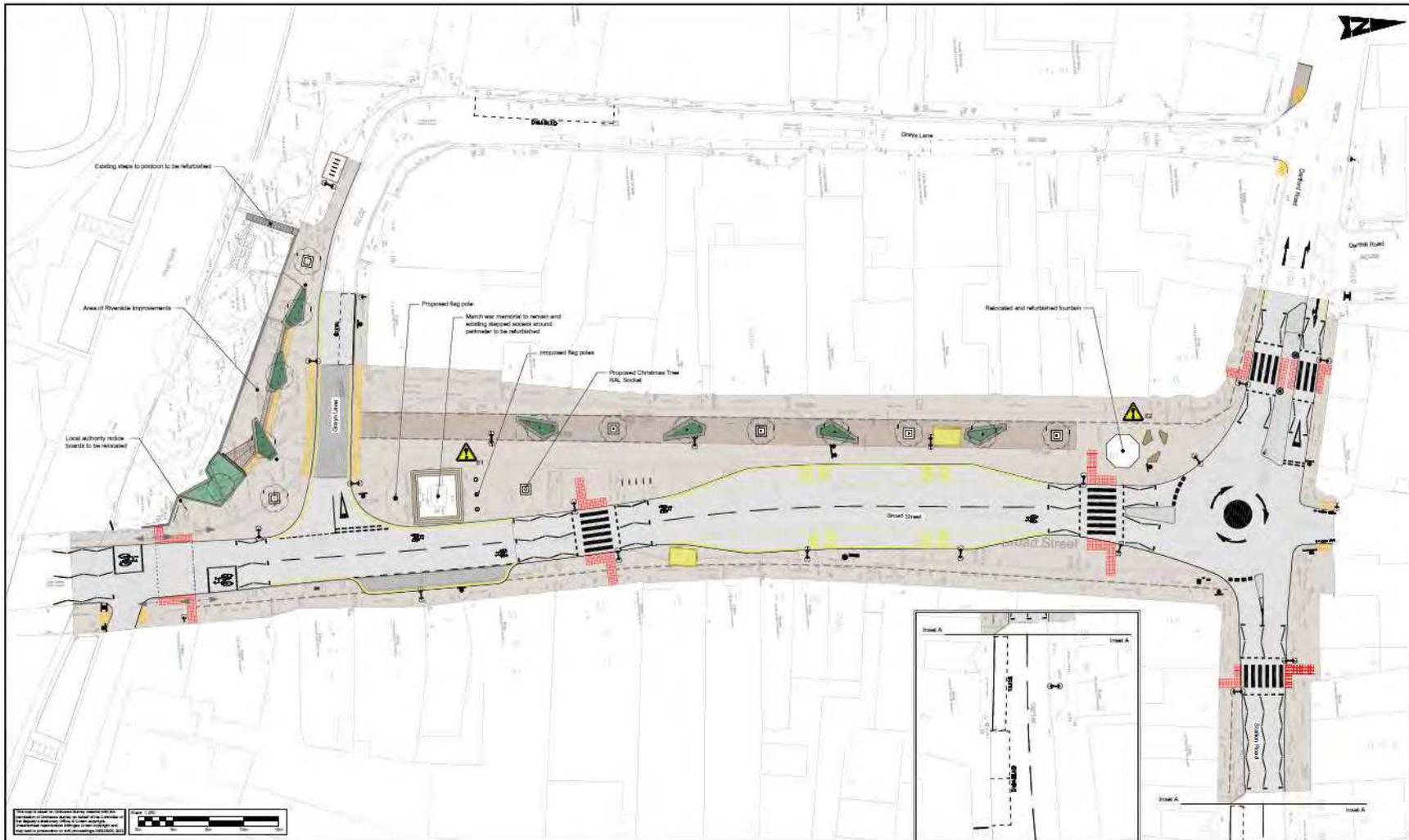


Figure 2.8: MATS Broad Street Scheme General Arrangement

A141 / Peas Hill Roundabout (60m ICD), in conjunction with development of a Hostmoor Avenue Roundabout

- 2.14.4 The Inscribed Circular Diameter (ICD) of the roundabout has been reduced from 60m, which was presented in OBC, to 52m to reduce the footprint of the junction and mitigate the requirement for land take. Sensitivity testing undertaken in both the VISSIM micro-simulation model, and the MATS Saturn based strategic model has demonstrated that this scheme still performs well operationally and delivers a similar level of benefit to the 60m ICD roundabout.
- 2.14.5 The scope of the MATS A141 / Peas Hill scheme has also been increased to include delivery of the A141 / Hostmoor Junction. This was included within the design scope at the OBC stage on the understanding that a developer led scheme would materialise at this location prior to construction of the MATS schemes. The creation of an all-movement junction at Hostmoor Avenue is critical to the success of the A141 / Peas Hill scheme as it removes a large number of u-turning trips from Peas Hill Roundabout which have an adverse impact on capacity.
- 2.14.6 As the MATS has progressed at a faster pace than developer proposals, construction of the scheme has been brought into scope to avoid it posing a risk to the successful operation of the A141 / Peas Hill scheme and ultimately the wider MATS package.
- 2.14.7 The form of this junction has been amended since OBC to ensure that it is appropriate for the forecast traffic flows and can be delivered with minimal land take. The current proposals are to construct a three arm, all movement, signalised junction. A General Arrangement (GA) drawing for the junction is provided along with the other schemes in Appendix B. The exact form of this junction will be further assessed and reviewed ahead of the submission of FBC2 and updated if necessary.
- 2.14.8 The scheme is shown in Figure 2.9 overleaf.



Figure 2.9: A141 / Peas Hill & A141 / Hostmoor Avenue Road Scheme General Arrangement

High Street / St Peter's Road Traffic Signal Improvements

2.14.9 This scheme remains fundamentally unchanged since the OBC and is shown in Figure 2.10 beneath.

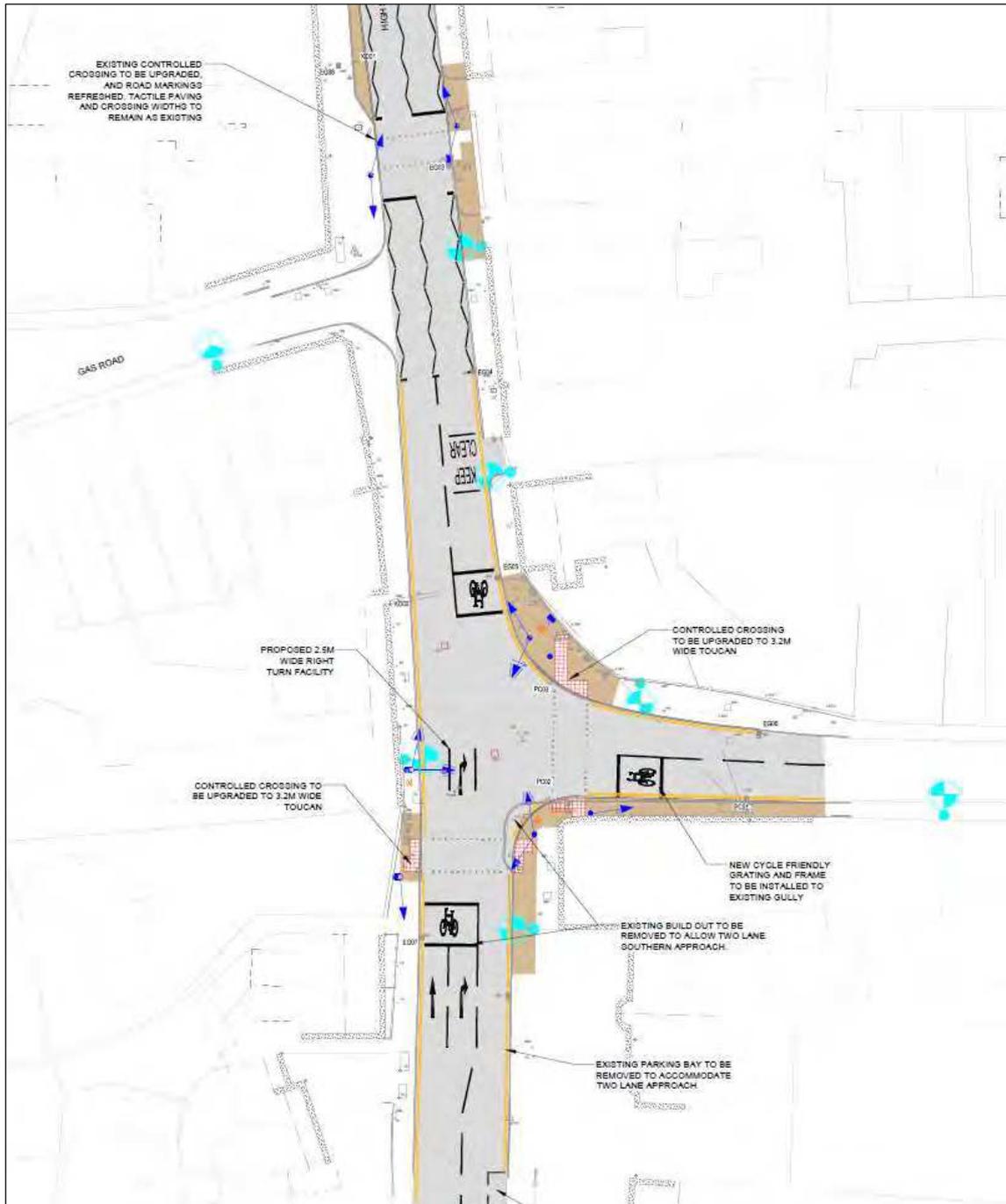


Figure 2.10: MATS High Street / St Peter's Road Scheme General Arrangement

A141 / Twenty Foot Road Signals

2.14.10 This scheme remains fundamentally unchanged since the OBC and is shown in Figure 2.11 beneath.



Figure 2.11: MATS A141 / Twenty Foot Road Scheme General Arrangement

Development of Northern Industrial Link Road

2.14.11 There has been an upgrade to the B1101 Elm Road / Longhill Road Junction since OBC, and the junction form has been changed from a priority junction to a roundabout to improve road safety and reduce the requirement for land acquisition.

2.14.12 The scheme is shown in Figure 2.12 overleaf.

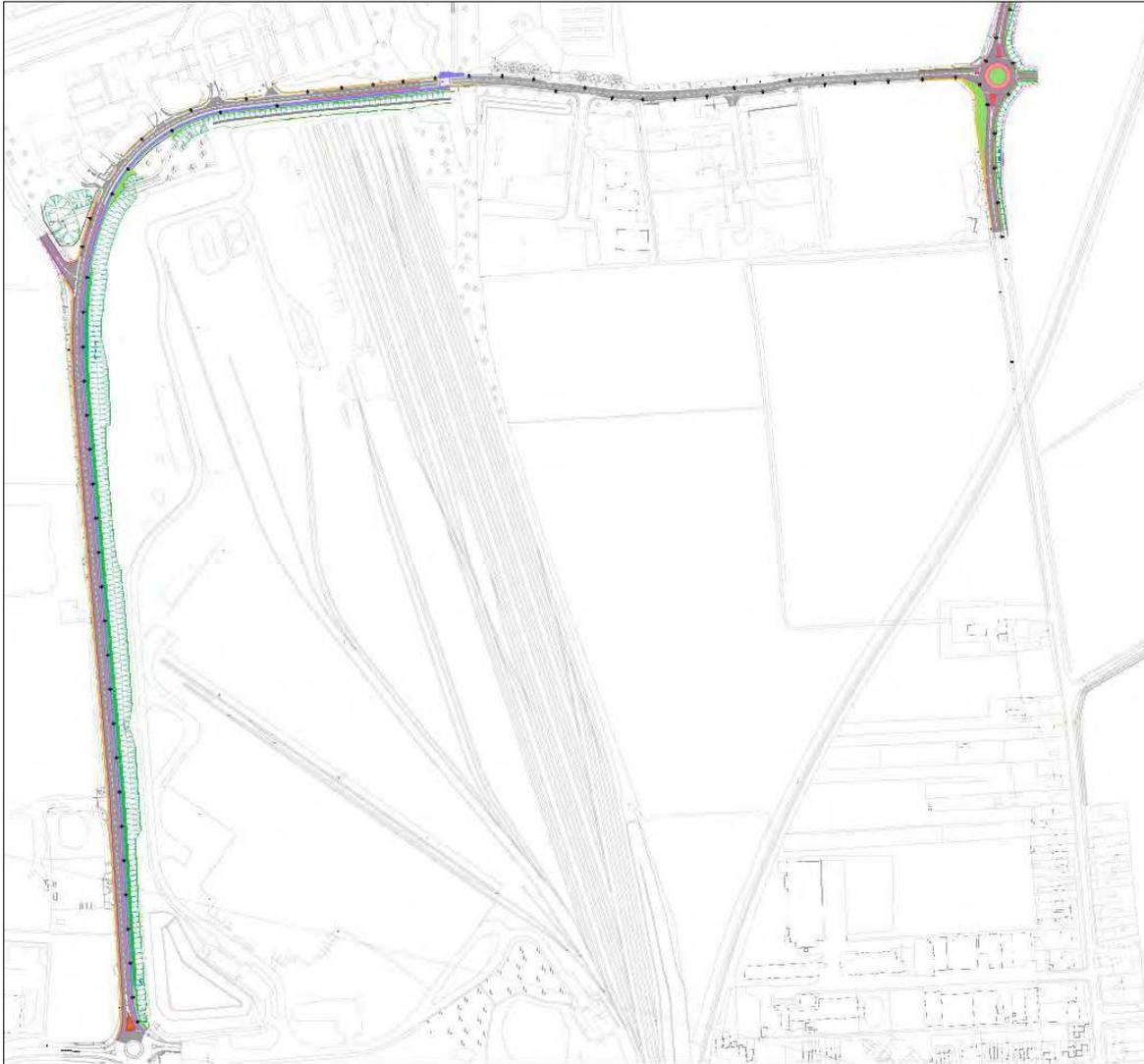


Figure 2.12: MATS NILR Scheme General Arrangement

Confirmation of Package 3a

2.14.13 As explained in Section 1.3, delivery of the MATS scheme will be phased into three stages, each represented by and updated FBC. The updated package of schemes being delivered by the MATS project includes:

FBC1:

- B1101 Broad Street / B1099 Dartford Road / B1101 Station Road (see Figure 2.7 beneath)
 - Replacement of the traffic signal-controlled junction with a roundabout
 - Reduction of Broad Street to a single lane in each direction.
 - Please see Figure 2.7 beneath.

FBC2:

- B1101 High Street / B1099 St Peter's Road (See Figure 2.8 beneath)
 - Upgrade the traffic signal control junction to include a separate northbound right turn lane on the B1101 The Causeway approach.
- A141 / Peas Hill Roundabout & A141 / Hostmoor Avenue Junction (see Figure 2.9 beneath)
 - Upgrade the existing roundabout to 52m ICD
 - Upgrade of A141 Isle of Ely Way (northbound), B1099 Wisbech Road and Whittlesey Road to two lane approaches
 - Upgrade to pedestrian crossing facilities around Peas Hill Roundabout
 - Creation of two lanes on the A141 Isle of Ely Way (northbound) from Peas Hill Roundabout to the A141 / Hostmoor Avenue Junction
 - Creation of an all-movement, three-arm signalised junction at the A141 / Hostmoor Avenue Junction, with two lane approaches on the A141 Isle of Ely Way (northbound) and Hostmoor Avenue and a three-lane approach on the A141 Isle of Ely Way (southbound).
- A141 / Twenty Foot Junction (see Figure 2.10 beneath)
 - Upgrade the existing priority junction to a signalised junction, with a northbound right turn flare on the A141 Isle of Ely Way northbound approach.

FBC3:

- Northern Industrial Link Road (See Figure 2.11 beneath)
 - Creation of a physical link between Hundreds Road and Longhill Road to create the Northern Industrial Link Road
 - Upgrade the B1101 Elm Road / Longhill Road Junction from a priority junction to a roundabout.
 - Provide a segregated cycle facility along the length of the route.

LTN 1/20 and Gear Change Compliance

- 2.14.14 The initial designs for each of the MATS schemes were developed before the emergence of LTN 1/20 guidance, however efforts have been made during the Preliminary and Detailed Design phases to ensure that the schemes do not have a detrimental impact on local cycling aspirations.
- 2.14.15 Both the MATS Broad Street and St Peter’s Road improvement schemes are considered to offer an improvement in cycling provision over the existing arrangements. Separate technical notes discussing the scheme designs in the context of the LTN 1/20 guidance and encouraging cycling are included in Appendix C.

The MATS Broad Street Scheme is considered to improve cycling provision through the town centre. A review of the scheme design within the context of LTN 1/20 has been undertaken and a technical note setting out the detail of this is included in Appendix C. In summary, the technical note confirms that:

*“The proposed highway works will reallocate road space to remove car parking (which is currently situated within a ‘central reserve’ between the north and southbound carriageways) and provide a single two-way carriageway with 3.25m lane widths, in line with LTN 1/20 recommendations. This will help reduce the vehicle dominance in the town centre by increasing public space and addressing issues of severance. It will also help reduce the number of different movements by motorists, so making it safer for cyclists and pedestrians”.*²⁷

- 2.14.16 A similar technical review will be undertaken for the Northern Industrial Link Road once the Detailed Design for that scheme is complete, however the provision of a dedicated cycling route where none currently exists is considered to be a significant improvement.
- 2.14.17 No significant changes have been made to cycling provision at the A141 / Peas Hill Roundabout, A141 / Hostmoor Avenue Junction and A141 / Twenty Foot Road due to the nature of the A141 route which is not considered appropriate for cyclists.

Policy Objectives Alignment of MATS Improvement Schemes

- 2.14.18 Table 2.13 illustrates how the MATS Improvement Schemes align with relevant National, Regional and Local policy objectives.

²⁷ CCCFHSF-ATK-HGN-XX-RP-CH-000006, Broad Street and Riverside, March, LTN 1/20 Compliance Review, Atkins, October 2022.

Table 2.13: Alignment of MATS Schemes with Policy Objectives

Policy		MATS Improvement Schemes (Package 3a)				
		Broad Street	Northern Industrial Link Road (NILR)	Peas Hill Roundabout	St Peters Road Improvement	Twenty Foot Road Signals
National Policy						
Levelling Up	Investing in the regeneration of town centres and high streets	Yes – will encourage footfall and facilitate delivery of FHSF public realm improvements and reduce congestion, traffic dominance and severance created by current highway layout.	Yes – will reduce through traffic congestion in town centre and improve journey times.	Yes - indirectly by reducing congestion and facilitating traffic flow on the A141, around March, to support sustainable growth.	Yes – will improve traffic flow and journey time reliability.	Indirectly - by reducing journey time to March.
	Improving local transport links and investing in local culture	Yes – will reduce congestion, improve journey times and encourage visitor numbers.	Yes – will reduce through traffic congestion in town centre and improve journey times.	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow and journey time reliability.
DfT Single Departmental Plan	Make journeys easier and reliable	Yes – will reduce congestion and improve journey times.	Yes – will reduce through traffic congestion in town centre and improve journey times.	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow and journey time reliability.
	Make transport sustainable	Yes – will reduce congestion, improve journey times and accessibility by sustainable modes.	Yes – will encourage mode shift to sustainable modes, by creating new active travel link and reducing through traffic congestion in March.	Indirectly – by reducing through traffic in March Town Centre will encourage uptake of sustainable travel.	Indirectly – by reducing through traffic in March Town Centre will encourage uptake of sustainable travel.	No
NPPF	Easier job creation	Yes – will encourage investment and economic growth.	Yes - will improve journey time reliability and encourage investment.	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow, access and journey time reliability.	Yes – will improve traffic flow and journey time reliability.
	Improve travel	Yes – will reduce congestion, improve journey times.	Yes – will improve accessibility, and journey time reliability.	Yes – will improve traffic flow, access and journey time reliability.	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow and journey time reliability.

Policy		MATs Improvement Schemes (Package 3a)				
		Broad Street	Northern Industrial Link Road (NILR)	Peas Hill Roundabout	St Peters Road Improvement	Twenty Foot Road Signals
Regional Policy						
CPCA Local Transport Plan	New Housing	Yes – will reduce congestion to accommodate sustainable growth.	Yes – will reduce congestion to accommodate sustainable growth.	Yes – will reduce congestion to accommodate sustainable growth.	Yes – will increase capacity of network, by improving traffic flow and reducing existing congestion, to facilitate sustainable growth.	Yes – will increase capacity of network, by improving traffic flow and reducing existing congestion, to facilitate sustainable growth.
	Access Jobs	Yes – will improve accessibility, and journey time reliability.	Yes – will improve accessibility, and journey time reliability.	Yes – will improve traffic flow and journey time reliability	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow and journey time reliability.
	Connect Business	Yes – will improve accessibility, and journey time reliability.	Yes – will improve accessibility, and journey time reliability.	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow and journey time reliability.	Yes – will improve traffic flow and journey time reliability.
	Journey Reliability	Yes – will improve journey time reliability by reducing congestion.	Yes – will improve journey time reliability by reducing congestion.	Yes – will improve journey time reliability by reducing congestion.	Yes – will improve journey time reliability by reducing congestion.	Yes – will improve journey time reliability by reducing congestion.
	Accessibility	Yes – will improve accessibility by all transport modes.	Yes - by reducing congestion and improving journey times.	Yes - by reducing congestion and improving journey times.	Yes – by improving traffic flow and journey time reliability.	Yes – by improving traffic flow and journey time reliability.
	Health/Well being	Yes will encourage active travel and improve public realm access. Reduction in congestion will improve air quality.	Yes – will deliver new active travel link.	No	Yes will encourage active travel.	No

Policy		MATS Improvement Schemes (Package 3a)				
		Broad Street	Northern Industrial Link Road (NILR)	Peas Hill Roundabout	St Peters Road Improvement	Twenty Foot Road Signals
Local Policy						
Fenland Local Plan	Improve transport Infrastructure to support growth in: <ul style="list-style-type: none"> Housing Employment Retail 	Yes – will support sustainable growth by reducing congestion, journey time reliability and access.	Yes – will support growth by reducing through traffic congestion in town centre and improve journey times across March.	Yes – will support growth by reducing traffic congestion and improve journey times across March	Yes – will increase capacity of network, by improving traffic flow and reducing existing congestion, to facilitate sustainable growth.	Yes – will increase capacity of network, by improving traffic flow and reducing existing congestion, to facilitate sustainable growth.
Growing Fenland: March Masterplan	Improve appearance of March Town Centre	Yes – creation of new public realm and reduced traffic congestion will facilitate regeneration, increase footfall and encourage investment.	Yes – indirectly, by reducing through traffic in March Town Centre.	Yes – indirectly, by reducing through traffic in March Town Centre.	Yes – indirectly, by reducing through traffic in March Town Centre.	No
	Reduce traffic flow through March Town Centre	Yes – will reduce congestion, improve journey times and accessibility.	Yes – will reducing through traffic congestion in town centre.	Yes – will reducing through traffic congestion in town centre.	Yes – will regulate traffic flow through the town centre.	No
March Neighbourhood Plan	Infrastructure to support sustainable growth	Yes – will reduce congestion, improve journey times and accessibility by sustainable modes.	Yes – will increase capacity of network, by improving traffic flow and reducing existing congestion, to facilitate sustainable growth.	Yes – will increase capacity of network, by improving traffic flow and reducing existing congestion, to facilitate sustainable growth.	Yes – will increase capacity of network, by improving traffic flow and reducing existing congestion, to facilitate sustainable growth.	Yes – will increase capacity of network, by improving traffic flow and reducing existing congestion, to facilitate sustainable growth.
	Regenerate March Town Centre	Yes – creation of new public realm and reduced traffic congestion will facilitate regeneration, increase footfall and encourage investment.	Yes – indirectly, by reducing through traffic congestion in town centre, and improve journey times.	Yes – indirectly, by reducing through traffic in March Town Centre and improving journey times.	Yes – by improving traffic flow and journey times through the town centre.	No

Contribution of the Options to the Scheme Objectives

2.14.19 A logic map that shows how the components of Package 3a will contribute to the scheme objectives is provided in Figure 2.13 below.

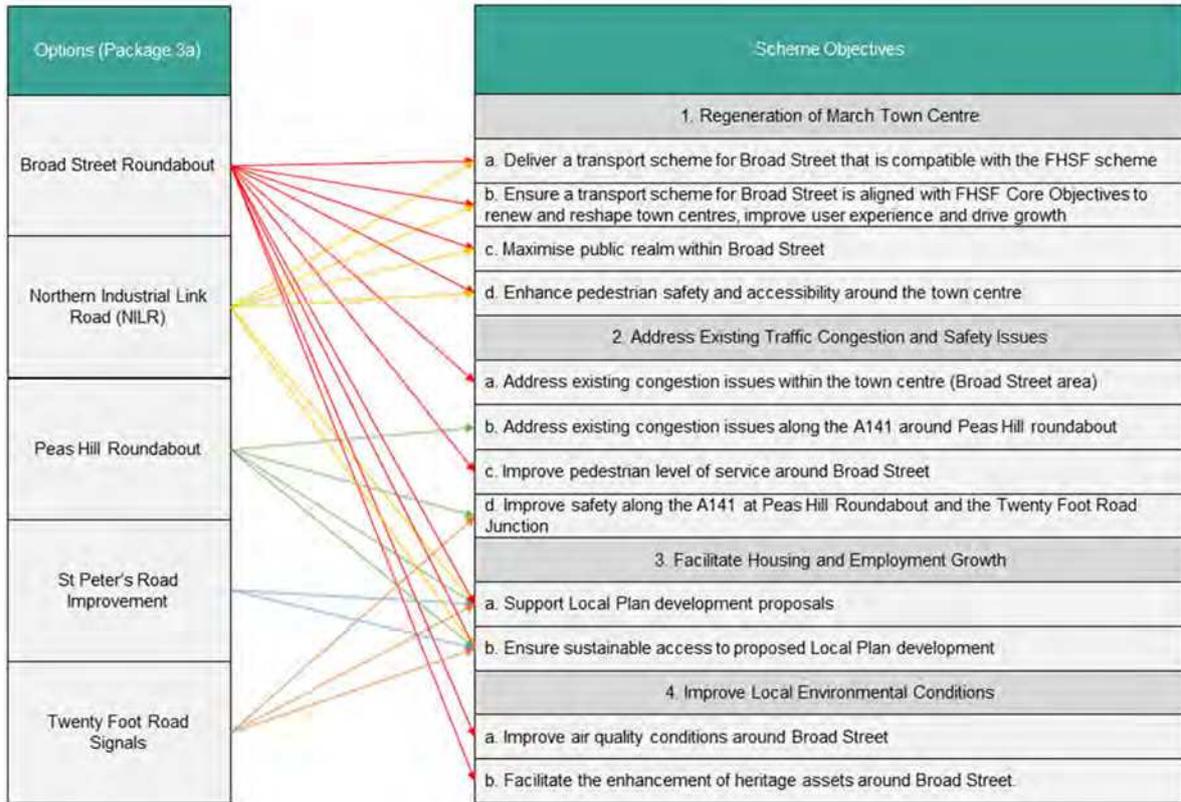


Figure 2.13: Logic Map of MATS Options and Objectives

2.15 Carbon Assessment

- 2.15.1 CPCA and PCC have committed to combat climate change and PCC aim to achieve ‘Net Zero’ carbon emissions by 2030. Carbon assessments have been undertaken for the March Area Transport Study (MATS) schemes in accordance with the following commitment from the Council’s Carbon Management Action Plan (Council CMAP) 2021: *“Develop detailed carbon assessments for major highway projects and use the information to influence the final design.”*
- 2.15.2 The purpose of the preliminary design carbon assessments was to baseline the construction carbon cost of the schemes early in the design process and highlight ‘hotspot’ areas where carbon reduction efforts now need to be focused. Where possible, detailed design carbon assessments were undertaken to highlight any carbon reductions achieved to date, as well as any other variations in carbon linked to scheme design changes. Detailed design assessments also demonstrate where construction phase carbon reduction initiatives need to be focused and provide a foundation for future workshops.
- 2.15.3 Table 2.14 and Figure 2.14 below present the preliminary and, where possible, detailed design carbon footprints for each of the MATS schemes. Based on the most recent carbon assessment undertaken, the total carbon output for all MATS schemes is 4070 tCO₂e, which is equivalent to the average annual emissions from 50 London buses.

Table 2.14: MATS Schemes Carbon Footprint by Design Phase

Scheme	Preliminary (tCO ₂ e)	Detailed (tCO ₂ e)	% change
Broad Street	523 (£1.6m)	-	-
Northern Industrial Link Road	1697 (£7m)	-	-
Peas Hill	549 (£2.3m)	1479 (£3.5m)	+169%
St Peters Signals	91 (£0.3m)	80 (£0.5m)	-12%
Twenty Foot Signals	224 (£1.1m)	291 (£2m)	+29%
Total	3084 (£12.3m)	-	-

- 2.15.4 The increases in carbon output for the detailed design carbon assessments can be attributed to significant increases in scopes of work and having additional information available for more comprehensive carbon accounting (Figure 2.1). Although such increases can partly mask the impacts of certain carbon reduction initiatives, it does increase the accuracy of the assessment and ensures efforts are focused in the correct areas during future stages.

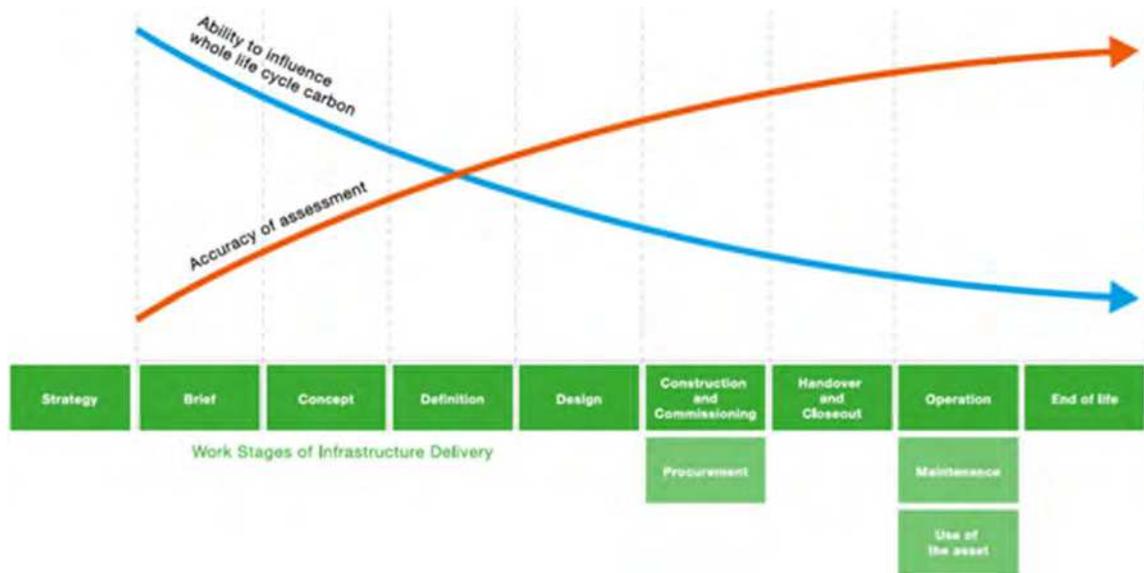


Figure 2.14: Relationship between Work Stages, Assessment Accuracy, and Ability to Influence Whole Life Cycle Carbon (Green Construction Board)

2.15.5 The most significant detailed design carbon output increase was associated with the Peas Hill scheme. As shown in Table 2.15 below, the detailed design BoQ included additional carbon intensive activities, such as sheet piling (318 tCO₂e) and structural concrete works (64 tCO₂e). There were also significant increases in drainage (107 tCO₂e), earthworks (515 tCO₂e), kerbs, footways & paved areas (59 tCO₂e), and traffic signs & road markings (64 tCO₂e). Such variations are matched by consistent increases in construction costs.

Table 2.15: Peas Hill Carbon Footprint by Design Phase

Series	Preliminary (tCO ₂ e)	Detailed (tCO ₂ e)	% change
Drainage & Service Ducts	26.85	134.34	400%
Earthworks	52.57	567.37	979%
Electrical Work for Road Lighting & Traffic Signs	12.69	2.15	-83%
Fencing	0.31	0	-100%
Kerbs, Footways, Cycleways and Paved Areas	60.27	119.22	98%
Landscape and Ecology	0.62	1.23	97%
Piling and Embedded Retaining Walls	0	317.89	318%
Preliminaries	163.75	118.33	-28%
Road Lighting Columns and Brackets, CCTV Masts & Cantilever Masts	31.52	23.42	-26%
Road Pavements	151.91	13.26	-91%
Road Restraint Systems (Vehicle and Pedestrian)	0	9.69	10%
Site Clearance	22.34	24.22	8%
Structural Concrete	0	64.35	64%
Traffic Signs & Road Markings	26.36	83.85	218%

2.15.6 The exception was St Peters Signals, where a 12% reduction (11 tCO₂e) in carbon output was achieved during the detailed design phase. This can be linked primarily to retaining existing street lighting columns and reducing the scope of road marking & traffic sign activities.

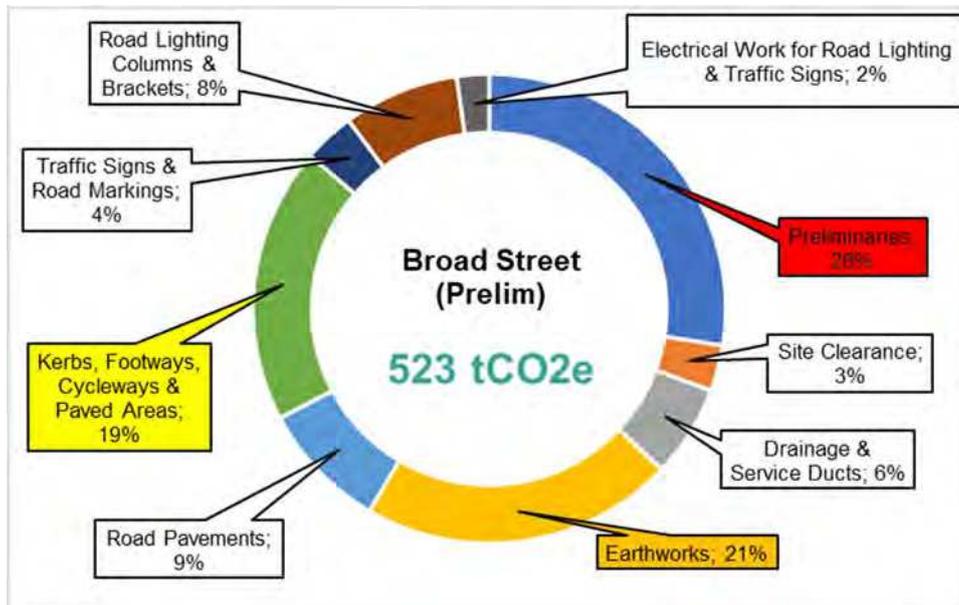


Figure 2.15: Broad Street Preliminary Design Carbon Footprint

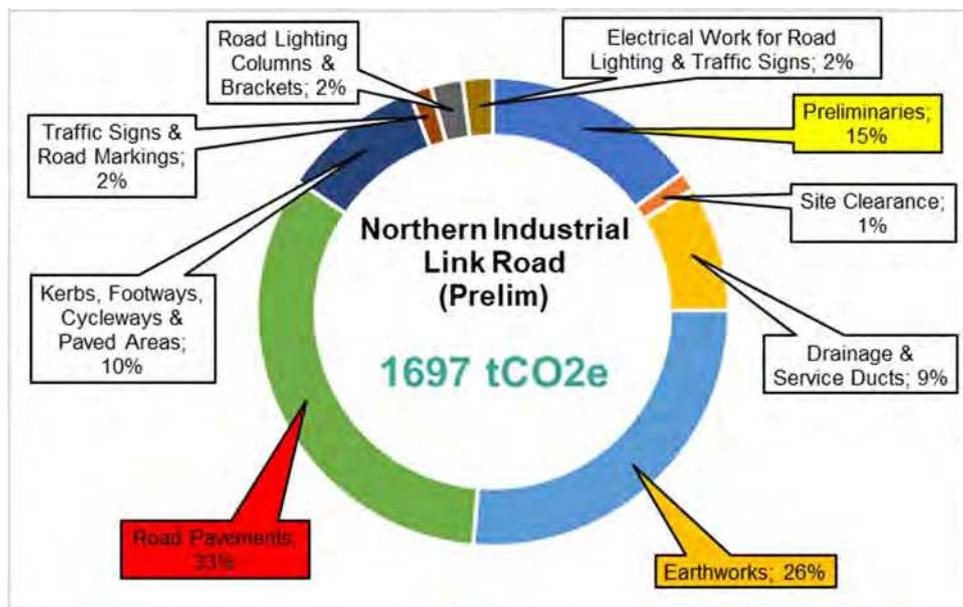


Figure 2.16: NILR Preliminary Design Carbon Footprint

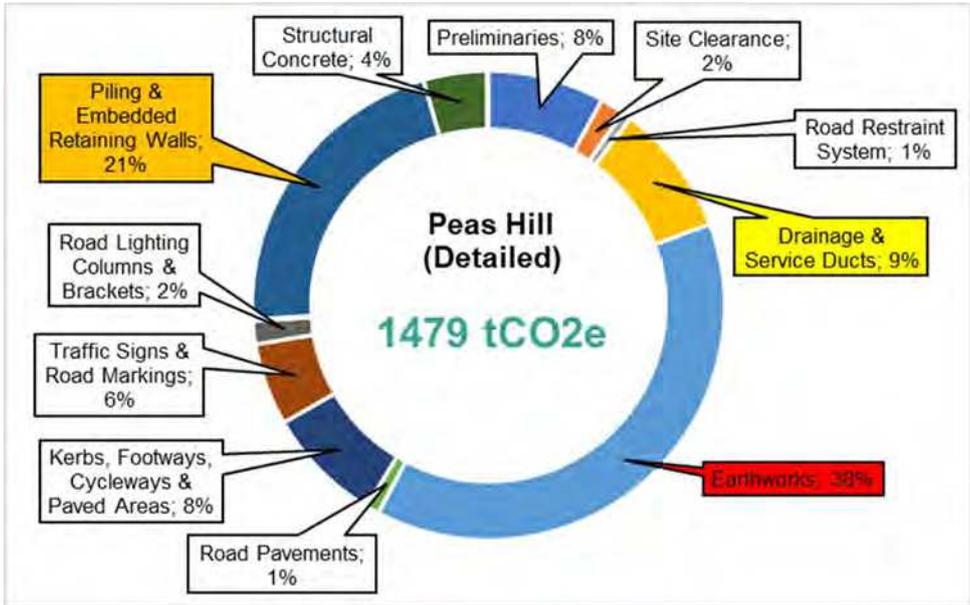


Figure 2.17: Peas Hill Detailed Design Carbon Footprint

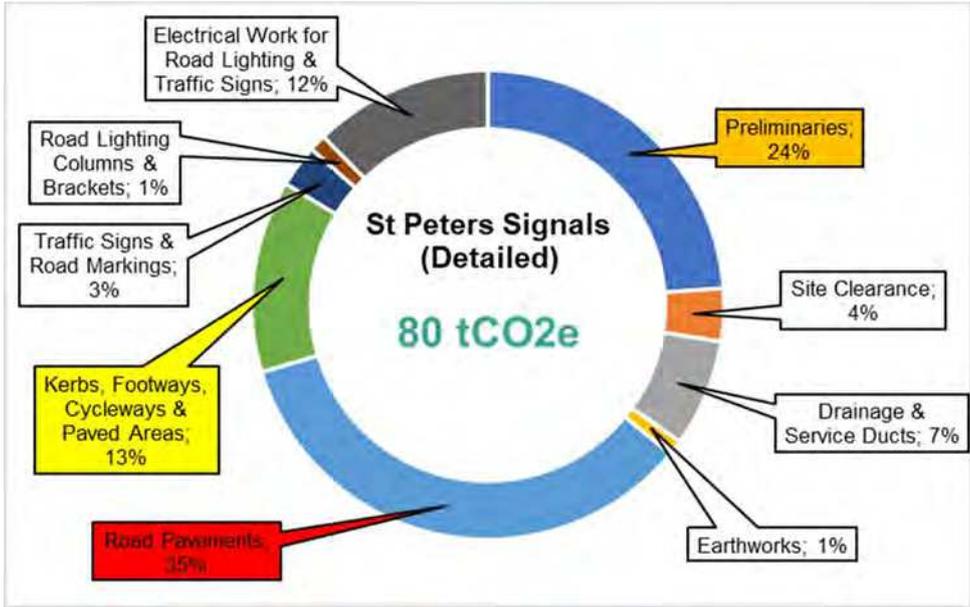


Figure 2.18: St Peters Road Detailed Design Carbon Footprint

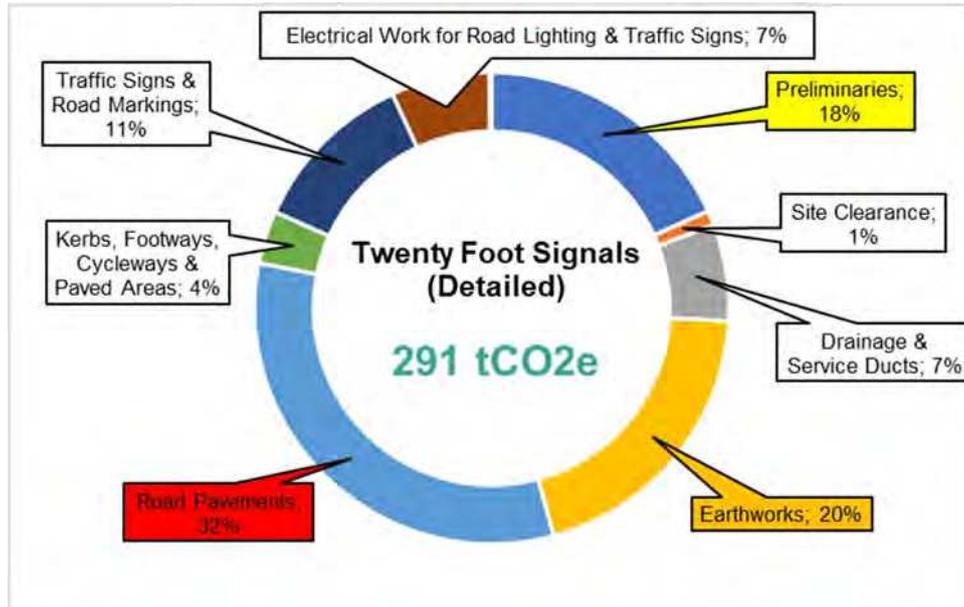


Figure 2.19: Twenty Foot Road Detailed Design Carbon Footprint

2.15.7 Carbon calculations were undertaken using the Milestone Infrastructure Carbon Tool supplemented by manual calculations to estimate carbon emissions using spend data. The assessments were based on the Bill of Quantities (BoQ) provided for both the preliminary and detailed design phases by Milestone estimators and Atkins designers respectively.

2.15.8 Figures 2.15 – 2.19 demonstrate that the highest carbon contributors based on the latest designs are:

Broad Street (Preliminary Design):

- Series 100: Site Preliminaries – 144 tCO2e (28%)
- Series 600: Earthworks – 112 tCO2e (21%)
- Series 1100: Kerbs, Footways, Cycleways & Paved Areas – 99 tCO2e (19%)

Northern Industrial Link Road (Preliminary Design):

- Series 700: Road Pavements – 562 tCO2e (33%)
- Series 600: Earthworks – 449 tCO2e (26%)
- Series 100: Site Preliminaries – 252 tCO2e (15%)

Peas Hill (Detailed Design):

- Series 600: Earthworks – 567 tCO2e (38%)
- Series 1600: Piling & Embedded Retaining Walls – 317 tCO2e (21%)
- Series 500: Drainage & Service Ducts – 134 tCO2e (9%)

St Peters Signals (Detailed Design):

- Series 700: Road Pavements – 28 tCO₂e (34%)
- Series 100: Site Preliminaries – 19 tCO₂e (24%)
- Series 1100: Kerbs, Footways, Cycleways & Paved Areas – 11 tCO₂e (13%)

Twenty Foot Signals (Detailed Design):

- Series 700: Road Pavements – 94 tCO₂e (32%)
- Series 600: Earthworks – 58 tCO₂e (20%)
- Series 100: Site Preliminaries – 53 tCO₂e (18%)

2.15.9 The methods used to undertake these carbon assessments and collate the data allow further scrutiny of carbon hotspots. For example, those shown in Figures 2.15 - 2.19 above can be further scrutinised to identify specific work ‘categories’ and ‘activities’ which are contributing the most significant proportions of carbon and facilitate a more focused carbon reduction effort. Table 2.16 and Figures 2.20 – 2.24 below highlight these and provide some suggested carbon reduction measures for consideration.

Table 2.16: MATS Schemes Carbon Footprint by Work Category

Activity	Carbon Output (tCO ₂ e)	Potential Carbon Reduction Measures
Broad Street (Preliminary Design)		
Disposal of Material	100.95	<ul style="list-style-type: none"> • Value engineering to reduce scope • Re-use of material on-site
Traffic Management	84.31	<ul style="list-style-type: none"> • Use of electric vehicle alternatives • Use of HVO fuel
Paved Areas	60.26	<ul style="list-style-type: none"> • Use of warm mix asphalt • Use of ‘superlow’ asphalt mix
Preliminaries	59.47	<ul style="list-style-type: none"> • Mains power connection for welfare • On-site renewable energy solutions • Use of HVO fuel within diesel generators
Beacons	39.21	<ul style="list-style-type: none"> • Reuse of existing assets • Use components with higher recycled content
Northern Industrial Link Road (Preliminary Design)		
Subbase	180.11	<ul style="list-style-type: none"> • Use of recycled aggregates • Use of geotextiles to reduce thickness
Base Course	148.56	<ul style="list-style-type: none"> • Use of asphalt with higher recycled content • Use of cold recycled bound materials
Disposal of Material	143.67	<ul style="list-style-type: none"> • Value engineering to reduce scope • Re-use of material on-site
Imported Fill	136.72	<ul style="list-style-type: none"> • Use of recycled aggregates • Use of geotextiles to reduce thickness
Traffic Management	133.16	<ul style="list-style-type: none"> • Use of electric vehicle alternatives • Use of HVO fuel

Activity	Carbon Output (tCO2e)	Potential Carbon Reduction Measures
Peas Hill (Detailed Design)		
Piling and Embedded Retaining Walls	317.89	<ul style="list-style-type: none"> Use of 'plastic' sheet piles Use of HVO fuel in sheet piling plant
Disposal of Material	219.65	<ul style="list-style-type: none"> Value engineering to reduce scope Re-use of material on-site
Surface Course	112.59	<ul style="list-style-type: none"> Use of warm mix asphalt Use of 'superlow' asphalt mix
Kerbs, Channels, Edgings, Combined Drainage, Kerb Blocks etc.	74.61	<ul style="list-style-type: none"> Use of Durakerb products Use of concrete with higher GGBS content
Service Ducts	58.66	<ul style="list-style-type: none"> Reuse existing assets Use of ducts with higher recycled content
St Peters Signals (Detailed Design)		
Binder Course	14.74	<ul style="list-style-type: none"> Use of asphalt with higher recycled content Use of cold recycled bound materials
Surface Course	8.87	<ul style="list-style-type: none"> Use of warm mix asphalt Use of 'superlow' asphalt mix
Traffic Signals	8.48	<ul style="list-style-type: none"> Reuse existing assets Use of 'superlow' asphalt mix
Traffic Management	8.36	<ul style="list-style-type: none"> Use of electric vehicle alternatives Use of HVO fuel
Compound, Office & Welfare Facilities	6.48	<ul style="list-style-type: none"> Mains power connection for welfare On-site renewable energy solutions Use of HVO fuel within diesel generators
Twenty Foot Signals (Detailed Design)		
Subbase	45.77	<ul style="list-style-type: none"> Use of recycled aggregates Use of geotextiles to reduce thickness
Imported Fill	36.00	<ul style="list-style-type: none"> Use of recycled aggregates Use of geotextiles to reduce thickness
Base Course	27.75	<ul style="list-style-type: none"> Use of asphalt with higher recycled content Use of cold recycled bound materials
Compound, Office & Welfare Facilities	19.91	<ul style="list-style-type: none"> Mains power connection for welfare On-site renewable energy solutions Use of HVO fuel within diesel generators
Traffic Management	18.88	<ul style="list-style-type: none"> Use of electric vehicle alternatives Use of HVO fuel

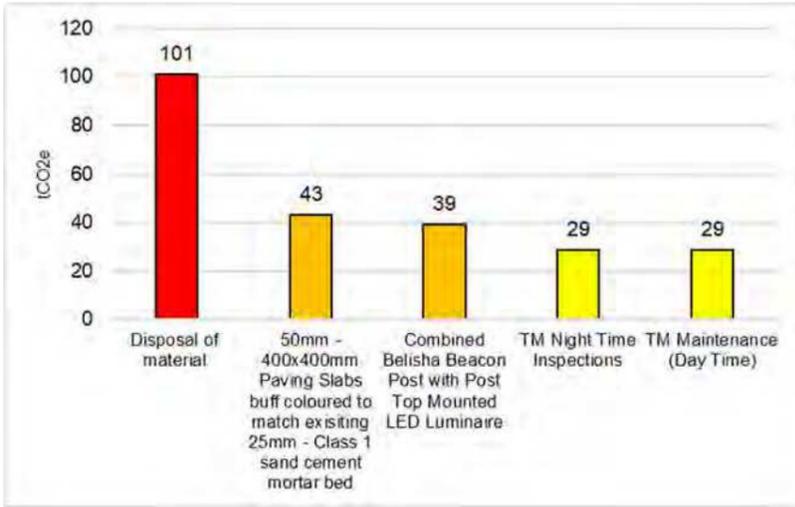


Figure 2.20: Broad Street – Work Activity Carbon Hotspots

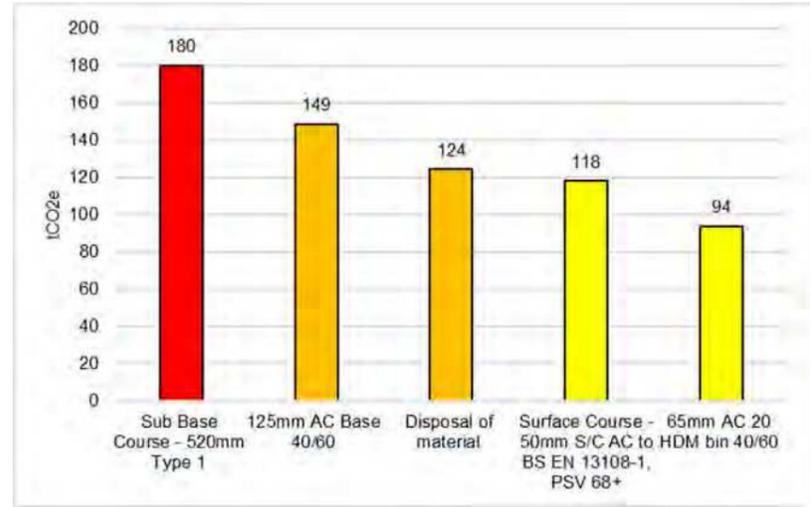


Figure 2.21: NILR – Work Activity Carbon Hotspots

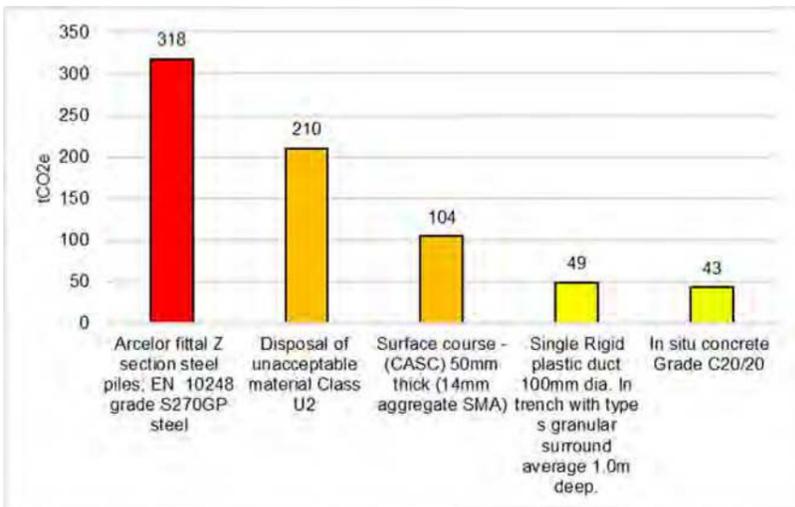


Figure 2.22: Peas Hill – Work Activity Carbon Hotspots

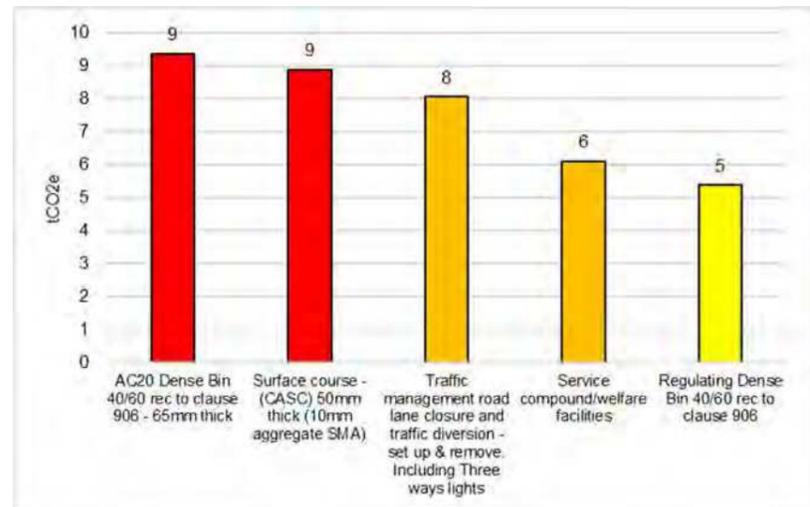


Figure 2.23: St Peters Road – Work Activity Carbon Hotspots

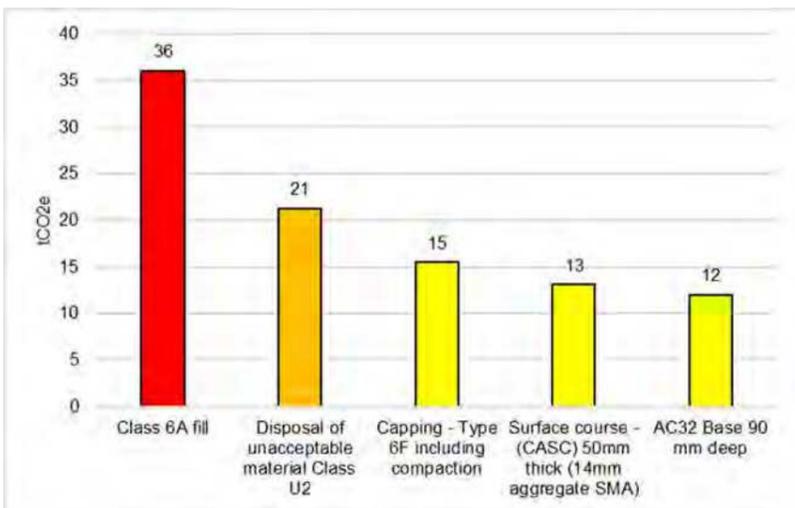


Figure 2.24: Twenty Foot Road – Work Activity Carbon Hotspots

- 2.15.10 It is recommended that a carbon reduction workshop is arranged at the earliest opportunity to help collaboratively identify further initiatives which could be considered for implementation. It is advised that this is coordinated at the earliest opportunity with representation from client, design, principal contractor, and supply chain organisations. Linked to the carbon 'hotspots' identified above, the workshop should focus on construction phase carbon reduction initiatives for Peas Hill, St Peters Signals, and Twenty Foot Signals schemes. For Broad Street and Northern Industrial Link Road schemes, the workshop should aim to identify detailed design value engineering and alternative material options. This will provide an opportunity to develop a carbon reduction plan for the schemes incorporating clear actions, responsibilities, and deadlines to ensure effective implementation of carbon reduction measures which also deliver cost savings. In all cases, construction will prioritise non-hazardous, reused, refurbished, recycled, and recyclable equipment and materials within specification, and those made from renewable sources with low(er) embodied energy, carbon footprint and water footprint.
- 2.15.11 The data generated from these carbon assessments can also be used to quantify the potential carbon savings associated with such interventions. This helps to ensure that we get the greatest carbon reductions for any additional expenditure required though, overall, it is anticipated that there will be a cost saving associated with such initiatives. For example, simple switches to Hydrotreated Vegetable Oil (HVO) and warm mix asphalt could reduce carbon outputs linked to diesel and asphalt use by 90% and 15% respectively. This would generate significant carbon savings overall considering the carbon hotspots presented above.
- 2.15.12 The principles of 'Build Less' and 'Build Clever' should always be embedded within the design development of a scheme to help drive the most significant carbon reductions possible (Figure 2.25). In the interest of continuous improvement, this reinforces the importance of undertaking the initial carbon assessment and workshop at the earliest opportunity when there is sufficient information available (i.e. BoQ). It should also be noted that there are operational phase carbon savings associated with the MATS schemes which have not yet been quantified, such as reducing congestion and idling traffic, and promoting active travel instead of driving. The intention is to quantify these aspects more effectively as suitable carbon accounting methods are developed and agreed.

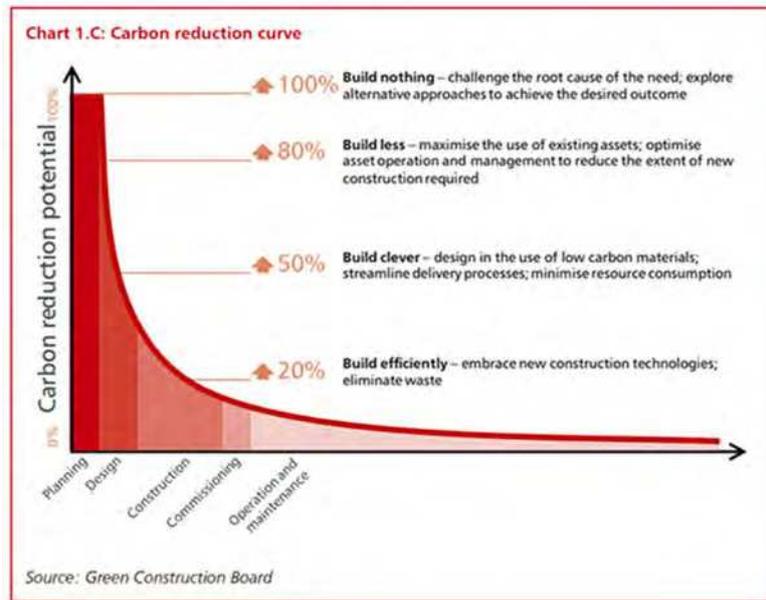


Figure 2.25: Relationship between Work Stages and Carbon Reduction Potential

2.15.13 These carbon assessments should also be updated when there are as-built (Peas Hill, St Peters Signals, Twenty Foot Signals) and detailed design (Broad Street, Northern Industrial Link Road) BoQ available. This will allow us to confirm the final carbon outputs associated with the schemes and highlight carbon reductions achieved throughout the whole project life cycles. This will require effective data collection during the construction phase. It is envisaged that this will provide another case study for future PCC and CPCA projects to replicate and build on adopting the approach summarised in Figure 2.26 below.

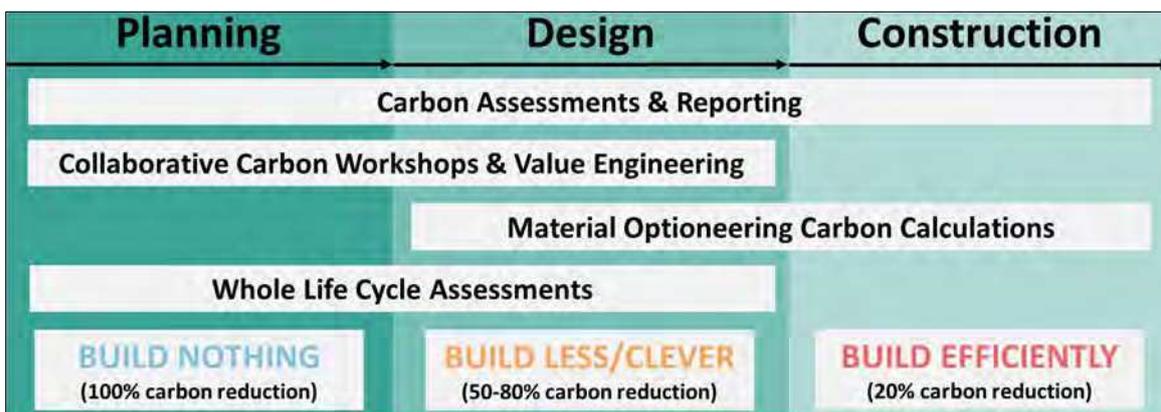


Figure 2.26: Key Carbon Management Processes Throughout the Project Lifecycle

3. Economic Dimension

3.1 Introduction

3.1.1 The Economic Dimension provides evidence of how the schemes are predicted to perform in relation to the stated objectives, the identified problems, and targeted outcomes. The Economic Dimension determines if the proposed schemes are likely to form a viable investment, whose strengths outweigh its weaknesses, and provides good value for money, with benefits outweighing its costs.

3.1.2 This section sets out the approach taken to assess the Economic Dimension for the MATS Improvement Schemes and demonstrates that the Full Package of schemes offer High Value for Money (VfM).

The Economic Dimension demonstrates that the MATS Broad Street Scheme offers Very High Value for Money.

3.1.3 The scheme appraisal focuses on the aspects of performance that are relevant to the nature of the intervention. These impacts are not limited to those directly impacting on the economy or those which can be monetised. The economic, environmental, social and distributional impacts of the proposal are all examined, using qualitative, quantitative and monetised information where appropriate.

3.2 Identified Scheme Package

3.2.1 As detailed in the Strategic Dimension, an extensive option assessment has been undertaken to identify a package of schemes which addresses the identified issues across March and meets the stated objectives. The MATS OAR recommended Package 3a as the preferred package of schemes across the town as a result of this option development and assessment process. The preferred package of schemes has evolved throughout the design process, and includes:

- Creation of a signalised junction at the A141 / Twenty Foot Road Junction
- Improvements to the A141 / Peas Hill Roundabout (52m ICD) in association with the creation of an all-movement signalised junction at the A141 / Hostmoor Avenue junction.
- High Street / St Peter's Road Traffic Signal Improvements
- Improvements to Broad Street / Dartford Road / Station Road, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction
- Development of a Northern Industrial Link Road (NILR).

3.2.2 Scheme designs for each of the interventions detailed above are provided in Appendix B.

3.3 Economic Assessment

Approach to Appraisal

3.3.1 The Economic Dimension for the recommended package of MATS Improvement Schemes is focused on the following aspects:

- Assessing the monetised direct, localised, and economic efficiency benefits of Package 3a (**Full Package**)

- Assessing the monetised direct, localised, and economic efficiency benefits of delivering improvements to Broad Street / Dartford Road / Station Road junction, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction (**MATS Broad Street Scheme**)

- Qualitative appraisal of wider scheme economic, environmental, and social benefits, as well as the enablement of planned development
- Distributional appraisal of total user benefits and non-working time (personal affordability)
- Offsetting identified benefits against the scheme costs to provide a Benefit to Cost (BCR) ratio.

3.3.2 It is acknowledged that a scheme can only be considered value for money if it meets the strategic objectives, and so this has been considered throughout the economic assessment.

Assessment Guidelines

3.3.3 Economic assessment undertaken to date has considered the DfT's TAG guidelines, with specific reference to the following documentation:

- Value for Money Framework: Moving Britain Ahead (July 2017)
- TAG Unit A1.1 – *Cost-benefit analysis* (November 2022)
- TAG Unit A1.2 – *Scheme Costs* (May 2022)
- TAG Unit A1.3 – *User and provider impacts* (May 2022)
- TAG Unit A3 – *Environmental Impact Appraisal* (May 2022)
- TAG Unit A4.1 – *Social Impact Appraisal* (November 2022)
- TAG Unit A4.2 – *Distributional Impact Appraisal* (May 2020)
- TAG Unit M1.1 – *Principles of Modelling and Forecasting* (January 2014)
- TAG Unit M3.1 – *Highway Assignment Modelling* (May 2020)
- TAG Unit M4 – *Forecasting and Uncertainty* (May 2019).

Modelling Assessment

- 3.3.4 The transport user benefits of the schemes were assessed using the SATURN-based MATS model. The model / appraisal forecast years developed in SATURN are 2026 and 2031, which have been used to appraise the impacts of the schemes and represent the growth outlined within the Local Plan.
- 3.3.5 The modelling approach is based on fixed demand and does not consider changes in modal share as a result of the package of schemes. The schemes are not expected to generate any significant mode shift because of the remoteness of March within the region and therefore the application of variable demand modelling (VDM) is not considered appropriate.
- 3.3.6 The SATURN Local Model Validation Report (LMVR) produced for the MATS provides details of the SATURN base model calibration and validation to a 2018 base year. This reported a strong level of model validation across all base year time periods in line with TAG criteria and is considered a suitable tool for evaluating the MATS Improvement Schemes.
- 3.3.7 The SATURN Forecasting Report produced for the MATS provides details of the traffic forecasting methodology used, as well as key assumptions made during the forecasting process. This has been undertaken in line with TAG guidelines and established 'Reference Case' conditions for 2026 and 2031 future forecast years.
- 3.3.8 The key objective of the SATURN models is to forecast, accurately, the likely transport impacts that the proposed schemes would have on highway users of the surrounding road network. User benefits can be calculated by modelling the highway network, in various years, and comparing with / without scheme scenarios to determine how introducing a scheme will impact on travel behaviour and patterns.
- 3.3.9 As detailed in the Strategic Dimension, the preferred package of schemes making up the MATS Improvement Schemes have been assessed relative to reference case conditions using the MATS SATURN Model with results presented in the MATS OAR.
- 3.3.10 Construction of the proposed schemes has been phased across future forecast years, with the A141 / Twenty Foot Road Signals, A141 / Peas Hill Roundabout (in conjunction with the developer funded Hostmoor Avenue Roundabout), High Street / St Peter's Road Signal Improvements and the Broad Street MATS Improvement Schemes, all considered deliverable by 2026, with the NILR deferred until 2031 to reflect the potential complexities associated with land acquisition at this location.

Economic Assessment Approach

3.3.11 Table 3.1 below outlines the monetised impacts that have been assessed as part of the economic assessment.

Table 3.1: Value for Money Framework Impacts Assessed

Value for Money Framework Impact Type	Impact	Method
Established	Journey Time Savings	TUBA
	Vehicle Operating Costs	TUBA
	Accidents	COBALT
	Noise	Noise Workbook
	Air Quality	Air Quality Valuation Workbook Local Air Quality Workbook
	Greenhouse Gases	TUBA
	Indirect Tax	TUBA
Evolving	Journey Time Reliability	TAG Unit A1.3 – Section 6.3
Non-Monetised Impacts	Landscape	Landscape Worksheet
	Townscape	Townscape Worksheet
	Historic Environment	Historic Environment Worksheet
	Biodiversity	Biodiversity Worksheet
	Water Environment	Water Environment Worksheet
	Journey Quality	Journey Quality Worksheet
	Security	Security Worksheet
	Affordability	TUBA & Distributional Impacts Worksheet
Severance	Severance Worksheet	

3.3.12 Established monetised impacts are those that produce monetary values that are widely accepted, well-researched, and tried and tested. Established monetised impacts are used to generate an initial Value for Money metric, which is reported in the Value for Money Statement.

3.3.13 Evolving monetised impacts are less widely accepted, researched, or tried and tested than established impacts and any resultant monetary values should be reported after the initial Value for Money metric. The adjusted metric can still be reported in the Value for Money Statement.

3.3.14 Indicative monetised impacts are not sufficiently widely accepted, researched, or tried and tested and cannot be considered definitive. Methodologies for indicative impacts are developing and have a high degree of uncertainty. No indicative monetised impacts have been assessed.

3.3.15 Non-monetised impacts involve the estimation of the magnitude of each impact, which is then assessed on a seven-point scale. Non-monetised impacts can be informed by a variety of evidence sources and analytical judgement.

3.3.16 Journey time savings, vehicle operating costs, greenhouse gases, and indirect tax have been assessed within TUBA 1.9.17 using model outputs from the Do Minimum and Do Something 2026 and 2031 SATURN models.

3.3.17 Annualisation factors shown below in Table 3.2 were specified within TUBA to calculate the likely annual transport user benefits for the AM, Inter and PM peak hours and have been derived from nearby ATC data. It was found that the hourly flows and speeds either side of the modelled AM and PM peak hours closely resembled the AM and PM peak hour flows and speeds, as shown in Figures 3.1 and 3.2 below. AM and PM annualisation factors have therefore been calculated that convert the single peak hour demand to annual peak period demand. None of the estimated annualisation factors exceeded the expected maximum threshold for each time period.

Table 3.2: TUBA Annualisation Factors

Time Slice	Time Period	Estimated Annualisation Factor	TUBA Expected Maximum Hours	Description
1	AM Peak	750	759	Convert from 08:00 – 09:00 to annual 07:00 – 10:00 period
2	PM Peak	699	759	Convert from 17:00 – 18:00 to annual 16:00 – 19:00 period
3	Inter Peak	1,469	1,518	Convert from 14:00 – 15:00 to annual 10:00 – 16:00 period

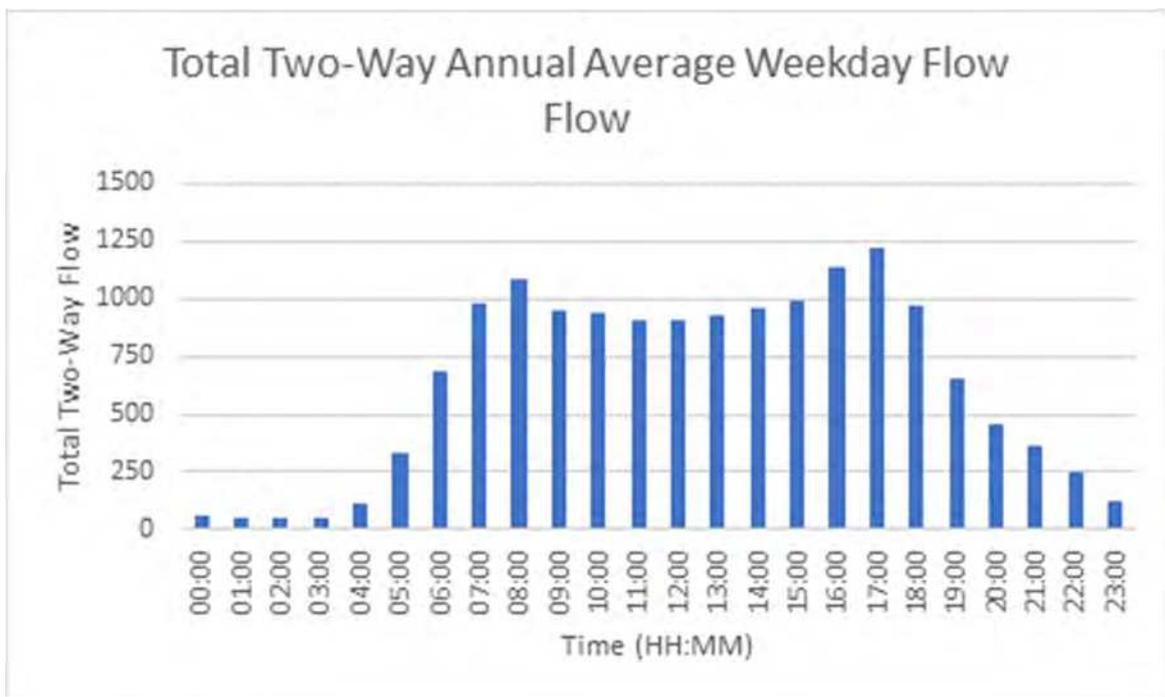


Figure 3.1: 24-hour Total Two-Way Annual Average Weekday Flow

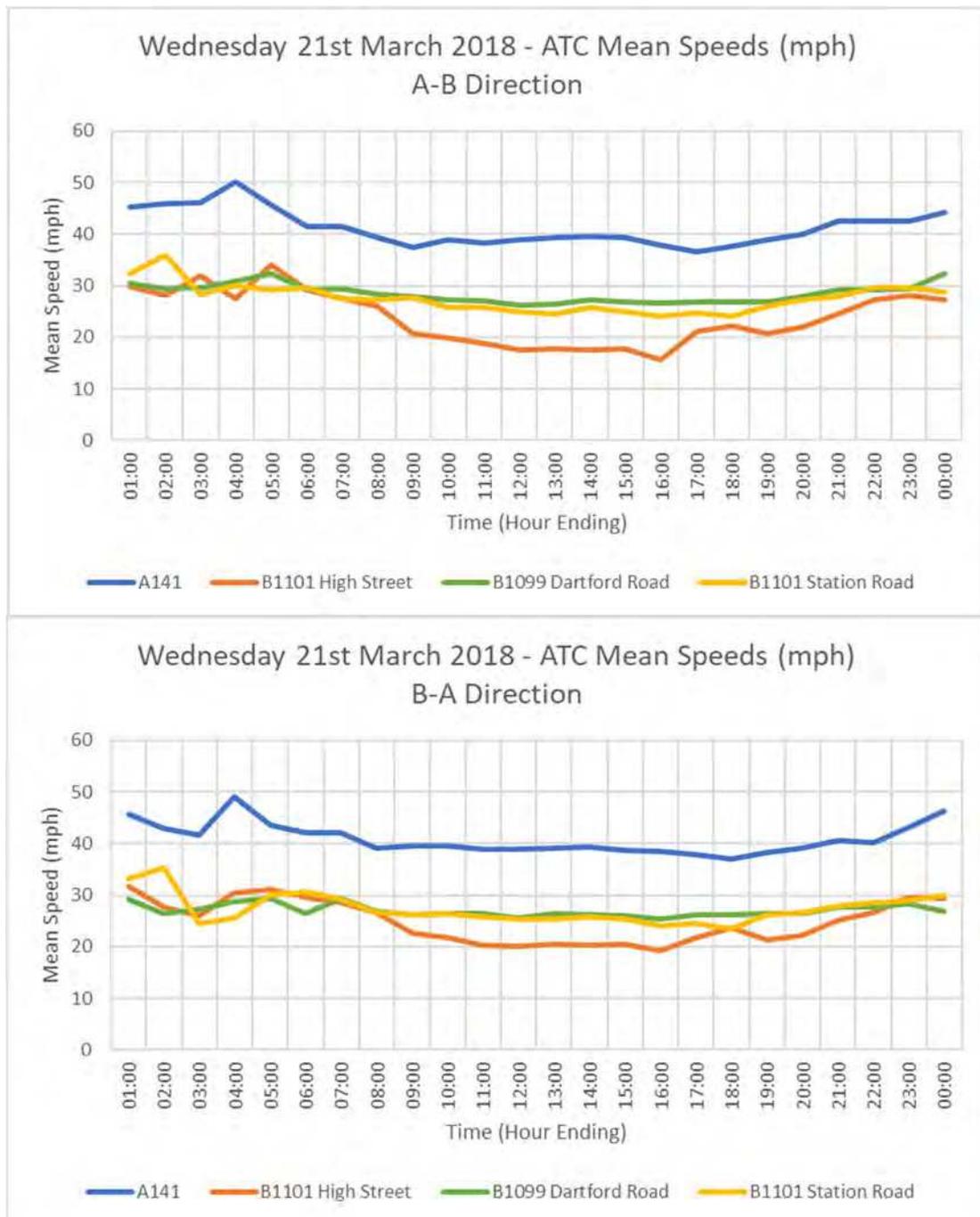


Figure 3.2: 24-hour Speed Profile by Direction at each ATC Site

- 3.3.18 The impact of construction has been accounted for within the TUBA assessment through introducing construction-related highway restrictions on the modelled network for each scheme location in the 12 months prior to opening. The benefits / disbenefits associated with the construction of each scheme have been annualised within TUBA to reflect the construction programme for each scheme.
- 3.3.19 The COBALT assessment uses 24-hour AADT base and forecast year model flows at each scheme location to estimate the accident benefits for the MATS Broad Street Scheme and the Full Package.

3.3.20 All established monetised impacts have been calculated over a 60-year whole life Present Value of Benefits (PVB) which, when compared to a Present Value of Costs (PVC), is then used to calculate a BCR. A Value for Money (VfM) category is then determined based on this BCR. The VfM categories defined by DfT in the Value for Money Framework, are shown in Table 3.3 below.

Table 3.3: DfT Value for Money Categories

Value for Money Category	Description
Very High	BCR greater than or equal to 4.0
High	BCR between 2.0 and 4.0
Medium	BCR between 1.5 and 2.0
Low	BCR between 1.0 and 1.5
Poor	BCR between 0.0 and 1.0
Very Poor	BCR less than or equal to 0.0

3.3.21 The Net Present Value (NPV) is also reported, and this represents the net total value of a scheme with scheme costs subtracted from its monetised benefits. PVB, PVC and NPV values are expressed in £'000s in 2010 market prices and values to allow direct comparison.

3.3.22 Monetised journey time reliability benefits have been assessed for the core scenario of the MATS Broad Street Scheme and the Full Package using the methodology outlined in TAG Unit A1.3 Section 6.3. Benefits have been annualised using the factors used in TUBA and discounted to 2010.

3.3.23 Journey time reliability benefits are an evolving monetised impact and should be identified separately from other more established economic benefits. Reliability benefits cannot be included in the main BCR for the MATS Broad Street Scheme or Full Package and should only be combined with other economic benefits to form the 'adjusted BCR'.

Key Risks, Sensitivities, and Uncertainties

3.3.24 Table 3.4 overleaf outlines the sensitivity tests undertaken to confirm the robustness of the business case.

Table 3.4: Sensitivity Tests

TAG Unit	Description	Software
A1.3	High Value of Time (VOT) – +25% for Commuting and Business, and +60% for Other purpose types	TUBA
A1.3	Low Value of Time (VOT) – -25% for Commuting and Business, and -60% for Other purpose types	TUBA
M4	Low Growth	TUBA and COBALT
M4	High Growth	TUBA and COBALT
M4	Common Analytical Scenario (CAS) Behavioural Change	TUBA
A3	High Estimate for Air Quality Improvements	Air Quality Valuation Workbook
A3	Low Estimate for Air Quality Improvements	Air Quality Valuation Workbook
A1.2	Optimism Bias – P Value for Cost Change to achieve a specific Value for Money Category	TUBA

3.3.25 Sensitivity tests have been undertaken to understand the potential impact of uncertainty around assumptions and forecasts on the project's value for money. The main risks to value for money are:

- Lower traffic growth than forecasted in the core scenario
- Lower Values of Time (VOT) for commuting, business and other travellers than estimated in the most recent value of time research and outlined in the TAG Data Book
- Lower than estimated reductions in air pollution
- Higher than estimated scheme costs.

3.3.26 The COVID-19 pandemic resulted a significant drop in highway usage as part of national lockdowns. The post-lockdown recovery periods have seen total national traffic levels recover close to pre-COVID-19 levels as shown in Figure 3.3 below. Mobility levels for each journey purpose in Fenland have not returned to pre-COVID-19 patterns as shown in Figure 3.4, with workplace and residential mobility below and above baseline levels, respectively.

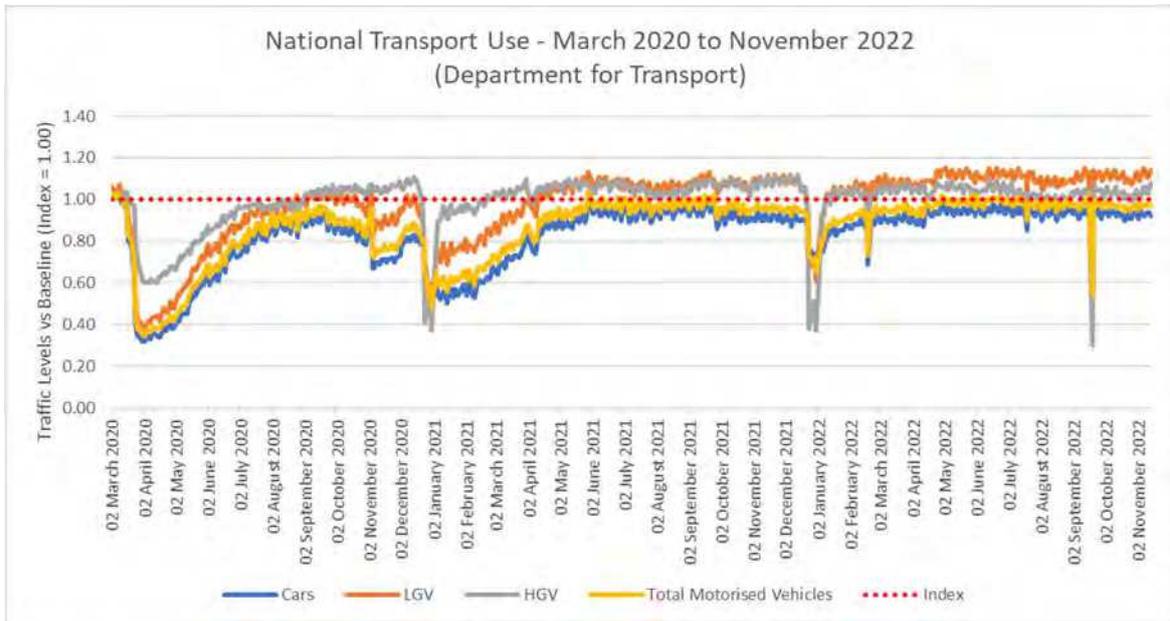


Figure 3.3: National Transport Use – March 2020 to November 2022 (Department for Transport)

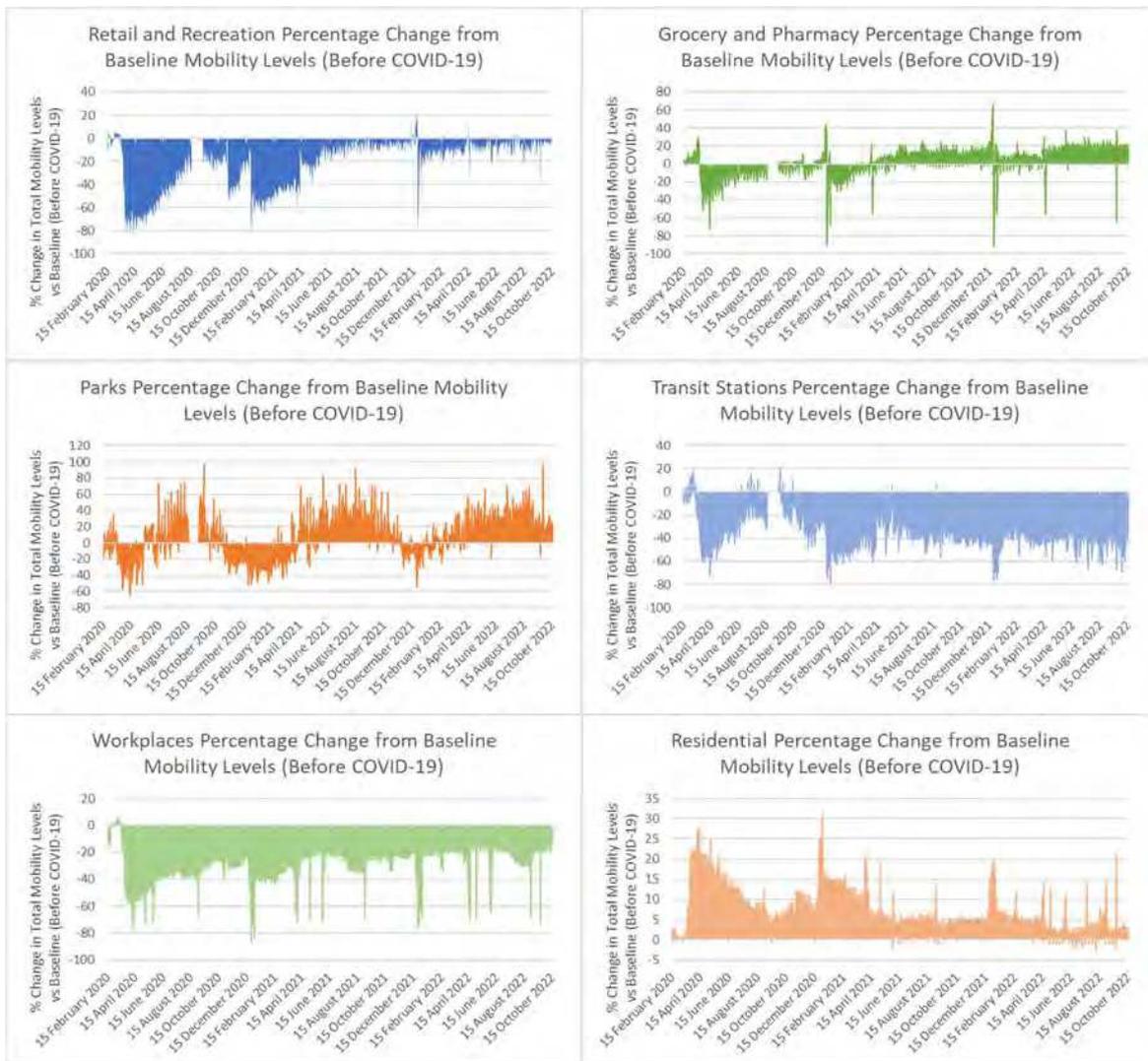


Figure 3.4: Fenland Mobility Levels by Travel Purpose – February 2020 to October 2022 (Google)

- 3.3.27 As no-one knows what overall impact this will have on highway usage and growth moving forward, the low growth and behavioural change sensitivity tests are considered robust proxies for measuring the scheme benefits against a scenario where traffic growth does not match pre-COVID-19 levels.
- 3.3.28 As the benefits of the package of MATS Improvement Schemes largely relate to reducing delay to existing and future traffic, a growth in future traffic levels beneath that anticipated is the greatest risk to the package of schemes. The results of the sensitivity tests, and their impact on the business case, are detailed later in this chapter.
- 3.3.29 As part of the scheme design and costing process, optimism bias has been calculated and is incorporated into the scheme costs used within the Economic Assessment. Further details on these costs are provided beneath.

3.4 Present Value Costs

3.4.1 Robust scheme cost estimates have been produced based on Detailed Designs produced in 2022, and with contractor input (ECI) into construction planning and risk review. Note that the design for the Northern Industrial Link Road is less mature and is more accurately described as an advanced Preliminary Design, and the Optimism Bias rates for this scheme have been amended to reflect this.

“The proposed highway works will reallocate road space to remove car parking (which is currently situated within a ‘central reserve’ between the north and southbound carriageways) and provide a single two-way carriageway with 3.25m lane widths, in line with LTN 1/20 recommendations. This will help reduce the vehicle dominance in the town centre by

3.4.2 The Base Investment Costs are detailed below in Table 3.4 and the subsequent steps taken to calculate the Present Value Costs (PVC) are described beneath.

3.4.3 The benefits assessment was undertaken for a 60-year appraisal period from the scheme opening year (2024 to 2083), with costs included from 2023 through to 2024. Further detail about the scheme costs is provided in the Financial Dimension.

3.4.4 The Base Investment Cost is the capital cost required to construct the scheme in current year (2022) prices, without a risk allowance or optimism bias. This is derived from the scheme cost estimate based on design information and early contractor involvement (ECI) and is the building block for all subsequent cost calculations. All Sunk Costs (those already incurred) have been omitted from the economic assessment in line with TAG unit A1.2.

3.4.5 Table 3.5 shows the Base Investment Cost for the Full Package profiled over the next six calendar years and broken down by cost type.

Table 3.5: Base Investment Cost (2022 Prices) – Full Package

Calendar Year	Construction (£)	Land & Property (£)	Preparation / Supervision (£)	Other (£)	Total
2023	2,212,997		389,042	532,337	3,134,376
2024	603,545	440,000	661,145	824,916	2,529,606
2025	5,400,204		1,344,186	841,843	7,586,234
2026	3,803,003	80,000	899,681	645,620	5,428,304
2027	8,004,122		1,137,596	531,861	9,673,579
2028			20,000		20,000
Total	20,023,871	520,000	4,451,650	3,376,577	28,372,098

3.4.6 Table 3.6 shows the Base Investment Cost for the MATS Broad Street Scheme profiled over the next three calendar years and broken down by cost type.

Table 3.6: Base Investment Cost (2022 Prices) – MATS Broad Street Scheme

Calendar Year	Construction (£)	Land & Property (£)	Preparation / Supervision (£)	Other (£)	Total
2023	2,212,997		149,286	292,508	2,654,791
2024	603,545		40,714	79,775	724,034
2025					
2026					
2027					
2028					
Total	2,816,542		190,000	372,283	3,378,825

3.4.7 The PVC has been calculated as follows:

- Real Cost increases were calculated using the Base Investment Cost spend profile. The Base Cost adjustment factor was calculated by dividing the Construction Industry Inflation Rate (12% in 2022 / 2023 and 2023 / 2024, 10% in 2024 / 2025, and then 5%²⁸ per annum thereafter) by the Annual GDP Factor derived from the TAG Databook (May 2022) for each of the years within the assessment period. The inflation rate was derived from construction output price indices as well as knowledge of costs associated with recent schemes in the Cambridgeshire region. Note that inflation has not been applied for the MATS Broad Street Scheme as this was included in the Contractor price and is therefore already captured in the Base Investment Cost.
- Optimism Bias was then applied in line with TAG unit A1.2 (May 2022). An Optimism Bias rate of 20% has been used for all schemes with completed Detailed Designs to represent the level of design maturity, however, an Optimism Bias rate of 23% has been applied to the NILR in acknowledgement that this design is not as progressed as the others.

The total Optimism Bias applied for the Full Package was £7,716,547.

The total Optimism Bias applied for the MATS Broad Street Scheme was £675,765.

²⁸ [Turner & Townsend raises inflation forecast to 8.5% \(theconstructionindex.co.uk\)](https://www.theconstructionindex.co.uk)

The Optimism Bias rates used are confirmed in Table 3.7 beneath:

Table 3.7: Application of Optimism Bias

Scheme	Design Stage	Optimism Bias Rate
Broad Street	Detailed Design	20%
A141 Peas Hill + A141 Hostmoor Avenue	Detailed Design	20%
A141 / Twenty Foot Road	Detailed Design	20%
St Peter's Road	Detailed Design	20%
Northern Industrial Link Road	Preliminary Design	23%

- Costs were then rebased back to 2010 using factors derived from the TAG Databook (May 2022) GDP Deflator.
- Costs were then discounted to 2010 in line with guidance provided in TAG unit A1.2.
- Finally, costs were converted to 2010 Market Prices using a factor of 1.19.

3.4.8 Note that the final three steps are undertaken within the TUBA software, and that risk has been excluded from the Economic Assessment in line with the latest TAG guidance.

3.4.9 Tables 3.8 and 3.9 below show the costs described above for the Full Package and MATS Broad Street Scheme, split into construction costs and maintenance costs.

3.4.10 Maintenance costs have been calculated based on an indicative maintenance schedule for the new infrastructure identified as representing an increased maintenance liability above existing infrastructure. Further detail on the calculation of maintenance costs is provided within the Financial Dimension (Chapter 4).

3.4.11 Note that CCC, as the Highway Authority, are liable for all future maintenance costs, and that these costs are not requested from the CPCA as part of the scheme funding. They are calculated to demonstrate the whole life cost of the scheme, and for use within the Economic Assessment.

Table 3.8: Economic Dimension Cost Estimates – Full Package

Description of Cost Type	Construction Cost (£)	Maintenance Cost Over 60 Years (£)
Base Investment Cost	28,372,098	206,500
Base Cost with Real Cost Increases	35,581,123	1,730,778
Base Cost with Real Cost Increases and Optimism Bias	43,297,671	1,730,778
Rebased to 2010 Price Year	34,115,431	1,363,727
Discounted to 2010 Prices	19,910,150	267,313
Adjusted to Market Prices	23,693,078	318,102

3.4.12 Please note that there is no increase in maintenance costs predicted for the MATS Broad Street Scheme, which will result in a significant reduction in transport infrastructure due to the removal of traffic signals.

Table 3.9: Economic Dimension Cost Estimates – MATS Broad Street Scheme

Description of Cost Type	Construction Cost (£)	Maintenance Cost Over 60 Years (£)
Base Investment Cost	3,378,825	0
Base Cost with Real Cost Increases	3,378,825	0
Base Cost with Real Cost Increases and Optimism Bias	4,054,590	0
Rebased to 2010 Price Year	3,194,723	0
Discounted to 2010 Prices	2,027,917	0
Adjusted to Market Prices	2,413,221	0

3.4.13 A full profile for the Economic Dimension cost calculations is provided within Appendix D.

3.5 Present Value Benefits

Transport User Benefits

- 3.5.1 The transport benefits of the MATS Broad Street Scheme and the Full Package were assessed using SATURN 11.4.07H.
- 3.5.2 Full details relating to the calibration and validation of the base model can be found in the LMVR, and details about the forecasting procedure can be found in the Forecasting Report.
- 3.5.3 Two core network scenarios were developed for the economic assessment, these were the Do Minimum (DM) and Do Something (DS) scenarios. The DM scenario represents future growth without highway intervention (without scheme), and the DS scenario (with scheme) includes the package of schemes (Full Package) within the model with the same level of future core traffic growth. An additional DS scenario has been developed that considers only the MATS Broad Street Scheme with the same growth assumptions as described for the DM and Full Package scenarios.
- 3.5.4 The difference between the DM and DS scenarios demonstrates the benefits of implementing the scheme. These benefits are measured using:
- Network assignment statistics
 - Link flow changes
 - Journey times
 - Journey routing.
- 3.5.5 The Model output files are then entered into the Transport User Benefits Appraisal (TUBA, 1.9.17) and COBALT v2.3 software to undertake the Economic Assessment and calculate a BCR.
- 3.5.6 TUBA produces figures for a number of benefits, including Greenhouse Gases, User benefits by purpose, 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.
- 3.5.7 The impact of construction has been assessed in TUBA for the following scheme locations for the Full Package only:
- Peas Hill Roundabout (Phase 1) – Approaches reduced to a single lane for 40 weeks
 - Peas Hill Roundabout (Phase 2) – Wisbech Road approach closed for 17 weeks
 - B1101 / St. Peter's Road – Full closure of junction for 2 weeks
 - Twenty Foot Road – Full closure of road for 9 weeks.
- 3.5.8 The total Present Value of Benefits (PVB) of the construction period for the Full Package is a disbenefit of £169,000.

The traffic management required for delivering the MATS Broad Street Scheme will only reduce capacity to levels similar to the end scheme (i.e., with two lanes reduced to one, and the traffic signals removed) and is therefore not been assessed in detail.

3.5.9 The total core TUBA PVB for the Full Package is £44,807,000.

The total core TUBA PVB for the MATS Broad Street Scheme is £16,590,000.

Accident Benefits

3.5.10 Separate COBALT assessments have been undertaken for the MATS Broad Street Scheme and the Full Package. Tables 3.10 and 3.11 summarise the results of the Full Package COBALT assessment and MATS Broad Street Scheme. All benefits have been discounted to 2010 and are reported in multiples of a thousand pounds.

Table 3.10: Full Package COBALT Results

Scenario	Full Package COBALT Accident Benefits (£'000s)		
	Links	Junctions	Total
Low Growth	217.4	4,950.6	5,168.0
Core Growth	125.5	5,559.5	5,685.0
High Growth	97.0	5,766.6	5,863.6

Table 3.11: Broad Street COBALT Results

Scenario	MATS Broad Street Scheme COBALT Accident Benefits (£'000s)		
	Links	Junctions	Total
Low Growth	-52.4	4,835.4	4,783.0
Core Growth	-75.6	4,748.1	4,672.5
High Growth	-77.5	4,835.4	4,757.9

3.5.11 The total combined TUBA and COBALT PVB for the Full Package is £50,492,000.

The total combined TUBA and COBALT PVB for the MATS Broad Street Scheme is £21,263,00.

Air Quality and Noise Benefits

- 3.5.12 Changes in air quality and noise have been quantitatively and monetarily assessed, with and without scheme for the MATS Broad Street Scheme and the Full Package. Air quality and noise impact assessments have been undertaken as part of the latest design phase and the results of which have been outlined within the Air Quality Valuation and Noise Workbooks (See Appendix F). Modelled 24-hour Annual Average Daily Traffic (AADT) and 18-hour Annual Average Weekday Traffic (AAWT) total vehicular flows, HGV percentages, and speed data have been extracted from SATURN and used as input for these assessments.
- 3.5.13 Baseline noise surveys were undertaken in line with the Calculation of Road Traffic Noise (CRTN) using the 1988 Shortened Measurement method. All surveys have been carried out by suitably qualified acousticians.
- 3.5.14 Road traffic noise calculations have been carried out in accordance with the methodology set out in the DfT's Memorandum 'Calculation of Road Traffic Noise' using SoundPLAN noise modelling software.
- 3.5.15 Existing receptor locations have been considered and used to establish the change in the daytime LA10, 16h noise levels. As per TAG Unit A3, the results have been converted to LAeq 16h (07:00 to 23:00 hours) to avoid overlap with the Lnight period (23:00 to 07:00).
- 3.5.16 Predictions were generated for the following scenarios:
- Short-term Assessment – Do Minimum scenario vs the Do Something scenario in the opening year (2026)
 - Long-term Assessment (without scheme) – Do Minimum scenario in the opening year against the Do Minimum scenario in the future year (opening + 15 years). The latest available modelled year is 2031.
 - Long-term Assessment (with Scheme) – Do Minimum scenario in the opening year vs the Do Something scenario in the future year (opening + 15 years). The latest available modelled year is 2031.
- 3.5.17 The impact magnitude scales for road traffic noise have been determined based on the guidance within the DMRB LA 111 (Rev 2) and mitigation options will be presented, if required.

