TRANSPORT & INFRASTRUCTURE COMMITTEE

Date:Wednesday, 16 November 2022

Democratic Services

Edwina Adefehinti
Interim Chief Officer Legal and Governance
Monitoring Officer

72 Market Street
Ely
Cambridgeshire
CB7 4LS

10:00 AM

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

AGENDA

Open to Public and Press

Arrangements for asking a public question can be viewed here - [Public Questions - Cambridgeshire & Peterborough Combined Authority (cambridgeshirepeterborough-ca.gov.uk)](cambridgeshirepeterborough-ca.gov.uk)

Part 2: Delivery

Part 3: Date of Next Meeting

18th January 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
Clerk Email:	Daniel.Snowdon@cambridgeshire.gov.uk

Cambridgeshire and Peterborough Combined Authority Transport and Infrastructure Committee: Minutes

Date: 13 July 2022

Time: 10.00am – 12.16pm

Present: Nik Johnson (Mayor and Chairman), Councillors Bovingdon, Cereste, McDonald, Seaton, Shailer, Thornburrow and Wakeford.

Apologies: Councillor Wakeford, substituted by Councillor Davenport Ray.

34. Apologies and declarations of interest

Apologies were received from Councillor Wakeford, substituted by Councillor Davenport Ray.

Councillor Peter McDonald declared an interest as a member of Cambridgeshire County Council's Highways and Transport Committee.

Councillor Boden declared an interest in minute 38, Local Bus Service Assessment Framework as a trustee of FACT that received funds from the Combined Authority.

35. Minutes – 14 March 2022 and Action Log

The minutes of the meeting on 14 March 2022 were approved as an accurate record and signed by the Mayor, subject to the addition of Councillor Bovingdon who was present at the meeting.

The action log was noted.

36. Combined Authority Forward Plan – 6 June 2022

The Combined Authority Forward Plan was noted.

37. Transforming Cities Fund

The Committee received a report that provided a summary of the Transforming Cities Fund (TCF) programme and set out how the Combined Authority intended to manage it over the course of the financial year.

The Combined Authority had received a £95m share of an overall £1.08bn that had been allocated to six Mayoral Combined Authorities. A report had been previously submitted to the Combined Authority Board that set out a programme. The Committee was informed that schemes within the programme were looking to be accelerated.

The presenting officer drew Members' attention to an amendment to recommendation c) to recommend to the Combined Authority Board.

During the course of discussion:

- Confirmation was sought by a Member that projects including Wisbech Access Strategy, March Junctions Project be progressed and consideration be given to the inclusion (if appropriate within TCF rules) to the Whittlesey Southern Relief Road Stage 1 report. It was confirmed that the Wisbech Access Strategy and the March Junctions Project were both included in the programme for accelerated delivery. Further work would be undertaken on the Whittlesey scheme to understand whether it qualified under the terms of the funding and whether it could be included in the list of prioritised schemes.

- The importance of connectivity was emphasised by a Member for areas such as Fenland and South Cambridgeshire.

- Attention was drawn by a Member to Cambridgeshire County Council and the interest it had as the Highway Authority. The work of officers was welcomed in developing the schemes and questioned whether if schemes that were unsuccessful could be retained for future consideration. The presenting officer confirmed that the work would not be forgotten, and the unsuccessful schemes would form a pipeline through which additional funding would be sought to take forward.

It was resolved unanimously to:

a) Note the current position in relation to the delivery of the TCF schemes programmed for 2022/23;

b) Agree to the revision to the programme and the process for this outlined within the paper; and

c) **Recommend the Combined Authority Board** delegate responsibility to the Interim Head of Transport and the Chair of Transport and Infrastructure Committee in consultation with the Chief Finance Officer and the Monitoring Officer to finalise the potential replacement capital schemes (packages) for agreement by Leaders.

38. Local Bus Service Assessment Framework

The Committee received a report detailing the financial pressures on the bus network brought about by the reduction in support from central government and the potential impacts on the region's bus network. There was likely to be a funding request to maintain services across the region following conversations with operators. The quantum of the potential cuts was being discussed and challenged with operators. Should the funding required exceed that available then it was likely cuts to services would need to be made and transparent criteria were being developed with partners, based on best practice, to facilitate decision making should the need arise.

During discussion, individual Members:

- Expressed disappointment that a bid for funding was unsuccessful due to it not being ambitious enough. It was appropriate that objective assessment criteria were being developed to assist the funding allocation. In the interests of fairness, it was requested that the cost per passenger journey per mile be assessed rather than simply cost per mile as otherwise rural bus services would be penalised significantly. It was also essential that the assessment took a broader view and included some subjectivity. The presenting officer explained that officers had sought clarity from the Government for why the bid for funding was unsuccessful and confirmed that subjective criteria such as mitigating social inclusion would be included in the assessment criteria. If the criteria were just based on numerical values, then the wrong results would be arrived at.

- Shared concerns regarding rural residents and the potential loss of services. The ability of rural residents to participate in active travel was much less than urban areas.

- Commented that removal of subsidy would cause huge disruption. The Greater Cambridge Partnership was continuing to work on supporting services but there would be a gap between when that funding would be available and questioned whether there was an ability to bridge it. The presenting officer confirmed that the GCP was included in discussions as were all constituent Councils on the assessment criteria.

- Questioned when funding would next be made available by government. Officers informed the Committee that meetings were due to take place with the Secretary of State at which financial support would be discussed.

- Highlighted rural isolation, and education transport. Cambridgeshire County Council spent large sums of money on education transport in areas where there was transport poverty in general and suggested that it be included within future work.

- Sought greater clarity regarding timescales. Members noted that an update would be presented to the July Combined Authority Board meeting. Criteria would then be discussed a Leaders' Strategy meeting on 10th August that would be presented to the August meeting of the Board. The timescales would allow for the 70 days' notice required of operators to deregister which marked the start of the process for discussions to take place and potential funding be put into place.

- Commented that the need for effective bus connectivity was now greater than ever given the pressures on the cost of living. A company in South Cambridgeshire was highlighted as an example of a company that was struggling due to delays with the processing of licenses at the DVLA. Officers responded by agreeing to identify how the Combined Authority could play an active role in that area.

- Attention was drawn to the success of dial-a-ride minibuses within Cambridge City and the forecast increased use of the service. The Combined Authority had provided funding previously for zero-emission minibuses and questioned whether demand responsive transport could be extended into wider areas. Members noted that lessons were being learned from Demand Responsive Transport in west Huntingdonshire for how that could be rolled out more widely through the Bus Strategy.

- Noted that officers confirmed an update would be forthcoming on the trial of Demand Responsive Transport in Huntingdonshire and timescales would be confirmed. Regarding assessment criteria, it was essential that qualitative data be considered and developed.

- Commented that school transport being in some way integrated was sensible, however, expressed concern that Cambridgeshire County Council had taken the decision not to permit the payment of fares by individuals that did not qualify for transport when there were seats available forcing more children to travel to school by car.

- Requested that when submitting future bids and in future reports the provision of financial support for buses is separated from the type of fuel used.

- Highlighted the importance of rail transport and alternative fuels.

It was resolved unanimously to:

a) Provide feedback on the need for and purpose of Local Bus Service Assessment Framework; and

b) Agree for officers to continue finalise an appropriate assessment framework for subsequent approval by the Combined Authority Board members.

39. East Anglian Alternative Fuels Strategy (EAAFS)

The Committee considered a report which provided an update on the East Anglian Alternative Fuels Strategy (EAAFS).

During discussion of the report, Members:

- Cautioned that it was essential that realism be maintained as rural areas would not be able to transition as easily as urban areas.

- Expressed concern regarding the rush for electrification and the pressures that was placing on the national grid.

- Emphasised the importance of not pursuing electrification at the expense of other alternative technologies such as hydrogen power that was still under development.

- Commented that it was unclear as to whether peak consumption of oil had been reached and that there would be a need to use it in the future for longer than many would want.

- Noted the importance of engaging with the private sector to enable change in rural areas.

- Noted the work Cambridge City Council had undertaken with the private sector to deliver electric vehicle charging points in car parks. There was also a desire to provide community electric vehicles, but it was constrained by the availability of such vehicles.

- Noted that the Steering Group was currently an officer group, however, invites could be extended to Members.

- Drew attention to alternative, sustainable fuels that would be beneficial to people in rural communities.

It was resolved unanimously to:

a) Note the progress on the EAAFS; and

b) Recommend that the Combined Authority Board approve a six-week public consultation on the EAAFS.

40. Active Travel – Cambridgeshire

The Committee considered a report that sought approval to recommend the Authority Board to drawdown funding for the completion of a programme of active travel measures in Cambridgeshire.

During the course of discussion, Members:

- Sought an update regarding the timings of tranches 3 and 4. Officers advised that tranche 3 was announced in late May 2022 and the CPCA was awarded £635k for projects in Peterborough and tranche 4 had just been announced.

- Noted that the first project board was due to take place on 14 September 2022 and the importance of the pipeline of projects from Cambridgeshire County Council.

- Noted that Cambridgeshire County Council had schemes that were ready for delivery and the ambition to create a centre for excellence in active travel and was recruiting to achieve that.

- Acknowledged and welcomed the work of CamCycle in developing schemes and Cambridge Living Streets. The importance of including active travel within emerging local plans was emphasised for site development and identification.

It was resolved unanimously/majority to:

a) Recommend to the Combined Authority Board the drawdown of £753,000 of Active Travel Funding from the Medium -Term Financial Plan to complete a programme of active travel improvements in Cambridgeshire; and

b) Recommend to the Combined Authority Board the delegation of authority to the Interim Head of Transport in consultation with the Chief Finance Officer and Monitoring Officer, to conclude a Grant Funding Agreement with Cambridgeshire County Council to enable work to progress.

41. Transport Modelling for Cambridgeshire and Peterborough

The Committee received a report detailing a variation to the proposed approach to develop a transport model for the Cambridgeshire and Peterborough area. Under the Department for Transport framework for taking forward transport schemes, a compliant transport model was mandatory to test options and demonstrate benefits. The Committee and Combined Authority Board were previously informed that the Combined Authority would take forward the development of a cloud based 'data layer' to store transport movement data. With data collection and transport modelling being commissioned at a later stage, however the timelines of the Combined Authority and other partner's schemes required a swifter approach.

During discussion, Members:

- Thanked the presenting officer for the work being undertaken. Commenting further, it was suggested that delaying slightly may be beneficial and shouldn't be constrained by the end of the financial year. It was explained that previous years' underspend was being utilised due to still emerging from the impact of the COVID-19 pandemic. Discussions were taking place with the Department for Transport and although delaying would be considered, officers had to be mindful of the Transport Team. It was also possible to undertake a lower cost short-term data collection.

- Welcomed the expansion of the map because it was essential to consider the border areas of the county and welcomed taking rail and rail freight into consideration.

- Welcomed the funding to develop the baseline data in Cambridge.

It was resolved unanimously to:

a) Agree the change in delivery for a new transport model with Cambridgeshire County Council being commissioned to lead the delivery of the model on behalf of all partners;

b) Recommend the Combined Authority Board agree the changes to the spending objectives for the initial transport model budget. Previously approved budget will now be committed to modelling activities of:

   i. Collection of data to populate current and future transport models.

   ii. Preparation of a full business case for the design and build of a new transport model; and

c) Note the future arrangements for the review of the model, full business case, and sign-off of MTFP funds (subject to approval) at a future date.

42. Kings Dyke Levelling Crossing Closure

The Committee received a report that provided a progress update of the Kings Dyke lever crossing closure and sought approval for funding from the Medium-Term Financial Plan.

During discussion, individual Members:

- Cited former District and County Councillor, Ralph Butcher for his work on the Kings Dyke crossing.

- Sought clarity regarding the report recommendations and why the funding was being requested. Concern was expressed that Cambridgeshire County Council had requested additional funding but had not provided sufficient reason for the request which was unsatisfactory.

- Expressed concern that there had been previously no indication of overspend on the project.

Following discussion, it was proposed by the Chair, with the agreement of Members to defer the item to the next meeting of the Committee at which greater clarity would be provided on the financial details and any disputed matters that may need to be discussed in exempt session.

43. Peterborough Bus Depot Relocation

The Committee received a report detailing the summaries of the position in relation to development of the Peterborough Bus Deport Relocation. The Mayor informed the Committee of a procedural amendment to recommendation c) that should request the funding from the revenue budget.

During discussion Members:

- Expressed disappointment that there was not the capacity to have the work completed internally rather than externally. The presenting officer highlighted the staffing pressures within the team that made it not possible to complete the necessary work internally.

- Confirmed that the Finance Team that the funding had to come from the revenue budget.

- Need to recognise the value and lack of officer time in all they are being tasked to do.

It was resolved unanimously to:

a) Note the current position in relation to the Peterborough Bus Depot Relocation; and

b) Support the proposal to investigate alternative options for the provision of a bus depot in Peterborough

c) Recommend the Combined Authority Board agree **to release** £40,000 **of revenue funding** ~~drawdown~~ ~~from the Bus Reform budget~~ to progress this project in a timely manner.

44. A141 St Ives Improvements

The Committee considered a report that summarised the work on the A141 and St Ives Improvements scheme and sought approval of the budget to progress the Outline Business Case.

During discussion individual Members:

- Emphasised the importance of the scheme to Huntingdonshire and sought greater clarity regarding the timescales for the project. The Committee was informed that the Outline Business Case would likely take around 2 years before moving to a full business case.

- Expressed concern regarding the environmental implications contained in the report, commenting that they did not appear very robust as the proposals would have a significant carbon impact. Officers explained that policies changed during Strategic Outline Business Case process and revisions would be made based on the new policies, including a ‘do nothing’ option that would provide more data on the carbon impact.

It was resolved unanimously to:

a) Note the progress on the A141 St Ives Improvements scheme;

b) Recommend the Combined Authority Board approve the release of £6m funding for the delivery of the Outline Business Case; and

c) Recommend the Combined Authority Board delegate authority to the Interim Head of Transport and Chief Finance Officer to enter into Grant Funding Agreements with Cambridgeshire County Council.

45. Performance and Finance Report

The Committee received the September Performance and Finance report which presented the progress to date made against budgets set in January 2021. It included the summary of the year-to-date transport revenue budget; the RAG risk rating; statistics from the Five-Year Gateway Review results; and an expenditure timetable for the 2021-22 budget.

It was resolved to note the contents of the report.

44. Date of next meeting

It was resolved to note the date of the next Transport and Infrastructure Committee would be 14 September 2022.

Mayor

Cambridgeshire and Peterborough Combined Authority
Forward Plan of Executive Decisions

Published 6 October 2022

The Forward Plan is an indication of future decisions. It is subject to continual review and may be changed in line with any revisions to the priorities and plans of the CPCA. It is re-published on a monthly basis to reflect such changes.

Purpose

The Forward Plan sets out all of the decisions to be taken by the Combined Authority Board, Executive Committees or by way of a Mayoral Decision Notice in the coming months. This makes sure that local residents and organisations know what decisions are due to be taken and when.

The Forward Plan is a live document which is updated regularly and published on the Combined Authority website (click the Forward Plan' button to view). At least 28 clear days' notice will be given of any key decisions to be taken.

What is a key decision?

A key decision is one which, in the view of the Overview and Scrutiny Committee, is likely to:

i. result in the Combined Authority spending or saving a significant amount, compared with the budget for the service or function the decision relates to (usually £500,000 or more); or
ii. have a significant effect on communities living or working in an area made up of two or more wards or electoral divisions in the area.

Non-key decisions and update reports

For transparency, the Forward Plan also includes all non-key decisions and update reports to be considered by the Combined Authority Board and Executive Committees.

Access to reports

A report will be available to view online one week before a decision is taken. You are entitled to view any documents listed on the Forward Plan after publication, or obtain extracts from any documents listed, subject to any restrictions on disclosure. There is no charge for viewing the documents, although charges may be made for photocopying or postage. Documents listed on this notice can be requested from Edwina Adefehinti, Deputy Monitoring Officer for the Combined Authority.

The Forward Plan will state if any reports or appendices are likely to be exempt from publication or confidential and may be discussed in private. If you want to make representations that a decision which it is proposed will be taken in private should instead be taken in public please contact Edwina Adefehinti, Deputy Monitoring Officer, at least five working days before the decision is due to be made.

Substantive changes to the previous month's Forward Plan are indicated in bold text for ease of reference. An accessible version of the information contained on the Forward Plan is also available on request from Democratic Services.

Notice of decisions

Notice of the Combined Authority Board's decisions and Executive Committee decisions will be published online within three days of a public meeting taking place.

Standing items at Executive Committee meetings

The following reports are standing items and will be considered by at each meeting of the relevant committee. The most recently published Forward Plan will also be included on the agenda for each Executive Committee meeting:

Housing and Communities Committee

1. Affordable Housing Programme Loans Update
2. Affordable Housing Programme – Update on Implementation

Skills Committee

1. Budget and Performance Report
2. Employment and Skills Board Update

Transport and Infrastructure Committee

1. Performance and Finance Report

Housing and Communities Committee – 7 October 2022 [rescheduled from 12 September 2022]

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
1.	24 High Street, Wisbech	Housing and Communities Committee	7 October 2022	Key Decision 2022/048	To consider making a grant for six one-bedroom affordable housing units inside a vacant property on Wisbech High Street, within a conservation area, to regenerate the High Street and increase footfall.	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Councillor Lewis Herbert Lead Member for Housing	It is not anticipated that there will be any documents other than the report and relevant appendices.
2.	Devolved funding to support community housing initiatives	Housing and Communities Committee	7 October 2022	Decision	To consider proposals to allocate devolved funding to support community housing schemes and make recommendations to the Combined Authority Board.	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Councillor Lewis Herbert Lead Member for Housing	It is not anticipated that there will be any documents other than the report and relevant appendices.
3.	Winding Up Angle Holdings and Angle Developments	Housing and Communities Committee	7 October 2022	Decision	To consider proposals for the winding up of Angle Holdings and Angle Developments	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Councillor Lewis Herbert	It is not anticipated that there will be any documents

	(East) (via H&CC)				(East) and make recommendations to the Combined Authority Board.			Lead Member for Housing	other than the report and relevant appendices.

Combined Authority Board – 19 October 2022

Governance items

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
4.	Combined Authority Board Membership Update September 2022	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To note a change in Cambridge City Council's substitute member of the Combined Authority Board and changes to substitute members of the Audit and Governance and	Relevant internal and external stakeholders	Edwina Adefehinti Deputy Monitoring Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					Overview and Scrutiny Committee.				
5.	Annotated Forward Plan	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To approve the latest version of the forward plan.	Relevant internal and external stakeholders	Edwina Adefehinti Deputy Monitoring Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
6.	Budget Monitor Update	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To provide an update on the revenue and capital budgets for the year to date.	Relevant internal and external stakeholders	Jon Alsop Section 73 Chief Finance Officer	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
									to be published.
7.	Independent Remuneration Panel Report	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To consider the recommendations of the Independent Remuneration Panel in relation to the Mayor's allowance.	Relevant internal and external stakeholders	Edwina Adefehinti Deputy Monitoring Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
8.	Interim Chief Executive's Diagnosis: Improvement Framework	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To share with CA Board the Chief Executive's diagnosis assessment of the Cambridge and Peterborough Combined Authority (CA) which the self-assessment exercise, completed	Relevant internal and external stakeholders	Gordon Mitchell Interim Chief Executive	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					following the Board meeting on 27 July 2022, helped inform. To seek approval for the Interim Chief Executive's proposals for an outline Improvement Plan that sets out the key areas of focus and outcomes required arising from the self-assessment exercise. To seek approval for the arrangements and membership for an Improvement Board to provide support and				

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					challenge to ensure identified areas of improvement are delivered and embedded.				
9.	Senior Management Re-structure **New item**	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To note the new CPCA structure and gain agreement to recruit to this new structure.	Relevant internal and external stakeholders	Mark Parkinson Interim Director Corporate Services	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
10.	Appointment of Directors to PropCo 1, PropCo2 and Growth Co - Companies wholly owned by the	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To approve the appointment of Directors to PropCo 1, PropCo2 and Growth Co - Companies wholly owned by the	Relevant internal and external stakeholders	Edwina Adefehinti Deputy Monitoring Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
	Combined Authority **New item**				Combined Authority.				relevant appendices.
11.	Minutes of the Extraordinary meeting on 20 May 2022* *Contains exempt information [see below]	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To approve the minutes of the meeting.	Relevant internal and external stakeholders	Richenda Greenhill, Democratic Services Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
12.	Minutes of the meeting on 27 July 2022* *Contains exempt information [see below]	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To approve the minutes of the meeting.	Relevant internal and external stakeholders	Richenda Greenhill, Democratic Services Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
13.	Minutes of the meeting on 31 August 2022* and Action Log *Contains exempt information [see below]	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To approve the minutes of the previous meeting and review the action log.	Relevant internal and external stakeholders	Richenda Greenhill, Democratic Services Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.

* These minutes contain information which is exempt from publication under Part 1 of Schedule 12A of the Local Government Act 1972, as amended, in that it would not be in the public interest for this information to be disclosed (information relating to an individual; information which is likely to reveal the identity of an individual; information relating to the financial or business affairs of any particular person (including the authority holding that information). The public interest in maintaining the exemption is deemed to outweigh the public interest in publication.

Mayoral Decision

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
14.	Adult Education Budget Contract Awards for 2022-23	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To report the award by way of Mayoral Key Decision 2022/013 of the Adult Education Budget Contract Awards for 2022-23 and delegated authority to enter into contracts.	Relevant internal and external stakeholders	Fliss Miller Interim Associate Skills Director	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.

Combined Authority Board Decisions

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
15.	Emerging Bus Strategy	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To consider the emerging Bus Strategy.	Relevant internal and external stakeholders	Steve Cox Associate Director and Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
16.	Kings Dyke: Request to draw down Subject to Approval Funding	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/025	To receive an update on the progress of the Kings Dyke project and consider recommendations to approve the drawdown of subject to approval funding.	Relevant internal and external stakeholders	Steve Cox Associate Director and Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
17.	Active Travel Grant Funding	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/040	To note the Active Travel Grant Funding award by government and consider a recommendation to approve the drawdown of the funding.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
18.	Capability and Ambition Fund **New Item**	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/060 [General Exception]	To provide an update on the Active Travel England's Capability and Ambition Funding bid and subject to approval of the bid to draw down the funds and enter into grant funding agreements	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
19.	E-Scooter Trial Next Steps **Moved from November**	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To consider an update on the e-scooter trial in Cambridge and approve next steps.	Relevant internal and external stakeholders	Steve Cox Associate Director and Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
20.	March Area Transport Scheme: Drawdown on funds for Active Travel	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/046	To receive an update on the Full Business Case and consider recommendations to approve drawdown on funds for active travel (walking and cycling).	Relevant internal and external stakeholders	Steve Cox Associate Director and Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
21.	Fengate Phase 1	Cambridgeshire and Peterborough	19 October 2022	Key Decision 2022/045	To consider recommendations to approve advance funding	Relevant internal and external stakeholders	Steve Cox Associate Director and	Mayor Dr Nik Johnson	It is not anticipated that there will be any

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
		Combined Authority Board			on active travel aspects through the drawdown on funds.		Tim Bellamy Interim Head of Transport		documents other than the report and relevant appendices.
22.	Peterborough Junction 3	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/044	To consider recommendations to approve advance funding on active travel aspects through the drawdown of funds.	Relevant internal and external stakeholders	Steve Cox Associate Director and Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
23.	Climate Commission	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/033	To approve the Business Case for revenue support to the Independent Commission on Climate and approve £50k per	Relevant internal and external stakeholders	Gordon Mitchell Interim Chief Executive	Councillor Bridget Smith Lead Member for the Environment	It is not anticipated that there will be any documents other than the report and

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					annum from Climate Commission subject to approval line in the medium-term financial plan (MTFP).			and Climate Change	relevant appendices to be published.
24.	Market Towns Programme Financial Update September 2022	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/043	To approve updated expenditure profiles for projects under the existing CPCA Market Towns Programme.	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published.
25.	Greater South East Net Zero Hub	Cambridgeshire and Peterborough	19 October 2022	Key Decision 2022/053	To agree the acceptance of the BEIS Net Zero Hub MoU 2022 to	Relevant internal and external stakeholders	Mark Parkinson	Councillor Bridget Smith	It is not anticipated that there will be any

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
	New item	Combined Authority Board		[General Exception]	2025 and the delivery of new projects and pilots; delegate authority to the Chief Executive, in consultation with the Chief Finance Officer and Monitoring Officer, to update the Net Zero Hub Board Terms of Reference and Accountable Body Agreement; and delegate authority to the Net Zero Hub Board for the use of the grants where the decisions do not impact the Combined		Interim Director Corporate Services	Lead Member for the Environment and Climate Change	documents other than the report and relevant appendices to be published.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					Authority staffing arrangements.				

Recommendations from Skills Committee

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
	~~Adult Education Budget Contract Awards for 2022-23~~ **MDN on 20.09.22**	~~Cambridgeshire and Peterborough Combined Authority Board~~	~~19 October 2022~~	~~Key Decision 2022/013~~	~~To approve Adult Education Budget Contract Awards for 2022-23 and delegate authority to enter into contracts.~~	~~Relevant internal and external stakeholders~~	~~Fliss Miller Interim Associate Skills Director~~	~~Councillor Lucy Nethsingha Lead Member for Skills~~	~~It is not anticipated that there will be any documents other than the report and relevant appendices to be published~~

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
	~~Multiply adult numeracy programme: Grant and Contract Awards~~ **Removed** [Decision taken under special urgency arrangements 31.08.22 KD2022/052]	~~Cambridgeshire and Peterborough Combined Authority Board~~	~~19 October 2022~~	~~Key Decision 2022/042~~	~~To approve the Multiply grant funding allocations to Further Education providers and the programme management approach.~~	~~Relevant internal and external stakeholders~~	~~Fliss Miller Interim Associate Skills Director~~	~~Councillor Lucy Nethsingha Lead Member for Skills~~	~~It is not anticipated that there will be any documents other than the report and relevant appendices to be published~~
26.	Addressing Further Education 'Cold-Spots' in East Cambridgeshire and St Neots	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/047	To approve a new budget-line for 'Addressing Further Education Coldspots Projects - East Cambs and St Neots' and the	Relevant internal and external stakeholders	Fliss Miller Interim Associate Skills Director	Councillor Lucy Nethsingha Lead Member for Skills	It is not anticipated that there will be any documents other than the report and relevant

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					allocation of £4.8m from Gainshare over three years and approve draw-down of £225,000 to procure consultants to develop the Business Cases.				appendices to be published

Recommendations from the Housing and Communities Committee

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
27.	Winding Up Angle Holdings and Angle Developments (East) (via H&CC)	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To consider proposals for the winding up of Angle Holdings and Angle Developments (East).	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Councillor Lewis Herbert Lead Member for Housing	It is not anticipated that there will be any documents other than the report and relevant appendices.
28.	Devolved funding to support community housing initiatives	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To consider proposals to allocate devolved funding to support community housing schemes.	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Councillor Lewis Herbert Lead Member for Housing	It is not anticipated that there will be any documents other than the report and relevant appendices.

Recommendations from the Business Board

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
29.	Recycled Local Growth Fund (LGF) Project Proposal~~s~~ – Category 2 Call: Produce Hub	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Key Decision 2022/022	To approve LGF Recycled Funding Proposal~~s~~ received under the Category 2 funding call: Produce Hub. and a project change request relating to the Medtech Mega Factory project.	Relevant internal and external stakeholders including Skills Committee	Steve Clarke Senior Responsible Officer Local Growth Fund and Market Insight and Evaluation	Alex Plant Chair of the Business Board	It is not anticipated that there will be any documents other than the report and relevant appendices to be published
30.	Enterprise Zones - Cambourne Business Park Boundary Change & Programme Update	Cambridgeshire and Peterborough Combined Authority Board	19 October 2022	Decision	To approve proposed changes to the boundary of Cambourne Business Park Enterprise Zone site, and to update members on the Enterprise Zones Programme evaluation review.	Relevant internal and external stakeholders including Skills Committee	Steve Clarke Senior Responsible Officer Local Growth Fund and Market Insight and Evaluation	Alex Plant Chair of the Business Board	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Skills Committee 7 November 2022

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
31.	University of Peterborough, Delivery Update and Future CPCA Role	Skills Committee	7 November 2022	Decision	To note the progress of the development of the University of Peterborough, its initial and potential performance against the original business plan objectives and to consider the future role of the CPCA in the further evolution and development of the University and make recommendations to the Combined Authority Board.	Relevant internal and external stakeholders, including the Business Board	Fliss Miller Interim Associate Skills Director	Councillor Lucy Nethsingha Lead Member for Skills	It is not anticipated that there will be any documents other than the report and relevant appendices to be published.
	~~University of Peterborough~~	~~Skills Committee~~	~~7 November 2022~~	~~Decision~~	~~To consider the Programme~~	~~Relevant internal and~~	~~Fliss Miller Interim Associate~~	~~Councillor Lucy Nethsingha~~	~~It is not anticipated that there~~

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
	~~Programme Business Case~~				~~Business Case for the University of Peterborough and make recommendations to the Combined Authority Board.~~	~~external stakeholders~~	~~Skills Director~~	~~Lead Member for Skills~~	~~will be any documents other than the report and relevant appendices to be published~~
32.	Careers Hub Operational Plan **New item**	Skills Committee	7 November 2022	Decision	To provide an update on the operational plan and progress of the Careers Hub, allowing committee members the opportunity to inform future activity.	Relevant internal and external stakeholders	Fliss Miller Interim Associate Skills Director	Councillor Lucy Nethsingha Lead Member for Skills	It is not anticipated that there will be any documents other than the report and relevant appendices to be published
33.	Working together with the Third Sector **New item**	Skills Committee	7 November 2022	Decision	To seek approval for the piloting of a different procurement route for local third sector	Relevant internal and external stakeholders	Fliss Miller Interim Associate Skills Director	Councillor Lucy Nethsingha	It is not anticipated that there will be any documents

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					providers for Adult Education Budget and Multiply and promoting volunteering.			Lead Member for Skills	other than the report and relevant appendices to be published
34.	Review of the Adult Education Budget Innovation Fund and Proposals for 2022-23 **New item**	Skills Committee	7 November 2022	Decision	To consider the impact and lessons learnt from projects funded from the Adult Education Budget Innovation Fund for 2020/21 and 2021/22 and to approve proposals for spend in 2022-23 academic year.	Relevant internal and external stakeholders	Fliss Miller Interim Associate Skills Director	Councillor Lucy Nethsingha Lead Member for Skills	It is not anticipated that there will be any documents other than the report and relevant appendices to be published
35.	Health and Care Sector Work Academy – Performance Review	Skills Committee	7 November 2022	Decision	To monitor performance of DWP Pilot programme: The	Relevant internal and external stakeholders	Fliss Miller Interim Associate Skills Director	Councillor Lucy Nethsingha	It is not anticipated that there will be any documents

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
	New item				Health and Care Sector Work Academy.			Lead Member for Skills	other than the report and relevant appendices to be published
36.	Growth Works Performance Review **New item**	Skills Committee	7 November 2022	Decision	To monitor performance of the Growth Works contract.	Relevant internal and external stakeholders	Fliss Miller Interim Associate Skills Director	Councillor Lucy Nethsingha Lead Member for Skills	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Housing and Communities Committee 14 November 2022

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
37.	Digital Connectivity Programme reprofiling **New item**	Housing and Communities Committee	14 November 2022	Decision	To seek approval to reprofile the Digital Connectivity Programme budget.	Relevant internal and external stakeholders	TBC	Councillor Lewis Herbert Lead Member for Housing	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Transport and Infrastructure Committee 16 November 2022

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
38.	A47 Dualling Update November 2022	Transport and Infrastructure Committee	16 November 2022	Decision	To provide an update on the outcome of the	Relevant internal and external	Steve Cox Associate Director	Mayor Dr Nik Johnson	It is not anticipated that there

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
	New item				National Highways Review.	stakeholders including the Audit and Governance Committee	Tim Bellamy Interim Head of Transport		will be any documents other than the report and relevant appendices.
39.	Draft Bus Strategy **New item**	Transport and Infrastructure Committee	16 November 2022	Decision	To consider the draft Bus Strategy, revised Bus Service Improvement Plan and position on franchising and make recommendations to the Combined Authority Board.	Relevant internal and external stakeholders including the Audit and Governance Committee	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
40.	Local Transport and Connectivity Plan Update **New item**	Transport and Infrastructure Committee	16 November 2022	Decision	To provide an update on the Local Transport and Connectivity Plan and associated workstreams.	Relevant internal and external stakeholders including the Audit and Governance Committee	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
41.	Transforming Cities Fund **Deferred from September**	Transport and Infrastructure Committee	16 November 2022	Decision	To provide an update on the Transforming Cities Fund (TCF), the process for future TCF decisions, and plans to review transport programme management processes.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
42.	Wisbech Rail Next Steps **Deferred from September**	Transport and Infrastructure Committee	16 November 2022	Decision	To consider an update on the progress on Wisbech Rail and a funding request for next steps and make recommendations to the Combined Authority Board.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
	~~E-Scooter Trial Next Steps~~	~~Transport and Infrastructure Committee~~	~~16 November 2022~~	~~Decision~~	~~To consider an update on the e-scooter trial in Cambridge and~~	~~Relevant internal and external stakeholders~~	~~Steve Cox Associate Director~~	~~Mayor Dr Nik Johnson~~	~~It is not anticipated that there will be any~~

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
	~~**Deferred from September**~~				~~make recommendations to the Combined Authority Board on next steps.~~		~~Tim Bellamy Interim Head of Transport~~		~~documents other than the report and relevant appendices.~~
43.	Snailwell Loop (Newmarket Curve) **Deferred from September**	Transport and Infrastructure Committee	16 November 2022	Decision	To consider proposals for the release of funds to develop a business case for options to re-open Snailwell Loop (Newmarket Curve)	Relevant internal and external stakeholders	Steve Cox Associate Director and Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
44.	A16 Norwood Improvements Outline Business Case	Transport and Infrastructure Committee	16 November 2022	Decision	To receive an update on the outcome of the Outline Business Case and proposed next steps and make recommendations to the Combined Authority Board.	Relevant internal and external stakeholders including the Audit and Governance Committee	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.

Combined Authority Board 30 November 2022

Governance items

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
45.	Minutes of the meeting on 19 October 2022 and Action Log	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Decision	To approve the minutes of the previous meeting and review the action log.	Relevant internal and external stakeholders	Richenda Greenhill, Democratic Services Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
46.	Annotated Forward Plan	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Decision	To approve the latest version of the forward plan.	Relevant internal and external stakeholders	Edwina Adefehinti Deputy Monitoring Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
47.	Budget Monitor Update	Cambridgeshire and Peterborough	30 November 2022	Decision	To provide an update on the revenue and	Relevant internal and external stakeholders	Jon Alsop Section 73 Chief	Mayor Dr Nik Johnson	It is not anticipated that there will be any

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
		Combined Authority Board			capital budgets for the year to date.		Finance Officer		documents other than the report and relevant appendices to be published.
48.	Approval of Procurement Policy	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Decision	To approve the Combined Authority's procurement policy	Relevant internal and external stakeholders including the Audit and Governance Committee	Edwina Adefehinti Deputy Monitoring Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.

Combined Authority Decisions

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
49.	Combined Authority Gainshare - Equity Fund	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Decision	To approve the Strategic Outline Business Case for the Growth Works Equity Fund project and outline next steps.	Relevant internal and external stakeholders	Steve Clarke Senior Responsible Officer Local Growth Fund and Market Insight and Evaluation	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
50.	Market Towns Programme: Supporting Community-Owned Businesses and Social Enterprises in Rural Hinterlands – Full Business Case	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Key Decision 2022/050	To approve the full business case for the proposed 'Market Towns Programme – Supporting Community-Owned Businesses & Social Enterprises in Rural Hinterlands' programme.	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
51.	Growth Co Business Plan 2022/23	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Decision	To approve the Cambridgeshire Peterborough Business Growth Company Limited (Growth Co) Business Plan 2022/23.	Relevant internal and external stakeholders	Steve Clarke Senior Responsible Officer Local Growth Fund and Market Insight and Evaluation	Alex Plant Chair of the Business Board	It is not anticipated that there will be any documents other than the report and relevant appendices to be published
52.	Climate and Strategy Business Cases November 2022 **New item**	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Key Decision 2022/055	To seek approval for climate and strategy Business Cases and funding from the Subject to Approval line in the Medium Term Financial Plan.	Relevant internal and external stakeholders	Chris Bolton Head of Programme Management Office	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Recommendations of the Transport and Infrastructure Committee

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
53.	Bus Strategy **New item**	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Key Decision 2022/058	To update the Board on work around bus franchising and seek approval for the Bus Strategy and revised Bus Service Improvement Plan.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published
54.	A16 Norwood Improvements Outline Business Case	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Key Decision 2022/042	To receive an update on the outcome of the Outline Business Case and approve next steps.	Relevant internal and external stakeholders including the Audit and Governance Committee	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
55.	Transforming Cities Fund **Deferred from September**	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Key Decision 2022/035	To consider and approve the recommended capital swaps to ensure the Transforming Cities Fund is spent in a timely manner.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
56.	Wisbech Rail Next Steps **Deferred from September**	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Key Decision 2022/014	To provide an update on the progress of Wisbech Rail and seek funding approval for next steps.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices.
	~~E-Scooter Trial Next Steps~~ ~~**Deferred from September**~~	~~Cambridgeshire and Peterborough Combined Authority Board~~	~~30 November 2022~~	~~Decision~~	~~To consider an update on the e-scooter trial in Cambridge and~~	~~Relevant internal and external stakeholders~~	~~Steve Cox Associate Director and~~	~~Mayor Dr Nik Johnson~~	~~It is not anticipated that there will be any documents~~

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					~~approve next steps.~~		~~Tim Bellamy Interim Head of Transport~~		~~other than the report and relevant appendices.~~

Recommendations from the Skills Committee

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
57.	University of Peterborough, Delivery Update and Future CPCA Role	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Key Decision 2022/029	To note the progress of the development of the University of Peterborough, its initial and potential performance against the	Relevant internal and external stakeholders, including the Business Board	Roger Thompson Director of Housing and Development	Councillor Lucy Nethsingha Lead Member for Skills	It is not anticipated that there will be any documents other than the report and relevant appendices

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					original business plan objectives and to consider the future role of the CPCA in the further evolution and development of the University.				to be published.
	~~University of Peterborough – Programme Business Case~~	~~Cambridgeshire and Peterborough Combined Authority Board~~	~~30 November 2022~~	~~Decision~~	~~To approve the Programme Business Case for the University for Peterborough.~~	~~Relevant internal and external stakeholders~~	~~Fliss Miller Interim Associate Skills Director~~	~~Councillor Lucy Nethsingha Lead Member for Skills~~	~~It is not anticipated that there will be any documents other than the report and relevant appendices to be published.~~

Recommendations from the Business Board

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
58.	Profile of Investments	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Decision	To note the profile of investments made by the Business Board.	Relevant internal and external stakeholders including Skills Committee	Steve Clarke Senior Responsible Officer Local Growth Fund and Market Insight and Evaluation	Alex Plant Chair of the Business Board	It is not anticipated that there will be any documents other than the report and relevant appendices to be published
59.	Growth Works Management Review November 2022	Cambridgeshire and Peterborough Combined Authority Board	30 November 2022	Decision	To monitor and review programme delivery and performance.	Relevant internal and external stakeholders including Skills Committee	Steve Clarke Senior Responsible Officer Local Growth Fund and Market Insight and Evaluation	Alex Plant Chair of the Business Board	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Skills Committee – 9 January 2023

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
60.	ARU Peterborough Phase 3 Full Business Case	Skills Committee	9 January 2023	Decision	To consider proposals for the full business case relating to Phase 3, The Living Lab, of ARU Peterborough and make recommendations to the Business Board and Combined Authority Board.	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Transport and Infrastructure Committee 18 January 2023

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
61.	Draft Local Transport and Connectivity Plan (LTCP) **New item**	Transport and Infrastructure Committee	18 January 2023	Decision	To update the committee on the progress of the LTCP and seek feedback ahead of the final document being submitted for the March round of meetings.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published
62.	Alternative Fuelled Vehicle Strategy **New item**	Transport and Infrastructure Committee	18 January 2023	Decision	To consider the draft Alternative Fuelled Vehicle Strategy and make recommendations to the Combined Authority Board (following a round of public consultation).	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Combined Authority Board – 25 January 2023

Governance items

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
63.	Minutes of the meeting on 30 November 2022 and Action Log	Cambridgeshire and Peterborough Combined Authority Board	25 January 2023	Decision	To approve the minutes of the previous meeting and review the action log.	Relevant internal and external stakeholders	Richenda Greenhill, Democratic Services Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
64.	Annotated Forward Plan	Cambridgeshire and Peterborough Combined Authority Board	25 January 2023	Decision	To approve the latest version of the forward plan.	Relevant internal and external stakeholders	Edwina Adefehinti Deputy Monitoring Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.

Recommendations from the Transport and Infrastructure Committee

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
65.	Alternative Fuelled Vehicle Strategy **New item**	Cambridgeshire and Peterborough Combined Authority Board	25 January 2023	Key Decision 2022/057	To approve the Alternative Fuelled Vehicle Strategy.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Recommendations from the Business Board

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
66.	LEP Integration Plan	Cambridgeshire and Peterborough Combined Authority Board	25 January 2023	Decision	To consider the outcomes of the LEP Review and the Combined Authority's LEP Integration Plan as required for submission to Government.	Relevant internal and external stakeholders	Steve Clarke Senior Responsible Officer Local Growth Fund and Market Insight and Evaluation	Alex Plant Chair of the Business Board	It is not anticipated that there will be any documents other than the report and relevant appendices to be published
67.	ARU Peterborough Phase 3 Full Business Case	Cambridgeshire and Peterborough Combined Authority Board	25 January 2023	Key Decision 2022/051	To consider and approve the full business case relating to Phase 3, The Living Lab, of ARU Peterborough.	Relevant internal and external stakeholders	Roger Thompson Director of Housing and Development	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Transport and Infrastructure Committee 15 March 2023

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
68.	Local Transport and Connectivity Plan **New item**	Transport and Infrastructure Committee	15 March 2023	Decision	To consider the final draft of the Local Transport and Connectivity Plan and make recommendations to the Combined Authority Board.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices to be published

Combined Authority Board - 22 March 2023

Governance items

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
69.	Minutes of the meeting on 25 January 2023 and Action Log	Cambridgeshire and Peterborough Combined Authority Board	22 March 2023	Decision	To approve the minutes of the previous meeting and review the action log.	Relevant internal and external stakeholders	Richenda Greenhill, Democratic Services Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
70.	Annotated Forward Plan	Cambridgeshire and Peterborough Combined Authority Board	22 March 2023	Decision	To approve the latest version of the forward plan.	Relevant internal and external stakeholders	Edwina Adefehinti Deputy Monitoring Officer	Councillor Edna Murphy Lead Member for Governance	It is not anticipated that there will be any documents other than the report and relevant appendices.
71.	Budget Monitor Update	Cambridgeshire and Peterborough Combined Authority Board	22 March 2023	Decision	To provide an update on the revenue and capital budgets	Relevant internal and external stakeholders	Jon Alsop Section 73 Chief Finance Officer	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
					for the year to date.				other than the report and relevant appendices to be published.

Recommendations from the Transport and Infrastructure Committee

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
72.	Local Transport and Connectivity Plan **New item**	Cambridgeshire and Peterborough Combined Authority Board	22 March 2023	Key Decision 2022/056	To approve the Local Transport and Connectivity Plan.	Relevant internal and external stakeholders	Steve Cox Associate Director Tim Bellamy Interim Head of Transport	Mayor Dr Nik Johnson	It is not anticipated that there will be any documents other than the report and relevant appendices

	Title of report	Decision maker	Date of decision	Decision required	Purpose of report	Consultation	Lead officer	Lead Member	Documents relevant to the decision submitted to the decision maker
									to be published.

FP/10/22

Comments or queries about the Cambridgeshire and Peterborough Combined Authority Forward Plan

Please send any comments or queries about the Forward Plan to Edwina Adefehinti, Deputy Monitoring Officer :

We need to know:

1. Your comment or query.

2. How we can contact you with a response (please include your name, a telephone number and your email address).

3. Who you would like to respond to your query. If you aren't sure just leave this blank and we will find the person best able to reply.

Agenda Item: 2.1

A16 Norwood Dualling

To:	Transport and Infrastructure Committee
Meeting Date:	16 November 2022
Public report:	Yes
Lead Member:	Mayor Dr Nik Johnson
From:	Anna Graham, Transport Programme Manager
Key decision:	No
Forward Plan ref:	N/A

Recommendations:

The Transport and Infrastructure Committee is recommended to:

a) Approve the Outline Business Case for the A16 Norwood Improvement Project.

The Transport and Infrastructure Committee is asked to decide the approach for A16 Norwood Dualling, either,

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.

c) Or defer the approval to start the Full Business Case until future funding has been secured for the construction phase.

Voting arrangements:

Item a) and c) a simple majority of all Members present and voting

Item b) 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

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 To provide an overview of the Outline Business Case for the A16 Norwood Improvement Project for member's approval and to seek approval for the drawdown of subject to approval funding for the development of the Full Business Case.

2 Background

2.1 The Norwood and Paston Reserve urban extension are key areas of residential growth for Peterborough and have been allocated for development within the Peterborough Local Plan (adopted July 2019), generating a combined total of 2,945 dwellings in the study area.

2.2 At the CA Board meeting on 27 January 2021 the Combined Authority approved the commissioning of the Outline Business Case (OBC) for the A16 Norwood project following completion of the Strategic Outline Business Case (SOBC).

2.3 The SOBC concluded that a package of interventions is needed to improve congestion, safety and enable growth in the area. It outlined interventions of:

- Closure of Newborough Road access onto A47;
- Dualling of A16 between the A16/A47/Welland Road Roundabout and the Norwood Development Access;
- Signalisation of A16/A47/Welland Road Roundabout on the A16 southbound approach;
- A 50-metre flare added to the A47 westbound approach to provide additional capacity for left turning traffic to Welland Road;
- Dedicated Left Turn Lane (LTL) from the A47 eastbound to the A16 northbound.

2.4 The SOBC reported that the package of works had a Benefit Cost Ratio (BCR) of 3.2 demonstrating high value for money.

2.5 The report to the CA Board also highlighted the interdependency of the project with the development of the Norwood Urban Extension. The package of interventions as set out above require the developers to provide a new access roundabout on the A16 and a new access junction with the Newborough Road, connected by an internal road – providing all residents with direct access to the A16.

3 Outcome of the Outline Business Case

3.1 The A16 improvement scheme continues to demonstrate high value for money, the OBC demonstrates a BCR of 2.9 whilst also having significant strategic value by supporting local growth, critically, the construction of 2,000 homes on the Norwood growth side.

3.2 The main challenges the A16 improvements seek to overcome are the peak hour congestion, the high levels of u-turning traffic from Newborough Road (limiting capacity) and a high accident rate. The primary objectives of the project include,

- Tackling congestion and improving journey times;
- Supporting Peterborough's growth agenda;
- Limit impact on the local environment and improve biodiversity;
- Improve active travel routes to provide a viable alternative to private car travel; and
- Improve road safety.

3.3 The package of interventions remains broadly similar to those identified at the SOBC stage, one change being to the closure of the Newborough road – it is proposed that the access onto the A47 will be closed, rather than the junction being fully closed. The preferred package of improvements include:

- Closure of the Newborough Road Junction access onto the A47 (Southbound only).
- Dualling of the A16 Norwood between the Norwood development roundabout and the A16/A47/Welland Road Roundabout.
- Partial signalisation of the A16/A47/Welland Road Roundabout (A16 Approach).
- Creation of a flare to provide a third lane on the A47 westbound approach.
- Creation of a left dedicated left from the A47 eastbound approach to the A16 Northbound exit.
- Realignment/reconstruction of the bridal way to the north of the A16/A47/Welland Road Roundabout, connecting the signalised crossing to Newborough Road.
- Active travel route enhancements from the Norwood site down Welland Road and towards the city centre.
- Landscaping including, wildflower and native tree planting.

3.4 The active travel and environmental scheme components are not yet as developed as the highway components – this will be addressed at the full business case stage. In addition, discussions with National Highways about exploring the feasibility of a pedestrian footbridge over the A47 are ongoing.

3.5 The OBC financial case determines that the outturn cost is approximately £13 million which includes risk allowances and inflation costs through to the end of construction in 2025. The current Medium Term Financial Plan has £12.4 million subject to approval, of which £1.2 million is being requested for drawdown for the development of the full business case. The subject to approval funding is based on a Transforming Cities Funding (TCF) allocation. As outlined in the TCF agenda item and supporting paper, ongoing discussions have taken place with the Department for Transport around the management of the TCF fund and deliverability within the necessary timescales. It has been agreed with Peterborough City Council and other stakeholders that the A16 Norwood cannot be constructed within the TCF timescales and therefore the construction will not be funded through this funding stream. Presently, there is no availability of funding within the currently MTFP, however, the project will be subject to the project prioritisation review for future funding.

3.6 In the meantime, Peterborough City Council Planning are in discussion with one developer and the Section 106 is in draft. The landowner adjacent has not yet made outline planning permission. However, both acknowledged the need for the internal road within the site to link the Newborough road with the A16 development roundabout access – supporting the delivery of this package of works.

3.7 All phases of the scheme to date, including Preliminary Design, and future phases of Detailed Design, 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.

3.8 The FBC phase duration is expected to be approximately 18 months.

4 Financial Implications

4.1 £1.2 million is being sought from the Medium-Term Financial Plan for the development of the

Full Business Case. Paragraph 3.5 also refers.

5 Legal Implications

5.1 Approval is sought for the delegation of 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

6 Public Health Implications

6.1 A primary of objective for the project is to provide improved active travel routes enabling a viable alternative to the car. Whilst the active travel and environmental scheme components are not yet as developed as the highway components – this will be addressed and the full business case stage and are expected to have a positive effect on health and wellbeing.

7 Environmental and Climate Change Implications

7.1 A primary project objective is to limit the impact of the scheme on the environment and improve biodiversity. Wildflower, native tree planting and landscaping are already part of the scope and will be developed further in the FBC.

7.2 The OBC includes a carbon assessment to measure and baseline the carbon cost of a scheme early in the design process, giving an opportunity to drive carbon reduction through innovation, value engineering, alternative material use and efficient construction methods. At the moment the highest carbon contributors are road pavement, kerbs and footways and site preliminaries. Analysis of the carbon hotspots has enabled a more focussed approach to reducing the project’s carbon and further work will continue during the FBC including updating the carbon assessment.

8 Appendices

8.1 Appendix 1 – A16 Norwood Outline Business Case

9 Background Papers

9.1 None.

MILESTONE INFRASTRUCTURE

A part of MGroupServices

A16 Norwood, Peterborough

Outline Business Case

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Document Control

Job Number: 5080930						
Document ref: A16 Norwood Outline Business Case					Authorisation	
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
1.0	Draft Report	HP	RPJ	RMJ	RMJ	27.5.2022
2.0	First Issue	HP	RPJ	RMJ	RMJ	31.5.2022
3.0	Updated following ITE Review	HP	RPJ	RMJ	RMJ	22.7.2022
4.0	Updated following Second ITE Review	HP	RPJ	RMJ	RMJ	26.8.2022

Contents

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Figures

Tables

Executive Summary

This Outline Business Case (OBC) makes a strong case for investment into the A16 Improvement Scheme, which will return High Value for Money with a BCR of 2.94 based on an economic assessment whilst having significant strategic value by support a significant local growth area identified within Peterborough's Local Plan.

Design and development work has been underway for several years to identify a package of highway improvements which will address future challenges along the A16 and A47 corridors, including congestion and road safety.

Critically, construction of the schemes will also support the delivery of 2,000 homes on the Norwood growth side, as identified within the Peterborough Local Plan 2016 to 2036 (Adopted on 24th July 2019). The developments at the Norwood site still need to mitigate their impacts and the schemes are only intended to support the sustainability of an area earmarked for growth.

More recent phases of the project have identified active travel and environmental improvements which will be incorporated into the next phase of design, and reduce severance for the new developments, providing healthier travel choices for users and the environment.

The OBC is set out in compliance with the DfT's Five Case Business Model.

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 compromise local growth aspirations:

- Peak Hour Congestion and Delay (particularly on the A47 and A16)
- High levels of U-turning traffic from Newborough Road (limiting capacity)
- High accident rate.

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

Primary objectives include:

- **Tackle congestion and improve journey times:** Tackle congestion and reduce delay along the A16 and on the primary approaches to the A16 / A47 / Welland Road Roundabout
- **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth at Norwood can be realised
- **Limit impact on the local environment and improve biodiversity**: Fully mitigate any adverse environmental impacts of a scheme, and ensure a biodiversity net gain within the study area
- **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.
- **Improve road safety:** Reduce accidents and improve personal security for all travellers within the 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 Option. Full details of this phase of work can be found in the A16 Norwood Option Assessment Report (October 2019) and are summarised within this OBC.

The package of schemes that make up the Preferred Option referred to as 'the scheme' from hereon includes:

Highway Components

- Closure of the Newborough Road Junction access onto the A47 (southbound only)
- Dualling of the A16 between the Norwood Development Roundabout and the A16 / A47 / Welland Road Roundabout
- Partial Signalisation of the A16 / A47 / Welland Road Roundabout (A16 approach)
- Creation of a flare to provide a third lane on the A47 westbound approach
- Creation of a Left Dedicated Left (LDL) from the A47 eastbound approach to the A16 northbound exit
- Realignment / reconstruction of the bridal way to the north of the A16 / A47 / Welland Road Roundabout, connecting the signalised crossing to Newborough Road

Active Travel Components

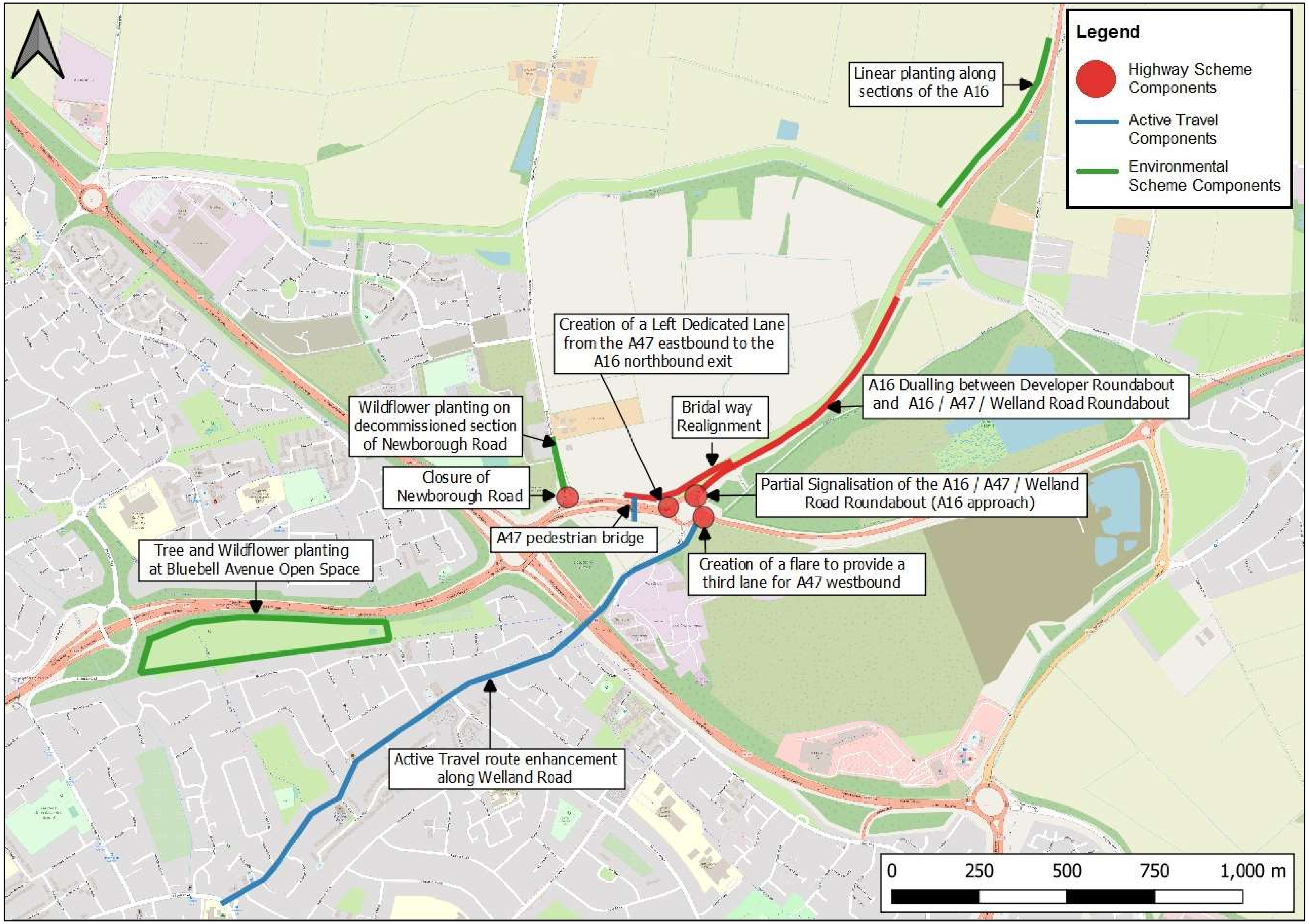
- Route enhancements from the Norwood site down Welland Road and towards the City Centre
- A pedestrian bridge over the A47 (feasibility to be explored during next design phase).

Environmental Components

- Wildflower planting is proposed in the immediate areas of the A16 development and on the decommissioned section of Newborough Road
- Linear planting of native trees and shrubs along sections of the A16 (north of the bridge) infilling gaps in the existing roadside hedgerows
- Tree and enhanced wildflower planting at Bluebell Avenue Open Space, located approximately 370m to the west of Junction 20.

It should be noted that the active travel and environmental scheme components are not yet as developed as the highway components. This will be addressed during the Detailed Design phase of the project.

The scheme outputs are shown in the Figure overleaf.


Legend
Highway Scheme Components
Active Travel Components
Environmental Scheme Components
Linear planting along sections of the A16
Creation of a Left Dedicated Lane from the A47 eastbound to the A16 northbound exit
A16 Dualling between Developer Roundabout and A16 / A47 / Welland Road Roundabout
Bridal way Realignment
Wildflower planting on decommissioned section of Newborough Road
Closure of Newborough Road
Partial Signalisation of the A16 / A47 / Welland Road Roundabout (A16 approach)
A47 pedestrian bridge
Tree and Wildflower planting at Bluebell Avenue Open Space
Creation of a flare to provide a third lane for A47 westbound
Active Travel route enhancement along Welland Road
0 250 500 750 1,000 m

Economic Dimension

The Economic Dimension demonstrates that the A16 Norwood scheme achieves a Benefit to Cost Ratio of 2.94 and offers **High Value for Money**. Further assessment as part of the Full Business Case will include a broader range of benefits, including active travel benefits.

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 specialist software to quantify additional benefits, including accident benefits and noise / air quality benefits. These assessments are described further in the Economic Dimension.

A breakdown of the scheme BCR is provided in the AMCB table beneath.

A16 Norwood AMCB	
Present Value of Benefits (PVB)	£21,320,000
Present Value of Costs (PVC)	£7,254,000
Net Present Value (NPV)	£14,066,000
Benefit to Cost Ratio (BCR)	2.94
Value for Money	**High**

The Present Value of Benefits for the A16 Norwood Improvement Scheme is £21,320,000. These are achieved against the Present Value of Cost of £7,254,000, generating a scheme BCR of 2.94 (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 Financial Dimension beneath.

A range of sensitivity tests have also been undertaken to determine the impact of different variables (such as cost, growth assumptions, funding source on the scheme BCR. These are set out within the Economic and Financial Dimensions and demonstrate that the scheme BCR is robust.

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

- 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. The costs include design and development costs as well as allowances for risk and inflation. The cost estimates for the scheme are summarised in the table beneath.

Description of Cost Type	Cost (£) Total
Base Investment Cost	8,530,488
Risk Adjusted Base Cost	10,290,443
Risk Adjusted Base Cost with Construction Industry Inflation (**Outturn Cost**)	**12,932,753**
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	13,388,167

The scheme Outturn Cost is £12,932,753 which includes risk allowance and inflation costs through to the end of construction in 2025. This figure represents the funding needed by Peterborough City Council to deliver this scheme.

The Inflated Risk Adjusted Costs incorporating Whole Life Costs (£13,388,167) 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 to ensure that the scheme will continue to provide value for money with post construction costs considered.

The CPCA currently have an allocation of £12,000,000 in the mid-term financial strategy (MTFS) to support delivery of this scheme. The scheme outturn cost will be jointly funded through developer contributions and the CPCA MTFS allocation. The proportional split between these two sources will be confirmed at FBC.

Discussions with developers about contributions are progressing well, however exact amounts have yet to be agreed. In addition to developer contributions towards the CPCA scheme, developer funded commitments, including the Norwood internal access road and the new A16 Norwood Development Roundabout, will support the delivery of this package.

Commercial Dimension

The Commercial Dimension demonstrates that the A16 Norwood Improvement Scheme can be reliably procured and implemented through existing channels whilst ensuring value for money in delivery of the scheme.

All phases of the scheme to date, including Preliminary Design, and future phases of Detailed Design, 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 Peterborough City Council, through the PHS Framework, has the necessary experience and governance structure to successfully manage the delivery of the A16 Norwood 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 beneath:

Timescale	Activity
June 2022 – July 2022	Outline Business Case reviewed by CPCA, and approval sought from CPCA board for the release of funding to undertake Detailed Design and produce a Full Business Case.
September 2022	Work commences on the Detailed Design and Full Business Case.
September 2022 – November 2022	Site Surveys undertkaen to inform the Detailed Design
March 2024	Detailed Design and scheme costings complete. Full Business Case submitted.
April 2024 – May 2024	Full Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding for scheme construction.
September 2024 – August 2025	Construction of the scheme undertaken, lasting approximately 12 months.
August 2026	1-year post-scheme monitoring undertaken
August 2030	5-years post-scheme monitoring undertaken

Stakeholders were consulted within this phase of work via email, letter or as part of the Walking, Cycling and Horse Riding (WCHR) Review, for comments on the Preferred Scheme at Preliminary Design stage.

Communication with developers and National Highways begun as part of the SOC and has continued through the development of Preliminary Design and this OBC. Communication has been quarterly via a working group which involves members of the CPCA and The Council's planning team, to discuss the project and wider updates on the Leeds Farm Planning Application (part of the Norwood Development).

Public perceptions of the Preferred Scheme were assessed as part of this phase of work, prior to the commencement of Detailed Design. The online consultation which featured on the PCC website and social media for a six-week period (1st November – 13th December 2021), highlighted elements of the scheme identified at OBC and Preliminary Design.

All comments received from stakeholders and members of the public will be incorporated into the Detailed Design where appropriate and reported within the FBC.

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 shown with the Management Dimension and include a range of quantitative and qualitative data collection methods that will be undertaken, including one year and five-year post scheme completion monitoring.

1. Introduction

1.1.1 This document sets out the Business Case for the A16 Norwood Improvement Scheme in Peterborough.

1.1.2 The scheme will help support growth aspirations of Peterborough City Council in relation to the planned Norwood and Paston Reserve urban extensions, as identified within the Peterborough Local Plan 2016 to 2036 (Adopted on 24th July 2019). The proposed highway improvements will add capacity and address future issues of congestion and delay along the A16 corridor, whilst active travel improvements will help reduce severance for users between the north-east of Peterborough and the City Centre.

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

1.1.4 The level of detail provided within the Business Case continually builds as the project progresses from Strategic Outline Case (SOC) to Outline Business Case (OBC), and then onto Full Business Case (FBC) ahead of construction. This progression reflects the greater level of detail that becomes available as the list of potential schemes is refined, and design of the preferred scheme matures.

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

1.1.6 The primary purpose of the OBC is to:

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

1.2 Study Area

1.2.1 The study area encompasses the Norwood and Paston Reserve Urban Extension sites, which are bordered to the west by the A15 Paston Parkway, to the east by the A16 and to the south by the A47 and intersected by Newborough Road.

1.2.2 The Norwood and Paston Reserve urban extensions, shown below in Figure 1.1, are key areas of residential growth for Peterborough and have been allocated for development within the Peterborough Local Plan 2016 to 2036 (Adopted on 24th July 2019)[1], generating a combined total of 2,945 dwellings in the study area.

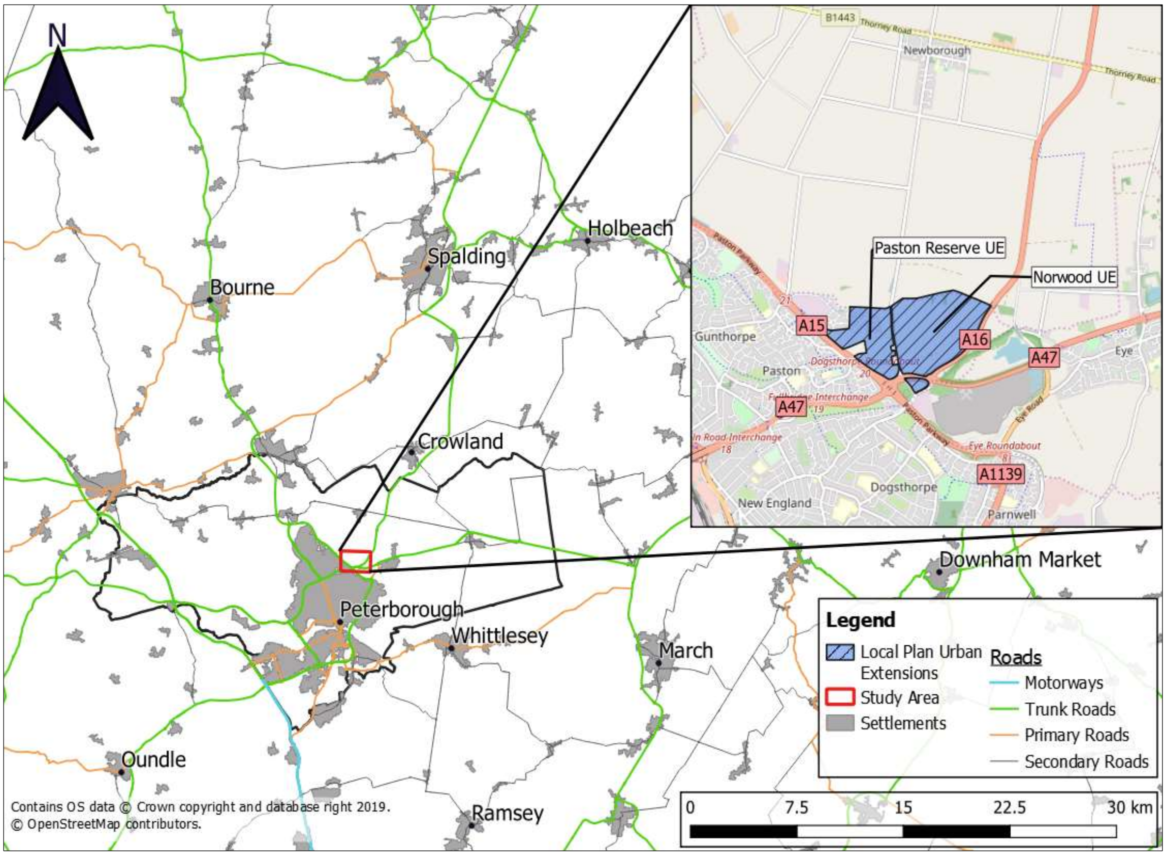


Figure 1.1: A16 Norwood Improvement Scheme Area

[1] Peterborough Local Plan (Adopted version).

1.2.3 The principal road network within the study area is shown in Figure 1.2 beneath.

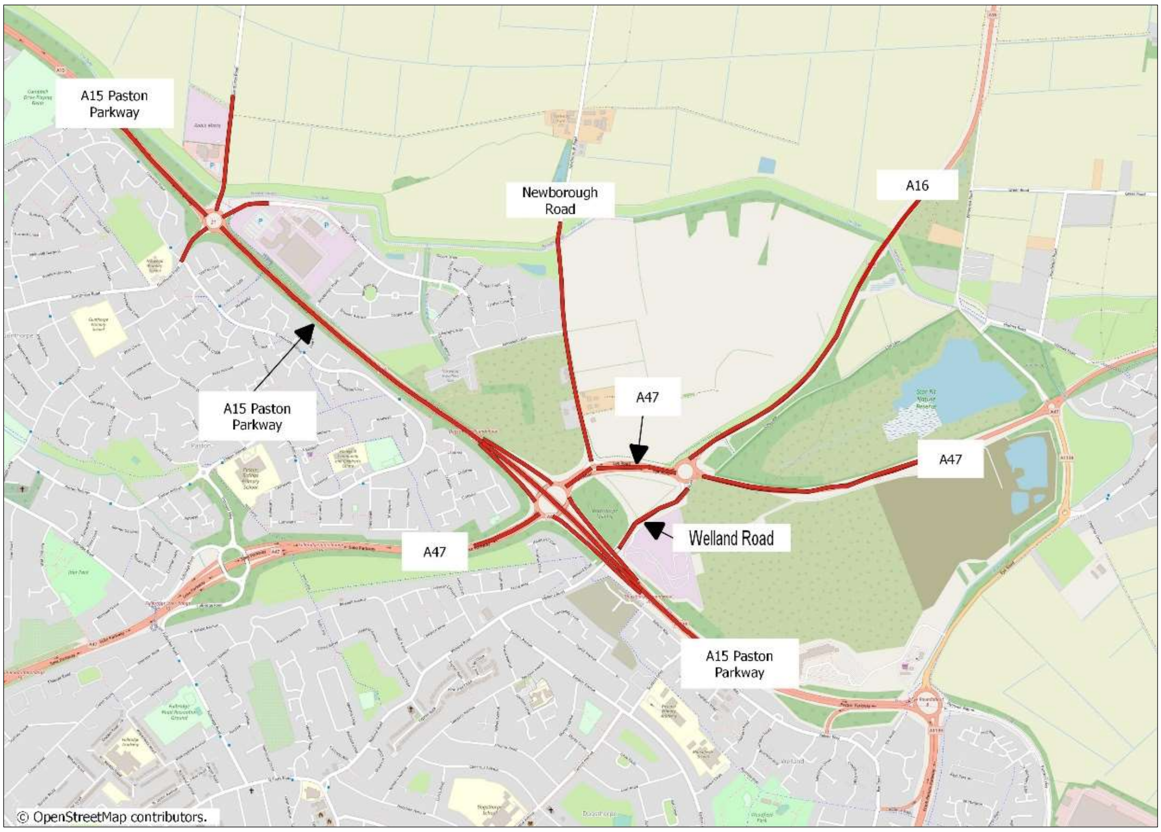


Figure 1.2: A16 Norwood Improvement Scheme Study Area Road Network

1.2.4 The A16 is a 125km principal road connecting Grimsby (Lincolnshire) and Peterborough, along with other primary destinations such as Boston and Spalding. The southern section of the A16 ends in Peterborough at the A16 / A47 / Welland Road Roundabout, which is operating over capacity with significant queueing and delays during the AM peak hour.

1.2.5 The A47 is a 309km east-west trunk road linking Birmingham to Lowestoft and passes through Peterborough. The significant queueing and delays along the A47 approach of the A16 / A47 / Welland Road Roundabout in Peterborough consequently encourages vehicles to rat-run via the A1139 Eye Road and increase queueing and delays at the A15 / A1139 / Parnwell Way signalised roundabout (Junction 8).

1.3 Growth Context

1.3.1 The population of Peterborough has grown considerably over recent years, increasing by 9.6% between 2011 and 2019, reaching a total population of 202,260 as of mid-2020 (based on Office for National Statistics estimates[2]). 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.

1.3.2 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, because 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 strategic network, and queues form at key junctions, the potential for delivering new homes and jobs in the area will become increasingly constrained. Peterborough City Council are committed to addressing these highway constraints on its strategic road network to ensure that its full growth aspirations can be realised and avoid congestion from spilling onto the local road network which is being prioritised to accommodate active travel journeys.

1.3.3 The Peterborough Local Plan 2016 to 2036 (Adopted July 2019) sets out the overall vision, priorities and objectives for Peterborough for the period up to 2036. The strategy identifies the required delivery of approximately 19,440 dwellings and 17,600 jobs between 2016 and 2036. It is estimated that urban extensions would account for approximately 59% of all residential growth in Peterborough.

1.3.4 The Norwood and Paston Reserve urban extensions, shown previously in Figure 1.1, have been allocated for development within the Peterborough Local Plan 2016 to 2036 (Adopted July 2019). The 80-hectare Norwood site will provide 2,000 dwellings, a local centre and primary school. The delivery of the development has been split into two phases.

1.3.5 The first phase of development (2019 – 2031) is known as the Land off Newborough Road (Leeds Farm Development), which includes up to 870 dwellings and auxiliary uses, including a primary school and local centre, and would initially be accessed via Newborough Road. The second phase of development (2026 – 2031) will complete the build out of the Norwood site and will include the remaining dwellings.

1.3.6 In April 2021, Leeds Farm development received outline permission to develop up to 870 residential dwellings, a two-form entry primary school and a 0.25ha local centre. The outline permission is subject to a transport related 'monitor and manage' condition. The transport modelling to support the planning application established that 200 dwellings could be built without highway mitigation

[2] Office National Statistics, Mid-Year Population Estimates, UK, June 2020.

measures being required. However on-going monitoring will be required to ensure actual traffic levels reflect those in the modelling. The monitor and manage conditions were recommended to ensure highway mitigation measures are implemented at the right time.

1.3.7 The committee report for the application also identified that highway mitigation measured identified through the monitor and manage approach could be in the form of developer contributions towards the wider highway scheme that is identified within this OBC.

1.3.8 It is expected that the entire Norwood site will ultimately have a primary point of access onto the A16 via a developer funded / built roundabout, with the secondary point of access being via Newborough Road. It is currently understood that the two points of access will be connected by an internal road, providing all residents with direct access to the A16. These currently assumed access arrangements are shown in Figure 1.3 below.

Figure 1.3: Development Access Arrangements

1.3.9 The access arrangements have been agreed in principle following consultation with both developers, and written statements confirming these arrangements, along with support for the A16 Norwood Improvement Scheme, are currently being prepared and will be in place before the project proceeds to Detailed Design and Full Business Case. An exact alignment for the internal link road, and A16 roundabout location will be confirmed once internal site layouts have been further developed.

1.3.10 Adjacent to the Norwood site (to the west of Newborough Road) is the Paston Reserve Urban Extension, which will eventually include 945 dwellings, a local centre, a primary and secondary school. As of March 2021, its reported within the Housing Monitoring Report that 652 dwellings have been constructed. However, given the time that has elapsed since the March publication of the Housing Monitoring Report[3], the indication of dwellings complete to date is estimated to be between 700-750 dwellings. Both the primary and secondary schools are nearing completion, with the first cohort of pupils expected in September 2022.

1.3.11 Primary access to the Paston Reserve site is currently via Manor Drive and Junction 21 of the A15 Paston Parkway, with secondary access provided by Newborough Road and the A47.

1.3.12 The current access points for the Norwood site are the:

- A16 / A47 / Welland Road Roundabout
- A47 / Newborough Road priority junction.

1.3.13 Alternative access points are located to the north and are limited to:

- B1443 / Guntons Road / Willow Drove priority junction
- A16 / B1443 Roundabout.

1.3.14 The A16 / A47 / Welland Road Roundabout accommodates a large number of peak hour commuter trips between Peterborough, Newborough, Crowland, Spalding, Eye, Thorney, March and Wisbech, and as a result suffers from severe peak period congestion and delays. This is exacerbated by a high number of u-turning vehicles, coming from Newborough Road, which has an adverse impact on the capacity of the A16 / A47 / Welland Road Roundabout. The removal of u-turning trips from Newborough Road is therefore a success factor for this project.

1.3.15 The Norwood study area is identified as a key residential growth area in the Peterborough Local Plan. However, the local transport network is likely to constrain the amount of development that can take place at this location and limit its full potential.

1.3.16 Peterborough City Council is engaging with developers to develop a coherent plan for delivering the infrastructure required to support the Norwood area. Rather than develop site specific highway mitigations, developers are being encouraged to contribute towards the delivery of the A16 Norwood Improvement Scheme which will accommodate the growth at Leeds Farm and Norwood, as well as addressing wider network issues.

[3] https://cccandpcc.sharepoint.com/sites/PCCPlanningPolicyPublicData/Shared Documents/Forms/AllItems.aspx?id=%2Fsites%2FPCCPlanningPolicyPublicData%2FShared Documents%2FPlanning Policy%2FLocal Plan Monitoring%2FHousing Monitoring%2F2021 Housing Monitoring Report%2Epdf&parent=%2Fsites%2FPCCPlanningPolicyPublicData%2FShared Documents%2FPlanning Policy%2FLocal Plan Monitoring%2FHousing Monitoring&p=true

1.4 Proposed Scheme

1.4.1 The package of schemes included within this OBC consists of the following, as shown in Figure 1.3:

Highway Scheme Components

- Closure of the Newborough Road Junction access onto the A47 (southbound only)
- Dualling of the A16 between the Norwood Development Roundabout and the A16 / A47 / Welland Road Roundabout
- Partial Signalisation of the A16 / A47 / Welland Road Roundabout (A16 approach)
- Creation of a flare to provide a third lane on the A47 westbound approach to the A16 / A47 / Welland Road Roundabout
- Creation of a Left Dedicated Lane (LDL) from the A47 eastbound approach to the A16 northbound exit
- Realignment / reconstruction of the bridal way to the north of the A16 / A47 / Welland Road Roundabout, connecting the signalised crossing to Newborough Road

Active Travel Components

- Active Travel route enhancements from the Norwood site down Welland Road to the Dogsthorpe Road Junction, connecting into a proposed PCC LCWIP Improvement Route
- A pedestrian bridge over the A47 (feasibility to be determined in the next stage)

Environmental Components

- Wildflower planting is proposed in the immediate areas of the A16 development and on the decommissioned section of Newborough Road
- Linear planting of native trees and shrubs along sections of the A16 (north of the bridge) infilling gaps in the existing roadside hedgerows
- Tree and enhanced wildflower planting at Bluebell Avenue Open Space, located approximately 370m to the west of Junction 20.

1.4.2 It should be noted that the active travel and environmental scheme components have been identified during the current phase of the study, either through the Preliminary Design process or as a result of stakeholder consultation, and these will be assessed fully as part of the Detailed Design and FBC.

MILESTONE INFRASTRUCTURE
A part of MGroupServices

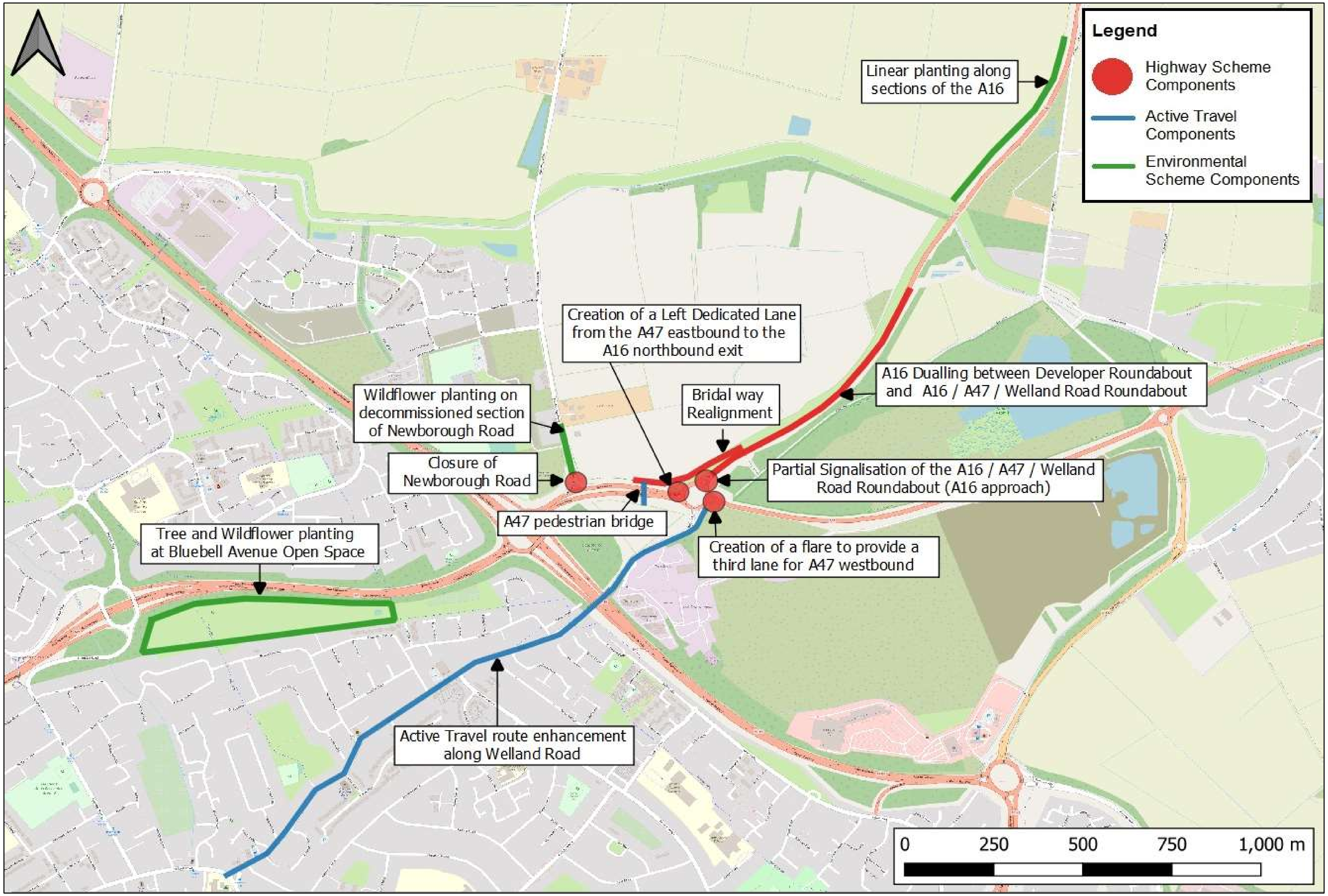


Figure 1.4: A16 Norwood Scheme Improvements

1.4.3 This Business Case demonstrates the need for, and value of, investing in schemes that together will provide the necessary increase in highway capacity to unlock congestion and significantly reduce delay along the A16 corridor. This will help to support the growth in the Norwood and Paston Reserve area, as well as providing wider network benefits.

1.5 Document Structure

1.5.1 Based on the context outlined above, the remainder of this report will consist of the following sections, with the aim of providing a thorough picture of baseline transport and development conditions across the study area, and the need for, and value in, investment to enable growth:

- **Chapter 2:** The Strategic Dimension identifies the need for an improvement at this location, considers an initial long list of options, and how these perform against CPCA, Peterborough City Council and the scheme objectives.
- **Chapter 3:** The Economic Dimension demonstrates that the preferred option offers value for money and details the quantitative and qualitative Economic Assessment undertaken to date on the scheme.
- **Chapter 4:** The Financial Dimension shows how the scheme has been costed, and the expected funding arrangement for delivering the scheme.
- **Chapter 5:** The Commercial Dimension sets out how Peterborough City Council will procure in a way that delivers value for money.
- **Chapter 6:** The Management Dimension explains how successful delivery of the scheme will be managed.

2. Strategic Dimension

2.1 Introduction

2.1.1 This chapter sets out the Strategic Dimension for the A16 Norwood package of scheme improvements. It demonstrates why improvements are needed at this location and considers how the package of schemes fit with local, regional and national policy, assisting 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 highway improvements within the Norwood area will contribute to achieving these strategic aims and polices.

Department for Transport Single Departmental Plan

2.2.2 The Single Departmental Plan published in June 2019[4] 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 along the A16 corridor, and within the general study area, has the potential to reduce congestion and improve journey time reliability. The delivery of these benefits will support housing and economic growth, aligning the main objectives of the DfT's Single Departmental Plan.

[4] https://www.gov.uk/government/publications/department-for-transport-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).

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 (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 A16 Norwood Improvement scheme to each of these components is discussed beyond the figure.

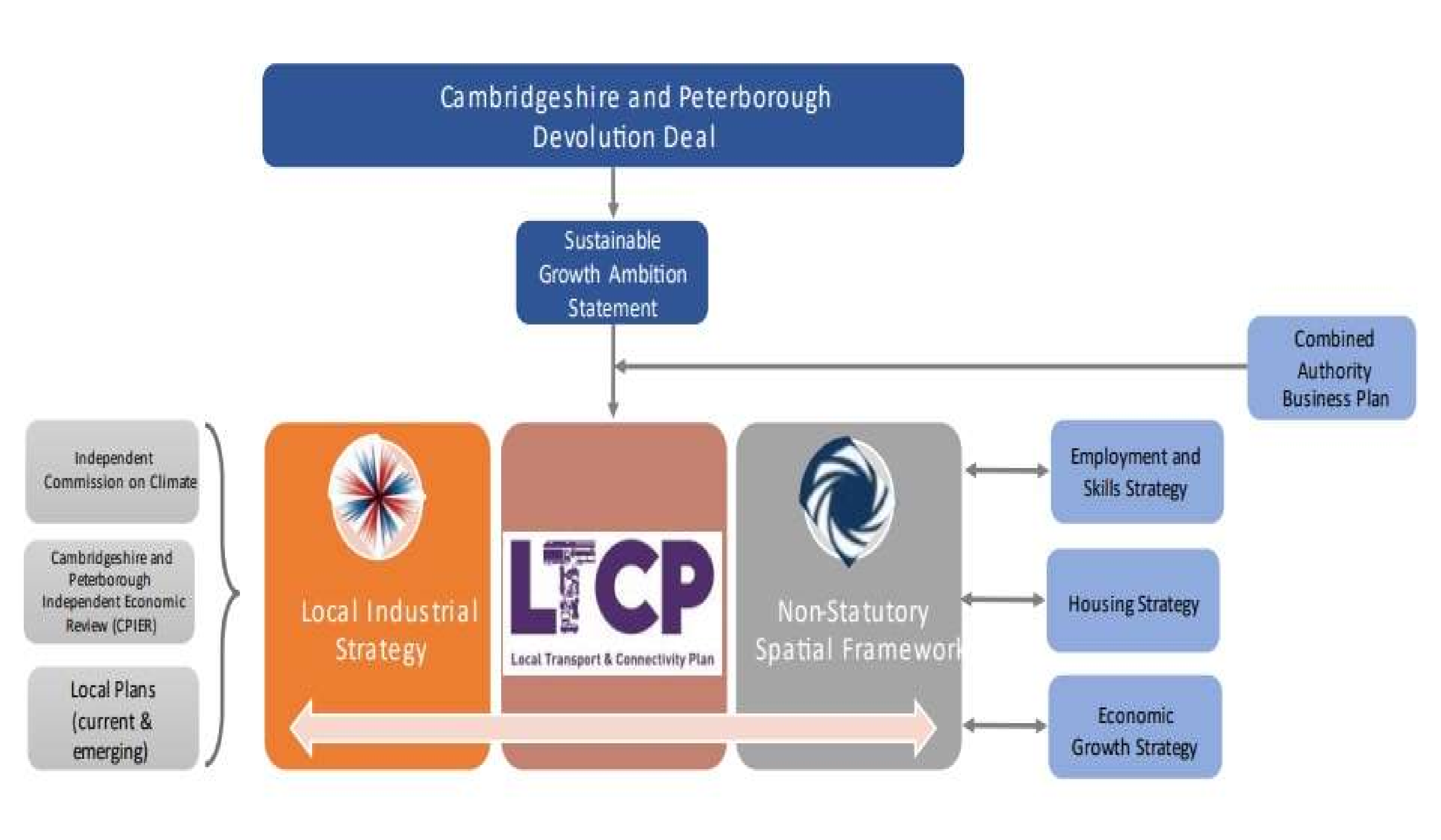


Figure 2.1: CPCA Policy Framework

Cambridgeshire and Peterborough Sustainable Growth Ambition Statement

2.2.8 The CPCA Mayor's Growth Ambition Statement sets out the regions priorities for achieving ambitious levels of inclusive growth and meeting the commitments of the Devolution Deal. The Statement's six themes[5] 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)[6]. 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.