3.5.18 The total noise benefits in 2010 values and prices for the Full Package are £3,220,240 over a 60-year appraisal period, and combines the following benefits:

- Sleep disturbance – £1,382,693
- Amenity – £1,238,898
- Acute Myocardial Infarction (AMI) – £288,260
- Stroke – £123,665
- Dementia – £186,724.

The total noise benefits in 2010 values and prices for the MATS Broad Street Scheme are £863,212 over a 60-year appraisal period, and combines the following benefits:

- Sleep disturbance – £394,468
- Amenity – £320,831
- Acute Myocardial Infarction (AMI) – £80,009
- Stroke – £27,069
- Dementia – £40,835.

It was estimated that the MATS Broad Street Scheme would result in an increase in households experiencing daytime noise of 59 and a reduction in households of 197.

Noise benefits for the MATS Broad Street Scheme are relatively high due to the town centre location, and the smoothing of traffic flow (resulting from the replacement of traffic signals with a roundabout) along a route with a high number of receptors. There is also some trip diversion as part of the full scheme as additional capacity is created on the A141 corridor (where there are fewer receptors) and trips from the Broad Street route re-route to the A141 to the west.

3.5.19 It was estimated that the MATS Broad Street Scheme would result in an increase in households experiencing daytime noise of 63 and a reduction in households of 480.

3.5.20 The scope of the operational Air Quality assessment includes the following:

- Liaise with the local planning authority to define and agree a scope of works
- Carry out a review of existing local, regional, national, and international policies and guidelines regarding the protection of air quality and identify any potential impacts from neighbouring facilities and sensitive receptors with the potential to be affected by the proposed development
- Review existing baseline conditions utilising existing local authority monitoring data and DEFRA's background mapping concentrations
- Undertake a detailed dispersion modelling using ADMS-Roads to determine the change in pollutant concentrations as a result of the operation of the scheme at existing sensitive receptor locations.

3.5.21 The following scenarios have been assessed:

- Baseline / Model verification
- Do Minimum (2026) – opening year of the scheme without development
- Do Something (2026) – opening year of the scheme with development.

3.5.22 The methodology outlined within TAG Unit A3 Section 3 has been followed and the TAG Local Air Quality (LAQ) and Air Quality Valuation Workbooks utilised.

3.5.23 The study area used for the assessment has been calculated using DMRB LA105 Guidance.

The total air quality benefits in 2010 values and prices for the MATS Broad Street Scheme are £164,745 over a 60-year appraisal period. It was estimated that the scheme would result in a reduction in NO_x emissions of 15 tonnes and PM2.5 emissions of 3 tonnes over a 60-year period.

3.5.24 The total air quality benefits in 2010 values and prices for the Full Package are £321,746 over a 60-year appraisal period. It was estimated that the scheme would result in a reduction in NO_x emissions of 12 tonnes and PM2.5 emissions of 8 tonnes over a 60-year period. This is likely due to an overall reduction in congestion despite the schemes collectively drawing more traffic onto the network.

3.5.25 The total combined TUBA, COBALT, noise, and air quality PVB for the Full Package is £54,034,000.

The total combined TUBA, COBALT, noise, and air quality PVB for the MATS Broad Street Scheme is £22,290,000.

Benefit Cost Ratio

3.5.26 The Benefit Cost Ratio (BCR) is the ratio of PVB to PVC. Tables 3.12 and 3.13 below summarise the Core and Adjusted BCRs for the MATS Broad Street Scheme and the Full Package.

Table 3.12: Analysis of Monetised Costs and Benefits (Core – MATS Broad Street Scheme)

Value (£'000s) 2010 prices, benefits discounted to 2010	
Benefits	
Greenhouse Gases	353
Consumer Users (Commuting)	3,591
Consumer Users (Other)	8,253
Business Users / Providers	4,757
Indirect Taxes	-364
Total Impact of Construction	0
Noise	863
Air Quality	165
Accidents	4,673
Journey Reliability (Adjusted only)	1,397
Present Value of Benefits (PVB)	22,290
Adjusted PVB	23,688
Costs	
Broad Transport Budget	2,413
Present Value of Costs (PVC)	2,413
Net Benefit / BCR Impact	
Net Present Value (NPV)	19,877
Benefit Cost Ratio (BCR)	9.24
Adjusted NPV	21,275
Adjusted BCR	9.82

Transport user, accident, noise, and air quality benefits combined for the MATS Broad Street Scheme will provide an NPV of £19,877,000 and a BCR of 9.82, which equates to Very High Value for Money.

Table 3.13: Analysis of Monetised Costs and Benefits (Core – Full Package)

Value (£'000s) 2010 prices, benefits discounted to 2010	
Benefits	
Greenhouse Gases	1,193
Consumer Users (Commuting)	12,184
Consumer Users (Other)	19,059
Business Users / Providers	13,747
Indirect Taxes	-1,207
Total Impact of Construction	-169
Noise	3,220
Air Quality	322
Accidents	5,685
Journey Reliability (Adjusted only)	4,490
Present Value of Benefits (PVB)	54,034
Adjusted PVB	58,524
Costs	
Broad Transport Budget	24,160
Present Value of Costs (PVC)	24,160
Net Benefit / BCR Impact	
Net Present Value (NPV)	29,874
Benefit Cost Ratio (BCR)	2.24
Adjusted NPV	34,364
Adjusted BCR	2.42

3.5.27 Transport user, accident, noise, and air quality benefits for the Full Package will provide an NPV of £29,874,000 and a BCR of 2.24, which equates to High Value for Money.

TUBA Benefits Breakdown

3.5.28 As well as providing a BCR, TUBA also provides data on where the benefits of the package of schemes 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. Tables 3.14 and 3.15 show the time benefits saving by vehicle for the MATS Broad Street Scheme and the Full Package, respectively.

Table 3.14: Non-Monetised Time Benefits by Time Saving (MATS Broad Street Scheme)

Non-Monetised Time Benefits by Time Saving					
Time Benefits ('000s of Person Hours) by Size of Time Saving					
< -5 mins	-5 to -2 mins	-2 to 0 mins	0 to 2 mins	2 to 5 mins	> 5 mins
-5	-9	-414	5,621	416	1

The table shows that the majority of journey time savings relating to the MATS Broad Street Scheme are between 0 to 2 minutes, followed by 2 to 5 minutes.

Table 3.15: Non-Monetised Time Benefits by Time Saving (Full Package)

Non-Monetised Time Benefits by Time Saving					
Time Benefits ('000s of Person Hours) by Size of Time Saving					
< -5 mins	-5 to -2 mins	-2 to 0 mins	0 to 2 mins	2 to 5 mins	> 5 mins
0	0	-2,852	8,442	8,202	724

3.5.29 The table shows that the majority of journey time savings are between 0 to 2 and 2 to 5 minutes, followed by 5 minutes or greater.

3.5.30 Tables 3.16 and 3.17 show the time benefits by distance for the MATS Broad Street Scheme and the Full Package, respectively.

Table 3.16: Non-Monetised Time Benefits by Distance (MATS Broad Street Scheme)

Non-Monetised Time Benefits by Distance					
Time Benefits ('000s of Person Hours) by Distance					
Vehicle Type	Purpose	< 1 kms	1 to 5 kms	5 to 10 kms	10 to 25 kms
Car	Business	4	85	93	1
Car	Commuting	24	340	430	3
Car	Other	129	2,629	1,205	3
LGV	Business	6	249	337	4
HGV	Business	-14	11	70	1

Table 3.17: Non-Monetised Time Benefits by Distance (Full Package)

Non-Monetised Time Benefits by Distance					
Time Benefits ('000s of Person Hours) by Distance					
Vehicle Type	Purpose	< 1 kms	1 to 5 kms	5 to 10 kms	10 to 25 kms
Car	Business	6	182	249	-2
Car	Commuting	32	1,038	1,697	18
Car	Other	174	5,115	4,113	25
LGV	Business	7	504	954	15
HGV	Business	0	9	372	6

- 3.5.31 The tables show that those making localised trips (5-10km) benefit most from the proposed package of schemes, although those making slightly shorter trips (1-5km) also benefit significantly from the schemes. As with the time savings, car users experience the greatest benefits, mostly those who commute or travel for other purposes.

3.5.32 Tables 3.18 and 3.19 show that the benefits of the schemes are greatest in the PM peak, but all peaks have significant benefits.

Table 3.18: User Benefits by Time Period (MATS Broad Street Scheme)

MATS Broad Street Scheme	
Period	User Time Benefits (£'000s)
AM Peak	3,082
PM Peak	7,671
Inter Peak	4,465

Table 3.19: User Benefits by Time Period (Full Package)

Full Package	
Period	User Time Benefits (£'000s)
AM Peak	16,114
PM Peak	20,344
Inter Peak	4,617

3.6 Sensitivity Testing

- 3.6.1 Sensitivity testing has been undertaken to determine whether the proposed schemes could still achieve value for money under different uncertainty scenarios.
- 3.6.2 The TAG Low Growth and Common Analytical Scenarios (CAS) Behavioural Change scenarios are considered to represent possible post COVID-19 and Brexit growth, although not enough is yet known about how transport will be affected in the long term. This testing has been undertaken by using figures from TEMPro 8.0 and the method outlined in TAG Unit M4 to create both 'low' and 'high' growth scenarios.
- 3.6.3 As stated in the TAG Uncertainty Toolkit, the CAS Behavioural Change scenario specifically considers a world in which people embrace alternative ways of working, shopping and travelling, including remote and flexible working and online shopping. The trends observed in the 2010s have been accelerated by the COVID-19 pandemic and extrapolated until 2040. The result of this is significantly lower (or negative) traffic growth over much of the forecast period.
- 3.6.4 The trip matrix totals are shown in Figures 3.5 to 3.7.

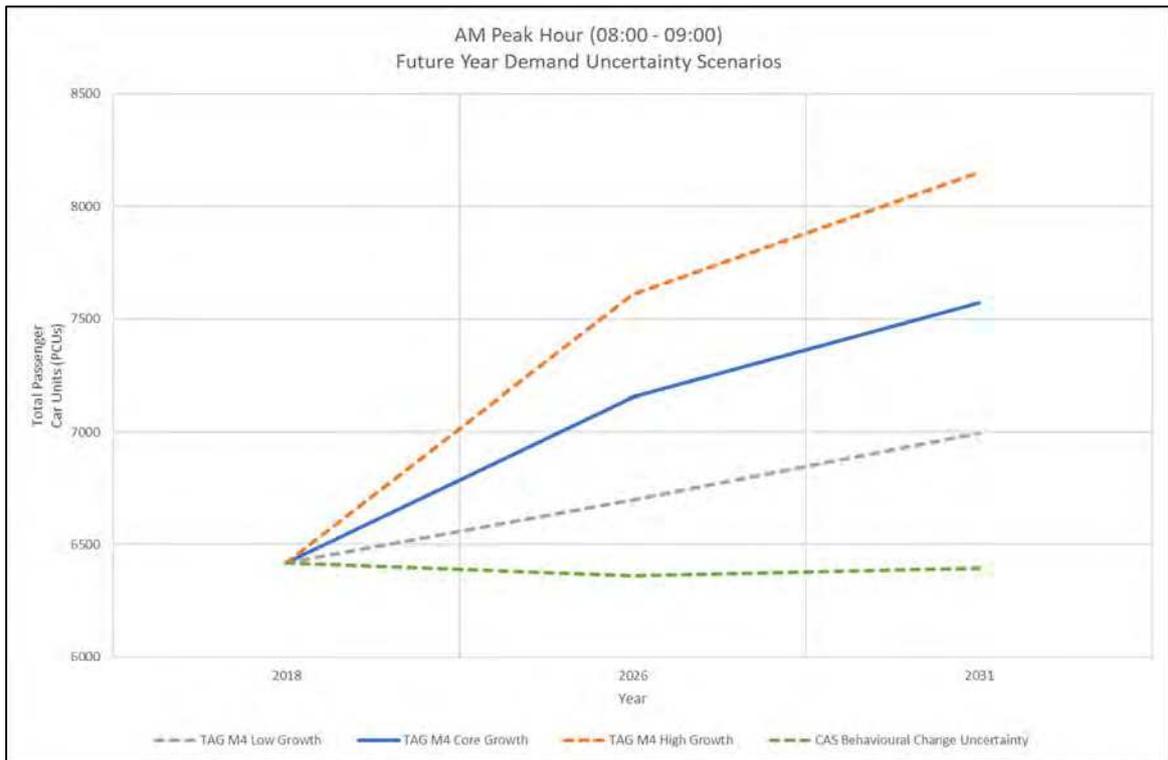


Figure 3.5: AM Peak Hour – Total Number of Trips in Model

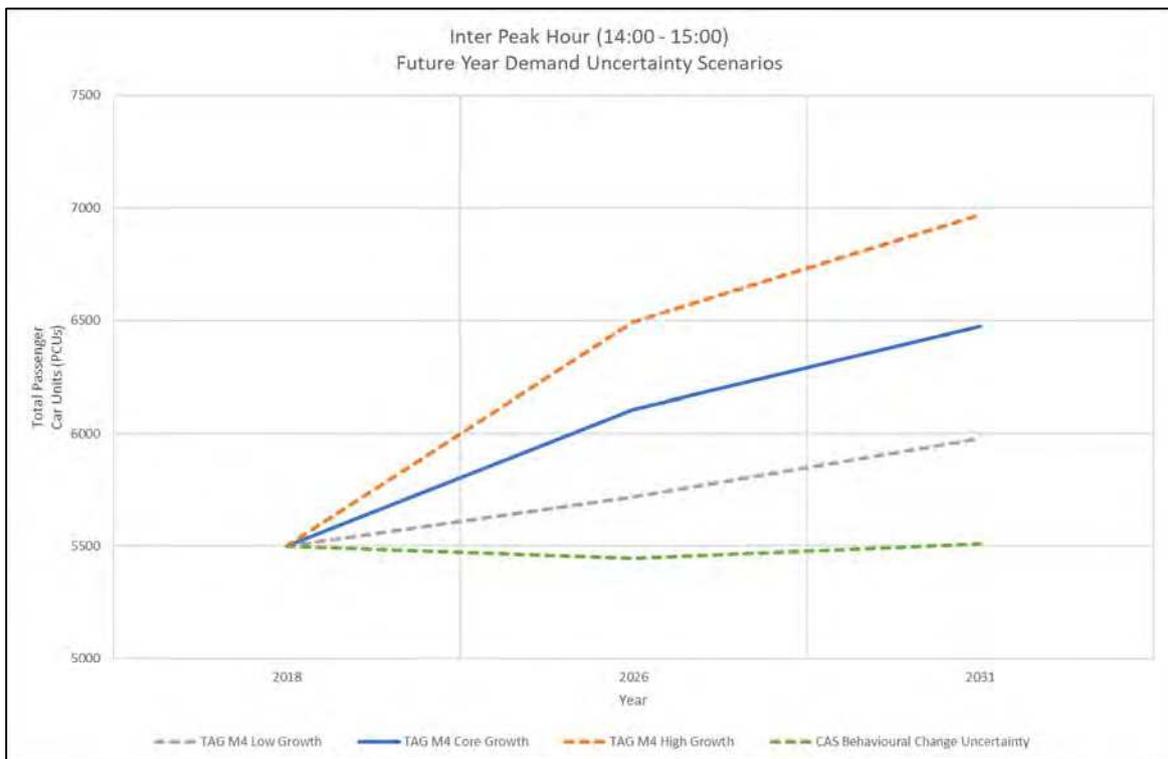


Figure 3.6: Inter Peak Hour – Total Number of Trips in Model

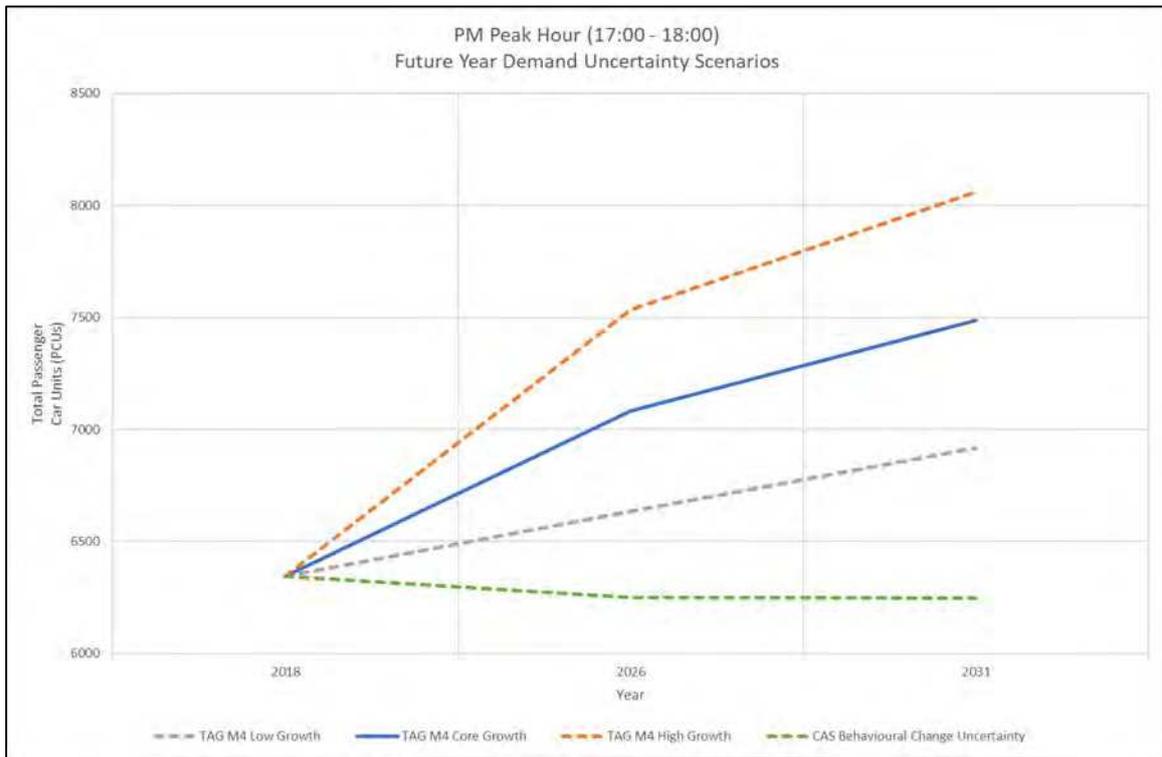


Figure 3.7: PM Peak Hour – Total Number of Trips in Model

- 3.6.5 Once the behavioural change, low and high growth scenarios had been run and assessed within the modelling, the Economic Assessment was repeated to determine whether the MATS Broad Street Scheme and the Full Package would still operate well and offer value for money if lower or higher than anticipated traffic growth occurred.
- 3.6.6 A summary of the economic results for each of the growth ranges used in the sensitivity test is presented in Tables 3.20 and 3.21 below, respectively.

Table 3.20: Benefit-Cost Ratio Under Different Growth Scenarios (MATS Broad Street Scheme)

Scenario	MATS Broad Street Scheme - Growth Sensitivity Tests			
	PVB (£'000s)	PVC (£'000s)	NPV (£'000s)	BCR
Behavioural Change Growth	7,343	2,413	4,930	3.04
Low Growth	15,621	2,413	13,208	6.47
Core Growth	22,290	2,413	19,877	9.24
High Growth	34,619	2,413	32,206	14.35

The results from the growth sensitivity tests show that the MATS Broad Street Scheme will offer at least High Value for Money in all growth scenarios, with BCRs ranging between 3.04 and 14.35.

Table 3.21: Benefit-Cost Ratio Under Different Growth Scenarios (Full Package)

Scenario	Full Package - Growth Sensitivity Tests			
	PVB (£'000s)	PVC (£'000s)	NPV (£'000s)	BCR
Behavioural Change Growth	10,694	24,160	-13,466	0.44
Low Growth	26,683	24,160	2,523	1.10
Core Growth	54,034	24,160	29,874	2.24
High Growth	89,940	24,160	65,780	3.72

- 3.6.7 The Full Package would offer Poor Value for Money in the Behavioural Change Scenario, Low Value for Money in the Low Growth Scenario, and at least High Value for Money in the Core and High Growth scenarios, with BCRs ranging between 0.44 and 3.72.
- 3.6.8 It is expected that the Behavioural Change Growth scenario would produce a particularly low BCR because the level of growth is significantly lower than the other scenarios, with negative growth in 2026, and there would therefore be significantly fewer trips experiencing the journey time savings produced by the Full Package.
- 3.6.9 Additional scheme benefit sensitivity tests have been undertaken on the Values of Time (VOT) used in TUBA for the core scenario. These scenarios consider VOT in the ranges of $\pm 25\%$ for Commuting and Business trips and $\pm 60\%$ for Other trips.
- 3.6.10 Tables 3.22 and 3.23 summarise the economic results for the Low VOT and High VOT tests for the MATS Broad Street Scheme and the Full Package.

Table 3.22: Benefit-Cost Ratio under Different VOT Scenarios (Full Package)

Scenario	Full Package - Growth Sensitivity Tests			
	PVB (£'000s)	PVC (£'000s)	NPV (£'000s)	BCR
Low VOT	33,959	24,160	9,799	1.41
Core VOT	54,034	24,160	29,874	2.24
High VOT	66,643	24,160	42,483	2.76

Table 3.23: Benefit-Cost Ratio under Different VOT Scenarios (MATS Broad Street Scheme)

Scenario	MATS Broad Street Scheme - Growth Sensitivity Tests			
	PVB (£'000s)	PVC (£'000s)	NPV (£'000s)	BCR
Low VOT	15,809	2,413	13,396	6.55
Core VOT	22,290	2,413	19,877	9.24
High VOT	28,771	2,413	26,358	11.92

The results from the VOT sensitivity tests show that the MATS Broad Street Scheme will offer at least Very High Value for Money in all VOT scenarios, with BCRs ranging between 6.55 and 11.92.

- 3.6.11 The Full Package would offer Low Value for Money in the Low VOT scenario and at least High Value for Money in the Core and High VOT scenarios, with BCRs ranging between 1.41 and 2.76.
- 3.6.12 Figures 3.8 and 3.9 summarise the core and sensitivity test BCRs calculated for the Full Package and the MATS Broad Street Scheme respectively.

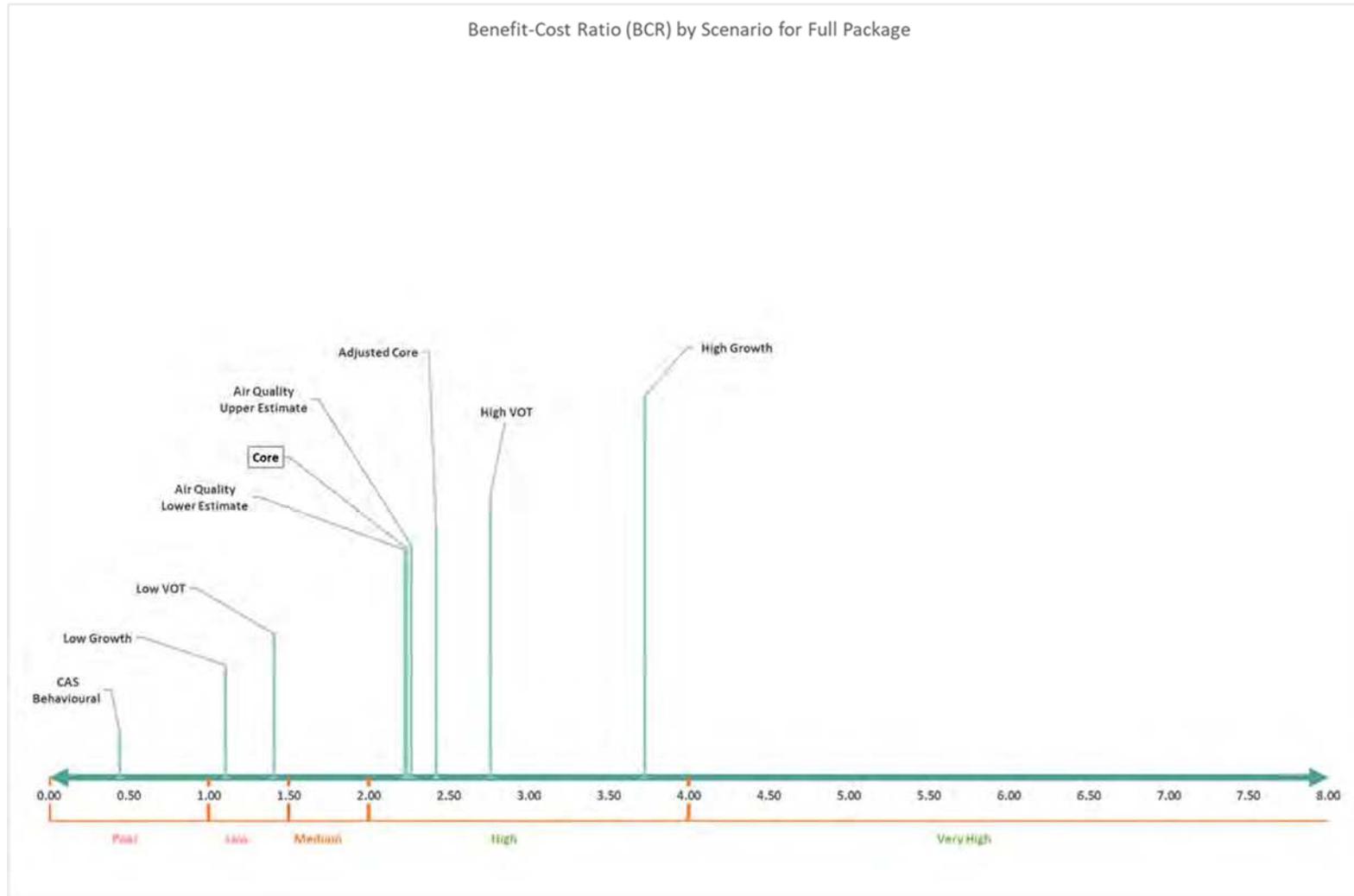


Figure 3.8: Core and Sensitivity Test BCRs – Full Package

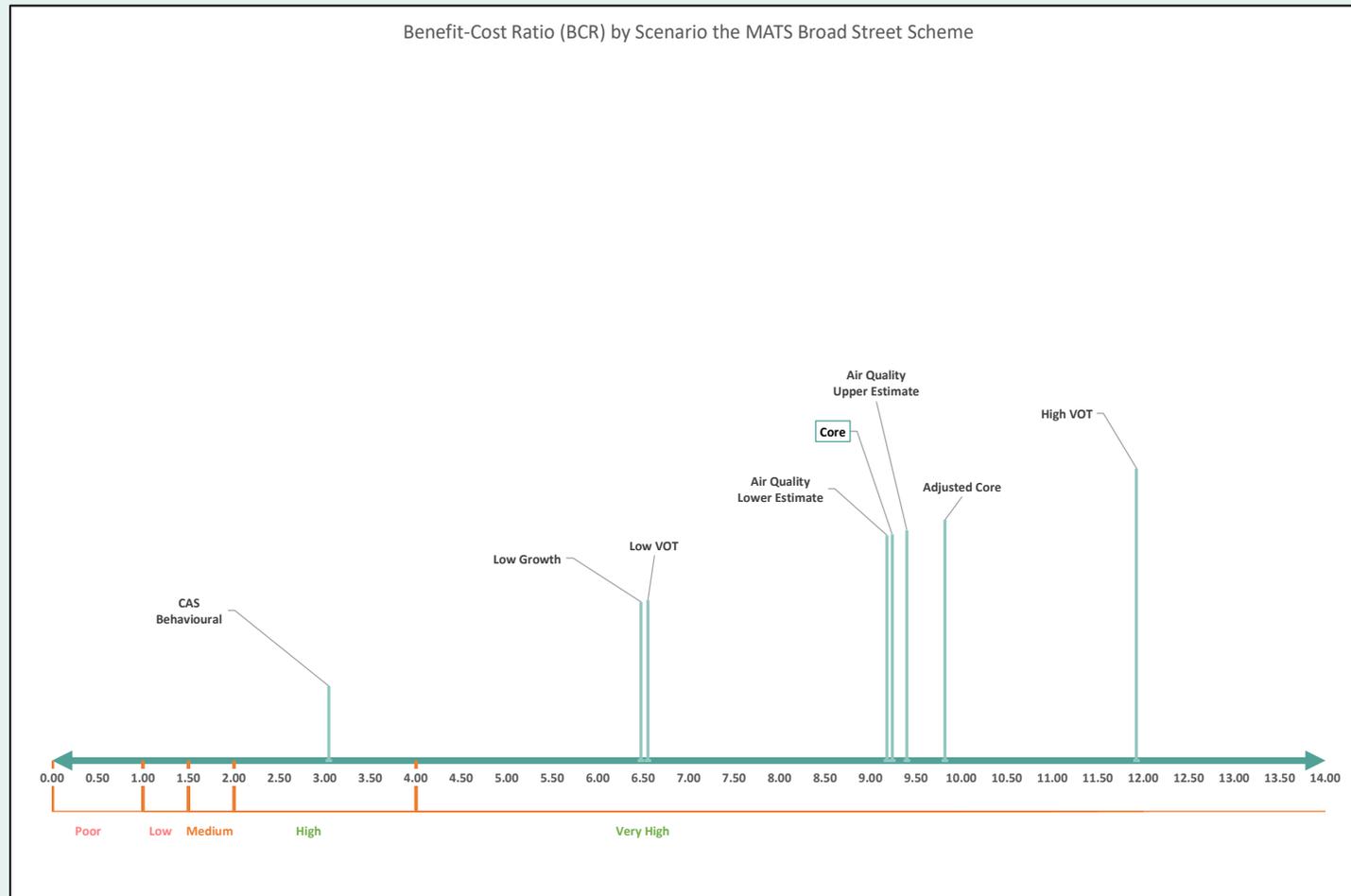


Figure 3.9: Core and Sensitivity Test BCRs – MATS Broad Street Scheme

- 3.6.13 A sensitivity test on the uncertainty around cost estimates has been undertaken for the MATS Broad Street Scheme and Full Package, using the method outlined in TAG Unit A1.2 Section 6. This approach considers P Values for different levels of Optimism Bias from the Reference Class Forecasting (RFC) values found in the latest TAG Optimism Bias Workbook. The RCF distribution can be used analyse the sensitivity of a project's VfM rating to cost overrun.
- 3.6.14 Table 3.24 summarises the cost changes required to reduce the Full Package BCR from 2.2 to over 4.0 (Very High Value for Money) and below 2.0 (Medium Value for Money).

Table 3.24: Cost Change Required to Reduce Full Package BCR to Lower Value for Money Categories

Item	Value	Units
Present Value of Cost (Exc. Optimism Bias)	20.1	£m
Present Value of Cost (Inc. Optimism Bias)	24.2	£m
Scheme Benefits	54.0	£m
Benefit to Cost Ratio	2.2	
Cost Change Needed for BCR of 4.0	-10.7	£m
Cost Change Needed for BCR of 2.0	2.9	£m
Total Cost Overrun Needed for BCR of 4.0 (%)	-33	%
Total Cost Overrun Needed for BCR of 2.0 (%)	34	%

- 3.6.15 Table 3.25 uses the calculated percentage cost overruns for each BCR rating from Table 3.26 to find the corresponding P Value on the RCF distribution curve.

Table 3.25: Associated P Values for Full Package

Cost Overrun Level	Expressed as a % of PVC (exc. OB)	Associated P Value
P-mean overrun	20%	54
Percentage overrun needed for Very High Value for Money	-33%	0
Percentage overrun needed for Medium Value for Money	34%	77

- 3.6.16 Table 3.25 shows that the Full Package has a 0% chance of costs being low enough to shift the scheme up to a BCR greater than 4.0 (Very High Value for Money). There is a 77% chance that costs will remain low enough that the VfM does not fall to Medium Value for Money.

Table 3.26 summarises the cost changes required to reduce the MATS Broad Street Scheme BCR from 6.2 to under 4.0 (High Value for Money) and 2.0 (Medium Value for Money).

Table 3.26: Cost Change Required to Reduce MATS Broad Street Scheme BCR to Lower Value for Money Categories

Item	Value	Units
Present Value of Cost (Exc. Optimism Bias)	2.0	£m
Present Value of Cost (Inc. Optimism Bias)	2.4	£m
Scheme Benefits	16.6	£m
Benefit to Cost Ratio	6.9	
Cost Change Needed for BCR of 4.0	1.7	£m
Cost Change Needed for BCR of 2.0	5.9	£m
Total Cost Overrun Needed for BCR of 4.0 (%)	106	%
Total Cost Overrun Needed for BCR of 2.0 (%)	313	%

Table 3.27 uses the calculated percentage cost overruns for each BCR rating to find the corresponding P Value on the RCF distribution curve.

Table 3.27: Associated P Values for MATS Broad Street Schemes

Cost Overrun Level	Expressed as a % of PVC (exc. OB)	Associated P Value
P-mean overrun	20%	54
Percentage overrun needed for High Value for Money	106%	100
Percentage overrun needed for Medium Value for Money	313%	100

Table 3.27 shows that the MATS Broad Street Scheme has a 100% chance that costs will remain low enough that the VfM does not fall to either Medium or High Value for Money.

3.7 Distributional Impacts

User Benefits

- 3.7.1 The distributional impacts of the MATS Broad Street Scheme and the Full Package have been considered to understand the variance of transport user benefits of non-business journeys across social groups using grading outlined in TAG Unit A4.2 Distributional Impact Appraisal.
- 3.7.2 The transport user benefits have been assessed against the Income Deprivation domain from the latest English Indices of Multiple Deprivation (IMD 2019), as shown in Tables 3.29 and 3.30 below.

Table 3.28: Distributional Impact Appraisal of Non-Business User Benefits (Full Package)

Census 2011 Lower Super Output Area (LSOA)	Full Package - User Benefits Distributional Analysis					Total
	IMD Income Domains £m					
	Most deprived areas ←			→ Least deprived areas		
	0-20%	20-40%	40-60%	60-80%	80-100%	
E01018077		1.74				1.74
E01018078	0.53					0.53
E01018079			0.87			0.87
E01018080			0.39			0.39
E01018081		7.88				7.88
E01018082			0.34			0.34
E01018083		1.37				1.37
E01018084			1.51			1.51
E01018085				1.38		1.38
E01018086		0.45				0.45
E01018087		2.71				2.71
E01018088			2.59			2.59
Total LSOA Benefits	0.53	14.15	5.70	1.38	0.00	21.76
Share of User Benefits	2%	65%	26%	6%	0%	100%
Share of Population	8%	41%	44%	8%	0%	100%
Assessment	✓	✓ ✓ ✓	✓	✓ ✓	Neutral	

Table 3.29: Distributional Impact Appraisal of Non-Business User Benefits (MATS Broad Street Scheme)

Census 2011 Lower Super Output Area (LSOA)	FBC 1 - User Benefits Distributional Analysis					Total
	IMD Income Domains £m					
	Most deprived areas ←			→ Least deprived areas		
	0-20%	20-40%	40-60%	60-80%	80-100%	
E01018077		1.29				1.29
E01018078	0.15					0.15
E01018079			0.14			0.14
E01018080			0.33			0.33
E01018081		1.29				1.29
E01018082			0.30			0.30
E01018083		0.88				0.88
E01018084			0.63			0.63
E01018085				0.39		0.39
E01018086		0.24				0.24
E01018087		1.18				1.18
E01018088			0.67			0.67
Total LSOA Benefits	0.15	4.88	2.07	0.39	0.00	7.48
Share of User Benefits	2%	65%	28%	5%	0%	100%
Share of Population	8%	41%	44%	8%	0%	100%
Assessment	✓	✓ ✓ ✓	✓	✓ ✓	Neutral	

3.7.3 The assessment shows that all IMD 2019 quintiles benefit from the intervention and there are no net disbenefits. The lowest two IMD quintiles (most deprived) would receive the greatest proportion of the transport user benefits and are therefore better off in relative terms.

Personal Affordability

- 3.7.4 The distributional impacts of the MATS Broad Street Scheme and the Full Package have been considered to understand the variance of the fuel and non-fuel vehicle operating cost benefits of non-business journeys across social groups using grading outlined in TAG Unit A4.2 Distributional Impact Appraisal.
- 3.7.5 The distribution of fuel and non-fuel vehicle operating cost benefits have also been assessed against the Income Deprivation domain, as shown in Tables 3.30 and 3.31 below.

Table 3.30: Distributional Impact Appraisal of Non-Business Fuel and Non-Fuel Vehicle Operating Cost Benefits (Full Package)

Census 2011 Lower Super Output Area (LSOA)	Full Package - Fuel and Non-Fuel Vehicle Operating Costs Distributional Analysis					Total
	IMD Income Domains £m					
	Most deprived areas ←			→ Least deprived areas		
	0-20%	20-40%	40-60%	60-80%	80-100%	
E01018077		0.00				0.00
E01018078	0.02					0.02
E01018079			0.03			0.03
E01018080			0.01			0.01
E01018081		0.68				0.68
E01018082			0.01			0.01
E01018083		0.16				0.16
E01018084			0.00			0.00
E01018085				0.06		0.06
E01018086		0.02				0.02
E01018087		0.11				0.11
E01018088			0.09			0.09
Total LSOA Benefits	0.02	0.99	0.15	0.06	0.00	1.21
Share of User Benefits	1%	81%	12%	5%	0%	100%
Share of Population	8%	41%	44%	8%	0%	100%
Assessment	✓	✓ ✓ ✓	✓	✓ ✓	Neutral	

Table 3.31: Distributional Impact Appraisal of Non-Business Fuel and Non-Fuel Vehicle Operating Cost Benefits (MATS Broad Street Scheme)

Census 2011 Lower Super Output Area (LSOA)	FBC 1 - Fuel and Non-Fuel Vehicle Operating Costs Distributional Analysis					Total
	IMD Income Domains £m					
	Most deprived areas ←			→ Least deprived areas		
	0-20%	20-40%	40-60%	60-80%	80-100%	
E01018077		0.06				0.06
E01018078	0.00					0.00
E01018079			0.02			0.02
E01018080			0.01			0.01
E01018081		0.10				0.10
E01018082			0.01			0.01
E01018083		0.12				0.12
E01018084			0.02			0.02
E01018085				0.03		0.03
E01018086		0.02				0.02
E01018087		0.06				0.06
E01018088			0.03			0.03
Total LSOA Benefits	0.00	0.35	0.09	0.03	0.00	0.48
Share of User Benefits	1%	74%	20%	6%	0%	100%
Share of Population	8%	41%	44%	8%	0%	100%
Assessment	✓	✓ ✓ ✓	✓	✓ ✓	Neutral	

- 3.7.6 The assessment shows that all IMD 2019 quintiles benefit from the intervention and there are no net disbenefits. The lowest two IMD quintiles (most deprived) would receive the greatest proportion of the fuel and non-fuel vehicle operating cost benefits and are therefore better off in relative terms.

3.8 Qualitative Appraisal

- 3.8.1 Thus far, appraisal of the schemes and VfM assessment has focused primarily on the likely transport user, accident, noise, and air quality economic benefits for the MATS Broad Street Scheme and the Full Package. No adjustments have been made to the initial BCR value. However, it is anticipated that there will be a number of additional social, distributional, and environmental benefits resulting from the proposed schemes. Consequently, the current core scenario PVB is considered to provide a conservative estimate of the overall level of benefit likely to result from the proposed schemes.
- 3.8.2 As such, a qualitative appraisal of the likely key additional benefits and impacts of the MATS Improvement Schemes has been undertaken. The qualitative point scales as outlined in TAG Unit A3 have been used to provide an overall assessment score for each impact, with TAG appraisal worksheets used where appropriate.
- 3.8.3 The results from this appraisal are detailed below and summarised in the Appraisal Summary Table (AST) contained within Appendix E.

Economy – Wider Impacts

- 3.8.4 It is anticipated that the MATS Improvement Schemes will deliver wider economic benefits, by facilitating the regeneration of March Town Centre and enabling housing and employment growth, including at the sites identified in the Fenland Local Plan. The schemes will also benefit business users and transport providers, through reduced congestion, reduced journey times, and improved journey time reliability.

Economy – Regeneration

- 3.8.5 The other MATS Improvement Schemes (Full Package) will support regeneration and growth, through reducing thorough traffic and existing congestion in the town centre, increasing the capacity of the transport network, improving traffic flow, and journey time reliability.

The package of MATS Improvement Schemes are anticipated to facilitate significant regeneration benefits in March Town Centre. The MATS Broad Street Scheme will reduce traffic congestion, traffic dominance and severance created by the current highway layout and facilitate the delivery of the FHSF public realm improvements scheme. This is likely to attract an increase in footfall and visitor dwell times in March Town Centre, stimulating an increase in economic activity and further investment.

Environment – Landscape

- 3.8.6 Landscape relates to both the physical and cultural characteristics of the land itself and the way in which those characteristics are perceived. The mix of characteristics and perceptions that contribute to landscape character give the study area a 'sense of place'.
- 3.8.7 The following landscape features have been assessed for each scheme location:
- Pattern – the relationship between topography and form, elevation and the degree of enclosure and scale.
 - Tranquillity – the remoteness and sense of isolation within the landscape. This can be affected or determined by noise levels and visual amenity.
 - Cultural – how landscape elements of an historic or traditional nature contribute to landscape character.
 - Landcover – the way in which the land is farmed or managed and how this contributes to the character of the landscape. The presence of semi-natural habitats and their associated landscape elements, as well as the structural diversity provided by trees and woods, are also considered.
 - Summary of Character – a summary of the relationship between each primary landscape features, with more general observations on the texture and diversity of the landscape, its scenic qualities, degree of development and visual unit or disharmony.
- 3.8.8 Each landscape feature has been assessed based on:
- The geographic sale at which features matter to policy makers and local stakeholders.
 - The rarity of landscape features within the locality. This can directly relate to importance.
 - The importance of each feature and at what level geographically.
 - Whether landscape features and their elements are replaceable within a given time frame, e.g., 100 years.
- 3.8.9 The impact of each scheme on the landscape has been determined based on the assessment, with a score provided using a seven-point scale ranging from 'Very Large Adverse (Negative) Effect' to 'Large Beneficial (Positive) Effect' as recommended in TAG Unit A3.
- 3.8.10 Full results have been summarised in the TAG Landscape Worksheet for each scheme, which can be found in Appendix F.
- 3.8.11 Table 3.32 overleaf summarises the landscape assessment scores for each scheme.

Table 3.32: Landscape Impact Assessment

Scheme	Summary Assessment Score	Qualitative Comments
Creation of a signalised junction at A141 / Twenty Foot Road	Neutral	The proposed scheme has a negligible effect on the landscape and can be accommodated well in this location.
Improvements to the A141 / Peas Hill Roundabout (52m ICD) and all-movement signalised junction at A141 / Hostmoor Avenue	Neutral	The proposed scheme has a negligible effect on the landscape and can be accommodated well in this location.
High Street / St. Peter's Road Traffic Signal Improvements	Neutral	Not Assessed
Improvements to Broad Street / Dartford Road / Station Road, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction. (MATS Broad Street Scheme)	Neutral	Not Assessed
Development of a Northern Industrial Link Road (NILR)		To be assessed at FBC 3.

Environment – Townscape

3.8.12 Townscape is the physical and social characteristics of the built and non-built urban environment and how those characteristics are perceived. The mix of characteristics and perceptions that contribute to townscape character give the study area a 'sense of place' or identity. Physical characteristics relate to the development form of buildings, structures, and spaces. Social characteristics relate to the how the physical characteristics are used and managed.

3.8.13 The following townscape features have been assessed for each relevant scheme location:

- **Layout** – the way that buildings, routes, and open spaces are placed in relation to each other.
- **Density and Mix** – the amount of floorspace of buildings relative to an area and range of uses.
- **Scale** – the size of building and structures in relation to their surroundings.
- **Appearance** – the local distinctiveness of buildings and structures within a townscape, which can be influenced by their detail and materials.
- **Human Interaction** – the way people (not vehicles) interact with the urban environment.
- **Cultural** – how townscape elements of a traditional or historic nature contribute to character.
- **Summary of Character** – a summary of the relationship between the primary townscape characteristics and features. More general observations on the texture and diversity of the townscape, its scenic qualities, type and degree of development and visual unity or disharmony are made here.

3.8.14 Each townscape feature has been assessed based on:

- The geographic sale at which features matter to policy makers and local stakeholders.
- The rarity of townscape features within the locality. This can directly relate to importance.
- The importance of each feature and at what level geographically.
- Whether townscape features and their elements are replaceable within a given time frame.
- Changes in the 'Without Scheme' case. This relates to changes that would happen irrespective of the scheme.

3.8.15 The impact of each scheme on the townscape has been determined based on the assessment, with a score provided using a seven-point scale ranging from 'Very Large Adverse (Negative) Effect' to 'Large Beneficial (Positive) Effect' as recommended in TAG Unit A3.

3.8.16 Full results have been summarised in the TAG Townscape Worksheet for each scheme, which can be found in Appendix F.

3.8.17 Full results have been summarised in the TAG Townscape Worksheet for each scheme, which can be found in Appendix F.

3.8.18 Table 3.33 below summarises the townscape assessment scores for each scheme.

Table 3.33: Townscape Impact Assessment

Scheme	Summary Assessment Score	Qualitative Comments
Creation of a signalised junction at A141 / Twenty Foot Road	Neutral	Not assessed
Improvements to the A141 / Peas Hill Roundabout (52m ICD) and all-movement signalised junction at A141 / Hostmoor Avenue	Neutral	Not assessed
High Street / St. Peter's Road Traffic Signal Improvements	Neutral	The scheme involves very small-scale interventions that are unlikely to have a noticeable effect on townscape.
Improvements to Broad Street / Dartford Road / Station Road, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction. (MATS Broad Street Scheme)	Large Beneficial	The scheme design will significantly improve the appearance and amenity of Broad Street and setting of distinct historic features, by increasing the public realm areas for users, removing the central parking areas and substantially reducing the dominance of traffic and improving safety. The scheme will result in the loss of some trees and the demolition of the 1920's toilet block that will result in a permanent change in layout and views. It is considered that this loss will be offset by the positive impact on connectivity – opening up views and improving visual links to the river frontage. The scheme reverses what had become a car-dominant environment, into a truly 'Broad Street' for pedestrians to enjoy within a unique setting.
Development of a Northern Industrial Link Road (NILR)		To be assessed at FBC 3.

The MATS Broad Street Scheme will have a Large Beneficial Impact on the Townscape of March through significant improvements to the appearance and amenity of Broad Street and setting of distinct historic features. This will be achieved by increasing the amount of public realm, removing central parking areas on Broad Street, and improving non-motorised user safety. The town centre will no longer be a car-dominant environment.

Environment – Historic Environment

3.8.19 The historic environment relates to buildings, areas, and sites of architectural or historic significance, which contribute to the character of the study area and its 'sense of place' or identity.

3.8.20 The following historic environment features have been assessed for each scheme location:

- **Form** – the physical form of the site, buildings, historic land / townscapes or other heritage assets.
- **Survival** – the state of completeness of each heritage asset.
- **Condition** – the appearance and present management of the historic environmental resource and the likely rate of change from the existing condition.
- **Complexity** – the diversity of elements and their relationships within a part of the historic environmental resource and the wider complexity of its relationships beyond the immediate limits.
- **Context** – the immediate setting of a site, building or area, and its intelligibility within its surroundings. The quality and detail of the immediate visual context and the value of any associations within that context with other elements are considered here.
- **Period** – a representation of the date of origin and duration of use of the historic environmental resource, e.g., Medieval (AD1066 – AD1540).

3.8.21 Each historic environment feature has been assessed based on:

- The geographic sale at which features matter to policy makers and local stakeholders.
- The significance relating to the value of a heritage asset to current and future generations.
- The rarity of historic environment features within the locality.

3.8.22 The impact of each scheme on the historic environment has been determined based on the assessment, with a score provided using a seven-point scale ranging from 'Very Large Adverse (Negative) Effect' to 'Large Beneficial (Positive) Effect' as recommended in TAG Unit A3.

- 3.8.23 Full results have been summarised in the TAG Historic Environment Worksheet for each scheme, which can be found in Appendix F.
- 3.8.24 Table 3.34 overleaf summarises the townscape assessment scores for each scheme.

Table 3.34: Historic Environment Impact Assessment

Scheme	Summary Assessment Score	Qualitative Comments
Creation of a signalised junction at A141 / Twenty Foot Road	Neutral	As the Scheme will predominantly entail widening and alterations to the existing road, it is expected that impacts will largely be to the historic landscape character. No substantial adverse settings impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for yet unknown archaeology.
Improvements to the A141 / Peas Hill Roundabout (52m ICD) and all-movement signalised junction at A141 / Hostmoor Avenue	Slight Adverse (Negative) Effect	As the Scheme will predominantly entail widening and alterations to the existing road, it is expected that impacts will largely be made to the ground. No substantial adverse settings impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for yet unknown archaeology.
High Street / St. Peter's Road Traffic Signal Improvements	Neutral	As the scheme will predominantly entail alterations to the existing road, it is expected that impacts will largely be absent. No substantial adverse setting impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for yet unknown archaeology.
Improvements to Broad Street / Dartford Road / Station Road, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction. (MATS Broad Street Scheme)	Neutral	Providing that appropriate management and mitigation measures are taken, no substantial adverse setting impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for yet unknown archaeology. It is expected there will be significant benefits relating to better access and user experience associated with relocating the Coronation Fountain.
Development of a Northern Industrial Link Road (NILR)	Neutral	Overall, an assessment of moderate to high potential for archaeology is made. Any finds are likely to be pre-Roman cut features and / or scattered artefacts or post-medieval evidence related to the former use of the area as a marshalling yard for the railway. No impact is expected to any of the listed buildings or non-designated assets as a result of the scheme.

The MATS Broad Street Scheme will have a Neutral Effect on March's historic environment unless appropriate management and mitigation measures are taken. Any damage to the Coronation fountain canopy could amount to substantial adverse effects but the relocated fountain would provide significant benefits relating to improved access and user experience. There is also potential for yet unknown archaeology.

Environment – Biodiversity

3.8.25 The following biodiversity features and mitigation plans have been assessed for each scheme location:

- **Area** – all key biodiversity and earth heritage environmental resources affected, or potentially affected. This should include both designated and non-designated sites and protected species.
- **Feature** – each feature of an environmental resource. A key environmental resource may have more than one feature that requires assessment.

3.8.26 Each biodiversity feature has been assessed based on:

- The geographic scale at which features matter to policy makers and local stakeholders.
- The importance of each feature based on rarity, representativeness, distinctiveness, quality, or designation status.
- The abundance of each feature relative to its target level and trend, where known.
- Whether biodiversity features and their elements are replaceable within a given time frame. Irreplaceable natural features are often considered more significant than one that is replaceable.
- The biodiversity and earth heritage value of features, which is determined based on the previous four indicators and criteria outlined in TAG Unit A3.

3.8.27 The magnitude of impact has then been considered based on the impact of the scheme on the significance of the identified features. Impacts may be direct or indirect, individual or cumulative, temporary or permanent, geographically dispersed, and may be harmful or beneficial. The criteria for determining the magnitude of the impact are outlined in TAG Unit A3 and is based on a five-point scale ranging from 'major negative' to 'positive'.

3.8.28 The appraisal of biodiversity and earth heritage value and the magnitude of impacts are combined to provide an overall assessment score, which determines the consequence of those impacts. The overall assessment score is based on a seven-point scale, ranging from 'Very Large Adverse (Negative) Effect' to 'Large Beneficial (Positive) Effect' as recommended in TAG Unit A3.

3.8.29 Full results have been summarised in the TAG Biodiversity Worksheet for each scheme, which can be found in Appendix F.

3.8.30 Table 3.35 overleaf summarises the biodiversity assessment scores for each scheme.

Table 3.35: Biodiversity Impact Assessment

Scheme	Summary Assessment Score	Qualitative Comments
Creation of a signalised junction at A141 / Twenty Foot Road	Slight Adverse (Negative) Effect	The score is based on there being no mitigation in place for any of the areas or species identified. The impacts on Nene Washes SAC/SPA/Ramsar will be determined following the outcome of the HRA. Slight adverse impacts are anticipated to coastal and floodplain grazing marsh, bats, breeding and wintering birds, otter, reptiles, amphibians, water vole, other priority mammals, Twenty Foot River, Ring's End LNR and Nene Washes SSSI. It is thought that with mitigation as outlined within the preliminary ecological appraisal, such as the implementation of a precautionary method of working and additional bat surveys, impacts on ecological receptors will be minimised.
Improvements to the A141 / Peas Hill Roundabout (60m ICD) and Roundabout at Hostmoor Avenue Roundabout	Slight Adverse (Negative) Effect	Slight adverse impact on broadleaved woodland, watercourses (ditches), ponds, badgers, bats, otters, water voles, priority mammals, breeding and wintering birds, reptiles, and amphibians.
High Street / St. Peter's Road Traffic Signal Improvements	Neutral	The score is based on there being no mitigation in place for any of the areas or species identified in the worksheet. This is because works are confined to the existing hardstanding road carriageway, with no vegetation clearance or disturbance to adjacent habitats anticipated.
Improvements to Broad Street / Dartford Road / Station Road, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction. (MATS Broad Street Scheme)	Slight Adverse (Negative) Effect	The score is based on there being no mitigation in place for any of the areas or species identified in the worksheet. Slight adverse impacts are anticipated to deciduous woodland, the River Nene (Old Course), bats, nesting birds, otters, and water voles. It is thought that with mitigation as outlined within the preliminary ecological appraisal, impacts on ecological receptors will be minimised.
Development of a Northern Industrial Link Road (NILR)		To be assessed at FBC 2

The MATS Broad Street Scheme will have a Slight Adverse (Negative) Effect on March unless appropriate management and mitigation measures are taken. The scheme will have a Slight Adverse (Negative) Effect on March's biodiversity unless appropriate management and mitigation measures are taken. Slight adverse impacts are anticipated to deciduous woodland, the River Nene, bats, nesting birds, otters, and water voles.

Environment – Water Environment

- 3.8.31 The following water environment resources and features have been considered for each scheme location:
- **Resources** – rivers / canals, floodplains, groundwater, sea and estuaries, and lakes and ponds.
 - **Features** – water supply, transport and dilution of waste products, biodiversity, aesthetics, cultural heritage, recreation, value to economy, conveyance of flow and material, and conveyance of flood flows.
- 3.8.32 Each water environment feature has been assessed based on the following indicators:
- The quality of the physical condition of each feature.
 - The geographic scale at which features have importance at a regional, national, or global scale. The greater scale, the greater the importance.
 - The rarity of the water attribute being evaluated.
 - Whether features are replaceable within a given time frame.
- 3.8.33 The importance of each feature is then determined based on the four indicators listed above and the four-point scale outlined in TAG Unit A3, which ranges from 'low' to 'very high'.
- 3.8.34 The magnitude of impact has then been considered based on the impact of the scheme on each identified feature. The criteria for determining the magnitude of the impact are outlined in TAG Unit A3 and is based on a seven-point scale ranging from 'large adverse' to 'large beneficial'.
- 3.8.35 The appraisal of importance and the magnitude of impact are then combined to provide an overall assessment score, which determines the significance of potential impacts. The overall assessment score is based on a five-point scale ranging from 'insignificant' to 'very highly significant' as recommend in TAG Unit A3.
- 3.8.36 Full results have been summarised in the TAG Water Environment Worksheet for each scheme, which can be found in Appendix F.
- 3.8.37 Table 3.36 overleaf summarises the biodiversity assessment scores for each scheme.

Table 3.36: Water Environment Impact Assessment

Scheme	Summary Assessment Score	Qualitative Comments
Creation of a signalised junction at A141 / Twenty Foot Road		To be assessed at FBC 2.
Improvements to the A141 / Peas Hill Roundabout (60m ICD) and Roundabout at Hostmoor Avenue Roundabout	Neutral	See Appendix F
High Street / St. Peter's Road Traffic Signal Improvements	Neutral	See Appendix F
Improvements to Broad Street / Dartford Road / Station Road, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction. (Construction – MATS Broad Street Scheme)	Neutral	See Appendix F
Improvements to Broad Street / Dartford Road / Station Road, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction. (Operational – MATS Broad Street Scheme)	Slight Adverse (Negative) Effect	See Appendix F
Development of a Northern Industrial Link Road (NILR)		To be assessed at FBC 2.

The MATS Broad Street Scheme will have a Neutral Effect on March's water environment during its construction. Any deterioration of the River Nene's water quality from fuel spillages and other contaminating liquids from construction-related activities can be mitigated by adopting a CEMP, which relates to mitigation measures associated with good site practice. Advice from the Pollution Prevention Guidelines and Control of Water Pollution from Linear Construction Sites will be followed. Good working practices will also minimise floodplain working and involve locating compounds outside of Flood Zones 2 and 3.

The MATS Broad Street Scheme will have a Slight Adverse (Negative) Effect on March's water environment during its operation. The scheme will not result in an increase in impermeable road area and therefore no water quality or flood risk impacts are anticipated. No impacts to hydromorphology are anticipated. However, there is potential for the installation of the attenuation tank to interact with groundwater, which could impact groundwater quality, levels, and flows. It is not known yet if mitigation measures are required and therefore these impacts should be investigated further.

FBC 1 will have a Slight Adverse (Negative) Effect on March unless appropriate management and mitigation measures are taken. FBC 1 will have a Neutral Effect on March during construction.

Social – Physical Activity Impacts

- 3.8.38 The NILR will provide new opportunities for physical activity through new and improved walking and cycling infrastructure. A DfT Active Mode Appraisal Toolkit (AMAT) assessment of the physical activity impacts of the NILR will be undertaken for the Full Package and is not required at this stage to support the FBC for the MATS Broad Street Scheme.

Social – Journey Quality Impacts

- 3.8.39 The NILR will provide new opportunities for journey quality through new and improved walking and cycling infrastructure. A DfT Active Mode Appraisal Toolkit (AMAT) assessment of the journey quality impacts of the NILR will be undertaken for the Full Package and is not required at this stage to support the FBC for the MATS Broad Street Scheme.
- 3.8.40 A qualitative assessment of the journey quality impacts of each scheme has been undertaken and Table 3.37 below summarises the overall assessment scores.

Table 3.37: Journey Quality Impact Assessment

Scheme	Summary Assessment Score	Total Two-Way AADT Flow (PCUs) in 2031 (With Scheme)
Creation of a signalised junction at A141 / Twenty Foot Road	Large Beneficial	21,132
Improvements to the A141 / Peas Hill Roundabout (60m ICD) and Roundabout at Hostmoor Avenue Roundabout	Large Beneficial	26,405
High Street / St. Peter's Road Traffic Signal Improvements	Large Beneficial	14,205
Improvements to Broad Street / Dartford Road / Station Road, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction. (MATS Broad Street Scheme)	Large Beneficial	23,737
Development of a Northern Industrial Link Road (NILR)	Moderate Beneficial	4,402

- 3.8.41 Table 3.37 demonstrates that all schemes provide a **Large Beneficial Impact** on journey quality, except for the NILR which will have a Moderate Beneficial Impact.

Social – Security

- 3.8.42 As stated in TAG Unit A4.1, road users are more vulnerable to crime where they are required to stop their vehicles or travel at slow speeds, such as at the approaches to signals or in congested conditions.
- 3.8.43 The MATS Improvement Schemes will reduce delays and queueing in March and in particular in March Town Centre where road users are often stationary for long periods, waiting for the signals to turn green.
- 3.8.44 The security indicators in the Security Impacts Worksheet have been considered and it is expected that based on these indicators alone there would be a **neutral security impact** from the MATS schemes.

Social – Severance

The MATS Broad Street Scheme will reduce road space allocated to vehicles and provide an additional uncontrolled crossing on Broad Street, which will improve pedestrian accessibility within the town centre and will likely result in a net **slight beneficial impact** on community severance.

Social – Access to Services

- 3.8.45 Accessibility, as described in TAG Unit A4.1 and 4.2, focuses on the public transport accessibility aspect of accessing employment, services, and social networks.
- 3.8.46 A key part of accessibility is understanding the needs of vulnerable social groups, which can include:
- People with children
 - Older people
 - People with a long-term illness
 - People with disabilities
 - People living in rural areas
 - Women – who can be less likely than men to have access to a car during the day and are often undertaking more complex trip chains relating to caring responsibilities
 - People with low incomes living in households with no access to a car.

3.8.47 TAG Unit A4.2 states that the appraisal of accessibility impacts should include a:

- **Strategic accessibility assessment** – identifying changes in opportunity to access services and journey time changes.
- **Accessibility Audit** – an assessment of the accessibility of infrastructure associated with the intervention and the access onto and within the public transport network.

3.8.48 There are no specific public transport interventions relating to the MATS improvement schemes and therefore a detailed distributional assessment of public transport accessibility with and without the schemes has not been undertaken. However, it is expected that the journey time benefits resulting from the schemes will have direct benefits for local bus services.

3.8.49 Figure 3.10 overleaf shows the number of services that can be reached with a mean journey time by public transport longer than the national average for March. A score of 0 (best) equates to no journey times to services longer than the national average. A score of 7 (worst) shows that journey times to all seven services are above the national average.

Map showing the number of services (out of seven) in each area with a mean journey time, by public transport, longer than the national average, in 2017, across England



Figure 3.10: Number of Key Services with a Mean Journey Time by Public Transport Longer than the National Average in 2017

3.8.50 Most residential areas in central and southern March have a score no greater than 2. However, residential areas in the north and east of March have scores ranging between 4 and 7.

It is expected that the MATS Broad Street Scheme will result in a reduction in journey times for buses operating through March Town Centre and will therefore increase the number of services that can be reached within a journey time equal to or less than the national average.

- 3.8.51 In October 2022 it was announced by Stagecoach that 18 bus services across Cambridgeshire would be cut, which includes the 33 route that operates between March Town Centre and Peterborough. The loss of this service will reduce the accessibility to key services in Peterborough for March residents.
- 3.8.52 It should also be noted however that there are fewer bus stops in the north and east of March that are served by existing bus services as shown in Figure 3.11. Residents in these locations would have to walk further to reach their nearest bus stop, increasing the overall journey time to reach key services. The CIHT Buses in Urban Developments guidance recommends a maximum walking distance of 300m for less frequent routes and 250m for town / city centres.

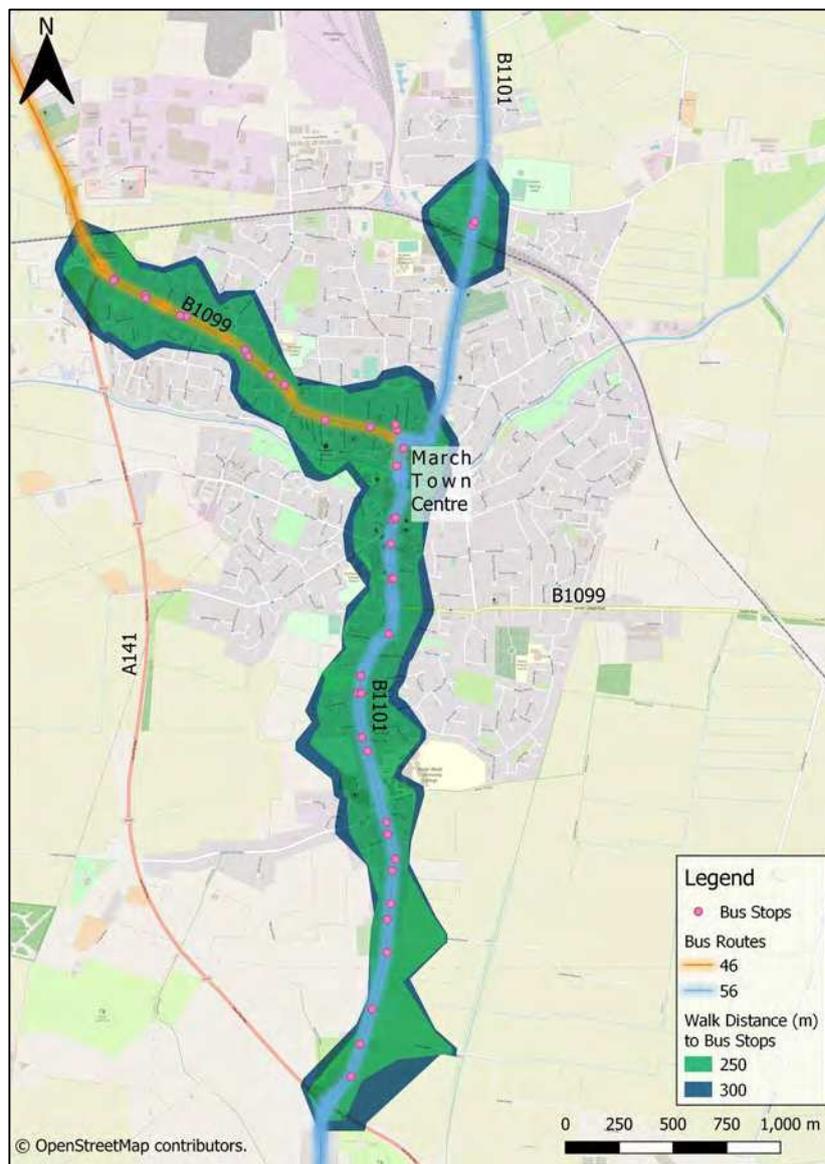


Figure 3.11: Walk Distance (m) to Bus Stops in March

- 3.8.53 The MATS Improvement Schemes will not reduce the walk distance to bus stops and therefore residents outside of a 300m distance from their nearest bus stop will likely remain disadvantaged.

3.9 Value for Money Statement

- 3.9.1 The Full Package is expected to provide **High Value for Money**, based on a Core BCR of **2.24**. The BCR could increase to 2.42, if journey time reliability scheme benefits are realised. The scheme will deliver significant transport user, noise, greenhouse gas, air quality, and accident benefits.
- 3.9.2 The BCR is considered conservative as it is only based on the benefits that can be monetised. Other scheme benefits relating to improved townscape, severance, personal affordability for income deprived groups, and journey quality are anticipated from the delivery of the Full Package.
- 3.9.3 There are also some Slight Adverse (Negative) Effects relating to the Full Package, which include impacts to the historic environment, biodiversity, and water environment.
- 3.9.4 Sensitivity testing has shown that the BCR could range between 0.44 and 3.72 based on uncertainty relating to value of time, travel behaviour, growth, and air quality.

In line with the DfT VfM Framework and based on updated quantitative analysis of detailed scheme costs and benefits, the MATS Broad Street Scheme is expected to provide **Very High Value for Money**, based on a Core Scenario BCR of **9.24**. The BCR could increase to 9.82, if journey time reliability scheme benefits are realised.

The scheme will deliver significant transport user, noise, greenhouse gas, air quality, and accident benefits.

The BCR is considered conservative as it is only based on the scheme benefits that can be monetised. Other scheme benefits relating to improved townscape, severance, personal affordability for income deprived groups, and journey quality are anticipated from the delivery of MATS Broad Street Scheme.

It is also likely that the scheme will facilitate significant regeneration benefits in March Town Centre through reduced congestion and severance, which will facilitate the delivery of the Future High Street Fund Public Realm Improvements scheme. This is likely to attract an increase in footfall and visitor dwell times in the town centre, stimulating increased economic activity and further investment.

There are also some Slight Adverse (Negative) Effects relating to the scheme, which include impacts to biodiversity and water environment.

Sensitivity testing has shown that the BCR could range between 3.04 and 14.35 based on uncertainty relating to value of time, travel behaviour, growth, and air quality.

4. Financial Dimension

4.1 Introduction

4.1.1 The Financial Dimension concentrates on the affordability of the proposed schemes, the funding arrangements and technical accounting issues. Costs within the Financial Dimension are presented for the complete MATS package, and for the MATS Broad Street Scheme in isolation (teal-green boxes).

4.2 Scheme Costing

Cost Build-Ups

4.2.1 The scheme cost estimates for the Financial Dimension have been prepared in line with guidance set out in TAG Unit A1.2 Scheme Costs (DfT, May 2022). Each of the steps taken to produce the cost estimates are explained beneath.

4.2.2 The scheme cost estimates have been robustly costed based on bills of quantities, ECI input into scheme delivery and indicative construction programmes based on Detailed Design information (note: this was Preliminary Design information for the Northern Industrial Link Road). These costs have been peer reviewed in collaborative costing workshops, and include:

- Any further design costs, as well additional surveys where required
- Staff costs, including local overheads and consultation costs
- Land acquisition and planning costs
- Construction costs, including mobilisation, supervision and costs associated with statutory undertakers works
- Risk Allowance

The scheme cost estimate for the MATS Broad Street Scheme is based on Target Cost prices received from the tendering exercise undertaken through the Eastern Highway Alliance (EHA).

4.2.3 Note that project costs incurred to date have been omitted from the costs presented beneath as “sunk costs” in line with TAG guidance.

- 4.2.4 The cost profile used in the preparation of scheme costs is based upon the milestone activities set out in the Management Dimension (Chapter 6) and reflects the phased approach taken to the FBC as explained in Section 1.3. It includes construction of the MATS Broad Street Scheme in 2023 at the same time as planning and procurement are progressed for the A141 / Twenty Foot Road, A141 Peas Hill Roundabout, A141 / Hostmoor Avenue Junction and High Street / St Peter's Road schemes which are due to begin construction in 2025 / 2026.
- 4.2.5 Detailed Design and delivery of the NILR has a longer programme due to the complexities involved with the scheme, including engagement with multiple stakeholders and the environmental sensitivities around the site. Further Preliminary Design work was undertaken in 2022, and Detailed Design for this scheme is profiled to commence in 2024. The construction phase of the NILR is profiled to begin in January 2027 and last for one year. These timescales will be confirmed in FBC3 which will set out the case for investment in the NILR.
- 4.2.6 The dates used to calculate the scheme costs, including the application of inflation, are shown in Table 4.1 overleaf.

Table 4.1: MATS Key Implementation Dates

Activity	Dates
MATS Broad Street Improvement Scheme (FBC1)	
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Broad Street Construction and FBC2	January 2023 - February 2023
Procurement of MATS Broad Street Contractor	October 2022 - February 2023
Construction of MATS Broad Street scheme (in conjunction with FHSF scheme construction)	February 2023 - March 2024
MATS Peas Hill & Hostmoor Avenue, Twenty Foot Road and St Peter's Road Schemes (FBC2)	
Obtain Utility Cost (C4s), Outline Planning, Land Engagement and Target Cost Procurement for Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	February 2023 - December 2023
Submit FBC2, requesting release of funding for Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	December 2023
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Construction and FBC3	December 2023 - March 2024
Obtain Full Planning Approval and Land Agreement (If no need for CPO) for Peas Hill and Twenty Foot Road Schemes.	March 2024 - December 2024
CPO and Side Road Order Statutory process	June 2023 - March 2025
Construction of Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	March 2025 - March 2026
MATS NILR Scheme (FBC3)	
Commence NILR Detailed Design, including Governance Process and statutory orders	March 2024 - March 2025
Begin Planning Process and supporting surveys (Ecology / Topography)	March 2024 - August 2025
Obtain Statutory Orders including CPO (approval from FDC, CCC)	March 2024 - October 2026
Target Cost Procurement for NILR	March 2025 - September 2025
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Construction	September 2025 - November 2025
NILR Construction	October 2026 - December 2027
MATS Post Scheme Monitoring and Evaluation	December 2028 - December 2033

4.2.7 It is likely that construction programme efficiencies will be identified during the procurement phase of the remaining MATS schemes, and the timescales presented above are considered robust.

The programme for the construction of the MATS Broad Street Scheme is fixed by the constraints associated with TCF funding and its interdependency with the FHSF Broad Street Scheme, which is funded separately (and outside the scope of this FBC). Like TCF funding, the funding requirements associated with the FHSF Broad Street Scheme require its completion before the end of the 2023 / 2024 Financial Year, which is why the MATS Broad Street Scheme has been accelerated for funding ahead of the remaining MATS schemes.

Scheme Cost Estimates

- 4.2.8 Each of the scheme cost estimates presented within the Financial Dimension are shown beneath in Table 4.2 and explained in greater detail throughout this chapter. The costs are presented for the entirety of the MATS project, reflecting the strategic significance of delivering all schemes as a package of improvements, and for the Broad Street Scheme alone to satisfy the requirements of FBC1.
- 4.2.9 Table 4.2 presents a summary of the Financial Dimension cost estimates for the entirety of the MATS improvement schemes.

Table 4.2: Financial Dimension Scheme Cost Estimates (2022 Price Base)

Description of Cost Type	Cost (£)
Base Investment Cost	28,372,098
Risk Adjusted Base Cost	34,851,794
Risk Adjusted Base Cost with Construction Industry Inflation (Outturn Cost)	47,693,154
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	49,423,931

Table 4.3 beneath presents the Financial Dimension cost estimates in relation to the MATS Broad Street Scheme in isolation, which is the subject of this funding request.

Table 4.3: Financial Dimension Scheme Cost Estimates (Broad Street)

Description of Cost Type	Cost (£)
Base Investment Cost	3,378,825
Risk Adjusted Base Cost	4,149,825
Risk Adjusted Base Cost with Construction Industry Inflation (Outturn Cost)	4,149,825
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	4,149,825

- 4.2.10 Please note that the costs calculated for use within the Economic Assessment are presented in the Economic Dimension (Chapter 3).
- 4.2.11 A full 60-year schedule showing how the costs have been calculated is presented in Appendix G.

Base Investment Cost

- 4.2.12 The Base Investment Cost is the capital cost required to construct the scheme in current year (2022) prices, without a risk allowance or inflation. This cost is the building block for all other scheme cost calculations.
- 4.2.13 A breakdown of the Base Investment Costs for each of the individual schemes is shown in Table 4.4 beneath. These costs have been used to calculate the total package cost, which has then been used for the Financial Dimension assessment.

Table 4.4: Base Investment Cost by Scheme (2022 Prices)

Base Investment Cost	St Peters Road	Broad Street	Northern Industrial Link Road	Peas Hill & Hostmoor Avenue	Twenty Foot Road	Total
Design	£ 81,598	£ 100,000	£ 1,614,952	£ 506,210	£ 240,441	£ 2,543,201
Land	£ -	£ -	£ 80,000	£ 420,000	£ 20,000	£ 520,000
Construction	£ 720,231	£ 2,816,542	£ 10,187,064	£ 4,583,100	£ 1,716,934	£ 20,023,871
Supervision	£ 179,900	£ 90,000	£ 970,875	£ 406,104	£ 261,570	£ 1,908,449
Other	£ 5,000	£ 372,283	£ 2,175,794	£ 569,205	£ 254,296	£ 3,376,577
Total	£ 986,729	£ 3,378,825	£ 15,028,685	£ 6,484,618	£ 2,493,241	£ 28,372,098

- 4.2.14 Over half of the costs associated with the MATS Improvement Schemes relate to the Northern Industrial Link Road. This scheme has evolved significantly since the concept stage and has been upgraded to include segregated active travel facilities along the length of the route, and an enhanced junction where Longhill Road meets the B1101 Elm Road. The costs associated with this scheme have a significant bearing on the economic assessment and viability of the full MATS package, and the scheme will be reviewed (value engineered) during the Detailed Design phase to ensure that it continues to provide value for money.
- 4.2.15 Table 4.5 below shows the Base Investment Cost for the full package, broken down into Construction, Land (and Property), Preparation and Supervision costs (including further design and FBC work), and Other costs which relate to procurement and project management.

Table 4.5: Base Investment Cost (2022 Prices)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Total Base Investment Cost (£)
2023	2,212,997		392,971	532,337	3,138,305
2024	603,545	440,000	657,216	824,916	2,525,677
2025	5,400,204		1,349,186	841,843	7,591,234
2026	3,803,003	80,000	899,681	645,620	5,428,304
2027	8,004,122		1,137,596	531,861	9,673,579
2028			20,000		20,000
Total	20,023,871	520,000	4,456,650	3,376,577	28,377,098

- 4.2.16 The scheme Base Investment Cost in 2022 prices is £28,377,098 for the full package of MATS Improvement Schemes. This includes £20,023,871 of Construction related costs and £4,456,650 for Design and Supervision costs (£2,548,201 Design / £1,908,449 Supervision).

- 4.2.17 The Design costs include all necessary surveys and costs to fully develop the Detailed Design for the NILR and to produce FBC2 and FBC3 for the remaining schemes.
- 4.2.18 The costs also include £520,000 of Land and Property Costs and £3,376,577 of Other Costs (access permits, TTROs, project management, staff costs and procurement).
- 4.2.19 Agricultural land costs have been informed by a review of agricultural land available for sale in Fenland in July 2021, with the maximum value per acre used.
- 4.2.20 Property costs have also been calculated based on a review of average property prices in March for properties near to the relevant schemes, and the highest average estimate has been used.
- 4.2.21 In the absence of any known information, costs associated with Network Rail land acquisition have been assumed based on a review of commercial and industrial land value in Fenland.
- 4.2.22 The values used to estimate land and property costs are shown beneath:
- Agricultural Land = £20,000 per acre / £48,000 per hectare
 - Property Value = £360,000 per property
 - Network Rail Land = £100,000 per hectare.

The Base Investment Cost for the Broad Street Scheme is shown in beneath in Table 4.6.

Table 4.6: Base Investment Cost (2022 Prices) (Broad Street)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Total Base Investment Cost (£)
2023	2,212,997		149,286	292,508	2,654,791
2024	603,545		40,714	79,775	724,034
2025					
2026					
2027					
2028					
Total	2,816,542		190,000	372,283	3,378,825

The scheme Base Investment Cost in 2022 prices is £3,378,825 for the MATS Broad Street Scheme. This includes £2,816,542 of Construction related costs and £190,000 for Design and Supervision costs (£100,000 Design / £90,000 Supervision).

The Design costs include designer support during the construction phase, as well as post scheme monitoring and evaluation.

The costs also include £372,283 of Other Costs (project management, staff costs and procurement).

Risk Adjusted Base Cost

- 4.2.23 The Risk Adjusted Base Cost includes a Quantified Risk Allowance (QRA) for each scheme. A priced Risk Register has been prepared for each of the schemes and is included in Appendix H. These Risk Registers have been developed by the project team with ECI support and have been peer reviewed.
- 4.2.24 The risk allocation for each of the five schemes is shown in Table 4.7 below, and totals £6,479,696 (or 23% of the Base Investment Cost).

Table 4.7: Risk Adjusted Base Cost by Scheme (2022 Prices)

MATS Scheme Intervention	Base Investment Cost (excl. Risk)	Quantified Risk Allowance	Risk Adjusted Base Cost
Broad Street	£ 3,378,825	£ 771,000	£ 4,149,825
B1101 / St Peter's Road	£ 986,729	£ 192,043	£ 1,178,772
A141 Peas Hill Roundabout & A141 Hostmoor Junction	£ 6,484,618	£ 1,074,765	£ 7,559,384
A141 / Twenty Foot Road	£ 2,493,241	£ 376,212	£ 2,869,453
Northern Industrial Link Road	£ 15,028,685	£ 4,065,676	£ 19,094,360
Total	£ 28,372,098	£ 6,479,696	£ 34,851,794

- 4.2.25 Table 4.8 beneath shows the Risk Adjusted Base Cost for the full package. The application of risk has been profiled to match the construction programme.

Table 4.8: Risk Adjusted Base Cost by Year (2022 Prices)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Risk Allowance (£)	Risk Adjusted Base Cost (£)
2023	2,212,997		389,042	532,337	605,786	3,740,162
2024	603,545	440,000	661,145	824,916	165,214	2,694,820
2025	5,400,204		1,344,186	841,843	1,263,862	8,850,095
2026	3,803,003	80,000	899,681	645,620	1,250,375	6,678,678
2027	8,004,122		1,137,596	531,861	3,194,459	12,868,038
2028			20,000			20,000
Total	20,023,871	520,000	4,451,650	3,376,577	6,479,696	34,851,794

- 4.2.26 The application of the Risk Allowance generates a Risk Adjusted Base Cost of £34,851,794.

The Risk Adjusted Base Cost for the MATS Broad Street Scheme is shown in beneath in Table 4.9.

Table 4.9: Risk Adjusted Base Cost (2022 Prices) (Broad Street)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Risk Allowance (£)	Risk Adjusted Base Cost (£)
2023	2,212,997		149,286	292,508	605,786	3,260,577
2024	603,545		40,714	79,775	165,214	889,248
2025						
2026						
2027						
2028						
Total	2,816,542		190,000	372,283	771,000	4,149,825

The total Risk Allowance for the Broad Street Scheme is £771,000 which takes the Risk Adjusted Base Cost to £4,149,825. This represents a Risk Allowance of 23% of the Base Investment Cost.

Inflated Risk Adjusted Cost (Outturn Cost)

- 4.2.27 The Inflated Risk Adjusted Cost, or Outturn Cost, is the Risk Adjusted Base Cost with inflation applied.
- 4.2.28 This construction industry inflation has been reviewed against the BCIS General Civil Engineering Cost Index (October 2022). The inflation forecasts from the BCIS Index show 14.29% inflation in 2022 which then drops to around 3% from 2023 onwards. However, there is no indication that inflation is beginning to ease and current prices continue to outstrip forecasts, and these forecasts have therefore been treated with a high degree of caution.
- 4.2.29 Table 4.10 beneath sets out the inflation rates that have been used in the assessment compared to the BCIS forecasts. The table shows that the inflation rate applied reduces incrementally from 12% in 2023 (when construction begins) to 5% by 2025 and that the value used exceeds the BCIS forecast for each year, demonstrating that it is robust.

Table 4.10: Construction Industry Inflation Forecasts (October 2022)

Index Date	Jan-21	Jan-22	Jan-23	Jan-24	Jan-25
Year Applicable	2021	2022	2023	2024	2025
BCIS General Civil Engineering Cost Index	164.5	181.3	207.2	214.3	220.5
% Inflation by Year	10.21%	14.29%	3.43%	2.89%	2.90%
Inflation Used in Assessment	12.00%	12.00%	12.00%	8.00%	5.00%

Note that inflation has not been applied for the MATS Broad Street Scheme as this is included in the Contractor price (at a rate of 10%) and is therefore already captured in the Base.

4.2.30 Inflation has been applied in line with the construction profile discussed above and shown in the Management Dimension (Chapter 6). The annual cost of inflation is presented in Table 4.11 below.

Table 4.11: Inflation Increases on Construction Costs 2023-28

Calendar Year	Risk Adjusted Base Cost (£)	Cost of Inflation (£)	Total with Inflation (£)
2023	3,740,162	57,550	3,797,712
2024	2,694,820	459,338	3,154,158
2025	8,850,095	3,139,589	11,989,684
2026	6,678,678	2,821,672	9,500,351
2027	12,868,038	6,351,845	19,219,883
2028	20,000	11,366	31,366
Total	34,851,794	12,841,360	47,693,154

4.2.31 The cost of inflation is £12,841,360 which is accrued between 2023 and 2028 when all capital expenditure occurs. The application of inflation brings the Package Outturn Cost to £47,693,154. Almost all of the inflation costs from 2026 onwards relate to the NILR, which accounts for 68% (or £9,173,517) of the total inflation costs.

4.2.32 The Outturn Cost represents the amount required by CCC to deliver the full package of schemes.

The Inflated Risk Adjusted Base Cost (Outturn Cost) for the Broad Street Scheme is shown in beneath in Table 4.12. Note that this is the same as the Risk Adjusted Base Cost as inflation costs have been included in the Contractor price.

Table 4.12: Inflated Risk Adjusted Cost (2022 Prices) (Broad Street Scheme)

Calendar Year	Risk Adjusted Base Cost (£)	Cost of Inflation (£)	Total with Inflation (£)
2023	3,260,577		3,260,577
2024	889,248		889,248
2025			
2026			
2027			
2028			
Total	4,149,825		4,149,825

Inflated Risk Adjusted Cost Including Whole Life Costs

- 4.2.33 Maintenance costs have also been calculated for the 60-year assessment period taking account of the same 5% construction industry inflation rate applied (from 2025 onwards) to the Inflated Risk Adjusted Cost. Maintenance costs have been applied from 2028 onwards, following construction of the final scheme.
- 4.2.34 Maintenance costs have only been included for the creation of additional infrastructure as all maintenance costs associated with existing infrastructure will continue to occur with or without the MATS intervention. Note that funding for future maintenance costs is not requested as part of the scheme funding, but instead becomes part of the Local Highway Authorities ongoing maintenance liability. The rationale for the inclusion or exclusion of maintenance costs is shown on the following page for each scheme:

- **A141 / Peas Hill Roundabout:** No maintenance costs have been included as the asset footprint remains largely unchanged. The improvement works at this location are not considered to have a significant impact on any future maintenance liability. The small increase in carriageway (as a result of the addition of flares) is considered to be offset by the removal of two lanes from Broad Street.
- **A141 / Hostmoor Avenue:** No maintenance costs have been included as the removal of traffic signals from the Broad Street Junction is considered to offset the implementation of traffic signals at the A141 / Hostmoor Avenue Junction, which will also have less traffic signal infrastructure than the outgoing Broad Street junction.

- **Broad Street:** No maintenance costs have been included as a junction already exists at this location. The removal of traffic signals from this site is a significant maintenance benefit (and will offset the creation of a signalised junction at A141 / Hostmoor Avenue). The amount of carriageway to be maintained along Broad Street will also be halved in future as the two lanes in each direction are reduced to a single lane.

- **A141 / Twenty Foot Road:** An allowance of £37,500 has been included for every fifteen years for maintenance at this junction. This reflects the addition of traffic signal infrastructure at this location and is based on recent experience (2022) of traffic signal maintenance in Cambridgeshire, which assumes £12,500 per approach (every fifteen years). This cost has been applied from 2041 onwards (fifteen years post scheme opening).
- **B1101 / St Peter's Road:** No maintenance costs have been included as the impact of the scheme on future maintenance is negligible.
- **Northern Industrial Link Road:** Maintenance costs have been included for the Hundred Road section of the scheme (550 metres) as this will be a significant upgrade to the existing infrastructure. Maintenance Costs have not been included for the Longhill Road section of the scheme, which is already a maintenance commitment. It is unknown who owns the streetlighting outside HMP Whitmoor, but it is assumed that this asset will continue to be maintained by the current owner.

- 4.2.35 An indicative cost estimate for maintenance of the Hundred Road section of the NILR indicates that annual maintenance as part of a wider cyclic maintenance programme would be in the region of an additional £550 per year, including repair works, landscaping, traffic management and contract fees. However, this value has been increased to £2,000 per year for the purpose of this assessment, representing a substantial contingency.
- 4.2.36 The maintenance costs are considered to be robust as highway maintenance is currently procured and delivered through a term maintenance contractor, and there is no reason to assume that this will differ in future. This means that future highway maintenance for this portion of the NILR will be carried out as part of the area wide cyclic maintenance programme, rather than in isolation, and thus benefit from the financial efficiencies of a term maintenance contract.
- 4.2.37 The portion of the scheme which represents an increase in maintenance liability is shown in yellow in Figure 4.1 beneath.

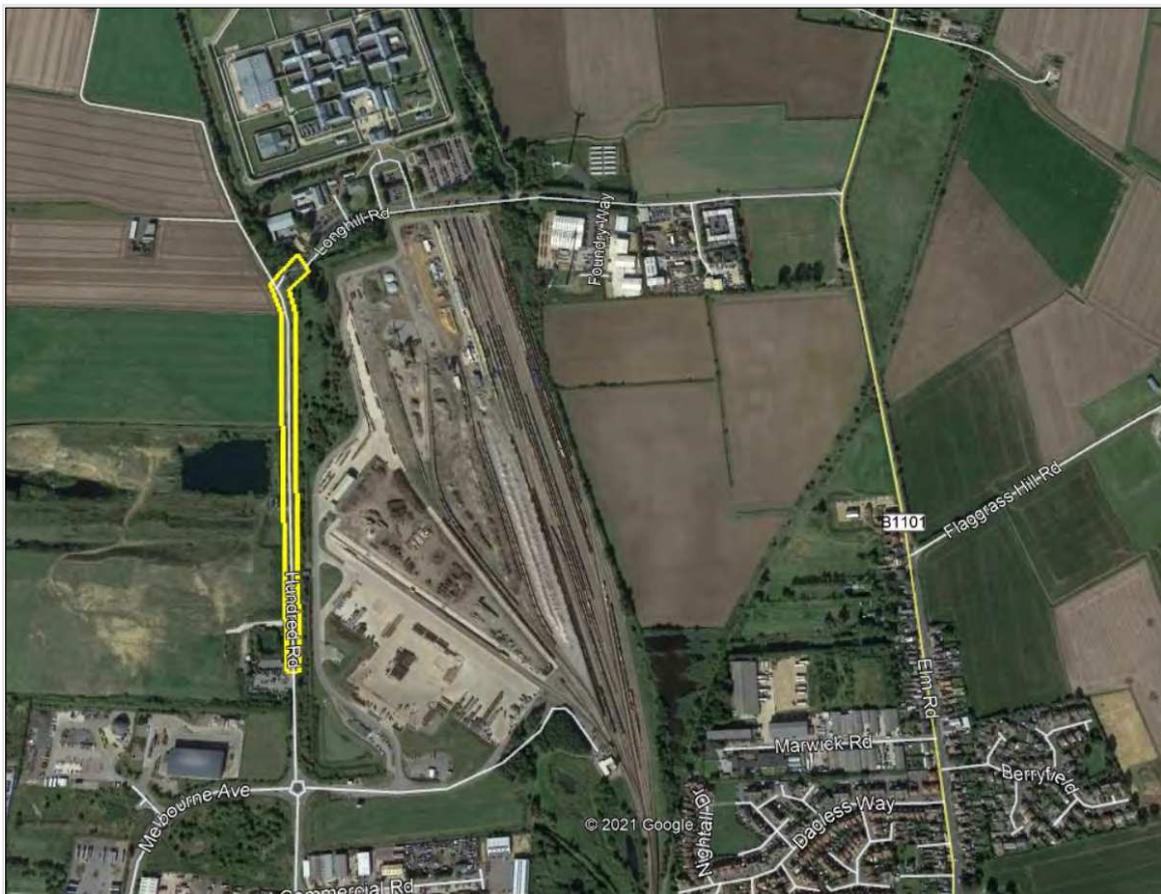


Figure 4.1: Additional Maintenance Liability on Northern Industrial Link Road

- 4.2.38 The additional maintenance costs have been applied from 2038 onwards (ten years after scheme completion, at which point the asset would require active maintenance), and the resultant costs are shown in Table 4.13 below.

Table 4.13: Calculation of Whole Life Maintenance Costs (2022 Prices)

Whole Life Maintenance Costs	Cost (£)
Maintenance Cost for 60 Assessment Period (without inflation)	206,500
Maintenance Cost for 60 Assessment Period (with inflation)	1,730,778

4.2.39 Table 4.14 shows the total Inflated Risk Adjusted Cost Including Whole Life Costs.

Table 4.14: Inflated Risk Adjusted Cost Including Whole Life Costs

Inflated Risk Adjusted Cost Including Whole Life Costs	Calendar Years	Cost (£)
Risk Adjusted Base Cost with Construction Industry Inflation (Outturn Cost)	2022 - 2028	47,693,154
Inflated Whole Life Costs	2029 - 2081	1,730,778
Inflated Risk Adjusted Cost Including Whole Life Costs	2021 - 2081	49,423,931

4.2.40 The Inflated Risk Adjusted Cost Including Whole Life Costs over the assessment period is £49,423,931. The Outturn Cost required to deliver the scheme is £47,693,154.

No maintenance costs have been included for the MATS Broad Street Scheme as the scheme is expected to generate a reduction in maintenance liability due to the removal of existing traffic signal infrastructure and a reduction in the number of lanes along Broad Street. As such, the Inflated Risk Adjusted Cost including Whole Life Costs for the MATS Broad Street Scheme is the same as the Outturn Cost.

4.2.41 All future maintenance costs will be the responsibility of Cambridgeshire County Council as the Highway Authority and are not requested as part of this Business Case.

4.2.42 A full 60-year schedule (2023 – 2083) showing how the costs have been calculated is presented in Appendix G.

4.3 Funding and Budgets

4.3.1 The following potential funding sources have been identified for the construction of the MATS schemes.

Transforming Cities Fund

4.3.2 The Transforming Cities Fund (TCF), which closed to applications in 2018, was a £2.45 billion capital grant transport fund aimed at driving up productivity through investments in public and sustainable transport infrastructure in some of England's largest city regions.²⁹

4.3.3 The Cambridgeshire and Peterborough Combined Authority (CPCA) was awarded £95 million in total through the TCF.³⁰ An initial £74 million was secured up to the 2020 / 2021 financial year, and an additional £21 million secured up to the 2022 / 2023 financial year.³¹ Confirmation has been given that this funding can be used into 2023 / 2024 to complete TCF funded schemes that began in the 2022 / 2023 Financial Year.

4.3.4 The TCF money awarded to the CPCA has been identified as a funding source for the MATS Broad Street Scheme which is an appropriate use for this funding. TCF funding will not be available for the construction of the remaining MATS schemes as the time limitation will have expired.

CPCA Single Investment Fund

4.3.5 It is possible that a portion of the Outturn Cost for the MATS Improvement Schemes will be funded by the CPCA from the Single Investment Fund. The CPCA has an infrastructure delivery budget of £20 million per year, allocated for the next 30 years. This funding will be invested in the Cambridgeshire and Peterborough Single Investment Fund, to boost growth within the region.

4.3.6 There is currently no allocation within the CPCA Medium Term Financial Plan for the MATS Improvement Schemes (beyond the MATS Broad Street Improvement).

S106 Developer Contributions

4.3.7 Parts of the overall package may be funded through Section 106 developer contributions where there is a clear link to a development's impact on the network, and a mitigation provided by a MATS improvement scheme. Engagement with Cambridgeshire County Council's Transport Assessment Team will remain ongoing to identify any potential opportunities for developer contributions as FBC2 and FBC3 develop. This is most likely to apply to funding for the A141 / Peas Hill Roundabout and A141 / Hostmoor Avenue Junction which are both situated along an identified growth corridor.

²⁹ <https://www.gov.uk/government/publications/apply-for-the-transforming-cities-fund>

³⁰ <https://www.gov.uk/government/publications/apply-for-the-transforming-cities-fund/awarded-funding-allocations>

³¹ <https://cambridgeshirepeterborough-ca.gov.uk/news/mayor-james-palmer-welcomes-budget-2018-including-21-million-to-combined-authority-from-transforming-cities-fund/>

CPCA Funding Commitment

- 4.3.8 Due to the total scheme cost it is expected that funding will come from several different sources. The CPCA's Single Investment Fund will also likely be used to supplement funding from all other sources.
- 4.3.9 The CPCA are committed to funding the MATS schemes, which clearly features in the authority's Mid Term Financial Strategy (MTFS), subject to a Full Business Case satisfying the requirements of the technical assurance review and approvals at the Combined Authority Board. The funding strategy for the MATS Broad Street Scheme is confirmed beneath, and the exact composition of funding will be confirmed in the Full Business Case for each of the subsequent stages.

Funding for the MATS Broad Street Scheme has been secured from the CPCA's Single Investment Fund which is invested to boost growth within the region. This funding pot is supplemented by further capital budgets.

The full scheme Outturn Cost of £4,149,825 will be funded through the CPCA Single Investment Fund using the authority's Transforming Cities Fund (TCF). A budget has already been allocated in the CPCA's Medium Term Financial Strategy (MTFS) subject to approval of this FBC. The funding profile for this allocation is shown beneath:

• FY 2022 / 2023:	£	2,114,000
• FY 2023 / 2024:	£	4,149,825
• Total:	£	6,263,825

The funding profile demonstrates that there is adequate funding available in FY 2023 / 2024 to cover the MATS Broad Street Scheme Outturn Cost (£4,149,825).

The TCF funding is time limited, and construction must begin in the 2022 / 2023 financial year and be complete by the of the 2023 / 2024 financial year (31st March 2024) to satisfy the funding requirements. The construction programme for the MATS Broad Street Scheme has been developed to fit within this timeframe, and to compliment the FHSF requirements which mirror those of the TCF.

There are not known to be any other financial constraints associated with the funding for the MATS Broad Street Scheme.

5. Commercial Dimension

5.1 Introduction

- 5.1.1 This chapter sets out the Commercial Dimension, outlining how the schemes can be procured, delivered, and operated as required through established channels. Adopting a commercial approach to project delivery is fundamental to ensuring scheme promoters get the best deal from the market. As such, the Commercial Dimension provides evidence that the schemes can be progressed through feasible procurement routes and ensures value for money is maximised during delivery of the schemes.
- 5.1.2 A high-level Commercial Dimension was outlined in the OBC, which included an outline 'output-based specification' and discussion on potential procurement options. In addition, outline information pertaining to sourcing options, payment mechanisms, pricing framework and charging mechanisms, risk allocation and transfer, contract length, and contract management was provided.
- 5.1.3 This Business Case now confirms the commercial approach and procurement route for the MATS Broad Street Scheme and re-affirms the options for the remaining MATS schemes.

5.2 Output Based Specification

- 5.2.1 Any chosen procurement option must be able to ensure delivery of infrastructure which delivers the intended scheme outcomes and meets the identified objectives.
- 5.2.2 Detailed designs of the MATS Improvement Schemes have been completed following on from the Preliminary and Feasibility designs produced in earlier phases of the project. Note that the Northern Industrial Link Road scheme remains at an advanced stage of Preliminary Design.
- 5.2.3 In preparation for procurement, the Broad Street scheme Detailed Design, produced by Atkins, was supported with ECI by Volker Highways. It is expected that these measures will reinforce the cost and programme certainties and minimise risk of cost, programme and quality challenges arising during construction. Similar ECI support was provided by Milestone Infrastructure for the remaining four projects, again to further develop cost, programme and quality certainty ahead of procurement.
- 5.2.4 In line with the identified scheme package and the associated Detailed Designs, the chosen procurement option must ensure successful development of the proposed highway interventions and ensure delivery of the following:
- Construction of the A141 / Twenty Foot Road traffic signal-controlled junction.
 - Construction of the A141 / Peas Hill Roundabout (52m ICD) enhancements in conjunction with the construction of a traffic signal-controlled junction at Hostmoor Avenue.
 - Construction of the High Street / St Peter's Road traffic signal improvements.

- Construction of the proposed changes along Broad Street, including reducing Broad Street to a single lane in each direction and the creation of a Broad Street / Dartford Road / Station Road Roundabout.
- Construction of the Northern Industrial Link Road and its active travel improvements.

5.2.5 It is expected that any preferred option will meet all the primary objectives outlined in the Strategic Dimension, and as many of the secondary objectives as possible. Details of how the schemes will be measured against these objectives are provided in the Benefits Realisation Plan and Monitoring and Evaluation Plan, as detailed in the Management Dimension.

5.3 Procurement Strategy

5.3.1 The following routes to procurement are available to the scheme promotor for delivery of the MATS Improvement Schemes:

- **Framework:** CCC is part of the Eastern Highways Alliance Framework 3. The contractors on this framework are BAM Nuttall, Dyer & Butler Ltd, John Sisk & Son, Eurovia UK Ltd, Galliford Try Infrastructure Ltd, Octavius Infrastructure Ltd, Interserve Construction Ltd, Jackson Civil Engineering Group Ltd and Marlborough Highways, across three differing value bands, some of which overlap. The framework has a limit of £30m per Work Package, across 3 value bands, with the option for higher value schemes with the approval of the EHA Board.
- **Standalone** – ‘Find a Tender’ service. This is the new UK e-notification service, introduced on 1st January 2021, where notices for new procurements from public sector organisations are required to be published in place of the Official Journal of the European Union’s Tenders Electronic Daily (OJEU / TED), following the end of the Brexit Transition Period. The thresholds for works from January 1st 2022 is £5,336,937 (excl. VAT).
- **Existing Cambridgeshire Highways Services Contract:** Procurement could be secured through the Cambridgeshire Highway Services Contract with Milestone Infrastructure, subject to any thresholds and caps.
- **Cambridgeshire and Peterborough Joint Professional Services Framework:** A new joint framework between CCC and Peterborough City Council for the procurement of professional services was awarded to Atkins and WSP in April 2021. This framework enables CCC and other public sector bodies within Cambridgeshire and Peterborough to enter into work orders with either of the two suppliers to provide professional and technical services to support the delivery of construction projects. The expectation is that CCC will use this framework to supplement existing arrangements, where appropriate, to support the development and delivery of infrastructure projects, from feasibility through to scheme construction.

5.3.2 The relative advantages and disadvantages of established procurement routes are summarised in Table 5.1 below.

Table 5.1: Comparison of Procurement Routes

Procurement Route	Advantages	Disadvantages
Eastern Highways Alliance Framework 3	<ul style="list-style-type: none"> • Reduces procurement process time and cost. • Quality checks have already been carried out through a framework tender process. • Further benefits from historical programme of work through efficiency savings and lessons learnt. 	<ul style="list-style-type: none"> • May exclude contractors that could potentially offer benefits not offered by framework contractors. • Framework contractors may not bid as competitively as those in an open procurement. • There are only two providers on each lot (except the highest value lot where there are only three) and so there is a risk that only one contractor bids for the work which could make the price uncompetitive. In the worst-case scenario, there may be no bids.
Scape	<ul style="list-style-type: none"> • Single source framework, so no need for secondary competition, which in theory makes it quicker as to progress straight to working with the provider (BBLP). • Reduces procurement process time and cost. • Quality checks have already been carried out through a framework tender process. • Further benefits from historical programme of work through efficiency savings and lessons learnt. 	<ul style="list-style-type: none"> • May exclude contractors that could potentially offer benefits not offered by framework contractors. • Framework contractors may not bid as competitively as those in an open procurement. • Evidencing VfM.
Pagabo	<ul style="list-style-type: none"> • Reduces procurement process time and cost. • Quality checks have already been carried out through a framework tender process. • Further benefits from historical programme of work through efficiency savings and lessons learnt. 	<ul style="list-style-type: none"> • May exclude contractors that could potentially offer benefits not offered by framework contractors. • Framework contractors may not bid as competitively as those in an open procurement.
Crown Commercial Services (CCS)	<ul style="list-style-type: none"> • Reduces procurement process time and cost. • Quality checks have already been carried out through a framework tender process. • Further benefits from historical programme of work through efficiency savings and lessons learnt. 	<ul style="list-style-type: none"> • May exclude contractors that could potentially offer benefits not offered by framework contractors. • Framework contractors may not bid as competitively as those in an open procurement.

Procurement Route	Advantages	Disadvantages
Open Procurement Process	<ul style="list-style-type: none"> Competitive tender process provides reassurance that a competitive price has been achieved and the most suitable contractor selected. Opportunity for a wide range of contractors to be invited to tender. 	<ul style="list-style-type: none"> Tender process can be lengthy and costly. Risk that an unfamiliar contractor winning the tender based on price but does not deliver to required performance criteria.
Cambridgeshire Highways Services Contract	<ul style="list-style-type: none"> Reduces procurement process and timescale. Quality checks already carried out. <p>Milestone involvement in preliminary design process and scheme development from the beginning reduces risk and potentially cost.</p>	<ul style="list-style-type: none"> Price comparisons cannot be made. Different approaches to delivery and risk not available.
Joint Professional Services Framework (JPSF)	<ul style="list-style-type: none"> Reduces procurement process and timescale. Quality checks already carried out. 	<ul style="list-style-type: none"> Price comparisons cannot be made. Different approaches to delivery and risk not available.

5.3.3 CCC has a broad experience of procuring consultancy services to support scheme delivery, through the Cambridgeshire Highways Services Contract, JPSF, the Eastern Highways Alliance Framework and Scape, to deliver a range of highways, public transport, active travel and logistics schemes. Examples include:

- Northstowe Bus Link – this is a scheme to link an existing housing estate to a nearby bus station. The value of the scheme was approximately £500,000 and it was procured through the Eastern Highway Alliance (EHA) in September 2022.
- Kings Dyke Level Crossing – this scheme is due to complete in December 2022 and has a total construction value of £21m. Procurement was undertaken in early 2020 with the contract awarded in April 2020 via the OJEU route.

The MATS Broad Street Scheme has been procured through the Eastern Highways Alliance (EHA) Framework 3. The procurement process began in July 2022 and tender packs were submitted in October 2022. Responses were received on 2nd December 2022. These are currently being reviewed by Cambridgeshire County Council, and the chosen Contractor will be confirmed in February 2023, with mobilisation expected to begin shortly afterwards (in February 2023).

5.3.4 Procurement options for the remaining schemes are currently under review and the preferred option will be confirmed at the respective FBC stages.

5.4 Market Maturity

- 5.4.1 CCC have successfully worked with the local supply chain to develop and deliver similar highway schemes across the County over recent years, demonstrating that they have the experience and knowledge needed to procure schemes in such a fashion. The team currently leading the procurement of the MATS schemes have in the region of 150 years of combined experience in procuring and managing the delivery of highway improvement schemes.
- 5.4.2 Recent schemes which have been procured along similar routes, include the Ely Bypass, Kings Dyke and the Northstowe Bus Link (further details are provided in the Management Dimension). The successful procurement of these schemes in recent years demonstrates that there is adequate maturity within the local contracting market (both within CCC and amongst Contractors) to deliver the MATS schemes successfully.

5.5 Sourcing Options

- 5.5.1 There are several options available to the scheme promoter for procuring the best suited contractor to deliver the preferred package of schemes. These include:
- A **traditional arrangement**, where the scheme promoter appoints a consultant to design the project in detail and prepare tender documentation including drawings, work schedules and bills of quantities etc. Contractors are then invited to submit tenders for the construction of the scheme. This allows close control of the design process by the client, however, offers limited opportunity for the contractor to influence design, increasing risks and costs.
 - A **single-stage Design & Build contract**, where the design and construction of the scheme is tendered as one package, with a contractor appointed to complete the design process started by Milestone Infrastructure, as well as undertaking the construction of the scheme. This arrangement offers an incentive for the contractor to ensure that the design is buildable and can facilitate a quicker start on construction.
 - A **two-stage Design & Build contract**, where the design and construction of the scheme is again tendered as one package. However, there is potential to review the contractor's performance and construction target cost and stop the process at the end of the design phase if necessary.

- **Early Contractor Involvement (ECI)** is similar to a traditional arrangement; however a contractor is appointed during the preliminary design stage under a consultancy agreement to provide construction advice on the design process being undertaken by the design consultant. ECI is a collaborative form of contract, bringing the contractor into the project team early, reducing overall project risk.
- **Private Finance Initiative (PFI)** – the scheme promoter buys the scheme from the private sector on a long-term basis, typically for 25 years. This will usually involve constructing and maintaining the delivered asset, which incentivises the supplier to have the highest regard to whole-life costing as the supplier has the risk of future operation and maintenance costs for a substantial period of time.

The MATS Broad Street Scheme will be let under a traditional arrangement NEC4 Engineering and Construction Contract (Option C).

This is recommended on the basis that the use of a target price contract for this project will enable a reduced risk premium to be paid by the Employer through the use of the pain / gain share mechanism. This is particularly advantageous for this project as the design will not be fully complete prior to tender.

Further detail on the rationale for the procurement strategy chosen for the MATS Broad Street Scheme is provided in Appendix L.

- 5.5.2 Procurement options for the remaining MATS schemes will be considered by CCC in the respective FBC's in relation to the scheme objectives / outputs, commercial constraints, exit strategy, risks, innovation, experience / control, and available contractors.

5.6 Payment Mechanisms

- 5.6.1 Payment timing will be adopted to maximise the value from the contract through minimising financing and construction costs. Prompt and fair payment mechanisms will be applied throughout the supply chain, in accordance with the contract tender documents issued as part of the procurement process.

- 5.6.2 It is envisaged that for each of the MATS schemes, the contract will be an NEC form of contract, which will be written to ensure that:

- The project objectives are achieved
- Risks are mitigated before and during construction
- Best value is achieved in terms of overall delivery.

- 5.6.3 Guidance from the Local Government Task Force states that “where practicable, payment mechanisms should be chosen to reflect opportunities offered by integrated team working. Wherever possible steps should be taken to discourage the potential abuse of retentions within the supply chain.”³²
- 5.6.4 Examples of possible payment mechanisms for the MATS schemes are provided in Table 5.2 below.³³

Table 5.2: Examples of Payment Mechanisms

Payment Mechanism	Description	Advantages	Disadvantages
Fixed Price (Design and Build)	The integrated supply team is appointed to design and construct the facility and is paid a combined fixed price for both components of the project. The risk of the design not working is transferred to the integrated supply team.	The client has certainty as to the final price of the facility. Buildability may be considered during design.	Transferring all risk to the integrated supply team may not be cost-effective, as the client still carries the risk to their business of the new facility not being available when required. Changes to requirements can be very expensive and destroy price certainty. The output specification needs to be very clear and avoid weaknesses or ambiguities, to prevent a reduction in the finished quality of the facility. There may be a break point between stages to review affordability and continued value for money.
Target Price	Client and supply team work together to develop a target price for the facility. Often there can be some sharing of efficiency improvements as well as risk.	The client has certainty over price and the integrated project team has an incentive to make cost savings for the benefit of both the supply team and the client.	The target and arrangements for sharing efficiency and cost savings need to be established carefully to ensure value for money.
Payment on The Basis of Outcomes	The integrated supply team is paid on the basis of achieved outputs such as delivery on time and achieving agreed standards of reliability, capacity and safety.	Incentivises the integrated supply team to consider the long-term needs of end-users and the overall performance of the completed scheme.	This form of contract can be complex, and it may take time to reach agreement with the integrated supply team on the outputs to be achieved and how achievement will be measured.

³² https://constructingexcellence.org.uk/wp-content/uploads/2015/04/Common_Minimum-Standards.pdf

³³ Office of Government Commerce (2007). *Procurement and Contract Strategies: Achieving Excellence in Construction Procurement Guide*.

Payment Mechanism	Description	Advantages	Disadvantages
Target Price with Agreed Profit and Overhead	A target price is developed during the design stage.	<p>The price has two elements – cost, which all those involved in the integrated project team seek to reduce, and profit, which increases as a result of greater efficiency and innovation.</p> <p>Pain / gain share lump sum profit and overhead as opposed to percentage.</p>	<p>All members of the integrated supply team need to know their individual costs, which they are incentivised to keep to a minimum.</p> <p>The target price has to be set at a level that gives sufficient incentive and value for money for the type and complexity of scheme being constructed.</p>

5.6.5 It should also be noted that incentives and performance targets can be used to achieve best value, including a bonus for early completion, target cost, and KPIs.

The MATS Broad Street Scheme is being procured using the NEC4 Engineering and Construction Contract (Option C), which is a Target Cost contract with a pre-agreed pain / gain percentage mechanism.

5.6.6 Payment mechanisms for the remaining four schemes will be confirmed in the respective FBCs, though they are likely to follow a similar model.

5.7 Pricing Framework and Charging Mechanisms

5.7.1 Under the adopted procurement approach, the contractor will provide the MATS Improvement Schemes construction works described in the contract for a sum of money. The contract will provide for specified risks to be carried by the employer, which will result in the lump sum being adjusted if the compensation events occur.

Any changes to the Target Cost will be valued in accordance with the NEC4 Engineering and Construction Contract (Option C) for the MATS Broad Street Scheme.

5.7.2 The pricing framework and charging mechanisms for the remaining schemes will be confirmed in the respective FBCs, although they are likely to be similar to those agreed for the MATS Broad Street Scheme.

5.8 Risk Allocation and Transfer

- 5.8.1 The allocation of risk is a pre-requisite to considering the optimum procurement approach and contracting model. For example, “price certainty” is bought by paying the contractor to accept the risk of fixing a price in a commercial, changing market. The degree of risk involved in key aspects of the delivery must therefore be assessed to consider whether it is more economic for CCC or the contractor to manage these risks.
- 5.8.2 The usual approach to risk transfer is that the management of a particular risk will rest with the party best placed to manage it. Risks associated with land acquisition and funding would tend to remain with CCC, while specific risks associated with construction would tend to be transferred to the contractor.
- 5.8.3 Although many of the design risks can only be resolved through rigorous design and review processes, once the design options are clear and the scope of land acquisition, planning requirements, and environmental requirements are fully identified, the primary risks will be related to construction. There is potential for transferring these risks through the construction procurement process.

The Broad Street Scheme has a fully costed Risk Register detailing the risk allocation and owner. This Risk Register has been shared with contractors and used to inform the Target Cost and procurement.

- 5.8.4 The risk allocation for the remaining four MATS schemes will be agreed during the procurement and confirmed in the respective FBCs.

5.9 Contract Length

5.9.1 A high-level overview of the project timescales is provided in Table 5.3 below. Note that timescales relating to CPCA review and approval for FBC2 and FBC3 are assumed and have not yet been agreed.

Table 5.3: Project Implementation Timescales

Activity	Dates
MATS Broad Street Improvement Scheme (FBC1)	
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Broad Street Construction and FBC2	January 2023 - February 2023
Procurement of MATS Board Street Contractor	October 2022 - February 2023
Construction of MATS Broad Street scheme (in conjunction with FHSF scheme construction)	February 2023 - March 2024
MATS Peas Hill & Hostmoor Avenue, Twenty Foot Road and St Peter's Road Schemes (FBC2)	
Obtain Utility Cost (C4s), Outline Planning, Land Engagement and Target Cost Procurement for Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	February 2023 - December 2023
Submit FBC2, requesting release of funding for Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	December 2023
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Construction and FBC3	December 2023 - March 2024
Obtain Full Planning Approval and Land Agreement (If no need for CPO) for Peas Hill and Twenty Foot Road Schemes.	March 2024 - December 2024
CPO and Side Road Order Statutory process	June 2023 - March 2025
Construction of Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	March 2025 - March 2026
MATS NILR Scheme (FBC3)	
Commence NILR Detailed Design, including Governance Process and statutory orders	March 2024 - March 2025
Begin Planning Process and supporting surveys (Ecology / Topography)	March 2024 - August 2025
Obtain Statutory Orders including CPO (approval from FDC, CCC)	March 2024 - October 2026
Target Cost Procurement for NILR	March 2025 - September 2025
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Construction	September 2025 - November 2025
NILR Construction	October 2026 - December 2027
MATS Post Scheme Monitoring and Evaluation	December 2028 - December 2033

Procurement of the MATS Broad Street Scheme began in October 2022 and tender responses have been received. The independent technical assurance review of this Business Case (FBC1) and resultant Board decision on funding is expected to conclude by January 25th, 2023, with a preferred Contractor selected in the week commencing 6th February 2023. Mobilisation and construction will then follow shortly after and have commenced by the end of February 2023.

The MATS Broad Street Scheme has been accelerated ahead of the remaining four MATS schemes to ensure compliance with the timescales associated with the FHSF and TCF funding. The financial restraints dictating this approach are explained in Section 4.3 of the Financial Dimension and the interdependency with the adjacent FHSF Broad Street Scheme is set out in Section 2.8 of the Strategic Dimension. Details on how delivery of the MATS Business Cases have been phased are provided in Section 1.3 of the introduction.

- 5.9.2 Timescales for the FBC2 activities are indicative and subject to approval to proceed at the CPCA Board Meeting on 25th January 2023. The programme for later tasks (associated with FBC2 and FBC3) are considered to be conservative with further opportunities for acceleration. For example, the programme for construction of the NILR assumes the requirement for land acquisition, however it may be possible for this to begin twelve months earlier if the land can be obtained through agreement.

5.10 Contract Management

- 5.10.1 The design works and the associated professional services contract will be managed by CCC's project management team. This will include the monitoring of project fees and the effective management of change. Monthly progress meetings are to be held, with standing items on the agenda such as programme, risks and financial review. For the site works, the responsibilities of the Project Manager and Supervisor will be carried out by the procured contractor. As part of this role, the procured contractor will audit costs to ensure that they are within scheme budgets, monitor the programme, monitor the monthly payment applications, assess compensation events (with client approval), resolve disputes, and supervise the works on site.

6. Management Dimension

6.1 Introduction

- 6.1.1 The purpose of the Management Dimension is to outline how the proposed schemes and the intended outcomes will be delivered successfully. It provides assurances that scheme accountability, programming, resources, assurances, risks, and communications can be managed effectively to ensure the scheme's delivery is ultimately successful.
- 6.1.2 This includes information relating to the management of project constraints and scheme dependencies; project governance, management and reporting structures; programme delivery milestones, assurance and approvals; communications and stakeholder management; outline plans for project monitoring, evaluation and benefits realisation; and the risk management of project delivery and construction.
- 6.1.3 This Management Dimension builds upon that reported within the OBC and provides further detail, especially in relation to the MATS Broad Street Scheme.

6.2 Evidence of Similar Projects

- 6.2.1 Evidence of the delivery of similar projects is provided below to re-affirm the feasibility of successfully delivering the MATS improvement schemes.

Ely Southern Bypass

- 6.2.2 The Ely Southern Bypass, as shown in Figure 6.1, below, is a new road that connects the A142 at Angel Drove to Stuntney Causeway and includes bridges over the railway line and the River Great Ouse and its floodplains.



Figure 6.1: Ely Southern Bypass (Source: VolkerFitzpatrick)

- 6.2.3 The purpose of the bypass is to ease congestion in and around Ely by providing a new link between Stuntney Causeway and Angel Drove to the south of the city. In addition, the new route removes the need for heavy goods vehicles to route through the city centre, which thus facilitated the permanent closure of a level crossing and eliminated the possibility of vehicle strike incidents at a low bridge accident hotspot.
- 6.2.4 The Ely Southern Bypass also facilitated active travel mode improvements, with enhanced walking and cycling provision around Ely Railway Station through the railway underpass. In addition, a new walkway attached to the bypass road bridge facilitates improvements to pedestrian access over the River Great Ouse, connecting the Fen Rivers Way and Ouse Valley Way footpaths together.
- 6.2.5 A contract for the detailed design, technical approval and construction of the bypass was tendered in line with procurement regulations and the contractor VolkerFitzpatrick was appointed in summer 2016. The Ely Southern Bypass opened to traffic on 31st October 2018 with the level crossing closed on 1st November 2018. The bridge walkway opened on 23rd January 2019 and the Ely underpass opened on 28th February 2019.
- 6.2.6 The project was funded by the CPCA, CCC, East Cambridgeshire District Council, Cambridgeshire and Peterborough Combined Authority (£22 million Growth Deal which includes £16 million from Department for Transport) and Network Rail.

Kings Dyke

- 6.2.7 The Kings Dyke scheme is located on the A605 between Peterborough and Whittlesey and the purpose of the scheme is to close the existing level crossing where considerable delays currently exist.



Figure 6.2: Kings Dyke (Source: Jones Brothers)

- 6.2.8 The scheme consists of the construction of approximately 1km of new road to the south of the existing road, a bridge over the railway line, an underpass for private access, two roundabouts and associated tie-ins to the existing highway. The existing level crossing will be stopped up upon completion of the scheme.
- 6.2.9 In spring 2020 the scheme went through a two-stage open tender under OJEU to procure a design and build contractor to carry out the Detailed Design and construction of the scheme. The successful contractor was Jones Bros and construction work commenced on site in June 2020. Construction is still ongoing and due to complete by December 2022.
- 6.2.10 The project is part funded by the Cambridgeshire and Peterborough Combined Authority (£24.4m) and by Cambridgeshire County Council (£7.6m).

6.3 Scheme Constraints and Dependencies

- 6.3.1 A number of potential constraints and interdependencies for the delivery of the MATS Improvement Schemes have been identified and are detailed in Section 2.7 and Section 2.8 respectively and summarised beneath.

Scheme Constraints

- 6.3.2 The key constraints requiring further consideration and potential management during the detailed design and construction phase of the MATS Improvement Schemes are summarised as follows:

- Funding: Confirmation of the CPCA and CCC funding sources, as detailed in the Financial Dimension (Chapter 4), will need to be secured and documented for inclusion in respective FBCs. Delays in securing the required funding, due to competing priorities or other issues, could delay the construction phase of the MATS Improvement Schemes. There is also the risk that the required funding will not be available.

Note that funding has been secured for the construction of the MATS Broad Street Scheme subject to CPCA Board approval. Therefore, this constraint only applies to the remaining MATS schemes.

- Land Acquisition: The requirement for land acquisition for the construction of the A141 / Peas Hill and A141 / Hostmoor Avenue, A141 / Twenty Foot Road junctions and NILR schemes requires negotiation with private landowners. There are also potential complexities associated with the compulsory purchase process if this is required, which may impact on the programme delivery schedule.

Note that there is no land acquisition required for the construction of the MATS Broad Street Scheme, and that this constraint only applies to the MATS schemes listed above.

- Planning: Planning permission is likely to be required for the A141 / Peas Hill and Hostmoor Avenue, the A141 / Twenty Foot Road and the NILR schemes, as the design proposals involve a change of land use and represent an extension or change to the existing highway boundary.

Note that there are no planning requirements for the MATS Broad Street Scheme, however planning is needed for the FHSF scheme. This is well progressed and discussed further in Section 2.8 of the Strategic Dimension.

- Spatial and Utility Constraints: The Broad Street scheme is constrained by the built environment as well as proximity to locally important historic structures within March Town Centre. This will require ongoing consultation with Historic England and FDC's Conservation Team. Ground surveys have identified the requirement for additional drainage and utility diversion assessments as part of the construction works, and these will need to be accommodated within the existing constraints. The Detailed Design and ECI stage have accounted for this.
- Construction Programming: Individual scheme construction phases will be scheduled to accommodate other planned highways works across March, in order to minimise disruption to road users.

The delivery of the Broad Street scheme is aligned to the delivery of the FHSF Broad Street and Riverside public realm proposals and has been procured as a single package.

- Stakeholder / Public Acceptability: The detailed design of the MATS Improvement Schemes should continue to be supported by key stakeholders impacted by scheme proposals, as well as members of the public.
- Environmental Constraints: Scheme design will need to take account of local ecological receptors, protected land and Habitats of Principle Importance within the defined study area. These requirements predominantly relate to the NILR scheme proposals.

Scheme Dependencies

- 6.3.3 The key scheme interdependencies which will influence the successful management and delivery of the MATS Improvements Schemes are summarised as follows:

Future High Street Fund Scheme

- 6.3.4 The FHSF public realm proposals adjoin the MATS Broad Street Scheme design boundary. The designs for the two schemes have been developed in parallel, with constant dialogue between the two project delivery teams, culminating in a joint procurement exercise. This will ensure that the schemes complement each other to deliver the optimal highway and public realm improvements for Broad Street.
- 6.3.5 The MHCLG award of FHSF funding is conditional on these funds being spent by March 2024. The interdependence between the FHSF scheme and the MATS Broad Street scheme dictates that both schemes be constructed at the same time, during 2023, as explained in Section 4.3 (Financial Constraints) of this Business Case.

Hostmoor Avenue Planning Applications

- 6.3.6 Although technically not a dependency, there are several live and anticipated planning applications in the vicinity of the A141 / Hostmoor Avenue Junction which are expected to have a future impact on the junction's operation. These include two sites directly to the east of the junction (one for a food store and one for a fast-food restaurant) which have submitted live planning applications, and a site to the west of the junction which has permitted planning permission for a retail park³⁴.
- 6.3.7 Growth from each of these developments has been considered within the assessment undertaken by the MATS project, ensuring that the scheme design can accommodate future trips generated by these sites.
- 6.3.8 The MATS project itself is not dependent on these developments, and alternate junction forms have been tested and proven to operate at this location should the development sites not come forward. Any changes required to the form of the A141 / Hostmoor Avenue Junction resulting from the progression of these planning applications, along with details of any S106 developer contributions, will be confirmed in FBC2.

Local Plan Growth Sites

- 6.3.9 The economic viability of the MATS Improvement Schemes for supporting local housing and employment growth aspirations requires the delivery of these growth ambitions to be realised. The degree of dependency has been explored through sensitivity testing and the assessment of a 'low growth' scenario, which is detailed in the Economic Dimension (Chapter 3).

³⁴ 1) F/YR19/1093/F - Erection of a A3 / A5 two-storey drive-thru restaurant / takeaway with associated parking and new access onto Hostmoor Avenue, 2) F/YR21/0885/F - Erection of a Class E(a) retail food store with associated parking and new access onto Hostmoor Avenue, 3) F/YR15/0640/F - Westry Retail Park.

March Pedestrian, Signage and Cycling Strategy

- 6.3.10 Proposals identified for delivery via the March Pedestrian, Signage and Cycling Strategy will encourage the use of active travel in March. These schemes will facilitate the impact of the MATS Improvement Schemes for ensuring the transport network in March can sustainably accommodate future growth in travel demand.

6.4 Governance, Organisational Structures, Roles and Responsibilities

- 6.4.1 The CPCA is the organisation ultimately responsible for the delivery of the MATS Improvement Schemes, with CCC nominated as the delivery partner, with delegated authority.
- 6.4.2 Figure 6.3 overleaf sets out the roles and responsibilities for managing the project of the key project staff and shows the reporting lines between the CPCA, CCC and wider project team.
- 6.4.3 The Figure shows that the CCC Project Manager is responsible for management of the project (delegated down from the CPCA) and is supported by the CPCA Programme Manager where needed. The CCC Project Manager manages delivery of the project with input from key stakeholders, including Fenland District Council, as well as technical specialists (transport planning, design, environment, etc.) and contractors procured to develop and construct the package of MATS Schemes.



Figure 6.3: Project Management Structure

6.4.4 A detailed Governance structure for the delivery of the MATS schemes is provided in Figure 6.4 below. It details the delegated authority structure of CCC's delivery teams and the reporting lines between CPCA, CCC, FDC and the Members' Steering Group. The structure will continue to be refined throughout each of the remaining phases of the MATS project, and indicate the specific roles assigned for project governance and management.

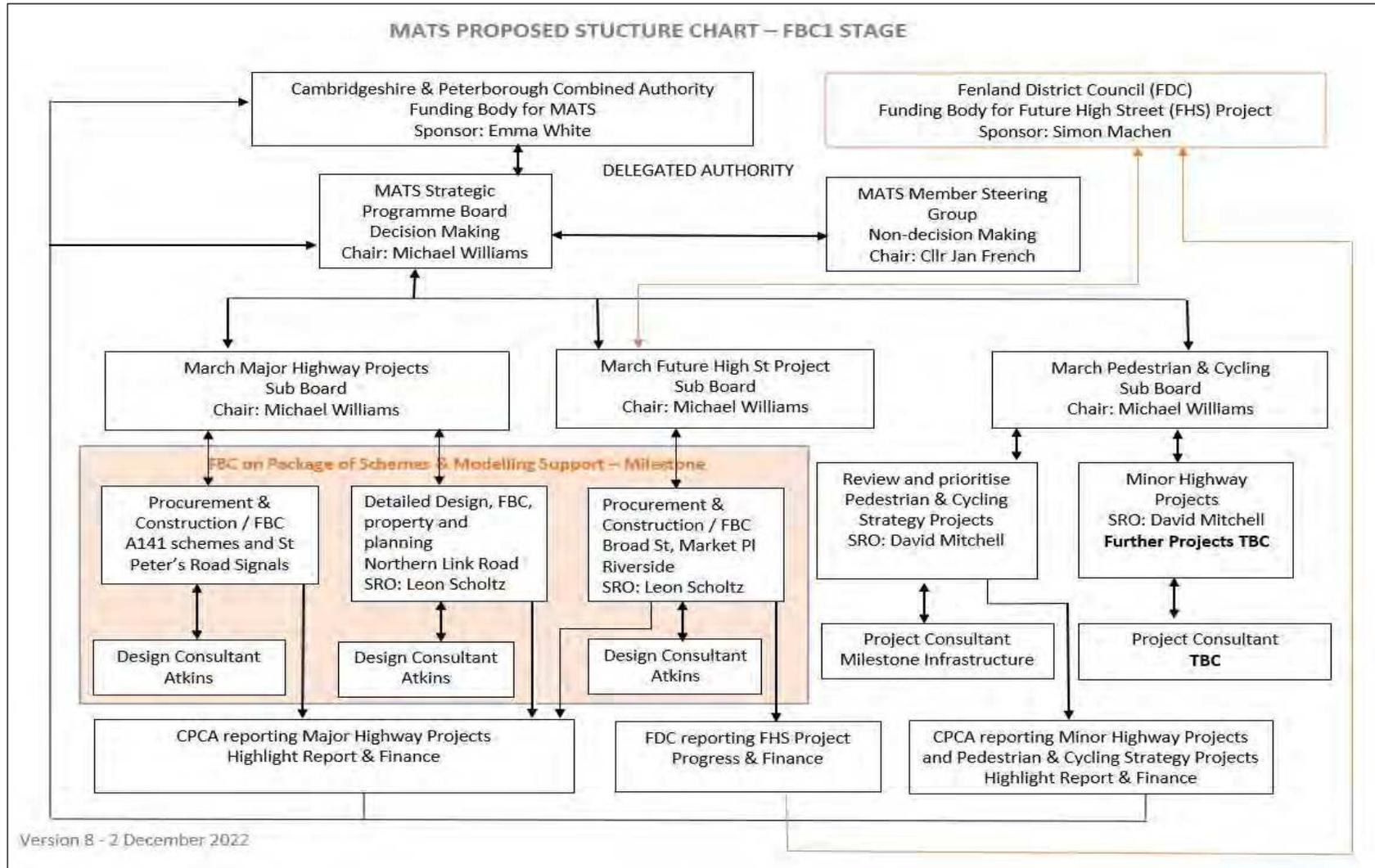


Figure 6.4: MATS Proposed Governance Structure Chart (FBC1 Stage)

- 6.4.5 The MATS Strategic Programme Board will oversee the continued development and delivery of the schemes and make key decisions relating to the delivery of the project. The purpose of the Strategic Programme Board is to provide oversight of the project and make the key decisions regarding governance, finance, risk management, and programme delivery.
- 6.4.6 CCC will take responsibility for the development and delivery of the MATS schemes, with four 'Project Sub Boards' set up to deliver the schemes as follows:
- March Major Highway Projects
 - A141 / Peas Hill Roundabout including A141 / Hostmoor Ave all-movement 3-arm signalised junction
 - A141 / Twenty Foot Road traffic signals.
 - High Street / St Peter's Road traffic signals.
 - March FHSF / MATS Project
 - Broad Street.
 - March Northern Link Road
 - Northern Industrial Link Road
 - March Minor Highway Projects
 - Quick Win Projects including Pedestrian / Cycling Strategy schemes.
- 6.4.7 Each 'Project Sub Board' will be supported by a Project Team of technical specialists, managed by a Project Team lead, designated by the CCC Project Sub Board.
- 6.4.8 Each Project Team will consist of key project delivery partners / stakeholders. The Project Team will be responsible for the daily running of the project, coordinating and managing all key stakeholders and partners, and managing scheme delivery. The Project Team 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.
- 6.4.9 Each Project Sub Board will report monthly to the MATS Strategic Programme Board on how the project is performing against the project objectives, key programme milestones, financial targets and whether there are any new risks that could impact on scheme delivery.

- 6.4.10 Regular Project Progress Meetings will be held throughout the duration of the schemes to allow the team to discuss important issues that could affect delivery.
- 6.4.11 The MATS Member Steering Group, consisting of elected members and key stakeholders, forms part of the Governance role. Further information regarding the role of the MSG is provided in the Communications and Stakeholder Engagement section, below.

6.5 Project Plan: Project Delivery Milestones

- 6.5.1 A timescale for the key project delivery milestones is illustrated in Table 6.1, below. These project delivery timescales assume funding will be available to progress each of the stage activities.

Table 6.1: Timescale for Project Milestones

Activity	Dates
MATS Broad Street Improvement Scheme (FBC1)	
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Broad Street Construction and FBC2	January 2023 - February 2023
Procurement of MATS Board Street Contractor	October 2022 - February 2023
Construction of MATS Broad Street scheme (in conjunction with FHSF scheme construction)	February 2023 - March 2024
MATS Peas Hill & Hostmoor Avenue, Twenty Foot Road and St Peter's Road Schemes (FBC2)	
Obtain Utility Cost (C4s), Outline Planning, Land Engagement and Target Cost Procurement for Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	February 2023 - December 2023
Submit FBC2, requesting release of funding for Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	December 2023
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Construction and FBC3	December 2023 - March 2024
Obtain Full Planning Approval and Land Agreement (If no need for CPO) for Peas Hill and Twenty Foot Road Schemes.	March 2024 - December 2024
CPO and Side Road Order Statutory process	June 2023 - March 2025
Construction of Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	March 2025 - March 2026
MATS NILR Scheme (FBC3)	
Commence NILR Detailed Design, including Governance Process and statutory orders	March 2024 - March 2025
Begin Planning Process and supporting surveys (Ecology / Topography)	March 2024 - August 2025
Obtain Statutory Orders including CPO (approval from FDC, CCC)	March 2024 - October 2026
Target Cost Procurement for NILR	March 2025 - September 2025
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Construction	September 2025 - November 2025
NILR Construction	October 2026 - December 2027
MATS Post Scheme Monitoring and Evaluation	December 2028 - December 2033

- 6.5.2 The delivery of the MATS Broad Street scheme is prioritised to align with the construction programme for the FHSF scheme, in order to meet the FHSF expenditure timeframe of March 2024.

- 6.5.3 The other MATS schemes project activity timelines will be revised and confirmed at FBC2 following procurement, to accommodate requirements associated with land acquisition negotiations, which will be reported through the Sub-Boards and Strategic Programme Board structure and documented in FBC2.

6.6 Assurance and Approvals Plan

- 6.6.1 The CPCA will manage the project in line with their existing assurance and approvals process. The CPCA Programme Manager, working closely with the CCC Project Manager and FDC Lead Officer, will be responsible for the daily running of the project, and any approvals required will be provided by the Strategic Programme Board.
- 6.6.2 The CPCA Assurance Framework³⁵ sets out the fundamental principles in relation to the use and administration of all funds within the Cambridgeshire and Peterborough Medium Term Financial Plan and outlines a culture underpinned by processes, practices, and procedures. The Assurance Framework sits alongside a number of other CPCA documents including the Constitution and Devolution Deal.
- 6.6.3 As part of the CPCA Assurance Framework, an Independent Technical Evaluation (ITE) of the Business Case will be undertaken at each stage of the project. The ITE will be undertaken by a third-party organisation and will assess the Business Case (and supporting information) against the CPCA's Technical Assurance Framework to make a recommendation to the CPCA Transport Board as to whether each phase of the Business Case is ready for submission to the CPCA Board for approval.
- 6.6.4 Further to the above, the Combined Authority has developed the 'Ten Point Guide'³⁶ to project management which outlines the governance requirements which should be followed throughout the life cycle of the project. It details the requirements at project initiation, including reiterating the need to establish a Project / Programme Board with the Combined Authority and delivery partners. The Project / Programme Board should also establish a RACI chart; a copy of the RACI template is included in the Combined Authority's Ten Point Guide.

³⁵ <https://mk0cpcamainsitehdbtm.kinstacdn.com/wp-content/uploads/documents/business-board/governance/Local-Assurance-Framework-.pdf>

³⁶ <https://cambridgeshirepeterborough-ca.gov.uk/wp-content/uploads/Monitoring-and-Evaluation-Framework-v1.6.pdf>

6.7 Communication and Stakeholder Engagement

6.7.1 Communication and Stakeholder engagement for the MATS project consists of:

- Providing regular updates on delivery progress and key activities to the local community, businesses and key stakeholders
- Engaging with the local community, businesses and key stakeholders about delivery 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, businesses and key stakeholders.

Stakeholder Engagement and Communication

6.7.2 Throughout the development of the MATS Improvement Schemes to date, regular Member Steering Group meetings (MSGs) have been held. MSGs include elected members from CCC, FDC and March Town Council (MTC), as well as local authority officers and consultants from planning, transport and engineering disciplines. Other stakeholders have attended as required, for example from the FHSF team. The MSG is not a decision-making group. The MATS Strategic Programme Board makes decisions relating to the delivery of the project as detailed in Section 6.4.

6.7.3 MSGs to date have provided key project stakeholders with regular updates on development of the schemes, given elected councillors the opportunity to steer the project, and provided information relating to transport works ongoing in the local area. It is expected that further MSGs will be held as the schemes develop.

6.7.4 Key stakeholder support has been received from representatives of HMP Whitemoor Prison, in regard to the NILR scheme. The scheme will enable an alternative entry / exit route to the facility, which is required to comply with national guidelines for prison access³⁷. Network Rail have also responded favourably, giving permission for access to their land for scheme survey work.

The Stakeholder Engagement Strategy for the MATS Broad Street Scheme lists details when and how stakeholder engagement will take place for the MATS and FHSF Broad Street Scheme. This is included in Appendix A.

³⁷ [CCC/HMP Whitemore Prison Meeting, 29th August 2019](#)

Public Consultation

- 6.7.5 Significant consultation with members of the public has already been undertaken during the development of the adopted Fenland Local Plan, the March Neighbourhood Plan and the Growing Fenland project.
- 6.7.6 In relation to the current schemes, proposals for a public consultation were due to take place over a six-week period during April and May 2020. A number of events were scheduled to engage with local residents and gather public opinion around specific interventions, as well as to gauge levels of support for the schemes as a whole. As a result of the onset of the Covid-19 pandemic, with central government restrictions placed on social interactions and a requirement for social distancing, proposals for traditional public consultation events were postponed on public safety grounds.
- 6.7.7 As an alternative, a fully online public consultation event was hosted by CCC over a six-week period during May and June 2020. This took members of the public through a virtual consultation 'room', which displayed key information about the MATS Improvement Schemes. This included the overall transport vision for March, the different options tested, and the individual schemes proposed at specific locations. This also offered residents the opportunity to fill out an online survey expressing their opinions in relation to specific interventions and the proposed scheme as a whole.



Figure 6.5: MATS Online Public Consultation (May – June 2020)

- 6.7.8 The online consultation event was heavily promoted to local residents by the CPCA, CCC and FDC through traditional channels and social media. There were approximately 5,400 visits to the online consultation site between 15th May 2020 and 28th June 2020, with a total of 115 usable completed surveys. Approximately 78% stated they were residents of March and covered a broad age range, reflective of the town's population.

6.7.9 Initial results from the online consultation indicated the following proportion of respondents either 'Strongly Supported' or 'Supported' each of the MATS Improvement Scheme elements:

- A141 / Twenty Foot Road Traffic Signals - 63%
- A141 / Peas Hill Roundabout - 62%
- Hostmoor Avenue Roundabout - 76%
- High Street / St Peter's Road Traffic Signal Improvements - 53%

- Broad Street Roundabout with associated public realm – 57%

- Northern Industrial Link Road - 70%.

6.7.10 This indicated that each of the MATS Improvement Scheme elements are supported by the majority of respondents. Full results and analysis from the online consultation are presented in the Future March: Summary Report of Consultation Findings (July 2020), available on CCC's website.³⁸

6.7.11 FDC also undertook a public consultation exercise regarding the March Future High Street Fund proposals, in May 2020.

6.7.12 A final round of Public Engagement was undertaken in September 2022 through a series of in-person events in March Town Centre. These events were attended by Cambridgeshire County Council and Fenland District Council Officers and presented the Detailed Design proposals for the schemes. A total of 55 people engaged with these events and feedback was collected and relayed to the project team.

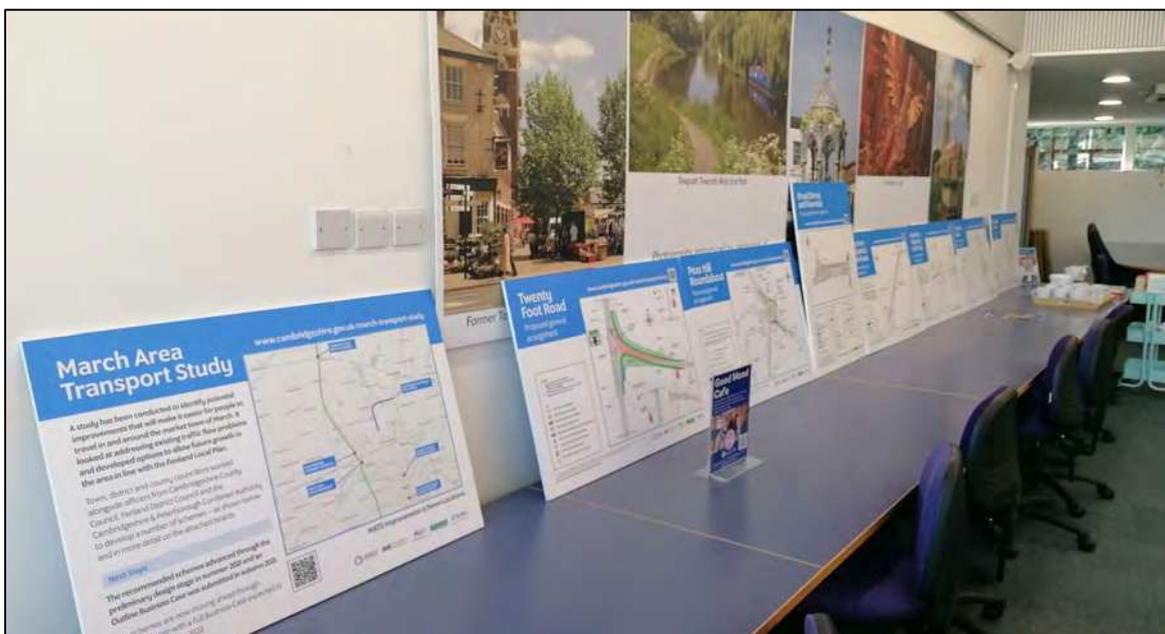


Figure 6.6: MATS Public Engagement Event (September 2022)

³⁸ <https://www.cambridgeshire.gov.uk/asset-library/Future-March-consultation-report-and-appendices.pdf>

6.8 Benefits Realisation Plan

- 6.8.1 A Benefits Realisation Plan has been prepared for the MATS, which sets out the approach to managing the realisation of benefits of the proposed improvement schemes. This document is included in Appendix I of this report.
- 6.8.2 The plan has been prepared in accordance with the guidance provided by the DfT (Transport Business Cases³⁹), HMT (The Green Book⁴⁰), and the Infrastructure and Projects Authority (Guide on Assurance of Benefits Realisation in Major Projects⁴¹).

6.9 Monitoring and Evaluation

- 6.9.1 A Monitoring and Evaluation Plan has also been prepared for the MATS schemes, which outlines the arrangements for monitoring and evaluating the proposed improvement schemes in accordance with guidance from the DfT⁴². This document is included in Appendix J of this report.
- 6.9.2 The Monitoring and Evaluation Plan has been prepared in accordance with the guidance provided by the DfT (The Transport Business Cases⁴³; Monitoring and Evaluation Framework for Local Authority Major Schemes⁴⁴) and HMT (The Green Book⁴⁵).
- 6.9.3 The plan provides information relating to the scheme background and context, scheme objectives and outcomes, data collection methods, resourcing and governance arrangements, delivery plan, and dissemination plan.
- 6.9.4 Crucially, the delivery plan identifies the key monitoring and evaluation tasks to be undertaken during pre-construction, construction, and post construction phases of scheme development. The monitoring and evaluation work will culminate with the production of a One Year After Monitoring and Evaluation Report (to be produced 12 months post scheme implementation) and a Final Monitoring and Evaluation Report (to be produced approximately five years post scheme implementation).
- 6.9.5 Note that Monitoring and Evaluation will be assessed in three phases to match the phasing developed for the FBCs, with the outcomes specific to the MATS Broad Street Scheme assessed following completion of that scheme (in 2024). Two further rounds of post scheme monitoring will then be undertaken following submission of FBC2 and FBC3.

³⁹ DfT (2013). [The Transport Business Cases](#)

⁴⁰ HMT (2020). [The Green Book: Central Government Guidance on Appraisal and Evaluation](#)

⁴¹ Infrastructure and Projects Authority (2016). [Guide on Assurance of Benefits Realisation in Major Projects](#)

⁴² DfT (2013). [The Transport Business Cases](#)

⁴³ DfT (2013). [The Transport Business Cases](#)

⁴⁴ DfT (2012). [Monitoring and Evaluation Framework for Local Authority Major Schemes](#)

⁴⁵ HMT (2020). [The Green Book: Central Government Guidance on Appraisal and Evaluation](#)

6.10 Risk Management Strategy

- 6.10.1 A Project Risk Register, managed by CCC, and a Construction Risk Register, produced by the lead design consultant, are provided for the delivery of the MATS Improvement Schemes. Both Risk Registers are reviewed regularly at progress meetings with updates reported to the Project Team and Strategic Programme Board through the monthly Highlight Reports.
- 6.10.2 The construction Risk Register for the MATS Broad Street Scheme was shared with contractors as part of the procurement process and has fed into the Target Cost exercise.

Project Risk Register

- 6.10.3 The live Project Risk Register has been developed by CCC to guide and inform the project. This identifies potential risks, considers the impact they may have, the likelihood of them occurring, and the measures that will be taken to mitigate these.
- 6.10.4 CCC update the Project Risk Register on a fortnightly basis and issue it to the CPCA every month. The latest version of the MATS Project Risk Register is provided in Appendix K. As of December 2022, there are 10 live risks identified of which 10 are rated as red, with the highest likelihood impact RAG score (12+) and 2 are rated as amber (5+ RAG score).
- 6.10.5 Each of these risks are actively managed and reviewed at CCC Progress Meetings and CPCA Project Board Meetings and have proposed mitigations in place.

Construction Risk Register

- 6.10.6 Construction Risk Registers identifying potential levels of risk associated with the Detailed Design and construction of each MATS Improvement Scheme have been developed and are included in Appendix H. These are live documents which will be continually evaluated as the design and procurement for each of the MATS Improvement Schemes evolve to ensure that all potential risks are identified that could have a detrimental effect on the construction and operation of the built schemes, with mitigation plans developed.
- 6.10.7 A summary of the evaluation of key construction risks identified for the construction of the MATS Improvement Schemes are provided in Table 6.3 below.

The MATS Broad Street Risk Register was shared with Contractors as part of the procurement exercise and is included in Appendix H. Costs from the Risk Register were incorporated into the scheme costs used in the Economic and Financial Dimensions.

Appendices

Appendix A: Stakeholder Engagement Strategy

March Future High Streets Communications Plan 2022

This Communication Plan identifies the types of communication and documentation that will be delivered to specified audiences for the March Future High Street Fund project, including residents and other stakeholders. The Plan specifies the way in which information will be shared and sets the schedule for communications throughout the project. The plan will be reviewed by key project stakeholders to ensure that all interested groups and all types of project information are covered, as well as to confirm the plans for timely delivery of that information.

Aim

To deliver consistent, coordinated, and targeted messaging to inform and engage a range of stakeholders, with the aim of raising awareness of planned works at key stages and the benefits they will bring to local people, businesses, and visitors to the town.

Key audiences

- Residents
- Partners (including March Town Council and Cambridgeshire County Council)
- Market traders
- Shop managers/owners
- Investors (DLUHC and CPCA)
- Media representatives
- March schools
- March Society
- FDC Members and Cambridgeshire County Council Members
- FDC staff

Objectives

- Raise awareness: Build awareness of project, timescales, processes, benefits, issues, successes.
- Clarify Broad Street road scheme: Ensure stakeholders are aware that the Broad Street road scheme is a March Area Transport Study (MATS) project, resulting from traffic assessments.
- Provide up-to-date information: Ensure stakeholders are provided with and can access the latest information.
- Influence perceptions: Increase understanding of works to encourage positive opinions and perceptions.
- Build positive relationships: Build trust with all stakeholders to increase confidence in the project, minimise uncertainty and improve problem-solving.

Key messages

- Project will help the town centre to remain vibrant and viable for the future.
- Project will help increase footfall into the town centre and increase the amount of time people spend there.
- Need for change – MATS work will reduce traffic congestion and pollution in the town centre, making it safer and healthier in the long-term.
- Loss of parking in town centre to be resolved with City Road car park mitigation and other parking options.

Communications approaches and target audiences

- Press Releases (all)
- Regularly update MFHSF webpage: www.fenland.gov.uk/mfhsf (all)
- Ongoing social media updates (all)
- Manned consultation pop-up in March Library (residents, traders, shop owners/managers)
- Manned consultation pop-up on March Market Place (residents, traders, shop owners/managers)
- Business letters and drop-in workshops (traders, shop owners/managers)
- Monthly email updates (FDC and CCC members and partners)

Communications Action Plan Undertaken to Date:

Date	Communications Activity	Lead Officer	Key stakeholders	Delivery by	Complete
May 2022	Update MFHSF webpage	DW/AA	All	6 May	
	Consult with Market Traders (Market Place)	MW	Traders	20 May	
	Consult with Street Licence holders	MW	Traders	20 May	
	March Town Council briefing	PH/MW	Partners	30 May	
June 2022	Update MFHSF webpage with preliminary designs for Riverside/Broad Street scheme	DW/AA	All	End June	
	Press Release with preliminary designs for Riverside/Broad Street scheme	AA	All	End June	
	Design MFHSF branding for comms materials (i.e. pull-up banners, Survey Monkey, social media, Library video)	CM	/	14 June	
	Town Centre walkaround and retailer engagement on Riverside/Broad Street scheme	MW	Shop owners /managers	16 & 22 June	
	Invites to traders/shop owners to attend Library consultation pop-up	MW	Market traders/shop owners/managers	16 & 22 June	
	Library pop-up information stand installed (prelim designs)	MW	/	20 June	
	Manned pop-up event at Library	MW	Residents, traders, shop owners	20 June 30 June	

	Social media engagement	AA/CM	All	Ongoing	Ongoing
	Monthly email update	MW	Members/partners	End June	
July 2022	Updated MFHSF webpages with FAQs from socials	MW/AA	All	1 July	
	Town Centre walkaround and retailer engagement on Riverside/Broad Street scheme	MW	Shop owners /managers	Completed	
	Manned pop-up event at Library	MW	Residents, traders, shop owners	7 July	
				14 July	
				21 July	
	Manned Market Place pop-up, Saturday market	MW	Residents, traders, shop owners	23 July	
	Re-engage with Market Traders on Market Place designs	MW	Market traders	Completed	
	Social media engagement	AA/CM	All	Ongoing	
Highlight Report	MW	Members/partners	End July		
August 22	Email response to people who completed feedback survey	MW/SM	Residents, traders, shop owners	End August	
	Market Trader relocation meeting	MW	Market traders	TBC	
	Social media engagement	AA/CM	All	Ongoing	
	Highlight Report	MW	Members/partners	End August	
Sept 22	Update MFHSF webpage with detailed designs for Riverside/Broad Street and FAQs	DW/AA	All	End Sept	
	Library pop-up information stand updated (detailed designs for Broad Street/Riverside)	MW	/	TBC	
	Update comms branding with new materials	CM	/	TBC	Postponed - December
	Press Release on war memorial flag poles	AA	All	End Sept	Postponed - TBC
	Highlights Report	MW	Members/partners	End Sept	

Future Communications Plan 22/23:

Marketplace:

ITEM	METHOD	DATE	AUDIENCE
Letters to Traders	Email / Letter	October	Traders
Comms on Relocation	Social / Press Release	November - Ongoing	General Public
Comms on Works	Social / Press Release	December	General Public
Signage for Relocation	Physical Signs	January	General Public
Member photo op	Press Release	WC Jan 9th	Members / MP / Leader / Minister?
Comms on re-opening	Social / Press Release	March	Public
Re-opening	Press Release	March	Members

Broad Street and Riverside:

ITEM	METHOD	DATE	AUDIENCE
Comms on Closures (GAS WORKS)	Social / Press Release	Early Jan	General Public
Comms on Contractor secured	Social / Press Release	Early Jan	General Public
Project Update	Website	January	All
Comms on works commencing (FHSF)	Social / PR / Website	April	All
Breaking Ground PR	Press Release	May	Members / MP / Leader / Minister
Ongoing Updates	Social / Website / Letters to Shopkeepers	May onwards (per 2 months)	Public / Shopkeepers
Physical Signage	Physical / Banners	Duration of Works	All

Premises Grants:

ITEM	METHOD	DATE	AUDIENCE
Grant Relaunch	Social / PR	Jan	Landlords
Press on successful applicants	Social / PR /website	Duration	Public
Press on works completed	Social / Website	Duration	All

Future Comms Investment Umbrella for March.

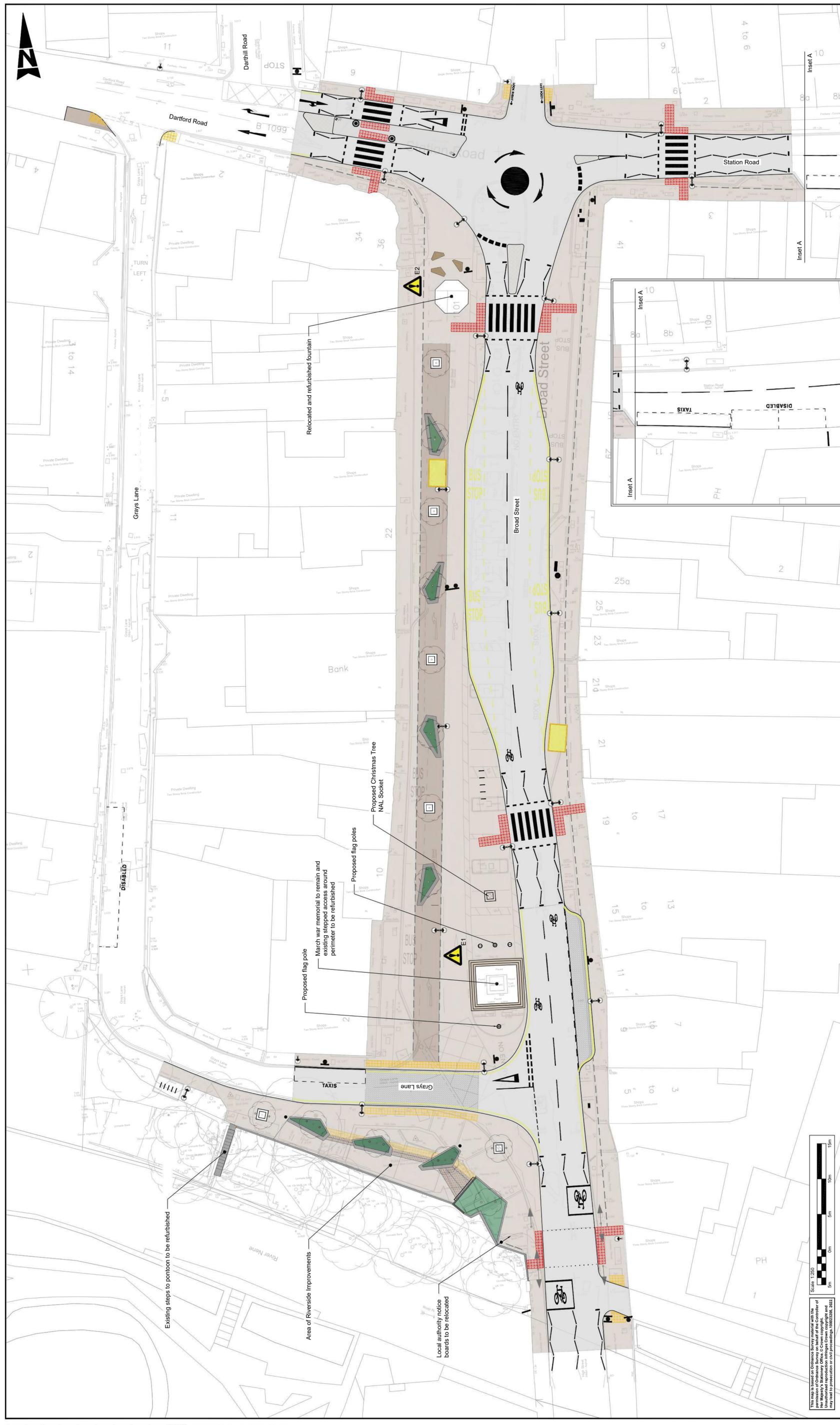
Officers received a steer from the Member Steering Group to identify and separate all elements of investment in March over the coming years, to be communicated with the public via an “investment umbrella” brand. As such officers have currently identified the following upcoming investment and projects which will be covered by this umbrella:

- ▶ Cityfibre Fibre Broadband Connections £5m
- ▶ Market Place £440k FHSF DLUHC Funding
- ▶ Riverside £1.25m FHSF DLUHC Funding
- ▶ Broad Street £2.3m FHSF DLUHC Funding
- ▶ March Area Transport Strategy investment into Broad Street £4.2m
- ▶ CPCA investment into March £2m
- ▶ Vacant Unit Investments £680k FHSF
- ▶ Cadent Gas – TBC (paid for through MATS)
- ▶ Changing Places £240k
- ▶ Further Potential Developer Investment in Development Sites in the future

Operational Notes –

Officers from Fenland District Council hold monthly meetings to discuss previous communications successes/challenges as well as to align upcoming communications with the project. All communications are approved via David Wright – Policy and Communications Manager before being published as well as relevant DLUHC (where required) approvals. Where applicable the team will always look to seek comment from relevant partners, members or ministerial stakeholders to support communications.

Appendix B: General Arrangement (GA) Drawings



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APPROVED - PUBLISHED

Project: Future High Street - Broad Street & Riverside
 Drawing Title: GENERAL ARRANGEMENT

Project Number: CCCFHSF - ATK - HGN -
 XX_ZZ - DR - CH - 000001

Project Name: Future High Street - Broad Street & Riverside

Revisions	Description	Revised By	Checked By	Issue Date
A1	Markings amended. Fountain relocated. Loading bay amended	DK	DK	25/03/22
A1	Proposed Toilet Block included. Station Rd taxi/disabled bay included.	RM	RM	05/05/22
A1	Lighting added. Minor changes to paving, shelters, loading & disabled bays.	RM	RM	19/05/22
A1	July updates following members meeting	DK	DK	20/07/22
A1	Changes to Riverside Area and Misc Updates Throughout	DK	DK	01/09/22

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

- C1 - Existing War Memorial to be protected and retained.
- E1 - Existing March Fountain to be protected and relocated.
- Maintenance / Cleaning

Use: None
 Decommissioning / Demolition: None

Proposed Sign Post and Face

See Safety, Health and Environment information box

8m Flag pole
 6m Flag pole

Notes:
 1. All dimensions are in metres unless otherwise stated

Zebra crossing
 Existing street furniture and utility cabinets to remain

Drainage channel
 Keep Left Bollard
 Existing controlled crossing signal to be reinstated
 Exterior Lighting Column

Individual tree pit location subject to position of utilities

Key

- Carriageway construction
- Alternative carriageway construction flush with adjacent footway
- Overrun carriageway construction
- Footway construction
- Alternative paving footway construction
- Riverside improvement access steps
- Tactile paving at controlled crossings
- Tactile Paving
- Bus shelter
- Planter and seating
- Cycle stands
- Seating

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Scale: 1:250

DO NOT SCALE

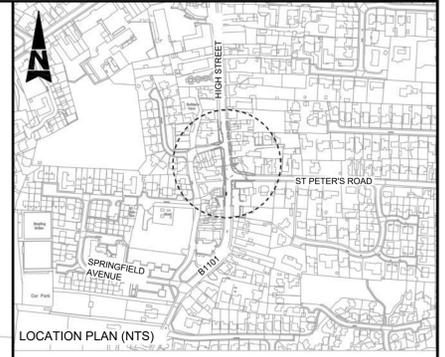
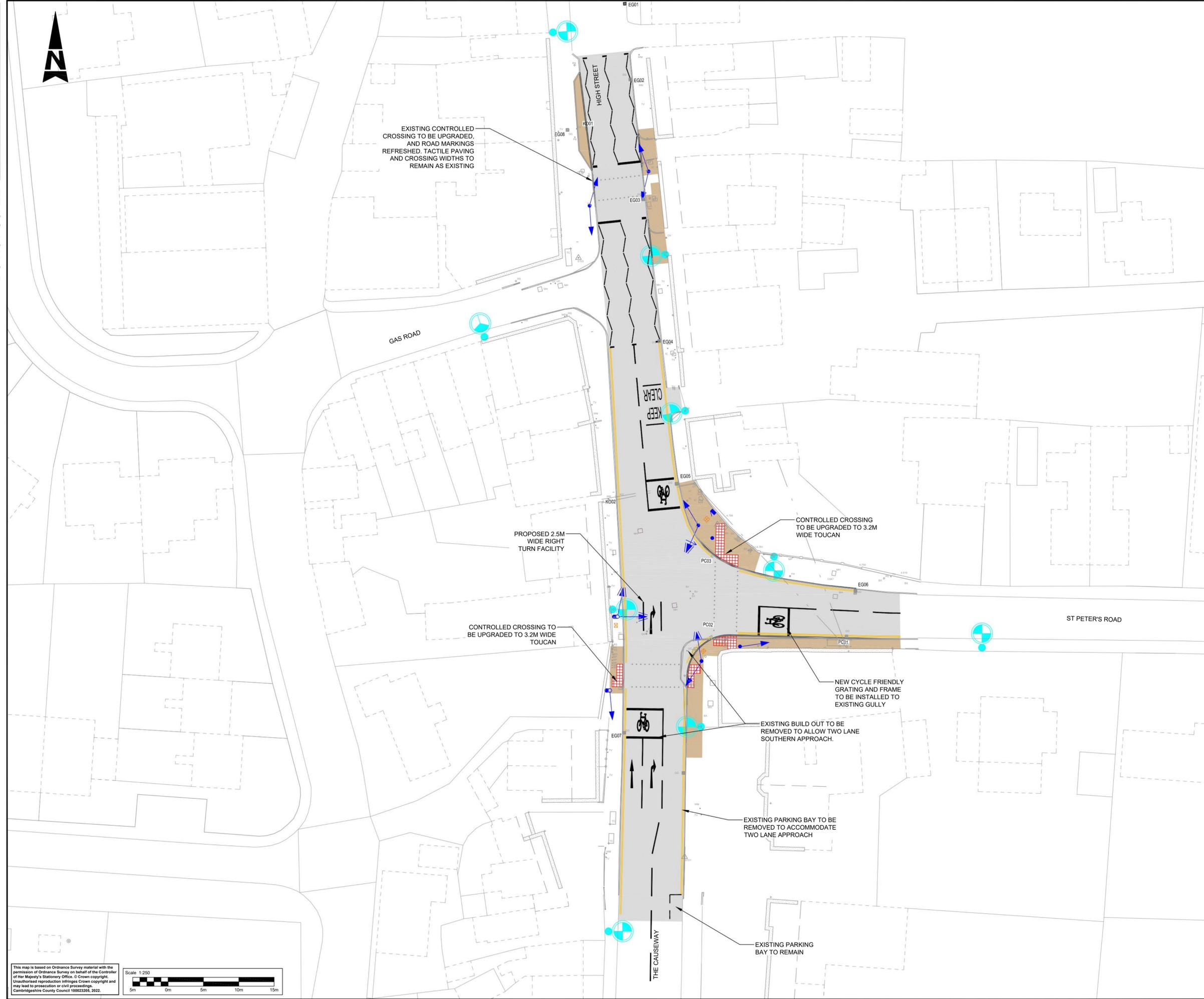
Page 1059 of 1324

DO NOT SCALE

Millimetres

0 10

100



NOTES:
 1. DO NOT SCALE FROM THIS DRAWING.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTS AND DRAWINGS.

- KEY:
- PROPOSED CARRIAGEWAY
 - PROPOSED FOOTWAY
 - PROPOSED SIGNAL HEAD
 - LOCATION OF NEW SIGNAL CONTROLLER
 - EXISTING MANHOLE TO REMAIN
 - PROPOSED SIGNAL MANHOLE
 - EXISTING GULLY TO REMAIN
 - PROPOSED GULLY
 - EXISTING LIGHTING COLUMN WITH NEW LED UNIT
 - PROPOSED LIGHTING COLUMN

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
FIRST ISSUE	A1	C01	TC	CW	JK	PM	09/09/22

APPROVED - PUBLISHED A1

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Cambridgeshire County Council

Project Title
MATS St Peter's Road Junction Improvement Scheme

Drawing Title
PUBLIC ENGAGEMENT GENERAL ARRANGEMENT

Drawing Number Project STPETERS - ATK - GEN - XX	Originator ATK	Volume GEN - DR - CH - 000001
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Scale 1:250





Appendix C: Design Review Considering LTN1/20 Guidance

Technical Note

Project:	Broad Street and Riverside, March		
Subject:	LTN 1/20 Compliance		
Author:	Mark Gearing		
Date:	25/10/2022	Project No.:	5210127
Atkins No.:	CCCFHSF-ATK-HGN-XX-RP-CH-000006		

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	For Information	MG	PM	DG	PM	3/11/22

Client signoff

Client	Cambridgeshire County Council
Project	Broad Street and Riverside, March
Project No.	5210127
Client signature / date	

Local Transport Note, LTN 1/20 provides a national standard for the design of cycle infrastructure. The national guidance recommends a basis for those standards based on 5 design principles and 22 summary principles. The guidance contains tools which give local authorities flexibility on infrastructure design and sets out measurable quality threshold to achieve when designing cycling schemes.

The 5 core design principles which represent the essential requirements to achieve more people travelling by cycle or on foot are:

- **Coherent** – Cycle networks should be planned and designed to allow people to reach their day-to-day destinations easily, along routes that connect, are simple to navigate and are of a consistently high quality. Neither cyclists nor pedestrians benefit from unintuitive arrangements that put cyclists in unexpected places away from the carriageway.
- **Direct** – Cycle routes should be at least as direct and preferably more direct than those available for motor vehicles. Routes involving extra distance or lots of stopping and starting will result in some cyclists choosing to ride on the main carriageway instead because it is faster and more direct, even if less safe.
- **Safe** – Not only must cycle infrastructure be safe, it should also be perceived to be safe so that more people feel able to cycle. Space for cycling is important but a narrow advisory cycle lane next to a narrow general traffic lane and guardrail at a busy junction is not an acceptable space for cyclists.
- **Comfortable** – Comfortable conditions for cycling require routes with good quality, well maintained smooth surfaces, adequate width for the volume of users, minimal stopping and starting and avoiding steep gradients. Uncomfortable transitions between on-and-off carriageway facilities are best avoided, particularly at locations where conflict with other road users is more likely.
- **Attractive** – Cycle infrastructure should help to deliver public spaces that are well designed and finished in attractive materials and be places that people want to spend time using. Sometimes well-intentioned signs and markings for cycling are not only difficult and uncomfortable to use, but are also unattractive additions to the street scape.

In relation to cycling, and as per the DMRB GG142 – Walking, cycling and horse-riding assessment and review, a WCHAR has been undertaken. The report reviews the policies and strategies at the time of the review along with accident data, trip generators and current provisions inside and outside of the scheme extents and proposing user opportunities for consideration of the designers.

Due to the rurality of the area and the historic nature of the market towns that developed along the route of the River Nene, road links from town to village and onwards consist of a mix of fast and winding country lanes and busy (mostly) single carriageway A roads. Travel by road to connect to wider links is therefore often slow, especially in comparison to using rail. Within March the road network is heavily constrained due to relative narrow streets, high parking demands and limited river crossings. Due to the rural nature of the district, there is a high dependency on motorised vehicles. There is also a high dependency on heavy goods vehicles (HGVs) due to the nature of the local economy. These issues make opportunities to reallocate road space for walking and cycling more limited and challenging.

At present the cycle network within and around March is not coherent and this was not part of the remit of the scheme. Broad Street has traditionally been considered a destination, rather than a through route for cyclists. Cycle stands are available within the 'central reserve' area which requires pedestrians and cyclists to cross the existing carriageways. Cyclists wishing to travel to or from Station Road to Broad Street also must negotiate the existing signalised junction.

Cycle routes were considered but with the low speeds along Broad Street it was felt that the proposed highway can safely accommodate cyclists, it would have also meant putting in a short length of off-road facility which would create two transitions for the cyclists to negotiate which LTN 1/20 advises against. LTN 1/20 also advises that cycles are treated as vehicles and are physically segregated from pedestrians. The simplest and most easily understood and neatest solution is by providing a kerb which keeps cyclist on the carriageway.

The proposed highway works will reallocate road space to remove car parking (which is currently situated within a 'central reserve' between the north and southbound carriageways) and provide a single two way carriageway with 3.25m lane widths, in line with LTN 1/20 recommendations. This will help reduce the vehicle dominance in the town centre by increasing public space and addressing issues of severance. It will also help reduce the number of different movements by motorists, so making it safer for cyclists and pedestrians

Additional cycle symbols to TRSGD diagram 1057 are to be placed in primary positions to guide cyclists along Broad Street, although this not suitable for roads of high volumes of motor traffic or high speeds, it is felt that with

the lower traffic speeds along Broad Street these will be beneficial to cyclist and alert motorists of their presence. Advanced Stop Lines are also to be provided at the signalised pedestrian crossing at the southern end of Broad Street. This enables cyclists to take up the appropriate position in the waiting area between the two stop lines, for their intended manoeuvre ahead of general traffic, before the signals change to green.

The provision of four new Zebra crossings; three single stage and one split stage crossings will make it easier for pedestrians and cyclists (once they have dismounted) wishing to cross Broad Street and Station Road. The improvement of footway and carriageway surfaces and refurbished guard railings will make it a more comfortable environment for pedestrians and cyclists. There will also be cycle parking based on the capacity suggested within LTN1/20 Table 11-1 with more convenient and secure cycle stands within Broad Street and a covered cycle stand within Grays Lane.

The removal of the existing signalised junction will be replaced with a mini-roundabout this can work well for cycling in a mixed traffic environment when traffic speeds and volumes are low and means that traffic on all arms has to give way. Despite the inscribed circle diameter (ICD) being greater than 15.0m recommended in LTN1/20 paragraph 10.7.35, the provision of single lane approaches and exits means that cyclists and motor vehicles can pass through the roundabout in a single stream compared to multi lane approaches for the existing signalised junction. An ICD in line with the LTN1/20 requirements could not be provided at the proposed mini-roundabout as it would restrict the turning movements of larger vehicles.

Following the stage 2 Road Safety Audit review of the design, no safety concerns were raised in relation to the provisions for cyclists.

MATS St Peter's Road Junction Improvement Scheme

Design Compliance with LTN 1/20 Technical Note
Cambridgeshire County Council

November 2022

STPETERS-ATK-HGN-XX-RP-CH-000001

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This document has 8 pages including the cover.

Document history

Document title: Design Compliance with LTN 1/20 Technical Note

Document reference: STPETERS-ATK-HGN-XX-RP-CH-000001

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1.0	First Issue	TC	CW	PM	PM	11/11/2022

Client signoff

Client	Cambridgeshire County Council
Project	MATS St Peter's Road Junction Improvement Scheme
Job number	5210324
Client signature/date	

Contents

Chapter	Page
1. Purpose	4
2. Background	4
2.1. Motor Traffic Flow	5
3. LTN 1/20 Cycle Infrastructure Design Requirements	5
4. LTN 1/20 Compliance	6
4.1. LTN 1/20 Compliance on existing arrangement	6
4.2. Review of proposed scheme against LTN 1/20	6
5. Conclusion	7

1. Purpose

This Technical Note has been produced to document the compliance of the MATS St Peter's Road Junction Improvement scheme with Local Transport Note 1/20: Cycle Infrastructure Design (LTN 1/20) on promoting a modal shift away from the use of private vehicles to the use of cycling and walking as a preferred mode of transport.

The purpose of this report is to support the Full Business Case for MATS scheme. The intention of this report is to appraise the proposed scheme against the requirements of LTN 1/20, being mindful of the existing road environment.

2. Background

The proposed work would provide alterations to the existing traffic signal-controlled junction at St Peter's Road and B1101, including as follow:

- The removal of parking bays and a build-out on B1101 to accommodate a two-lane approach to the junction from the south;
- The provision of a 2.5m wide right turn facility to accommodate vehicles turning right from B1101 onto St Peter's Road;
- The replacement of the existing controlled crossings with 3.2 metre (m) wide Toucan crossings on B1101 and St Peter's Road arms of the junction;
- The provision of a cycle friendly gully grate and frame on the St Peter's Road westbound approach to the junction;
- The upgrade of the existing signal-controlled crossing on High Street to the north of Gas Street;
- The resurfacing of the carriageway and some sections of footway within the extents of the scheme; and
- Improvements to drainage to resolve an existing ponding issue.



Figure 2-1 – St Peter's Road Junction Location Plan – Google Earth 2022

A stage 1 Road Safety Audit has been undertaken: no safety concerns were raised in relation to the provisions for cyclists.

2.1. Motor Traffic Flow

In the table 2-1 below, it indicates the existing motor traffic flow in pcu between 07:00 to 19:00 recorded on 27/03/2018 and estimated motor traffic in pcu for 24 hours by multiplying annual average weekday factors for non-motorway of 1.2.

Table 2-1 - Existing Traffic Figures 2018

Location	Traffic Flow (pcu/ 12 hour)	Estimated Traffic Flow (pcu/24 hour)
B1101 High Street Approach to Junction	4527	5468
B1101 High Street Exit from Junction	6029	7234
St Peter's Road Approach to Junction	2831	3397
St Peter's Road Exit from Junction	1954	2345
B1101 The Causeway Approach to Junction	5010	6012
B1101 The Causeway Exit from Junction	4414	5297

3. LTN 1/20 Cycle Infrastructure Design Requirements

Local Transport Note, LTN 1/20 provides a national standard for the design of cycle infrastructure. The national guidance recommends a basis for those standards based on 5 design principles and 22 summary principles. The guidance contains tools which give local authorities flexibility on infrastructure design and sets out measurable quality threshold to achieve when designing cycling schemes.

The 5 core design principles which represent the essential requirements to achieve more people travelling by cycle or on foot are:

- **Coherent** – Cycle networks should be planned and designed to allow people to reach their day-to-day destinations easily, along routes that connect, are simple to navigate and are of a consistently high quality. Neither cyclists nor pedestrians benefit from unintuitive arrangements that put cyclists in unexpected places away from the carriageway.
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- **Safe** – Not only must cycle infrastructure be safe, it should also be perceived to be safe so that more people feel able to cycle. Space for cycling is important but a narrow advisory cycle lane next to a narrow general traffic lane and guardrail at a busy junction is not an acceptable space for cyclists.
- **Comfortable** – Comfortable conditions for cycling require routes with good quality, well maintained smooth surfaces, adequate width for the volume of users, minimal stopping and starting and avoiding steep gradients. Uncomfortable transitions between on-and-off carriageway facilities are best avoided, particularly at locations where conflict with other road users is more likely.
- **Attractive** – Cycle infrastructure should help to deliver public spaces that are well designed and finished in attractive materials and be places that people want to spend time using. Sometimes well-intentioned signs and markings for cycling are not only difficult and uncomfortable to use, but are also unattractive additions to the street scape.

4. LTN 1/20 Compliance

4.1. LTN 1/20 Compliance on existing arrangement

There is an off-road cycle facility on the north-western side of the scheme, providing a path from the on-carriageway facility on Gas Lane towards the Town Centre. The off-road route is currently blocked by a pillar box.

The existing St Peter's Road junction includes advanced cycle stop lines, with short lengths of advisory on-carriageway cycle lane on each approach to the junction.

At present, the arrangement is not coherent. There are no cycle facilities on the exits from the junction, and there is no coherent link to the off-road facility north of Gas Road.

There are commercial properties within the scheme extent, but there are currently no cycle parking facilities.

4.2. Review of proposed scheme against LTN 1/20

It should be noted that this scheme is a small scale congestion relief scheme, primarily providing a right turn lane. As such the impact on other road users, including cyclists, is minimal.

The proposed scheme affects existing cycling facilities in the following areas:

- Removal of short length of approach cycle lane on northbound approach to the junction.
- Widening existing shared use surface and cycle track on the B1101 High Street Northbound footway.
- Resurfacing carriageway and footway.
- No resolution to coherence of cycle facilities
- No increased cycle parking provision

4.2.1. Removal of B1101 The Causeway Northbound cycle track

At the B1101 Northbound approach to the junction, it is proposed to remove the existing cycle lane to accommodate the provision of a 2.5m wide right turn facility for vehicles turning right from B1101 onto St Peter's Road. There is insufficient space within the highway boundary to accommodate both the additional right turn lane and the cycle lane. Provision of the right turn lane is the core justification for this scheme.

On B1101 Northbound, the existing Motor Traffic Flow is above 6000 pcu/24 hour. According to figure 4.1 in LTN 1/20, the provision of a short length of on carriageway advisory cycle lane in an area of such high traffic flows is unlikely to be beneficial to all but the most competent cyclists. These cyclists are likely to be comfortable cycling through the existing junction.

4.2.2. Widening existing shared use surface and cycle track

The works include removal of an existing parking bay on B1101 High Street, the regained space will be used the space to widen the existing shared use surface and segregated cycle track. This will provide adequate width for cyclists to negotiate the pillar box which obstructs the existing cycle way.

It was considered to use this area for cycle parking, but it was believed that the improved coherence and usability of the existing cycle facility offered the greater benefit to cyclists.

4.2.3. Resurfacing carriageway and footway

The improvement of carriageway surfaces will provide a more comfortable ride quality for cyclists.

4.2.4. No improved coherence

No improvements have been made to the coherence of the cycle facilities, particularly the link from the north bound on-carriageway route (the advanced cycle stop line) to the off-carriageway route. The introduction of a cycle symbol on this length of road was considered, however the symbol would not be being used in the standard way, as such it was not believed appropriate.

It should be noted that this does not make the existing situation worse, but it does not make an improvement where the existing site does not conform to LTN1/20 guidance.

4.2.5. No increased cycle parking provision

No increased cycle parking facilities are proposed as part of this scheme. There is available space at the site of the existing parking lay-by, as noted in 4.2.2, it is felt that this space is better used to provide a cycle facility to avoid the pillar box.

Again, it should be noted that this does not make the existing situation worse, but it does not make an improvement where the existing site does not conform to LTN1/20 guidance.

5. Conclusion

The proposed scheme is relatively minor, as such there is a limited scope to make improvements.

The scheme does not provide further cycling facilities to encourage less confident and young cyclists to use the junction due to space constraints. However, experienced cyclists will continue to use the junction.

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Appendix D: Economic Dimension Cost Schedule (60 years)

March Area Transport Study - Do Something Scheme Costs in 2010 Market Prices for Input to Economic Case (Broad Street Only)

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)						(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Total Contribution of Optimism Bias		(4) Rebased to 2010 Price Base	(5) Discounted to 2010 Prices			(6) Adjusted to Market Prices
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2023	1	£2,212,997	£0	£0	£149,286	£292,508	£2,654,791	1.000	£0.00	£2,654,791	£530,958	£3,185,749	£2,510,140	1.035	0.639	£1,604,994	£1,909,942.68
2024	2	£603,545	£0	£0	£40,714	£79,775	£724,034	1.000	£0.00	£724,034	£144,807	£868,841	£684,584	1.035	0.618	£422,923	£503,278.70
2025	3	£0	£0	£0	£0	£0	£0	1.256	£0.00	£0	£0	£0	1.035	0.597	£0	£0.00	
2026	4	£0	£0	£0	£0	£0	£0	1.296	£0.00	£0	£0	£0	1.035	0.577	£0	£0.00	
2027	5	£0	£0	£0	£0	£0	£0	1.339	£0.00	£0	£0	£0	1.035	0.557	£0	£0.00	
2028	6	£0	£0	£0	£0	£0	£0	1.381	£0.00	£0	£0	£0	1.035	0.538	£0	£0.00	
2029	7	£0	£0	£0	£0	£0	£0	1.426	£0.00	£0	£0	£0	1.035	0.520	£0	£0.00	
2030	8	£0	£0	£0	£0	£0	£0	1.472	£0.00	£0	£0	£0	1.035	0.503	£0	£0.00	
2031	9	£0	£0	£0	£0	£0	£0	1.520	£0.00	£0	£0	£0	1.035	0.486	£0	£0.00	
2032	10	£0	£0	£0	£0	£0	£0	1.571	£0.00	£0	£0	£0	1.035	0.469	£0	£0.00	
2033	11	£0	£0	£0	£0	£0	£0	1.624	£0.00	£0	£0	£0	1.035	0.453	£0	£0.00	
2034	12	£0	£0	£0	£0	£0	£0	1.678	£0.00	£0	£0	£0	1.035	0.438	£0	£0.00	
2035	13	£0	£0	£0	£0	£0	£0	1.735	£0.00	£0	£0	£0	1.035	0.423	£0	£0.00	
2036	14	£0	£0	£0	£0	£0	£0	1.795	£0.00	£0	£0	£0	1.035	0.409	£0	£0.00	
2037	15	£0	£0	£0	£0	£0	£0	1.854	£0.00	£0	£0	£0	1.035	0.395	£0	£0.00	
2038	16	£0	£0	£0	£0	£0	£0	1.915	£0.00	£0	£0	£0	1.035	0.382	£0	£0.00	
2039	17	£0	£0	£0	£0	£0	£0	1.979	£0.00	£0	£0	£0	1.035	0.369	£0	£0.00	
2040	18	£0	£0	£0	£0	£0	£0	2.045	£0.00	£0	£0	£0	1.035	0.356	£0	£0.00	
2041	19	£0	£0	£0	£0	£0	£0	2.114	£0.00	£0	£0	£0	1.035	0.344	£0	£0.00	
2042	20	£0	£0	£0	£0	£0	£0	2.186	£0.00	£0	£0	£0	1.035	0.333	£0	£0.00	
2043	21	£0	£0	£0	£0	£0	£0	2.260	£0.00	£0	£0	£0	1.035	0.321	£0	£0.00	
2044	22	£0	£0	£0	£0	£0	£0	2.338	£0.00	£0	£0	£0	1.035	0.310	£0	£0.00	
2045	23	£0	£0	£0	£0	£0	£0	2.419	£0.00	£0	£0	£0	1.035	0.300	£0	£0.00	
2046	24	£0	£0	£0	£0	£0	£0	2.504	£0.00	£0	£0	£0	1.035	0.290	£0	£0.00	
2047	25	£0	£0	£0	£0	£0	£0	2.592	£0.00	£0	£0	£0	1.035	0.280	£0	£0.00	
2048	26	£0	£0	£0	£0	£0	£0	2.684	£0.00	£0	£0	£0	1.035	0.271	£0	£0.00	
2049	27	£0	£0	£0	£0	£0	£0	2.779	£0.00	£0	£0	£0	1.035	0.261	£0	£0.00	
2050	28	£0	£0	£0	£0	£0	£0	2.879	£0.00	£0	£0	£0	1.035	0.253	£0	£0.00	
2051	29	£0	£0	£0	£0	£0	£0	2.982	£0.00	£0	£0	£0	1.035	0.244	£0	£0.00	
2052	30	£0	£0	£0	£0	£0	£0	3.089	£0.00	£0	£0	£0	1.035	0.236	£0	£0.00	
2053	31	£0	£0	£0	£0	£0	£0	3.199	£0.00	£0	£0	£0	1.030	0.281	£0	£0.00	
2054	32	£0	£0	£0	£0	£0	£0	3.314	£0.00	£0	£0	£0	1.030	0.272	£0	£0.00	
2055	33	£0	£0	£0	£0	£0	£0	3.433	£0.00	£0	£0	£0	1.030	0.264	£0	£0.00	
2056	34	£0	£0	£0	£0	£0	£0	3.556	£0.00	£0	£0	£0	1.030	0.257	£0	£0.00	
2057	35	£0	£0	£0	£0	£0	£0	3.683	£0.00	£0	£0	£0	1.030	0.249	£0	£0.00	
2058	36	£0	£0	£0	£0	£0	£0	3.814	£0.00	£0	£0	£0	1.030	0.242	£0	£0.00	
2059	37	£0	£0	£0	£0	£0	£0	3.949	£0.00	£0	£0	£0	1.030	0.235	£0	£0.00	
2060	38	£0	£0	£0	£0	£0	£0	4.089	£0.00	£0	£0	£0	1.030	0.228	£0	£0.00	
2061	39	£0	£0	£0	£0	£0	£0	4.234	£0.00	£0	£0	£0	1.030	0.221	£0	£0.00	
2062	40	£0	£0	£0	£0	£0	£0	4.383	£0.00	£0	£0	£0	1.030	0.215	£0	£0.00	
2063	41	£0	£0	£0	£0	£0	£0	4.536	£0.00	£0	£0	£0	1.030	0.209	£0	£0.00	
2064	42	£0	£0	£0	£0	£0	£0	4.694	£0.00	£0	£0	£0	1.030	0.203	£0	£0.00	
2065	43	£0	£0	£0	£0	£0	£0	4.857	£0.00	£0	£0	£0	1.030	0.197	£0	£0.00	
2066	44	£0	£0	£0	£0	£0	£0	5.025	£0.00	£0	£0	£0	1.030	0.191	£0	£0.00	
2067	45	£0	£0	£0	£0	£0	£0	5.195	£0.00	£0	£0	£0	1.030	0.185	£0	£0.00	
2068	46	£0	£0	£0	£0	£0	£0	5.367	£0.00	£0	£0	£0	1.030	0.180	£0	£0.00	
2069	47	£0	£0	£0	£0	£0	£0	5.548	£0.00	£0	£0	£0	1.030	0.175	£0	£0.00	
2070	48	£0	£0	£0	£0	£0	£0	5.736	£0.00	£0	£0	£0	1.030	0.170	£0	£0.00	
2071	49	£0	£0	£0	£0	£0	£0	5.932	£0.00	£0	£0	£0	1.030	0.165	£0	£0.00	
2072	50	£0	£0	£0	£0	£0	£0	6.133	£0.00	£0	£0	£0	1.030	0.160	£0	£0.00	
2073	51	£0	£0	£0	£0	£0	£0	6.343	£0.00	£0	£0	£0	1.030	0.155	£0	£0.00	
2074	52	£0	£0	£0	£0	£0	£0	6.564	£0.00	£0	£0	£0	1.030	0.151	£0	£0.00	
2075	53	£0	£0	£0	£0	£0	£0	6.796	£0.00	£0	£0	£0	1.030	0.146	£0	£0.00	
2076	54	£0	£0	£0	£0	£0	£0	7.040	£0.00	£0	£0	£0	1.030	0.142	£0	£0.00	
2077	55	£0	£0	£0	£0	£0	£0	7.297	£0.00	£0	£0	£0	1.030	0.138	£0	£0.00	
2078	56	£0	£0	£0	£0	£0	£0	7.563	£0.00	£0	£0	£0	1.030	0.134	£0	£0.00	
2079	57	£0	£0	£0	£0	£0	£0	7.840	£0.00	£0	£0	£0	1.030	0.130	£0	£0.00	
2080	58	£0	£0	£0	£0	£0	£0	8.130	£0.00	£0	£0	£0	1.030	0.126	£0	£0.00	
2081	59	£0	£0	£0	£0	£0	£0	8.433	£0.00	£0	£0	£0	1.030	0.123	£0	£0.00	
2082	60	£0	£0	£0	£0	£0	£0	8.743	£0.00	£0	£0	£0	1.030	0.119	£0	£0.00	
2083	61	£0	£0	£0	£0	£0	£0	9.061	£0.00	£0	£0	£0	1.030	0.116	£0	£0.00	
2084	62	£0	£0	£0	£0	£0	£0	9.389	£0.00	£0	£0	£0	1.030	0.112	£0	£0.00	
Total		£2,816,542	£0	£0	£190,000	£372,283	£3,378,825		£0	£3,378,825	£675,765	£4,054,590	£3,194,723			£2,027,917	£2,413,221

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.	£3,378,825
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£3,378,825
(3)	The next stage is to apply optimism bias.	£4,054,590
(4)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	£3,194,723
(5)	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).	£2,027,917
(6)	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	£2,413,221

March Area Transport Study - Do Something Scheme Costs in 2010 Market Prices for Input to Economic Case (Broad Street Only)

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)		(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Total Contribution of Optimism Bias		(4) Rebased to 2010 Price Base	(5) Discounted to 2010 Prices			(6) Adjusted to Market Prices
		Maintenance Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2023	1	£0	£0	1.120	£0.00	£0	£0.00	£0	£0	1.035	0.639	£0	£0.00
2024	2	£0	£0	1.254	£0.00	£0	£0.00	£0	£0	1.035	0.618	£0	£0.00
2025	3	£0	£0	1.355	£0.00	£0	£0.00	£0	£0	1.035	0.597	£0	£0.00
2026	4	£0	£0	1.422	£0.00	£0	£0.00	£0	£0	1.035	0.577	£0	£0.00
2027	5	£0	£0	1.494	£0.00	£0	£0.00	£0	£0	1.035	0.557	£0	£0.00
2028	6	£0	£0	1.568	£0.00	£0	£0.00	£0	£0	1.035	0.538	£0	£0.00
2029	7	£0	£0	1.647	£0.00	£0	£0.00	£0	£0	1.035	0.520	£0	£0.00
2030	8	£0	£0	1.729	£0.00	£0	£0.00	£0	£0	1.035	0.503	£0	£0.00
2031	9	£0	£0	1.815	£0.00	£0	£0.00	£0	£0	1.035	0.486	£0	£0.00
2032	10	£0	£0	1.906	£0.00	£0	£0.00	£0	£0	1.035	0.469	£0	£0.00
2033	11	£0	£0	2.002	£0.00	£0	£0.00	£0	£0	1.035	0.453	£0	£0.00
2034	12	£0	£0	2.102	£0.00	£0	£0.00	£0	£0	1.035	0.438	£0	£0.00
2035	13	£0	£0	2.207	£0.00	£0	£0.00	£0	£0	1.035	0.423	£0	£0.00
2036	14	£0	£0	2.317	£0.00	£0	£0.00	£0	£0	1.035	0.409	£0	£0.00
2037	15	£0	£0	2.433	£0.00	£0	£0.00	£0	£0	1.035	0.395	£0	£0.00
2038	16	£0	£0	2.555	£0.00	£0	£0.00	£0	£0	1.035	0.382	£0	£0.00
2039	17	£0	£0	2.682	£0.00	£0	£0.00	£0	£0	1.035	0.369	£0	£0.00
2040	18	£0	£0	2.816	£0.00	£0	£0.00	£0	£0	1.035	0.356	£0	£0.00
2041	19	£0	£0	2.957	£0.00	£0	£0.00	£0	£0	1.035	0.344	£0	£0.00
2042	20	£0	£0	3.105	£0.00	£0	£0.00	£0	£0	1.035	0.333	£0	£0.00
2043	21	£0	£0	3.260	£0.00	£0	£0.00	£0	£0	1.035	0.321	£0	£0.00
2044	22	£0	£0	3.423	£0.00	£0	£0.00	£0	£0	1.035	0.310	£0	£0.00
2045	23	£0	£0	3.595	£0.00	£0	£0.00	£0	£0	1.035	0.300	£0	£0.00
2046	24	£0	£0	3.774	£0.00	£0	£0.00	£0	£0	1.035	0.290	£0	£0.00
2047	25	£0	£0	3.963	£0.00	£0	£0.00	£0	£0	1.035	0.280	£0	£0.00
2048	26	£0	£0	4.161	£0.00	£0	£0.00	£0	£0	1.035	0.271	£0	£0.00
2049	27	£0	£0	4.369	£0.00	£0	£0.00	£0	£0	1.035	0.261	£0	£0.00
2050	28	£0	£0	4.588	£0.00	£0	£0.00	£0	£0	1.035	0.253	£0	£0.00
2051	29	£0	£0	4.817	£0.00	£0	£0.00	£0	£0	1.035	0.244	£0	£0.00
2052	30	£0	£0	5.058	£0.00	£0	£0.00	£0	£0	1.035	0.236	£0	£0.00
2053	31	£0	£0	5.311	£0.00	£0	£0.00	£0	£0	1.030	0.281	£0	£0.00
2054	32	£0	£0	5.576	£0.00	£0	£0.00	£0	£0	1.030	0.272	£0	£0.00
2055	33	£0	£0	5.855	£0.00	£0	£0.00	£0	£0	1.030	0.264	£0	£0.00
2056	34	£0	£0	6.148	£0.00	£0	£0.00	£0	£0	1.030	0.257	£0	£0.00
2057	35	£0	£0	6.455	£0.00	£0	£0.00	£0	£0	1.030	0.249	£0	£0.00
2058	36	£0	£0	6.778	£0.00	£0	£0.00	£0	£0	1.030	0.242	£0	£0.00
2059	37	£0	£0	7.117	£0.00	£0	£0.00	£0	£0	1.030	0.235	£0	£0.00
2060	38	£0	£0	7.473	£0.00	£0	£0.00	£0	£0	1.030	0.228	£0	£0.00
2061	39	£0	£0	7.846	£0.00	£0	£0.00	£0	£0	1.030	0.221	£0	£0.00
2062	40	£0	£0	8.239	£0.00	£0	£0.00	£0	£0	1.030	0.215	£0	£0.00
2063	41	£0	£0	8.651	£0.00	£0	£0.00	£0	£0	1.030	0.209	£0	£0.00
2064	42	£0	£0	9.083	£0.00	£0	£0.00	£0	£0	1.030	0.203	£0	£0.00
2065	43	£0	£0	9.537	£0.00	£0	£0.00	£0	£0	1.030	0.197	£0	£0.00
2066	44	£0	£0	10.014	£0.00	£0	£0.00	£0	£0	1.030	0.191	£0	£0.00
2067	45	£0	£0	10.515	£0.00	£0	£0.00	£0	£0	1.030	0.185	£0	£0.00
2068	46	£0	£0	11.041	£0.00	£0	£0.00	£0	£0	1.030	0.180	£0	£0.00
2069	47	£0	£0	11.593	£0.00	£0	£0.00	£0	£0	1.030	0.175	£0	£0.00
2070	48	£0	£0	12.172	£0.00	£0	£0.00	£0	£0	1.030	0.170	£0	£0.00
2071	49	£0	£0	12.781	£0.00	£0	£0.00	£0	£0	1.030	0.165	£0	£0.00
2072	50	£0	£0	13.420	£0.00	£0	£0.00	£0	£0	1.030	0.160	£0	£0.00
2073	51	£0	£0	14.091	£0.00	£0	£0.00	£0	£0	1.030	0.155	£0	£0.00
2074	52	£0	£0	14.796	£0.00	£0	£0.00	£0	£0	1.030	0.151	£0	£0.00
2075	53	£0	£0	15.535	£0.00	£0	£0.00	£0	£0	1.030	0.146	£0	£0.00
2076	54	£0	£0	16.312	£0.00	£0	£0.00	£0	£0	1.030	0.142	£0	£0.00
2077	55	£0	£0	17.128	£0.00	£0	£0.00	£0	£0	1.030	0.138	£0	£0.00
2078	56	£0	£0	17.984	£0.00	£0	£0.00	£0	£0	1.030	0.134	£0	£0.00
2079	57	£0	£0	18.883	£0.00	£0	£0.00	£0	£0	1.030	0.130	£0	£0.00
2080	58	£0	£0	19.828	£0.00	£0	£0.00	£0	£0	1.030	0.126	£0	£0.00
2081	59	£0	£0	20.819	£0.00	£0	£0.00	£0	£0	1.030	0.123	£0	£0.00
2082	60	£0	£0	21.860	£0.00	£0	£0.00	£0	£0	1.030	0.119	£0	£0.00
2083	61	£0	£0	22.953	£0.00	£0	£0.00	£0	£0	1.030	0.116	£0	£0.00
2084	62	£0	£0	24.101	£0.00	£0	£0.00	£0	£0	1.030	0.112	£0	£0.00
Total		£0	£0		£0	£0	£0	£0	£0			£0	£0

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.	£0
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£0
(3)	The next stage is to apply optimism bias.	£0
(4)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	£0
(5)	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).	£0
(6)	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	£0

March Area Transport Study - Do Something Scheme Costs in 2010 Market Prices for Input to Economic Case