2.2.12 The A16 Norwood Scheme 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 Improvement Scheme will address increase highway capacity to unlock congestion and significantly reduce delay along the A16 corridor, making Peterborough more accessible for commuters from Lincolnshire and from Fenland via the A47. The Scheme 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.

[5] https://cambridgeshirepeterboroughcagov.cmis.uk.com.
[6] https://www.cpier.org.uk.

Cambridgeshire and Peterborough Independent Commission on Climate

2.2.13 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.

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

2.2.15 Recommendations featured within the October 2021 report[7] 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.

2.2.16 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.

2.2.17 The A16 Norwood scheme will help support the growth aspirations of Peterborough City Council. The highway elements will add capacity and address existing and future issues of congestion and delay along the A16 corridor, better connecting residents and commuters to the wider network, whilst the active travel improvements will help to reduce the severance for users between the north-east of Peterborough and the City Centre and encourage trips from Norwood to be made sustainably.

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

Local Industrial Strategy

2.2.18 The Local Industrial Strategy[8] 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.

2.2.19 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

2.2.20 The CPCA Assurance Framework[9] 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.

2.2.21 This has a direct implication for the A16 Norwood 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 A16 Norwood Scheme will provide improvements to future journey times and delay along a key corridor to the west of the City.

Local Transport Plan

2.2.22 In January 2020, the CPCA adopted a Local Transport Plan for Cambridgeshire and Peterborough[10] 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.

2.2.23 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.

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

9 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.

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

2.2.24 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.

2.2.25 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'.

2.2.26 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.

2.2.27 The objectives of the Local Transport Plan underpin the delivery of the goals for an improvement within the Norwood study area, and form the basis against which scheme, initiatives and policies will be assessed. The initial scheme objectives for an A16 Norwood Improvement Scheme were devised at the beginning of the study and pre-date the objectives of the Local Transport Plan.

2.2.28 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 an A16 Norwood Improvement Scheme are set out later in this chapter.

2.2.29 The objectives of the CPCA Local Transport Plan are:

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

2.2.30 The A16 is identified within the Local Transport Plan as a corridor in need of improvement to relieve congestion and support growth in the Norwood area[11].

Emerging CPCA Local Transport and Connectivity Plan (LTCP)

2.2.31 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.

[11] Peterborough Long Term Transport Strategy, 2010.

2.2.32 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.

2.2.33 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.

2.2.34 The draft LTCP is currently in a consultation phase, which is live from the 12th May to 4th August via multiple platforms. Feedback from the consultation will be incorporated into the final version of the LTCP, which will be subject to approval of the CPCA Board later in the year.

Mayoral Ambition

2.2.35 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.

2.2.36 The new Mayor vision is that future policies and actions will be driven by inclusivity and the '3 C's' of Compassion, Co-operation and Community, and have a stronger 'greenprint' running through strategy aiding the acceleration in carbon reduction by 2050[12].

2.2.37 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 (LCTP), to reflect the growing dependence on digital infrastructure. The LCTP will be finalised in Spring 2022.

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

2.2.38 Despite the A16 Norwood Improvement Scheme being developed before the new Mayors visions and publication of the LCTP, the scheme does provide strong connections to the 3'Cs:

- **Compassion:** The scheme will address existing issues and increase highway capacity along the A16 corridor, improving operational efficiency and providing wider network benefits for the Norwood development area and its future residents. In addition to highway improvements, upgrades to the bridal way alongside the A16 will increase accessibility for all users, connecting the residential development to wider network with the City.
- **Co-Operation:** Strong engagement with key stakeholders including developers and National Highways has been maintained through the progression of the scheme and Business Case process, helping to create a scheme which recognises the interests of all partners
- **Community:** The incorporation of the bridal way into the scheme and upgrades to meet the recent highway code changes for prioritising active travel users, will increase accessibility to the development area, drawing upon health and wellbeing. Environmental and biodiversity elements included within the scheme also show the dedication of the Project Team to minimise impact and safeguard the environment.

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

2.2.39 In October 2020, The Council adopted the Local Transport Note 1/20: Cycle Infrastructure Design (LTN 1/20) guidance. The guidance sets out five core principles[13] 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.

2.2.40 The above LTN 1/20 core principles are embedded within the wider DfT Gear Change Policy, adopted in 2020[14], 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.

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

2.2.41 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.

2.2.42 The A16 Norwood scheme will adhere to Gear Change and LTN 1/20 policy guidance through the inclusion of active travel aspirations, including cycle route enhancements along Welland Road, as well as a pedestrian bridge over the A47 (subject to feasibility). These aspirations will enable improved connectivity between the Norwood site and the wider cycle network toward the City Centre, as well as limit severance for active users to the north-east of the City.

2.2.43 Consultation with stakeholders and members of the public have been undertaken during this phase of work, which has identified the need to include additional active travel measures beyond the realignment / reconstruction of the bridal way to the north of the A16 / A47 / Welland Road roundabout that connects the signalised crossing to Newborough Road. Proposals received during the consultation period (mentioned above) will be explored further during the next phase of work and incorporated into the Detailed Design where appropriate.

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 how the proposed scheme will support and facilitate the objectives of each policy document.

2.3.2 Appendix A details other local policies that are relevant to improvements in the A16 Norwood Improvement Scheme study area.

Table 2.1: Wider Policy Context and Delivery Impacts

Policy Framework	Policy Function	Objectives	Study Impact
Department for Transport Single Departmental Plan	Sets out the DfT's objectives and the plans for achieving them	• Support the creation of stronger, cleaner, more productive economy • Help to connect people and places, balancing investment across the country • Make journeys easier, modern and reliable • Make sure transport is safe secure and sustainable • Prepare the transport system for technological progress and a prosperous future outside the EU • Promote a culture of efficiency and productivity in everything we do.	Improvements within the A16 study area will: • Support the housing and economic growth ambitions of the city • Improve reliability for drivers on this section of the city's road network
Cambridgeshire and Peterborough Combined Authority Local Transport Plan	Describes how transport interventions can be used to address current and future challenges and opportunities. Sets out policies and strategies needed to secure growth and ensure planned largescale development can take place in the county in a sustainable way. The Local Transport Plan completes the suite of documents which articulates the Combined Authority's response to the CPIER	• Housing – support new housing and development to accommodate a growing population and workforce • Employment – connect all new and existing communities so all residents can easily access jobs within 30 minutes by public transport • Business and Tourism – Ensure all of our region's businesses and tourist attractions are connected sustainably to our main transport hubs, ports and airports • Resilience – build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability • Safety – embed a safe systems approach in to all planning and transport operations to achieve Vision Zero (zero fatalities or serious injuries) • Accessibility – promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all • Health and Well-being – provide 'healthy streets' and high quality public realm that puts people first and promotes active lifestyles • Air quality – ensure transport initiatives improve air quality across the region to exceed good practice standards • Environment – deliver a transport network that protects and enhances our natural, historic and built environments • Climate Change – reduce emissions to as close to zero as possible to minimise the impact of transport and travel on climate change.	Improvements within the A16 study area will: • Support the housing and economic growth ambitions of the city • Improve journey time reliability for drivers on this section of the city's road network • Reduce the number of accidents • Help to connect new residents of Norwood to the wider city network, and improve accessibility for all users, including active travel users and equestrians • Undergo carbon assessments to ensure carbon cost savings are incorporated into design and construction • Protect and enhance the environment of the study area, aiming to achieve Biodiversity Net Gain.
Peterborough City Council Strategic Priorities	The Council's priorities to help meet its vision to: 'create and bigger and better Peterborough that grows the right way, and through truly sustainable growth	• Drive growth, regeneration and economic development • Improve educational attainment and skills • Safeguard vulnerable children and adults • Implement the Environment Capital Agenda • Support Peterborough's culture and leisure trust Vivacity • Keep all our communities safe, cohesive, and healthy • Achieve the best health and wellbeing for the city	Improvements within the A16 study area will: • Support the housing and economic growth ambitions of the city • Improve journey time reliability for drivers on this section of the city's road network • Reduce the number of accidents.
Peterborough City Council Local Plan	Updates the 2011 Core Strategy and looks to deliver 21,315 homes and 17,600 jobs by 2036		
DfT Gear Change / LTN 1/20 Guidnace	Introduces higher design standards for cycle infrastructure in which local authoritites must comply. Sets the vision to transform future transport systems, so that active travel becomes the 'natural first choice' for journeys by 2030.	• Theme 1 - Better streets for cycling and people • Theme 2 - Putting cycling and walking at the heart of transport, place and policy • Theme 3 – Empowering and encouraging local authorities • Theme 4 - Enabling and protecting those who choose cycling and walking	Improvements within the A16 study area will: • Enhance cycle and walking infrastructure within the study area • Ensure improvements to active travel are of the latest design standards

Fit Within Wider Environmental Policy

2.3.3 Alongside the overarching policies outlined in Table 2.1, local policy has 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.

2.3.4 By factoring in the environment into scheme development from the offset, it better ensures the protection and enhancement of biodiversity at a minimum of 10% and meets aspirations set out within the various policies.

2.3.5 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 relevant to the scheme will be explored further within the latter stages of this chapter.

Table 2.2: Environmental Policy Context and Impact of the Scheme

Policy Framework	Policy Description / Function	Objectives	Study Supports and Facilitates the Policy Objectives
Cambridgeshire and Peterborough Combined Authority Local Transport Plan	Objective 9: Deliver a transport network that protects and enhances our natural, historic and built environment. Ensuring scheme improve rather than damage the environment based on DEFRA, Environment Agency and Natural England guidance.	• Protection and enhancement of the natural environment • Improving sustainable access to the natural environment • Delivering green infrastructure	Improvements at Norwood will: • Enhance the transport network by incorporating environmental enhancements into the final scheme • Will achieve Biodiversity Net Gain • Undergo extensive surveys, ensuring the protection of species • Engage with environmental stakeholders throughout the project, ensuring protection and licences for construction
Peterborough City Council Local Plan	Policy LP29: Any development should be prepared based on the overriding principle that; the existing tree and woodland cover is maintained, improved and expanded; and opportunities for expanding woodland are actively considered, and implemented where practical and appropriate to do so.	• Where the proposal will result in the loss of tree or woodland the Council will expect the retainment of trees that make a significant contribution to the landscape or biodiversity value of the area, provided this can be done without compromising the achievement of good design for the site. • Where it is appropriate for higher value tree(s) (category A or B trees) and/or woodland to be lost, then appropriate mitigation via compensatory tree planting will be required. Such planting should meet the five Tree Planting Principles • Where appropriate and practical, opportunities for new tree planting should be explored as part of all development (in addition to any necessary compensatory tree provision).	Improvements at Norwood will: • Undergo extensive surveys, gaining understanding of the species and value of trees/ habitats 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 benfits provided by trees and woodlands, how the Council aim to maintain, improve and expand tree cover, as well as the wider management of the City's tree stock in regards to development.	• To maintain and enhance the tree population of the city • To increase the tree canopy cover across the city with particular reference to areas with low canopy cover. • To maintain and maximise the ecosystem services provided by the Council's trees. • To promote biodiversity and conserve tree and woodland ecosystems. • To conserve and protect ancient woodland and ancient trees with significant ecological, historical and amenity value. • To work with partners to expand the woodland cover through sustainable external funding.	Improvements at Norwood will: • Include environmental elements within the final scheme design, enhancing the local environment and biodiversity within the study area • Actively explore / implement additional planting areas within the study area following guidance on replanting principles whilst working with partners Aragon • Undergo extensive surveys, gaining understanding of the species / habitats, and possible impact to these within the study area and identify mitigations • Engage with environmental stakeholdders to protect the identfied species and historic environment on site within design and construction
DfT proposed Environment Bill (Nature and Conservation Covenants) 2020	The Environment Bill will use a localised action approach to help contribute to the recovery of our natural environment, improving biodiversity and protecting urban street trees.	• 10% biodiversity net gain requirement on new development / schemes • A strengthened biodiversity duty on public authorities • Local Nature Recovery Strategies (LNRSs) • Species Conservation Strategies and Protected Sites Strategies • Targeted measures to protect existing trees	Improvements at Norwood will: • Achieve Biodiversity Net Gain at a minimum of 10% • Provide substantial evidence during option development with regard to tree loss, accounting for species type, maturity and ecological value. • Provide mitigations for species / historic environment protection during construction
CPCA / PCC endorsed Natural Cambridgeshire Doubling Nature Vision	By doubling the area of rich wildlife habitats and natural green-space, Cambridgeshire and Peterborough will become a world-class environment where nature and people thrive, and businesses prosper.	• Access to green space for communities • Air Quality, quality of life and public health • Long term financial gains • Ownership of the vision and growth agenda by local communities through an enhanced 'sense of place' • Increasing tree cover and the network of woodlands, hedgerows, within and around our towns and cities • Expanding the flower-rich grasslands on the limestone plateau west of Peterborough • Ensuring that at least 90% of our richest wildlife areas are in good ecological condition	Improvements at Norwood will: • 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 set the requirement for the A16 Norwood Improvement Scheme.

2.4.2 It should be noted that the following section outlining the problems identified for the A16 Norwood study area, and the justification of why improvements are needed at this location are based on pre-COVID-19 traffic levels and conditions. The impact of COVID-19 on highway usage is discussed in section 2.12 ‘Key Risks’.

Problems Identified

2.4.3 There is a very clear and compelling case for change within the A16 Norwood corridor. The Local Plan has allocated Norwood as a residential urban extension along with further residential development on the neighbouring site at Paston Reserve, totalling over 2,945 new homes.

2.4.4 Evidence of existing conditions of the highway network within the study area, demonstrates that there are already congestion issues during the morning peak hour. If transport infrastructure is not improved and increased transport capacity provided, it will impact the growth aspirations for the Norwood area.

2.4.5 These challenges identified within the study area are set out beneath in the following themes:

- Peak hour congestion and delay (particularly on the A47 and A16 approaches to the roundabout)
- U-turning traffic from Newborough Road (degrading the capacity of the roundabout)
- High accident rate.

2.4.6 Proposed growth at the Norwood site is forecast to exacerbate these existing issues. If not resolved, these factors will compromise the city’s growth aspirations as well as the Council’s objectives to keep Peterborough a pleasant place to live and work.

Peak Hour Congestion and Delay

2.4.7 Figure 2.2 and 2.3 overleaf show the typical speeds (representing delay) at 08:30 and 17:30 on a neutral weekday (May 2022) to the east of Peterborough. Junctions with significant delay during the AM and PM peak periods include:

- A16 / A47 / Welland Road roundabout
- A47 / A1139 roundabout (Junction 20)
- A1139 / Peterborough Road Roundabout
- A15 / A1139 / Parnwell Way signalised roundabout (Junction 8).

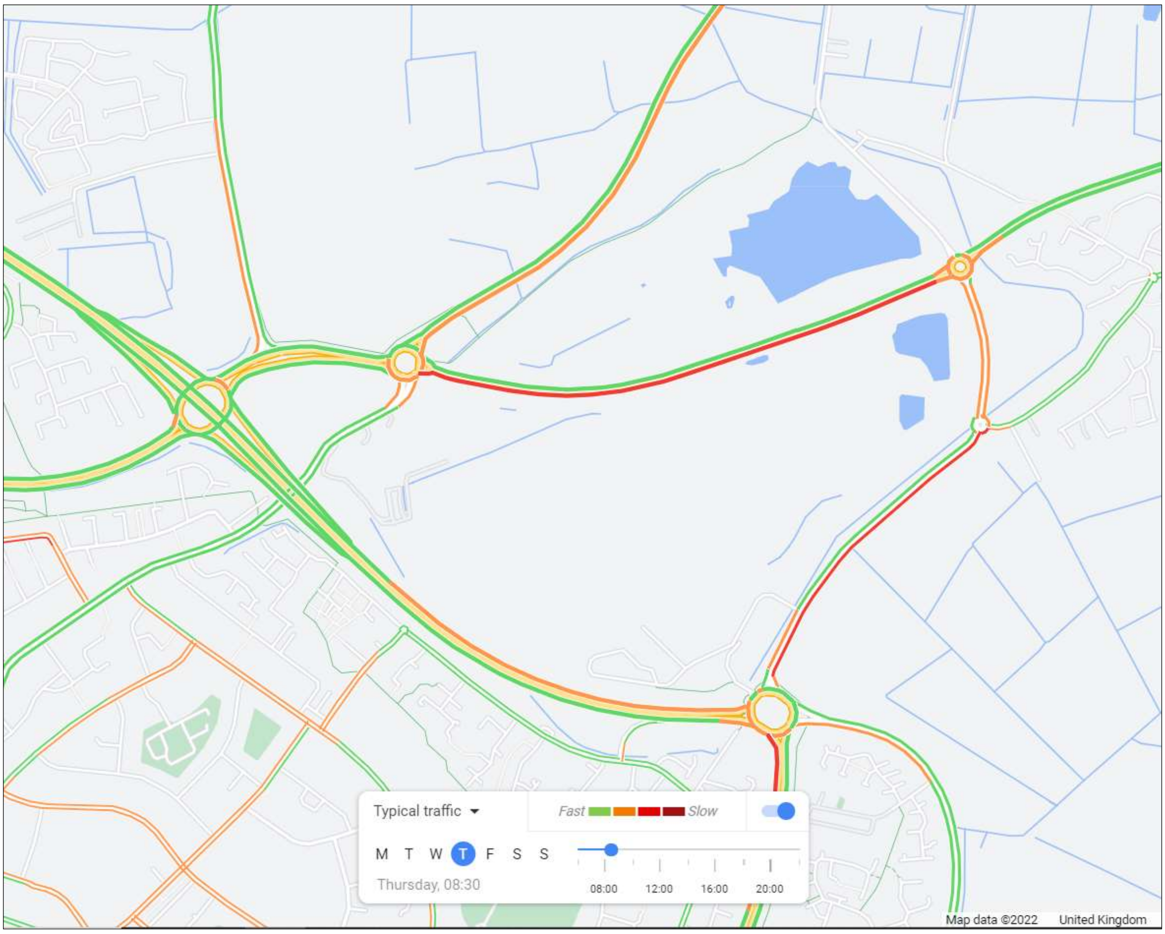


Figure 2.2: Google Traffic, Typical AM Peak Hour Delay to the East of Peterborough (May 2022)

2.4.8 Figure 2.2 shows delay along the A16 southbound and A47 westbound on the approach to the A16 / A47 / Welland Road Roundabout. This is due to the volume of traffic and tidal nature of trips into Peterborough during the AM peak hour. Two significant inbound traffic flows (A16 and A47) merge at the A16 / A47 / Welland Road Roundabout, and capacity at the junction is compromised by a high proportion of u-turning traffic from Newborough Road.

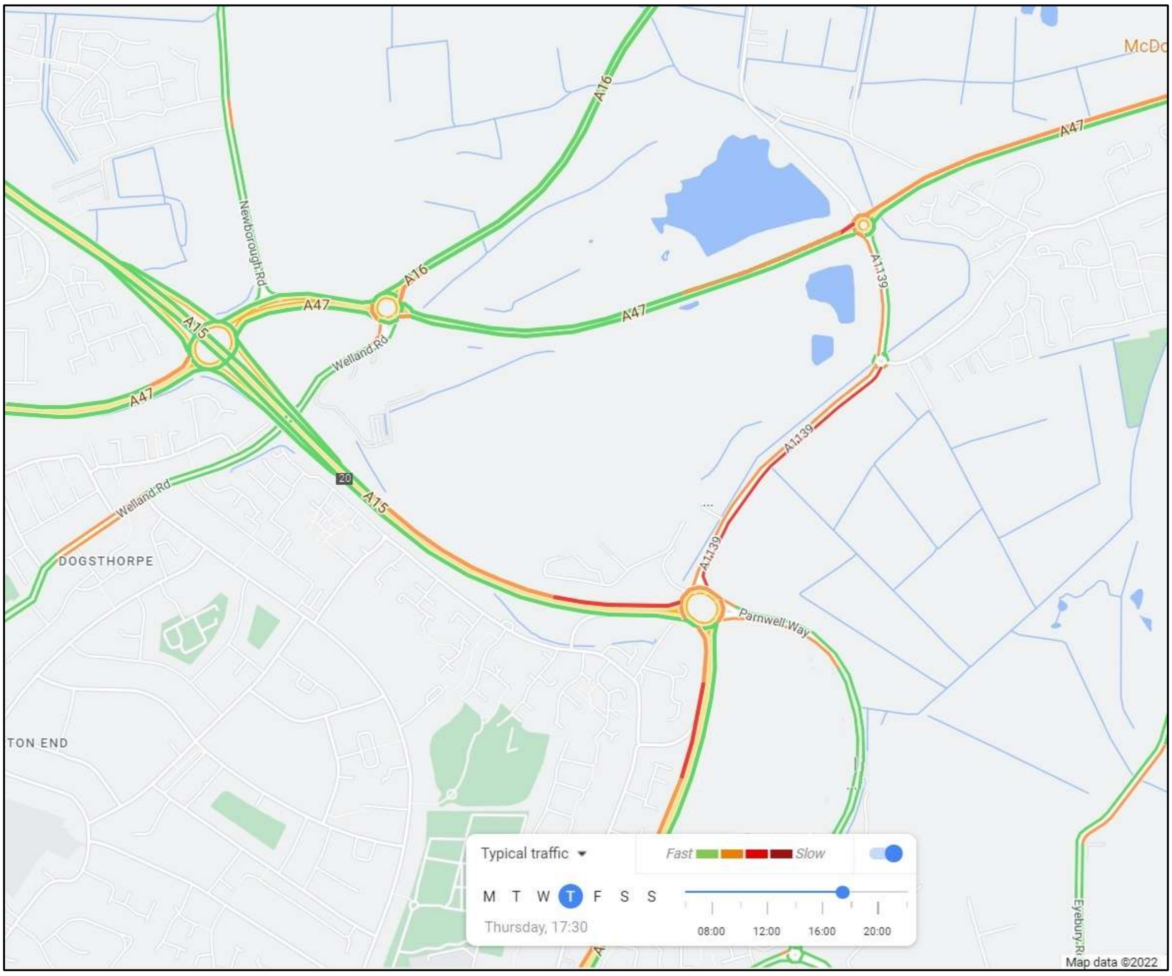


Figure 2.3: Google Traffic, Typical PM Peak Hour Delay to the East of Peterborough (May 2022)

2.4.9 The tidal nature of delay is evident again in the PM peak hour, as delay forms on the A47 eastbound approach to the A1139 / A47 Roundabout and beyond.

2.4.10 Satellite Navigation data (2018) has been used to better understand historic journey times and delay within the study area. Figure 2.4 overleaf shows the journey times for the Free Flow period (FF, 00:00 – 05:00), AM peak hour (08:00 – 09:00), Inter peak hour (14:00 – 15:00) and PM peak hour (17:00 – 18:00) within the study area for weekdays in October 2018.

2.4.11 Note that this data and analysis predate the Covid-19 pandemic, and that further analysis will be undertaken using post pandemic data and included within the Full Business Case.

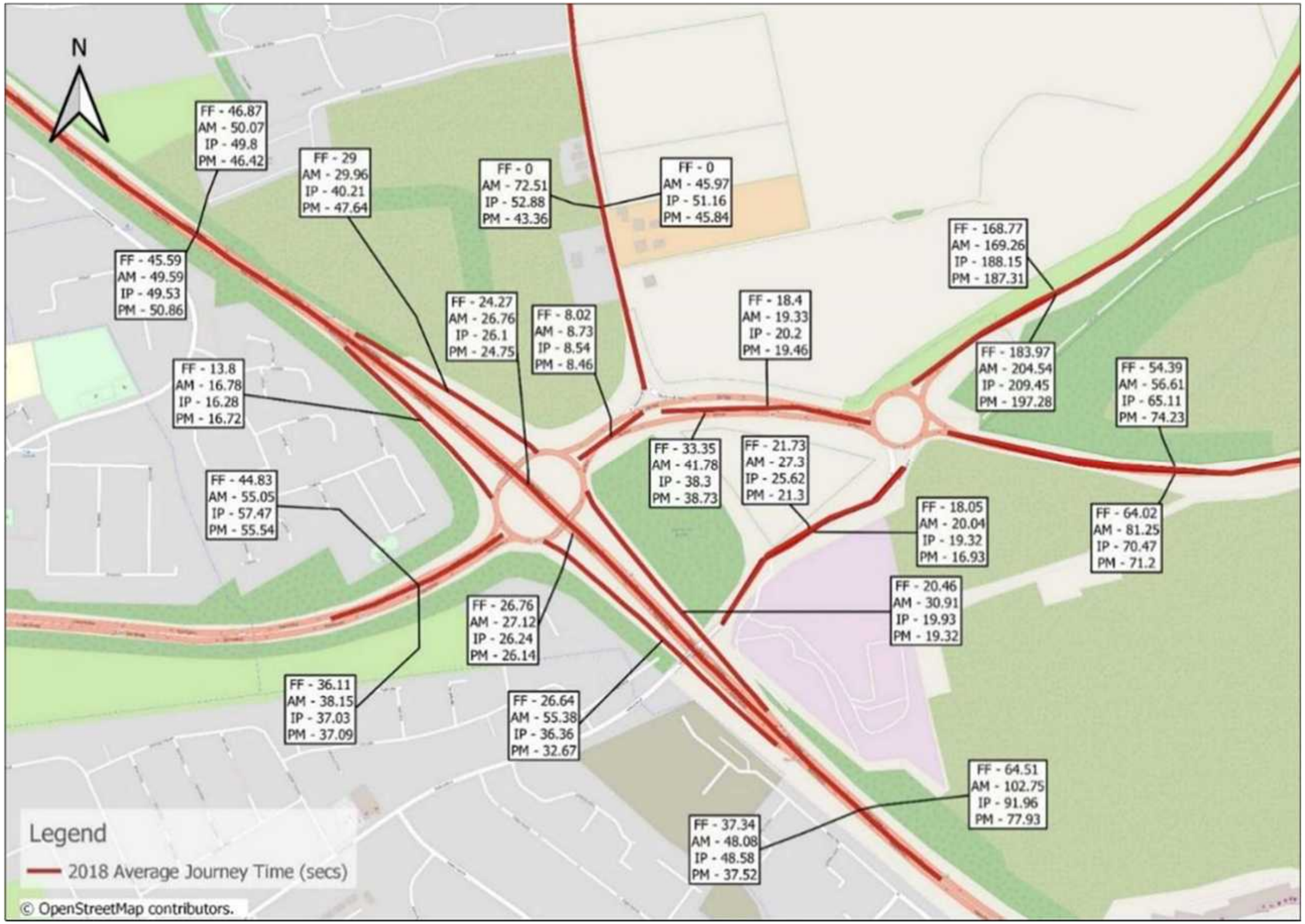


Figure 2.4: Average Traffic Master Journey Times (secs – Free-Flow, AM, Inter-peak and PM Peak Hour).

2.4.12 There are some significant increases in journey times in the AM peak hour when compared to the free flow period, including a 20 second increase per vehicle on the A16 southbound. There is also an increase in journey time on the A47 westbound towards the A16 / A47 / Welland Road Roundabout of 17 seconds per vehicle in the AM peak when compared to the free flow period.

2.4.13 It should be noted that not enough trips were recorded along Newborough Road in the free flow period for a journey time record to be ascertained.

2.4.14 As with the AM peak hour, the Inter peak hour experiences an increase in average journey time (25 seconds per vehicle) along the A16 southbound compared to the free flow period. The majority of other journey times are similar to those in the free flow period.

2.4.15 In the PM peak hour, there are increases in average journey time compared to the free flow period along the A16 southbound (13 seconds per vehicle), A16 northbound (19 seconds per vehicle) and the A47 eastbound exit from the A16 / A47 / Welland Road Roundabout (20 seconds per vehicle).

2.4.16 The Norwood development is likely to exacerbate existing delay in this area.

U-Turning Traffic

2.4.17 Part of the capacity constraint at the A16 / A47 / Welland Road Roundabout is caused by u-turning traffic from Newborough Road. The A47 / Newborough Road junction is currently a left in / left out only junction, and so any vehicle from Newborough Road destined for Peterborough must U-turn at the roundabout, as shown in Figure 2.5 below.

Figure 2.5: U-turning Traffic Route from Newborough Road

2.4.18 This movement has a significant impact on capacity at the roundabout, as vehicles on the busier A16 and A47 westbound movements (AM peak hour) must stop and give–way to every u-turning vehicle from Newborough Road. If not resolved, this issue will be exacerbated in future with the development of Paston Reserve and Norwood both having direct access to Newborough Road.

High Accident Rate

2.4.19 Figure 2.6**Error! Reference source not found.** shows the incident density weighted by severity along the A16 and at the A16 / A47 / Welland Road Roundabout compared to the wider area to the east of Peterborough (2016 – 2019).

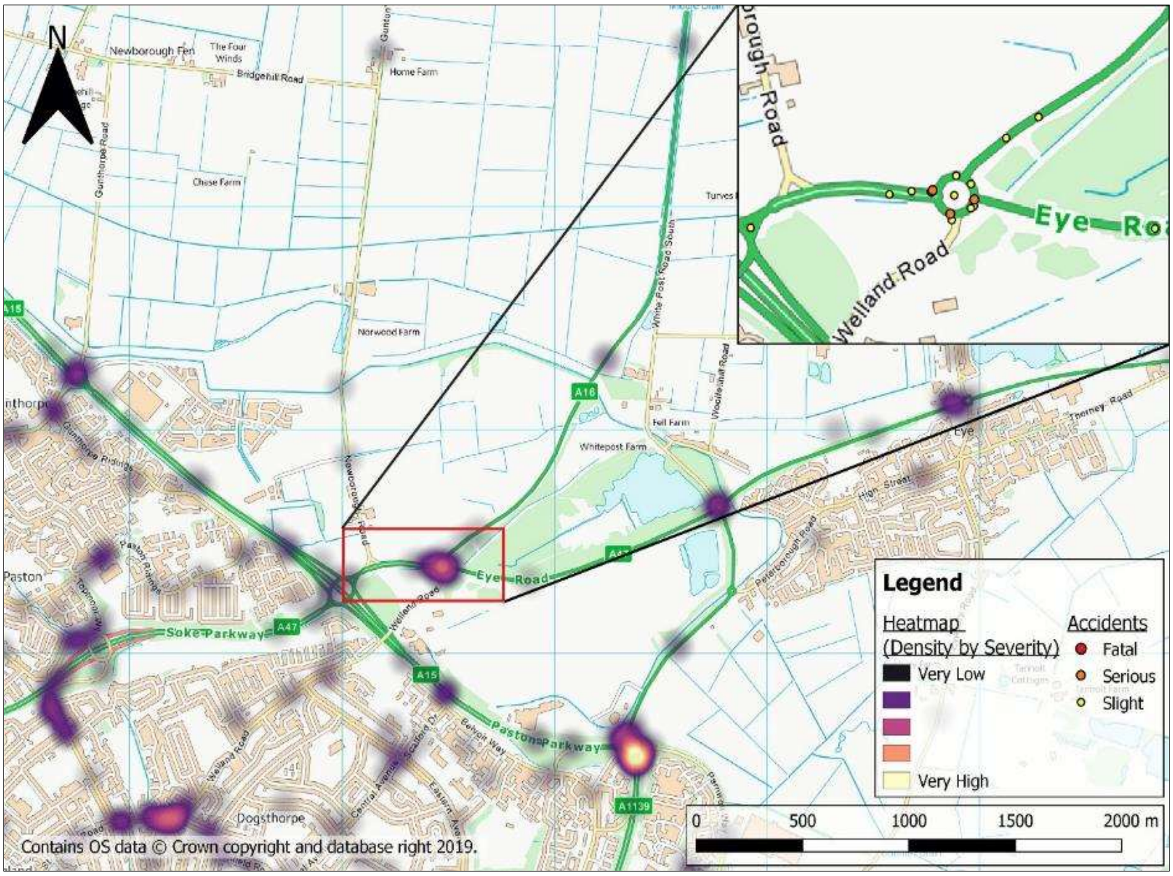


Figure 2.6: Accident Density Weighted by Severity (2016 – 2019 Dataset)

2.4.20 Figure 2.6 shows that the A16 / A47 / Welland Road Roundabout has a higher density of accidents than other junctions along the A47 to the east of Peterborough. Only Junction 8 (A15 Paston Parkway / A1139 Frank Perkins Parkway / Parnwell Way Roundabout) to the south-east of the study area has a higher density of accidents.

2.4.21 Nearly all of the accidents have happened on either the circulatory or the approaches close to the give way line of the roundabout, with most being a result of either failing to look properly or misjudging the speed of the other vehicle. All recorded serious accidents occur on the A47 (eastbound and westbound) and Welland Road approaches close to the give way line. It is expected that the proposed scheme, and specifically the partial signalisation of the A16 / A47 / Welland Road Roundabout, will improve safety at this junction, and this is evidenced within the Economic Dimension.

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
- Local growth stalls
- Attractiveness of Norwood as a place to live and Peterborough as a place to work will decrease.

Congestion, Delay and Poor Journey Times

2.5.2 Norwood and Paston reserve are identified as an area of growth in the Peterborough Local Plan, with residential development expected to come forward before 2036. Combined these areas are expected to facilitate 2,945 dwellings, two local centres, two primary schools and a secondary school. Forecast trip rates from these sites once fully built out, as per the PTM3 Model forecasts, is approximately 2,085 trips during the AM peak hour and 2,198 trips in the PM peak hour.

2.5.3 Without intervention, the existing issues of peak hour delay and congestion along the A16 and A47 will deteriorate further. This will impact on the operational performance of the highway network across the study area and compromise the viability of local growth aspirations within the Norwood area.

2.5.4 The Peterborough Transportation Model (PTM3) model has been used to assess conditions within the Norwood study area in future years should the growth occur without any highway improvements (Do Minimum (DM) Scenario).

2.5.5 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.

2.5.6 PTM3 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.

2.5.7 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), 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.

2.5.8 Figure 2.7 shows delay (seconds per vehicle) in the AM peak hour across the study area in the 2036 DM scenario.

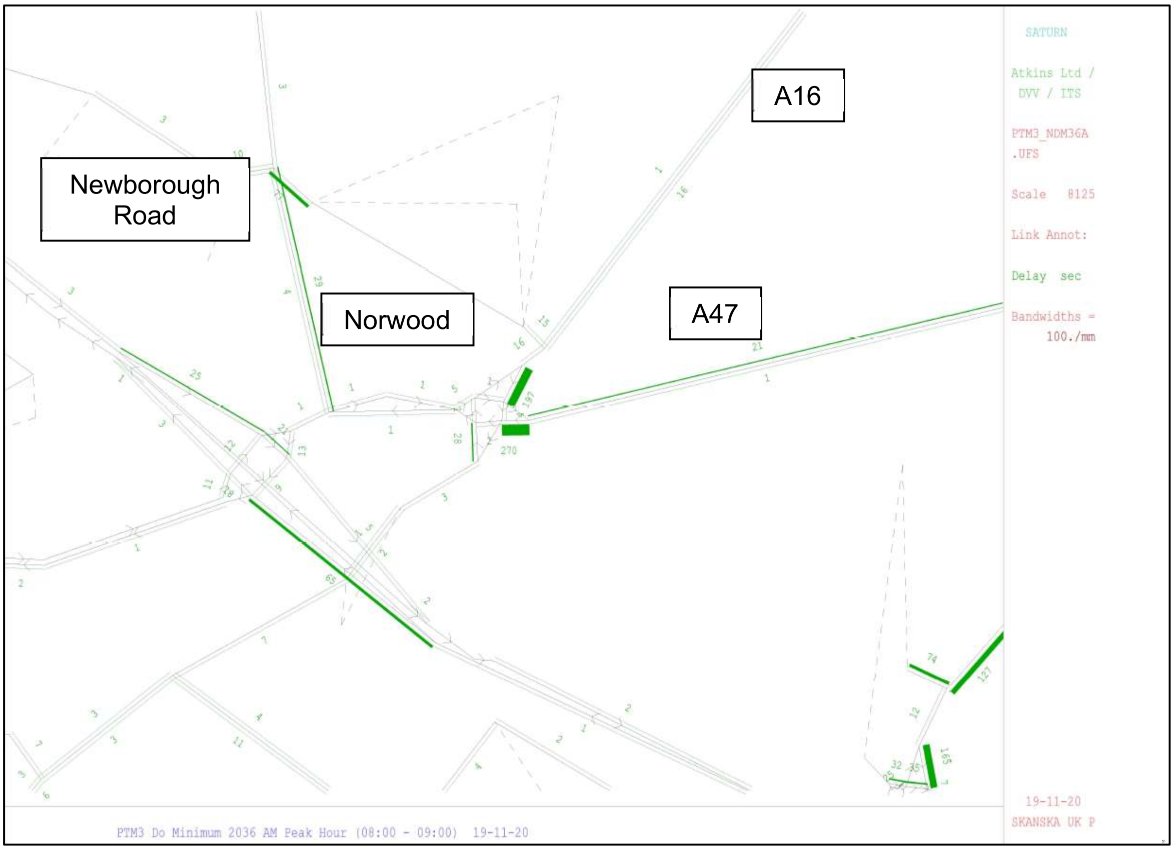


Figure 2.7: AM Peak Hour Delay (seconds per vehicle) 2036 Do-Minimum Scenario (PTM3)

2.5.9 Figure 2.7 shows that without intervention there is expected to be significant levels of delay on both the A16 southbound approach (197 seconds per vehicle) and the A47 westbound approach (270 seconds) at the A16 / A47 / Welland Road Roundabout.

2.5.10 There is also expected to be 85 seconds of delay (per vehicle) on the Development Access onto Newborough Road.

2.5.11 Figure 2.8 shows delay (seconds per vehicle) in the PM peak hour across the study area in the 2036 DM scenario.

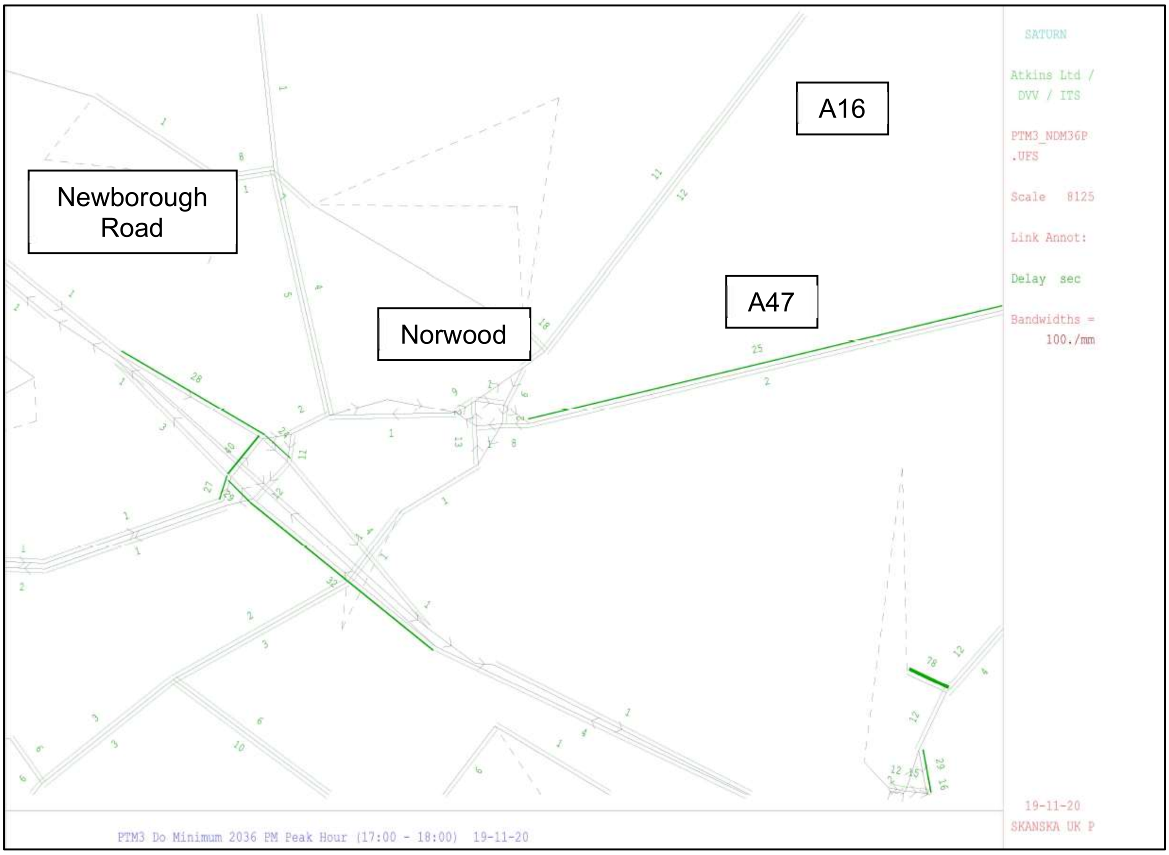


Figure 2.8: PM Peak Hour Delay (seconds per vehicle) 2036 Do-Minimum Scenario (PTM3)

2.5.12 Figure 2.8 suggests that delay is less pronounced in the PM peak hour, however delay is evident on the A47 eastbound in several places. Existing and future issues of delay are expected to be at their worst during the AM peak hour. This is as a result of the tidal nature of traffic entering Peterborough during the morning peak hour, when more vehicles use the A16 southbound and A47 westbound approaches towards Peterborough.

Likelihood of Accidents will Increase

2.5.13 It is likely that accidents will increase within the study area, in particular at the A16 / A47 / Welland Road roundabout, if no intervention done. As previously mentioned, the forecast increase in delay and travel time is expected to rise which will entail more stopping and starting on approach to the junction.

Local Growth Stalls

2.5.14 At present, the development of Leeds Farm only has permission to build up to 200 dwellings[15] as the only access is via Newborough Road. However, this is an interim arrangement, and further development cannot progress beyond 200 dwellings without broader improvements to the highway network. No viable package of measures has yet been proposed by developers that would enable the Norwood site to be fully developed, and this is a risk to local growth.

2.5.15 The proposed packaged of measures contained within this OBC does however provide comprehensive improvements that will support the full growth of the Norwood site and can be delivered in conjunction with the developers and National Highways.

Attractiveness of Norwood as a Place to Live and Peterborough as a Place to Work Will Decrease

2.5.16 The A16 corridor provides a main access point to the east of Peterborough, which contains many businesses and developments that will be affected by its operation. As traffic, queueing and delays increase, it is likely the area will become more congested in peak times. Businesses and their employees in the east of Peterborough will increasingly become frustrated with the difficulty of accessing and exiting their premises and may look to relocate or work elsewhere.

2.5.17 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.

2.5.18 The location of Norwood by the A47 and A16, and the impact of delay and congestion along the A16 and at the A16 / A47 / Welland Road Roundabout (often encouraging commuters to reroute via the A1139 Eye Road during the peak periods) means that issues at this location have an impact across the east of Peterborough, and also on strategic long-distance trips that have no suitable alternatives for east-west travel.

2.5.19 It should also be noted that without a coherent plan for delivering the infrastructure of the Norwood site, there is an increased risk that development comes forward in a piecemeal and disjointed fashion, whereby developer contributed highway mitigations do not address wider network requirements. If this were to occur The Council and National Highways would likely inherit future network issues.

[15] http://plandocs.peterborough.gov.uk/PublicDocuments/01262474.pdf

2.6 Internal Drivers for Change

2.6.1 Internal drivers for change are the 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 for Norwood come from levels of deprivation for the city, local growth aspirations, and the structured framework of support provided by the CPCA to enable this growth to be realised.

Index of Deprivation

2.6.3 As highlighted in Section 1.3, 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 Despite high population growth, the socio-economic growth of the city has not grown at an equal rate, resulting in the city being reported as one of the 'most deprived' areas within the country and CPCA region[16], in relation to income deprivation and income disparity[17].

2.6.5 Figure 2.9 overleaf shows residential areas of the city by Index of Multiple Deprivation (2019)[18]. Areas in dark red are amongst the top 10% most deprived in England and areas of dark green are amongst the 10% least deprived.

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

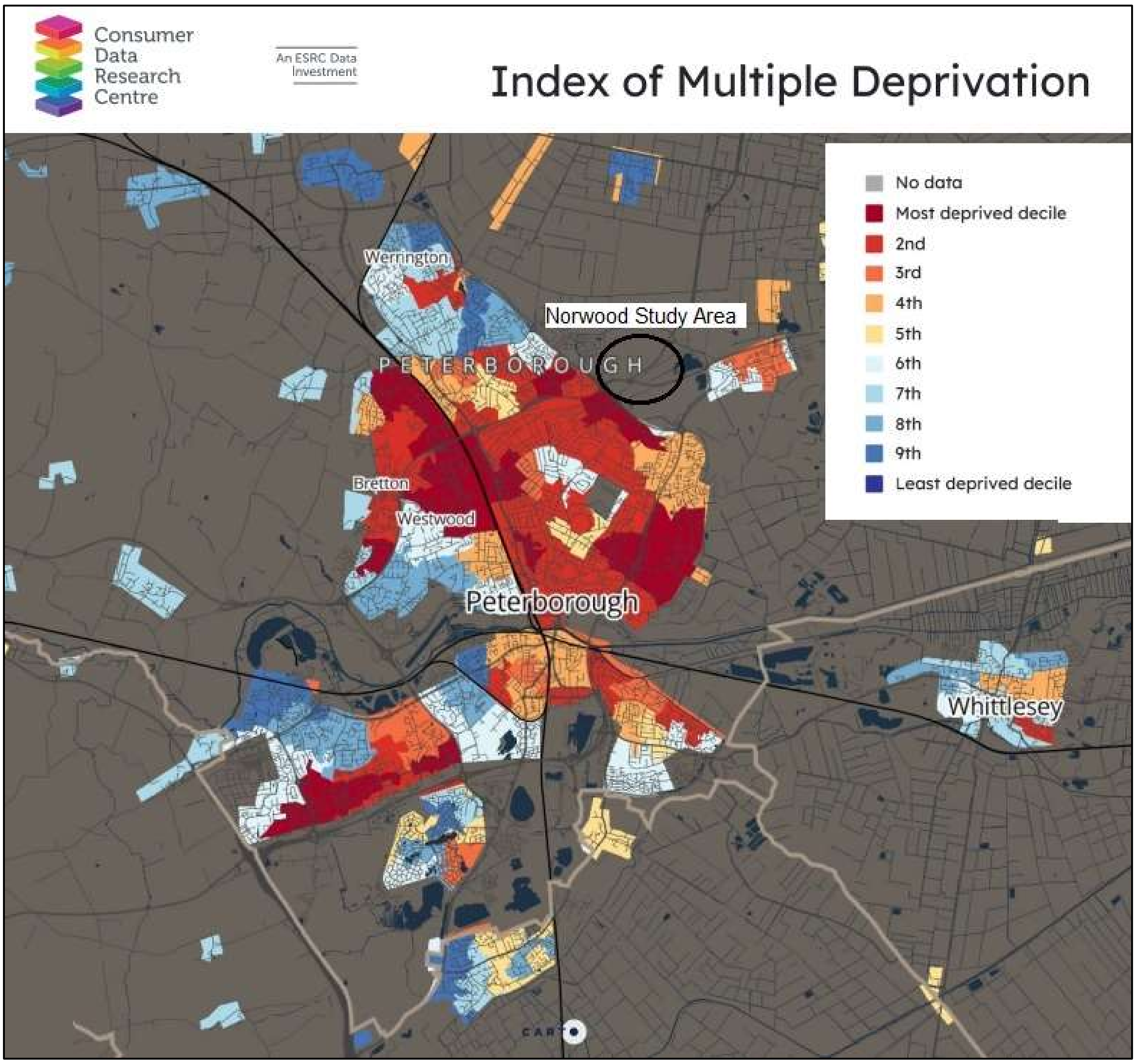


Figure 2.9: 2019 Index of Multiple Deprivation (Consumer Data Research Centre)

2.6.6 As highlighted in Figure 2.9, 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.

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

Local Growth Aspirations

2.6.8 Peterborough is forecast to experience significant employment and population growth over the next few decades, reflecting a continuation of past trends. The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities and objectives for Peterborough for the period up to 2036. The updated strategy identifies the required delivery of 19,440 new homes and 17,600 new jobs by 2036[19]. 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 support the continuing of Peterborough's strong history of growth is a key internal driver for change for the A16 Norwood Scheme.

2.6.10 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. The Local Transport Plan identifies 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 Section 2.5 also noted that no scheme beyond these proposals has been identified that would enable full local growth to be realised. Planning permission for the Leeds Farm site has only been granted for 200 dwellings due to the lack of alternative access beyond Newborough Road, and the detrimental impact that u-turning traffic from Newborough Road is known to have on the A16 / A47 / Welland Road Roundabout and surrounding highway network.

Combined Authority Support

2.6.12 The CPCA has identified a number of strategic projects which it believes will provide transformational benefits for the area. This feasibility study for highway improvements along the A16 corridor is one of the studies shortlisted as a priority, beginning in the financial year 2017 / 2018.

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

2.6.13 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.

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

2.6.15 In October 2017 the CPCA methodology for prioritising investment was based on the criteria shown in Table 2.3 below.

Table 2.3: Combined Authority Criteria

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

2.6.16 The A16 corridor has been prioritised for investment by the CPCA, and the CPCA's investment strategy is another internal driver for change, and an enabler for a scheme to be developed at this location.

2.7 External Drivers for Change

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

The A47 Alliance

2.7.2 The A47 Alliance is a campaign group comprised of twenty-four organisations including Local Authorities, MPs, Local Enterprise Partnerships and wider support from business groups and other stakeholders along the A47 trunk road in East Anglia. The Alliance's primary objective is the full dualling of the entire 115-mile stretch of the A47 between Peterborough and Lowestoft, with appropriate grade separation (bridges and flyovers) by 2030 which will:

- Boost the regional economy as a result of new employment
- Unlock housing developments planned along the route
- Reduce additional costs to businesses from as a result of delays along the A47
- Improve productivity

2.7.3 Improvements at the A16 / A47 / Welland Road Roundabout will be necessary in order to:

- Boost the attractiveness of the east of Peterborough as an employment area by reducing delays and queueing along the A47
- Support local growth
- Reduce additional costs to businesses in the east of Peterborough by reducing delays and queueing along the A47.

2.7.4 Improvements at the junction at the A16 / A47 / Welland Road Roundabout will be considerate of future aspirations for dualling from this junction to the east.

2.7.5 Beyond the dualling of the A47, the scheme will also create opportunities to deliver active travel routes and connections within the wider area, enhancing PCC's Local Cycling and Walking Infrastructure Plan (LCWIP) and Rural Cycling Strategy.

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 which must be achieved, whereas secondary objectives are other outputs that may result from the scheme but are not necessary to the success of the scheme. The secondary objectives tend to be delivered as a consequence of delivering the primary objectives, as a causal chain effect. The primary objectives therefore represent the transport outcomes required by the scheme.

2.8.2 The objectives of the A16 Norwood improvement scheme were developed ahead of the Option Development Workshop to provide a framework against which to score potential options. 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 A16 Norwood Improvement Scheme are listed beneath.

2.8.4 Primary objectives include:

- **Tackle congestion and improve journey times:** Tackle congestion and reduce delay along the A16 and on the primary approaches to the A16 / A47 / Welland Road Roundabout
- **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth at Norwood can be realised
- **Limit impact on the local environment and improve biodiversity**: Fully mitigate any adverse environmental impacts of a scheme, and ensure a biodiversity net gain within the study area
- **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.
- **Improve road safety:** Reduce accidents and improve personal security for all travellers within the study area.

2.8.5 Secondary objectives include:

- **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around the A16 corridor, such as the A47, A15 Paston Parkway, A1139 Eye Road and Newborough Road.

2.8.6 The schemes developed for the A16 Norwood Improvement study will need to satisfy all of the primary objectives, and as many of the secondary objectives as possible.

SMART Objectives

2.8.7 Based on the strategic objectives, it is valuable to further establish Specific, Measurable, Achievable, Relevant and Time-constrained (SMART) spending 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 A16 Norwood Improvement project:

- **Tackle congestion and improve journey times:** to ensure that, by 2031, delay remains beneath the following levels on approach to the A47 / A16 / Welland Road Roundabout (representing no more than a 50% increase on DS modelled delay, and representing a significant improvement over the DM scenario):
    - A16 southbound approach – 30 seconds (AM peak) / 10 seconds (PM peak)
    - A47 westbound approach – 50 seconds (AM peak) / 30 seconds (PM peak)
- **Support Peterborough's growth agenda:** to provide sufficient highway capacity at the A16 / A47 / Welland Road junction to support the creation of 2,000 dwellings across the Norwood growth site within the current Local Plan period (to 2036).
- **Limit impact on the local environment and improve biodiversity:** to achieve a 20% biodiversity net gain within one year of completion of the scheme.
- **Improve Active Travel Routes to provide viable alternative to private car travel:** to provide an LTN 1/20 compliant route connecting the Norwood growth site with Welland Road to the south of the A47 within five years of scheme completion.
- **Improve road safety:** to achieve a 40% per year reduction in personal injury accidents at the A16 / A47 / Welland Road roundabout following completion of the scheme.
- **Positively impact traffic conditions on the wider network:** to ensure that highway junctions within the study area do not exceed capacity (RFC 0.85) as a result of growth from the Norwood sites within the Local Plan period (to 2036).

2.9 Measures of Success

2.9.1 Table 2.4 beneath sets out the measures for success against which any potential improvements should be monitored. The primary objectives are shown in white and the secondary objectives are shown in green.

Table 2.4: Study Objectives and Measures of Assessment

Objective	Scheme Outcome	Measure of Assessment
Tackle congestion and improve journey times	• Reduced congestion and delay on the approaches to the A16 / A47 / Welland Road Roundabout.	• Traffic surveys to be conducted within the study area • Comparison of existing and future journey times for key approaches of the A16 / A47 / Welland Road
Support Peterborough's growth agenda	• Ensure successful delivery of committed and statutory development at Norwood, through increasing capacity on the road network, in order to cater for existing and future traffic demand.	• Preferred scheme to be assessed against future traffic growth
Limit impact on the local environment and improve biodiversity	• Mitigate and offset any detrimental environmental impacts of a scheme and enhance natural and historic features around the scheme at all opportunities.	• Post scheme review of biodiversity gain compared to pre-scheme situation
Improve Active Travel Routes to provide viable alternative to private car travel	• Provide increased pedestrian and cycling connectivity within the local area.	• Post scheme review of active travel routes, in relation to quality and safety (as specified in local policies) • Active travel counts to be conducted on new routes to gauge usage
Improve road safety	• Reduce accidents across all modes of transport	• Review the existing accident statistics for the study area, then compare this against future data post construction
Positively impact traffic conditions on the wider network	• Reduce delay on the wider network.	• Traffic surveys to be conducted within the study area • Comparison of existing and future journey times

2.10 Carbon Assessment

2.10.1 In line with the CPCA and PCC's commitment to combating climate change and PCC's aim to achieve 'Net Zero carbon emissions by 2030', the proposed A16 Norwood scheme will undergo a Carbon Assessment prior to gaining formal approval for the final design and construction.

2.10.2 This will fulfil the following commitment stated within The Council's Carbon Management Action Plan (Council CMAP) 2021[20].

'Develop detailed carbon assessments for major highway projects and use the information to influence the final design'

2.10.3 The purpose of the Carbon Assessment is to measure and baseline the carbon cost (tonnes of carbon dioxide equivalent (tCO2e)) of a scheme early in the design process, allowing for opportunities to drive carbon reduction through innovation and to assess the benefits of value engineering, use of alternative materials and implementation of more efficient construction methods.

2.10.4 Figure 2.10 provides an overview of the process followed by Milestone Infrastructure for undertaking carbon emission calculations, initially at Preliminary Design and secondly at Detailed Design as the scheme progresses.

2.10.5 Further information regarding the methodology and data used for Carbon Assessments can be found in Appendix B.

[20] https://www.peterborough.gov.uk/asset-library/council-carbon-management-action-plan-2021.pdf.

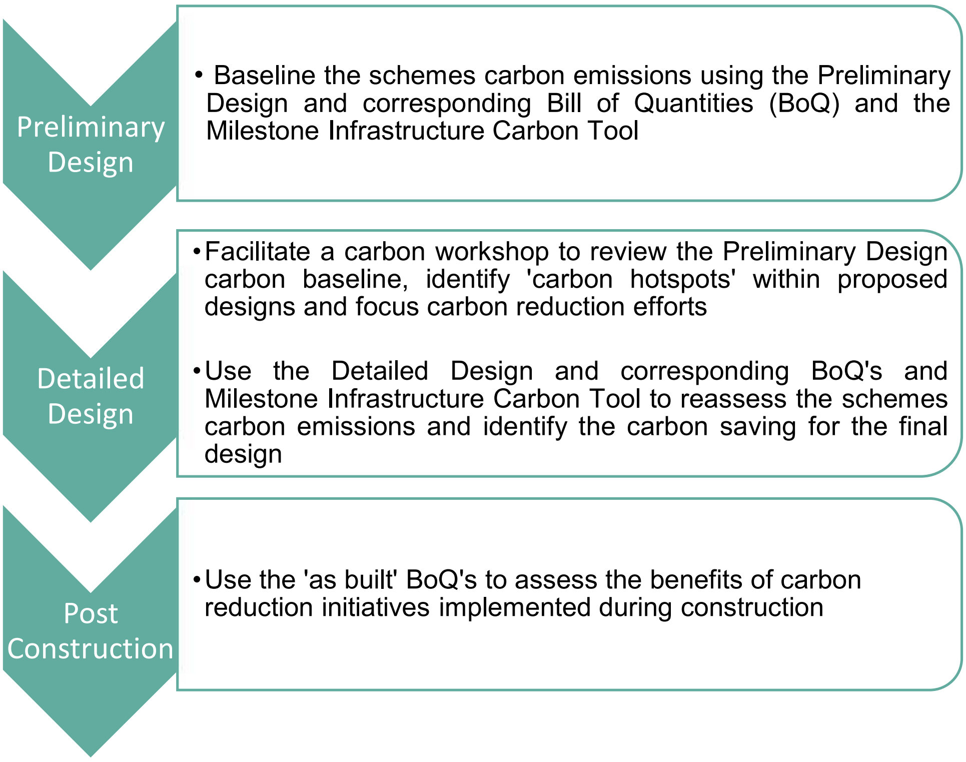


Figure 2.10: Carbon Assessment Process Overview

2.10.6 As per the initial stage illustrated in Figure 2.11 (overleaf), a baseline carbon cost was developed for the A16 Norwood scheme using the Preliminary Design and the corresponding Bill of Quantities. Figure 2.11 overleaf shows the baseline carbon cost generated for the scheme under this phase of work, highlighting the highest carbon contributors of:

- Road Pavement: 490 tCO2e (27%)
- Kerbs and Footways: 376 tCO2e (21%)
- Site Preliminaries: 363 tCO2e. (20%).

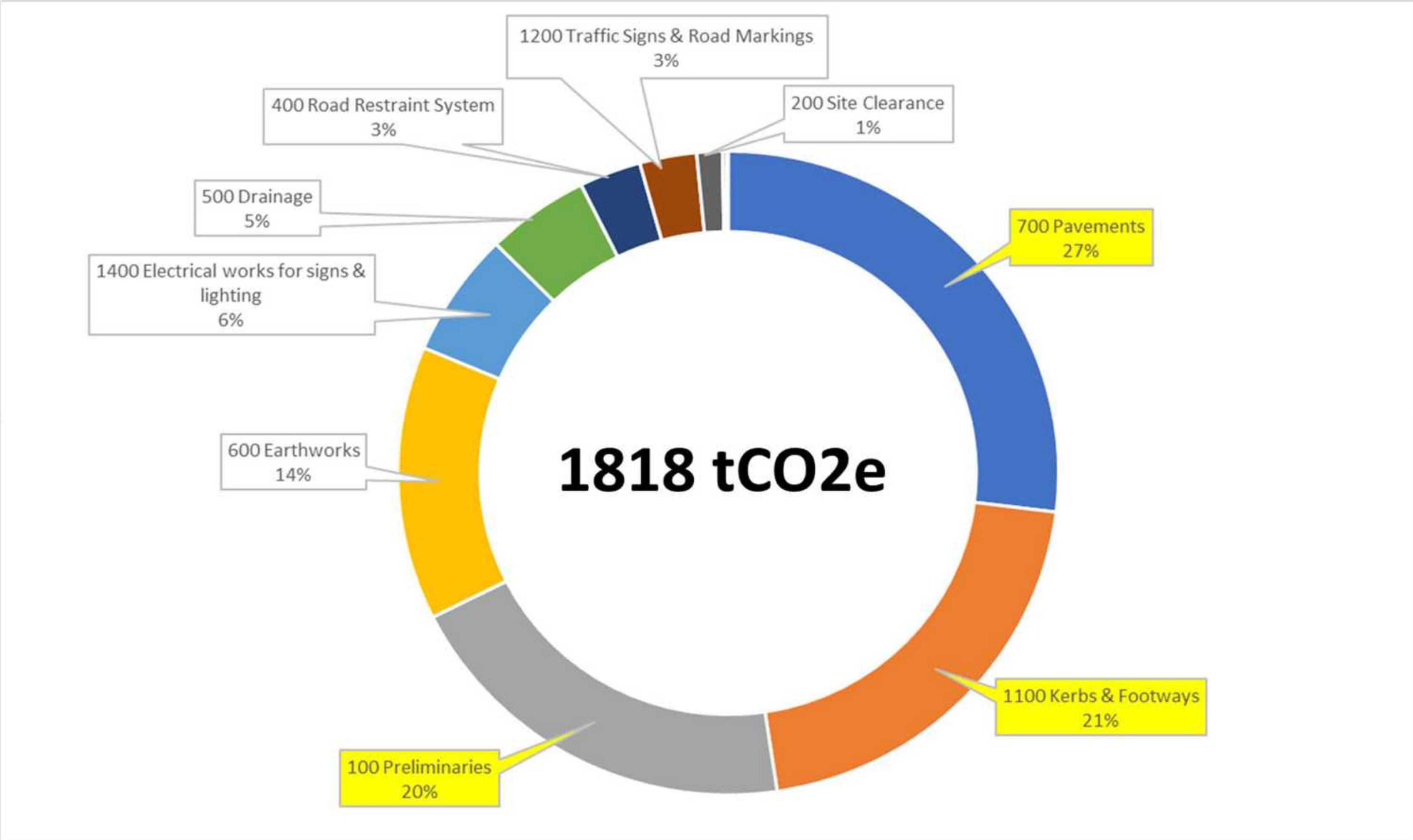


Figure 2.11: Preliminary Carbon Footprint Broken Down by Work Activity 'Series'

2.10.7 Further analysis of these carbon hotspots has enabled the identification of specific work 'categories' and 'activities' which are contributing the most significant proportions of carbon to facilitate a more focused carbon reduction effort. Table 2.5 below and Figure 2.12 overleaf highlight these and provide some suggestions for carbon reduction measures.

Table 2.5: Preliminary Carbon Footprint Broken Down by Work 'Activity'

Work Activity	Carbon Output (tCO2e)	%	Potential Carbon Reduction Measures
Sub Con Week Prelim	193.4	10.6	Mains Electric Connection / Renewable Energy power supply / HVO Fuel
Combined Kerb Drainage Standard Units with Splayed Profile With 280mm Channel Depth (100mm Upstand) - ACO280 Or Similar (SP(KD))	162.0	8.9	Value Engineering / Higher GGBS concrete
320mm thick granular Type 1 sub-base to Clause 803, in carriageway, hard shoulder and hard strip	109.6	6.0	Value Engineering / Recycled Aggregates
Imported acceptable material in embankments and other areas of fill	104.9	5.8	Value Engineering / Use of site-won materials
110mm thick AC20 dense bin 40/60 binder/binder reg course to clause 929	80.8	4.4	Warm Mix Asphalt / Cold Recycled Bound Materials (CRBM)
120mm thick AC20 dense bin 40/60 base course to clause 929	76.4	4.2	Biogenic Binder in Asphalt / Higher RAP content
Signals Installation	65.4	3.6	Re-use functioning signals from elsewhere
Traffic management Maintenance	60.4	3.3	EV alternatives / HVO Fuel / Smart traffic management monitoring systems
225 mm internal diameter PVCu drain, depths to invert not exceeding 2 metres	60.2	3.3	Re-use of excess pipework from elsewhere / Higher recycled content in pipework
Paved area comprising Type 1 unbound mixture sub base 350mm thick	58.9	3.2	Value Engineering / Recycled Aggregates
Disposal of Material	56.7	3.1	Value Engineering / Re-use on site
110mm thick AC20 dense bin 40/60 binder course to clause 929	52.9	2.9	Warm Mix Asphalt / Cold Recycled Bound Materials (CRBM)
50mm thick CASC+ surface course - 53 PSV	50.3	2.8	SuperLow' Asphalt Product / Warm Mix Asphalt
Imported topsoil Class 5B	37.8	2.1	Value Engineering / Re-use site-won material
Paved area comprising AC14 Binder Course in accordance with BS EN 13108-1:2006 with a 40/60 pen binder 90mm thick	33.9	1.9	Ultifaspath pavement material / Cold Recycled Bound Materials (CRBM)
50mm thick TSCS surface course - 68 PSV	32.3	1.8	Warm Mix Asphalt /Higher RAP content
Pre-Cast Concrete Edging Kerbs (150x914x50mm) (EK)	30.5	1.7	Durakerb product / Rediweld product

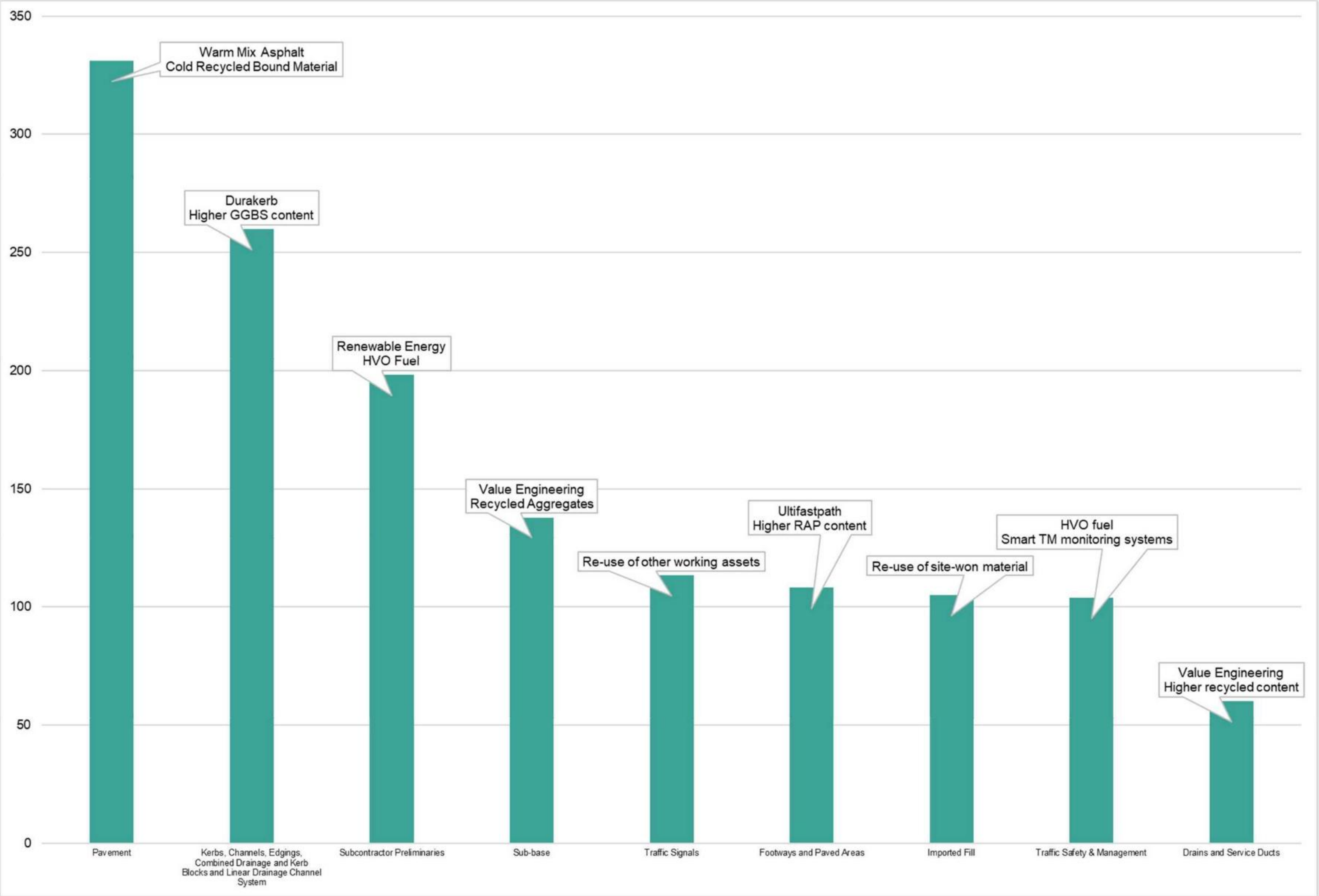


Figure 2.12:Preliminary Carbon Footprint Broken Down by Work 'Category'

2.10.8 This information and the Preliminary carbon baseline will be used to further inform the design of the Preferred Scheme in the next stage of Detailed Design and FBC. Aspirations identified during this phase of work which will form a minimum carbon effort within the next phase of work include:

- The use of low temperature Asphalt
- Retaining as much of the existing carriageway during construction as possible, using profile planning and regulating to achieve designed surface levels
- The use of a low carbon concrete mixes / products
- The use of plastic kerbing where appropriate
- The use of recycled materials such as Type 4 Plannings in footways
- The introduction of a drainage attenuation feature at the point of outfall.

2.10.9 This Preliminary Carbon Assessment will be updated when the BoQ are made available for the Detailed Design within the next phase of work, enabling a carbon reduction to be demonstrated between business case stages. Additionally, as per Figure 2.10, a final 'as-built' carbon footprint will be calculated for the scheme to highlight any further carbon reductions through the construction phase.

2.10.10 Through the monitoring of carbon at each of the design stages, it is hoped that this approach will lead to tangible changes in scheme design and construction methods, therefore improving the overall sustainability of the scheme in line with the CPCA and The Council's climate objectives.

2.11 Constraints, Powers and Approvals

2.11.1 Scheme constraints are set out in Table 2.6 beneath, including proposed mitigations for how these will be managed.

Table 2.6: Constraints and Measures of Mitigation

Constraint	Detail of Constraint	Response / Mitigation Measure
Funding / Budget	The cost of the scheme will need to compete with other transport infrastructure funding priorities, and the Improvements will need to be achievable within budgets available.	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.
Alignment to Developer Proposals	There is a requirement to align developer highway mitigations to schemes which will be delivered within this project by PHS. Progression of developer planning applications has the potential to impact the delivery of the PHS highway schemes as the project progresses and wider study area develops.	Consultations between PCC and developers has been continuous throughout this phase of work, and this will continue into Detailed Design, with developer proposals confirmed in the next phase and their timescales for delivering required mitigations agreed prior to construction.
Environmental / Ecology	Land to the east of the A16 (Dogsthorpe Star Pit) is a Site of Special Scientific Interest (SSSI), supporting scarce and nationally rare species and fauna. An area of Ancient Woodland (Little Wood) is also within located close to the SSSI. The study area is located within an Amber and Green zone for great Crested Newts. Ecological site investigations have identified the site as having potential for bats, breeding birds and common reptiles.	Will be managed through ecological / arboricultural surveys to inform design and identify measures necessary to protect vulnerable species and plants during construction. To protect species, works will be undertaken within the appropriate seasons, and under the working methods stated within the agreed Precautionary Method of Works.
Highway Boundary / Scheme Design	Ground conditions associated with highway widening and the likelihood of uncovering hazardous material within the study extents are unknown at this stage.	Surveys are to be commissioned at the start of the Detailed Design phase, to further refine scheme design. Due to the existing carriageway having undergone recent construction / amendments the likelihood of hazardous material such as 'asbestos' is considered low.
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 to be undertaken with utility companies, during Detailed Design and prior to construction commencing onsite. Sufficient lead in time for statutory diversions should be incorporated into the construction programme before work onsite commences.
Traffic Management	Complex traffic management requirements are expected for the construction of the scheme, in relation to maintaining the operation of both the A47 and A16.	Early involvement of PCC will be required prior to construction, to plan ahead with TM arrangements and agree a construction programme.
Disapproval from the public or stakeholders	Feedback has been received from stakeholders and members of the public during the consultation period undertaken during this phase of work. Elements within the scheme are considered controversial, and objections from the public and some stakeholders are likely to continue into the final phase of Detailed Design.	Comments received during the stakeholder and public consultations during this phase of work are to be reviewed during the next phase of work and responses integrated into design where appropriate.
COVID – 19	The pandemic had an impact on travel behaviour and the daily use of travel systems, however data from the Peterborough network has shown a steady recovery back to pre-pandemic levels. Despite government restrictions being eased, there continues to be considerations onsite such as social distancing and the need to travel in separate vehicles	Traffic on the Peterborough network (adjacent to the study area) will continue to be monitored and reported within the Business Case process. Routine monitoring of traffic will help determine how flows compare to baseline traffic levels collected at the start of the project. Frequent communication between the project team regarding programme timings, risks and mitigations.

2.11.2 In addition to the constraints shown in Table 2.7, the following powers and approvals will be required to deliver the scheme.

Table 2.7: Powers and Consents

Type	Consent / Approval	Issuer	Description	Current Status
Highways	TTRO	Peterborough City Council	Temporary Traffic Regulation Order allowing temporary restrictions to the road, enabling traffic management required for construction.	Will be sought prior to construciton. Temporary roadspace booking to be confirmed once construction programme finalised.
	TTRO	National Highways	Temporary Traffic Regulation Order allowing temporary restrictions to the road, enabling traffic management required for construction.	Will be sought prior to construciton. Temporary roadspace booking to be confirmed once construction programme finalised.
Environment	Site of Special Scientific Interest (SSSI) Assent	Natural England	Consent needed from Natural England prior to the start of works due to the proximity to the Dogsthorpe Star Pit SSSI site.	Needed prior to construction upon completion of the LSE Assessment (see below). Response from Natural England likely to take up to 28 days. No response has to be taken as refusal of assent. Fast-track service available at a cost.
	Screening for Likely Significant Effect (LSE) Assessment	Local Planning Authority	Report needed to inform the Habitats Regulations Assessment (HRA) which will be undertaken by the competent planning authority as part of the planning process to test if a project could significantly harm the features of a SSSI site.	To be commissioned during the Detailed Design stage.
	Archaeological Watching Brief & Supply of Geotechnical Survey shapefiles	Peterborough City Council (Natural & Historic Environment)	Stakeholder consultation confirmed Archaeological interest in the site due it producing evidence for activity dating back to the Iron Age and Roman period. Archaeological watching brief recommended for all groundworks within undisturbed areas/virgin soils, including ground investigation works. Shapefile data for geotechnical surveys also requested.	Peterborough City Council Archaeologist (Dr Rebecca Casa-Hatton) to be contacted to oversee all ground investigation works and any subsequent groundworks involving disturbance of virgin soils. Shapefile fata for geotechnical surveys to be shared once available.
	Consultation	The Wildlife Trust	Recommended by Natural England as Dogsthorpe Star Pit SSSI is also designated as a County Wildlife Site (CWS) and Local Nature Reserve (LNR).	To be undertaken during the Detailed Design stage.
	Biodiversity Net Gain (BNG) Assessment	Peterborough City Council	Consultation required with Peterborough City Council upon completion of initial BNG Assessment to ensure that a 20% positive BNG is achieved in accordance with organisational targets.	BNG Assessment to be completed before the end of 2022 to allow liaison with PCC (Michael Britton and Darren Sharpe) and inform Detailed Design.
	Land Drainage Consent	Internal Drainage Board (IDB) and/or Lead Local Flood Authority (LLFA)	Consent needed from either the IDB or LLFA where works are likely to temporarily and/or permanently impact on the risk of flooding, maintenance regimes and/or water flows.	Requirements to be determined during the Detailed Design stage.
	Great Crested Newt (GCN) and/or Reptile Mitigation Licence	Natural England	Initial ecological surveys have highlighted an increased risk of needing to obtain mitigation licences for GCN and Reptiles due to potential unavoidable impacts. This will be dependent on the scheme design and follow-up surveys.	Further surveys to be scheduled during Spring 2023 and requirements confirmed during the Detailed Design Stage.
Design	RSA2	Peterborough City Council	Road Safety Audit Stage 2	Road Safety Audit Stage 1 Undertaken, RSA1 Comments need to be agreed with the Client
	National Highways Technical Approval	National Highways	National HIghways Technical Approval of the Design in relation to A47	To commence at Detailed Design Stage
	Drainage Consents	Anglian Water	Potential Drainage Consents	To be reviewed at Detailed Design Stage
	Stopping Up Order for Newborough Road	Peterbough Magistrates Court	Newborough Road to be Closed	Plans to be produced at Detailed Design Stage
	Change in Equestrian Route	British Horse Society	Change in Equestrian Route	Liasion to continue at Detailed Design Stage
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.

2.11.3 All these powers and consents can be obtained by Peterborough City Council, and do not represent a significant risk to delivery. This table will be updated with progress throughout the detailed design phase and completed as part of the FBC.

2.12 Scope

2.12.1 The project scope is to develop and deliver a scheme, which achieves the primary objectives of:

- Tackles congestion and improves journey times: Tackle congestion and reduce delay along the A16 and on the primary approaches to the A16 / A47 / Welland Road Roundabout. The package of schemes will add capacity to the highway network, addressing existing peak hour congestion, and help to facilitate planned residential growth within Norwood.
- Support Peterborough's growth agenda: ensure that the planned employment and housing growth at Norwood can be realised.
- Limit impact on the local environment and improve biodiversity: Fully mitigate any adverse environmental impacts of a scheme and ensure a biodiversity net gain is achieved within the study area.
- 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.
- Improve road safety: reduce accidents and improve personal security for all travellers within the study area.

2.13 Interdependencies

2.13.1 The Norwood and Paston Reserve urban extensions have been allocated for development within the Peterborough Local Plan 2016 to 2036 (Adopted July 2019). The 80-hectare Norwood site will provide 2,000 dwellings when complete.

2.13.2 The first phase of the Leeds Farm development (2019 – 2031) currently holds outline planning permission (granted April 2021) for 870 dwellings, a primary school and local centre. It should be noted that the planning permission is subject to transport related ‘monitor and manage’ conditions, as its estimated only 200 dwellings can be built without the introduction of highway mitigation measures.

2.13.3 Under the ‘monitor and manage’ conditions of the planning application, the developer is required to make the following improvements along the A16 corridor, to accommodate the full number of dwellings:

- New access roundabout with the A16
- New access priority junction with Newborough Road.

2.13.4 These improvements are deemed necessary for traffic from the development to be able to access and interact with the wider network and have been considered whilst developing the Preliminary Design associated with this OBC.

2.13.5 The second phase of development (2026 – 2031) which will complete the Norwood site (1,130 dwellings) currently holds no form of planning permission, however the developers are in pre-application discussions with the Planning Authority for Outline Planning Permission. This will be monitored closely as the project moves into the final stage of the FBC and Detailed Design.

2.14 Key Risks

2.14.1 The scheme is considered to be low risk in construction terms. However, the primary risk for the project concerns developing a coherent plan for delivering the infrastructure required to support local growth, which includes aligning the delivery of the PHS scheme to developer aspirations and timescales.

2.14.2 As mentioned in section 2.13 above, the first phase of the Norwood site holds outline planning permission (granted April 2021), whilst the second phase currently holds no form of planning permission. Confirmed developer plans and timescales are required before the submission of the FBC and Detailed Design (expected March 2024), in order to gain construction funding approval from the CPCA.

2.14.3 In order to mitigate potential impact from developers on the PHS scheme delivery, Peterborough City Council's planning team have been engaging with developers throughout this phase of work, and both developers are now actively engaged in discussion with the Council. This engagement will need to be sustained into the next phase of work to maintain momentum and confirm developer timescales and align developer / PHS highway mitigations in order to address the wider network requirements, as opposed to a fragmented approach by both parties.

2.14.4 These discussions have also considered the requirement for a small parcel of land from the Norwood growth site to accommodate the relocated Bridleway (as a result of the creation of a Left Dedicated Lane from the A47 to the A16). The developer owning this land is aware of the need and prepared to provide the land as part of the scheme. This need will be factored into the development spatial plans as they progress as part of the planning process.

2.14.5 The latest scheme development has condensed the delivery timescales for the A16 Norwood Improvement Project to better reflect the Leeds Farm Development aspirations, and this OBC proposes delivering the improvements in a single phase, rather than a two staged approach as proposed at SOBC.

COVID-19

2.14.6 The COVID-19 pandemic saw significant changes in highway usage during the national lockdowns between 2020 and 2021, creating uncertainty about how transport systems will be used in the long-term. Despite this, data monitoring of the Peterborough area suggests highway usage is back to a minimum of 90% of pre COVID-19 levels[21].

2.14.7 A review of traffic flows along the A47 Trunk Road using National Highway ATC data[22] has shown that traffic flows along the route have recovered following the pandemic. Data shown in Figure 2.13 and Figure 2.14 show a comparison of daily traffic flows covering a month period in October 2020 and October 2021, when compared to a 2019 baseline. This data has been taken from ATC sites located approximately 350m east of the A47 / A16 / Welland Road Roundabout. Data extracted displays both the east and westbound flows for a 24-hour period.

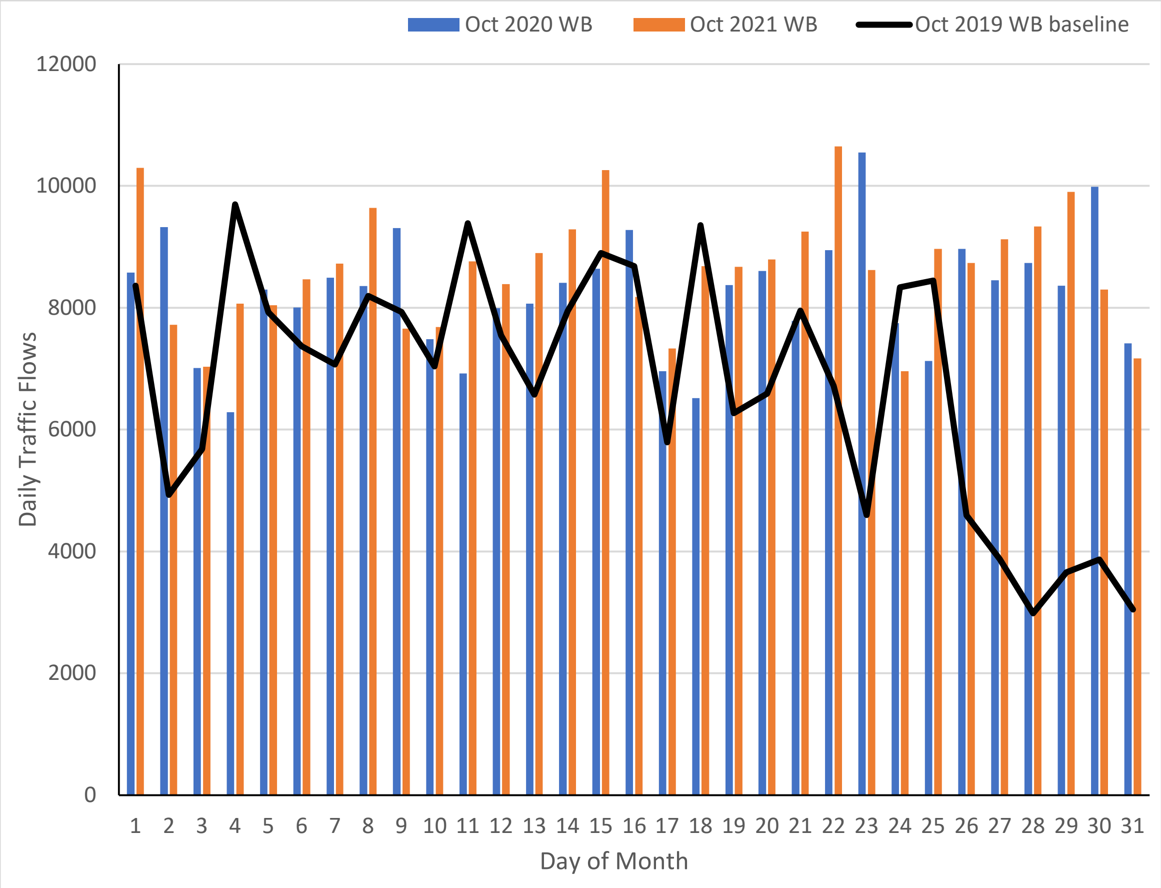


Figure 2.13: A47 Westbound ATC Data Comparison

21 Peterborough live sensor data (2021): Strategic Parkway Route of A1260 Nene Parkway southbound approach to Junction 3, inclusive of Monday to Thursday traffic levels covering a 24-hour period.