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)						(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Total Contribution of Optimism Bias		(4) Rebased to 2010 Price Base	(5) Discounted to 2010 Prices			(6) Adjusted to Market Prices
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2023	1	£2,212,997	£0	£0	£389,042	£532,337	£3,134,376	1.079	£37,962.67	£3,172,339	£634,468	£3,806,807	£2,999,488	1.035	0.639	£1,917,885	£2,282,283.53
2024	2	£603,545	£0	£440,000	£661,145	£824,916	£2,529,606	1.188	£338,973.32	£2,868,579	£573,716	£3,442,295	£2,712,279	1.035	0.618	£1,675,597	£1,993,960.26
2025	3	£5,400,204	£0	£0	£1,344,186	£841,843	£7,586,234	1.256	£1,943,208.85	£9,529,442	£1,905,888	£11,435,331	£9,010,213	1.035	0.597	£5,378,112	£6,399,952.96
2026	4	£3,803,003	£0	£80,000	£899,681	£645,620	£5,428,304	1.296	£1,606,243.45	£7,034,547	£1,617,946	£8,652,493	£6,817,538	1.035	0.577	£3,931,715	£4,678,740.42
2027	5	£8,004,122	£0	£0	£1,137,596	£531,861	£9,673,579	1.339	£3,275,008.11	£12,948,587	£2,978,175	£15,926,762	£12,549,136	1.035	0.557	£6,992,426	£8,320,986.81
2028	6	£0	£0	£0	£20,000	£0	£20,000	1.381	£7,628.27	£27,628	£6,355	£33,983	£26,776	1.035	0.538	£14,415	£17,154.01
2029	7	£0	£0	£0	£0	£0	£0	1.426	£0.00	£0	£0	£0	£0	1.035	0.520	£0	£0.00
2030	8	£0	£0	£0	£0	£0	£0	1.472	£0.00	£0	£0	£0	£0	1.035	0.503	£0	£0.00
2031	9	£0	£0	£0	£0	£0	£0	1.520	£0.00	£0	£0	£0	£0	1.035	0.486	£0	£0.00
2032	10	£0	£0	£0	£0	£0	£0	1.571	£0.00	£0	£0	£0	£0	1.035	0.469	£0	£0.00
2033	11	£0	£0	£0	£0	£0	£0	1.624	£0.00	£0	£0	£0	£0	1.035	0.453	£0	£0.00
2034	12	£0	£0	£0	£0	£0	£0	1.678	£0.00	£0	£0	£0	£0	1.035	0.438	£0	£0.00
2035	13	£0	£0	£0	£0	£0	£0	1.735	£0.00	£0	£0	£0	£0	1.035	0.423	£0	£0.00
2036	14	£0	£0	£0	£0	£0	£0	1.795	£0.00	£0	£0	£0	£0	1.035	0.409	£0	£0.00
2037	15	£0	£0	£0	£0	£0	£0	1.854	£0.00	£0	£0	£0	£0	1.035	0.395	£0	£0.00
2038	16	£0	£0	£0	£0	£0	£0	1.915	£0.00	£0	£0	£0	£0	1.035	0.382	£0	£0.00
2039	17	£0	£0	£0	£0	£0	£0	1.979	£0.00	£0	£0	£0	£0	1.035	0.369	£0	£0.00
2040	18	£0	£0	£0	£0	£0	£0	2.045	£0.00	£0	£0	£0	£0	1.035	0.356	£0	£0.00
2041	19	£0	£0	£0	£0	£0	£0	2.114	£0.00	£0	£0	£0	£0	1.035	0.344	£0	£0.00
2042	20	£0	£0	£0	£0	£0	£0	2.186	£0.00	£0	£0	£0	£0	1.035	0.333	£0	£0.00
2043	21	£0	£0	£0	£0	£0	£0	2.260	£0.00	£0	£0	£0	£0	1.035	0.321	£0	£0.00
2044	22	£0	£0	£0	£0	£0	£0	2.338	£0.00	£0	£0	£0	£0	1.035	0.310	£0	£0.00
2045	23	£0	£0	£0	£0	£0	£0	2.419	£0.00	£0	£0	£0	£0	1.035	0.300	£0	£0.00
2046	24	£0	£0	£0	£0	£0	£0	2.504	£0.00	£0	£0	£0	£0	1.035	0.290	£0	£0.00
2047	25	£0	£0	£0	£0	£0	£0	2.592	£0.00	£0	£0	£0	£0	1.035	0.280	£0	£0.00
2048	26	£0	£0	£0	£0	£0	£0	2.684	£0.00	£0	£0	£0	£0	1.035	0.271	£0	£0.00
2049	27	£0	£0	£0	£0	£0	£0	2.779	£0.00	£0	£0	£0	£0	1.035	0.261	£0	£0.00
2050	28	£0	£0	£0	£0	£0	£0	2.879	£0.00	£0	£0	£0	£0	1.035	0.253	£0	£0.00
2051	29	£0	£0	£0	£0	£0	£0	2.982	£0.00	£0	£0	£0	£0	1.035	0.244	£0	£0.00
2052	30	£0	£0	£0	£0	£0	£0	3.089	£0.00	£0	£0	£0	£0	1.035	0.236	£0	£0.00
2053	31	£0	£0	£0	£0	£0	£0	3.199	£0.00	£0	£0	£0	£0	1.030	0.281	£0	£0.00
2054	32	£0	£0	£0	£0	£0	£0	3.314	£0.00	£0	£0	£0	£0	1.030	0.272	£0	£0.00
2055	33	£0	£0	£0	£0	£0	£0	3.433	£0.00	£0	£0	£0	£0	1.030	0.264	£0	£0.00
2056	34	£0	£0	£0	£0	£0	£0	3.556	£0.00	£0	£0	£0	£0	1.030	0.257	£0	£0.00
2057	35	£0	£0	£0	£0	£0	£0	3.683	£0.00	£0	£0	£0	£0	1.030	0.249	£0	£0.00
2058	36	£0	£0	£0	£0	£0	£0	3.814	£0.00	£0	£0	£0	£0	1.030	0.242	£0	£0.00
2059	37	£0	£0	£0	£0	£0	£0	3.949	£0.00	£0	£0	£0	£0	1.030	0.235	£0	£0.00
2060	38	£0	£0	£0	£0	£0	£0	4.089	£0.00	£0	£0	£0	£0	1.030	0.228	£0	£0.00
2061	39	£0	£0	£0	£0	£0	£0	4.234	£0.00	£0	£0	£0	£0	1.030	0.221	£0	£0.00
2062	40	£0	£0	£0	£0	£0	£0	4.383	£0.00	£0	£0	£0	£0	1.030	0.215	£0	£0.00
2063	41	£0	£0	£0	£0	£0	£0	4.536	£0.00	£0	£0	£0	£0	1.030	0.209	£0	£0.00
2064	42	£0	£0	£0	£0	£0	£0	4.694	£0.00	£0	£0	£0	£0	1.030	0.203	£0	£0.00
2065	43	£0	£0	£0	£0	£0	£0	4.857	£0.00	£0	£0	£0	£0	1.030	0.197	£0	£0.00
2066	44	£0	£0	£0	£0	£0	£0	5.025	£0.00	£0	£0	£0	£0	1.030	0.191	£0	£0.00
2067	45	£0	£0	£0	£0	£0	£0	5.195	£0.00	£0	£0	£0	£0	1.030	0.185	£0	£0.00
2068	46	£0	£0	£0	£0	£0	£0	5.367	£0.00	£0	£0	£0	£0	1.030	0.180	£0	£0.00
2069	47	£0	£0	£0	£0	£0	£0	5.548	£0.00	£0	£0	£0	£0	1.030	0.175	£0	£0.00
2070	48	£0	£0	£0	£0	£0	£0	5.736	£0.00	£0	£0	£0	£0	1.030	0.170	£0	£0.00
2071	49	£0	£0	£0	£0	£0	£0	5.932	£0.00	£0	£0	£0	£0	1.030	0.165	£0	£0.00
2072	50	£0	£0	£0	£0	£0	£0	6.133	£0.00	£0	£0	£0	£0	1.030	0.160	£0	£0.00
2073	51	£0	£0	£0	£0	£0	£0	6.343	£0.00	£0	£0	£0	£0	1.030	0.155	£0	£0.00
2074	52	£0	£0	£0	£0	£0	£0	6.564	£0.00	£0	£0	£0	£0	1.030	0.151	£0	£0.00
2075	53	£0	£0	£0	£0	£0	£0	6.796	£0.00	£0	£0	£0	£0	1.030	0.146	£0	£0.00
2076	54	£0	£0	£0	£0	£0	£0	7.040	£0.00	£0	£0	£0	£0	1.030	0.142	£0	£0.00
2077	55	£0	£0	£0	£0	£0	£0	7.297	£0.00	£0	£0	£0	£0	1.030	0.138	£0	£0.00
2078	56	£0	£0	£0	£0	£0	£0	7.563	£0.00	£0	£0	£0	£0	1.030	0.134	£0	£0.00
2079	57	£0	£0	£0	£0	£0	£0	7.840	£0.00	£0	£0	£0	£0	1.030	0.130	£0	£0.00
2080	58	£0	£0	£0	£0	£0	£0	8.130	£0.00	£0	£0	£0	£0	1.030	0.126	£0	£0.00
2081	59	£0	£0	£0	£0	£0	£0	8.433	£0.00	£0	£0	£0	£0	1.030	0.123	£0	£0.00
2082	60	£0	£0	£0	£0	£0	£0	8.743	£0.00	£0	£0	£0	£0	1.030	0.119	£0	£0.00
2083	61	£0	£0	£0	£0	£0	£0	9.061	£0.00	£0	£0	£0	£0	1.030	0.116	£0	£0.00
2084	62	£0	£0	£0	£0	£0	£0	9.389	£0.00	£0	£0	£0	£0	1.030	0.112	£0	£0.00
Total		£20,023,871	£0	£520,000	£4,451,650	£3,376,577	£28,372,098		£7,209,025	£35,581,123	£7,716,547	£43,297,671	£34,115,431			£19,910,150	£23,693,078

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.	£28,372,098
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£35,581,123
(3)	The next stage is to apply optimism bias.	£43,297,671
(4)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	£34,115,431
(5)	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).	£19,910,150
(6)	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	£23,693,078

March Area Transport Study - Do Something Scheme Costs in 2010 Market Prices for Input to Economic Case

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)		(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Total Contribution of Optimism Bias		(4) Rebased to 2010 Price Base	(5) Discounted to 2010 Prices			(6) Adjusted to Market Prices
		Maintenance Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2023	1	£0	£0	1.120	£0.00	£0	£0.00	£0	£0	1.035	0.639	£0	£0.00
2024	2	£0	£0	1.254	£0.00	£0	£0.00	£0	£0	1.035	0.618	£0	£0.00
2025	3	£0	£0	1.355	£0.00	£0	£0.00	£0	£0	1.035	0.597	£0	£0.00
2026	4	£0	£0	1.422	£0.00	£0	£0.00	£0	£0	1.035	0.577	£0	£0.00
2027	5	£0	£0	1.494	£0.00	£0	£0.00	£0	£0	1.035	0.557	£0	£0.00
2028	6	£0	£0	1.568	£0.00	£0	£0.00	£0	£0	1.035	0.538	£0	£0.00
2029	7	£0	£0	1.647	£0.00	£0	£0.00	£0	£0	1.035	0.520	£0	£0.00
2030	8	£0	£0	1.729	£0.00	£0	£0.00	£0	£0	1.035	0.503	£0	£0.00
2031	9	£0	£0	1.815	£0.00	£0	£0.00	£0	£0	1.035	0.486	£0	£0.00
2032	10	£0	£0	1.906	£0.00	£0	£0.00	£0	£0	1.035	0.469	£0	£0.00
2033	11	£0	£0	2.002	£0.00	£0	£0.00	£0	£0	1.035	0.453	£0	£0.00
2034	12	£0	£0	2.102	£0.00	£0	£0.00	£0	£0	1.035	0.438	£0	£0.00
2035	13	£0	£0	2.207	£0.00	£0	£0.00	£0	£0	1.035	0.423	£0	£0.00
2036	14	£0	£0	2.317	£0.00	£0	£0.00	£0	£0	1.035	0.409	£0	£0.00
2037	15	£0	£0	2.433	£0.00	£0	£0.00	£0	£0	1.035	0.395	£0	£0.00
2038	16	£2,000	£2,000	2.555	£3,109.17	£5,109	£0.00	£5,109	£4,026	1.035	0.382	£1,536	£1,828.33
2039	17	£2,000	£2,000	2.682	£3,364.63	£5,365	£0.00	£5,365	£4,227	1.035	0.369	£1,559	£1,854.83
2040	18	£2,000	£2,000	2.816	£3,632.86	£5,633	£0.00	£5,633	£4,438	1.035	0.356	£1,581	£1,881.71
2041	19	£39,500	£39,500	2.957	£77,311.52	£116,812	£0.00	£116,812	£92,039	1.035	0.344	£31,683	£37,702.32
2042	20	£2,000	£2,000	3.105	£4,210.23	£6,210	£0.00	£6,210	£4,893	1.035	0.333	£1,627	£1,936.64
2043	21	£2,000	£2,000	3.260	£4,520.74	£6,521	£0.00	£6,521	£5,138	1.035	0.321	£1,651	£1,964.71
2044	22	£2,000	£2,000	3.423	£4,846.78	£6,847	£0.00	£6,847	£5,395	1.035	0.310	£1,675	£1,993.19
2045	23	£2,000	£2,000	3.595	£5,189.12	£7,189	£0.00	£7,189	£5,665	1.035	0.300	£1,699	£2,022.07
2046	24	£2,000	£2,000	3.774	£5,548.58	£7,549	£0.00	£7,549	£5,948	1.035	0.290	£1,724	£2,051.38
2047	25	£2,000	£2,000	3.963	£5,926.01	£7,926	£0.00	£7,926	£6,245	1.035	0.280	£1,749	£2,081.11
2048	26	£2,000	£2,000	4.161	£6,322.31	£8,322	£0.00	£8,322	£6,557	1.035	0.271	£1,774	£2,111.27
2049	27	£2,000	£2,000	4.369	£6,738.42	£8,738	£0.00	£8,738	£6,885	1.035	0.261	£1,800	£2,141.87
2050	28	£2,000	£2,000	4.588	£7,175.34	£9,175	£0.00	£9,175	£7,230	1.035	0.253	£1,826	£2,172.91
2051	29	£2,000	£2,000	4.817	£7,634.11	£9,634	£0.00	£9,634	£7,591	1.035	0.244	£1,852	£2,204.40
2052	30	£2,000	£2,000	5.058	£8,115.81	£10,116	£0.00	£10,116	£7,971	1.035	0.236	£1,879	£2,236.35
2053	31	£2,000	£2,000	5.311	£8,621.61	£10,622	£0.00	£10,622	£8,369	1.030	0.281	£2,348	£2,793.98
2054	32	£2,000	£2,000	5.576	£9,152.69	£11,153	£0.00	£11,153	£8,788	1.030	0.272	£2,393	£2,848.23
2055	33	£2,000	£2,000	5.855	£9,710.32	£11,710	£0.00	£11,710	£9,227	1.030	0.264	£2,440	£2,903.53
2056	34	£39,500	£39,500	6.148	£203,342.76	£242,843	£0.00	£242,843	£191,343	1.030	0.257	£49,125	£58,458.29
2057	35	£2,000	£2,000	6.455	£10,910.63	£12,911	£0.00	£12,911	£10,173	1.030	0.249	£2,536	£3,017.39
2058	36	£2,000	£2,000	6.778	£11,556.16	£13,556	£0.00	£13,556	£10,681	1.030	0.242	£2,585	£3,075.98
2059	37	£2,000	£2,000	7.117	£12,233.97	£14,234	£0.00	£14,234	£11,215	1.030	0.235	£2,635	£3,135.71
2060	38	£2,000	£2,000	7.473	£12,945.67	£14,946	£0.00	£14,946	£11,776	1.030	0.228	£2,686	£3,196.59
2061	39	£2,000	£2,000	7.846	£13,692.95	£15,693	£0.00	£15,693	£12,365	1.030	0.221	£2,738	£3,258.66
2062	40	£2,000	£2,000	8.239	£14,477.60	£16,478	£0.00	£16,478	£12,983	1.030	0.215	£2,792	£3,321.94
2063	41	£2,000	£2,000	8.651	£15,301.48	£17,301	£0.00	£17,301	£13,632	1.030	0.209	£2,846	£3,386.44
2064	42	£2,000	£2,000	9.083	£16,166.55	£18,167	£0.00	£18,167	£14,314	1.030	0.203	£2,901	£3,452.20
2065	43	£2,000	£2,000	9.537	£17,074.88	£19,075	£0.00	£19,075	£15,030	1.030	0.197	£2,957	£3,519.23
2066	44	£2,000	£2,000	10.014	£18,028.62	£20,029	£0.00	£20,029	£15,781	1.030	0.191	£3,015	£3,587.56
2067	45	£2,000	£2,000	10.515	£19,030.05	£21,030	£0.00	£21,030	£16,570	1.030	0.185	£3,073	£3,657.23
2068	46	£2,000	£2,000	11.041	£20,081.56	£22,082	£0.00	£22,082	£17,399	1.030	0.180	£3,133	£3,728.24
2069	47	£2,000	£2,000	11.593	£21,185.63	£23,186	£0.00	£23,186	£18,269	1.030	0.175	£3,194	£3,800.63
2070	48	£2,000	£2,000	12.172	£22,344.91	£24,345	£0.00	£24,345	£19,182	1.030	0.170	£3,256	£3,874.43
2071	49	£39,500	£39,500	12.781	£465,352.67	£504,853	£0.00	£504,853	£397,787	1.030	0.165	£65,551	£78,005.86
2072	50	£2,000	£2,000	13.420	£24,840.27	£26,840	£0.00	£26,840	£21,148	1.030	0.160	£3,383	£4,026.36
2073	51	£2,000	£2,000	14.091	£26,182.28	£28,182	£0.00	£28,182	£22,206	1.030	0.155	£3,449	£4,104.54
2074	52	£2,000	£2,000	14.796	£27,591.40	£29,591	£0.00	£29,591	£23,316	1.030	0.151	£3,516	£4,184.24
2075	53	£2,000	£2,000	15.535	£29,070.97	£31,071	£0.00	£31,071	£24,482	1.030	0.146	£3,584	£4,265.49
2076	54	£2,000	£2,000	16.312	£30,624.51	£32,625	£0.00	£32,625	£25,706	1.030	0.142	£3,654	£4,348.31
2077	55	£2,000	£2,000	17.128	£32,255.74	£34,256	£0.00	£34,256	£26,991	1.030	0.138	£3,725	£4,432.74
2078	56	£2,000	£2,000	17.984	£33,968.53	£35,969	£0.00	£35,969	£28,341	1.030	0.134	£3,797	£4,518.82
2079	57	£2,000	£2,000	18.883	£35,766.95	£37,767	£0.00	£37,767	£29,758	1.030	0.130	£3,871	£4,606.56
2080	58	£2,000	£2,000	19.828	£37,655.30	£39,655	£0.00	£39,655	£31,246	1.030	0.126	£3,946	£4,696.01
2081	59	£2,000	£2,000	20.819	£39,638.07	£41,638	£0.00	£41,638	£32,808	1.030	0.123	£4,023	£4,787.19
2082	60	£2,000	£2,000	21.860	£41,719.97	£43,720	£0.00	£43,720	£34,448	1.030	0.119	£4,101	£4,880.15
2083	61	£2,000	£2,000	22.953	£43,905.97	£45,906	£0.00	£45,906	£36,171	1.030	0.116	£4,181	£4,974.91
2084	62	£2,000	£2,000	24.101	£46,201.27	£48,201	£0.00	£48,201	£37,979	1.030	0.112	£4,262	£5,071.51
Total		£206,500	£206,500		£1,524,278	£1,730,778	£0	£1,730,778	£1,363,727			£267,313	£318,102

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.	£206,500
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£1,730,778
(3)	The next stage is to apply optimism bias.	£1,730,778
(4)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	£1,363,727
(5)	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).	£267,313
(6)	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	£318,102

Appendix E: Appraisal Summary Table (AST)

Appraisal Summary Table		Date produced:	6	12	2022	Contact:		
Name of scheme:		FBC 1 - Broad Street Scheme				Name	Emma White	
Description of scheme:		Improvements to Broad Street / Dartford Road / Station Road junction, including replacing the traffic signals with a mini-roundabout, and altering Broad Street to be one lane in each direction				Organisation	GPCA	
						Role	Promoter/Official	
Impacts	Summary of key impacts	Assessment						
		Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable or	
		Value of journey time changes(£)			4,727,474			
		Net journey time changes (£)						
		0 to 2min	2 to 5min	> 5min				
		4,327,611	385,911	13,952				
Economy	Business users & transport providers	The scheme will improve journey times for business users and transport providers travelling to / through the town centre, with the majority of journey time savings in the 0 to 2 minute range.	Not Assessed			4,757,000	Not Assessed	
	Reliability impact on Business users	The scheme will improve journey time reliability for business users travelling to / through the town centre.	Not Assessed			400,309		
	Regeneration	It is anticipated that the scheme will facilitate significant regeneration benefits in March town centre. The Broad Street scheme will reduce traffic congestion, traffic dominance and severance created by the current highway layout and facilitate the delivery of the FHSF public realm improvements scheme. This is likely to attract an increase in footfall and visitor dwell times in March town centre, stimulating an increase in economic activity and further investment.	Not Assessed			Not Assessed		
	Wider Impacts	It is anticipated the scheme will deliver wider economic benefits, by facilitating the regeneration of March town centre and enabling housing and employment growth, including at the sites identified in the Fenland Local Plan. The scheme will also benefit business users and transport providers, through reduced congestion, reduced journey times, and improved journey time reliability.	Not Assessed			Not Assessed		
Environmental	Noise	•Sleep disturbance – £394,468 •Amenity – £320,831 •Acute Myocardial Infarction (AMI) – £80,009 •Stroke – £27,069 •Dementia – £40,835. Overall net reduction in households experiencing daytime noise	There would be an increase of 59 households experiencing daytime noise and a reduction in households of 197.			863,212	Not Assessed	
	Air Quality	There is an overall net improvement in local air quality with the scheme.	Reduction of 15 tonnes of NOx emissions and 3 tonnes of PM2.5 emissions.			164,745	Not Assessed	
	Greenhouse gases	Reduced fuel consumption as a consequence of significant journey time savings has resulted in a reduction in non-traded and traded carbon emissions over a 60-year appraisal period.	Change in non-traded carbon over 60y (CO2e) -4,434 Change in traded carbon over 60y (CO2e) .65			353,000	Not Assessed	
	Landscape	Not Assessed	Not Assessed			Neutral	Not Assessed	
	Townscape	The scheme design will significantly improve the appearance and amenity of Broad Street and setting of distinct historic features, by increasing the public realm areas for users, removing the central parking areas and substantially reducing the dominance of traffic and improving safety. The scheme will result in the loss of some trees and the demolition of the 1920's toilet block that will result in a permanent change in layout and views. It is considered that this loss will be offset by the positive impact on connectivity - opening up views and improving visual links to the river frontage. The scheme reverses what had become a car dominant environment, into a truly 'Broad Street' for pedestrians to enjoy within a unique setting.	Not Assessed			Large Beneficial	Not Assessed	
	Historic Environment	Providing that appropriate management and mitigation measures are taken, no substantial adverse setting impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for yet unknown archaeology. It is expected there will be significant benefits relating to better access and user experience in relation to the relocated Coronation Fountain.	Not Assessed			Neutral	Not Assessed	
	Biodiversity	The score is based on there being no mitigation in place for any of the areas or species identified in the worksheet. Slight adverse impacts are anticipated to deciduous woodland, the River Nene (Old Course), bats, nesting birds, otters, and water voles. It is thought that with mitigation as outlined within the preliminary ecological appraisal, impacts on ecological receptors will be minimised.	Not Assessed			Slight Adverse (Negative) Effect	Not Assessed	
	Water Environment	The Scheme will not result in an increase in impermeable road area, therefore no water quality impacts are anticipated. Also because there is no increase in impermeable area there will be no increase in flood risk which could be caused by an increase in surface water runoff. Although the Scheme footprint extends into Flood Zone 2 and 3, works in this area will only be related to road markings. Therefore, no encroachment is expected into flood zone 2 or 3. Additional attenuation will be incorporated into the Scheme which will be a beneficial impact to flood risk. The Scheme does not include any modifications to the bridge which crosses the River Nene (Old Course). Additionally, the works to the steps leading down to the tow path adjacent to the watercourse will not interact with the watercourse. Therefore no impacts to hydromorphology are anticipated. There is no bedrock aquifer underlying the study area. Both Secondary (A) Superficial aquifer and Secondary (undifferentiated) Superficial Aquifer underlay the study area. There is the potential for the installation of the attenuation tank to interact with groundwater, potentially impacting groundwater quality, levels and flows. At this stage, it is unknown if mitigation measures are required. Hence, these impacts should be further investigated and if necessary mitigation incorporated into the design.	Not Assessed			Slight Adverse (Negative) Effect	Not Assessed	
Social	Commuting and Other users	The scheme will improve journey times for commuting and other users travelling to / through the town centre, with the majority of journey time savings in the 0 to 2 minute range.	Value of journey time changes(£) 11,787,229 Net journey time changes (£)				0-20% - ✓ 20-40% - ✓✓ 40-60% - ✓✓✓ 60-80% - ✓✓✓ 80-100% - Neutral	
	Reliability impact on Commuting and Other users	The scheme will improve journey time reliability for commuting and other users travelling to / through the town centre.	Not Assessed			996,691		
	Physical activity	Not Assessed	Not Assessed			Not Assessed		
	Journey quality	Improvements in pedestrian crossing facilities, road surfacing, and journey times. Reductions in frustration, fear of potential accidents and route uncertainty. All of which are likely to be experienced by about 23,747 two-way 24-hour AADT flow along Broad Street	Not Assessed			Large Beneficial	Not Assessed	
	Accidents	Replacing the town centre signals with a mini-roundabout and reducing Broad Street to a single lane in each direction improves the safety of the town centre by reducing the likelihood of PIAs and casualties of occurring at the current frequency.	A reduction of 129 PIAs over a 60-year appraisal period. There would be a reduction of 174.1 slight, 10.8 serious, and 0.8 fatal casualties.			4,673,000	Not Assessed	
	Security	Road users are more vulnerable to crime where they are required to stop their vehicles or travel at slow speeds during congested periods. The MATS Improvement Schemes will reduce delays and queuing in March and in particular in March Town Centre where road users are often stationary for long periods, waiting for the signals to turn green.	Not Assessed			Neutral	Not Assessed	
	Access to services	There are no specific public transport interventions relating to the Broad Street scheme and therefore a detailed distributional assessment of accessibility has not been undertaken. However, it is expected that a reduction in journey times in March Town Centre as a result of the scheme will improve journey times for buses, improve reliability of services, and improve accessibility of key services for local residents.	Not Assessed			Not Assessed	Not Assessed	
	Affordability	Improvements in journey times and distances will reduce fuel and non-fuel vehicle operating costs and provide significant benefits for all social groups. The largest share of user benefits are for those residing in the 20% to 40% IMD Income Domains	75% of fuel and non-fuel VOC benefits will be received by those living in the 0% to 40% domains.			480,000 (Fuel and Non-Fuel VOC)	0-20% - ✓ 20-40% - ✓✓ 40-60% - ✓✓ 60-80% - ✓✓ 80-100% - Neutral	
	Severance	The scheme will reduce road space allocated to vehicles and provide an additional uncontrolled crossing on Broad Street, which will improve pedestrian accessibility within the town centre and will likely result in a net slight beneficial impact on community severance.	Not Assessed			Slight Beneficial	Not Assessed	
	Option and non-use values	Not Assessed	Not Assessed			Not Assessed		
Public Accountant	Cost to Broad Transport Budget	Not Assessed			2,413,000			
	Indirect Tax Revenues	Not Assessed			-364,000			

Appraisal Summary Table		Date produced: 6 12 2022			Contact:			
Name of scheme: MATS Package 3a		Name: Emma White			Organisation: CPCA			
Description of scheme: Broad Street, A141 Peas Hill + A141 Hostmoor Avenue, A141 / Twenty Foot Road, St. Peter's Road, Northern Industrial Link Road (NILR)		Role: Promoter/Official						
Impacts	Summary of key impacts	Assessment						
		Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ Vulnerable grp	
Economy	Business users & transport providers	Value of journey time changes(£)			Not Assessed	13,747,000	Not Assessed	
		Net journey time changes (€)						
Economy	Reliability impact on Business users	Value of journey time changes(£)			Not Assessed	1,371,950		
		Net journey time changes (€)						
Economy	Regeneration	Not Assessed			Not Assessed	Not Assessed		
		Not Assessed			Not Assessed	Not Assessed		
Environmental	Noise	There would be an increase of 63 households experiencing daytime noise and a reduction in households of 480.			Not Assessed	3,220,240	Not Assessed	
		Reduction of 12 tonnes of NOx emissions and 8 tonnes of PM2.5 emissions.			Not Assessed	321,746	Not Assessed	
Environmental	Air Quality	There is an overall net improvement in local air quality with the scheme.			Not Assessed	1,193,000		
		Reduced fuel consumption as a consequence of significant journey time savings has resulted in a reduction in non-traded and traded carbon emissions over a 60-year appraisal period.			Not Assessed	1,193,000		
Environmental	Greenhouse gases	All MATS schemes are expected to have a negligible effect on the landscape and can be accommodated well in the scheme locations.			Not Assessed	Neutral	Not Assessed	
		The Broad Street scheme design will significantly improve the appearance and amenity of Broad Street and setting of distinct historic features, by increasing the public realm areas for users, removing the central parking areas and substantially reducing the dominance of traffic and improving safety.			Not Assessed	Large Beneficial	Not Assessed	
Environmental	Landscape	The scheme will result in the loss of some trees and the demolition of the 1920's toilet block that will result in a permanent change in layout and views. It is considered that this loss will be offset by the positive impact on connectivity - opening up views and improving visual links to the river frontage. The scheme reverses what had become a car dominant environment, into a truly 'Broad Street' for pedestrians to enjoy within a unique setting.			Not Assessed	Large Beneficial	Not Assessed	
		The impact on townscape is expected to be neutral in all other scheme locations.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
Environmental	Townscape	Providing that appropriate management and mitigation measures are taken, no substantial adverse setting impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for yet unknown archaeology. It is expected there will be significant benefits relating to better access and user experience in relation to the relocated Coronation Fountain.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
		The Peas Hill scheme will entail widening and alterations to the existing road and this could mean potential impacts in relation to yet unknown archaeology.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
Environmental	Historic Environment	The score is based on there being no mitigation in place for any of the areas or species identified in the worksheets. Slight adverse impacts are anticipated to deciduous woodland, the River Nene (Old Course), bats, nesting birds, otters, and water voles in the vicinity of the Broad Street scheme. It is thought that with mitigation as outlined within the preliminary ecological appraisal, impacts on ecological receptors will be minimised.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
		Similar impacts are expected for the Twenty Foot Road and Peas Hill scheme locations.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
Environmental	Biodiversity	The MATS Broad Street scheme will not result in an increase in impermeable road area. Therefore no water quality impacts are anticipated. Also because there is no increase in impermeable area there will be no increase in flood risk which could be caused by an increase in surface water runoff. Although the Scheme footprint extends into Flood Zone 2 and 3, works in this area will only be related to road markings. Therefore, no encroachment is expected into flood zone 2 or 3. Additional attenuation will be incorporated into the Scheme which will be a beneficial impact to flood risk.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
		The MATS Broad Street scheme does not include any modifications to the bridge which crosses the River Nene (Old Course). Additionally, the works to the steps leading down to the low path adjacent to the watercourse will not interact with the watercourse. Therefore no impacts to hydromorphology are anticipated.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
Social	Water Environment	There is no bedrock aquifer underlying the Broad Street study area. Both Secondary (A) Superficial aquifer and Secondary (undifferentiated) Superficial Aquifer underlie the study area. There is the potential for the installation of the attenuation tank to interact with groundwater, potentially impacting groundwater quality, levels and flows. At this stage, it is unknown if mitigation measures are required. Hence, these impacts should be further investigated and if necessary mitigation incorporated into the design.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
		Medicinal impacts are expected at the other scheme locations.			Not Assessed	Slight Adverse (Negative) Effect	Not Assessed	
Social	Commuting and Other users	Value of journey time changes(£)			Not Assessed	31,243,000	0-20% - ✓✓ 20-40% - ✓✓✓ 40-60% - ✓✓ 60-80% - ✓✓ 80-100% - Neutral	
		Net journey time changes (€)						
Social	Reliability impact on Commuting and Other users	Value of journey time changes(£)			Not Assessed	3,118,000		
		Net journey time changes (€)						
Social	Physical activity	Not Assessed at FBC 1			Not Assessed	Not Assessed		
		Improvements in pedestrian crossing facilities, road surfacing, and journey times. Reductions in frustration, fear of potential accidents and route uncertainty. All of which are likely to be experienced by about 23,737 two-way 24-hour AADT flow along Broad Street, 21,132 at the A141 / Twenty Foot Road Junction, 26,405 at the Peas Hill Roundabout, 14,205 at the St. Peter's Road Junction, and 4,697 along the NILR.			Not Assessed	Large Beneficial	Not Assessed	
Social	Accidents	The MATS Improvement Schemes will significantly reduce the likelihood of PIAs and casualties occurring at the current frequency.			A reduction of 124 PIAs over a 60-year appraisal period. There would be a reduction of 156.7 slight, 16.2 serious, and 1.5 fatal casualties.	Not Assessed	5,685,000	Not Assessed
		Road users are more vulnerable to crime where they are required to stop their vehicles or travel at slow speeds during congested periods. The MATS Improvement Schemes will reduce delays and queuing in March and in particular in March Town Centre where road users are often stationary for long periods, waiting for the signals to turn green.			Not Assessed	Neutral	Not Assessed	Not Assessed
Social	Security	There are no specific public transport interventions relating to the schemes and therefore a detailed distributional assessment of accessibility has not been undertaken. However, it is expected that a reduction in journey times in March Town Centre and along the A141 as a result of the schemes will improve journey times for buses, improve reliability of services, and improve accessibility of key services for local residents.			Not Assessed	Not Assessed	Not Assessed	Not Assessed
		Improvements in journey times and distances will reduce fuel and non-fuel vehicle operating costs and provide significant benefits for all social groups. The largest share of user benefits are for those residing in the 20% to 40% IMD Income Domains.			82% of fuel and non-fuel VOC benefits will be received by those living in the 0% to 40% domains.	Not Assessed	1,210,000 (Fuel and Non-Fuel VOC)	0-20% - ✓ 20-40% - ✓✓✓ 40-60% - ✓ 60-80% - ✓✓ 80-100% - Neutral
Social	Affordability	The Broad Street scheme will reduce road space allocated to vehicles and provide an additional uncontrolled crossing on Broad Street, which will improve pedestrian accessibility within the town centre and will likely result in a net slight beneficial impact on community severance.			Not Assessed	Slight Beneficial	Not Assessed	Not Assessed
		Option and non-use values			Not Assessed	Not Assessed	Not Assessed	
Public Account	Cost to Broad Transport Budget	Not Assessed			Not Assessed	24,160,000		
		Indirect Tax Revenues			Not Assessed	Not Assessed	-1,207,000	

Appendix F: TAG Sheets

Air Quality Valuation Workbook - Worksheet 3

Scheme Name: MATS All Schemes

Present Value Base Year

Current Year

Proposal Opening year:

Project (Road/Rail or Road and Rail):

Overall Assessment Score:

Damage Costs Approach (Emissions)

Present value of change in NOx emissions (£):

Present value of change in PM2.5 emissions (£):

OR

Present value of change in PM10 emissions (£):

Impact Pathways Approach (Concentrations)

Present value of change in NO2 concentrations (£):

Of which:

Concentration costs:

Other impacts:

Present value of change in PM2.5 concentrations (£):

Of which:

Concentration costs:

Other impacts:

Total Change

Total value of change in air quality (£):

Quantitative Assessment:

Impact Pathways Approach (Concentrations)

Change in NO2 assessment scores over 60 year appraisal period:

(between 'with scheme' and 'without scheme' scenarios)

Change in PM2.5 assessment scores over 60 year appraisal period:

(between 'with scheme' and 'without scheme' scenarios)

Damage Costs Approach (Emissions)

Change in NOx emissions over 60 year appraisal period (tonnes):

(between 'with scheme' and 'without scheme' scenarios)

Change in PM2.5 emissions over 60 year appraisal period (tonnes):

(between 'with scheme' and 'without scheme' scenarios)

OR

Change in PM10 emissions over 60 year appraisal period (tonnes):

(between 'with scheme' and 'without scheme' scenarios)

Qualitative Comments:

The total NPV is predicted to be £321,746 as a result of the scheme presenting a benefit. This is likely due to a reduction in congestion despite the schemes collectively drawing more traffic onto the network.

Sensitivity Analysis:

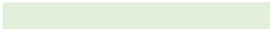
Upper estimate net present value of change in air quality (£):

Lower estimate net present value of change in air quality (£):

Data Sources:

DEFRA Emission Factor Toolkit version 11.0
Traffic data was provided from Milestone Infra, Nov 2022

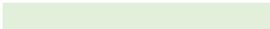




£48,503

£273,242

£0



£0

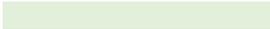
£0

£0

£0

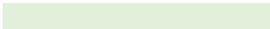
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£0



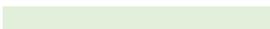
£321,746

*positive value reflects a **net benefit** (i.e. air quality improvement)



0.00

0.00



-12

-8

0

a overall reduction in

£1,032,760

£63,334

Noise Workbook - Worksheet 1

Proposal Name: March Area Transport Study

Present Value Base Year

Current Year

Proposal Opening year:

Project (Road, Rail or Aviation):

Net present value of change in noise (£):

positive value reflects a net benefit (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):	£1,382,693
Net present value of impact on amenity (£):	£1,238,898
Net present value of impact on AMI (£):	£288,260
Net present value of impact on stroke (£):	£123,665
Net present value of impact on dementia (£):	£186,724

Quantitative results

Households experiencing increased daytime noise in forecast year:	63
Households experiencing reduced daytime noise in forecast year:	480
Households experiencing increased night time noise in forecast year:	n/a
Households experiencing reduced night time noise in forecast year:	n/a

Qualitative Comments:

Night-time results estimated from daytime traffic data based on national averages of the differences between daytime and night-time flows.

The overall effects of the schemes can be classified as beneficial in terms of noise effects.

Data Sources:

Road traffic model provided by MilestoneInfra on 23/11/2022.
 Dwellings within 300 metres of each of the five schemes part of the March Area Transport Study identified through Ordnance Survey (OS) AddressBase Premium as provided by Cambridgeshire County Council on 23/11/2022.
 In accordance with OS AddressBase Premium, no dwellings are present within 300m of the Twenty Foot Road Signals scheme.

TAG Townscape Impacts Worksheet

Features	Step 2	Step 3				Step 4	
	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	Broad Street - a wide open character of Broad Street marked at each end by a war memorial and coronation fountain, crosses Town Bridge to the south to link with the narrower High Street. Lined on both sides by a wide pavement and shops and restaurants. Central parking areas are a dominant feature, resulting in severance and fragmentation of this principal street. Historic street layout to east and along the river Nene, where garden frontages are a feature, is characterised by a finer grain, smaller and more frequent layout of buildings.	Local	Commonplace	High importance at a local level	Substitutable	Unlikely to change for the better - due to traffic and congestion.	Large beneficial - coordinated design strategy for public realm will enhance layout and relationship of Broad Street to river whilst reducing dominance of traffic.
Density and mix	Medium to high density development with distinct residential areas to north, east and west of Broad Street, and along Nene Parade and West End. Interspersed with Sainsburys, car parking and the George Campbell Leisure Centre and open space to the south of the river as well as the riverside and tree lined walks.	Local	Commonplace	Medium importance at a local level	Substitutable	Unlikely to change	Moderate beneficial - fits well and will enhance the mix and relationship between Broad Street and riverside amenity.
Scale	Mostly two storey buildings line Broad Street, Nene Parade and West End along the river. Small to medium scale historic street layout and the small scale of buildings is a feature to the east and along the river Nene contributing to the sense of place and contrasting with the open space and larger scale development of the leisure centre to the south.	Local	Commonplace	Medium importance at a local level	Substitutable	Unlikely to change	Moderate beneficial - fits well and will enhance the scale and sense of place particularly the relationship between Broad Street and riverside amenity.

Appearance	The Victorian development, war memorial and coronation fountain are characteristic features along Broad Street as well as the cottages on Nene Parade and at West End which include predominantly local materials, styles and traditional details. The existing 1920's toilet block and shelter is also a distinct feature to the south which in combination with existing trees prevents views to the River Nene. The central parking areas in Broad Street are a dominant feature and detract from the appearance of this principal street.	Local	Commonplace	Medium importance at a local level	Substitutable	Unlikely to change for the better - due to traffic and congestion.	Moderate beneficial - well designed inc features that reflect existing characteristics and materials.
Human interaction	Broad Street shops and restaurants are a focus for pedestrian activity with people arriving on foot, cycle and by car. The River Nene is a navigation channel used by leisure craft. The riverside walk is also the National Trail (Hereward Way) linking to and sharing views to the public open space to the south. A national cycle network route is also a feature.	Local	Commonplace	Medium importance at a local level	Substitutable	Unlikely to change	Large beneficial - improved connectivity between broad street and riverside enhancement area. Enhanced public realm improving experience. The new scheme promotes interaction, and encourages visitors to dwell within the space, which will result in greater human interaction, and interaction with surrounding townscape.
Cultural	Buildings of architectural and historic interest from 17C contribute positively to the cultural value of March, located on the second largest fenland island. Broad Street shops and restaurants and the riverside walk, open space and development provide a community focus. Strong road, rail and waterway transport connections with the wider Fen. As one of the ancient fen rivers and former inland port the navigation channel of the River Nene has strong historic links with adjacent development corresponding with former quays and port cottages.	Regional	Commonplace	Medium importance at a regional level	Older buildings less substitutable	Unlikely to change	Moderate beneficial - scheme brings local improvement and enhancements to public realm. With scope to increase the benefits of other transport schemes in wider area to help relieve traffic and congestion. The proposals gives greater prominence to the two historic assets, the war memorial and fountain, reconnecting these elements with the public realm.
Land use	Mix of distinct residential interspersed with retail, commercial along main and local roads and recreational facilities including a leisure centre and open space to the south. Car parking and congestion a distinct feature of the area.	Local	Commonplace	Medium importance at a local level	Substitutable	Unlikely to change due to traffic and congestion.	Moderate benefit - potential to encourage investment in shops and restaurants and attract visitors to the area.

Summary of character	<p>The townscape character within the study area comprising Broad Street and the Riverside to the south of Broad Street is considered to be of medium to high sensitivity and is located within the March Conservation Area.</p> <p>The townscape is characterised by a small to medium scale historic street layout and the finer grain and small scale of buildings of architectural and historic interest dating back to 17C that predominantly include local materials, styles and traditional details.</p> <p>The area comprises distinct areas with residential properties located to the north of the B1101 and along and to west of Gray's Lane, as well as commercial, retail and recreational facilities including George Campbell Leisure Centre, a national cycle network route, a river walk and other areas of amenity value that include public open space to the south, play areas and tree lined walks that form an attractive setting and backdrop.</p> <p>Broad Street is a principal street in the town centre that links to the High Street via the Town Bridge to the south. Broad Street is a wide open Victorian street dominated by traffic. It is bordered by a uniform width pavement and lined by many of the original early 19th century two storey buildings comprising shops and restaurants. The central area is designated for parking, which is a dominant feature in Broad Street and has resulted in a one way movement. The central islands are also characterised by a Grade II listed cast iron Coronation Fountain to the north and the WW1 west memorial raised on steps to the south, lighting and mature trees.</p> <p>The existing 1920s toilet block and shelter located at the southern end of Broad Street in combination with the riverside trees screen views of the River Nene, a navigation channel used by leisure craft. Riverside development is characterised by cottages and some garden frontages.</p>	Large beneficial
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Reference Sources

Natural England National Character Area 46 - The Fens

Step 5 - Summary Assessment Score

Large beneficial

Qualitative Comments

<p>The scheme design will significantly improve the appearance and amenity of Broad Street and setting of distinct historic features, by increasing the public realm areas for users, removing the central parking areas and substantially reducing the dominance of traffic and improving safety.</p> <p>The scheme will result in the loss of some trees and the demolition of the 1920's toilet block that will result in a permanent change in layout and views. It is considered that this loss will be offset by the positive impact on connectivity - opening up views and improving visual links to the river frontage. The scheme reverses what had become a car dominant environment, into a truly 'Broad Street' for pedestrians to enjoy within a unique setting.</p>

Noise Workbook - Worksheet 1

Proposal Name: Broad Street Roundabout

Present Value Base Year

Current Year

Proposal Opening year:

Project (Road, Rail or Aviation):

Net present value of change in noise (£):

positive value reflects a net benefit (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):

Net present value of impact on amenity (£):

Net present value of impact on AMI (£):

Net present value of impact on stroke (£):

Net present value of impact on dementia (£):

Quantitative results

Households experiencing increased daytime noise in forecast year:

Households experiencing reduced daytime noise in forecast year:

Households experiencing increased night time noise in forecast year:

Households experiencing reduced night time noise in forecast year:

Qualitative Comments:

Night-time results estimated from daytime traffic data based on national averages of the differences between daytime and night-time flows.

The effects of the scheme can be classified as beneficial in terms of noise effects.

Data Sources:

Road traffic model provided by MilestoneInfra on 23/11/2022.

Dwellings within 300 metres of the Broad Street Roundabout identified through

Ordnance Survey (OS) AddressBase Premium as provided by Cambridgeshire County Council on 23/11/2022.

Qualitative Comments:

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Sensitivity Analysis:

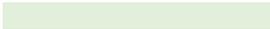
Upper estimate net present value of change in air quality (£):

Lower estimate net present value of change in air quality (£):

Data Sources:

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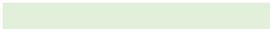




£56,210

£108,535

£0



£0

£0

£0

£0

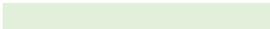
£0

£0



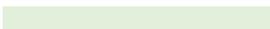
£164,745

*positive value reflects a net benefit (i.e. air quality improvement)



0.00

0.00



-15

-3

0

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£551,871

£28,440

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TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	The study area for this scheme was 300 metres. The scheme boundary is on Broad Street, a typical Victorian street lined with shops and with many of the original buildings remaining. It has an early 19th century cast iron memorial fountain canopy to the north and a First World War War Memorial to the south, both listed. There is also a Grade II listed ex Public House, now occupied for commercial use, adjacent to the fountain. This is within the Conservation Area. There are 18 listed buildings within the Study Area. The toilet block is apparently not a listed asset on the HER but the FDC Conservation Officer advised that it was a 1920s build and one of the first to allow women. Although the HER was not consulted for this exercise, heritage statements completed for this project concluded that there were medieval and Roman below ground remains within the Study Area. There is potential for unknown remains.	Local to regional	Low to medium, with the significance of the Coronation fountain canopy being higher, due to the high profile of the manufacturer and quality of skill and workmanship.	Most of the assets are common. The Coronation fountain canopy is more unusual, manufactured by one of the most prolific suppliers of architectural cast-iron in the world, there are over 80 listed structures by the same manufacturer but an unknown number of canopies such as this.	Relocation of the Grade II listed Coronation fountain canopy is required. Renewal of the memorial steps. Impact to below ground remains is anticipated to be low. Any permanent setting impacts to the listed buildings, particularly the coronation fountain and war memorial, are anticipated to be a positive as a result of reduced vehicle dominance and increased pedestrian access to these historic features.
Survival	Good survival generally, regarding built heritage. The fountain below the canopy is no longer present. The survival of below ground remains is unknown. The Conservation Area Appraisal and Management Plan described the need for the inclusion of Broad Street within the Conservation Area, saying that Broad Street was vulnerable to further change that would negatively impact the significance of its historic character. The Conservation Area Appraisal and Management Plan describes the existing record of survival of archaeological remains of all periods. The potential for survival of remains is high within the town due to accumulated layers of peat deposits .	Generally, the survival of Listed Buildings matters on a regional to national scale. Any unknown remains preserved within the peat could be of regional to national importance. The memorial matters on a	The survival of the built heritage within the Study Area is important to understand the development of the town during the 19th-20th century. Any unknown remains preserved within the peat could be of high significance. The memorial is of more significance as it represents the work of the erstwhile largest century supplier of cast iron in the world and represents lost skills and irreplaceable workmanship.	Common. With the exception of the Coronation fountain, which is more unusual, manufactured by one of the most prolific suppliers of architectural cast-iron in the world, there are over 80 listed structures by the same manufacturer but an unknown number of canopies such as this.	Removal of the public toilets/shelter is not expected to have a significant permanent adverse impact on the conservation area; however, planning permission will be required for their demolition. Planning permission for demolition within a Conservation Area and a listed building consent application will be required (for both the memorial conservation work and the memorial relocation). The relation will require the close observation and advice of a specialist Conservation Engineer. All works will require the consultation of a heritage specialist and the Conservation Officer and County Archaeologist.
Condition	The Conservation Area Appraisal and Management Plan mentions details on listed buildings and assets that require conservation and mending. Broad Street was added to the Conservation Area recently for the purposes of giving its historic character the protection that was felt it needed. Any surviving unknown archaeological remains have the potential to be well preserved due to peat layers. The Coronation fountain was refurbished in 2011 by Heritage Engineering. It is important that a specialist Conservation Engineer is employed and consulted, for the moving of the fountain, as the workmanship and materials are irreplaceable and its condition unknown to the author at the time of writing.	Local with the exception of the fountain which is national	low with the exception of the Coronation fountain, which is medium to high	Common with the exception of the Coronation fountain which is rare	
Complexity	The historic environment consists of built heritage, largely comprising buildings, also including a war memorial, a Coronation fountain, and below ground remains of Roman and Medieval date.	Local	low	Common	
Context	March is the county town of the Isle of Ely and before the draining of the fens, was an island in its own right, overlooking the former fen. It is on the second largest fenland island. It sits on the old course of the River Nene where the road between Ely and Wisbech (the two chief towns of the Isle) fords the river	Local and National	Medium	Rare - the settlement type, being a town on a fenland island, is rare.	
Period	The built heritage is largely 19th and 20th century, whilst below ground remains are, where known, of medieval and Roman date.	Local	Medium	Common	

Reference Sources

The National Heritage List for England. Publicly available local authority information relating to conservation areas and non-designated heritage assets, was consulted. The March Conservation Area, Appraisal and Management Plan, <https://memorialdrinkingfountains.wordpress.com/2013/09/26/coronation-fountain/>, PCAS Archaeology Heritage Statement: Coronation Fountain, Broad Street, March, Fenland, Cambridgeshire, PCAS Archaeology Heritage Statement: Site of Public Toilets, Broad Street, March, Fenland, Cambridgeshire (both August 2022).

Step 5 - Summary Assessment Score

The overall effect on the historic environment resource is considered to be Neutral to Slight Adverse, depending on further assessment. This assessment is subject to change following the introduction of any new information.

Qualitative Comments

Providing that appropriate management and mitigation measures are taken, no substantial adverse settings impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for as yet unknown archaeology. Any damage to the Coronation fountain canopy could amount to substantial adverse effects.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Traditional orchard (priority habitat)	<p>There is one parcel of priority traditional orchard habitat present approximately 280 m southwest of the scheme extent.</p> <p>This habitat parcel is separated from the scheme extent by roads and residential and commercial properties. There is no direct hydrological link between the scheme extent and the traditional orchard.</p>	Regional	Priority Habitats are of regional importance with potential for substitution in some instances	Unknown	Medium	<p>Neutral</p> <p>Due to the distance between the scheme extent and the traditional orchard, and the fact there is no hydrological connection between the scheme and the traditional orchard, no direct or indirect impacts are anticipated.</p>	Neutral
Deciduous woodland (priority habitat)	<p>The desk study revealed there are two parcels of deciduous woodland priority habitat within 500 m of the scheme extent, the closest of which is approximately 5 m west. During the walkover survey, an additional parcel of deciduous woodland was identified within the scheme boundary, on the north bank of the River Nene Old Course.</p>	Regional	Priority Habitats are of regional importance with potential for substitution in some instances	Unknown	Medium	<p>Minor negative</p> <p>No vegetation clearance is anticipated as a result of the proposed scheme, however, the woodland could be subject to disturbance impacts and pollution events during the construction phase of the proposed scheme.</p>	Slight adverse
River Nene Old Course (priority habitat)	<p>The River Nene Old Course is directly adjacent to the south of the scheme extent, running in a west to east direction along the south of the site extent.</p>	Regional	Regional - The River Nene (Old Course) extends from Peterborough to Upwell, Norfolk. It provides habitat for local wildlife such as commuting otter.	Unknown	Low	<p>Minor negative</p> <p>No in-channel works are anticipated to the River Nene, however, it could be subject to disturbance impacts such as pollution events during construction.</p>	Slight adverse
Amphibians	<p>The desk study provided recent records of common frogs, common toads, and great crested newts within 500 m of the scheme extent. However, there are no ponds or drains within the scheme extent nor within 500 m of the scheme, and the habitat on site primarily consists of hardstanding and developed land. The deciduous woodland on site likely would provide suitable foraging and hibernation habitat for amphibians, however as there is no connectivity to breeding habitats, they are unlikely to be present. Furthermore, no vegetation clearance is anticipated within the deciduous woodland.</p>	Local	Local - The lack of suitable habitat means that any amphibians present within or close to site will be of local importance at most only.	Unknown	Low	<p>Neutral</p> <p>Due to the fact there is no nearby suitable breeding habitat for amphibians, and limited vegetation on site, no direct or indirect habitats are anticipated.</p>	Neutral
Bats	<p>The desk study provided 35 recent bat records within 2 km of the scheme, including a record of a soprano pipistrelle approximately 10 m southeast of the scheme extent. This is not a roost record.</p> <p>The toilet block which is due to be demolished was determined to have moderate suitability to support roosting bats. The sanitation building which is due for demolition could not be fully assessed for bat roosting potential, therefore bat potential is assumed.</p> <p>None of the trees in the woodland had roosting potential, however, the woodland provides suitable habitat for commuting and foraging bats. The street trees on Broad Street itself were all immature and did not have bat roosting potential.</p>	Local	Local - trees and buildings within and adjacent to the scheme extent may support bat populations of local importance. Due to the urban nature surrounding the site, bat populations on and adjacent to site are unlikely to be of higher importance.	Unknown	Low	<p>Intermediate negative</p> <p>As buildings with bat roosting potential are to be demolished, in the absence of mitigation there is the potential for a direct loss of bat roosts. Bats commuting and foraging within the woodland and along the river may be subject to disturbance impacts such as lighting, noise and vibration during the construction phase of the scheme.</p>	Slight adverse

Badger	The desk study returned no records for badgers within 500 m of the scheme. The deciduous woodland on site may support commuting and foraging badgers, or opportunities for badger sett building, however, the site visit revealed no evidence of badger within the woodland. Furthermore, there are no impacts anticipated to the deciduous woodland.	Local	Local - the deciduous woodland habitat on site may support local populations of badgers	Unknown	Low	Neutral As a result of there only being a small area suitable for badgers on site, which is an area unaffected by the works, no impacts to badger are anticipated.	Neutral
Nesting birds	The trees in the deciduous woodland on site could support populations of nesting birds on site. Furthermore, the toilet block which is due for demolition was noted as having an old bird nest adjacent to the drainpipe.	Local	Local - the deciduous woodland habitat and buildings on site may support local nesting bird populations	Unknown	Low	Minor negative Demolition of buildings on site may result in direct loss of nests, and loss of opportunities for nesting birds. No impacts are anticipated to trees in the deciduous woodland.	Slight adverse
Reptiles	The deciduous woodland on site may provide suitable habitat for basking, foraging, commuting and hibernating reptiles. Furthermore, the River Nene (Old Course) may provide opportunities for grass snakes. The desk study returned four recent records of reptiles within 500 m of the scheme, the closest of which is a common lizard approximately 100 m from the site extent.	Local	Local - the deciduous woodland habitat on site may support local populations of reptiles	Unknown	Low	Neutral As a result of there only being a small area suitable for reptiles on site, an area which is unaffected by the works, no impacts to common species of reptile are anticipated.	Neutral
Otter	The River Nene (Old Course) may support populations of otters. The river banks within the survey area have heavily modified brick walls with little to no aquatic vegetation present and therefore do not provide suitable resting habitat for otter. The woodland adjacent to site has no understory and therefore provides no suitable cover for resting otter. However, there is the opportunity for otters who may commute and forage along the river, and the banks of the river are more natural upstream and therefore could provide suitable habitat for otter resting.	Local	Otter are a European Protected Species and as such are of value at a European level. However, owing to the site location and the urban nature of the surroundings, otter have been evaluated as being of local importance.	Unknown	Medium	Minor negative No in-channel or bank works are anticipated to the river, however, there is the possibility of pollution events which could harm commuting otter.	Slight adverse
Water vole	The River Nene (Old Course) may support populations of water vole. The river within the survey area has heavily modified brick walls with little to no aquatic vegetation present, therefore is not suitable for water vole burrowing or foraging. However, there is the opportunity for water vole who may commute along the river, and the banks of the river are more natural upstream and therefore could provide suitable habitat for water vole burrowing.	Local	Water voles are afforded legal protection under the Wildlife and Countryside Act 1981 (as amended). However, they are present across the local and wider environment and due to the urban nature of the site, water vole have been evaluated as being of local importance.	Unknown	Medium	Minor negative No in-channel or bank works are anticipated to the river, however, there is the possibility of pollution events which could harm commuting water vole.	Slight adverse
River Nene Old Course (aquatic habitat)	The River Nene (Old Course) is an artificial watercourse which forms part of the Middle Level Water Body, which has an overall classification of "moderate". Its biological quality elements are classified as "moderate", with fish and invertebrates classified as "high" and macrophytes and phytobenthos classified as "moderate". No in-channel or bank works to the River Nene (Old Course) are required as a result of the scheme. Therefore, there are no mechanisms for direct watercourse or riparian habitat loss or disturbance as a result of the scheme. However, works close to the river bank could result in pollution events. No significant increase in noise disturbance is anticipated due to the non-intrusive nature of the works, and the high levels of turbidity in the watercourse limits the potential for visual disturbance associated with workforce and plant movements.	Regional	Regional - The River Nene (Old Course) extends from Peterborough to Upwell, Norfolk. It provides habitat for local wildlife.	Unknown	Medium	Neutral	Neutral

Aquatic macrophytes	<p>The desk study returned no results for protected or priority aquatic macrophytes within 2 km of the site. It was noted during the survey that the depth and turbid nature of the watercourse is likely to limit the growth of submerged and marginal emergent macrophytes within the river channel.</p> <p>No in-channel or bank works to the River Nene (Old Course) are required. As such, there are no mechanisms for direct disturbance that could affect aquatic macrophytes. Works close to the river banks could cause pollution events which could limit the suitability of the channel to support aquatic macrophytes.</p>	Local	Local - The River Nene (Old Course) supports aquatic macrophytes of local importance	Unknown	Low	Neutral	Neutral
Aquatic macroinvertebrates	<p>The desk study returned no results for protected or priority macroinvertebrates within 2 km of the site. There is a nearby Environment Agency macroinvertebrate monitoring site 3.4 km downstream with a similar typology to the river course near to the study area. This monitoring site indicates poor habitat and/or water quality, with a macroinvertebrate assemblage which has a low sensitivity to reduced flows and indicative of a heavily sedimented channel bed.</p> <p>It is unlikely that aquatic macroinvertebrates are present at any great number within the river channel.</p>	Local	Local - The River Nene (Old Course) supports aquatic macroinvertebrates of local importance at most	Unknown	Low	Neutral	Neutral
Fish	<p>The desk study returned no records of protected or priority fish species within 2 km of the Site.</p> <p>One Environment Agency fish monitoring site is located on the River Nene (Old Course) approximately 2 km downstream of the Site. The fish assemblage is dominated by coarse fish species, with survey yielding records of roach (<i>Rutilus rutilus</i>), rudd (<i>Scardinius erythrophthalmus</i>), common bream (<i>Abramis brama</i>), pike (<i>Esox lucius</i>), perch (<i>Perca fluviatilis</i>), silver bream (<i>Abramis bjoerkna</i>) and tench (<i>Tinca tinca</i>).</p> <p>No in-channel or bank works to the River Nene (Old Course) are required as a result of the scheme. Therefore, there are no mechanisms for direct watercourse or riparian habitat loss or disturbance as a result of the scheme. However, works close to the river bank could result in pollution events. No significant increase in noise disturbance is anticipated due to the non-intrusive nature of the works, and the high levels of turbidity in the watercourse limits the potential for visual disturbance associated with workforce and plant movements.</p>	Local	Local - The River Nene (Old Course) supports fish populations of local importance	Unknown	Low	Neutral	Neutral

Reference Sources

Multi-Agency Geographic Information for the Countryside (MAGIC) website (<https://magic.defra.gov.uk/MagicMap.aspx>), Information from Cambridgeshire and Peterborough Environmental Records Centre, Bing Maps (<https://www.bing.com/maps>), Google Earth (<https://earth.google.com/web/>), Woodland Trust Ancient Tree Inventory (<https://atli.woodlandtrust.org.uk/>), Ordnance Survey maps, Environment Agency Ecology and Fish Data Explorer website (<https://environment.data.gov.uk/ecology-fish>), Environment Agency Catchment Data Explorer website (<https://environment.data.gov.uk/catchment-planning>), Environment Agency Water Framework Directive classification data (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy), Environment Agency River Basin Management Plans, Environment Agency Main River Map, OS District Vector Map (<https://www.ordnancesurvey.co.uk/business-government/products/vectormap-district>).

Summary Assessment Score

Slight adverse

Qualitative Comments

The summary score of slight adverse is based on there being no mitigation in place for any of the areas or species identified in column B. Slight adverse impacts are anticipated to deciduous woodland, the River Nene (Old Course), bats, nesting birds, otter and water vole. It is thought that with mitigation as outlined within the preliminary ecological appraisal, impacts on ecological receptors will be minimised.

TAG Water Environment Impacts Worksheet - Construction

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Possible Measures	Assessment data availability	Scale	Rarity	Substitutability	Importance	Magnitude	Significance	Resource assessment score with mitigation
Study area: 1 km radial buffer from the works area (which consists of a 100m buffer on the General Arrangement)												
Potential Construction Impacts:												
<p>Potential for deterioration in water quality resulting from construction activities e.g. spillages of fuels and other contaminating liquids, accidental leaks of hazardous materials, mobilisation of contamination following disturbance of contaminated ground or groundwater.</p> <p>This impact can likely be mitigated by adopting a Construction Environmental Management Plan (CEMP) which will include mitigation measures associated with good site practice and the preparation of robust method statements (e.g. Pollution Prevention).</p> <p>At waterbody scale this impact would not be significant.</p>	<p>River Nene (old course) (Ordinary Watercourse)</p> <p>WFD reportable reach: Middle Level (GB205033000050)</p>	Water Supply	Use of water supply (potable, industrial or agricultural)	Location and number of abstraction points	No abstraction licence information available at the time of reporting. Indicator of quality not used in assessment.							
				Volume of water abstracted								
				Use of water (potable most important)								
		Chemical water quality	Existing chemical classification/status and objective under the WFD.	Existing chemical classification: Fail (2019) Chemical objective: Good by 2063	Regional	Commonplace	Replaceable	Medium	Moderate Adverse	Low Significance		
				Likelihood of a change in classification arising (+ve or -ve)	No information available to indicate direction of change.							
				Location and number of discharge points	No discharge consents information available at the time of reporting Indicator of quality and measures not used in assessment.							
		Volume of effluent discharged										
		Transport and dilution of waste products	Presence of surface water discharge points	Proportion of flow made up by effluent at different times of the year								
				Contribution of discharge to total river flow								
		Biodiversity	Biological water quality	Existing ecological classification/status and objective under the WFD	Existing classification: Moderate (2019) Objective: Good by 2027	Regional	Commonplace	Replaceable	Medium	Moderate Adverse	Low Significance	
				Likelihood of a change in classification arising (+ve or -ve)	No information available to indicate direction of change.							
			Fisheries quality	EC Fishery designation (Salmonid, Cyprinid or undesignated)	Not considered in the water environment assessment, refer to Biodiversity assessment. Indicator of quality and measure not used in assessment.							
				Results of River Habitat Survey	River Habitat Surveys have not been undertaken at the time of reporting. Indicator of quality and measure not used in assessment.							
			Conservation value of river corridor	Presence of designations (e.g. SSSI, NNR, LNR, SINC)	Not considered in the water environment assessment, refer to Biodiversity assessment. Indicator of quality and measure not used in assessment.							
				Presence of protected species or BAP species	Presence of protected species or BAP species not considered in the water environment assessment, refer to Biodiversity assessment. Indicator of quality and measure not used in assessment.							
		Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment	Contribution to landscape character and quality not considered in the water environment assessment, refer to landscape assessment. Feature not used in assessment.							
		Cultural heritage	Presence of historic features associated with river	Results of historic environmental assessment	Presence of historic features associated with river not considered in the water environment assessment, refer to Culture Heritage assessment. Feature not used in assessment.							
				Presence of designations (e.g. SAMs, listed buildings)								
Recreation	Riverside access	Presence of route and importance	Indicator of quality and measure not used in assessment									
		Use of the river for recreation	Presence of facilities and clubs for using the river environment	Indicator of quality and measure not used in assessment								
		Use for angling (number of clubs/membership)	Indicator of quality and measure not used in assessment									
Value to economy	Value of the uses of the river (e.g. commercial fishing, abstractions, discharges, navigation, leisure and riverside development land)	Value to local economy (e.g. employment, relative property prices, cost of alternatives, etc)	Indicator of quality and measure not used in assessment									
Conveyance of flows and material	Presence of watercourses	Number and size of watercourse	Indicator of quality and measure used in floodplain resource so as to not duplicate scoring.									
		Existing flood risk	Indicator of quality and measure used in floodplain resource so as to not duplicate scoring.									
<p>Potential increase in flood risk, both to the Scheme and surrounding land uses arising from: the storage of materials or temporary changes in topography and earthworks reducing floodplain capacity or impeding flood flow routes, an increase in temporary impermeable areas at site compounds increasing rainfall runoff and discharge of abstracted water (used in construction processes).</p> <p>This impact can likely be mitigated. Mitigation measures could include:</p> <ul style="list-style-type: none"> - Developing a drainage strategy to address the management of surface waters to ensure flood risk to the surrounding area is not increased. - Developing Flood Management Plans to ensure the proposed construction site can be safely operated and will not be affected in the event of a flood, where floodplain working to be minimised as far as possible; - Ensuring temporary land-take for construction include adequate areas of land set aside for robust flood control measures, for example sustainable drainage control; - Ensuring temporary flood compensation areas are put in place in advance of any earthworks 	<p>River Nene (old course) ordinary watercourse floodplain</p>	Conveyance of flood flows	Presence of flood zones	Existing flood risk/flood return period	Although the watercourse is not designated as Main River, there are areas of Flood Zones 2 and 3 adjacent to this watercourse. This indicates that the Flood Zones may be associated with the watercourse. Areas to the east of the study area (surrounding Gaul Road), and areas to the north west (majority of Creek road and surrounding roads) are within Flood Zones 2 and 3. Also, the southern area of the proposed Scheme passing over the River Nene (old course) sits within these Flood Zones.	Regional	Commonplace	Limited to substitution	Very High	Large Adverse	Very Highly Significant	
				Flood flow routes	Location / importance of flood flow routes	Unknown at the time of reporting. Indicator of quality not used in assessment.						
		Surface water flooding	Location of surface water flooding	There is currently low to high risk of surface water flooding throughout the study area. There is a small section at high risk of flooding from surface water within Broad Street close to the junction connecting to Dartford Road in the north side of the Scheme. The majority of the east side of Broad Street has a medium and low risk of flooding from surface water. The southern extent of the Scheme, connecting Broad Street to West End is at low risk of flooding. The majority of Dartford Road is shown to be at low to medium risk of flooding from surface water.	Regional	Commonplace	Limited to substitution	Very High	Large Adverse	Very Highly Significant		
				Biodiversity	Conservation value of river corridor	Results of River Habitat Survey	River Habitat Surveys have not been undertaken at the time of reporting. Feature not used in assessment					

Neutral

Neutral

resulting in loss of floodplain.				Presence of designations (e.g. SSSI, NNR, LNR, SINC)s	Presence of designations is not considered under the floodplain resource. Feature not used in assessment.																
				Presence of protected species or BAP species	Presence of protected species or BAP species not considered in the water environment assessment, refer to Biodiversity assessment. Feature not used in assessment.																
		Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment	Contribution to landscape character and quality not considered in the water environment assessment, refer to landscape assessment. Feature not used in assessment.																
No impacts anticipated. These watercourses are not located in the study area, however, it is assumed their floodplains are located in the study area. However, the floodplains are located on the periphery of the study area and therefore no impacts are anticipated.	Mortons Leam (Main River) floodplain River Nene Tidal (Main River) floodplain Tidal River (100 ft) (Main River) floodplain	Conveyance of flood flows	Presence of flood zones	Existing flood risk/flood return period																	
			Flood flow routes	Location / importance of flood flow routes																	
			Surface water flooding	Location of surface water flooding																	
	Delph (Main River) floodplain	Biodiversity	Conservation value of river corridor	Results of River Habitat Survey																	
				Presence of designations (e.g. SSSI, NNR, LNR, SINC)s																	
				Presence of protected species or BAP species																	
			Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment																
		Conveyance of flood flows	Flow routes	Location and importance of flow routes																	
			Groundwater levels	Charges in levels and recharge																	
Potential for deterioration in groundwater quality resulting from construction activities (particularly the installation of the underground attenuation tank) e.g. from spillages of fuels and other contaminating liquids, accidental leaks of hazardous materials, mobilisation of contamination following disturbance of contaminated ground or groundwater. This impact can likely be mitigated by adopting a CEMP which will include mitigation measures associated with good site practice and the preparation of robust method statements (e.g. Pollution Prevention). At waterbody scale this impact would not be significant.	Secondary (undifferentiated) Superficial Aquifer WFD groundwater body: No WFD groundwater body present.	Water supply	Use for water supply (potable, industrial or agricultural)	Location and number of abstraction points	No abstraction licence information available at the time of reporting. Indicator of quality not used in assessment.																
				Volume of water abstracted																	
				Use of water (potable most important)																	
				Groundwater vulnerability	Location and grade of source protection zone	There are no Source Protection Zones (SPZ) within the 1km boundary															
						Classification of aquifer vulnerability	The majority of the Scheme has a groundwater vulnerability of-medium-low with the southern extent of the Scheme being unproductive. The northern section of the study area has predominantly a low groundwater vulnerability. The southern section of the study area has predominantly a medium-low groundwater vulnerability.	Local	Rare	Limited to substitution	Low	Moderate Adverse	Insignificant								
					Classification/status and objective under WFD	No WFD groundwater body within the study area.															
				Transport and dilution of waste products	Presence of discharge points	Location and number of discharge points	No discharge consents information available at the time of reporting. Feature not used in assessment.														
						Location and number of discharge points															
				Value to the economy	Value of the uses of the groundwater (e.g. abstractions and discharges)	Value to local economy (e.g. employment, cost of alternatives, etc.)	No abstraction licence or discharge consent information available at the time of reporting. Feature not used in assessment.														
				Biodiversity	Conservation value of areas fed by groundwater	Results of River Habitat Survey	River Habitat Surveys have not been undertaken at the time of reporting. Feature not used in assessment														
						Presence of designations (e.g. SSSI, NNR, LNR, SINC)s															
						Presence of protected species or BAP species	Presence of protected species or BAP species not considered in the water environment assessment, refer to Biodiversity assessment. Feature not used in assessment.														
						Presence of Groundwater Dependant Terrestrial Ecosystems under the WFD	Unknown at the time of reporting. Feature not used in assessment.														
		Conveyance of flood flows	Flow routes	Location and importance of flow routes	Unknown at the time of reporting. Feature not used in assessment.																
				Groundwater levels	Charges in levels and recharge																
Potential for deterioration in groundwater quality resulting from construction activities (particularly the installation of the underground attenuation tank) e.g. from spillages of fuels and other contaminating liquids, mobilisation of contamination following disturbance of contaminated ground or groundwater. This impact can likely be mitigated by adopting a CEMP which will include mitigation measures associated with good site practice and the preparation of robust method statements (e.g. Pollution Prevention). At waterbody scale this impact would not be significant.	Secondary (A) Superficial Aquifer WFD groundwater body: No WFD groundwater body present.	Water supply	Use for water supply (potable, industrial or agricultural)	Location and number of abstraction points	No abstraction licence information available at the time of reporting. Indicator of quality not used in assessment.																
				Volume of water abstracted																	
				Use of water (potable most important)																	
				Groundwater vulnerability	Location and grade of source protection zone	There are no Source Protection Zones (SPZ) within the 1km boundary															
						Classification of aquifer vulnerability	The majority of the Scheme has a groundwater vulnerability of-medium-low with the southern extent of the Scheme being unproductive. The northern section of the study area has predominantly a low groundwater vulnerability. The southern section of the study area has predominantly a medium-low groundwater vulnerability.	Local	Rare	Limited to substitution	High	Moderate Adverse	Significant								
					Classification/status and objective under WFD	No WFD groundwater body within the study area.															
				Transport and dilution of waste products	Presence of discharge points	Location and number of discharge points	No discharge consents information available at the time of reporting. Feature not used in assessment.														
						Location and number of discharge points															
				Value to the economy	Value of the uses of the groundwater (e.g. abstractions and discharges)	Value to local economy (e.g. employment, cost of alternatives, etc.)	No abstraction licence or discharge consent information available at the time of reporting. Feature not used in assessment.														
				Biodiversity	Conservation value of areas fed by groundwater	Results of River Habitat Survey	River Habitat Surveys have not been undertaken at the time of reporting. Feature not used in assessment														
						Presence of designations (e.g. SSSI, NNR, LNR, SINC)s	Feature not used in assessment														

Neutral

Neutral

			Presence of protected species or BAP species	Presence of protected species or BAP species not considered in the water environment assessment, refer to Biodiversity assessment. Feature not used in assessment.						
			Presence of Groundwater Dependant Terrestrial Ecosystems under the WFD	Unknown at the time of reporting. Feature not used in assessment.						
	Conveyance of flood flows	Flow routes	Location and importance of flow routes	Unknown at the time of reporting. Feature not used in assessment.						
		Groundwater levels	Charges in levels and recharge							

Reference Sources

Environmental datasets held on Defra's MAGIC website <https://magic.defra.gov.uk/home.htm>
 Environment Agency - Catchment Data Explorer <http://environment.data.gov.uk/catchment-planning/>
 Flood Map for Planning <https://flood-map-for-planning.service.gov.uk/>
 Check your long term flood risk (surface water flooding extent) <https://check-long-term-flood-risk.service.gov.uk/map>
 Data.gov - <https://www.data.gov.uk/>

Summary Assessment Score (post mitigation)

Neutral

Qualitative Comments

The general construction activities associated with the Scheme could potentially result in the deterioration of the water quality of the River Nene (old course) from spillages of fuels and other contaminating liquids, accidental leaks of hazardous materials, mobilisation of contamination following disturbance of contaminated ground or groundwater. However, this impact can be mitigated by adopting a CEMP which will include mitigation measures associated with good site practice and the preparation of robust method statements. Although now withdrawn by the Environment Agency the Pollution Prevention Guidelines still detail good practice advice for undertaking work which may have the potential to result in water pollution. The CIRIA guidance C648, 'Control of Water Pollution from Linear Construction Sites' also provides good advice. This impact also applies to groundwater, particularly as excavation will be required for the installation of the attenuation tank.

There is the potential that construction activities could cause an increase in flood risk to the Scheme itself and surrounding land uses e.g., through temporary site compounds, but this can be mitigated through good working practices including minimising floodplain working and locating compounds outside of the Flood Zones 2 and 3 as far as possible.

As there are potential impacts which are very highly significant the overall assessment score for the operation of the Scheme is **Large Adverse**. This has been determined with reference to sections 5.3.15 – 5.3.20 and 10.2 of TAG UNIT A3 - Environmental Impact Appraisal, May 2019, Department for Transport, Transport Analysis Guidance, as summarised below:

- Most adverse category. The scheme as a whole is assessed according to the most adverse assessment of the features affected i.e. if a single feature scores 'large adverse' and this is the highest individual assessment score for all features then the overall assessment score should be 'large adverse'.

However, applying water quality (surface water and groundwater) and flood risk mitigation will reduce the significance of effect to neutral.

TAG Water Environment Impacts Worksheet - Operational

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Possible Measures	Assessment data availability	Scale	Rarity	Substitutability	Importance	Magnitude	Significance	Resource assessment score with mitigation
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Study area: 1 km radial buffer from the works area (which consists of a 100m buffer on the General Arrangement)

Potential Operational Impacts:

<p>No impacts anticipated.</p> <p>As there will be no increase in impermeable area it is anticipated that there will be no impacts to surface water quality.</p> <p>The extent of the Scheme extends onto the bridge which crosses the River Nene. However, the works on the bridge only include new road markings. Therefore no impacts to hydromorphology are anticipated.</p> <p>Access steps down to the River Nene (Old Course) tow path will be replaced. As these steps are on the embankment no impacts to hydromorphology are anticipated.</p>	<p>River Nene (Old Course) (Ordinary Watercourse)</p> <p>WFD reportable reach: Middle Level (GB205033000050)</p>	Water Supply	Use of water supply (potable, industrial or agricultural)	Location and number of abstraction points								
				Volume of water abstracted								
				Use of water (potable most important)								
			Chemical water quality	Existing chemical classification/status and objective under the WFD.								
				Likelihood of a change in classification arising (+ve or -ve)								
			Transport and dilution of waste products	Presence of surface water discharge points	Location and number of discharge points							
		Volume of effluent discharged										
		Contribution of discharge to total river flow		Proportion of flow made up by effluent at different times of the year								
		Biodiversity	Biological water quality	Existing ecological classification/status and objective under the WFD								
				Likelihood of a change in classification arising (+ve or -ve)								
			Fisheries quality	EC Fishery designation (Salmonid, Cyprinid or undesignated)								
			Conservation value of river corridor	Results of River Habitat Survey								
				Presence of designations (e.g. SSSI, NNR, LNR, SINCs)								
			Presence of protected species or BAP species									
		Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment								
		Cultural heritage	Presence of historic features associated with river	Results of historic environmental assessment								
				Presence of designations (e.g. SAMS, listed buildings)								
		Recreation	Riverside access	Presence of route and importance								
			Use of the river for recreation	Presence of facilities and clubs for using the river environment								
				Use for angling (number of clubs/membership)								
Value to economy	Value of the uses of the river (e.g. commercial fishing, abstractions, discharges, navigation, leisure and riverside development land)	Value to local economy (e.g. employment, relative property prices, cost of alternatives, etc)										
Conveyance of flows and material	Presence of watercourses	Number and size of watercourse										
		Existing flood risk										
No impacts anticipated.	River Nene (old course) ordinary watercourse floodplain	Conveyance of flood flows	Presence of flood zones	Existing flood risk/flood return period								
			Flood flow routes	Location / importance of flood flow routes								
			Surface water flooding	Location of surface water flooding								
		Biodiversity	Conservation value of river corridor	Results of River Habitat Survey								
				Presence of designations (e.g. SSSI, NNR, LNR, SINCs)								
				Presence of protected species or BAP species								

		Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment																		
<p>No impacts anticipated.</p> <p>Although these watercourses are not within the study area, it is assumed there floodplains are within the study area.</p> <p>Although the Scheme footprint extends into flood zone 2 and 3, works in this area will only be related to road markings. Therefore, no encroachment is expected into flood zone 2 or 3.</p>	<p>Mortons Leam (Main River) floodplain</p> <p>River Nene Tidal (Main River) floodplain</p> <p>Tidal River (100 ft) (Main River) floodplain</p> <p>Delph (Main River) floodplain</p>	Conveyance of flood flows	Presence of flood zones	Existing flood risk/flood return period																		
			Flood flow routes	Location / importance of flood flow routes																		
			Surface water flooding	Location of surface water flooding																		
		Biodiversity	Conservation value of river corridor	Results of River Habitat Survey																		
				Presence of designations (e.g. SSSI, NNR, LNR, SINC)s																		
				Presence of protected species or BAP species																		
		Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment																		
Conveyance of flood flows	Flow routes	Location and importance of flow routes																				
	Groundwater levels	Charges in levels and recharge																				
<p>The Scheme includes the installation of an underground attenuation tank which could potentially cause a pathway for pollutants to enter the groundwater and impact groundwater levels and flows.</p>	<p>Secondary (undifferentiated) Superficial Aquifer</p> <p>WFD groundwater body: No WFD groundwater body present.</p>	Water supply	Use for water supply (potable, industrial or agricultural)	Location and number of abstraction points	No abstraction licence information available at the time of reporting. Indicator of quality not used in assessment.																	
				Volume of water abstracted																		
				Use of water (potable most important)																		
		Groundwater vulnerability	Location and grade of source protection zone	There are no Source Protection Zones (SPZ) within the 1km boundary																		
				Classification of aquifer vulnerability	The majority of the Scheme has a groundwater vulnerability of-medium-low with the southern extent of the Scheme being unproductive. The northern section of the study area has predominantly a low groundwater vulnerability. The southern section of the study area has predominantly a medium-low groundwater vulnerability.		Local	Rare	Limited to substitution	Low	Slight adverse	Insignificant										
					Classification/status and objective under WFD		No WFD groundwater body within the study area.															
		Transport and dilution of waste products	Presence of discharge points	Location and number of discharge points		No discharge consents information available at the time of reporting. Feature not used in assessment.																
				Location and number of discharge points																		
		Value to the economy	Value of the uses of the groundwater (e.g. abstractions and discharges)	Value to local economy (e.g. employment, cost of alternatives, etc.)		No abstraction licence or discharge consent information available at the time of reporting. Feature not used in assessment.																Slight adverse
		Biodiversity	Conservation value of areas fed by groundwater	Results of River Habitat Survey		River Habitat Surveys have not been undertaken at the time of reporting. Feature not used in assessment																
Presence of designations (e.g. SSSI, NNR, LNR, SINC)s				Feature not used in assessment																		
Presence of protected species or BAP species				Presence of protected species or BAP species not considered in the water environment assessment, refer to Biodiversity assessment. Feature not used in assessment.																		
Presence of Groundwater Dependant Terrestrial Ecosystems under the WFD				Unknown at the time of reporting. Feature not used in assessment.																		
Conveyance of flood flows	Flow routes	Location and importance of flow routes		Unknown at the time of reporting. Feature not used in assessment.																		
	Groundwater levels	Charges in levels and recharge																				
<p>The Scheme includes the installation of an underground attenuation tank which could potentially cause a pathway for pollutants to enter the groundwater and impact groundwater levels and flows.</p>	<p>Secondary A Superficial Aquifer</p> <p>WFD groundwater body: No WFD groundwater body present.</p>	Water supply	Use for water supply (potable, industrial or agricultural)	Location and number of abstraction points	No abstraction licence information available at the time of reporting. Indicator of quality not used in assessment.																	
				Volume of water abstracted																		
				Use of water (potable most important)																		
		Groundwater vulnerability	Location and grade of source protection zone	There are no Source Protection Zones (SPZ) within the 1km boundary																		

			Classification of aquifer vulnerability	The majority of the Scheme has a groundwater vulnerability of-medium-low with the southern extent of the Scheme being unproductive. The northern section of the study area has predominantly a low groundwater vulnerability. The southern section of the study area has predominantly a medium-low groundwater vulnerability.	Local	Rare	Limited to substitution	High	Slight Adverse	Significant
			Classification/status and objective under WFD	No WFD groundwater body within the study area.						
Transport and dilution of waste products	Presence of discharge points		Location and number of discharge points	No discharge consents information available at the time of reporting.						
			Location and number of discharge points	Feature not used in assessment.						
Value to the economy	Value of the uses of the groundwater (e.g. abstractions and discharges)		Value to local economy (e.g. employment, cost of alternatives, etc.)	No abstraction licence or discharge consent information available at the time of reporting. Feature not used in assessment.						
Biodiversity	Conservation value of areas fed by groundwater		Results of River Habitat Survey	River Habitat Surveys have not been undertaken at the time of reporting. Feature not used in assessment						
			Presence of designations (e.g. SSSI, NNR, LNR, SINC)s	Feature not used in assessment						
			Presence of protected species or BAP species	Presence of protected species or BAP species not considered in the water environment assessment, refer to Biodiversity assessment. Feature not used in assessment.						
			Presence of Groundwater Dependant Terrestrial Ecosystems under the WFD	Unknown at the time of reporting. Feature not used in assessment.						
Conveyance of flood flows	Flow routes		Location and importance of flow routes	Unknown at the time of reporting. Feature not used in assessment.						
	Groundwater levels		Changes in levels and recharge							

Slight adverse

Reference Sources

Environmental datasets held on Defra's MAGIC website <https://magic.defra.gov.uk/home.htm>
 Environment Agency - Catchment Data Explorer <http://environment.data.gov.uk/catchment-planning/>
 Flood Map for Planning <https://flood-map-for-planning.service.gov.uk/>
 Check your long term flood risk (surface water flooding extent) <https://check-long-term-flood-risk.service.gov.uk/map>
 Design drawings - CCCFHSF-ATK-HDG-XX_ZZ-DR-CH-001001_C01.pdf , CCCFHSF-ATK-HDG-XX_ZZ-DR-CH-001002_C01.pdf , CCCFHSF-ATK-HDG-XX-DE-CD-001002_C01.pdf

Summary Assessment Score (post mitigation)

Slight adverse

Qualitative Comments

The Scheme will not result in an increase in impermeable road area, therefore no water quality impacts are anticipated. Also because there is no increase in impermeable area there will be no increase in flood risk which could be caused by an increase in surface water runoff. Although the Scheme footprint extends into Flood Zone 2 and 3, works in this area will only be related to road markings. Therefore, no encroachment is expected into flood zone 2 or 3. Additional attenuation will be incorporated into the Scheme which will be a beneficial impact to flood risk.

The Scheme does not include any modifications to the bridge which crosses the River Nene (Old Course). Additionally, the works to the steps leading down to the tow path adjacent to the watercourse will not interact with the watercourse. Therefore no impacts to hydromorphology are anticipated.

There is no bedrock aquifer underlying the study area. Both Secondary (A) Superficial aquifer and Secondary (undifferentiated) Superficial Aquifer underlay the study area. There is the potential for the installation of the attenuation tank to interact with groundwater, potentially impacting groundwater quality, levels and flows. At this stage, it is unknown if mitigation measures are required. Hence, these impacts should be further investigated and if necessary mitigation incorporated into the design.

As there is a potential impact which is significant the overall assessment score for the operation of the Scheme is **Slight Adverse**. This has been determined with reference to sections 5.3.15 – 5.3.20 and 10.2 of TAG UNIT A3 - Environmental Impact Appraisal, May 2019, Department for Transport, Transport Analysis Guidance, as summarised below:

- Most adverse category. The scheme as a whole is assessed according to the most adverse assessment of the features affected i.e. if a single feature scores 'large adverse' and this is the highest individual assessment score for all features then the overall assessment score should be 'large adverse'.

Further assessment is required to determine any potential impacts to groundwater flow, level and quality and to determine if there are any requirements for additional mitigation.

TAG Journey Quality Impacts Worksheet

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		No Change	
	Facilities	There will be a new pedestrian crossing provided as part of the Broad Street scheme, which will reduce pedestrian severance in the town centre		
	Information		No Change	
	Environment	All schemes will provide improved surfacing and reduced congestion in March town centre compared to without scheme		
Travellers' Views	-	Broad Street scheme location will be less congested compared to without scheme and will improve travellers' views of the surrounding townscape		
Traveller Stress	Frustration	Reduced frustration expected as congestion is reduced compared to without scheme		
	Fear of potential accidents	It has been estimated that there will be a reduction in accidents as a result of the schemes and consequently the provision of safer infrastructure <u>should reduce the fear of accidents.</u>		
	Route uncertainty	Improvements in journey times in the town centre compared to without scheme will increase certainty in the journey time reliability of bus services and the ability to access the town centre within a reasonable time.		

Reference Source

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Summary Assessment Score

Large Beneficial.

Qualitative Comments

Two-Way 24-hour AADT flow of 22,612 PCUs on Broad Street in 2031 Do Something scenario
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TAG Journey Quality Impacts Worksheet

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		No Change	
	Facilities	There will be a new signalised junction provided, which will reduce congestion along Twenty Foot Road and improve safety at the junction		
	Information		No Change	
	Environment	Improved surfacing and reduced congestion compared to without scheme		
Travellers' Views	-		Twenty Foot Road will be less congested compared to without scheme but A141 will experience increased delay with the introduction of additional signals, potentially blocking views of surrounding countryside	
Traveller Stress	Frustration	Reduced frustration at Twenty Foot Road expected as congestion is reduced compared to without scheme. Drivers waiting at this minor arm will no longer have to wait to find a gap in the A141 traffic		
	Fear of potential accidents	It has been estimated that there will be a reduction in accidents as a result of the schemes and consequently the provision of safer infrastructure should reduce the fear of accidents.		
	Route uncertainty		No Change	

Reference Source

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Summary Assessment Score

Large Beneficial.

Qualitative Comments

Two-Way 24-hour AADT flow of 21,132 PCUs on A141 in 2031 Do Something scenario (FBC 3)
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TAG Biodiversity Impacts Worksheet

Area	Description of feature/ attribute	Step 3			Biodiversity and earth heritage value	Step 4 Magnitude of impact	Step 5 Assessment Score
		Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to trends)			
Broadleaved woodland (Priority habitat)	<p>There are three parcels of priority deciduous woodland identified through the desk study, all located 270 m south of the scheme extent.</p> <p>In addition, the walkover survey identified one area of broadleaved woodland located to the east of Wisbech Road at the junction with Hootmoor Avenue.</p> <p>The broadleaved woodland habitat on site consisted of species including silver birch, sycamore, white poplar, field maple, elder, ash, hawthorn, sycamore, and dogrose.</p> <p>Some of the broadleaved woodland habitat on site may be lost as a result of site clearance to facilitate the scheme. The parcels of priority woodland located 270 m south are unlikely to be affected by the scheme proposals.</p>	Local	Local - considered to be of importance to biodiversity conservation, but broadleaved woodland habitats are common in the wider landscape	Unknown	Low	Intermediate negative	Slight adverse
Open mosaic habitat (Priority habitat)	<p>The desk study identified one area of open mosaic habitat, located 270 m south of the scheme extent. This habitat parcel is separated from the scheme extent by roads, residential housing, and commercial properties.</p> <p>No direct impacts are anticipated to this priority habitat as a result of the scheme, and no indirect impacts are anticipated such as pollution events, due to the distance between the scheme and the open mosaic habitat, and the fact they are separated by roads and residential and commercial properties with no hydrological link.</p>	Local	Local - Considered to be of importance to biodiversity conservation, however this is a common habitat in the wider landscape.	Unknown	Low	Neutral	Neutral
Watercourses (ditches)	<p>The desk study and walkover survey identified three field drains within the scheme boundary and within 50 m of the scheme extent. Two field drains are within the scheme boundary.</p> <p>The drains may be subject to indirect impacts such as pollution events during the construction phase of the scheme. There is no loss of ditches as a result of the scheme.</p> <p>The drains had flowing water or were completely dry at the time of survey, therefore there is limited potential for amphibians including great crested newts.</p>	Local	Local - Provides habitat to local aquatic species, as well as water vole and other	Unknown	Low	Intermediate negative	Slight adverse
Ponds (priority habitat)	<p>There are two ponds within 50 m of the scheme extent, the closest is approximately 8 m east of the scheme.</p> <p>The ponds are not expected to be lost as a result of the scheme, however may be subject to indirect impacts such as pollution events during the construction phase of the scheme.</p>	Local	Local - provides habitat to local populations of amphibians and other aquatic species	Unknown	Low	Intermediate negative	Slight adverse
Badger	<p>The desk study identified no records of badger within 500 m of the scheme extent. A narrow path was identified leading to dense scrub on site which may be a badger path. The grass verges, woodland, and dense scrub provide opportunities for foraging and commuting badger, and sett building.</p> <p>Vegetation clearance could potentially result in loss of foraging and commuting habitat, or could disturb badger setts if present. Any recreation work could result in loss or disturbance of badger setts. However, due to the small scheme area, the impacts are likely to be localised.</p>	Local	Local - badgers are common in the landscape, however the scheme area could support locally important populations	Unknown	Low	Minor negative	Slight adverse
Bats	<p>Desk study records indicate that bats are present within the surrounding environment. Records comprise of brown long-eared bat, common pipistrelle, Daubenton's, other Myotis sp., noctule, soprano pipistrelle and other unidentified bats.</p> <p>The trees and buildings close to the scheme extent could provide opportunities for roosting bats. Furthermore, the trees, watercourses, and scrub could provide commuting and foraging habitat for bats.</p> <p>Vegetation clearance could result in loss of potential roosting, foraging, and commuting habitat for bats.</p>	Local	Local - bats are common in the landscape with common species present, however the scheme area could support locally important populations	Unknown	Low	Intermediate negative	Slight adverse
Other	<p>The desk study provided three recent records of otter within 500 m from the site, associated with the River Nene old course. The closest record is 480 m from the scheme, separated by roads and buildings. The River Nene is 400 m south of the scheme at its closest point.</p> <p>Three ditches were identified during the field survey and desk study, which may provide suitable habitat for otters. One ditch which crosses underneath Wisbech Road is connected hydrologically to the River Nene.</p> <p>No direct impact is anticipated to the drains, however they could be subject to indirect impacts such as pollution events during the construction phase of the scheme, thereby reducing the quality of potential other habitat.</p>	Local	Local - the drains on site may provide habitat for local populations of other	Unknown	Low	Minor negative	Slight adverse
Water vole	<p>One recent record of water vole was provided by the desk study, associated with the River Nene old course. This record is located 430 m south of the scheme. There are three ditches within or adjacent to the scheme extent which could potentially support water voles.</p> <p>The drains on site which may support water vole populations may be subject to indirect disturbance impacts such as pollution events during the construction phase of the scheme.</p>	Local	Local - the drains on site may provide habitat for local populations of water vole	Unknown	Low	Minor negative	Slight adverse
Priority mammals	<p>The grassland, line of trees, scrub, woodland, and surrounding arable land provides suitable habitat for other priority mammal species such as brown hare and hedgehog.</p> <p>Vegetation clearance on site may result in impacts to priority mammals foraging or commuting within the area.</p>	Local	Local - the habitats on site may provide habitat for local populations of priority mammals	Unknown	Low	Minor negative	Slight adverse
Breeding and wintering birds	<p>Grassland, woodland, scrub, and trees within and adjacent to site provide suitable nesting habitat for nesting birds, and wintering birds may forage in the surrounding arable land.</p> <p>Vegetation clearance on site may result in loss or disturbance of breeding and wintering bird habitat. However, the vegetation loss associated with the scheme is small in area and therefore unlikely to affect local populations.</p>	Local	Local - local populations of breeding and wintering birds may use the habitats provided by the scheme area	Unknown	Low	Minor negative	Slight adverse
Reptiles	<p>The field survey identified areas of grassland, woodland, and dense scrub within and adjacent to site which could provide suitable foraging, basking, sheltering and hibernation habitat for all but common species of reeve (common lizard, grass snake, adder, and slow worm). Grass snakes may be present close to the ditches.</p> <p>Vegetation clearance on site may result in loss or disturbance of small areas of foraging and hibernation habitat for common reeve lizards.</p>	Local	Local - the grassland, scrub, woodland and drain habitats on and adjacent to site may support common species of reptiles in low numbers	Unknown	Low	Minor negative	Slight adverse
Amphibians	<p>There are approximately 50 field drains and two ponds located within 500 m of the Proposed Scheme. There are two ponds located within 50 m of the scheme which could support populations of amphibians including great crested newts.</p> <p>The grassland, woodland and scrub habitat identified in the survey area may provide suitable foraging and hibernation habitat for populations of amphibian species. Three drains are within the footprint of the scheme, however these were either dry or flowing. It is not anticipated that any drains will be directly impacted as a result of the scheme.</p> <p>There is no loss of pond habitat anticipated as a result of the scheme, however, vegetation clearance reduces the amount of terrestrial habitat available for amphibians. There is also potential for damage to breeding ponds through pollution events during the construction phase.</p>	Local	Local - the pond habitats on site may support populations of amphibians, and the scrub and woodland habitat provides suitable terrestrial habitat	Unknown	Low	Minor negative	Slight adverse

Reference Sources	<p>Map Agency Geographic Information for the Countywide (MAGIC) website (https://magic.odm.gov.uk/MapMag.aspx), information from Cambridge and Peterborough Environmental Records Centre, Bing Maps (https://www.bing.com/maps), Google Earth (https://earth.google.com/web/), Woodland Trust Ancient Tree Inventory (https://atit.woodlandtrust.org.uk/), Ordnance Survey maps, Extended UKH0 habitat survey</p>
Summary Assessment Score	Slight adverse
Qualitative Comments	

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	The Historic environment within a 500m study area includes one Grade II listed church approximately 85 m north of the scheme and, within its setting, the old rectory (undesigned asset). Undesignated below ground remains include a Roman road (to the north) and sites containing evidence of prehistoric settlement activity.	The historic environment matters on a local to regional level. Evidence of local early Iron Age settlement is of regional importance.	The known assets are of low to medium significance.	The forms represented within the historic environment are common, with the exception of the early Iron Age site north of Hostmoor Avenue, which is regionally uncommon.	The area of the Scheme is within a varied landscape. There is a likely to be very limited impacts to archaeological remains. The Scheme may have adverse impacts upon non-designated assets, but this cannot be quantified at this point. Due to nature of the Scheme is it
Survival	Good to Poor. The historic landscape as a whole has been degraded through urban development around March and up to 1m of made ground exists through a lot of the red line area. The state of survival of the non-designated archaeological remains is not currently known - below ground remains within the red line area are not known. It is advised that this is assessed at further assessment through consultation with the Local Planning Authority Archaeologist.	Generally, the survival of non-designated heritage assets matters on a local to regional scale.	The survival of the non-designated heritage assets is of low to medium significance and contributes to an understanding of settlement of the landscape through time.	The survival of below ground remains within the red line area is unknown. The survival of the surrounding historic environment in general is common.	not expected that the listed buildings will experience impact or a change in setting.
Condition	It is beyond the remit of this exercise to evaluate the condition of individual heritage assets, the condition of the historic environment as a whole is evaluated in the 'survival' and 'form' sections.	The condition of non-designated heritage assets mainly matters on a local to regional scale.	Overall condition of the cultural heritage landscape is of low to moderate significance.	The condition of below ground remains within the red line area is unknown. The condition of the surrounding historic environment in general has not been assessed but is expected to be common.	
Complexity	The known historic resource largely comprises evidence of settlement, such as pits, houses, and elements of material culture.	The complexity of the historic environment matters on a local level	the complexity of the historic environment is of low significance.	The complexity of the historic environment is common.	
Context	The setting consists of Wesbech Road, the surrounding fields to the west of the scheme, and modern developments to the east and south. The church and rectory retain the boundaries as shown on 19th century mapping.	The setting matters on a local to regional level	The significance of the context is low to medium	the rarity of the context is common	

Period	The historic environment consists of elements dating from the Bronze Age through to Roman period, with a 19th century church. The setting is overwhelmingly modern.	local to regional	low to medium	common	
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Reference Sources

The National Heritage List for England. Only publically available local authority information relating to conservation areas and non-designated heritage assets, obtained from Heritage Gateway, was utilised.

Step 5 - Summary Assessment Score

The overall effect on the historic environment resource is considered to be slight adverse.

Qualitative Comments

As the Scheme will predominantly entail widening and alterations to the existing road, it is expected that impacts will largely be to made ground. No substantial adverse settings impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for as yet unknown archaeology.

TAG Landscape Impacts Worksheet

Features	Step 2		Step 3			Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	The site sits on the north-west edge of the built up area of March, just to the north of the River Nene. The area to the west is low lying fen land, criss crossed by drainage ditches separating large arable fields. There is a railway line which the A141 crosses over on embankment and along the Pees Hill there is ribbon development of light industrial and commercial buildings.	This pattern of landscape is typical of this part of the country so is likely to matter at a local level.	The type of pattern found here is commonplace and the proposed development would have little effect on it.	The landscape pattern here, particularly to the west is distinctive but is not recognised as important.	The landscape pattern here is commonplace and easily substituted.	The proposed works are minor alterations to the existing road layout and would have negligible impact on pattern.
Tranquillity	The A141 is a major road taking traffic into and out of March and as such is not tranquil for most of the time. This lack of tranquillity is exacerbated by the development along the A141 and the rail line which it crosses over. To the west in the arable land there is a greater degree of tranquillity which increases with distance from the A141.	There is not a great deal of tranquillity along the A141 and is important at a local scale only.	The A141 is not tranquil, and this is quite common in this area.	As tranquillity is low this is not important to maintain.	This level of tranquillity is easily substituted.	The changes to the road layout are modest and would not affect the tranquillity of the area.
Cultural	The landscape to the west of the A141 is a very traditional one of arable fields separated by a complex system of drainage channels which form part of a wider network of water level controls in East Anglia. Just to the north of the site there is the line of a roman road which crosses the A141 indicating historic use of this area. Along the A141 itself however there is a mix of undistinguished 20th and 21st century commercial and housing development with little cultural value.	The cultural aspects of the area are important at a local scale only.	There is little in the way of cultural associations with the A141, it being a relatively new and upgraded route so it's cultural associations are not rare.	The cultural aspects of the parts affected by the works are not important.	Cultural aspects are easily substituted.	The proposals would not affect the cultural aspects of the landscape.
Landcover	To the west of the A141 the landcover comprises low lying arable fields with crops of different types and very little in the way of trees or woodland. There is some domestic scale vegetation and small incidental blocks of woodland and individual trees along the A141 but again, this does not form a significant element of the landscape.	The landcover along the A141 is important at a local scale only.	The type of landcover found here is not rare.	The landcover is important locally.	The landcover could be substituted quite easily though it would take many years to develop to the same size.	There would be very minor losses of vegetation principally grass and some shrubs so the landcover impact is negligible.
Summary of character	The A 141 is a relatively new section of road and is characterised by domestic scale ribbon development for much of the length being studied. It lies on the edge of a large area of agricultural land to the west and there are some fine open views across the landscape from it. The vegetation is patchy along its length with some patches of woodland and individual mature trees adjacent to the road.					The proposals are very minor in scale and would have a neutral effect on the landscape overall.

Reference Sources

Natural England NCA Profile: 46, The Fens (NE424)

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The proposed scheme has a negligible effect on the landscape and can be accommodated well in this location.

Item No.	Description	Unit	Quantity	Rate	Amount	Remarks
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TAG Journey Quality Impacts Worksheet

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		No Change	
	Facilities	There will be a new all movement signalised junction provided at the Hostmoor Avenue junction, which will remove the large number of U-turners at Peas Hill Roundabout and reduce congestion		
	Information	Drivers will be able to turn right out of Hostmoor Avenue and signage will be amended accordingly		
	Environment	Improved surfacing and reduced congestion compared to without scheme		
Travellers' Views	-	Peas Hill Roundabout and Hostmoor junction will be less congested compared to without scheme and reduce the potential for views of surrounding countryside to be blocked by queueing vehicles		
Traveller Stress	Frustration	Reduced frustration at both Peas Hill Roundabout and Hostmoor junction expected because drivers from Hostmoor Avenue will no longer be required to travel to Peas Hill Roundabout and do a U-turn to travel north.		
	Fear of potential accidents	It has been estimated that there will be a reduction in accidents as a result of the schemes and consequently the provision of safer infrastructure should reduce the fear of accidents.		
	Route uncertainty	Drivers from Hostmoor Avenue will have greater route certainty for travelling north along the A141		

Reference Source

Summary Assessment Score

Large Beneficial

Qualitative Comments

Two-Way 24-hour AADT flow of 26,405 PCUs on A141 between Hostmoor Avenue junction and Peas Hill Roundabout in 2031 Do Something scenario (FBC 3

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Traditional Orchard (Priority Habitat)	There is one parcel of priority traditional orchard habitat located approximately 480 m northwest of the scheme extent. This habitat parcel is separated from the scheme extent by roads, and residential and commercial properties. There is no hydrological link between the scheme and the parcel of traditional orchard.	Regional	Priority Habitats are of regional importance with potential for substitution in some instances	Unknown	Medium	Neutral Due to the distance between the scheme extent and the traditional orchard, and the fact there is no hydrological connection between the scheme and the traditional orchard, no direct or indirect impacts are anticipated.	Neutral
River Nene Old Course (River, Priority Habitat)	The River Nene Old Course runs in a west to east direction approximately 490 m north of the scheme extent. The river is separated from the scheme extent by roads, and residential and commercial properties. There is no hydrological link between the river and the scheme extent.	Regional	Priority Habitats are of regional importance with potential for substitution in some instances	Unknown	Medium	Neutral Due to the distance between the scheme extent and the river, and the fact there is no hydrological connection, no direct or indirect impacts are anticipated.	Neutral
Other ditches (Priority Habitat)	The desk study identified three drains within 500 m of the scheme extent, the closest of which is approximately 350 m southwest of the scheme extent. The drains are not directly hydrologically connected to the scheme, and the drains and the scheme extent are separated by roads, and commercial and residential properties.	Regional	Priority Habitats are are of regionally important sites with potential for substitution	Unknown	Medium	Neutral Due to the distance and lack of hydrological connection between the drains and the scheme extent, no direct or indirect impacts are anticipated.	Neutral
Bats	A review of Google Streetview shows that the scheme extent is surrounded by buildings which may provide roosting opportunities for bat species. There are some immature trees within front gardens of residential properties, however, these appear too small to support roosting bats. There are some hedgerows at the front of residential properties, however, there is no continuity for foraging or commuting bats. Street lighting on both roads of the junction reduces the quality of the habitat for bats. A search on MAGIC for recently granted European Protected Species (EPS) licences for bats within 2 km of the scheme extent returned no results.	Local	Local - The buildings immediately adjacent to site could support bat roosts which are locally important. No impacts to these buildings are anticipated.	Unknown	Low	Neutral There is no vegetation clearance anticipated as a result of the scheme, therefore there is no direct impact anticipated to bats. The works are restricted to the existing road carriageway which are already live roads. Therefore, no additional disturbance is anticipated at the construction or operation phases of the scheme.	Neutral
Nesting birds	Trees and bushes adjacent to the scheme extent may provide opportunities for nesting birds.	Local	Local - trees, hedgerows, and buildings on site could provide habitat for locally important populations of nesting birds	Unknown	Low	Neutral No vegetation clearance is anticipated, and the works are entirely confined to the existing carriageway, therefore no direct or indirect disturbance impacts are anticipated for nesting birds.	Neutral
Amphibians	A search on MAGIC for recently granted EPS licence applications for great crested newts within 500 m of the scheme extent returned no results. The three drains within 500 m of the proposed scheme may support populations of breeding amphibians. However, due to the distance between the scheme extent and the drains, and the lack of both hydrological and vegetation connection between the scheme extent and the drains, it is considered highly unlikely that amphibians will travel from the drains to the scheme extent.	Local	Local - Nearby drains could support breeding amphibian species	Unknown	Low	Neutral The hardstanding habitat on site does not provide suitable terrestrial habitat for amphibians and there are not waterbodies with connectivity to the site. Therefore, no direct or indirect impacts are anticipated for amphibians.	Neutral

Reference Sources

Multi-Agency Geographic Information for the Countryside (MAGIC) website (<https://magic.defra.gov.uk/MagicMap.aspx>), Bing Maps (<https://www.bing.com/maps>), Google Earth (<https://earth.google.com/web/>), Woodland Trust Ancient Tree Inventory (<https://ati.woodlandtrust.org.uk/>), Ordnance Survey maps.

Summary Assessment Score

Neutral

Qualitative Comments

The summary score of neutral is based on there being no mitigation in place for any of the areas or species identified in column B. This is because works are confined to the existing hardstanding road carriageway, with no vegetation clearance or disturbance to adjacent habitats anticipated.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	This assessment considers the Site and a Study Area of 250m. The Historic environment within a 250m study area comprises 6 Grade II listed buildings and one Grade II* listed building. The red line area falls into the southernmost extent of the March Conservation Area. There is a scheduled monument within 500m of the Site. Undesignated assets have not been assessed as part of this exercise but online sources show none beyond excavations of post medieval building remains in plots adjacent to existing housing. As yet unknown remains cannot be assessed but the Conservation Area Appraisal shows high archaeological potential given the peat layers and evidence of prehistoric occupation in the wider area. The historic landscape consists of 18th-20th century housing.	The historic environment matters on a local level with the exception of the Grade II* listed building, which matters on a national level.	Grade II listed buildings and the Conservation Area are of medium significance, the Grade II* building is of high significance. The significance of the assets reside in both their historical, communal and evidential value.	Listed buildings relating to post-medieval domestic buildings are relatively common both at a regional and national level, examples are well represented in the designated assets list. The Conservation Area is rare in the Marches for being a settlement on a causeway within historic marshland.	Although the Scheme is within a rich built historic environment, it is not anticipated to have adverse impacts upon the significance of assets within the Study Area. The Scheme may have adverse impacts upon unknown non-designated assets, but this cannot be quantified at this point. An appropriate and proportionate scheme of assessment and mitigation may be proposed by the County Archaeologist.
Survival	There are no known assets other than the listed buildings and Conservation Area. The historic landscape appears unchanged since 1st edition mapping. Survival of unknown remains is likely given the high archaeological potential as described within the March Conservation Area Appraisal.	Generally, the survival of Listed Buildings matters on a regional to national scale. Any unknown remains preserved within the peat could be of regional to national importance.	The survival of the built heritage within the Study Area is important to understand the development of the town during the 16th-20th century and their use from the post-medieval to the modern period. Any unknown remains preserved within the peat could be of high significance.	Built Heritage - Common. Unknown remains within peat - rare	
Condition	There are no known assets other than the listed buildings and Conservation Area, of which an assessment of condition is beyond the scope of this document. The condition of unknown assets or of undesignated assets is beyond the scope of this exercise.	Local	low	common	
Complexity	The historic environment comprises a mixture of 20th century commercial premises and 18th-20th century two storey domestic housing along a junction.	Local	low	common	
Context	The setting of the listed buildings and Conservation Area is that of 18th-20th century buildings set alongside the main road into March, forming part of the core of the historic settlement. March is on the second largest Fenland island, on the River Nene.	Local and National	Medium	Rare - the settlement type, being a town on a fenland island, is rare.	
Period	The listed buildings are largely 18th century in origin, with the exception of the 19th century building at 86 High Street.	Local	Medium	common	

Reference Sources

The National Heritage List for England. Publicly available local authority information relating to conservation areas and non-designated heritage assets, was consulted.

Step 5 - Summary Assessment Score

The overall effect on the historic environment resource is considered to be neutral. This assessment is subject to change following the introduction of any new information.

Qualitative Comments

As the Scheme will predominantly entail alterations to the existing road, it is expected that impacts will largely be absent. No substantial adverse settings impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for as yet unknown archaeology.

TAG Townscape Impacts Worksheet

	Step 2	Step 3					Step 4
Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	The townscape is characterised by	Local	Commonplace	Medium importance at a	Substitutable	Unlikely to change	Neutral
Density and mix	It is a low to medium density	Local	Commonplace	Medium importance at a	Substitutable	Unlikely to change	Neutral
Scale	The townscape is a mix of one, two or	Local	Commonplace	Medium importance at a	Substitutable	Unlikely to change	Neutral
Appearance	There are a mix of building types	Local	Commonplace	Medium importance at a	Substitutable	Unlikely to change	Neutral
Human interaction	The streets affected by the	Local	Commonplace	Medium importance at a	Substitutable	Unlikely to change	Neutral
Cultural	Some of the buildings along the	Local	Commonplace	Medium importance at a	Older buildings less substitutable	Unlikely to change	Neutral
Land use	The area is predominantly	Local	Commonplace	Medium importance at a	Substitutable	Unlikely to change	Neutral
Summary of character	The area in which the scheme is proposed is an ordinary area of townscape albeit with some attractive residential buildings from the 19th and early 20th century. It is likely to be valued at a local scale.						Neutral

Reference Sources

Natural England National Character Area 46 - The Fens

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme involves very small scale interventions that are unlikely to have a noticeable effect on townscape.
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TAG Water Environment Impacts Worksheet

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Possible Measures	Assessment data availability	Scale	Rarity	Substitutability	Importance	Magnitude	Significance	Resource assessment score with mitigation		
Study area: 1 km radial buffer from the works area (which consists of a 100m buffer on the General Arrangement)														
Potential Impacts:														
<p>No impacts anticipated.</p> <p>As there will be no increase in impermeable road area anticipated that there will be no operational impacts to surface water quality.</p> <p>The Scheme does not cross the watercourse, therefore no hydromorphology impacts during operation are anticipated.</p>	<p>River Nene (old course) (Ordinary Watercourse)</p> <p>WFD reportable reach: Middle Level (GB205033000050)</p>	Water Supply	Use of water supply (potable, industrial or agricultural)	Location and number of Volume of water abstracted Use of water (potable most)										
			Chemical water quality	Existing chemical classification/status and objective under the WFD Likelihood of a change in classification arising (+ve or -ve)										
		Transport and dilution of waste products	Presence of surface water discharge	Location and number of discharge Volume of effluent discharged										
			Contribution of discharge to total river flow	Proportion of flow made up by effluent at different times of the year										
		Biodiversity	Biological water quality	Existing ecological classification/status and objective under the WFD Likelihood of a change in classification arising (+ve or -ve)										
				Fisheries quality	EC Fishery designation (Salmonid, Cyprinid or undesignated)									
		Conservation value of river corridor	Results of River Habitat Survey											
			Presence of designations (e.g. SSSI, NNR, LNR, SINC)											
			Presence of protected species or BAP species											
		Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment										
		Cultural heritage	Presence of historic features associated with river	Results of historic environmental assessment Presence of designations (e.g. SSSI, NNR, LNR, SINC)										
		Recreation	Riverside access	Presence of route and importance										
			Use of the river for recreation	Presence of facilities and clubs for Use for angling (number of)										
		Value to	Value of the uses of	Value to local economy (e.g. Number and size of watercourse)										
Conveyance of flows and	Presence of watercourses	Existing flood risk												
		Existing flood risk/flood return period												
<p>No impacts anticipated.</p> <p>There will be no increase in impermeable road area, therefore there will be no increase in surface water runoff.</p> <p>The Scheme does not encroach into flood zones 2 or 3.</p> <p>Although the Scheme footprint extends into an area at Medium and Low risk of surface water flooding, the works in this area are only include new road markings.</p>	<p>River Nene (old course) ordinary watercourse floodplain</p>	Conveyance of flood flows	Presence of flood zones	Existing flood risk/flood return period										
			Flood flow routes	Location / importance of flood flow routes										
		Biodiversity	Conservation value of river corridor	Location of surface water flooding										
				Results of River Habitat Survey Presence of designations (e.g. SSSI, NNR, LNR, SINC) Presence of protected species or BAP species										
Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment												
<p>No impacts anticipated.</p> <p>Although these watercourses are not within the study area, it is assumed there floodplains are within the study area.</p> <p>The Scheme does not encroach into flood zones 2 or 3.</p>	<p>Morton's Leam (Main River) floodplain</p> <p>River Nene Tidal (Main River) floodplain</p> <p>New Bedford River (Main River) floodplain</p> <p>River Delph (Main River) floodplain</p> <p>Counter Drain (Main River) floodplain</p>	Conveyance of flood flows	Presence of flood zones	Existing flood risk/flood return period										
			Flood flow routes	Location / importance of flood flow routes										
		Biodiversity	Conservation value of river corridor	Location of surface water flooding										
				Results of River Habitat Survey Presence of designations (e.g. SSSI, NNR, LNR, SINC) Presence of protected species or BAP species										
		Aesthetics	Contribution to landscape character and quality	Results of river landscape assessment										
<p>No impacts anticipated.</p>	<p>Secondary (undifferentiated) (Ordinary Watercourse)</p>	Water supply	Use for water supply (potable, industrial or agricultural)	Location and number of Volume of water abstracted										

TAG Journey Quality Impacts Worksheet

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		No Change	
	Facilities	There will be a new right turn lane for traffic from the B1101 The Causeway south arm destined to St. Peter's Road. This will reduce the frequency of northbound vehicles being stuck behind vehicles waiting to turn right.		
	Information		No Change	
	Environment	Improved surfacing and reduced congestion compared to without scheme		
Travellers' Views	-	B1101 The Causeway will be less congested compared to without scheme and reduce the potential for views of surrounding townscape to be blocked by queueing vehicles		
Traveller Stress	Frustration	Reduced frustration at the junction expected because northbound drivers from B1101 The Causeway will be less frequently be stuck behind vehicles waiting to turn right into St. Peter's Road		
	Fear of potential accidents	It has been estimated that there will be a reduction in accidents as a result of the schemes and consequently the provision of safer infrastructure should reduce the fear of accidents.		
	Route uncertainty		No Change	

Reference Source

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Summary Assessment Score

Large Beneficial

Qualitative Comments

Two-Way 24-hour AADT flow of 14,205 PCUs on A141 along B1101 The Causeway in 2031 Do Something scenario (FBC 3)

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	Description	Scale it matters	Significance	Rarity	Impact
Form	The Historic environment within a 500m study area comprises no listed buildings or other designated assets. Undesignated assets have not been assessed as part of this exercise but online sources show none. There is potential for unknown remains but as yet these cannot be assessed. The historic landscape consists of fieldsystems, drains (20 ft River), road systems and farms.	The historic environment as currently understood matters on a local level. There is potential for unknown remains.	No known assets have been identified during this assessment. The significance of unknown assets cannot be assessed.	No known assets have been identified during this assessment.	Although no known assets have been identified during this assessment, the scheme is within a varied landscape. The Scheme may have adverse impacts upon unknown non-designated assets, but this cannot be quantified at this point. An appropriate and proportionate scheme of assessment and mitigation may be proposed by the County Archaeologist.
Survival	No known assets have been identified during this assessment but there is potential for unknown remains. The historic landscape appears unchanged since 1st edition mapping.	Local	Low	common	
Condition	No known assets have been identified during this assessment. The condition of unknown assets or of undesignated assets is beyond the scope of this exercise.	Local	low	common	
Complexity	The historic environment comprises only field systems of some age, and the 20 ft drain. No known assets have been identified during this assessment. Further complexity, introduced by unknown assets, cannot be assessed here.	Local	low	common	
Context	There are no known assets for which setting can be described.	na	na	na	
Period	There are no known assets for which period can be described.	na	na	na	

Reference Sources

The National Heritage List for England. Publically available local authority information, relating to conservation areas and non-designated heritage assets, was consulted on Heritage Gateway.

Step 5 - Summary Assessment Score

The overall effect on the historic environment resource is considered to be neutral. This assessment is subject to change, should new information be introduced.

Qualitative Comments

As the Scheme will predominantly entail widening and alterations to the existing road, it is expected that impacts will largely be to the historic landscape character. No substantial adverse settings impacts to designated and non-designated heritage assets are anticipated. Any construction relating to new road elements could mean potential for as yet unknown archaeology.

TAG Landscape Impacts Worksheet

Features	Step 2		Step 3			Step 4
	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	The site sits around 2km to the north of March in an area of low lying fen land, criss crossed by drainage ditches separating large arable fields. It is adjacent to the Twenty Foot River and there are other large watercourses to the north.	This pattern of landscape is typical of this part of the country so is likely to matter at a local level.	The type of pattern found here is commonplace and the proposed development would have little effect on it	The landscape pattern here, is distinctive but is not recognised as important.	The landscape pattern is commonplace and easily substituted.	The proposed works are minor alterations to the existing road layout and would have negligible impact on pattern
Tranquility	The A141 where it joins with Twenty Foot Road is a major route taking traffic into and out of March and as such is not tranquil for most of the time. In the surrounding arable land there is a greater degree of tranquility which increases with distance from the A141.	There is not a great deal of tranquility along the A141 and is important at a local scale only.	The A141 is not tranquil, and this is quite common in this area.	As tranquility is low this is not important to maintain.	This level of tranquility is easily substituted.	The changes to the road layout are modest and would not affect the tranquility of the area
Cultural	The landscape at the junction of Twenty Foot Road and the A141 is a very traditional one of arable fields separated by a complex system of drainage channels which form part of a wider network of water level controls in East Anglia. The drainage network was established over many centuries and is a cultural feature in itself.	The cultural aspects of the area are important at a local scale only.	There is little in the way of cultural associations with the A141, it being a relatively new and upgraded route so it's cultural associations are not rare.	The cultural aspects of the parts affected by the works are not important.	Cultural aspects are easily substituted.	The proposals would not affect the cultural aspects of the landscape
Landcover	The landcover comprises low lying arable fields with crops of different types and very little in the way of trees or woodland. There is some domestic scale vegetation and small incidental blocks of woodland and individual trees in the wider area but again, this does not form a significant element of the landscape.	The landcover along the A141 and Twenty Foot Road is important at a local scale only	The type of landcover found here is not rare.	The landcover is important locally.	The landcover could be substituted quite easily.	There would be very minor losses of rough grass so the landcover impact is negligible
Summary of character	The A 141 lies within a large area of low lying agricultural land with a number of major and minor watercourses and there are some fine open views across the landscape from it.					The proposals are very minor in scale and would have a neutral effect on the landscape overall.

Reference Sources

Natural England NCA 46. The Fens (NE424)

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The proposed scheme has a negligible affect on the landscape and can be accommodated well in this location.

TAG Biodiversity Impacts Worksheet							
Area	Step 2 Description of feature attribute	Scale of which attribute applies	Step 3 Importance of attribute	Trend in attribute	Biodiversity and heritage linkage	Step 4 Magnitude of impact	Step 5 Assessment Score
New Wetlands Special Protection Area (SPA), Special Area of Conservation (SAC), and Ramsar Site	The site is located 1.2 km north-west of the scheme. It is an area of naturally flooded and grassland with a network of drainage ditches. The site supports nationally rare plants and invertebrates and robust breeding and overwintering bird populations including an internationally important population of wintering Bewick's Swan.	National	National - SPA supports important invertebrates and bird populations	Increasing/Persistent (due to the site's association with the New Wetlands SPA)	Very High	To be determined following outcome of SPA	To be determined following outcome of SPA
New Wetlands Site of Special Scientific Interest (SSSI)	This site is located 1.2 km north-west of the scheme. This site supports internationally and nationally important populations of waterfowl and waders but is also an important flooded habitat. The site also has an extensive ditch network. No direct impacts are anticipated to the SSSI due to the distance between the SSSI and the scheme. There is a potential for noise disturbance and pollution events during construction phase only. However there are no direct hydrological connections and at a distance of 1.2 km, any potential impacts are likely to be very minor.	National	National - A SSSI is important for nationally important flora and fauna types and the national supports	Increasing/Persistent (due to the site's association with the New Wetlands SPA)	High	Minor negative	Slight adverse
Highly End Local Nature Reserve (LNR)	The site is located 0.2 km north-west of the scheme. It supports a mosaic of extensive meadow habitat, three large ponds and small areas of scrub. No direct impacts are anticipated to the LNR due to the distance between the LNR and the scheme. There is a potential for indirect impacts such as pollution events during the construction phase of the scheme. However there are no direct hydrological connections and because any disturbance impacts are likely to be minor.	Regional	Regional - supports a mosaic of important habitat	Unknown	Medium	Minor negative	Slight adverse
Coastal and floodplain grazing marsh (Priority habitat)	Three ponds within 500 m of the scheme extent. One is directly to the south, however the scheme extent is to the north east of the ponds. There is a small area of the priority habitat which may be lost as a result of the most significant associated with the scheme. This area of habitat will be allowed to regenerate following the scheme. Some of the priority habitat may be lost as a result of the scheme, and other areas may be subject to disturbance effects such as pollution events.	Local	Local - a priority habitat, currently in poor condition, but important locally for nature conservation	Unknown	Low	Intermediate negative	Slight adverse
Twenty Foot Flow (Watercourse, priority habitat)	Runs from east to west along the south part of site. The flow intersects with Marsh Road. No direct impacts are anticipated, however, the drain may be subject to disturbance effects such as pollution events during construction only.	Regional	Regional - the river has a high length of 6.5 km, important for fish and wildlife, and breaking near the site.	Unknown	Medium	Minor negative	Slight adverse
Badger	The desk study did not provide any recent records of badgers within 2 km of the site, nor were any badger evidence identified in the survey. The habitat close to the scheme could be used for badger setts and provides suitable habitat for badger foraging and commuting, and hence potential for setts building. Vegetation clearance is anticipated around the road verges which may reduce opportunities for badger commuting, however, this is limited.	Local	Local - badgers are common in the landscape, the scheme area could support locally important populations	Unknown	Low	Minor negative	Slight adverse
Reed	The desk study provided records of Bewick's reed, reed bed, common poplar, and aspen poplar within 2 km of the scheme, the closest within 170 m north-west of the site boundary. Tree lines and the watercourse on site provide opportunities for setts, commuting and foraging. Trees on site may support badgers and setts building. The bridge on site was assessed and it did not appear to have any suitable roosting habitats for bats. Some vegetation clearance is required including the green strip of some trees, potentially resulting in loss or disturbance of bat roosts.	Local	Local - the site could support bat roosts which are locally important	Unknown	Low	Intermediate negative	Slight adverse
Other	Desk study records include that other common birds along the Twenty Foot Flow, the closer directly south of the site boundary, located close to site. Others could use the trees along the north-western boundary to roost. No direct impacts are anticipated to the Twenty Foot Flow, however, it may be subject to disturbance impacts such as pollution events or noise disturbance which may impact populations of water vole.	Local	Local - the site could support locally important other populations	Unknown	Low	Intermediate negative	Slight adverse
Water vole	The field survey identified that deep vegetated banks could provide suitable foraging habitat for water voles at the Twenty Foot Flow. However, no recent records of water voles are associated with the river. Furthermore, the river channel is exposed with lack of vegetation cover which limits the water vole potential. No direct impacts are anticipated to the Twenty Foot Flow, however, it may be subject to disturbance impacts such as pollution events or noise disturbance which may impact populations of water vole.	Local	Local - the site could support locally important water vole populations	Unknown	Low	Minor negative	Slight adverse
Priority mammals	The grassland verges, line of trees and scrub and hedgerows in the scheme likely support habitats for foraging priority mammals such as hedgehogs. Vegetation clearance, although minor, may limit the opportunities for commuting and foraging.	Local	Local - the scheme could support local populations of hedgehogs	Unknown	Low	Minor negative	Slight adverse
Breeding and wintering birds	The site and surrounding area provide lines of trees, meadow grassland, and scrub habitat which could be used by nesting birds during the breeding season, including priority species which have been recorded in the area such as yellowhammer. Furthermore, New Wetlands SPA and Ramsar site supports internationally important populations of Bewick's swan. This species roosts on open water. However, foraging in nearby scrub fields throughout the SPA. The area surrounding the site consists of predominantly scrub landscape, meaning Bewick's swan roosts with New Wetlands SPA may forage close to the scheme. Vegetation clearance may result in direct loss of habitat for breeding and wintering birds. Birds associated with New Wetlands SPA may forage in nearby fields and hedgerows may be subject to indirect disturbance impacts.	Regional	Regional - the habitat within the site may be used by birds associated with the New Wetlands SPA.	Unknown	Medium	Minor negative	Slight adverse
Reptiles	There are areas of low-lying grassland and small areas of scrub within the green verges which could offer suitable foraging and nesting habitat for all four terrestrial species of reptiles (common lizard, grass snake, adder, and slow worm). This is especially the case if the grassland becomes managed less frequently and the sward height grows to become more suitable for reptiles. Cold stones may be present close to the Twenty Foot Flow. Vegetation clearance, although minor, may limit the opportunities for foraging and hibernating reptiles.	Local	Local - the site could support local populations of common reptile species	Unknown	Low	Minor negative	Slight adverse
Amphibians	There are three watercourses, primarily comprising headwaters, within SSSIs of the Proposed Scheme, which may support breeding populations of amphibians including great crested newt. There are no ponds within 500 m of the scheme, including 1 km of water imagery. The drains were not surveyed during the hydrology survey, so it could be determined whether there were formed of standing or flowing water. If they are formed of standing water, these drains could offer suitability for great crested newts. Vegetation clearance may limit opportunities for amphibian populations including great crested newts, however, vegetation clearance is limited to the priority habitat is being affected by the proposed scheme. There is also potential for indirect impacts to ponds and drains as a result of pollution events during the construction phase, potentially harming breeding ponds.	Local	Local - the site could support local populations of amphibian species	Unknown	Low	Minor negative	Slight adverse

Reference Sources

Mid-Angles Geoparks Information for the Cotswolds BACCC; website: <http://imga.a8a.gov.uk/MidAngles.aspx>; Information from Cambridge and Peterborough Environmental Records Centre; Bing Maps (Bing.com/maps.com); Google Earth (Bing.com/maps.com); Woodland Trust Ancient Tree Inventory (Bing.com/maps/earth/); Cotswolds Survey map; Cotswolds LNRs; Habitat survey

Summary Assessment Score

Slight adverse

Qualitative Comments

The summary scores of slight adverse is based on there being no mitigation in place for any of the areas of species identified in column B. The impacts on New Wetlands (SAC/SPA/Ramsar) will be determined following the outcome of the SPA. Slight adverse impacts are anticipated to coastal and floodplain grazing marsh, bats, breeding and wintering birds, other, reptiles, amphibians, water vole, other priority mammals, Twenty Foot Flow, Highly End LNR and New Wetlands SSSI. It is thought that with mitigation in place such as the implementation of a precautionary method of working and additional surveys, impacts on ecological receptors will be minimised.

March Northern Link Road

Heritage Desk-Based Assessment

Cambridgeshire County Council

October 2020

Project:	MATS Northern Link Road		
Subject:	Heritage Desk Based Assessment		
Document Reference:	CPX31155-ATK-EHR-XX_XX-RP-LH-000001		
Author:	E Moon		
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Client signoff

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Project	MATS Northern Link Road
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Table of Contents

1.	Introduction	6
1.1	Proposed Development	6
2.	Methodology	7
2.1	Overview	7
2.2	The Study Area	7
2.3	Baseline data collection	8
2.4	Limitations and Assumptions	8
2.5	Assessment Criteria	8
3.	Policy, legislation, and guidance	12
3.1	Planning policy and legislation	12
3.2	Guidance	13
4.	Baseline Conditions	15
4.1	Site Overview	15
4.2	Previous Archaeological Investigations (Events)	20
4.3	Historic and Archaeological Chronological Overview	21
5.	Archaeological Assessment	34
5.1	Potential Impact	34
5.2	Significance and Potential Survival	34
6.	Significance and Impact Assessment	36
6.1	Designated Assets	36
6.2	Non-designated Assets	38
7.	Conclusion and Recommendation	40
7.1	Conclusion	40
7.2	Recommendations	40
8.	Bibliography	41
1.1	Designated Assets	43
1.2	Non-designated Assets	44
1.3	Events	45
2.1	Designated Assets	46
2.2	Non-designated Assets	46
2.3	Events	58
3.1	National Planning Policy Framework (2021)	67
3.2	Planning Practice Guidance (PPG) 2014	70
3.3	Historic Environment Good Practice Advice (Second Edition 2017)	71

Executive Summary

The proposed Scheme is to widen and upgrade the Hundred Road, connecting it to Longhill Road so that there will be a continuous road and footpath linking Elm Road to the roundabout at the south of Hundred Road.

There are two listed buildings within the 1km study area: Morgan House, Norwood Road (NHLE 1216356, Grade II Listed Building) located 650m south of the Scheme and Water Tower, Whitemoor, Marshalling Yard, March (NHLE 1228967, Grade II Listed Building) located 250m north and east of the Scheme.

There are 104 non-designated assets within the 1km study area. These consist of records of archaeological evidence dating from the Mesolithic to the post-medieval periods and upstanding historic records from the post-medieval periods.

There is considered to be a very low potential for archaeology associated with the Palaeolithic, a low potential for Mesolithic, Neolithic, Medieval and Modern archaeology. There is assessed to be a moderate potential for archaeology of Bronze Age, Iron Age, Roman and post-Medieval date. Overall, an assessment of moderate potential for archaeology is made. Any finds are likely to be pre-Roman cut features and/or scattered artefacts or post-medieval evidence related to the former use of the area as a marshalling yard for the railway.

No impact to significance is expected to any of the listed buildings or non-designated assets as a result of changes in their setting caused by the Scheme.

1. Introduction

1.1 Proposed Development

Background

- 1.1.1 Cambridgeshire County Council (CCC) have commissioned Atkins, under the Cambridgeshire Joint Professional Services Framework (JPSF) to produce a desk-based assessment (DBA) ahead of the proposed upgrade of the Hundred Road, March centred on TL 41073 99265.

The Scheme

- 1.1.2 The proposed Scheme is to widen and upgrade the Hundred Road, connecting it to Longhill Road so that there will be a continuous road and footpath linking Elm Road to the roundabout at the south of Hundred Road. The Scheme also involves junction improvements and the installation of a layby for parking. To enable the works, diversion or culverting of some drainage ditches and the removal of hedgerow and shrubland is likely to be required.

Aims and Objectives

- 1.1.3 The principal aim of this DBA is to establish the nature, extent, and significance of the historic environment within the proposed development to provide a supporting baseline to enable informed decision making on the impacts and effects of the proposed development on the historic environment.
- 1.1.4 In order to achieve this, the specific objectives of this assessment are to:
- Interrogate the historic environment record (HER) data provided by Cambridgeshire County Council;
 - Identify and contextualise the historical and archaeological baseline of the Scheme and the surrounding environs;
 - Identify known designated and non-designated heritage assets within the Scheme boundary which may be impacted by the proposed development;
 - Assess the heritage significance and setting of the known historic environment resource through a programme of desk-based research;
 - Assess the likely impact on the significance of identified heritage assets;
 - Assess the potential for previously unrecorded archaeological remains; and
 - Provide recommendations for an appropriate mitigation strategy, aimed at avoiding or reducing the impact of the proposed development upon the significance of archaeological assets.

Consultation

- 1.1.5 Emily Rose Moon (Assistant Archaeological Consultant, Atkins) contacted Ruth Beckey (Archaeological Officer, Cambridgeshire County Council) on 08 August 2022 to enquire as to whether she would like anything in particular addressed in the DBA or whether she had any questions or concerns. As of 01 September 2022, no response has been obtained.

2. Methodology

2.1 Overview

- 2.1.1 This DBA has been produced in accordance with the requirements of National Planning Policy Framework (NPPF) (Department of Communities and Local Government, 2021), Planning Practice Guidance (Department of Communities and Local Government, 2021), standards specified by the Chartered Institute for Archaeologists (CIfA, 2014; 2017), Conservation Principles (Historic England, 2008), and local planning policies (Fenland District Council, 2014). no response has been obtained.
- 2.1.2 The information presented within this document is correct at the time of writing to the best knowledge of the author, within the limits imposed in dealing with historic materials and mapping. The archaeological resource is by its nature an unknown resource prior to confirmation through archaeological investigations.

2.2 The Study Area

- 2.2.1 The information presented within this document is correct at the time of writing to the best knowledge of the author, within the limits imposed in dealing with historic materials and mapping. For the purposes of establishing baseline conditions for this assessment, a study area was defined, encompassing an area of 1km around the proposed development and incorporating the boundary of site ownership. Data on all heritage assets was gathered to comprehensively characterise the historic environment, inform the understanding of potential impacts, and identify the potential for as-yet unknown archaeological remains within the study area.
- 2.2.2 Designated heritage assets comprise World Heritage Sites, scheduled monuments, listed buildings, registered parks and gardens, registered battlefields and conservation areas.
- 2.2.3 Non-designated assets comprise monuments, archaeological sites, buildings, places and landscapes which do not meet the criteria for a designated asset but require consideration under planning policy due to their heritage significance.
- 2.2.4 The extents of the study area are based on professional judgement and in line with professional guidance which has been designed to account for the sensitivity of the historic environment and the potential impacts of the Scheme. These, therefore, account for:
- The historical and archaeological context of the proposed development;
 - The settings of heritage assets within the Scheme and surrounding landscape; and
 - The potential for heritage assets to survive within the Scheme footprint.
- 2.2.5 For the purposes of this assessment, 'Scheme' will be used to refer to the proposed development and 'study area' for the land within the 1km buffer.
- 2.2.6 Maps showing asset distribution can be found in **Error! Reference source not found.** and gazetteers of all assets can be found in **Error! Reference source not found.**

2.3 Baseline data collection

2.3.1 The following sources of data were consulted during preparation of this assessment:

- National Heritage List for England (NHLE) maintained by Historic England, for listed buildings, scheduled monuments, Registered Parks and Gardens and Registered Historic Battlefields;
- Cambridgeshire County Council (CCC) for information relating to non-designated heritage assets, including buildings and structures of historic interest (not listed), known archaeological sites and areas of archaeological potential, Historic Landscape Characterisation (HLC), findspots and past archaeological investigations (events);
- British Geological Survey (BGS): Online digital solid and superficial geological data and historic borehole records;
- Ordnance Survey Mapping and other historic map sources;
- Documentary sources: published histories, site reports, and monographs;
- Online resources: Web-published material, including local planning authority planning policies, and aerial photography.

2.4 Limitations and Assumptions

2.4.1 This assessment comprises a desk-based review of data from the HER of Cambridgeshire County Council as well as a variety of secondary sources. Whilst this information is assumed to be accurate, it is not a complete record of the historic environment and does not preclude the potential for previously unidentified archaeological remains or deposits to be encountered. The value of any such unknown/unidentified assets cannot be determined at this time.

2.5 Assessment Criteria

Assessment of Significance

2.5.1 Where known historic assets are identified, the heritage significance of such assets is determined by reference to existing designations where available. For previously unidentified sites where no designation has been assigned, an estimate has been made of the likely historic, artistic, or archaeological importance of that resource based on professional knowledge and judgement.

2.5.2 The definition of cultural significance is readily accepted by heritage professionals both in the UK and internationally and was first fully outlined in the Burra Charter, which states in article one that '*cultural significance*' or '*cultural heritage value*' means aesthetic, historic, scientific, social or spiritual value for past, present or future generations (International Council on Monuments and Sites, 2013; Article 1.2). This definition has since been adopted by heritage organisations around the world and is applicable to 'Section 16: Conserving and enhancing the historic environment' of the National Planning Policy Framework (NPPF, 2021).

2.5.3 The following paragraphs as set out in the NPPF include key provisions considered of particular importance to this application which focuses on non-designated assets and the potential for archaeological remains.

- 2.5.4 *Paragraph 194 - In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance.*
- 2.5.5 *Paragraph 199 - When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss, or less than substantial harm to its significance.*
- 2.5.6 *Paragraph 203 – The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgment will be required having regard to the scale of any harm or loss and the significance of the heritage asset.*
- 2.5.7 In the NPPF Glossary, significance is defined as: 'The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting. For World Heritage Sites, the cultural value described within each site's Statement of Outstanding Universal Value forms part of its significance.'
- 2.5.8 For previously unidentified sites where no designation has been assigned, an estimate has been made of the likely historic, artistic or archaeological importance of that resource based on professional knowledge and judgement. Assessment of the significance of heritage assets is undertaken using professional judgement guided by the criteria set out in Table 2.1 below.

Table 2.1: Assessing the Significance of Heritage Assets

Significance	Description	Example
Very High	Internationally important or significant heritage assets	World Heritage Sites, or buildings recognised as being of international importance.
High	Nationally important heritage assets generally recognised through designation as being of exceptional interest and value.	Grade I and II* Listed Buildings, Grade I and II* Registered Parks and Gardens, Scheduled Monuments, Protected Wreck Sites, Registered Historic Battlefields, Conservation Areas with notable concentrations of heritage assets and non-designated assets of national or international importance.
Medium	Nationally or regionally important heritage assets recognised as being of special interest, generally designated.	Grade II Listed Buildings, Grade II Registered Parks and Gardens, Conservation Areas and non-designated assets of regional or national importance, including archaeological remains, which relate to regional research objectives or can provide important information relating to particular

		historic events or trends that are of importance to the region.
Low	Assets that are of interest at a local level primarily for the contribution to the local historic environment.	Non-designated heritage assets such as locally listed buildings, non-designated archaeological sites, non-designated historic parks and gardens etc. Can also include degraded designated assets that no longer warrant designation.
Negligible	Elements of the historic environment which are of insufficient significance to merit consideration in planning decisions and hence be classed as heritage assets.	Non-designated features with very limited or no historic interest. Can also include highly degraded designated assets that no longer warrant designation.
Unknown	The importance of an asset has not been ascertained.	

Assessing Buried Archaeological Potential

- 2.5.9 Buried archaeological evidence is often an unknown quantity which can be difficult to fully identify during a desk-based assessment. The assessed potential is based on available evidence, but the physical nature and extent of any archaeological resource surviving within the Site cannot be confirmed without detailed information on the below ground deposits or results of on-site fieldwork, typically through non-intrusive (e.g. geophysical, LiDAR), and intrusive (archaeological, geoarchaeological evaluation) survey.
- 2.5.10 A site's archaeological potential is identified using professional judgement and knowledge and is informed by Historic England's Conservation Principles, Policies and Guidance (2008). A site's baseline potential is compared to the level of existing impact upon it, from modern and historic developments. The potential for surviving archaeological evidence of past activity within the Scheme boundary is expressed in the report as being:
- **High:** The available evidence suggests a high likelihood for past activity within the Scheme boundary and a strong potential for archaeological evidence to survive intact or reasonably intact;
 - **Medium:** The available evidence suggests a reasonable likelihood for past activity within the Scheme and consequently there is a potential that archaeological evidence could survive;
 - **Low:** The available evidence suggests archaeological evidence of activity is unlikely to survive within the Scheme, although some minor land-use may have occurred; and
 - **Uncertain:** Insufficient information to assess.

Setting

- 2.5.11 A site's archaeological potential is identified using professional judgement and knowledge and is informed by Historic England's Conservation Principles, Policies and Guidance (2008). The setting of each designated asset will be

assessed in accordance with Historic England's 'The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning: 3' (2nd edition 2017). The guidance states that a thorough assessment of setting needs to be considered that is proportionate to the significance of the heritage asset under consideration. The setting of a heritage asset does not just include views to the asset, but also views from it, and can be affected by environmental issues such as noise, dust, and vibration etc. from nearby land use.

3. Policy, legislation, and guidance

3.1 Planning policy and legislation

3.1.1 Table 3.1. below provides a summary of legislation and policies the Scheme relevant to this assessment.

Table 3.1: Legislation and national policy

Legislation and Policy	
Legislation	
Ancient Monuments and Archaeological Areas Act 1979	The Ancient Monuments and Archaeological Areas Act 1979, the Secretary of State (Department of Culture, Media and Sport - DCMS) can schedule any site which appears to be of national importance because of its historic, architectural, traditional, artistic or archaeological interest. It is a criminal offence to damage a scheduled monument. Additional controls are placed upon works affecting scheduled monuments and areas of archaeological importance under the Act. The consent of the Secretary of State (DCMS), as advised by Historic England, is required for certain works affecting Scheduled Monuments.
Planning (Listed Buildings and Conservation Areas) Act 1990	England, under Section 1 of the Planning (Listed Buildings and Conservation Areas) Act 1990, the Secretary of State is required to compile lists of buildings of special architectural or historic interest, on advice from Historic England. Works affecting listed buildings are subject to additional planning controls. Under the Act, planning authorities are instructed to have special regard to the desirability of preserving a listed building, its setting, or any features of special architectural or historic interest which it possesses (Planning (Listed Buildings and Conservation Areas) Act s.66(1)). Designation as a listed building confers additional controls over demolition, alteration and extension through the requirement for Listed Building Consent to be obtained before undertaking works under such circumstances.
National Policy	
National Planning Policy Framework (NPPF) 2021	The National Planning Policy Framework (NPPF, 2021) provides the Government's national planning policy on the conservation of the historic environment, supported by the Planning Practice Guidance (updated June 2021). It was published in March 2012 and revised in July 2021. This DBA aims to address relevant policy within the NPPF in relation to Section 16 'Conserving and enhancing the historic environment'. Section 16 of the NPPF is presented in full in Appendix C.
Local Policy	
Fenland Local Plan 2014	The Fenland District Local Plan was adopted in May 2014. It has one key policy relating to the Historic Environment. Policy LP18 – The Historic Environment The Council will protect, conserve and seek opportunities to enhance the historic environment throughout Fenland. This will be achieved through: <ul style="list-style-type: none"> the consideration of applications for planning permission and listed building consent; the use of planning obligations to secure the enhancement of the significance of any heritage asset, where development might impact on that significance (including impact on setting);

- keeping up-to-date and implementing conservation area appraisals and management plans, and using such up to date information in the determination of planning applications;
- making use of Article 4 Directions, where appropriate, to prevent unsympathetic alterations to buildings in conservation areas;
- the preparation and maintenance of a list of buildings and other heritage assets of local importance;
- steps to reduce the number of heritage assets in Fenland on English Heritage's Heritage at Risk Register; and the use of grant schemes, as resources permit, to safeguard heritage assets at risk and encourage sympathetic maintenance and restoration of listed buildings and historic shop fronts.

All development proposals that would affect any designated or undesignated heritage asset will be required to:

(a) describe and assess the significance of the asset and/or its setting to determine its architectural, historic or archaeological interest; and

(b) identify the impact of the proposed works on the special character of the asset; and

(c) provide a clear justification for the works, especially if these would harm the asset or its setting, so that the harm can be weighed against public benefits.

The level of detail required should be proportionate to the asset's importance and sufficient to understand the potential impact of the proposal on its significance and/or setting.

All development proposals that would affect a heritage asset will be determined in accordance with local policy in this Plan and national policy in the National Planning Policy Framework. Where permission is granted, a programme of work and/or the implementation of any necessary mitigation measures may be secured by condition or as part of a planning obligation in order to minimise any adverse impact.

3.2 Guidance

3.2.1 This assessment has been undertaken in accordance with current best practice and in line with, but not limited to, the following Standards and Guidance:

- **Standards and guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists, 2020):** The Chartered Institute for Archaeologists' (CIfA) guidance aims to define good practice principles for the production of desk-based assessments and also aligns itself with CIfA's code of conduct. The document is regarded as a standard only, and therefore avoids a prescriptive level of detail. The standard of this guidance has not been met if an assessment should fail to determine the nature, extent and significance of the historic environment within a specified area.
- **Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (Chartered Institute for Archaeologists, 2020):** The Chartered Institute for Archaeologists' (CIfA) guidance aims to define good practice principles for the commissioning or production of consultancy advice on archaeology and the historic environment.

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- **Managing significance in decision-taking in the historic environment, Historic Environment Good Practice Advice in Planning Note 2 (Historic England, 2015):** This advice note provides information on good practice to assist in implementing historic environment policy in the NPPF and PPG and contains guidance on assessing the significance of heritage assets by using appropriate expertise.
 - **Preserving Archaeological Remains Decision-taking for Sites under Development (Historic England, revised 2016):** This advice is for developers, owners, archaeologists and planners working on projects where the intention is to retain and protect archaeological sites beneath or within the development. It can also be read in relation to other land-use or site management work. It has a particular focus on decision-taking on waterlogged archaeological sites.
 - **The Setting of Heritage Assets Historic Environment Good Practice Advice in Planning Note 3 (Historic England, revised 2017):** This advice note sets out guidance against the backdrop of the National Planning Policy Framework and the related guidance provided in the Planning Practice Guide. Furthermore, the guidance provides advice on understanding setting and how it may contribute to the significance of heritage assets, as well as a suggested methodology for assessing impacts on setting.
 - **Planning Practice Guidance: Conserving and Enhancing the Historic Environment (NPPF, DCLG, 2014: updated 2019):** The Ministry for Housing, Communities and Local Government (MHCLG) published 'Conserving and Enhancing the Historic Environment' in April 2014. This was last updated in February 2018. The Guidance notes that 'conservation is an active process of maintenance and managing change. It requires a flexible and thoughtful approach to get the best out of assets as diverse as listed buildings to as yet undiscovered, non-designated buried remains of archaeological interest'. It should be noted that the wording of PPG is reflective of the now superseded 2012 NPPF.

4. Baseline Conditions

4.1 Site Overview

Introduction

- 4.1.1 The location, topography, and geology of a development site can provide indication of its suitability for past human activity. Topography and geology can provide information on whether ground levels have been raised or terraced away and can contribute to our understanding of the archaeological survival potential of a site.

Site Location

- 4.1.2 The site is located on Longhill Road and Hundred Road (see **Error! Reference source not found.**). To the east it joins Elm Road and to the south Hundred Road becomes Norwood Road before joining the B1099 Wisbech Road further south. The site is shown in Figure 4-2 to Figure 4-6.
- 4.1.3 The site is bounded to the north by HM Whitemoor and agricultural fields to the north-east, east and west. To the west, there is also the location of a former quarry, now a recycling centre. It is bounded to the south by Whitemoor Yard and to the south-east by an industrial park and March Bears Rugby Club sports field.

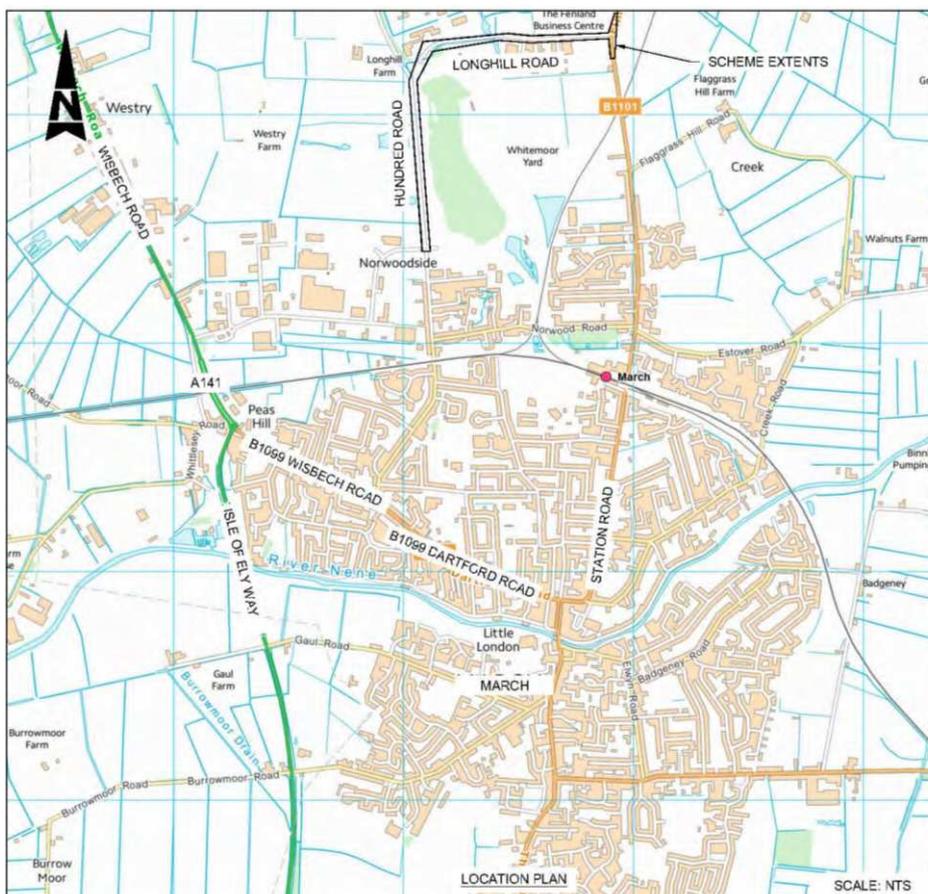


Figure 4-1 Site location plan.



Figure 4-2: View north along Elm Road.



Figure 4-3: View south along Hundred Road of the road without pedestrianisation.



Figure 4-4: View south showing Hundred Road with agricultural fields to the west.



Figure 4-5: Pedestrian link between Longhill Road and Hundred Road.



Figure 4-6: View west along Longhill Road.

Topography and Geology

- 4.1.4 March is the county town of the Isle of Ely and before the draining of the fens, was an island in its own right, overlooking the former fen (see Figure 4-7 **Error! Reference source not found.**). It sits on the old course of the River Nene where the road between Ely and Wisbech (the two chief towns of the Isle) fords the river. The study area is fairly consistent at 4-6m Above Ordnance Datum (AOD). The topography is clearly visible in the LiDAR results (Figure 4-7).
- 4.1.5 The British Geological Survey (BGS) online map identifies the bedrock of the area as Ampthill Clay Formation – Mudstone. To the north of the study area, there is a superficial deposit of Oadby Member - Diamicton. To the west of the study area, there is a superficial deposit of March Gravels Member - sand and gravel. There are superficial deposits that surround the fenlands which largely comprise of lowland, wetland and flat deposits around the town of March which was created on higher land within the fens. March is situated on a north-south aligned ridge of gravel running from Doddington and Town End Common (to the south of March) to Norwood Common (to the north of March) and is surrounded by former moor and fenland.
- 4.1.6 The Site, which runs along Hundred Road, runs through countryside unsurprisingly associated with industrial activity such as Roman salt working. The location of March on high ground will have attracted early settlement in the area and made it a nodal point within an extensive network of fen edge routeways.

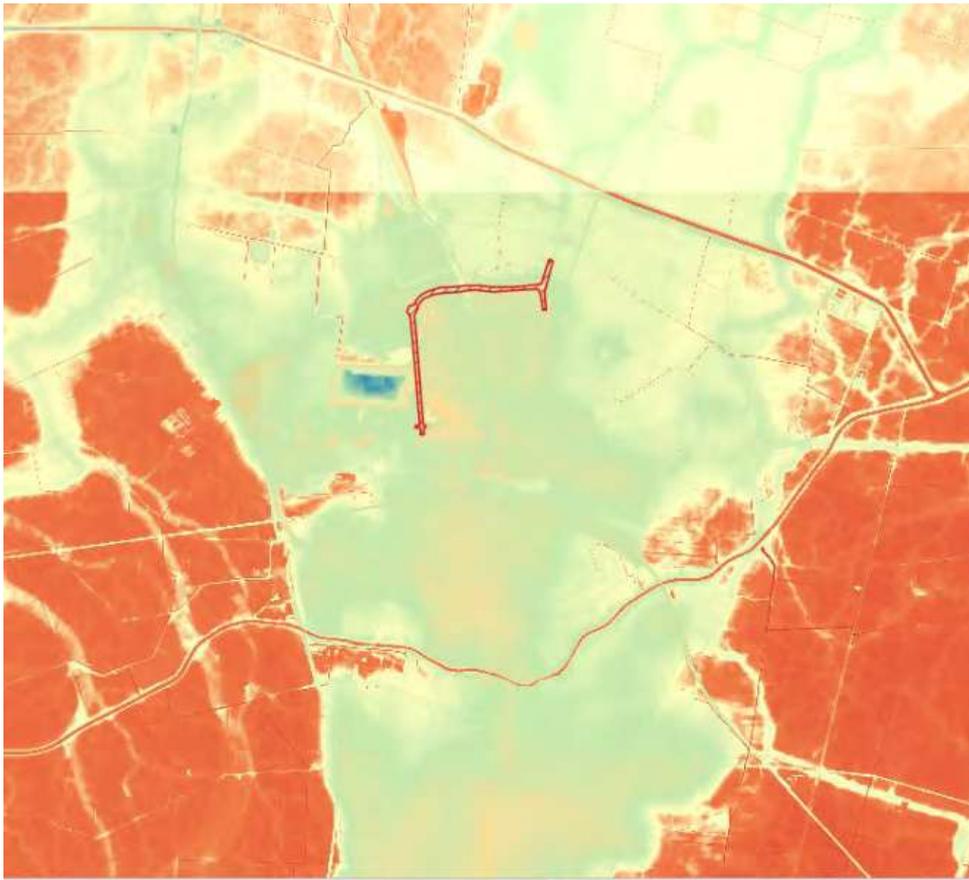


Figure 4-7: LiDAR data showing the Site (Environmental Agency).

Fen Causeway

- 4.1.7 The Site runs north south across the former Fen Causeway, a northeast-southwest (MCB19672) Roman road dating to AD. 2 (MCB07938) which ran from the Roman Towns of Brampton (south of March) and Venta Icenorum at Caistor St Edmund from Stalham in Norfolk. The March section of the causeway runs on higher ground over the Fenland. Locally, it includes two parallel ditches that flanked a metalled surface (CB15033) and is characterised by a layer of gravel overlying a thin alluvial soil (MCB16828). Archaeological work carried out along the route of the causeway, including within the marshalling yard and sidings where truncation of all remains was expected (ECB3561/3845/104), identified settlement features, evidence of a 1st century AD date for the Roman road, pre-causeway enclosures, roadside burials (ECB497) and industrial activity. Roman salterns (ECB496) have also been identified close by.
- 4.1.8 Hundred Road is one of a network of roads that run along the ridge referred to in 4.1.3; depicted in Figure 4-9 as Norwood Drove, it is shown leading to Norwood Common and almost certainly connected with the Fen Causeway. Having a long history, nationwide, drove roads hit their height during the medieval period and (locally) as the fens were drained, being particularly necessary for driving animals to the commons and to market. Given the evidence for the longevity of activity at March, it is very possible that Hundred Road has more ancient origins.

4.2 Previous Archaeological Investigations (Events)

- 4.2.1 There have been 37 previous archaeological investigations occurring from 1959 to 2020 which can be divided into five geographical areas of the study area: North (Longhill Road), Central (Hundred Road/Whitemoor), West (Westry), East (Elm Road) and South (March centre). A map of the events can be found in **Error! Reference source not found.**
- 4.2.2 There are a number of previous events which have occurred in immediate proximity to the Scheme in the Central area around Whitemoor Sidings and Hundred Road. Evaluation at Barn Farm, Hundred Road in 1995 revealed a series of probable field boundary ditches and concentration of activity likely Roman in date (ECB282). The same year, an aerial photograph assessment identified a number of cropmarks of various dates. Between November 2003 and 2004, Archaeological Project Services revealed archaeology dating from the early Bronze Age to probable Roman occupation however, no evidence of the Fen Causeway was encountered (ECB2014). In 2004, further evaluation trenches revealed a truncated ditch and pit of unknown date (ECB2032). No dateable evidence was uncovered during evaluation in 2004 by CCC AFU to the south-west of this area (ECB2032). In July 2008, nineteen trenches at the Trading Park to the west of Hundred Road, revealed artefactual evidence of Late Mesolithic and early Neolithic, a dense concentration of Bronze Age activity and Roman agricultural evidence (ECB2965). Further large-scale investigations took place at the Marshalling Yard in 2010 by North Pennines Archaeology Ltd (ECB3845) in which early prehistoric features were encountered and evidence of Roman field systems seeming to correspond to the location of the Fen Causeway. Evidence of the former railway yard and track beds of the marshalling yard were uncovered. A year prior in May 2009, Wardell Armstrong recorded the remaining three air raid shelters or pill boxes at the site. Most recently in 2020, Britannia Archaeology Ltd undertook an archaeological evaluation at Nelson House, 22 Norwood Road as a condition of planning permission (ECB6244). The site uncovered a post-medieval Fenland drain.
- 4.2.3 Adjacent to this central area is the northern grouping of events which is the location of the earliest archaeological intervention at the site occurring 1959-1960 which produced extensive evidence for 1st-4th century occupation (ECB496). To the north of the Longhill Road portion of the Scheme, an evaluation occurred in 2003 (ECB3504) in which the thirteen trenches revealed evidence of a major early Roman salt making site and associated settlement dating to the first and second centuries. Evidence was extensive and well preserved. Further excavation at this site was carried out in 2006 by Cambridgeshire County Council Archaeological Fieldwork Unit (ECB1437). A significant further excavation was carried out by Cambridge Archaeological Unit in 2008 totalling 0.17ha providing evidence of extensive early Roman occupation as well as earlier prehistoric activity (ECB3085). In 2013, archaeological excavation was carried out as a condition of planning permission which revealed four broad phases of activity from the Iron Age to post-medieval (ECB4048). No archaeological findings were made during a watching brief by Oxford Archaeology East in May 2009 (ECB3191).
- 4.2.4 The western portion of archaeological works consists of an evaluation at Foundry Way in 2013 (ECB4048) which revealed activity dating to the post-medieval and modern periods. Evaluation at land south of Westry Hall in 2015 (ECB4462)

revealed Iron Age features suggestive of a built structure. Evaluation at land to the north of Woodville in 2019 revealed no archaeological features (ECB5833).

- 4.2.5 In the eastern portion, Roman occupation was uncovered during excavations at Estover Road, Fen Causeway in 1985 (ECB497) which allowed for the conclusion that there was an earlier, likely Iron Age trackway associated with the Fen Causeway. Further evidence for Roman occupation was uncovered at 128 Elm Road where ceramic building material was recovered from a gully (ECB3561). At land off Elm Road, post-medieval drainage and former greenhouses were uncovered at the site as well as residual flint (ECB3737). Geophysical surveys and subsequent evaluation revealed a number of features and finds of Iron Age and Roman date (ECB4500). Further evaluation nearby in May 2015 also revealed a number of artefacts and features of this date with some evidence of early Neolithic artefacts (ECB4477). Cropmarks and possible field boundaries were also identified through an aerial photography assessment conducted in June 2015 which included parallel ditches associated with the Fen Causeway (ECB4642). No archaeological features or finds were uncovered during evaluation at 53 Elm Road in 2002 (ECB283) nor Evaluation at Dagless Way, Elm Road 2001 (ECB408) or evaluation at 92 Elm Road in 2005 (ECB1929) nor at land east of Berryfields in 2018 (ECB5295).
- 4.2.6 The remaining events occurred to the south of the study area and largely fall on the southern side of the railway line. In March 2001, excavations revealed evidence for 19th to 20th century activity as well as probable prehistoric features (ECB280). Following this, further excavations occurred in 2002 and revealed features relating to occupation in the Late Bronze Age through to the Medieval period (ECB928). A Roman complex of ditches and field systems were uncovered by Cambridgeshire County Council Archaeological Field Unit in 2006 (ECB2346) and further Roman ditches uncovered by Oxford Archaeology East in April 2009 (ECB3170). No archaeological finds or features were uncovered in excavations in March 2010 by Archaeological Solutions at land to the west of Robingoodfellows Lane (ECB3349) nor at works at 168 Norwood Road by Witham Archaeology in August 2012 (ECB3823) or Queen Street Close in 2014 by Pre-Construct Archaeology (ECB4219) or 327 Norwood Road in March 2019 by University of Leicester Archaeological Services (ECB5821). Just north of the railway line, an evaluation occurred along the route of the proposed Anglian Water pipeline in August 2005 by CCC AFU revealing a single neolithic flake and six small modern trenches (ECB1992).

4.3 Historic and Archaeological Chronological Overview

Baseline data

Listed Buildings

- 4.3.1 There are two listed buildings within the 1km study area. These are:
- Morgan House, Norwood Road (NHLE 1216356, Grade II Listed Building) located 650m south of the Scheme.
 - Water Tower, Whitemoor, Marshalling Yard, March (NHLE 1228967, Grade II Listed Building) located 250m north and east of the Scheme.
- 4.3.2 These will be discussed in context in the following baseline assessment.

Non-designated Assets

- 4.3.3 There are 104 non-designated assets within the 1km study area. These consist of records of archaeological evidence dating from the Mesolithic to the post-medieval periods and upstanding historic records from the post-medieval periods. The details of these assets are set out in the following sections.

Chronological Overview

Palaeolithic (800,000 – c.12,000BC)

- 4.3.4 This period was characterised by the development of stone tool technologies. It spans the end of the Pleistocene geological epoch and marks the emergence of modern humans from earlier hominid species by the Upper Palaeolithic period (c. 40,000 – c.10,000 BC.). By the end of the Palaeolithic, the ice retreated for the last time as the climate got warmer and drier, and woodlands expanded.
- 4.3.5 The landscape in general would have been unfavourable for people to live permanently due to its cold climate. However, during the short summers, it is possible that hunter gatherer communities crossed the landmass which connected Britain to continental Europe. Human settlers in Britain would have survived by hunting reindeer and elk and gathering the few edible plants.
- 4.3.6 There is no evidence of this time period in the study area.

Mesolithic (10,000 – 4,000BC)

- 4.3.7 The landscape changed during this period, corresponding with a period of rising sea levels and landward inundation as the post-glacial ice sheet melted. The arrival of microlithic technologies marks this period, many of which were fixed onto spears and harpoons required for hunting. Mesolithic people followed a seasonal pattern of occupation depending on food source management. Activity would likely have been focused close to rivers for predictable resources sourced through hunting, gathering and fishing.
- 4.3.8 There is very little evidence of this time period in the study area however, at a site on the Hundred Road (MCB18211) 85m west of the Scheme, a small lithic assemblage of 58 residual worked flints was recovered from the topsoil. No clear concentrations were evident, but a significant later Mesolithic or early Neolithic component to the assemblage indicates activity in the vicinity. In line with wider archaeology of the Fenland, it is likely that this area was utilised for resources on a seasonal basis during the Mesolithic period.

Neolithic (4,000 – c. 2,500 B.C)

- 4.3.9 The arrival of farming from continental Europe marks the beginning of the Neolithic period and a radical change in the relationship between people and the natural environment. This period witnessed extensive forest clearances to make way for crops and animal herds, and a marked almost absolute decline in inclusion of hunted meat or foraged wild food, in the diet. The Early Neolithic is comparable to the Mesolithic in terms of stone tool technologies however, this period saw the development of monumental features including long barrows and causewayed enclosures. The Middle Neolithic is marked by the earliest evidence of stone circles, cursus monuments and individual burials. The Late Neolithic period, whilst demonstrating some cultural overlap, saw an introduction of a new style of pottery, along with henges, a replacement of rectangular style dwellings with smaller round ones, palisaded enclosures and an increasing focus on springs and the sources of rivers.

- 4.3.10 There is some evidence of this time period in the study area which is largely concentrated to the south of the Scheme. In 1973, a Neolithic flaked flint axe was uncovered near to the Fen Causeway (MCB02010) 200m south-east of the Scheme, with a further assemblage of struck flints and small animal bones located on Norwood Road, 620m south of the Scheme, which has too been dated to this time period (MCB18159). At Foundry Road, 400m south-east of the Scheme; 16 later prehistoric worked flints were uncovered ground together on an otherwise Roman site which led to a conclusion of background Neolithic occupation (MCB19586). Further evidence has been provided by excavations of a post-medieval site on Elm Road where a small, polished axe (MCB19586) thought to be Neolithic in date was discovered with an assemblage of modern artefacts.
- 4.3.11 This evidence shows that there was likely Neolithic occupation of the study area which was possibly seasonal and/or settled. Further evidence is possibly truncated by extensive Roman occupation of the area.
- Bronze Age (2,000 – 700 B.C)
- 4.3.12 The Bronze Age is characterised by the introduction of metal technologies. This period saw an increase in economic and cultural communications with mainland Europe giving rise to new burial rites, objects and technology. The climate began to deteriorate; where once the weather was warm and dry it became much wetter driving the population away from easily defended sites in the hills and into the fertile valleys. Ore sources, such as tin and copper, were both used as components for bronze smelting and thus became increasingly important as bronze gradually replaced stone as the main material for tools. The period sees the increase in visibility of settlement sites and associated field systems within the archaeological record across much of Britain.
- 4.3.13 There is extensive evidence of Bronze Age occupation in the study area ranging from find spots such as a faceted axe (MCB03844), rough brown glacial flints and jacks (MCB04548), flint scatters (MCB08459) and beaker sherds (MCB07936). A particularly interesting find was a small, one-handed urn found just north of March station in overlying soil (MCB05924). It was elaborately decorated with cross-hatchings, oblong hexagonal compartments, and a broad zigzag around the lower part. It was found 250m west of the Scheme with other pottery in the ballast pit worked at the time of the construction of the Peterborough and Ely branch of the Great Eastern Railway.
- 4.3.14 A number of features have been uncovered during excavations in the area, including in proximity to the footprint of the scheme. At Estover Road, 800m south-east of the Scheme, a few Bronze Age and Iron Age features were revealed which included an isolated pit with Beaker pottery (MCB07936b) but there was insufficient evidence to suggest the presence of any substantial prehistoric site. 330m west of the Scheme, early Bronze Age remains were uncovered in Whitemoor sidings (MCB16673) consisting of ditches, small shallow pits and postholes with small quantities of early Bronze Age pottery, a couple of thumbnail scrapers and several flint flakes. The pottery assemblage includes fragments from a small, collared urn and two beakers with incised decoration. Late Bronze Age remains at the same site (MCB16674) consist of pits containing Late Bronze pottery, flint flakes and burnt stone. The central pit contained a sequence of organic rich fills, containing burnt animal and fish bone, along with charred cereals, weed seed and nut fragments. This site is suggestive of more extensive Bronze Age occupation in this study area.

- 4.3.15 A further high concentration of Bronze Age features have been identified at a site on Hundred Road (MCB18212) 300m west of the Scheme which comprised of a series of linear features and pits with at least two phases of water holes. Post-holes and domestic debris indicated a possible structure which was interpreted as a cremation pyre. Several burials were recovered. Another inhumation burial (MCB15266) was found in an area of many enclosures and/or drove ways dating to the late Bronze Age or mid-Iron Age located 770m south-east.
- 4.3.16 Two further pieces of evidence exist in the form of cropmarks of ring ditches identified from aerial photographs as a possible double concentric ring ditch and round barrow at Westry Farm (MCB29292) 130m north-west and Longhill Farm (MCB29293) 850m west respectively.
- 4.3.17 There is clearly extensive evidence of Bronze Age occupation in the study area which likely consisted of settlement and associated activities. There is evidence suggesting that some areas of Bronze Age occupation continued into settlements of the Iron Age and Roman periods.

Iron Age (c. 700BC – AD 43)

- 4.3.18 The Iron Age period is characterised by the adoption of iron working techniques with settlement areas and associated agricultural land division become more extensive. However, generally, people continued to live in small villages and farmsteads. Due to the iron technology, tipped ploughs made farming more efficient and agricultural production increased. The Iron Age also saw the wider use and the further development of hillforts, possibly for the defence of intermittently occupied settlement and storage areas. These began to be built in the late Bronze Age, around 1000 BC, but became much larger and more elaborate throughout the Iron Age.
- 4.3.19 There are a number of recorded assets of this period within close proximity to the footprint of the scheme. 800m north-west of the Scheme, an unploughed earthwork site with possible stock enclosures and signs of industrial activity has been uncovered (MCB07936). The site likely dates to the late Iron Age or early Roman period but it is certain that it dates to before the construction of the Fen Causeway. The site includes local coarse pottery, pottery appropriate to a Claudio-Neronian date and a rural burial placed along the field boundaries. At a multi-phase site on Foundry Way (MCB30645) just 130m south of the Scheme, Late Iron Age features including evidence of a structure, pottery, briquetage and animal bones were uncovered with evidence of reuse of Bronze Age features.
- 4.3.20 In addition, cropmarks of a double-ditched Iron Age or Roman settlement enclosure (MCB08441) can be seen 900m to the west of the Scheme. This is defined by two concentric broad ditches with an entrance through both to the north. It is surrounded by cropmark traces of ditches which may be boundaries and enclosures. Immediately to the north are two overlapping ring ditches which may represent the remains of earlier round barrows.
- 4.3.21 There is clearly evidence of the Iron Age in the study area although it is less extensive than the Bronze Age and Roman periods. It is likely, however, that some evidence may have been truncated by later Roman settlement and/or difficult to differentiate from evidence of these time periods.

Romano-British (AD 43- AD 410)

- 4.3.22 The British landscape changed rapidly after the arrival of the Romans in AD43. A new road network was established, connecting the major settlements and forts

located throughout the landscape (Margery, 1967). Many former Oppida (an Iron Age trading settlement/central place) became regional administrative centres, and the new roads saw expansion of rural agricultural settlements, centred on farms or villas with larger market type settlements often located where roads crossed rivers.

- 4.3.23 The Roman occupation of the area is extensive which is likely due to the presence of the Fen Causeway which transects Hundred Road at the southern end of the site boundary (MCB15033). The Fen Causeway runs between Denver in Norfolk in the east and Peterborough in the west. It covers 39km, passing March, before joining the major Roman north-south route, Ermine Street, west of the modern-day Peterborough. Within the study area, the site of the road is identifiable by a number of cropmarks and earthworks to the north and south. Built structures and features within proximity to the road include a shrunken kiln, a possible shrine as well as paddocks and enclosures (MCB09381) and a large roadside ditch (MCB16828). Significantly, evidence of the metalled surface of the road itself was identified 840m south-east of the Scheme in approximate position of the Fen Causeway (MBC20684). Associated with this platform were examples of rare Roman pottery and animal bone, iron and wooden objects, burnt and struck flint. In addition, environmental samples revealed some charcoal and/or charred wood, seeds indicative of damp, rough grassland and some cereal fragments. This all gives evidence of extensive use of this stretch of the road.
- 4.3.24 There are a number of recorded assets of this period within close proximity to the footprint of the scheme. A number of isolated finds have been uncovered dating to this time period including a stamped handle (MCB05905), a grey ware pottery vessel (MCB05906), pottery scatters (MCB08443/MCB08445/MCB08452), two collections of Roman Nene Valley ware and grey ware (MCB17742/MCB17743). The closest of these to the Scheme is a pottery scatter located 15m north of the Scheme on Longhill Road (MCB08445).
- 4.3.25 A number of isolated features indicative of settlement of this area have been identified and/or excavated including two loose groups of Roman enclosures (MCB05907/MCB05925), ditches (MCB18456), a possible ditchway or trackway (MCB08440), a number of NW-SE and NE-SW orientated ditches (MCB16675), a rectilinear enclosure (MCB08972) and a cluster of ditches, pits and gullies containing Roman pottery (MCB15267). An extensive field system of ditches, tracks and watercourses have also been identified (MCB08978) and analysis suggests that the modern field boundary 'Hundred Drove' follows the line of an ancient road from Flagrass Roman settlement 150m east of the Scheme. A further field system was identified 630m south of the Scheme which is thought to have been associated to the settlement on the fringes of March (MCB18160).
- 4.3.26 Evidence of settlement has also been uncovered through archaeological works at Norwood (MCB06016), 15m north of the Scheme where a small group of sub-rectangular enclosures either side of a stream revealed loom weights, a quern, a skeleton of premature baby under a probable hut floor as well as a large area of "saltern pits" producing briquetage and a possible salt works (MCB08444). Further inhumations were uncovered during excavations 200m south-east of the Scheme in 1950 (MCB06001) at a possible Roman burial ground or camp where discoveries included bone instruments, early Roman pottery and silver and copper coins. However, the exact location of these excavation is disputed. Further extensive occupation is evidenced by a site on Foundry Way 80m south of the Scheme (MCB18546) where 24 features including postholes, pits, several

ditches, a watering hole and a possible well with related structure (group of intercutting pits) were identified. Artefactual evidence includes animal and plant remains, a large amount of Roman pottery and a Hertfordshire puddingstone rotary quern. There is evidence of extensive modern disturbance.

- 4.3.27 In addition to the settlement evidence, a major early Roman salt making site has been uncovered dating to the 1st and 2nd centuries also on Foundry Way 140m south of the Scheme (MCB15747). The remains were extensive and well-preserved, comprising structural evidence and industrial features including a kiln with flue and associated postholes. Briquetage, salt and salt-making objects were recovered in abundance. The domestic occupation evidence comprised enclosure ditches, posthole and possible slot structures, wells, pits and other features, in addition to an assemblage of pottery and animal bones suggestive of an average status site. Soil sample evidence suggests grass and reeds were used as fuels and that crops were being processed in the vicinity
- 4.3.28 It is clear that there is some overlap between the Iron Age and Roman periods with Roman activity present at a number of Iron Age sites including 140m south of the Scheme on Foundry Way (MCB30645) where the Roman period of activity consisted of a series of intercutting ditches forming boundaries that appear to respect the earlier Iron Age ditches. Continued field systems from the Bronze Age to Roman periods have also been interpreted at a site on Hundred Road 80m west of the Scheme (MCB18213) where the area has been associated with intensive horticulture.
- 4.3.29 There was clearly extensive occupation of this area during the Roman period which is likely due to the close proximity of the Fen Causeway and development of an earlier settlement.
- Medieval (AD 410 – AD 1520)
- 4.3.30 Historical records show that March was a pre-conquest settlement; it was given to the monastery of Ely in c. 1000 (Atkinson et al, 2002, p116-123) and was recorded as a settlement in the Domesday Book, as Merche, (likely deriving from the Old English, Mearc meaning ‘boundary’). By 1250, it was a fair size village and became the county town of the Isle of Ely. The oldest church in the town, St. Wendreda was originally built in 1346 and is dedicated to the town’s own saint, the 7th century Anglo-Saxon daughter of King Anna of East Anglia. This is the only known dedication to her.
- 4.3.31 Before the draining of the Fens during the 17th century, March was essentially an island in the marshy fens which operated as a minor port for coal and grain trading. A market appears to have been held at the centre of the town during this time period however, this was not formalised until the 17th century.
- 4.3.32 A system of drove roads across the ridge are preserved in the modern road system, Hundred Road (Norwood Drove, shown in Figure 4-8 below) being one such example. Given the established history of trackways and its location on higher ground to facilitate settlement and transportation, it’s likely these were early roads as with other locations in the fens such as Flag Fen and Bradley Fen. Having a long history, nationwide, drove roads hit their height during the medieval period and (locally) as the fens were drained. These helped facilitate the movement of livestock seasonally to and from the fen pastures to the market in March, and via interconnecting droves and markets more widely.
- 4.3.33 There is no surviving evidence of this time period in the study area.

Post Medieval (AD 1520 - AD 1900)

- 4.3.34 The Study area has undergone much change during this period. The area within the footprint of the scheme does, however, include land that has not demonstrably altered since it was depicted on early 19th century mapping,
- 4.3.35 The draining of the Fens in the 17th century, and the construction of the Twenty Foot River (MCB05937) on the Middle Level of the Cambridgeshire Fens (cut by Cornelius Vermuyden in 1651 from Whittlesey Dyke), enabled expansion of March and development of the surrounding countryside. Although the waterway was primarily intended for drainage it was also used for other activities such as the transportation of agricultural produce within the area. This was assisted by the erection of a single arched bridge over the River Nene which linked areas to the north and south of the settlement. In 1670, a charter was granted by Charles II to the Lord of the Manor of Doddington allowing a weekly market and two annual fairs to be held at March. From this time, the town developed in size due to its ever-expanding role in trade and industry.
- 4.3.36 The commons (in which the Site is located) were over stocked during the 17th century due to this population growth and piecemeal inclosure began during this period. Northwood Common was part of a section of the commons set aside for common and cow pasture, administrated in such a way as to manage overstocking.
- 4.3.37 There are a number of asset records in the HER which refer to civil buildings and residences evidencing this expansion of settlement after the inclosure of the commons. These assets have largely been identified through survey of the 19th century OS maps, as further 20th century expansion has led to their demolition.
- 4.3.38 The 1841 tithe map (Figure 4-8) shows the study area as entirely agricultural with little development; Hundred Road is marked as 'Norwood Drove', with small stripfields arranged either side. (The name 'drove' relates to the function of the roads as cattle drove roads, providing access to agricultural land across the fens.) Norwood Road is marked as Mill Road, with Estover Farm (MCB24283) clearly marked. Norwood House (MCB27531) can be seen to the northwest and Elm Road (although not named) is clearly shown to the east of the study area. Longhill Farm (not an asset, now covered by Norwood Junction) is also possibly present as three buildings are marked in the same location.
- 4.3.39 The 19th century draft first edition OS map (Figure 4-9) show that the site is located to the north of March village, on what was once Norwood Common, again with the current Hundred Road labelled as Norwood Drove and with Norwood House to the northwest. Twenty Foot River (MCB5937) can clearly be seen marked to the north. Prosperous House (MCB27997) and garden and Temperance Hall (MCB24290) are also marked.

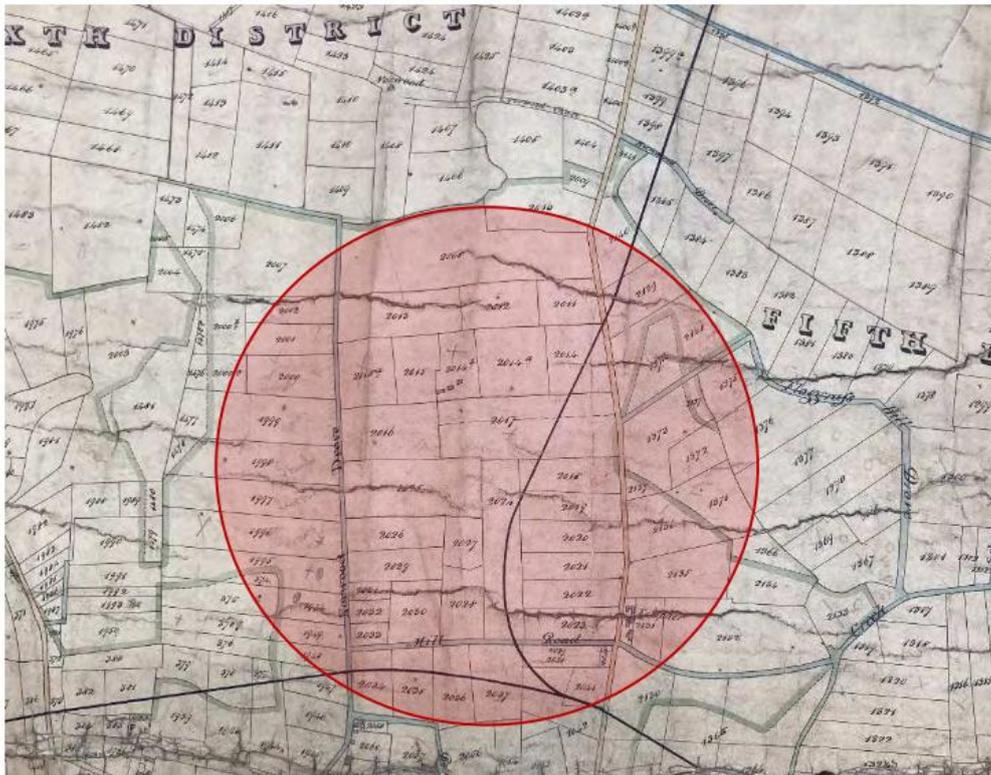


Figure 4-8: 1841 tithe map showing the location of the site as agricultural. Norwood Drove can be seen running north to south, now Hundred Road.



Figure 4-9: 19th century draft first edition OS map showing the area of the site marked as Norwood Common.

- 4.3.40 The 1st edition Ordnance Survey mapping (Cambridgeshire XII.13, 1887, 1:2,500) shows the large amounts of railway infrastructure that were put in place across the study area and surrounding area by the mid-19th century. Residential development (such as Whitemoor Cottages) and new farms, enabled by improved transport infrastructure are evident on the 1st edition, including Longhill Farm (MCB27529), Longhill Farm North (MCB27530), Vinegar Hill Farm, Westry Farm, Flaggrass Hill Farm (MCB24287), The Wrangles (MCB22917).
- 4.3.41 In addition to these residential properties, there is the site of a former windmill marked as 'old windmill' on the 1st edition OS 1885 map (MCB24260). Only the single-storeyed brick base of this smock mill still existed when it was recorded in 1972. At that time an octagonal slate roof had been added to use it as a store in a builder's yard but it has since been demolished. The nature of the survival of this asset is unknown.
- 4.3.42 A Non-Conformist Chapel was also founded in the area in 1859 as an extension of West Fen Chapel but it has since been demolished and the exact former location is uncertain (MCB16676).
- 4.3.43 Morgan House, Norwood Road (Grade II listed building, NHLE 1216356) also dates from this period and is an early 19th century brick house of 2 storeys painted with steeply pitched, pantiled roof and end parapets and stacks.
- 4.3.44 Also mapped are a number of assets associated with various industries in the area including the site of gravel pits (MCB24284) which have since been built over, the site of manure works no longer extant (MCB24285), a former blacksmiths workshop (MCB27532) and beer house (MCB27533) both of which are most likely, non-extant.
- 4.3.45 The historic character of the modern site is dominated by the Whitemoor Marshalling Yard which relates to the March and Wisbech Railway. This opened in 1847 with a station on the South Brink (MCB19612). This original line departed March and St Ives to Wisbech. However, in 1848, The Ely to Peterborough line of the Great Eastern Railway (linking St Ives and March, as well as Peterborough and Wisbech) was opened (MCB 24025). The original 1847 railway line was joined to this new connection and the full line remains in use today. A photograph of the line as it passes under Norwood Road to the south of the site extent can be seen in Figure 4-10. A further line opened in 1879 by the Great Northern Railway (MCB26852) in competition for the northern coal trade and eventually, both rail companies agreed to run the rail in partnership. The intermediate stations closed in the 1950s and 1960s but freight traffic continued into the later 1970s.
- 4.3.46 The influence of these trade routes assisted the town's expansion and due to its location at the north end of the town, encouraged the northward trend of the town plan which was a shift away from St Wendreda's Church as the original nucleus of the town Atkinson et al, 2002, 117). In 1921, 22.3% of employed males in the local population were employed at the sidings so it had a large impact on the development of the town. March Railway Station (MCB16618) was rebuilt in red brick in the 1860s but has been altered many times since. It has a platform canopy supported by cast-iron columns with decorative spandrels. It has also a cast-iron footbridge over the tracks and an overall use of a multicoloured paint scheme which produces an attractive appearance.
- 4.3.47 The Whitemoor Marshalling Yard (MCB16676) itself is transected by the Scheme at the northern end. The yard was first developed as a railway-sidings in the

1850s as a result of March's location close to the inland port of Wisbech in the highly productive agricultural heartland of East Anglia, and at the nodal point of the web of fenland routeways. It was first depicted on the 1886 first edition OS map as loop lines of the Great Northern and Great Eastern Joint Railway line with an engine shed, good sheds and small structures. The site of an engine shed and associated railway track have been recorded (MCB24286). The sidings progressively expanded westwards until it reached capacity at 1265 wagons. In 1929, the LNER opened a new marshalling yard as a result of increased rail freight traffic. The new yard was referred to as 'Up' yard and was substantially larger than the former sidings now known as 'Down' yard (MCB31729). The 'Up' yard was the first to use the Fröhlich system of hydraulic brakes and with a capacity for over 8000 wagons, it was the largest marshalling yard in Great Britain. Freight traffic slowly declined throughout the late 20th century and the marshalling yard closed in the early 1990s. On closure, the site was largely demolished with the only visible evidence remaining being a layer of ballast, a concrete faced ramp at the NE corner of the site and the 19th century railway water tower in English bond red brick with ashlar dressing and a welded steel tank (Grade II listed building, NHLE 1228967). In 2003-4, archaeological works were conducted at the site in advance of redevelopment on the former marshalling yard which uncovered extensive evidence of the former use of the site including brick and concrete foundations of a goods shed, engine shed, water cooling tank and examination tunnel as well as two railway turntables, inspection pits and sections of rail track (MCB19672).

- 4.3.48 Archaeological excavations have also revealed evidence of this period. Following evaluation in 2006 on land to the east of Norwood Road, 50m east of the Scheme, a series of post holes aligned north-south were uncovered which were interpreted as either a fence line or the remains of an ephemeral building dating to the post-medieval period (MCB18161). In addition, at an excavation at land south of Phoenix House, 1km west of the Scheme, a rough brick surface of 17th-19th century date (MCB20095) was recorded towards the south of the site which has been interpreted as part of a path or garden feature. Other cropmarks of a series of linear and curvilinear features, enclosures and a watercourse of unknown date, directly south of Chain Bridge Farm, Elm (MCB11642) have been recorded as well as two post-medieval ditches (MCB15268) at a site on Northern Office. Evidence of St Mary's Church Rectory formal gardens have also been uncovered (MCB12167) 1km south-west of the Scheme.



Figure 4-10: Bridge over the railway on Norwood Road (looking north).

Modern (1900AD - present)

- 4.3.49 Over the course of the eighty years between the 1st edition Ordnance Survey and mid twentieth century mapping, expanding railway infrastructure covered the entirety of land to the east of Norwood Drove/Hundred Road and to the south of Longwood Road, up to Longhill Farm North (OS mapping, not shown). This expansion swallowed Long Hill Farm (MCB27529). Huge commercial and residential development has altered the historic character of the landscape surrounding the site, to the extent that much of the 19th century rural agricultural infrastructure has gone. These include The Wrangles (MCB22917); Westwood House (MCB24261); Estover Cottage (MCB26842); Norwood House (MCB27531) (which can be seen on the 19th century OS map in Figure 4-9); Norwood Cottage (MCB29402); Longhill Farm (MCB27529); Longhill Farm North (MCB27530); Spalding House (MCB27996) and Prosperous House (MCB27997). Estover Farmhouse (MCB24283) is thought to still be extant although the associated farm buildings have been demolished and replaced with modern alternatives. Flagrass Hill Farm (MCB24287) has been rebuilt over time, although it is possible that aspects of the original building may survive to some extent at the present farm site. Temperance Hall (MCB24290), 1km south-east, remains extant.
- 4.3.50 There are a number of assets of World War II date within the study area, these include a Type 22/24/28 shell proof pillbox (MCB16445) and a Type 28a anti-tank gun emplacement (MCB16446) both located 700m north-east of the Scheme and both destroyed in 1987. Three Type 24 thin-walled brick-shuttered

pillboxes (MCB16447/16448/29658) approximately 300m north of the Scheme. Three Type 22 pillboxes shown on the 1970 1:2500 OS map have since been demolished (MCB29658/29659/29660) as has a Type 24 concrete and brick pillbox at March rail yard, north of Norwoodside (MCB29294) and a former World War Two Home Guard store (MCB16451) located 400m north of the Scheme. In addition, during excavations at the Marshalling Yard, a number of WWII brick-built surface air raid shelters with reinforced roofs were identified (MCB19672). These assets show the extent of military defences in this town during the 1940s however, most don't seem to be extant.

- 4.3.51 At the north-west corner of the Scheme is HMP Whitemoor (MCB29290) which was constructed in 1988 on the site of the former marshalling yard north of March. See view of the prison from the road in Figure 4-11. It was first intended to be a category-B prison however, it was later upgraded to make it a dispersal prison for category-A inmates. The prison opened in October 1991 with accommodation for 534 inmates. Whitemoor is an example of a “New Gallery” prison design with common services in the central spine of buildings with cruciform houseblocks. Cell wings of New Gallery houseblocks are open-galleried and not floored as in 1960s prison design.
- 4.3.52 To the west of the scheme is the March Recycling Centre which is located within an infilled quarry (see Figure 4-12, below). Its presence indicates that there is no archaeological potential in this area, although archaeological potential still exists between Hundred Road and the limits of the recycling centre.



Figure 4-11: View of HMP Whitemoor on the left facing east on Longhill Road.



Figure 4-12: View of the March Recycling Centre facing south-west from Hundred Road.

Unknown

- 4.3.53 A number of assets within the HER are cropmarks of unknown date. These include a number of cropmarks of intersecting banks (MCB08976), a double-ditch or track with a small rectilinear enclosure attached to the east side (MCB08977), possible rectangular enclosure with rounded corners and adjacent enclosures (MCB08979), a ring ditch at MCB08980 and irregular enclosures (MCB30035). Linear features were noted at MCB09380, MCB09433, MCB11000 and at MCB20496, the linear features included buried enclosures and tracks. Cropmark evidence of agricultural features were noted in the form of probable field boundaries at MCB09379, MCB15692 and MCB10694 and trackways conforming to roddon and water systems at MCB11001 as well as undated drains at MCB30648. This shows that there is extensive historic use of the study area.

5. Archaeological Assessment

5.1 Potential Impact

- 5.1.1 If any previously unknown archaeological evidence was uncovered as a result of this Scheme, it would be impacted. There are sections of the site, particularly to the west of Hundred Road and north of Longhill Road, where surviving remains are very likely. However, it is important to note two things. Firstly, over large sections of the site, any surviving remains are likely to have been truncated by the railway, the marshalling yard and recycling centre.
- 5.1.2 Secondly, of the areas of greater potential mentioned above. Evaluations have already taken place at Barn Farm west of Hundred Road (ECB282), within the Marshalling Yard (ECB3845) and to the north and south of Longhill Road at the junction with Foundry Way (ECB1437). Excavations of unknown extent also took place during 1950-61, within the field to the north of Longhill Road at the junction with the B1101, where the Roman settlement and possible possible saltworks was identified (MCB6016; ECB496). Compounded with further development at the site, it is unlikely that proposed works within the site would encounter any new archaeology within most of its footprint.
- 5.1.3 It is also important to note that the nature of the proposals largely entail improvements to an existing road and thus it is not considered likely that extensive archaeology would be uncovered that has not previously been identified from the construction and maintenance of the road. Impacts are most likely where ditches and pavements are planned outside of the existing footprint of the road. The possible earthworks within the field surrounding the March Recycling Centre may be the most vulnerable to change introduced by the proposals (MCB10763).

5.2 Significance and Potential Survival

- 5.2.1 The Site follows a ridge of higher ground in proximity to the Roman Fen Causeway and within and overlooking former fenland. Given its prominent location on higher ground and the ridge, it would have attracted activity from a very early date. As a result of this, there is a moderate to high archaeological potential within areas of the Site's footprint that have not been previously disturbed.
- 5.2.2 There is considered to be a very low potential for archaeology associated with the Palaeolithic. Similarly, there is considered to be a low potential for archaeology associated with the Mesolithic as there is only fragmentary surviving evidence. There is considered to be low potential for Neolithic archaeology as evidence in the area is limited to flint artefacts with any evidence of more extensive occupation likely truncated by later settlements. Despite this, given the environment of the wider Fenlands and discoveries elsewhere, encountering evidence of the prehistoric cannot be entirely discounted.
- 5.2.3 There is considered to be moderate to high potential to encounter archaeology of Bronze Age date as there is evidence for extensive occupation of this area during this time period. Any evidence encountered is likely to consist of cut features such as pits, ditches and postholes and/or associated or isolated finds of pottery, tools and organic fills.

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- 5.2.4 Surviving evidence of the Iron Age in the study area is restricted to agricultural enclosures and signs of industry. Whilst there is less evidence of Iron Age occupation of the area, it is likely that occupation was continuous from the Bronze Age through to the Roman periods. The lack of surviving evidence could be explained by the continued use of Bronze Age settlements and the similarity of late Iron Age and early Roman archaeology preventing clear categorisation. For this reason, there is considered to be a moderate potential for archaeology of this time period to be uncovered.
- 5.2.5 There is considered to be a moderate to high potential for archaeology associated with the Roman period as there is extensive evidence of settlement likely associated with the Fen Causeway which transects Hundred Road at the southern end of the site boundary. There are surviving features associated with this road and evidence of it is found frequently in excavations in the study area. Any surviving evidence is likely to take the form of cut features, evidence of salt industry, isolated and associated finds and surviving road surface.
- 5.2.6 There is considered to be moderate potential for archaeology associated with the medieval period.
- 5.2.7 Whilst there is a clear post-medieval settlement in the area, it is likely that archaeological potential is restricted to the area of the marshalling yard where previous excavations have revealed extensive evidence for the 19th century railway. As the area has been thoroughly excavated and it is unlikely that further evidence of this period would be uncovered at the site. For this reason, despite the large amount of post-medieval evidence in this location, there is considered to be a moderate to high potential for archaeology associated with the railway to be uncovered as a result of this Scheme.
- 5.2.8 There is considered to be low potential for archaeology associated with the modern periods to be uncovered as a result of this Scheme.