22 Highways England - WebTRIS - Map View

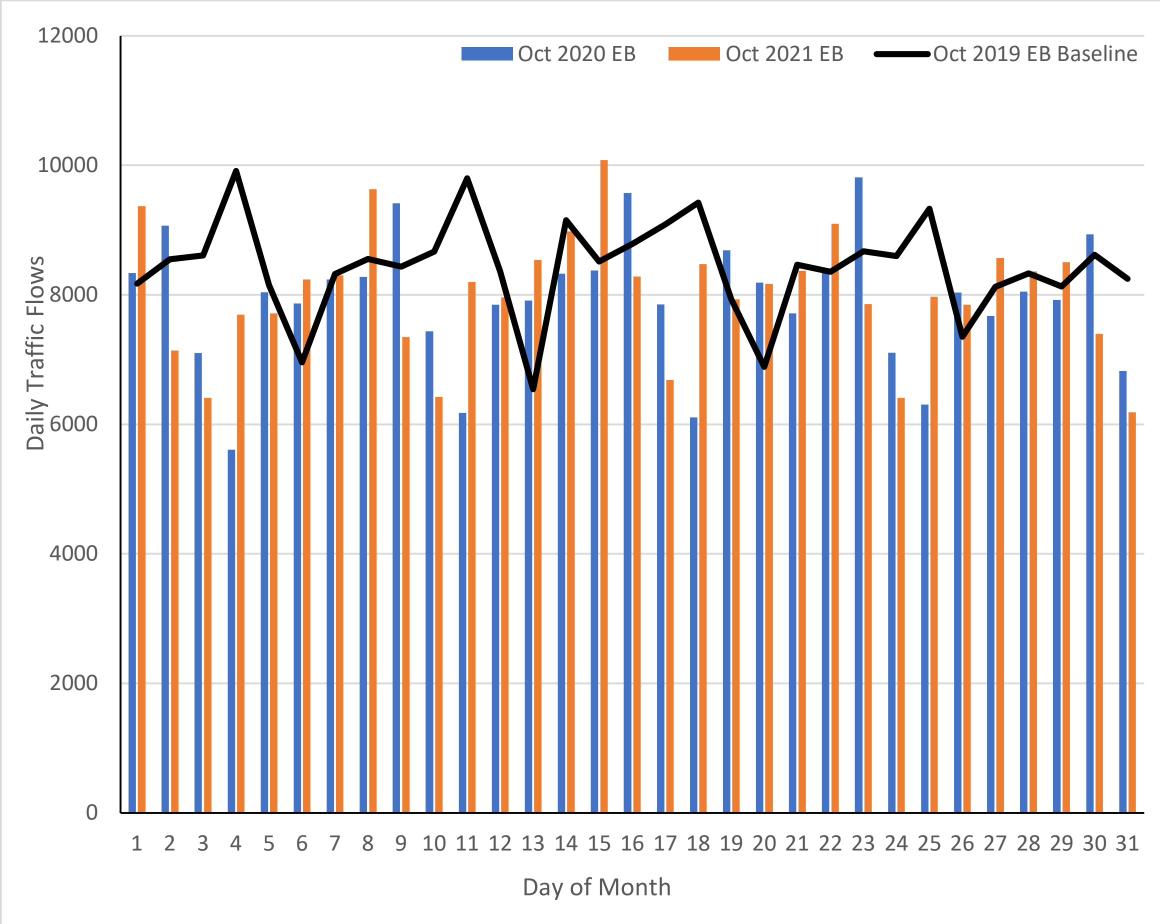


Figure 2.14: A47 Eastbound ATC Data Comparison

2.14.8 Figures 2.13 and 2.14 highlight daily traffic flows across the months follow the same general pattern, with daily traffic flows peaking and troughing at relatively the same time of the month. Traffic flows for October 2021 are shown to be higher than those in October 2020, which is expected, as a greater number of government restrictions were eased at this time (October 2021).

2.14.9 Daily traffic flows for the westbound approach of the A47 during October 2021 range between approximately 7,000 and 10,500 vehicles, whilst traffic flows eastbound are slightly lower ranging between approximately 6,200 – 10,000 vehicles a day at this location. Daily traffic flows for October 2021 are generally above the 2019 baseline, in both directions, indicating a recovery in traffic flows from the pandemic.

2.14.10 Even though evidence suggests a strong recovery of traffic flows on the Peterborough network has already occurred following the pandemic, monitoring of the highway network will continue into the next phase of the study and further data will be presented within the FBC.

2.14.11 Other key strategic risks and their mitigations are identified below:

Table 2.8: Strategic Risks and Mitigations

Risk	Impact	Mitigation
Delay to decision on scope of scheme	Delay in developers obtaining planning approval / establishing a plan for developer contributions to highway mitigation measures. Developer decisions could determine changes to the scope at business case stages.	CPCA will be updated on the planning application outcomes. Its hoped developers will reach a decision on developer contributions to highway improvements before the FBC commences. Communication with developers to be maintained between approval of OBC to start of FBC.
Delay in obtaining approval to commence the next stage	Delay in commencing the FBC and Detailed Design. Without approval its difficult to set timeframes for programme of works, and raise WO for Milestone Infrastructure to undertake the work.	Monitor when the review of the OBC will be completed by, and look for upcoming board meeting where approval can be requested. Draft programme will be prepaped looking at potential timescales for each task.
Project progress on hold	Delay to the project programme, approval / commencement of final business case stage.	Regular progress meetings to be undertaken. Isues which may impact on programme to be identified as early as possible and potential mitigation measures implemented.
Not coming to an agreement with developer	Project could be placed on hold between OBC approval and FBC commencing. Study to date could need updating to reflect any changes proposed by developers.	Communication with developers to be maintained in order to reach agreements. Regular progress meetings to be held, to make project team aware of any changes at earlist point, and included within project programme.
Delay to delivery of the development	Delay of developer contributions to highway mitigations may alter construction of PHS scheme delivery elements.	Monitor developer agreements and interaction this has with planned timescales.

2.14.12 Appendix C contains the Project Risk Register which identifies each of these risks and considers mitigation. The Risk Register is a live document which is managed by PCC and reviewed regularly by the CPCA and PCC during the monthly Project Board meetings.

2.15 Stakeholders

2.15.1 The key stakeholders are considered to be:

- CPCA as the Local Transport Authority and funding body for the scheme
- The Council as the Local Highway Authority
- Norwood Developers and landowners including Taylor Wimpey / Calco 101 in relation to the Leeds Farm Development, and Church Commissions in regard to land to the north of the A47 / A16 / Welland Road Roundabout
- Peterborough City Cabinet Member and Ward Councillors
- National Highways as the organisation responsible for the A47 Trunk Road
- British Horse Society
- Peterborough Local Cycle Forum
- PCC Education Services
- Natural England in regard to ecological / biodiversity assessments within the studies footprint
- Historic England in regard to Archaeology/ Cultural Heritage assessments within the studies footprint
- Environment Agency
- The Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire, as the organisation responsible for the Dogsthorpe Star Pitt SSSI
- PCC representatives for the natural and historic environment, Archaeology and Heritage, Water and Drainage, Environmental Health and Planning
- Emergency Services
- Residents affected by the scheme, including along Newborough Road
- Businesses affected by the scheme.

2.15.2 Engagement and communication with key stakeholders is an essential element of the planning process for major transport schemes. Stakeholder's needs and requirements should be considered as part of the scheme progression.

Stakeholder Consultation

2.15.3 Stakeholder consultations were undertaken by the Project Team as part of this OBC and Preliminary Design phase of work, ahead of the commencement of Detailed Design. Stakeholders were contacted via email or letter or as part of the Walking, Cycling and Horse Riding (WCHR) Review, for comments on the Preferred Scheme at Preliminary Design Stage.

2.15.4 It should be noted that stakeholder engagement with National Highways began as part of the SOBC and has continued through the development of Preliminary Design and this OBC. Communication with National Highways has included a working group which involves members of the CPCA and The Council's planning team, in order to discuss the project and wider updates on the Leeds Farm Planning Application (part of the Norwood Development). The working group has met quarterly over the past year to discuss the various workstreams of the project, which has helped drive the project forward.

2.15.5 Feedback received from stakeholders during the consultation largely centred on land acquisition for the bridal way, connectivity to the Leeds Farm NMU routes and greater inclusion for active travel provisions within the project, as well as the recent January 2022 updates to the Highway Code.

2.15.6 Consultation feedback regarding active travel was received from the Peterborough Cycle Forum (PCF), in response to the WCHR Review. The PCF work in partnership with The Council to promote cycling within the city and influence policies and plans for future cycle facilities.

2.15.7 Feedback from the PCF demonstrates the organisation supports the need for improvements as part of the A16 Norwood scheme by stating "by increasing capacity and reducing congestion on sections of the A47 and A16 the proposed road scheme will deliver benefits for many drivers, including through traffic, commuters and residents of the Norwood urban expansion". However, further feedback from the PCF suggests the project requires further consideration in relation to active travel provision. PCF would like to see infrastructure provided for a central route (following the shortest distance) which starts from Newborough Road, crossings the A16 and connects into wider networks on Welland Road. With this in mind the PCF suggest:

- The construction of an underbridge to cross the A47, connecting Newborough Road with Welland Road
- The construction of a cycleway / footway from Newborough Road to White Post Road, parallel to the A16 and passing under it at Car Dyke
- The installation of a Toucan crossing on the A47, approximately 60m east of the A47/A16 roundabout
- The removal of the existing signalised crossing on the A16.

2.15.8 Comments received from PCF have been considered during this phase of assessment, and the provision of active travel improvements will be included as the project progresses to FBC and Detailed Design stage, including the provision of a grade separated crossings over the A47 and active travel improvements linking Norwood with the City Centre via Welland Road.

2.15.9 All other comments received from stakeholders during consultation will be explored further and incorporated into scheme design where appropriate as the project progresses to the final phase of Detailed Design.

Public Consultation

2.15.10 Public consultation was undertaken alongside the Preliminary Designs to assess public views of the scheme ahead of Detailed Design. The online consultation which featured on the PCC website and social media for a six-week period (1st November – 13th December 2021) explained the need for improvements, displayed the scheme designs and sought feedback.

2.15.11 A total of 49 members of the public responded during the consultation period. Comments received focused on upgrading active travel routes, poor bus / public transport facilities to the north-east of the city, considerations of the environmental assets within the study area, and more specifically the closure of Newborough Road as proposed by the scheme.

2.15.12 In relation to Newborough Road, 25% of the total comments received related directly to the proposed closure of Newborough Road. Comments received show a mixed opinion from members of the public, however most comments received were against the full closure of Newborough Road.

2.15.13 Closure of the road southbound, and specifically the access onto the A47, are critical components of the wider package of measures because:

- Technical work undertaken to date has demonstrated that this element is required to support wider network efficiency (need to remove u-turning traffic from the A16 / A47 / Welland Road Roundabout)
- Maintaining the Newborough Road access goes against the scheme objectives (removing u-turners is key to achieving a primary objective)
- The internal configuration Newborough Road will ultimately change as the Norwood developments progress.

2.15.14 Further technical assessment undertaken during this phase of the study has demonstrated that the scheme objectives can still be met by retaining access from the A47 onto Newborough Road (northbound only). This would improve access into the Norwood site (and beyond) from the A47, whilst still removing the issues created by u-turning traffic coming from Newborough Road (southbound) onto the A47. The proposed scheme has been updated to reflect this, and this amendment to the package will be incorporated into the Detailed Designs.

2.15.15 Consultation responses relating to active travel have been used to define the improvements that will made as part of the next phase of the project, specifically improvements from the Norwood growth site to Welland Road and on towards the City Centre.

2.16 Option Development

2.16.1 This section discusses the process followed for developing options and shortlisting these 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 A16 Norwood Option Assessment Report (OAR), which was submitted alongside the Strategic Outline Business Case in November 2020. Any subsequent amendments to the package of options are described within this chapter.

2.16.2 An option development workshop was held on the 24th of February 2020 and attended by Peterborough Highway Services staff from a variety of disciplines, including transport planning and design. The workshop reviewed the existing conditions and issues within the A16 Norwood improvement scheme study area, explored its relationship with the surrounding road network and various constraints, and discussed planned growth at the site. The purpose of the workshop was to develop potential improvement options to be considered within this study.

2.16.3 A total of nine options were considered, with potential schemes ranging in estimated cost and potential level of impact on the network. These nine options formed the 'Long List' and are summarised in Table 2.9.

Table 2.9: Long List of Options for A16 Norwood Improvement Scheme

A47 / Newborough Road Priority Junction
Signalisation of A47 / Newborough Road Junction to make it all movement
Creation of a roundabout at the A47 / Newborough Road Junction
Tunnel Newborough Road under the A47
Closure of Newborough Road between the A47 and Norwood Lane
A16
Roundabout on the A16 at Norwood eastern development access
Dual A16 between A16 / A47 / Welland Road Roundabout and Norwood Development Access
A16 / A47 / Welland Road Roundabout
Full signalisation of A16 / A47 / Welland Road Roundabout
Expand existing roundabout and create a 'Hamburger' style junction
Dedicated left turn from A47 to A16

EAST Assessment

2.16.4 The DfT's Early Assessment and Sifting Tool (EAST) was used to assess the Long List of options against objectives to discount any schemes that are not considered to meet the fundamental scheme objectives.

2.16.5 The objectives used in the EAST assessment were formulated to reflect CPCA, Peterborough City Council and scheme objectives, as well as other factors which can influence the deliverability of a scheme (such as likely public and stakeholder support). Scores were based on the discussion and collective opinion of the workshop delegates. The objectives used are outlined in Table 2.10 beneath.

Table 2.10: Scheme Objectives

Strategic Objectives
Ability to reduce congestion/ improve journey times
Making the best use of existing infrastructure
Ability to make Safety Improvements
Ability to support the local growth agenda, including housing and employment growth
Economic Objectives
Affordability (Value for Money)
Scale of impact on local environment (Ecology, Noise and Air)
Management / Deliverability Objectives
Land Acquistion and CPO
Scheme Risk / Buildability
Stakeholder support and public acceptability

2.16.6 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.

2.17 Shortlisting Summary

2.17.1 Table 2.11 summarises the EAST assessment and identifies which options were shortlisted for inclusion within the traffic modelling. Following the Option Development Workshop, discussions between Peterborough City Council and developers confirmed that Option 5 (Roundabout on the A16 at Norwood eastern development access) would be delivered by the developer as part of their planning obligation. Consequently, this has been removed from the option testing and included within the DM scenario.

2.17.2 Improvements at this location have been an aspiration for Peterborough City Council for many years, and a scheme has been referenced in the last several generations of the Council's Local Transport Plan. Historic attempts to look at low-cost options on this route have been assessed in the past, but nothing satisfactory has been developed and the need for a more significant intervention was acknowledged during the option development phase of this project.

Table 2.11: EAST Assessment Scores

Scheme		Evaluation										
		Strategic Case				Economic Objectives			Management / Deliverability Objectives			Progressed to Option Assessment
		Reduce Congestion / Improve Journey Times	Making best use of existing infrastructure	Safety	Ability to support the local growth agenda, including housing and employment growth	Ecological Impact	Noise / Air Pollution Impact	Value for Money / Affordability	Land Acquisition & CPO	Scheme Risk / Buildability	Stakeholder Support	
1	Signalisation of Newborough Road / A47 junction to make it all movement	1	1	1	2	0	0	2	0	3	0	Yes
2	Creation of a roundabout at the Newborough Road / A47 junction	1	1	-1	2	-1	-1	2	0	0	0	Yes
3	Tunnel Newborough Road under the A47	2	-1	3	1	-2	1	-2	0	-3	0	No
4	Closure of Newborough Road between A47 and Norwood Lane	3	3	3	1	-2	2	3	0	3	0	Yes
5	Roundabout on the A16 at Norwood Development Access	-1	1	-1	3	-1	-1	2	-1	3	3	Yes
6	Dual A16 between A47/A16 roundabout and Norwood Development Access	2	1	0	2	-1	-1	2	0	3	3	Yes
7	Full signalisation of A47/A16 roundabout	1	2	2	1	0	0	2	0	3	0	Yes
8	Expand existing A47/A16 roundabout and create a 'Hamburger' style junction	1	0	-1	1	-1	0	1	-1	0	0	No
9	Dedicated left turn from A47 to A16	1	2	0	1	-1	0	2	-1	3	0	Yes

Low-Cost Options

2.17.3 Beyond the low-cost options considered in the EAST assessment, other low cost (relative to the preferred scheme) options have been considered and assessed prior to the commencement of the A16 Norwood Improvement Project. Technical assessment undertaken in support of the Leeds Farm planning application considered a variety of options including signalising the A47 / Newborough Road and full signalisation of the A47 / A16 / Welland Road roundabout to mitigate the impact of the development. These options were considered by PCC and National Highways as the planning authorities and were not deemed acceptable at either a strategic or operational level. This knowledge was used to inform the option development phase of this study.

2.17.4 Active travel options were also discounted as standalone schemes prior to the option development phase as they would not provide enough capacity alone to bring the developments forward, especially given the location of the Norwood growth site on the periphery of Peterborough, and the high levels of severance created by the A15 Paston Parkway and A47. Active travel improvements will instead form part of the broader package of measures proposed at FBC.

2.17.5 Demand management solutions, such as model filters, reduced parking provision and additional public transport services would also fail to provide the capacity needed, as standalone options, to accommodate the growth, and would make the site unviable. As with active travel measures, demand management solutions will form part of the overall solution for accommodating growth at the Leeds Farm and Norwood sites, however these measures largely relate to the developments themselves and will be explored further through the planning process.

Technical and Economic Assessment (Shortlisting)

2.17.6 The technical assessment of shortlisted options has been undertaken using the PTM3 model and is reported in the A16 Norwood OAR. Note that the improvements discussed within the following sections refer to highway improvements only, however it should be noted that active travel improvements have been identified during Preliminary Design and consultation and will be included within the Detailed Design and Full Business Case.

2.17.7 Active travel improvements will complement the internal layout of the Norwood Development (once known) and provide pedestrians and cyclists with a high standard of connectivity between the development and the wider transport network, particularly the City Centre via improvements along Welland Road.

2.17.8 PTM3 has been developed using SATURN (Version 11.4.07), 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 period of time.

2.17.9 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, in order 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.

2.17.10 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.

2.17.11 To understand traffic conditions in future years, growth factors have been derived from the DfT's Trip End Model Presentation Program (TEMPro) from the appropriate National Trip Ends Model (NTEM) zone for each traffic input zone to the network in the forecast years 2026, 2031 and 2036. Local growth of LGV and HGV traffic has been estimated using 2015 Road Traffic Forecast data produced from the National Transport Model (NTM).

2.17.12 Do-Minimum (DM) models for 2026, 2031 and 2036 have been produced to enable an assessment of the options and a comparison to what would happen if no transport intervention(s) were delivered. The DM models include some infrastructure which the Norwood developments are expected to deliver, such as an internal link road connecting Newborough Road with the A16, and a new roundabout on the A16 providing access into the Norwood development site.

2.17.13 The technical assessment undertaken at this stage of the Norwood Access Study has concentrated on the 2036 future year to capture the full impact of the Local Plan growth and ensure that it can all be facilitated.

Package Development

2.17.14 Two packages of options were developed to address the existing and future issues identified within the study area and were based on options considered within the Option Development Workshop. The Packages differ in the improvements proposed for the A16 / A47 / Welland Road Roundabout.

2.17.15 Each of the packages build from a common starting point, which has been broken down into a series of stages that are discussed below.

Stage 1

2.17.16 Based on the observations from existing conditions, and the DM modelling, the first stage in the package development closed Newborough Road's access onto the A47, effectively removing this junction from the Strategic Network. As a result of this closure, access to the Norwood area (and beyond) is provided via the following locations, all of which feature within the DM network:

- A16 and Developer Roundabout (predominantly for Norwood)
- Junction 21 (A15 Paston Parkway) and Manor Drive (predominantly for Paston Reserve)
- A16 / A15 and B1443 (predominantly for Newborough).

2.17.17 This removed the u-turning traffic from the A16 / A47 / Welland Road Roundabout, which currently compromises the junction's efficiency and safety.

Stage 2

2.17.18 To address the delay caused by an increase in traffic on the A16 from the Norwood site, the 500m section of the A16 between the developer roundabout the A16 / A47 / Welland Road Roundabout was dualled in both directions.

2.17.19 This successfully removed the link delay along the A16 between the two roundabouts, and expectedly reduced the level of delay on the A16 southbound approach to the A16 / A47 / Welland Road Roundabout as reduced congestion on the A16 meant that vehicles were moved more efficiently along the link.

Stage 3

2.17.20 Having addressed the distribution and routing issues created by the Newborough Road access onto the A47, different options were then considered to reduce delay at the A16 / A47 / Welland Road Roundabout. It is at this point that the two packages emerged, each containing the interventions discussed above, but differing in their approach to addressing delay at the A16 / A47 / Welland Road Roundabout. The different packages were:

- **Package 1:** Partial signalisation of the A16 / A47 / Welland Road Roundabout (at-grade improvements)
- **Package 2:** New Grade Separated Junction (grade separated improvements)

2.17.21 Each package was developed iteratively, with different components added to address specific issues identified by the transport modelling. For example, partial signalisation of the A16 / A47 / Welland Road Roundabout led to an increase in delay during the PM peak hour on the A47 eastbound approach which disproportionately affected left turning vehicles (towards A16 northbound). Consequently, a Left Dedicated Lane (LDL) from the A47 to the A16 was incorporated into the package, which removed the delay.

2.17.22 Each package ultimately consisted of the following schemes.

Package 1:

- Closure of Newborough Road access onto A47
- Dualling of A16 between A16 / A47 / Welland Road Roundabout and the Norwood Development Access
- Partial signalisation of A16 / A47 / Welland Road Roundabout on the A16 southbound approach
- A 50-metre flare added to the A47 westbound approach to provide additional capacity for left turning traffic to Welland Road
- Dedicated Left Turn Lane (LDL) from the A47 eastbound to the A16 northbound.

Package 2:

- Closure of Newborough Road access onto A47
- Dualling of A16 between A16 / A47 / Welland Road Roundabout and the Norwood Development Access
- Creation of a Grade-separated junction at the existing A16 / A47 / Welland Road Roundabout, with the A47 having priority through the junction.

2.17.23 The technical and economic assessment of both options identified that Package 1 was the preferred option. These assessments are reported in full in the OAR and are summarised beneath.

Technical Assessment

2.17.24 Figure 2.15 below shows the change in delay (per vehicle) between the 2036 DM scenario and Package 1 during the AM peak hour. Note that blue denotes a decrease in delay because of Package 1, and green an increase in delay.

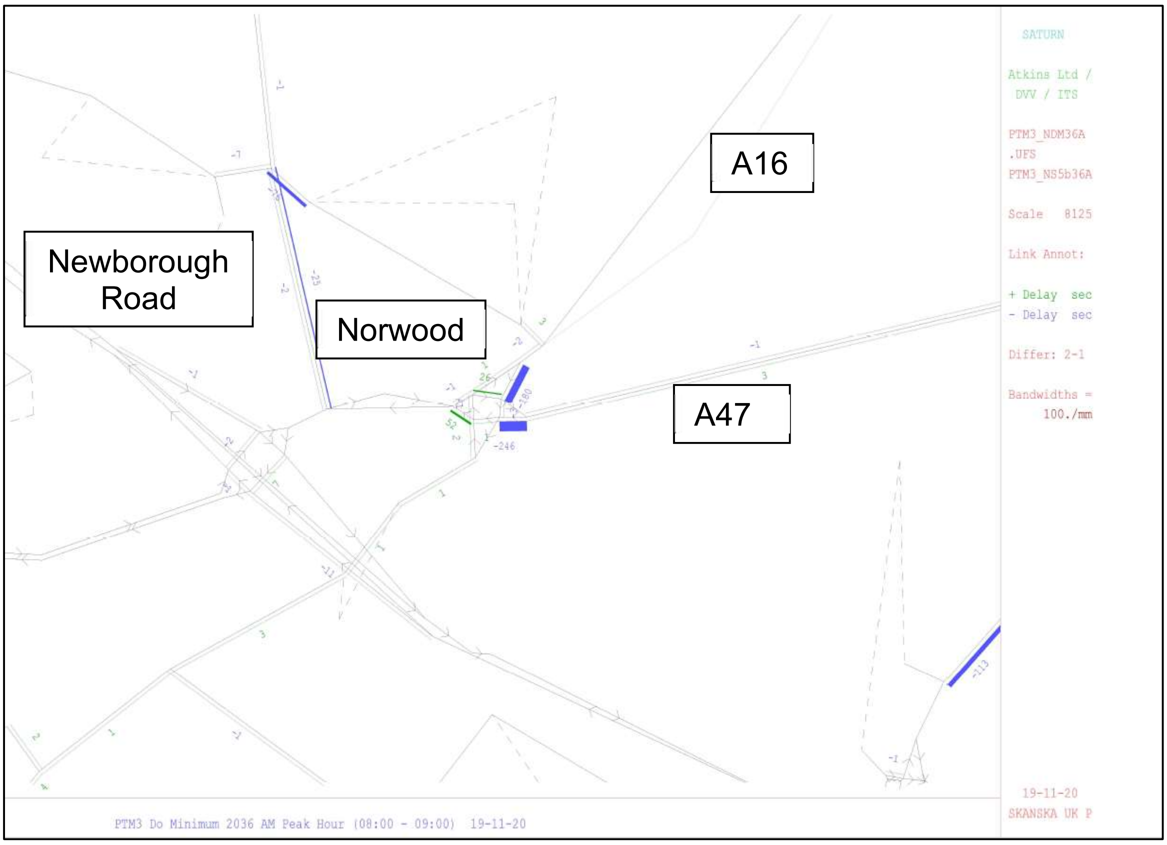


Figure 2.15: 2036 AM Peak Hour Change in Total Delay (seconds per vehicle) – Package 1 Impact on DM Scenario

2.17.25 Figure 2.15 shows that Package 1 is expected to have a significant improvement to the level of delay experienced on the A16 southbound approach to the A16 / A47 /Welland Road Roundabout, with delay reduced by 180 seconds per vehicle compared to the DM scenario.

2.17.26 The A47 westbound approach also demonstrates a decrease in delay of 256 seconds per vehicle compared to the DM Scenario.

2.17.27 Figure 2.16 overleaf shows the change in traffic demand between the DM scenario and Package 1 in the AM peak hour.

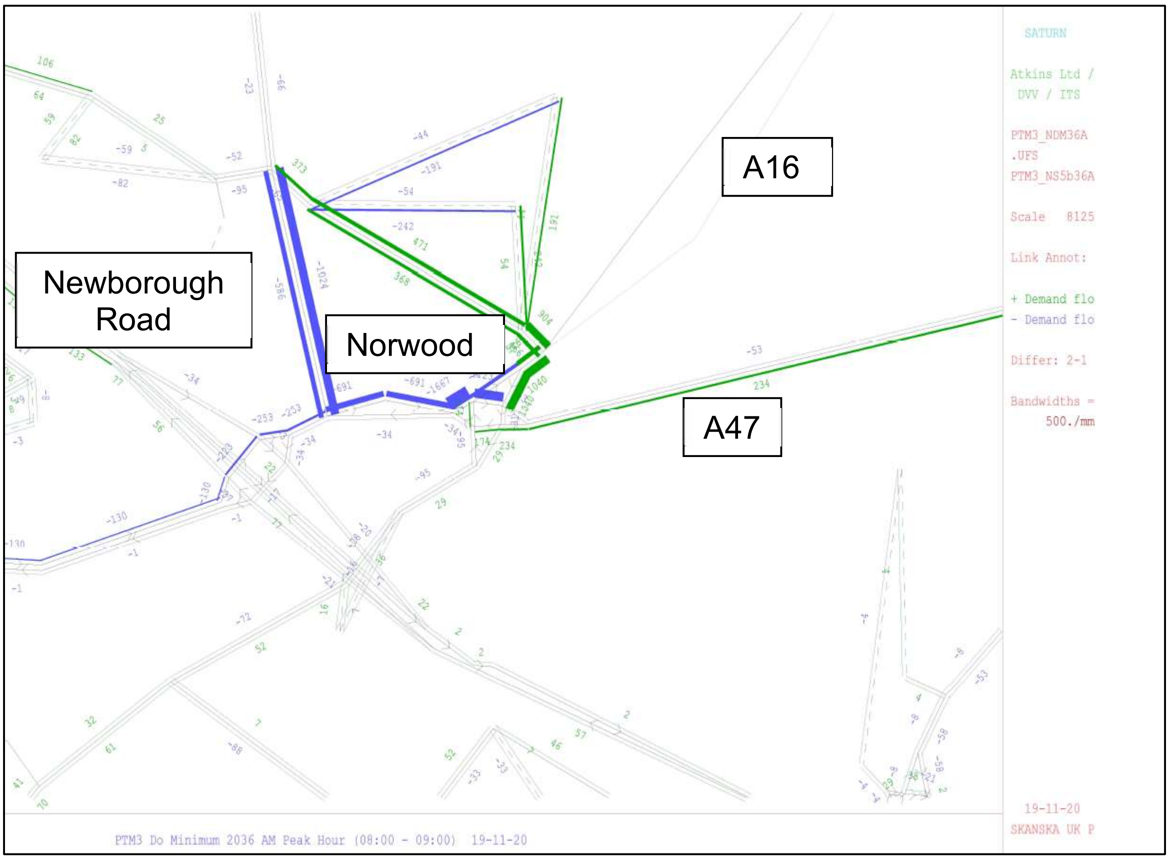


Figure 2.16: 2036 AM Peak Hour Change in Demand Flow – Package 1 Impact on DM Scenario

2.17.28 Figure 2.16 demonstrates that the package successfully removes trips from Newborough Road, including u-turning traffic at the A16 / A47 / Welland Road Roundabout. As these trips re-route, there is an increase in traffic flow along the A16, however delay along this route is significantly reduced as demonstrated in Figure 2.15.

Package 1: 2036 PM Peak Hour Results

2.17.29 Figure 2.17 below shows the change in delay (per vehicle) between the 2036 DM scenario and Package 1 during the PM peak hour. Note that blue denotes a decrease in delay as a result of Package 1, and green an increase in delay.

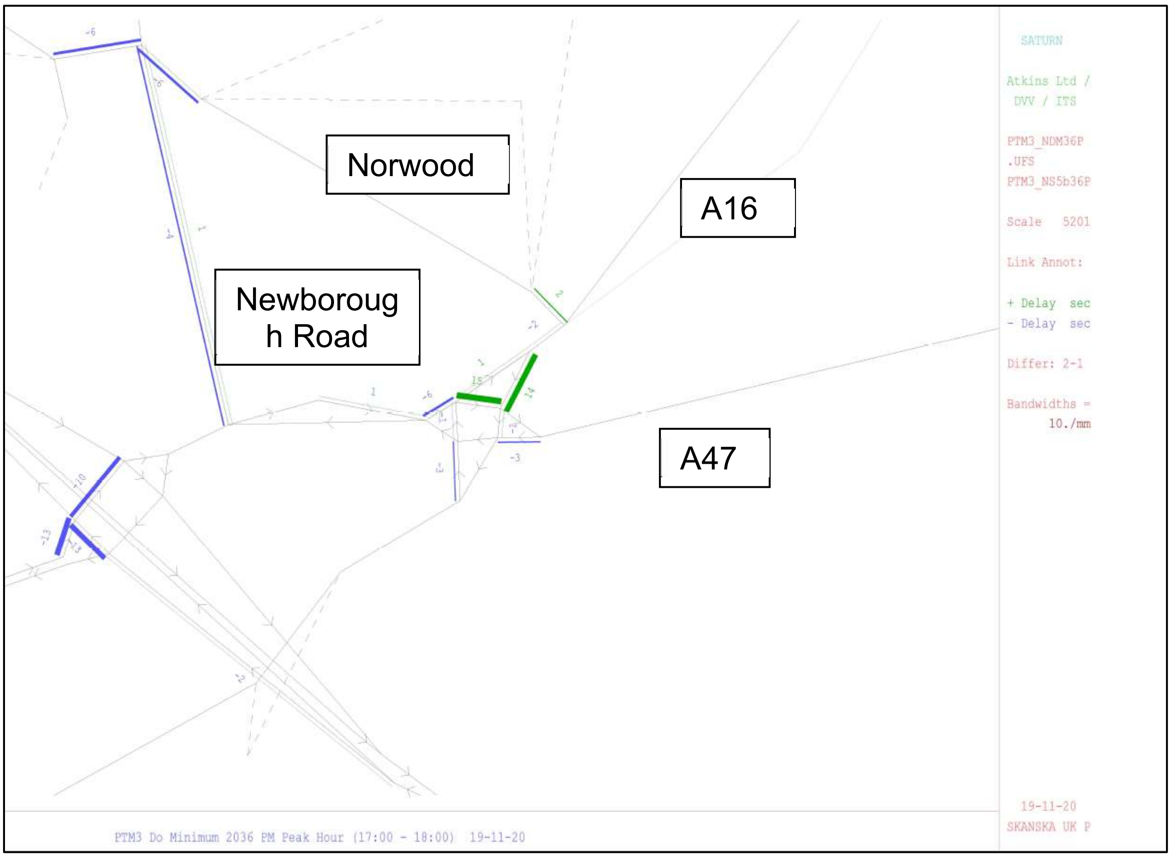


Figure 2.17: 2036 PM Peak Hour Change in Total Delay (seconds per vehicle) – Package 1 impact on DM Scenario

2.17.30 Figure 2.17 shows that Package 1 has a negligible impact on delay during the PM peak hour as the issue of congestion is less pronounced in this time period. There is a 15 second increase on the northern circulatory of the A16 / A47 / Welland Road Roundabout which is transient delay associated with the installation of traffic signals.

Economic Assessment

2.17.31 The Economic Assessment undertaken as part of the Option Assessment Report calculated a Benefit to Cost Ratio (BCR) for Package 1 and Package 2. A comparison of the results from this assessment are presented in Table 2.12 beneath.

Table 2.12: Option Shortlisting Summary

Value (£000's) 2010 prices, benefits discounted to 2010	Package 1	Package 2
Greenhouse Gases	-1	-17
Consumer Users (Commuting)	4,168	1,521
Consumer Users (Other)	5,442	5,144
Business Users / Providers	5,476	6,601
Indirect Taxes	53	56
Present Value of Benefits (PVB)	**15,138**	**13,305**
Broad Transport Budget	4,757	22,035
Present Value of Costs (PVC)	**4,757**	**22,035**
Net Present Value (NPV)	**10,381**	**-8,730**
Benefit / Cost Ratio (BCR)	**3,182**	**0.604**
Value for Money Statement	**High**	**Poor**

2.17.32 The Economic Assessment within the OAR demonstrated that Package provides High Value for Money. Package 2 is expected to provide Poor value for money, due to the significantly higher (relative) cost compared to Package 1. On this basis, Package 1 was selected as the preferred option and progressed for further assessment.

2.17.33 Please note that the results of the Economic Assessment shown above are from the OAR and predate the OBC. An updated Economic Assessment has been completed for the OBC and is included within Chapter 3 (Economic Dimension).

2.18 Operational Assessment

2.18.1 An operational assessment of Package 1 has been undertaken using a PTV VISSIM model to test the operational performance of the proposed improvements. Further details of the VISSIM assessment are available upon request.

2.18.2 The assessment compared the Do-Minimum (DM) and Do-Something (DS) scenarios for the future years of 2026, 2031 and 2036 using forecast traffic flows from the PTM3 SATURN model.

Assessment Results

2.18.3 Results from a comparison of the DM and DS scenarios for each of the modelled years were used to understand the impact of the proposed improvements on the study area and wider network.

2.18.4 Summary results for AM and PM peak hours for key junctions within the study area are presented beneath for the 2026, 2031 and 2036 future years (Tables 2.13 – 2.15).

Table 2.13: VISSIM 2026 Junction Performance Summary

2026		DM				DS			
Time	Junction	Queue Length (m)		Delay (secs)		Queue Length (m)		Delay (secs)	
		Max	Average	Average	LOS†	Max	Average	Average	LOS†
0800-0900	A15 / Gunthorpe Road / Manor Drive	407	38	24	C	1004	312	63	F
	A47 Junction 20	108	7	18	B	112	7	17	B
	A47 / Newborough Road	33	0	2	A	0	0	1	A
	A16 / A47 Eye Road / Welland Road	406	150	59	F	286	59	29	D
	A16 / Developer Roundabout	1014	309	40	E	31	0	10	B
1700-1800	A15 / Gunthorpe Road / Manor Drive	156	21	20	C	338	34	25	C
	A47 Junction 21	496	29	25	C	98	6	13	B
	A47 / Newborough Road	335	47	27	D	0	0	1	A
	A16 / A47 Eye Road / Welland Road	357	122	37	E	220	10	14	B
	A16 / Developer Roundabout	185	4	8	A	149	1	6	A

2.18.5 Results from the 2026 comparison show that for both the AM and PM peak hours, there are predicted improvements to junction capacity, delay and queue lengths at all of the junctions except for Junction 21 A15 / Gunthorpe Road / Manor Drive).

2.18.6 Increases in delay and queues at the A15 / Gunthorpe Road / Manor Drive junction are forecast within both peak hours due to the high forecast number of right-turners from the A15 Paston Parkway into Manor Drive, which reduces the gap availability for traffic on the southbound approach to the junction. This junction is already identified by PCC for improvement, and design work will commence once funding is available. Note that subsequent scheme amendments which are discussed within section 2.19 are also forecast to significantly reduce this issue.

Table 2.14: VISSIM 2031 Junction Performance Summary

2031		DM				DS			
Time	Junction	Queue Length (m)		Delay (secs)		Queue Length (m)		Delay (secs)	
		Max	Average	Average	LOS†	Max	Average	Average	LOS†
0800-0900	A15 / Gunthorpe Road / Manor Drive	740	111	43	E	449	63	36	D
	A47 Junction 20	112	7	19	B	619	65	48	E
	A47 / Newborough Road	79	1	5	A	0	0	1	A
	A16 / A47 Eye Road / Welland Road	1016	406	91	F	669	143	64	F
	A16 / Developer Roundabout	1015	325	81	F	1011	117	31	D
1700-1800	A15 / Gunthorpe Road / Manor Drive	178	24	21	C	261	30	23	C
	A47 Junction 21	902	111	40	D	356	10	17	C
	A47 / Newborough Road	416	96	30	D	13	0	3	A
	A16 / A47 Eye Road / Welland Road	358	133	40	E	294	76	25	C
	A16 / Developer Roundabout	273	13	11	B	330	103	27	D

2.18.7 Results from the 2031 comparison demonstrates an improvement in junction performance at most junctions throughout the study area within both peak hours.

2.18.8 Results for the A15 / Gunthorpe Road / Manor Drive junction and the A47 at Junction 20 vary across peak hours. The A15 / Gunthorpe Road / Manor Drive junction is expected to benefit from reduced queues and delays as a result of the scheme, however there is a modest increase during the PM peak hour. The A47 at Junction 20 is predicted to have the opposite effect, with performance deteriorating in the AM peak and improving in the PM peak hour. This is not considered to be a significant operational concern, as Traffic signals at this junction can be re-validated in future years to help improve operational efficiency of the junction alongside the proposed scheme (the traffic signals were not fully optimised during this assessment).

Table 2.15: VISSIM 2036 Junction Performance Summary

2036		DM				DS			
Time	Junction	Queue Length (m)		Delay (secs)		Queue Length (m)		Delay (secs)	
		Max	Average	Average	LOS†	Max	Average	Average	LOS†
0800-0900	A15 / Gunthorpe Road / Manor Drive	838	151	47	E	644	95	40	D
	A47 Junction 20	502	35	38	D	264	16	26	D
	A47 / Newborough Road	274	53	28	D	0	0	1	A
	A16 / A47 Eye Road / Welland Road	1016	454	92	F	373	95	37	E
	A16 / Developer Roundabout	1016	330	90	F	377	92	19	C
1700-1800	A15 / Gunthorpe Road / Manor Drive	245	29	23	C	372	43	26	C
	A47 Junction 21	908	152	44	D	903	119	32	D
	A47 / Newborough Road	436	75	16	C	97	7	5	A
	A16 / A47 Eye Road / Welland Road	351	115	43	E	300	78	25	C
	A16 / Developer Roundabout	240	13	12	B	346	108	27	D

2.18.9 Results for 2036 again demonstrate an operational improvement at all junctions within the study area with the exception of the A15 / Gunthorpe Road / Manor Drive. Again, this junction is impacted by the increased number of right turners from the A15 Paston Parkway northbound approach into Manor Drive, but subsequent changes to the package (described beneath) are expected to significantly mitigate the impact of this.

Welland Road Sensitivity Test

2.18.10 The operational assessment showed that the Welland Road approach to the A16 / A47 / Welland Road roundabout was experiencing increased vehicle delay. A sensitivity test was undertaken to determine if extending the flare on Welland Road and changing the lane allocations would improve conditions for traffic on this approach.

2.18.11 The proposed improvement consisted of a two-lane approach along the length of the link, with the left-hand approach lane open to left-turning and ahead traffic, and the right-hand lane open to ahead and right-turning traffic, in order to provide greater capacity for the dominant ahead movement.

2.18.12 The results show that the additional lane along Welland Road, and the opening of the left-hand lane at the junction approach to ahead movements initially provides some benefits, with flows forecast to increase during the 2026 and 2031 AM peak periods. However, this ultimately results in an increase in delay (and reduction in traffic flow) during the 2031 and 2036 PM peak hours.

2.18.13 The sensitivity test was not conclusive, and further options will be assessed to improve the performance of this approach as part of the Detailed Design and FBC.

2.19 Scheme Amendments Since SOBC

2.19.1 Further strategic, operational and economic assessment has been undertaken alongside the development of the Preliminary Designs and since the SOBC was submitted in December 2020.

2.19.2 The most significant amendment to the package during this phase has been the change to Newborough Road, which was originally identified for full closure. In line with consultation feedback and supported by sensitivity testing undertaken as part of the economic assessment, the current proposals keep Newborough Road northbound only. This will enable access from the A47 onto Newborough Road, which reduces re-routing disbenefits (particularly notable during the inter peak period when broader scheme benefits are reduced) and reduces pressure on the A15 Paston Parkway / Gunthorpe Road / Manor Drive junction, which was shown to experience issues in the operational assessment as a result of traffic re-routing following the closure of Newborough Road.

2.19.3 Note the access from Newborough Road onto the A47 (southbound) will still be removed as part of the proposed scheme, to avoid the continued degradation to the performance of the A16 / A47 / Welland Road Roundabout because of u-turning traffic.

2.19.4 The consultation and preliminary design development also identified the opportunity to include active travel improvements. These improvements will be considered within the next stage of the assessment, including (but not limited to) a new footbridge over the A47 linking Norwood to Welland Road and active travel improvements along Welland Road, linking the development to the City Centre.

2.20 Strategic Dimension Summary

2.20.1 The Strategic Dimension has outlined the wider policy context for the proposed scheme, including the policy framework of the CPCA, including the Sustainable Growth Ambition Statement, CPIER, Local Industrial Strategy, the Local Transport Plan and emerging LTCP and Gear Change and LTN 1/20 guidance.

2.20.2 The Norwood study area is identified as a key residential growth area in the Peterborough Local Plan, however, it is necessary to increase in highway capacity to unlock congestion and significantly reduce delay along the A16 corridor which will support local growth.

2.20.3 Evidence of existing conditions of the highway network within the study area, demonstrates that there are already congestion issues during the peak hours. If transport infrastructure is not improved and increased transport capacity not provided, local growth cannot be delivered sustainably. Current developer proposals have only secured planning permission for 200 dwellings, and no transport mitigations have been identified (beyond the proposals within this Business Case) to support full growth at Norwood.

2.20.4 These following (pre-COVID) issues have been identified within the study area during peak hours:

- Peak Hour Congestion and Delay (particularly on the A47 and A16)
- U-turning traffic from Newborough Road
- High accident rate.

2.20.5 Without intervention, the existing issues of peak hour delay and congestion along the A16 and A47 will increase further, impacting the operational performance of the highway network across the study area, and will compromise the viability of local growth aspirations.

2.20.6 Assessments undertaken in the PTM3 model have shown that under the 2036 DM scenario, without highway intervention delay would be more pronounced during the AM peak hour, reaching 197 seconds (3 minutes 17 seconds) per vehicle on the A16 southbound, and 270 seconds (4 minutes 30 seconds) on the A47 westbound approach of the A16 / A47 / Welland Road Roundabout during the AM peak hour.

2.20.7 The scheme objectives were developed by considering the existing and future issues within the Norwood study area as well as the wider policy objectives.

2.20.8 Primary objectives include:

- **Tackle congestion and improve journey times:** Tackle congestion and reduce delay along the A16 and on the primary approaches to the A16 / A47 / Welland Road Roundabout
- **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth at Norwood can be realised
- **Limit impact on the local environment and improve biodiversity:** Fully mitigate any adverse environmental impacts of a scheme and ensure a biodiversity net gain within the study area
- **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.
- **Improve road safety:** Reduce accidents and improve personal security for all travellers within the study area.

2.20.9 The A16 Norwood Improvement Scheme will satisfy all of the primary objectives, and the secondary objective stated within the Strategic Dimension.

2.20.10 The scheme is considered to be low risk in construction terms. However, the primary risk to the project includes concerns about developing a coherent plan for delivering the infrastructure required to support local growth, which includes aligning the delivery of the PHS scheme to developer aspirations and timescales for both development areas within the Norwood.

2.20.11 At present planning applications from developers are at differing rates of progression. Confirmed developer plans and timescales are required before the submission of the FBC and Detailed Design (expected March 2024), in order to gain construction funding approval from the CPCA.

2.20.12 Peterborough City Council's planning team have been engaging with developers throughout this phase of work to mitigate potential impact from developers on the PHS scheme delivery. This engagement will need to be sustained into the next phase of work to maintain momentum and avoid a fragmented approach by both parties.

2.20.13 The COVID-19 pandemic impacted travel behaviours throughout the lockdowns experienced during 2020 and 2021. Despite this data collection from the Peterborough area has demonstrated that peak hour road traffic has made a strong recovery since the pandemic and is generally above 90% of pre COVID-19 levels.

2.20.14 The option development and assessment process has been reported within this chapter and in greater detail within the Option Assessment Report (OAR) (November 2020). An option identification workshop was held to identify options, which were then scored against objectives using an EAST assessment to shortlist options to take forward for further assessment.

2.20.15 Two packages were created and assessed and the technical and economic assessment identified Package 1 as the Preferred Option. The assessments are reported in full in the OAR.

2.20.16 As reported within the OAR. Package 1 is expected to have a significant reduction in delay of 180 seconds per vhicle in AM peak hour on the A16 southbound approach and a 256 seconds per vehicle reduction in delay on the A47 westbound approach. Package 1 was expected to provide High Value for Money, and this has been confirmed by more recent Economic Assessment undertaken as part of the OBC (reported in the following chapter).

3. Economic Dimension

3.1 Introduction

3.1.1 The Economic Dimension provides evidence of how the scheme is predicted to perform in relation to the stated objectives, the identified problems and targeted outcomes. The Economic Dimension determines if the proposed scheme is likely to provide 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 A16 Norwood improvement scheme and demonstrates that the proposed scheme would offer Medium 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 Economic Assessment

Approach to Appraisal

3.2.1 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, social, and enablement of planned development
- Offsetting identified benefits against the scheme costs to provide a Benefit to Cost ratio (BCR).

Modelling Assessment

3.2.2 The transport benefits of the scheme were assessed using the SATURN based PTM3. The model / 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.

3.2.3 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.

3.2.4 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.

3.2.5 The model analysis provided in the OAR demonstrates that Package 1 will reduce congestion, leading to less delay and travel time. The difference between the DM and Package 1 scenario demonstrates the benefits of implementing the scheme, which largely consist of mitigating future issues.

3.2.6 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. The annualisation factors shown below in Table 3.1 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 National Highways WebTRIS data. It was found that the 07:00 – 08:00 and 16:00 – 17:00 hour flows closely resembled the total flows observed within the modelled AM and PM peak hours. AM and PM annualisation factors have therefore been calculated that convert the single peak hour demand to annual peak period demand.

Table 3.1: Annualisation Factors

Time Period	Annualisation
AM (07:00 – 09:00)	488
Inter (10:00 – 16:00)	1,624
PM (16:00 – 18:00)	525

3.2.7 A proportionate approach focused on transport user benefits (Transport Economic Efficiency, TEE) has been undertaken to demonstrate the value for money that can be expected from the scheme.

3.2.8 Table 3.2 shows the cost profile used within the Economic Assessment for the scheme, which is derived from the broader project programme.

Table 3.2: Scheme Base Investment Cost Profiles

Cost Profile	2022	2023	2024	2025	Total
Design	£627,547	£506,114	£126,529		£1,260,190
Land					
Construction (Highways)			£2,079,940	£4,159,881	£6,239,821
Construction (Structures)					
Supervision			£205,813	£411,626	£617,439
Other	£64,632	£193,895	£83,819	£70,691	£413,037
Total	**£692,179**	**£700,009**	**£2,496,102**	**£4,642,198**	**£8,530,488**

3.2.9 The activities shown in Table 3.2 include:

- 2022 to 2024 – Detailed Design and Full Business Case
- 2024 – Construction / Supervision of Scheme
- 2025 – Construction complete, and scheme open for use.

Present Value of Costs

3.2.10 A robust scheme cost estimate has been produced based on preliminary 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.

3.2.11 The benefits assessment was undertaken over a 60-year appraisal period from the scheme opening year (2025 to 2085), with costs included from 2022 through to 2085. Further detail about the scheme costs is provided within the Financial Dimension.

3.2.12 The Base Investment Cost is the capital cost required to construct the scheme in current year (2022) prices, without a risk allowance or optimism bias. This is derived from the scheme cost estimate based on design information 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.

3.2.13 Table 3.3 shows the Base Investment Cost profiled over calendar years, and broken down into Construction, Land, Design and Supervision costs.

Table 3.3: Base Investment Costs (2022 Prices)

Calendar Year	Construction (£)	Land & Property (£)	Preparation / Supervision (£)	Other (£)	Total
2022			627,547	64,632	692,179
2023			506,114	193,895	700,009
2024	2,079,940		332,342	83,819	2,496,102
2025	4,159,881		411,626	70,691	4,642,198
Total	**6,239,821**		**1,877,629**	**413,037**	**8,530,488**

3.2.14 Note that there are not expected to be any land or property costs associated with the scheme at this stage, and that the Preparation and Supervision Costs include Business Case development, all design work including site surveys and supervision during the construction phases.

3.2.15 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%[23] 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 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 of 23% was applied to represent the maturity of the design. The total Optimism Bias applied was £2,356,317.
- 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.

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

3.2.16 Table 3.4 beneath shows the costs described above.

Table 3.4: Economic Case Scheme Cost Estimates

Description of Cost Type	Construction Cost (£)	Maintenance Cost Over 60 Years (£)
Base Investment Cost	8,530,488	75,000
Base Cost with Real Cost Increases	10,244,859	455,413
Base Cost with Real Cost Increases and Optimism Bias	12,601,176	455,413
Rebased to 2010 Price Year	9,878,086	357,000
Discounted to 2010 Prices	6,029,184	77,762
Adjusted to Market Prices	6,649,138	92,537

3.2.17 A full profile for the Economic Dimension cost calculations is provided within Appendix D.

Present Value Benefits

Transport User Benefits

3.2.18 The transport user benefits of the scheme were assessed using the SATURN based PTM3 (built in v11.4.07H).

3.2.19 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.

3.2.20 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.

3.2.21 It should be noted that there are no developer funded / delivered highway mitigations included within the model network in either scenario as the intention is that both developments will make a financial contribution to the delivery of the A16 Norwood Improvement Scheme, which caters for both growth sites as well as wider growth, rather than develop site specific mitigations.

3.2.22 This means that the proposed scheme will generate the benefits resulting from reducing future year congestion associated with growth from both sites (as well as wider area growth), and this is reflected within the model scenarios used in the economic assessment.

3.2.23 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.

3.2.24 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.

3.2.25 TUBA produces figures for a number of benefits, including Greenhouse Gases, Transport 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.

3.2.26 This identifies the TUBA Present Value Benefits (PVB) to be £14,233,000.

3.2.27 The TUBA benefits arising from each time period are shown in Table 3.5 below.

Table 3.5: Transport User Benefits by Time Period

Norwood Improvement Scheme Benefits (£,000)	
Time Period	User Time
AM Peak	8,324
Inter Peak	229
PM Peak	3,564

3.2.28 Table 3.5 shows that the greatest benefits are realised in the AM peak, by more than double that of the PM peak. The Inter peak benefits are the lowest at £229,000.

<u>Accident Benefits</u>

3.2.29 As shown in Figure 3.1 below, the A47 / A16 / Welland Road Roundabout is an accident hotspot, with nine slight and four serious accidents (PIAs) over a five-year period between 2015 and 2019, resulting in 18 casualties.

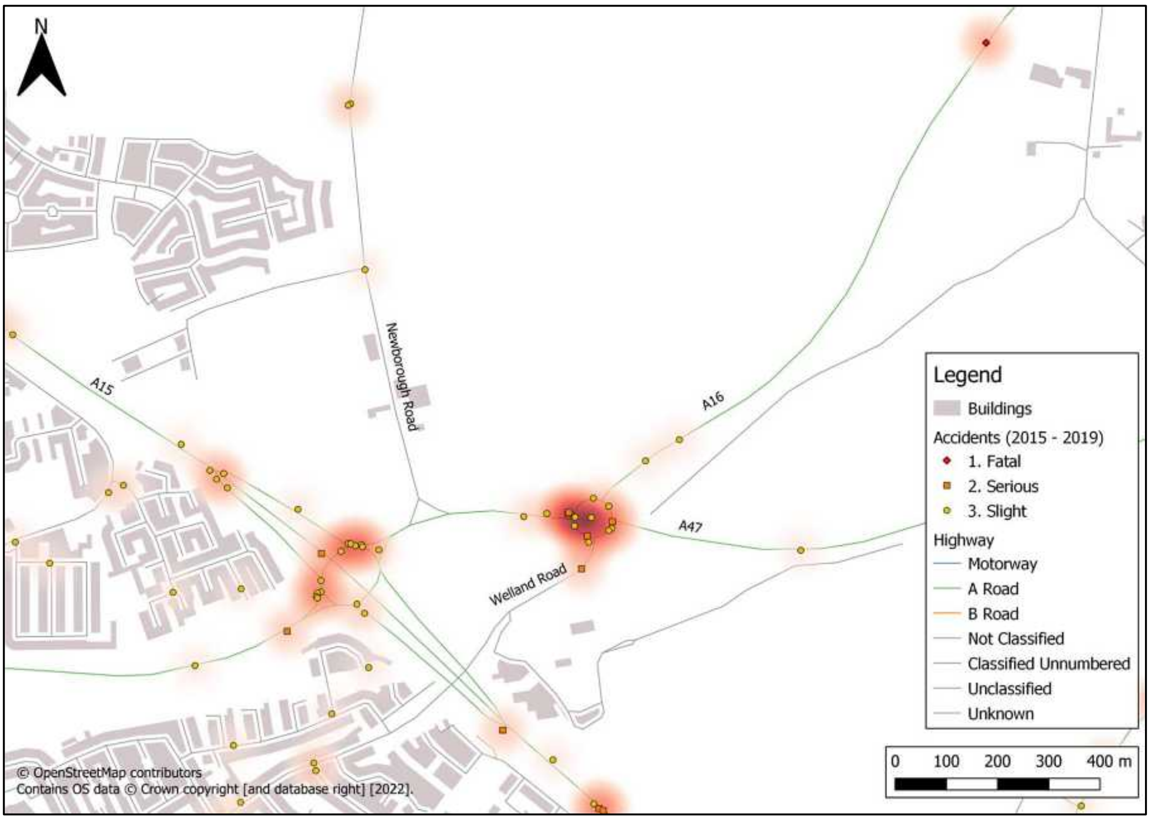


Figure 3.1: Accidents by Severity Heatmap

3.2.30 All except one accident took place during the daytime, of which three were in wet / damp conditions. Seven of the 13 accidents involved a rear-end shunt, as a result of either sudden braking from following too close or failing to look properly. The other accidents were a result of failing to judge another person's path or speed or making a poor turn / manoeuvre.

3.2.31 None of the accidents involved NMUs. One accident involved an OAP and one with children.

3.2.32 A COBALT (v2.3) assessment was undertaken using local accident data collected over a three-year period between 2017 and 2019 and 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.

3.2.33 The total accident savings in 2010 values and prices is £7,093,200. COBALT estimates the scheme would result in a reduction of 186.7 accidents over a 60-year appraisal period. There would be a reduction of two fatal, 21.9 serious and 253.6 slight casualties.

3.2.34 A sensitivity test has been undertaken to estimate the total accident savings in 2010 values and prices based on the default accident values within COBALT. The test will determine how accident savings based on local statistics differ from the average.

3.2.35 The total accident savings in 2010 values and prices under the sensitivity test is £3,429,600. COBALT estimates the scheme under the sensitivity test would result in a reduction of 62.5 accidents over a 60-year appraisal period. There would be a reduction of 1.4 fatal, 13.2 serious, and 84.8 slight casualties.

Environmental Benefits

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

3.2.37 The TUBA assessment estimated £505,000 benefits relating to a reduction of 2,765 tonnes of untraded CO_2 emissions and -8 tonnes of traded CO_2 emissions across all three modelled time periods over a 60-year appraisal period.

3.2.38 Air quality and noise impact assessments had also been undertaken as part of the Preliminary Design 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.

3.2.39 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.

3.2.40 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.

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

- Short Term Assessment – Do Minimum scenario in the opening year against the Do Something scenario in the opening year (2026)
- Long Term Assessment (With Scheme) – Do Minimum scenario in the opening year against the Do Something scenario in the future (opening + 15) year (2036 – latest available modelled year)
- Long Term Assessment (Without Scheme) – Do Minimum scenario in the opening year against the Do Minimum scenario in the future (opening +15) year (2036 – latest available modelled year).

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

3.2.43 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.

3.2.44 The following scenarios will be 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.

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

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

3.2.47 The total air quality benefits in 2010 values and prices are -£53,533 over a 60-year appraisal period. It was estimated that the scheme would result in an increase in NO_2 and PM2.5 concentrations of 501.59 and 936.86, respectively.

3.2.48 It is estimated that 257 properties would benefit from a reduction in PM2.5 levels, and 5,034 properties would experience no change by 2036. However, 1,637 properties would experience a deterioration in PM2.5 levels.

3.2.49 It is estimated that 99 properties would benefit from a reduction in NO_2 levels, and 5,524 properties would experience no change by 2036. However, 1,304 properties would experience a deterioration in NO_2 levels.

3.2.50 The total noise benefits in 2010 values and prices are £47,995 over a 60-year appraisal period, and combines the following benefits:

- Sleep disturbance – £23,657
- Amenity – £16,045
- Acute Myocardial Infarction (AMI) – £5,092
- Stroke – £1,278
- Dementia – £1,925.

3.2.51 It was estimated that the scheme would result in a net reduction of one household experiencing daytime noise.

Benefit Cost Ratio

3.2.52 The estimated PVB has been compared to a PVC 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 3.6 below.

Table 3.6: 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

3.2.53 The values presented in Table 3.7 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 3.7: VfM of the A16 Improvement Scheme

Value (£'000s) 2010 prices, benefits discounted to 2010	
Benefits	
Greenhouse Gases	505
Consumer Users (Commuting)	4,864
Consumer Users (Other)	4,539
Business Users / Providers	4,837
Indirect Taxes	-512
Accident Savings	7,093
Air Quality	-54
Noise	48
Present Value of Benefits (PVB)	21,320
Costs	
Broad Transport Budget	7,254
Present Value of Costs (PVC)	7,254
Net Benefits / BCR Impact	
Net Present Value (NPV)	14,066
Benefit to Cost Ratio (BCR)	2.94

3.2.54 Based on transport user, accident savings, air quality and noise benefits, this scheme will provide High Value for Money, with a BCR of 2.94.

Key Risks, Sensitivities and Uncertainties

3.2.55 Sensitivity tests have been undertaken to confirm the robustness of the business case in the eventuality of a change in scheme costs.

3.2.56 Table 3.8 below shows the PVC values required to achieve each Value for Money statement.

Table 3.8: Cost Sensitivity

Value for Money	BCR	PVB (£'000s)	PVC Range
Poor	BCR between 0.0 and 1.0	21,320	PVC > £21,320
Low	BCR between 1.0 and 1.5	21,320	£21,320 < PVC > £14,213
Medium	BCR between 1.5 and 2.0	21,320	£14,213 < PVC > £10,660
High	BCR between 2.0 and 4.0	21,320	£10,660 < PVC > £5,330
Very High	BCR greater than or equal to 4.0	21,320	PVC < £5,330

3.2.57 The PVC would need to be reduced by £1,924,000 (27%) to achieve a BCR of at least 4.0, which equates to Very High Value for Money. The scheme would achieve Medium Value for Money if the PVC increased by a value between £3,406,000 (47%) and £6,959,000 (96%).

3.2.58 High and Low Growth scenarios have been developed in line with TAG Unit M4 to assess the sensitivity of the scheme's transport user benefits to varying growth assumptions.

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

- Calculate the proportion of base year demand to be added based on parameter *p,* which varies by mode. For one year after the base year (2019), proportion *p* of base year demand is added to the core scenario. For 36 or more years after the base year, proportion 6*p* of base year demand is added to the core scenario. Between one and 36 years after the base year, the proportion of base year demand rises from *p* to 6*p* in proportion with the square root of the years. For example, 16 years after the base year the proportion is 4*p.*
- The value of *p* is set to 2.5% for highway demand, which reflects uncertainty around annual forecasts from the National Transport Model (NTM).
- The core scenario matrix is adjusted on a cell-by-cell basis by taking the appropriate proportion of the model base year matrix and adding it or subtracting it from the future year core scenario matrix.
- The low growth should be based on the same ranges below the core scenario as the high growth scenario is above it.

- Local growth assumptions have been accounted for within the high and low growth scenarios. The most likely sources of growth (Reasonably Foreseeable) that had not been included in the core scenario have been included within the high growth scenario. The less likely sources of growth (More than Likely) that had been included in the core scenario have been excluded from the low growth scenario. Total growth has been constrained to the levels calculated in the previous steps.
- Local assumptions about supply have not been changed from the core scenario, with the exception of access roads to additional developments that have been included and minor changes to the core scenario network needed to accommodate growth in demand.

3.2.60 The trip matrix totals for the Central, High, and Low, growth scenarios are displayed in Table 3.9, and represented graphically in Figure 3.2 to Figure 3.4.

Table 3.9: Number of Trips in Low, Central, and High Growth Scenarios

Total number of trips by scenario (PCUs)			
AM	Low	Central	High
2019	87,476	87,476	87,476
2026	93,889	98,275	104,259
2031	99,634	105,870	113,981
2036	104,325	112,648	122,370
IP	Low	Central	High
2019	72,308	72,308	72,308
2026	77,863	82,003	86,837
2031	82,912	88,587	95,049
2036	87,567	94,742	102,501
PM	Low	Central	High
2019	90,937	90,937	90,937
2026	96,695	101,774	107,876
2031	102,011	109,203	117,394
2036	107,040	116,142	126,013

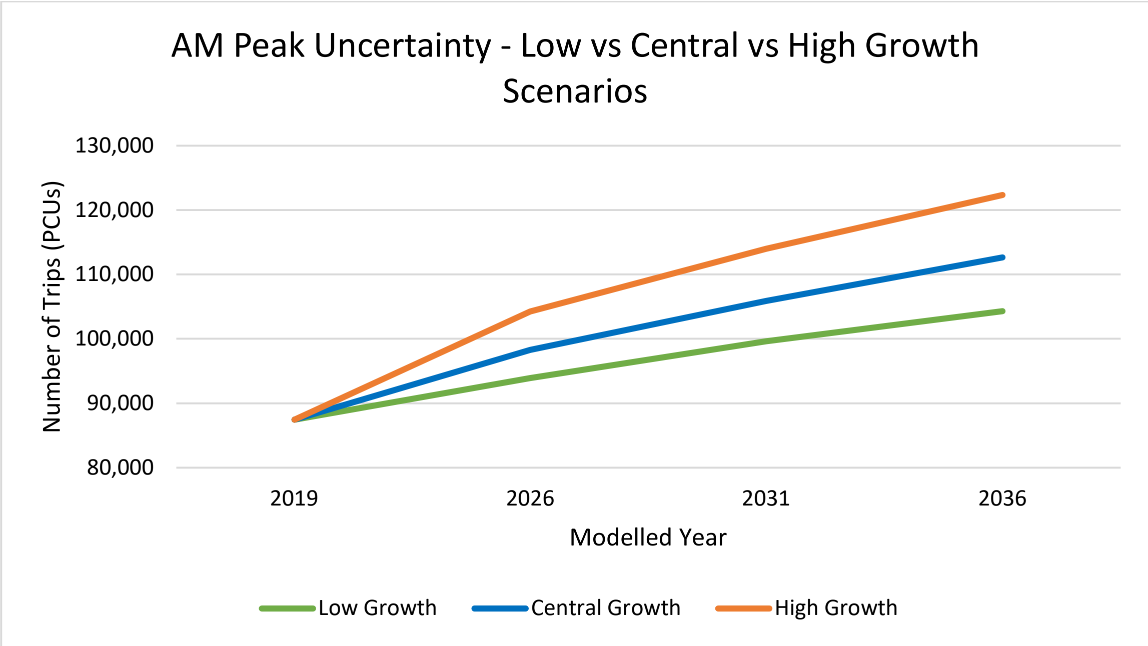


Figure 3.2: AM Peak Hour - Total number of Trips in Model

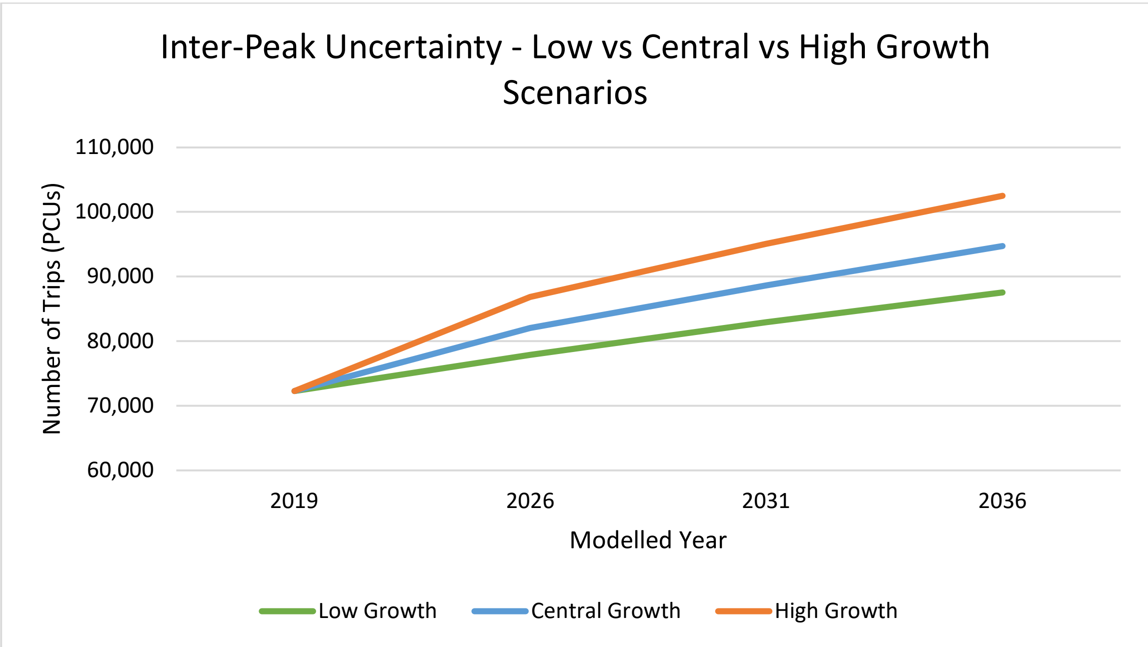


Figure 3.3: Inter-Peak Hour - Total Number of Trips in Model

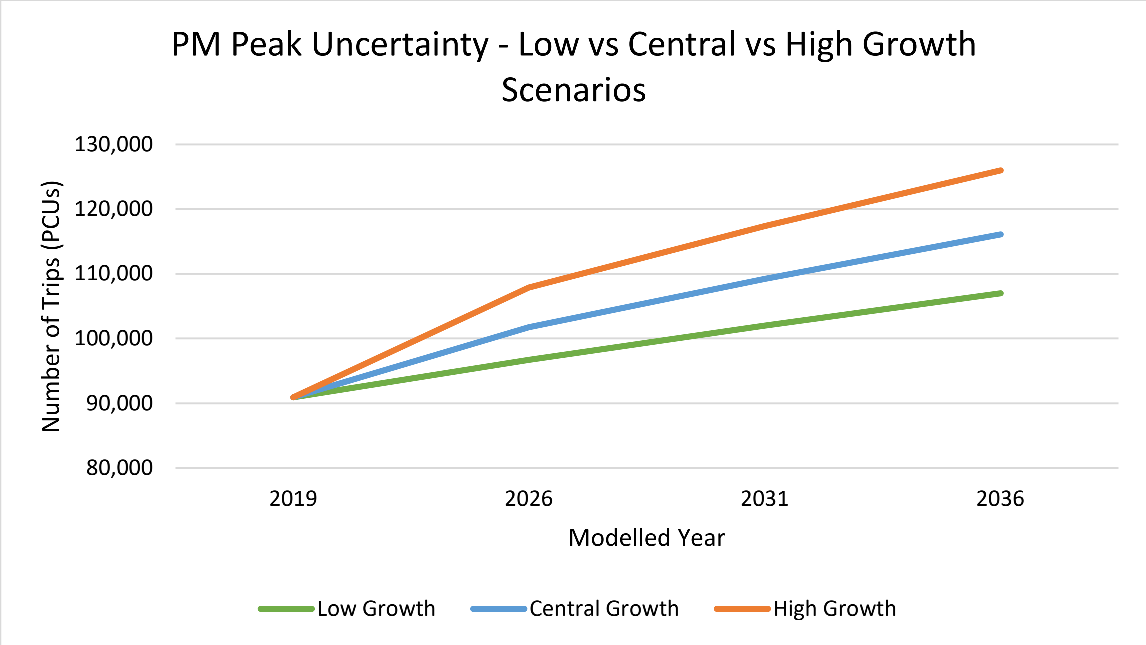


Figure 3.4: PM Peak Hour - Total Number of Trips in Model

3.2.61 Once the low and high growth scenarios had been run and assessed within the model, the Economic Assessment was repeated. Table 3.10 below shows the transport user benefits of the scheme for the high and low growth scenarios.

Table 3.10: Low, Central and High Growth Sensitivity Tests – Transport User Benefits

Option	Growth Scenario	PVB (£'000s)	PVC (£'000s)	NPV (£'000s)
Newborough Road Southbound Closure & Full-Time Signals	Low	8,129	7,254	875
	Central	14,233	7,254	6,979
	High	33,414	7,254	26,160

3.2.62 The scheme provides positive benefits in all three growth scenarios based on transport user benefits alone. There are significant transport user benefits in the high growth scenario, which outweigh the PVC by £26,160,000.

3.2.63 The central scenario was further tested to understand the impact of closing Newborough Road fully vs in one direction and the operation of full-time vs part-time signals at the A47 / A16 / Welland Road Roundabout on all core benefits, as shown in Table 3.11 overleaf.

Table 3.11: Newborough Road Closure & A47 / A16 / Welland Road Roundabout Signals Sensitivity Testing

Option	PVB (£'000s)	PVC (£'000s)	NPV (£'000s)	BCR	Value for Money
Full Newborough Road Closure & Part-Time Signals	18,547	7,254	11,293	2.56	High
Full Newborough Road Closure & Full-Time Signals	17,564	7,254	10,310	2.42	High
Newborough Road Southbound Closure & Part-Time Signals	22,460	7,254	15,206	3.10	High
Newborough Road Southbound Closure & Full-Time Signals	21,320	7,254	14,066	2.94	High

3.2.64 Closing Newborough Road in the southbound direction and implementing signals at the A46 / A16 / Welland Road Roundabout in the AM and PM peak periods only provides the greatest benefit, with a BCR of 3.10, which equates to High Value for Money. All infrastructure changes resulted in BCRs greater than 2.0 (High Value for Money).

3.3 Qualitative Appraisal

3.3.1 The appraisal of the scheme and VfM assessments have primarily focused on monetising the following benefits:

- Reducing congestion
- Reducing road accidents
- Improving local air quality
- Reducing noise
- Reducing greenhouse gases.

3.3.2 It is anticipated that there will be additional social, environmental, economic, and distributional 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.

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

3.3.4 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.

3.3.5 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:

- Physical Activity
- Journey Quality
- Accidents
- Accessibility
- Personal Affordability
- Security
- Severance.

3.3.6 Note of the above factors, the latter two are not assessed for the scheme and the first two factors will be assessed at the next stage of the project.

3.3.7 The assessment of the impact for each social and environmental resource has been outlined in TAG Worksheets (Appendices E-J) for qualitative appraisal and the Appraisal Summary Table (Appendix K).

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

Landscape Impacts

3.3.9 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'[24].

3.3.10 The landscape of Peterborough is categorised with five National Character Areas (NCA) as shown in Figure 3.5, of which the Norwood development site lies within Area 46:The Fens. On a smaller scale, the Landscape Character Area (LCA) of the study area is defined as the 'Peterborough Fen Fringe', as identified within Figure 3.6 overleaf[25].

3.3.11 The LCA provides guidance on the character and local distinctiveness of the landscape within areas and assesses the landscape in terms of its sensitivity to change and ability to accept development.

[24] TAG UNIT A3 Environmental Impact Appraisal (publishing.service.gov.uk)
[25] Peterborough Local Plan (Adopted version)

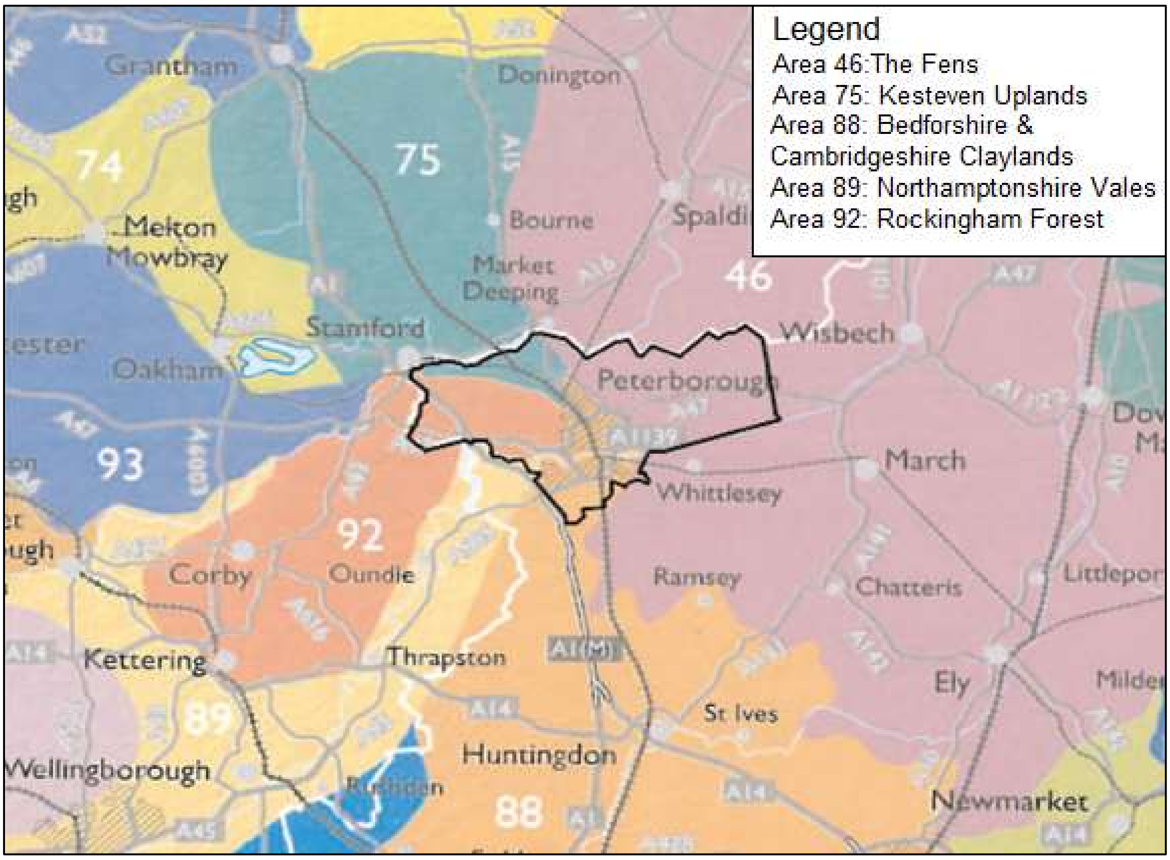


Figure 3.5: Peterborough National Character Areas

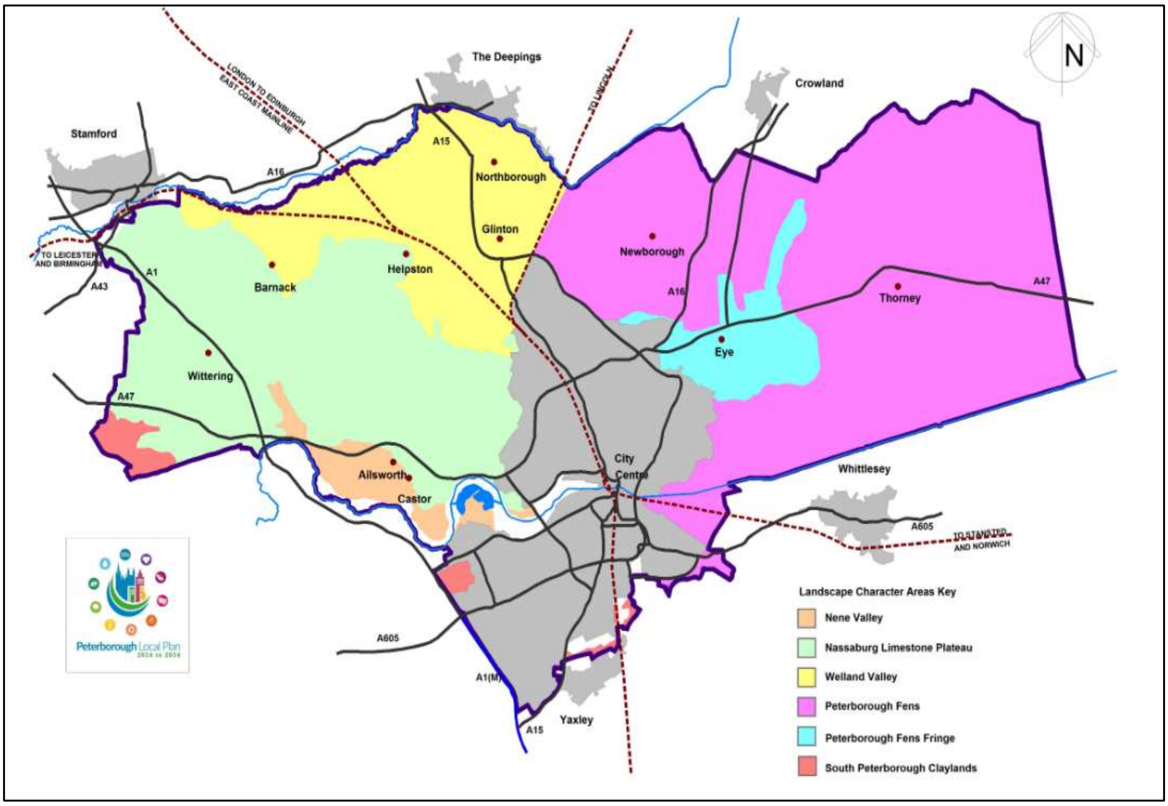


Figure 3.6: Peterborough Landscape Character Areas

3.3.12 The LCA of the Fen Fringe forms a 'transitional, gently undulating, arable agricultural area'[26] between Peterborough and the Fens, which has been influenced by clay extraction activities (notably at Dogsthorpe Star Pit) and the development of highway infrastructure within the area overtime.

3.3.13 The highway network creates visual and audible intrusions on the landscape, however much of the LCA away from these features is open and exposed. The vegetation coverage accompanying the landscape in this area is characterised by hedgerows, scattered trees and tree shelter belts, including those which line local roads.

3.3.14 The area surrounding the Norwood study area is largely flat arable farmland, with the A16 and A47 Trunk Road being the dominant features to the east, and A15 Paston Parkway bounding the study area to the west. The existing land use of the proposed scheme is hardstanding associated with the current road network.

3.3.15 The proposed scheme is not located within a statutory or non-statutory designated for landscape character or quality, and the predominant land use of the area will not change as a result of the proposed scheme which improves the existing road network. As a result, the proposed scheme is considered unlikely to result in any significant adverse effects on the landscape and visual amenity value of the local area.

Townscape Impacts

3.3.16 Townscape is the physical and social characteristics of the built and non-built urban environment, as well as the perception of those characteristics. Given the landscape of the study area is arable low lying, with the main features being the strategic highway routes of the A16 and A47 Trunk Road, Townscape is considered outside the scope of the project and has not been assessed.

Historic Environment Impacts

3.3.17 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.

[26] PCC Planning and Environmental Protection Committee Paper (April 2021)

3.3.18 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.

3.3.19 The Norwood study area is not located within a Conservation Area, nor does the site boundary contain any Listed Buildings or designated heritage assets of Parks and Gardens. As shown in Figure 3.7 below, the closest designated historic asset within a 1km radius of the Norwood study area is the Scheduled Monument Car Dyke (namely the section between Whitepost Road and Fen).

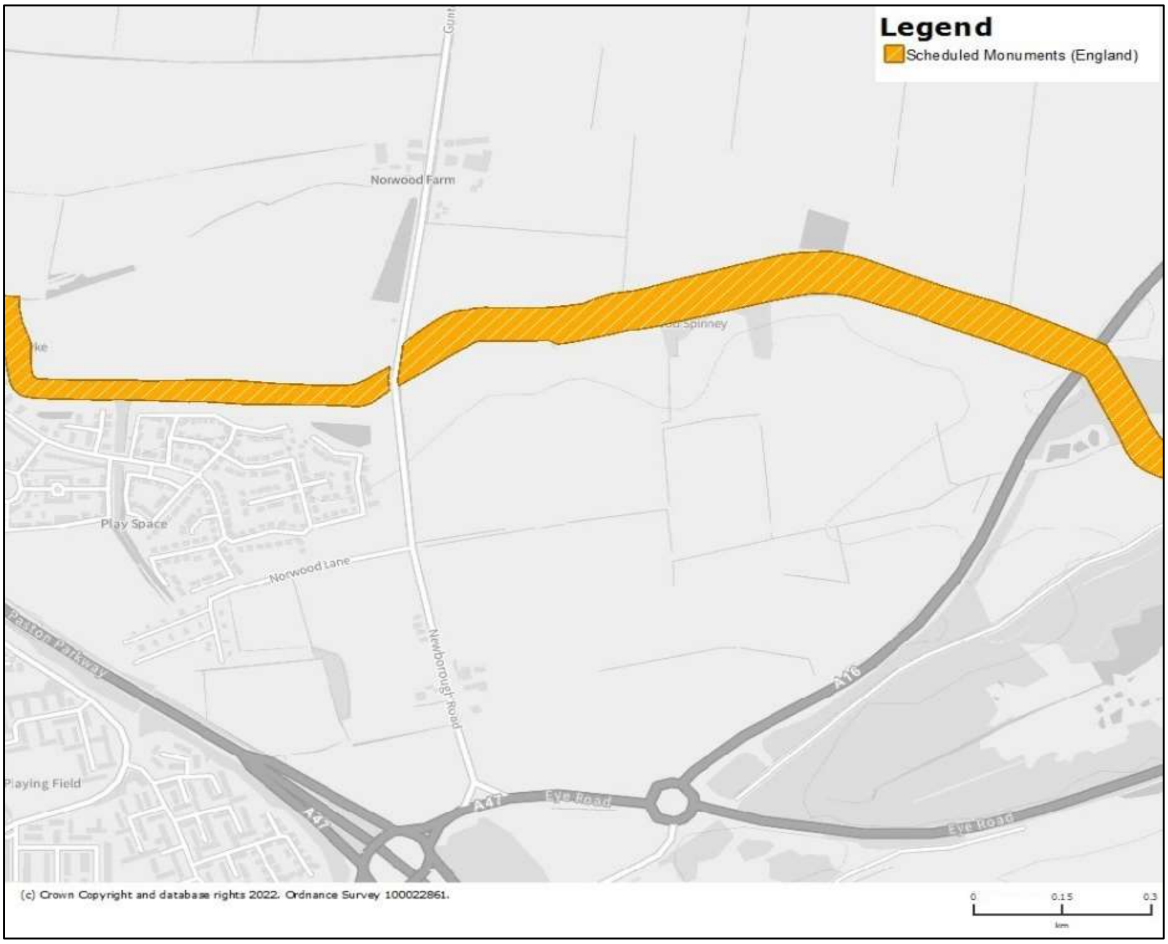


Figure 3.7: Historic Environment Within 1km Radius of the Norwood Study Area

3.3.20 Car Dyke is defined within historic records as a 'rare example of a surviving Roman canal'[27]. Its presence is said to be a significant feature within the existing setting of Peterborough, which helps provide a boundary between the City and the adjacent Fens.

[27] PCC Planning and Environmental Protection Committee Paper (April 2021)

3.3.21 As a Scheduled Monument the asset is considered to represent a heritage receptor of high value and is an important feature of the Roman historical landscape with high archaeological value, through its alignment and function and any deposits that lie within it.

3.3.22 The Scheduled Monument is located approximately 780m north of the proposed Norwood scheme.

3.3.23 The land required for the proposed scheme is within previously developed and disturbed land, however given the close proximity to the Car Dyke Scheduled Monument there is potential for buried archaeological remains to be encountered.

3.3.24 The mitigation measures in respect to unknown buried archaeological remains will be included within the CEMP and adopted during the proposed development to ensure any finds encountered during excavation works are noted, recorded, and subsequently preserved. Mitigation measures will 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.

3.3.25 Overall, the impact to the historic environment from the proposed scheme is considered to be a slight adverse effect if archaeological remains were to be uncovered during proposed works.

Biodiversity Impacts

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

3.3.27 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 a 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.