6. Significance and Impact Assessment

6.1 Designated Assets

March Whitemoor Yard Marshalling Water Tower (NHLE 1228967, Grade II Listed Building)

Significance

- 6.1.1 The significance of the Water Tower (NHLE 1228967, Grade II Listed Building) is entirely related to its age and function as a late 19th century railway water tower within a large 19th century marshalling yard. Steam trains would stop to replenish their supplies of the water needed to operate their engines. Aspects of the structure such as the brick cornice and segmentally arched windows, lift the design beyond merely functional which contributes to its architectural significance. The railway is the sole element of its setting which contributes towards its significance. The surrounding roads do not lend much in the way of significance to the water tower, beyond the historical connection between their construction and the development of the area. At the time of survey, the water tower and road are not intervisible, being largely shielded from the road by hedges and trees as shown in Figure 6-1. It is only visible from a westerly view from Elm Road to the east Figure 6-2.

Impact

- 6.1.2 It is not anticipated that the Scheme will impact upon the significance of this asset as the road improvements will not alter the relationship between the water tower and those elements of setting which contribute towards its significance (namely the railway). It will not divorce the water tower from the railway infrastructure within which it has historically operated and will not introduce a new element into the setting of this asset and thus, no impact is expected.



Figure 6-1: View towards the listed water tower which is shielded by these trees and hedges.



Figure 6-2: View westwards of the water tower (rectangular structure) from Elm Road.

Morgan House (NHLE 1216356, Grade II Listed Building)

Significance

- 6.1.3 Morgan House (NHLE 1216356, Grade II Listed Building) derives significance from its evidential value as an early 19th century residential property at a time of expansion in the area. It is the only surviving example of a group of rural residential dwellings depicted on the 1841 tithe map. It has minor architectural significance as a reasonable example of an early 19th century house. It derives no significance from its surroundings and from Google mapping imagery, appears to have a modern roof (Google 2022).

Impact

- 6.1.4 It is not anticipated that Morgan House (NHLE 1216356, Grade II Listed Building) will experience impact as a result of this Scheme because it does not derive significance from its surroundings. It is located over 650m south of the southern end of the road improvements, and is surrounded by modern development. The Site does not form part of the setting of the asset, and the asset will not be visible from the works. The Scheme will not result in a change to the setting of this asset. Overall, no impact is expected.

6.2 Non-designated Assets

- 6.2.1 It is assumed that most of the non-designated assets will not experience impact as a result of this Scheme as they are either not extant, archaeological records, screened from the Scheme and/or at too great a distance to share a visual relationship. There are however, two assets which warrant consideration.
- 6.2.2 Whitemoor Marshalling Yard (MCB16676) draws its significance from its historical association with the Great Northern and Great Eastern Joint Railway which transformed March and facilitated its growth in the 19th century. It is also historically significant for being both the first marshalling yard to use the Fröhlich system of hydraulic brakes and the biggest marshalling yard in Great Britain at the turn of the 20th century. The yard also draws significance from its continued use from construction during the 1870s to the 1990s showing over a century of use of the site for the purpose for which it was built. This contributes to the significance of the asset as a whole. For this reason, it also has communal value for the development of the community of workers associated with this yard who have memories of this area as a daily place of work.
- 6.2.3 Despite the close proximity of the Scheme to the Whitemoor Marshalling Yard (MCB16676), it is not anticipated that it will result in impact to the significance of the asset as much of the site has previously been cleared for redevelopment at the start of the 21st century. In addition, the nature of this Scheme is to improve an existing road and it will not, therefore, introduce a new element into the setting of this asset. Furthermore, the role of this asset in facilitating greater transport and trade routes would be in line with the improvements proposed in this Scheme. No impact is anticipated.
- 6.2.4 Whitemoor Prison (MCB29290) is the only other asset in close proximity to the road and it draws its significance from its historical value as an example of a late 20th century prison designed in the 'New Gallery' style which is a move away from floored houseblocks of the 1960s to open-galleried areas. It is thus aesthetically

and architecturally significant. It also has communal value for former and current prisoners and their friends and family.

- 6.2.5 It is not anticipated that the Scheme will impact upon the significance of this asset as it is a modern prison built at the same time as the present road. In addition, prison design is, by its nature, inward looking and thus it is any change to the outer setting of this asset will not impact upon the significance of the asset itself. No overall impact is expected.

7. Conclusion and Recommendation

7.1 Conclusion

- 7.1.1 There is considered to be a very low potential for archaeology associated with the Palaeolithic, a low potential for Mesolithic, Neolithic, Medieval and Modern archaeology. There is assessed to be a moderate to high potential for archaeology of Bronze Age, Iron Age, Roman and post-Medieval date within parts of the site. Overall, an assessment of moderate to high potential for archaeology is made. Any finds are likely to be pre-Roman cut features and/or scattered artefacts or post-medieval evidence related to the former use of the area as a marshalling yard for the railway.
- 7.1.2 No impact is expected to any of the listed buildings or non-designated assets as a result of this Scheme.

7.2 Recommendations

- 7.2.1 We propose that a programme of appropriate and proportional phased archaeological investigation is undertaken, using both non-intrusive and intrusive techniques, to develop a robust understanding of the archaeological potential of the Proposed Development site in order to develop a suitable approach to mitigation, be it through avoidance of impacts, preservation of archaeological remains in situ or through archaeological excavation.
- 7.2.2 The nature and scale of this phased programme of archaeological investigation would be developed in consultation with the Cambridgeshire County Council and/or Fenland District Council archaeological advisor(s) and be undertaken in accordance with a Written Scheme of Investigation.

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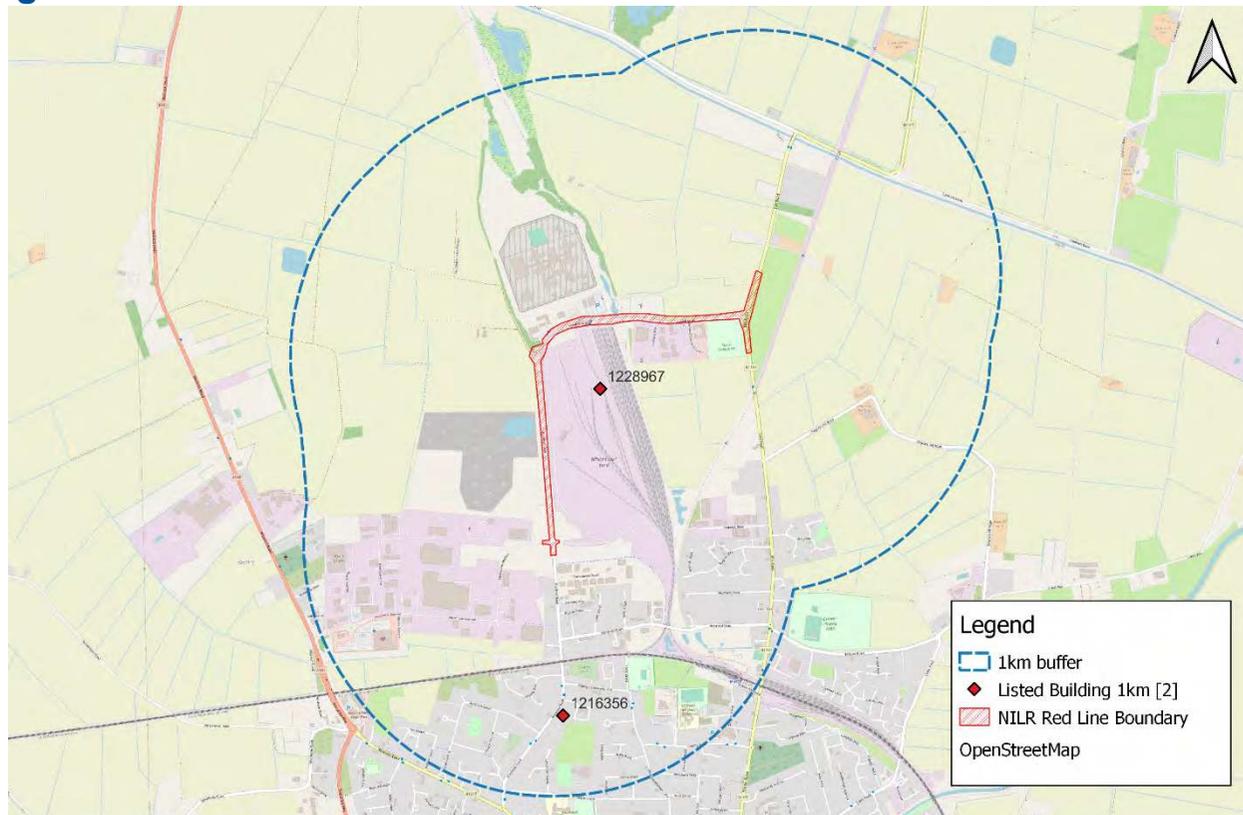
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Appendices

1 Appendix A. Asset Plans

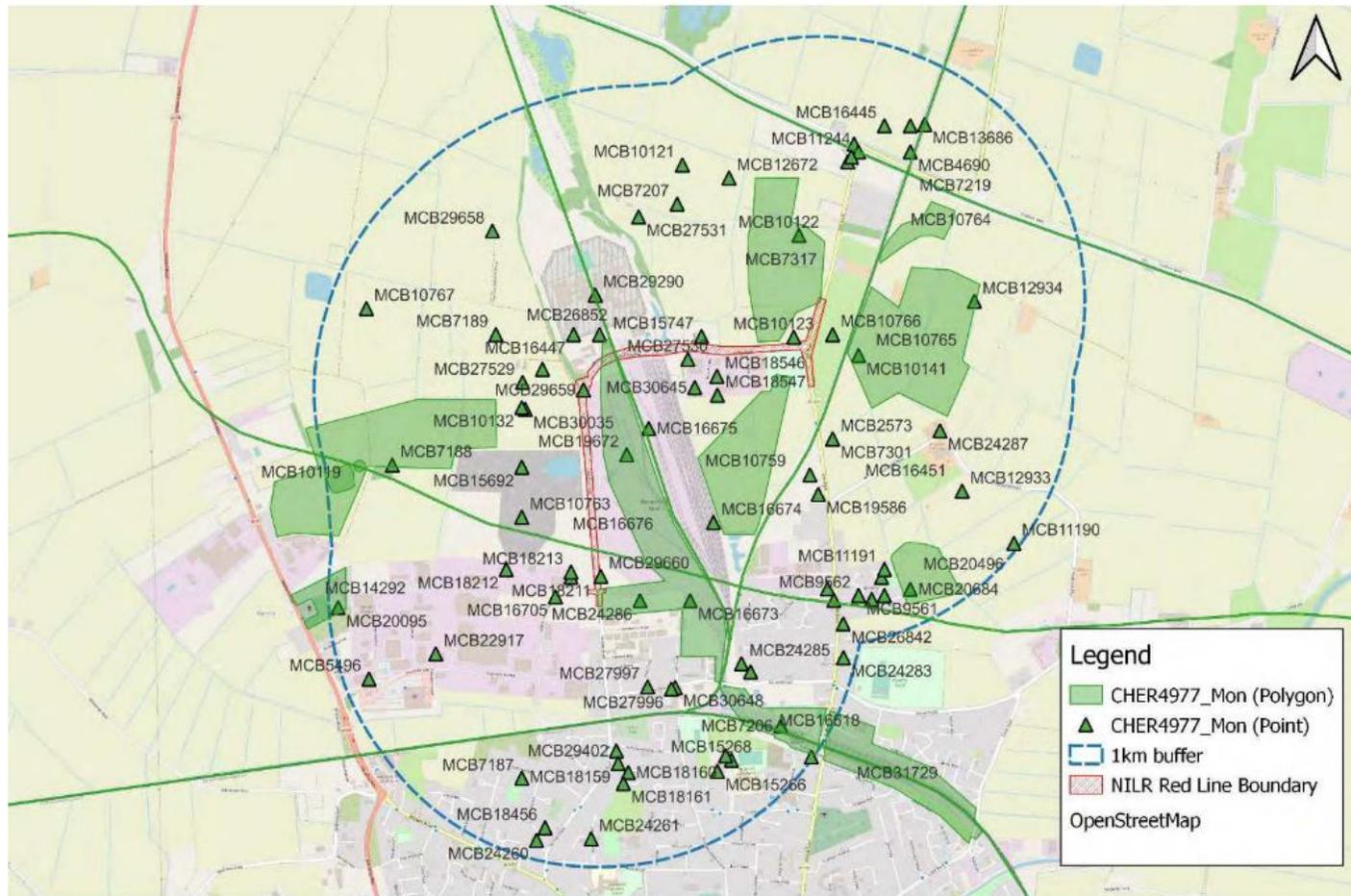
1.1 Designated Assets



Northern Link Road, March: Listed Buildings

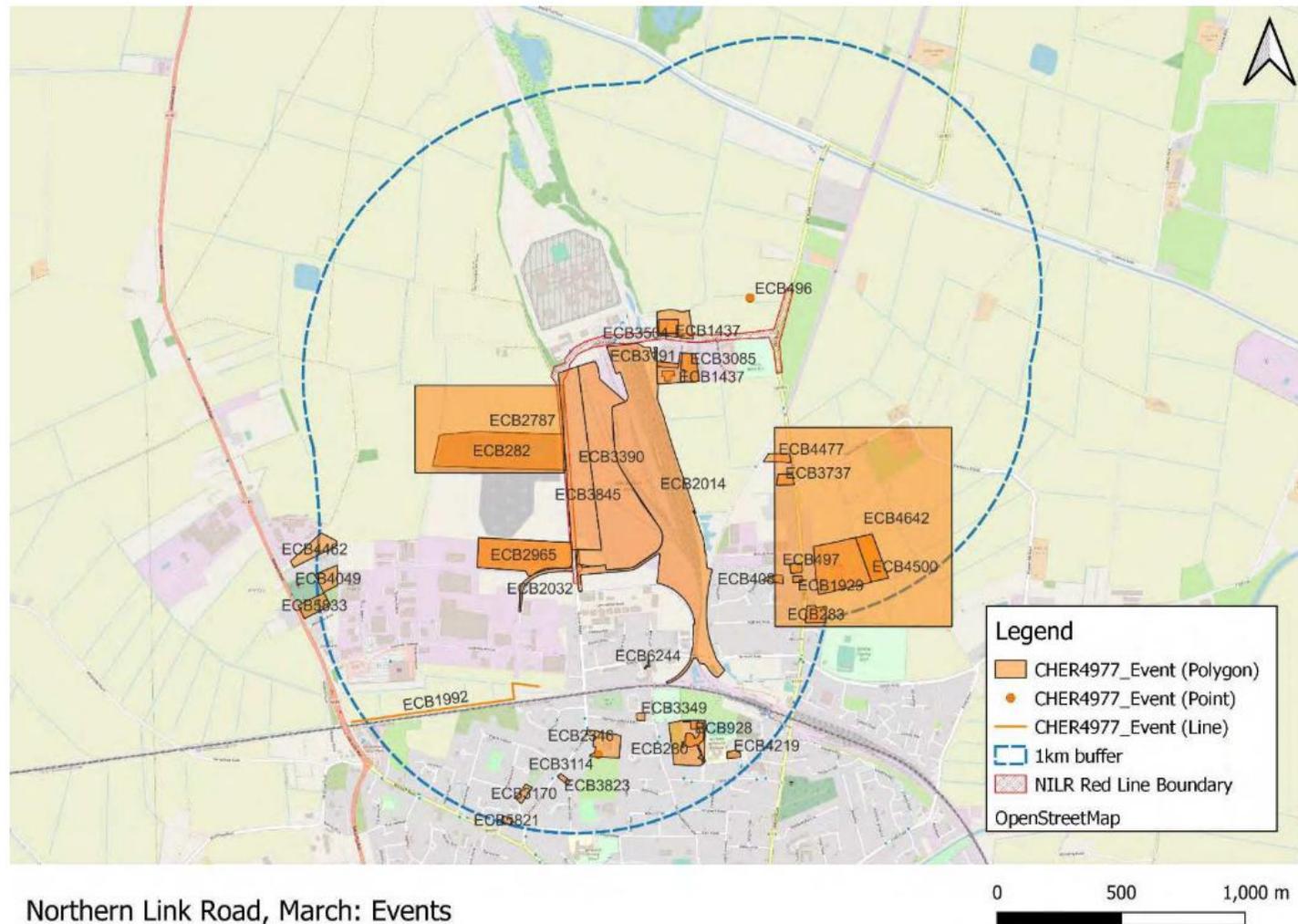
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1.2 Non-designated Assets



Northern Link Road, March: Non-designated assets

1.3 Events



Northern Link Road, March: Events

2 Appendix B. Gazetteers

2.1 Designated Assets

NHLE Number	National Grid Ref	Site Name	Description (summary)	Designation
1216356	TL 41140 97694	Morgan House, Norwood Road	Early 19 th century brick house of 2 storeys, painted with steeply pitched pantiled roof and end parapets and stacks. Symmetrical facade of three original recessed window openings, now with mid C20 fenestration. Central doorway with C20 door.	Grade II Listed Building
1228967	TL 41295 99052	Water Tower, Whitemoor Marshalling Yard, March	Railway water tower. Late C19. Red brick in English bond with ashlar dressings. Welded steel tank. Rectangular plan. Sides have blind arcades; north and south of one bay, east and west two bays; with tall round arches with plain stone imposts. The east and west arches have large segmentally arched windows with cast-iron frames with glazing bars, the centre panes form a pivoted opening light. Brick cornice above and surmounted by large rectangular welded steel tank, probably a replacement.	Grade II Listed Building

2.2 Non-designated Assets

HER Number	Type	National Grid Ref	Site Name	Description (summary)	Period
02010	Find spot	TL 42 99	Neolithic axe find, Hundred Road, March	A flaked flint axe found in 1973 near the old Roman Causeway, Hundred Road, March; Length 17,3 cms, maximum width 4,5cms. Presented by H Brighty 23/07/1977	Neolithic
03844	Find spot	TF 423 000	Bronze Age axe, Elm	Late BA faceted axe. Found February 1971.	Bronze Age

04548	Find spot	TL 4021 9808	Bronze Age flint implements, March	Rough brown glacial flints. Ground left rough for building. Flint jacks also, but not kept. Fenland Survey.	Bronze Age
05905	Find spot	TL 408 977	Roman stamped handle, March	March, Russell Avenue: Stamped handle, IVL.SVRI.CR, in possession of Mr. CEM Fyson.	Roman
05906	Find spot	TL 403 989	Roman pottery vessel, March	"Westry" – roman babies bottle in grey ware or Roman lamp filler.	Roman
05907	Monument	TL 407 884	Linear features lying S of River Nene roddon	Loose group of Roman enclosures visible on RAF AP. Indefinite indications of settlement nucleus on drove leading N to W Water. Fragmentary cropmarks possibly associated with this group are visible on HE Reconnaissance aerial photographs taken on 5th September 2013. These are approximately 500m to the west at TL 4020 9944.	Roman
05924	Find spot	TL 418 979	Bronze age urn, March	Small urn with one handle, found just N of March station. Elaborately decorated with cross-hatchings, oblong hexagonal compartments, and a broad zigzag around the lower part. Found with other pottery in the ballast pit worked at the time of the construction of the Peterborough and Ely branch of the Great Eastern Railway. Not found in gravel, but in the overlying soil. Compact, well wrought ware, light-brown in colour.	Bronze Age
05925	Monument	TL 414 999	Roman enclosure, Norwood House, March	Loose enclosure group alongside West Water. No further information. Nothing visible on available RAF APs.	Roman
05937	Monument	TL 376 983	Twenty foot river	The Twenty Foot River is an artificial waterway on the Middle Level of the Cambridgeshire Fens; the Middle Level is the name given the area containing the network of waterways lying between and connecting the River Nene with the Great Ouse. It was cut by Cornelius Vermuyden in 1651 from Whittlesey Dike . Although the waterway was primarily intended for drainage it was also used for other activities such as the transportation of agricultural produce within the area.	Post-Medieval
06001	Monument	TL 42 99	Roman inhumation, March	Reported as mounds with Roman burial urn uncovered by plough in 1950. Possible Roman burial ground or camp. Discoveries include bone instruments, early Roman pottery; silver and copper coins; and a skeleton, believed to be that of a Roman soldier. From an examination of R2, the field might be either at TL/4211/9905 or at TL/4231/9890; more probably the latter as that appears to have some irregularity of surface.	Roman

06016	Monument	TL 418 996	Norwood Roman settlement	Small group of subrectangular enclosures either side of stream. Investigation 1959 - 1961 produced occupation from late C1 to C4 with loom weights, quern, skeleton of premature baby under probable hut floor (another skeleton from adjoining field) and large area of "saltern pits" producing briquetage including fire-bars and baked clay cylindrical stand; more briquetage, ash and burnt clay.	Roman
07936	Monument	TL 421 984	Roman enclosures, Estover Road	Unploughed earthwork site – early Roman or IA as pre-Fen Causeway. Possible stock enclosures with signs of industrial activity. Local coarse pottery uncovered with isolated rural burial placed along field boundaries. The earliest features included a pit containing a quantity of Beaker sherds. Further Early Bronze Age sherds came from other features. One of the earthwork enclosures may have been of Middle Iron Age date, being circular rather than rectangular and yielding potsherds of this earlier date as well as briquetage. The bulk of the earthworks appear to have been Late Iron Age/Early Roman, with pottery appropriate to a Claudio-Neronian date occurring in the primary fills of some of the ditches. The Fen Causeway and associated features produced sherds of 2nd to 4th century date. Unstratified metal finds included a Late Bronze Age/Early Iron Age ring-headed bronze pin and a Roman bronze circular plate-brooch.	Bronze Age to Roman
07936a	Monument	TL 421 984	Late Iron Age Remains, Estover Road	Unploughed earthwork site – early Roman or IA as pre-Fen Causeway. Possible stock enclosures with signs of industrial activity. Local coarse pottery uncovered with isolated rural burial placed along field boundaries (possible Roman).	Iron Age to Roman
07936b	Find spot	TL 421 984	Bronze Age features, Estover Road	A few middle to late Iron Age and BA features were revealed, but insufficient to suggest the presence of any substantial prehistoric site but an isolated pit with Beaker pottery, a further Bronze Age pit group, and a Middle Iron Age ditch were located.	Bronze Age
08440	Monument	TL 4026 9888	Roman settlement and field systems, March	Cropmark of probable later prehistoric or Roman broad double-ditched drove way or trackway visible on aerial photographs. It is centred at TL 4033 9902 and can be seen extending E-W in sweeping curve to the north of Westry Farm, then continuing NE to beyond Longhill Farm where it cannot be traced past Norwood Drove at c.TL 4099 9919. The cropmarks of probable IA/Roman settlement and field system can be seen coinciding with the trackway and further possible IA/Roman enclosures have been identified to the north of Longhill Farm.	Roman

08441	Monument	TL 400 988	Roman remains, March	Cropmarks of the double-ditched Iron Age or Roman settlement enclosure described above can be seen at TL 4008 9884 to the west of Westry Farm, visible on aerial photographs taken in 2009. The enclosure is defined by two concentric broad ditches with an entrance through both to the north. There appears to be an external ditched out-work around the enclosure entrance attached to the outer ditch, particularly prominent on the eastern side. The corners are curved and northern side slightly convex. It is surrounded by cropmark traces of ditches which may be boundaries and enclosures associated with the enclosure. Immediately to the north are two overlapping ring ditches which may represent the remains of earlier round barrows.	Iron Age to Roman
08444	Monument	TL 4186 9977	Roman salt works, March	Roman site 06016 - cropmark site and excavation	Roman
08443	Find spot	TF 4141 0005	Roman pottery, March	Few sherds only (late C2 - late C3) as site, formerly on a roddon, is now bulldozed flat. Cropmarks to SW.	Roman
08445	Find spot	TL 4185 9938	Roman pottery scatter, March	Area of dark occupation with sherds (early C3 -late C4). Saltern not seen but sherds collected.	Roman
08452	Find spot	TL 4080 9911	Roman artefacts, March	Gravelly boulder clay, dark area with burnt stone and a few sherds (late C2 - early C3). Poor crop condition.	Roman
08459	Find spot	TL 4210 9931	Bronze Age flint scatter, March	A scatter of Bronze Age flint was identified by the Fenland Survey on the fen edge.	Bronze Age
08972	Monument	TL 416 989	Ditches and enclosures	Parallel double-ditches heading N from three sides of a rectilinear enclosure towards an area of cropmarks and finds of Romano-British date	Roman
08976	Monument	TL 408 986	Banks, March	Intersecting banks. White cropmarks - presumably banks crossing one another. All may be geological. Disturbed area, which, if archaeological (unlikely) is too vague to plot.	Unknown
08977	Monument	TL 423 997	Cropmark complex, March	Cropmark of a double ditch or track with a small rectilinear enclosure attached to the east side.	Unknown
08978	Monument	TL 423 993	Romano-British agricultural remains, March	Extensive field system of rectilinear ditches and curvilinear tracks and a group of neat ditches in the north west forming a rectangular enclosure with rounded corners. Old watercourses can also be seen, but were not plotted. It seems possible that the modern field boundary "Hundred Drove" follows the line of an ancient road from Flaggrass Roman settlement.	Roman
08979	Monument	TL 420 993	Enclosures, March	Possible rectangular enclosure with rounded corners and adjacent enclosures.	Unknown

08980	Monument	TL 402 994	Ring ditch and possible enclosure, March	Small ring ditch. Three straight ditches meeting to form a right-angled U. Appearance looks too sharp to be archaeological. Lies in area of recent quarrying on light band.	Unknown
09379	Monument	TL 427 985	Field boundaries, March	Field boundaries; road is probably the Fen Causeway	Unknown
09380	Monument	TL 421 985	Enclosures, March	Linear features, possibly geology, but more likely recent boundaries as alignment parallels modern field divisions.	Unknown
09381	Monument	TL 421 984	Cropmarks nr Estover Cottage (Dagless Way, Elm Rd), March	Estover Cottage: small rectilinear enclosures under grass suggest settlement N of drove near probable line of Fen Causeway or fields of gravelly boulder clay. No finds. Adjacent field rough ploughed when visited.	Roman to Medieval
09433	Monument	TL 421 000	March Chain, cropmark	Cropmark, March Chain	Unknown
10694	Monument	TL 416 000	Old River Nene, March	Old river Nene with bordering ditches plus other enclosures adjacent. Some may be recent field boundaries (familiar in layout to some at Upwell associated with 'blocks')	Unknown
11000	Monument	TL 425 987	Linear features, March	Linear features (? part of field system described in RN 07936) plus double ditched track.	Unknown
11001	Monument	TL 425 995	Field system and trackway, March	Centred grid ref for area of fields and tracks irregularly laid out to conform to roddon / water system, although using straight ditches. Abuts Fen Causeway and Flaggrass.	Unknown
11642	Monument	TL 4235 0020	Cropmarks, Elm	Cropmarks of a series of linear and curvilinear features, enclosures and a watercourse of unknown date, directly south of Chain Bridge Farm, Elm	Post-Medieval
12167	Park and Garden	TL 400 983	Saint Mary's Church Rectory, March	St Mary's church rectory formal gardens	Post-Medieval
15033	Monument	TL 36994 98595	The Fen Causeway	Cropmark remains of part of the Roman Fen Causeway, an undated trackway and an undated linear feature adjacent to Sixteen Foot Drain Cropmarks of a Roman rectangular settlement with a trackway and field system, either side of the Fen Causeway. Scatters of Roman pottery have been recovered from the site.	Roman
15266	Monument	TL 41555 97725	Prehistoric and undated features, Northern Office	A series of late Bronze Age to mid Iron Age ditches were found during excavation, suggested to be the remains of enclosures and/or drove-ways. A single crouched inhumation was also excavated aged between 40 and 45 years old. It adhered to the common form of burial practice, it was on the left hand side with its head to north.	Late Bronze Age to Middle Iron Age
15267	Monument	TL 41586 97786	Roman features, Northern Office, March	Ditches, pits and gullies containing Roman pottery were found during the excavation of the site. Little evidence for post-Roman activity was observed.	Roman

15268	Monument	TL 41609 97769	Medieval and Post-Medieval features, Northern Office, March	Excavation revealed one medieval and two post-medieval ditches. Several modern features were found, including land drains and soakaways.	Post-Medieval to Modern
15692	Monument	TL 40800 98891	Field boundary ditches, Barn Farm, March	Excavations have identified a series of probable field boundary ditches peripheral to a concentration of activity to the north of the development area. No structural evidence or concentrations of occupation debris were identified and only six pottery sherds were recovered from 67 excavated sections.	Unknown
15747	Monument	TL 41493 99392	Roman salt working site and settlement, Longhill Road, March	Evidence of a major early Roman salt making site and associated settlement, dating to the first and second centuries AD. The remains were extensive and well preserved, comprising structural evidence and industrial features including a kiln with flue and associated postholes.	Roman
16445	Monument	TL 421 001	Destroyed gun emplacement, Chainbridge	Type 22/24/28 shell proof pillbox. Destroyed c. 1987.	Modern
16446	Monument	TF 423 001	Destroyed gun emplacement, Chainbridge	Type 28a anti-tank gun emplacement. Destroyed c. 1987.	Modern
16447	Monument	TL 410 993	Pillbox, March rail yards	Type 24 thin walled pillbox, brick shuttered.	Modern
16448	Monument	TL 410 993	Pillbox, March rail yards	Type 24 thin walled pillbox, brick shuttered.	Modern
16451	Monument	TL 4212 9885	Home Guard Store, March	The site of a Second World War Home Guard store alongside Flaggrass Hill Road, to the west of Flaggrass Hill Farm.	Modern
16618	Monument	TL 417 979	March railway station	Railway station included multiple sidings and sheds as well as March North and March East Junctions. On the Ely and Peterborough Railway, opened in 1846. Platform canopy supported by cast-iron columns with decorative spandrels at top. Cast-iron footbridge over tracks. Use of multicolour paint scheme produces an attractive appearance. Main building rebuilt in red brick in 1860s, but suffering from many alternations since.	Modern
16673	Monument	TL 4145 9837	Early Bronze Age remains, Whitemoor sidings, March	A number of Early Bronze Age features were identified in a trench in area 9, which was subsequently expanded to allow area excavation. The remains are characterised by ditches, small shallow pits and postholes, containing small quantities of early Bronze Age pottery, a couple of thumbnail scrapers and several flint flakes. The pottery assemblage includes fragments from a small collared urn and two beakers with incised decoration. The abraded nature of the pottery suggests it have been redeposited. The former extent of the	Bronze Age

				remains was not ascertained owing to high levels of disturbance in the surrounding area.	
16674	Monument	TL 4154 9868	Late Bronze Age remains, Whitemoor sidings, March	The remains comprise a line of three large pits on a E-W alignment, containing Late Bronze pottery, flint flakes and burnt stone. The central pit contained a sequence of organic rich fills, containing burnt animal and fish bone, along with charred cereals, weed seed and nut fragments. Two groups of postholes were identified in proximity to the pit alignment, and a further two intercutting pits occurred to the south, one containing late Bronze Age pottery and a complete loom weight	Bronze Age
16675	Monument	TL 4128 9903	Field system, Whitemoor sidings, March	A number of NW-SE and NE-SW orientated ditches were identified in area 2 at the northern end of the site, west of the water tower. Two of which were found to contain Romano-British pottery, and the features are interpreted as a probable Romano-British field system.	Roman
16676	Monument	TL 413 987	Whitemoor marshalling yard, March	19th century marshalling yard including the railwaymen's mess, plant maintenance depot, carriage and wagon workshop, wash plant, boiler house, train crews office, fuel point, and 8cwt crane.	Modern
16828	Monument	TL 4200 9838	Roman roadside ditch, Elm Road, March	Large roadside ditch to Fen Causeway. Some modern features but no evidence Roman settlement.	Roman
16835	Monument	TF 420 000	Site of Baptist Chapel, Chain Bridge, March	Non-Conformist chapel founded in 1859 as off-shoot of West Fen Chapel (also Baptist: MCB16835). Now demolished and exact location uncertain.	Modern
17742	Find spot	TL 42188 98469	Roman pottery, Burnet Gardens, March	A collection of Roman Nene Valley ware and grey ware collected from the garden of 12 Burnet Gardens, March. Much of the pottery is in good condition. At least one bowl was represented and several of the sherds appear to be from the same vessel.	Roman
17743	Find spot	TL 42151 98385	Roman pottery, The Hollies, March	A collection of Roman Nene Valley ware and grey ware collected from the garden of 5 The Hollies, March. Among the sherds were the base of a globular vessel and the rims of a small flagon, a grey ware jar and a grey ware bowl	Roman
18159	Monument	TL 41172 97756	Prehistoric feature, Norwood Road, March	An archaeological evaluation undertaken on land to the east of Norwood Road, March in 2006 encountered one large pit in the northwestern part of the site that contained an assemblage of struck flints and a small amount of animal bone	Neolithic
18160	Monument	TL 41211 97721	Roman ditches and field system, Norwood Road	An archaeological evaluation undertaken on land to the east of Norwood Road, March in 2006 encountered evidence of Roman activity, particularly to the northwest and southwest parts of the site. An east-west aligned ditch was excavated, running	Roman

				across the northwestern part of the site along with a series of large ditches thought to have been part of a field system or property boundaries for nearby settlement on the fringes of March.	
18160	Monument	TL 41192 97679	Post-medieval remains, Norwood Road	Further to evaluation, an excavation was undertaken on land to the east of Norwood Road, March in 2006 which encountered a series of post holes aligned north-south, dating to the post medieval period, thought to be a fence line or the remains of an ephemeral building.	Post-medieval
18211	Monument	TL 4099 9847	Late Mesolithic/early Neolithic activity, Hundred Road, March	A small lithic assemblage of 58 residual worked flints was recovered from the topsoil and later features during evaluation. No clear concentrations were evident, but a significant later Mesolithic/early Neolithic component to the assemblage indicates activity in the vicinity.	Mesolithic to Neolithic
18212	Monument	TL 4074 9850	Bronze Age remains, Hundred Road, March	High concentration of BA features comprising a series of linear features, intercutting and smaller pits, post holes and at least two phases of water holes, and a stretch of curvilinear ditch. Domestic debris. The post built structure was particularly intriguing, at 3m diameter was too small to be a dwelling and showed signs of repeated burning. Some of the cremations contained pyre material suggesting the structure may have been the site of a cremation pyre. Several burials were also recovered, including that of an infant and several children.	Bronze Age
18213	Monument	TL 4099 9848	Prehistoric and Roman remains, Hundred Road	An evaluation revealed at least two phases of field system in the eastern part of the proposed development area, including a truncated pre-Roman field system thought to be of Bronze Age date. A number of closely spaced linear features were recorded in the northern part of area 2, interpreted as a system of cultivation trenches, possibly associated with intensive Romano-British horticulture. Also a four-post structure and pit were also recorded, providing some evidence for prehistoric activity in this area of the site.	Late Prehistoric to Roman
18456	Monument	TL 4088 9750	Possible Roman ditches, Smiths Close, March	Evaluation recorded two ditches of possible Roman date, which may have formed part of an enclosure towards the centre of the site. No further archaeological features were identified and significant levels of modern disturbance were recorded in the southern part of the development area.	Roman
18546	Monument	TL 4155 9923	Early Roman features, Foundry Way, March	24 features including postholes, pits, several ditches and a watering hole. Possible well with related structure (group of intercutting pits). Animal/plant remains and a large amount of Roman pottery. Hertfordshire puddingstone rotary quern. Modern disturbance.	Roman

18547	Monument	TL 4155 9916	Neolithic pit, Foundry Way, March	A number of features of early Roman date. 16 later prehistoric worked flints were also found, several grouped together in a tree throw and also in a small pit to the very southern end of the site, which suggests that there is a level of background Neolithic occupation and further Neolithic activity may be present south of the excavation area.	Neolithic
19467	Monument	TL 4198 9842	Undated ditch and modern gullies, Elm Road, March	Evaluation identified an undated ditch and two modern gullies, with residual Roman ceramic building material being recovered from the gully.	Modern
19586	Monument	TL 4194 9878	Neolithic axehead and Post medieval features at Elm Road	A two trial trench evaluation revealed features relating to post-medieval drainage and evidence of former greenhouses that occupied the site during the 1960s. A single pit containing a small polished Neolithic axe was discovered, although the pit also contained fragments of coal and other potentially modern detritus so it is unclear of what date the pit is.	Neolithic to Post-medieval
19612	Monument	TL 4379 0347	March and Wisbech Branch Railway	The first railway line to reach Wisbech, that from St. Ives and March, was opened in May 1847. The original station was on the South Brink near the Grammar School, but in 1848, the line was prolonged to join the East Anglian Railway at Watlington (now Magdalen Road) and a new station was opened on the site of the present East Station. The two stations were both in use up to at least 1851	Modern
19672	Monument	TL 4120 9893	Roman and Modern features and finds at Whitemoor Marshalling Yard, March	A number of 19th and 20th century earthworks and structures which are directly related to the former Whitemoor Marshalling Yards. These include foundations of the Engine Shed, Water Cooling Tank, Examination Tunnel all recorded on plans of the former railway sidings. Two railway turntables, inspection pits and sections of rail track and brick structures were also identified. A series of WWII air raid structures were also identified, which were simple brick built surface bomb shelters, with a reinforced roof.	Roman to Modern
20095	Monument	TL 4009 9835	Post-Medieval feature at Land South of Phoenix House, Westry	An archaeological evaluation was carried out and revealed activity dating to the post-medieval and modern periods. A recent phase of dumping of waste and demolition material was evident at the eastern extent. A rough brick surface was recorded towards the south of the site and may have been part of a path or garden feature. The bricks used dates to the 17th to 19th century.	Post-Medieval to Modern
20496	Monument	TL 4236 9848	Cropmark features, Berryfield, March	Several linear features running WNW-ESE running parallel to each other and several sub-circular anomalies. Traces of buried enclosures, tracks and boundaries recorded as marks in crops as seen in the earlier geophysical survey. There was an E-W system of boundaries within the site, likely to have been former fields, with associated tracks and small enclosures. Further evidence of cropmarks were found to the east of the site, as well as parallel ditches associated with the Fen Causeway.	Unknown

20684	Monument	TL 4229 9842	Iron Age and Roman pit groups and enclosures, Berryfields, March	Series of Roman features and metalled surface in approximate position of Fen Causeway. Some rare Roman pottery and animal bone, iron and wooden objects, burnt and struck flint. Some charcoal/charred wood, seeds indicate of damp, rough grassland and some cereal fragments from samples.	Iron Age to Roman
22917	Monument	TL 4046 9817	The Wrangles, March	Site of a house named The Wrangles illustrated on the 1st edition Ordnance Survey map dated to 1885. The building is no longer extant.	Post-Medieval
23854	Monument	TL 4191 9886	Undated ditch and pit, north of Elm House, March	The finds assemblage comprised a single sherd of prehistoric pottery and an Early Neolithic blade flake. Possible pit in trench 1, a north-south aligned linear feature in trench 2 and a trench 3 comprised a possible linear feature, an east-west aligned ditch, a possible north-south aligned ditch and a possible post-hole.	Unknown
24025	Monument	TL 3954 8864	Great Eastern Railway (Ely & Peterborough Branch)	The Ely to Peterborough line was opened in 1847 linking the line from London to Norwich with Peterborough. The line remains in use.	Post-Medieval to Modern
24260	Monument	TL 4085 9746	Old Windmill	Site of former windmill marked as 'old' on the 1st edition Ordnance Survey map dated to 1885. Only the single-storeyed brick base of this smock mill still existed when recorded in 1972. At that time an octagonal slate roof had been added to use it as a store in a builders yard, but it has since been demolished.	Post-Medieval to Modern
24261	Monument	TL 4106 9746	Westwood House, March	Site of Westwood House illustrated on the 1st edition Ordnance Survey map dated to 1885. The building is no longer extant	Post-Medieval to Modern
24283	Monument	TL 4204 9816	Estover Farm, March	Site of Estover Farm illustrated on the 1st edition Ordnance Survey map dated to 1885. The farm buildings have been demolished. However, the farmhouse appears to remain extant.	Post Medieval
24284	Monument	TL 4168 9810	Gravel pits, March	Site of gravel pits illustrated on the 1st edition Ordnance Survey map dated to 1885. The building is no longer extant. The pits have since been built over.	Post-Medieval
24285	Monument	TL 4146 9813	Manure Works, March	Site of a Manure works illustrated on the 1st edition Ordnance Survey map dated to 1885. The building is no longer extant.	Post-Medieval
24286	Monument	TL 4125 9838	Engine Shed, March	Site of an engine shed and associated railway track illustrated on the 1st edition Ordnance Survey map dated to 1885. The shed building has since been demolished and the railway track removed.	Post-Medieval
24287	Monument	TL 4241 9903	Flaggrass Hill Farm, March	Site of Flaggrass Hill Farm illustrated on the 1st edition Ordnance Survey map dated to 1885. The site is still used as a farm, however, it is unclear how much of the original farm buildings remain as the site appears to have	Post-Medieval

				undergone significant alterations	
24290	Building	TL 4191 9778	Temperance Hall, March	Site of a temperance hall illustrated on the 1st edition Ordnance Survey map dated to 1885. The hall appears to be extant.	Post-Medieval
26842	Monument	TL 4204 9829	Site of former Estover Cottage, March	Site of former Estover Cottage, March on Ordnance Survey First Edition maps from 1885.	Post-Medieval
26852	Monument	TL 3739 0370	Great Northern and Great Eastern Joint Railway	Course of dismantled railway, opened in 1879 and closed in the late 1970s. The railway opened in 1867, more as the product of the competition between the Great Northern and Great Eastern Railway Companies to participate in the northern coal traffic, than for local needs. In 1879, realising the waste of time and resources spent in competition, the companies agreed to run the line jointly. The intermediate stations closed in the 1950s and 60s, but freight traffic continued into the late 1970s, after which the line was dismantled	Post-Medieval to Modern
27529	Building	TL 4080 9921	Longhill Farm, March	Longhill Farm recorded on Ordnance Survey First Edition maps from 1885.	Post-Medieval
27530	Monument	TL 4144 9930	Longhill Farm North, March	Longhill Farm North recorded on Ordnance Survey First Edition maps from 1885.	Post-Medieval
27531	Monument	TL 4125 9985	Norwood House, March	Norwood House recorded on Ordnance Survey First Edition maps from 1885.	Post-Medieval
27532	Monument	TF 4205 0006	Former blacksmiths workshop, March	Former blacksmiths workshop recorded on Ordnance Survey First Edition maps from 1885.	Post-Medieval
27533	Monument	TL 4208 0012	Plough Inn, former beer house, March	Former beer house recorded on Ordnance Survey First Edition maps from 1885.	Post-Medieval
27996	Monument	TL 4137 9804	Spalding House, March	Site of former house recorded on Ordnance Survey maps from 1885. Since demolished.	Post-Medieval
27997	Monument	TL 4128 9805	Prosperous House, March	Site of former house recorded on Ordnance Survey maps from 1885. Since demolished.	Post-Medieval
29290	Monument	TL 4108 9955	Whitemoor Prison	Building work for HMP Whitemoor began in February 1988 on the site of a former railway marshalling yard north of March. Category-A inmates, a vulnerable prisoner unit, an Assessment Centre for Core Sex. Whitemoor is an example of a "New Gallery" prison. Central spine of buildings and the houseblocks are cruciform in plan. Cell wings of New Gallery houseblocks are open-galleried, not floored as in 1960s prisons. HMP Whitemoor is	Modern

				constructed of brick with red bricks at ground floor level and yellow bricks above.	
29292	Monument	TL 4107 9889	Undated ring ditches, Westry Farm, March	Cropmarks of a ring ditch interpreted as a possible double concentric ring ditch seen to the west of Westry Farm at TL 4017 9891 on aerial photographs taken in 2009. The outer circuit measures approximately 15m in diameter. A second single ring ditch can be seen overlapping the south-eastern portion of the double ring ditch.	Bronze Age
29293	Monument	TL 4087 9926	Undated ring ditch, Longhill Farm, March	Cropmarks of a ring ditch interpreted as a possible Bronze Age round barrow seen at TL 4088 9927 to the east of Longhill Farm on aerial photographs taken in 2009.	Bronze Age
29294	Monument	TL 4164 9840	Pillbox, rear of Nighthall Drive, March	The site of a Second World War type 24 concrete and brick pillbox at March rail yard, north of Norwoodside.	Modern
29402	Monument	TL 4116 9780	Site of Norwood Cottage, March	Former Norwood Cottage recorded on Ordnance Survey First Edition maps from 1885. Now demolished.	Post-Medieval
29658	Monument	TL 4068 9979	Pillbox, March	Type 22 Pillbox shown on the 1970 1:2500 OS map and visible on aerial imagery. Extant	Modern
29659	Monument	TL 4103 9918	Pillbox, March	Type 22 Pillbox shown on the 1970 1:2500 OS map and visible on aerial imagery. Since demolished.	Modern
29660	Monument	TL 4110 9847	Pillbox, March	Type 22 Pillbox shown on the 1970 1:2500 OS map and visible on aerial imagery. Since demolished.	Modern
30035	Monument	TL4081 9911	Irregular enclosure, March	Irregular enclosure recorded in fields south of Longhill Farm, March on aerial imagery from 2013. Measures approximately 50m northeast-southwest and 40m northwest-southeast.	Unknown
30645	Monument	TL 4146 9919	Iron Age, Roman and post medieval features, Foundry Way, March	Bronze Age features consisted of a number of pits containing prehistoric, Bronze Age and Iron Age pottery and animal bone. Late Iron Age features including evidence of a structure, pottery, briquetage and animal bones. The Roman period of activity consisted of a series of intercutting ditches forming boundaries that appear to respect the earlier Iron Age ditches. Post-med ditch.	Iron Age to Post-Medieval
30648	Monument	TL 4139 9804	Undated drain, Norwood House, March	An undated drain aligned eastwest and measuring 3.2m by 1.18m across the width of the trench (1.8m). No finds were recovered from the drain, however, it is interpreted as post medieval in date.	Unknown
31729	Monument	TL 4227 9770	March Railway Yards	March 'Down' Yard recorded to the south of the railway on Ordnance Survey First Edition maps from 1885. Yard included several railway sidings and	Post-Medieval

goods sheds.
March 'Up' Yard added to the north of the railway on Ordnance Survey Third Edition maps from c.1927. 'Up' yard was substantially larger than the southern sidings.

2.3 Events

ID	Event Type	Name	Organisation	Date	Summary
280	Evaluation	Evaluation at Northern Office, March, 2001	CCC AFU	March 2001	Three trenches were machine excavated to evaluate the 1.2 ha site, revealing evidence for 19-20th C activity (a ditch and pit), together with undated features that may be prehistoric, including a double posthole, parallel ditches and ditched enclosures.
282	Evaluation	Evaluation at Barn Farm, Hundred Road, March, 1995	Oxford Archaeology	March to April 1995	An evaluation identified a series of probable field boundary ditches peripheral to a concentration of activity north of the development area. No structural evidence or concentrations of occupation debris were identified, and only 6 pottery sherds were recovered. No dates can be attributed with certainty, but nearby sites are Roman, and that date may apply here. A D-shaped feature seen in the aerial photo assessment may be naturally formed, perhaps the course of a meandering low-energy watercourse.
283	Evaluation	Evaluation at 53 Elm Road, March, 2000	Hertfordshire Archaeological Trust	April 2000	Evaluation was undertaken in advance of development. No archaeological features or finds were recovered
408	DBA	Evaluation at Dagless Way, Elm Road, March, 2001	Hertfordshire Archaeological Trust	July to August 2001	Desk-based assessment and trenching revealed the site to have been largely in agricultural use over the last 250 years. Despite proximity to the reputed course of the Roman fen causeway, and the site's location on the edge of the March 'island', no archaeological features or finds were identified.
496	Excavation	Excavations at Norwood, March, 1959-1960	TWP	1959-1960	investigation 1959 - 1961 by TWP at a produced occupation from late C1 to C4 (R2) with loom weights, quern, skeleton of premature baby under probable hut floor (another skeleton from adjoining field) and large area of "saltern pits" producing

					briquetage including fire-bars and baked clay cylindrical stand; more briquetage, ash and burnt clay, CFP and Miss A Dornier, and bronze brooch.
497	Evaluation	Evaluation at Estover Road, Fen Causeway, 1985	English Heritage	September 1985	An unploughed earthwork site, covering c 4 ha was partially excavated in advance of housing development. Fourteen trenches and small areas were machine-stripped, and revealed features sampled. It was concluded that the Fen Causeway was later than the trackway. Provisionally, the Roman road is at this point early, probably 1st century AD. The enclosures exhibit a precise rectilinear layout, which is aligned on the trackway, not the Roman road. Therefore, they are probably pre-causeway, i.e. very early Roman or more likely late Iron Age, and continued in use into the Roma period, when some additions were made. No indication of a contemporary domestic settlement in the enclosures was found, suggesting these are more likely stock enclosures than arable fields. There are signs of some industrial activity.
928	Excavation	Excavation at Northern County Offices, March 2002	Hertfordshire Archaeological Trust	Feb to March 2002	Following evaluation in 2001, an open area excavation was carried out. A series of features relating to occupation in the Late Bronze Age through to Medieval periods was identified.
1437	Evaluation	Evaluation at Longhill Road, March, 2003	CCC AFU	June to July 2003	Thirteen trenches were machine excavated prior to development, uncovering evidence of a major early Roman salt mating site and associated settlement, dating to the first and second centuries AD. The remains were extensive and well preserved, comprising structural evidence and industrial features including a kiln with flue. Much briquetage and salt making objects was recovered. Soil sample evidence suggests grass and reeds were used as fuels.
1929	Evaluation	Evaluation at 92 Elm Road, March, 2005	Archaeological Solutions	May to July 2005	Five trenches were excavated to evaluate the site in advance of proposals to redevelop the land for residential use. The Fen Causeway was located in the northern part of the site, aligned E-W and characterised by a layer of gravel with a large roadside ditch on its southern site. A few modern features were recorded in the southern part of the site, but no other roadside activity or

					evidence of Roman settlement was found
1992	Evaluation	Evaluation along the Anglian water pipeline, A141 to Norwood Road, March, 2005	CCC AFU	August 2005	An evaluation was carried out along the route of a proposed Anglian Water pipeline, comprising 282m of trenching. A single early Neolithic flake was found in the topsoil during trenching, and six small modern trenches were identified in the westernmost trench, thought to be related to the construction of the railway and associated embankment in the early 19th century
2014	Evaluation and monitoring	Evaluation and monitoring at Whitemoor Sidings, March	Archaeological Project Services	November 2003 to Feb 2004	A programme of evaluation, mitigation excavation and monitoring were undertaken in advance of and during the redevelopment of the former marshalling yard. Although the construction and use of the marshalling yards had truncated much of the site, three areas of surviving archaeological remains were identified and investigated. The first, of Early Bronze Age, was characterised by shallow ditches, pits and post holes. A second featured a series of large pits, post holes and gullies, indicative of Late Bronze Age settlement in the vicinity, and the third was a field system, of probable Roman date. No evidence of the Fen Causeway was identified in any of the trenches.
2032	Evaluation	Evaluation at Melbourn Avenue - Hundred Road, March	CCC AFU	Feb 2004	Three evaluation trenches were excavated in advance of the construction of an industrial link road and associated services. The evaluation revealed a truncated ditch and pit, although no datable evidence was recovered.
2346	Evaluation	Evaluation at Norwood Road, March, 2006	CCC AFU	September 2006	Further to evaluation, an excavation was undertaken on land to the east of Norwood Road, March in 2006 which encountered further remains relating to a complex of ditches or field system dated to the Roman period. A series of roughly parallel ditches in the southwestern part of the site suggests that the field system may have originally been Iron Age in date and superseded in the Roman period

2787	AP assessment	AP assessment at Hundred Road, March, 1995	Air Photo Services (Cambridge)	March 1995	An AP assessment was undertaken to examine an area of some 7 hectares, showing a number of possible cropmarked ditches which follow the same axial alignment of cropmarks in the area. A Dshaped feature with broad ditches was recorded, which is likely to have an archaeological origin, with parallels identified elsewhere at March and Cottenham. Two lengths of bank have also been mapped which may be natural features
2965	Evaluation	Evaluation at Trading Park, Hundred Road, March, 2008	Cambridge Archaeological Unit	July 2008	A total of nineteen trenches were excavated to evaluate the site in advance of the proposed construction of a highways depot and waste transfer station. Evidence for Late Mesolithic/early Neolithic activity was demonstrated through the recovery for flint artefacts from the top soil and in secondary contexts. A dense concentration of Bronze Age features, comprising watering holes, pits, urned cremations and land enclosures was identified in the NW area of the site. In contrast evidence for a Roman field system and cultivation pits was recorded in the eastern half of the site, which aligned perpendicular with the Fen Causeway. A small number of prehistoric post holes, pits and a truncated field system were also identified.
3027	Excavation	Excavation at Highways Depot, Hundred Road, March, 2008	Oxford Archaeology East	September to November 2011	Further to previous evaluation, an area excavation totalling 2.2ha was undertaken on land at March Highways depot, prior to development. Archaeological evidence from the Mesolithic to the post medieval period was recorded. The most extensive remains dated to the Bronze Age period and included a sequence of large watering holes and pits to the northern western part of the site, seven cremations, a post built structure, a ring gully and linear gullies. A series of enclosures were recorded across the site, dating from the Roman period. A substantial boundary ditch dating to the Roman period was also located running around the area of the watering holes.
3085	Excavation	Excavation at Foundry Way, March, 2008	Cambridge Archaeological Unit	November to December 2008	An archaeological excavation totalling 0.17ha was undertaken at land south of Foundry Way, March following an trial trench evaluation in 2003 and prior to redevelopment of the site. The site was split into 3 areas arranged around the existing industrial units on site. 24 features including pits, postholes, several ditches and a watering hole were revealed across the site, although many of these had experienced modern truncation to

					the upper levels prior to the import of another topsoil which had previously been laid across the site. The majority of the features were confirmed to be early Roman in date and along with animal and plant remains, a large amount of Roman pottery was retrieved suggesting a continuation of the activity found to the north in 2003. A number of later prehistoric worked flints were also found, several grouped together in a tree throw and also in a small pit to the very southern end of the site, which suggests that there is a level of background Neolithic occupation and further Neolithic activity may be present south of the excavation area. Modern disturbance affected many features on the site and included disused service trenches, 5 field drains and the removal of topsoil as mentioned earlier
3170	Evaluation	Evaluation on land at Smiths Chase, March, 2009	Oxford Archaeology East	April 2009	Four trenches totalling 70m were excavated in advance of proposals for residential development. Two ditches of possible Roman date were recorded, which may have formed part of an enclosure towards the centre of the site.
3191	Watching brief	Watching brief at Foundry Way, March, 2009	Oxford Archaeology East	May 2009	A watching brief was undertaken during ground reduction in preparation for an area of hardstanding. No archaeological features were encountered.
3349	Excavation	Evaluation at land west of Robingoodfellows Lane, March 2010	Archaeological Solutions	March 2010	Two trenches were excavated in advance of proposed residential development. No archaeological finds or features were encountered.
3390	Survey	Survey of Air Raid Shelters and Pill Boxes, Whitemoor sidings	Wardell Armstrong	May 2009	Three air raid shelters/ pill boxes were surveyed in advance of development in 2009. All three of the structures had been covered by made ground. Slit trenches had been opened on two of the structures prior to the survey.
3504	Evaluation	Excavation at Longhill Road, March, 2004	Archaeological Project Services	October 2004 to January 2005	Following evaluation in 2003 (ECB1437), an excavation was carried out and revealed extensive evidence of Early Roman saltmaking, including a hearth along with associated settlement. Saltmaking was indicated through briquetage retrieved from features across the site along with ditches which once contained

					saltwater. Rectangular ditched enclosures and pottery dated to the 2nd-3rd century indicate settlement activity in the same area.
3561	Evaluation	Evaluation on land adjacent to 128 Elm Road, March, 2011	Archaeological Solutions	April 2011	Evaluation comprising four trial trenches was undertaken in advance of construction of 8 residential dwellings. An undated ditch and two modern gullies were identified, and residual Roman ceramic building material was recovered from the gully.
3737	Evaluation	Trial trenching on Land off Elm Road, March 2012	Allen Archaeology	March 2012	A two trial trench evaluation revealed features relating to post-medieval drainage and evidence of former greenhouses that occupied the site during the 1960s. A single pit containing a small polished Neolithic axe was discovered, although the pit also contained fragments of coal and other potentially modern detritus so it is unclear of what date the pit is.
3823	Evaluation	Evaluation at 168 Norwood Road, March, 2012	Witham Archaeology	August 2012	An archaeological trial trench evaluation was undertaken on the proposed site of a new house in grounds currently forming part of 168 Norwood Road, March. No archaeologically significant finds were recorded.
3845	Excavation	Excavation at Whitmoor Marshalling Yard, March 2010	North Pennines Archaeology Ltd	June to August 2010	An archaeological trial trench evaluation and subsequent open area excavation was carried out in June 2010. The evaluation involved 65 trenches divided up into areas. It was carried out prior to the excavation to establish the nature and extent of archaeological remains in the area. Following this, open area excavations focused upon four areas of the site which during the evaluation revealed to be the most densely packed in terms of archaeological features. The most significant archaeological features dated to the Romano-British and modern periods, with a single feature being of possible prehistoric date. This single feature was a ditch located in the south-western part of the site. Romano-British features consisted of a series of pits located in the centre of the site with substantial boundary features in the southern part of the site. Ditches are indicative of a field system being established around an already existing boundary ditch which pottery recovered dated to the 1st-2 nd century AD. A trackway running

					northeast-southwest was uncovered and seemed to correspond to the Fen Causeway Roman Road, but further investigation revealed it appeared to be an agglomeration of later features relating to the development of a Romano-British field system. Modern features of interest were the remains of the infrastructure of the former railway marshalling yard with remains of early track beds were noted at several locations.
4048	Evaluation	Excavation at Foundry Way, March in 2013	Archaeological Project Services	October to December 2013	Archaeological excavation carried out in response to an archaeological condition on planning permission for the construction of a wind turbine on the site. The excavation revealed four broad phases of activity from the Iron Age to post medieval period.
4049	Evaluation	Evaluation at Land South of Phoenix House, Westry 2013	Britannia Archaeology Ltd	October 2013	An archaeological evaluation was carried out and revealed activity dating to the post-medieval and modern periods. A recent phase of dumping of waste and demolition material was evident at the eastern extent. A rough brick surface was recorded towards the south of the site and may have been part of a path or garden feature. The bricks used date from the 17th to 19th century.
4219	Evaluation	Evaluation at Queen Street Close, March, 2014	Pre-Construct Archaeology LTD	July 2014	An archaeological evaluation was carried out consisting of five trial trenches. No archaeological finds or features were identified. There was a lot of modern disturbance and no residual finds present in the topsoil.
4462	Evaluation	Evaluation at Land south of Westry Hall, 351 Wisbech Road, March, 2015	Oxford Archaeology East	June 2015	Between 2nd and 4th June 2015, an archaeological evaluation was conducted at land south of Westry Hall, 351 Wisbech Road, March which revealed a single undated linear ditch in one trench and a number of postholes suggestive of a structure in another. Two of the trenches contained no archaeological features. The trench containing the postholes was extended to reveal a sub-circular roundhouse comprising eleven surviving postholes. Small quantities of pottery from the postholes date the building to the Early Iron Age.

4477	Evaluation	Evaluation of land north of Elm House, Elm Road, March in 2015	Witham Archaeology	May 2015	Three trenches were investigated as part of the search including two linear trenches measuring 20m in length and a one T shaped trench measuring 30m in length in total. The evaluation revealed limited archaeological evidence comprising a single undated pit and ditch from trench 3. Only two artefacts were recorded from unstratified deposits comprising a probable Early Neolithic to Early Iron Age fragment of pottery and an Early Neolithic blade flake. Natural deposits were encountered in trench 1 at a depth of 0.34m below present ground level and in trench 2 at a depth of 0.25m below present ground level.
4500	Evaluation and geophysical survey	Evaluation and Geophysical Survey on Land East of Berryfield, March, 2015	Archaeological Solutions	March to July 2015	The geophysical survey identified several anomalies including several linear features running WNW-ESE running parallel to each other and several sub-circular features. There was slight magnetic disturbance along the western most section of the survey which may have masked some archaeological features. An archaeological evaluation was undertaken on Land East of Berryfields, March, following an aerial photography assessment (ECB4642) and geophysical survey. The evaluation revealed a number of multi-period features including several postholes, ditches of Roman and Modern date, Roman pits, a gully, possible ponds of Roman date and a metalled surface which contained highly abraded mid-to-late Iron Age pottery and struck flint.
4642	AP assessment	Aerial Photography Assessment on Land East of Berryfield, March 2015	Air Photo Services Ltd	June 2015	In June 2015 an aerial photography assessment was undertaken on Land East of Berryfield, March, in conjunction with an evaluation and geophysical survey of the site (ECB4500). The survey found extensive traces of buried enclosures, tracks and boundaries recorded as marks in crops. There was an E-W system of boundaries within the site, likely to have been former fields, with associated tracks and small enclosures. Further evidence of cropmarks were found to the east of the site, as well as parallel ditches associated with the Fen Causeway (CB15033).
5295	Excavation	Excavation on Land East of Berryfields in 2018	Independent Archaeology Consultants	April to July 2018	Archaeological excavation carried out in response to an archaeological condition on planning permission for the development of a residential estate. The site was previously

					arable land and comprised approximately 1.2ha and the excavation called for a complete stripping of the area.
5821	Evaluation	Land west of 327 Norwood Road, March in 2019	University of Leicester Archaeological Services	March 2019	Archaeological evaluation undertaken in response to an archaeological condition on planning permission for residential development. The evaluation consisted of two evaluation trenches and identified no significant archaeological finds or features.
5833	Evaluation	Evaluation on land north of Woodville, Wisbech Road, March in 2019	Pre-Construct Archaeology LTD	March 2019	Archaeological evaluation undertaken in response to a condition on planning permission for the redevelopment of the site for residential purposes. The underlying geology comprises West Walton and Ampthill Clay mudstones with Oadby member superficial geology. The site is currently overgrown scrubland measuring 0.66ha in area. The evaluation comprised five trenches - 1 measuring 50m in length, 2 measuring 45m in length and 2 measuring 20m in length - within the development impact area.
6244	Evaluation	Evaluation at Nelson House 22, Norwood Road, March in 2020	Britannia Archaeology Ltd	July 2020	Archaeological evaluation undertaken in response to an archaeological condition on planning permission for redevelopment of the site for residential purposes. The site is currently in use as a public house. The evaluation consisted of two trenches within the proposed development area, one measuring 15m the other measuring 20m. The evaluation revealed an undated Fenland drain or probably post medieval date

3 Appendix B. Planning Policies and Guidance

3.1 National Planning Policy Framework (2021)

3.1.1. *Conserving and enhancing the historic environment*

3.1.2. *189. Heritage assets range from sites and buildings of local historic value to those of the highest significance, such as World Heritage Sites which are internationally recognised to be of Outstanding Universal Value (Fn. 66). These assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations (Fn. 67).*

3.1.3. *190. Plans should set out a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. This strategy should take into account:*

- 1. the desirability of sustaining and enhancing the significance of heritage assets, and putting them to viable uses consistent with their conservation;*
- 2. the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring;*
- 3. the desirability of new development making a positive contribution to local character and distinctiveness; and*
- 4. opportunities to draw on the contribution made by the historic environment to the character of a place.*

3.1.4. *191. When considering the designation of conservation areas, local planning authorities should ensure that an area justifies such status because of its special architectural or historic interest, and that the concept of conservation is not devalued through the designation of areas that lack special interest.*

3.1.5. *192. Local planning authorities should maintain or have access to a historic environment record. This should contain up-to-date evidence about the historic environment in their area and be used to:*

- 1. assess the significance of heritage assets and the contribution they make to their environment; and*
- 2. predict the likelihood that currently unidentified heritage assets, particularly sites of historic and archaeological interest, will be discovered in the future (Fn. 66). Some World Heritage Sites are inscribed by UNESCO to be of natural significance rather than cultural significance; and in some cases they are inscribed for both their natural and cultural significance (Fn. 67). The policies set out in this chapter*

relate, as applicable, to the heritage-related consent regimes for which local planning authorities are responsible under the Planning (Listed Buildings and Conservation Areas) Act 1990, as well as to plan-making and decision-making.

- 3.1.6. 193. *Local planning authorities should make information about the historic environment, gathered as part of policy-making or development management, publicly accessible. Proposals affecting heritage assets*
- 3.1.7. 194. *In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.*
- 3.1.8. 195. *Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.*
- 3.1.9. 196. *Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the deteriorated state of the heritage asset should not be taken into account in any decision.*
- 3.1.10. 197. *In determining applications, local planning authorities should take account of:*
- 1. the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;*
 - 2. the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and*
 - 3. the desirability of new development making a positive contribution to local character and distinctiveness.*
- 3.1.11. 198. *In considering any applications to remove or alter a historic statue, plaque, memorial or monument (whether listed or not), local planning authorities should have regard to the importance of their retention in situ and, where appropriate, of explaining their historic and social context rather than removal.*

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- 3.1.12. *Considering potential impacts*
- 3.1.13. *199. When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.*
- 3.1.14. *200. Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:*
- 1. grade II listed buildings, or grade II registered parks or gardens, should be exceptional;*
 - 2. assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional (Fn. 68).*
- 3.1.15. *201. Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:*
- 1. the nature of the heritage asset prevents all reasonable uses of the site; and*
 - 2. no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and*
 - 3. conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and d) the harm or loss is outweighed by the benefit of bringing the site back into use.*
- 3.1.16. *202. Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.*
- 3.1.17. *203. The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.*
- 3.1.18. *204. Local planning authorities should not permit the loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred.*

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- 3.1.19. *205. Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.*
- 3.1.20. *206. Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.*
- 3.1.21. *207. Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 201 or less than substantial harm under paragraph 202, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.*
- 3.1.22. *208. Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies*

3.2 Planning Practice Guidance (PPG) 2014

- 3.2.1. The DCLG published Planning Practice Guidance¹¹ online in 2014, to expand upon the NPPF. ‘Conserving and Enhancing the Historic Environment’ was published in April 2014, and last updated in February 2018. The Guidance notes that ‘conservation is an active process of maintenance and managing change. It requires a flexible and thoughtful approach to get the best out of assets as diverse as listed buildings to as yet undiscovered, non-designated buried remains of archaeological interest’. It should be noted that the wording of PPG is reflective of the now superseded 2012 NPPF.
- 3.2.2. The London Plan (March 2016) lays out the broad strategies guiding future development in London. The Plan recognises the “immeasurable benefit” the historic environment plays in the economy, culture, and quality of life of the city. Policy 7.8 governs heritage assets and archaeology within Greater London. The London Plan also sets out the framework for which local borough plans are produced.
- 3.2.3. Paragraph A – ‘*London’s heritage assets and historic environment, including listed buildings, registered historic parks and gardens and other natural and historic landscapes, conservation areas, World Heritage Sites, registered*

battlefields, scheduled monuments, archaeological remains and memorials should be identified, so that the desirability of sustaining and enhancing their significance and of utilising their positive role in place shaping can be taken into account.'

- 3.2.4. Paragraph B – *'Development should incorporate measures that identify, record, interpret, protect and, where appropriate, present the site's archaeology'.*
- 3.2.5. Paragraph C – *'Development should identify, value, conserve, restore, re-use and incorporate heritage assets, where appropriate.'*
- 3.2.6. Paragraph E – *'New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-site. Where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset.'*

3.3 Historic Environment Good Practice Advice (Second Edition 2017)

- 3.3.1. Historic England have produced guidance documents on planning and the historic environment; three of these are of relevance to the proposed development:
1. Historic Environment Good Practice Advice in Planning Note 1 (GPA 1) – The Historic Environment in Local Plans (March 2015).
 2. Historic Environment Good Practice Advice in Planning Note 2 (GPA 2) – Managing Significance in Decision-Taking in the Historic Environment (March 2015).
 3. Historic Environment Good Practice Advice in Planning Note 3 (GPA 3) – The Setting of Heritage Assets (March 2015).
- 3.3.2. GPA 1 and GPA 2 provide guidance for local authorities, planning consultants and other heritage organisations in taking decisions on planning developments, particularly in relation to Local Plans. This guidance emphasises the policy of the National Planning Policy Framework in ensuring that all plan-making, heritage protection and decision taking in relation to developments or local plans should be proportionate to the significance of heritage assets affected and the impact on the significance of those assets.
- 3.3.3. GPA 3 lays out a staged approach to proportionate decision making when considering the impact of potential developments on the setting of heritage assets; this guidance also reflects the stance towards setting which is taken in national planning policy.
- 3.3.4. This approach consists of:
1. *Step 1: identify which heritage assets and their settings are affected*

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2. *Step 2: assess whether, how and to what degree these settings make a contribution to the significance of the heritage assets*
 3. *Step 3: assess the effects of the proposed development, whether harmful or beneficial, on that significance*
 4. *Step 4: explore the way to maximise enhancement and avoid or minimise harm*
 5. *Step 5: make and document the decision and monitor outcomes*

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TAG Journey Quality Impacts Worksheet

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness		No Change	
	Facilities	There will be a new link road provided for vehicles travelling between the A141 and B1101.		
	Information	There will be new signage relating to the new link road		
	Environment	Reduced traffic through March Town Centre will reduce the impact of traffic-related noise on residential areas.		
Travellers' Views	-	Town Centre will be less congested compared to without scheme and reduce the potential for views of surrounding townscape to be blocked by queueing vehicles.		
Traveller Stress	Frustration	Reduced frustration for vehicles wanting to travel between the A141 and B1101 compared to without scheme, which currently requires east-west travel via the town centre or low capacity residential streets.		
	Fear of potential accidents	It has been estimated that there will be a reduction in accidents as a result of the schemes and consequently the provision of safer infrastructure should reduce the fear of accidents.		
	Route uncertainty	The NILR will provide the fastest east-west route through the March study area and increase certainty for undertaking this movement.		

Reference Source

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Summary Assessment Score

Moderate Beneficial

Qualitative Comments

Two-Way 24-hour AADT flow of 4,402 PCUs on Northern Industrial Link Road (NILR) in 2031 Do Something scenario (FBC 3)

Appendix G: Financial Dimension Cost Schedule (60 years)

March Area Transport Study - Do Something Scheme Costs for Input to Financial Case (Broad Street Only)

Calendar Year	Assessment Year	(1) Base Cost Estimate 2022 Prices						(2) Risk Adjusted Base 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)
2023	1	£2,212,997	£0	£0	£149,286	£292,508	£2,654,791	£605,786	£3,260,577	1.000	£0.00	£3,260,577	£0	£0	£3,260,577
2024	2	£603,545	£0	£0	£40,714	£79,775	£724,034	£165,214	£889,248	1.000	£0.00	£889,248	£0	£0	£889,248
2025	3	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2026	4	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2027	5	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2028	6	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2029	7	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2030	8	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2031	9	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2032	10	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2033	11	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2034	12	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2035	13	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2036	14	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2037	15	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2038	16	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2039	17	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2040	18	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2041	19	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2042	20	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2043	21	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2044	22	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2045	23	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2046	24	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2047	25	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2048	26	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2049	27	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2050	28	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2051	29	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2052	30	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2053	31	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2054	32	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2055	33	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2056	34	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2057	35	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2058	36	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2059	37	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2060	38	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2061	39	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2062	40	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2063	41	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2064	42	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2065	43	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2066	44	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2067	45	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2068	46	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2069	47	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2070	48	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2071	49	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2072	50	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2073	51	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2074	52	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2075	53	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2076	54	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2077	55	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2078	56	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2079	57	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2080	58	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2081	59	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2082	60	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2083	61	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
2084	62	£0	£0	£0	£0	£0	£0	£0	£0	1.000	£0.00	£0	£0	£0	£0
Total		£2,816,542	£0	£0	£190,000	£372,283	£3,378,825	£771,000	£4,149,825		£0	£4,149,825	£0	£0	£4,149,825

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.	£3,378,825
(2)	The base costs have been adjusted to incorporate risk.	£4,149,825
(3)	The risk adjusted costs have been adjusted to incorporate increases in construction costs.	£4,149,825
(4)	The inflated risk adjusted costs have been adjusted to incorporate whole life costs.	£4,149,825

March Area Transport Study - Do Something Scheme Costs for Input to Financial Case

Calendar Year	Assessment Year	(1) Base Cost Estimate 2022 Prices						(2) Risk Adjusted Base 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)
2023	1	£2,212,997	£0	£0	£389,042	£532,337	£3,134,376	£605,786	£3,740,162	1.120	£57,550.25	£3,797,712	£0	£0	£3,797,712
2024	2	£603,545	£0	£440,000	£661,145	£824,916	£2,529,606	£165,214	£2,694,820	1.254	£459,337.53	£3,154,158	£0	£0	£3,154,158
2025	3	£5,400,204	£0	£0	£1,344,186	£841,843	£7,586,234	£1,263,862	£8,850,095	1.355	£3,139,589.01	£11,989,684	£0	£0	£11,989,684
2026	4	£3,803,003	£0	£80,000	£899,681	£645,620	£5,428,304	£1,250,375	£6,678,678	1.422	£2,821,672.16	£9,500,351	£0	£0	£9,500,351
2027	5	£8,004,122	£0	£0	£1,137,596	£531,861	£9,673,579	£3,194,459	£12,868,038	1.494	£6,351,844.80	£19,219,883	£0	£0	£19,219,883
2028	6	£0	£0	£0	£20,000	£0	£20,000	£0	£20,000	1.568	£11,365.90	£31,366	£0	£0	£31,366
2029	7	£0	£0	£0	£0	£0	£0	£0	£0	1.647	£0.00	£0	£0	£0	£0
2030	8	£0	£0	£0	£0	£0	£0	£0	£0	1.729	£0.00	£0	£0	£0	£0
2031	9	£0	£0	£0	£0	£0	£0	£0	£0	1.815	£0.00	£0	£0	£0	£0
2032	10	£0	£0	£0	£0	£0	£0	£0	£0	1.906	£0.00	£0	£0	£0	£0
2033	11	£0	£0	£0	£0	£0	£0	£0	£0	2.002	£0.00	£0	£0	£0	£0
2034	12	£0	£0	£0	£0	£0	£0	£0	£0	2.102	£0.00	£0	£0	£0	£0
2035	13	£0	£0	£0	£0	£0	£0	£0	£0	2.207	£0.00	£0	£0	£0	£0
2036	14	£0	£0	£0	£0	£0	£0	£0	£0	2.317	£0.00	£0	£0	£0	£0
2037	15	£0	£0	£0	£0	£0	£0	£0	£0	2.433	£0.00	£0	£0	£0	£0
2038	16	£0	£0	£0	£0	£0	£0	£0	£0	2.555	£0.00	£0	£2,000	£5,109	£5,109
2039	17	£0	£0	£0	£0	£0	£0	£0	£0	2.682	£0.00	£0	£2,000	£5,365	£5,365
2040	18	£0	£0	£0	£0	£0	£0	£0	£0	2.816	£0.00	£0	£2,000	£5,633	£5,633
2041	19	£0	£0	£0	£0	£0	£0	£0	£0	2.957	£0.00	£0	£39,500	£116,812	£116,812
2042	20	£0	£0	£0	£0	£0	£0	£0	£0	3.105	£0.00	£0	£2,000	£6,210	£6,210
2043	21	£0	£0	£0	£0	£0	£0	£0	£0	3.260	£0.00	£0	£2,000	£6,521	£6,521
2044	22	£0	£0	£0	£0	£0	£0	£0	£0	3.423	£0.00	£0	£2,000	£6,847	£6,847
2045	23	£0	£0	£0	£0	£0	£0	£0	£0	3.595	£0.00	£0	£2,000	£7,189	£7,189
2046	24	£0	£0	£0	£0	£0	£0	£0	£0	3.774	£0.00	£0	£2,000	£7,549	£7,549
2047	25	£0	£0	£0	£0	£0	£0	£0	£0	3.963	£0.00	£0	£2,000	£7,926	£7,926
2048	26	£0	£0	£0	£0	£0	£0	£0	£0	4.161	£0.00	£0	£2,000	£8,322	£8,322
2049	27	£0	£0	£0	£0	£0	£0	£0	£0	4.369	£0.00	£0	£2,000	£8,738	£8,738
2050	28	£0	£0	£0	£0	£0	£0	£0	£0	4.588	£0.00	£0	£2,000	£9,175	£9,175
2051	29	£0	£0	£0	£0	£0	£0	£0	£0	4.817	£0.00	£0	£2,000	£9,634	£9,634
2052	30	£0	£0	£0	£0	£0	£0	£0	£0	5.058	£0.00	£0	£2,000	£10,116	£10,116
2053	31	£0	£0	£0	£0	£0	£0	£0	£0	5.311	£0.00	£0	£2,000	£10,622	£10,622
2054	32	£0	£0	£0	£0	£0	£0	£0	£0	5.576	£0.00	£0	£2,000	£11,153	£11,153
2055	33	£0	£0	£0	£0	£0	£0	£0	£0	5.855	£0.00	£0	£2,000	£11,710	£11,710
2056	34	£0	£0	£0	£0	£0	£0	£0	£0	6.148	£0.00	£0	£39,500	£242,843	£242,843
2057	35	£0	£0	£0	£0	£0	£0	£0	£0	6.455	£0.00	£0	£2,000	£12,911	£12,911
2058	36	£0	£0	£0	£0	£0	£0	£0	£0	6.778	£0.00	£0	£2,000	£13,556	£13,556
2059	37	£0	£0	£0	£0	£0	£0	£0	£0	7.117	£0.00	£0	£2,000	£14,234	£14,234
2060	38	£0	£0	£0	£0	£0	£0	£0	£0	7.473	£0.00	£0	£2,000	£14,946	£14,946
2061	39	£0	£0	£0	£0	£0	£0	£0	£0	7.846	£0.00	£0	£2,000	£15,693	£15,693
2062	40	£0	£0	£0	£0	£0	£0	£0	£0	8.239	£0.00	£0	£2,000	£16,478	£16,478
2063	41	£0	£0	£0	£0	£0	£0	£0	£0	8.651	£0.00	£0	£2,000	£17,301	£17,301
2064	42	£0	£0	£0	£0	£0	£0	£0	£0	9.083	£0.00	£0	£2,000	£18,167	£18,167
2065	43	£0	£0	£0	£0	£0	£0	£0	£0	9.537	£0.00	£0	£2,000	£19,075	£19,075
2066	44	£0	£0	£0	£0	£0	£0	£0	£0	10.014	£0.00	£0	£2,000	£20,029	£20,029
2067	45	£0	£0	£0	£0	£0	£0	£0	£0	10.515	£0.00	£0	£2,000	£21,030	£21,030
2068	46	£0	£0	£0	£0	£0	£0	£0	£0	11.041	£0.00	£0	£2,000	£22,082	£22,082
2069	47	£0	£0	£0	£0	£0	£0	£0	£0	11.593	£0.00	£0	£2,000	£23,186	£23,186
2070	48	£0	£0	£0	£0	£0	£0	£0	£0	12.172	£0.00	£0	£2,000	£24,345	£24,345
2071	49	£0	£0	£0	£0	£0	£0	£0	£0	12.781	£0.00	£0	£39,500	£504,853	£504,853
2072	50	£0	£0	£0	£0	£0	£0	£0	£0	13.420	£0.00	£0	£2,000	£26,840	£26,840
2073	51	£0	£0	£0	£0	£0	£0	£0	£0	14.091	£0.00	£0	£2,000	£28,182	£28,182
2074	52	£0	£0	£0	£0	£0	£0	£0	£0	14.796	£0.00	£0	£2,000	£29,591	£29,591
2075	53	£0	£0	£0	£0	£0	£0	£0	£0	15.535	£0.00	£0	£2,000	£31,071	£31,071
2076	54	£0	£0	£0	£0	£0	£0	£0	£0	16.312	£0.00	£0	£2,000	£32,625	£32,625
2077	55	£0	£0	£0	£0	£0	£0	£0	£0	17.128	£0.00	£0	£2,000	£34,256	£34,256
2078	56	£0	£0	£0	£0	£0	£0	£0	£0	17.984	£0.00	£0	£2,000	£35,969	£35,969
2079	57	£0	£0	£0	£0	£0	£0	£0	£0	18.883	£0.00	£0	£2,000	£37,767	£37,767
2080	58	£0	£0	£0	£0	£0	£0	£0	£0	19.828	£0.00	£0	£2,000	£39,655	£39,655
2081	59	£0	£0	£0	£0	£0	£0	£0	£0	20.819	£0.00	£0	£2,000	£41,638	£41,638
2082	60	£0	£0	£0	£0	£0	£0	£0	£0	21.860	£0.00	£0	£2,000	£43,720	£43,720
2083	61	£0	£0	£0	£0	£0	£0	£0	£0	22.953	£0.00	£0	£2,000	£45,906	£45,906
2084	62	£0	£0	£0	£0	£0	£0	£0	£0	24.101	£0.00	£0	£2,000	£48,201	£48,201
Total		£20,023,871	£0	£520,000	£4,451,650	£3,376,577	£28,372,098	£6,479,696	£34,851,794		£12,841,360	£47,693,154	£206,500	£1,730,778	£49,423,931

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.	£28,372,098
(2)	The base costs have been adjusted to incorporate risk.	£34,851,794
(3)	The risk adjusted costs have been adjusted to incorporate increases in construction costs.	£47,693,154
(4)	The inflated risk adjusted costs have been adjusted to incorporate whole life costs.	£49,423,931

Appendix H: Construction Risk Registers

Project Number	Project Name	Risk/Opportunity	Ref No.	Classification	Project Stage	Project Risk/Opp Description	Potential Impact	Risk Mitigation / Realisation Measures	Residual Risk Rating			Residual Risk Allowance					Date risk was last updated:
									Likelihood	Impact	Score	Estimated probability	Minimum Impact (£)	Likely Impact (£)	Maximum Impact (£)	Suggested client capacity budget	
30CPX31151	MATS	Risk	1.00	Technical	DS3 - Preliminary Design	3rd party utility works overrunning within the construction works	Delays to construction programme increasing cost	Principal contractor to manage utilities. Engagement with utility companies to manage diversions	3	4	12	50%	£100,000	£300,000	£600,000	£150,000	11/11/2022
30CPX31151	MATS	Risk	4.00	Financial	DS3 - Preliminary Design	Increased inflation due to current global events (war in Ukraine)	Likely to increase fuel costs, which will have a knock on effect to all other commodities.	Ensure inflation is built into cost and cost management system is reflective of global events	4	3	12	65%	£250,000	£500,000	£1,000,000	£325,000	11/11/2022
30CPX31151	MATS	Risk	5.00	Technical	DS3 - Preliminary Design	Unexpected stats / shallow stats affecting proposed design details;	increased time and cost to investigate / deal.	Obtain trial holes at key locations	4	4	16	70%	£75,000	£200,000	£400,000	£140,000	11/11/2022
30CPX31151	MATS	Opportunity	6.00	Technical	DS3 - Preliminary Design	Footway widths v Full depth construction v stats	The reduced footway widths mean we may need to lower the carriageway. This is likely to have an impact on buried services.	Investigation and collaboration	3	4	12	50%	£0	£0	£0	£0	19/08/2022
30CPX31151	MATS	Risk	11.00	Technical	DS3 - Preliminary Design	Loading bay, inc banks, requirements accommodated	There could be objections from the businesses, which could trigger a public inquiry, which would increase costs and delay programme	Liaison with Fenland - decision distributed with highlight report - discussion for Project Board. CCC to identify County Councilors and ensure early engagement that proposals are supported. FDC have engaged businesses, holding event at library and market in June.	3	3	9	20%	£10,000	£20,000	£30,000	£4,000	11/11/2022
30CPX31151	MATS	Risk	13.00	Commercial	DS3 - Preliminary Design	Long lead items - items cannot be ordered until instructed to commence and may potentially delay the overall programme	This could delay start on site, and ultimately completion date	Identification of long lead in items through ECI	1	3	3	15%	£25,000	£75,000	£100,000	£11,250	11/11/2022
30CPX31151	MATS	Risk	15.00	Project	DS3 - Preliminary Design	Compound area	Need area for compound that is practical for both doing the work and minimising impact / disruption (car park behind library?)	ask Fenland re car park. Initial ECI identified that car park would be suitable.	4	3	12	75%	£10,000	£50,000	£100,000	£37,500	11/11/2022
30CPX31151	MATS	Risk	19.00	Technical	DS3 - Preliminary Design	Accidents (and breakdowns) within traffic management	Cost increase and extension of programme due to on site incident and subsequent investigations.	Advanced warning of works. Mass barrier to be used to protect works.	3	3	9	50%	£2,500	£10,000	£50,000	£5,000	11/11/2022
30CPX31151	MATS	Risk	23.00	Technical	DS3 - Preliminary Design	Managing buses during construction	Buses will have to stop in carriageway during construction - or else the bus stops will need to be removed for the duration	Currently ok with planned construction works relating to prelim proposals. Potential challenges with regards to accommodate utility diversion works. C4 designs to be considered under current phasing plan once received.	2	2	4	25%	£7,500	£25,000	£50,000	£6,250	11/11/2022
30CPX31151	MATS	Risk	25.00	Commercial	DS3 - Preliminary Design	Mobilisation period is restricted - upon confirmation to commence construction it is approximately four weeks programmed for mobilisation which is very challenging for the supply chain	This could delay start on site, and ultimately completion date	Liaise with contractor at earliest opportunity to program additional resources - is this a programming issue? CDM requires sufficient time is allowed for mobilisation	1	2	2	5%	£5,000	£10,000	£15,000	£500	11/11/2022
30CPX31141	MATS	Risk	27.00	Project	DS3 - Preliminary Design	Fountain relocation being delivered by third party, need to ensure that the programmes are aligned.	Delay to moving the fountain could delay the project start.	Close engagement with FDC re: fountain programme	5	3	15	85%	£2,500	£20,000	£40,000	£17,000	11/11/2022
30CPX31151	MATS	Risk	28.00	Governance	DS3 - Preliminary Design	Street lighting - de-acrual and redesign cost	Increased maintenance cost to BB PFI. Delays to approval process.	Engagement with BB team.	3	3	9	50%	£10,000	£20,000	£60,000	£10,000	11/11/2022
30CPX31151	MATS	Risk	30.00	Project	DS3 - Preliminary Design	Traffic management for the construction works could create disruption for the whole area, equally the length of time traffic management is in place will influence the cost of the scheme.	Disruption to public. Increased cost.	Engage a traffic management contractor and tailor construction to minimise disruption to traffic, NMUs, businesses (by day) and residents (by night) without compromising scheme budget. NB there is interplay between St Peter's Rd and Market Square.	2	3	6	30%	£25,000	£50,000	£75,000	£15,000	11/11/2022
30CPX31151	MATS	Risk	32.00	Communications	DS3 - Preliminary Design	Business access / deliveries during the works;	prolongation / change in working arrangements which increases cost	Ensure access requirements are included in WI	2	3	6	20%	£5,000	£20,000	£30,000	£4,000	11/11/2022
30CPX31151	MATS	Risk	34.00	Project	DS3 - Preliminary Design	Network management for the construction works could create disruption for the whole area, equally the length of time traffic management is in place will influence the cost of the scheme.	Disruption to public. Increased cost.	Ensure programme is mindful of events planned within Market Square / surrounding area including Market Square FHSF scheme.	3	3	9	50%	£2,500	£5,000	£7,500	£2,500	11/11/2022
30CPX31151	MATS	Risk	38.00	Commercial	DS3 - Preliminary Design	The compressed design program is contingent on 3rd party design, roadspace and contractor resourcing, performance and delivery	Extended design period and delayed start on site	regular programme review at progress meeting	2	3	6	30%	£7,500	£15,000	£30,000	£4,500	11/11/2022
30CPX31151	MATS	Risk	40.00	Environmental	DS3 - Preliminary Design	Statutory undertakers' plant. Safety risk of any incidents involving any underground plant	Safety incident, impacting cost/ programme / reputation	Review the received C2 information, identifying any problem areas. Appropriate surveys (GPR / cat and genny / trial holes) to confirm the location of plant and inform our design. Ensure up to date plans are included in WI.	3	5	15	50%	£5,000	£10,000	£35,000	£5,000	11/11/2022
30CPX31151	MATS	Risk	41.00	Corporate	DS3 - Preliminary Design	MATS construction funding is not awarded	The scheme does not go ahead	Work with Milestone to ensure FBC stacks up / MATS funding can be released early. Scheme kill	3	5	15						11/11/2022
30CPX31151	MATS	Risk	43.00	Project	DS3 - Preliminary Design	Cellars	Unexpected protection measures + increased cost	Cellars should be visible on GPR survey. Fenland to also ask businesses. Cellar survey information received.	2	2	4	50%	£5,000	£10,000	£15,000	£5,000	11/11/2022
30CPX31151	MATS	Risk	44.00	Communications	DS3 - Preliminary Design	Strong lobbying for separate cycle lane provision;	There could be objections to TROs - risk is likely to be reputational, but may delay start	Early engagement with cycle groups (+ communication with decision making body). Raise decision to Board. Look at alternatives?	2	2	4	30%	£10,000	£20,000	£30,000	£6,000	11/11/2022
30CPX31151	MATS	Risk	46.00	Communications	DS3 - Preliminary Design	Taxi bay	There could be objections from the taxi companies, main impact is likely to be reputational but could increase costs and delay programme	Ongoing conversations between Fenland / Taxi companies	2	2	4	20%	£10,000	£20,000	£30,000	£4,000	11/11/2022
30CPX31151	MATS	Risk	49.00	Governance	DS3 - Preliminary Design	There is a change in legislation with regard to water discharge.	Could add 6-9 months to approval times	Early engagement with approval authority	2	2	4	30%	£2,500	£5,000	£10,000	£1,500	11/11/2022
30CPX31151	MATS	Risk	50.00	Technical	DS3 - Preliminary Design	Tie in of footway adjacent to shop frontages where highway boundary has not been defined	Delays in programme when seeking approval.	Include within works	2	2	4	30%	£10,000	£20,000	£30,000	£6,000	11/11/2022
30CPX31151	MATS	Risk	52.00	Environmental	DS3 - Preliminary Design	Noise complaints during the works - mostly can be mitigated with daytime working;	Mostly reputational - could lead to increased cost for mitigations	Ensure noise information is collected prior to scheme. Ensure appropriate working practices are included in WI. Noise survey is included in MATS estimate. Engagement with Environmental health rep.	2	2	4	30%	£5,000	£10,000	£40,000	£3,000	11/11/2022
30CPX31151	MATS	Risk	55.00	Environmental	DS3 - Preliminary Design	Air quality / dust etc;	Safety / reputational - could lead to increased cost for mitigations	Ensure appropriate working practices are included in WI. Mindful of effects when specifying materials (i.e. minimising cuts)	2	2	4	30%	£5,000	£10,000	£30,000	£3,000	11/11/2022
30CPX31151	MATS	Risk	67.00	Communications	DS3 - Preliminary Design	Access groups: change to disabled parking	There could be objections to TROs - risk is likely to be reputational, but may prevent scheme completion until resolution.	Early engagement with access groups FDC to lead on public engagement. Engagement planned at end of May in local library.	1	3	3	10%	£10,000	£20,000	£30,000	£2,000	11/11/2022
30CPX31151	MATS	Risk	73.00	Financial	DS3 - Preliminary Design	Parallel streams of funding for the "same" scheme	Competing demands from different funding bodies - delay decisions.	Keeping CPCA included with design evolution.	1	2	2	15%	£12,500	£20,000	£40,000	£3,000	11/11/2022
30CPX31151	MATS	Risk	77.00	Political	DS3 - Preliminary Design	Statutory Undertakers: Reputational risk should any undertakers require to install new plant through areas of new high-quality paving.	Reputational damage	Engage with the undertakers' transmission teams to identify any upcoming works, and apply for Section 58 license . Paige to check planned works. Area being designated as high amenity and special surface. Additional pavement surfacing to be included for future maintenance (storage area to be determined).	1	2	2	15%	£0	£0	£0	£0	11/11/2022

Select from Dropdown menu	A clear description of the Risk. The drafter should describe the risk e.g. 'The Risk is that...' It is important that the description is carefully-worded, to define the			Select from Dropdown menu	Select from Dropdown menu	Calculated by formula	Name and organisation	Brief description of what measures could be taken to reduce or minimise the risk. Could be used to help evaluate.	Select from Dropdown menu	Select from Dropdown menu	Calculated by formula	Name and organisation			Likelihood of the Risk occurring (regardless of impact)	Based on Modelling	Based on Modelling	Based on Modelling		
Project Stage	Project Risk/Opp Description	Potential Impact	Primary impact (time/cost):	Inherent Risk/Opp Rating			CCC Lead Officer	Risk Mitigation / Realisation Measures	Residual Risk Rating			Risk/Opp Action Owner	Actions Identified/Taken	Residual Risk Allowance						
				Likelihood	Impact	Score			Likelihood	Impact	Score			Time Allowance in Programme (days)	Estimated probability	Minimum Impact (£)	Likely Impact (£)	Maximum Impact (£)	Suggested client contingency budget	
DS4 - Detailed Design	Risk of MATS being challenged under judicial review over Consultation/Public Engagement.	Delay to programme whilst judicial process is undertaken.	Cost increase	2	3	6	Roland Jordaan	Online Consultation was held over May/June 2021, due to COVID-19 restrictions on public gatherings. OBC was signed off in November and MATS FBC is being developed alongside Detailed Design. Public Engagement event proposed for September 2022.	2	2	4	Project Board	Item presented to MATS Strategic Project Board in May 22 and June 22. Given that Programme has moved past OBC stage, decision to proceed with Public Engagement in September 2022.		30%	£2,000	£5,000	£10,000	£1,500	
DS4 - Detailed Design	Risk of statutory undertakers stating that they do need diversion / protection works.	Cost increase, delay to design phase. Delay to construction phase.	Cost increase	3	3	9	Roland Jordaan	Go back out to stats for C3 estimates prior to construction	1	3	3	CCC PM			30%	£50,000	£100,000	£200,000	£30,000	
DS5 - Delivery	Risk of finding unexpected stats	Delay to programme	Completion of works date	2	3	6	Roland Jordaan	Limited construction and GRP which should minimise risk	3	2	6	CCC PM			50%	£2,000	£10,000	£50,000	£5,000	
DS5 - Delivery	Thin layers of pavement remaining following planing	Cost increase to undertake remedial works	Cost increase	3	3	9	Roland Jordaan	To be allowed for in cost estimate	1	1	1	CCC PM			15%	£2,000	£10,000	£15,000	£1,500	
DS4 - Detailed Design	Unable to relocate postbox	Reduction in quality of finished works		4	2	8	Roland Jordaan	Relocation of postbox may require planning permission, which may undermine programme.	4	2	8	CCC PM	No cost - alters quality							£0
DS5 - Delivery	Existing drainage network is found to be poor quality when on site, which will require remedial works	Cost increase to undertake remedial works	Cost increase	3	3	9	Roland Jordaan	To be allowed for in cost estimate	1	1	1	CCC PM	No risk cost - included in cost estimate							£0
DS5 - Delivery	Inflation: world events are impacting inflation rates	Cost increases at a higher rate than accounted for	Cost increase	4	4	16	Roland Jordaan	To be allowed for in cost estimate	3	2	6	CCC PM	Allowance made within estimate - this risk is to cover above and beyond.		50%	£22,500	£45,000	£67,500	£22,500	
DS5 - Delivery	Risk of new utilities being added to scheme prior to construction.	New utility diversions have to be undertaken, increasing costs and delaying start of programme	Cost increase	2	3	6	Roland Jordaan	Go back out to stats for C3 estimates prior to construction	2	3	6	CCC PM	Included in cost identified for above stats risk (line 6)							£0
DS5 - Delivery	Unavailability of materials	Items are difficult to procure, increasing lead in times and hence start of works.	Start of works date	2	3	6	Roland Jordaan	No specialist requirements included within scheme - all items should be readily available.	1	3	3	CCC PM			15%	£5,000	£10,000	£15,000	£1,500	
DS5 - Delivery	Unavailability of roadspace	Roadspace is not available to deliver works	Start of works date	2	4	8	Roland Jordaan	Early engagement with road space team	2	4	8	CCC PM	main issue is start on site, cots is low - mainly logistics.		30%	£2,000	£5,000	£10,000	£1,500	
DS5 - Delivery	Complaints during works due to air quality	Increased staff time dealing with complaints: decrease in customer satisfaction	Cost increase	2	2	4	Roland Jordaan	Consider need for "before" surveys	2	2	4	CCC PM			30%	£2,000	£5,000	£10,000	£1,500	
DS5 - Delivery	Complaints during works due to noise	Increased staff time dealing with complaints: decrease in customer satisfaction	Cost increase	2	2	4	Roland Jordaan	Consider need for "before" surveys	2	2	4	CCC PM			30%	£2,000	£5,000	£10,000	£1,500	
DS5 - Delivery	Collisions in working area	Health and safety risk to staff. Delays to completion of job, and associated cost increases	Completion of works date	2	2	4	Roland Jordaan	Ensure float is allowed for in programme	1	2	2	CCC PM	float allowed in programme		15%	£2,000	£5,000	£10,000	£750	
DS5 - Delivery	Adverse weather	Delays to completion of job and associated cost increases.	Completion of works date	3	3	9	Roland Jordaan	Programmed for Autumn 24	3	3	9	CCC PM			50%	£2,000	£10,000	£20,000	£5,000	
DS5 - Delivery	Understanding business requirements, esp March MOT Centre	Unclear how well used March MOT Centre is and the truning circle requirements for access / egress. Could add additional constraints on Traffic Management	Completion of works date	3	3	9	Roland Jordaan	Engagement with local business	3	3	9	CCC PM			50%	£2,000	£10,000	£20,000	£5,000	
DS5 - Delivery	Location of Compound Area	Unclear where Compound area can viably be located	Start of works date	3	3	9	Roland Jordaan	Due to small area and proximity of March depot - use towable welfare unit within works area	3	3	9	CCC PM	Cost within scheme cost							£0