3.3.28 Figure 3.8 overleaf highlights the land-based designations within the study area.

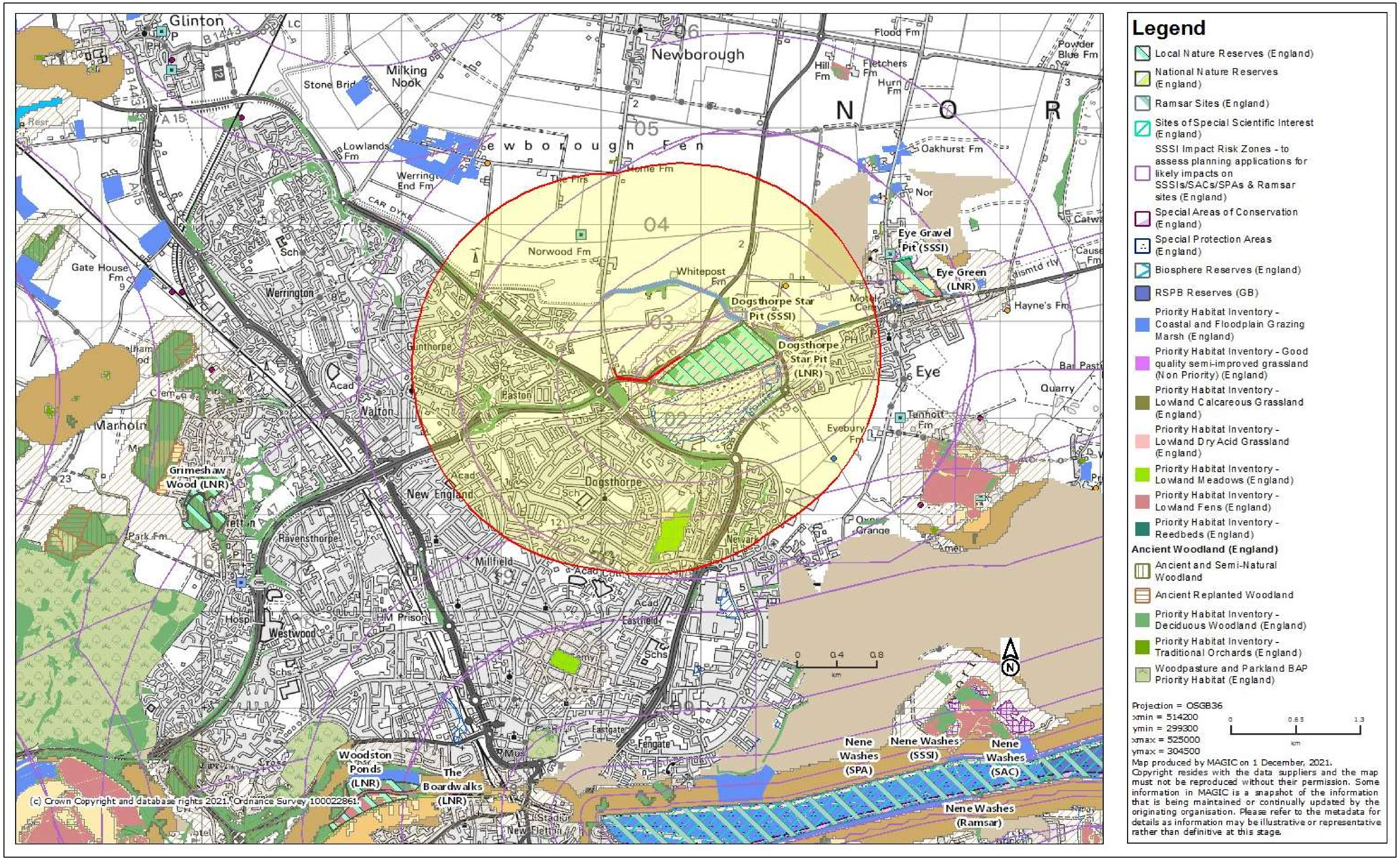


Figure 3.8: Land Based Designations within the 2km of the Norwood Study Area

3.3.29 The Norwood study area lies within an immediate Impact Risk Zone (IRZ) of the Dogsthorpe Star Pit Site of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR).

3.3.30 A SSSI is a statutory land-based designation under the Wildlife and Countryside Act (1981). At the closest point the proposed scheme is within 50m of the designated site.

3.3.31 The now excavated former clay pit associated with the brick industry of Peterborough, spans 37ha and contains a variety of habitats including scrub, grassland, reedbeds, and network of small pools and open water. The site is designated for its diverse aquatic invertebrate assemblage including 64 species of Water Beetle (5 of which are nationally rare and a further 35 nationally scarce), and high array of plant communities which are rare across Cambridgeshire[28]. The importance of the site is considered on a national scale.

3.3.32 It should also be noted that Littlewood County Wildlife Site (CWS) lies immediately east of the Dogsthorpe Star Pit SSSI and is designated for its Ancient Semi Natural Woodland. The site provides a buffer of protection for the SSSI.

3.3.33 The proposed works are not within the SSSI or CWS but have the potential to impact the site through nuisance, pollution, and disturbance.

3.3.34 Alongside designated features mentioned above, habitats within the vicinity of the proposed scheme are comprised of poor semi-improved grassland, scattered bramble scrub, hedgerows, broad-leaved woodland, and areas of planted young trees. An Ecological Site investigation of the proposed work area, undertaken in November 2021, identified the following constraints and mitigations:

- **The site has negligible potential for hosting bats**: 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). Suitable trees were assessed during the site visit, however a lack of suitable features (e.g. cracks/crevices) were observed. Despite negligible potential for bats, wider habitats surrounding the proposed scheme area such as linear hedgerows, grassland and woodland do provide potential commuting and foraging habitats for bats. Additionally, 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 further explored at Detailed Design and designed in accordance with the relevant British Standards and Institute of Lighting Professionals

[28] Dogsthorpe Star Pit | Wildlife Trust for Beds, Cambs & Northants (wildlifebcn.org).

- **Tree / grassland vegetation is likely to support breeding birds**: All nesting birds are protected under the Wildlife and Countryside Act (1981). Localised areas of existing vegetation were identified to provide food and nesting opportunities for common bird species. It's expected that vegetation supporting breeding birds will be removed, to enable the proposed works to be undertaken. Further assessments relating to bird species will be undertaken during the next phase of Detailed Design, following greater detail that becomes available in relation to site clearance associated with construction. 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 moderate potential to host Great Crested Newts (GCN's):** GCN's are protected under Annexe II and IV of the Habitats Directive, Conservation of Habitats and Species Regulations (Schedule 2), and the Wildlife Countryside Act (1981). The proposed scheme site lies within Amber and Green Risk Zones for the protected species of GCN's (See Figure 3.9). These zones indicate population centres for the species and comprise of connecting habitats which aid natural dispersal. Data records dating back to 2001 have indicated varying levels of the species over the years within the locality of the scheme, however 2018 / 2019 survey data (provided by CPERC) have indicated a presence of GCN's associated with the SSSI ponds[29]. The proposed scheme is not expected to result in any loss of habitat such as ponds that could sustain GCN populations, however with suitable foraging and commuting habitats identified for the species it is considered a Precautionary Method of Working (PMoW) for GCN'S should be implemented, whereby any habitat manipulation is 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. Further assessments into GCN's will be reassessed within the next phase of work, closer to construction
- **The site has moderate potential to host basking and foraging reptiles:** The site has been assessed as providing potential opportunities to support common reptile species, within grasslands and scattered scrub along the A16 verges and the bridleway. Further assessment closer to construction are required, however, to avoid any potential adverse impact on reptiles if found, works should 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

[29] Ecological Constraints Report_Milestone Infrastructure (Rev.02_January 2022)

- **The site has moderate potential to host deer:** Although not a protected species, observations were made for defined pathways on verges and surrounding arable land which were suitable for deer. Evidence of deer crossing the A16 were also noted during the Ecological Site Investigation. Further assessments into the presence of deer will be undertaken closer to construction of the scheme, with design giving attention to how to deter deer from crossing the proposed dual crossing and/or alert them to the presence of vehicles.

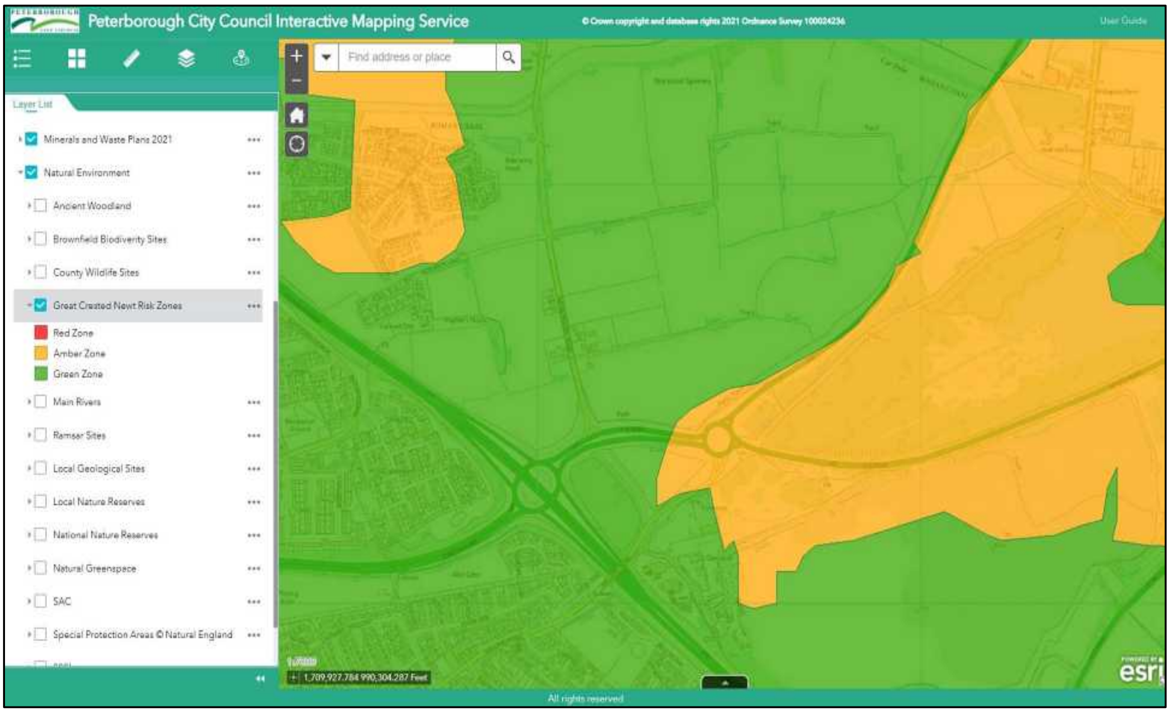


Figure 3.9: Norwood Study Area Great Crested Newt Risk Zones

3.3.35 Most of the proposed scheme is within areas of hardstanding associated with existing highway network; however, vegetation loss is expected for the scheme in areas of poor semi-improved grassland along the A16 verges. Given the nearby designated sites and the initial ecological findings of the site investigation (November 2021), it is concluded that without appropriate mitigation, the proposed scheme is expected to have a slight / moderate adverse impact subject to further design work.

3.3.36 The scheme will however deliver a minimum of 20% net gain in biodiversity to ensure the site is in better condition than it was prior. This consideration will be integrated in further design work.

Water Environment Impact

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

3.3.38 Policy LP32 (Flood and Water Management) states that developments must demonstrate that they can contribute positively to the water environment and its ecology where possible and not adversely affect surface and ground water. A new development should not place itself or others at increased risk of flooding.

3.3.39 There are no significant surface waters within or adjacent to the proposed scheme. However, the Norwood and Paston development areas do fall within the Welland Management Catchment Area, for the Folly River (including Werrington and Marholm Brocks) waterbody. This catchment and water body is classified as having 'poor' ecological status as of February 2022 by the Environment Agency. The proposed scheme will have no significant impact on this waterbody catchment area.

3.3.40 As shown in Figure 3.10 below the Norwood study area is located within a Flood Zone 1; 'an area with low probability of flooding'. As a result, the scheme is not expected to have an impact on water environments across the City.

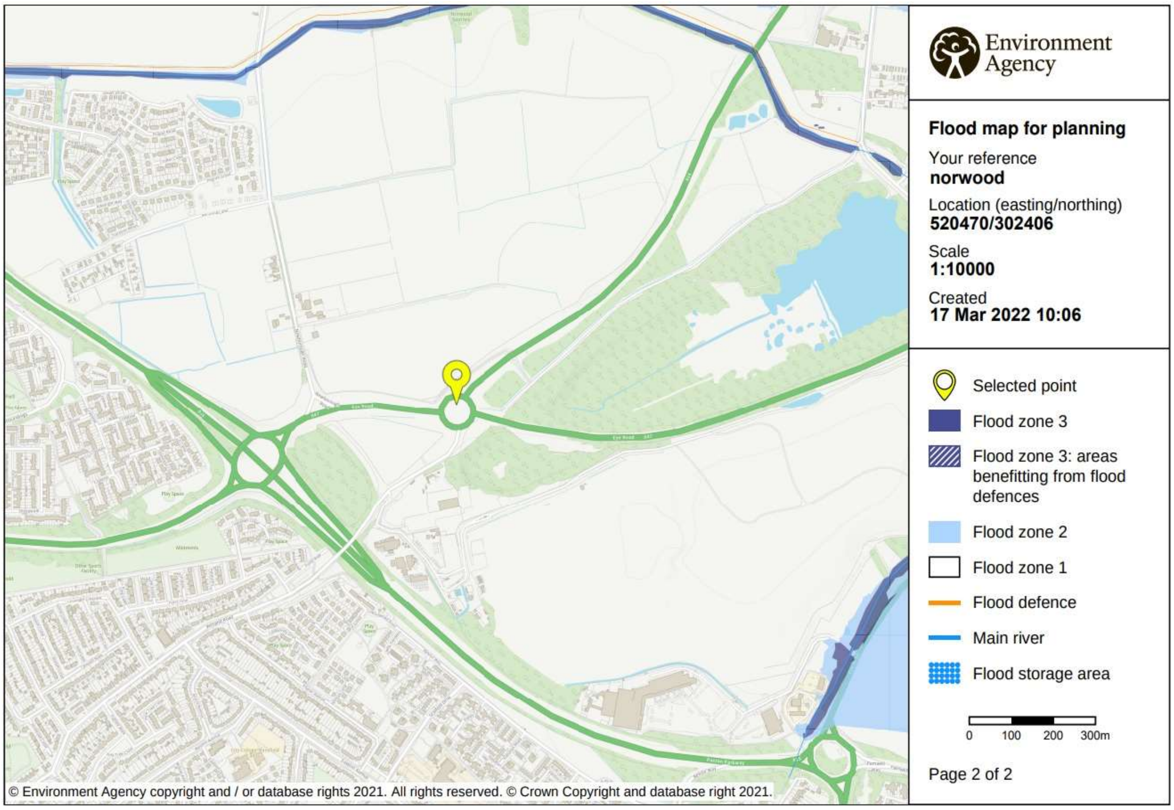


Figure 3.10: Environment Agency Flood Map for Planning

3.3.41 Existing road drainage and the series of ditches within the vicinity of the study area will likely be affected by the scheme. Surface run-off and drainage will be managed onsite during construction, and a further flood risk assessment will be undertaken during Detailed Design stage of the project. Consent from the Environment Agency and the Local Planning Authority will be sought prior to construction.

3.3.42 In conclusion, it is considered the proposed improvement scheme will have a negligible impact on the water environments surrounding the study area.

Personal Security and Severance Impacts

3.3.43 The A16 Norwood Scheme is not expected to have an impact in terms of personal security and severance, and therefore these impacts have not been assessed.

Accessibility Impacts

3.3.44 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.

3.3.45 The appraisal of accessibility focuses on public transport access to employment, services, and social networks, as stated in TAG Unit A4.2.

3.3.46 Figure 3.11 below shows the bus service provision within the study area.

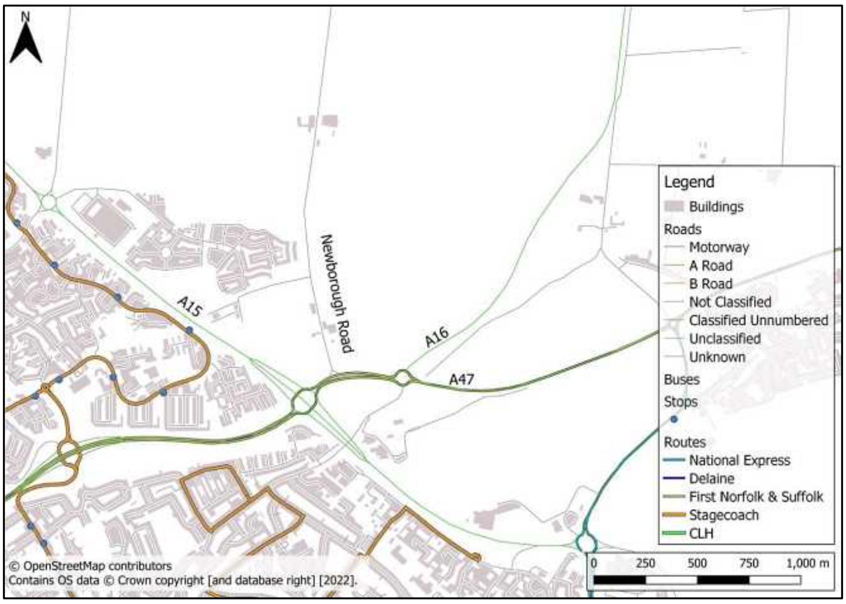


Figure 3.11: Bus Routes and Stops

3.3.47 At present, the only bus route within the study area is the First Norfolk and Suffolk service, which runs every 30 minutes along the A47. There are no bus stops near the Leeds Farm and Norwood sites. However, it is expected that there will be an extension to an existing service to provide reasonable access to the city centre.

3.3.48 A reduction in journey times along the A16 and A47 is expected to improve bus service reliability between the Leeds Farm and Norwood sites, and the city centre, as well for the existing First Norfolk and Suffolk service.

3.4 Value for Money Statement

3.4.1 Delivering the A16 Norwood Improvement Scheme will provide High Value for Money, with a BCR of 2.94 based on transport user, accident savings, air quality, and noise benefits.

3.4.2 Low and High Growth sensitivity tests have shown that the transport user PVB could range between £8,129,000 and £33,414,000 over a 60-year appraisal period.

3.4.3 The central growth scenario was tested further to understand the impact of closing Newborough Road fully vs closing in one direction, and the operation of full-time vs part-time signals at the A47 / A16 / Welland Road Roundabout on all core benefits. It was found that all infrastructure scenarios would result in at least High Value for Money, except for the delivery of the full Newborough Road closure and full-time signals which would provide Medium Value for Money.

3.4.4 The scheme is expected to have a slight adverse (negative) effect on the Historic Environment and Biodiversity and further scheme development will attempt to mitigate this. However, the scheme is expected to have a neutral effect on Townscape and the Water Environment.

3.4.5 The results of the qualitative, quantitative, and monetary assessments have been summarised in the Appraisal Summary Table (AST), which can be found in Appendix K.

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 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 beneath.

4.2.2 The estimate has 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:

- Development of the Business Case (future FBC)
- Detailed Design Costs, as well as 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, including Commuted Sums payment for National Highways
- Construction Costs, including mobilisation, supervision and costs associated with statutory undertakers works
- Risk Allowance
- Optimism Bias (for use in the Economic Assessment).

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 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: Milestone Activities

Timescale	Activity
June 2022 – July 2022	Outline Business Case reviewed by CPCA, and approval sought from CPCA board for the release of funding to undertake Detailed Design and produce a Full Business Case.
September 2022	Work commences on the Detailed Design and Full Business Case.
September 2022 – November 2022	Site Surveys undertkaen to inform the Detialed Design
March 2024	Detailed Design and scheme costings complete. Full Business Case submitted.
April 2024 – May 2024	Full Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding for scheme construction.
September 2024 – August 2025	Construction of the scheme undertaken, lasting approximately 12 months.
August 2026	1-year post-scheme monitoring undertaken
August 2030	5-years post-scheme monitoring undertaken

4.2.5 It is likely that construction programme efficiencies will be identified as part of the next phase of work, and the timescales presented above are considered robust for this phase of assessment.

Scheme Cost Estimates

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

Table 4.2: Financial Dimension Scheme Cost Estimates

Description of Cost Type	Cost (£) Total
Base Investment Cost	8,530,488
Risk Adjusted Base Cost	10,290,443
Risk Adjusted Base Cost with Construction Industry Inflation (**Outturn Cost**)	**12,932,753**
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	13,388,167

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

Base Investment Cost

4.2.8 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 based on a bill of quantities derived from the Preliminary Designs and is the building block for all other scheme cost calculations. This cost also includes all activities required to be undertaken in advance of construction, such as Detailed Design, production of the Full Business Case, and planning and engagement costs (amongst others).

4.2.9 Table 4.3 below shows the Base Investment Cost broken down into Construction, Preparation (including design and business case development) and Supervision costs, and ‘Other’ costs which relate to planning, environment, third party costs and project management. Note that it is assumed that there are no land costs associated with this scheme as the small amount of land required is within the Norwood development, which this scheme helps to facilitate.

Table 4.3: Base Investment Cost (2022 Prices)

Calendar Year	Construction Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Total Base Investment Cost (£)
2022		627,547	64,632	692,179
2023		506,114	193,895	700,009
2024	2,079,940	332,342	83,819	2,496,102
2025	4,159,881	411,626	70,691	4,642,198
Total	**6,239,821**	**1,877,629**	**413,037**	**8,530,488**

4.2.10 The Base Investment Cost in 2022 prices is £8,530,488 for the A16 Norwood Improvement Scheme. This includes £6,239,821 of Construction related costs, £1,877,629 of Preparation and Supervision costs and £413,037 of 'Other' costs.

4.2.11 Other costs consist of the following items:

- Affected property overheads
- Peterborough City Council staff costs
- Public engagement / communication costs
- National Highways commuted sums payments
- Post completion design activities, including road safety audits, as built drawings and health and safety files.

Risk Adjusted Base Cost

4.2.12 The Risk Adjusted Base Cost takes the Base Investment Cost and adds on a risk allowance. The risk has been calculated for the schemes using the following allowances:

- Contractor's Risk Provision (5%) of construction cost: of for standard contracting risks such as inclement weather and plant failure.
- Budget Detail Contingency (5%) of construction cost: for incidental costs not covered by the core bill of quantities.
- Design Development Contingency (15%) 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 3% of the construction cost.

4.2.13 The total risk allowance equates to 28% of the construction costs, or 17% of the total project costs. The values are discussed further beneath.

4.2.14 Table 4.4 below shows the inclusion of the risk allowance within the scheme costs for the improvement scheme. The application of risk has been profiled to match the construction programme.

Table 4.4: Risk Adjusted Base Cost (2022 Prices)

Calendar Year	Construction Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Risk Allowance (£)	Risk Adjusted Base Cost (£)
2022		627,547	64,632		**692,179**
2023		506,114	193,895		**700,009**
2024	2,079,940	332,342	83,819	586,652	**3,082,753**
2025	4,159,881	411,626	70,691	1,173,304	**5,815,502**
Total	**6,239,821**	**1,877,629**	**413,037**	**1,759,955**	**10,290,443**

4.2.15 The total risk allowance included within the cost estimate is £1,759,955, and takes the Risk Adjusted Base Cost to £10,290,443. Note that a Quantified Risk Assessment has not been produced at this stage of the project but will be completed as part of the Detailed Design once full ECI has been engaged. The QRA will be used to inform the Financial and Economic assessments within the FBC.

Inflated Risk Adjusted Cost (Outturn Cost)

4.2.16 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

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

4.2.18 This construction industry inflation has been calculated using forecast indices from the BCIS General Civil Engineering Cost Index (February 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%[30] has been applied to all costs incurred from 2025 onwards (including maintenance costs in the Economic Assessment).

4.2.19 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 4.5 below.

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

Table 4.5: Inflation Increases on Construction Costs (2022 – 25)

Calendar Year	Risk Adjusted Base Cost (£)	Cost of Inflation (£)	Total with Inflation (£)
2022	692,179		692,179
2023	700,009	70,001	770,010
2024	3,082,753	647,378	3,730,131
2025	5,815,502	1,924,931	7,740,433
Total	**10,290,443**	**2,642,310**	**12,932,753**

4.2.20 The cost of inflation is £2,642,310 which is accrued between 2023 and 2025 when Construction is scheduled to complete. The application of inflation brings the Scheme Outturn Cost to £12,932,753.

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

Inflated Risk Adjusted Cost Including Whole Life Costs

4.2.22 Maintenance costs have also been calculated within the 60-year assessment period taking account of inflation. Maintenance costs have been applied from construction completion onwards.

4.2.23 Maintenance costs have been included for the introduction of traffic signals at the A16 / A47 / Welland Road Roundabout and have been priced on recent experience of traffic signal maintenance. This assumes a maintenance cost of £12,500 per approach (£25,000 in total) every fifteen years from 2039 onwards (fifteen years after scheme opening).

4.2.24 Note that no maintenance allowance has been included for the carriageway widening as it is considered that this will be offset by the removal of the current maintenance liability following the closure of part of Newborough Road.

4.2.25 Maintenance costs are shown in Table 4.6 below.

Table 4.6: Calculation of Whole Life Maintenance Costs

Whole Life Maintenance Costs	Cost (£)
Maintenance Cost per year (every 15 years)	£25,000
Maintenance Cost for 60 Assessment Period (without inflation)	75,000
Maintenance Cost for 60 Assessment Period (with inflation)	455,413

4.2.26 Table 4.7 below shows the total Inflated Risk Adjusted Cost Including Whole Life Costs.

Table 4.7: Inflated Risk Adjusted Cost Including Whole Life Costs

Inflated Risk Adjusted Cost Including Whole Life Costs	Calendar Years of Cost	Cost (£)
Risk Adjusted Base Cost with Construction Industry Inflation **(Outturn Cost)**	2022 - 2025	12,932,753
Inflated Whole Life Costs	2026 - 2085	455,413
Inflated Risk Adjusted Cost Including Whole Life Costs	2022 - 2085	13,388,167

4.2.27 The Inflated Risk Adjusted Cost Including Whole Life Costs over the 60-year assessment period is £13,388,167. Note that only the Outturn Cost is required to deliver the scheme, which is £12,932,753.

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

4.3 Budgets and Funding Cover

Funding Cover

4.3.1 It is anticipated that the full scheme Outturn Cost of £12,932,753 will be jointly funded through developer contributions from the Norwood growth sites and by the CPCA Single Investment Fund.

4.3.2 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.

4.3.3 The CPCA currently have an allocation of £12,000,000 in the mid-term financial strategy for this scheme. This will be used to supplement developer contributions which will be agreed ahead of the FBC. Exact amounts for developer contributions are yet to be confirmed as discussions are still underway. Both developers are engaged in these discussions and support delivery of the scheme.

4.3.4 The funding profile by source is shown in Table 4.8 beneath. Note that developer contributions cannot be reported as these are still in discussion as part of the planning process, however the exact amounts will be confirmed at FBC.

Table 4.8: Funding Profile by Source

Funding Source	2022	2023	2024	2025	Total
Leeds Farm Developer Contribution			Amount TBC	Amount TBC	TBC
Land North of the A47 / A16 Developer Contribution			Amount TBC	Amount TBC	TBC
CPCA MTFS Allocation	£ 692,179	£ 770,010	Amount TBC - subject to confirmed developer contributions.	Amount TBC - subject to confirmed developer contributions.	TBC
Total	£ 692,179	£ 770,010	£ 3,730,131	£ 7,740,433	£ 12,932,753

4.3.5 In addition to developer contributions, developer funded access arrangements, such as the Norwood internal access road and the new A16 Norwood Development Roundabout, will support the delivery of this package.

4.3.6 There are not known to be any financial constraints beyond the availability of funding from the CPCA Single Investment Fund, which is currently considered adequate to cover the scheme costs.

4.4 Completion of the Business Case

4.4.1 Subject to acceptance of the OBC, the next stage of scheme development is Detailed Design and production of an FBC. Costs for these tasks are currently included within the scheme costs reported in this chapter and the Value for Money assessment undertaken within the Economic Dimension.

4.4.2 It is requested that funding for the Design Cost is released in advance of the funds required for construction, to undertake the further design and business case development stages. These costs would then be reported as costs already incurred within the scheme cost estimates included within the FBC.

4.4.3 The funding required to complete the next stage is £1,179,484, which includes:

- Site Surveys
- Detailed Design, including active travel design and A47 footbridge feasibility assessment
- Full Business Case
- Planning engagement
- Environment specialist input and surveys
- Staff costs
- Public engagement and project communications.

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 The A16 Norwood Option Assessment Report (OAR) details the work undertaken to develop multiple improvement options at this location, and the modelling undertaken to identify the Preferred Scheme.

5.2.2 The OAR discusses the process through which the Preferred Scheme has been identified. The scheme will include the following outputs:

- Closure of the Newborough Road Junction access onto the A47 (southbound only)
- Dualling of the A16 between the Norwood Development Roundabout and the A16 / A47 / Welland Road Roundabout
- Partial Signalisation of the A16 / A47 / Welland Road Roundabout (A16 approach)
- Creation of a flare to provide a third lane on the A47 westbound approach to the A16 / A47 / Welland Road Roundabout
- Creation of a Left Dedicated Lane (LDL) from the A47 eastbound approach to the A16 northbound exit
- Realignment / reconstruction of the bridal way to the north of the A16 / A47 / Welland Road Roundabout, connecting the signalised crossing to Newborough Road
- Active travel enhancements from the Norwood site down Welland Road to the Dogsthorpe Road Junction
- A pedestrian bridge over the A47 between the Norwood site and Welland Road (feasibility to be considered at the next stage)
- Wildflower planting is proposed in the immediate areas of the A16 development and on the decommissioned section of Newborough Road
- Linear planting of native trees and shrubs along sections of the A16 (north of the bridge) infilling gaps in the existing roadside hedgerows
- Tree and enhanced wildflower planting at Bluebell Avenue Open Space, located approximately 370m to the west of Junction 20.

5.2.3 Preliminary Design work has been completed on the highway scheme elements, and the General Arrangement (GA) drawing for this is provided in Appendix M. As previously stated, the active travel and environmental enhancements that complement the highway elements have been identified during the Preliminary Designs and stakeholder consultation and will be developed further within the next phase of work.

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

- **Tackle congestion and improve journey times:** Tackle congestion and reduce delay along the A16 and on the primary approaches to the A16 / A47 / Welland Road Roundabout
- **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth at Norwood can be realised
- **Limit impact on the local environment and improve biodiversity:** Fully mitigate any adverse environmental impacts of a scheme, and ensure a biodiversity net gain within the study area
- **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.
- **Improve road safety:** Reduce accidents and improve personal security for all travellers within the study area.

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

5.2.6 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 A16 Norwood Scheme can be delivered within the agreed budget
- **Programme Certainty:** Achieve an efficient delivery that ensures that the scheme is delivered to programme and operational in 2025
- **Quality:** Ensure an appropriate level of detail within the Preliminary and Detailed Design stages, as well as in the final scheme delivery, matching the scheme promoters' expectations

- **Continuity of Knowledge:** Maintain project knowledge to support scheme progression and construction and the successful rebuttal of any project challenge. Scheme knowledge generated through the current phase of work and into the next phase of Detailed Design and FBC development, is an asset and will help enhance quality of delivery and achievement of programme.

5.3 Procurement Strategy

5.3.1 All phases of the scheme, including Detailed Design, Construction and Site Supervision will be delivered in house by Peterborough Highway Services (PHS). PHS is a ten-year NEC3 Term Service Contract between Peterborough City Council and Milestone Infrastructure, with the responsibility for improving and maintaining Peterborough's transport network. The collaboration began in 2013 and, following the award of a five-year extension, runs until 2028.

5.3.2 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.

5.3.3 The existing subcontractor supply chain is appropriate for undertaking the work associated with the A16 Norwood scheme, and the scheme will be delivered within the contract's lifespan (before 2028).

5.3.4 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.

5.3.5 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.

5.3.6 There is sufficient expertise within PHS and the local supply chain to ensure that there will be a competitive tender for sub-contractors. The Junction 15 Highway Improvement Scheme was awarded £8.1m of funding for construction by the CPCA in November 2021 and procurement of sub-contractors was undertaken in the first few months of 2022. This exercise was successfully completed to enable the preferred contractor to begin on site in May 2022 to construct the main highway works within the scheme. The same procurement and construction team would be leading the procurement phase of the A16 Norwood Improvement Scheme.

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 A16 Norwood scheme to date. All skills and competencies to deliver this scheme are available within the PHS contract.

5.4.2 To ensure that the procurement remains commercially 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 These providers / disciplines are regularly reviewed, including 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 scheme, individual packages of work are competitively tendered, and quotations are obtained from a minimum of 3 sub-contractors. These quotations are then subject 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. All effort will be made to avoid any sub-subcontracting of works. In any case, the use of sub-subcontractors must be approved prior to their appointment.

5.5.6 This process has been used on a number of major scheme projects over recent years and has enabled major schemes to de delivered successfully and to a high standard in Peterborough.

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 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 client unless its genuine and not disallowable costs. Forecast end costs and programmes are also updated periodically, in order to ensure the client is updated in relation to the expected scheme final spend.

5.7.3 Milestone Infrastructure will actively be involved in the value engineering workshop and ECI process during the design and construction phases of the scheme, with full commitment to deliver best value to the client.

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 C), which will be reviewed regularly at project progress meetings. Further details on the management of risk are provided in the Management Dimension.

5.8.3 Detail about the allocation of project risk between the CPCA and PCC, and the responsibilities for managing this, can be found within Chapter 6 of the CPCA's Assurance Framework[31].

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.

[31] https://cambridgeshirepeterborough-ca.gov.uk/assets/Assurance-Framework-Publication-Nov-2019.pdf.

5.9 Contract Length

5.9.1 The original PHS contract runs until 2023, and a five-year extension has recently been agreed prolonging the contract until 2028. The PHS contract has the relevant skills and competencies to deliver this scheme, and its delivery of the A16 Norwood Improvement Scheme will be fully completed within the contract lifespan.

5.9.2 A detailed Construction Programme will be produced as part of the Full Business Case as part of the next phase of work. At this stage however, it is estimated that construction of the scheme will begin in Autumn of 2024.

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

Table 5.1: Project Implementation Timescales

Timescale	Activity
June 2022 – July 2022	Outline Business Case reviewed by CPCA, and approval sought from CPCA board for the release of funding to undertake Detailed Design and produce a Full Business Case.
September 2022	Work commences on the Detailed Design and Full Business Case.
September 2022 – November 2022	Site Surveys undertaken to inform the Detailed Design
March 2024	Detailed Design and scheme costings complete. Full Business Case submitted.
April 2024 – May 2024	Full Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding for scheme construction.
September 2024 – August 2025	Construction of the scheme undertaken, lasting approximately 12 months.
August 2026	1-year post-scheme monitoring undertaken
August 2030	5-years post-scheme monitoring undertaken

5.9.4 These dates are indicative only and assume that funding will be available to progress each of the stages. The milestones shown above may change as the scheme evolves, or to reflect changes in external factors, such as the Norwood development programme.

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 to monitor delivery of the scheme and all commercial arrangements relating to this. The PHS Project Board meets monthly 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 progression of design and the business case stages, as well as the final 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. The Management Dimension

6.1 Introduction

6.1.1 The Management Dimension explains how the scheme promoter will successfully manage delivery of the proposed 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. Both of these schemes are located on the Parkway Network at strategically sensitive locations and demonstrate PHS' ability to successfully manage and deliver highway schemes of this scale.

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

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

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

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

6.2.6 As with Junction A16 Norwood scheme, Junction 20 is located on the strategic A47 route linking the A1 and Midlands with Norfolk and East Anglia. The Council and its partners worked closely with HE to successfully plan and manage the delivery of the scheme.

6.2.7 Junction 20 is located 400 metres to the west of the A16 / A47 / Welland Road Roundabout, and local knowledge and experience from that site will be applied to the delivery of this scheme.

Figure 6.1: Junction 20 Improvement (Post Completion)

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

6.2.8 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. 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 (A1M) Improvement (Post Completion)

6.3 Programme / Project Dependencies

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

- **Leeds Farm Development Delivery:** The proposed package is intended to facilitate growth at the Norwood site (as identified within the Local Plan). This development constitutes a significant proportion of the anticipated growth within the study area, and the viability and requirement of the schemes would need to be reassessed if delivery of the Leeds Farm site was compromised.
- **Leeds Farm Development Programme:** Design, Business Case submission and the delivery of the package of schemes should be coordinated with the development proposals of the Leeds Farm Development, to ensure highway improvement works do not hold back planned growth. The delivery of the Business Case and scheme programme will need to adjust if the development programme changes.
- **National Highways (NH) Consent:** Delivery of the scheme will be dependent on consent from NH to work on sections of their network. Other space may be needed within their boundary for the positioning of equipment and the deployment of traffic management. NH are aware of the scheme and have been an active stakeholder throughout the project. The Council have a successful track record of working with NH on schemes along the A47, and they will be included within the progression of the FBC and Detailed Design as well as scheme delivery planning.
- **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 A16 Norwood Improvement Scheme. Careful liaison with NH will be necessary to ensure that the scheme does not conflict with any planned works that they have along this section of the route.
- **Construction Disruption:** The Council have significant recent experience of undertaking maintenance and delivering improvements on its highway network, particularly on strategic routes, 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 will begin during the Detailed Design phase to ensure that these diversions are factored into the construction programme to mitigate any delay to the delivery of the scheme.

6.4 Governance, Organisational Structures and Roles

6.4.1 The CPCA are the organisation ultimately responsible for the delivery of the A16 Norwood Improvement Scheme, and the Council 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 Management Team will be responsible for delivery and day-to-day management of the consultants and contractors. They will co-ordinate inputs from technical advisors responsible for the delivery of key work streams within an agreed programme, including:

- Stakeholder Engagement
- Design Development
- Transport Modelling
- Environmental Assessment
- Business Case Development
- Early Contractor Involvement (ECI) and Scheme delivery.

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

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 A16 Norwood Improvement Scheme to date. All skills and competencies to deliver this scheme are available within the local PHS contract.

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

Figure 6.3: Key Project Roles and Responsibilities

6.4.8 The Project Manager will be Lewis Banks from PCC through detailed design and FBC. Beyond FBC a project manager will be (nominated from PCC's Highway Maintenance Team to mange the project through the construction phase. The PCC Project Manager is part of the Delivery Partner Team shown in Figure 6.3 and reports into multiple layers in the governance structure above.

6.5 Programme / Project Reporting

6.5.1 The Project Manager is responsible for reporting how the project is performing 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: Key Project Milestones

Timescale	Activity
June 2022 – July 2022	Outline Business Case reviewed by CPCA, and approval sought from CPCA board for the release of funding to undertake Detailed Design and produce a Full Business Case.
September 2022	Work commences on the Detailed Design and Full Business Case.
September 2022 – November 2022	Site Surveys undertaken to inform the Detailed Design
March 2024	Detailed Design and scheme costings complete. Full Business Case submitted.
April 2024 – May 2024	Full Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding for scheme construction.
September 2024 – August 2025	Construction of the scheme undertaken, lasting approximately 12 months.
August 2026	1-year post-scheme monitoring undertaken
August 2030	5-years post-scheme monitoring undertaken

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

6.6.3 At present, construction of the scheme is expected to commence in Autumn 2024, however this will be dependent on external factors, such as successful consultation with the developers of the Norwood site.

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.

6.7.5 Based on the assurance and approvals guidance detailed above, Table 6.2 beneath details the approvals pathway required for the remainder of the project as it progresses through the business case stages.

Table 6.2: Approvals Pathway

Assurance Framework Stage	Approvals
Gateway 2: OBC	Independent Technical Review sign off CPCA Board Approval / release of FBC funding. Chief Finance Officer (CFO) sign off.
Gateway 3: FBC	Monthly CPCA Project Board approvals Design Approvals – Issue of Detailed Design Drawings / RSA / PCC Technical Review Developer and National Highways Review Target Cost Approval Compound Agreement Independent Technical Review sign off CPCA Board Approval for Construction Funding
Gateway 4: Construction and Delivery	Construction Order Raised CPCA Project Close Out / Written confirmation to CPCA director Prepare / Agree Final Accounts Final Highlight Report
Gateway 5: Monitoring and Evaluation	CPCA Road Safety Audit to be conducted 1 year after construction Project Monitoring 1 Year After Construction Report – PCC / CPCA report approval Project Monitoring 5 Year After Construction Report – PCC / CPCA report approval

6.8 Communication 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 (including National Highways)
- Engaging with the local community, businesses and key stakeholders regarding delivery of the scheme, ensuring 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.

Project Liaison Officer

6.8.2 A designated Project Liaison Officer (PLO) will be assigned to the scheme throughout the stakeholder and public consultation period and will be present during the final phase of 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.

6.8.3 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.

6.8.4 The PLO will report findings from the post-scheme monitoring to stakeholders and respond to queries and feedback about the scheme through the council's usual communications channels.

Stakeholder Consultation

6.8.5 The key stakeholders identified for the A16 Norwood scheme are:

- CPCA as the Local Transport Authority and funding body for the scheme
- The Council as the Local Highway Authority
- Norwood Developers and landowners including Taylor Wimpey and Calco 101 in relation to the Leeds Farm Development, and Church Commissions in regard to land to the north of the A47 / A16 / Welland Road Roundabout.
- Peterborough City Cabinet Member and Ward Councillors
- National Highways as the organisation responsible for the A47 Trunk Road
- British Horse Society
- Local Cycle Forum
- PCC Education Services
- Natural England in regard to ecological / biodiversity assessments within the studies footprint
- Historic England in regard to Archaeology/ Cultural Heritage assessments within the studies footprint
- Environment Agency
- The Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire, as the organisation responsible for the Dogsthorpe Star Pitt SSSI
- PCC representatives for the natural and historic environment, Archaeology and Heritage, Water and Drainage, Environmental Health and Planning
- Emergency Services
- Residents affected by the scheme, including Newborough Road
- Businesses affected by the scheme.

6.8.6 Stakeholder consultations were undertaken by the Project Team as part of this OBC and Preliminary Design phase, in line with the timings of the public consultation. All stakeholders were consulted via email, letter or as part of the Walking, Cycling and Horse-Riding Review (WCHR) for comments on the Preferred scheme.

6.8.7 Feedback received from stakeholders during the consultation largely centred on land acquisition for the bridal way, connectivity to the Leeds Farm NMU routes as well as the recent January 2022 updates to the Highway Code. All comments received during this consultation will be explored further and incorporated into scheme design where appropriate as the project progresses to the final phase of Detailed Design.

Public Consultation

6.8.8 Public consultation on the concept of a scheme at this location was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan that was adopted in January 2020. At this point, no indication of the scheme type was made to residents (as this was yet to be developed), but it should be noted that no objections relating to the development of Norwood and the principle of improvements to this area were received.

6.8.9 Public perceptions on the A16 Norwood Improvement Scheme were reassessed as part of the OBC and Preliminary Design stage. The online consultation featured on the PCC website and social media for 6 weeks between the 1st November and 13th December 2021. A total of 49 responses were received during the consultation period.

6.8.10 Comments received largely focused upon Newborough Road and the proposed closure of the current access from the A47, suggestions for active travel improvements and highlighting the environmental assets within the study area.

6.8.11 Amendments have been made to the proposed scheme to reflect the comments received, and the scheme design has been updated to retain access from the A47 onto Newborough Road (northbound only) and define the active travel improvements that will be developed as part of the next phase of the project, which will include a link from the Norwood growth site to Welland Road (south of the A47) and improvements along Welland Road towards the City Centre.

6.8.12 All comments received during the consultation will be further reviewed during the Detailed Design phase of the project and incorporated where appropriate. Further development of the active travel improvements will also be possible once further detail is available in relation to the development site layouts and active travel connections to the wider highway network.

6.9 Key Issues for Implementation

6.9.1 The following table assesses the complexity of delivering the A16 Norwood Improvement Scheme, considering buildability, potential disruption during construction, likely delivery agents (complexity of partnership arrangements), stakeholder acceptability and public acceptability / support.

Table 6.3: Key Issues Associated with Scheme Delivery

Implementation Issue	Description and Comment
Buildability	Moderate significance with buildability issues
	Issues with NRSWA Statutory Diversionary Works possible following findings of high-level communication network onsite along the A47 corridor, including City Fibre, UKPN and National Grid IP Mains. Must provide sufficient lead in time for diversion / slewing of existing assets.
	Additional drainage in the form of a highway attenuation pond may be required at the outfall on the A16, catering for the additional northbound carriageway to the A16. Land may be required to accommodate the required highway pond. Issue to be mitigated against in the next phase of Detailed Design.
	Unknown ground conditions associated with the extension of earthworks required to accommodate the additional lane on the A16. Surveys to be commissioned during the next phase of Detailed Design.
	Minimal potential for hazardous materials to be discovered within the study area, including coal Tar in pavements and asbestos. Issue is considered low risk as the carriageway has been constructed / altered recently.
	The design of how the northern section of the A16 will tie into the developer roundabout is not yet known, and therefore current Preliminary Designs is truncated to assume a tie-in point. Depending on the junction arrangement and timing of works from the developer, a temporary tie in design may be required.
Approvals Prior to Construction	Low risk with approvals
	A Section 6 Agreement is required between PCC and National Highways, to allow works to be conducted on parts of National Highways Strategic Road Network. The Section 6 Agreement will be addressed during Detailed Design and is subject to design drawings being formally issued to the National Highways Project Manager and then comments being integrated into the Final Design. An agreement on any departures from standards will also be required with National Highways. Non agreement from National Highways is unlikely as the organisation is a key stakeholder and communication will be continued throughout the progression of Detailed Design.
	Consent is required from both the PCC Drainage Team and the Environment Agency at Detailed Design stage, in relation to drainage and discharge in the study area. Agreement from both stakeholders is subject to design drawings being formally issued and then comments being integrated into the Final Design.
Disruption During Construction	Moderate disruption to construction
	COVID-19 poses a continued risk during construction. Prior planning to programme adequately allowing for safe COVID practices including adequate welfare provisions alongside the prior procurement of long lead items/ materials is vital to minimise disruption whilst onsite.
Complexity of Partnerships	Moderate complexity with Partners
	Land required from the Church Commissioners to accommodate the realigned bridleway has been questioned (during the WCHR questionnaire) by the landowners consultant as 'excessive'. The alternative proposal set forward by the stakeholder in response to the consultation will be reviewed during the next phase of Detailed Design, whereby discussions of land acquisitions will be explored further. At this stage the design remains of the bridle realignment remains.
	The progression of developer planning applications remains slow, which has the potential to impact the delivery of the PHS highway scheme as the project progresses and wider study area develops. Communication with developers is to be continued into Detailed Design, with developer timescales agreed prior to construction.
Environment / Habitat Mitigation	Moderate complexity for environmental issues
	Land to the east of the A16 (Dogsthorpe Star Pit) is a Site of Special Scientific Interest (SSSI), supporting scarce and nationally rare species and fauna. An area of Ancient Woodland (Little Wood) is also located close to the SSSI. Will be managed through ecological / arboricultural surveys to inform design and identify measures necessary to protect vulnerable species and plants during construction.
Stakeholder / Public Acceptability	Moderate impact of stakeholder acceptability
	There is potential for negative publicity during the final phase of Detailed Design and construction from both stakeholders and the public. Comments received during the stakeholder and public consultations during this phase of work are to be reviewed during the next phase of work and responses integrated into design where necessary.

6.10 Risk Management Strategy

6.10.1 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.

6.10.2 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.

6.10.3 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 C.

6.11 Scheme Evaluation

6.11.1 The Scheme Evaluation Plan for the A16 Norwood study will be prepared prior to scheme construction, to set out how the effects should be evaluated following implementation. The Scheme Evaluation Plan comprises the Benefits Realisation Plan and the Monitoring and Evaluation Plan.

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

Expected Benefits

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

6.11.4 The primary objectives include:

1. **Tackle congestion and improve journey times:** Tackle congestion and reduce delay along the A16 and on the primary approaches to the A16 / A47 / Welland Road Roundabout
2. **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth at Norwood can be realised
3. **Limit impact on the local environment and improve biodiversity**: Fully mitigate any adverse environmental impacts of a scheme, and ensure a 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 for all travellers within the study area.

6.11.5 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 the A16 corridor, such as the A47, A15 Paston Parkway, A1139 Eye Road and Newborough Road.

Benefits Realisation Plan

6.11.6 An outline Benefits Realisation Plan has been prepared for the A16 Norwood project, which sets out the approach to managing the realisation of benefits of the proposed improvement schemes. In accordance with guidance from the DfT (2022)[32], this document is outlined at this stage of work and will be completed at the FBC stage.

6.11.7 The outline Benefits Realisation Plan is included within Appendix N of this report. The plan has been prepared in accordance with the guidance provided by the DfT (Transport Business Cases, 2022), HMT (The Green Book[33]), and the 'Guide to Developing the Project Business Case' (2018)[34].

6.11.8 Table 6.4 overleaf provides a summary of the benefits register as detailed in the Benefits Realisation Plan.

[32] DfT (2022) Transport business case guidance - GOV.UK (www.gov.uk)
[33] HMT (2020). The Green Book: Central Government Guidance on Appraisal and Evaluation
[34] Guide to developing the Project Business Case (2018)(publishing.service.gov.uk)

Table 6.4: Benefits Register Summary

Benefit	Benefit Category and Class	Description	Service Feature	Activities Required	Responsible Officer	Performance Measure	Timescale
Reduced congestion and improved journey times	Monetised journey time savings	Enhanced network performance	Implementation of new highways infrastructure / mitigations at the A16 / A47 / Welland Road Roundabout and adjoining A16 and A47 strategic routes	Successful delivery of the A16 Norwood improvement schemes.	Peterborough City Council (PCC) / Cambridgeshire, Peterborough Combined Authority (CPCA)	Will contribute to objective 1. Ratio of peak hour to free flow journey times to be less than 1.5. No blocking back present between junctions.	Benefit(s) to be realised once the scheme has been implemented and is open to the public
Planned housing and employment growth	Wider social benefits (improved availability of housing and employment)	Realisation of local plan housing and employment growth ambitions	Improved highways capacity as a result of the implementation of improved highways infrastructure, to facilitate traffic growth on the transport network			Will contribute to objective 2 – Developments are not restricted in this area due to transport network issues.	
Improved air quality	Environmental benefits; wider social benefits (improved population health)	Improved air quality in future years	Reduction in emissions from vehicles as a result of reduced congestion, due to improved highways infrastructure.			Will contribute to objective 3 – Air quality impact matches or improved on modelled values.	
Achievement of biodiversity net gain	Environmental benefits; wider social benefits (improved population health)	Increase in the scale of replanting and environmental mitigations onsite in the future	Implementation of replanting, environmental enhancements across the site area including wildflower enhancement areas and linear planting along the A16			Will contribute to objective 3 – Biodiversity Net Gain of 20% or greater achieved.	
Provision of new active travel infrastructure	Wider social benefits (improved health), Environmental benefits;	Increased number of active travel routes connecting the development site to wider network and city centre	Implementation of safer highways infrastructure including a Pegasus controlled crossing, route improvements along Welland Road and the potential for a new bridge over the A47 (subject to feasibility).			Will contribute to objective 4 – Increased length of active travel provision including pedestrian provision and LTN 1/20 compliant cycleways	
Improved wider network efficiency	Monetised journey time savings	Enhanced network performance	Implementation of new highways infrastructure / mitigations at the A16 / A47 / Welland Road Roundabout and adjoining A16 and A47 strategic routes			Will contribute to objective 6 - Journey times within 20% of forecast change.	
Improved road safety	Monetised (quantifiable) benefits due to fewer accidents	Reduction in the number of KSI incidents at proposed intervention sites	Implementation of new highways infrastructure / mitigations at the A16 / A47 / Welland Road Roundabout and adjoining A16 and A47 strategic routes. Alongside the implementation of new active travel provisions including a controlled crossing, route improvements along Welland Road and the potential for a new bridge over the A47 (subject to feasibility). .			Will contribute to objective 5 – Accident statistics are reduced compared to the forecast in line with Cobalt predictions.	

Monitoring and Evaluation

6.11.9 An outline Monitoring and Evaluation Plan has been prepared for the A16 Norwood project, which outlines the arrangements for monitoring and evaluating the proposed improvement schemes. As per the DfT guidance for the Benefits Realisation Plan, this document is outlined at this stage of work and will be completed at the FBC stage.

6.11.10 The outline Monitoring and Evaluation Plan is included in Appendix O of this report. The outline Monitoring and Evaluation Plan has been prepared in accordance with the guidance provided by the DfT (The Transport Business Cases, 2022) Monitoring and Evaluation Framework for Local Authority Major Schemes[35] and HMT (The Green Book[36]).

6.11.11 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.

6.11.12 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. It is envisaged that the monitoring and evaluation work will culminate with the production of a One Year After Monitoring and Evaluation Report (to be produced 12-24 months post scheme implementation) and a Final Monitoring and Evaluation Report (to be produced approximately five years post scheme implementation).

6.11.13 The logic map detailed in Figure 6.4 (overleaf) highlights the links between context, inputs, outputs, outcomes, and impacts of the scheme and gives a visual representation of where Monitoring and Evaluation should be focused. The logic model outlines the causal chain of events that represent the process by which the desired outcomes and scheme objectives are to be achieved.

6.11.14 The logic model has informed the approach proposed in the Monitoring and Evaluation Plan and will help ensure monitoring resources are targeted appropriately through the timeline of scheme development and provide effective measurement of objectives and outcomes.

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

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

[35] DfT (2012). Monitoring and Evaluation Framework for Local Authority Major Schemes
[36] HMT (2020). The Green Book: Central Government Guidance on Appraisal and Evaluation

Context

Norwood and Paston reserve urban extension areas are key areas of growth for Peterborough, as identified in the Local Plan 2016 – 2036 (Adopted July 2019), which will generate a combined total of 2,945 dwellings within the proposed study area

The Scheme will provide the necessary increase in highway capacity to unlock the identified growth throughout the area, as well as tackle any associated congestion issues from the proposed growth

Inputs

CPCA funding and resources

PCC resources

Contractor resources

Sub-contractor resources

Stakeholder support

Network Improvement Scheme

Outputs

Closure of Newborough road southbound access onto A47

Dualling of the A16 between the A16 / A47 / Welland Road roundabout and the Norwood development Access

Partial signalisation of the A16 / A47 / Welland Road roundabout on the A16 southbound approach

Addition of a flare to the A47 westbound approach, to provide additional capacity for left turners to Welland Road

Addition of a dedicated left lane, from the A47 eastbound approach to the A16 Northbound exit

Replanting within the study area including linear tree / shrub planting along the A16 and wildflower planting at several locations

Active travel route enhancements from the Norwood site down Welland Road

Pedestrian bridge over the A47 (subject to further feasibility)

Transport Outcomes

Improved journey times for users within the study area, particularly of the A16 / A47 / Welland Road roundabout

Reduction in queue lengths, during peak times on all key approaches

The separation of movements on key junctions, aiding the reduction in accidents

People, Business, and Place Outcomes

Improved network efficiency will help facilitate the Norwood development area, and will increase the attractiveness of the City as a place to live and invest

Early environmental considerations, aiding the achievement of a minimum 20% biodiversity net gain across the study area

Impacts

Economy benefits, including reduced costs, investment and regeneration, and benefits to local businesses

Society benefits, including improved health and wellbeing, and better connectivity to services

Environmental benefits, including biodiversity improvements, improved air quality, and reduced emissions

Figure 6.4: Monitoring and Evaluation Logic Map

Appendices

MILESTONE INFRASTRUCTURE

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Appendix A – Wider Policy Context

Appendix A: Wider Policy Context

National Planning Policy Framework

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

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

The scheme will contribution to delivering the following NPPF objectives:

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

Department for Transport Single Departmental Plan

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

The objectives outlined in the plan are:

- Support the creation of a stronger, cleaner more productive economy
- Help to connect people and places, balancing investment across the country
- Make journeys easier, modern and reliable
- Make sure transport is safe, secure and sustainable

- Prepare the transport system for technological progress, and a prosperous future outside the EU
- Promote a culture of efficiency and productivity in everything we do.

Peterborough City Council's Vision and Strategic Priorities

The Council's vision is to

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

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

The strategic priorities for the Council are:

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

Peterborough City Council Local Plan

The Local Plan (adopted July 2019) updates the 2011 Core Strategy and looks to deliver 20,112 new homes between 2017 and 2036, and 17,600 jobs between 2015 and 2036. The development strategy for the new Local Plan is to focus the majority of new housing development in, around and close to the urban area of the city of Peterborough. Only a small percentage of residential development is allocated to the villages and rural area. Similarly, employment development will be focussed on the city centre, urban area or urban extensions.

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

- Drive growth, regeneration and economic development
- Improve education attainment and skills

- Safeguard vulnerable children and adults
- Implement the Environment Capital agenda
- Support Peterborough's culture and leisure trust Vivacity
- Keep all our communities safe, cohesive and healthy
- Achieve the best health and wellbeing for the City. The Local Plan identifies Thorpe Wood as a strategic employment location for the city and additional B1 use is allocated within the area.

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

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

Appendix B – Carbon Assessment Methodology

1. Appendix B_PHS Carbon Assessment Methodology

1.1 Introduction

1.1.1 This section sets out the approach for calculating the embodied greenhouse gas (GHG) emissions associated with Peterborough Highway Services (PHS) Majors schemes and culminates in a total embodied carbon value which can be used as a baseline to drive carbon reductions and assess the benefits of value engineering, using alternative materials, and implementing more efficient construction methods.

1.1.2 Embodied carbon is the term used for the GHG emissions associated with the creation of a highway's asset, including the production and transportation of materials to site. It is referred to within this report as 'carbon' and is measured in tonnes of carbon dioxide equivalent (tCO2e). The quantification and assessment of embodied carbon is a key stage in the carbon management process in accordance with PAS2080 principles.

1.1.3 Materials, fuel and energy use, waste arisings and transportation during construction all produce carbon emissions either directly, as in the case of transportation, or indirectly as embodied carbon which relates to the emissions from production/manufacturing processes for the materials being used.

1.1.4 Peterborough City Council (PCC) declared a climate emergency in May 2019 and aims to be a carbon neutral organisation by 2030. There is also an objective for net-zero carbon emissions across the entire county by 2045. In line with the Cambridgeshire & Peterborough Combined Authority (CPCA) and PCC's commitment to combating climate change and achieving 'Net Zero' carbon emissions by 2030, proposed schemes will undergo carbon assessments prior to gaining formal approval for the final design and construction.

1.1.5 Carbon emissions associated with proposed scheme will be quantified using a combination of the Milestone Infrastructure Carbon Tool and manual calculations. The carbon data will be presented in a dashboard to facilitate identification of carbon 'hotspots' and help designers/delivery teams to focus their carbon reduction efforts accordingly. This assessment will be undertaken based on the information available at preliminary and detailed design development with assumptions and interpretation where necessary.

1.2 Methodology

1.2.1 The following methodology is proposed for calculating carbon emissions associated with preliminary and detailed design phases of the proposed scheme. It would also be possible to update the carbon assessment post-construction using an as-built Bill of Quantities to assess the benefits of any carbon reduction initiatives implemented during the construction phase.

1.2.2 The calculation of carbon emissions associated with proposed schemes will be undertaken using a combination of the Milestone Infrastructure Carbon Tool and manual calculations. This tool uses carbon conversion factors from the UK Government GHG Conversion Factors and Inventory of Carbon and Energy (ICE) databases.

1.2.3 The data used within the Carbon Tool will comprise estimates of proposed scheme construction material types and quantities, based on information provided by the Design Team in the form of a Bill of Quantities (BoQ). This data is used as inputs to the Carbon Tool to generate an initial estimate of the carbon footprint of the proposed scheme. The tool is based on the standard Method of Measurement for Highways Works from the Specification for Highways Works to align with the typical BoQ format. In addition to fuel and energy usage, it captures Scope 1, 2 and 3 emissions for the follow 'Bill' elements:

- Site Preliminaries
- Traffic Management
- Site Clearance
- Fencing
- Vehicle Restraint Systems
- Drainage
- Earthworks
- Pavements
- Kerbs & Footways
- Signs and Road Markings
- Street Lighting
- Ducting & Electrical
- Structural Concrete
- Piling
- Waterproofing
- Bridge Joints
- Brickwork & Blockwork

1.2.4 Each category within the Carbon Tool is further divided into item /material types e.g. fill and aggregate (within the bulk materials category). For each item type the Carbon Tool provides a unit and CO2e value for that item.

1.2.5 It is noted that elements of the design would continue to be refined throughout the design process resulting in changes in material quantities.

1.3 Data and Key Assumptions

1.3.1 Attempts will be made to calculate the carbon emissions for every item. However, in some scenarios, either carbon factors do not currently exist (and therefore carbon cannot be estimated with a suitable degree of accuracy) or suitable information does not exist on which to base carbon assumptions.

1.3.2 In scenarios where an appropriate carbon factor in the carbon tool is not available; a suitable alternative will be used (i.e. manual calculation to estimate carbon emissions based on spend data or other available information).

1.3.3 It is expected that the highway construction will require maintenance and replacement during its design life. The carbon emissions associated with these future activities have will be excluded from the assessment due to the inherent uncertainty in their frequency and extent.

1.3.4 The information provided will be based on the carbon footprint following any carbon reduction initiatives delivered during the preliminary and detailed design phases. Further carbon reductions could be driven by the contractor going forwards and should be a point of discussion where construction methods may contribute to a reduction or increase in emissions.

1.4 Approach to Carbon Reduction

1.4.1 Reporting and guidance, such as PAS 2080:2016 (BSI, 2016) indicate that the potential to influence carbon emissions decreases as a project progresses. The largest savings can be achieved during the planning stage, with more modest reductions achievable during design and construction.

1.4.2 Carbon quantification is necessary on the proposed scheme to better understand the carbon footprint of the scheme and to enable opportunities for carbon savings to be identified.

1.4.3 The facilitation of workshops will help to identify how design decisions and construction activities can influence the proposed schemes carbon footprint. The most significant carbon reductions are likely to be attributed to the fact that opportunities have been sought to enhance the sustainability of the design early in the process. Workshops will help to highlight ‘carbon hotspots’ and allow designers to focus carbon reduction efforts in the right areas whilst highlighting the carbon implications of certain decisions throughout the design development.

1.4.4 As a starting point, the ongoing design specification should aim to reduce or avoid where practicable, the use of significant high impact materials, (e.g. steel and concrete), or processes (e.g. significant earthwork excavations). Where this is not possible, material volumes or processes should be substituted with lower intensity replacements if achievable within the bounds of the design standards for safety and quality.

1.4.5 It is hoped that this approach leads to tangible changes in the design which improve the overall sustainability of the scheme in line with the CPCA and The Council’s climate objectives.

Appendix C – Project Risk Register

Risk ID	Date Identified	Cause(s)	Risk Event	Effect(s)	Mitigation Plan	Likelihood (1-5)	Impact (1-5)	RAG score (likelihood x impact)	Risk Owner	Date Closed
26	Oct-21	Need for use of developer land	**Purchase of land** Third Party (developer land) may be required at the A47 / A16 roundabout – would be needed to provide a bridleway.	Increase in scheme costs Possible delay to scheme if an agreement cannot be reached within current programme	Discussions will be held with developer early to understand if land can be purchased. If land is not available than alternative options will be considered.	3	3	9	Lewis Banks (PCC Project Manager)	
27	Oct-19	Need for more walking and cycling elements to be included in scheme	**Aligning project to CPCA objectives for sustainable travel** It is important that the project includes deliverables focusing on sustainable travel modes.	Help secure future funding Reduce car travel	Development of the business case will consider scheme options for buses, walking and cycling. The project consultation will offer an opportunity to understand where routes are most needed.	3	3	9	Lewis Banks (PCC Project Manager)	
21	Apr-21	Developer agreement	If the two planned developments don’t progress, it will have an impact on elements of the scheme (The Link Road).	Delay to programme Additional budget required	PCC planning to continue dialogue with both developers.	2	3	6	Lewis Banks (PCC Project Manager)	
18	Feb-21	Change to project scope	**Impact on budget and programme** Risk of a project scope increase to include the Norwood Link Road and associated roundabout. Potential to impact both budget and programme.	Delay to scheme delivery Additional budget may be required	Options are being considered and meetings are being held with relevant parties to bring forward development of link road.	2	3	6	Lewis Banks (PCC Project Manager)	
20	Apr-21	Archaeological findings	**Archaeological findings** There is a risk that improvement works could be impacted by discovery of archaeological remains that may require excavating.	Delay to programme	During the development of the business case and design investigative work will be undertaken to understand the site and advice will be sought from archaeological specialist.	3	2	6	Lewis Banks (PCC Project Manager)	
13	Feb-20	Unknown Envrionmental Issues	**Environmental Issues** Environmental Issues such as noise, air or ecology may cause a delay to design and construction if suitable mitigation approaches not considered. Furthermore, if surveys identify anything significant on site, further surveys may be required.	Potential to introduce delays to programme and additional costs	Desktop Environmental study was undertaken at SOBC stage to identify any possible environmental issues. At OBC stage an environmental report will be undertaken to indentify any environmental impacts (such as SSSI sites and tree loss) and mitigation measures.	2	3	6	Lewis Banks (PCC Project Manager)	

28	Mar-22	Budget under spend	**Carry over of unspent budget to 2022/23** There is a posibility that the project budget allocated for 2021/22 will not be fully spent within the financial year.	Budget will need to be requested to be carried over into 2022/23.	PCC will monitor spend and if there is a possibility that not all of the budget will be spent, the CPCA will be informed.	2	3	6	Lewis Banks (PCC Project Manager)	
19	Apr-21	Fly tipping	**Fly tipping** There is a risk that fly tipping issues in the area where the improvements are planned may continue or become worse once the Newborough Road access is closed.	Increased cost in clearing Complaints from landowners Bad publicity	During the scheme design this will be looked at further. Possible solutions will be considered and these will be incorporated into the design.	2	2	4	Lewis Banks (PCC Project Manager)	
3	Mar-20	Delay to project	**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.	Likely effect is that a delay would be caused	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 islolate.	2	2	4	Lewis Banks (PCC Project Manager)	
6	Dec-19	Results of surveys which may necessitate alterations to proposed works scope or methodology	**Change in proposals** There also is a possibility that the data may provide results that may require change in what we propose as improvements.	Likely effect is that a delay would be caused	Ensure all investigations are carried out at an early design stage	2	2	4	Lewis Banks (PCC Project Manager)	
8	Dec-19	Public and stakeholder objections	**Consultation** There is good possibility that we may receive objections for the improvements that we may decide to undertake for the project.	Likely effect is that a delay would be caused Possible changes to design	Early consultation/notification as deemed necessary by PCC. Develop publicity strategy and liaise with businesses/residents affected by the works and scheme mobilisation	2	2	4	Lewis Banks (PCC Project Manager)	
12	Feb-20	Unknnown STATS	**Unknown Stats** STATS maybe found at the junction and cause a delay to design or construction if not found early enough	Likely effect is that a delay would be caused	STAT Plans are being requested at an early stage of the project prioir to design to ensure engineers are aware of the STATS that are present within the vicnity of the junction	2	2	4	Lewis Banks (PCC Project Manager)	
14	Feb-20	Adverse publicity	**Disruption to network** There is possibility that adverse publicity may be received due to the disruption to the network during construction	Likely effect is that a delay would be caused	Advise the public as early as possible about the consutruction timetable. Avoid busy periods such as christmas to minimis the delays to travelling public	2	2	4	Lewis Banks (PCC Project Manager)	
22	Apr-21	HE agreement	If during the HE technical review any changes are needed, this could have delay to progression of study and programme.	Delay to programme	Mitigation is to maintain strong communication with HE as a key stakeholder.	2	2	4	Lewis Banks (PCC Project Manager)	

23	May-21	Time required for surveys	**Survey delay** The programme provided currently shows a delay which takes the submission of the OBC to 9th May 2022, which in turn squeezes the July Project Board. This is as the result of the 12 week road space lead in that we've added for the Topo surveys	Possibility that OBC may not be ready for the July 2022 Board meeting	The site team have been working with the survey company and revised the TM requirements to reduce the road-space requirement, especially on the HE network. As a result of this, we expect to reduce the 12 weeks to 6 weeks or less, which fits with the original July Board dates. Once revised programme had confirmed the above, it will be issued and the dates below confirmed.	2	2	4	Lewis Banks (PCC Project Manager)	
29	Mar-22	Biodiversity Net Gain	Difficulty is achieving Biodiversity Net Gain objectives currently set for project.	Risk of not meeting standards ste by DEFRA.	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.	2	2	4	Lewis Banks (PCC Project Manager)	
25	Oct-21	Further transport modelling required	**Delay to completion of VISSIM/Saturn** It has been realised that additional modelling is required to assess the different options that are being considered	Delay to completion of transport modelling Task end to be amended	The end date will be revised, but overall impact will be low as the task is not within the critical pathway on the programme.	3	1	3	Lewis Banks (PCC Project Manager)	
24	Jul-21	Passenger Transport services	**Inclusion of passenger transport services** Inclusion of passenger transport services Other than highway improvements, the scheme should also include improvements to public transport into the development.	Inclusion of buses services into development Encourage residents to travel by public transport	To include the CPCA Passenger Transport team in discussions with proposals of scheme. Seek their advice on what can be done to include buses into scheme.	1	1	1	Lewis Banks (PCC Project Manager)	
9	Feb-20	Budget escalation	**More funding required** Work to develop options or time take to model the options may take longer than originally anticpated	Likely effect is that more funding would be required	Programme has allowed for additional time for option development and modelling tasks based on experience of pervious priojects. Overall budget for project is being managed closely to ensure it is to programme, and early warnings can be goven if an overspend is likely.	2	3	6	Lewis Banks (PCC Project Manager)	

17	Jan-21	Change of supplier	**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.	Likely effect is that a delay would be caused	Regular communication will be maintained and programme will be revised should there be a need.	2	2	4	Lewis Banks (PCC Project Manager)	
16	Oct-20	Delay in obtaining approval to commence next stage of the project - OBC Raising order to Skanska	**Delay to start of OBC** Due to not receiving approval it becomes difficult to set time frames for programme of works.	We will not be in a postion to raise an order. Skanska will not able to start work on the Outline Business Case.	We will monitor when the review of the SOBC will be completed and will then look for the upcoming board meeting where we can request approval to commence the next stage. A draft programme will be prepared looking at timescales for each of the tasks. UPDATE PCC governance process currently underway. Approval is being sought and will hopefully be confirmed by end of April.	1	1	1	Lewis Banks (PCC Project Manager)	May-21
15	May-20	Limited benefits compared to costs	**Low score BCR** Potential for poor scheme BCR (due to limited benefits compared to costs).	Risk scheme may not offer value for money or achieve the outcomes desired	Will monitor closely during economic assessment and wider benefits explored if necessary.	1	1	1	Lewis Banks (PCC Project Manager)	Oct-20
10	Feb-20	Failure to achieve project outcomes	**Not meeting outcomes** Preferred option does not deliver the original project outcomes	likely effect is the scheme will not resolve the original problems identified.	Scheme objectives will be developed based on the problems identified at the junction and the wider policy objectives. Options will be scored against scheme objectives to ensure that they fit with what is to be achieved.	1	1	1	Lewis Banks (PCC Project Manager)	Oct-20
11	Feb-20	Poor value for money	**BCR Score** BCR for scheme is poor/low value for money.	Likely effect is the scheme will not be deliverable/funded	Options are developed with a good understanding of the existing problems, including an understanding of the current congestion/delay at the junction. Therefore is is likely that a preferred scheme would deliver a postivie BCR. If a only a poor BCR is achieveable, the project will be halted at SOBC stage and not progressed further.	1	1	1	Lewis Banks (PCC Project Manager)	Oct-20

1	Feb-20	Delay in use of PTM3	**Modelling Issues** The PTM3 Saturn Model is still being validated and therefore any delays to the PTM3 programme will impact on this programme	Likely effect is that a delay would be caused	Priority is being given to the PTM3 project in terms of resources to ensure it is ready to test options for this project.	1	1	1	Lewis Banks (PCC Project Manager)	Oct-20
4	Dec-19	Inaccuracy or delay in receiving survey information	**Data issues** Issues with the data such as a road closure/accident may not provide accurate data.	If needed we may decide to undertake another survey to provide us with more data to analyse.	We will plan to schedule the survey at a time when there are no other road works on the network close to the site of the survey.We will contact survey company at an early stage so they can provide a date when the survey can be carried out to avoid a delay, if there is delay then we will contact other survey companies to ask if they have availability/resource to carry out the survey.	1	1	1	Lewis Banks (PCC Project Manager)	Oct-20
7	Sep-19	Delay in obtaining approval to commence project	**Unable to raise order to Skanska** Without approval to start the project we will not be able to get a works order over to Skanska.	Skanska will not able to start work on business case.	To hold a meeting with Skanska to discuss order and schedule of works for rest of the financial year	1	1	1	Lewis Banks (PCC Project Manager)	Jan-20
2	Nov-19	Delay in obtaining approval to commence	**Fully spending grant within financial year**	There will be grant unspent, which could	To hold a meeting with Skanska to discuss what can be achieved	1	1	1	Lewis Banks (PCC Project Manager)	Apr-20
5	Oct-19	Delay in obtaining approval to commence project Raising order to Skanska	**Time frames for delivery** Due to not receiving approval it becomes difficult to set time frames for programme of works.	Skanska will not be able to provide accurate programme of works for the project. Therefore it will not be known how much of the budget will be spent.	Utilise Peterborough Highways contract to ensure best use of available time and resources. Getting the programme confirmed early	1	1	1	Lewis Banks (PCC Project Manager)	Jan-20
30	Apr-22	LTN 1/20 active travel components	The amount of active travel components included within the scheme has been raised within Board meetings, and will be explored further in the next stage once development masterplans are known, so active travel components tie together with the development proposals	Potential for CA funding to be impacted should active travel components not be at the required level.	The Walking Cycling and Horse Riding Review completed as part of consultation for this phase of work will help understand current issues and improvements required. Comments will be investigated in the next phase of work.	2	4	8	Lewis Banks (PCC Project Manager)	
31	Apr-22	Rise in inflation	Scheme construction cost may increase significantly following rise in inflation of raw materials.	More funding than previously identified would be required	This will be regularly monitored. One of the options considered could be to procure raw materials early.	3	3	9	Lewis Banks (PCC Project Manager)	

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Appendix D – Economic Dimension 60 Year Cost Profile (Construction and Maintenance)

A16 Norwood - Do Something Scheme Costs in 2010 Market Prices for Input to Economc Case

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	£0	£0	£0	£627,547	£64,632	**£692,179**	0.000	£0.00	**£692,179**	£0	**£692,179**	£159,201	**£851,380**	**£667,398**	1.035	0.662	**£441,673**	**£525,590.98**
2023	2	£0	£0	£0	£506,114	£193,895	**£700,009**	1.078	£54,333.00	**£754,342**	£0	**£754,342**	£173,499	**£927,841**	**£727,336**	1.035	0.639	**£465,062**	**£553,423.53**
2024	3	£2,079,940	£0	£0	£332,342	£83,819	**£2,496,102**	1.170	£423,797.61	**£2,919,899**	£0	**£2,919,899**	£671,577	**£3,591,476**	**£2,815,365**	1.035	0.618	**£1,739,281**	**£2,069,744.55**
2025	4	£4,159,881	£0	£0	£411,626	£70,691	**£4,642,198**	1.266	£1,236,240.06	**£5,878,439**	£0	**£5,878,439**	£1,352,041	**£7,230,479**	**£5,667,987**	1.035	0.597	**£3,383,168**	**£4,025,969.97**
2026	5	£0	£0	£0	£0	£0	**£0**	1.308	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.577	**£0**	**£0.00**
2027	6	£0	£0	£0	£0	£0	**£0**	1.349	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.557	**£0**	**£0.00**
2028	7	£0	£0	£0	£0	£0	**£0**	1.393	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.538	**£0**	**£0.00**
2029	8	£0	£0	£0	£0	£0	**£0**	1.438	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.520	**£0**	**£0.00**
2030	9	£0	£0	£0	£0	£0	**£0**	1.485	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.503	**£0**	**£0.00**
2031	10	£0	£0	£0	£0	£0	**£0**	1.535	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.486	**£0**	**£0.00**
2032	11	£0	£0	£0	£0	£0	**£0**	1.586	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.469	**£0**	**£0.00**
2033	12	£0	£0	£0	£0	£0	**£0**	1.640	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.453	**£0**	**£0.00**
2034	13	£0	£0	£0	£0	£0	**£0**	1.695	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.438	**£0**	**£0.00**
2035	14	£0	£0	£0	£0	£0	**£0**	1.753	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.423	**£0**	**£0.00**
2036	15	£0	£0	£0	£0	£0	**£0**	1.811	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.409	**£0**	**£0.00**
2037	16	£0	£0	£0	£0	£0	**£0**	1.871	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.395	**£0**	**£0.00**
2038	17	£0	£0	£0	£0	£0	**£0**	1.933	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.382	**£0**	**£0.00**
2039	18	£0	£0	£0	£0	£0	**£0**	1.998	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.369	**£0**	**£0.00**
2040	19	£0	£0	£0	£0	£0	**£0**	2.065	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.356	**£0**	**£0.00**
2041	20	£0	£0	£0	£0	£0	**£0**	2.135	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.344	**£0**	**£0.00**
2042	21	£0	£0	£0	£0	£0	**£0**	2.208	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.333	**£0**	**£0.00**
2043	22	£0	£0	£0	£0	£0	**£0**	2.284	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.321	**£0**	**£0.00**
2044	23	£0	£0	£0	£0	£0	**£0**	2.363	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.310	**£0**	**£0.00**
2045	24	£0	£0	£0	£0	£0	**£0**	2.446	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.300	**£0**	**£0.00**
2046	25	£0	£0	£0	£0	£0	**£0**	2.532	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.290	**£0**	**£0.00**
2047	26	£0	£0	£0	£0	£0	**£0**	2.622	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.280	**£0**	**£0.00**
2048	27	£0	£0	£0	£0	£0	**£0**	2.715	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.271	**£0**	**£0.00**
2049	28	£0	£0	£0	£0	£0	**£0**	2.812	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.261	**£0**	**£0.00**
2050	29	£0	£0	£0	£0	£0	**£0**	2.913	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.253	**£0**	**£0.00**
2051	30	£0	£0	£0	£0	£0	**£0**	3.017	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.244	**£0**	**£0.00**
2052	31	£0	£0	£0	£0	£0	**£0**	3.125	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.289	**£0**	**£0.00**
2053	32	£0	£0	£0	£0	£0	**£0**	3.237	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.281	**£0**	**£0.00**
2054	33	£0	£0	£0	£0	£0	**£0**	3.353	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.272	**£0**	**£0.00**
2055	34	£0	£0	£0	£0	£0	**£0**	3.473	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.264	**£0**	**£0.00**
2056	35	£0	£0	£0	£0	£0	**£0**	3.597	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.257	**£0**	**£0.00**
2057	36	£0	£0	£0	£0	£0	**£0**	3.725	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.249	**£0**	**£0.00**
2058	37	£0	£0	£0	£0	£0	**£0**	3.858	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.242	**£0**	**£0.00**
2059	38	£0	£0	£0	£0	£0	**£0**	3.995	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.235	**£0**	**£0.00**
2060	39	£0	£0	£0	£0	£0	**£0**	4.136	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.228	**£0**	**£0.00**
2061	40	£0	£0	£0	£0	£0	**£0**	4.281	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.221	**£0**	**£0.00**
2062	41	£0	£0	£0	£0	£0	**£0**	4.431	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.215	**£0**	**£0.00**
2063	42	£0	£0	£0	£0	£0	**£0**	4.586	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.209	**£0**	**£0.00**
2064	43	£0	£0	£0	£0	£0	**£0**	4.745	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.203	**£0**	**£0.00**
2065	44	£0	£0	£0	£0	£0	**£0**	4.909	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.197	**£0**	**£0.00**
2066	45	£0	£0	£0	£0	£0	**£0**	5.075	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.191	**£0**	**£0.00**
2067	46	£0	£0	£0	£0	£0	**£0**	5.243	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.185	**£0**	**£0.00**
2068	47	£0	£0	£0	£0	£0	**£0**	5.420	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.180	**£0**	**£0.00**
2069	48	£0	£0	£0	£0	£0	**£0**	5.603	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.175	**£0**	**£0.00**
2070	49	£0	£0	£0	£0	£0	**£0**	5.795	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.170	**£0**	**£0.00**
2071	50	£0	£0	£0	£0	£0	**£0**	5.991	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.165	**£0**	**£0.00**
2072	51	£0	£0	£0	£0	£0	**£0**	6.196	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.160	**£0**	**£0.00**
2073	52	£0	£0	£0	£0	£0	**£0**	6.412	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.155	**£0**	**£0.00**
2074	53	£0	£0	£0	£0	£0	**£0**	6.639	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.151	**£0**	**£0.00**
2075	54	£0	£0	£0	£0	£0	**£0**	6.877	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.146	**£0**	**£0.00**
2076	55	£0	£0	£0	£0	£0	**£0**	7.128	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.142	**£0**	**£0.00**
2077	56	£0	£0	£0	£0	£0	**£0**	7.388	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.138	**£0**	**£0.00**
2078	57	£0	£0	£0	£0	£0	**£0**	7.658	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.134	**£0**	**£0.00**
2079	58	£0	£0	£0	£0	£0	**£0**	7.942	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.130	**£0**	**£0.00**
2080	59	£0	£0	£0	£0	£0	**£0**	8.238	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.126	**£0**	**£0.00**
2081	60	£0	£0	£0	£0	£0	**£0**	8.541	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.123	**£0**	**£0.00**
2082	61	£0	£0	£0	£0	£0	**£0**	8.851	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.119	**£0**	**£0.00**
2083	62	£0	£0	£0	£0	£0	**£0**	9.172	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.116	**£0**	**£0.00**
2084	63	£0	£0	£0	£0	£0	**£0**	9.504	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.112	**£0**	**£0.00**
2085	64	£0	£0	£0	£0	£0	**£0**	9.843	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.109	**£0**	**£0.00**
Total		£6,239,821	£0	£0	£1,877,629	£413,037	£8,530,488		£1,714,371	£10,244,859	£0	£10,244,859	£2,356,317	£12,601,176	£9,878,086			£6,029,184	£6,649,138

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.	**£8,530,488**
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	**£10,244,859**
(3)	~~Following the real cost adjustment a quantified risk contribution has been applied.~~	**£10,244,859**
(4)	The next stage is to apply optimism bias.	**£12,601,176**
(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).	**£9,878,086**
(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).	**£6,029,184**
(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	**£6,649,138**

A16 Norwood - Do Something Scheme Costs in 2010 Market Prices for Input to Economc Case

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)		(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Risk Adjusted Base Cost (2022 Prices)		(4) Total Contribution of Optimism Bias		(5) Rebased to 2010 Price Base	(6) Discounted to 2010 Prices			(7) Adjusted to Market Prices
		Maintenance Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Quantified Risk Adjustment	Risk Adjusted Cost	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£0	£0	0.000	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.662	£0	£0.00
2023	2	£0	£0	1.050	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.639	£0	£0.00
2024	3	£0	£0	1.103	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.618	£0	£0.00
2025	4	£0	£0	1.158	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.597	£0	£0.00
2026	5	£0	£0	1.216	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.577	£0	£0.00
2027	6	£0	£0	1.276	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.557	£0	£0.00
2028	7	£0	£0	1.340	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.538	£0	£0.00
2029	8	£0	£0	1.407	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.520	£0	£0.00
2030	9	£0	£0	1.477	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.503	£0	£0.00
2031	10	£0	£0	1.551	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.486	£0	£0.00
2032	11	£0	£0	1.629	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.469	£0	£0.00
2033	12	£0	£0	1.710	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.453	£0	£0.00
2034	13	£0	£0	1.796	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.438	£0	£0.00
2035	14	£0	£0	1.886	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.423	£0	£0.00
2036	15	£0	£0	1.980	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.409	£0	£0.00
2037	16	£0	£0	2.079	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.395	£0	£0.00
2038	17	£0	£0	2.183	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.382	£0	£0.00
2039	18	£25,000	£25,000	2.292	£32,300.46	£57,300	£0	£57,300	£0.00	£57,300	£44,918	1.035	0.369	£16,563	£19,710.45
2040	19	£0	£0	2.407	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.356	£0	£0.00
2041	20	£0	£0	2.527	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.344	£0	£0.00
2042	21	£0	£0	2.653	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.333	£0	£0.00
2043	22	£0	£0	2.786	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.321	£0	£0.00
2044	23	£0	£0	2.925	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.310	£0	£0.00
2045	24	£0	£0	3.072	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.300	£0	£0.00
2046	25	£0	£0	3.225	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.290	£0	£0.00
2047	26	£0	£0	3.386	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.280	£0	£0.00
2048	27	£0	£0	3.556	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.271	£0	£0.00
2049	28	£0	£0	3.733	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.261	£0	£0.00
2050	29	£0	£0	3.920	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.253	£0	£0.00
2051	30	£0	£0	4.116	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.244	£0	£0.00
2052	31	£0	£0	4.322	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.289	£0	£0.00
2053	32	£0	£0	4.538	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.281	£0	£0.00
2054	33	£0	£0	4.765	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.272	£0	£0.00
2055	34	£25,000	£25,000	5.003	£100,079.71	£125,080	£0	£125,080	£0.00	£125,080	£98,050	1.030	0.264	£25,928	£30,854.64
2056	35	£0	£0	5.253	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.257	£0	£0.00
2057	36	£0	£0	5.516	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.249	£0	£0.00
2058	37	£0	£0	5.792	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.242	£0	£0.00
2059	38	£0	£0	6.081	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.235	£0	£0.00
2060	39	£0	£0	6.385	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.228	£0	£0.00
2061	40	£0	£0	6.705	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.221	£0	£0.00
2062	41	£0	£0	7.040	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.215	£0	£0.00
2063	42	£0	£0	7.392	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.209	£0	£0.00
2064	43	£0	£0	7.762	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.203	£0	£0.00
2065	44	£0	£0	8.150	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.197	£0	£0.00
2066	45	£0	£0	8.557	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.191	£0	£0.00
2067	46	£0	£0	8.985	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.185	£0	£0.00
2068	47	£0	£0	9.434	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.180	£0	£0.00
2069	48	£0	£0	9.906	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.175	£0	£0.00
2070	49	£0	£0	10.401	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.170	£0	£0.00
2071	50	£25,000	£25,000	10.921	£248,033.33	£273,033	£0	£273,033	£0.00	£273,033	£214,031	1.030	0.165	£35,270	£41,971.42
2072	51	£0	£0	11.467	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.160	£0	£0.00
2073	52	£0	£0	12.041	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.155	£0	£0.00
2074	53	£0	£0	12.643	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.151	£0	£0.00
2075	54	£0	£0	13.275	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.146	£0	£0.00
2076	55	£0	£0	13.939	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.142	£0	£0.00
2077	56	£0	£0	14.636	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.138	£0	£0.00
2078	57	£0	£0	15.367	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.134	£0	£0.00
2079	58	£0	£0	16.136	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.130	£0	£0.00
2080	59	£0	£0	16.943	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.126	£0	£0.00
2081	60	£0	£0	17.790	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.123	£0	£0.00
2082	61	£0	£0	18.679	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.119	£0	£0.00
2083	62	£0	£0	19.613	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.116	£0	£0.00
2084	63	£0	£0	20.594	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.112	£0	£0.00
2085	64	£0	£0	21.623	£0.00	£0	£0	£0	£0.00	£0	£0	1.030	0.109	£0	£0.00
Total		£75,000	£75,000		£380,413	£455,413	£0	£455,413	£0	£455,413	£357,000			£77,762	£92,537

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.	£75,000
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£455,413
(3)	~~Following the real cost adjustment a quantified risk contribution has been applied.~~	£455,413
(4)	The next stage is to apply optimism bias.	£455,413
(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).	£357,000
(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).	£77,762
(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	£92,537

A part of MGroupServices

Appendix E – TAG Worksheet: Landscape

TAG Landscape Impacts Worksheet

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	The location of the proposed highway scheme is within the LCA of the'Peterborough Fen Fringe'. The landscape surrounding the proposed scheme is characterised by low-lying flat arable farmland, with a small residential area along Newborough Road. Dominant features are the A16 and A47 to east and A15 to the west. The vegetation coverage accompanying the landscape in this area is characterised by hedgerows, scattered trees and tree shelter belts, including those which line local roads. The proposed highway scheme is not located within a statutiry or non-statutory designated area for landscape character or quality, and the predominant land use of the area will not change as a result of the proposed scheme which improves the existing road network.	Locally	At scheme level the landscape is relatively common within the Fens. The main highway routes are common of local infrastructure.	Moderate Local. The proposed scheme lies within a LCA. The main routes within the study area are of high importance for residents and visitors of the City. Policy LP27: Landscape Character of Peterborough Local Plan states that new development in and adjoining the countryside should be located and designed in a way that is sensitive to its landscape setting; retaining, enhancing or restoring the distinctive qualities of the landscape character area and sub area in which it would be situated.	The highway scheme itself would not take anything away from the existing landscape or change the landuse of the area, as proposed works are to the existing highway network.	**Neutral Effect:** The Landscape pattern will not be altered by the scheme.
Tranquility	The scheme is located to the north-east of Peterborough, and has several main roads within the study area, these being the A16 and A47, of which both experience high daily traffic flows. These routes provide key routes for residents / vistors of the city and provide access to wider areas of Crowland and Thorney, then further afield to Kings Lynn. The existing highway network creates visual and audible intrusions on the landscape, however much of the LCA away from these features is open and exposed. The proposed scheme would not impact levels of tranquility in the long-term however construction phases may cause impact.	Locally important routes for the City. Disruption due to the highway network is at a local level.	The level of tranquility is relatively common within the Fens alongside these main roads. Levels of visual, lite and audible intrusion associated with the highway are common within the local wider infrastructure network.	Intrusion is of high importance at a local level, particularly for the residents located along Newborough Road. Likely to worsen as a result of the Norwood and Paston development.	The existing levels of tranqulity would be easily maintained, and potentially imporved over time as vegetation matures. Design improvements could lead to more effective noise attenuation and less intrustive lighting options.	**Slight Adverse Effect.** By improving the operational efficiency of the junction, there is potentuial for the scheme to reduce the visual amentity by increasing the future levels of traffic in the area.
Cultral	The area in which the Norwood scheme lies is the Peterborough Fen Fringe, associated with the history of the Peterborough clay extractions and brick industry. There is a rich cultural heritage in the study area, with the scheme located close proximity to a Scheduled Monumnet.	Locally	Locally rare.	Moderate Local. The proposed scheme lies within a LCA, and close to heritage assets. Policy LP27: Landscape Character of Peterborough Local Plan states that new development in and adjoining the countryside should be located and designed in a way that is sensitive to its landscape setting; retaining, enhancing or restoring the distinctive qualities of the landscape character area and sub area in which it would be situated.	The historic assets are of low substitutability.	**Neutral Effect:** The cultural element of the landscape will not be altered by the scheme.
Landcover	Landcover consists mostly of hedgerows, scattered trees and tree shelter belts, including those which line the local roads. There are no distinctive or unusual trees of particular value at this site. Planting is not unusual to the area and can be seen along the main routes which cross through the study area. Although the trees can be replaced with similar species without difficulty, replacement trees would take some time to reach full maturity	Locally. Screening purpose is present to some degree.	Species for screening trees are typical of surrounding areas on the network.	Moderate importance for their screening function, however are of lower quality.	The scheme will require a degree of vegetation clearence. Replanting can occur without difficulty, but vegetation will need time to reach full maturity. The project will deliver a minimum 10% net gain in biodiversity that would compliment the existing natural features of the study area.	**Slight Adverse Effect.** There is likely going to be vegeation loss associated with the scheme and construction. Lengthy period to re=establish the landcover is needed.

Reference Sources

Step 5 - Summary Assessment Score

Neutral Effect.

Qualitative Comments

The proposed scheme will neutral impact the scale, landform and pattern of the landscape surrounding the Norwood study area. Tranquility associated with improving the operational efficiency may be slightly impacted long-term, however this will be associated in connection with the nearby developments of Norwood and Paston. The likely tree loss along the A16 will be noticeable during and for a time after the works are complete, however vegetation is easily replaced. Replanting measures will allow for no change to landscape in the future. The landscape here is not designated or vulnerable to change.

Appendix F – TAG Worksheet: Historic Environment

TAG Historic Environment Impacts Worksheet

Feature	Step 2 Description	Step 3 Scale it matters	Significance	Rarity	Step 4 Impact
Form	The Norwood study area is not located within a Conservation Area, nor does the site boundary contain any Listed Buildings or designated heritage assets of Parks and Gardens. The closest designated historic asset within a 1km radius of the Norwood study area is the Scheduled Monument Car Dyke (namely the section between Whitepost Road and Fen). The assest is positioned 780m north of the proposed Norwood scheme. Car Dyke is designated for being a 'rare example of a Roman Canal', that is a significant feature within Peterborough's setting. The asset is considered to represent a heritage receptor of high value, representing an important feature of the Roman historical landscape with high archaeological value, through its alignment and function and any deposits that lie within it.	The protection and enhancement of heritage assets is of national concern as set out in the National Planning Policy Framework (NPPF), which sets out to conserve heritage assets in proportion to their significance. Any potential archaeological remains are considered likely to be of local and regional importance.	Buried remains associated with the Scheduled Monument would likely be considered of national significance.	Archaelogical remains in the area is still unknown, but are likely to be relatively 'common' archaeological features for the region.	**Slight Adverse Effect:** Given the distance from the Scheduled Monumnet, it is unlikely that the scheme will directly impact the asset or land surrounding it. Despite this there is potential for buried archaeological remains to be encountered during construction. The scale of this impact is considered minimal due to the nature of the improvement works which are taking place within the confines of the existing Highway infrastructure, which would have likely impacted any buried archaeological remains during the original construction phases of the main routes of A16 / A47. Mitigation could result in an ameliorative outcome, with any remains being recorded prior to removal through implementation of an archaeological watching brief, if required, following consultation with the Peterborough City Council Archaeologist.
Survival	Archaelogical features previously discovered consisted of Early Bronze Age and Post-Medieval. Landuse of the area surrounding the propsed scheme has been significantly altered, following the development of the highway network of the A47 and A16. The survival of any archaeolgical remains since the construction of the parkway is unknown.	The protection and enhancement of heritage assets is of national concern as set out in the National Planning Policy Framework (NPPF), which sets out to conserve heritage assets in proportion to their significance. The condition of heritage assets is a factor to their significance.	If any buried remains were to be uncovered during construction in pockets of undisturbed land, items would likely be considered of national significance.	The condition of the known heritage assets is common locally, as development of the City has been altered.	**Slight Adverse Effect:** Despite the original construction of the A47 / A16 uncovering and excavating extensive archaeological remains, the potential for more intact remains is unknown.
Condition	Heritage assets within the surrounding area of the proposed scheme are documented as maintained. The condition of any remains are unknown but likely to have been impacted previously by the construction of both the highway network.	The protection and enhancement of heritage assets is of national concern as set out in the National Planning Policy Framework (NPPF), which sets out to conserve heritage assets in proportion to their significance. The condition of heritage assets is a factor to their significance.	If any buried remains were to be uncovered during construction in pockets of undisturbed land, items would likely be considered of national significance.	The condition of the known heritage assets is common locally, as development of the City has been altered.	**Slight Adverse Effect:** Despite the original construction of the A47 / A16 uncovering and excavating extensive archaeological remains, the potential for more intact remains is unknown.
Complexity	The complexity of the surviving remains are unknown, but likely to be relatively complex in form if similar to, and potentially associated with, the remains excavated in the Scheduled Monument Area in the past.	The protection and enhancement of heritage assets is of national concern as set out in the National Planning Policy Framework (NPPF), which sets out to conserve heritage assets in proportion to their significance. The complexity of heritage assets is a factor to their significance.	Buried remains associated with the Scheduled Monument would likely be considered of national significance.	Archaelogical remains in the area unknown, but are likely to be relatively 'common' archaeological features for the region.	**Neutral Effect:** The scheme would have a neutral impact on the complexity of the heritage assets.
Context	The norwwod study area is characterised by the highway network facilitating the flow of traffic of residents, workers and visitors between the City and beyond towards Wisbech and Kings Lynn. This layout of the highway network is common and found elsewhere in Peterborough. The landscape surrounding the study area is laregly flat low-lying arable farmland, which is open and exposed. The highway network does provide intrusion on the landscape of the area.	The context of heritage assets is a consideration at all levels.	The context is of locally common.	The context is fairly uncommon in Peterborough.	**Neutral Effect:** The historic environment largley remains the same, given the works remain within the existing highway boundary and previously disturbed archaeological land. If any new discoveries during proposed works were to be discovered, the impact on items would be mitigated against by methods of works / watching briefs etc.
Period	Historic records have shown findings from the early Bronze Age and Post Medieval period.	Policy LP19 details the council's position in terms of the city's historic environment. It states the council recognised that the historic environment plays an important role in the quality of life for local communities and will protect, conserve and seek opportunities to enhance the city's rich heritage and their settings.	The heritage assets are locally significant because they could provide an understanding of the Medieval / Post Medieval development of the region.	If archaeological remains were to be uncovered it would be of local and regional importance, furthering the historic records of the area.	**Neutral Effect:** The historic environment largley remains the same, given the works remain within the existing highway boundary and previously disturbed archaeological land. If any new discoveries during proposed works were to be discovered, the impact on items would be mitigated against by methods of works / watching briefs etc.

Reference Sources

Step 5 - Summary Assessment Score

Slight Adverse Impact.

Qualitative Comments

The archaeological potential of the surrounding area is relatively high but this is in part reduced due to the scale of the highway network within the vicinity of the scheme at present. 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. At this stage with mitigations not confirmed for construction, the result is a slight adverse effect, however this can be managed in the next phase of work.

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Appendix G – TAG Worksheet: Biodiversity

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**
Nene Washes SPA, SSSI and Ramsar	The Nene Washes is a 15 square km Ramsar internationally important wetland site, a Special Area of Conservation, a Special Protection Area and a Nature Conservation Review site. The site is almost entirely lowland wet grassland managed primarily for breeding waders, which involves grazing and mowing to maintain a short and varied sward. There are swampier areas which support nesting cranes and spotted crakes. Reeds and trees are discouraged. The Nene Washes internationally designated site for nature conservation lies within 5km of the proposed works to the south.	**International**	**Very High** The Nene Washes is a SSSI of local, regional, national and international importance, supporting Wildfowl and wadering birds, invertebrate and botanical species. It accommodates nationally and internationally important groups of migratory, breeding and non-breeding bird species.	**Monitored Species - Above target levels** The Natural England report known as The European Site Conservation Objectives: supplementary advice on conserving and restoring site features for the Nene Washes Special Protection Area (SPA) was published in January 2019. Attributes for each ecological characteric of the designated species and habitats are described, with qualitative and quantitative targets set. As of 2019/2020, there has been a substantial decline in Bewick's swans. The population of the other species are above the target levels. A summary of the population trends for these species is shown in the Addendum to this Worksheet. No data is available for 2020/2021.	**Very High** High importance and rarity, international scale and limited potential for substitution. Nationally designated site	**Neutral** This proposed works are not within the SSSI, and no impact should be proposed.	**Neutral**
Dogsthorpe Star Pit Site of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR) Site within the immediate Impact Risk Zone for the SSSI	Dogsthorpe Star Pit SSSI and LNR spans an area of 37ha and is comprised of a landscape that contains a variety of habitats including scrub, grassland, reedbeds, and network of small pools and open water. The site is a former clay pit associated with the brick industry of Peterborough. The site is designation under the Wildlife and Countryside Act (1981), for its diverse aquatic invertebrate assemblage including 64 species of Water Beetle (5 of which are nationally rare and a further 35 nationally scarce), and high array of plant communities which are rare across Cambridgeshire . The importance of the site is considered on a national scale. The proposed scheme is located 50m away from the SSSI	**International / National**	**Very High** The SSSI is of local, regional, national and international importance, supporting a host of species recognised as nationally scarare / rare, and holds high importance within the local area of Cambrisgeshire.	**Unknown** No trend data is evident for this location. The proposed scheme is located within an immediate impact zone for the SSSI, so potential for impact is present. The proposed works are however defined within the existing highway boundary.	**Very High** High importance and rarity, international scale and limited potential for substitution. Nationally designated site	**Minor Negative:** This proposed works are not within the boundary of the SSSI, however works are within an immediate impact zone. Proposed works located 50m away from the site at cloest point/.	**Slight Adverse**
Littlewood County Wildlife Site (CWS)	The CWS lies immediately east of the Dogsthorpe Star Pit SSSI, and is designated for its Ancient Semi Natural Woodland. The site provides a buffer of protection for the SSSI.	**National**	**High** The CWS holds importance on national and local scale, providing a buffer zone for the SSSI, and ancient woodland.	**Unknown** No trend data is evident for this location. The proposed scheme is located within an immediate impact zone for the SSSI, so potential for impact is present. The proposed works are howeverdefined within the existing highway boundary.	**High**	**Neutral** This proposed works are located over 1km away from the CWS, no impact is expected.	**Neutral**
Birds (Protected Species)	Protect species. The proposed working area has potential to impact breeding / nesting bitrds. Localised areas of existing vegetation were identified to provide food and nesting opportunities for common bird species. It's 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).	**International**	**Very High** 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**	**Minor Negative:** Localised areas of existing vegetation were identified to provide food and nesting opportunities for common bird species. It's expected that vegetation supporting breeding birds will be removed to enable the proposed works to be undertaken.	**Slight Adverse**
Bats (Protected Species)	The site has negligible potential for hosting bats. Suitable trees were assessed during the site visit, however a lack of suitable features (e.g. cracks/crevices) were observed. Despite negligible potential for bats, wider habitats surrounding the proposed scheme area such as linear hedgerows, grassland and woodland do provide potential commuting and foraging habitats for bats. Additionally, 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	**National**	**High** 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).	**Stable** The National Bat Monitoring Programme (NBMP) produce population trends for 11 of Great Britain's breeding bat species. All are considered to have been stable or to have increased since the baseline year of monitoring (1999 for most species).	**High**	**Minor Negative** Should vegetation removal be required, the proposed works may disturb features that are suitable for bats. The construction and final design may impact foraging and commuting bats as well as provide issues of light dispersal.	**Slight Adverse**
Amphibians (Protected Species)	The propsoed working area has moderate potential to host Great Crested Newts (GCN's). The proposed scheme site lies within Amber and Green Risk Zones for the protected species of GCN's. These zones indicate population centres for the species and comprise of connecting habitats which aid natural dispersal. The proposed scheme is not expected to result in any loss of habitat such as ponds that could sustain GCN populations, however with suitable foraging and commuting habitats identified for the species, it is considered a Precautionary Method of Working (PMoW) for GCN'S should be implemented, whereby any habitat manipulation is 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. Further assessments into GCN's will be reassessed within the next	**International**	**Very High** GCN are protected under Annexe II and IV of the Habitats Directive, Conservation of Habitats and Species Regulations (Schedule 2), and the Wildlife and Countryside Act (1981) (Schedule 5).	**Decline** GCNs have suffered enormous declines with 50% of ponds in the UK lost in the 20th century and 80% of current ponds in a poor state. The population baseline estimate given for the site is that from the 2014 occupancy modelling work undertaken by Froglife, commissioned by Natural England. Data records within the vicinity of the SSSI, dating back to 2001 have indicated varying levels of the species over the years within the locality of the scheme, however 2018 / 2019 survey data (provided by CPERC) have indicated a presence of GCN's associated with the SSSI ponds.	**Very High** GCN are a protected species.	**Minor Negative:** The proposed works are not within the boundary of the SSSI, however works have the potential to impact the suitable foraging and commuting terrestrial habitats for GCN's.	**Slight Adverse**
Common Reptiles	The site has moderate potential to host basking and foraging reptiles. The site has been assessed as providing potential opportunities to support common reptile species, within grasslands and scattered scrub along the A16 verges and the bridleway. To avoid any potential adverse impact on reptiles if found, works should 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.	**International**	**Very High** Retiles are protected under the Wildlife and Countryside Act (1981) (Schedule 5).		**Very High** Reptiles are a protected species.	**Minor Negative:** The proposed works are not within the boundary of the SSSI, however works have the potential to impact the suitable foraging and commuting terrestrial habitats for common reptiles.	**Slight Adverse**

Reference Sources

Summary Assessment Score

Slight Adverse Effect.

Qualitative Comments

The proposed works is located within the Impact Risk Zone of the SSSI, and within a Amber / Green Zone for the protected species of GCN's. At this stage of the project, it is expected that a degree of impact will be placed upon already identified species within an ecological constraints reports (undertken November 2021), with species including common birds, bats, GCN's and wider common reptiles. A precautionary method of works is recommended at this stage, as well as avoiding particular seasons i.e bird breeding season etc.

The scheme is required to deliver a minimum of 10% biodiversity net gain.

Appendix H – TAG Worksheet: Water Environment

TAG Water Environment Impacts Worksheet

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Flood Risk	Floodplain	Conveyance of flood flows	Low: The study area is within Flood Zone 1, low probability for flooding.	Local	Common	Not feasible	Low	Negligible	Insignificant

Reference Sources

Summary Assessment Score

Neutral Impact

Qualitative Comments

The risk to water quality and surface water across the study area is low. The study area is located within a Flood Risk zone 1, low probability for flooding. The construction activities and the new scheme in operation are considered to have an insignificant impact on water features beyond the study area. Mitigation measures outlined within a CEMP will further prevent any adverse impact on key features. Operational drainage will be designed to ensure there will be no additional flood risk from surface water runoff.

Appendix I – TAG Worksheet: Air Quality Valuation

Air Quality Valuation Workbook - Worksheet 3

Scheme Name:	A16 Peterborough
Present Value Base Year	2010
Current Year	2022
Proposal Opening year:	2031
Project (Road/Rail or Road and Rail):	Road Transport (RT)

<u>Overall Assessment Score:</u>

Damage Costs Approach (Emissions)

Present value of change in NOx emissions (£):	£0
Present value of change in PM2.5 emissions (£):	£0
<u>OR</u>	
Present value of change in PM10 emissions (£):	£0

Impact Pathways Approach (Concentrations)

Present value of change in NO2 concentrations (£):	-£5,278
<u>Of which:</u>	
Concentration costs:	-£3,306
Other impacts:	-£1,972
Present value of change in PM2.5 concentrations (£):	-£48,255
Of which:	
Concentration costs:	-£48,407
Other impacts:	£152

Total Change

Total value of change in air quality (£):	-£53,533

*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)	501.59
Change in PM2.5 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	936.86

Damage Costs Approach (Emissions)

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

Qualitative Comments:

Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):	-£169,680
Lower estimate net present value of change in air quality (£):	-£11,099

Data Sources:

Appendix J – TAG Worksheet: Noise

Noise Workbook - Worksheet 1

Proposal Name: A16 Norwood

Present Value Base Year	2010
Current Year	2022
Proposal Opening year:	2026
Project (Road, Rail or Aviation):	road

Net present value of change in noise (£):	£47,995

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

Net present value of impact on sleep disturbance (£):	£23,657
Net present value of impact on amenity (£):	£16,045
Net present value of impact on AMI (£):	£5,092
Net present value of impact on stroke (£):	£1,278
Net present value of impact on dementia (£):	£1,925

Quantitative results

Households experiencing increased daytime noise in forecast year:	1
Households experiencing reduced daytime noise in forecast year:	2
Households experiencing increased night time noise in forecast year:	n/a
Households experiencing reduced night time noise in forecast year:	n/a

Qualitative Comments:

An outline application (19/00272/OUT) for the erection of up to 870 residential dwellings; provision of a two-form entry primary school and playing field; a local centre up to 0.25ha with A1/A2/A3/A4/A5/D1 use classes; open space and landscaping; and other infrastructure and associated works including demolition of all buildings on site, with access secured and all other matters reserved is planned at Land off Newborough Road, Leed's Farm, Paston, Peterborough. The development is planned in an area where noise levels changes are predicted to be negligible but for the reduction in the immidiacy of Newborough Road due to the closure of the juntion of this road with the A47. Due to the uncertainty linked to the traffic links between the development and the current road network as well as the fact that most of the site is in an area where noise levels changes are predicted to be negligible, a valuation of £0 is considered for the new development.

Data Sources:

Road traffic model produced by Capita.

Appendix K – TAG Worksheet: Appraisal Summary Table (AST)

Appraisal Summary Table

Date produced:		
Contact:		
Name		
Organisation		
Role		

Name of scheme:	A16 Norwood Improvement Scheme
Description of scheme:	A scheme with both highway and active travel improvements to help facilitate growth aspirations of the Norwood and Paston urban extensions to the north-east of Peterborough. Additional highway capacity will address issues of delay and congestion on strategic routes, whilst active travel provision will better connect the future development to the wider network limiting severance for users.

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 journeys within 5 minutes.	Value of journey time changes(£): £4,836,000 Net journey time changes (£): 0 to 2min £1,538,000; 2 to 5min £3,250,000; > 5min £48,000	Not Assessed	£4,837,000	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	No Noise Important Areas (NIA) are defined within the study area. No significant adverse effects are expected during the operation of the proposed scheme, with receptors closest to the scheme predicted to have less than 3 dB LA10 change in the long term. No noise or vibration mitigation measures are envisaged to be required for the operational phase of the proposed scheme, and no properties qualify for insulation under the Noise Insulation Regulations 1975.	Not Assessed	Not Assessed	£47,995	Not Assessed
	Air Quality	Dispersion modelling has been carried out to predict the impact of future traffic-related exhaust emissions. Following the assessment completion, the A16 Norwood scheme is predicted to have a negligible impact on NO2, PM10 and PM2.5 concentrations, and all existing receptors considered in the assessment. The overall effect of A16 Norwood operation on air quality is therefore considered to be not significant.	Not Assessed	Not Assessed	-£68,158	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.	Change in non-traded carbon over 60y (CO2e): -60 Change in traded carbon over 60y (CO2e): -6,672	Not Assessed	£505	
	Landscape	The scheme is not in conflict with policies relating to the protection or enhancement of the landscape. The proposed highway scheme is not located within a statutiry or non-statutory designated area for landscape character or quality, and the predominant land use of the area will not change as a result of the proposed scheme which improves the existing road network.	Not Assessed	Neutral Effect	Not Assessed	
	Townscape	Following an audit of Townscape, this category was considered out of the scope of the project.	Not Assessed	Not Assessed	Not Assessed	
	Historic Environment	The study area is not located within a Conservation Area, nor does the site boundary contain any Listed Buildings or designated heritage assets of Parks and Gardens. However, does contain a Scheduled Monument 'Car Dyke' 780 north of the proposed scheme. The archaeological potential of the surrounding area is relatively high but this is in part reduced due to the scale of the development to the highway network within the vicinity of the scheme at present. 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.	Not Assessed	Slight Adverse (negative) Effect	Not Assessed	
	Biodiversity	The proposed works is located within an Impact Risk Zone of a SSSI, and within a Amber / Green Zone for the protected species of GCN's. At this stage of the project, it is expected that a degree of impact will be placed upon already identified species (as reported within an ecological constraints reports, undertken November 2021), with species including common birds, bats, GCN's and wider common reptiles. Therefore, the assessment score at this time is slight adverse in the absence of appropriate mitigations. Subject to further design work at next stage.	Not Assessed	Slight Adverse (negative) Effect	Not Assessed	
	Water Environment	The study area is located within a Gflood Risk zone 1; low probability of flooding. The proposed scheme will have no significant impact on wider waterbody catchment areas or features byond the study area. Operational drainage will be designed to ensure there will be no additional flood risk from surface water runoff.	Not Assessed	Neutral Effect	Not Assessed	
Social	Commuting and Other users	The scheme will result in a net reduction in journey times for commuting and other users over a 60-year appraisal period for all time periods. The most significant benefits are experienced for journeys within 5 minutes.	Value of journey time changes(£): £9,404,000 Net journey time changes (£): 0 to 2min £1,167,000; 2 to 5min £8,257,000; > 5min -£20,000	Not Assessed	£9,403,000	Not Assessed
	Reliability impact on Commuting and Other users	Not Assessed	Not Assessed	Not assessed	Not Assessed	
	Physical activity	To be assessed at next phase				
	Journey quality	To be assessed at next phase				
	Accidents	Accident savings have been assessed using COBALT v2.2 for all links and junctions within the study area based on default accident rates and modelled 24-hour AADT flows. The scheme has been estimated to result in a reduction in accidents and casualties over a 60-year appraisal period.	COBALT estimates the scheme would result in a reduction of 186.7 accidents over a 60-year appraisal period. There would be a reduction of two fatal, 21.9 serious and 253.6 slight casualties.	Not assessed	£7,093,000	Not Assessed
	Security	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
	Access to services	A reduction in journey times along the A16 and A47 is expected to improve bus service reliability between the Leeds Farm and Norwood sites, and the city centre, as well for the existing First Norfolk and Suffolk service.	Not Assessed		Not Assessed	Not Assessed
	Affordability	Not Assessed	Not Assessed		Not Assessed	Not Assessed
	Severance	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
	Option and non-use values	Not Assessed	Not Assessed	Not Assessed	Not Assessed	
Public Account	Cost to Broad Transport Budget	The Cost to Broad Transport Budget incorporates real cost increases, risk assessment, and optimism bias at 23%.			£7,254,000	
	Indirect Tax Revenues				-£512	

Appendix L – Financial Dimension 60 Year Cost Profile

A16 Norwood - Do Something Scheme Costs for Input to Financial Case

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)	Inflated Whole Life Costs	Total (Including Whole Life Costs)
2022	1	£0	£0	£0	£627,547	£64,632	**£692,179**	£0	**£692,179**	0.000	£0.00	**£692,179**	£0	**£692,179**
2023	2	£0	£0	£0	£506,114	£193,895	**£700,009**	£0	**£700,009**	1.100	£70,000.91	**£770,010**	£0	**£770,010**
2024	3	£2,079,940	£0	£0	£332,342	£83,819	**£2,496,102**	£586,652	**£3,082,753**	1.210	£647,378.19	**£3,730,131**	£0	**£3,730,131**
2025	4	£4,159,881	£0	£0	£411,626	£70,691	**£4,642,198**	£1,173,304	**£5,815,502**	1.331	£1,924,931.15	**£7,740,433**	£0	**£7,740,433**
2026	5	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.398	£0.00	**£0**	£0	**£0**
2027	6	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.467	£0.00	**£0**	£0	**£0**
2028	7	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.541	£0.00	**£0**	£0	**£0**
2029	8	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.618	£0.00	**£0**	£0	**£0**
2030	9	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.699	£0.00	**£0**	£0	**£0**
2031	10	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.784	£0.00	**£0**	£0	**£0**
2032	11	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.873	£0.00	**£0**	£0	**£0**
2033	12	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.966	£0.00	**£0**	£0	**£0**
2034	13	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.065	£0.00	**£0**	£0	**£0**
2035	14	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.168	£0.00	**£0**	£0	**£0**
2036	15	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.276	£0.00	**£0**	£0	**£0**
2037	16	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.390	£0.00	**£0**	£0	**£0**
2038	17	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.510	£0.00	**£0**	£0	**£0**
2039	18	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.635	£0.00	**£0**	£57,300	**£57,300**
2040	19	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.767	£0.00	**£0**	£0	**£0**
2041	20	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.905	£0.00	**£0**	£0	**£0**
2042	21	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.051	£0.00	**£0**	£0	**£0**
2043	22	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.203	£0.00	**£0**	£0	**£0**
2044	23	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.363	£0.00	**£0**	£0	**£0**
2045	24	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.532	£0.00	**£0**	£0	**£0**
2046	25	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.708	£0.00	**£0**	£0	**£0**
2047	26	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.894	£0.00	**£0**	£0	**£0**
2048	27	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.088	£0.00	**£0**	£0	**£0**
2049	28	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.293	£0.00	**£0**	£0	**£0**
2050	29	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.507	£0.00	**£0**	£0	**£0**
2051	30	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.733	£0.00	**£0**	£0	**£0**
2052	31	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.969	£0.00	**£0**	£0	**£0**
2053	32	£0	£0	£0	£0	£0	**£0**	£0	**£0**	5.218	£0.00	**£0**	£0	**£0**
2054	33	£0	£0	£0	£0	£0	**£0**	£0	**£0**	5.479	£0.00	**£0**	£0	**£0**
2055	34	£0	£0	£0	£0	£0	**£0**	£0	**£0**	5.753	£0.00	**£0**	£125,080	**£125,080**
2056	35	£0	£0	£0	£0	£0	**£0**	£0	**£0**	6.040	£0.00	**£0**	£0	**£0**
2057	36	£0	£0	£0	£0	£0	**£0**	£0	**£0**	6.342	£0.00	**£0**	£0	**£0**
2058	37	£0	£0	£0	£0	£0	**£0**	£0	**£0**	6.659	£0.00	**£0**	£0	**£0**
2059	38	£0	£0	£0	£0	£0	**£0**	£0	**£0**	6.992	£0.00	**£0**	£0	**£0**
2060	39	£0	£0	£0	£0	£0	**£0**	£0	**£0**	7.342	£0.00	**£0**	£0	**£0**
2061	40	£0	£0	£0	£0	£0	**£0**	£0	**£0**	7.709	£0.00	**£0**	£0	**£0**
2062	41	£0	£0	£0	£0	£0	**£0**	£0	**£0**	8.094	£0.00	**£0**	£0	**£0**
2063	42	£0	£0	£0	£0	£0	**£0**	£0	**£0**	8.499	£0.00	**£0**	£0	**£0**
2064	43	£0	£0	£0	£0	£0	**£0**	£0	**£0**	8.924	£0.00	**£0**	£0	**£0**
2065	44	£0	£0	£0	£0	£0	**£0**	£0	**£0**	9.370	£0.00	**£0**	£0	**£0**
2066	45	£0	£0	£0	£0	£0	**£0**	£0	**£0**	9.839	£0.00	**£0**	£0	**£0**
2067	46	£0	£0	£0	£0	£0	**£0**	£0	**£0**	10.331	£0.00	**£0**	£0	**£0**
2068	47	£0	£0	£0	£0	£0	**£0**	£0	**£0**	10.847	£0.00	**£0**	£0	**£0**
2069	48	£0	£0	£0	£0	£0	**£0**	£0	**£0**	11.390	£0.00	**£0**	£0	**£0**
2070	49	£0	£0	£0	£0	£0	**£0**	£0	**£0**	11.959	£0.00	**£0**	£0	**£0**
2071	50	£0	£0	£0	£0	£0	**£0**	£0	**£0**	12.557	£0.00	**£0**	£273,033	**£273,033**
2072	51	£0	£0	£0	£0	£0	**£0**	£0	**£0**	13.185	£0.00	**£0**	£0	**£0**
2073	52	£0	£0	£0	£0	£0	**£0**	£0	**£0**	13.844	£0.00	**£0**	£0	**£0**
2074	53	£0	£0	£0	£0	£0	**£0**	£0	**£0**	14.536	£0.00	**£0**	£0	**£0**
2075	54	£0	£0	£0	£0	£0	**£0**	£0	**£0**	15.263	£0.00	**£0**	£0	**£0**
2076	55	£0	£0	£0	£0	£0	**£0**	£0	**£0**	16.026	£0.00	**£0**	£0	**£0**
2077	56	£0	£0	£0	£0	£0	**£0**	£0	**£0**	16.828	£0.00	**£0**	£0	**£0**
2078	57	£0	£0	£0	£0	£0	**£0**	£0	**£0**	17.669	£0.00	**£0**	£0	**£0**
2079	58	£0	£0	£0	£0	£0	**£0**	£0	**£0**	18.552	£0.00	**£0**	£0	**£0**
2080	59	£0	£0	£0	£0	£0	**£0**	£0	**£0**	19.480	£0.00	**£0**	£0	**£0**
2081	60	£0	£0	£0	£0	£0	**£0**	£0	**£0**	20.454	£0.00	**£0**	£0	**£0**
2082	61	£0	£0	£0	£0	£0	**£0**	£0	**£0**	21.477	£0.00	**£0**	£0	**£0**
Total		**£6,239,821**	**£0**	**£0**	**£1,877,629**	**£413,037**	**£8,530,488**	**£1,759,955**	**£10,290,443**		**£2,642,310**	**£12,932,753**	**£455,413**	**£13,388,167**

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.	**£8,530,488**
(2)	The base costs have been adjusted to incorporate risk.	**£10,290,443**
(3)	The risk adjusted costs have been adjusted to incorporate increases in construction costs.	**£12,932,753**
(4)	The inflated risk adjusted costs have been adjusted to incorporate whole life costs.	**£13,388,167**

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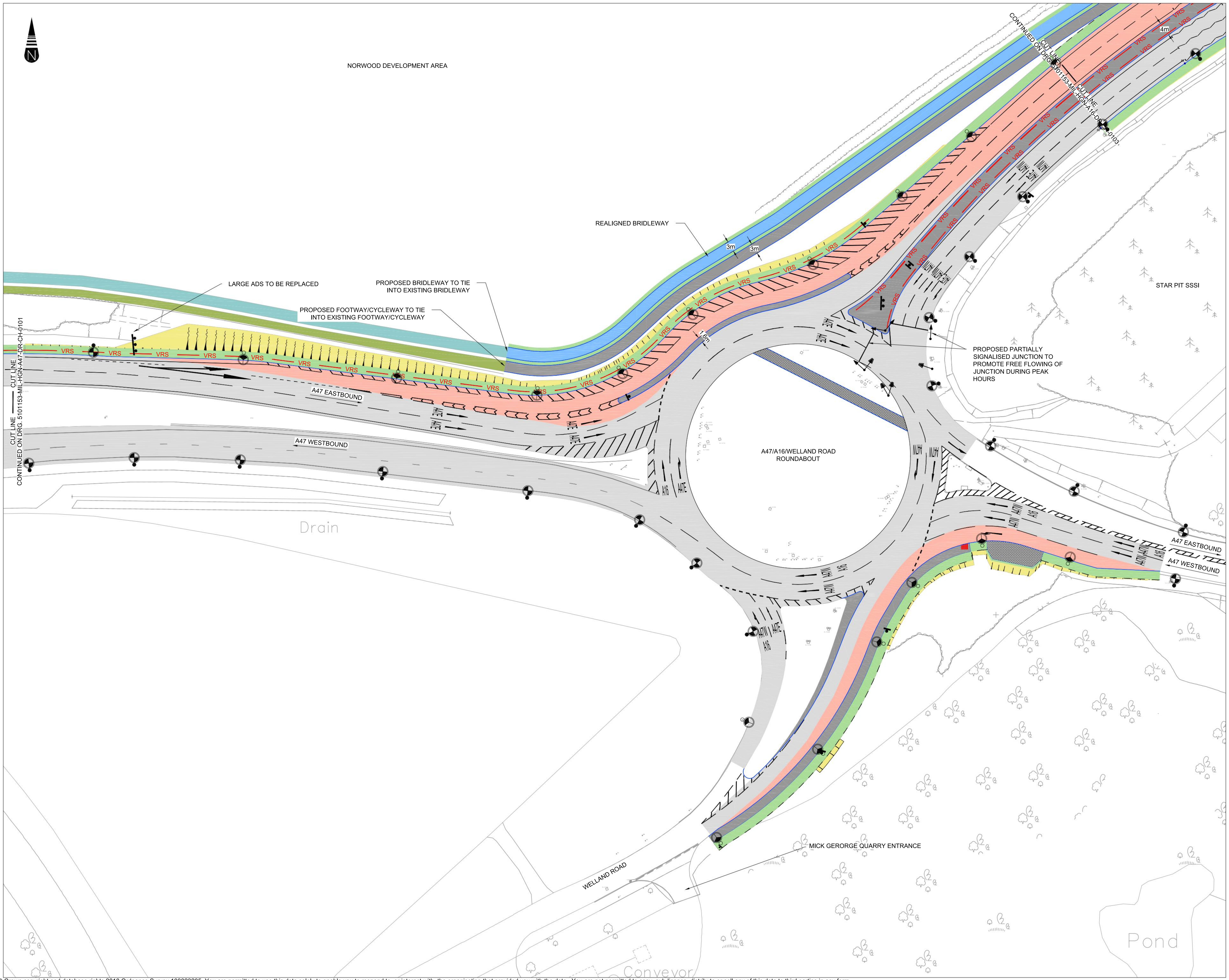
Appendix M – Scheme General Arrangement (GA) Drawings



KEY

- EXISTING CARRIAGEWAY
- PROPOSED CARRIAGEWAY
- PROPOSED CENTRAL RESERVE / TRAFFIC ISLAND / REALIGNED SHARED-USE FOOTWAY/CYCLEWAY
- PROPOSED HIGHWAY VERGE
- PROPOSED EARTHWORKS (1:3 TIE IN)
- EXISTING BRIDLEWAY
- PROPOSED BRIDLEWAY
- PROPOSED MAINTENANCE HARDSTANDING
- PROPOSED TACTILE PAVING
- PROPOSED KERBLINE
- PROPOSED ROAD MARKING
- VRS PROPOSED VRS
- PROPOSED LIGHTING COLUMN
- EXISTING LIGHTING COLUMN
- PROPOSED TRAFFIC SIGN
- INDICATIVE STUB POLE / 4m POLE
- PROPOSED TRAFFIC SIGNAL HEAD

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL MEASUREMENTS SHOWN ARE IN METRES UNLESS STATED OTHERWISE.
3. SITE VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
4. REPORT ALL DISCREPANCIES TO THE DRAWING ORIGINATOR IMMEDIATELY.
5. FOR DETAILS OF PROPOSED STREET LIGHTING, REFER TO DRAWINGS 5080930-MIL-HLG-OR-DR-EO-1301 TO 1303

Rev	Date	Description	Drn	Chkd	App
P02	21/01/2022	Layout updated with current design	JE	DMB	SPW
P01	21/12/2021	First Issue	-	-	-

Revisions

Drawing Originator

Peterborough Highway Services

Delivered by MILESTONE · PETERBOROUGH CITY COUNCIL

Drawing Status

PRELIMINARY DESIGN

Project Name

A16 NORWOOD IMPROVEMENT SCHEME
A47 - A16 ROUNDABOUT

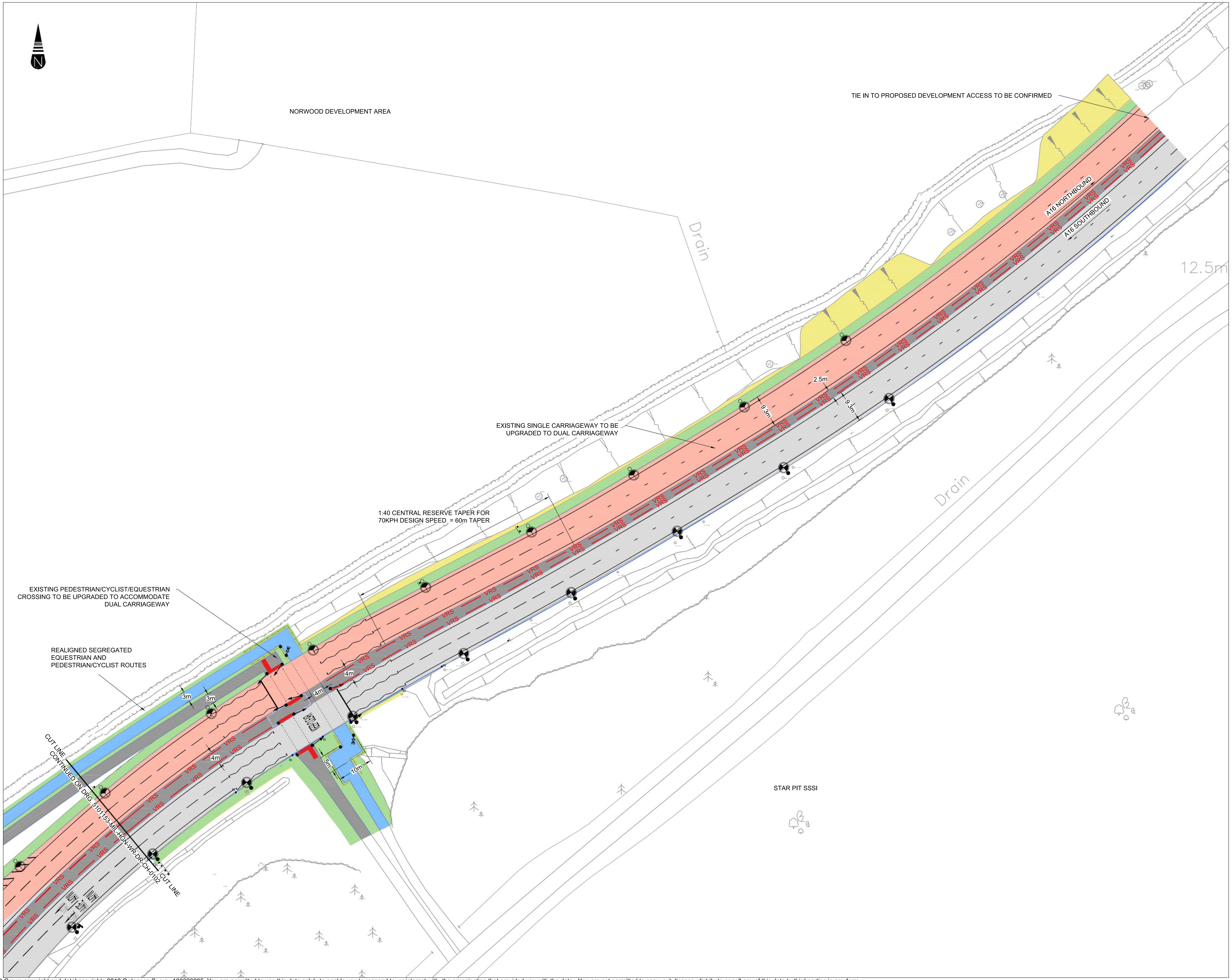
Title

GENERAL ARRANGEMENT SHEET 2 OF 3

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:500	JE	JS	SPW
		Drawn Date 21/12/2021	Checked Date 21/12/2021	Approved Date 21/12/2021

Drawing Number	Status	Rev
5101153-MIL-HGN-WR-DR-CH-0102	S2	P02

File printed: 21 January 2022 15:18:20 File location: P:\Central Functions\ESol\06 Peterborough Highways\5101153 A16 Norwood Improvement Scheme\8 CAD\8.3 Preliminary\8.3.1 DWG\5101155 A47-A16-WR Rndbt\100\5101153-MIL-HGN-WR-DR-CH-0102 - GA RevB.dwg Printed by: Elliott, Jordan



KEY:

- EXISTING CARRIAGEWAY
- PROPOSED FULL DEPTH CARRIAGEWAY CONSTRUCTION
- PROPOSED RE-ALIGNED BRIDLEWAY
- PROPOSED CENTRAL RESERVE / REALIGNED SHARED-USE FOOTWAY/CYCLEWAY
- PROPOSED HIGHWAY VERGE
- PROPOSED EARTHWORKS (1:3 TIE IN)
- PROPOSED KERBLINE
- PROPOSED TACTILE PAVING
- VRS PROPOSED VEHICLE RESTRAINT SYSTEM
- PROPOSED PEDESTRIAN GUARDRAIL
- PROPOSED POST AND RAIL WOODEN FENCING
- PROPOSED ROAD MARKING
- INDICATIVE STUB POLE / 4m POLE
- PROPOSED TRAFFIC SIGNAL HEAD
- PROPOSED TRAFFIC SIGN
- PROPOSED LIGHTING COLUMN
- EXISTING LIGHTING COLUMN

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
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5. FOR DETAILS OF PROPOSED STREET LIGHTING, REFER TO DRAWINGS 5080930-MIL-HLG-OR-DR-EO-1301 TO 1303

Rev	Date	Description	Drn	Chk'd	App
P02	21/01/2022	Layout updated with current design	JE	DMB	SPW
P01	21.12.21	First Issue	-	-	-

Revisions

Peterborough Highway Services
Delivered by MILESTONE
PETERBOROUGH CITY COUNCIL

Drawing Status
PRELIMINARY DESIGN

Project Name
A16 NORWOOD IMPROVEMENT SCHEME
A16 DUALLING

Title
GENERAL ARRANGEMENT
SHEET 3 OF 3

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:500	CJ	JS	SPW
		Drawn Date 21.12.21	Checked Date 21.12.21	Approved Date 21.12.21

Drawing Number	Status	Rev
5101153-MIL-HGN-A16-DR-CH-0103	S2	P02

File Plotted: 21 January 2022 15:21:20 File location: P:\Central Functions\ESol\06 Peterborough Highways\5101153 A16 Norwood Improvement Scheme\8 CAD\8.3 Preliminary\8.3.1 DWG\5101154 A16 Dualling\100\5101153-MIL-HGN-A16-DR-CH-0103-P01 - GA RevB.dwg Printed by: Elliott, Jordan

Appendix N – Benefits Realisation Plan

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Delivering what we **promise**

A16 Norwood, Peterborough

Benefits Realisation Plan

Document Control

Job Number: 5080930						
Document ref: A16 Norwood Benefits Realisation Plan					Authorised	
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
1.0	First Report	HP	RMJ	RMJ	RMJ	31/05/2022

Delivering what we **promise**

MILESTONE INFRASTRUCTURE
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Contents

Tables

Figures

No Figures.

Delivering what we **promise**

1. Introduction

1.1 Background

1.1.1 The purpose of this outline Benefits Realisation Plan is to support the A16 Norwood Outline Business Case (OBC).

1.2 Purpose of This Document

1.2.1 The DfT 'Transport Business Cases' guidance published in February 2022 states the Benefits Realisation Plan should set out the approach to managing the realisation of benefits. The guidance specifies that the Benefits Realisation Plan is outlined at the Outline Business Case (OBC) stage and completed at the Full Business Case (FBC) stage[1].

1.2.2 The 'Guide to Developing the Project Business Case' (2018)[2] states a Benefits Realisation Plan should 'set out a framework for the identification of potential benefits, their planning, modelling and tracking', whilst assigning responsibilities for the realisation of benefits throughout key phases of the project's lifespan'. The Green Book (2022)[3] states all major projects must capture the realisation of benefits within a **'benefits register',** a tool for aiding the implementation and operational management of a project. The benefits register template provided within this guidance 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] Transport business case guidance - GOV.UK (www.gov.uk)
[2] Guide to developing the Project Business Case (publishing.service.gov.uk)
[3] The Green Book (2022) - GOV.UK (www.gov.uk)

1.3 Document Structure

1.3.1 This document is structured as follows:

- **Chapter 2:** Provides information relating to the scheme objectives
- **Chapter 3:** Contains the benefits register for the A16 Norwood Improvement Scheme.

2. Scheme Objectives

2.1.1 The objectives of for A16 Norwood improvement scheme were developed during the Strategic Outline Case (SOC), ahead of the initial Option Development phase of the project. The project objectives are based on goals and outcomes of local policy documents and have provided a framework in which potential options have been scored and developed further as the business case process progresses.

2.1.2 Although the objectives devised within the SOC pre-date those of the CPCA, in should be noted that 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 A16 Norwood Improvement Scheme are listed beneath:

2.1.3 Primary objectives include:

1. **Tackle congestion and improve journey times:** Tackle congestion and reduce delay along the A16 and on the primary approaches to the A16 / A47 / Welland Road Roundabout
2. **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth at Norwood can be realised
3. **Limit impact on the local environment and improve biodiversity**: Fully mitigate any adverse environmental impacts of a scheme, and ensure a 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.

2.1.4 Secondary objectives include:

5. **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around the A16 corridor, such as the A47, A15 Paston Parkway, A1139 Eye Road and Newborough Road.
6. **Improve road safety:** Reduce accidents and improve personal security for all travellers within the study area.

2.1.5 The scheme objectives above relate to the benefits that the proposed intervention schemes of the A16 Norwood project seek to realise.

3. Benefits Register

3.1.1 The benefits register for the A16 Norwood Improvement Scheme is provided in Table 3.1, overleaf.

3.1.2 It should be noted that the benefits register has been completed to an 'outline' level at this stage of work in accordance with the DfT guidance on 'Transport Business Cases (2022) The benefits register will be updated to a 'completed' state at the FBC stage, along with the remainder of the Benefits Realisation Plan requirements.

Table 3.1: A16 Norwood Improvement Scheme Benefits Register

Benefit	Benefit Category and Class	Description	Service Feature	Potential Costs	Activities Required	Responsible Officer	Performance Measure	Target Improvement	Full Year Value	Timescale
Reduced congestion and Improved journey times	Monetised journey time savings	Enhanced network performance	Implementation of new highways infrastructure / mitigations at the A16 / A47 / Welland Road Roundabout and adjoining A16 and A47 strategic routes	**TBC**			Will contribute to objective 1	TBC – scope of this benefit to be quantified using traffic modelling	**TBC**	
Planned housing and employment growth	Wider social benefits (improved availability of housing and employment)	Realisation of local plan housing and employment growth ambitions	Improved highways capacity as a result of the implementation of improved highways infrastructure, to facilitate traffic growth on the transport network	**TBC**			Will contribute to objective 2	**TBC**	**TBC**	
Improved air quality	Environmental benefits; wider social benefits (improved population health)	Improved air quality in future years	Reduction in emissions from vehicles as a result of reduced congestion, due to improved highways infrastructure.	**TBC**			Will contribute to objective 3	**TBC**		
Achievement of biodiversity net gain	Environmental benefits; wider social benefits (improved population health)	Increase in the scale of replanting and environmental mitigations onsite in the future	Implementation of replanting, environmental enhancements across the site area including wildflower enhancement areas and linear planting along the A16	**TBC**	Successful delivery of the A16 Norwood improvement schemes.	Peterborough City Council (PCC) / Cambridgeshire, Peterborough Combined Authority (CPCA)	Will contribute to objective 3	**TBC**	**TBC**	Benefit(s) to be realised once the scheme has been implemented and is open to the public
Provision of new active travel infrastructure	Wider social benefits (improved health), Environmental benefits;	Increased number of active travel routes connecting the development site to wider network and city centre	Implementation of safer highways infrastructure including a Pegasus controlled crossing, route improvements along Welland Road and the potential for a new bridge over the A47 (subject to feasibility).	**TBC**			Will contribute to objective 4	**TBC**	**TBC**	
Improved network efficiency	Monetised journey time savings	Enhanced network performance	Implementation of new highways infrastructure / mitigations at the A16 / A47 / Welland Road Roundabout and adjoining A16 and A47 strategic routes	**TBC**			Will contribute to objective 5	TBC – scope of this benefit to be quantified using traffic modelling	**TBC**	
Improved road safety	Monetised (quantifiable) benefits due to fewer accidents	Reduction in the number of KSI incidents at proposed intervention sites	Implementation of new highways infrastructure / mitigations at the A16 / A47 / Welland Road Roundabout and adjoining A16 and A47 strategic routes. Alongside the implementation of new active travel provisions including a controlled crossing, route improvements along Welland Road and the potential for a new bridge over the A47 (subject to feasibility).	**TBC**			Will contribute to objective 6	**TBC**	**TBC**	

Appendix O – Scheme Evaluation Plan

A16 Norwood, Peterborough

Scheme Evaluation Plan

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Document Control

Job Number: 5080930						
Document ref: A16 Norwood Scheme Evaluation Plan					Authorised	
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
1.0	Draft Report	HP	RMJ	RMJ	RMJ	31/05/2022

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Contents

Delivering what we **promise**

MILESTONE INFRASTRUCTURE
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Tables

Figures

| Delivering what we promise

1. Introduction

1. Background

1. The purpose of this Monitoring and Evaluation Plan is to support the A16 Norwood Outline Business Case (OBC).

2. Purpose of this Document

1. The DfT 'Transport Business Cases' guidance published in February 2022 states the Monitoring and Evaluation Plan should set out the arrangements for monitoring and evaluating the intervention. The guidance specifies that the Monitoring and Evaluation Plan is outlined at the Outline Business Case (OBC) stage and completed at the Full Business Case (FBC) stage[1].

2. As defined in The Green Book (2022)[2], 'Evaluation is a systematic assessment of an intervention's design, implementation, and outcomes', designed to determine if the project:

   - Has been designed and delivered as expected in an efficient manor
   - What effect the intervention has had, for whom and why
   - 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)

3. This document has been prepared in accordance with the HM Treasury 'Guide to Developing the Project Business Case' (2018)[3].

[1] Transport business case guidance - GOV.UK (www.gov.uk)
[2] The Green Book (2022) - GOV.UK (www.gov.uk)
[3] Guide to developing the Project Business Case (publishing.service.gov.uk)

3. Document Structure

1. The Cambridgeshire and Peterborough Combined Authority (CPCA) Assurance Framework[4] 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.

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)[5] 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.

3. The cost of the A16 Norwood Improvement Scheme is expected to be significantly less than £50m and the study has not been specified for Fuller Evaluation, resulting in the project falling under the Standard Monitoring tier.

4. The Structure of this Monitoring and Evaluation Plan is as follows:

   - **Chapter 2:** Provides information relating to the scheme background and context
   - **Chapter 3:** Provides information relating to the scheme objectives and outcomes
   - **Chapter 4:** Outlines the data collection methods
   - **Chapter 5:** Outlines the resourcing and governance arrangements
   - **Chapter 6:** Outlines the delivery plan
   - **Chapter 7:** Outlines the dissemination plan.

[4] Local-Assurance-Framework-.pdf .
[5] Major Scheme Business Cases: Evaluation Guidance for Local Authority Major Schemes (publishing.service.gov.uk)

2. Scheme Background and Context

1. Scheme Context

1. The study area encompasses the Norwood and Paston Reserve Urban Extension sites, which are bordered to the west by the A15 Paston Parkway, to the east by the A16 and to the south by the A47 and intersected by Newborough Road.

2. The Norwood and Paston Reserve urban extensions, shown below in Figure 1, are key areas of residential growth for Peterborough and have been allocated for development within the Peterborough Local Plan 2016 to 2036 (Adopted on 24th July 2019)[6], generating a combined total of 2,945 dwellings in the study area.

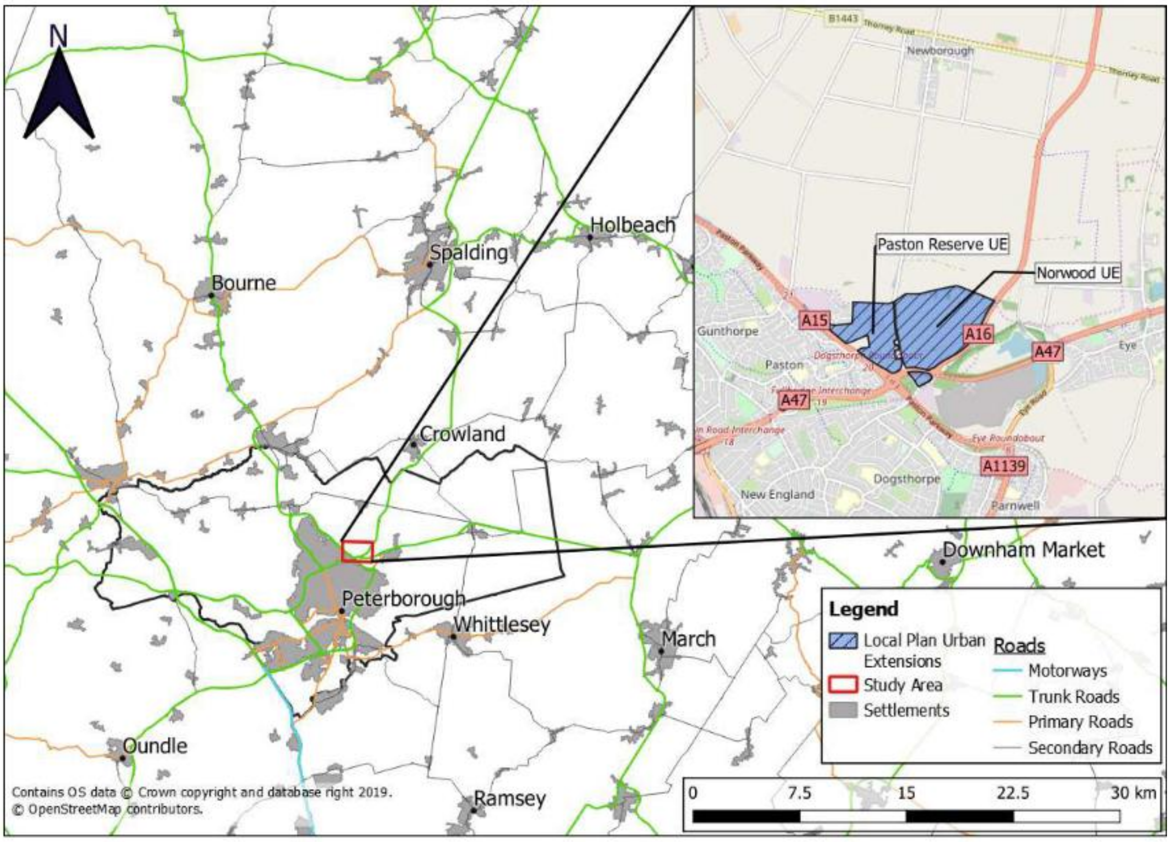

Figure 1: A16 Norwood Improvement Scheme Area

3. The scheme will help facilitate growth aspirations of Peterborough City Council in relation to the planned Norwood and Paston urban extensions. Highway improvements of the scheme will add capacity and address existing and future issues of congestion and delay along the A16 corridor, whilst active travel improvements will help reduce the severance for users between the north-east of Peterborough and the City centre.

[6] Peterborough Local Plan (Adopted version).

2. Scheme Development

1. A SOC and an Optional Appraisal Report (OAR) were submitted to the Cambridgeshire and Peterborough Combined Authority (CPCA) and approved in October 2019. The project is currently at the Outline Business Case (OBC) and Preliminary Design stage.

3. Scheme Objectives and Outcomes

1. Introduction

1. The purpose of this chapter is to define the scheme objectives and the associated outcomes and impacts. Assumptions underpinning how the scheme will achieve the scheme objectives and the associated outcomes and impacts is provided in the form of a logic map.

2. Scheme Objectives and Outcomes

1. The objectives of the A16 Norwood improvement scheme were developed during the Strategic Outline Case (SOC), ahead of the initial Option Development phase of the project. The project objectives are based on goals and outcomes of local policy documents and have provided a framework in which potential options have been scored and developed further as the business case process progresses.

2. Although the objectives devised within the SOC pre-date those of the CPCA, in should be noted that 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 A16 Norwood Improvement Scheme are listed beneath:

3. Primary objectives include:

    1. **Tackle congestion and improve journey times:** Tackle congestion and reduce delay along the A16 and on the primary approaches to the A16 / A47 / Welland Road Roundabout

    2. **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth at Norwood can be realised

    3. **Limit impact on the local environment and improve biodiversity**: Fully mitigate any adverse environmental impacts of a scheme, and ensure a 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.

1. Secondary objectives include:

    5. **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around the A16 corridor, such as the A47, A15 Paston Parkway, A1139 Eye Road and Newborough Road.

    6. **Improve road safety:** Reduce accidents and improve personal security for all travellers within the study area.

1. It is evident from the above objectives that the main associated outcomes and impacts of the scheme are:
    - The mitigation of existing traffic congestion and poor journey times, enhancing the wider network
    - The facilitation of housing and employment growth
    - The improvement of local environmental conditions
    - The facilitation of active travel routes
    - The mitigation of safety issues within the study area.

2. Logic Map

1. The logic model shown in Figure 2 outlines the causal chain of events that represents the process by which the desired outcomes and scheme objectives are to be achieved.

2. The Logic Map will be updated to a 'complete' status as the project progresses to the Full Business Case (FBC) stage.

Context

- Norwood and Paston reserve urban extension areas are key areas of growth for Peterborough, as identified in the Local Plan 2016 – 2036 (Adopted July 2019), which will generate a combined total of 2,945 dwellings within the proposed study area
- The Scheme will provide the necessary increase in highway capacity to unlock the identified growth throughout the area, as well as tackle any associated congestion issues from the proposed growth

Inputs

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

Network Improvement Scheme

Outputs

- Closure of Newborough road southbound access onto A47
- Dualling of the A16 between the A16 / A47 / Welland Road roundabout and the Norwood development Access
- Partial signalisation of the A16 / A47 / Welland Road roundabout on the A16 southbound approach
- Addition of a flare to the A47 westbound approach, to provide additional capacity for left turners to Welland Road
- Addition of a dedicated left lane, from the A47 eastbound approach to the A16 Northbound exit
- Replanting within the study area including linear tree / shrub planting along the A16 and wildflower planting at several locations
- Active travel route enhancements from the Norwood site down Welland Road
- Pedestrian bridge over the A47 (subject to further feasibility)

Transport Outcomes

- Improved journey times for users within the study area, particularly of the A16 / A47 / Welland Road roundabout
- Reduction in queue lengths, during peak times on all key approaches
- The separation of movements on key junctions, aiding the reduction in accidents

People, Business, and Place Outcomes

- Improved network efficiency will help facilitate the Norwood development area, and will increase the attractiveness of the City as a place to live and invest
- Early environmental considerations, aiding the achievement of a minimum 20% biodiversity net gain across the study area

Impacts

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

Figure 2: A16 Norwood Scheme Logic Map

7. Data Collection Methods

1. Introduction

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. Where appropriate, maps will be provided to show the spatial coverage of data collection.

2. Data Collection Approach

1. Data will be collected to support the production of the One Year After Monitoring and Evaluation Report (12-24 months post scheme implementation) and the Final Monitoring and Evaluation Report (approximately five years post scheme implementation). These reports will consider all the schemes implemented as part of the package for the A16 Norwood Improvement Scheme.

2. More detailed information relating to the data collection approaches will be provided at the FBC stage, at which point the monitoring and evaluation arrangements will be completed.

3. Spatial Coverage

1. Data will be collected for the study area, which comprises of the area surrounding the Norwood and Paston Reserve development sites, including the A16 and A47 Strategic routes, as outlined in Figure 1.1 of this report.

8. Resourcing and Governance

1. Introduction

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.

2. Monitoring and Evaluation Budget

The Green Book Guidance

1. The Green Book 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'.

2. Table 1 overleaf provides a summary of the 'outline' monitoring and evaluation plan for the A16 Norwood Improvement Scheme, highlighting data collection, reporting programme and indicative costs. It should be noted that the cost is estimate at this point in the project, and a detailed cost estimate for these activities and information relating to budgetary responsibility will be provided at the FBC stage.

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Table 1: Monitoring and Evaluation Measures and Budget Estimate

	Measure	Measure of Success	Data Source and Expected Findings	Data Collection / Reporting Programme			Ownership	Impact Type	Indicative Cost Estimate
				Baseline	Delivery	Post Completion			
Inputs-	Scheme Costs	CPCA Funding	CPCA Funding / submission of Full Business Case / Cost Data	Planned	Actual		CPCA / PCC	-	
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Site Inspection	2023	2024 - 2025	2026	CPCA / PCC	-	£1500
Objectives	Outcomes								
1 / 5 / 6	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours for the A16 /A47 / Welland Road roundabout	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage, showing that ratio of peak hour to free flow travel times is below 1.5, and that no blocking back occurs due to queues.	2022 - 2024	-	2026	CPCA / PCC	Economical	£500 for data analysis at both 1 year and 5 years reporting Total = £1000
		New Infrastructure for Sustainable Modes	Site Inspection / Usage Data. Increased length of pedestrian provision and LTN1/20 compliant cycleways.	2022 - 2024	-	2026	CPCA / PCC	Economical	£500 for data analysis at both 1 year and 5 years reporting Total = £1000
		Reduce the number of KSI incidents across the study area	Peterborough Database of Road Traffic Records. Expected decreased accidents in line with cobalt forecast.	2022 - 2024	-	2026	CPCA / PCC	Societal / Economical	£500 for data analysis at both 1 year and 5 years reporting Total = £1000
4	Travel Demand	Enhanced Network Performance, on the A47 / A16 and wider network of A16 corridor, such as the A47, A15 Paston Parkway, A1139 Eye Road and Newborough Road	Manual Classified Counts / Site Visits / Video Survey Footage. Expected increase in vehicles with no blocking back observed as a result of queues.	2022 - 2024	-	2026	CPCA / PCC	Economical	£4000 for MCC surveys and £500 for data analysis at both 1 year and 5 years reporting Total = £5000
2	Impact on Economy	Realisation of Local Housing and Employment Growth Ambitions	PCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2022 - 2024	-	2026	CPCA / PCC	Economical	£500 for data analysis at both 1 year and 5 years 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. Biodiversity net gain of 20% or greater.	2022 - 2024	-	2026	CPCA / PCC	Environmental	£1000 for site inspections and data analysis at both 1 year and 5 years reporting Total = £2000
3	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / PCC Air Quality Monitoring Sites / Future traffic demand data. Air quality impact to be less than or equal to modelled values	2022 - 2024	-	2026	CPCA / PCC	Environmental / Societal	£1000 data analysis at both 1 year and 5 years reporting Total = £2000
Reporting	Year 1 report summarising the outcomes of the monitoring and evaluation work			2023	-	2026	CPCA / PCC	-	£3,000
	Year 5 report summarising local economic growth, scheme impacts and development figures prior and post opening of the scheme			-	-	2030	CPCA / PCC	-	£3,000
	Total Monitoring and Evaluation Budget								£20,500

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3. Governance Structure

1. The CPCA have the responsibility for ensuring Value for Money from the A16 Norwood Improvement Scheme. Under the CPCA, PCC will be responsible for ensuring the Scheme Evaluation Plan is undertaken as outlined within this report.

2. Figure 3 provides an outline of the overall governance structure highlighting key roles and lines of accountability for the development and delivery of the scheme.

3. Further information regarding the governance structure for the delivery of the Monitoring and Evaluation Plan will be completed at the FBC stage.

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

Figure 3: Organisation and Governance Structure Overview

4. Risk Management

1. The risk management approach will be confirmed at the FBC stage.

5. Quality Assurance

1. The quality assurance approach will be confirmed at the FBC stage.

9. Delivery Plan

1. Introduction

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.

2. Scheme Construction Programme / Project plan

1. Table 2 below shows key project milestones for progressing scheme delivery.

Table 2: Key Project Delivery Milestones

Timescale	Activity
June 2022 – July 2022	Outline Business Case reviewed by CPCA, and approval sought from CPCA board for the release of funding to undertake Detailed Design and produce a Full Business Case.
September 2022	Work commences on the Detailed Design and Full Business Case.
September 2022 – November 2022	Site Surveys undertaken to inform the Detailed Design
March 2024	Detailed Design and scheme costings complete. Full Business Case submitted.
April 2024 – May 2024	Full Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding for scheme construction.
September 2024 – August 2025	Construction of the scheme undertaken, lasting approximately 12 months.
August 2026	1-year post-scheme monitoring undertaken
August 2030	5-years post-scheme monitoring undertaken

3. Delivery Plan and Timeframe for Data Collection

1. An outline delivery plan, which includes information relating to the timeframe for data collection, for the monitoring and evaluation of the A16 Norwood project is provided in Table 3, below.

Table 3: Monitoring and Evaluation Plan Outline Delivery Plan

Task	Timeframe
Pre-Construction	
Production of outline Benefits Realisation Plan	May 2022
Outline of Monitoring and Evaluation Plan	May 2022
Completion of Benefits Realisation Plan	FBC stage
Completion of Monitoring and Evaluation Plan	FBC stage
During Construction	
Collection / collation of baseline data requirements before and / or during scheme construction (i.e. as close as possible to the opening year of the scheme)	During construction
Collection of data used to monitor scheme delivery performance and processes to be collected during construction	During construction
Post Construction	
One Year After Monitoring and Evaluation Report	12-24 months post scheme implementation
Final Monitoring and Evaluation Report	Approximately five years post scheme implementation

2. Note that the delivery plan in Table 3 will be completed at the FBC stage, in accordance with guidance from the DfT.

4. Reporting of Monitoring and Evaluation Findings

1. The monitoring and evaluation findings will be reported as follows, to the timeframes outlined in Table 3:

- One Year After Monitoring and Evaluation Report
- Final Monitoring and Evaluation Report.

10. Dissemination Plan

1. Introduction

1. The purpose of this chapter is to provide details of how the findings from the evaluation will be communicated to key stakeholders and how the lessons will be disseminated.

2. Outline Dissemination Plan

1. It is envisaged that the findings from the evaluation, reported in the form of the **One Year After Monitoring and Evaluation Report** and **Final Monitoring and Evaluation Report**, will be shared with the key stakeholders involved in the development of the A16 Norwood Project once they are available. The reports associated with this Monitoring and Evaluation will likely be published on the PCC website.
2. Note that this dissemination plan will be completed at the FBC stage.

CAMBRIDGESHIRE
& PETERBOROUGH
COMBINED AUTHORITY

Agenda Item: 2.2

Wisbech Rail

To:	Transport and Infrastructure Committee
Meeting Date:	16 November 2022
Public report:	Yes
Lead Member:	Mayor Dr Nik Johnson
From:	Anna Graham, Transport Programme Manager
Key decision:	No
Forward Plan ref:	N/A
Recommendations:	The Transport and Infrastructure Committee is asked to decide the approach for Wisbech Rail, either:

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 is linked to the delivery of Ely Area Capacity Enhancements (EACE) or,

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 removes the current dependency on EACE whilst still being mindful of the future strategy to link into Cambridge.

c) If option b) is selected 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.

Voting arrangements: For items a) and b) A simple majority of all Members present and voting

For item c) 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

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 The paper seeks Members views on the next steps for Wisbech Rail and subject to approval of option b) seek Combined Authority approval for the drawdown of funding to enable an options assessment report to be carried out.

2 Background

2.1 A Business Case and Governance in Railway Investment Projects (GRIP) 3b was completed in the summer of 2020 and identified that a heavy rail, with a two trains per hour service direct to Cambridge from Wisbech, and a centrally located station, would be a viable option.

2.2 Following engagement with Department for Transport (DfT), Office of Rail and Road (ORR) and Network Rail, the March 2021 Combined Authority Board agreed that Network Rail would undertake a review of the existing work and assess options for the Wisbech to March line. It was intended the outcome of this work would coincide with the results of the Ely Area Capacity Enhancements (EACE) Outline Business Case.

2.3 Network Rail undertook:

- Business Case review;
- PACE (Project Acceleration in a Controlled Environment) review of documentation;
- Engineering review; and
- High Level Light Rail.

3. Network Rail Review

3.1 Network Rail's review concluded that there was a strong strategic focus within the 2020 business case, which supported the need for public transport links from Wisbech and the potential benefits of connecting to Cambridge.

3.2 Significantly, however, Network Rail recommended removing assumptions about EACE. The Wisbech to Cambridge 2020 business case assumed that EACE would provide the necessary infrastructure upgrades to enable increased services to Cambridge and as a result these costs were not included within the Wisbech to Cambridge Business Case. In Network Rail's view this assumption should not have been included and therefore all costs required for Wisbech to Cambridge should be part of the business case as a standalone project.

3.3 It was also assumed that one train path may be available at Ely North Junction and a further train path could be sought through EACE. Network Rail's work has shown that there is currently no capacity at Ely and securing future train paths is highly competitive and there is no guarantee the Wisbech to Cambridge would be successful.

3.4 Whilst the EACE Outline Business case demonstrates decarbonisation and connectivity benefits, it does, however, require a significant funding, with a total cost of over £450 million. Government have not yet announced the next steps for EACE.

3.5 Network Rail's review of the 2020 Wisbech Rail Business Case also noted that:

- The passenger demand figures are different – higher - to those that have been prepared for the Ely Area Capacity Enhancement Business Case;
- The assessment of cost for each mode option needed greater detail; and,
- Further detail around timetabling at Cambridge would be needed.

3.6 In addition to the review of the existing work, Network Rail also produced a high-level feasibility study for light rail, this was produced following engagement with DfT and ORR whose view was that further options needed to be considered. The report concluded that there is potential for a light rail passenger operation between March and Wisbech highlighting Tram-Train or Very Light Rail could be used. However, economic assessment of each light rail mode and a potential autonomous pod initiative were not provided within the report and would require further development to understand Benefit Cost Ratios.

3.7 The Network Rail review concluded that lower cost light rail may offer a more credible transport solution and recommended further work be undertaken to examine light rail options.

3.8 An initial proposal for Wisbech Rail next steps outlined an approach which included the development of a business case for a service between Wisbech and March and sought to develop light rail to an outline business case standard. Engagement with Fenland District Council and Members it was agreed that transport connectivity for Wisbech was a priority, however, heavy rail continued to be supported.

3.9 Following this initial engagement two options are presented for consideration, the first is to continue to press for heavy rail recognising that potential delivery of Wisbech to Cambridge timeframe is linked to the delivery of EACE. Secondly, an Option Assessment Report is developed rather than a complete business case to provide the economic analysis on mode options, including existing information on heavy rail, based on a service operating between Wisbech and March which removes the current dependency on EACE whilst still being mindful of the future strategy to link into Cambridge.

3 Financial Implications

4.1 Network Rail has estimated £300,000 for the next phase of work to produce an options assessment Report. Wisbech Rail currently has £230,000 approved budget available. Subject to the approval of the Options Assessment Report option £80,000 to be drawn down from the Medium-Term Financial Plan, totalling £310,000. £300,000 needed for the Network Rail Options Assessment Report and £10,000 for any additional engagement with strategic stakeholders.

4.2 The MTFP has £5.7 million subject to approval for Wisbech Rail in 2022/23.

4 Legal Implications

5.1 Subject to the approval of recommendation b) the Combined Authority will enter into a Basic Services agreement with Network Rail to undertake the Option Assessment Report.

5 Public Health Implications

6.1 The objectives of increasing connectivity to Wisbech are to improve access to employment and educational opportunities, and to support economic growth in a sustainable manner which enables improved health.

6.2 In addition, the existing preliminary designs include a cycleway to encourage active travel supporting both health and improved wellbeing.

6 Environmental and Climate Change Implications

7.1 Wisbech Rail seeks to provide an alternative to car use – supporting economic growth in a sustainable way.

7 Other Significant Implications

8.1 None.

8 Appendices

9.1 Appendix 1 – Wisbech Rail Project Review

9.2 Appendix 2 – Options Assessment Report Scope

9.3 Appendix 3 – Wisbech to March Light Rail Potential Final Report

9 Background Papers

10.1 None.

Development Group

Eastern Region

Wisbech Rail Review

Date: May 2022

	Name	Date	Signature
Prepared by:			
Development Manager	Mark Chettle	09/05/2022	Digitally signed by Mark Chettle DN: cn=Mark Chettle gn=Mark Chettle c=GB United Kingdom l=GB United Kingdom o=Network Rail ou=Capital Delivery - Eastern e=mark.chettle@networkrail.co.uk Reason: I am the author of this document Location: Date: 2022-05-09 12:10+01:00
Approved by:			
Sponsor	Robert Russell	09/05/2022	Robert Russell Digitally signed by Robert Russell Date: 2022.05.09 12:41:21 +01'00'

Issue record

Issue No	Brief history of amendment	Date of issue
A01	For client release	10/03/2022
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Table of Contents

1. Overview

The purpose of this document is to capture Network Rail's view on the Wisbech Rail GRIP 3 documentation produced by Cambridgeshire and Peterborough Combined Authority (CPCA) in response to a request from CPCA. The report will broadly cover four areas:

- Business Case review
- PACE / GRIP review including PM review of documentation
- Engineering review
- Light Rail feasibility

The review of these four areas will identify any gaps in the existing documentation and will provide a list of recommendations/requirements to address them.

2. Executive Summary

This document summarises Network Rail's assessment of the development work completed to date by CPCA on reconnecting Wisbech and March by rail.

The document provides analysis and commentary on the areas listed in section 1 and below:

- Business Case review
- PACE / GRIP review including PM review of documentation
- Engineering review
- Light Rail feasibility

From assessing the work done to date the report recommends the further activities required to complete PACE 1 (broadly equivalent to GRIP 3) should the project continue as a rail scheme.

It is acknowledged that the project has been developed to this point with minimal input from Network Rail and has, necessarily, not been subject to Network Rail's internal governance processes. Thus, while it may appear there are gaps in areas such as GRIP documentation this can be explained by the fact Network Rail have not been heavily involved to date and did not formally remit the earlier work. It does not imply that the work produced to date is of a poor standard, in fact much of it is of a very good standard.

It should also be noted that, as per the introduction to the Mott MacDonald GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report (398128-009-C), a "slimmed down" version of the GRIP 3 design process has been used, with the focus on developing designs for those elements which significantly impact capital cost. This is a very reasonable approach for CPCA to adopt.

It is also acknowledged in the conclusion of the same report that there are a number of deliverables required to achieve GRIP 3 stage gate approval and it is stated that a full list would need to be developed in conjunction with Network Rail.

The Full Business Case executive summary also states that further work is required prior to completion of GRIP 3, partly due to the limited input to date from Network Rail or the DfT. This report should be read with that context in mind.

Business Case

The business case produced by Mott MacDonald is overall a well-presented document, with a strong strategic focus, highlighting the need for public transport links from Wisbech and the perceived benefits of this link extending to Cambridge. However, the level of information and detail is not at an appropriate level of maturity for Full Business Case (FBC) level. There are assumptions throughout, particularly around infrastructure and timetabling, that would not be expected or accepted at this stage of work. These assumptions would need to be verified and further explored to allow the project to progress to an FBC stage.

The key issues that have been identified sit in 10 broad categories which are explored in more detail in section 4:

- Timetabling and train path availability, particularly from March to Cambridge
- Performance impacts on timetable
- Cost assumptions, particularly for infrastructure from March to Cambridge
- Level Crossing approach
- Expected passenger numbers and demand
- Do Minimum scenarios
- Proposed contract structures
- Options development assumptions
- Approvals and deliverability
- COVID assumptions and impact

The biggest risk sits with any integration onto the main line. Removing assumptions around what the Ely Area Capacity Enhancement (EACE) project will provide and understanding what this scheme itself will need to provide is key. This also applies to the capital cost assumptions and patronage, both of which are vital components of a successful business case.

Engineering Status

The reports produced by Mott MacDonald are wide-ranging with well thought out options and conclusions. However, there are some gaps in the reports which would need to be addressed before the project is able to pass through the PACE 1 phase gate. Some of the gaps that need to be addressed include:

- The strategic approach towards level crossings. This needs to consider the safety, financial, project and performance risks and issues associated with closure, upgrade, highway diversion and grade separated crossings
- There is limited consideration of the requirements of the Common Safety Method – Risk Evaluation and Assessment (EU 402/2013) now enshrined in UK law
- The demand modelling is limited and there is insufficient evidence to support a heavy rail solution. The reports demonstrate a desire to facilitate freight services, without providing any clarity on the services required or that the potential market for freight services exists

Decisions need to be made to reduce the number of options and permutations in relation to modal choice, station location and passenger/freight demand. This decision making will help define the future direction of the project.

Uninterrupted connectivity onto the wider rail network is dependent on the availability of train paths. Currently these are constrained and there are competing demands from train operators for these train paths. Future demand and economic valuation of train paths together with forthcoming changes to the industry structure will introduce a greater strategic focus on network capacity utilisation and may affect the availability of train paths beyond the Wisbech to March route.

While the review concludes that heavy rail is a viable option, lower cost light rail may offer a more credible solution. It is recommended that further work be undertaken to examine the light rail option.

The full NRDD engineering study can be found in Appendix A.

Light Rail Feasibility

The light rail feasibility study concludes that there is potential for a light rail passenger operation between March and Wisbech. The assessment of suitable rolling stock types concludes that Tram; Tram-Train or Very Light Rail (VLR) vehicles could be used. The choice of rolling stock being subject to the specification of the short and long term service aspirations.

The study further concludes that in consideration of the client's specification a tram-train solution appears the best credible light rail option. Tram-train would enable future operation on both the national rail network and any on-street operation into Wisbech town centre or to the Garden Town.

On the basis that light rail is considered a credible and feasible option further work is recommended to examine the options in more detail and to develop cost estimates to assist the business case for reopening the line.

The full light rail feasibility study can be found in Appendix B.

GRIP/PACE Status

The work produced to date by Mott MacDonald on behalf of CPCA is of a good standard. However, there are a large number of GRIP/PACE deliverables missing that would normally be expected to have been completed by the conclusion of GRIP 3/PACE 1. In order to pass through the PACE 1 phase gate these missing deliverables should be produced, reviewed and signed off. Section 6 covers these products in more detail.

A number of the key documents produced by the project to support the GRIP 3 work have issues that should be addressed with input from Network Rail. There are wide ranging assumptions that need to be worked through and validated that will have a significant impact on the viability of some areas of the proposals, e.g., the impact of the Ely Area Capacity Enhancement (EACE) project.

Overall, from a GRIP/PACE product perspective, the project is not mature enough to pass through the PACE 1 phase gate.

3. The Project

The following sections provide an overview of the project and a summary of the project's objectives and outputs.

3.1. Project Overview

The key project aim is to improve transport access to Wisbech, which is not well-served by existing public transport provision. In particular, improving access to Cambridge as a key regional centre for employment. The current proposal is to reopen the mothballed Wisbech branch and connect it to the Ely-Peterborough line at March.

3.2. Boundaries

Boundaries are not yet formally fixed as this is dependent on the final service provision selected. However, the engineering review undertaken by Network Rail Design Delivery (NRDD)/Capital Delivery Eastern is limited to the existing mothballed Wisbech branch and connections at March.

The remitted stage also includes work to evaluate the business case and the possibility of non-heavy rail options. This required consideration of areas beyond the boundaries identified above at a strategic level only. These elements of work have been delivered by NRDD, the Network Rail Light Rail team, Eastern Investment Directorate, Anglia Sponsorship and System Operator as appropriate.

3.3. Interfaces

This project interfaces with the emerging North Anglia portfolio of railway projects. In particular, ambitions to run services beyond March to Cambridge are subject to sufficient capacity being created along the line of route. This is likely to have a particular dependency on Ely Area Capacity Enhancement (EACE) and the signalling renewal on the Ely-Peterborough line anticipated in CP7 (2024-2029).

4. Business Case Review

4.1. Overview

The purpose of this section is to capture Network Rail's view on the Full Business Case (FBC) submitted by CPCA in June 2020. The section provides thoughts on the key areas covered within a proposed business case of this level, citing areas that require revision or deeper examination.

4.2. High Level Summary

It is a consensus among all who have reviewed the business case that the level of information and detail throughout is not at an appropriate level of maturity for FBC level. There are assumptions throughout, particularly around infrastructure and timetabling that would need to be verified and further explored to allow the project to progress to a Full Business case stage.

The key issues that have been identified sit in 10 broad categories:

- Timetabling and train path availability
  - The timetable analysis to date is not at an adequate level of detail to give us confidence that the paths the CPCA seek (2 trains per hour (tph) Wisbech-Cambridge) are currently achievable.
  - The Ely Area Capacity Enhancement (EACE) scheme provides no commitment to additional capacity being made available for services serving Wisbech-March-Cambridge.
- Performance impacts
  - Should the proposed paths be made available there is little/no evidence that these new paths will avoid any negative impact on the current timetable
- Cost Assumptions
  - Business case assumes capital costs for infrastructure from March to Cambridge is included in the overall capital costs for March to Cambridge in the EACE scheme. Works between Wisbech and March are not included in the EACE scope at this time
- Level Crossing Approach
  - Although the approach and perceived costs of closing and adapting/diverting level crossings has been included, there is no evidence showing increased capital costs for increased level crossing risks along the March to Wisbech route
- Expected Passenger Numbers and Demand
  - Variance between the patronage showed in the business case for additional trips up to 2039 and that EACE have identified, with this scheme being in excess of that predicted by EACE
  - Almost all of the forecast patronage comes from the resulting increase in services from March-Cambridge (approximately 90 %). This is not dependent on the Wisbech branch reopening (which is the only part the business case proposal assumes as its cost base, costing circa £200m).
- Do Minimum scenarios
  - Lack of evidence that all committed schemes being delivered in the region are included within the Do Minimum scenario of the economic case. This may have led to double counting of benefits
- Proposed Contract Structures

- Proposition within the Commercial case suggests CPCA sit as the single lead entity. A single delegated delivery body could be used for the scheme, potentially sitting under a client group led by CPCA.
- Options Development Assumptions
  - Treating this scheme as a standalone shuttle service between Wisbech and March initially could be a useful method to determine and show demand and removes the schemes reliance on EACE
  - Dismissal of a light rail solution may need some additional thought as this could provide a viable option for the above.
- Approvals and Deliverability
  - Various assumptions and omissions around deliverability, programme and risks require further examination. Further exploration of these would add robustness to the case
- COVID assumptions and impact
  - The effects of COVID-19 have not been considered. Now that the railway is recovering and there is a better understanding of how the railway will look moving forward, this should be included in forecasting and demand modelling.

4.3. Detailed Findings

The business case produced by Mott MacDonald for CPCA is overall a well-presented document, with a strong strategic focus, highlighting the need for public transport links from Wisbech and the perceived benefits of this link extending to Cambridge.

Although well researched, the overall findings of the document lack a certain level of maturity that would be expected from an FBC. These gaps reduce the validity of certain statements in the case and increase the risks associated with the project greatly should the scheme progress.

From the review undertaken by Network Rail, the table below provides a review of the key areas that would require further detail and examination to improve any business case submitted:

Theme	Comments
Timetabling analysis & train path availability	• The timetable analysis to date is not at an adequate level of detail to give us confidence that the paths the CPCA seek (2 trains per hour (tph) Wisbech-Cambridge) are currently achievable. The analysis is not sufficiently detailed for a scheme that is at FBC or in late GRIP 3; as such the risk remains that the paths are unachievable or additional scope (both between March – Cambridge and March – Wisbech) is required to deliver the business case output. o The CPCA's analysis suggest that there may be retiming of other services required (but little indication as to which services) in order to make 2tph Wisbech-Cambridge work in full. The implications of this could be substantial on the extent of recast required of the timetable; the worst case, for example, could be that the proposal impacts Great Northern (Thameslink) services.
	• The Ely Area Capacity Enhancement (EACE) does not include the Wisbech path/s within its scope however, the business case is wholly dependent on a path/s being available following completion of the EACE scheme. Please can you clarify how the train service would be operated without an Ely path?
Performance impacts	• Should the 2tph Wisbech-Cambridge path/s be achievable no evidence is provided to demonstrate that the performance of the network would not be significantly affected. The reliability of the network is based on the usage of the infrastructure as well as the interactions of services with other services using the same track.. This is particularly pertinent noting the majority of the March – Wisbech reopening

	proposal is predicated on single line running. Elements of the work show very high utilisation factors which is a very early way of understanding the likely performance of a proposal. ○ We support the position within the business case that train performance is a Critical Success Factor. However, at this stage the risk remains that additional infrastructure (both between March – Cambridge and March – Wisbech) is required to deliver this requirement.
Cost Assumptions	• The business case assumes that the EACE scheme provides all the infrastructure necessary from March-Cambridge to run these services. This includes potential level crossing upgrades. EACE has commissioned a study to see if an additional service between Peterborough and Cambridge would trigger a need for further level crossing infrastructure. It should be noted that infrastructure on the route between Peterborough and Ely is not currently in EACE's scope. • EACE is currently remitted to provide a total capacity of 11train paths per hour. Based on the current assumptions in the EACE proposal, there are not enough paths to provide the 2tph assumed in the Wisbech-Cambridge proposal. ○ Should a decision be taken to commission work to add additional paths beyond the **11th path** currently assumed in the EACE proposal, it is likely that the proposed Wisbech – Cambridge **service would be in direct competition with other proposals for paths through Ely. These may include future propositions such as Cambridge – Norwich (which could be in the form of an EWR eastern extension), Cross-country – Cambridge (potentially Stansted)/Norwich or freight. If an 11th path is created by the EACE programme, it should not be assumed that this would be an Ely to Wisbech service.**

	• End to end journey infrastructure costs do not appear to have been fully taken into account. Could you clarify what out of the following BCR costs does CPCA have and what needs further work?
	    ○ All level crossing costs that would require upgrade to run the service (including those around Cambridge)
	    ○ Any costs for signalling changes to operate the service
	    ○ Power upgrade costs
	    ○ Additional rolling stock costs (only the operational expenditure of rolling stock seems to have been accounted for)
	    ○ Depot and stabling costs
	    ○ Any infrastructure costs for upgrades required at Cambridge or other stations to allow the service to run
	    ○ Full operating costs (from discussions with potential operator)
	• The scheme should not assume EACE will be delivered and full costs should be included with no dependence on final approval of other schemes. EACE is at Develop stage within RNEP with no guarantee of scheme delivery.