Select from Dropdown menu	A clear description of the Risk. The drafter should describe the risk e.g. 'The Risk is that...' It is important that the description is carefully-worded, to define the			Select from Dropdown menu	Select from Dropdown menu	Calculated by formula	Name and organisation	Brief description of what measures could be taken to reduce or minimise the risk. Could be used to help evaluate.	Select from Dropdown menu	Select from Dropdown menu	Calculated by formula	Name and organisation			Likelihood of the Risk occurring (regardless of impact)	Based on Modelling	Based on Modelling	Based on Modelling	
DS5 - Delivery	Request for change of scope from Members	Change in political direction leads to scope creep.	Cost increase	3	3	9	Roland Jordaan	Limited opportunity to change scope following FBC	2	5	10	CCC PM			30%	£2,000	£5,000	£10,000	£1,500
DS5 - Delivery	No funding: FBC not granted	Stops scheme	Start of works date	2	5	10	Roland Jordaan	FBC submitted early			0	CCC PM	No cost: scheme kill.						£0
DS5 - Delivery	Coordination of third parties: it may not be possible to coordinate the external lighting and signals team ad the DNO connection.	This may delay the programme, leading to increased cost.	Completion of works date	3	2	6	Roland Jordaan	Early engagement with affected third parties	2	2	4	CCC PM			30%	£5,000	£10,000	£30,000	£3,000
DS5 - Delivery	The arisings are contaminated and have to be disposed of as unacceptable.	Increased cost for disposal	Cost increase	3	4	12	Roland Jordaan	Intrusive investigation at start of works?	3	4	12	CCC PM			30%	£50,000	£100,000	£150,000	£30,000
DS5 - Delivery	Long lead in times for street lighting apparatus	This may delay the programme, leading to increased cost.	Completion of works date	3	2	6	Roland Jordaan	Order lighting and signal apparatus (especially lanterns) in advance	2	2	4	CCC PM			15%	£5,000	£10,000	£30,000	£1,500
DS5 - Delivery	Delay in signals approval	May mean that signals cann	Start of works date	3	2	6	Roland Jordaan	Ensure appropriate time is allowed for approval process	2	2	4	CCC PM			15%	£2,000	£5,000	£10,000	£750
DS5 - Delivery	Delay in street lighting approval	May delay the start of works.	Start of works date	3	2	6	Roland Jordaan	Ensure appropriate time is allowed for approval process	2	2	4	CCC PM			15%	£2,000	£5,000	£10,000	£750

Project Number	Project Name	Risk/Opportunity	Current Status	Impact Trend	Ref No.	Classification	Project Risk/Opp Category	Project Stage	Project Risk/Opp Description	Potential Impact	Primary Impact (time/cost):	Inherent Risk/Opp Rating			CCC Lead Officer	Risk Mitigation / Realisation Measures	Residual Risk Rating											
												Leafhood	Impact	Score			Leafhood	Impact	Score	Risk/Opp Action Owner	Actions Identified/Taken	Time Allowance in Programme (days)	Estimated probability	Minimum Impact (£)	Likely Impact (£)	Maximum Impact (£)	Suggested client contingency budget	
30CPX31152	Twenty Foot Road	Risk	CLOSED	NEW	11.00	Technical	Design	DS3 - Preliminary Design	Investigate junction lay out options - i.e. move back to preliminary design stage CCC have suggested to redesign the junction, in order to increase the length of the queuing lane. Prelim design suggests the current length is adequate, however microsimulation results have not been yet shared to support this view. Also, prelim design has not provided island of adequate width to support safety or maintenance works. Increasing the width of the island will have direct impact to the A141 carriageway width.	Both of these issues practically take the project back to optioneering stage, that will have significant impact on the programme and increased costs. May also result in abortive works	Completion of works date	4	4	16	Vana Andriatogianni	1) Review the microsimulation traffic model results to understand the necessity of increasing the queuing lane. Further to that to identify ways to mitigate impact on the programme, i.e. is the increase of the queuing lane required after all? 2) Identify the impact of the island width modification to the A141 layout with regards to land, utilities and retaining solutions. Depending on the outcome, it could be that the cost estimates need to be ready by 24th of November will carry a higher risk value, due to pending design works related.	3	4	12	CCC PM	Update Layout is now agreed with Client, further to amendments to the 500 work area and traffic issues							£0
30CPX31152	Twenty Foot Road	Risk	LIVE	NEW	13.00	Financial	Scheme Development	DS5 - Delivery	Increased inflation due to global event	Costs	Cost Increase	4	4	16	Leon Scholtz	Insure inflation is build into financial models	4	3	12	CCC PM	Capital cost for construction is assumed £2M - Construction year 2024 - Difference between inflation impact assumed in the cost estimate and risk of variation in time, has been assumed equal to 2% max		50%	£100,000	£150,000	£200,000	£75,000	
30CPX31152	Twenty Foot Road	RISK	LIVE	NEW	15.00	Project	External Stakeholders	DS5 - Delivery	If agreement to purchase third-party land cannot be reached then time-consuming compulsory purchase may be required.	Delay of the programme	Start of works date	4	4	16	Wole Odetola	1) Early identification of landowners. 2) Early liaison with affected landowners.	3	3	9	CCC PM	Scheme programme to include CPO, then risk to be considered as the variation. CCC PM to raise this as an issue, not having considered CPO in the complete scheme FBCI programme. Risk Cost to follow once programme was updated.							£0
30CPX31152	Twenty Foot Road	Risk	CLOSED	---	2.00	Project	Design	DS4 - Detailed Design	RSAT comments are not yet addressed in the design.	This may require re-design and subsequent delays to the scheme.	Start of works date	4	3	12	Ruhan Joshi	1) Early assessment against RSAT comments. 2) Notify CCC as early as possible of any design changes needed and recommend next steps to CCC.	4	2	8	Contractor	RSAT comments have been reviewed - Right turn to 20FR can be fixed during alignment design - Info about junction traffic figures has been requested by CCC Update: All RSAT comments have been addressed for these stage. Anything that will come from RSAT will need to be addressed at later stage.							£0
30CPX31152	Twenty Foot Road	Risk	CLOSED	---	4.00	Project	Design	DS4 - Detailed Design	The current design will require HGVs to straddle the two northbound lanes in order to successfully navigate the right turn, blocking the lanes providing stacking.	This may require re-design and subsequent delays to the scheme.	Start of works date	4	3	12	Ruhan Joshi	1) Early assessment of swept paths. 2) Askins to complete swept paths checks and share early sketches for approval.	3	2	6	Contractor								£0
30CPX31152	Twenty Foot Road	Risk	LIVE	---	6.00	Project	Design	DS4 - Detailed Design	VRB may be required before the Hobbs Lole Bridge parapets.	This may require a structural assessment	Cost Increase	4	3	12	Ruhan Joshi	1) Complete RRRAP and notify CCC of requirements immediately	3	2	6	Contractor	CCC to come back with as built info of the bridge, while Askins review the need for an RRRAP. RRRAP not required as the road will be 40 mph - The gap between the maintenance hard slip and the bridge parapet can be closed by introducing VRB, to mitigate risk through design. After receiving police view on the speed limit, it may need to remain at 50mph, hence a RRRAP analysis may be required. Once the changes of VRB are completed, there may be a risk on the bridge parapet to be replaced. This is a new task and not in the programme. Although the length is very limited, proposal is to cost the worst case scenario for the purposes of FBCI, regardless of the VRB design final conclusions, if not on time.	120	90%	£30,000	£90,000	£120,000	£54,000	
30CPX31152	Twenty Foot Road	Risk	LIVE	---	9.00	Project	Consultation/Comms	DS4 - Detailed Design	Outline planning application is assumed for the purposes of FBCI. The planning route has not been yet clarified.	Delay, Cost	Completion of works date	3	4	12	John Stanley	1) CCC to agree on the Planning procedure and instruct Askins on the expected feed in	2	3	6	CCC PM	To be considered in the next phase of FBCI, i.e. FBC2. No land to be brought at this stage. To be discussed with FBCI owners, in order to manage risk, action with CCC Costs rational is based on the comparison between outline and detailed design proposals, costs and programme.	0	80%	£20,000	£35,000	£50,000	£28,000	
30CPX31152	Twenty Foot Road	Risk	CLOSED	NEW	10.00	Environmental	Surveys	DS4 - Detailed Design	Flood risk assessment may be required, this is additional work.	Cost	Cost Increase	3	4	12	Vana Andriatogianni	1) Askins to check if a flood risk assessment is required	2	3	6	Contractor	The scope included budget of about £15K for an initial flood risk assessment. To be progressed by Askins. Outline FRA is completed and concludes that no further FRA work is required at this stage.							£0
30CPX31152	Twenty Foot Road	Risk	CLOSED	---	3.00	Project	Design	DS4 - Detailed Design	Signalised junction 150m north of site, risk of proposed signals interfering and causing congestion.	If this is to be addressed in detailed design, it will incur a cost increase and potential time delay.	Cost Increase	3	3	9	Ruhan Joshi	1) Early decision required to assess the conflict, with a review of existing traffic models. 2) Askins to confirm traffic signals info has been received or otherwise to suggest what is missing. Confirmed.	3	2	6	Contractor	Askins suggests to link the two junctions, as oppose to CCC Daniel Downes who is of the opinion they are so far that there would be no issues with traffic build up, so doesn't see the point in linking them. To be further examined if junction optioneering goes forward (please see new risk No. 11) Update: New meeting has been planned for Thursday the 21st. Traffic information was uploaded on 19th of July. Traffic data does not support congestion scenario and traffic signals interference. Risk to be closed.							£0
30CPX31152	Twenty Foot Road	Risk	LIVE	---	14.00	Technical	Scheme Development	DS5 - Delivery	Third party utility works overrunning within the construction works	Delay of the programme	Completion of works date	3	3	9	Steven Bown	Principal Contractor to manage utilities	2	2	4	CCC PM	Minimum cost impact: £5K per week overheads to mitigate Max: £12K per week including TM etc		50%	£40,000	£60,000	£75,000	£30,000	
30CPX31152	Twenty Foot Road	Risk	LIVE	NEW	16.00	Technical	Design	DS4 - Detailed Design	GI surveys, and subsequently GR and GDR, may suggest for design alterations once completed, primarily earthworks and scheme footprint	Delay to the programme and additional fees	Start of works date	3	3	9	Ruhan Joshi	New embankment assumed slope for detailed design is conservative, i.e. 1:3. The data from Geological Desk Top Study indicates there are no active or historical landfills / waste management facilities within 500m of the site (Groundsure Insights, 2022) Earthworks design to be reviewed and finalized after the completion of GR/GDR There is no retaining solution requirement for this project	2	2	4	Askins TL	GI surveys planned for end of October. GR/GDR to be completed early 2023 Update on the 21st of November: access to the field has not been granted, hence the geotech investigations including water level monitoring need to be now planned prior to FBCI. Risk probability is now increased to 60% from 30% in previous version	30	60%	£20,000	£40,000	£75,000	£24,000	
30CPX31152	Twenty Foot Road	Risk	LIVE	NEW	18.00	Technical	Design	DS4 - Detailed Design	CCC review of the design may result to design changes.	Delay to the programme	Start of works date	3	3	9	Ruhan Joshi	CCC to review detailed design package and come back with comments in time for the project to be completed in time. FBCI will not bear those design changes, to be considered in FBC2	2	3	6	Askins TL	Risk is possibly low, due to close collaboration between CCC team and Askins delivery team, while optioneering.	30	30%	£20,000	£30,000	£50,000	£9,000	
30CPX31152	Twenty Foot Road	Risk	LIVE	---	5.00	Environmental	Design	DS4 - Detailed Design	Environmental surveys may flag additional issues	This could trigger further mitigation, design and delays	Start of works date	2	4	8	Vana Andriatogianni	1) Askins to review existing environmental information and come back with proposals for CCC to review. 2) Undertake surveys and notify CCC of requirements immediately	2	2	4	Contractor	Gap analysis completed and will be shared with CCC week starting 29th of July. Update 20/08/2022: FBC requirements have been shared with Askins - Askins to provide cost estimate of anticipated works. Any surveys that will result will be identified on time. FRA has been completed. The following surveys are currently being planned: 1. coastal and floodplain grazing marsh visit after rain 2. Survey for bats, access required 3. an other survey needs to be undertaken - any time of year 4. Ecology/water team to be consulted Impact on the planning application has been assumed for the times preferred.	90	50%	£20,000	£35,000	£50,000	£17,500	
30CPX31152	Twenty Foot Road	Risk	LIVE	---	12.00	Project	External Stakeholders	DS4 - Detailed Design	Risk of MATS being challenged under judicial review over Consultation/Public Engagement. Objections during planning permission due to impacts on habitability, land impact on properties, commercial use of land etc. may require re-design or delay the scheme	Delay to programme	Start of works date	2	4	8	John Stanley	Online Consultation was held over May/June 2022, due to COVID-19 restrictions on public gatherings, CCC was signed off in November and MATS FBCI is being developed alongside Detailed Design. Public Engagement event proposed for September 2022.	2	3	6	CCC PM	Item presented to MATS Strategic Project Board in May 22 and June 22. Given that Programme has moved past OBC stage, decision to proceed with Public Engagement in September 2022. Risk mitigated with the public engagement events that took part and of September. Judicial review period to be incorporated in the scheme programme. Monthly Consultant fees: min£5K Monthly Legal fees: min£5K Max land acquisition difference: £50K Max fees: 1.5x	90	20%	£30,000	£50,000	£90,000	£10,000	
30CPX31152	Twenty Foot Road	Risk	CLOSED	---	1.00	Technical	Project Scope	DS4 - Detailed Design	It is assumed that the existing topographical survey is accurate and appropriate for the design.	If additional topographical survey is deemed to be required, this will incur an additional cost and potential time delay.	Cost Increase	2	3	6	Vana Andriatogianni	1) Assess topographical survey information and notify CCC of additional requirements immediately.	1	3	3	Contractor	CCC endorses spot checks to have detailed design topo requirements checked and confirmed. CCC to confirm cost and programme impact before starting any works related. Topo checks CE has been issued and approved. Works are planned for early September. There should not be any issues. Highways to cross check topo surveys data provided before this risk is removed.							£0
30CPX31152	Twenty Foot Road	Risk	LIVE	NEW	17.00	Technical	External Stakeholders	DS4 - Detailed Design	Drainage outfalls on the North East may have impact on the private land	Delay to the programme and additional fees	Start of works date	2	3	6	Vana Andriatogianni	1) Early identification of landowners. 2) Early liaison with affected landowners.	2	2	4	Askins TL	This is not a design change. The outfall discharges in the field currently. This is retained in the design, by accommodating the carriageway widening. Discharge is increased slightly. Cost estimate assumed design optioning in order to accommodate the outfall in a different manner MAX by land	60	40%	£20,000	£20,000	£200,000	£8,000	
30CPX31152	Twenty Foot Road	Risk	CLOSED	---	8.00	Authority	Surveys	DS4 - Detailed Design	Possible lane / road closures to enable work - TTRO application process requires 12 weeks' notice	Cost Estimates not ready on time for the business case study	Completion of works date	1	4	4	Ruhan Joshi	1) Confirm notice requirements for TTRO 2) Combined effort to reduce the risk, delay may not be end up being mitigated due to existing highways standards.	1	2	2	Askins TL	Update: Further to the meetings with stakeholders involved i.e. TM subcontractors and CCC Network Management, it has been confirmed that TTROs are not required.							£0
30CPX31152	Twenty Foot Road	Risk	LIVE	---	7.00	Environmental	Design	DS5 - Delivery	C2s may be outdated at construction	C2s will need to be requested, delaying works	Cost Increase	1	3	3	Ruhan Joshi	1) Refresh C2s before construction commences. Maintain engagement with Street Works.	1	2	2	Contractor	Monthly Consultant fees: min£5K Monthly Contractor fees: min£5K Construction additional works: min £20K Max times 3	90	20%	£50,000	£75,000	£150,000	£15,000	
30CPX31152	Twenty Foot Road	Opportunity	LIVE	---	19.00	Technical	External Stakeholders	DS4 - Detailed Design	Value Engineering opportunity for excavated material 1) Re-use a proportion of material on-site in capping and general fill. 2) Deposit on site as landscaping fill material, eg in a bund, wide verges.	Re-use of available material at site and minimise waste material to dispose tip of site		3	-3	-9	Ruhan Joshi	1) Contingency covered in BoQs for import of materials and disposal of materials	3	-3	-9	Contractor	To complete geotechnical investigation prior to construction.	60	40%	£10,000	£25,000	£50,000	£10,000	

Northern Link Road

Project Number	Project Name	Risk/Opportunity	Current Status	Impact Trend	Ref No.	Classification	Project Risk/Opportunity Category	Project Stage	Project Risk/Opportunity Description	Potential Impact	Primary Impact (Time/Cost)	Inherent Risk/Opportunity Rating			CCC Lead Officer	Risk Mitigation / Realisation Measures	Residual Risk Rating										
												Likelihood	Impact	Score			Likelihood	Impact	Score	Risk/Opportunity Action Owner	Actions Identified/Taken	Time Allowance to Programme (days)	Estimated probability	Minimum Impact (£)	Likely Impact (£)	Maximum Impact (£)	Suggested client contingency budget
30CPK1155	Northern Link Road	Risk	LIVE	—	1.00	Environmental	Statutory Process	D03 - Preliminary Design	Land required for road construction is found to be contaminated then remediation may be required	Delay, Cost	Cost increase	4	4	16	Robin Mason	1) Undertake desk study to review information held on adjacent landfill site. 2) Consider whether site investigation/testing should be brought forward in programme. 3) Check land fill site monitoring points, send email to CCC for information site located on the board outside. 4) For the refuse site seek information and check for classes (check Google map for photo on the board)	3	3	9	Alina TL	CCC Env and Waste management team to help Alina with the communication, being the owner. CCC to send contact information for more details and monitoring points coordinates (Possible information availability: Item 1) to provide more info to program. Update: Geological desk study is completed and suggests there is high risk for the land to be contaminated. SRB expecting point of communication in CCC. This is still outstanding - action with CCC. There is a layer of extremely poor ground that needs to be improved, if it is found to be contaminated as well, it may need to be removed in total and treated appropriately. Depth 400mm min ground. Impact engineering fill. 1) Land treatment 2) Realignment For risk cost, it has been assumed a variation of an extra 400mm (max scenario) to be replaced. Works to dig out, import and place this extra depth have been roughly £1.1m to dig out + £300k to import including fill works	90%	£198,440	£297,660	£396,880	£287,894	
30CPK1155	Northern Link Road	Risk	LIVE	—	2.00	Project	Internal Stakeholder	D05 - Delivery	If agreement to purchase third party land cannot be reached then time-consuming compulsory purchase may be required. (Random Shop Issues) Scheme unable to proceed if the CPO is not allowed for in the programme	Delay	Start of works date	4	4	16	Steven Bown	1) Early identification of landowners. 2) Early liaison with affected landowners.	3	3	9	CCC PM	A lot of the proposed works take part in third party land because the existing long HR road appears to have been built on private land (this is in addition to the Poles and Network that already identified). Depending on the nature of the agreements and comments the land acquisition agreement process could be lengthy. Need to create a plan showing the land plots boundaries overlying the works to understand the impact. Update: Plan has been completed and will be issued next week for CCC to work around the existing to acquire. Plan was issued - CCC will be procuring land agent to work around the land procurement strategy. This will take place next year for FBC2. Scheme programme to include CPO, then risk to be considered as the scheme. Risk to be assessed in 2024/25 CCC to raise this as an issue, not having concluded CPO in the complete scheme FBC1 programme. Risk Cost to follow once programme was updated.	40%				£0	
30CPK1155	Northern Link Road	Risk	LIVE	NEW	17.00	Financial	Scheme Development	D05 - Delivery	Increased inflation due to global event	Cost	Cost increase	4	4	16	Leon Scholtz	Ensure inflation is built into financial models	4	3	12	CCC PM	Capital cost for construction is assumed E20M - Construction year 2027. Difference between inflation impact assessment in the cost estimate and risk of variation in time, has been assumed equal to 2% new	100%	£1,000,000	£1,500,000	£2,000,000	£1,500,000	
30CPK1155	Northern Link Road	Risk	LIVE	—	10.00	Technical	Surveys	D03 - Preliminary Design	Network Rail approval is required for topo survey works in their fields, risk of abortive works if not obtained in time	Cost	Cost increase	3	5	15	John Stanley	1) Alina to liaise with Network Rail to seek approval for works. No delays on responses should not keep back the rest of the surveys.	2	3	6	CCC PM	Alina has liaised with NR asking for additional info, expecting responses. Network Rail to send BAPA by 27/06/22. Update: CCC have received BAPA. Currently with CCC Legal to confirm payment has been made. Alina to survey team can access the location. Highway fence is missing on the NLR side. CCC to update the above. £15k per month Design/PM time for prolongation	180	60%	£30,000	£30,000	£30,000	£30,000
30CPK1155	Northern Link Road	Risk	LIVE	—	3.00	Environmental	Surveys	D03 - Preliminary Design	Ecology survey not included in the current scope of work, associated works may delay programme if required	Delay, Cost	Cost increase	4	3	12	Vana Ananthaganesan	1) Alina to review the submitted PEA and undertake a gap analysis. 2) Identify the potential key constraints within the report and come back to CCC with a certain proposal	3	2	6	Alina PM	Env gap analysis to be completed this week (see 24/06/22) Gap Analysis issued to CCC for comments. CCC have confirmed if ecology surveys are required they can be planned for the above. Impact on the planning application has been assessed for design team risk design needs 20% of average monthly flow + max profile design volume	90	50%	£15,000	£15,000	£30,000	£7,500
30CPK1155	Northern Link Road	Risk	CLOSED	—	4.00	Technical	Design	D04 - Detailed Design	If existing carriageway is found to have underlying issues then remedial/structural reconstruction may be required. (based on evidence of condition of existing road, failure mode not known at this time)	Delay, Cost	Cost increase	3	4	12	Robin Mason	1) Determine the future mode of existing pavement. 2) Undertake intrusive investigation early in programme. 3) Alina to progress pavement surveys	3	2	6	Alina TL	Decision on pavement full reconstruction needs to be resolved. Pavement surveys now completed.					£0	
30CPK1155	Northern Link Road	Risk	LIVE	—	5.00	Technical	Design	D04 - Detailed Design	If ground conditions are not favourable then ground remediation may be required. (based on evidence of condition of existing road)	Delay, Cost	Cost increase	3	4	12	Robin Mason	1) Undertake PSBR as early in programme as possible. 2) Consider undertaking geotechnical site investigation and subsequent design as early in the programme as possible (could usually be undertaken during detail design)	3	3	9	Alina TL	Update: Proceed with preliminary Geotech desk top study to understand risks related. Ground improvement may need to take place. Full GPR to detail the ground improvement method. Action with Alina to complete the risk costs + prob, once the geotechnical S&C are available and optimising is required. In the cost estimate the assumed works will be extra granular base with geotextiles, min 300mm. Variation for the purposes of the risk cost would be the need for complete ground improvement.	60%	£1,000,000	£2,500,000	£4,000,000	£1,500,000	
30CPK1155	Northern Link Road	Risk	CLOSED	—	6.00	Technical	Design	D05 - Delivery	If existing utilities are not accurately identified then there is a risk of delay during construction.	Delay, Cost	Completion of works date	3	4	12	Robin Mason	1) Procure an underground utilities mapping survey early in the programme. 2) Develop a risk led strategy for utilities interfaces. 3) Consider bringing out the activities forward in programme if justified by the level of risk.	2	2	4	Alina TL	UPE 118 surveys under preparation. Final report received. Surveys are planned for August, permit communication has been shared with CCC for access permission. GPR surveys have stopped in September. GPR surveys are now completed. Clash analysis workshop to identify any need for redesign of all design in programme. November. Considering the risk is now designed out, the risk can be closed.					£0	
30CPK1155	Northern Link Road	Risk	CLOSED	—	7.00	Authority	Surveys	D03 - Preliminary Design	Possible lane / road closures to enable work - TfRQ application process requires 12 weeks' notice	Cost	Completion of works date	3	4	12	Robin Mason	1) Confirm notice requirements for TfRQ 2) Coordinated effort to reduce the risk, delay may not be met and being mitigated due to existing highways interfaces.	1	2	2	Alina TL	Update: Further to the meetings with stakeholders involved in TfM subcontractors and CCC Network Management, it has been confirmed that TfRQ is not required.					£0	
30CPK1155	Northern Link Road	Risk	LIVE	—	8.00	Project	Consultation/Comm	D03 - Preliminary Design	Outlier planning application is assumed for the purposes of FBC	Delay, Cost	Completion of works date	3	4	12	John Stanley	1) CCC to agree on the Planning procedure and instruct Alina on the expected fees in	2	3	6	CCC PM	To be considered in the next phase of FBC, i.e. FBC2. No need to be brought at this stage. To be discussed with FBC1 teams, in order to manage risk, action with CCC. Costs related to land in the context between outline and detailed planning application costs and times	80%	£20,000	£35,000	£50,000	£28,000	
30CPK1155	Northern Link Road	Risk	CLOSED	—	9.00	Technical	Surveys	D03 - Preliminary Design	Surveys will be delayed if land information is not available to arrange access	Delay	Start of works date	3	4	12	Steven Bown	1) Use Land Search Information registry for identification of ownership and contact details. 2) Send a letter to the responsible (Highways Act) with the details of the survey etc.	2	3	6	CCC PM	Info received from CCC, further action is to send the letter to the land owners. Update: CCC to confirm letters are out, otherwise surveys cannot be planned. All letters have gone out. Topo surveys to be completed by 11/10/2022.					£0	
30CPK1155	Northern Link Road	Risk	CLOSED	—	11.00	Technical	Design	D03 - Preliminary Design	Delayed start of design works, has resulted in surveys time schedule being challenged due to resources limitations	Delay	Start of works date	4	3	12	Vana Ananthaganesan	1) Either outsource or use LIDAR topo to start design works and complete the ground topography surveys later in the programme. 2) In future design stages undertake a verification exercise to confirm earlier decisions may be required.	2	3	6	Alina PM	Design works are progressing using LIDAR topo, as per CCC's approval. Topo surveys to be completed as per the scope. There is a risk that the topo surveys information may not be ready for design update on for the cost estimate. Risk is now a result - Topo survey is almost completed and will be ready for use during the next stage of design. Risk can close					£0	
30CPK1155	Northern Link Road	Risk	CLOSED	—	12.00	Environmental	Surveys	D03 - Preliminary Design	Flood risk assessment may be required, this is additional work.	Cost	Cost increase	5	2	10	Vana Ananthaganesan	1) Initial flood risk assessment - this will be a high level flood risk assessment which is likely to highlight that the primary flood risk concerns are associated with surface water drainage. The aim of the FRA will be to scope out the requirement for floodplain compensation - risk may be reduced or not allow for the same, reduce risk with some initial work. 2) Alina to join the QA meeting planned for the 8th to discuss to discuss and request feedback. 3) Further to the meeting, Alina to prepare a cost and this assessment for the works to discuss with CCC.	3	3	9	Alina PM	Update: QA panel endorsed the requirement to prepare a flood risk assessment. Action with Alina to prepare a change control document. Flood risk assessment has been confirmed and will progress. Risk to be closed.					£0	
30CPK1155	Northern Link Road	Risk	CLOSED	—	13.00	Project	Internal Stakeholder	D05 - Delivery	If third party land is required that is unregistered then there may be delays in identifying the owner and agreeing to purchase.	Delay	Start of works date	3	3	9	Vana Ananthaganesan	1) Early identification of landowners.	2	3	6	Alina PM	Update: (Combined with action of Risk 9) Impact on design programme should be minimum, however it will delay it by a degree and land acquisition times for next project stages. All owners have been identified, risk to close					£0	
30CPK1155	Northern Link Road	Risk	CLOSED	—	14.00	Technical	Design	D03 - Preliminary Design	If access details for adjacent development Local Household Waste Recycling Centre are not provided before preliminary design begins then there is a likelihood of abortive work.	Delay, Cost	Completion of works date	3	3	9	Robin Mason	1) Obtain details for waste recycling centre redesign.	2	2	4	Alina TL	At the moment, there is no confirmed date of planning, hence to consider the existing layout whilst progressing the NLR prelin design on the right time. Completely new access. NLR to consider as is and highlight the problem for next stage, should there be no progress with the planning application, CCC to provide new layout would help to understand impact. Update: information has been provided					£0	
30CPK1155	Northern Link Road	Risk	LIVE	NEW	19.00	Technical	Scheme Development	D05 - Delivery	Third party utility works overrunning within the construction works	Delay to the programme	Completion of works date	3	3	9	Steven Bown	To be re-evaluated during detailed design stage and prior to the beginning of construction	2	2	4	CCC PM	For the purposes of the Risk Cost, BT realignment has been assumed for 200m, last minute before construction.	40	20%	£100,000	£150,000	£300,000	£30,000
30CPK1155	Northern Link Road	Risk	CLOSED	NEW	15.00	Project	Design	D03 - Preliminary Design	The feasibility study and reference design did not identify any need for equitation provision, however comments made in CCC QA panel meetings suggest there may be an expectation that this provision be made. If a need for equitation provision is identified then there is a high likelihood of a substantial increase in scheme budget and cost.	Cost	Cost increase	2	4	8	Vana Ananthaganesan	1) Progress the WCHAR assessment. 2) CCC to discuss the requirement internally	2	4	8	Alina PM	Update: WCHAR works has started. WA to report any findings to CCC team. CCC to update as well. Currently a cycling strategy is being developed by CCC Major projects. CCC to provide relevant info. WCHAR Assessment completed. No need for equitation provision has been identified. Risk can be closed					£0	
30CPK1155	Northern Link Road	Risk	CLOSED	NEW	18.00	Communications	Internal Stakeholder	D03 - Preliminary Design	The highways fence in the preliminary design appears to allow more land under CCC ownership compared to what is needed	Delay to programme if land acquisition is required	Cost increase	4	2	8	John Stanley	1) Review land search information 2) Finalising the red boundary plan for definitive planning 3) Survey required at the location	3	1	3	CCC PM	This is just for one single property, where the property fence has probably been set further back, just to have enough room to reserve. Update: Being in agreement having a signed agreement, it is assumed that design will be accepted by the land owner. Risk to be closed. Refer to Risk 102 for land owner reservation notes that could lead to CPO					£0	
30CPK1155	Northern Link Road	Risk	LIVE	NEW	20.00	Communications	Internal Stakeholder	D03 - Preliminary Design	Risk of MATS being challenged under judicial review over Consultation/Public Engagement.	Delay to programme	Start of works date	2	4	8	John Stanley	Online Consultation was held over May/June 2022, due to COVID-19 restrictions on public gatherings. OBC was signed off in November and MATS FBC is being developed alongside Detailed Design. Public Engagement event happened in September 2022.	2	3	6	CCC PM	Item presented to MATS Strategic Project Board in May 22 and June 22. Given that Programme has received past OBC stage, decision to proceed with Public Engagement in September 2022. Public Engagement event happened in September 2022. No major negative feedback has been received. Not clear if there is a problem with the risk cost has been qualified for this kind of event ERM per week prolongation. Consultation fees have been considered for max for 20.5 weeks	180	10%	£60,000	£90,000	£127,500	£9,000
30CPK1155	Northern Link Road	Risk	LIVE	—	21.00	Technical	Internal Stakeholder	D03 - Preliminary Design	Risk of new utilities being added on the network between design and construction phase	Delay	Completion of works date	2	3	6	Robin Mason	Street works team to manage section 85 notices, to be discussed on the QA call weekly	1	2	2	CCC PM	CCC to confirm progress up to date and monitor. Re-review risk being detailed design stage and procurement.					£0	
30CPK1155	Northern Link Road	Risk	LIVE	—	16.00	Technical	Statutory Process	D04 - Detailed Design	CIs may be outdated at construction	Cost	Cost increase	1	3	3	Robin Mason	Consider recheck CIs before construction commences	1	2	2	Alina TL	Proper actions to design out this risk at current stage of design, in prelin, have been taken. GPR survey and CIs required. CIs are expected to have been gathered by end of November to feed in the cost estimate. May not have been all collected in time for the risk to be closed. Refer to Risk 102 for land owner reservation notes that could lead to CPO					£0	
30CPK1155	Northern Link Road	Risk	LIVE	NEW	22.00	Environmental	Internal Stakeholder	D05 - Delivery	Description: If noise levels at nearby properties increase then there is a risk of successful Part 1 claims.	Cost (post-construction)	Cost increase	1	2	2	Roland Jordan	Undertake detailed surveys and noise modelling to determine the true impact of noise. Based on outcome of noise modelling consider use of low noise surfacing and/or screening	1	2	2	CCC PM	Added 17/11/2022: Develop a programme of surveys to include noise surveys to inform detailed noise modelling and build an evidence base for potential future claims. Note that the above actions are 'business as usual' and not exceptional in any way.					£0	

Appendix I: Benefits Realisation Plan



March Area Transport Study (MATS)

Benefits Realisation Plan

Document Control

Document ref: March Area Transport Study Full Business Case 1_BRP						
Rev	Purpose	Originated	Checked	Reviewed	Approved	Date
1.0	FBC1 - First Issue	NP	RPJ	RMJ	RMJ	09.12.2022
2.0	FBC1 – Updated Post ITE	NP	RPJ	RMJ	RMJ	19.12.2022

Contents

1.	Introduction.....	1
1.1	Background	1
1.2	Purpose of This Document.....	1
1.3	Document Structure	2
2.	Scheme Objectives.....	3
3.	Benefits Register	4

Tables

Table 2.1:	MATS Scheme Objectives	3
Table 3.1:	MATS Benefits Register.....	5

1. Introduction

1.1 Background

1.1.1 The purpose of this Benefits Realisation Plan is to support the March Area Transport Study (MATS) Full Business Case (FBC1).

1.2 Purpose of This Document

1.2.1 DfT guidance¹ stipulates that the Benefits Realisation Plan should set out the approach to managing the realisation of benefits.

1.2.2 The Green Book (2020)² (paragraph 5.30) states that the “expected benefits of an intervention and how these will be measured and realised should be set out in a **benefits register**. This is a key strand of implementation, operational management, and a key part of the management dimension of a business case.” The **benefits register** template provided in the Green Book includes the following criteria:

- **Benefit category and class** – categories e.g., public sector benefits (direct / indirect), wider social benefits. Classes such as: cash / noncash releasing, quantitative / qualitative etc.
- **Description** – including enabling programme, project, or activity
- **Service feature** – what aspect of the proposal will give rise to the benefit – to facilitate monitoring?
- **Potential costs** – incurred during delivery
- **Activities required** – to secure benefit
- **Responsible officer** – senior responsible officer (SRO) for project or programme
- **Performance measure** – key performance indicators (KPIs) and relationship to SMART objectives
- **Target improvement** – expected level of change
- **Full-year value** – value of benefits (£m)
- **Timescale** – number of years.

1.2.3 This document was also prepared in accordance with guidance provided by the Infrastructure and Projects Authority.³

¹ DfT (2022). <https://www.gov.uk/government/publications/transport-business-case>

² HM Treasury (2020). [The Green Book](#)

³ <https://www.gov.uk/government/publications/assurance-of-benefits-realisation-in-major-projects>

1.3 Document Structure

1.3.1 This document is structured as follows:

- **Chapter Two** provides information relating to the scheme objectives
- **Chapter Three** contains the benefits register for the MATS.

2. Scheme Objectives

- 2.1.1 The MATS scheme objectives were developed during the Strategic Outline Business Case (SOBC) stage, following consultation with key stakeholders during an Objective Setting Workshop held in June 2020.
- 2.1.2 The MATS scheme objectives are set out in Table 2.1 beneath. Those shown in teal-green relate specifically to the MATS Broad Street Scheme and are therefore directly pertinent to FBC1. Those shown in white relate to the wider MATS project (either specific schemes, or implementation of the package as a whole) and will be met following FBC3.

Table 2.1: MATS Scheme Objectives

1	Regeneration of March Town Centre	a	Deliver a transport scheme for Broad Street that is compatible with the FHSF scheme
		b	Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience and drive growth
		c	Maximise public realm within Broad Street
		d	Enhance pedestrian safety and accessibility around the town centre
2	Address Existing Traffic Congestion and Safety Issues	a	Address existing congestion issues within the town centre (Broad Street area)
		b	Address existing congestion issues along the A141 around Peas Hill roundabout
		c	Improve pedestrian level of service around Broad Street
		d	Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction
3	Facilitate Housing and Employment Growth	a	Support Local Plan development proposals
		b	Ensure sustainable access to proposed Local Plan development
4	Improve Local Environmental Conditions	a	Improve air quality conditions around Broad Street
		b	Facilitate the enhancement of heritage assets around Broad Street.

- 2.1.3 The scheme objectives above relate to the benefits that the proposed intervention schemes of the MATS seek to realise.

3. Benefits Register

3.1.1 The benefits register for the MATS is provided overleaf in Table 3.1.

Table 3.1: MATS Benefits Register

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Benefit Owners	Benefit Enablers	Timescales
<p>Regeneration of March Town Centre:</p> <ul style="list-style-type: none"> Deliver a transport scheme for Broad Street that is compatible with the FHSF scheme Ensure a transport scheme for Broad Street is aligned with FHSF core Objectives to renew and reshape town centres, improve user experience, and drive growth Maximise public realm within Broad Street Enhance pedestrian safety and accessibility around the town centre 	<ul style="list-style-type: none"> Broad Street / Dartford Road/Station Road Mini Roundabout Reduce the number of lanes to one in each direction on Broad Street 	<ul style="list-style-type: none"> Deliver a transport scheme for Broad Street that is compatible with the FHSF Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience, and drive growth Maximise public realm within Broad Street Enhance pedestrian safety and accessibility around the town centre Wider social benefits 	<ul style="list-style-type: none"> Commuters / Business trips Local Residents Visitors to the City Bus Operators 	CPCA / CCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance Promotion of March City Area 	<ul style="list-style-type: none"> Benefit(s) to be realised within one year post scheme opening
<p>Address Existing traffic Congestion and safety Issues:</p> <ul style="list-style-type: none"> Address existing congestion issues within the town centre (Broad Street area) Address existing congestion issues along the A141 around Peas Hill roundabout Improve pedestrian level of service around the Broad Street Improve safety along the A141 at Peas Hill Roundabout and the Twenty-foot Road junction 	<ul style="list-style-type: none"> A141 / Peas Hill Roundabout Improvements (52m ICD) along with creation of an all-movement signalised junction at the A141 / Hostmoor Avenue Junction. A141 / Twenty Foot Road Signals Development of Northern Industrial Link Road (NILR) 	<ul style="list-style-type: none"> Address existing congestion issues within the town centre (Broad Street area) Address existing congestion issues along the A141 around Peas Hill Roundabout Improve pedestrian level of service around Broad Street Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction Monetise (quantifiable) benefits due to fewer accidents Monetise journey time savings 	<ul style="list-style-type: none"> FDC in regard to fulfilment of the Local Plan Businesses in March Residents / Local Community Commuters / Business trips 	CPCA / CCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of March City Area Monitoring of network performance Road safety audit Monitoring / investigation of accidents 	<ul style="list-style-type: none"> Benefit(s) to be realised once the scheme has been implemented and is open to the public.
<p>Facilitate Housing and Employment Growth:</p> <ul style="list-style-type: none"> Support Local Plan development proposals Ensure sustainable access to proposed Local Plan Development 	<ul style="list-style-type: none"> Development of Northern Industrial Link Road (NILR) High Street / St peter's Road Traffic Signal Improvements 	<ul style="list-style-type: none"> Support Local Plan development proposals Ensure sustainable access to proposed Local Plan development Wider social benefits (improved availability of housing and employment) 	<ul style="list-style-type: none"> FDC in regard to fulfilment of the Local Plan Residents / Local Community 	CPCA / CCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of Fengate businesses and wider City Area 	<ul style="list-style-type: none"> Benefit(s) to be realised once the scheme has been implemented and is open to the public.
<p>Improve Local Environmental Conditions:</p> <ul style="list-style-type: none"> Improve air quality conditions around Broad Street Facilitate the enhancement of heritage assets around Broad Street 	<ul style="list-style-type: none"> Broad Street / Dartford Road / Station Road Mini Roundabout Reduce the number of lanes to one in each direction on Broad Street 	<ul style="list-style-type: none"> Improved air quality in future years. Facilitate the enhancement of heritage assets around Broad Street Achievement of 10% biodiversity net gain Wider social benefits 	<ul style="list-style-type: none"> CCC / CPCA in regard to environment and biodiversity Businesses in March Residents / Local Community 	CPCA / CCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of Fengate businesses and wider City Area Biodiversity Net Gain Calculation Air quality monitoring 	<ul style="list-style-type: none"> Benefit(s) to be realised once the scheme has been implemented and is open to the public.

Appendix J: Monitoring and Evaluation Plan



March Area Transport Study (MATS)

Monitoring and Evaluation Plan

Document Control

Document ref: March Area Transport Study Full Business Case 1_MEV						
Rev	Purpose	Originated	Checked	Reviewed	Approved	Date
1.0	FBC1 - First Issue	NP	RPJ	RMJ	RMJ	09.12.2022
2.0	FBC1 – Post ITE Review	NP	RPJ	RMJ	RMJ	19.12.2022

Contents

1.	Introduction.....	1
1.1	Scope	1
1.2	MATS FBC Structure	1
1.3	Purpose of This Document.....	4
1.4	Document Structure	4
2.	Scheme Background and Context.....	5
2.1	Introduction.....	5
2.2	Purpose of the MATS.....	6
2.3	Scheme Objectives and Outcomes.....	7
3.	Scheme Inputs, Outputs, Outcomes, and Impacts.....	11
3.1	Introduction.....	11
3.2	Inputs.....	11
3.3	Outputs.....	11
3.4	Outcomes	11
3.5	Impacts.....	12
3.6	Logic Map.....	12
3.7	Benefits Strategy	14
4.	Data Collection Methods	15
4.1	Introduction.....	15
4.2	Types of Measures.....	15
4.3	Stages of Monitoring and Evaluation	16
4.4	Measures to be Monitored	17
4.5	Spatial Coverage.....	20
5.	Resourcing and Governance.....	21
5.1	Introduction.....	21
5.2	Monitoring and Evaluation Budget(s).....	21
5.3	Governance Structure	24
5.4	Risk Management	25
5.5	Quality Assurance	26
6.	Delivery Plan	28
6.1	Introduction.....	28
6.2	Delivery Plan and Timeframe for Data Collection	28

6.3	Reporting of Monitoring and Evaluation Findings	30
7.	Dissemination Plan	31
7.1	Introduction.....	31
7.2	Dissemination Reporting	31
7.3	Stakeholder Engagement.....	31
7.4	Lessons Learnt.....	31

Tables

Table 2.1:	MATS Scheme Objectives	8
Table 3.1:	Benefits Strategy.....	14
Table 4.1:	Standard Monitoring Measures.....	17
Table 4.2:	Monitoring and Evaluation Data Requirements	18
Table 4.3:	Monitoring and Evaluation Approach – Outcomes	19
Table 5.1:	Monitoring and Evaluation Plan (MATS Broad Street)	22
Table 5.2:	Monitoring and Evaluation Plan (MATS Remaining Schemes)	23
Table 5.3:	Risk Matrix and Mitigations	26
Table 6.1:	Delivery Plan	28
Table 6.2:	Project Milestones.....	29

Figures

Figure 1.1:	MATS FBC Phasing Structure	2
Figure 2.1:	March Location Area.....	6
Figure 3.1:	Logic Map	13
Figure 4.1:	Scheme Locations	20

1. Introduction

1.1 Scope

- 1.1.1 This document is the Monitoring and Evaluation Plan for the March Area Transport Study (MATS) Broad Street Scheme (FBC1) and provides an update on the Outline Business Case (OBC) for the remaining MATS improvement schemes, namely the A141 / Peas Hill Roundabout, A141 / Hostmoor Avenue, A141 / Twenty Foot Road, B1101 High Street / St Peter's Road and the Northern Industrial Link Road. This report has been produced in conjunction with the MATS Full Business Case (FBC1) on behalf of Cambridge County Council (CCC).
- 1.1.2 The aim of this report is to support the March Area Transport Study (MATS) Full Business Case (FBC1) by explaining the proposals for post scheme monitoring and evaluation to determine whether the schemes have successfully met their objectives and the anticipated benefits have been realised.

1.2 MATS FBC Structure

- 1.2.1 For context, the MATS FBC will be presented in three phases, with each focusing on the delivery of different schemes from the overall MATS package. Each phase will present the case for investment for the whole MATS package, confirming the strategic benefits associated with delivering all five schemes, as well as demonstrating (through sensitivity testing) that the funding for each phase will still deliver value and benefits should future phases falter.
- 1.2.2 The FBC phasing is presented in Figure 1.1 beneath, with dark teal indicating when each scheme will reach full FBC status, and the light teal showing an update to the information presented in the OBC (but not fully developed to FBC).

- 1.2.4 This approach creates an FBC 1 which is focused on the delivery of the MATS Broad Street Scheme. This is effectively a hybrid FBC / OBC + as shown in Figure 1.1. The FBC components relate to the Broad Street Scheme, and the OBC+ components relate to the remaining four schemes which were included in the OBC presented to CPCA Board in November 2021 but have been updated within this submission following completion of the Detailed Designs (and Preliminary Design for the Northern Industrial Link Road).
- 1.2.5 For clarity, the information that relates specifically to the FBC for the Broad Street Scheme (FBC1) is presented within teal-coloured boxes as shown below, enabling the reader to distinguish clearly between information pertinent to the MATS Broad Street Scheme FBC1 and the OBC+ for the remaining MATS schemes.

Information that is pertinent to the MATS Broad Street Scheme (FBC1) is presented within these teal-coloured boxes).

- 1.2.6 It is anticipated that FBC1 will be updated to FBC2 and presented to the CPCA in December 2023 to request the release of construction funding for the A141 / Peas Hill Roundabout and A141 / Hostmoor Avenue Junction, A141 / Twenty Foot Road and B1101 High Street / St Peter's Road schemes. Detailed Design on these schemes has been completed, and the remaining tasks required to produce FBC2, including procurement, planning approvals and land acquisition will be completed throughout 2023.
- 1.2.7 A third phase (FBC 3) will then present the case for investment for the Northern Industrial Link Road (NILR). The technical assessment undertaken in earlier phases of this study identified that the NILR is required in the medium-term future (by 2028) and has been separated from FBC 2 to ensure the necessary information for this scheme, including a confirmed procurement route and a scheme target cost, is current at the time of construction.

1.3 Purpose of This Document

1.3.1 DfT guidance¹ stipulates that monitoring and evaluation arrangements should be outlined at the Outline Business Case (OBC) stage and completed at the Full Business Case (FBC) stage. The monitoring and evaluation information included in a business case should summarise outline arrangements for monitoring and evaluating the intervention.

1.3.2 For context, the Green Book (2020)² defines monitoring and evaluation as follows:

- **Monitoring** – the collection of data, both during and after implementation to improve current and future decision making
- **Evaluation** – the systematic assessment of an intervention’s design, implementation, and outcomes. It tests: if or how far an intervention is working or has worked as expected; if the costs and benefits were as anticipated; whether there were significant unexpected consequences; and how it was implemented and if changes were made why.

1.3.3 This document has been prepared in accordance with the Department for Transport’s Monitoring and Evaluation Framework for Local Authority Major Schemes (2012).³

1.4 Document Structure

1.4.1 For the most part, this document is structured in accordance with the monitoring and evaluation plan guidance for standard monitoring, as provided in Appendix 5 of the Department for Transport’s (DfT’s) Monitoring and Evaluation Framework for Local Authority Major Schemes (2012)⁴. It is structured as follows:

- **Chapter Two** provides information relating to the scheme background and context
- **Chapter Three** provides information relating to the scheme inputs, outputs, outcomes, and impacts
- **Chapter Four** outlines the data collection methods
- **Chapter Five** outlines the resourcing and governance arrangements
- **Chapter Six** outlines the delivery plan
- **Chapter Seven** outlines the dissemination plan.

¹ DfT (2022). <https://www.gov.uk/government/publications/transport-business-case/transport-business-case-guidance>

² HM Treasury (2020). [The Green Book: Central Government Guidance on Appraisal and Evaluation](#)

³ DfT (2012). [Monitoring and Evaluation Framework for Local Authority Major Schemes](#)

⁴ DfT (2012). [Monitoring and Evaluation Framework for Local Authority Major Schemes](#)

2. Scheme Background and Context

2.1 Introduction

Fenland

- 2.1.1 Fenland covers approximately 200 square miles within the county of Cambridgeshire. It is a rural and sparsely populated district with many diverse communities, each with very different needs. Geographically, Cambridge and the rest of Cambridgeshire are to the south, Peterborough to the west, Wisbech and King's Lynn to the north-east, and West Norfolk to the east. The sub-regional centres of Cambridge, Peterborough and King's Lynn have a considerable influence on various parts of the district in terms of employment, retail and health provision.
- 2.1.2 Although the district remains relatively sparsely populated, Fenland has experienced considerable housing and population growth in recent years, in line with growth across Cambridgeshire. According to the 2011 Census, Fenland had a population of approximately 95,300, compared to 83,700 in 2001 and 75,500 in 1991, and has continued to grow rapidly since 2011. In 2020, Fenland had an estimated total population of approximately 102,080⁵, which represents a 7% increase since 2011. This growth is expected to continue and needs to be positively planned for.
- 2.1.3 Growth in employment in Fenland has not matched workforce expansion and out-commuting is increasing. Currently, almost 40% of Fenland's working population commute out of the district for work. To meet the needs of a growing workforce, Fenland requires growth in employment land and business opportunities. To achieve this, infrastructure needs to be improved to retain and attract employers.
- 2.1.4 The population distribution of Fenland is characteristically rural, with the four market towns of Wisbech, March, Whittlesey and Chatteris forming the main population centres, each with their own distinct and individual character.

March

- 2.1.5 The location of March relative to surrounding areas is shown in Figure 2.1, below. March is a historic market town at the heart of The Fens with a population of approximately 22,980 as of 2011.⁶ It forms the administrative centre of Fenland and lies at the heart of the district's ongoing economic function as a centre for agriculture, reflected in the number of food production businesses which are key employers in the town.

⁵ <https://cambridgeshireinsight.org.uk/population/report/view/f7de925f5608420c825c4c0691de5af2/E07000010/>

⁶ https://www.fenland.gov.uk/media/16583/Fenland-Monitoring-Report-2018-2019/pdf/Fenland_Monitoring_Report_2018-2019.pdf?m=637261848570770000

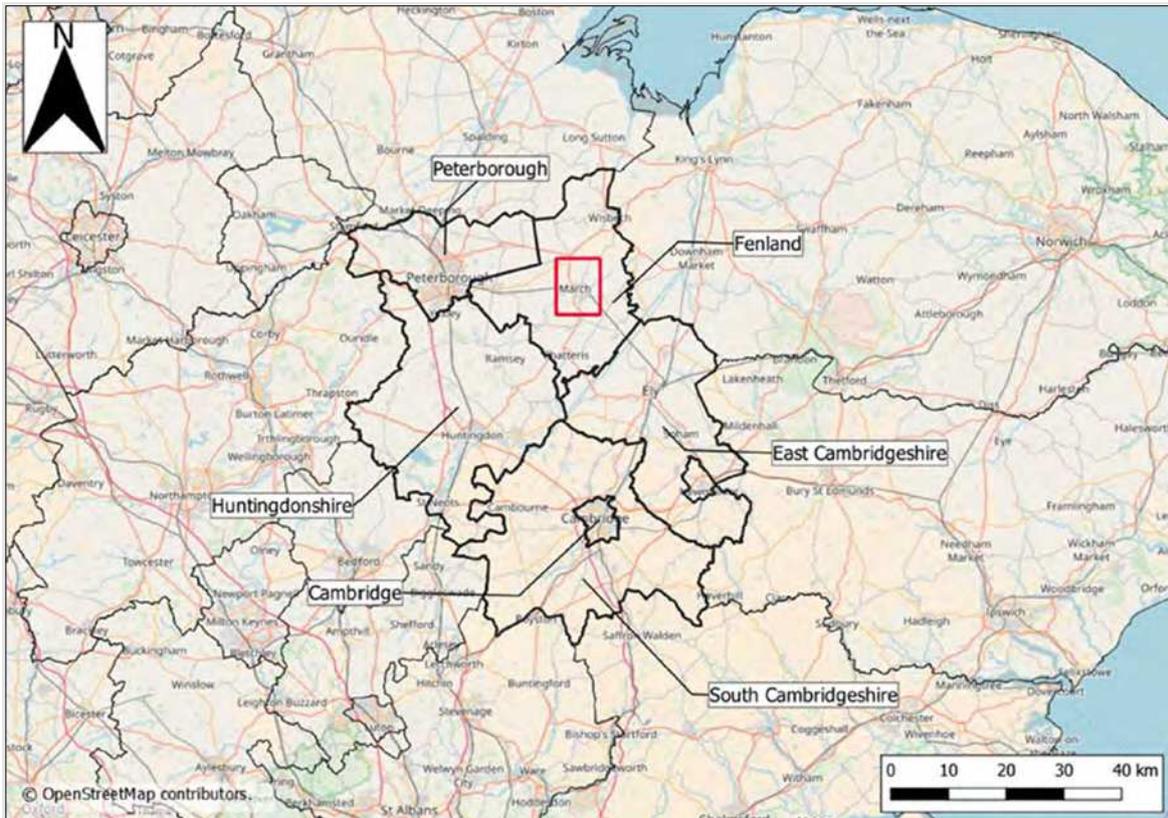


Figure 2.1: March Location Area

- 2.1.6 A review of 2011 Census data revealed that approximately 61% of employed individuals both lived and worked in March, with approximately 39% commuting out of the town for work.
- 2.1.7 Investment in local transport infrastructure is central to ensuring the long-term economic prosperity of March as a thriving market town, by helping to revitalise the town centre, encourage inward investment and realise aspirational housing and employment growth ambitions.

2.2 Purpose of the MATS

- 2.2.1 The purpose of the MATS is “to identify potential transport interventions in March to address existing capacity and safety problems whilst mitigating for future growth in the demand for travel resulting from increases in housing and employment opportunities identified in the Fenland Local Plan (2014).”
- 2.2.2 The adopted Local Plan includes targets for the delivery of 4,200 new homes in March and 30 hectares of employment land, with the potential to provide over 2,000 new jobs. March is a focus for housing, employment, and retail growth within the district.
- 2.2.3 The MATS Improvement Schemes are aimed at addressing and realising adopted Local Plan growth by 2031, rather than emerging Local Plan growth

2.3 Scheme Objectives and Outcomes

- 2.3.1 To provide focus for the MATS Improvement Schemes, a set of clear, specific objectives have been established which align with the strategic and local policy drivers and address the identified issues. Scheme objectives need to consider the key stakeholder views and opinions, as well as the scheme constraints and interdependencies with other projects, to address the identified issues
- 2.3.2 In order to devise specific objectives for the MATS Improvement Schemes, an Objective Setting Workshop was held on 17th June 2020. This was attended by transport, planning and engineering representatives from key stakeholders, including:
- CPCA
 - CCC
 - FDC
 - Skanska (Milestone) / Capita.
- 2.3.3 Twelve scheme objectives, which remain unchanged since the SOBC, will be used to measure the success of the recommended package of MATS Improvement Schemes.
- 2.3.4 The objectives of the MATS Improvement Schemes, which were established at the SOBC stage, are set out in

Table 2.1: MATS Scheme Objectives

- 2.3.5 overleaf. Those objectives which are specific to the MATS Broad Street Scheme are shown in teal-green.

Table 2.1: MATS Scheme Objectives

1	Regeneration of March Town Centre	a	Deliver a transport scheme for Broad Street that is compatible with the FHSF scheme
		b	Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience, and drive growth
		c	Maximise public realm within Broad Street
		d	Enhance pedestrian safety and accessibility around the town centre
2	Address Existing Traffic Congestion and Safety Issues	a	Address existing congestion issues within the town centre (Broad Street area)
		b	Address existing congestion issues along the A141 around Peas Hill roundabout
		c	Improve pedestrian level of service around Broad Street
		d	Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction
3	Facilitate Housing and Employment Growth	a	Support Local Plan development proposals
		b	Ensure sustainable access to proposed Local Plan development
4	Improve Local Environmental Conditions	a	Improve air quality conditions around Broad Street
		b	Facilitate the enhancement of heritage assets around Broad Street.

Almost all the objectives listed above either directly relate to, or are relevant to, the MATS Broad Street Scheme.

SMART Objectives

The following SMART Objectives have been developed to enable the success and benefits of the MATS Broad Street Scheme to be clearly and accurately measured through post scheme monitoring and evaluation. The SMART measure for each of the objectives is provided beneath in green.

1. Regeneration of March Town Centre

- a. Deliver a transport scheme for Broad Street that is compatible with the FHSF scheme: *Deliver an improvement at the B1101 Broad Street / B1099 Dartford Road / B1101 Station Road Junction which replaces the existing traffic signal-controlled junction with a roundabout and reduces Broad Street to a single lane in each direction.*
- b. Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience, and drive growth: *Deliver an improvement at the B1101 Broad Street / B1099 Dartford Road / B1101 Station Road Junction that enables the FHSF scheme design to be realised.*
- c. Maximise public realm within Broad Street: *Reduce the carriageway footprint to enable the creation of an additional 50% of Public Realm.*
- d. Enhance pedestrian safety and accessibility around the town centre: *Increase the number of pedestrian crossing locations at the B1101 Broad Street / B1099 Dartford Road / B1101 Station Road Junction and along Broad Street and reduce the B1101 Broad Street to a single lane in each direction.*

2. Address Existing Traffic Congestion and Safety Issues

- a. Address existing congestion issues within the town centre (Broad Street area): Reduce delay to 30 seconds (or less) on all approaches to the B1101 Broad Street / B1099 Dartford Road / B1101 Station Road Junction to during the AM and PM peak hours by 2026.
- b. Address existing congestion issues along the A141 around Peas Hill roundabout: This objective does not relate to the MATS Broad Street Scheme, and a SMART objective will be developed for FBC2.
- c. Improve pedestrian level of service around Broad Street: Achieve an 80% increase in user satisfaction in the level and quality of pedestrian provision in post scheme surveys.
- d. Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction: This objective does not relate to the MATS Broad Street Scheme, and a SMART objective will be developed for FBC2.

3. Facilitate Housing and Employment Growth

- a. Support Local Plan development proposals. This objective does not directly relate to the MATS Broad Street Scheme, and a SMART objective will be developed for FBC2.
- b. Ensure sustainable access to proposed Local Plan development: This objective does not directly relate to the MATS Broad Street Scheme as there is no Local Plan development situated within the immediate vicinity of the town centre.

4. Improve Local Environmental Conditions

- a. Improve air quality conditions around Broad Street. Reduce NOx and PM2.5 emissions by 5% by 2026.
- b. Facilitate the enhancement of heritage assets around Broad Street: Enable the refurbishment and relocation of the March Town Centre Fountain as part of the MATS / FHSF Broad Street Scheme to enhance its position and enjoyment by local residents.

3. Scheme Inputs, Outputs, Outcomes, and Impacts

3.1 Introduction

3.1.1 The purpose of this chapter is to identify the scheme inputs, outputs, outcomes, and impacts. Assumptions underpinning how the scheme will achieve the associated outcomes and impacts is provided in the form of a logic map.

3.2 Inputs

3.2.1 The following inputs have been identified:

- Transforming Cities Fund (TCF) via the CPCA Single Investment Fund.

3.3 Outputs

3.3.1 The following outputs have been identified:

- Broad Street Roundabout
- Northern Industrial Link Road (NILR)
- Peas Hill Roundabout & Hostmoor Avenue Traffic Signals
- St Peter's Road Improvement
- Twenty Foot Road Signals
- Northern Industrial Link Road.

3.4 Outcomes

3.4.1 The following outcomes have been identified:

- Addresses existing congestion issues
- Enables the delivery of the FHSF scheme
- Improves pedestrian level of service around Broad Street
- Improves safety.

3.5 Impacts

3.5.1 The following impacts have been identified:

- Ensures sustainable access to proposed Local Plan development
- Facilitates the enhancement of heritage assets around Broad Street
- Fewer accidents
- Improved air quality conditions around Broad Street
- Improved pedestrian experience in March town centre, which encourages active travel and increased footfall (with subsequent economic benefits)
- Positive contribution to the regeneration of March town centre
- Supports Local Plan development proposals.

3.6 Logic Map

3.6.1 A logic map, which shows the inputs, outputs, outcomes, and impacts identified above, is provided overleaf in **Error! Reference source not found.**⁷.

⁷ Note that the logic map was produced in line with the following report that was commissioned by the DfT:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/3817/logicmapping.pdf

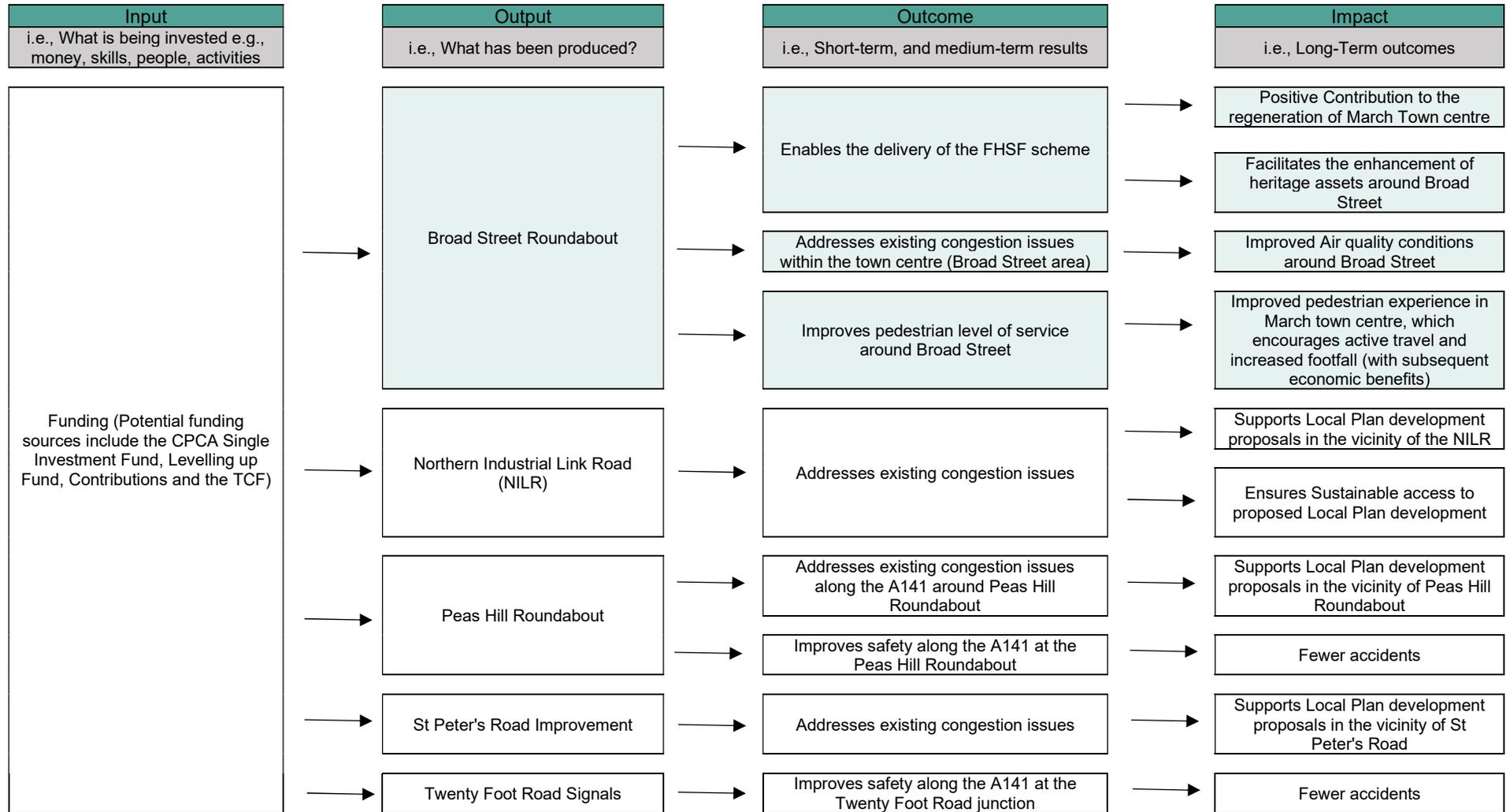


Figure 3.1: Logic Map

3.7 Benefits Strategy

Table 3.1: Benefits Strategy

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Benefit Owners	Benefit Enablers	Timescales
<p>Regeneration of March Town Centre:</p> <ul style="list-style-type: none"> Deliver a transport scheme for Broad Street that is compatible with the FHSF scheme Ensure a transport scheme for Broad Street is aligned with FHSF core Objectives to renew and reshape town centres, improve user experience, and drive growth Maximise public realm within Broad Street Enhance pedestrian safety and accessibility around the town centre 	<ul style="list-style-type: none"> Broad Street / Dartford Road/Station Road Mini Roundabout Reduce the number of lanes to one in each direction on Broad Street 	<ul style="list-style-type: none"> Deliver a transport scheme for Broad Street that is compatible with the FHSF Ensure a transport scheme for Broad Street is aligned with FHSF Core Objectives to renew and reshape town centres, improve user experience, and drive growth Maximise public realm within Broad Street Enhance pedestrian safety and accessibility around the town centre Wider social benefits 	<ul style="list-style-type: none"> Commuters / Business trips Local Residents Visitors to the City Bus Operators 	CPCA / CCC	<ul style="list-style-type: none"> Completion of the schemes Monitoring of network performance Promotion of March City Area 	<ul style="list-style-type: none"> Benefit(s) to be realised within one year post scheme opening
<p>Address Existing traffic Congestion and safety Issues:</p> <ul style="list-style-type: none"> Address existing congestion issues within the town centre (Broad Street area) Address existing congestion issues along the A141 around Peas Hill roundabout Improve pedestrian level of service around the Broad Street Improve safety along the A141 at Peas Hill Roundabout and the Twenty-foot Road junction 	<ul style="list-style-type: none"> A141 / Peas Hill Roundabout Improvements (52m ICD) along with creation of an all-movement signalised junction at the A141 / Hostmoor Avenue Junction. A141 / Twenty Foot Road Signals Development of Northern Industrial Link Road (NILR) 	<ul style="list-style-type: none"> Address existing congestion issues within the town centre (Broad Street area) Address existing congestion issues along the A141 around Peas Hill Roundabout Improve pedestrian level of service around Broad Street Improve safety along the A141 at Peas Hill Roundabout and the Twenty Foot Road Junction Monetise (quantifiable) benefits due to fewer accidents Monetise journey time savings 	<ul style="list-style-type: none"> FDC in regard to fulfilment of the Local Plan Businesses in March Residents / Local Community Commuters / Business trips 	CPCA / CCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of March City Area Monitoring of network performance Road safety audit Monitoring / investigation of accidents 	<ul style="list-style-type: none"> Benefit(s) to be realised once the scheme has been implemented and is open to the public.
<p>Facilitate Housing and Employment Growth:</p> <ul style="list-style-type: none"> Support Local Plan development proposals Ensure sustainable access to proposed Local Plan Development 	<ul style="list-style-type: none"> Development of Northern Industrial Link Road (NILR) High Street / St peter's Road Traffic Signal Improvements 	<ul style="list-style-type: none"> Support Local Plan development proposals Ensure sustainable access to proposed Local Plan development Wider social benefits (improved availability of housing and employment) 	<ul style="list-style-type: none"> FDC in regard to fulfilment of the Local Plan Residents / Local Community 	CPCA / CCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of Fengate businesses and wider City Area 	<ul style="list-style-type: none"> Benefit(s) to be realised once the scheme has been implemented and is open to the public.
<p>Improve Local Environmental Conditions:</p> <ul style="list-style-type: none"> Improve air quality conditions around Broad Street Facilitate the enhancement of heritage assets around Broad Street 	<ul style="list-style-type: none"> Broad Street / Dartford Road / Station Road Mini Roundabout Reduce the number of lanes to one in each direction on Broad Street 	<ul style="list-style-type: none"> Improved air quality in future years. Facilitate the enhancement of heritage assets around Broad Street Achievement of 10% biodiversity net gain Wider social benefits 	<ul style="list-style-type: none"> CCC / CPCA in regard to environment and biodiversity Businesses in March Residents / Local Community 	CPCA / CCC	<ul style="list-style-type: none"> Completion of the schemes Promotion of Fengate businesses and wider City Area Biodiversity Net Gain Calculation Air quality monitoring 	<ul style="list-style-type: none"> Benefit(s) to be realised once the scheme has been implemented and is open to the public.

4. Data Collection Methods

4.1 Introduction

- 4.1.1 The purpose of this chapter is to provide an overview of the data collection approaches, including assumptions being made about sample sizes, mode, and frequency of data collection.
- 4.1.2 The Monitoring and Evaluation Plan for the MATS Improvement Schemes takes a proportionate and targeted approach and aims to demonstrate how the scheme has performed in relation to its objectives and intended outcomes.
- 4.1.3 The monitoring plan is designed to determine whether the MATS Improvement Schemes:
- Has been designed and delivered efficiently and effectively
 - Has met the requirements of the stated scheme objectives
 - Has achieved the desired outcomes and impacts
 - Represents value for money
 - Resulted in any unintended outcomes and impacts (both positive and negative)

4.2 Types of Measures

- 4.2.1 The following types of measure will be monitored, as defined in the DfT framework:
- Inputs – what is being invested to deliver the Scheme
 - Outputs – what has been delivered, and how it is being used
 - Outcomes – intermediate effects of the Scheme, such as changes in traffic flow
 - Impacts – longer-term effects on wider social and economic outcomes, such as economic growth

4.3 Stages of Monitoring and Evaluation

4.3.1 Monitoring and Evaluation is required both during the development and construction, as well as in the years following implementation of the improvement scheme, in order to meet the stated evaluation objectives and effectively assess any scheme outcomes and impacts.

4.3.2 As per the DfT standard monitoring guidance, the monitoring process will be split into three stages:

- **Pre-construction and during delivery (monitoring)**
 - Baseline data is 2018 surveys, limited surveys / assessments to be undertaken in 2022 before scheme construction commences as part of FBC
 - Data to monitor scheme delivery will be collected during construction
- **One-year after (Monitoring and Evaluation)**
 - Data to monitor scheme performance will be collected at least one year (but less than two years) after scheme opening.
 - An initial “One Year After” report will be published within two years of scheme opening, focusing on the scheme’s outcomes
- **Five-years after (Monitoring and Evaluation)**
 - Further data will be collected up to approximately five years after scheme opening
 - A final “Five Years After” report will be published within six years of scheme opening, based on analysis of all the data available, including an assessment of the wider impacts of the scheme

4.4 Measures to be Monitored

4.4.1 The measures which will be monitored for evaluation of the scheme, as stated within the DfT standard monitoring guidance, are set out in Table 4.1 beneath.

Table 4.1: Standard Monitoring Measures

Item	Type of Measure	Data Collection Timing	Rationale
Scheme Build	Input	During Delivery	Knowledge
Delivered Scheme	Output	During Delivery Post Opening (1 Year)	Accountability
Scheme Costs	Input	During Delivery Post Opening (1 Year)	Accountability
Scheme Objectives	Output / Outcome / Impact	Pre-Delivery Post Opening (up to 5 years)	Accountability
Travel Demand	Outcome	Pre-Delivery Post Opening (1 year and up to 5 Years)	Accountability / Knowledge
Travel Time and Reliability	Outcome	Pre-Delivery Post Opening (1 year and up to 5 Years)	Accountability / Knowledge
Impact on Economy	Impact	Pre-Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge
Impact on Local Environment / air quality	Impact	Pre-Delivery During Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge
Carbon	Impact	Pre-Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge

4.4.2 In addition, an assessment will be undertaken to determine the extent to which the MATS Improvement Schemes have delivered the Value for Money (VfM) that was anticipated in the appraisal set out in the FBC. This will be done by re-calculating the benefit-cost ratio (BCR) in both the “One Year After” and “Five Years After” reports and comparing it to the BCR calculated in the FBC.

4.4.3 Data collection for the package of schemes is required at various stages through scheme development to ensure effective monitoring and evaluation takes place.

4.4.4 Table 4.1 overleaf beneath sets out the data that will be collected to monitor and evaluate the MATS improvement schemes, along with the rationale for its inclusion, the proposed data collection method, and the proposed frequency of data collection.

Table 4.2: Monitoring and Evaluation Data Requirements

Measure	Data to be Used	Rationale for Inclusion	Data Collection Method	Frequency of Data Collection
Scheme Build	<ul style="list-style-type: none"> Progress of construction against key milestones Qualitative feedback from the Project Team Information from the Risk Register Project programme / disruptions to delivery 	To gain knowledge and understanding of the level of effectiveness of the scheme build processes and to learn lessons for future projects.	<ul style="list-style-type: none"> Analysis of key project documents by the scheme's Project Team, including Risk Register, Review of Early Warnings etc, Interviews with key staff 	On-going throughout the construction and delivery of the schemes, reporting on monthly basis
Delivered Scheme	<ul style="list-style-type: none"> Scheme definition at full funding approval Scheme design drawings Logged design iterations Information from project change control log 	To assess the impact of change during construction, and realisation of scheme objectives.	<ul style="list-style-type: none"> Desk study / site visits Analysis of key project documents by the schemes Project Board 	During construction and 1 year after scheme opening
Scheme Costs	<ul style="list-style-type: none"> Forecast scheme costs at time of funding approval (FBC) Actual outturn costs once scheme is completed 	Cost analysis enables 'performance to budget' to be monitored and corrective actions to be implemented. Lessons Learnt to be realised and implemented for other similar projects, alongside having potential to refine contractual arrangements where necessary.	<ul style="list-style-type: none"> Financial monitoring of the scheme costs from approval to scheme completion Project Manager's monthly reports to Project Board Interviews with key staff 	Ongoing throughout construction and delivery of the scheme, reporting on a monthly basis.
Travel Demand	<ul style="list-style-type: none"> Daily traffic flows classified into vehicle types and by movement 	To monitor changes in traffic flows in March, more specifically at the junctions / links to be improved.	<ul style="list-style-type: none"> Desk study / site visits Collated data from 12-hour manual classified counts 	Baseline 2018 before scheme completion, 1 year after scheme opening and 5 years after scheme opening. ATC - continuous monitoring
Travel Times and Reliability	<ul style="list-style-type: none"> TomTom or Traffic Master data 	To monitor changes in travel times and queuing on key routes in March	<ul style="list-style-type: none"> Desk study / site visits Survey footage review Journey time dataset for a month period 	Baseline 2018 before scheme completion, 1 year after scheme opening and 5 years after scheme opening.
Impact on Economy	<ul style="list-style-type: none"> Local employment statistics 	To assess the economic impact of the scheme on March	<ul style="list-style-type: none"> Desk Study of economic data provided by CCC Review of Local Plan goals for economic growth 	Baseline 2018, before scheme completion, 1 year after scheme opening and 5 years after scheme opening
Impact on the Local Environment / Air Quality	<ul style="list-style-type: none"> Carbon emission workshops / calculations Biodiversity calculations – completed scheme maps 	To monitor and assess the emissions as a result of the MATS schemes and any impact on the environment	<ul style="list-style-type: none"> Desk study / site visits Analysis of key project documents by the schemes Project Board 	Baseline 2018, during construction, before scheme completion, 1 year after scheme opening and 5 years after scheme opening
Carbon	<ul style="list-style-type: none"> Carbon emission workshops / calculations Traffic flows and speeds around the March 	To monitor carbon emission within the March area as a result of the scheme	<ul style="list-style-type: none"> Desk Study analysis FBC calculation for carbon Analysis of key project documents by the schemes Project Board 	Baseline 2018, before scheme completion, 1 year after scheme opening and 5 years after scheme opening

Outputs

4.4.5 The outputs identified for the MATS consist of the infrastructure schemes, comprising the Broad Street Roundabout, NILR, Peas Hill Roundabout, St Peter’s Road Improvement, and the Twenty Foot Road Signals. The scheme designs and plans form the baseline information for these outputs. Once the schemes have been delivered, on-street audits can be undertaken to verify that these schemes have been delivered in accordance with the scheme designs and plans, which will constitute successful delivery of these outputs. In this instance, the anticipated output value of the proposed schemes cannot be quantified per se, as the measure is binary in the sense that either: “yes, the schemes have been successfully delivered”, or “no, the schemes have not been successfully delivered”.

Outcomes

4.4.6 The monitoring and evaluation approach with regard to the outcomes is outlined in Table 4.3 below.

Table 4.3: Monitoring and Evaluation Approach – Outcomes

Outcome	Proposed Approach for Monitoring	Anticipated Outcome Value	Proposed Method of Collecting Baseline Information
Addresses existing congestion issues	Compare pre-scheme traffic data with post-scheme traffic data.	Reduced queue lengths. Reduced delays. Increased junction capacity.	Collect pre-scheme traffic data (e.g., ACTs, MCTCs, queue length surveys).
Enables the delivery of the FHSF scheme	On-street audit to verify that the delivery of the Broad Street Scheme has enabled the delivery of the FHSF scheme.	Successful delivery of the FHSF scheme, including all identified FHSF components.	From previously undertaken site visits, it is evident that the FHSF cannot be delivered without changes to the highway layout around Broad Street. As such, additional baseline information is not required.
Improves pedestrian level of service around Broad Street	On-street audits to understand how the scheme will change pedestrian level of service around Broad Street.	Improved pedestrian level of service.	From previously undertaken site visits, the project team has an understanding of existing pedestrian level of service around Broad Street, and this is documented in the OBC, OAR, and other associated reports. As such, additional baseline information is not required.
Improves safety	Compare pre-scheme accident data with post-scheme accident data.	Fewer accidents. Reduced accident severity.	Obtain data from CCC.

4.5 Spatial Coverage

4.5.1 Data will be collected for the different scheme locations in Figure 4.1, which comprises the town of March.

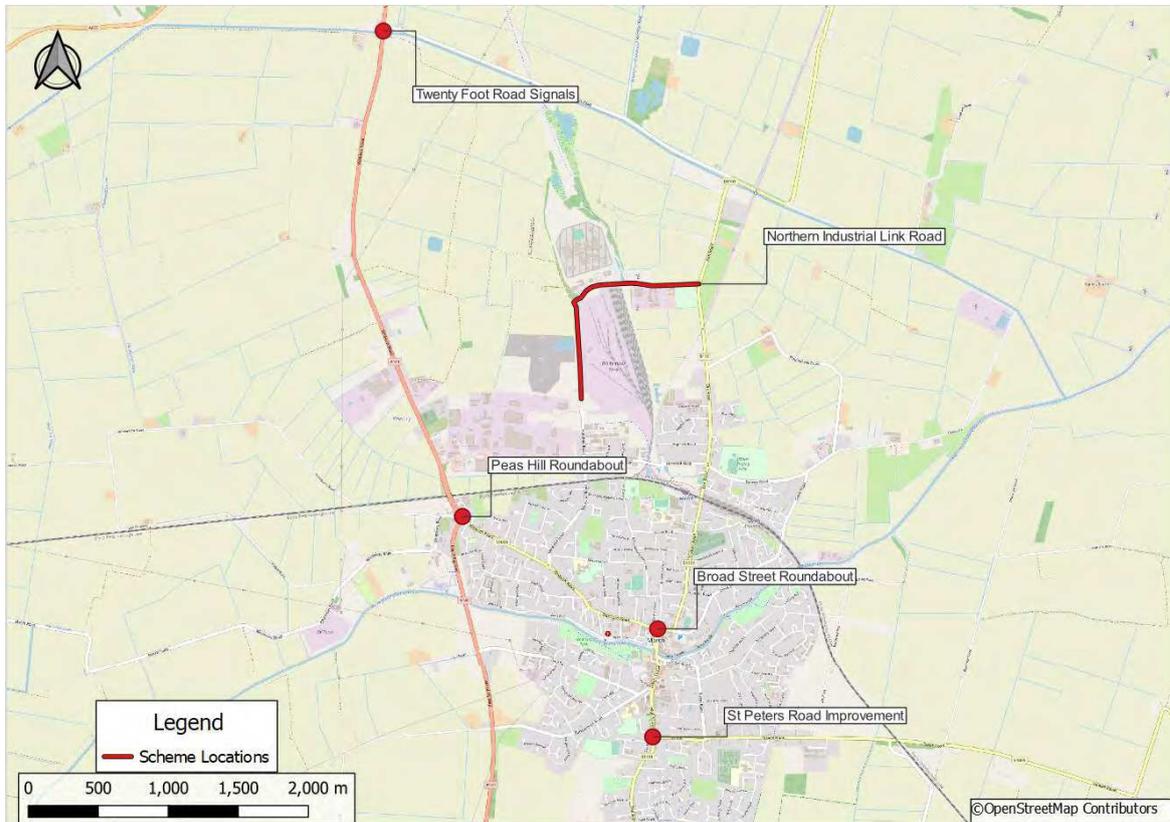


Figure 4.1: Scheme Locations

5. Resourcing and Governance

5.1 Introduction

- 5.1.1 The purpose of this chapter is to provide details of the monitoring and evaluation budget(s) and the governance structure for the delivery of the Monitoring and Evaluation plan, including details of who will be responsible for delivering the plan and procedures for risk management and quality assurance.

5.2 Monitoring and Evaluation Budget(s)

Green Book Guidance

- 5.2.1 The Green Book (paragraph 1.7) specifies that the “monitoring and evaluation of all proposals should be proportionately included in the budget and the management plan of all significant proposals as an integral part of all proposed interventions.”

MATS Monitoring and Evaluation Budget(s)

- 5.2.2 The cost of baseline / implementation reporting has been included in the scheme development costs and are reported in the MATS FBC1.
- 5.2.3 An indicative cost estimate for monitoring and evaluation activities and reporting is £5,000 (MATS Broad Street) and £20,000 (MATS remaining schemes). A detailed cost estimate for these activities and information relating to budgetary responsibility is provided in the Table 5.1 and Table 5.2 overleaf.

Table 5.1: Monitoring and Evaluation Plan (MATS Broad Street)

	Measure	Measure of Success	Data Source	Data Collection / Reporting Programme			Ownership	Indicative Cost Estimate
				Baseline	Delivery	Post Completion		
Inputs-	Scheme Costs	CPCA Funding	CPCA Funding submission Final Scheme Cost Data	Planned	October 2022 – January 2023	-	CPCA / CCC	-
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Inspection On-Site	March 2018	February 2023 – March 2024	2025	CPCA / CCC	£300
Objectives	Outcomes							
1 / 2	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage	October 2019	-	March 2025 / March 2029	CPCA / CCC	£100 for data analysis at both 1 year and 5 year reporting Total = £200
		Enhanced Network Performance for Public Transport, namely for the Stagecoach 46 and 56 Service	Local Bus Company Punctuality Data	2019 / 2022	-	March 2025 / March 2029	CPCA / CCC	£100 for data analysis at both 1 year and 5 year reporting Total = £200
		New Infrastructure for Sustainable Modes	Site Inspection / Usage Data	2021 / 2022	-	March 2025 / March 2029	CPCA / CCC	£100 for data analysis at both 1 year and 5 year reporting Total = £200
		Reduce the number of accidents at Broad Street Area	Cambridgeshire County Council	Dataset 2014 - 2019	-	March 2025 / March 2029	CPCA / CCC	£100 for data analysis at both 1 year and 5 year reporting Total = £200
1/2	Travel Demand	Enhanced Network Performance, Broad Street Area	Classified Turning Counts / Site Visits / Video Survey Footage	October 2019	-	March 2025 / March 2029	CPCA / CCC	£750 for count surveys and £100 for data analysis at both 1 year and 5 year reporting Total = £1,700
1/2/3	Impact on Economy	Employment Growth Ambitions in March	CCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2019	-	March 2025 / March 2029	CPCA / CCC	£100 for data analysis at both 1 year and 5 year reporting Total = £200
4	Impact on the Local Environment	Ensure a Net Gain of Biodiversity across the Study Area	Biodiversity Calculation / Site Survey and Desk Based Assessment	October 2022	-	March 2025 / March 2029	CPCA / CCC	£200 for site inspections and data analysis at both 1 year and 5 year reporting Total = £400
2/4	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / CCC Air Quality Monitoring Sites / Future traffic demand data	October 2022	-	March 2025 / March 2029	CPCA / CCC	£200 data analysis at both 1 year and 5 year reporting Total = £400
Reporting	Year 1 reports summarising the outcomes of the monitoring and evaluation work			-	-	2025	CPCA / CCC	£600
	Year 5 report summarising local economic growth, scheme impacts and development figures prior and post opening of the scheme			-	-	2029	CPCA / CCC	£600
Total Monitoring and Evaluation Budget								£5,000

Table 5.2: Monitoring and Evaluation Plan (MATs Remaining Schemes)

	Measure	Measure of Success	Data Source	Data Collection / Reporting Programme			Ownership	Indicative Cost Estimate
				Baseline	Delivery	Post Completion		
Inputs-	Scheme Costs	CPCA Funding	CPCA Funding submission Final Scheme Cost Data	Planned	October 2022 – January 2023	-	CPCA / CCC	-
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Inspection On-Site	March 2018	November 2022 – March 2024	2028	CPCA / CCC	£1200
Objectives	Outcomes							
1 / 2	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage	October 2019	-	November 2028 / November 2032	CPCA / CCC	£400 for data analysis at both 1 year and 5 year reporting Total = £800
		Enhanced Network Performance for Public Transport, namely for the Stagecoach 56 and 46 Service	Local Bus Company Punctuality Data	2019 / 2022	-	November 2028 / November 2032	CPCA / CCC	£400 for data analysis at both 1 year and 5 year reporting Total = £800
		New Infrastructure for Sustainable Modes	Site Inspection / Usage Data	2021 / 2022	-	November 2028 / November 2032	CPCA / CCC	£400 for data analysis at both 1 year and 5 year reporting Total = £800
		Reduce the number of accidents along Northern Industrial Link Road, Peas Hill Roundabout and Twenty Foot Road Junction	Cambrighshire County Council	Dataset 2014 - 2019	-	November 2028 / November 2032	CPCA / CCC	£400 for data analysis at both 1 year and 5 year reporting Total = £800
1/2	Travel Demand	Enhanced Network Performance, Broad Street Area, Peas Hill Roundabout and Twenty Foot Road Junction	Classified Turning Counts / Site Visits / Video Survey Footage	October 2019	-	November 2028 / November 2032	CPCA / CCC	£3,000 for count surveys and £400 for data analysis at both 1 year and 5 year reporting Total = £6,800
1/2/3	Impact on Economy	Employment Growth Ambitions in March	CCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2019	-	November 2028 / November 2032	CPCA / CCC	£400 for data analysis at both 1 year and 5 year reporting Total = £800
4	Impact on the Local Environment	Ensure a Net Gain of Biodiversity across the Study Area	Biodiversity Calculation / Site Survey and Desk Based Assessment	October 2022	-	November 2028 / November 2032	CPCA / CCC	£800 for site inspections and data analysis at both 1 year and 5 year reporting Total = £1600
2/4	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / CCC Air Quality Monitoring Sites / Future traffic demand data	October 2022	-	November 2028 / November 2032	CPCA / CCC	£800 data analysis at both 1 year and 5 year reporting Total = £1600
Reporting	Year 1 reports summarising the outcomes of the monitoring and evaluation work			-	-	2028	CPCA / CCC	£2,400
	Year 5 report summarising local economic growth, scheme impacts and development figures prior and post opening of the scheme			-	-	2032	CPCA / CCC	£2,400
Total Monitoring and Evaluation Budget								£20,000

5.3 Governance Structure

- 5.3.1 The CPCA have the responsibility for ensuring Value for Money from the MATS package of schemes. Under the CPCA, CCC will be responsible for ensuring the Monitoring and Evaluation Plan is undertaken as outlined within this report.
- 5.3.2 Monitoring during construction and post scheme opening is likely to be undertaken by CCC. However, owners for each monitoring task should be defined following the approval of the FBC.
- 5.3.3 Delivery of the scheme to date has been managed by the CCC Project Manager and wider Project Team, consisting of key project delivery partners. The Project Team have been responsible for the daily running of the project and will continue to meet on a monthly basis throughout the construction period. The main responsibilities being to:
- 5.3.4 The delivery team will continue to meet monthly throughout the construction phase of the project. Its main responsibilities are to:
- Comment on delivery and ensure sufficient resource is allocated to scheme delivery
 - Monitor overall delivery against programme to ensure key activities / milestones are completed
 - Consider project costs and risks and review and advise on any impacts to project delivery
 - Provide governance for the project and initiate corrective action where necessary
 - Provide updates, including written progress reports
- 5.3.5 The existing Project Board will be used to oversee the continued delivery of the scheme by the Project Team, and to make key decisions relating to the delivery of the project. The Project Board will be continuing to meet on a monthly basis until the scheme is complete. Arrangements will then be agreed for the on-going resource / schedule for reporting associated with the monitoring and evaluation plan of the scheme.
- 5.3.6 Full details of the governance structure for the MATS project is provided in the Management Case of the MATS FBC1.

5.4 Risk Management

5.4.1 The risk management strategy for the evaluation process is in line with the strategy for the project delivery. Risk areas identified in relation to evaluation of the project are:

- **Baseline data** – transport data issues (completeness, correctness, accuracy, and relevance), impacting on processing.
- **Baseline data collection** – unable to collect data before site opens e.g., weather, or resourcing constraints.
- **Data processing** – inaccuracy of data analysis, impacting on evaluation.
- **Future year data** – funding issues prevent future data survey collection.
- **Evaluation** – post analysis realisation that baseline data will be insufficient for purpose or potential newly identified factors.

5.4.2 Table 5.3 below highlights the calculated likelihood and severity of the risk identified for the project evaluation, as well as mitigation measures that can be taken.

Table 5.3: Risk Matrix and Mitigations

Risk	Likelihood Score (1-5)	Impact Score (1-5)	RAG Score (Likelihood x Impact)	Mitigations
Baseline Data Accuracy Accuracy lost because of programming or processing errors.	1	2	2	Baseline data has been used throughout the business case lifespan of the project. Baseline data has been reassessed in preparation for the required monitoring and evaluation, and is sufficient for future data comparisons.
Baseline Data Collection Incorrect data due to road works, weather etc	3	2	6	Construction programme is known, careful planning / weather monitoring to be undertaken when arranging surveys.
Data Processing Data recieved can be incosistent due to machine malfunction, Weather etc	1	1	2	Once data is recieved from survey companies, rigourous reviewing to be undertaken to highlight any inconsistencies / issues at the earliest point.
Future Year Data Lack of funding for future year data collection	2	5	10	Funding required for the monitoring and evaluation of the project has been costed prior to construction and will be recieved with the construction funding (approval January 2023). Funding will be separated for future use.
Evaluation Lack of funding for evaluation process.	1	2	2	As above.

5.5 Quality Assurance

- 5.5.1 The project to date has been managed by CCC in line with their existing assurance and approvals processes, namely the CPCA Assurance Framework. The CPCA Assurance Framework sits alongside a number of Combined Authority documents including the '10-point guide' mentioned above and details the fundamental principles in relation to the use, administration and evaluation of Cambridgeshire and Peterborough Investments.
- 5.5.2 Under the management of The Council, a Project Manager was assigned and has been responsible for the daily running of the project. In instances where approval was required, the Project Manager would be advised and then provided by the Project Board.

5.5.3 The Project Manager will also be responsible for quality assurance for the MEP. Development and ongoing maintenance of the scheme evaluation plan will ensure that it reflects the programme and key milestones.

5.5.4 The Project Manager will also:

- Arrange for the undertaking of quality checks by internal peer review to ensure high quality
- Record proceedings at meetings with the project board, project team and technical specialists, and reporting them in the form of meeting minutes including a clear record of actions and action dates
- Ensure compliance with the consistency in approach / assessment / presentation of documents and output
- Contribute to project close out and post project appraisal exercises for the task.

6. Delivery Plan

6.1 Introduction

6.1.1 The purpose of this chapter is to outline the project plan and timeframe for data collection, provide details regarding progress reporting back to the DfT, and outline the strategy for the reporting of monitoring and evaluation findings.

6.2 Delivery Plan and Timeframe for Data Collection

6.2.1 A delivery plan for the monitoring and evaluation of the MATS is provided in Table 6.1 below.

Table 6.1: Delivery Plan

Monitoring Activity	Broad Street Scheme Timescale	Twenty Foot / Peas Hill / Hostmoor/ St Peter's Road Scheme Timescale	NILR Scheme Timescale
Prior to scheme Build (Baseline)	2018	2018	2018
During Construction	2023	2025	2026
Scheme Opening	2024	2026	2027
One year post scheme opening	2025	2027	2028
Five years post scheme opening	2029	2031	2032

6.2.2 For context, the project milestones are presented in Table 6.2, below, to allow comparison with the delivery plan and timeframe for data collection dates in Table 6.1.

Table 6.2: Project Milestones

Activity	Dates
MATS Broad Street Improvement Scheme (FBC1)	
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Broad Street Construction and FBC2	January 2023 - February 2023
Procurement of MATS Broad Street Contractor	October 2022 - February 2023
Construction of MATS Broad Street scheme (in conjunction with FHSF scheme construction)	February 2023 - March 2024
MATS Peas Hill & Hostmoor Avenue, Twenty Foot Road and St Peter's Road Schemes (FBC2)	
Obtain Utility Cost (C4s), Outline Planning, Land Engagement and Target Cost Procurement for Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	February 2023 - December 2023
Submit FBC2, requesting release of funding for Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	December 2023
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Construction and FBC3	December 2023 - March 2024
Obtain Full Planning Approval and Land Agreement (If no need for CPO) for Peas Hill and Twenty Foot Road Schemes.	March 2024 - December 2024
CPO and Side Road Order Statutory process	June 2023 - March 2025
Construction of Peas Hill and Hostmoor Avenue, Twenty Foot Road St Peters Road Schemes.	March 2025 - March 2026
MATS NILR Scheme (FBC3)	
Commence NILR Detailed Design, including Governance Process and statutory orders	March 2024 - March 2025
Begin Planning Process and supporting surveys (Ecology / Topography)	March 2024 - August 2025
Obtain Statutory Orders including CPO (approval from FDC, CCC)	March 2024 - October 2026
Target Cost Procurement for NILR	March 2025 - September 2025
CPCA Technical Assurance Review, CCC / CPCA Committees, Board Approval to Proceed to Construction	September 2025 - November 2025
NILR Construction	October 2026 - December 2027
MATS Post Scheme Monitoring and Evaluation	December 2028 - December 2033

6.3 Reporting of Monitoring and Evaluation Findings

6.3.1 The monitoring and evaluation findings will be issued as the following Reports:

- One Year After Monitoring and Evaluation Report (FBC1) – 2025
- One Year After Monitoring and Evaluation Report (FBC2) – 2027
- One Year After Monitoring and Evaluation Report (FBC3) – 2028
- Five Years After Monitoring and Evaluation Report (FBC1) – 2029
- Five Years After Monitoring and Evaluation Report (FBC2) – 2031
- Final Monitoring and Evaluation Report – 2032.

7. Dissemination Plan

7.1 Introduction

- 7.1.1 This Scheme Evaluation Plan will be agreed with CCC and CPCA prior to the submission of the FBC. Costs for monitoring and evaluation will be included within the final funding request from the CPCA for construction costs.

7.2 Dissemination Reporting

- 7.2.1 Monitoring will be undertaken before and during construction, and after the opening of the Scheme. A “One Year After” evaluation report will be produced within two years of the Scheme opening, followed by a “Five Years After” report within six years of the Scheme opening. The reports associated with this Monitoring and Evaluation will be published on the CCC website.

7.3 Stakeholder Engagement

- 7.3.1 CCC and the Project Team have engaged with key stakeholders throughout the development of the Scheme, and this will continue during the delivery phase. The list of stakeholders who received communication regarding the scheme can be found in the Strategic Case of the FBC and the Stakeholder Engagement Strategy is included in Appendix A of the MATS FBC1.

7.4 Lessons Learnt

- 7.4.1 The Package of schemes will represent a significant investment of public money for March by the CPCA. Monitoring and evaluation is therefore essential, not only to demonstrate that the schemes have been delivered as planned with the desired impacts, but also to inform and enlighten future decision makers, both locally and nationally. In this way, future investment can be targeted to provide the best value for money.

7.4.2 Post scheme Lessons Learnt workshops will be held with the project delivery team to discuss the following themes. Findings from these workshops will be reported in the 'One Year' Post Scheme Monitoring and Evaluation Reports detailed in Section 6.3.

- **Delivery:** Has the Scheme been delivered as intended and to the expected timetable? If any internal and external factors affected delivery, what impact did these have? Could they have been foreseen or avoided? What went well and what went less well?
- **Cost:** How accurate were the cost estimates? If Outturn costs were different from expectations, why was this, and what actions were taken? Were the allowances for quantified risk and Optimism Bias reasonable, or should a different approach be taken in future?
- **Traffic / Journey Reliability:** Has the scheme produced the expected changes to congestion and journey time reliability in March, and were there any unintended changes? If not, what are the reasons? If there are differences, are they due to Scheme specific, or external factors affecting traffic demand? Are there implications for similar schemes in the future?
- **Economy:** Has the Package of schemes enhanced the position of March in relation to policies and growth aspirations? Has it altered the perception of the town as a place to work, better attracting new investors as a place of opportunity? Have there been any unintended consequences?
- **Value for money:** Did the traffic model provide a realistic forecast of future growth and the effects of the Schemes? If there are differences, are they enough to raise questions about the VfM category attributed to the Scheme?
- **Environment:** Were the environmental impacts of the schemes in line with expectations? Is mitigation perceived to have been effective? Have there been any unintended impacts, and, if so, how might they have been foreseen, or avoided with future schemes?