	• Costs need to be benchmarked against the actual outturn costs of recent comparable projects. • In turn the elements building up the project need to be carefully considered to ensure that they are appropriate for a line of this type – for example it appeared that the S&C work being proposed for March station to connect to the new branch was a type suited to quite high-speed operation, probably over specified for this application, and in that context it also appeared to be somewhat more expensive than expected. • The Wisbech-March line proposed will be relatively low speed so assumptions around the purchase of brand new material may also be inflating costs unnecessarily. With Whitemoor Yard adjacent there is opportunity to source material recently removed from high speed mainlines which is still perfectly

	adequate for lower speed line use. Sourcing from Whitemoor will also ensure that material is 'local' and reduces overall transport distances.
Level Crossing Approach	• We note that a substantial element of the capital cost is related to the closure and diversion of existing level crossings along the route between March and Wisbech, but that the business case does not include any costs for addressing increased level crossing risk between March and Cambridge (see above). We note that the CPCA may wish to seek a decision which would allow a number of the existing level crossings to be re-instated on the March to Wisbech section in order to consider reducing cost. Given NR obligations to mitigate or remove level crossing risks and the proposal we will be the asset owner of the resulting reopening, NR and ORR would clearly wish to be involved in any consideration of proposals in this regard.
	• ORR's policy on the creation or reinstatement of level crossings on rail lines is clear that these are only to be considered when there is no other reasonably practicable option available. The proposals that CPCA have already generated indicate that there are 'practicable' options for grade separation for the road/rail interfaces, and that including for these costs the overall scheme BCR is above 1. Arguments therefore about the 'reasonableness' of any particular site to be proposed as a crossing will need to be extremely robust if it is to be shown that the costs of closure, diversion or basic grade separation at a particular location are grossly disproportionate to the costs of a suitable at-grade crossing.
	• While ORR does not have a role to approve or agree the decision making around this level crossing question it is important that it is approached in a way that is clear and defensible. ORR may wish to discuss this further with CPCA to ensure that there is clarity on the evidence and process necessary. ORR is a statutory consultee to Transport and Works Act Inquiries and will be expected to make a Statement of Case offering an opinion on the safety of the proposals and this would of course include any level crossings. If ORR are not of the opinion that a proposed level crossing is the only reasonably practicable option then ORR will have to make that point to the Inquiry.
Expected passenger numbers and demand	• The patronage in the business case appears to show that circa 6.6m additional trips will be generated per annum by the proposal by 2039. These numbers appear to be in excess of growth that EACE has been able to identify within the same catchment area.
	• The case must be aligned with WebTAG growth rates as per DfT guidance. • https://www.gov.uk/guidance/transport-analysis-guidance-webtag .
	• Almost all of the forecast patronage appears to come from the resulting increase in services from March-Cambridge (approximately 90 %). This is not dependent on the Wisbech branch reopening (which is the only part the business case proposal assumes as its cost base, costing circa £200m) as in theory all that would be needed is turnaround capability at March. As the scheme does not propose to fund any of the required improvements for the March-Cambridge stretch, and instead assumes EACE does, these benefits could be argued to be required to be attributed to EACE. This could make the March to Wisbech economic case weaker.
Do Minimum scenarios	• Could you confirm whether all committed schemes being delivered in the region are included within the Do Minimum scenario of the economic case, most notably the Kings Lynn – Cambridge 8-car scheme. If this hasn't been included this could result in the double counting of benefits. ○ In addition, although the 2tph Wisbech-Cambridge paths are presumed predicated on the EACE infrastructure, no indication is within the Do Minimum scenario that all the passenger services EACE enables has also been included.
Proposed Contract Structures	• Experience suggests that in rail projects with their many separate technical and operational disciplines, with the related differing sub-contractors, there is great benefit in having a single body responsible for delivery. This places responsibility

	for integration in a single place. Structures with different delivery bodies carry much greater integration risks. There is no reason that CPCA and others should not form some type of joint client board, but then place a single body below this with the responsibility and delegated authority to deliver.
	• We note the examples of major road schemes and the Cambridge guided bus as projects delivered, but consider that the degree of technical complexity in a rail scheme, particularly one integrating into existing rail infrastructure, is of a significantly different scale and the previous experience may not be comparable.
	• Have all delivery modes been adequately considered?
Option Development Assumptions	• The option development should consider the RNEP stage and the dependency on a non-committed scheme. Should the CPCA not wish to include the costs of EACE in the business case for the Wisbech-Cambridge proposal, the CPCA concept around beginning services with some form of shuttle between March and Wisbech appears to be a sensible choice. This could be linked to a proportionate level of connection to the existing network to support stock transfer etc. • Establishing early demand with a shuttle connection could be a sensible first step. • In the context of a stand-alone shuttle, there are concerns around the rejection of light rail modes on the basis of technical risk. Light rail does not imply overhead electrification; a diesel tram-train could be an option though it is acknowledged that there is a limited supply market compared to other rolling stock types. • The use of tram type rolling stock and operational concepts could in turn lead to different decisions about some of the intersections of roads and rail alignment, and the approach to signalling needs on the line.
	• The weighted assessment in table 2 is very close between National Rail and the two tram-train options. This seems to be mainly influenced by "no existing client knowledge and experience of delivering tram-train schemes, plus the technology and delivery mechanisms are less proven" (2.15.4). This may be correct, but as the scores are so close some further sensitivity analysis might be beneficial to confirm the approach.
Approvals and deliverability	• Based on other schemes, the schedule presented in Table 12 looks potentially achievable, but also very optimistic. For example, the case references Cambridge South station, which is probably much lower complexity as a scheme being approved in March 2020 and opening in 2025 (section 2.9.1).
	• The risk identification in table 13 correctly references approvals as a risk, but is limited to NR design approval. Approvals and authorisations are more complex than this and the risk may be underestimated.
	• The strategic case and the management case both reference a QRA is yet to be done. This would significantly help inform the robustness of assumptions made in the case.
	• Table 3.19 risk ID 8 refers to a tight radius at March station. If this affects platform curvature this could be a significant issue. Managing the step gap between track and train is a key issue for the industry with almost half the total harm for passengers arising from this gap. Curved platforms mean bigger steps. If the Class 755 is used this does have design features that help, but it's easy to underestimate the risk and impact.
COVID impact	• Covid-19 is likely to impact the strategic case at least; without more detailed work it is difficult to assess the magnitude of impact, or indeed whether it is positive or negative.
Consents	• For a project at FBC level a consenting strategy would be expected. Beyond a high-level mention within the management case, there doesn't appear to be a defined consent strategy. The lack of one adds considerable risk to any proposed programme as there is no confidence in the ability to obtain land or permissions.

4.4. Conclusion

The case for change within the Business Case is apparent. Wisbech is an area of deprivation that suffers from not having a reliable form of public transport beyond that of buses trying to operate on already congested roads. The use of the mothballed March-Wisbech line presents an opportunity to connect this Town onto the wider rail network, connecting the people of Wisbech to a greater array of employment, healthcare and education.

Although compelling from a strategic perspective, the FBC submitted relies on a lot of assumptions which would not be expected or accepted at this level. The biggest risk sits with any integration onto the mainline – removing assumptions around what EACE will provide and understanding what this scheme itself will need to provide is key. This is also relevant for capital cost assumptions and patronage – both of which are vital components of a successful Business case.

Based on the size, maturity and the number of uncertainties, the project may in fact benefit from re-addressing the above and look to submit an Outline Business case. This may also be of benefit if a light rail solution is investigated further.

5. Project Reports Review

This section of the report covers the key documents produced by the project and provides commentary and suggestions for future work from a Project Management perspective.

5.1. GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report (398128-009-C)

There are a number of assumptions documented in the report that should be validated. For example, railway asset condition and highways/level crossings condition.

Interfaces with other Network Rail projects, e.g., Ely Area Capacity Enhancement (EACE) and re-signalling projects need to be checked and reconsidered in light of industry changes since production of the report.

The report mentions engagement with the likely Train Operating Company (TOC), Greater Anglia (GA), but does not detail what discussions have been held. The TOC will need to be consulted on operations, proposals for the stations, staffing requirements etc. These discussions may influence the requirements and the designs for the project.

There is a lack of evidence of scoring of options in the report and justification for selecting particular options. For example, section 5.6.2.2 in the report includes a paragraph covering platform construction type. A preferred option is chosen but without any specific evidence to show why.

Designs have been produced for March Station, including platform modifications, car parks etc. Work is currently taking place to redevelop March station, including a new ticket hall and waiting area, as well as an expansion to the current car park to the south of the station. This is likely to mean that the works proposed at March Station as part of this study will need to be reconsidered.

The environment section of the option selection report appears quite light, and it is difficult to see how it is weighted relevant to other considerations during option selection. This should be reviewed.

A Carbon Assessment is provided in Appendix T of the report. Some of the assumptions/exclusions within the assessment would benefit from some clarification – for example, track foundations already being in place, temporary works for drainage not being considered, P-Way fittings not being included etc. Some of the graphs are quite difficult to interpret and there is little explanatory text. This is not of a standard that would be suitable for a NR project and would likely need to be revisited. Evidence of carbon being integrated into the option selection process and general design process should also be provided.

5.2. Options Assessment Report (398128-005-D)

The cost estimate for the tram-train scheme does not appear to have been built up using the same methodology as the estimate for the heavy rail scheme, which may have led to unfair comparisons being made. The guided busway option (DS3) includes vehicle costs, but other options do not, again meaning that estimates are difficult to compare on a like for like basis.

As per the GRIP 3 heavy rail report, assumptions need to be validated, particularly around Ely Area Capacity.

5.3. Delivery Strategy (398128-009-E)

The high level programme shown in table 5 has GRIP 5 detailed design starting well before completion of TWAO process. This would present a risk and should be understood and assessed by the project.

5.4. Assessment of Rail Operations (398128-007-C)

The report acknowledges that the Ely area is unable to accommodate any additional services without compromising performance and adversely affecting the existing level crossing risk. It is also stated that the EACE scheme aims to provide up to 11tph through Ely North Junction, and that to accommodate 2tph from Wisbech – Cambridge, capacity for 13tph would be required. This is beyond the current scope of the EACE project.

Platforms 5/6 at Cambridge are identified for services running to/from Wisbech. It is not clear whether any assessment of platform availability at Cambridge has been carried out.

The report also acknowledges that running additional services between Wisbech and Cambridge could change level crossing risk profiles, triggering the need for upgrades on the mainline between March and Cambridge. This does not appear to have been factored into cost estimates.

Section 5.3.4 summarises the modelling carried out to date and concludes that finding a path for 2tph from Wisbech to Cambridge is not possible with the current timetable and would only be possible if Ely North Junction is remodelled to accommodate these services. This therefore creates a dependency on the Ely Area Capacity Enhancement project, or a similar scheme, neither of which are confirmed or have the paths for Wisbech services built into their output requirements.

5.5. Environmental Report (398128- MMD-00-XX-RP-EN-0001-B)

The purpose of the Environment Report is slightly unclear and there are a number of omissions, though some of these have been covered by the Preliminary Ecological Appraisal (PEA) and elements of the option selection report.

One area that does not appear to have been considered is Social Value. The Socio-Economic impacts from this scheme will be significant, both during construction and operation. It is recommended that an assessment is completed to strengthen any business case for the development. Additionally, this project could be a good candidate for the newly released NR Social Value Profit Calculator.

5.6. Preliminary Ecological Appraisal (PEA) (398128-MMD-00-XX-RP-EN-0003-B)

The PEA is a thoroughly written document and provides a good starting point for developing an approach to ecology management. A lot of constraints have been identified, as anticipated, and there will need to be extensive statutory stakeholder engagement. The number of additional surveys required is considerable, and these will need to be appropriately programmed as the project proceeds. Habitat creation normally requires quite significant land acquisition, so this needs to be factored into the consents strategy as well as the project cost estimate.

5.7. Estimating

Capital cost estimates have been produced for both tram-train and heavy rail options and are contained in the respective reports covering these options. There are a number of exclusions in these estimates that could have a significant bearing on the overall project costs, including, but not limited to:

- Land purchase or rental (added in the business case for the heavy rail option)

- Utilities diversions, relocation and protection (for tram-train scheme)
- Re-location of affected businesses
- Planning and consents costs
- Inflation (added in the business case for the heavy rail option)
- All costs associated with Insurance Top Up Fund, the Network Rail Fee Fund or the Industry Risk Fund (only mentioned for tram-train scheme)
- Project risk allowance (added in business case and options assessment report)

5.8. Heavy Rail Estimate

The estimate appears to cover the relevant elements of the scheme (exclusions aside) and the unit rates used for the rail elements seem appropriate.

As stated in the Railway Control Systems section of the exclusions table, the cost of interlocking is assumed to be borne by another project. It may be more prudent to include the cost of interlocking in this project estimate and present the potential for it to be funded by another scheme as an opportunity, rather than treating it as an exclusion.

The allowance for environmental mitigation measures (2.5 %) appears low, particularly given the findings of the Preliminary Ecological Appraisal. The cost and schedule impacts of environmental mitigation can be significant and had a considerable influence on a recent similar project to bring the Dartmoor line back into National Rail service.

The allowance for civils/drainage works on the Heavy Rail Option 4C (and other options) appears low considering the relatively unknown ground conditions in the area. Further ground investigations will be required to more accurately inform these allowances.

5.9. Light Rail Estimate

The indirect costs presented for the light rail scheme appear high, constituting more than 50 % of the total cost for both options DS1 and DS5.

Estimates produced by the project for light rail and heavy rail are difficult to compare. For example, the light rail estimate includes an allowance of circa £14.5m for signalling works, including re-signalling of March East area. The heavy rail estimate for the selected option (option 4C) assumes this cost is borne by another project (as mentioned above) and has a total allowance for signalling of circa £4m. Another example is Contractor’s preliminaries. These have been calculated differently for the light and heavy rail schemes, resulting in very different figures being produced. The estimates should be produced using the same methodology and assumptions (as far as possible) to enable informed comparison and decision making.

As identified in the GRIP/PACE review (section 6 of this report), a cost planning report should be provided alongside any estimate. This should contain explanation of the estimate produced, as well as benchmarks to provide confidence that the estimated cost is realistic.

6. GRIP/PACE Review

6.1. Overview

At the time the documentation to be reviewed was produced by CPCA, Network Rail operated under the Governance for Railway Investment Projects (GRIP) project and programme delivery framework. This approach was developed to manage and control infrastructure investment projects in order to minimise and mitigate the risks associated with delivering projects and programmes.

In response to the government's challenge to the rail industry to pioneer new ways of working that will reduce the time and cost of delivering infrastructure projects, project SPEED (Swift, Pragmatic and Efficient Enhancement Delivery) was jointly developed by the Department for Transport (DfT) and Network Rail in the summer of 2020. This led to a number of key themes being identified, including Governance and Assurance.

This in turn led to the creation of PACE (Project Acceleration in a Controlled Environment). The PACE framework replaces GRIP and is designed with an increased level of flexibility and delegated authority for decision making to Network Rail's regions including individual projects and programmes.

All PACE deliverables have been assigned a RAG rating in accordance with where the requirement for their completion originates. The RAG rating supports the Sponsor and Project Manager in selecting the right products for the project and understanding what level of approval may be required to follow a different approach where that is in the best interests of successful project delivery.

Due to this change in project delivery framework, the documentation produced to date has been reviewed against both GRIP and PACE, with recommendations for addressing any gaps assessed only against PACE.

6.2. GRIP Product Analysis

Below is the list of GRIP products that would typically have been expected to be produced by a project that has reached GRIP stage 3 alongside Network Rail's assessment of whether these products have been created or not. As stated earlier in the document, due to the works not being undertaken by NR at that stage, it is envisaged that there will naturally be gaps in the GRIP products produced.

Ref	Product Name	GRIP Stage 1	GRIP Stage 2	GRIP Stage 3	Produced by Project	Comments
G1	Stage Gate Checklist				X	
G2	Stage Gate Certificate				X	
G3	LoC Assessment *(Management Level of Control)*				X	
CS1	Client Remit				X	
CS2	Sponsors Instruction				X	
CS3	Feasibility Report				✓	GRIP 2 Heavy Rail Feasibility Report Low Cost Alternative Tram-Train Feasibility
CS4	Option Selection Report				✓	GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report
CS5	Asset Management Plan (AMP Process)				X	
CS6	Diversity Impact Assessment				X	
PM1	Project Management Plan				X	
PM2	Stakeholder & Customer Management Plan				X	
R0	Requirements Management Plan (RMP)				X	
CA1	Land and Consents Strategy				X	Outlined in business case and delivery strategy
CA2	Land and Consents Commitments Register				X	
CA3	Network Change				X	Informal consultation only at GRIP 2 & 3.
CA4	Station and Depot Change				X	
CP2	Formal Cost Planning Report				X	Estimate produced but without accompanying report

CP5	Lifecycle Cost GRIP 3 Report				X	Specifically excluded from business case - see section 5.3.2
RV1	Strategic Risk Assessment				X	
RV2	Risk Register				✓	Contained within business case
RV4	Quantitative Cost Risk Assessment (QCRA)				X	Risk based on percentages
RV5	Programme Quantitative Schedule Risk Assessment (QSRA)				X	
RV6	VM Output Definition				X	
RV7	VM Option Selection				X	
RV9	VM Lessons Learnt				X	
EG0	Preliminary System Definition and Safety Verification Categorisation Application				X	Acknowledged by Mott MacDonald in GRIP 3 report that CSM has not yet been considered - see section 14.2
EG5	Project Hazard Record				✓	Hazard record in appendix C of GRIP 3 report - HAZID has been held
EG4	System Definition				X	
EG6	System Safety Plan				X	
EG7	Safety Justification Report				X	
EG2	Project Authorisation Strategy				X	
EG10	Engineering Compliance Certificate				X	
EN1	Environmental & Social Performance Appraisal				X	Environmental Report and Preliminary Ecological Appraisal have been produced
HS1	Safety Risk & Mitigation Log				X	
HS2	Project Safety Strategy				X	
HS3	Health and Safety File				X	
CDM1	CDM Plan				X	

6.3. PACE Product Analysis

Below is the list of PACE products that would typically have been expected to be produced by a project that has reached the end of PACE 1, alongside Network Rail's assessment of whether these products have been produced or not. A narrative on each product has also been provided to explain its purpose as well as Network Rail's assessment on what would need to be done in order for the project to complete PACE 1.

Ref	Product Name	Produced by Project	Comments/Recommendations
P.CR1	Client Remit	✗	To be produced in order to complete PACE 1
P.CR2	Sponsors Instruction	✗	To be produced in order to complete PACE 1
P.CR3	Asset Management Plan (AMP Process)	✗	AMP001-003 forms to be produced in order to complete PACE 1
P.CR4	Diversity Impact Assessment	✗	To be produced in order to complete PACE 1
P.CR6	Option Selection Report	✓	
P.MP1	Phase Plan	✗	To be produced in order to complete PACE 1
P.MP2	Phase Gate Certificate	✗	To be produced in order to complete PACE 1
P.MP3	LoC Assessment	✗	To be produced in order to complete PACE 1
P.MP4	↓ Project Management Plan	✗	To be produced in order to complete PACE 1
P.MP4/1	→ Risk Management Plan	✗	Arrangements for risk management detailed within business case. Strategy to be produced in order to complete PACE 1 - this can form part of the PMP
P.MP4/2	→ Stakeholder & Customer Management Plan	✗	Brief section within business case discussing communications and stakeholder management. Plan to be produced in order to complete PACE 1 - this can form part of the PMP
P.MP4/3	→ Scope Management Plan	✗	To be produced in order to complete PACE 1 - this can form part of the PMP
P.MP4/4	→ Land & Consents Strategy	✗	Outlined in business case - should be either a standalone document or form part of PMP
P.MP4/5	→ Project Safety Strategy	✗	To be produced in order to complete PACE 1 - this can form part of the PMP

P.MP4/6	→ Integrated Assurance & Approvals Plan	✗	Not required/appropriate at this stage. To be produced at next stage when there is more clarity over project direction.
P.MP5	Risk Register	✓	Risks listed within business case and option selection report - do not appear to be quantified. These should be collated and quantified in terms of cost, time and probability (with appropriate mitigations defined) before the end of PACE 1.
P.RM1	Quantitative Cost Risk Assessment (QCRA)	✗	To be produced in order to complete PACE 1 for LoC 1 & 2 projects
P.RM2	Project Quantitative Schedule Risk Assessment (QSRA)	✗	To be produced in order to complete PACE 1 for LoC 1 & 2 projects
P.HS1	Health & Safety File	✗	To be produced and updated as far as possible in order to complete PACE 1 - QF703 to be in place
P.HS2	CDM Plan	✗	To be produced in order to complete PACE 1
P.HS3	Pre-Construction Information	✗	To be produced in order to complete PACE 1
P.HS6	Safety Risk & Mitigation Log	✗	To be produced in order to complete PACE 1 - this can be combined into a single log with the Project Hazard Record (EG5) if preferred
P.CA2	Land and Consents Commitments Register	✗	To be produced in order to complete PACE 1
P.CA3	Network Change	✗	Not required at this stage - can be produced in PACE 2
P.CA4	Station and Depot Change	✗	Not required at this stage - can be produced in PACE 2
P.EN1	Environmental & Social Appraisal	✗	Some environmental deliverables produced but this is still required in order to complete PACE 1
P.CP1	Formal Cost Planning Report	✗	Summarised in business case - full report required in order to complete PACE 1
P.CP5	Lifecycle Cost Report	✗	Specifically excluded from business case - see section 5.3.2. It is recommended that this is produced before the end of PACE 1.

P.RV6	VM Output Definition	X	Best Practice to complete this for complex projects in order to complete PACE 1
P.RV7	VM Option Selection	X	Best Practice to complete this for complex projects in order to complete PACE 1
P.RV9	VM Lessons Learnt	X	Recommended that lessons learnt session is held prior to completion of PACE 1
EG0	Preliminary System Definition and Safety Verification Categorisation Application	X	Acknowledged by Mott MacDonald in GRIP 3 report that CSM has not yet been considered - see section 14.2 of GRIP 3 report. This needs to be produced in order to complete PACE 1.
EG2	Project Authorisation Strategy	X	Acknowledged by Mott MacDonald in GRIP 3 report that CSM has not yet been considered - see section 14.2 of GRIP 3 report. This needs to be produced in order to complete PACE 1.
EG4	System Definition	X	Acknowledged by Mott MacDonald in GRIP 3 report that CSM has not yet been considered - see section 14.2 of GRIP 3 report. This needs to be produced in order to complete PACE 1.
EG5	Project Hazard Record	✓	Hazard record in appendix C of GRIP 3 report - HAZID has been held
EG6	System Safety Plan	X	Acknowledged by Mott MacDonald in GRIP 3 report that CSM has not yet been considered - see section 14.2 of GRIP 3 report. This needs to be produced in order to complete PACE 1.
EG7	Safety Justification Report	X	Acknowledged by Mott MacDonald in GRIP 3 report that CSM has not yet been considered - see section 14.2 of GRIP 3 report. This needs to be produced in order to complete PACE 1.
EG10	Engineering Compliance Certificate	X	To be produced in order to complete PACE 1

6.4. PACE Products Narrative

P.CR1 Client Remit
The purpose of the Client Remit product is to provide an overview of the scheme, including boundaries, interfaces, and known exclusions. It is also used to define the project requirements which will be developed through the lifecycle of the project. This document should be created at the point of project inception and helps to provide requirements traceability to ensure that all project requirements are delivered. This document should be produced in order to complete PACE 1.

P.CR2 Sponsors Instruction
The Sponsors Instruction acts as the project requirements document through the lifecycle of the project. It should be updated at regular intervals through the project lifecycle to track requirements at a level of detail appropriate to the stage the project is at. This document should be produced in order to complete PACE 1.

P.CR3 Asset Management Plan (AMP Process)
The Asset Management Plan (AMP Process) provides a mechanism for introducing new assets or affecting existing assets on NR's infrastructure through the development and implementation of an AMP which defines:

a) The responsibilities for the various elements of inspection and maintenance before, during and after project works.
b) The relationships and the exchanges of information between the Maintainer, Asset Owner and the Project Manager; and
c) The required AMP deliverables in support of project works.

This supports:

a) The arrangements for the management of assets undergoing change:
b) Assurance of the continued safe and effective maintenance of all assets through the project lifecycle; and
c) Network Rail in discharging its duties under the Construction, Design and Management Regulations, in accordance with NR/L2/OHS/0047, through the provision of pre-construction information.

In order to complete PACE 1 AMP forms 001-003 should be completed and agreed with the relevant Network Rail Project Interface Coordinator (PIC). The purpose of these forms is primarily to provide the asset maintainers with information regarding the project including scope and key contacts, and to agree a draft list of AMP products to be produced later in the project lifecycle.

P.CR4 Diversity Impact Assessment
The Diversity Impact Assessment (DIA) is a tool that helps the industry make sure that our programmes, policies, projects and the way we design, build and operate services works well for our staff and customers and ensures we are compliant with the Equality Act 2010. All projects should produce a DIA as early as possible during PACE 1, this can then be updated as the project progresses. A DIA should be produced in order to complete PACE 1.

P.CR6 Option Selection Report
A report containing evidence of a robust option selection process should be completed by all projects. This should include details of areas including (but not limited to): scope, requirements, selected option, compliance with requirements, constructability, access & possessions, programme, risks and assumptions.

An Option Selection Report has been produced for the project. Comments on this are provided in section 5 and Appendix A.

P.MP1 Phase Plan

The phase plan is a document that records the agreement between the Sponsor and the Project Manager regarding which PACE products are required, what stage of the project they are to be produced at and who is responsible for producing them. This should be populated by the project and used as the basis for the P.MP2 Phase Gate Certificate required below in order to complete PACE 1.

P.MP2 Phase Gate Certificate

The phase gate certificate is a version of the Phase Plan that contains a record of the project status at the end of each PACE phase. It details which products have been completed and provides a link to where they are stored on an appropriate document management system. This document should be signed by the Sponsor and Project Manager. This should be completed by the project as a formal record of the PACE 1 phase gate review.

P.MP3 LoC Assessment

The Level of Control (LoC) Assessment is a tool to determine how complex a project is, and in turn the controls and checks that must be placed around it. Projects are categorised from LoC 1 – 4, with LoC 1 being the most complex and LoC 4 the least complex. Projects are assessed against 6 categories:

1) Novelty
2) Technology & Design
3) Delivery Complexity
4) Pace
5) Operational Impact
6) Stakeholder Complexity/Reputational Risk

This assessment should be carried out by the project in order to complete PACE 1. Due to the proposed size and complexity of the project, it is likely to be assessed as a LoC 1 or LoC 2 project.

P.MP4 Project Management Plan

The Project Management Plan (PMP) describes how the project will be managed. This should include details of areas including (but not limited to): Scope, roles and responsibilities, stakeholder management, reporting, governance, risk management, planning, procurement and commercial management, environment and sustainability. Due the proposed size and complexity of the project it is recommended that a PMP be produced by the project in order to complete PACE 1.

P.MP4/1 Risk Management Plan

This document describes how risk is to be managed on a project. It is permissible for this to form a section of the PMP or to be a standalone document. Within Network Rail, a regional Risk Management Plan can be referred to if appropriate. Due the proposed size and complexity of the project it is recommended that a Risk Management Plan be produced by the project in order to complete PACE 1.

P.MP4/2 Stakeholder Management Plan

This document describes the project's approach to stakeholder management. It is permissible for this to form a section of the PMP or to be a standalone document. Due the proposed size and complexity of the project it is recommended that a Stakeholder Management Plan be produced by the project in order to complete PACE 1.

P.MP4/3 Scope Management Plan
The purpose of this document is to describe the processes and roles & responsibilities associated with the development, management and validation of the scope. It is permissible for this to form a section of the PMP or to be a standalone document. Due the proposed size and complexity of the project it is recommended that a Scope Management Plan be produced by the project in order to complete PACE 1.

P.MP4/4 Land & Consents Strategy
The purpose of this document is to identify the broad scope of land and consents requirements for the project and set out how these will be obtained/satisfied and supported through the project. The strategy should be produced as early as possible in PACE 1 and reviewed/updated throughout the project lifecycle.

It is noted that an outline Land & Consents Strategy has been included in both the business case and delivery strategy for the project. These documents have identified a Transport and Works Act Order (TWAO) as the preferred consenting route. Network Rail concur that this is appropriate for the currently proposed scheme.

It is recommended that a Land & Consents Strategy, either standalone or as part of a Project Management Plan, be produced by the project in order to complete PACE 1.

P.MP4/5 Project Safety Strategy
The Project Safety Strategy outlines the health and safety principles that apply to the project. It describes the safety policy, organisation and overall project safety arrangement applicable to design and delivery phases of the project. Due the proposed size and complexity of the project it is recommended that a Project Safety Strategy be produced by the project in order to complete PACE 1.

P.MP4/6 Integrated Assurance & Approvals Plan (IAAP)
This document enables the project to capture all assurance and approval activities in one place to provide an oversight of governance and assists in co-ordinating assurance activities and approval points to avoid overlaps or gaps. It is not necessary for the project to produce an IAAP in order to complete PACE 1, though it is recommended that one is produced at the start of the next stage of development.

P.MP5 Risk Register
The risk register exists to track and monitor any risks that might impact on a project. Risks are quantified in terms of time, cost and probability and feed into the QCRA (P.RM1) and QSRA (P.RM2) processes. A risk register has been created by the project and currently forms part of the business case document. These risks should be quantified in terms of time and cost to provide a view on the level of risk exposure to the project. These values will also feed into the QCRA and QSRA processes described below.

P.RM1 Quantitative Cost Risk Assessment (QCRA)
The QCRA is undertaken to provide a range of risk exposures (recommend appropriate contingency value) for an investment decision and/or to inform the adequacy of the current contingency (compare remaining exposure against the remaining contingency). A QCRA should be undertaken by the project in order to complete PACE 1.

P.RM2 Quantitative Schedule Risk Assessment (QSRA)
The QSRA is used to assess the likelihood of completing a programme of works to planned timescales and/or to provide a range of potential completion dates. The QSRA report captures the assumptions, risks and uncertainty to the delivery of the programme of works, together with any action plans required to ensure successful delivery. A QSRA should be undertaken by the project in order to complete PACE 1.

P.HS1 Health and Safety File
The Health and Safety File is a repository of health and safety information that serves as a legal record, benefitting both clients and end users – from initial construction through use, cleaning, maintenance, alterations and refurbishment, and demolition. By the end of PACE 1, the Principal Designer representative for the project should have:

a) Contacted the NR National Records Group to obtain the QF703; H&S File Memorandum of Agreement and Deliverable Document Matrix;
b) Completed the QF703, H&S File Memorandum of Agreement and Deliverable Document Matrix; and
c) Agreed the format of records in the H&S file with the Client Representative and the National Records Group.

P.HS2 CDM Plan
The CDM plan provides detail and assurance on how the duties of the CDM regulations 2015 will be discharged and met by the project. The project should compile a CDM plan prior to completing PACE 1.

P.HS3 Pre-Construction Information
The purpose of this document is to draw together information in the client's possession (or which is reasonably obtainable by or on behalf of the client), which is relevant to the construction work and is of an appropriate level of detail and proportionate to the risks involved, including:

a) Information about:
   i. The project
   ii. Planning and management of the project
   iii. Health and safety hazards, including design and construction hazards and how they will be addressed; and
b) Information in any existing health and safety file.

The project should compile a Pre-Construction Information pack prior to completing PACE 1.

P.HS6 Safety Risk & Mitigation Log
This document is used to identify and record any health and safety risks on the project, as well as actions to address them. It is permissible for this product to be standalone, or to be combined with EG5 Project Hazard Record. A Safety Risk & Mitigation Log should be produced prior to completing PACE 1.

P.CA2 Land and Consents Commitments Register
The purpose of this document is to record any consents that are required for the project based on the information known at the time. This document is a live register that is updated throughout the lifecycle of the project. A Land & Consents Commitment Register should be produced in order to complete PACE 1.

P.CA3 Network Change
Network Change is the process that projects must comply with if they are proposing anything that constitutes a physical change to the network, or a change to the operation of trains on the network. The process is in place to ensure that train operators are made aware of any changes to the network so that they can assess any impact this may have on their services and can plan accordingly. The project should begin informal consultation during PACE 1 and begin the formal process at the start of PACE 2.

P.CA4 Station and Depot Change
Stations alter throughout their life as things are added and taken away from them, and their use within the rail network changes. When stations are updated, either by projects or changing use, the contractual elements that guide the relationship between Network Rail and the Station Facility Owner will also change. These contractual elements are defined in the Station Access Conditions (SACs) for each station.

Station Change is the regulatory process used to facilitate these changes. The procedures are set out in the SACs and ensure that all users of stations are properly consulted about changes and that changes are formally registered with the ORR, so that the various parties can understand their obligations. The project should begin this process at the start of PACE 2.

P.EN1 Environmental and Social Appraisal (ESA)
This is a tool used to help identify and manage the environmental and social risks and opportunities associated with the project. The output of the tool is an action plan which allows projects to be developed in accordance with compliance obligations and industry best practice. Completing the ESA provides the project with a holistic assessment of the environmental and social risks and opportunities that must be managed for the successful delivery of the project. An Environmental and Social Appraisal should be produced in order to complete PACE 1.

It is noted that the project has produced a number of environmental deliverables, primarily an Environmental Report and a Preliminary Ecological Appraisal (PEA). Comment on these reports is provided in section 5.

P.CP1 Formal Cost Planning Report
The purpose of the Cost Planning Report is to provide a cost estimate for the project as well as a narrative explaining the makeup of costs and applicable benchmarks. Estimates are built using the Rail Method of Measurement (RMM) format. It is noted that an estimate has been produced as part of the GRIP 3 work for input into the business case. A Formal Cost Planning Report including benchmarking should be produced in order to complete PACE 1.

P.CP5 Lifecycle Cost Report
The purpose of the lifecycle cost report is to quantify the long-term costs of maintenance, operation and disposal to ensure that major capital projects balance the cost of acquisition with these ongoing whole life costs. It is recommended that a Lifecycle Cost Report is produced by the project prior to completion of PACE 1.

R.RV6 VM Output Definition
This is part of the NR Value Management process and comprises a facilitated workshop to determine the project purpose and functional requirements. A report is then produced to record the outputs of the workshop. It is recommended that a VM Output Definition workshop is held at the earliest available opportunity in order to help define the Minimum Viable Product (MVP) for the project.

R.RV7 VM Option Selection
This is the next part of the NR Value Management Process. It provides confirmation of the preferred option(s) for progression and is usually the result of a facilitated workshop but may also consist of a summary of option appraisals undertaken by the project and design teams. A VM Option Selection Workshop should also be held prior to the completion of PACE 1 in order to validate the work to date with reference to the VM Output Definition Workshop and MVP process.

R.RV9 VM Lessons Learnt
Another part of the NR Value Management Process. Lessons Learnt workshops should be held at the end of each PACE phase as minimum. The purpose of this is to support NR's strategic vision to become a learning organisation, improving business through better understanding of systemic issues. It is recommended that the project holds a Lessons Learnt workshop prior to the completion of PACE 1.

EG0 Preliminary System Definition and Safety Verification Categorisation Application
This document should be produced during the feasibility stage of the project (GRIP 2/PACE 1 ES2) at the latest. It provides details of the project scope, novelty and complexity amongst other things, which help to provide a project position on Common Safety Method (CSM) significance and Interoperability. This position

then needs to be verified by Network Rail Assurance Panel (NRAP) and influences the level of application of CSM and Railways (Interoperability) Regulations (RiR) required on the project. The Preliminary System Definition and Safety Verification Categorisation Application should be produced by the project as soon as possible as the outcome of these processes will influence the level of CSM-RA application required on the project.

EG2 Project Authorisation Strategy

The Project Authorisation Strategy sets out which elements of the project will require authorisation for placing into service under the RiR and also whether the project delivers significant change to the railway system as defined by the CSM regulations. The document should set out the proposed scope, structure and timescales for:

- The authorisations to be obtained from the safety authority;
- Any derogations from the requirements of applicable technical specifications for interoperability (TSIs) to be obtained from the competent authority; and
- The safety assessments and associated safety acceptances required to bring the project into use.

This document needs to be produced to enable the project to complete PACE 1.

EG4 System Definition

The System Definition is one of the key CSM documents to be produced by projects. The purpose of the document is to complement the hazard record by bounding the scope of the hazard identification and risk assessment process and provide sufficient context to facilitate an assessment of the correct application of the process by an independent body. This is a live document that should be updated through the project lifecycle as details of the project emerge.

This document needs to be produced to enable the project to complete PACE 1.

EG5 Project Hazard Record

A hazard record should be started from the beginning of the project to record safety hazards for the various options being considered and be used to inform feasibility work and subsequent option selection. The hazard record should be updated (including identification of any new hazards) and maintained throughout the project lifecycle. It is noted that a HAZID workshop has been held and a hazard record produced and provided in appendix C of the GRIP 3 multi-disciplinary report, though the format of this hazard record does not meet all the mandated requirements of CSM-RA.

EG6 System Safety Plan

The System Safety Plan is another key part of the CSM suite of documents. The main purpose of the document is, as part of the risk management process, to identify the different 'actors' tasks, and their risk management activities through the lifecycle of the project. It should be updated at regular intervals as the project develops.

This document needs to be produced to enable the project to complete PACE 1.

EG7 Safety Justification Report

A further key part of the CSM process, the purpose of the Safety Justification Report is to present the hazards identified as a result of the significant change and demonstrate that these are controlled to be tolerable and As Low as Reasonably Practicable (ALARP) through a means of safety measures. It should show that the system is suitably safe by demonstrating compliance with all safety requirements set in the System Definition, or, where Safety Requirements have not been met, the safety impact has been judged to be tolerable and ALARP.

This document needs to be produced to enable the project to complete PACE 1.

EG10 Engineering Compliance Certificate

The purpose of the Engineering Compliance Certificate is to formally accept evidence of compliance to the technical scope and requirements documentation, identify any formalised changes or variations to this scope as well as present any non-compliance to Network Rail standards. This can be utilised at any point in the project lifecycle to check compliance but is typically used at the end of GRIP stages/PACE phases. An Engineering Compliance Certificate should be produced in order to complete PACE 1.

7. Next Steps

Before the project proceeds any further, it is recommended that discussions are held between NR, CPCA and DfT to determine the future direction of the project. As well as heavy rail, other options such as tram-train and light rail should be further considered as per the recommendations of the NR engineering report and NR light rail feasibility study.

Next steps from the NR engineering and light rail feasibility studies are collated below.

NR Engineering Report

1. The multiple options and permutations for providing a service between March and Wisbech need to be reduced and refined to enable the project to move forward.

   The continued consideration of multiple options and permutations impedes cost and time efficient development.

2. The development of a more detailed strategic approach to level crossings is required that considers the safety, financial, project and performance risks and issues associated with closure, upgrade, highway diversion and grade separation.

   There will be an increase in the level crossing risk profiles due to an increase in road traffic since the line last operated. Closure of any level crossing will be subject to agreement with any users and financial settlements may be required. Where level crossings are to remain open risks will need to be mitigated in the context of different modal options and how rail vehicles operate along the line.

3. Further work is required to explore the light rail tram-train solution

   Network Rail's Light Rail and Knowledge team's report (Source Document 11) concludes that there is potential for a light rail passenger operation between March and Wisbech. The assessment of suitable rolling stock types concludes that Tram; Tram Train, or Very Light Rail vehicles could be used. The operating costs of light rail are likely to be significantly lower than comparable heavy rail services.

4. Further work is required to confirm the passenger and freight demand, particularly post COVID-19 pandemic, to determine the most appropriate solution that meets this demand.

   The reports do not adequately evidence a thorough Transport Study and therefore do not provide a solid base on which to make an informed decision. Both heavy and light rail tram-train facilitate freight services. A light rail tram-train option offers a potentially more credible solution based on overall cost, an optimised level crossing strategy, connectivity to the National Rail network and direct access into Wisbech Town and Wisbech Garden Town.

5. Develop a System Definition and System Safety Plan in line with the proposer's legal obligations set out in Common Safety Method for Risk Evaluation and Assessment Regulation (EU) 402/2013.

   The starting point for anyone proposing any change in relation to the mainline railway system is the Common Safety Method – RA, and this applies when any technical, operational or organisational change is being proposed to the railway system. The proposer in this instance is deemed to the combined local authority or their agent.

6. A detailed asset condition survey is required for the entire route. This will assist in confirming the rail infrastructure work required for the option selected.

The condition of the former railway infrastructure is not known and it has not been fully maintained since the line was mothballed. A full asset condition survey will enable greater clarity on the scale and costs of any railway infrastructure works required.

Light Rail Feasibility Report

1. The legal status of all the former level crossings on the March to Wisbech line should be confirmed. Confirmation is required if the legal status needs to change if the route is to be used by light rail vehicles.

   Establishing the existing rights and liabilities at each crossing will help inform the appropriate solution for each vehicle option.

2. Options for the ownership, operations and maintenance responsibility for the route need to be identified and resolved prior to further development. This includes any on street system into Wisbech town centre or the extension to serve the Garden Town.

   While Network Rail retains the freehold of the former railway alignment and associated land there are various options for the long term reinstatement of the route and service. Any extensions beyond the existing Network Rail land boundary create options for the delivery, operation and ownership of any assets.

3. A detailed asset condition survey is required of the entire route. This will assist to confirm the level of remedial work required to reinstate any form of rail infrastructure. This survey to include March Station and the required alterations to create a fully accessible route to the Wisbech platforms.

   The former railway infrastructure has not been fully maintained since the line was mothballed. A full asset condition survey will enable greater clarity on the scale and costs of any reinstatement of railway infrastructure.

4. Continued analysis of the light rail rolling stock market and the opportunity for further development in areas such as stored energy and very light rail.

   There are continuing technological developments in light rail that may provide further opportunities for the Wisbech to March route. The very light rail market is still emergent and the full capability (and limitations) of this mode are not yet fully understood.

5. Consider the requirements of providing a double track route between Wisbech and March.

   The ability to provide a full double track route will confirm the maximum capacity of the route and determine the degree to which any future-proofing works are required should the initial phase of reopening be less than double track.

Appendix A. NRDD Engineering Review

NetworkRail

Engineering Services

Route Services

March to Wisbech Engineering Assessment Report

Project Name:	March to Wisbech	
Project Number:	OP: 176291	Task: 1.3.1
Development Manager:	Mark Chettle	

Prepared by: Christopher Ruddy	Signature: PP
Date: 22-0-2022	Job Title: Senior Project Engineer
Peer Reviewed by: Peter Harman	Signature:
Date: 22-02-2022	Job Title: Principal Engineer
Approved by: Amanda Mumford-Rudd	Signature:
Date: 22-02-2022	Job Title: Scheme Design Team Lead and Principal Engineer

Document version control

Date	**Version**	**Editor**	**Approver**	**Description / Change reason**
24.01.22	1.0	Christopher Ruddy	Amanda Mumford-Rudd	Draft for comment
22.02.22	2.0	Christopher Ruddy	Amanda Mumford- Rudd	Final document for issue

Executive Summary

The railway from March to Wisbech was opened by the Eastern Counties Railway in 1847 and became part of the Great Eastern Railway in 1862. Originally built as a double track railway to serve the Port of Wisbech, it was later extended to Watlington Junction on the Ely to King's Lynn route.

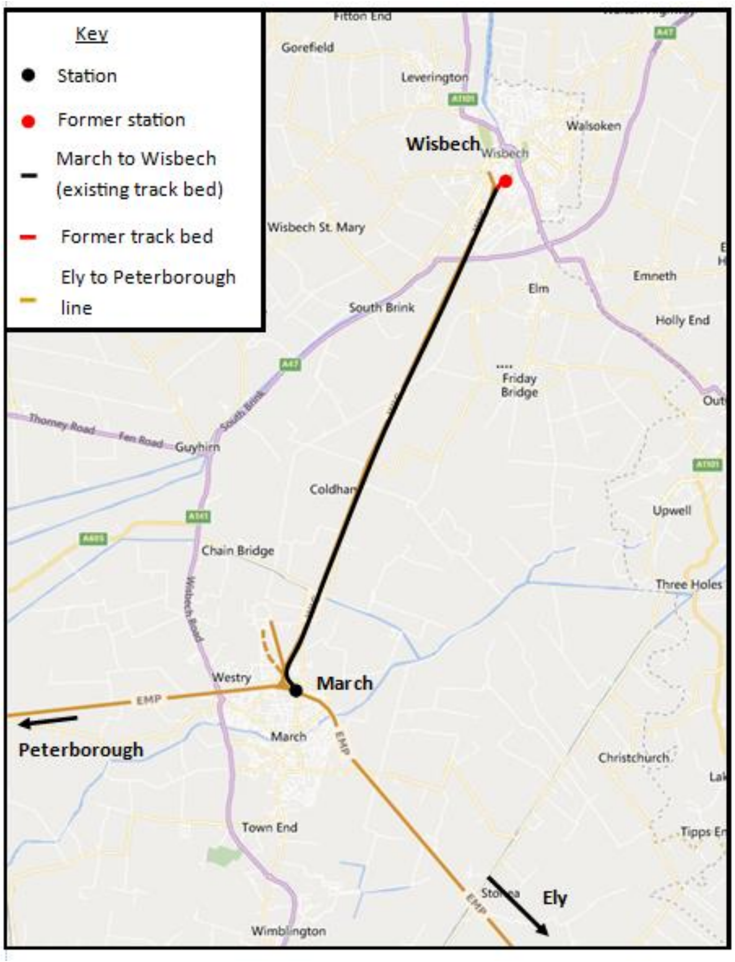

Figure 1 March to Wisbech Line

Passenger service ceased in the 1960s. Until 2000 it was used for freight-only operations as far as the Metal Box and Purina sites, located south of Wisbech. The line has not been formally closed, nor has it been subject to Network Change. It remains part of the existing railway network.

Cambridgeshire and Peterborough Combined Authority propose a transport link from Wisbech to Cambridge based on the previous rail connection between March and Wisbech. Mott MacDonald have investigated the feasibility of heavy rail and light rail alternatives and concluded the preferred transport mode is heavy rail.

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Network Rail's Scheme Design Team have been asked by Network Rail's Capital Delivery Eastern Region to undertake a feasibility review of the proposals developed by Mott MacDonald on behalf of the Cambridgeshire and Peterborough Combined Authority based on 9 key documents and other supporting information produced by Mott MacDonald. This report summarises the findings of that review.

The purpose of the Scheme Design Team's review is:

a) to consider any identified gaps in the scope of the study or recommendations as to areas to investigate further
b) to review the risks of undertaking the work identified in the study to Network Rail and advise on the completeness of the hazards detailed within the material presented for review
c) to recommend what actions will be required to develop the study to achieve the end of GRIP 3 (PACE Phase 1)
d) to advise on the appropriateness of the rail solution proposed and consider this relative to light rail options
e) to consider the impact of freight services running on a new line to Wisbech

This feasibility review concludes:

- The reports produced by Mott MacDonald are wide ranging with options and conclusions which are considered in this report.
- There are gaps in the reports including:
  - The assumptions relating to level crossings require further examination and the development of a more detailed strategic approach that considers the safety, financial, project and performance risks and issues associated with closure, upgrade, highway diversion and grade separation
  - There is limited consideration of the requirements of the Common Safety Method - Risk Evaluation and Assessment (EU 402/2013), now enshrined in UK law
  - The demand modelling is limited, and the reports do not provide sufficient evidence on which to make an informed decision to reinstate conventional heavy rail services. The reports demonstrate a desire to facilitate freight services, without providing any clarity on the services required or that the potential market for freight services exist.
- The risks identified are wide ranging and appropriate for this stage of development. Looking forward:
  - As the project progresses all new and existing risks will need to be considered on an iterative basis for the transport solution progressed
  - The lack of a clear level crossing strategy is currently the biggest risk to the project
  - The qualifications and assumptions documented including those relating to level crossings will need to be validated

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Route Services

NetworkRail

- Given the current number of options and permutations including those relating to modal choice, station location and passenger/freight demand, progression to GRIP 3 (now PACE Stage A/1) is challenging. To successfully progress requires:
  - The client to make informed decisions limiting the options and permutations
  - A detailed geotechnical survey of the trackbed, embankments and major structures is required along the entire route to confirm their suitability for use and to identify any remedial works required
- A heavy rail solution facilitates the introduction of conventional freight and passenger services and uninterrupted connectivity to the National Rail network. However, a lower cost Tram Train/light rail solution may be more appropriate based on:
  - A Tram Train solution facilitates uninterrupted connectivity for passenger services to the National Rail network with the added advantage of including a service to Wisbech town centre and to the proposed Wisbech Garden Town
  - A light rail solution, whilst not facilitating uninterrupted connectivity for passenger services to the National Rail network, is a credible solution for point-to-point transport and services to Wisbech town centre and to the proposed Wisbech Garden Town
  - The overall strategy for addressing the issues associated with level crossings is simplified by a Tram Train/light rail solution, which would permit application of lower cost minimum intervention installations
  - There is an opportunity to consider light freight trams/Tram Train as has been utilised in Europe
- Conventional freight services are only accommodated by a heavy rail infrastructure solution. The reports demonstrate a desire to facilitate freight services, without providing any clarity on the services required or that the potential market for freight services exist. The impacts of facilitating freight services on the line include:
  - Potential interruption to passenger train paths by freight services
  - An increase in the rate of degradation of the asset
  - Increased capital and maintenance costs associated with heavy rail
- Uninterrupted connectivity onto the wider rail network is dependent on the availability of train paths. Currently these are constrained and there are competing demands from train operators for these train paths. Future demand and economic valuation of train paths together with forthcoming changes to industry structure will introduce a greater strategic focus on network capacity utilisation and may affect the availability of train paths beyond the Wisbech route

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In conclusion, the Scheme Design team's feasibility review considers that whilst heavy rail is a viable option, light rail may offer a more appropriate solution. We recommend further work to examine the lower cost light rail Tram Train option. This is reinforced by Network Rail's Light Rail team's study which concludes that light rail is a credible and feasible option.

OFFICIAL

Route Services

NetworkRail

Contents

OFFICIAL

OFFICIAL

1. Introduction

Network Rail Design Delivery's Scheme Design Team have been instructed by Network Rail's Capital Delivery Eastern Region to undertake a feasibility review of the proposals developed by Mott MacDonald on behalf of the Cambridgeshire and Peterborough Combined Authority, who propose a transport link from Wisbech to Cambridge based on the previous rail connection between March and Wisbech.

The work undertaken by Mott MacDonald began in 2015 and a significant number of documents were produced to inform the development of the proposed transport link. Key documents were updated and re-issued in 2020 and the feasibility review by Scheme Design Team is based on a desktop review of these updated documents.

2. Background

The railway from March to Wisbech was opened by the Eastern Counties Railway in 1847 and became part of the Great Eastern Railway in 1862. Originally built as a double track railway to serve the Port of Wisbech, it was later extended to Watlington Junction on the Ely to King's Lynn route. The line from March to Wisbech; the Wisbech Goods Branch, Engineer's Line Reference (ELR) WIG, runs from March East Junction at 85 miles 78 chains to the nominal end of the line at 93 miles 49 chains at Wisbech. Passenger service ceased in 1968. The track has been substantially removed beyond Weasenham Lane level crossing at 93 miles 15 chains. The remaining rail corridor remains in Network Rail ownership.

The line was constructed as a twin track railway but was single lined in 1972. From 1972 to 2000 it was used for freight only operations as far as the Metal Box and Purina sites, located south of Wisbech. The March end of the line continues to be used to access Whitemoor Yard in conjunction with the chord line from March West Junction and to support shunting movements, but only as far as 86 miles 18 chains.

The line was operated on the "One Train" principle with a Train Staff (OTS), and therefore facilitated only one train operating on the line at any one time.

Since 2000, the line has been officially described in the Network Rail Sectional Appendix as "Out of Use" (temporarily), from 86 miles 18 chains to Wisbech". The line has not been formally closed, nor has it been subject to Network Change, taking it out of the existing National Rail railway network.

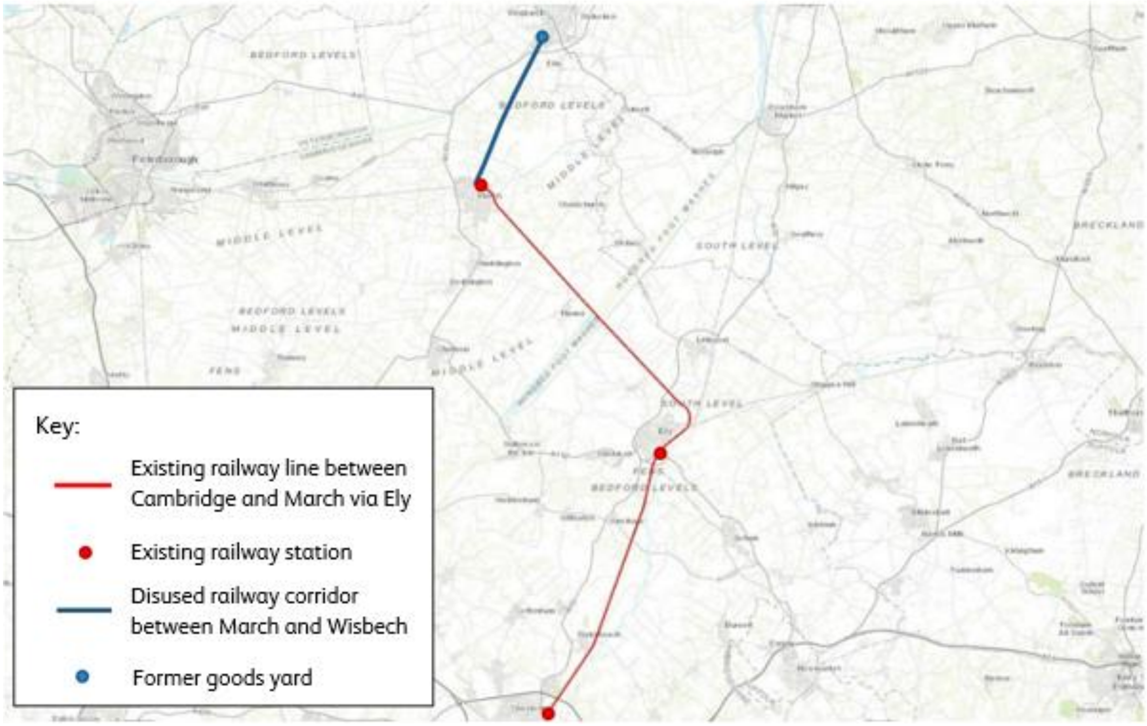

Figure 2 Cambridge to Wisbech via March.

Source: Mott MacDonald/GIS Mapping Low cost alternative Tram Train feasibility report 2019

When in freight only use, the line had a nominal permissible speed of 25mph, but lower restrictions applied over some of the numerous level crossings to manage level crossing risks associated with the line of route, which is largely straight and virtually level throughout.

The line has not received any recent maintenance nor renewal of track and other discipline apparatus.

3. Scope of the study

The scope of this study is to undertake a feasibility review of the proposals developed by Mott MacDonald on behalf of the Cambridgeshire and Peterborough Combined Authority, who propose a transport link from Cambridge to Wisbech based on the previous rail connection between March and Wisbech.

The purpose of the review is:

a) to consider any identified gaps in the scope of the (Mott MacDonald) study or recommendations as to areas to investigate further
b) to review the risks of undertaking the work identified in the study to Network Rail and advise on the completeness of the hazards detailed within the material presented for review
c) to recommend what actions will be required to develop the (Mott MacDonald) study to achieve the end of GRIP 3 (PACE Phase 1)

OFFICIAL

Route Services

NetworkRail

d) to advise on the appropriateness of the rail solution proposed (by Mott MacDonald) and consider this relative to light rail options
e) to consider the impact of freight services running on a new line to Wisbech

The report structure reflects these five subject areas.

This is a desktop review informed by nine key documents commissioned by Cambridgeshire and Peterborough Combined Authority and written by Mott MacDonald. These documents are:

1. Heavy rail feasibility report:

   March to Wisbech Transport Corridor: GRIP2 Heavy Rail Feasibility Report
   05 August 2019 398128 | 002 | B

   This report investigates the feasibility and cost of re-opening the railway line between March Station and Wisbech to heavy rail services.

2. Heavy rail multi-disciplinary option selection report

   March to Wisbech Transport Corridor: GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report
   26 June 2020 398128 | 009 | C

   This report documents the optioneering and engineering employed, to develop a single preferred heavy rail solution, for the March to Wisbech transport corridor, to the level of detail required to support Full Business Case (FBC) cost estimation.

3. Assessment of rail operations report:

   March to Wisbech Transport Corridor: Assessment of Rail Operations
   17 March 2020 398128| 007| C

   This report describes the operational analysis that has been undertaken to examine possible timetable patterns, service constraints and capacity for introducing a two train per hour (2tph) service between Wisbech and March.

4. Low-cost alternative - Tram -Train feasibility report:

   March to Wisbech Transport Corridor: Low-Cost Alternative – Tram Train
   16 August 2019 398128 | 004 | B

   This report describes the proposed Tram Train solution and set out the rationale for selecting this mode as the low-cost alternative to heavy rail.

5. Delivery strategy:

   March to Wisbech Transport Corridor: Delivery strategy
   20 July 2020 398128 | 009 | E

   The purpose of the Delivery Strategy is to identify and assess potential approaches to deliver the preferred scheme option that was identified earlier in the project lifecycle in the Options Assessment Report (OAR).

6. Environmental report:

   March to Wisbech Transport Corridor: Environmental Report
   July 2020 398128|MMD-00-XX-RP-EN-001|B

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This report presents the environmental constraints and opportunities for the reinstatement and refurbishment of the March to Wisbech rail corridor and March Station as well as the creation of a new railway station at Wisbech.

7. Alternative highway schemes report:

   March to Wisbech Transport Corridor: Environmental Report
   10 July 2020

   This report summarises alternative options for highways Schemes 1 and 2 and recommends a preferred option for each scheme.

8. Comments register:

   This spreadsheet captures inputs from industry and the requirement to actively involve and consult with industry providing their advice on potential delivery structures and mechanisms to support the business case submission.

9. Full business case:

   March to Wisbech Transport Corridor: Full Business Case
   26 June 2020 398128-011-E

   This report identifies a single option design in accordance with Transport Appraisal Guidance requirements for the March to Wisbech Transport Corridor.

10. Other related documents have been considered including:

11. Network Rail's Light Rail Knowledge & Development team's Report

    Wisbech to March: Potential for Light Rail
    December 2021

    Network Rail's Light Rail Knowledge & Development team assess the potential for reopening rail passenger services on the former March to Wisbech line using light rail technology. This report summarises the findings of that assessment.

No topographic surveys, site investigations, structural condition assessments or site visits were required or undertaken as part of this review.

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Route Services

NetworkRail

4. Supporting background information

In this section of the report, we provide additional background on factors affecting the introduction of heavy rail passenger and freight services between March and Wisbech and onward to Cambridge. This is intended to provide additional context relating to project risks, opportunities, barriers, dependencies and constraints relating to the introduction of train services and summarises the known capacity and journey time constraints on the existing rail network.

Operational constraints including connectivity to wider network

As custodians of the existing rail network, Network Rail is responsible for maintaining and developing the current operational railway alongside enhancements. This is an agreed industry process which engages TOC, FOC, Local Authorities and other appropriate partners and stakeholders.

There are several possible schemes being considered on the routes from March which have the potential to impact on any proposed March to Wisbech service.

Current and proposed infrastructure allows for maximum of 2 trains per hour from Wisbech to March. There is limited expansion capability to improve upon this with current proposals. There is an aspiration for trains to continue onward to Cambridge. Currently there are no onward paths to Cambridge.

At the time of writing, no major renewals or enhancements are known to be confirmed, although various works streams have been proposed, most notably a project at Ely North Junction, known as the Ely Area Capacity Enhancement (EACE). This project aims to increase the trains paths through Ely North Junction to 11 trains per hour, but crucially this does not appear to include any provision for additional services for Wisbech to Cambridge, which would require 13 trains per hour through Ely North Junction. To fully understand the performance/resilience impact, operational modelling is required, and should be carried out as part of the March to Wisbech project and the Ely Area Capacity Enhancement project.

Further constraints include the existing platform and track layout arrangement at March station which would require some alteration to allow for the additional train movements required to run trains to/from Wisbech. The track layout at March is already very restrictive as trains have to use the bi-directional Platform 2 to reach Whitemoor Junction and Whitemoor Yard. The proposed infrastructure includes reinstatement of a Platform 3 at March.

The main constraint on train services is the fact that this is a single line route, with no capacity for trains to pass. This facilitates a maximum of two trains per hour in each direction. The introduction of a passing loop is required to enable a 30 minute service interval to be achieved, enable service reliability, and allow for any potential increase in service. However, there will be limitations subject to timetable recast to provide any service further than March.

OFFICIAL

Route Services

NetworkRail

Infrastructure assets

The existing asset condition and the need for major renewal of track bed, rails, sleepers and fastenings is required, as well as heavy maintenance or renewal/upgrade of several bridge structures on the route.

Level crossings

There will be an increase in the level crossing risk profiles due to an increase in road traffic since the line last operated. Re-introducing conventional heavy rail services will require an assessment of ALCRM level crossing risk scores. It is assumed it will be possible to close the majority of level crossings. However, where this is not possible, such as the A47 trunk road, significant highway redirection or a grade separated crossing would be required, at significant cost. Where level crossings are proposed for closure, there is a need for a full consultation with users on the future of the crossings. Although most are minor roads, they do serve communities which may be severely inconvenienced by closure. Closure of any level crossing will be subject to agreement with any users and financial settlements may be required. Where level crossings are to remain open, all level crossing apparatus would require to be completely renewed and upgraded to meet current legislation and regulatory requirements.

A light rail Tram Train operation would permit application of lower cost minimum intervention installations and could cut the cost of project implementation and operation by a considerable factor.

Should train services continue to Ely or Cambridge, there are 38 level crossings of various types between March and Cambridge. Each one of these would be subjected to risk assessments associated with the introduction of additional rail services. This is a significant issue for the Wisbech - Cambridge 2 trains per hour (tph) service pattern, if implemented. The introduction of a 2 tph service would increase the number of trains across these level crossings by four services within a one - hour period. Network Rail would need to demonstrate that risk factors such as barrier down time (affecting road traffic) have been considered and increased risk of interaction between trains and road/pedestrian users is mitigated. As additional services running through the existing level crossings between March and Cambridge would increase level crossing risk, they may also trigger a requirement to upgrade these level crossings or replace with bridges.

Environmental including land acquisition

The original line of route is no longer complete, with conurbation and industrial building developments over the original line. Any new railway operating would be significantly shorter than the original without considerable new green field railway line being built or property acquisition to regain the original route lost to development.

For a heavy rail solution the only realistic option for the town would be a brownfield site next to the Nestle Factory. The factory is located at the northern end of the discussed railway corridor, the existing factory occupies the site of the former Wisbech Goods Yard. The site prevents a direct link from the corridor to Wisbech town centre.

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For a light rail Tram Train solution, a street running agreement with the council would be required to limit/avoid property demolition.

Rolling stock

Any rail solution will be dependent on the availability or procurement of additional rolling stock irrespective of level of service or modal choice.

This needs to be in line with current decarbonisation and elimination of dependence on fossil fuel strategies. This means rolling stock needs to be powered by battery, OLE, hydrogen, diesel/battery. Self-powered, bi-mode and hybrid are all potential considerations.

The availability of heavy rail rolling stock for cascading is limited and unlikely to deliver against a decarbonisation strategy. Adapted or new rolling stock would be required.

Light rail Tram Train vehicles support a low carbon traction power solution. Light rail vehicle suppliers routinely design rolling stock to meet individual system requirements on which they will operate.

A light rail solution does not preclude freight. A Tram Train or light rail solution offers a possible alternative freight potential using freight tram trains similar to those used in Europe.

Heavy rail freight and Tram Train are suited to and support different types of freight movement. A light rail freight solution can have the advantage of facilitating the transport of materials and goods that are uneconomic to move using heavy rail.

The freight capability of rolling stock is dependent on both the rolling stock and the infrastructure provided.

OFFICIAL

Route Services

NetworkRail

5. Study gaps and further investigation

The reports explore the feasibility of heavy and light rail options and are wide ranging with options and conclusions that are considered in this report. This report identifies a number of areas which would benefit from further investigation.

Level crossings

Level crossings have been considered for all potential solutions. However, the level crossing portfolio would benefit from further consideration as the safety, financial, performance and project risks remain a significant liability for the project.

The Mott Macdonald report identifies 23 level crossings which includes the Wisbech Bypass AOCL crossing the A47 trunk road. This is informed by Network Rail's 2016 Level Crossing Closure report and a 2015 Mott MacDonald site walkout. Network Rail Light Rail and Knowledge team's report (*Source Document 11*) identifies 7 active and 12 passive crossings. This is informed by analysis of mapping imagery/data to identify physical evidence of level crossings in situ supported by evidence obtained from a site visit. The number of level crossings and the project requirements at these locations; closure, upgrade, highway diversion and grade separation, need to be clarified.

It is entirely possible that where level crossings are present, these could not be brought back into use in today's environment; grade separated crossing would be required, such as road bridges or re-routed highway. The potential costs associated with grade separation and re-routing of highways are included in the report costs estimates.

The GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report (*Source Document 4)* assumes that several level crossings could be closed, either by Compulsory Purchase Order or negotiation, and others can be bought from landowners. No alternatives are given, and further work is required to identify alternatives should this not be the case and there are challenges associated with closure.

The GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report (*Source Document 4)* also assumes that a number of more complex highway level crossings will be replaced with bridges. Work needs to be done to confirm that these assumptions can be realised. Again, no alternatives are given should this not be the case.

Depending on the modal choice, rolling stock and traction type eventually decided upon, level crossing closure or renewal will be a major consideration, and safety and financial risk. This is further exacerbated by the potential need for grade separated crossings between rail and road traffic which potentially requires major road redirection or grade separated structures to be built.

A light rail option would permit application of lower cost minimum intervention installations, or retention of automatic installations. A full Tram Train option would offer the opportunity to remove standard railway crossing controls completely with the

OFFICIAL

Route Services

NetworkRail

installation of signalised traffic light junctions at light rail/road interfaces. This would be subject to suitable risk assessment at each location.

Common Safety Method

None of the documents reviewed mention Regulation 402/2013 on the Common Safety Method for Risk Evaluation and Assessment (CSM - RA) to any great extent, other than the financial cost of carrying out this process. CSM - RA is a legal requirement mandated by EU, and now UK law. It is essential that the process to identify existing hazards (as well as known and potential future hazards) is started as early as possible, and how the risks these present are, or may, be mitigated.

A simple, initial Hazard Record is included in Appendix C of the GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report – Page 193 (*Source Document 4)*. However, the format of the hazard record does not meet all the mandated requirements of CSM - RA.

Determine the need for freight

The demand modelling is limited. The reports demonstrate a desire to facilitate freight services, without providing any clarity on the services required or that the potential market for freight services exist. A specialist transportation demand assessment for both potential passenger and freight traffic would inform the decision of modal choice and potential current and future freight opportunities. The need for freight capability and the type of capability on the line needs to be further understood and confirmed, as this impacts on the appropriate solution to be taken forward, and whether or not the line continues to be suitable for freight traffic including gross tonnage and frequency.

Heavy rail/Tram Train/light rail solution

A study by Network Rail's Light Rail Knowledge team (*Source Document 11)*, commissioned by Cambridgeshire and Peterborough Combined Authority, has considered the suitability of light rail technology for the provision of a passenger rail service between March and Wisbech. The study concludes that a light rail operation appears feasible with several options of vehicle type available. These include the potential for the introduction of light rail freight vehicles. The report further concludes:

- a Tram Train would be an optimum light rail solution
- the number of level crossings on the route may make a full or hybrid light rail operation cheaper than a comparable heavy rail solution

Further work is recommended to examine the light rail and in particular the Tram Train option in more detail.

Signalling

The method of new signalling is not fully detailed; the line was One Train Staff working previously. If a passing loop is required, then Track Circuit Block with new colour light signals is stated as being the only option for signalling. The number and location of signals is entirely dependent on the headways required, number of level crossings and

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what type of level crossings are implemented. There is no confirmation that the existing electro-mechanical signalling is suitable for additional locking that may be required at March East Signal Box, especially if layout alterations at March East Junction and/or station layout are required. The reports reviewed only suggests a new NX (eNtry – eXit) panel or Visual Display Unit (VDU) solution may be needed at March Signal Box for any new signalling option.

There is no mention as to what means of signalling would be employed if Tram Train or other light rail were to be chosen as the solution. This is perhaps not needed at this early stage.

Traction power

There is currently no traction power supply on the existing railway between Ely and Peterborough via March. The various reports reviewed provide limited information on traction power solutions.

There is some commentary on the difficulty of providing OHLE apparatus for a light rail solution in Wisbech town centre due to the nature of the streets and buildings, coupled with their listed status. The reports do not comment on the feasibility or difficulties that may be encountered by electrifying the March to Wisbech branch other than it would be expensive. There is no commentary on the feasibility of providing the necessary infrastructure to cater for OHLE, and if this would be achieved using conventional piles, or screw/helical piles, or if the topography of the landscape is suitable for these types of structures. There is no mention if geotechnical surveys have been carried out for this purpose, however, the GRIP 3 heavy rail report does state that these may be required at a later stage; GRIP 4.

Traction power based on low carbon alternatives are not considered. There are similar low carbon traction power systems for heavy and light rail options. There are opportunities to introduce self-powered vehicles using new and existing technology including battery, hydrogen, diesel/battery/bi-mode/hybrid and ground based fast charging systems. Battery/bi-mode technology is used in Europe and is currently being introduced onto the UK national rail network. A ground based fast charging system is currently being trialled in the UK.

Approaches to traction power need to be explored in more detail.

Geotechnical and ground condition for overhead line

Geotechnical and ground topographical surveys for any OHLE apparatus structure may be required to assess the ground suitability for these structures, and for any grade separated crossing solutions.

Future work bank

The full business case report (*Source Document 9)* provides minimal commentary on Network Rail Eastern’s current workbank, and any opportunities to combine any works

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required with planned workbank to take advantage of any line of route or major renewals, and to provide economy of scale. Projects mooted include resignalling of Ely and Cambridge areas (CP7) and the Ely Area Capacity Enhancement (EACE) Scheme (no indicative Control Period date given, CP7 earliest)

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6. Risk review of work identified

As a general principle, the original reports have considered the potential hazards and subsequent risks but may have not fully accounted for all the hazards and risks that may be introduced by some of the options presented.

The Full Business Case (*Source Document 9)* document has a comprehensive risk section, detailing risk in a hierarchy with three categories:

1. Strategic risk
2. Programme risk
3. Scheme risk

Mitigating factors for these risks are provide in tabular form in the report.

These are further broken down into 19 key project risks, along with uncertainties and sensitivity analysis coupled with assumptions. No mitigating factors are proposed.

The Heavy Rail Feasibility Report (*Source Document 4)* has 10 principal risks identified for that option:

Risk 1. The timetabling assessment work has been based on the existing timetable. There is a risk that a re-cast of the timetable will affect the assumptions made.

Risk 2. Network Rail have previously stated that the timetable alterations for a service from Wisbech to Cambridge are not deemed possible at this time. This is not seen as best use of current infrastructure on what is an already constrained network. The capacity upgrade proposals for the Ely to Ely North Junction area are a key dependency for any proposed Wisbech to Cambridge rail service.

Risk 3. The introduction of a new double junction at March is unlikely to be welcomed by Network Rail Asset Management and an alternative layout might be required – this may not be readily achieved.

Risk 4. The layout is constrained by March East Signal Box; its listed status may mean relocating it.

Risk 5. The introduction of a new fixed diamond crossing for the Peterborough turnback layout is unlikely to be accepted by Network Rail Asset Management. An alternative layout might be required, and this may not be readily achieved.

Risk 6. The provision of a diverse “B-leg” for safety critical signalling and telecommunications circuits has not been explored but will be required.

Risk 7. Re-decking WIG/2314 Chain Bridge may not be possible without alterations to the levels of the adjacent highway.

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Risk 8. The effect on pedestrian flow and fire evacuation arrangements resulting from the proposals for March Station have not been investigated.

Risk 9. The effect of the March Station proposals on the Operation of Whitemoor Yard has not been investigated in detail.

Risk 10. For services from Wisbech to Cambridge and Wisbech to Peterborough, additional rail traffic on the network will alter level crossing risk profiles between March and Cambridge/Peterborough Stations. This may trigger requirements for additional level crossing upgrade or closure schemes.

Completeness of hazards

At this early stage, the hazards encountered by constructing and operating the chosen solution have not yet been fully investigated and would need to be considered via a Quantified Risk Assessment (QRA) and/or hazard workshop(s) once the final solution has been chosen. This process should already have been started and documented, driven by CSM - RA obligations. This process should be started as early as possible. CSM - RA legislation dictates the risks should be reduced so far as is reasonably practicable. CSM - RA legislation also states that a project should list the existing hazards, prior to any work commencing or changes implemented.

Hazards regarding the numerous level crossings on the route are not fully complete, given that it may not be possible to re-open some level crossing, landowners may reject the opportunity to sell or give up access, and if others cannot be closed by Network Rail.

For the level crossings that remain, there is little commentary on the difference between level crossing operation when used by heavy rail (including freight) versus Tram Train/light rail. As a general principle, heavy rail requires more onerous controls and limitations on speed, sighting and time of road closure, versus light rail which has less onerous requirements and a simpler interface.

Hazards relating to new electrification have not been considered, nor have hazards around mixed traffic if Tram Train is utilised on the National Rail network. For light rail services, point to point changing at March station has not been considered, with regard to items such as differing platform heights and passenger movements.

OFFICIAL

Route Services

NetworkRail

Operational risk

The Assessment of Rail Operation Report (*Source Document 3)* describes the operational analysis undertaken to examine possible timetable patterns, service constraints and 2 trains per hour capability between March and Wisbech.

The report highlights that operating rail services over the level crossings between March and Wisbech would introduce a level of risk. The report also states that any service that continued to Cambridge would increase the trains per hour crossing the numerous level crossings on that route, leading to an increase of barrier down time. This raises the potential for a need to mitigate the risks associated with level crossings (closure, upgrade, bridge, grade separation) between Ely and Cambridge.

The Full Business Case report (*Source Document 9)* assumes that Network Rail will be the Infrastructure Manager and Owner for the railway infrastructure delivered by this Scheme, which also leads to the assumption that Network Rail will operate, maintain and renew the infrastructure following its handover. This would seem a reasonable assumption for a conventional heavy rail solution, but one that would have to be agreed by the promotor and Network Rail.

It is possible that Network Rail could divest itself of all these risk by allowing the combined local authority to take on the operation of the railway, especially if a Tram Train or Very Light Rail option is taken forward.

With a light rail solution, Network Rail staff operating and maintaining the railway would require appropriate training and competence. This approach has been successfully implemented on the Tram Train Pilot Operation in South Yorkshire.

However, allowing a third party to operate a rail system which could interface or run alongside Network Rail infrastructure introduces its own set of risks, and the combined authority may not be best placed to operate a transport system they have no experience or knowledge of.

It is noted that lineside fencing is incomplete throughout the existing line and would most likely need to be completely renewed to deter trespass and vandalism, and animal incursion.

Level crossings

There is a financial and project risk if landowners do not want to sell or readily agree to their accommodation or user worked level crossings being closed, especially if compulsory purchase orders are needed.

The local authorities will require extensive consultation where roads are required to be diverted or where the level and frequency of road traffic prohibit level crossings being reopened.

OFFICIAL

Route Services

NetworkRail

The GRIP 3 report (*Source Document 4)* concludes that level crossing risk assessments should be carried out at a later GRIP stage to determine whether lower cost alternatives to the NR level crossing closure schemes can be shown to align with legislative and regulatory requirements for level crossing safety.

Depending on the modal choice, rolling stock and traction type eventually decided upon, level crossing closure or renewal will be a major consideration with associated safety and financial risk.

Asset condition

Some of the existing assets appear to be in various states of disrepair, there is no guarantee these can be repaired or are suitable for reuse. Full renewal is anticipated.

This is particularly true for permanent way, where it is concluded that all of the rail, sleepers and fastenings would need to be completely renewed. Some of the existing components are now obsolete. Although photographic evidence suggests that parts of the line might have been re-laid in modern flat bottom rail on concrete sleepers, the track has not been maintained for an extended period of time, it is overgrown by lineside vegetation, suffers major ballast contamination and the current geometric condition is unknown. It is assumed that the line must be completely re-laid, from formation level upward including substantial ballast renewal before the re-introduction of a passenger service. The site walk out by Network Rail's Light Rail and Knowledge Development team supports this approach.

The adoption of light rail Tram Train would permit a lighter form of track construction to be used and therefore a marginal reduction in track costs, however this may preclude the running of any conventional heavy rail freight.

The clearance of substantial amounts of trackside vegetation will also be required. It is also be assumed that all lineside fencing will need to be replaced and upgraded where appropriate, due to recent lineside residential, and other, developments.

Most of the route is carried on a low embankment 2.0 - 3.0m high above the surrounding fens. Although the condition of these embankments will need to be formally assessed, they would appear to be in generally good condition and in need of only minimal remedial works prior to the re-introduction of a passenger service. An earlier site visit identified a potentially unstable embankment between 89 - 90m. Further assessment of earthworks and track bed along the entire route is recommended.

Overhead line

There is little or no commentary as whether local ground conditions (topography, geotechnical survey) are suitable for installation of overhead line apparatus if this option were to be chosen for Tram Train or light rail electric traction.

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7. Progress to end of GRIP 3 (PACE Phase 1)

Mott MacDonald list several recommendations relating to required infrastructure in section 14.1 of the GRIP 3 heavy rail report (*Source Document 4)*, which then goes on to recommend a comprehensive list of further actions relating to:

- Surveys
- Stakeholder consultation
- Assurance
- Engineering management
- Track
- Signalling
- Highways
- Geotech
- Telecoms
- And others.

Network Rail Design Delivery's Scheme Design Team recommended actions required to achieve GRIP 3 are summarised below.

Options and permutations

To allow the project to move forward to GRIP 3/PACE ES3, it is advised that some of the many options and permutations still to be decided upon are narrowed down or eliminated. These include, but are not limited to:

- Freight requirements
- Station location at Wisbech (Parkway, or Town centre Garden Town)
- Route of any new line
- Point to point or through service to Ely/Cambridge
- Rolling stock and traction type

Tram Train or light rail solution

The Scheme Design Team recommends consideration of Tram Train solution and identification of hazards for a mixed traffic solution, and further investigation into realistic level crossing solutions where light rail is used.

Further, the location of any new station also needs to be narrowed down or confirmed, as this also impacts on the solution taken forward.

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The budget available for the project would need to be ascertained, a heavy rail solution is quoted as being more expensive, due to the need to address the level crossing issues and potentially the need to build grade separated crossings in some cases.

Freight

The need or desire for freight to operate on the line needs to be confirmed, as this greatly affects the solution taken forward. It should be noted that the option assessment report (Appendix A) of the Full Business Case report (*Source Document 9)* concluded that freight is not deemed financially viable. Whilst sufficiently sized markets may emerge in the future, and the scheme design should not, as far as reasonably practicable, preclude future provision of freight facilities at Wisbech, the current business case development processes has proceeded on the working assumption that rail freight services will not be delivered on the March to Wisbech corridor.

Common Safety Method

New mainline railways within Great Britain and Northern Ireland are subject to the provisions of both the Railway (Interoperability) Regulations 2011 and the Common Safety Method on Risk Evaluation and Assessment (CSM - RA) Regulation. If the project were to be treated as the opening of a new section of the mainline railway network the design of its infrastructure would also need to comply with National Technical Specification Notices (NTSN) and current National Technical Rules (NTR). However, there is potential to apply for exemption from the Railway Interoperability Regulations particularly if a Tram Train solution is utilised. Tram Train vehicles and infrastructure required for Tram Train operation is exempt from the Railway (Interoperability) Regulations 2011. Where the line is proposed as Tram Train or light rail consideration should be given to excluding the route from the main line railway requirements of the Railway and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS). This would make the March to Wisbech line and vehicles subject to urban rail standards currently under development by RSSB. The CSM – RA applies to the railway irrespective of interoperability.

The Common Safety Method for Risk Assessment (CSM - RA) process does not appear to have been formally started, as mandated by the legislation. A Preliminary System Definition and System Safety Plan should be completed at the earliest opportunity by the proposer, together with a Project Hazard Record compliant with the requirements of the CSM - RA legislation.

The project should start the process of CSM - RA as early as possible and in due course identify an independent assessment body.

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8. Consideration of an alternative light rail solution

Network Rail Design Delivery's Scheme Design Team have not been specifically asked to propose a solution based on the material provided for review. However, we have been asked to advise on the appropriateness of the recommended heavy rail versus a light rail solution. A Tram Train or light rail solution appears to be valid lower cost solution worthy of serious consideration.

Heavy rail solution

A heavy rail solution as proposed as one of the main conclusions and recommendations of the Mott MacDonald reports utilising National Rail infrastructure potentially allows for services to continue to Ely, Cambridge and beyond. This solution also has the potential to support any freight running.

However, the potential can only be realised if the significant risks associated with the level crossings between March and Wisbech can be mitigated. The increase in level crossing risk between Ely and Cambridge will also need to be mitigated.

A conventional heavy rail solution supports a Wisbech Parkway type station as the line could only extend as far as the out-of-town station propositions, whereas Tram Train or light rail would be able to extend into Wisbech town centre and/or to the proposed Garden Town if this was desired.

Tram Train/light rail solution

This section should be read in conjunction with the November 2021 report produced by Network Rail's Light Rail Knowledge & Development team; Wisbech to March: Potential for Light Rail (November 2021) report (*Source Document 11)*

One of the Mott Macdonald documents provided for review was a light rail feasibility option dated 16 August 2019. The light rail feasibility report recommends a diesel - electric hybrid vehicle Tram Train option as the likely outcome, after a modal and route sifting workshop. This is a credible solution which is worthy of serious consideration. The document stops short however, of recommending Tram Train or light rail as a final solution, rather lists some of the major hurdles of construction needing overcome to utilise this solution.

A consideration with a Tram Train solution is the provision of electric traction power. Electrifying the route with for example 750V d.c or 25kV OHLE is not considered in the Mott Macdonald documents. However, battery technology has advanced significantly in the last 10+ years with the potential for electric rail vehicles to travel up to 40 miles between charges with further developments anticipated extending this to 60 miles. Light rail/Tram Train traction power options also include onboard energy storage systems, diesel/battery, and battery hybrid options. A Tram Train solution using dedicated hybrid rolling stock would appear to be a cost effective, feasible solution worth exploring further.

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Light rail/Tram Train rail vehicle opportunities are explored more fully in the report by Network Rail's Light Rail and Knowledge Development team's report (*Source Document 11)* dated December 2021

Light Rail/Tram Train vehicles operating on tramways are designed for highway interfaces. For level crossings along the route, that remain open, the level of infrastructure can be substantially reduced compared to heavy rail options based on "line of sight" operation with a Tram Train or other light rail vehicle able to stop much quicker and within a shorter distance. This would make the road - rail interfaces at level crossing less costly, simpler and safer.

Movement of freight is not precluded by a Tram Train solution but would potentially limit the million gross tonnage per annum (MGTPA) of freight.

Several options for line of route and station locations are included in the light rail feasibility report (*Source Document 2)* produced by Mott MacDonald. The report also lists several benefits, including improved connectivity to the town centre, the ability to serve the new Garden Town, and negates the need for grade separated highway crossings (reducing costs and risk). This also retains the ability to connect to the National Rail network. However, there are also significant challenges presented, including access to Wisbech town centre particularly around accommodating a tram in the town environment.

The historic town of Wisbech is a highly constrained urban environment. Any new infrastructure to be built next to, or in, the town is potentially constrained by:

- Numerous listed buildings and structures
- Narrow streets, particularly Cromwell Road (B198), which is currently a two-way carriageway bound by terraced housing to the east and the River Nene to the west. There is therefore no potential to widen the street without significant infrastructure impacts
- The River Nene which separates the proposed Garden Town from the existing Wisbech town centre

The Network Rail Light Rail Knowledge and Development team report (*Source Document 11)* considers and identifies routes into Wisbech Town Centre which minimise any impact from these constraints seeking full penetration into the town centre and limiting any demolition required. A traction power stored energy solution limits any infrastructure requirements that might affect the setting of historic buildings or areas of conservation.

The studies to date generally focus on the technical and engineering aspects of introducing rail services on the route and thus lead to a discussion on modal options. The operating cost of each mode may be a factor in the overall case. In this case the operating cost of light rail options are likely to be significantly lower than comparable heavy rail services.

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Route Services

NetworkRail

9. Freight services between March and Wisbech

A solution that accommodates freight services running on a new line to Wisbech needs to be set in the context of opportunities, risks and dependencies. These considerations include:

- Conventional heavy rail freight would normally be catered for by a heavy rail infrastructure solution
- The asset condition of the four main underbridges on the route and works that may be needed to make them suitable for freight, depending on the gross tonnage and Route Availability (RA)
- Freight services would impact on train running, line speed and level crossing provision with a heavy rail solution
- Locomotive, wagon type and gross annual tonnage expected would need to be confirmed
- It is possible that Tram Train rolling stock could be used for light weight palletised type freight, but with limited gross tonnage with the benefit that lighter freight volumes become economically viable.
- The operation of freight services on light rail is possible with suitable light rail controls and with track infrastructure suitable for freight vehicle axle loads.

A heavy rail solution accommodates traditional passenger and freight services. A Tram Train solution has the potential to accommodate passenger and freight services dependent on the infrastructure provided suitable controls. The level and type of control is dependent on risk assessment, the type of freight and frequency of movements.

The Mott Macdonald light rail feasibility report (*Source Document 2)* does not provide any commentary on freight opportunities as to what, if any, freight could be employed when using a Tram Train solution. Network Rail's Light Rail Knowledge and Development team's report (*Source Document 11)* provides further information on light rail solution freight opportunities.

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10. Conclusions

This Engineering Assessment Report is the output of a feasibility review of March to Wisbech Transport Corridor Options, developed by Mott MacDonald on behalf of Cambridgeshire and Peterborough Combined Authority.

The modal choices considered in this report include:

- **Heavy rail** Conventional heavy rail that has the potential to facilitate passenger and freight services
- **Light rail** Light Rail Tram Train which has the potential to facilitate passenger and freight services with direct access into Wisbech Town and Wisbech Garden Town
- **Very Light Rail** This has not been considered to any great extent in the context of this report

Light Rail (Tram Train and tram) and Very Light Rail options are considered in a study completed by Network Rail's Light Rail Knowledge team (*Source Document 11)*.

This feasibility review concludes that heavy rail is a viable solution, which has the potential to provide uninterrupted connectivity onto the National Rail network together with a freight capability. However, there are significant hurdles with regards to level crossings that would need to be overcome.

In comparison, light rail in the form of Tram Train offers a potentially more credible solution based on overall capital and operating costs, an optimised level crossing strategy and connectivity into Wisbech town centre and Wisbech Garden Town.

In addition, there is lack of available train paths onto the wider Network Rail network, which combined with an unproven need for freight means a Tram Train option should be considered. This is reinforced in the report (*Source Document 11)* by Network Rail's Light Rail team that concludes *"light rail is considered a credible and feasible option and recommends further work to examine the light rail options in more detail, and to develop cost estimates to assist the business case for reopening the line."*

Table 1 provides a summary analysis comparing heavy and light rail (Tram Train) options informed by this feasibility review.

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Modal solution	Heavy rail	Light rail Tram Train
Connectivity for passengers	Potential for uninterrupted connectivity onto National Rail network. No direct access to Wisbech Town and Wisbech Garden Town.	Potential for uninterrupted connectivity onto National Rail network. Potential for direct access into Wisbech Town and Wisbech Garden Town.
Level Crossings	Complex conventional level crossing infrastructure and highway interfaces. Risks associated with ability to close level crossings and divert highways.	Designed for highway interfaces. Level crossing design can be optimised, and the level of infrastructure required substantially reduced.
Rolling Stock	Finite availability of rolling stock nationally and potential acquisition of new rolling stock required. Operation and maintenance costs are known and similar to existing heavy rail.	New Tram Train vehicles required. The premise of Tram Train is that vehicle designs are adaptable and able to be tailored to meet system specific infrastructure requirements routinely. Operation and maintenance costs dependent on system specific requirements.
Signalling control	Complex conventional signalling including level crossing infrastructure and interfaces.	Opportunity for a simplified control system and substantially reduced level crossing infrastructure for Tram Train only operation.
Station	Location of station limited to out of town/brown/greenfield site. Conventional heavy rail station infrastructure.	Opportunity for direct access into Wisbech town centre and new Garden Town. Opportunity for simplified light rail station infrastructure.
Freight operations	Accommodates freight movements on conventional infrastructure.	Potential to facilitate freight but requires heavy rail infrastructure with associated increase in infrastructure costs.
Traction Power Supply	Diesel traction requires no additional infrastructure. Missed opportunity for decarbonisation. Electric traction requires 25kV OLE infrastructure.	Potential for diesel/electric or hybrid traction requiring no additional infrastructure. Opportunity for electric traction supporting decarbonisation using

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	There is currently no OLE infrastructure between March and Ely. Self-powered; battery, hydrogen, diesel/battery, hybrid requiring limited infrastructure to recharge rail vehicles	light weight 750V dc infrastructure. Self-powered; battery, hydrogen, diesel/battery, hybrid requiring limited infrastructure to recharge rail vehicles
Estimated capital costs of proposed infrastructure	March to Wisbech circa £178m. *Reference: GRIP 3 Heavy Rail Report Q2 2019 prices excluding risk allowances and optimism bias.*	Option 1: March to Wisbech Parkway circa £126m. Option 2: March to Wisbech Town circa. £178m. *Reference: Low cost alternative tram train feasibility report Q2 2019 prices excluding risk allowances and optimism bias.*

Table 1 Heavy and light rail option considerations

A heavy rail solution facilitates the introduction of conventional freight and passenger services and uninterrupted connectivity to the National Rail network. However, a lower cost light rail Tram Train solution may be more appropriate based on:

- A Tram Train solution facilitates uninterrupted connectivity for passenger services to the National Rail network with the added possible advantage of including a service to Wisbech town centre and to the proposed Wisbech Garden Town
- The overall strategy for addressing the issues associated with level crossings is simplified by a Tram Train/light rail solution, which would permit application of lower cost minimum intervention installations
- A light rail or Very Light Rail solution does not facilitate uninterrupted connectivity for passenger services to the National Rail network. It is a credible solution for point-to-point transport and services to Wisbech town centre and to the proposed Wisbech Garden Town

We now consider gaps in the reports, risks to Network Rail, progression to GRIP 3/PACE1 and freight considerations.

There are gaps in the reports produced by Mott MacDonald relating to:

- The lack of a strategic approach in respect of level crossings that considers the safety, financial, project and performance risks and issues associated with closure, upgrade, highway diversion and grade separated crossings
- There is limited consideration of the requirements of the Common Safety Method - Risk Evaluation and Assessment (EU 402/2013) now enshrined in UK law

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- The demand modelling is limited and there is insufficient evidence to support a heavy rail solution. The reports demonstrate a desire to facilitate freight services, without providing any clarity on the services required or that the potential market for freight services exist

The risks considered up to this point are deemed applicable for the current stage of development. As the project progresses all new and existing risks will need to be considered on an iterative basis for the transport solution progressed. As a key stakeholder, Network Rail need to be part of this hazard identification and risk assessment process to ensure risks to Network Rail are managed. The lack of a robust level crossing strategy is currently the biggest risk to the project.

To allow the project to move forward to GRIP 3/PACE 1 some of the many options and multiple permutations need to be discounted. Limiting the number of options allows for the cost effective development of a credible solution. Key elements that need to be considered are:

- Confirming the freight demand and the implications of providing this facility on the project including any impact on the business case

- Confirming the anticipated passenger numbers by completing a thorough transportation study

- Reducing the number of station locations currently being considered to a manageable and realistic number of sites

- Reducing the number of line of route options for any new service provision

- Developing an option based on a point to point service provision given the current and future lack of train paths beyond March

- Undertaking asset condition surveys to identify the work required to support heavy or light rail options

Facilitating freight services is one of the clients desired outcomes. The reports demonstrate a desire to facilitate freight services, without providing any clarity on the services required or that the potential market for freight services exist. A transport study would identify that the local and regional transport demand, for freight (and passengers), exists. Outputs could then be used to inform modal choice decisions.

Conventional freight services are only accommodated by a heavy rail infrastructure solution. Operationally, light rail Tram Train could co-exist on the route without any restricted working. Other light rail or Very Light Rail solutions and freight could potentially co-exist if the freight requirement were relatively limited and could be timed outside light rail and Very Light Rail operating times. The reports focus on a heavy rail solution, but do not explore the nuances of freight, light rail and Very Light Rail operation and demonstrate a desire to facilitate freight services, but do not provide any clarity on the services required or that the potential market for freight services exist.

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The impacts of facilitating freight services on the line include:

- Potential interruption to passenger train paths by freight services
- An increase in the rate of degradation of the asset
- Increased capital and operating costs associated with heavy rail

Based on all the parameters considered, heavy rail is a valid solution. However, light rail in the form of Tram Train offers a potentially more credible solution based on overall cost, an optimised level crossing strategy and connectivity to the national rail network. Light rail Tram Train additionally offers the opportunity for direct access into Wisbech town centre and Wisbech Garden town, whilst not discounting the introduction of freight services now, or at a point in the future.

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11. Next steps

This report has identified a number of next steps. These are summarised below and should be read in conjunction with the five next steps identified in the Network Rail Light Rail team report "Wisbech to March: Potential for Light Rail November 2021", Appendix 3:

Next step 1

The multiple options and permutations for providing a service between March and Wisbech need to be reduced and refined to enable the project to move forward.

The continued consideration of multiple options and permutations impedes cost and time efficient development.

Next step 2

The development of a more detailed strategic approach to level crossings is required that considers the safety, financial, project and performance risks and issues associated with closure, upgrade, highway diversion and grade separation

There will be an increase in the level crossing risk profiles due to an increase in road traffic since the line last operated. Closure of any level crossing will be subject to agreement with any users and financial settlements may be required. Where level crossings are to remain open risks will need to be mitigated in the context of different modal options and how rail vehicles operate along the line.

Next step 3

Further work is required to explore the light rail Tram Train solution

Network Rail's Light Rail and Knowledge team's report (Source Document 11) concludes that there is potential for a light rail passenger operation between March and Wisbech. The assessment of suitable rolling stock types concludes that Tram; Tram Train; or Very Light Rail vehicles could be used. The operating cost of light rail are likely to be significantly lower than comparable heavy rail services.

Next step 4

Further work is required to confirm the passenger and freight demand, particularly post Covid-19 pandemic, to determine the most appropriate solution that meets this demand

The reports do not adequately evidence a thorough Transport Study and therefore do not provide a solid basis on which to make an informed decision. Both heavy and light rail Tram Train facilitate freight services. A light rail Tram Train option offers a potentially more credible solution based on overall cost, an optimised level crossing strategy, connectivity to the National Rail network and direct access into Wisbech Town and Wisbech Garden Town.

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Next step 5

Develop a System Definition and System Safety Plan in line with the proposer's legal obligations set out in Common Safety Method for Risk Evaluation and Assessment Regulation (EU) 402/2013.

The starting point for anyone proposing any change in relation the mainline railway system is the Common Safety Method – RA, and this applies when any technical, operational or organisational change is being proposed to the railway system. The proposer in this instance is deemed to be the combined local authority or their agent.

Next step 6

A detailed asset condition survey is required for the entire route. This will assist in confirming the rail infrastructure work required for the option selected.

The condition of the former railway infrastructure is not known, and it has not been fully maintained since the line was mothballed. A full asset condition survey will enable greater clarity on the scale and costs of any railway infrastructure works required

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Appendices

Please see below a list of the appendices referenced in this document.

Appendix A – Glossary

Appendix B – Reference source documents

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Appendix A: Glossary

Acronym	Meaning
0m 00ch	miles and chains
ac	Alternating Current
AWS	Advanced Warning System
dc	Direct Current
DfT	Department for Transport
DMU	Diesel Multiple Unit
DNO	Distribution Network Operator
EaWR	Electricity at Work Regulations
EMU	Electric Multiple Unit
ETCS	European Train Control System
GRIP	Governance of Rail Investment Projects
GSM-R	Global Standard for Mobile communications - Railway
FOC	Freight Operating Company
FTN	Fixed Telecoms Network
LRSSB	Light Rail Safety and Standards Board
NTSN	National Technical Specification Notices
OLE	Overhead Line Equipment
ORR	Office of Rail and Road
PACE	Project Acceleration in a Controlled Environment
RIR	Railway (Interoperability) Regulations
ROC	Railway Operating Centre
ROGS	Railway and Other Guided transport Systems (Safety) Regulations
RSSB	Rail Safety and Standards Board
S&C	Switches & Crossings

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TOC	Train Operating Company
tph	Trains per hour
TPWS	Train Protection Warning System
TSI	Technical Specifications for Interoperability

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Appendix B: Source Documents

Documents commissioned by combined authority produced by Mott MacDonald

1. Heavy rail feasibility report:

March to Wisbech Transport Corridor: GRIP2 Heavy Rail Feasibility Report 05 August 2019 by Mott MacDonald 398128 | 002 | B

The primary objectives of this report commissioned by Cambridgeshire and Peterborough Combined Authority are to investigate the feasibility and cost of re-opening the railway line between March Station and Wisbech to heavy rail services. This report was originally developed by Mott McDonald in 2015 as part of a wider Cambridgeshire County Council commissioned study, which included DfT Business Cases. In 2018 Mott McDonald were commissioned to update and further develop design and DfT Business Cases for the March to Wisbech Transport Corridor. This report has been updated as part of the 2018 commission.

2. Low-cost alternative - Tram - Train feasibility report:

March to Wisbech Transport Corridor: Low-Cost Alternative – Tram Train 16 August 2019 by Mott MacDonald 398128 | 004 | B

The aim of this report commissioned by Cambridgeshire and Peterborough Combined Authority is to describe the proposed Tram Train solution and set out the rationale for selecting this mode as the low-cost alternative to heavy rail. Key challenges in delivering tram train are also set out, together with indicative journey times and capital costs for the scheme.

3. Assessment of rail operations report:

March to Wisbech Transport Corridor: Assessment of Rail Operations 17 March 2020 398128| 007| C

This report describes the operational analysis that has been undertaken to examine possible timetable patterns, service constraints and capacity for introducing a two train per hour (2tph) service between Wisbech and March, and ideally running through to Cambridge.

4. Heavy rail multi-disciplinary option selection report

March to Wisbech Transport Corridor: GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report
26 June 2020 398128 | 009 | C

The purpose of this GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report commissioned by Cambridgeshire and Peterborough Combined Authority is to document the optioneering and engineering employed, to develop a single preferred heavy rail solution, for the March to Wisbech transport corridor, to the level of detail required to support Full Business Case (FBC) cost estimation. A slimmed down version of the GRIP 3 design process has been used, with the focus on developing designs for those elements which significantly impact capital cost.

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5. Delivery strategy

March to Wisbech Transport Corridor: Delivery strategy 20 July 2020 398128 | 009 | E

The purpose of the Delivery Strategy is to identify and assess potential approaches to deliver the preferred scheme option that was identified earlier in the project lifecycle in the Options Assessment Report (OAR).

6. Environmental report

March to Wisbech Transport Corridor: Environmental Report
July 2020 398128|MMD-00-XX-RP-EN-001|B

The Environmental Report presents the environmental constraints and opportunities for the reinstatement and refurbishment of the March to Wisbech rail corridor and March Station as well as the creation of a new railway station at Wisbech. A high-level qualitative assessment of the constraints identified is also provided. The report focuses on the proposed rail corridor, March Station, potential locations for a Wisbech Heavy Rail station and stops in Wisbech for a Tram Train Option.

7. Alternative highway schemes report

March to Wisbech Transport Corridor: Environmental Report
10 July 2020

The purpose of this report is to summarise alternative options for highways Schemes 1 and 2 and recommend a preferred option for each scheme. The report is intended to be read with the March to Wisbech Transport Corridor GRIP 3 Heavy Rail Multi-Disciplinary Option Selection Report 398128-009-C.

8. Comments register

Updated draft 6 May 2020

This document captures inputs from industry and the requirement to actively involve and consult with industry (including NR and ORR) as well as potential infrastructure investors providing their advice on potential delivery structures and mechanisms to support the business case submission.

9. Full business case

March to Wisbech Transport Corridor: Full Business Case
26 June 2020 398128-011-E

The purpose of this Full Business Case (FBC) is to identify a single option design in accordance with Transport Appraisal Guidance requirements for the March to Wisbech Transport Corridor.

10. Other related documents have been considered

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Documents commissioned by combined authority produced by Network Rail

11. Network Rail's Light Rail Knowledge & Development team's Report

Wisbech to March: Potential for Light Rail
December 2021

Network Rail's Light Rail Knowledge & Development team assess the potential for reopening rail passenger services on the former March to Wisbech line using light rail technology. This report summarises the findings of that assessment.

Appendix B. Light Rail Feasibility Study

Report

Wisbech to March: Potential for Light Rail

December 2021

Authorisation

Prepared by	Checked by	Approved by
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12/11/21	1.0	Alex Dodds	**SC**	Initial draft for client review
13/12/21	1.1	Alex Dodds	**SC**	Final document for issue

Executive Summary

The seven-mile March to Wisbech railway, located in North Cambridgeshire, England (see Figures 1A to D below) was opened in 1847 with passenger services operating until 1968. Freight services continued to run until 2000. Since 2000 the line has remained in a mothballed, non-operational condition. Network Rail's Light Rail Knowledge & Development team has been requested to assess the potential for reopening rail passenger services on the line using light rail technology.

This report summarises the findings of that assessment.

Network Rail's light rail team considered the options for adopting suitable light rail technology and operational solutions. This was done without a constraint of complying with current national rail design and operating standards – other than at any interface with the current rail network.

The study concludes that there is potential for a light rail passenger operation between March and Wisbech. The assessment of suitable rolling stock types concludes that Tram; Tram Train; or Very Light Rail (VLR) vehicles could be used. The choice of rolling stock being subject to the specification of the short and long term service aspirations.

The factors influencing the choice of light rail vehicle include:

- Requirement to operate on the national rail network (e.g. to Peterborough, Ely, Cambridge);
- The multiplicity of level crossings on the route and vehicle's suitability to create a cost effective solution at each
- Opportunity to operate into Wisbech town centre using the highway network
- Future extension of the service to serve the Wisbech Garden Town development
- Consideration of passenger demand and thus vehicle size.

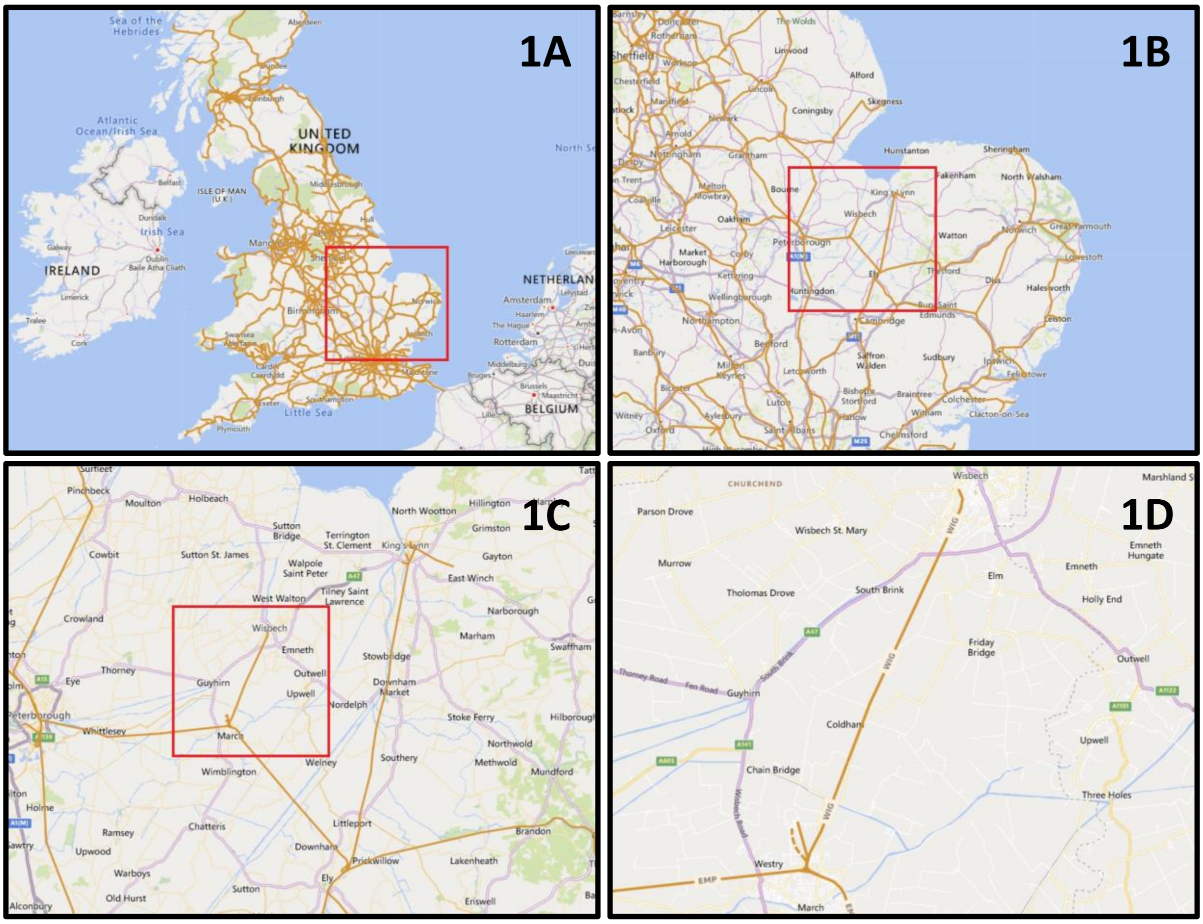
The study concludes that in consideration of the client's specification a Tram Train solution appears the best credible light rail option. Tram Train would enable future operation on both the national rail network and any on street operation into Wisbech town centre or to the Garden Town.

The next generation of Very Light Rail vehicles are an emerging technology, with the first demonstrator vehicle being showcased in Autumn 2021. Further development and engagement is needed with the manufacturers to explore the full potential, and limitations, of this new vehicle.

Key infrastructure aspects considered by the review include:

- The cost effective solutions for the numerous level crossings under light rail operation
- Options for an on street route into Wisbech town centre
- The location of a terminus station at Wisbech
- The required alterations at March Station and connections to the main line

At the client's request the report is largely a qualitative assessment of the potential for light rail on the March to Wisbech line. On the basis that light rail is considered a credible and feasible option further work is recommended to examine the options in more detail and to develop cost estimates to assist the business case for reopening the line.



Figures 1A to 1D – Map Series Showing the March-Wisbech Line in a UK, Regional, Area and Local Context

Contents

1 Introduction

Network Rail's Eastern Region directorate has requested the company's Light Rail Knowledge & Development team to assess the potential for reopening rail passenger services on the former March to Wisbech line using light rail technology. This report summarises the findings of that assessment.

The seven-mile March to Wisbech railway (known as the Bramley Line) was opened in 1847 with passenger services operating until 1968. Freight services continued to run until 2000. Since 2000 the line has remained substantially in Network Rail ownership in a mothballed, non-operational condition.

The reinstatement of rail passenger services between Wisbech and March (and possibly further afield) has been the subject of various local campaigns and studies. These given greater emphasis in recent years in the context of improving connectivity; reducing road congestion and tackling climate change through transport decarbonisation.

Recent studies to reinstate the rail connection have looked at options for conventional railway and light rail solutions, including on-street tram operation in Wisbech. To date the estimated cost of these solutions has been a limiting factor in the success of the case for reopening.

As part of the continuing evaluation of the case to reopen the line Network Rail's light rail team was asked to provide a high-level assessment of the "art of the possible" for light rail solutions. This assessment took a fresh look at the potential for light rail technology to enable a reconnection between March and Wisbech.

Network Rail's light rail team considered the options for adopting suitable light rail technical and operational solutions. This without constraint of current national rail design and operating standards – other than at any interface with the current rail network.

2 Background

The former March to Wisbech railway ran for approximately seven miles (10km) through the Cambridgeshire Fenland linking the two towns at either end.

The line was opened as a double track railway in 1847 with one intermediate station at Coldham (which closed in 1966). At one time the route continued beyond Wisbech to Watlington (on the line to Kings Lynn) and beyond March to St Ives.

The station at Wisbech was subsequently renamed Wisbech East to differentiate it from another station located at the north of the town on the former Midland and Great Northern line. Passenger services on the line ceased in 1968. The route was subsequently shortened with the Wisbech East station location being lost to residential development. Freight services continued until 2000, serving the Nestlé Purina and Metal Box facilities. Following the cessation of freight services, the rail corridor remains in Network Rail ownership. However following land acquisition by Nestlé (for expansion of its factory) the railway owned corridor terminates just beyond Weasenham Lane on the outskirts of the town.

Given the topography of the Fenlands the route had numerous level crossings for highways and footpath and farm access.

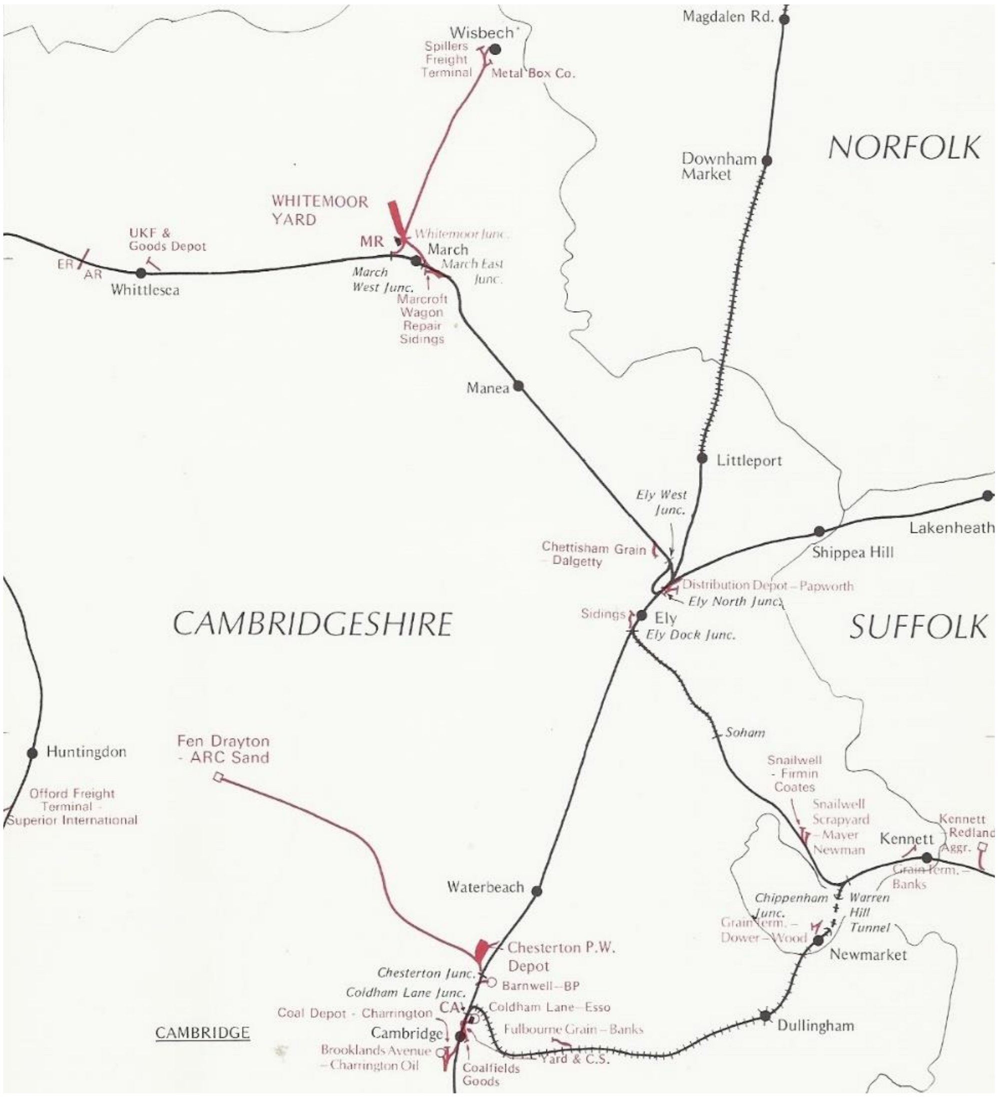


Figure 2: Map of Cambridgeshire late 1980s rail network (Source: Rail Atlas Great Britain & Ireland, Baker, 1988)

Figure 2 shows the residual March to Wisbech route from the late 1980s. Note the station is shown as having "unadvertised/excursion" status.

The reinstatement of rail passenger services between March and Wisbech has been the subject of various campaigns and studies in recent years.

These include:

- Wider Economic Benefits of a Rail Service Between March and Wisbech, Mott MacDonald & Cambridgeshire County Council (2014)
- Study into Re-Opening of March to Wisbech Rail Link, Outline Business Case, Mott MacDonald & Cambridgeshire County Council (2015)
- March-Wisbech Transport Corridor Low Cost Alternative - Tram-Train, Mott MacDonald (2019)
- March to Wisbech Transport Corridor Options Assessment Report, Mott MacDonald (2019)
- March to Wisbech Transport Corridor Full Business Case, Mott MacDonald (2020)

These studies have contributed to understanding the feasibility and options for reinstatement of rail passenger services (including assessment of light rail). These studies have included consideration of extending reinstated Wisbech services beyond March to Cambridge and Peterborough. However, there is limited or no capacity on the mainline for these additional services. It is understood that further investment on the existing network would be required to provide the capacity for new Wisbech services to operate through to Ely and Cambridge.

The most recent business case work concluded by discounting a Tram Train option in favour of a heavy rail solution with through running to Cambridge. However, the network capacity issues noted above are considered to make this option either too costly or impractical in the short/medium term.

Between 2009 and 2018 Network Rail, working with local partners, designed and implemented the UK's first Tram Train operation between Sheffield and Rotherham. From this experience Network Rail created a team as a dedicated centre of excellence for light rail knowledge. This team supports colleagues and stakeholders in the development of light rail schemes on or interfacing with the national rail network. This team brings a wealth of experience from delivering the Tram Train service and is using this to assess the case for delivering low cost innovative railway solutions.

In 2021 Network Rail's light rail team was invited to take a fresh look at reinstating rail passenger services to Wisbech in the context of the potential for light rail solutions. This to take the form of a high level consideration of "the art of the possible" and without constraints of conventional railway solutions. The assessment would concentrate on the creation of a dedicated service between March and Wisbech while commenting on the potential for that solution to enable through services to Peterborough and/or Cambridge.

3 Scope

The scope of the study was discussed with Network Rail's Eastern Region Strategic Planning team and agreed as:

- Examine the possibility of providing a rail service between Wisbech and March using light rail technology.
- Service options of 1 or 2 trains per hour in each direction.
- Services to be considered as self-contained to the route in short/medium term.
- Consideration for future through operation to either Peterborough or Cambridge and what infrastructure/vehicle/operating alterations may be required over the base solution.
- Study to consider suitable terminating location(s) in Wisbech.
- Output to be a short report reviewing the route and high level options to reinstating it using light rail technology. Report to provide a broad conclusion on the likely feasibility of a light option(s) and, where appropriate, indicate a preferred form of light rail solution.
- Report should highlight areas of opportunity where a light rail solution might enable a more cost-effective solution compared to heavy rail.
- Report should highlight any assumptions and risks in the solutions identified – for example in relation to compliance/deviation from industry standards.

4 Discussion and Findings

4.1 Service provision

Previous studies have identified a baseline service of 2 tph between March and Wisbech, which is the Client's base requirement. This is likely to be the maximum a heavy rail option would support. A Tram Train/light rail option could support additional service options depending on the final selection of route into the town centre and the location of the stops:

- A terminus at Weasenham Lane/the Purina factory could support 2, 3 or 4 tph depending on demand and location of passing facilities
- A terminus in the town centre at/near the Horsefair bus station could support up to 4 tph (subject to demand and passing facilities).
- The provision of a Park and Ride (P&R) facility at the A47 crossing could enable a supplementary service between the P&R stop and Wisbech town centre providing an opportunity to significantly reduce traffic into town. The combination of through and P&R shuttle services could provide up to 8 tph with 2, 3 or 4 going through to March
- The town centre operation would require significant traffic management to optimise the passage of the light rail service and enable a robust timetable.
- Through services to either Cambridge or Peterborough, although technically feasible with Tram Train, would require capacity upgrades on the Peterborough – Ely – Cambridge route. It should be noted that there are already existing services competing for limited train paths within the Peterborough-Ely-Cambridge corridor, and it may not be possible to deliver all of these without significant enhancements in route capability. This is however outside the scope of this report.

All the above options require further work to assess the overall timetable feasibility and the likely demand over the next 20-30 years to select the best option. A proposed "garden town" on the North side of the River Nene would provide further extension opportunities for the tramway, however these should be the subject of a separate study as part of the development of that scheme.

4.2 Infrastructure

The infrastructure requirements have been based on the following assumptions for Tram Train operation:

- Whitemoor Junction to Wisbech is designated as a tramway
- Whitemoor Junction to March remains heavy rail
- A railway to tramway operational rules interface is provided on the Wisbech side of Whitemoor Junction
- Tram Train services will use a reinstated Platform 3 at March station with option to reinstate the main line connection at the Ely end of the station
- The route will be a segregated tramway except in Wisbech where if required it would be an on-street tramway to the bus station terminus
- All level crossings on the original branch line will be designated as tramway crossings with appropriate highway controls

The formation and track bed are extant from Whitemoor Junction to Weasenham Lane on the outskirts of Wisbech and could be restored to double track for all or part of the route depending on initial and future timetable demands. While the formation for the most part seems in good basic condition, a full survey will be required to check the state of the embankments, particularly as most of the route is bounded by deep drainage ditches which may have resulted in scouring over the years out of use. Key requirements will be:

- Clear vegetation from track bed and trackside where sight lines may be compromised e.g. road crossings
- Restore drainage and prepare track bed
- Replace underbridge decks – the only underbridges on the route are over watercourses
- Relay track to tramway standards – note while 80lb rail would be suitable, Network Rail only bulk buys 113lb rail
- If double track, consider number and position of turnback crossovers to manage service perturbation
- All crossings will be tramway crossings with appropriate highway and tramway signalling control and with standard tramway signage
- All crossings should comply with LRG 1.0 – Tramway Principles and Guidance (TPG) (LRSSB, 2021) and associated light rail standards
- Any on-street sections should have embedded grooved rail and consideration given to innovative designs which minimise the need to move utilities
- Integrated highway and tramway signalling, and control will be required for the on-street sections
- The light rail vehicles are most likely to be high floor (to match those at March Station) and careful consideration is required for the location of on-street stops in Wisbech
- With exception of March Station, the other stops could be basic tram stops with 915mm high platforms.
- The platform/vehicle interface at all locations will be RVAR compliant and allow unaided level boarding to maximise accessibility. Foot crossings will be acceptable for any new stops on the original route.
- Consideration should be given to restoring double track from Whitemoor Junction into the disused platforms at March station with associated works to replace the missing tracks and possibly the former Junction at the East end.
- Signalling for the new layout will need to be installed which will require some changes to the existing scheme plan
- A new accessible footbridge is recommended at March. This will enable the service to offer end to end accessibility
- A servicing depot could be provided in the former engineers' sidings area at March alongside Platform 4

4.3 Rolling stock

There are numerous light rail rolling stock types and suppliers, with some vehicles currently in production/operation, and others in various stages of development. Given the status of vehicles in operation, and the flexibility of operation it offers, a Tram Train vehicle is considered the most appropriate light rail mode for the route. This is subject to confirmation of demand and desired journey time, as well as the type of service offered (e.g. segregated shuttle vs hybrid interface to adjacent urban centres). Tram Train enables operation on a line of sight tramway route, with passive provision to safely operate on heavy rail main lines in the future.

The current UK Tram Train vehicles in service are the Stadler Citylink Class 399 (low floor) in South Yorkshire; and the Stadler Citylink Class 398 (high floor) on order for Transport for Wales. Other manufacturers supplying Tram Train vehicles include Alstom and Siemens.

Figure 3 – Class 399 Citylink Low Floor Tram Train Operating in Sheffield (Photo: Ian Ambrose)

Figure 4 – Class 398 Citylink High Floor Tram Train Under Construction for Core Valley Lines (Source: Transport for Wales)

The March to Wisbech service is likely to have a journey time of between 15 and 20 minutes which will require 2 vehicles for the baseline service and up to 6 plus an operational spare for the maximum potential service frequency. This assumes a maximum speed of 60mph and suitable traffic management in Wisbech town centre to avoid congestion delays. This is a small order and better economy of scale might be achieved by joining with other Tram Train orders. The vehicle capacity will depend on the loading forecasts and the current vehicle length of 37-40m should be sufficient and the interior seating layout can be adapted to suit the customer preference. The route is sufficiently short to consider battery self-power rather than full electrification. Fast battery charging facilities to be provided at March and possibly the Wisbech terminus.

While Tram Train vehicles offer the greatest potential for service flexibility, alternative vehicle options should be considered in the context of efficiency, connectivity and cost of operation. The first of these is a standard tram vehicle. This would have lower capital cost than a Tram Train and still offer potential for street running. Tram does not offer the ability for future operation on the main line railway. Using a standard tram may require additional control measures for the shared running between Whitemoor Junction and March station. Existing standard tram vehicles are available from multiple manufacturers, with designs built to accommodate various urban rail gauges. These come in both low and high floor configurations, offering the flexibility to accommodate pre-existing infrastructure constraints, such as high floor platforms. This has already been applied successfully in Manchester, where existing heavy rail lines have been converted to tramways.

Figure 5 – Bombardier M5000 High Floor Tram Operating in Manchester (Source: Tom Page/Creative Commons)

Another alternative vehicle is Very Light Rail (VLR). The 'first generation' of VLR vehicle was the Parry People Mover used on the Stourbridge Branch in the West Midlands. Multiple second generation vehicles are under development, with the focus of VLR innovation centred in the West Midlands. One of these is the 'Revolution' VLR vehicle, intended for use on lines like the Stourbridge Branch, where a low capacity/low cost shuttle service is implemented on a segregated heavy rail alignment. The vehicle is exceptionally light weight, with potential consequential savings on track form[1] and structures. Such a vehicle could be an alternative for the Wisbech branch if the operation were to be limited to a segregated shuttle between March and Wisbech.

One potential limitation of VLR over a tram vehicle is its inability to operate on street alignments. However the vehicles may require modification to do so, such as fitting of skirting, roll-under protection, and track brakes[2]. Without these modifications, it is likely that a VLR vehicle would be restricted to segregated operation on the Wisbech line. The vehicle's small size may be an issue, dependent on the passenger demand anticipated, and interface with existing connecting services from March. Like standard trams, the vehicles are unlikely to be able to interwork on heavy rail main line, confining them to operate a segregated shuttle between Wisbech and March. This would not preclude some form of limited exemption to operate over the short distance between Whitemoor Junction and March Station. There is the issue of level crossings on the route to consider, with VLR vehicles potentially requiring different levels of protection infrastructure, dependent on the extent

[1] Note any potential savings on track/track form may be offset against Network Rail's bulk buying for standard 113ib rail see Section 4.2

[2] A similar French design includes these features

of alterations made to the standard vehicle design[3]. Recent discussions with the manufacturer of the 'Revolution' VLR vehicle have indicated the potential to incorporate market requirements into a production vehicle. This could include various design amendments for the vehicle to be classed as light rail/tram or a Tram Train and operate under line of sight regulations.

Figure 6 –Revolution VLR High Floor Demonstrator Vehicle (Source: Simon Coulthard)

4.4 Level Crossings

Based on the number of level crossings on the route and when compared to a traditional heavy rail solution a full or hybrid light rail operation could cut the cost of project implementation and operation by a considerable factor. Many sites would be considered substandard for a regular interval heavy rail passenger operation, and with 7 active sites identified alongside 12 passive ones, the cost of crossing interventions/improvements alone could make or break the project business case. A detailed description of the status of each crossing is included in Appendix B.

A light rail option would permit application of lower cost minimum intervention installations, or retention of automatic installations at current sites. A full Tram Train option would offer the potential to remove standard railway crossing controls altogether and install signalised traffic light junctions at every hybrid light rail/road interface. This would however be subject to localised vegetation clearance and suitable risk assessment of each location on an individual basis.

[3] Given the assumptions on infrastructure in 4.2, designating the VLR vehicle as a tram train would overcome most of the issues as the route can be built to tramway standards. This will also simplify the vehicle approval process

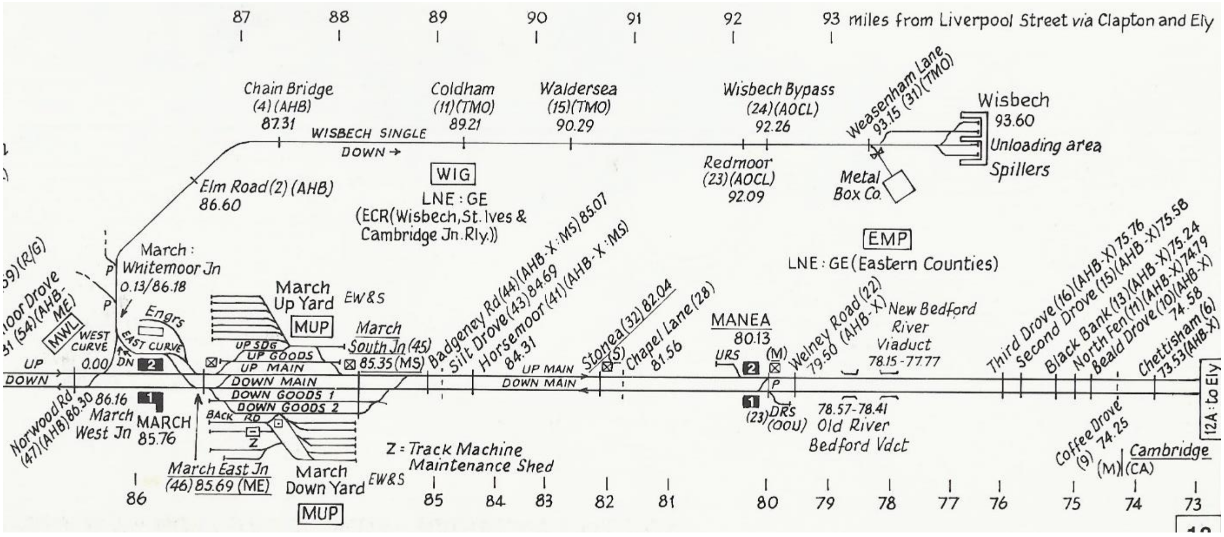


Figure 7 – Line Diagram of Wisbech Branch (Quail Map Company, 1998)

The nature of interventions required can be broken down into three specific crossing types:

- Active crossings intersecting major roads
- Active crossings intersecting minor roads
- User Worked Crossings

The level of infrastructure intervention required can be broken down for each in detail, however this would largely depend on the type of vehicle selected to operate the service, and the nature of modifications undertaken to accommodate locally specific infrastructure.

Active crossings Intersecting Major Roads

An example of this arrangement would be the Wisbech Bypass (see Figure 7 above). This was formerly an AOCL located on a busy main road. Such an arrangement would no longer be acceptable as a heavy rail solution, as the road has seen significant traffic growth, with high usage by HGVs. One option would be to create a grade separated solution in this location. Grade separation would be costly and add complexity. If this were to be undertaken, it is anticipated that the road would require elevating above the rail alignment. Not only would this cause significant disruption to road traffic during construction, but would also require substantial land take for the approach structures and significant aggregate for use as filler material. Concrete approach structures require less aggregate fill however these are generally more expensive to build, and raise environmental considerations from the increased use of synthetic material.

Application of a Tram Train or Tram option may offer a potential compromise solution. Tram vehicles fitted with track brakes already operate on a line of sight basis in urban and suburban areas, intersecting with major roads. Where an interface is created, road traffic lights are incorporated with tram signals to create a standard highway junction. This is treated just like any other road junction, with the exception that trams are often given priority over road traffic when approaching the site. Creation of a standard highway junction on the Wisbech bypass may be possible, and even practical utilising the powers of a light rail order for street interface operation. There is a need to clarify the legal status of the current crossing and the ability to reactivate a crossing at this location. Consultation with stakeholders such as the highways authority will be important.

Application of a VLR option may have a significant effect on the type of road crossing provided. By way of an example, an unmodified Revolution VLR vehicle would likely require some form of active crossing control at major road interfaces. Dependent on how such a vehicle was categorised (e.g. heavy rail, hybrid light rail, etc.), this could introduce a minimum requirement for road warning lights and half/full barrier protection. This has the potential to affect the type of solution implemented on the Wisbech Bypass, given a standard rail crossing us unlikely to be feasible in the current context. Such installations could however be suitable for use at less busy sites such as Elm Road in March or Station Road in Coldham.

Low cost, simplified level crossing equipment is used on continental rail networks. Many European countries apply simplified barrier mechanisms at automated crossings effectively, without compromising on the operation of the railway and providing a suitable level of safety based on anticipated risk. Such equipment is occasionally imported for use in a UK context, however for non-railway applications, such as barriers protecting car parks, secure installations and lifting bridges. Siemens, Schweitzer Electric and Unipart Dorman, all offer some form of simplified modular signalling/crossing control arrangement, as part of their wider international supply portfolio. It is anticipated that with some limited development, this technology could be applied for use in a UK context, operating with light rail vehicles and speeds comparable to many secondary heavy rail passenger lines. An example of the Schweizer Electronic Flex crossing system, currently in use on the continent is shown in Figure 8 below.

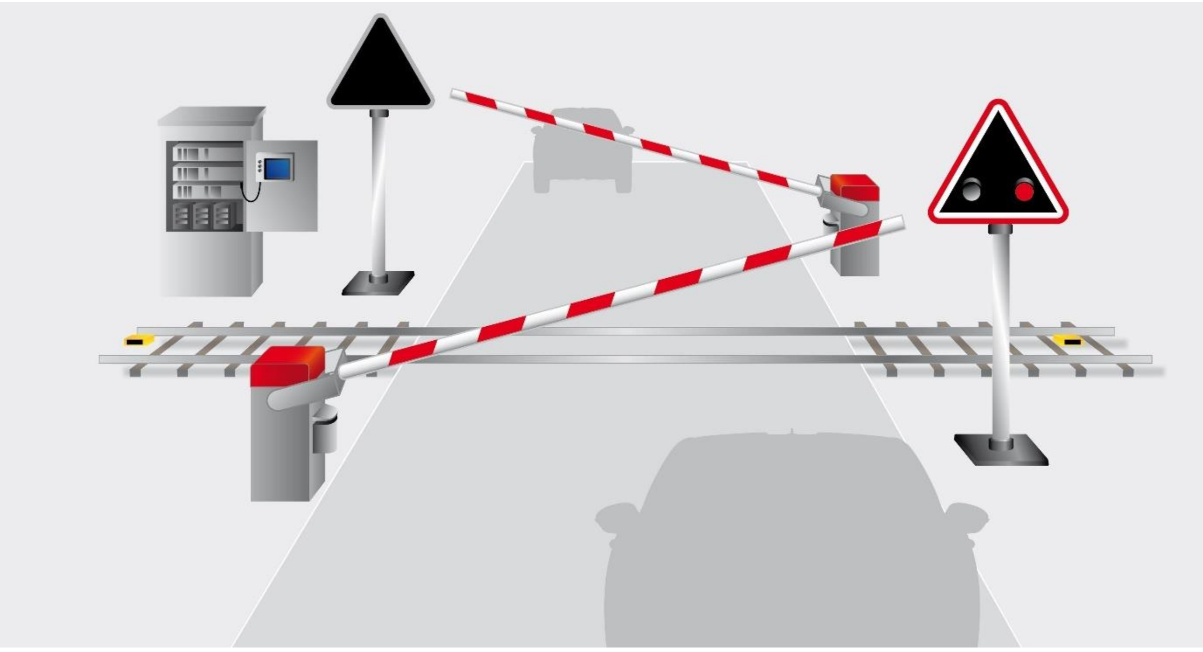


Figure 8 – Schweizer Electronic Flex Crossing System (Source: Schweizer Electronic)

Active crossings Intersecting Minor Roads

An example of this arrangement is Redmoor (see Figure 7). This was formerly an AOCL located on a quiet semi-rural/residential road.

Application of a Tram Train or Tram option offers the simplest road/rail interface solution in this instance. Given the poor sighting at the Redmoor crossing, it is anticipated that traffic lights would be required to facilitate a suitable interface. This would be treated as a standard road junction under current highway regulations. At locations where good sighting distance is available in both directions, it may be possible to incorporate a formalised road junction, without the need for an active traffic light system. Tram vehicles would operate on a line of sight basis over such crossings, with cars required to give way to approaching tram vehicles. This would be subject to individual risk assessment at specific sites, based on key local characteristics.

In the example of Redmoor, application of a VLR vehicle option would require more substantial crossing infrastructure. As per the major road example, this is assumed to be a form of active warning road lights as a minimum. Requirements for provision of barriers would require specific risk assessment for each location, largely dependent on local characteristics, anticipated rail vehicle line speed, and road usage. A simple categorisation would be application of the same active warning lights as major road interfaces, minus provision of barriers. This does not however mean projects would be limited to a single type of warning light arrangement, as several types currently exist for different crossing applications. One example of this is the Schweizer Electronic Vamos crossing system, currently in use in the UK at User Worked Crossing installations (see Figure 9 below).

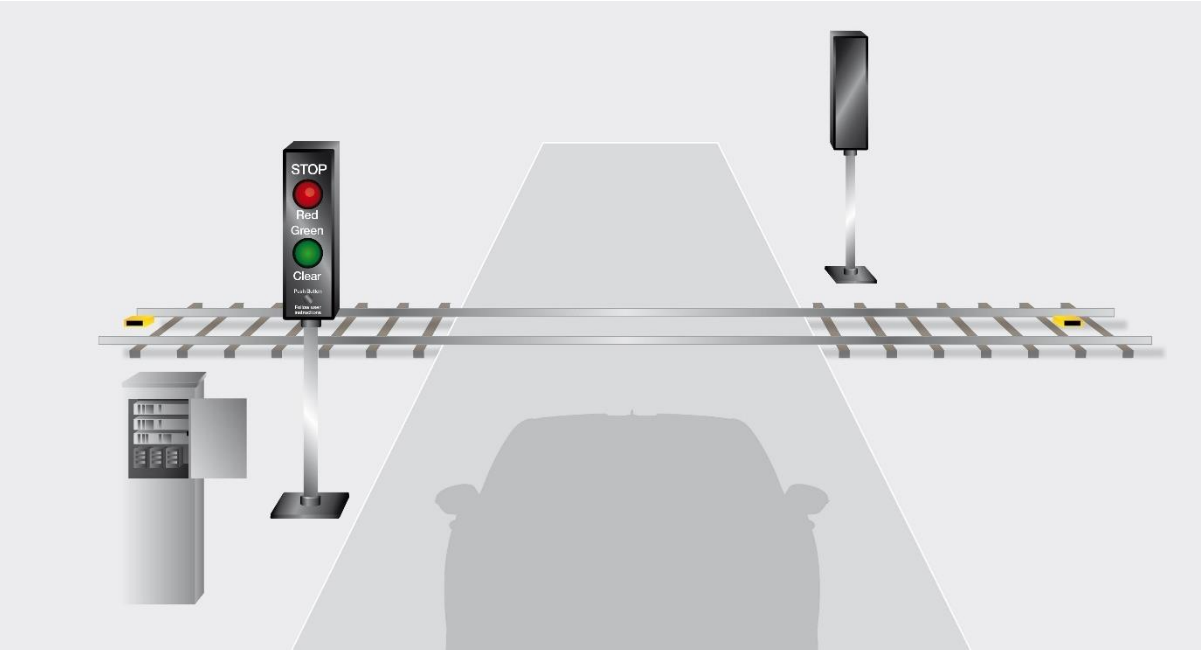


Figure 9 – Schweizer Electronic Vamos Crossing System (Source: Schweizer Electronic)

User Worked Crossings

An example of this arrangement would be Clarkes User Worked Crossing (see Appendix B1.2). This was a basic occupation crossing equipped with passive signage and metal gates. It is located on private land inaccessible to the public and connects agricultural land on one side of the crossing to a farm complex on the other.

Application of a Tram Train or Tram option could allow application of a basic signage based road interface solution, with give way indications for road vehicles. This would be dependent on current/anticipated usage of the adjacent fields, as there could be a risk of livestock accessing the rail alignment. Where fields are to be used for the purpose of grazing, etc. user worked gates would be a minimum requirement. Where gates are provided, it is anticipated that basic give way signage would be replaced with usage signage instructions, including details of penalties for not closing gates.

User Worked Crossings are standard on heavy rail infrastructure and it is not anticipated that such arrangements would differ greatly where a VLR vehicle option is applied on the route. There would need to be consideration of modifications to the VLR vehicle in terms of driver visibility, braking capability and impact protection. A worst case scenario would be a crossing with poor visibility in both directions, utilised regularly by long/slow vehicles. In a heavy rail context, this would normally be managed through the provision of telephones. Telecoms requirements add additional cost/complexity to projects, requiring alternatives to be considered.

One option is to provide a control centre/signal box number for users to call via a mobile phone. Given most of the crossing in question operate with nominated users, as opposed to general public, it would not be unreasonable to expect users to be equipped with mobile phones. Another covers use of remote GSM-R public call technology. This concept uses standalone solar/battery powered

GSM-R handsets installed at crossings, to provide contact with the signaller/controller in the event of poor mobile phone coverage. This technology is already in use successfully at several locations on the UK heavy rail network.

Figure 10 – Typical UWC installation on Wisbech Branch Route (Photo: Alex Dodds)

5 Optioneering

5.1 Minimum Intervention

Option Overview

Baseline optioneering for a light rail proposal assumes the Client base specification of up to 2 services each way per hour. To allow for expansion as allowance has been made for up to 3 services per hour. This assumes an approximate 20 minute journey time incorporating any additional intermediate stops. Requirements for infrastructure provision will ultimately be dependent on the attained journey time and service schedule, however as a minimum this would include a single/double platform station/tram stop on the edge of Wisbech town centre and an intermediate mid-point passing loop on an otherwise single track route.

The route would be largely self-contained, with a signalised interface at the southern end, where the freight only line to Whitemoor connects with the Peterborough-Ely through lines at March Station. Given this limited heavy rail interface, it is assumed that the service would be implemented as a Tram Train/hybrid light rail operation. With the heavy rail interface limited to a single interlocking transition, scope for utilising Very Light Rail vehicles may be possible, subject to application of route separation/lockout arrangements[4] provided in the Whitemoor Junction/March Station area. However, Tram Train rolling stock offers greater flexibility for service extension onwards from March on existing heavy rail.

Proposed Infrastructure

[4] Designation of the VLR vehicle as a tram train may avoid the need for this

The minimum intervention option reduces the cost of initial construction through limiting the infrastructure requirement. It is proposed that a station site located on the edge of Wisbech town centre be utilised for commencement of service. This option would require minimal land take and would run through a former industrial corridor up to a site south of the Nestlé Purina factory. The station would be located on the existing factory site staff car park. This would require relocation of these facilities elsewhere, however this would not be unfeasible due to the varying industrial land uses around the site (with some adjacent plots being semi-derelict at the time of writing).

It is recommended that the station site incorporates a single platform, limited light rail signalling infrastructure, a singe track and platform, with associated light rail based facilities. This initial option is outlined in Figure 11 below. As noted in the Option Overview, in the event a minimum intervention station option was not sufficient to meet anticipated demand, or proposed service schedule, scope exists for a second platform on the same site. It is recommended that provision be made for conversion of the single platform into an island, should future demand warrant (see Figure 11 below). This would require the initial build to be of a suitable width, possibly with platform copers pre-installed.

Provision of parking facilities is also recommended, due to the station's location within the wider urban area, and the potential for use of the town as a railhead for outlying rural areas in the vicinity. Options for a car park on the site are shown in Figure 11 and Figure 12. An alternative option to provide sufficient parking for rail users avoiding additional traffic through the town is to include a park and ride stop at the A47 crossing

One of the disadvantages of the Nestlé Purina site is the potential impact on pedestrian connectivity. In this instance the proposed site offers significant potential for enhanced pedestrian connectivity, with only minor intervention. There are five potential pedestrian corridors that could be constructed/enhanced to provide pedestrian connectivity in all geographic directions from the station. These are listed in clockwise order as follows:

- North footway skirting Nestlé Purina factory (main pedestrian connection to town centre)
- East connection to Victory Road and east side residential areas
- South connection to Weasenham Lane and industrial/commercial district
- South West pedestrian access via Oldfield Lane
- West connection to Cromwell Road through existing footway adjacent to Nestlé Purina factory

Figures 11 and 12 outline pedestrian access provision in brown, with potential light rail style pedestrian crossings denoted in yellow.

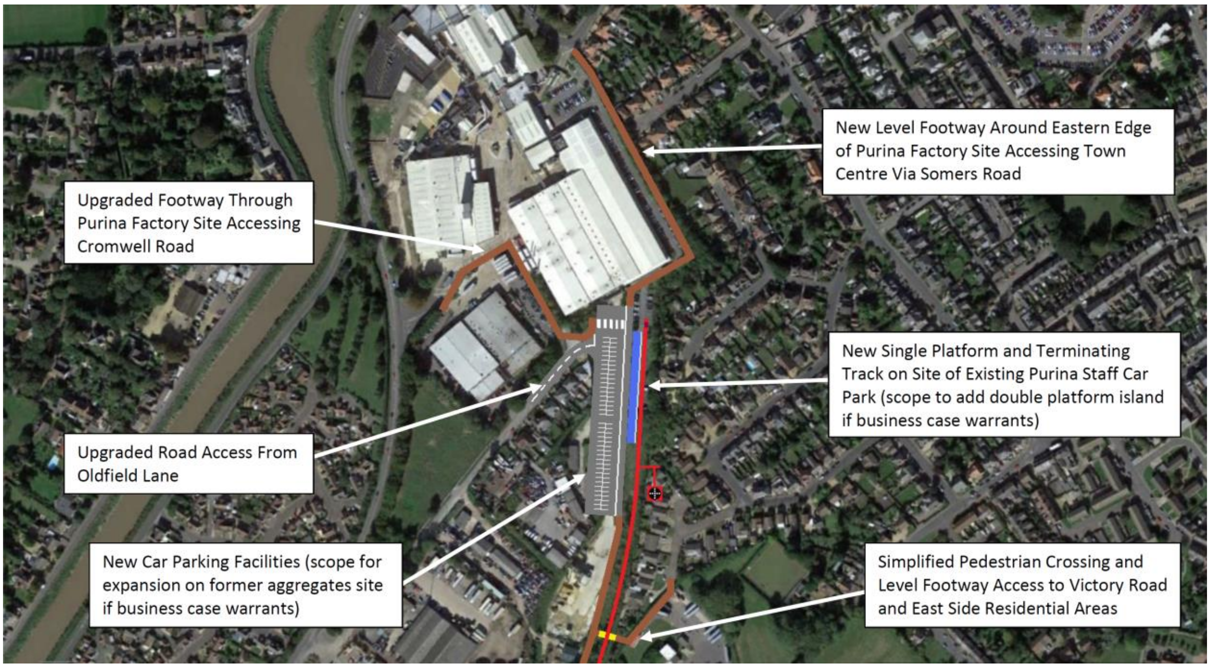


Figure 11 – Proposed Purina Factory Car Park Station Site

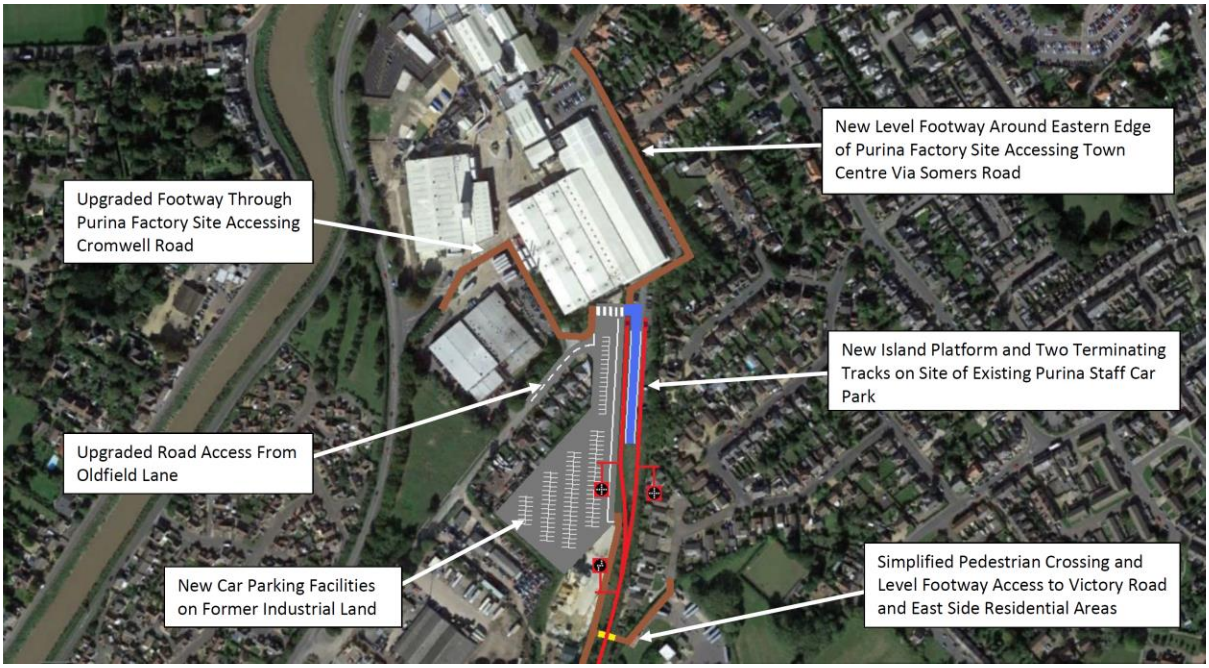


Figure 12 – Proposed Purina Factory Car Park Station Site

Regarding core route infrastructure a minimum light rail intervention for the route would incorporate a single track with a mid-point passing loop (outlined in Figure 13 below). This would allow for a minimum 20 minute peak service provision, assuming that trains would be scheduled to pass in the loop on an out and back basis. If additional contingency time, or extended layovers were required at Wisbech, a second platform would be required for operational flexibility and to accommodate potential service disruption. Signalling interventions include a simplified light rail based single line occupation system. This is similar to examples seen on tram networks throughout the country, with a specific example being the single track Meadowhall Interchange line on the Sheffield Supertram network (see Figure 14 below).

Figure 13 – Proposed Route and Coldham Regulating Loop Location

Figure 14 – Example Single Line Occupation Tramway Controls at Meadowhall Interchange, Sheffield (Source: Ian Ambrose)

Where light rail and heavy rail lines interface a signalling arrangement like that on the Tinsley Chord Tram Train connection in Sheffield is recommended. This incorporates a single main aspect signal on the approach to Whitemoor Junction. This would be designated as the transition point from light rail to heavy rail infrastructure. A corresponding train crew instruction sign would be provided in the opposing direction at the signal denoting 'Start of Line of Sight Infrastructure'. This would be the point that drivers switched to the light rail line of sight operation on the single track section. This arrangement is outlined in Figure 15.

It is recommended that an approach berth or annunciation be provided on the single line, to advise the Network Rail signaller of approaching light rail vehicles. Figure 17 outlines the simplified transition arrangements applied by the Sheffield Tram Train project. It is assumed that in this case, drivers would receive a cautionary aspect for movements towards light rail infrastructure, as is the case on Sheffield Tram Train. The ownership, operation and maintenance responsibility of the light rail infrastructure will need to be agreed. With formal boundaries established if the light rail section is not the responsibility of Network Rail.

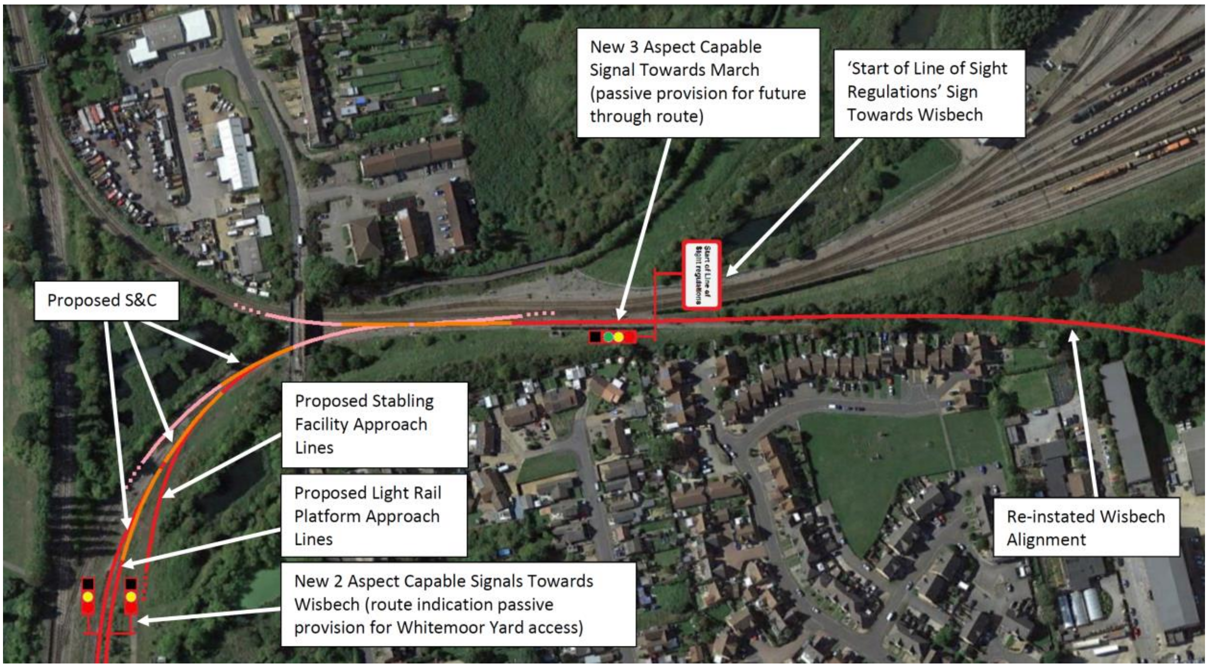


Figure 15 – Proposed March East Curve Connection

Figure 16 – Key to Aerial Image Overlay Diagrams (Figures 14, 18, 22, 24 and 25)

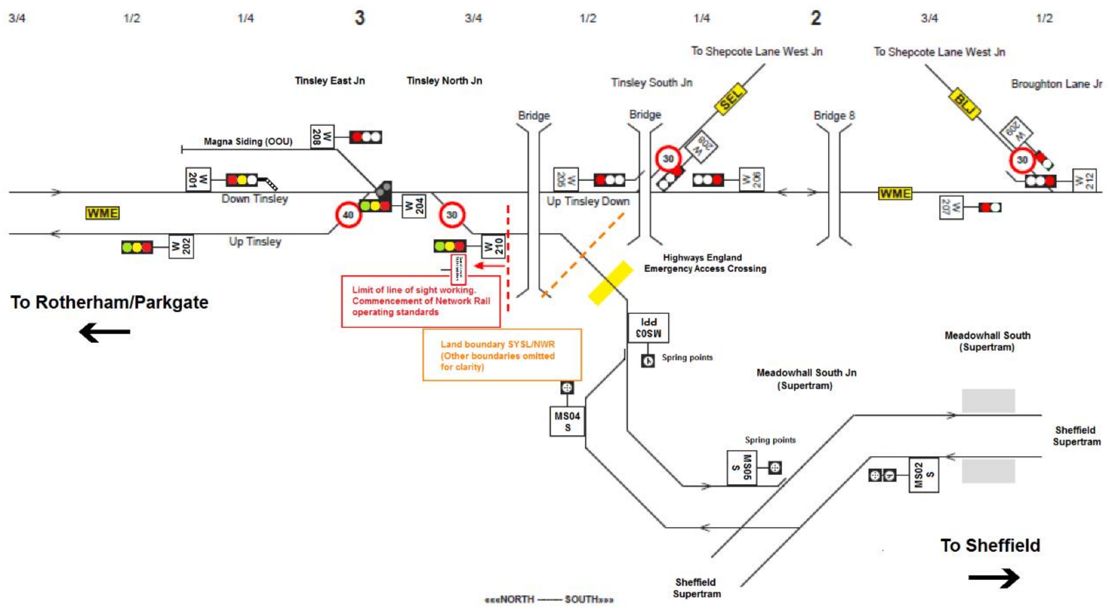


Figure 17 – Simplified Heavy Rail Interface Signalling at Tinsley Chord on Sheffield Tram Train Extension

Access to March Station is assumed to be via the existing West Curve connection to/from Whitemoor Yard. This would require limited shared running on heavy rail infrastructure, with the integrity of the interlocking providing suitable light rail vehicle separation. In addition to re-instating existing S&C towards the Wisbech alignment, a new turnout would be required from the curve towards a proposed platform and depot facility in the current disused area of March Station. Figure 18 shows the indicative layout for two platforms on the disused through alignment. Potential cost savings could be made through temporary frangible decking over the eastern end (shown in yellow), to permit passenger circulation and level access to the north side car park, without re-instating the currently disused portion of station footbridge.

Figure 18 makes provision for two platform lines; however one may be acceptable to reduce cost or align with the service specification. This would require as a minimum, full reconditioning of the current disused platform faces (dark blue) and associated remedial work to structures adjacent to circulation areas. A recent site visit noted severe deterioration in station canopies and supporting metalwork, which may require addressing separately as part of a wider package of station enhancements[5]. Passive provision is made for future platform extensions (light blue) if the business case warranted, or a single extended platform to hold up to two 35-40m vehicles. Signals shown are two aspect with route indication, however the latter may be dispensed with if only one route is to be made available towards the Wisbech branch.

The current land area north of the station site appears to be utilised by Network Rail/contractors for storage of materials and vehicle access. This may permit the optional construction of a two road stabling area for light rail vehicles, and optional maintenance shed (highlighted in pink in Figure 18). This would require re-allocation of maintenance/operational use into a smaller compound area east of the existing site. A standard Ground Position Light signal is assumed to be acceptable for such a facility in this instance

[5] Upgrade work to March station has been approved and is underway. Proposed access to the island platform needs to be confirmed

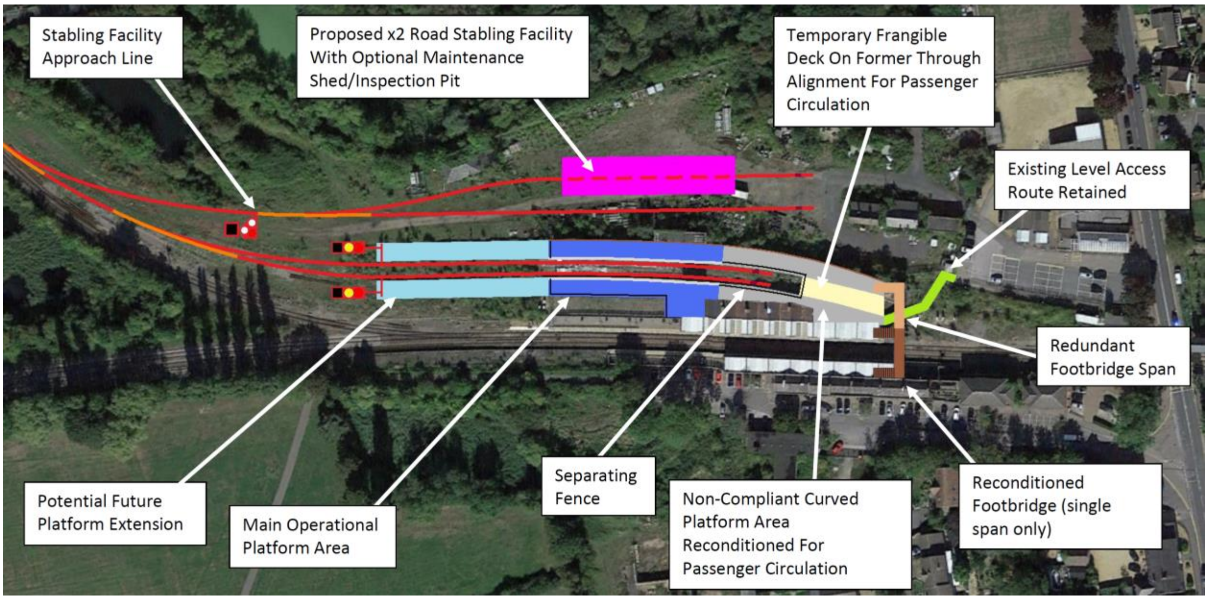


Figure 18 – Proposed March Station Terminating Platforms

Additional Requirements

Additional considerations for the proposed route include level crossings outlined separately in Section 4. Light Rail optioneering offers significant potential cost savings over heavy rail, due to the greater reliance on vehicle capability for managing road rail interfaces. Vehicles intended for tramway operation are normally fitted with track brakes, enhanced standard braking capability, improved driver visibility, and crash energy management. As such, level crossing equipment provision can be substantially reduced over equivalent heavy rail options. None of the existing level crossing equipment provided on the route would be satisfactory for a modern passenger operation, and it is proposed that each crossing be re-assessed for operation with a light rail hybrid service.

A minimum provision on tramway networks is un-signalled crossings. These simply incorporate advisory signage and assume standard road junction compliance. This may be acceptable for several of the user worked crossings on the route, however it is recommended that gates be retained for control of livestock from adjacent fields. Telephones are not normally provided on tramway crossings, however in this instance individual risk assessment may require some form of permission based crossing, in the event of frequent slow traffic/poor sighting/visibility. Technology exists to provide remote GSM-R solar powered communications to rural crossings, which may assist in improving safety without a disproportionate impact on cost. It should be noted that Signal Post Telephones are not proposed for light rail infrastructure, with all traffic based communications being managed by radio, preferably from a central control. Further detail on level crossing interventions can be found in Section 4.4.

Examples of light rail and simplified crossings are shown in Figure 19 (traffic light control interlocked with tram signal indicators) and Figure 20 (simplified light weight barriers).

Figure 19 – Standard Tramway Traffic Light Road Junction Crossing (Source: YouTube/MrCrompton 33012)

Figure 20 – Simplified Light Rail Barrier Crossing on Isle of Man Steam Railway (Source: YouTube/Perryd Pelle)

For a self-contained light rail service (March-Wisbech only) traction power is assumed to be battery. This would require as a minimum, charging points at both terminus stations, and provision of shore supply in any depot facility constructed. Two options are available for charging facilities including four foot mounted charging grids and overhead conductor bars. Currently no UK market Tram Train vehicles are equipped for four foot mounted charging grids, however the two vehicle types currently in production (Class 398 and Class 399) are both capable of overhead charging.

If a self-contained network is preferred other potential rolling stock could include Very Light Rail (VLR) vehicles. Examples such as the Revolution VLR can be provided with both battery and diesel powerpacks and are proposed to accommodate fast charging from lineside infrastructure.

5.2 Wisbech Town Centre Interchange

Option Overview

The application of light rail vehicles offers the opportunity for the service to run closer into Wisbech town centre. This would require street running to access a more central location and would potentially extend journey times beyond the assumed 20 minutes of a segregated edge of town station alignment. If the aspiration was to assume a minimum of 2, 3 or 4 tph (see section 4.1) this would require additional route capacity in the urban area to accommodate the extended journey time. Requirements for flexibility of operation, brought about by issues over service reliability/road traffic interface, may dictate a need for additional passing loops/double track infrastructure in the main route corridor.

As per the Minimum Intervention Option outlined in Section 5.1, the core route would be largely self-contained, with a signalised interface at the southern end, where the freight only line to Whitemoor connects with the Peterborough-Ely through lines at March Station. Given this limited heavy rail interface, it is assumed that the service would be implemented as a Tram Train operation, accounting for the extended street tramway interface at the Wisbech end of the route. This would also offer greater flexibility for service extension onwards from March on existing heavy rail if the business case warranted.

Proposed Infrastructure

The required infrastructure for a Wisbech town centre tramway connection would largely mirror that outlined in the Minimum Intervention Option in Section 5.1. The core route infrastructure and March Station options would be the same, excepting potential capacity based interventions associated with the operation of a street tramway service. The most notable difference is the addition of approximately 1.1 miles of unidirectional embedded rail double track street tramway between Weasenham Lane and Horse Fair Shopping centre (see Figure 21 below). This alignment has been identified as the most direct to the main shopping precinct however is only enabled by direct incorporation of the rail alignment into the existing two lane roadway.

Formal signalisation will be required at each major road junction dissected by the tramway alignment, with corresponding tram signal indicators specifically for light rail vehicle movements. There is scope for tram stops to be added along the line of route, in both high level and low level platform configuration. High level platforms offer greater flexibility for onward connection and are slightly more complex to implement in an urban environment. Space does exist in certain locations (such as land in front of the Nestlé Purina factory), where tracks could be gauntleted to provide a segregated high level platform stopping point for light rail vehicles in each direction.

One of the most significant interventions of this proposal would be the construction of a two platform terminus station at the Horse Fair Shopping Centre. This would break off from the street alignment, avoiding the Horse Fair Roundabout and terminating in the ground level of the existing Horse Fair multi-storey car park. Two platforms are assumed to be the minimum intervention in this instance due to the potential performance impact associated with street running discussed in the Option Overview.

A scissors crossover would be required to regulate traffic between the two platforms, and this would need to be clear of the active roadway, to avoid damage to the S&C. The only suitable alignment in this instance runs through part of the current Job Centre site, which would need to be partially re-developed to facilitate a segregated alignment. It is assumed that tram signals and points indicators would be installed as per standard installations for tramways in other mainland UK cities. Additional traffic management interventions, such as road traffic lights, junction stand backs and yellow box hatching would be required on the approach to Horse Fair Roundabout, to ensure adequate traffic management in an already congested part of the town.

The existing Horse Fair multi storey car park structure may not incorporate suitable vertical clearance for Tram Train style vehicles. Thus, potential partial or full reconstruction of the upper parking deck to accommodate Tram Train vehicles below may be required. Construction of buildings and car par structures above active tramways is not uncommon, and scope may exist for incorporating 'air rights' development above the station site and above the partially demolished Job Centre site.

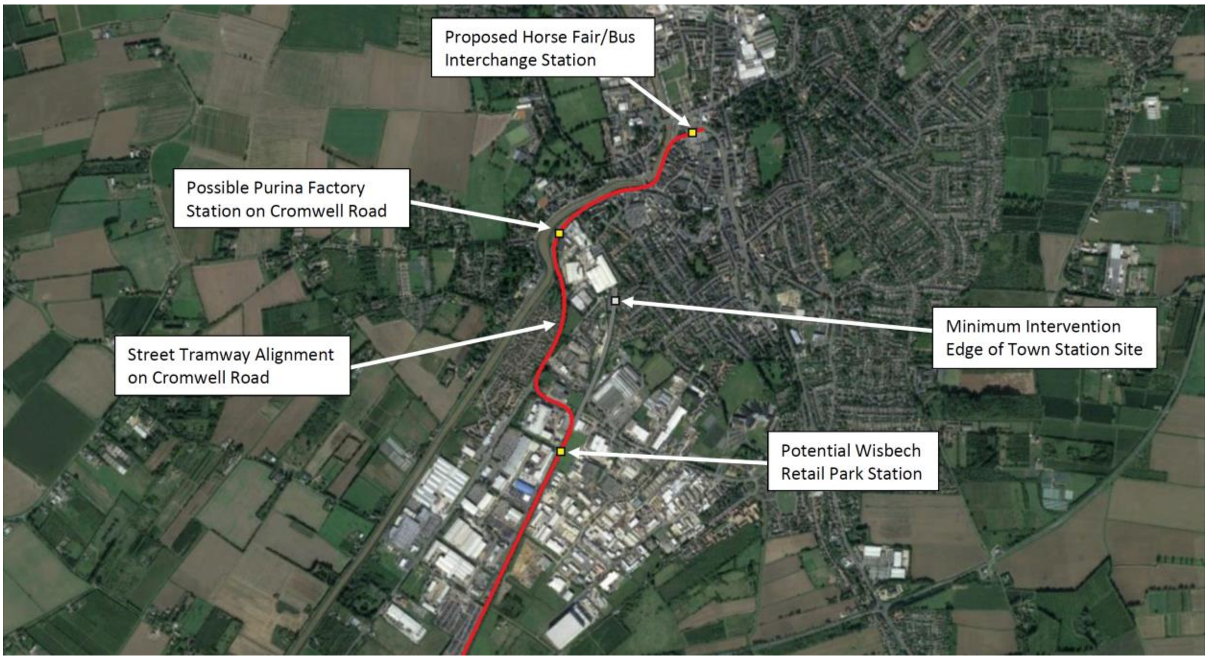


Figure 21 – Proposed Wisbech Street Tramway Route Alignment to Horse Fair Interchange

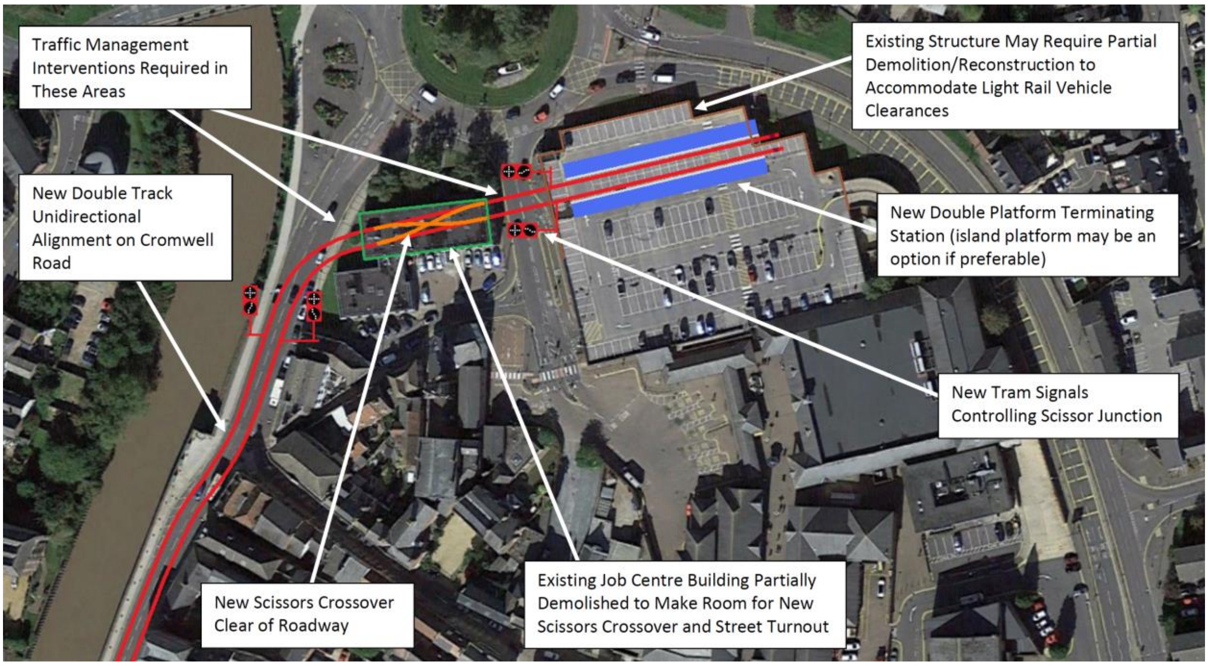


Figure 22 – Proposed Horse Fair Interchange Town Centre Station

As noted earlier in this section additional track infrastructure along the core line of route may be required, to provide enhanced service resilience for interface with a street tramway. It is assumed this would take the form of at least two regulating loops in each direction, between Chain

Bridge/Coldham South and Waldersea/Redmoor (see Figure 23 below). This would provide capacity to pass services at one third intervals along the route, and could be utilised both for contingency pathing, and future enhanced service if the demand warranted.

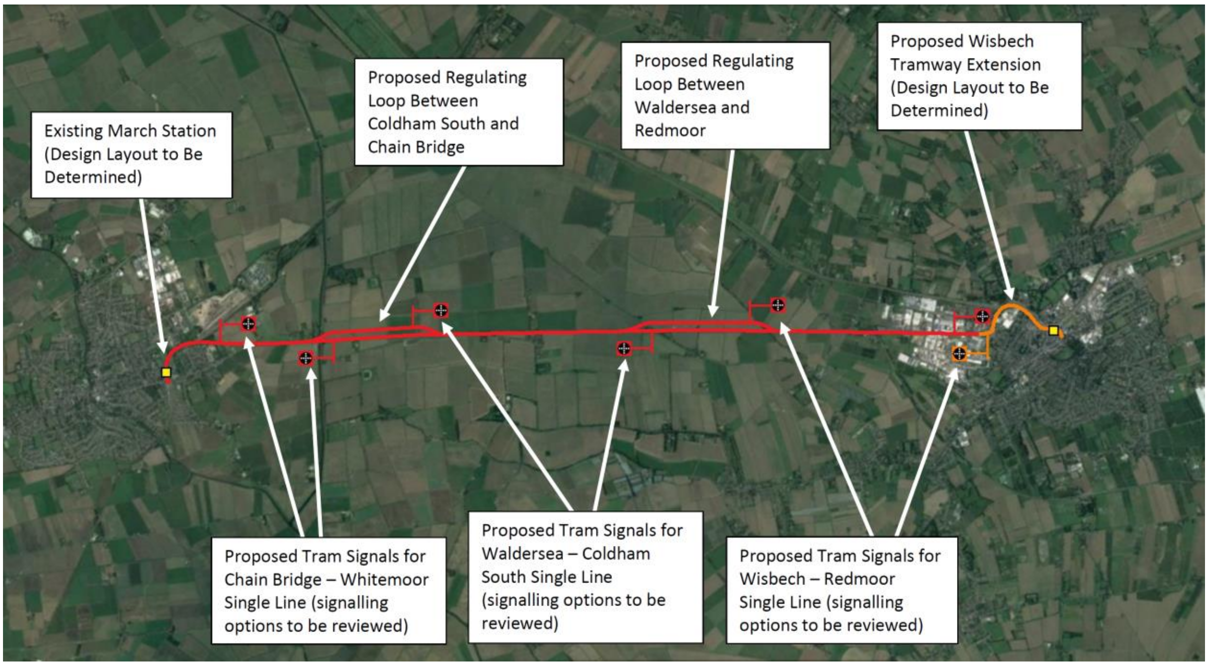


Figure 23 – Proposed Route and Chain Bridge/Waldersea Double Regulating Loop Location

Additional Requirements

Additional considerations remain largely the same for this proposal, as per the Minimum Intervention Option covered in Section 5.1. One of the key differences is anticipated to be the use of embedded rail on the street running sections of route. This would need to be taken into consideration from a procurement and installation perspective, as well as for long term maintenance of the asset. Such a small amount of a very specific infrastructure may add cost/complexity to the project, however larger combined procurement initiatives may be possible through industry organisations such as UKTram. The ownership, operation and maintenance of the on-street sections would need to be established.

Another key difference from the Minimum Intervention Option concerns rolling stock. Integration of a street tramway into the system operation requires the use of a tram or Tram Train type vehicle. For a self-contained network, some form of modified 'off the shelf' tram design may be adequate for the limited interlocking segregation proposed at the Whitemoor Junction. An example being the M5000 tram design used in Manchester. Where onward heavy rail connectivity is being considered in the long term the available option is a Tram Train

6 Future Considerations

6.1 Increase in Service Provision

Heavy Rail Connectivity Beyond March

While the client's baseline requirement is for a dedicated shuttle service between March and Wisbech there is the opportunity, and longer term aspiration, to extend the service beyond March to Peterborough, Ely and/or Cambridge. This section discusses the potential requirements at March to enable such a service extension.