Appendix K: Project Risk Register

Risk Information										Cause & Effect		Inherent Score			Risk Control		Residual Score			Action required			Risk cost	Target Score		
Risk Ref	Risk Title	Date Identified	Risk Type	Priority	Risk Status	Risk Owner	Risk Lead	Latest Review Date	Last Reviewed By	Last Review Comments	Cause	Effect	Inherent Risk Score	Likelihood Rating	Impact Score	Control (mitigation action)	Control Owner	Residual Likelihood Score	Residual Impact score	Residual Risk Score	Action	Person responsible	Date to be implemented by	Cost of risk/control (€k)	Escalation threshold	Target Risk Score
1	3rd party utility works	01/06/2022	Other	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	3rd party utility works overrunning within the construction works	Delay to construction programme/cost increase to project	5	2	4	Principal contractor to manage utilities. Engagement with utility companies to manage diversions	JL/SB	1	4	4	CP's being sought to identify affected utilities. Proactive relations to help manage system & reflective of global events	JL/SB	26 Nov 22	€300,000.00	Yes	4
2	Increased inflation due to current global events impact on material	01/06/2022	Financial	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	Likely to increase fuel costs, which will have a knock on effect to all other commodities. Unchecked rates / inflation costs affecting proposed design details	Increased project costs	5	3	2	Ensure inflation is built into cost and cost management system is reflective of global events	JL/SB	3	2	6	Management system & reflective of global events	JL/SB	26 Nov 22	€500,000.00	Yes	6
3	Footway widths v full depth construction v state	01/06/2022	Financial	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	The reduced footway widths mean we may need to bear the cartage way	Programme delay/cost increase	5	3	3	Obtain trial holes at key locations	JL/SB	2	3	6	Obtain trial holes at key locations	JL/SB	26 Nov 22	€5,000.00	Yes	6
4	Statutory undertakers' plant	01/06/2022	Safety	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	Safety risk of any incidents involving any underground plant	Safety incident impacting cost/ programme / reputation	5	2	4	Investigation and collaboration	JL/SB	1	4	4	Investigation and collaboration	JL/SB	26/11/2022	€0.00	Yes	6
5	FSC Programme	01/06/2022	Planning or Environmental	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	Release of the MAITS Construction funding's dependent on OFCA approval of FSC	Delayed approval will impact the flow MAITS	5	1	5	Work closely with OFCA to understand requirements for FSC approval process. Weekly update meetings with the OFCA have been established	JL/SB	1	5	5	Review the received CI information, identifying any problem areas. Appropriate surveys (GPR / cut and cover) / test holes to confirm the location of plant and inform our design. Ensure up to date plans are included in all	JL/SB	26/11/2022	€3,750.00	Yes	6
6	Network Rail BADA	01/06/2022	Planning or Environmental	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	Access required to Network Rail owned land for conduct MAITS preliminary surveys	Delays obtaining Network Rail approval will delay Adams undertaking survey work	5	1	5	Work closely with Network Rail to agree access arrangements, updated in BADA	JL/SB	1	5	5	Work closely with Network Rail to agree access arrangements, updated in BADA	JL/SB	26/11/2022	€10,000.00	Yes	5
7	Private Land	01/06/2022	Planning or Environmental	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	Private land access required for Adams to undertake detailed design surveys	Delays obtaining approval to access private land are encountered in the MAITS FSC review period, this will cause programme delays for the next phase of the project. This is a critical path funding stipulation	5	1	3	Obtain Land Registry information. Agree Land Agent, Dublin Knowledge	JL/SB	2	3	5	Obtain Land Registry information. Agree Land Agent, Dublin Knowledge	JL/SB	26/11/2022	€0.00	Yes	5
8	FSC and GSA Sign Off	01/06/2022	Strategy	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	Timely review of the MAITS FSC is required to ensure the project progress smoothly into the next phase	No interested parties. No operational / procurement in place for costs for FSC - delay to approval and transfer to construction and funding	5	2	4	Continued engagement with OFCA. Bi-weekly. Liaison with STEB to assess business case options	JL/SB	1	4	4	Continued engagement with OFCA. Bi-weekly. Liaison with STEB to assess business case options	JL/SB	26/11/2022	€0.00	Yes	4
9	Procurement D&A	26/07/2022	Strategy	Approaching	Open	JL/SB	JL/SB	26/09/2022	JL/SB	Reviewed	Seeking procurement options from D&A		5	1	4	Talking to Milestone involve D&A next commercial	JL/SB	1	4	4	Continued engagement	JL/SB	26/09/2022	€0.00	Yes	4

Appendix L: Procurement Strategy Rational

CCC Procurement Strategy Rational (NEC vs JCT)

The council delivery vehicles for the Eastern Highways Alliance and the current term services delivery contract with Milestone both use the NEC 4 options A through to E.

Whilst CCC do use JCT within the council, the NEC is considered less adversarial than the JCT form of contract and it's uniquely designed with three key characteristics:

- To stimulate good management between parties and by extension the associated works on site.
- To be used in a wide variety of commercial situations.
- To use a clear and precise language without any legal jargon.

To determine the best form of NEC Contract, CCC have listed the pros and cons for the five options.

Option A: Priced contract with activity schedule

This option contains a priced lump sum contract which is then linked to a contract programme drafted with an activity schedule. Each activity on the schedule is then allocated a price.

Each interim payment is then made upon the completion of:

1. Each group of completed activities (without defect)
2. Each completed activity not within a group

Pros:

- Simplified payment process – it's easier to measure when an activity is completed rather than when the output of work completed on an option with a BoQ
- Greater cost certainty for clients compared to a Target Cost option

Cons:

- For contractors – there is no provision for partial payment. If there is an issue with completing an activity, no payment is made until the activity is completed leading to cash flow problems.
The “all risk” nature of the project for the contractor, often leads to a more adversarial, rather than collaborative, attitude towards scope changes and on-site problems. The” all risk” nature means that a greater percentage of risk is built into the lump sum.
- Not suited to projects where scope/design is incomplete or will be liable to change.

Option B: Priced contract with bill of quantities

This option contains a priced contract which is linked to a Bill of Quantities (BoQ). The BoQ will contain project specific measurements which are derived from the drawings and specifications. Each measurement will then be linked to a rate.

Pros:

- If there is any error of measurement in the BoQ then both parties will know how much additional amount needs to be paid and received
- Greater flexibility for all parties in terms of cash flow

Cons:

- For items which contain multiple elements of work built into a singular rate, it can be difficult to assess the percentage of work complete.
- Whilst the contract is deemed remeasurable, this remeasurement is often restricted to a percentage of the total contract, after which the change is assessed as defined cost-plus fee making it unsuitable for contract without a clearly defined scope.

Option C: Target contract with an activity schedule

This option contains a target contract which is linked to an activity schedule. The target contract, contains a price which is more commonly referred to as a target cost.

Under Option C, the interim payment process is as follows:

1. The contractor submits an application for payment to the client's representative (often Project Manager) on a monthly basis.
2. The application will contain a breakdown of the contractors cumulative "defined cost" plus fee minus any "disallowed cost". This combined cost is known as the "Price for Work Done to Date" (PWDD).
3. The application is then reviewed by the client to ensure all cost is allowable under NEC.
4. The agreed cumulative cost is then deducted from the amount previously paid under the contract. This amount is then paid to the contractor.

As the works progress, the target cost may be adjusted to reflect any agreed Compensation Event.

Once the works are completed, the final "Defined Cost" plus fee and the Target Cost are compared. The difference between the two is then shared between the contractor and client. This is known as the "pain/gain" mechanism and the method of how the split is calculated will vary from project to project.

Pros:

- This arrangement encourages both parties to work more collaboratively as the financial success is shared by both client and contractor. Similarly, the financial failure of a project is shared. This collaborative working can reduce disputes and accelerate innovation.

Cons:

- Some share ranges can sometimes be disproportionately unfavourable to contractors leading to a higher proportion of risk being included in the initial target.

Option D: Target contract with Bill of Quantities

This contract contains a target cost contract which is linked to a Bill of Quantities (BoQ). Similar to Option C, the financial loss and financial gain is shared by both Contractor and Client. However, unlike Option C, this Option utilises a Bill of Quantities to make up the price of works.

This Option is sometimes used on framework agreements, where an agreed Schedule of Rates is in place and used to build multiple Target Cost's throughout the framework agreement.

Pros:

- This arrangement encourages both parties to work more collaboratively as the financial success is shared by both client and contractor. Similarly, the financial failure of a project is shared. This collaborative working can reduce disputes and accelerate innovation.

Cons:

- It should be noted that unlike Option B this is not a re-measure contract. So, any error in measurement which won't amend the price and could cause a financial loss. This may lead to this excessive risk being included within the target cost.
- Not suited to contracts without a clearly defined scope or incomplete design.

Option E: Cost reimbursable contract

This option is a cost reimbursable option. Works are paid on an open book basis. Under this option the contractor is paid all of their incurred "Defined Cost" and an agreed overhead and profit percentage. The client often takes on huge financial risk with this option.

Although this contract is often referred to as "Cost Plus", contractors should not get complacent and assume Option E means a blank cheque book for works. The terms within the contract should set out clearly what is and isn't to be reimbursed to the contractor.

Pros:

- Works that require immediate attention and cannot be defined at the project outset may benefit from a fast contract agreement.

Cons:

- Cost certainty for Client is low
- Inability for both parties to accurately plan cashflow.

CCC Recommendation

CCC's preferred form of contract is an Option C, Target Price Contract with an activity schedule. This is recommended on the basis that the use of a target price contract for this project will enable a reduced risk premium to be paid by the Employer through the use of the pain / gain share mechanism. This is particularly advantageous for this project as the design will not be fully complete prior to tender. So, a Bill of Quantities cannot be accurately prepared, therefore this option is recommended over an Option D contract.

March Broad Street FHSF

WCHAR Assessment Report

Fenland District Council

31 January 2022

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Contents

Chapter	Page
1. Background	4
2. WCHAR Study Area	5
3. WCHAR Assessment	6
3.1. Walking, cycling and horse riding policies and strategies	6
3.2. Personal injury collision data	9
3.3. Multi-modal transport service and interchange information	9
3.4. Key trip generators and local amenities	10
3.5. Site Visit Information	10
3.6. Stakeholder Liaison	10
3.7. Existing walking, cycling and horse-riding network facilities	10
4. Key Findings and Opportunities	11
4.1. General	11
4.2. Pedestrian/Cyclist specific opportunities	11
4.3. Equestrians	11
5. Next Steps	12
6. Walking, Cycling and Horse-Riding Assessment Team Statement	13
Appendix A. General Arrangement	14

Tables

Table 3-1 - National Policies and Strategies	6
Table 3-2 - Local Policy and Strategy	7

Figures

Figure 1-1 - Broad Street General Arrangement Snapshot (Version C06)	4
Figure 2-1 - WCHAR Study Area	5
Figure 3-1 - Local Bus Stops	9

1. Background

The March Broad Street project, delivered for Fenland District Council and Cambridgeshire County Council, is a redevelopment of the March Town Centre, including both highway and public realm improvements. It aims to achieve a more accessible, attractive and safe public realm incorporating a variety of changes.

The site is located towards the centre of March, on the junction between Broad Street (B1101) and Station Road (B1101)/Dartford Road (B1099). The site forms part of March's main shopping frontages and is lined by several retail and food establishments. Broad Street also holds a historic fountain structure at the northern end, and a war memorial at the southern end. Both of these features are to be retained and made a centre piece contributing to the attraction of March as a destination.

The proposed scheme is planned to provide the improvements as listed below. A snapshot is shown in Figure 1-1, however for the full general arrangement of the scheme, please refer to Appendix A.

- The reallocation of road space to remove car parking (which is currently situated within a 'central reserve' between the north and southbound carriageways) and provide a single, two-way carriageway.
- The provision of new public realm to the west of Broad Street between Dartford Road and to the south of Gray's Lane, including the Riverside area.
- Removal of car parking from the central 'reserve' and relocation of taxi ranks to existing/modified on street parking bays.
- The creation of two new 2.75 metre (m) wide bus stops on Broad Street.
- The provision of four new Zebra crossings; three single stage and one split stage crossings.
- The relocation of the March fountain to within the new public realm.
- Improve footway surfaces and remove guard railings where possible.
- Improve pedestrian crossing facilities across Broad Street.
- Review cycle parking provision in Broad Street to provide more convenient and secure Sheffield stand provision on both sides of the street.



Figure 1-1 - Broad Street General Arrangement Snapshot (Version C06)

The proposal seeks to remove the signalised junction between Broad Street (B1101) and Station Road (B1101)/Dartford Road (B1099), relocate the fountain and install a mini-roundabout.

Three zebra crossings are proposed to three of the four arms of the roundabout. The zebra crossings would be situated on Broad Street, Station Road and Dartford Road, and replace the pedestrian crossings that form part of the existing signalised junction arrangement.

March is relatively well connected by road to other areas despite its rural setting and benefits from a railway station situated on the Stansted to Birmingham line. It has an established legacy as a Market Town, also benefitting from a historic urban form and attractive riverside setting, as well as several stable employers.

2. WCHAR Study Area

The area referred to as the 'WCHAR Study Area' in this report, and in accordance with DMRB GG142, is circled approximately in Figure 1-2 below. It includes the extents of the Broad Street scheme, extended with a 1km radius.

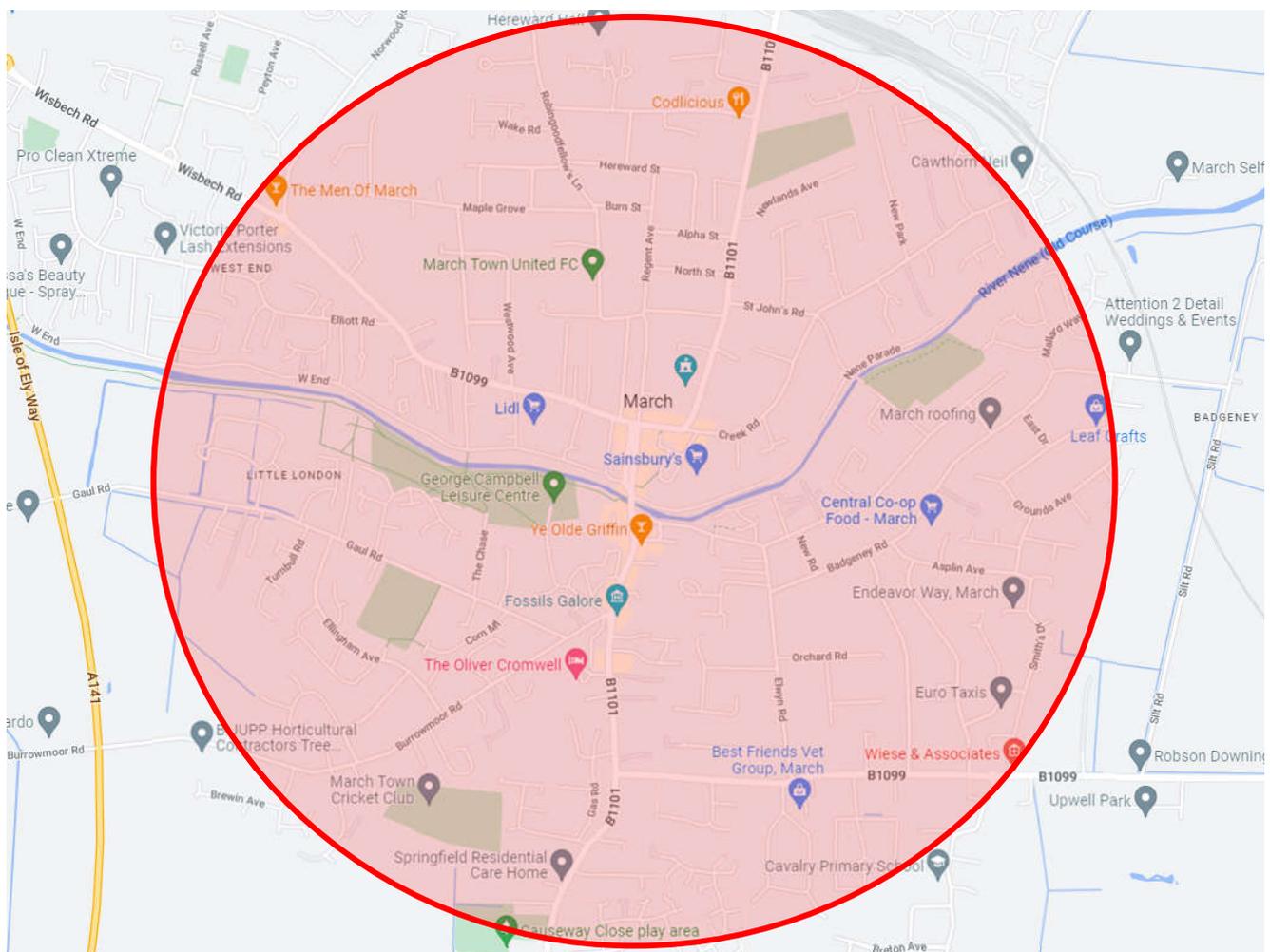


Figure 2-1 - WCHAR Study Area

3. WCHAR Assessment

The DMRB Standard GG142, accepted as the WCHAR assessment process for this scheme, categorises this project as a ‘small highways scheme’ and thus requires assessment of the following elements;

- Walking, cycling and horse riding policies and strategies within or related to the WCHAR study area.
- Personal injury collision data.
- Multi-modal transport service and interchange information within the WCHAR study area.
- Key trip generators and local amenities within the WCHAR study area.
- Information gathered during a site visit.
- Information gathered during liaison with key stakeholders.
- Existing walking, cycling and horse-riding network facilities within the WCHAR study area.

These elements are assessed and summarised in sections 3.1 to 3.6 below.

3.1. Walking, cycling and horse riding policies and strategies

3.1.1. National Policy and Strategy

National policies and strategies relevant to the proposed scheme are outline in Table 3-1 below.

Table 3-1 - National Policies and Strategies

Document	Key Points	Relevance to scheme
Countryside and Rights of Way Act 2000	<p>The Countryside and Rights of Way Act 2000 (CRoW Act) is known informally as the ‘right to roam’ act. It provides a right of public access on foot to areas of open land comprising mountain, moor, heath, down and registered common land.</p> <p>The act encourages the creation of new routes and clarifies uncertainties about existing rights.</p> <p>The Act requires local authorities to review and publish plans for improving rights of way in their areas, taking into account the needs of the public including disabled people. These Rights of Way Improvement Plans (RoWIPs) set out a 10-year plan for improvement of the Public Right of Way (PRoW) network for the benefit of the public.</p>	The potential scheme can provide infrastructure to support the encouragement of walking and cycling.
National Planning Policy Framework, Ministry of Housing, Communities & Local Government, 2019	<p>Section 8 states ‘<i>Planning policies and decisions should aim to achieve, healthy, inclusive and safe places which.....encourage walking and cycling</i>’</p> <p>Para 102 states ‘<i>Transport issues should be considered from the earliest stages of plan-making and development proposals so that opportunities to promote walking, cycling and public transport are identified and pursued</i>’.</p>	The potential scheme can provide infrastructure to support the encouragement of walking and cycling.
Cycling and Walking Infrastructure Strategy (CWIS), Department for Transport (DfT), 2017	CWIS outlines the government’s ambition to make cycling and walking a natural choice for shorter journeys, or as part of longer journeys by 2040.	The potential scheme can provide infrastructure to support the uptake of walking and cycling.

<p>Gear Change - A bold vision for cycling and walking, DfT, 2020</p>	<p>This document outlines the vision to facilitate a step-change in cycling and walking, whilst acknowledging there is a unique opportunity to transform the role cycling and walking can play in the transport system, and get England moving differently</p> <p>It sets out the actions required at all levels of government to make this a reality, grouped under four themes:</p> <ul style="list-style-type: none"> • better streets for cycling and people. • cycling and walking at the heart of decision-making. • empowering and encouraging local authorities. • enabling people to cycle and protecting them when they do. 	<p>The potential scheme can provide infrastructure to support the uptake of walking and cycling.</p> <p>Gear Change is supported by the DfT design guidance document 'Local Transport Note 1/20 Cycle Infrastructure Design' (LTN 1/20), which this scheme is assessed against in a dedicated technical note.</p>
<p>Road Safety Statement 2019: a lifetime of road safety DfT, Driver and Vehicle Standards Agency, Driver and Vehicle Licensing Agency, and National Highways, 2019</p>	<p>The Road Safety Statement focuses on actions for the next two years to move the UK to an integrated approach to road safety, focusing on both collision prevention and post collision response. The Statement is divided into three areas - safer people, safer vehicles and safer roads.</p> <p>This document is still the most recent at the time of writing in 2022.</p>	<p>The potential scheme can provide infrastructure or improvements to facilitate/provide solutions to identified road safety issues/concerns, thus providing safer conditions for all users.</p>

3.1.2. Local Policy

The study area for this assessment sits within Cambridgeshire, with Cambridgeshire County Council holding responsibility for transport policy and strategies. The policies and strategies that relate to March are summarised in Table 3-2.

Table 3-2 - Local Policy and Strategy

Document	Key Points	Relevance to scheme
<p>Cambridgeshire Local Cycling and Walking Infrastructure Plan (LCWIP) Cambridgeshire County Council, (No publication date)</p>	<p>The Cambridgeshire Local Cycling and Walking Infrastructure Plan (LCWIP) forms part of the Government's aim to make walking and cycling the natural choice for all short journeys or as part of a longer journey. The Department for Transport recommended that all local authorities should develop LCWIPs and have advised that those authorities with plans will be well placed to bid for future funding.</p> <p>The Cambridgeshire LCWIP covers the whole County and focuses on each district to highlight priority routes for cycling using census data to identify where funding could have the greatest effect in terms of where people live and work. For walking it focuses on Cambridge City and the Market Towns to identify the main routes to school, local shops, employment and train/bus stations.</p>	<p>NCN Route 63 runs to the North-West of Broad Street, with another smaller local route surrounding the town centre. The town centre itself is a destination which provides cycle parking.</p>
<p>Transport Strategy for Cambridge and South Cambridgeshire,</p>	<p>The Strategy provides a policy framework and programme of schemes for the area, addressing current problems and consistent with the policies of the Third Cambridgeshire LTP. It sets out the need for the transport network to support growth and provide</p>	<p>These policies aim to ensure that (public transport), cycling and walking are the best</p>

<p>Cambridgeshire County Council, 2014</p>	<p>additional capacity to allow for the additional demands of new residents and workers. The transport network must also help protect Cambridge and South Cambridgeshire’s distinctive character and environment.</p>	<p>ways of getting around - an aspiration the proposed scheme can support.</p>
<p>Cambridgeshire Local Transport Plan (LTP) 2011-2031, Cambridgeshire County Council, 2015</p>	<p>Transport has a key role to play in bringing about the Council’s vision for Cambridgeshire by contributing towards the delivery of its Priorities, set out below:</p> <ul style="list-style-type: none"> • Supporting and protecting people when they need it most; • Helping people to live independent and healthy lives in their communities; and • Developing our local economy for the benefit of all. <p>These Priorities informed the LTP Objectives, of particular relevance are Objectives 3 and 5 summarised below:</p> <ul style="list-style-type: none"> • LTP Objective 3: Managing and delivering the growth and development of sustainable communities; and • LTP Objective 5: Meeting the challenges of climate change and enhancing the natural environment. <p>One of the key challenges the LTP aims to address is ‘making sustainable modes of transport a viable and attractive alternative to the private car (Challenge 3). The aim is to overcome this challenge in a number of ways including promoting sustainable networks for walking and cycling and making provisions for cyclists on-road and off-road.</p>	<p>The Local Transport Plan promotes walking and cycling as part of the overall transport plan for the county.</p>

3.1.3. Key Policy Themes

All levels of policy strongly support active travel. The following themes are prominent:

- Walking and cycling should be promoted and encouraged where possible, due to the many benefits active travel can deliver to individuals, communities and society. There is a strong commitment to increase active travel at both national and local policy.
- New development and development design should support, promote and encourage active travel.
- The needs of active users should be taken into consideration when planning new infrastructure, in particular regarding user safety and comfort.
- Cycling (and walking) should be promoted and encouraged where possible, due to the many health (both physical and mental) and environmental benefits that these modes can deliver to the population.
- Infrastructure to support cycling (and walking) trips should be well-integrated, direct and where possible, fully segregated from motor vehicles in order to improve actual and perceived safety.

Therefore, these themes will be used by the assessment team help formulate opportunities for the scheme.

3.2. Personal injury collision data

No Personal Injury Collision data has been provided to the Audit Team for the local highway network relevant to this scheme. The Audit Team, however, has undertaken a review of collision data on the Crash Map website. The review, which focussed on the most recently available five-year period (2015 to 2020), identified 10 personal injury collisions within the extents of the proposed scheme. All 10 collisions resulted in injuries to pedestrians and pedal cyclists.

Six of the collisions were recorded on Broad Street between the junction of Gray’s Lane and the B1099 Dartford Road. Of these six collisions, five resulted in ‘slight’ injuries (one pedal cyclist and four pedestrians) and one in ‘serious’ injury to a pedestrian.

Three personal injury collisions were recorded on the B1099 Dartford Road at the junction with Broad Street, resulting in ‘slight’ injury to pedestrians. The remaining collision was recorded at the B1099 junction with Darthill Road, also resulting in ‘slight’ injury to a pedestrian.

3.3. Multi-modal transport service and interchange information

3.3.1. Rail Services

March Railway station is situated approximately 1.0km North of Broad Street. The station is operated by Greater Anglia and includes services operated by CrossCountry, EMR and Greater Anglia. The main destinations for trains from March are Ipswich, Stansted Airport, Cambridge, Birmingham New Street, Norwich and Peterborough. There are two platforms and approximately two trains run per hour from each platform on weekdays.

3.3.2. Bus Services

There are two bus stops within the extents of the study area, which facilitate trips on bus routes as follows:

- 33 (Peterborough to March via Whittlesey)
- 36 (March to Peterborough)
- 46 (Wisbech to March)
- 8A (March to Cottenham)
- 302 (St Ives to March via Chatteris and Warboys)

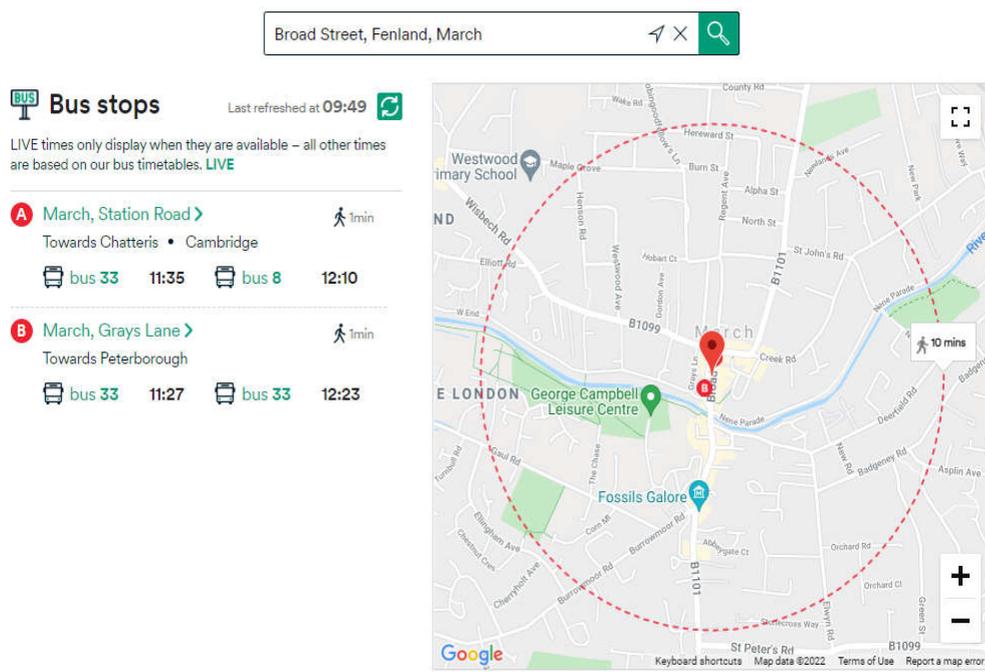


Figure 3-1 - Local Bus Stops

3.3.3. E-Scooter Rental Services

Currently, there are no electric scooter rental services, or similar, available within the WCHAR study area.

3.4. Key trip generators and local amenities

3.4.1. Existing

Particularly with the regeneration of the town centre, Broad Street itself intends to be a destination and thus a trip generator. Ability for people from the surrounding area to access the centre through active means of transport should be supported.

Within the study area, there are two supermarkets, a series of pubs and restaurants, a leisure centre, several parks and the March Town FC football ground. All of these destinations are linked with local roads with designated footways.

Further afield, the surrounding towns of Wisbech, King's Lynn, Downham Market and Ely will also generate trips. Peterborough, Huntingdon and Cambridge are also likely to generate trips for both work and leisure. These destinations are linked to March by bus and train services.

Finally, Stanstead Airport and London would generate less frequent trips.

3.4.2. Future Development

There are several residential-led developments surrounding the study area, and plans to renew the marketplace south of Broad Street. The residential areas and Marketplace are linked to the scheme through existing roads and footways.

3.5. Site Visit Information

Upon visiting the site, the connectivity of footways throughout the town centre was clear. However, these were only designated for pedestrians, resulting in cyclists using the carriageway which is very busy, tended to be congested with parked cars and includes bus stops. There are, however, cycle parking facilities including an undercover cycle rack in the central reserve of the street. The area generally felt car-dominated, with clear room for improvement for the prioritisation of walking and cycling.

No horse-riders were observed across several site visits.

3.6. Stakeholder Liaison

The design team are engaged with a representative of both the local access group and CamSight, the local charity for visually impaired people during design development. The respective representatives input will be used in development of the scheme to adequately to meet their needs.

3.7. Existing walking, cycling and horse-riding network facilities

Due to the rurality of the area and the historic nature of the market towns that developed along the route of the river Nene, road links from town to village and onwards consist of a mix of fast and winding country lanes and busy (mostly) single carriageway A roads. Travel by road to connect to wider links is therefore often slow, especially in comparison to using rail. Within towns the road network, particularly in the town centres, is also heavily constrained due to relative narrow streets, high parking demands and in some cases limited river crossings. Due to the rural nature of the district, there is a high dependency on motorised vehicles. There is also a high dependency on heavy goods vehicles (HGVs) due to the nature of the local economy. These issues make opportunities to reallocate road space for walking and cycling more limited and challenging.

4. Key Findings and Opportunities

4.1. General

A good quality connected network of routes required, but is not the only provision needed. While infrastructure is the most prominent requirement, promotion and encouragement of active travel modes also play an important part in changing travel behaviours.

Broad Street is the core of March's Town Centre. Efforts to address the current dominance of cars, create better infrastructure for pedestrians and provide sustainable modes of transport will help to improve dwell time in the Town Centre. Key heritage landmarks should be celebrated as an important part of March's identity. Vacant units also offer an opportunity to boost social and civic functions, as alternatives to retail, that are necessary for the success of future high streets.

Opportunity 1 – Reduce Dominance of Cars and Congestion in the Townscape

Increase footway and public realm space within the town centre, and reduce the space allocated to vehicular traffic. This, paired with celebration of the historic memorial and fountain of Broad Street, will encourage people to spend more time and money in the town centre. It may also be possible to reduce road congestion with amendments to the junction at the north of Broad Street. These improvements are in line with the proposed scheme.

4.2. Pedestrian/Cyclist specific opportunities

Opportunity 2 – Improve Pedestrian Level of Service in the Town Centre

The proposed scheme should improve the pedestrian level of service in the Town Centre, including enhanced features such as benches and public realm for people to dwell, as well as connectivity through crossings. This should be considered carefully with any amendments to the junction at the north of Broad Street.

Opportunity 3 – Improve Crossing Facilities at the North of Grays Lane

The existing crossing at the north of Grays Lane does not provide easy navigation for pedestrians with reduced mobility. Additional infrastructure should be considered to allow wheelchair users to easily use this footway.

4.3. Equestrians

Horse riding is not considered to be a method of travel to access places of education and employment and is therefore not a transport mode this strategy targets. Therefore, no specific opportunities for the improvement of equestrian facilities are identified.

However, horse-riding is a very important activity in the rural community and must be considered for wider network links where byways and bridleways are in use. New links for connecting towns and villages to improve travel options on foot and by bicycle should also consider adding value by including access for equestrians. Where improvements are recommended for routes that include equestrian use, surface types and available space must be carefully considered. This is especially important as walking and cycling improvements often require all weather surfaces which, if not provided, could be restrictive for horse riding. Equally, soft grass-based routes could be 'churned' by high levels of horse-riding use especially in winter months, making these inaccessible for walkers and cyclists. It is essential that a clear understanding of all user requirements and a delicate balance of interventions is considered for all multi-user routes.

5. Next Steps

The material contained within this assessment report is intended to be used to help the designer provide engineering solutions with due regard for the needs of pedestrians, cyclists and equestrians. The opportunities identified within this report will be reviewed as the scheme design progresses, alongside any new opportunities identified as a result of the developing scheme design.

In accordance with GG 142 a single review report shall be prepared at the end of the detailed design phase of the scheme which will document decisions made as part of the design in response to those opportunities highlighted in this assessment report as well as any further opportunities identified in the preliminary and detailed design stages.

6. Walking, Cycling and Horse-Riding Assessment Team Statement

WALKING, CYCLING AND HORSE-RIDING LEAD ASSESSOR

As Lead Assessor, I confirm that this walking, cycling and horse-riding assessment report has been compiled in accordance with DMRB GG 142. The walking, cycling and horse-riding assessment was undertaken by the following assessment and review team:

Matthew Lambert
Principal Engineer
Atkins Transportation

matthew.lambert@atkinglobal.com

Signed: ML

Date: December 2022

WALKING, CYCLING AND HORSE-RIDING ASSESSORS

Kavita Negi
Assistant Engineer, Atkins Global Technology Centre

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Engineer, Atkins Transportation

Peter Miles
Project Manager, Atkins Transportation

Charlie Shepherd
Assistant Engineer, Atkins Transportation

DESIGN TEAM LEADER

As design team leader for the scheme, I confirm that the GG 142 assessment has been undertaken at the earliest stage of scheme development possible given the scheme history and that the wider design team has been involved in the process.

I confirm that in my professional opinion the appointed Lead Assessor has the appropriate experience for the role making reference to the Lead Assessor Expected Competencies contained in DMRB GG 142.

Peter Miles
Project Manager
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peter.miles@atkinglobal.com

Signed: PM

Date: December 2022

Appendix A. General Arrangement

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March Broad Street FHSF

WCHAR Review Report

15 December 2022

Notice

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This document has 104 pages including the cover.

Document history

Document title: WCHAR Review Report

Document reference: C01

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
C01	For Information	CS	ML	DJG	PM	20/12/2022

Client signoff

Client	
Project	March Broad Street FHSP
Job number	
Client signature/date	

Contents

Chapter	Page
1. Background	4
1.1. WCHAR Study Area	5
2. Review of Walking, Cycling and Horse-Riding Assessment Opportunities	6
3. Detailed Design Stage Walking, Cycling and Horse-Riding Review	7
4. Walking, Cycling and Horse-Riding Assessment Team Statement	8
Appendix A. General Arrangement	9

Tables

No table of figures entries found.

Figures

Figure 1-1 - Broad Street General Arrangement Snapshot (Version C06)	4
Figure 2-1 - WCHAR Study Area	5

1. Background

The March Broad Street project, delivered for Fenland District Council and Cambridgeshire County Council, is a redevelopment of the March Town Centre, including both highway and public realm improvements. It aims to achieve a more accessible, attractive and safe public realm incorporating a variety of changes.

The site is located towards the centre of March, on the junction between Broad Street (B1101) and Station Road (B1101)/Dartford Road (B1099). The site forms part of March's main shopping frontages and is lined by several retail and food establishments. Broad Street also holds a historic fountain structure at the northern end, and a war memorial at the southern end. Both of these features are to be retained and made a centre piece contributing to the attraction of March as a destination.

The proposed scheme is planned to provide the improvements as listed below. A snapshot is shown in Figure 1-1, however for the full general arrangement of the scheme, please refer to Appendix A.

- The reallocation of road space to remove car parking (which is currently situated within a 'central reserve' between the north and southbound carriageways) and provide a single, two-way carriageway.
- The provision of new public realm to the west of Broad Street between Dartford Road and to the south of Gray's Lane, including the Riverside area.
- Removal of car parking from the central 'reserve' and relocation of taxi ranks to existing/modified on street parking bays.
- The creation of two new 2.75 metre (m) wide bus stops on Broad Street.
- The provision of four new Zebra crossings; three single stage and one split stage crossings.
- The relocation of the March fountain to within the new public realm.
- Improve footway surfaces and remove guard railings where possible.
- Improve pedestrian crossing facilities across Broad Street.
- Review cycle parking provision in Broad Street to provide more convenient and secure Sheffield stand provision on both sides of the street.

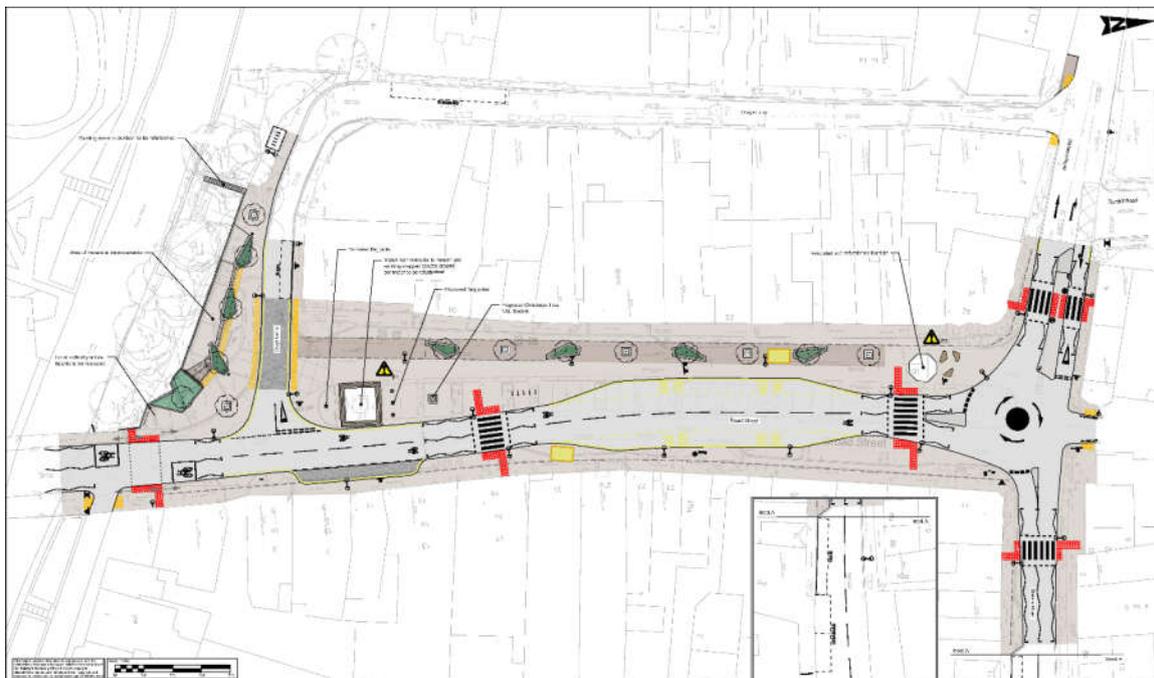


Figure 1-1 - Broad Street General Arrangement Snapshot (Version C06)

The proposal seeks to remove the signalised junction between Broad Street (B1101) and Station Road (B1101)/Dartford Road (B1099), relocate the fountain and install a mini-roundabout.

Three zebra crossings are proposed to three of the four arms of the roundabout. The zebra crossings would be situated on Broad Street, Station Road and Dartford Road, and replace the pedestrian crossings that form part of the existing signalised junction arrangement.

March is relatively well connected by road to other areas despite its rural setting and benefits from a railway station situated on the Stansted to Birmingham line. It has an established legacy as a Market Town, also benefitting from a historic urban form and attractive riverside setting, as well as several stable employers.

1.1. WCHAR Study Area

The area referred to as the 'WCHAR Study Area' in this report, and in accordance with DMRB GG142, is circled approximately in Figure 1-2 below. It includes the extents of the Broad Street scheme, extended with a 1km radius.

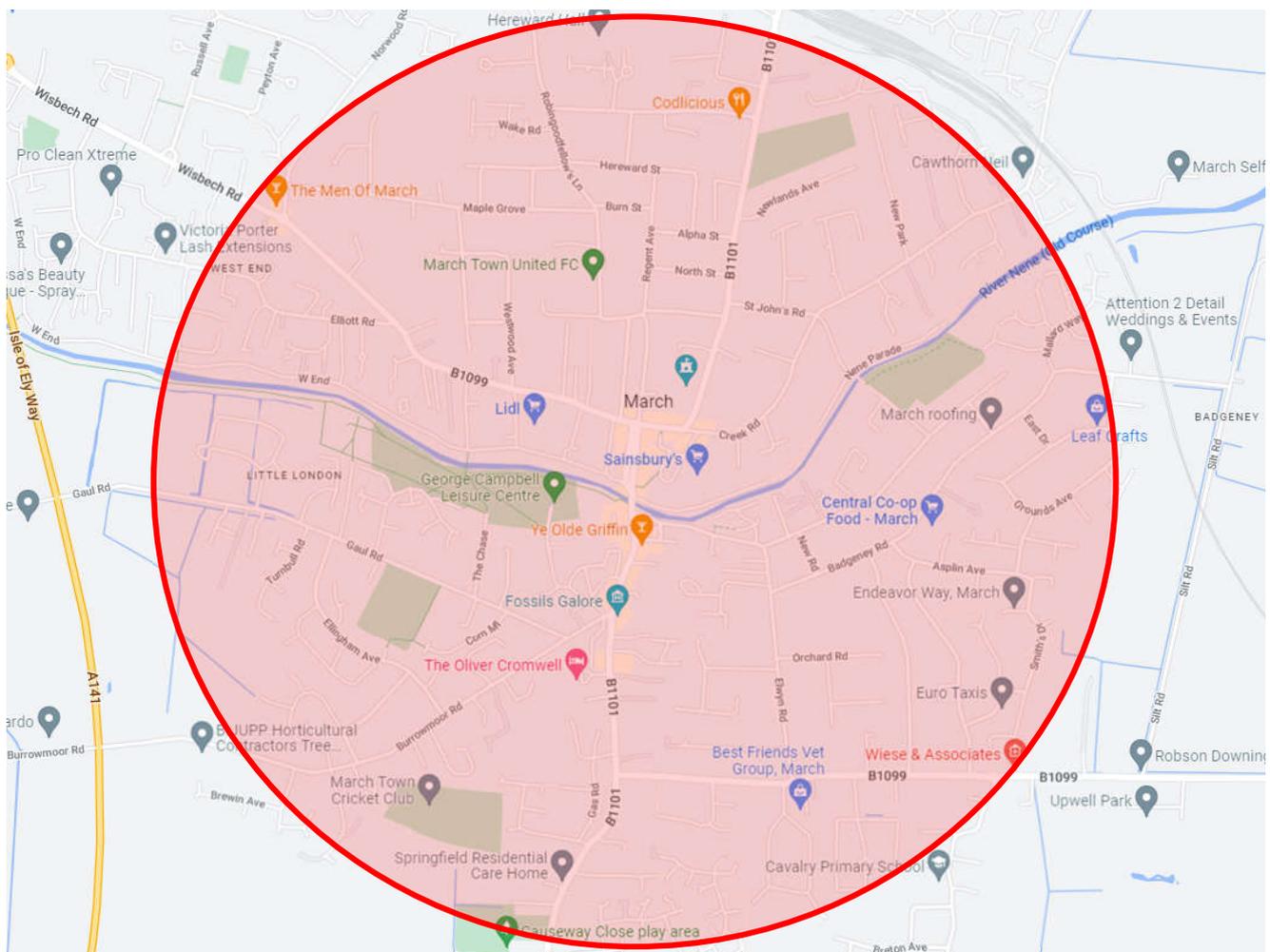


Figure 1-2 - WCHAR Study Area

2. Review of Walking, Cycling and Horse-Riding Assessment Opportunities

Based on findings from the site visit and desktop research carried out in the assessment, the following opportunities were recommended in the assessment report for consideration at the scheme design stage. GG 142 encourages the identification of opportunities that are associated with the scheme, but which may not be within the geographical scope of the works and thus it may not be possible to deliver some opportunities within the proposals. However, the identification of these further opportunities is intended to allow them to be highlighted for consideration in future works.

Opportunity 1 – Reduce Dominance of Cars and Congestion in the Townscape

Increase footway and public realm space within the town centre, and reduce the space allocated to highways. This, paired with celebration of the historic memorial and fountain of Broad Street, will encourage people to spend more time and money in the town centre. It may also be possible to reduce road congestion with amendments to the junction at the north of Broad Street. These improvements are in line with the proposed scheme.

Action Taken and Outcome

The scheme has prioritised the allocation of space for footways and public realm above all else. As a result, the scheme has now seen 62% of the town centre taken up by carriageway space, to now just 41%. The public realm space within the scheme extents has increased by approximately 2400m² or 109%. This will provide significant benefits for walking and cycling in the town centre.

The junction at the North of Broad Street has also been designed as a mini-roundabout, predicted to have a positive impact on congestion based on traffic modelling. It is also predicted that the traffic speeds will reduce realising a further positive impact on safety.

Opportunity 2 – Improve Pedestrian Level of Service in the Town Centre

The proposed scheme should improve the pedestrian level of service in the Town Centre, including enhanced features such as benches and public realm for people to dwell, as well as connectivity through crossings. This should be considered carefully with any amendments to the junction at the north of Broad Street.

Action Taken and Outcome

The proposed scheme improves the pedestrian level of service around Broad Street. Much of the space currently taken by road and parking can be reallocated as pedestrian areas, with enhanced features such as seating, trees and planting.

Three zebra crossings are proposed to three of the four arms of the roundabout. Robingoodfellows Lane is lightly trafficked and relatively easy to cross as a pedestrian. Cyclists can use the new carriageway which will be a slower more controlled environment enhancing the cycling experience in town centre, which also includes cycle parking facilities. The zebra crossings would be situated on Broad Street, Station Road and Dartford Road, and replace the pedestrian crossings that form part of the existing signalised junction arrangement.

Opportunity 3 – Improve Crossing Facilities at the North of Grays Lane

The existing crossing at the north of Grays Lane does not provide easy navigation for pedestrians with reduced mobility. Additional infrastructure should be considered to allow wheelchair users to easily use this footway.

Action Taken and Outcome

This feature has been explored and included in the scheme, with an additional island to improve connectivity for wheelchair users.

3. Detailed Design Stage Walking, Cycling and Horse-Riding Review

This section records any user-related opportunities identified during the design phase. They have been developed through discussions between the Lead Assessor and the wider design team and recorded here (along with actions taken / outcomes).

In accordance with GG 142 this review report has been prepared at the end of the detailed design phase of the scheme and documents decisions made as part of the design process regarding opportunities identified in the detailed design stage.

No new opportunities have been identified during the design phase of the project, over and above those improvements described in section 2 above. During the design phases, the early identified opportunities from the WCHAR Assessment have been developed and incorporated into the scheme as envisaged.

It is considered that opportunities for pedestrians and cyclists have been realised in the design, whilst acknowledging the importance of Broad Street, Station Road and Dartford Road as key vehicular transport routes for March and the surrounding areas, to create a well balanced scheme for the location.

4. Walking, Cycling and Horse-Riding Assessment Team Statement

WALKING, CYCLING AND HORSE-RIDING LEAD ASSESSOR

As Lead Assessor, I confirm that this walking, cycling and horse-riding review report has been compiled in accordance with GG 142 and thus contains the appropriate information for the wider design team. The walking, cycling and horse-riding review was undertaken by the following assessment & review team:

Matthew Lambert
Principal Engineer
Atkins Transportation

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Signed: ML

Date: December 2022

WALKING, CYCLING AND HORSE-RIDING ASSESSORS

Kavita Negi
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Daniel Kelly
Engineer, Atkins Transportation

Peter Miles
Project Manager, Atkins Transportation

Charlie Shepherd
Assistant Engineer, Atkins Transportation

DESIGN TEAM LEADER

As design team leader for the scheme, I confirm that the GG 142 assessment has been undertaken at the earliest stage of scheme development possible given the scheme history and that the wider design team has been involved in the process.

I confirm that in my professional opinion the appointed Lead Assessor has the appropriate experience for the role making reference to the Lead Assessor Expected Competencies contained in DMRB GG 142.

Peter Miles
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Appendix A. General Arrangement

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Technical Note

Project:	Broad Street and Riverside, March		
Subject:	LTN 1/20 Compliance		
Author:	Mark Gearing		
Date:	25/10/2022	Project No.:	5210127
Atkins No.:	CCCFHSF-ATK-HGN-XX-RP-CH-000006		

Document history

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1.0	For Information	MG	PM	DG	PM	3/11/22

Client signoff

Client	Cambridgeshire County Council
Project	Broad Street and Riverside, March
Project No.	5210127
Client signature / date	

Local Transport Note, LTN 1/20 provides a national standard for the design of cycle infrastructure. The national guidance recommends a basis for those standards based on 5 design principles and 22 summary principles. The guidance contains tools which give local authorities flexibility on infrastructure design and sets out measurable quality threshold to achieve when designing cycling schemes.

The 5 core design principles which represent the essential requirements to achieve more people travelling by cycle or on foot are:

- **Coherent** – Cycle networks should be planned and designed to allow people to reach their day-to-day destinations easily, along routes that connect, are simple to navigate and are of a consistently high quality. Neither cyclists nor pedestrians benefit from unintuitive arrangements that put cyclists in unexpected places away from the carriageway.
- **Direct** – Cycle routes should be at least as direct and preferably more direct than those available for motor vehicles. Routes involving extra distance or lots of stopping and starting will result in some cyclists choosing to ride on the main carriageway instead because it is faster and more direct, even if less safe.
- **Safe** – Not only must cycle infrastructure be safe, it should also be perceived to be safe so that more people feel able to cycle. Space for cycling is important but a narrow advisory cycle lane next to a narrow general traffic lane and guardrail at a busy junction is not an acceptable space for cyclists.
- **Comfortable** – Comfortable conditions for cycling require routes with good quality, well maintained smooth surfaces, adequate width for the volume of users, minimal stopping and starting and avoiding steep gradients. Uncomfortable transitions between on-and-off carriageway facilities are best avoided, particularly at locations where conflict with other road users is more likely.
- **Attractive** – Cycle infrastructure should help to deliver public spaces that are well designed and finished in attractive materials and be places that people want to spend time using. Sometimes well-intentioned signs and markings for cycling are not only difficult and uncomfortable to use, but are also unattractive additions to the street scape.

In relation to cycling, and as per the DMRB GG142 – Walking, cycling and horse-riding assessment and review, a WCHAR has been undertaken. The report reviews the policies and strategies at the time of the review along with accident data, trip generators and current provisions inside and outside of the scheme extents and proposing user opportunities for consideration of the designers.

Due to the rurality of the area and the historic nature of the market towns that developed along the route of the River Nene, road links from town to village and onwards consist of a mix of fast and winding country lanes and busy (mostly) single carriageway A roads. Travel by road to connect to wider links is therefore often slow, especially in comparison to using rail. Within March the road network is heavily constrained due to relative narrow streets, high parking demands and limited river crossings. Due to the rural nature of the district, there is a high dependency on motorised vehicles. There is also a high dependency on heavy goods vehicles (HGVs) due to the nature of the local economy. These issues make opportunities to reallocate road space for walking and cycling more limited and challenging.

At present the cycle network within and around March is not coherent and this was not part of the remit of the scheme. Broad Street has traditionally been considered a destination, rather than a through route for cyclists. Cycle stands are available within the 'central reserve' area which requires pedestrians and cyclists to cross the existing carriageways. Cyclists wishing to travel to or from Station Road to Broad Street also must negotiate the existing signalised junction.

Cycle routes were considered but with the low speeds along Broad Street it was felt that the proposed highway can safely accommodate cyclists, it would have also meant putting in a short length of off-road facility which would create two transitions for the cyclists to negotiate which LTN 1/20 advises against. LTN 1/20 also advises that cycles are treated as vehicles and are physically segregated from pedestrians. The simplest and most easily understood and neatest solution is by providing a kerb which keeps cyclist on the carriageway.

The proposed highway works will reallocate road space to remove car parking (which is currently situated within a 'central reserve' between the north and southbound carriageways) and provide a single two way carriageway with 3.25m lane widths, in line with LTN 1/20 recommendations. This will help reduce the vehicle dominance in the town centre by increasing public space and addressing issues of severance. It will also help reduce the number of different movements by motorists, so making it safer for cyclists and pedestrians

Additional cycle symbols to TRSGD diagram 1057 are to be placed in primary positions to guide cyclists along Broad Street, although this not suitable for roads of high volumes of motor traffic or high speeds, it is felt that with

the lower traffic speeds along Broad Street these will be beneficial to cyclist and alert motorists of their presence. Advanced Stop Lines are also to be provided at the signalised pedestrian crossing at the southern end of Broad Street. This enables cyclists to take up the appropriate position in the waiting area between the two stop lines, for their intended manoeuvre ahead of general traffic, before the signals change to green.

The provision of four new Zebra crossings; three single stage and one split stage crossings will make it easier for pedestrians and cyclists (once they have dismounted) wishing to cross Broad Street and Station Road. The improvement of footway and carriageway surfaces and refurbished guard railings will make it a more comfortable environment for pedestrians and cyclists. There will also be cycle parking based on the capacity suggested within LTN1/20 Table 11-1 with more convenient and secure cycle stands within Broad Street and a covered cycle stand within Grays Lane.

The removal of the existing signalised junction will be replaced with a mini-roundabout this can work well for cycling in a mixed traffic environment when traffic speeds and volumes are low and means that traffic on all arms has to give way. Despite the inscribed circle diameter (ICD) being greater than 15.0m recommended in LTN1/20 paragraph 10.7.35, the provision of single lane approaches and exits means that cyclists and motor vehicles can pass through the roundabout in a single stream compared to multi lane approaches for the existing signalised junction. An ICD in line with the LTN1/20 requirements could not be provided at the proposed mini-roundabout as it would restrict the turning movements of larger vehicles.

Following the stage 2 Road Safety Audit review of the design, no safety concerns were raised in relation to the provisions for cyclists.



**CAMBRIDGESHIRE
& PETERBOROUGH**
COMBINED AUTHORITY

Agenda Item No: 2.6

Authorisation of Expenditure on ZEBRA zero emissions buses project

To:	Transport and Infrastructure Committee
Meeting Date:	18 th January 2023
Public report:	Yes
Lead Member:	Cllr Anna Smith, Chair of Transport and Infrastructure Committee
From:	Oliver Howarth, Bus Strategy Manager
Key decision:	N/A
Forward Plan ref:	
Recommendations:	<p>The Transport and Infrastructure Committee is recommended to:</p> <p>Recommend to the Combined Authority Board to approve capital expenditure of £2,994,000 of funds allocated to the approved ZEBRA Business Case.</p>
Voting arrangements:	<p>A vote in favour by at least two thirds of all Members (or their Substitute Members) appointed by the Constituent Councils, to include the Members appointed by Cambridgeshire County Council or Peterborough City Council, or their Substitute Members</p>

1. Purpose

- 1.1 To recommend to the Combined Authority Board to approve capital expenditure of funds allocated to the approved ZEBRA Business Case.

2. Background

- 2.1 The ZEBRA (Zero Emission Bus Regional Area) project originated in a Department for Transport (DfT) scheme to encourage roll out of electric buses. The Combined Authority led a consortium of CPCA, Stagecoach and the Greater Cambridge Partnership (GCP) on a proposal to buy 30 zero emission electric double-deckers. This scheme was accepted by DfT. The proposed expenditure was £4.295m from DfT, £2.994m from CPCA; £2.25m from GCP and £7.035m from Stagecoach. The total capital expenditure is therefore £16.574m and the project is fully funded.
- 2.2 At its meeting in September 2021 the Combined Authority Board approved funding of up to £16.4m from the Medium-Term Financial Plan and the apportionment of 40 / 60 as a split of any under / overspend against the budget between Cambridgeshire County Council (40%) and the Combined Authority (60%).
- 2.3 Thirty Volvo BZL double decker buses have been ordered by Stagecoach for delivery in February to April 2023. These are revised delivery dates (2-3 months later than intended) as there has been some delay as these are the first Volvo BZLs to be built and Volvo found a potential safety issue which required to be eliminated. This has been completed.
- 2.4 Works are close to completion on refitting Cowley Road bus depot in Cambridge with simultaneous overnight charging facilities for all thirty buses. Work is now commencing at Babraham Road Park & Ride to provide a charging facility for the five Park & Ride services.
- 2.5 It is intended to launch the ZEBRA bus fleet into service in March 2023.
- 2.6 The Combined Authority is requested to spend the money existing and allocated within the MTFP to complete the project by acquiring and placing in service the 30 electric double decker buses and completing the electrical power charging facilities

Significant Implications

3. Financial Implications

- 3.1 The Medium-Term Financial Plan has an approved budget amount of £2.994 million for the ZEBRA project.

4. Legal Implications

- 4.1 The ZEBRA project has an agreed Grant Funding Agreement in place between the Combined Authority, Cambus Ltd, Stagecoach East and the County Council.

- 4.2 The Grant Funding Agreement includes the approved apportionment of 40 / 60 as a split of any under / overspend against the budget between Cambridgeshire County Council (40%) and the Combined Authority (60%).

5. Public Health Implications

- 5.1 There will be a positive impact on public health by focusing thirty Zero Emission buses into the city core and thereby improving air quality for the residents and people of Cambridge.

6. Environmental and Climate Change Implications

- 6.1 There will be a positive impact on public health by focusing thirty Zero Emission buses into the city's core. It is anticipated that the reduction in bus emissions in the city centre/Air Quality Management Zone (AQMZ) will equate to 40-45%. Crucially NO_x, PM, and carbon emissions in the city centre/AQMZ are expected to return to environmentally acceptable levels following this intervention.

- 6.2 Specifically:

- After year 1 CO₂ emitted is expected to fall by 1,405,262 kg/CO₂e - a 74% reduction versus pre-implementation levels
- After year 8 absolute CO₂ emitted is expected to fall by 12,175,980.4 kg/CO₂e - an overall decline of 80% on pre-implementation levels
- After year 17 absolute CO₂ emitted is expected to fall by 27,997,093.29 kg/CO₂e, representing an overall decline of 86% on pre-implementation levels.

7. Other Significant Implications

- 7.1 N/A.

8. Appendices

- 8.1 None

9. Background Papers

- 9.3 [Board Paper September 2021](#)



**CAMBRIDGESHIRE
& PETERBOROUGH**
COMBINED AUTHORITY

Agenda No:2.7

Bus Update, including Framework

To: Cambridgeshire and Peterborough Combined Authority Board

Meeting Date: 18 January 2023

Public report: Yes

Lead Member: Cllr Anna Smith, Chair of Transport and Infrastructure Committee

From: Tim Bellamy, Interim Head of Transport

Key decision: N/A

Forward Plan ref: N/A

Recommendations: The Transport and Infrastructure Committee are recommended to:

- a) Note the outline programmes for the continued development of the Bus Strategy, the review of the Bus Franchising business case, and refreshed Bus Service Improvement Plan programme and the additional resources being used to accelerate this work;
- b) Recommend to the Combined Authority Board to approve the procurement and retendering of the services provided by the 6 contracts as listed at 2.10 of this report. To also approve the budget for these services and to delegate authority to the interim Head of Transport to enter into contracts with successful bidders.
- c) Recommend to the Combined Authority Board to approve the extension of the current 23 contracts with providers for a period of 12 months subject to budget approval for these services. To also delegate authority to the interim Head of Transport to enter into contracts to extend the period as stated. These contracts will be reviewed as part of a full review of services;

- d) Feedback on the development of the Local Bus Service Assessment Framework; and
- e) Recommend to the Combined Authority Board to approve the re-appointment of the current suppliers for the provision of the ENTCS (English National Concessionary Travel Scheme). In addition to approve the budget for this service. To also, delegate authority to the Interim Head of Transport to enter into contracts with the suppliers.

1. Purpose

- 1.1 To outline the programme of work necessary to develop an appropriate Bus Strategy for the region. This Strategy will be strongly aligned to the vision, aims and objectives of the Local Transport and Connectivity Plan (LTCP). Feedback will be subsequently sought from Members around the overarching vision and direction of travel for this Strategy.
- 1.2 To outline the process around the development, consultation, and implementation of a Local Bus Service Assessment Framework (LBSAF) with a standardised series of questions that will assess the need for bus services on a consistent and rational basis. This will allow the provision of a logical bus network within the budget available for service support.

2. Background

Bus Strategy

Principles

- 2.1 A key component of the LTCP's suite of documents is the emerging Bus Strategy. This document articulates what the Combined Authority wants the bus network to look and feel like (vision for buses within Cambridgeshire and Peterborough) and public consultation on this document commenced on 11th January 2023 for six weeks. There is clear alignment between the Bus Strategy and the LTCP; the emerging priorities of the Combined Authority; the Climate Change Commission recommendations; and our Devolution Deal.
- 2.2 As outlined previously, implementing the Strategy will require some difficult choices to be made, both in terms of where investment is made and how the infrastructure is used. It will also require additional funding, from both central government and local partners to make the vision a reality. The Combined Authority will need to work closely with operators to make this happen.
- 2.3 Key principles of the vision are:
 - Best-in-class: High quality bus services;
 - Sustainable growth: Bus services that support growth and environmental sustainability; and
 - Opportunity for all: Bus network provides convenient access to jobs, facilities, and services for all, irrespective of income, age, ability, location, or access to a car.
- 2.4 In order to deliver against these principles, it is important that the work of the Combined Authority considers these when undertaking the review and retendering of the bus network and associated services.

Bus Services and Retendering

- 2.5 Our bus services are a mixture of commercial routes (paid for from fares) and supported services (which we commission and fund through competitive tender). Around 90% of journeys on buses in the Combined Authority area are commercial.
- 2.6 Over the last year, severe economic factors have worsened the market for running commercial bus routes:

- Passenger numbers are down by around 24% compared to pre-covid. More people are working from home, reducing bus income;
- Concessionary pass use is down by 48% compared to pre-Covid demonstrating older people choosing to avoid public transport;
- The cost of fuel has risen by around £60 per bus per day;
- There is an ongoing shortage of drivers, driving up training costs and payroll costs; and
- Insurance and utility costs have risen sharply.

2.7 On 16th September, it was confirmed by Stagecoach that a number of services would be withdrawn. Therefore, the Combined Authority commenced a competitive tender process that offered alternative operators the chance to provide them.

2.8 These 23 contracts are due to finish at the end of March 2023 unless the Combined Authority invokes the extension clause. If the Combined Authority does not wish to extend the contracts, then due notice needs to be given to operators to allow sufficient time for these services to be deregistered with the Traffic Commissioner. The minimum requirement is 42 days and therefore the Combined Authority will need to confirm with operators by 17th February 2023.

2.9 Similarly if the Combined Authority wish to extend the contracts, it would be necessary to provide the same notice period. The preference would be to provide operators with more notice, if possible, to allow for effective arrangements to be made. However, the decision on funding for passenger transport and buses is inextricably linked to the budgetary discussions at the Combined Authority Board later in January and therefore the notice period for operators might be limited.

2.10 At the Combined Authority Board meeting on 19th October members were informed of short-term waivers issued to delay the tender of six services to terminate at the end of March 2023 rather than their original contract end date. These services are:

- 16A - Cambridge - Long Rd - Teversham - Fulbourn - Balsham - Great Thurlow
- 17 - Royston - Bassingbourn - The Mordens
- 68 - Wisbech Town service
- 101 - Whittlesford - Duxford - Saffron Walden
- 199 – Cambridge - Newnham
- Zipper 1 – Witcham - Haddenham - Wilburton - Ely

2.11 The Combined Authority Board were advised previously in October 2022 that a thorough, robust, and comprehensive review of the bus service network would be completed by March 2023. However, in order to understand the views of the general public and how best to shape the overarching network, it is important that this work is informed by the public consultation that commenced in the week of 9th January 2023. It is now envisaged that the full review of the service provision across the region will be presented to the Transport and Infrastructure Committee in autumn 2023 for consideration ahead of the budget setting process later in the financial year. This will allow for the revised network to be in place for April 2023.

2.12 In order to align with this revised programme, it is important that the services outlined in paragraph 2.10 and the 23 contracts previously agreed continue to be supported by being extended with new contracts commencing 1st April 2023. Therefore, it is recommended to the Combined Authority Board to approve the extension of the current 23 contracts with

existing providers for a period of 12 months and to approve the budget for these services. These contracts will therefore be reviewed as part of a full review of services. The retender of the services identified an extra cost of £1.7m for the 5-month period this would suggest a cost of £4.08m for a full 12-month period.

Framework

- 2.13 In order to allow for informed decisions to be made around bus provision and routes across the region based on a range of funding options, it is important that the Combined Authority continue to develop, agree, and deliver an appropriate framework to ensure transparency when releasing any potential funds to support our bus services if required in future years. Feedback from Members on the appropriateness of the framework is sought. The Local Bus Service Assessment Framework (LBSAF) seeks to prioritise bus services in a logical, passenger-focused way. The LBSAF would have two functions, namely:
- Allow the Combined Authority to prioritise where the limited financial resources could be allocated if such service costs exceed the revenue funding available; and
 - Once a revised supported bus network is put in place, it would allow the Combined Authority to respond to specific changes to the commercial bus network over which it has no control and assess the need for additional contracted services that result from commercial changes (or indeed to operators ceasing to provide a contracted service where a comparable commercial service is started), in a way that is structured, agreed, and transparent.
- 2.14 It is important that the Combined Authority adopts a methodical, objective, and consistent approach to enable it to balance the differing potential transport needs of residents; and, to manage the network in the light of changes to the commercial bus network and public demand; and the potential changes in available funding.
- 2.15 The LBSAF aims to determine whether there is a need for a service as a result of commercial transport operators' failure to provide one. This would comprise 'gateway' assessments that will help the Combined Authority to determine whether they need to consider procuring a supported service in each circumstance. The five assessment stages could be:
- Is there market failure?
 - Will the service intervention offer value for money?
 - Does the available transport for the area affected meet the Service Intervention Point (SIP) benchmark?
 - What is the impact on current transport users?
 - Conclusion and decision making.
- 2.16 Increases or reductions in public transport provision will impact on social exclusion. For example, it maybe that service reductions would prevent people from accessing key local services or activities, such as jobs, learning, healthcare, food shopping or leisure. Problems may vary by type of area (for example urban or rural) and for different groups of people, such as disabled people, older people, or families with children. Therefore, it is proposed that the second component part of the LBSAF will be used to assess social exclusion and access to key destinations and feedback from Members is sought, further information on this element of the LBSAF can be found in the appendices (entitled *Methodology for Prioritising Bus Routes for Investment*).

- 2.17 The LBSAF will try to consider the amount of community support for each of the services under threat. This will be one of the assessment criteria within the LBSAF and enable Members to make informed decisions.
- 2.18 Through active engagement with partners and Leaders, the Combined Authority will be able to finalise a LBSAF that will assess any future reductions in bus provisions and potentially allow limited funding to be allocated through a clear, transparent process.

Timescales

- 2.19 A full and thorough review of the bus network will be delivered following the agreement of the Bus Strategy in Spring 2023. This assessment will utilise the emerging LBSAF and will involve the use of external consultants to assist the Combined Authority in making an independent evaluation of all the services that it financially assists. In order to deliver this critical review a budget will need to be found to support this work going forward.
- 2.20 In addition, it is essential that the assessment maintains a golden thread between the Combined Authority's overarching strategy, the LTCP and the emerging position around Franchising and Enhanced Partnerships. Franchising would mean that the Combined Authority becomes responsible and accountable for the planning and provision of bus services within a defined area (either all or part of a Local Authority's area) and therefore any development in this space needs to dovetail with those of the LBSAF.

English National Concessionary Travel Scheme

- 2.21 The Combined Authority acts as the Travel Concession Authority (TCA) on behalf of the DfT to administer the Statutory English National Concessionary Travel Scheme (ENCTS) for its residents. Prior to April 2021 the ENCTS was administered on behalf of the Combined Authority by Cambridgeshire County Council and Peterborough City Council under two separate arrangements. Work has taken place this year to combine these services onto one Cambridgeshire-wide system that is more compliant with both DfT guidelines and with GDPR legislation. This project goes live on 1st February 2023.
- 2.22 The DfT specifies which digital systems must be used to underpin the scheme and that these must be obtained through ITSO accredited suppliers. In the past CCC and PCC joined together to procure these services under a bespoke framework agreement led by CCC; allowing each Authority to draw down services from the same suppliers. This Framework awarded the Unicard Ltd the contract for the Host Operated Processing system (HOPS) which tracks card usage on buses and Card Bureau and Printing services to Euclid Ltd. Both suppliers are ITSO accredited, leaders in a small field and have won two CCC Framework retendering rounds based on quality and cost. The contracts have been reviewed quarterly and have always met or exceeded the service levels expected. The Cambridgeshire application system has been developed with automatic two-way links with both suppliers that work seamlessly and without human intervention to update each other and to issue passes. This has greatly increased the efficiency of the process and complies with our statutory obligations for data storage and handling.
- 2.23 The current framework is due to expire on 31st March 2023. Since the last retendering round several frameworks have become available that TCAs can join without going out to full tender. The Combined Authority is not specifically named in these frameworks, but they are made available to all TCAs to use. It is beneficial re-award the contracts to the current suppliers because the Combined Authority has a statutory duty to maintain continuity of

service for residents. The timescale involved means that there is insufficient time to do a full retendering exercise. The existing framework route is one now used by the majority of TCAs and is considered appropriate and more efficient.

- 2.24 The pool of ITSO accredited suppliers is limited, and the two current suppliers are leaders in the field and have provided good service. In addition, it would take time to redevelop the links within CCC's system were we to change suppliers which would affect continuity of the service.
- 2.25 It is not possible to request a proposal from the Frameworks until after the 1st February when all passholder details will be held in the Cambridgeshire system and an accurate report can be obtained. Indicative costs for the contract are given below based on this year's budget, however it should be borne in mind that costs have increased since the last Framework was awarded five years ago,

3. Financial Implications

- 3.1 The financial assistance will need to align with the Medium-Term Financial Plan and budget conversation that the Combined Authority Board will be finalising at its meeting in January. Any extension to these contracts would be dependent on funds being approved at this meeting. The six existing contracts detailed in Paragraph 2.10 previously equated to £355,000 per annum.
- 3.2 The total cost associated with the bus contracts equates to approximately £6.9m.
- 3.3 Whilst the total one-year cost of the Euclid work equates to £88,931 and a four year budget of £355,724.

4. Legal Implications

- 4.1 None.

5. Public Health Implications

- 5.1 With potential service reductions, access to healthcare facilities may be reduced significantly and therefore this will be considered through the LBSAF.

6. Environmental and Climate Change Implications

- 6.1 With a reduction in public transport provision, there will be a potential for adverse impacts on the area's environment and climate change due to the increased reliance on the private car.

7. Other Significant Implications

- 7.1 None.

8. Appendices

- 8.1 Appendix 1 – LBSAF

Appendix 2 - Methodology



**CAMBRIDGESHIRE
& PETERBOROUGH**
COMBINED AUTHORITY

Draft Local Bus Service Assessment Framework 2022

September 2022



Introduction

This process is to assist the Combined Authority's officers to judge which bus services are the most important in a logical but passenger-focused way and make the appropriate recommendations to the Combined Authority Board.

With this in mind and following intensive discussions with other Transport Authorities, the Combined Authority officers have designed a Local Bus Service Assessment Framework (LBSAF) to aid this decision-making process.

This is a process for assessing changes to the market-defined bus network.

The Combined Authority has a responsibility to look at where market failure occurs in the local road passenger transport network, to determine whether in these instances a service is needed and if, in the Authority's opinion, it is then to provide one. This role is a direct result of the section 63(1)(a) of the Transport Act 1985, where all Transport Authorities are required: *"to secure the provision of such public passenger transport services as the council consider it appropriate to secure to meet any public transport requirements within the county which would not in their view be met apart from any action taken by them for that purpose"*.

Therefore, the Combined Authority has a statutory duty to act in accordance with the provisions under 63(1)(a), as not doing so could be subject to legal challenge. What this means in reality is that the Combined Authority needs to consider any changes and undertake a full Equality Impact Assessment.

In addition, the Combined Authority have developed a Vision for the future which states:

1. The bus is the mode of choice for journeys that are not feasible on foot, cycle or using micro mobility forms of travel.
2. The bus network supports sustainable growth.
3. The bus helps to protect and enhance the environment.
4. The bus network supports the health and wellbeing of the population.
5. The bus provides opportunity for all.

Under this guidance there may be opportunities to develop and expand parts of the bus network and such opportunities should be assessed in the same way.

Given the limited funding available it is imperative that the Combined Authority adopts a methodical approach to enable it to balance the differing potential transport needs of residents; and, to manage the network in the light of changes to the commercial bus network and public demand.

Aim of the Local Bus Service Assessment Framework

The proposed LBSAF has two functions. Firstly, given that it is not possible to fund every conceivable public transport need for service users in Cambridgeshire and Peterborough, it will allow the Combined Authority to prioritise where their limited financial resources should be allocated. Secondly, once the revised supported bus network is put in place, it will allow the Combined Authority to respond to changes to the commercial bus network over which it has no control and assess the need for additional contracted services that result from commercial changes (or indeed to operators ceasing to provide a contracted service where a comparable commercial service is started), in a way that is structured, agreed, and transparent. This will enable the bus network to truly reflect the vision, aims and aspirations of the Local Transport and Connectivity Plan and associated Bus Strategy.

The LBSAF comprises the following 'gateway' assessments that will help the Authority to determine whether they need to consider buying a supported service in each circumstance.

Statement of strategic priority

The following sections of route define the strategic core network. These routes form the backbone of the bus network and create a basic bus map on to which non-core bus services can be mapped and assessed.

Core network links:

- Peterborough – Wisbech
- Peterborough – Whittlesey - Coates
- March – Chatteris – Ely
- March – Wisbech
- Cambridge – Gt Shelford – Sawston
- Cambridge – Cambourne – St Neots
- Cambridge – Addenbrookes
- Huntingdon – Cambourne
- Whittlesey – Ramsey – Huntingdon
- St Ives – Cambridge
- Cambridge – Waterbeach – Ely
- Ely – Littleport
- Ely – Fordham – Soham – Burwell

Local Bus Service Assessment Framework: Quantitative Assessment

To proceed to procurement, a proposed bus service will need to pass all the assessment gateways as follows:

Assessment Stage 1: Is there market failure?

The Authority will consider the following factors when determining whether a market failure has occurred.

- Are there reasonable alternative services on offer that will already allow residents to make the same journey?
- Are there broadly comparable journeys or suitable alternative destinations accessible without the need for an intervention by the CPCA?
- Will any CPCA service provision risk undermining the economic viability of a commercial service?

If there are reasonable alternative or broadly comparable services available or the provision of a contracted service would undermine the economic viability of a commercial bus service, then normally assessment will end here, and no contracted service will be provided.

Assessment Stage 2: Will the service intervention offer value for money?

A service will be assessed to determine whether it offers value for money for the taxpayer. This will be done by considering the nett cost to the taxpayer of carrying each passenger after all income for the service (from on-bus fares, concessionary travel and any season tickets or other pass arrangements) has been taken into account over a given period (usually one year) has been calculated and this will be divided by the number of passenger journeys (individual movements) of all types carried on the service over the same period. This is the cost per passenger journey (CPPJ).

The Combined Authority has set an upper limit to the cost per passenger journeys beyond which it will not normally continue to provide the service. This upper cost will initially set at £12.00 but may be reviewed periodically in light of changing circumstances.

If the cost is higher than the maximum CPPJ figure, then provision of a contracted service will not normally be considered.

Assessment Stage 3: Does the available transport for the area affected meet the Service Intervention Point (SIP) benchmark?

To this end the Combined Authority has developed a table setting out Service Intervention Points (SIPs) that indicate the level of service available to residents in an area beneath which it will consider the need to provide additional transport services.

The assessment will utilise the work carried out by the County Council through the Cambridgeshire Insight, Local Population Estimates and Forecasts. This provides very accurate population estimates that enable local agencies not to be solely reliant on the 2011 Census data.

Settlement Population*	Minimum service level
A. Less than 100	No service
B. 100 - 499	1 return journey during the day, 1 day per week
C. 500 - 999	1 return journey during the day, 5 days per week
D. 1000 - 1999	Peak return journey & one return journey during the day, 5 days per week
E. 2000 - 4999	4 return journeys per day, including one peak return journey, 6 days per week
F. 5000 - 9999	8 return journeys, including one peak return journey, 0800-1700, 6 days per week
G. 10000 - 19999	Hourly service 0700-1800, 6 days per week
H. 20000 - 39999	At least 2 services to different destinations hourly at frequency shown at G.

If the SIP level of service is met by existing services, then assessment will normally stop here, and no additional contracted service will be provided. Due consideration will be provided to the settlement hierarchy established in District's Local Plans, as this provides relevant estimations on core settlements and the importance of links between them.

If the SIP level is not met, then assessment proceeds to Assessment Stage 4.

Assessment Stage 4: What is the impact on current transport users?

This stage assesses the impact of a loss of service or decision to provide a service on current or potential future bus service users, particularly where the Combined Authority has a statutory duty to provide transport for specific groups.

Assessment Stage 5 – Conclusion

Once the assessment stage has been completed a decision will be made about whether a service is in principle required based on the process set out above. If the decision is that a service is, in principle, needed, then the process will proceed to the budget setting stage. If insufficient funding is available in the local bus budget to provide a new service, even if it has a high priority, then the following options would be explored:

- Not to provide the service at this time, but place it upon a reserve list, with priority for provision, should additional funding be made available at a future date.
- Allocate additional funding to provide the service identified from other sources.
- Provide the service and fund it by withdrawing services with the overall lowest priority (lowest priority category and highest cost per a passenger journey within that category) sufficient to provide the necessary funding.

In the short term it is proposed that this decision will be made by the Head of Transport and in liaison with the Authority as necessary. If funding is available, the service will be procured.

Further Changes to Bus Service Funding Priorities

Over time it is possible that circumstances will change and the level of financial support for local bus services may vary. In these circumstances, support for services will be altered in line with the priority allocated to them under the LBSAF. Each service affected will be considered in its own right and in the case of service reductions, impact and equality assessments will be undertaken before any changes are made and service users will be consulted where possible. In making any such changes, the Combined Authority will aim as far as possible to ameliorate the impact of any service loss through the use of alternative services, such as community transport.

Additional Qualitative Assessment

Problems with transport provision and the location of services can reinforce social exclusion. They prevent people from accessing key local services or activities, such as jobs, learning, healthcare, food shopping or leisure. Problems can vary by type of area (for example urban or rural) and for different groups of people, such as disabled people, older people, or families with children.

Therefore, an assessment will be undertaken to assess the criticality of the routes in relation to rural accessibility and social exclusion. This will include the links to:

- Employment;
- Learning; and
- Healthcare.

The separate appendix to this paper provides more detail around the informed qualitative assessment that will assist officers in providing recommendations to Members (entitled *Methodology for Prioritising Bus Routes for Investment*).



**CAMBRIDGESHIRE
& PETERBOROUGH**
COMBINED AUTHORITY

Draft Methodology for Prioritising Bus Routes for Investment – Route Design Standard

September 2022



Introduction

The Cambridgeshire and Peterborough Combined Authority requires a method of assessing which bus routes to subsidise that considers a wide range of parameters including value for money, support for rural areas, support for deprived areas and contribution to sustainable travel to work, education, and access to vital services such as hospital and GPs.

A brief review of literature shows that there is no standard method for doing this. In the US¹ there was a study that split route assessment between a group of separate standards. Of relevance to this methodology was the proposed 'Route Design Standard' considering population density, employment density and equity of access alongside an 'Economic Design Standard' that considered aspects such as costs per passenger mile, subsidy per passenger per mile etc. There would then be a subsequent set of standards applied to the design of the timetable.

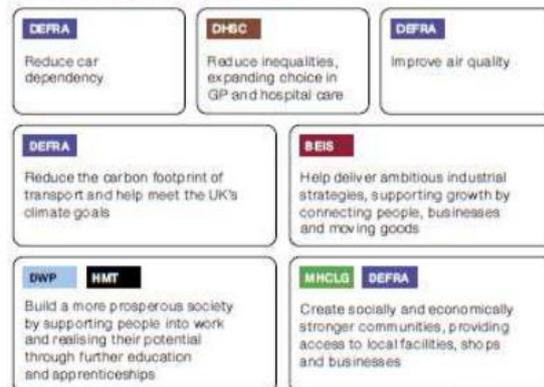
Other research focuses on evaluating the effectiveness of existing services against a specific policy objective. For example, the assessment of the 'Better Bus Area' initiative focused on the data needed to assess effectiveness against the stated aim of "support the local economy and facilitate economic development through the improvement of local bus infrastructure, patronage numbers and services". Other work by the National Audit Office (NAO) starts from a similar place, posing the question 'Why buses are important, and to whom?'². The question is then answered in relation to supporting the achievement of government policy.

Figure 1

Local public transport and wider government objectives

Local public transport influences policy objectives of two thirds of government departments

An effective public transport system can...



And enable...



- BEIS** Department for Business, Energy & Industrial Strategy
- DCMS** Department for Digital, Culture, Media & Sport
- DfE** Department for Education
- DEFRA** Department for Environment, Food & Rural Affairs
- MOJ** Ministry of Justice
- DHSC** Department of Health & Social Care
- DWP** Department for Work & Pensions
- HMT** HM Treasury
- MHCLG** Ministry of Housing, Communities & Local Government

Note
1 Objectives from 10 departments (including the Department for Transport), of 15 central government departments in 2019.

Source: National Audit Office summary of central government department objectives as set out, for example, in Single Departmental Plans as at 2019

¹ [BUS ROUTE EVALUATION STANDARDS \(trb.org\)](http://bus.route.evaluationstandards.trb.org)

² [Improving local bus services in England outside London \(nao.org.uk\)](http://improving.local.bus.services.in.England.outside.London.nao.org.uk)

Based on this simple read through the proposed methodology is based on the following:

1. Having an approach that acknowledges each route needs to meet an 'Economic Design' standard and a 'Route Design Standard'.
 - a. The Economic Design Standard (addressed elsewhere) – but to include population data.
 - b. The Route Design Standard being based on how well subsidising the route helps to meet the policy objectives of the combined authority as defined by the Sustainable Growth Ambition Statement.

Route Design Standard – Methodology

The Sustainable Growth Ambition statement (SGAS)³ was reviewed alongside the proposed monitoring paper for the SGAS⁴ and the draft Local Transport and Connectivity Plan (LTCP)⁵. The main points of each were then used to draw up a series of headings under which data could be identified for the assessment of the value of each route toward supporting the aims of the Combined Authority. This was done noting that not every aim within the SGAS is immediately relevant to the direct provision of bus services e.g., building a knowledge-based economy.

The following list was chosen:

1. *Reducing inequalities*: Supporting disadvantaged communities, with access to education, employment, and work.
2. *Productivity*: Supporting people to connect with larger labour markets / better employment.
3. *Connectivity*: Supporting links between places and access to services (e.g., Hospital).
4. *Climate*: Potential future value of the route for supporting mode shift from car to bus.

Against these headings a data list was drawn up. There were restrictions on the data that could be

- It needed to be available at a small area level to enable a fine grain analysis of each route.
- The data needed to be recognised as authoritative.
- The data needed to be relatively contemporary (noting the time delay in releasing national statistics).
- Data needed to be available within the CPCA Corporate GIS system for analysis (see *appendix one and two of this report for a detailed account of the analytical process*).

In addition, it was thought that some data could be used outside of a ranking calculation to provide useful context. For example, to understand the rural / town / urban coverage of the routes, or to understand the relative size of the labour markets (not available at small area level) that the route was linking people to.

³ [Document.ashx \(cmis.uk.com\)](https://cmis.uk.com/Document.ashx)

⁴ [Agenda Item No \(cmis.uk.com\)](https://cmis.uk.com/AgendaItemNo)

⁵ [Draft-LTCP.pdf \(yourltcp.co.uk\)](https://yourltcp.co.uk/Draft-LTCP.pdf)

Theme	Reducing Inequalities			Productivity		Connectivity			Climate
Data Set	Index of Multiple Deprivation 2019 – IMD Score	Index of Multiple Deprivation 2019 - Education and Skills Domain	<i>Context only</i> Rural / Urban Classification 2016 ⁶	Income Estimates of small areas 2018 ⁷	<i>Context only</i> Relative labour market size ⁸	Journey time statistics of England and Wales 2019 ⁹	Index of Multiple Deprivation 2019 – Access to services Score ¹⁰	Significant service points on route (based on Ordnance Survey data) - Hospital - Higher Education (inc sixth forms) - Any others?	Relative traffic volumes on route – based on Basemap 2019 (TRACC data)
Route x						<i>A choice of one of the above – to be tested</i>			

⁶ [Rural Urban Classification - GOV.UK \(www.gov.uk\)](http://www.gov.uk) Awaiting an update based on the 2021 census (current classification is 2011 based)

⁷ [Income estimates for small areas, England and Wales - Office for National Statistics \(ons.gov.uk\)](http://ons.gov.uk) noting that 2018 is the latest release (made in 2020). A calculation will be considered to understand the ratio of earnings between different areas.

⁸ Dft Journey time statistics include modelled employment centre data – ratio of connection could be used e.g. a route connecting a small labour market area to a much bigger one.

⁹ [Journey time statistics, England: 2019 - GOV.UK \(www.gov.uk\)](http://www.gov.uk) Published in 2021

¹⁰ This is to be tested for overlap with the Dft Access to Service model used to develop the Journey Time Statistics. There may be so much overlap that one indicator is sufficient

Appendix 1

Capturing Geographical Information

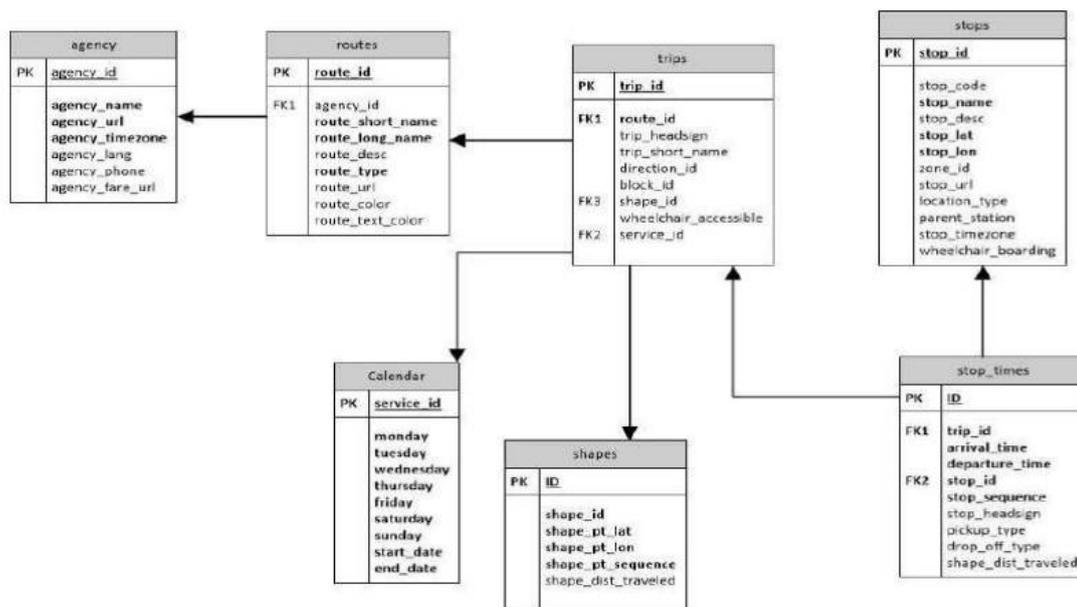
Appendix 1: Capturing Geographical Information

Initially accessing the information required for the assessment was straight forward, however the processing and management of the data requires several steps each of which require separate quality assurance to ensure that no errors are introduced.

1. The most recent bus service data is downloaded in GTFS¹¹ format data from the DfT [All timetables data \(dft.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/422222/all_timetables_data.pdf).

Most of the Cambridgeshire routes are part of the East Anglian Dataset whereas the routes starting in Peterborough centre on the East Midlands Dataset.

2. The data is not comprehensive. It is only as good as the information that is submitted by the bus companies and commissioning authorities. Past reviews have shown that routes are sometimes missed or incomplete. This is so, for those delivered by smaller operators.
3. GTFS data has a very specific format and relationship between the tables of information.



One very specific challenge in this case is to extract the right 'Shapes' based on the 'Routes' that are being analysed. This is because there isn't a direct relationship between the two within the GTFS format. Rather the relationship is made via the 'Trips' table. When running the join care needs to be taken to extract the desired shape as there may be multiple shapes for each route / trip based on real world differences in the timetable e.g., some bus trips having extensions at peak times.

¹¹ General Transit Feed Specification

4. The data was processed using a GTFS loader¹² in QGIS (Desktop GIS) to disassemble the GTFS file. Into its various tables of routes / trips / times / shapes.
5. The selection of Cambridgeshire specific routes is then made (the process is doubled up as Peterborough routes are on the East Midlands dataset). Identification needs to be done with care as there are multiple routes with the same shortcode e.g., there are eight route 5s in the database. The field 'tripheadsign' can be used to separate these out e.g., selecting the route 5 with the Cambridge Headsign rather than Ipswich.
6. As per section 3 above, the query relationship between the tables is then carried out within QGIS. The linking code lines are randomly generated unique long integers, and the route numbers, operator codes etc are also integers / short text. Therefore, additional information is introduced at this stage to enable the data to be understandable, for example a common-sense descriptor (created by the public transport team) to go alongside the route number.
7. The process was then checked for quality assurance purposes. As per expected the query structure returned ten correct routes and eleven with errors. The errors included incomplete routes or there being multiple (possibly historic versions of the same route on the database) and routes with alternative spurs depending on the time of day or alternative routes depending on 'there or back'. Corrections were then made to the queries.
8. Where there were partial closures to routes of, they were missing entirely from the GTFS download (e.g., V5) then these were captured by hand drawn lines (with reference to the timetable / stop information).
9. The resulting GIS dataset is then uploaded into ArcGIS online for display, sharing and analysis.

¹² [GTFS Loader — QGIS Python Plugins Repository](#) This plugin allows to load a GTFS ZIP file, that will be extracted into the GeoPackage with individual tables. For stops and shapes it creates vector layers.

Appendix 2:

Query Building

Appendix 2: Query Building

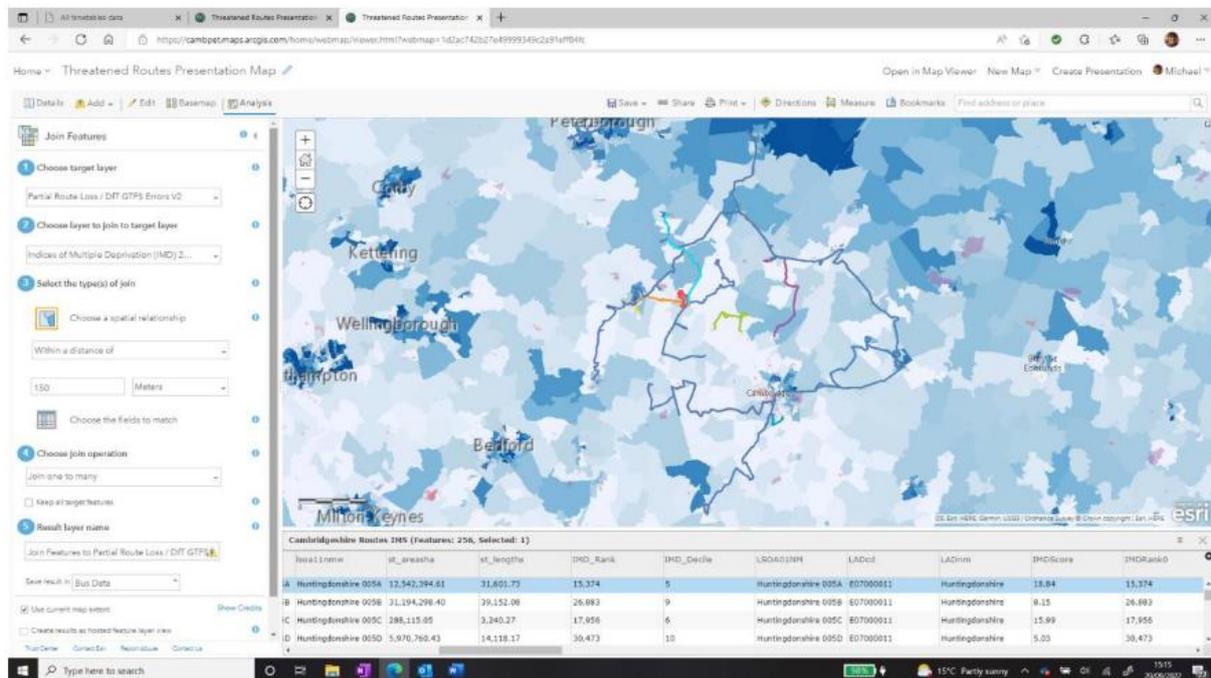


Figure 1 - Query building to identify IMD data for each route

As per the screen shot above a query was built within ArcGIS Online (AGOL) to identify where each bus route passes within 150m of a Lower Super Output Area (LSOA) as the crow flies, and to gather up the Index of Multiple Deprivation (IMD 2019) data for that LSOA.

The distance of 150 metres was selected subjectively, but with reference to the limited study literature available on the distance people are willing to walk to a bus-stop¹³. Keeping in mind the route only need be with 150ms of an LSOA boundary, with the LSOA extending an even great distance. 150m appeared to be a compromise between selecting too narrow an area or too much (noting studies identify a range of walk to stop of 100 to 700 metres, depending on area geography).

It should be noted that the route was used rather than individual bus stops so as to identify fully the potential reach of the service given future options may consider adding stops to routes to gain additional value.

An illustration is provided overleaf (see figure 2) for the results of the selection process in Peterborough. For each of the three routes:

- Route 29 was within 150 metres of the boundary of 23 LSOAs
- Route 23 was within 150 metres of the boundary of 12 LSOAs
- Route 24 was within 150 metres of the boundary of 15 LSOAs

¹³ [\(PDF\) Acceptable walking distance accessible to the nearest bus stop considering the service coverage \(researchgate.net\)](#)

As the routes were relatively close some of the LSOA selected were the same. This is not seen as a problem, but rather a reflection of the ground conditions.

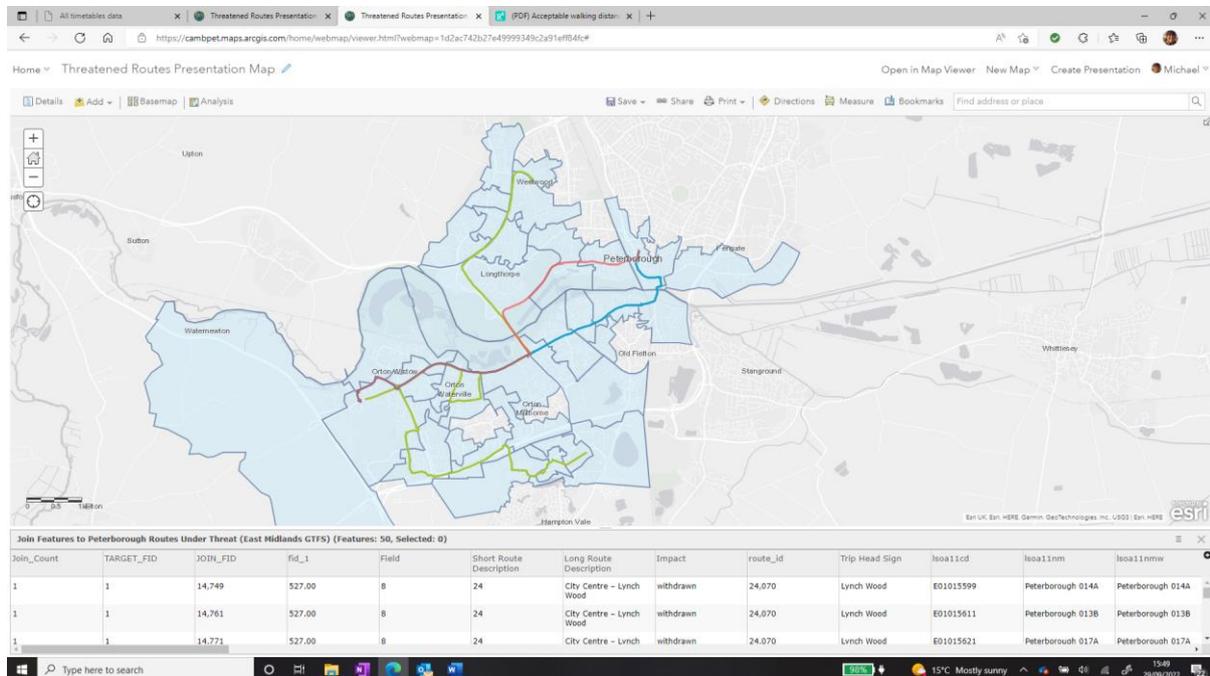


Figure 2 - Selection of LSOAs based on the three threatened Peterborough City Routes

The results of the example query were as per the table below with route 29 running closer to more deprived areas compared to routes 24 and 23. (Minimum and Maximum values were included to ensure no exceptionally deprived areas.

Bus Route	Average of IMD Score	Max of IMD Score	Min of IMD Score
23	15.31	38.37	8.15
24	19.90	41.70	6.00
29	24.48	57.29	8.03

Finally, a visual sense check was carried out on the selection process. This identified a problem in a very limited number of cases where a route ran a distance along dual carriageways / motorways where there wasn't the possibility of stopping, with the route not serving the communities it went through. In those cases, e.g., route 29 above in Peterborough a separate custom query was built and used to adjust the captured data.

It should also be noted that the analysis process could have been exercised using bus stop data. Which would help resolve the problem identified above. However, the analysis by stop, particularly where those stops are close together would yield a significantly larger dataset with a lot of overlap and duplication (on a many to many query). The subsequent cleaning of the data would greatly lengthen the analysis process, so given that speed of response was a priority a simpler route-based method was chosen.