As noted in Section 5 Optioneering, such service extension places a limitation on the type of rail vehicle that can be used in all feasible scenarios, namely Tram Train. Loading gauge restrictions and a lack of electrification limits any chosen vehicle to a battery hybrid option. Due to the presence of electrification on the fringes of the route (Ely-Cambridge, and Peterborough), it is recommended that consideration be given to a 25kV charging capability from overhead catenary. This does not rule out alternative ground based charging provision previously discussed, with charging grids installed in the four foot at the respective terminals. Alternative options exist for onward heavy rail operation beyond March; however these are limited to the semi segregated mode of operation outlined in the Minimum Intervention Option in Section 5.1.

March Station

An extended service enables opportunities for stabling and maintenance of Tram Train/light rail vehicles at existing depot facilities. This would avoid the stabling/maintenance facilities shown in Figure 25. Figure 25 highlights the key changes required to permit light rail vehicle access to the main running lines east of the station. It is assumed that the existing east end freight connection would remain in situ, with the platform lines being designated for Tram Train use only. This would require reconfiguration of the existing level access arrangements for the north side Platform 2.

As a minimum, this proposal recommends significant rehabilitation of the existing footbridge structure (shown in dark brown), which is not PRM compliant and in poor condition. To obtain full PRM compliance lifts would be required. This proposal recommends the construction of a new central footbridge on the site of the existing long stay car park, and former terminating bays in the central island (shown in light brown with lifts in yellow). This would provide a significant enhancement in overall station accessibility, in addition to PRM compliance, and may permit removal of the existing footbridge structure if the asset condition is poor enough to warrant[6].

More complex signalling arrangements would also be required for the new routes created, with a new single lead spur from the existing main lines connecting to up to two platform lines. In order to accommodate the new S&C on approach to the level crossing, the existing crossover S&C may require partial re-alignment to permit parallel movements. It is assumed that the platform spur would be served by an additional crossover east of the level crossing, within the limits of the existing goods loops. A minimum of two new two aspect signals would be required as starters for the proposed additional platforms, with consideration given to application of standard heavy rail overlaps. It should be noted that this would require changes to the main line interlocking along with additional indications/approach controls on signals controlling westbound movements towards the station.

The layout shown in Figure 24 covers future service provision eastbound towards Ely and Cambridge. It is recommended that consideration be given to service provision towards Peterborough. The site constraints of the existing station, and its defined location make the

[6] This may be partially resolved in the current station refurbishment programme. The plans for the footbridge need to be confirmed

question of westbound connectivity somewhat of a challenge. Figure 25 below outlines two potential proposals for a Peterborough service, with both requiring additional infrastructure intervention and potential operational compromise.

The first and most technically complex option would be for an additional spur line connecting one or more of the proposed re-instated through platforms at the western end of the station. This would require a platform reversal in March Station for services proceeding towards Peterborough. This would potentially add additional time to schedules and tie up a platform for the duration of the change procedure. The west chord would connect at the existing March West Junction, in order to utilise the existing crossover for the single lead freight curve and shorten the junction lead times on the main line. This would require enhancement to the basic proposed signalling provision, with one or more west facing signals requiring full aspect sequence and route provision.

It should be noted that while a second platform connection may be desirable in flexibility/ performance terms, this has the potential to add technical complexity/maintenance issues to the intervention. This is due to the requirement for up to two non-standard cast crossing diamonds on an existing track curve.

The second option covered in Figure 25 covers installation of a separate platform on the existing West Curve freight alignment to Whitemoor Yard (shown in blue). This would potentially free up capacity in the main station area for Cambridge services and terminating shuttles from Wisbech, while also permitting through journeys not requiring a reversal. This option would permit fewer signalling infrastructure interventions to enable a Peterborough service, with only minor alterations to the existing freight line required to install TPWS/AWS/overlaps to passenger standards. A walkway could be constructed across apparently unused land to reach the main station site, with PRM compliant access to the main station assumed to be via the proposed new footbridge structure in the centre of the site. An optional connection could also be included to Norwood Road to improve station accessibility if the business case warranted.

It should be noted that for the West Curve platform connection, standards limitations on station design may require some form of deviation or may limit application entirely. One of the key issues concerns platform stepping distances. These would be non-standard for any platform structure installed on a curve of that specific radius. It is however anticipated that any light rail vehicle used for the service would incorporate some form of retractable step system to mitigate this issue. This would render the platform unfit for use by standard heavy rail vehicles. Another standards issue to consider would be the issue of wayfinding within the station site. The West Curve is located some distance away from the main station complex, and even with a PRM compliant walking route, the location may be difficult to find for customers not used to the arrangements. Signage and wayfinding innovations can mitigate against such issues, however the distance between the two sites may be a challenge for persons with reduced mobility in general.

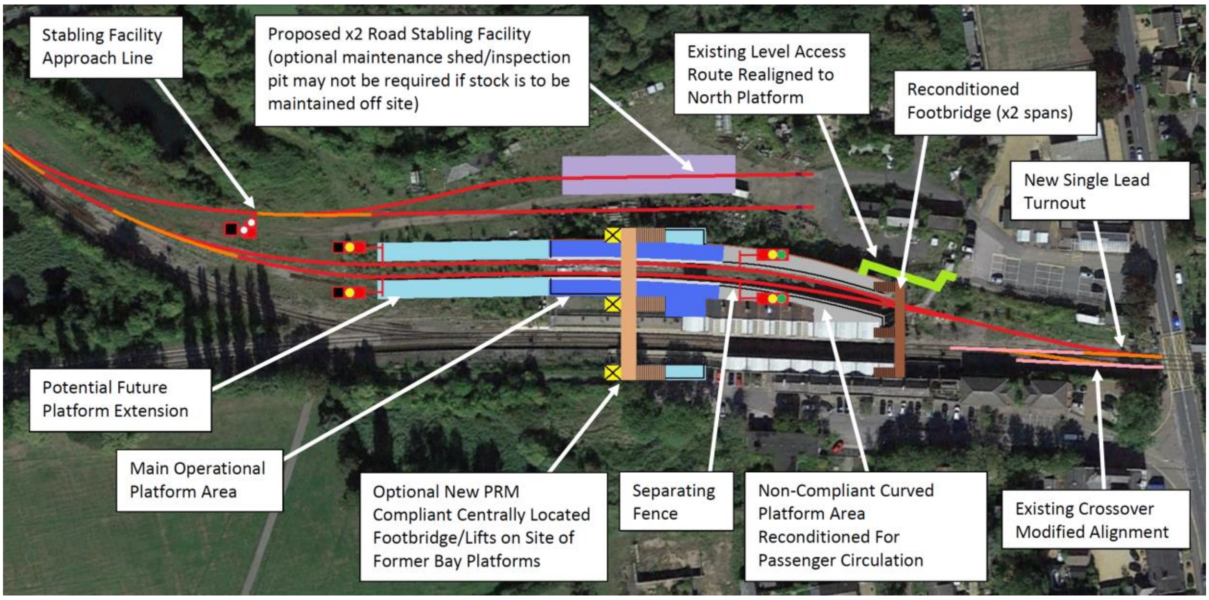


Figure 24 – Proposed March Station Additional Through Platforms

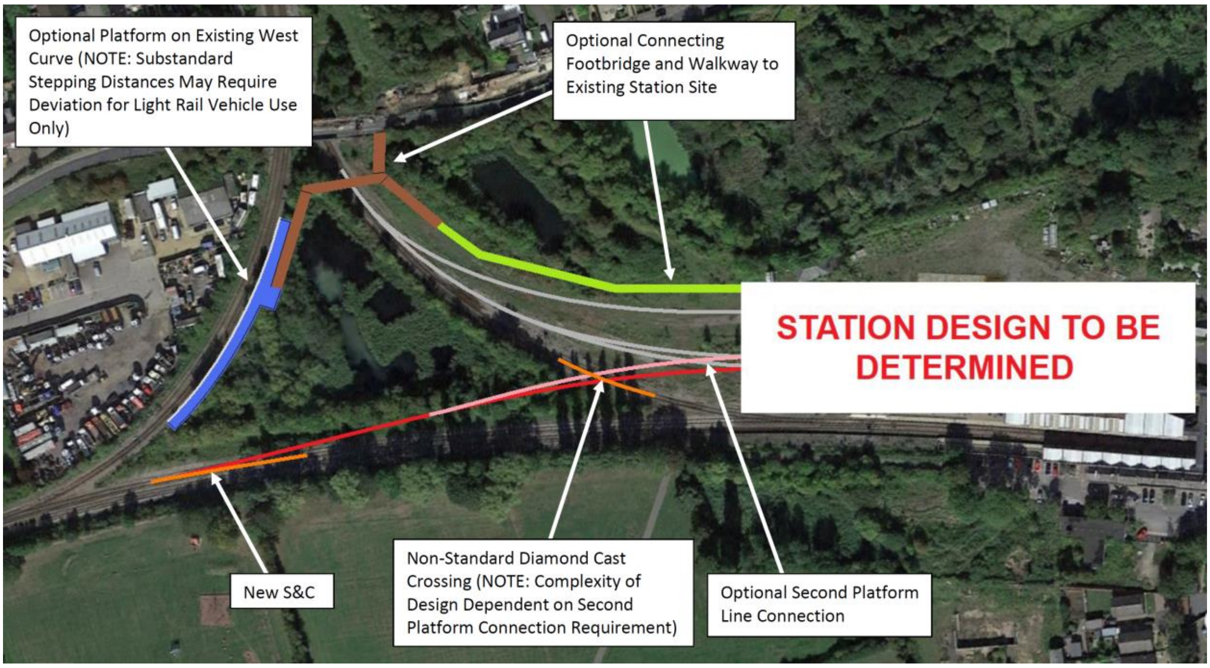


Figure 25 – Proposed March Station West End Access

Additional Considerations

A key consideration is the potential impact of the future West side Garden Town development proposed in Wisbech. The impact is currently difficult to quantify as detailed proposals are not advanced, however it is evident that passive provision for a western connection would be prudent. Figure 26 below outlines several potential high level route options, placed in the context of the detailed versions outlined in Section 5 Optioneering. From the West side Garden Town development perspective, this includes three potential routings for either a ‘Y’ shaped connection, separate terminating spur, or combination of the two to form some sort of ‘loop’ arrangement. This introduces the question of additional station stop provision on these routes and whether the business case for these would be enhanced by some additional requirement for route interchange.

It should be noted that Options 2A, 2B and 3A in Figure 26 all cover some form of tramway based street running as part of the high level proposal, limiting them to tram/Tram Train based vehicle applications. Option 1 (Core) and Option 3B do offer potential for other VLR/light rail vehicle types. This is covered with the caveat of a limitation on existing urban area penetration and does not rule out safeguarding of a segregated route through the proposed garden town district.

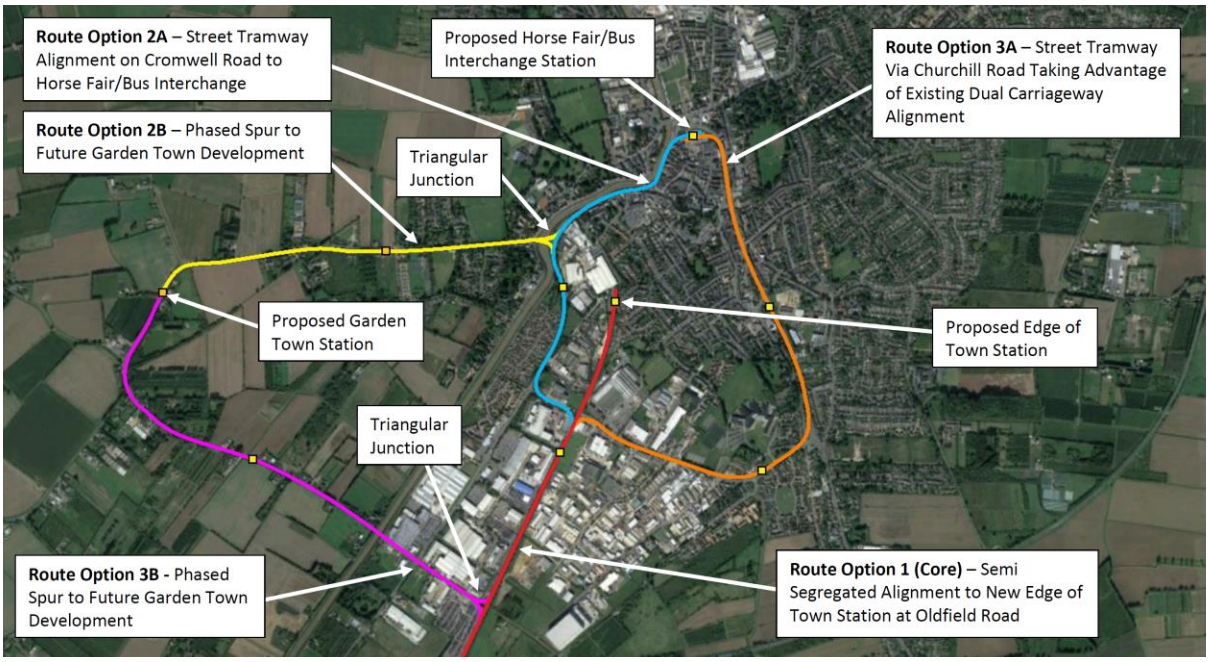


Figure 26 – Summary of Potential Wisbech Area Route Options

6.2 Heavy Rail Option

This section provides a summary of the requirements for a heavy rail solution. Its intent is to highlight the key areas of difference with the light rail options discussed elsewhere.

Operational standards and practices differ considerably between light and heavy rail systems, and this is particularly pertinent for train control and level crossings. The cheapest heavy rail option would be one that limits signalling intervention, which could be achieved through a system of One Train Working. One Train Working systems by nature are not suited to frequent passenger operations and could limit service options to hourly at best (assuming a 20 minute end to end journey time between March and Wisbech).

Adding additional capacity to a heavy rail single line would require formal signal interlocking protection where intermediate loops are provided. This could include some form of token working, or a fully track circuited single line section. Regardless, this would require provision of full heavy rail lineside signalling and supporting infrastructure such as TPWS and AWS. This in turn requires a robust signalling power supply to support system operation, along with a complex and extensive lineside cabling arrangement. There is also no guarantee that additional infrastructure would offer significant gains in capacity, due to the more stringent standards for train speeds and braking distances applied to heavy rail signalling design.

A crucial consideration when evaluating heavy rail options for route re-openings/re-instatements is the issue of level crossings. Current practice within the heavy rail sector is to seek closure/replacement of road/rail crossing interfaces where possible. Where crossings are retained as part of reopening projects, ORR best practice recommends application of full barrier crossings on main roads and/or urban/residential neighbourhoods. An example of such an arrangement is shown in Figure 25 below. There are seven active warning crossing sites on the Wisbech branch. Most are of the TMO/AOCL variety which are either considered non-preferred by modern day regulatory standards, or unsuitable for passenger service operation. There may be scope to retain the two semi-intact AHB crossings on the route, subject to suitable risk assessment. Standard practice however is currently to install MCB-OD full barrier crossings, in lieu of older automatic types. These are some of the most expensive and technically complex crossings in the national portfolio, second only to crossings equipped with remote CCTV control.

Figure 27 – Typical Full Barrier Heavy Rail Level Crossing (Source: NR Media Centre)

Additional factors to consider cover station design and construction, largely driven by heavy rail accessibility compliance. Light rail station stops are generally cheaper to build and are subject to differing design standards and guidance. Within the station fabric, integrated CIS systems, help points, station phones and TRTS. There are also end of route infrastructure requirements to consider such as heavy rail compliant buffer stops, compliant overruns, train crew walking routes and lighting. Finally, train control is an important long term requirement of any project, and where this takes place from will have a significant impact on cost, complexity and level of impact/disruption to existing infrastructure. In the case of the Wisbech Line, March East Junction Signal Box would be a reasonable assumption for initial line control. This location is however planned for future re-control into a ROC facility, and as such any signalling changes applied would need to be incorporated as part of future re-signalling schemes.

6.3 The Role of Technology

Improvements in battery technology within the last decade have enabled electric rail vehicles with practical ranges available to the mass market. Within the rail industry, VivaRail has a simple battery vehicle with a stated range of approximately 40 miles between charges. Further developments are currently in progress and an enhanced battery system with a 60 mile range is anticipated at the time of writing. Additionally, most tram manufacturers offer battery hybrid options which currently charge from the OLE, and alternatives are under consideration.

Other manufacturers are developing rail based battery systems, with Stadler leading innovation on inductive charging systems for the new MerseyRail fleet of vehicles. In parallel, infrastructure companies have been developing methods of safely delivering charging current to rail vehicles, and Furrer & Frey is known to be developing at least two of these. One is an overhead retractable charging system, currently being trialled for use on the Coventry VLR scheme, with the other being a four foot track mounted unit, currently being developed for use with the Revolution VLR vehicle.

One of the most important developments in the field of battery technology, after range, is the charging time capability. New 'fast charging' systems are currently being trialled or are under development in this field, with VivaRail currently offering an option for its battery vehicles capable of fully charging a unit in 10 minutes. Charging time is critical when considering service provision/options, as this greatly affects turnaround times and service recovery, in the event of disruption.

As the development of battery charging technology is moving apace with differing methods being trialled it will be important to understand the optimum solution as the vehicle and infrastructure specification is developed.

An important technological development within the rail industry relates to the future capability for interoperation of different types of rail vehicles. The current Level 2 crashworthiness standards for light rail vehicles have allowed operators like Tyne & Wear Metro/Stagecoach Supertram to run light rail services on shared infrastructure with heavy rail services. Both examples run with enhanced legacy signalling control provisions and associated safety systems ensuring traffic separation. Future developments in the field of Digital Railway technology are anticipated to bring additional flexibility to the control of legacy routes. One aspect of this covers application of ETCS operation to manage light/heavy rail vehicle separation. In effect, traffic separation on cab signalled vehicles could be 'programmed' based on vehicle type, with a 'virtual buffer' being placed around lower category light rail vehicles operating in the area. It is unclear at this stage how such technology would affect VLR vehicle operation on Network Rail main lines, however it may offer a practical/cost effective solution for limited heavy rail interfaces for future projects.

Another area of consideration is the current decarbonisation drive being promoted by the government. Rail has a potential role to play in transfer of freight. Early concepts have already been proposed for Freight VLR/Freight Tram Train vehicles, and consideration is already being given to practical routes these could be operated on. Light rail vehicles offer greater scope for urban penetration at an acceptable cost over heavy rail alternatives. Issues arise when interfacing with heavy rail main lines, and this highlights the need for effective transload capability and cargo transfer solutions. The Revolution VLR is being considered in a freight variant (see Figure 28 below).

Figure 28 – Proposed Freight VLR (Source: Transport Design International)

Further study will be needed to understand the feasibility of operating a VLR freight service on the Wisbech line, including any transhipment requirements at either end of the route.

7 Conclusion

This study has considered the suitability of light rail technology for the provision of passenger rail service between March and Wisbech. The study concludes that a light rail operation is feasible with several options of vehicle type available.

The potential vehicle options have been identified as:

- Very Light Rail
- Tram
- Tram Train
- Heavy Rail

Each vehicle option is dependent on the required service specification and influenced by the following key elements:

- Urban penetration within Wisbech town/Garden City development
- Location of Wisbech railhead
- Complexity of train control/signalling infrastructure
- Complexity of level crossing infrastructure/engineering intervention
- Provision of loops/regulating facilities within the corridor
- Station design/compatibility with existing infrastructure at March
- Cost/constructability considerations
- Onward connectivity to adjacent urban centres, e.g. Cambridge, Peterborough, etc.

Figure 29 is a summary of a comparative qualitative assessment of each vehicle option against the key elements. The RAG status provides an indication of the comparative complexity/degree of difficulty/whole system cost of each option. Note that VLR technology is at an earlier stage of development compared to the other modes. Further research is required to enable a greater level of assurance on the benefits of VLR compared to the other vehicle options.

	Tram	**Tram Train**	**Very Light Rail**	**Conventional Train**
Ability to access Wisbech town centre				
Compatibility with a future Garden Town extension				
Ability to service an edge of town Wisbech Station				
Comparative complexity of signalling control required				
Comparative complexity of level crossing interventions				
Complexity of station design/integration				
Ability to operate on the main line				
Comparative indicative capital cost				
Comparative indicative operating cost				

Figure 29: Indicative comparative analysis of possible rail vehicle types for deployment on the Wisbech to March line.

The comparative analysis indicates Tram Train as having the best potential for a light rail operation on the route. This is supported by the following key conclusions:

- The base service specification has a limited interface with heavy rail operations. This combined with the potential for a street tramway operation into Wisbech centre and the future possibility of for service extension onwards from March suggests a Tram Train would be an optimum solution.
- The number of level crossings on the route may make a full or hybrid light rail operation cheaper than a comparable heavy rail solution. Many of the current level crossing locations are considered substandard for a modern regular interval heavy rail passenger operation.
- Light rail vehicles operating on tramways are designed for highway interfaces (including track brakes and enhanced forward visibility). For these vehicles level crossing design can be optimised and the level of infrastructure required substantially reduced over equivalent heavy rail options.

The two development options outlined in Section 5 cover potential implementation of each light rail option identified, excluding heavy rail as outside the scope of this document. The Minimum Intervention option proposed in Section 5.1 is compatible with all light rail vehicle types assessed. This is due to its segregated nature and limited requirements for interoperation with heavy rail services. This would require novel operational process development and offers the most cost effective solution for enabling an initial service between March and Wisbech.

The use of any one vehicle type at commissioning should not preclude the future use of another. For example, initial deployment of a VLR vehicle would not preclude later application of a Tram Train. This assumes that a single floor height is selected for any vehicles used on the route. The Minimum Intervention option does not offer full urban penetration or connectivity with the existing bus interchange. This requires consideration of walkability of the station site from the town centre and how this and the applicable pedestrian routes are managed. This does avoid potential traffic congestion on the main north-south corridor into the town centre. It does not preclude phased development of additional light rail connections, as future travel needs are identified.

The Wisbech Town Centre Interchange option, proposed in Section 5.2 offers full urban penetration to the existing bus interchange. This is intended to take full advantage of light rail operational capability, and primarily focusses on application of a Tram or Tram Train vehicle solution. Further assessment is required of the capability of VLR technology to understand the potential of this mode to operate into the centre of Wisbech. The Tram Train option is a proven technology with the capability to operate on the main line, segregated light rail and on-street tramway routes. While this option may be more costly in initial outlay it offers greater flexibility for future system expansion.

8 Next Steps

This report has identified several actions that are recommended to be adopted as next steps in future development. These are summarised below:

Recommended Next Step 1

The legal status of all the former level crossings on the March to Wisbech line should be confirmed. Confirmation is required if the legal status needs to change if the route is to be used by light rail vehicles.

Establishing the existing rights and liabilities at each crossing will help inform the appropriate solution for each vehicle option.

Recommended Next Step 2

Options for the ownership, operations and maintenance responsibility for the route need to be identified and resolved prior to further development. This includes any on street system into Wisbech town centre or the extension to serve the Garden Town.

While Network Rail retains the freehold of the former railway alignment and associated land there are various options for the long term reinstatement of the route and service. Any extensions beyond the existing Network Rail land boundary create options for the delivery, operation and ownership of any assets.

Recommended Next Step 3

A detailed asset condition survey is required of the entire route. This will assist to confirm the level of remedial work required to reinstate any form of rail infrastructure. This survey to include March Station and the required alterations to create a fully accessible route to the Wisbech platforms.

The former railway infrastructure has not been fully maintained since the line was mothballed. A full asset condition survey will enable greater clarity on the scale and costs of any reinstatement of railway infrastructure.

Recommended Next Step 4

Continued analysis of the light rail rolling stock market and the opportunity for further development in areas such as stored energy and very light rail.

There are continuing technological developments in light rail that may provide further opportunities for the Wisbech to March route. The very light rail market is still emergent and the fully capability (and limitations) of this mode are not yet fully understood.

Recommended Next Step 5

Consider the requirements of providing a double track route between Wisbech and March.

The ability to provide a full double track route will confirm the maximum capacity of the route and determine the degree to which any future-proofing works are required should the initial phase of reopening be less than double track.

9 Appendices

Appendix A: Glossary

Acronym	Meaning
0m 00ch	Miles and Chains
ABCL	Automatic Open Crossing Locally Monitored
AC	Alternating Current
AOCL	Automatic Barrier Crossing Locally Monitored
AHBC	Automatic Half Barrier Crossing
AWS	Advanced Warning System
CIS	Customer Information System
DC	Direct Current
DfT	Department for Transport
DMU	Diesel Multiple Unit
DNO	Distribution Network Operator
EMU	Electric Multiple Unit
ETCS	European Train Control System
GRIP	Governance of Rail Investment Projects
GSM-R	Global Standard for Mobile communications - Railway
FOC	Freight Operating Company
FPC	Footpath Crossing
FTN	Fixed Telecoms Network
LRSSB	Light Rail Safety and Standards Board
MCB	Manually Controlled Barrier crossing
MCB-CCTV	Manually Controlled Barrier crossing – Closed Circuit Television
MCB-OD	Manually Controlled Barrier crossing – Obstacle Detector

OLE	Overhead Line Equipment
ORR	Office of Rail and Road
OTW	One Train Working
PRM	Persons with Reduced Mobility
ROC	Railway Operating Centre
ROGS	Railway and Other Guided transport Systems (Safety) Regulations
RSSB	Rail Safety and Standards Board
SEU	Signalling Equivalent Unit
S&C	Switches & Crossings
TfW	Transport for Wales
TMO	Traincrew Manually Operated (crossing)
TOC	Train Operating Company
tph	Trains per hour
TPWS	Train Protection Warning System
TRTS	Train Ready To Start
TSI	Technical Specifications for Interoperability
ULR	Ultra Light Rail
UWC	User Worked Crossing
VfM	Value for Money
VLR	Very Light Rail
WMG	Warwick Manufacturing Group

Appendix B: Route Level Crossing Assessment

B1 Level Crossings

This appendix provides a review of each of the main level crossings on the Wisbech line. The review is based on historic data and from a site visit conducted in June 2021. The site visit was a visual only survey of the current condition. The intent of this appendix is to provide an overview of the differing crossing types it is not a formal engineering assessment of current condition or future potential.

B1.1 Significant Road Crossing Interfaces

Elm Road Automatic Half Barrier (AHB) Crossing (WIG 86m 60ch)

This installation is located on the B1101 secondary road that runs between the Norwoodside district of March up to the Wisbech ring road. It should be noted that in this location the road name is Elm Road, however this changes multiple times on the alignment north of Friday Bridge.

An initial site assessment taken from historical imagery captured in 2018 identifies an elderly 'all in one' AHB installation, possibly from the 1970s, in poor condition. Original wooden laminate barrier arms are missing along with the entire Down side entry 'penguin' unit. The remaining incandescent light installations are in reasonable original condition. The "bomac" surface appears to have been recently removed and replaced with a patched tarmac fill. The rails remain in situ either side of the crossing with some light vegetation encroachment. Examination of imagery notes a former lineside speed sign on the Wisbech side of the crossing, denoting a former line speed of 25mph at this location.

The B1101 in this location appears in average surface condition with full road markings and standard lane width. The road has straight approaches on both sides of the crossing with street lighting either side. The road speed is 60mph at the crossing location and is bordered by a 30mph zone on the south side. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement. This would be subject to bridging/closure/diversion being discounted as practical options.

Figure AB1 – Elm Road Site Overview


Figure AB2 – Looking South Along B1101/Elm Road Towards March

Chain Bridge Automatic Half Barrier (AHB) Crossing (WIG 87m 31ch)

This installation is located on the B1101 secondary road that runs between the Norwoodside district of March up to the Wisbech ring road. This is north east of the Elm Road AHB crossing and intersects with an unclassified road at this location.

An initial site assessment identifies another elderly ‘all in one’ AHB installation, similar to the example at Elm Road, albeit in slightly better condition. Original wooden laminate barrier arms are partially/fully intact along with both integrated ‘penguin’ units. The incandescent light installations remain intact in reasonable original condition. The “bomac” surface also remains in situ, in remarkably good condition considering the time elapsed since abandonment. The rails remain in situ either side of the crossing with some light vegetation encroachment. This location presents a unique constraint being situated immediately next to the Twenty Foot River waterway. This restricts crossing equipment on the March side into a narrow strip between the road and riverbank, with the adjacent rail bridge running directly off the B1121 road.

The B1121 in this location appears in good surface condition with full road markings and standard lane width. The road has straight approaches on both sides of the crossing transitioning to a sharp diverging bend on the south side approximately 200m from the crossing. The road speed is 60mph at the crossing location, and lower advisory speeds may apply for the diverging bend on the south side. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement. This would be subject to bridging/closure/diversion being discounted as practical options.

Figure AB3 – Chain Bridge Site Overview

Figure AB4 – Looking South East Along B1101 Towards Wisbech

Coldham Traincrew Manually Operated (TMO) Crossing (WIG 89m 21ch)

This installation is located on the unclassified Station Road that connects with the B1101 at Coldham village. This is situated approximately half-way on the alignment between March and Wisbech, around 1.9 miles north of Chain Bridge AHB.

An initial site assessment identifies a former TMO crossing installation in remarkably good condition, considering the period of disuse. Both manual wooden gates and concrete posts were fully intact as of 2018, albeit somewhat overgrown. The original wooden "bomac" surface remains in situ, also in reasonable condition, with some historic light tarmac patching up to the outer sides of the rail. The rails remain in situ either side of the crossing with moderate to heavy vegetation encroachment. The Stop Boards relating to the TMO crossing operation also remain in place on their original posts. This location presents an interesting constraint being situated immediately next to residential properties in Coldham village. The two houses closest to the alignment appear to be relatively new build in comparison with other properties in the area. It is however unclear whether these sites were developed subsequent to formal route abandonment. The presence of these properties could present a restriction on development of a formalised remote/automatic crossing layout, with lights/barrier equipment possibly encroaching on their party land.

Station Road in this location appears in average surface condition, with minimal road markings and narrow lane width. Most of the markings are in poor faded condition, with the crossing stop marker on the Up side having been lost under a recent resurfacing effort. The road has straight approaches on both sides of the crossing however markings on the Down side only apply for 50m immediately before the crossing itself. The road speed on the Coldham village side is 30mph with the speed increasing to the 60mph national limit on the north side of the crossing immediately beyond the gates. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement due to the residential nature of the location. This would be subject to closure/diversion being discounted as practical options.

Figure AB5 – Coldham Site Overview

Figure AB6 – Looking West Along Station Road

Waldersea Traincrew Manually Operated (TMO) Crossing (WIG 90m 29ch)

This installation is located on Long Drove unclassified Road connecting Ring's End and Friday Bridge. This is situated approximately one mile north of the Coldham TMO crossing on the geographical rail alignment.

An initial site assessment identifies a former TMO crossing installation in remarkably good condition, considering the period of disuse. Both manual wooden gates and concrete posts were fully intact as of 2018, albeit somewhat overgrown. The Down side gate appears in markedly better condition than the Up side as the adjacent site is used by a heritage organisation.

The original alignment appears to have been installed with dock tramway style check rails with no "bomac" surface present. This arrangement remains in original condition however the flangeways have become degraded and blocked with debris over time. The rails remain in situ either side of the crossing with moderate to heavy vegetation encroachment north of the crossing. The south side remains clear, presumably due to intervention from the heritage operation. The Stop Boards relating to the TMO crossing operation also remain in place on their original posts. The sharp angle of this crossing could present a restriction on development of a formalised remote/automatic crossing layout, with lights/barrier equipment potentially located some distance from the actual alignment.

Long Drove Road in this location appears in average surface condition, with no road markings and substandard lane width with passing places. The road has straight approaches on both sides of the crossing however there is a slight kink on the Up side alignment, that could present a challenge for sighting unless some level of vegetation clearance was applied. The road speed is assumed to be a 60mph national limit in the absence of any other evident restriction signage. It is unclear what good practice guidance would recommend for this location, given the unclassified nature of the road and the immediate rural surroundings. As noted earlier any MCB-OD Mk2/CCTV installation at this location would require significant work to alter the alignment of the roadway and may have been one of the factors for not installing an AHB/AOCL originally. As referenced previously, any crossing control intervention would be subject to bridging/closure/diversion being discounted as practical options.

Figure AB7 – Waldersea Site Overview

Figure AB8 – Looking North East Along Long Drove Road

Redmoor Automatic Open Crossing Locally Monitored (AOCL) (WIG 92m 09ch)

This installation is located on the unclassified Redmoor Lane that runs between the South Brink district of Wisbech down to Begdale. This is approximately 2 miles north east of the Waldersea TMO crossing.

An initial site assessment identifies an elderly ABCL installation in moderate to poor condition, and with most original equipment largely intact. All four incandescent light installations remained intact as of 2018, in reasonable original condition. The original AOCL indicator lights are also intact in both directions. The "bomac" surface has been completely removed as part of recent resurfacing, with the edge kerb stones being all that remain as an outline. The rails appear to have been severed on both sides as part of this work. Beyond the severed points, the rails remain in situ either side of the crossing with some light vegetation encroachment. This location presents another unique constraint being situated immediately next to a form of drainage culvert on the north side of the crossing. This restricts crossing equipment on the Wisbech side into a narrow strip between the road and the edge of the culvert, with the adjacent rail bridge running directly off Redmoor Lane. The original REB installation is still present on the Wisbech side of the alignment however, this is not in a secure condition and appears to have been gutted of operational equipment.

Redmoor Lane in this location appears in moderate to poor surface condition with partial road markings in similar condition and narrow lane width. The road has straight approaches on both sides of the crossing. The road speed appears to be a 60mph national limit on both sides of the crossing, however the presence of residential properties in the area suggests that lower advisory speeds may be aspirational at some point in the future. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement. This would be subject to bridging/closure/diversion being discounted as practical options.

Figure AB9 – Redmoor Site Overview

Figure AB10 – Looking West Along Redmoor Lane

Wisbech Bypass Automatic Open Crossing Locally Monitored (AOCL) (WIG 92m 26ch)

This installation is located on the A47 Wisbech Bypass road that runs around the east side of Wisbech town. This is approximately 0.5 miles north of the Redmoor AOCL crossing.

An initial site assessment identifies the remains of another elderly ABCL installation in very poor condition, with most original equipment missing. All four incandescent light installations were missing as of 2018, with only the combination AOCL indicator light post and fittings remaining. The "bomac" surface has been completely removed as part of a recent resurfacing effort, with most traces of the original alignment being limited to a tarmac patch outline. The rails appear to have been severed on both sides as part of this work. Beyond the severed points, the rails remain in situ either side of the crossing with some moderate to heavy vegetation encroachment. The original REB installation is still present on the March side of the alignment and appears to be in a secure condition (although condition of interior components is unknown).

The A47 Wisbech Bypass in this location appears in moderate to good surface condition with full road markings, as would be expected of a major A road. The road has reasonably straight approaches on both sides of the crossing with the east side approach curving gently off to the north, without affecting sigh lines. The road speed is 60mph on both sides of the crossing, and direct observation indicates the route is used by several commercial and heavy goods vehicles. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement. This would be subject to bridging/closure/diversion being discounted as practical options. Given the A47's current designation, it may well be possible that a new heavy rail crossing installation would be unacceptable from a risk ranking point of view.

Figure AB11 – Wisbech Bypass Site Overview

Figure AB12 – Looking East Along A47 Wisbech Bypass

Weasenham Lane Traincrew Manually Operated (TMO) Crossing (WIG 93m 15ch)

This installation is located on Weasenham Lane unclassified Road connecting the B198 in the west to Churchill Road in the east. This is situated in an industrial estate area approximately one mile north of the A47 Wisbech Bypass AOCL crossing, on the geographical rail alignment.

An initial site assessment identifies a former TMO crossing installation in moderate to poor condition in line with the period of disuse. A single manual wooden gate and concrete posts remained intact on the Up side as of 2018. The Down side gate is missing completely, and no traces of the original post locations remain.

The original alignment crossing the roadway has disappeared completely, and there is no evidence of tarmac patching at the crossing site itself. This suggests that the road was resurfaced in its entirety at this location, since the original crossing structure was removed. The status of the rails south of the crossing is unknown due to substantial overgrowth between industrial units, however these are assumed to remain based on analysis of satellite imagery. The rails have been removed to the north of the crossing site, with only a dirt track and corrugated barrier indicating where the original alignment led. No other visible infrastructure remains, although this could feasibly be obscured by vegetation growth on the south side of the crossing.

Weasenham Lane in this location appears in average surface condition, with full road markings and standard lane width, albeit the markings are somewhat faded. The road has straight approaches on both sides of the crossing, however there is a gentle curve to the south on the Up side alignment which would not likely affect sighting. The road speed is assumed to be a 30mph limit for a built up industrial area, in the absence of any other evident restriction signage. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement due to the heavily commercialised/industrial nature of the location. This would be subject to closure/diversion being discounted as practical options.

Figure AB13 – Weasenham Lane Site Overview

Figure AB14 – Looking West along Weasenham Lane

B1.2 User Worked/Footpath Crossing Interfaces

Clarkes User Worked (UWC) Crossing (WIG 86m 48ch)

This location falls between Whitemoor Junction and Elm Road AHB. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and wooden crossing boards spanning the track. It is unclear if these are still actively maintained by the rail authority. The crossing appears to connect a local farm on the Up side of the alignment to adjacent fields on the Down side. The nearest identifiable landmark defined on Ordnance Survey map resources is Three Corner Cut.

Figure AB15 – Unnamed User Worked Crossing Site Overview

Sheldrach User Worked (UWC) Crossing (WIG 87m 10ch)

This location falls between Elm Road and Chain Bridge AHB crossings. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and a dirt road alignment spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ. The crossing appears to connect a local farm on the Up side of the alignment to the

B1101 Elm Road on the Down side. This appears to be the primary vehicular access for Elm Tree Farm as defined on Ordnance Survey map resources.

Figure AB16 – Unnamed User Worked Crossing Site Overview

Fishers User Worked (UWC) Crossing (WIG 87m 54ch)

This location falls between Chain Bridge AHB crossing and Coldham TMO crossing. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and a dirt road alignment spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to be missing or buried under dirt. The crossing appears to connect a local farm on the Up side of the alignment to adjacent fields on the Down side. This appears to be secondary vehicular access for Chain Bridge Farm as defined on Ordnance Survey map resources.

Figure AB17 – Unnamed User Worked Crossing Site Overview

Ballast Pit User Worked (UWC) Crossing (WIG 88m 21ch)

This location falls between Chain Bridge AHB crossing and Coldham TMO crossing. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and a dirt road alignment spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ. The crossing appears to connect a local farm on the Up side of the alignment to adjacent fields on the Down side. This appears to be secondary vehicular access for Rutlands Farm as defined on Ordnance Survey map resources.

Figure AC18 – Unnamed User Worked Crossing Site Overview

Crellins and Heads King User Worked (UWC) Crossings (WIG 89m 69ch and 90m 21ch)

These locations fall between Coldham and Waldersea TMO crossings. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and a dirt road alignment spanning the track at both locations. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ, although are heavily overgrown at the northernmost site. The crossings appear to connect a local farm on the Down side of the alignment to adjacent fields on the Up side. These appear to be secondary vehicular access for Fourscore Farm as defined on Ordnance Survey map resources.

Figure AB19 – Unnamed User Worked Crossings Site Overview

Co-Op No. 1 and No. 2 User Worked (UWC) Crossings (WIG 90m 42ch and 91m 00ch)

These locations fall between Waldersea TMO crossing and Redmoor Lane AOCL. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and wooden crossing boards/dirt road alignment spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ at both locations. The crossings appear to connect local farms and Bet Drove on the Up side of the alignment to adjacent fields on the Down side. The nearest identifiable landmarks appear to be Lillypool House, and Jew House Cottages as defined on Ordnance Survey map resources.

Figure AB20 – Unnamed User Worked Crossings Site Overview

Crooked Bank Road and Holly Bank User Worked (UWC) Crossings (WIG 91m 32ch and 91m 42ch)

These locations fall between Waldersea TMO crossing and Redmoor Lane AOCL. Analysis of satellite imagery does not indicate gates or crossing infrastructure at either location; however the southernmost site is heavily overgrown. The rails appear to remain in situ at both locations. The crossings appear to connect local farms and Belt Drove on the Up side of the alignment to adjacent fields on the Down side. The two crossings appear to serve formally defined tracks, these being Crooked Bank and Narrow Drove respectively, as defined on Ordnance Survey map resources.

Figure AB21 – Unnamed User Worked Crossings Site Overview

Broad Drove User Worked (UWC) Crossing (WIG 91m 78ch)

This location falls between Waldersea TMO crossing and Redmoor Lane AOCL. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and wooden crossing boards spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ. The crossing appears to connect local farms on both sides of the alignment along a local dirt road known as Broad Drove. The nearest identifiable landmark appears to be Whitehouse Farm on the Down side, as defined on Ordnance Survey map resources.

Figure AB22 – Unnamed User Worked Crossing Site Overview

New Bridge Lane Footpath (FPC) Crossing (WIG 92m 44ch)

This location falls between the A47 Wisbech Bypass AOCL and the Weasenham Lane TMO crossing. The site appears to be a former road alignment that was historically downgraded to permit foot/cycle traffic only. Bollards and concrete blocks have been installed to restrict vehicle access, which appear to be a recent addition, possibly installed when the rail alignment was tarmacked over. This crossing is not listed on the historical Quail map shown in Figure 2, so the downgrade may have occurred on construction of the A47 Wisbech bypass, with traffic diverted accordingly.

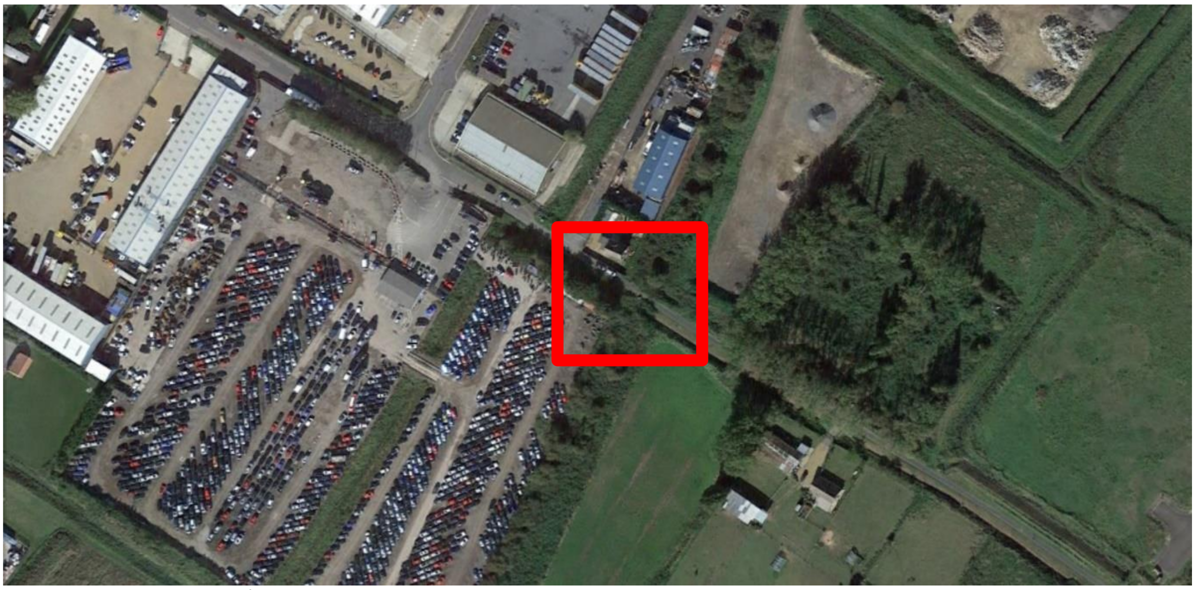


Figure AB23 – New Bridge Lane Site Overview

Figure AB24 – Looking East Along New Bridge Lane

Development Group

Network Rail Anglia HQ
One Stratford Place
London
E20 1EJ

NRDD OFFER PACK (SHORT FORM)	Compliance Date: 21/09/2020

Project Title:	March to Wisbech Phase 2: Shuttle Option	**NRDD Offer Pack Ref:**	NAT446A
Project Op Code:	TBC	**NRDD Offer Pack Version:**	V 1.0
Client:	Mark Chettle Development Manager Capital Delivery Eastern Region on behalf of Robert Russell Sponsor Eastern Region	**Date**	**06/09/2022**
		This offer is valid until:	**06/10/2022**

Requirements:

Context and Background

Network Rail Design Delivery working with Network Rail's Light Rail Team shall consider opportunities to introduce a shuttle passenger service between March and Wisbech in Cambridgeshire to improve transport connectivity and access to the commuting markets nearby to support job opportunities and the economic regeneration of the region.

The proposed infrastructure enhancements are limited to the March to Wisbech transport corridor. The objective of these enhancements is to facilitate the following project outputs:

- Provision of guided rail transport system from March to Wisbech based on a shuttle service between March and Wisbech
- Transport options considered to include conventional rail vehicle Tram-Train, Very Light Rail (VLR)

Purpose

The purpose of the outputs provided by Network Rail Design Delivery and Network Rail's Light Rail Knowledge team are:

- To develop guided rail transport options linking March to Wisbech based on a conventional rail vehicle, Tram-Train and Very Light Rail (VLR).
  Previous work for Cambridge and Peterborough Combined Authority (CPCA) by Mott Macdonald has focussed on a transport solution that includes connectivity to the national rail network.There are significant capacity issues on the wider network, which there is currently no timescale to resolve. CPCA have asked Network Rail to look at options for a shuttle service to facilitate engagement and informed decision making by CPCA and their stakeholders
- To provide Cambridge and Peterbrough Comnbined authority with an Option Selection Report to enable CPCA and their stakeholders to make an informed modular choice based on a minimum viable product approach; a shuttle service of 2 trains per hour between March and Wisbech.

Background

The railway from March to Wisbech was opened by the Eastern Counties Railway in 1847 and became part of the Great Eastern Railway in 1862. Originally built as a double track railway to serve the Port of Wisbech, it was later extended to Watlington Junction on the Ely to King's Lynn route. The line from March to Wisbech; the Wisbech Goods Branch, Engineer's Line Reference (ELR) WIG, runs from March East Junction at 85 miles 78 chains to the nominal end of the line at 93 miles 49 chains at Wisbech. Passenger service ceased in 1968. The track has been substantially removed beyond Weasenham Lane level crossing at 93 miles 15 chains. The remaining rail corridor remains in Network Rail ownership.

The line was constructed as a twin track railway but was single lined in 1972. From 1972 to 2000 it was used for freight only operations as far as the Metal Box and Purina sites, located south of Wisbech. The March end of the line continues to be used to access Whitemoor Yard in conjunction with the chord line from March West Junction and to support shunting movements, but only as far as 86 miles 18 chains.

The line was operated on the "One Train" principle with a Train Staff (OTS), and therefore facilitated only one train operating on the line at any one time.

Since 2000, the line has been officially described in the Network Rail Sectional Appendix as "Out of Use" (temporarily), from 86 miles 18 chains to Wisbech". The line has not been formally closed, nor has it been subject to Network Change, taking it out of the existing National Rail railway network.

Work completed to date:

CPCA commissioned Mott Macdonald to investigate options to introduce a transport link between March and Wisbech. The work undertaken by Mott MacDonald began in 2015 and a significant number of documents were produced to inform the development of the proposed transport link. Key documents were updated and re-issued in 2020.

In 2021/20222:

- Network Rail Design Delivery undertook a feasibility review of proposals developed by Mott MacDonald on behalf of the Cambridgeshire and Peterborough Combined Authority. The review was informed by 9 key documents and other supporting information.
- Network Rail's Light Rail Knowledge team considered the options for adopting suitable light rail technology and operational solutions. This was done without a constraint of complying with current national rail design and operating standards – other than at any interface with the current rail network.
- Network Rail's Eastern Region Development Group produced a report capturing Network Rail's view on the Wisbech Rail GRIP 3 documentation produced by Cambridgeshire and Peterborough Combined Authority (CPCA) in response to a request from CPCA. The report

broadly covers four areas which identify any gaps in the existing documentation and provide a list of recommendations/requirements to address them:

- Business Case review
- PACE / GRIP review including PM review of documentation
- Engineering review
- Light Rail feasibility

This piece of work follows on from work already completed by NR.

Scope

This remit is for Network Rail Design Delivery and Network Rail's Light Rail Knowledge team supported by Network Rail's Eastern Region Development Group to investigate options to provide a transport link from March to Wisbech based on a rail guided shuttle solution.

The following infrastructure engineering disciplines shall be included:

Track engineering

Control: signalling engineering

Traction system

Civil and structures engineering

Level Crossings

Network Rail Light Rail

This remit will be delivered in three phases.

Phase 1: Remit:

Network Rail Design Delivery work with the client and Network Rail's Light Rail Team to develop an agreed remit. This document contains the draft output of this collaboration.

Phase 2: Development of shuttle based conceptual solutions

Network Rail Design Delivery and Network Rail's Light Rail Knowledge team supported by Network Rail's Eastern Region Development Group to develop outline shuttle based options for a rail guided transport solution between March and Wisbech. The modal choices to be considered include conventional rail vehicle, Tram-Train and Very Light Rail (VLR). The outputs will include:

- Rail vehicle options including maintenance and operation
- Outline infrastructure requirements
- Aspirational service patterns

A short summary report will be produced detailing the infrastructure engineering opportunities, vehicle options and potential operating model(s).

Phase 3: Development of single modal solution

- Review the existing out of use rail network infrastructure.
- Confirmation of aspirational service patterns for chosen modal solution through liaison with internal Stakeholders (supplied by client).
- Provide outline rolling stock requirements.
- Undertake a desktop review of the existing and new infrastructure required to support the outline service provision working with stakeholders including Network Rail Capacity and Planning Team as appropriate.
- Confirm the restrictions on capacity on the existing network/wider connectivity and identify future opportunities to enhance the infrastructure between March and Wisbech to support connectivity onto the wider rail network.
- Support Capital Delivery (CD) Cost Planner during estimating process.

Governance and Assurance

The Delivery Manager for NRDD will meet (anticipated this will be virtual) with the Customer Lead Contact (or nominee) on a periodic basis to review:

- Work undertaken previous period
- Planned work to be undertaken next period
- Variations
- Cost of work done with variance to budgeted work
- AGFC of the agreed work

Both the engineering assessment and the final report referred to in Sections 4 and 5 will be checked and peer reviewed prior to final issue to the Eastern Region Development Team Manager.

Assumptions:

- No site visits will be undertaken, all work will be based on the information available from Network Rail records and data or that available from other secure sources.
- Current information shall be available as required. Any delay may result in resource re planning and delay to delivery dates.
- Scope of work is pre GRIP as such NR/L2/INI/02009 will not be directly applied however, appropriate assurance will be provided through application of 'Scheme Design Team Local Work Instruction: Checking and Review'.
- Cost Planning data can be applied to the level of detail provided at this stage of development.
- Stakeholder delivery to programme.
- The breakdown in cost between Phase 2 and 3 is indicative.

Deliverables:
Network Rail Design Delivery and Network Rail's Light Rail Knowledge team supported by Network Rail's Eastern Region Development Group shall: a. Provide a short report detailing the infrastructure engineering opportunities (Phase 2) b. Provide a final report detailing the infrastructure enhancements required (Phase 3) c. Provide a schedule of quantities

Exclusions:
The following are specifically excluded from this offer: • timetable and capacity modelling and advice; • preparation of cost plans; • completion of risk and value analyses; • deliverability (constructability) assessments (although general advice concerning constructability issues will be provided); and; • site visits. For the avoidance of doubt, the following staff resources are therefore excluded from the cost estimate: • FNPO / System Operator; • Region / Route based teams (inc RAM, Level Crossing Managers, etc); • Capital Delivery (including estimating & construction); • Legal; • Property and legal teams; and; • Economic analysis team. As Client, please refer to the following for details of Client and Principal Designer duties under CDM 2015 : https://www.citb.co.uk/documents/cdm%20regs/2015/cdm-2015-clients-interactive.pdf https://www.citb.co.uk/documents/cdm%20regs/2015/cdm-2015-principal-designers-interactive.pdf for details of Client and Principal Designer duties under CDM 2015

Programme / Delivery dates:

The key milestones for the delivery of the outputs are set out below.

Deliverables			
	Description	Owner	Due Date
1	Agree scope with Senior Development Manager		30 September 22
2	Agree remit and funding		28 October 22
3	Commence		30 January 23
4	Progress review		Every 4 weeks from 30th January 23
5	Commence Phase 1 summary report		27 March 23
6	Draft Phase 1 summary report for stakeholder review		17 April 23
7	Commence Phase 2 report		31 July 23
8	Draft final report for stakeholder review		11 September 23
9	Draft Schedule of Quantities for each option		25th September 23
10	Final Report		16th October 23
11	Final Schedule of Quantities		30th October 223
12	Project close out		30th November 23

Table 1: Programme

Pre-requisites and Dependencies:

The following pre-requisites and dependencies are applicable to enable NRDD and Network Rail's Light Knowledge team to undertake the proposed scope of works:

- Provision of any documents (and the revision status of each) provided by the client.
- Support by Network's Rail's Eastern Region Development team working collaboratively with NRDD and Network Rail's Light Knowledge Rail team

Risks and Mitigations

A preliminary project risk assessment has been undertaken and the results are set out in the table 3 below:

Risks and Mitigations		
	Risk Description	**Mitigating Action**
1	Lack of scope at start of project	Agreed project remit
2	Volume of work and resource available	Proactive management of priorities and liaison with Eastern Region Development team
3	Remit update by client	NRDD reserve right to increase charge and timescale in light of major changes
4	Availability of stakeholders for input	Client to arrange and lead input by external stakeholders
5	Design detail does not match with cost planning data.	Share example level of detail required for development team to match to detail of design included in concept development stage.

Table 2 Risks and Mitigations

Commercial:
This offer is based on an estimated number of hours required to complete the remit / scope as detailed here-in. Resources to deliver the work will be planned, but not secured, until receipt of signed budget holder's agreement in the form of a NRDD Agreement Form or Finance WAF is received by NRDD. This offer does not include any allowance for shift enhancement payments incurred for working Bank Holidays to provide design office cover or similar. Any variations to the content of the original offer shall be managed via Project Change Control. The combined offer and agreement will be used to form the basis of the commercial arrangement between the client and NRDD. Estimating costs have been included in this offer and will need to be recovered whether the work is awarded or not. **NRDD and Network Rail Light Knowledge team costs will be recovered via Direct Booking:** NRDD operate via Oracle Time and Labour and will book directly to the Client's Oracle project number requiring an NRDD allocated Task line within and project budget to the value of this Offer.

Report

Wisbech to March: Potential for Light Rail

December 2021

Authorisation

Prepared by	Checked by	Approved by
Alex Dodds Light Rail Knowledge Manager	Ian Ambrose Technical Lead, Light Rail	Simon Coulthard Head of Light Rail Knowledge & Development
A. K. Dodds		

Document version control				
Date	**Version**	**Editor**	**Approver**	**Description / Change Reason**
12/11/21	1.0	Alex Dodds	**SC**	Initial draft for client review
13/12/21	1.1	Alex Dodds	**SC**	Final document for issue

Executive Summary

The seven-mile March to Wisbech railway, located in North Cambridgeshire, England (see Figures 1A to D below) was opened in 1847 with passenger services operating until 1968. Freight services continued to run until 2000. Since 2000 the line has remained in a mothballed, non-operational condition. Network Rail's Light Rail Knowledge & Development team has been requested to assess the potential for reopening rail passenger services on the line using light rail technology.

This report summarises the findings of that assessment.

Network Rail's light rail team considered the options for adopting suitable light rail technology and operational solutions. This was done without a constraint of complying with current national rail design and operating standards – other than at any interface with the current rail network.

The study concludes that there is potential for a light rail passenger operation between March and Wisbech. The assessment of suitable rolling stock types concludes that Tram; Tram Train; or Very Light Rail (VLR) vehicles could be used. The choice of rolling stock being subject to the specification of the short and long term service aspirations.

The factors influencing the choice of light rail vehicle include:

- Requirement to operate on the national rail network (e.g. to Peterborough, Ely, Cambridge);
- The multiplicity of level crossings on the route and vehicle's suitability to create a cost effective solution at each
- Opportunity to operate into Wisbech town centre using the highway network
- Future extension of the service to serve the Wisbech Garden Town development
- Consideration of passenger demand and thus vehicle size.

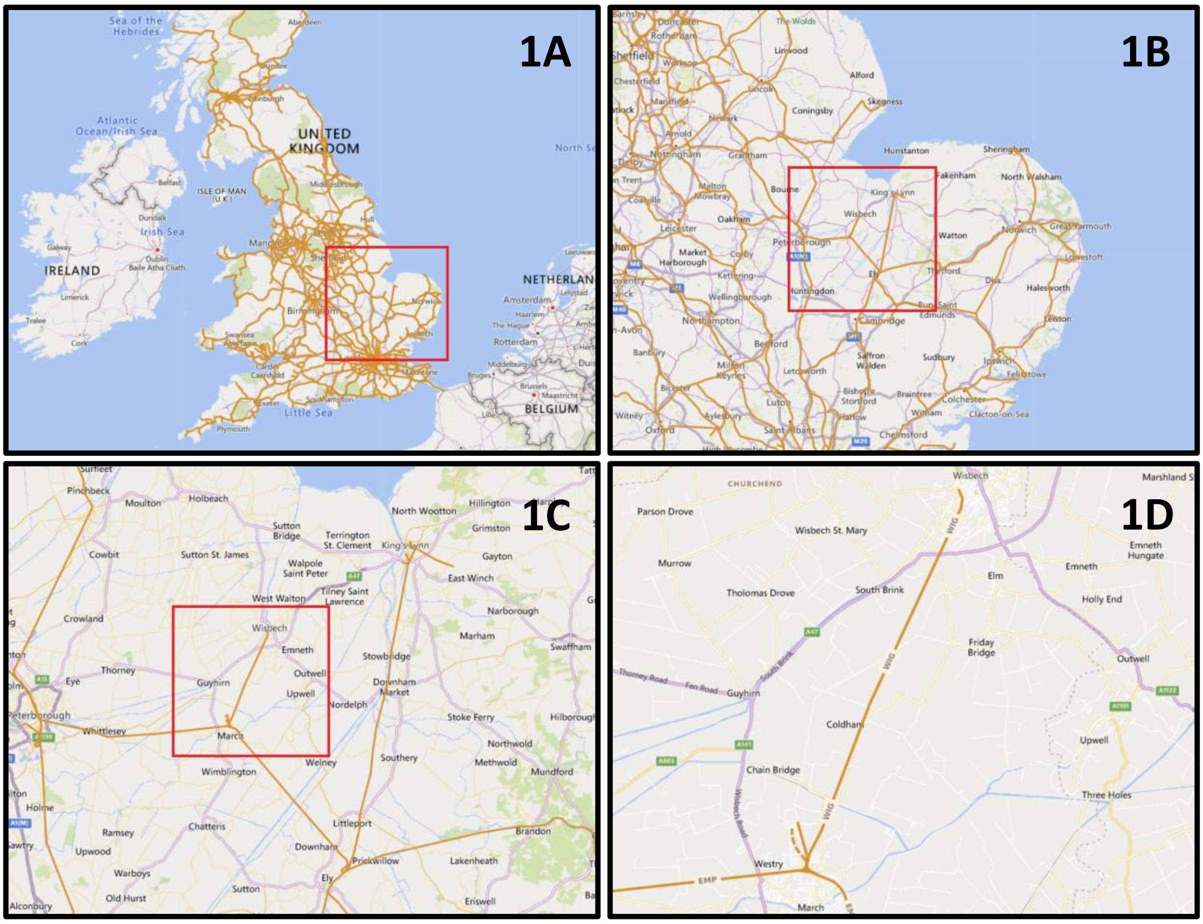
The study concludes that in consideration of the client's specification a Tram Train solution appears the best credible light rail option. Tram Train would enable future operation on both the national rail network and any on street operation into Wisbech town centre or to the Garden Town.

The next generation of Very Light Rail vehicles are an emerging technology, with the first demonstrator vehicle being showcased in Autumn 2021. Further development and engagement is needed with the manufacturers to explore the full potential, and limitations, of this new vehicle.

Key infrastructure aspects considered by the review include:

- The cost effective solutions for the numerous level crossings under light rail operation
- Options for an on street route into Wisbech town centre
- The location of a terminus station at Wisbech
- The required alterations at March Station and connections to the main line

At the client's request the report is largely a qualitative assessment of the potential for light rail on the March to Wisbech line. On the basis that light rail is considered a credible and feasible option further work is recommended to examine the options in more detail and to develop cost estimates to assist the business case for reopening the line.



Figures 1A to 1D – Map Series Showing the March-Wisbech Line in a UK, Regional, Area and Local Context

Contents

1 Introduction

Network Rail's Eastern Region directorate has requested the company's Light Rail Knowledge & Development team to assess the potential for reopening rail passenger services on the former March to Wisbech line using light rail technology. This report summarises the findings of that assessment.

The seven-mile March to Wisbech railway (known as the Bramley Line) was opened in 1847 with passenger services operating until 1968. Freight services continued to run until 2000. Since 2000 the line has remained substantially in Network Rail ownership in a mothballed, non-operational condition.

The reinstatement of rail passenger services between Wisbech and March (and possibly further afield) has been the subject of various local campaigns and studies. These given greater emphasis in recent years in the context of improving connectivity; reducing road congestion and tackling climate change through transport decarbonisation.

Recent studies to reinstate the rail connection have looked at options for conventional railway and light rail solutions, including on-street tram operation in Wisbech. To date the estimated cost of these solutions has been a limiting factor in the success of the case for reopening.

As part of the continuing evaluation of the case to reopen the line Network Rail's light rail team was asked to provide a high-level assessment of the "art of the possible" for light rail solutions. This assessment took a fresh look at the potential for light rail technology to enable a reconnection between March and Wisbech.

Network Rail's light rail team considered the options for adopting suitable light rail technical and operational solutions. This without constraint of current national rail design and operating standards – other than at any interface with the current rail network.

2 Background

The former March to Wisbech railway ran for approximately seven miles (10km) through the Cambridgeshire Fenland linking the two towns at either end.

The line was opened as a double track railway in 1847 with one intermediate station at Coldham (which closed in 1966). At one time the route continued beyond Wisbech to Watlington (on the line to Kings Lynn) and beyond March to St Ives.

The station at Wisbech was subsequently renamed Wisbech East to differentiate it from another station located at the north of the town on the former Midland and Great Northern line. Passenger services on the line ceased in 1968. The route was subsequently shortened with the Wisbech East station location being lost to residential development. Freight services continued until 2000, serving the Nestlé Purina and Metal Box facilities. Following the cessation of freight services, the rail corridor remains in Network Rail ownership. However following land acquisition by Nestlé (for expansion of its factory) the railway owned corridor terminates just beyond Weasenham Lane on the outskirts of the town.

Given the topography of the Fenlands the route had numerous level crossings for highways and footpath and farm access.

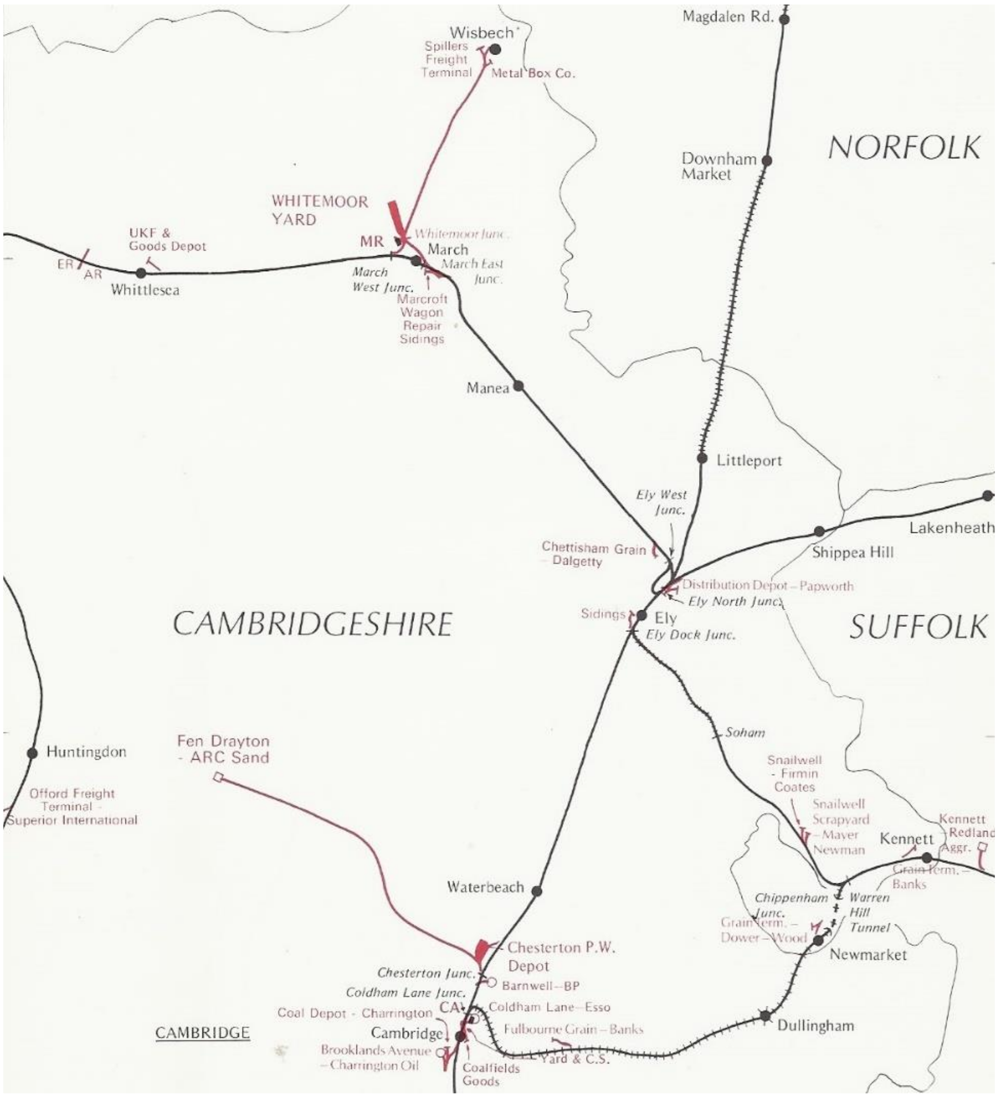


Figure 2: Map of Cambridgeshire late 1980s rail network (Source: Rail Atlas Great Britain & Ireland, Baker, 1988)

Figure 2 shows the residual March to Wisbech route from the late 1980s. Note the station is shown as having “unadvertised/excursion” status.

The reinstatement of rail passenger services between March and Wisbech has been the subject of various campaigns and studies in recent years.

These include:

- Wider Economic Benefits of a Rail Service Between March and Wisbech, Mott MacDonald & Cambridgeshire County Council (2014)
- Study into Re-Opening of March to Wisbech Rail Link, Outline Business Case, Mott MacDonald & Cambridgeshire County Council (2015)
- March-Wisbech Transport Corridor Low Cost Alternative - Tram-Train, Mott MacDonald (2019)
- March to Wisbech Transport Corridor Options Assessment Report, Mott MacDonald (2019)
- March to Wisbech Transport Corridor Full Business Case, Mott MacDonald (2020)

These studies have contributed to understanding the feasibility and options for reinstatement of rail passenger services (including assessment of light rail). These studies have included consideration of extending reinstated Wisbech services beyond March to Cambridge and Peterborough. However, there is limited or no capacity on the mainline for these additional services. It is understood that further investment on the existing network would be required to provide the capacity for new Wisbech services to operate through to Ely and Cambridge.

The most recent business case work concluded by discounting a Tram Train option in favour of a heavy rail solution with through running to Cambridge. However, the network capacity issues noted above are considered to make this option either too costly or impractical in the short/medium term.

Between 2009 and 2018 Network Rail, working with local partners, designed and implemented the UK’s first Tram Train operation between Sheffield and Rotherham. From this experience Network Rail created a team as a dedicated centre of excellence for light rail knowledge. This team supports colleagues and stakeholders in the development of light rail schemes on or interfacing with the national rail network. This team brings a wealth of experience from delivering the Tram Train service and is using this to assess the case for delivering low cost innovative railway solutions.

In 2021 Network Rail’s light rail team was invited to take a fresh look at reinstating rail passenger services to Wisbech in the context of the potential for light rail solutions. This to take the form of a high level consideration of “the art of the possible” and without constraints of conventional railway solutions. The assessment would concentrate on the creation of a dedicated service between March and Wisbech while commenting on the potential for that solution to enable through services to Peterborough and/or Cambridge.

3 Scope

The scope of the study was discussed with Network Rail's Eastern Region Strategic Planning team and agreed as:

- Examine the possibility of providing a rail service between Wisbech and March using light rail technology.
- Service options of 1 or 2 trains per hour in each direction.
- Services to be considered as self-contained to the route in short/medium term.
- Consideration for future through operation to either Peterborough or Cambridge and what infrastructure/vehicle/operating alterations may be required over the base solution.
- Study to consider suitable terminating location(s) in Wisbech.
- Output to be a short report reviewing the route and high level options to reinstating it using light rail technology. Report to provide a broad conclusion on the likely feasibility of a light option(s) and, where appropriate, indicate a preferred form of light rail solution.
- Report should highlight areas of opportunity where a light rail solution might enable a more cost-effective solution compared to heavy rail.
- Report should highlight any assumptions and risks in the solutions identified – for example in relation to compliance/deviation from industry standards.

4 Discussion and Findings

4.1 Service provision

Previous studies have identified a baseline service of 2 tph between March and Wisbech, which is the Client's base requirement. This is likely to be the maximum a heavy rail option would support. A Tram Train/light rail option could support additional service options depending on the final selection of route into the town centre and the location of the stops:

- A terminus at Weasenham Lane/the Purina factory could support 2, 3 or 4 tph depending on demand and location of passing facilities
- A terminus in the town centre at/near the Horsefair bus station could support up to 4 tph (subject to demand and passing facilities).
- The provision of a Park and Ride (P&R) facility at the A47 crossing could enable a supplementary service between the P&R stop and Wisbech town centre providing an opportunity to significantly reduce traffic into town. The combination of through and P&R shuttle services could provide up to 8 tph with 2, 3 or 4 going through to March
- The town centre operation would require significant traffic management to optimise the passage of the light rail service and enable a robust timetable.
- Through services to either Cambridge or Peterborough, although technically feasible with Tram Train, would require capacity upgrades on the Peterborough – Ely – Cambridge route. It should be noted that there are already existing services competing for limited train paths within the Peterborough-Ely-Cambridge corridor, and it may not be possible to deliver all of these without significant enhancements in route capability. This is however outside the scope of this report.

All the above options require further work to assess the overall timetable feasibility and the likely demand over the next 20-30 years to select the best option. A proposed "garden town" on the North side of the River Nene would provide further extension opportunities for the tramway, however these should be the subject of a separate study as part of the development of that scheme.

4.2 Infrastructure

The infrastructure requirements have been based on the following assumptions for Tram Train operation:

- Whitemoor Junction to Wisbech is designated as a tramway
- Whitemoor Junction to March remains heavy rail
- A railway to tramway operational rules interface is provided on the Wisbech side of Whitemoor Junction
- Tram Train services will use a reinstated Platform 3 at March station with option to reinstate the main line connection at the Ely end of the station
- The route will be a segregated tramway except in Wisbech where if required it would be an on-street tramway to the bus station terminus
- All level crossings on the original branch line will be designated as tramway crossings with appropriate highway controls

The formation and track bed are extant from Whitemoor Junction to Weasenham Lane on the outskirts of Wisbech and could be restored to double track for all or part of the route depending on initial and future timetable demands. While the formation for the most part seems in good basic condition, a full survey will be required to check the state of the embankments, particularly as most of the route is bounded by deep drainage ditches which may have resulted in scouring over the years out of use. Key requirements will be:

- Clear vegetation from track bed and trackside where sight lines may be compromised e.g. road crossings
- Restore drainage and prepare track bed
- Replace underbridge decks – the only underbridges on the route are over watercourses
- Relay track to tramway standards – note while 80lb rail would be suitable, Network Rail only bulk buys 113lb rail
- If double track, consider number and position of turnback crossovers to manage service perturbation
- All crossings will be tramway crossings with appropriate highway and tramway signalling control and with standard tramway signage
- All crossings should comply with LRG 1.0 – Tramway Principles and Guidance (TPG) (LRSSB, 2021) and associated light rail standards
- Any on-street sections should have embedded grooved rail and consideration given to innovative designs which minimise the need to move utilities
- Integrated highway and tramway signalling, and control will be required for the on-street sections
- The light rail vehicles are most likely to be high floor (to match those at March Station) and careful consideration is required for the location of on-street stops in Wisbech
- With exception of March Station, the other stops could be basic tram stops with 915mm high platforms.
- The platform/vehicle interface at all locations will be RVAR compliant and allow unaided level boarding to maximise accessibility. Foot crossings will be acceptable for any new stops on the original route.
- Consideration should be given to restoring double track from Whitemoor Junction into the disused platforms at March station with associated works to replace the missing tracks and possibly the former Junction at the East end.
- Signalling for the new layout will need to be installed which will require some changes to the existing scheme plan
- A new accessible footbridge is recommended at March. This will enable the service to offer end to end accessibility
- A servicing depot could be provided in the former engineers' sidings area at March alongside Platform 4

4.3 Rolling stock

There are numerous light rail rolling stock types and suppliers, with some vehicles currently in production/operation, and others in various stages of development. Given the status of vehicles in operation, and the flexibility of operation it offers, a Tram Train vehicle is considered the most appropriate light rail mode for the route. This is subject to confirmation of demand and desired journey time, as well as the type of service offered (e.g. segregated shuttle vs hybrid interface to adjacent urban centres). Tram Train enables operation on a line of sight tramway route, with passive provision to safely operate on heavy rail main lines in the future.

The current UK Tram Train vehicles in service are the Stadler Citylink Class 399 (low floor) in South Yorkshire; and the Stadler Citylink Class 398 (high floor) on order for Transport for Wales. Other manufacturers supplying Tram Train vehicles include Alstom and Siemens.

Figure 3 – Class 399 Citylink Low Floor Tram Train Operating in Sheffield (Photo: Ian Ambrose)

Figure 4 – Class 398 Citylink High Floor Tram Train Under Construction for Core Valley Lines (Source: Transport for Wales)

The March to Wisbech service is likely to have a journey time of between 15 and 20 minutes which will require 2 vehicles for the baseline service and up to 6 plus an operational spare for the maximum potential service frequency. This assumes a maximum speed of 60mph and suitable traffic management in Wisbech town centre to avoid congestion delays. This is a small order and better economy of scale might be achieved by joining with other Tram Train orders. The vehicle capacity will depend on the loading forecasts and the current vehicle length of 37-40m should be sufficient and the interior seating layout can be adapted to suit the customer preference. The route is sufficiently short to consider battery self-power rather than full electrification. Fast battery charging facilities to be provided at March and possibly the Wisbech terminus.

While Tram Train vehicles offer the greatest potential for service flexibility, alternative vehicle options should be considered in the context of efficiency, connectivity and cost of operation. The first of these is a standard tram vehicle. This would have lower capital cost than a Tram Train and still offer potential for street running. Tram does not offer the ability for future operation on the main line railway. Using a standard tram may require additional control measures for the shared running between Whitemoor Junction and March station. Existing standard tram vehicles are available from multiple manufacturers, with designs built to accommodate various urban rail gauges. These come in both low and high floor configurations, offering the flexibility to accommodate pre-existing infrastructure constraints, such as high floor platforms. This has already been applied successfully in Manchester, where existing heavy rail lines have been converted to tramways.

Figure 5 – Bombardier M5000 High Floor Tram Operating in Manchester (Source: Tom Page/Creative Commons)

Another alternative vehicle is Very Light Rail (VLR). The 'first generation' of VLR vehicle was the Parry People Mover used on the Stourbridge Branch in the West Midlands. Multiple second generation vehicles are under development, with the focus of VLR innovation centred in the West Midlands. One of these is the 'Revolution' VLR vehicle, intended for use on lines like the Stourbridge Branch, where a low capacity/low cost shuttle service is implemented on a segregated heavy rail alignment. The vehicle is exceptionally light weight, with potential consequential savings on track form[1] and structures. Such a vehicle could be an alternative for the Wisbech branch if the operation were to be limited to a segregated shuttle between March and Wisbech.

One potential limitation of VLR over a tram vehicle is its inability to operate on street alignments. However the vehicles may require modification to do so, such as fitting of skirting, roll-under protection, and track brakes[2]. Without these modifications, it is likely that a VLR vehicle would be restricted to segregated operation on the Wisbech line. The vehicle's small size may be an issue, dependent on the passenger demand anticipated, and interface with existing connecting services from March. Like standard trams, the vehicles are unlikely to be able to interwork on heavy rail main line, confining them to operate a segregated shuttle between Wisbech and March. This would not preclude some form of limited exemption to operate over the short distance between Whitemoor Junction and March Station. There is the issue of level crossings on the route to consider, with VLR vehicles potentially requiring different levels of protection infrastructure, dependent on the extent

[1] Note any potential savings on track/track form may be offset against Network Rail's bulk buying for standard 113ib rail see Section 4.2
[2] A similar French design includes these features

of alterations made to the standard vehicle design[3]. Recent discussions with the manufacturer of the 'Revolution' VLR vehicle have indicated the potential to incorporate market requirements into a production vehicle. This could include various design amendments for the vehicle to be classed as light rail/tram or a Tram Train and operate under line of sight regulations.

Figure 6 –Revolution VLR High Floor Demonstrator Vehicle (Source: Simon Coulthard)

4.4 Level Crossings

Based on the number of level crossings on the route and when compared to a traditional heavy rail solution a full or hybrid light rail operation could cut the cost of project implementation and operation by a considerable factor. Many sites would be considered substandard for a regular interval heavy rail passenger operation, and with 7 active sites identified alongside 12 passive ones, the cost of crossing interventions/improvements alone could make or break the project business case. A detailed description of the status of each crossing is included in Appendix B.

A light rail option would permit application of lower cost minimum intervention installations, or retention of automatic installations at current sites. A full Tram Train option would offer the potential to remove standard railway crossing controls altogether and install signalised traffic light junctions at every hybrid light rail/road interface. This would however be subject to localised vegetation clearance and suitable risk assessment of each location on an individual basis.

[3] Given the assumptions on infrastructure in 4.2, designating the VLR vehicle as a tram train would overcome most of the issues as the route can be built to tramway standards. This will also simplify the vehicle approval process

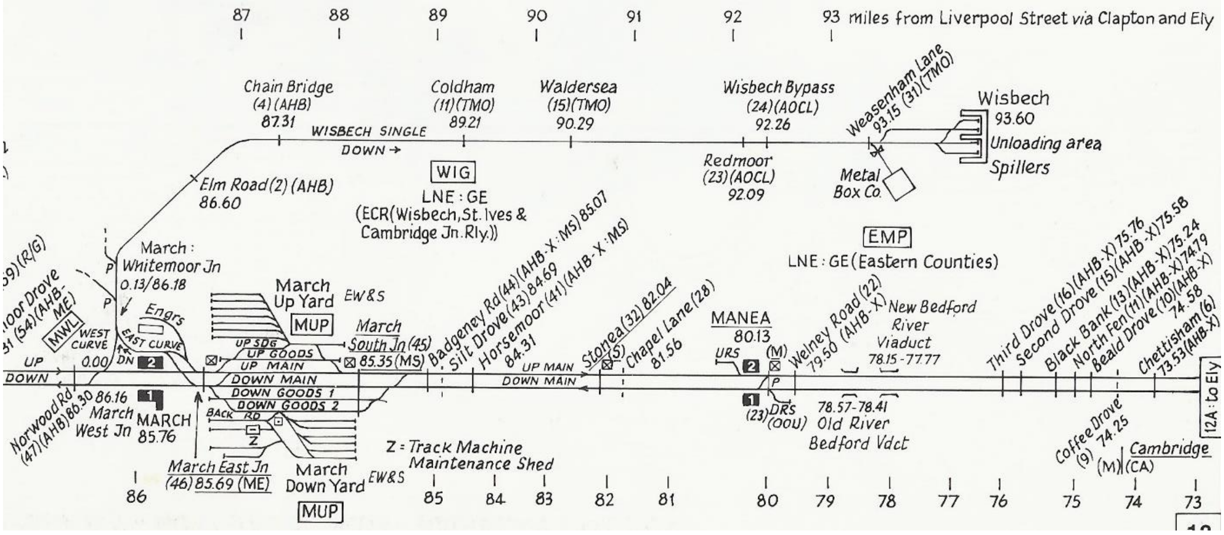


Figure 7 – Line Diagram of Wisbech Branch (Quail Map Company, 1998)

The nature of interventions required can be broken down into three specific crossing types:

- Active crossings intersecting major roads
- Active crossings intersecting minor roads
- User Worked Crossings

The level of infrastructure intervention required can be broken down for each in detail, however this would largely depend on the type of vehicle selected to operate the service, and the nature of modifications undertaken to accommodate locally specific infrastructure.

Active crossings Intersecting Major Roads

An example of this arrangement would be the Wisbech Bypass (see Figure 7 above). This was formerly an AOCL located on a busy main road. Such an arrangement would no longer be acceptable as a heavy rail solution, as the road has seen significant traffic growth, with high usage by HGVs. One option would be to create a grade separated solution in this location. Grade separation would be costly and add complexity. If this were to be undertaken, it is anticipated that the road would require elevating above the rail alignment. Not only would this cause significant disruption to road traffic during construction, but would also require substantial land take for the approach structures and significant aggregate for use as filler material. Concrete approach structures require less aggregate fill however these are generally more expensive to build, and raise environmental considerations from the increased use of synthetic material.

Application of a Tram Train or Tram option may offer a potential compromise solution. Tram vehicles fitted with track brakes already operate on a line of sight basis in urban and suburban areas, intersecting with major roads. Where an interface is created, road traffic lights are incorporated with tram signals to create a standard highway junction. This is treated just like any other road junction, with the exception that trams are often given priority over road traffic when approaching the site. Creation of a standard highway junction on the Wisbech bypass may be possible, and even practical utilising the powers of a light rail order for street interface operation. There is a need to clarify the legal status of the current crossing and the ability to reactivate a crossing at this location. Consultation with stakeholders such as the highways authority will be important.

Application of a VLR option may have a significant effect on the type of road crossing provided. By way of an example, an unmodified Revolution VLR vehicle would likely require some form of active crossing control at major road interfaces. Dependent on how such a vehicle was categorised (e.g. heavy rail, hybrid light rail, etc.), this could introduce a minimum requirement for road warning lights and half/full barrier protection. This has the potential to affect the type of solution implemented on the Wisbech Bypass, given a standard rail crossing us unlikely to be feasible in the current context. Such installations could however be suitable for use at less busy sites such as Elm Road in March or Station Road in Coldham.

Low cost, simplified level crossing equipment is used on continental rail networks. Many European countries apply simplified barrier mechanisms at automated crossings effectively, without compromising on the operation of the railway and providing a suitable level of safety based on anticipated risk. Such equipment is occasionally imported for use in a UK context, however for non-railway applications, such as barriers protecting car parks, secure installations and lifting bridges. Siemens, Schweitzer Electric and Unipart Dorman, all offer some form of simplified modular signalling/crossing control arrangement, as part of their wider international supply portfolio. It is anticipated that with some limited development, this technology could be applied for use in a UK context, operating with light rail vehicles and speeds comparable to many secondary heavy rail passenger lines. An example of the Schweizer Electronic Flex crossing system, currently in use on the continent is shown in Figure 8 below.

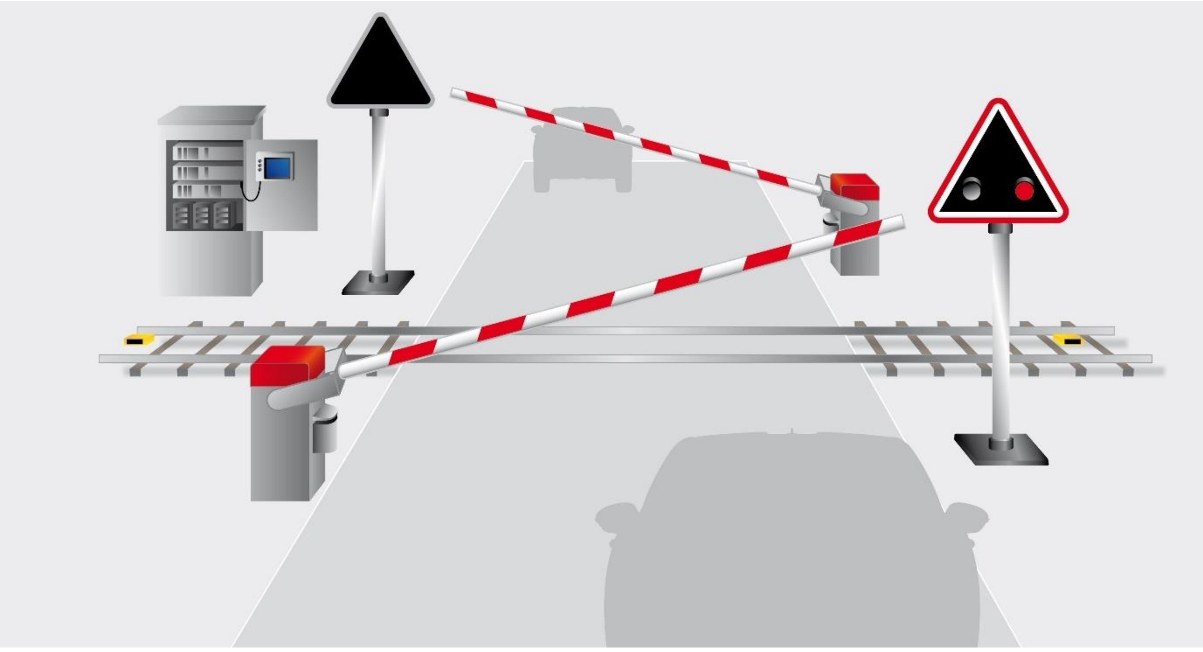


Figure 8 – Schweizer Electronic Flex Crossing System (Source: Schweizer Electronic)

Active crossings Intersecting Minor Roads

An example of this arrangement is Redmoor (see Figure 7). This was formerly an AOCL located on a quiet semi-rural/residential road.

Application of a Tram Train or Tram option offers the simplest road/rail interface solution in this instance. Given the poor sighting at the Redmoor crossing, it is anticipated that traffic lights would be required to facilitate a suitable interface. This would be treated as a standard road junction under current highway regulations. At locations where good sighting distance is available in both directions, it may be possible to incorporate a formalised road junction, without the need for an active traffic light system. Tram vehicles would operate on a line of sight basis over such crossings, with cars required to give way to approaching tram vehicles. This would be subject to individual risk assessment at specific sites, based on key local characteristics.

In the example of Redmoor, application of a VLR vehicle option would require more substantial crossing infrastructure. As per the major road example, this is assumed to be a form of active warning road lights as a minimum. Requirements for provision of barriers would require specific risk assessment for each location, largely dependent on local characteristics, anticipated rail vehicle line speed, and road usage. A simple categorisation would be application of the same active warning lights as major road interfaces, minus provision of barriers. This does not however mean projects would be limited to a single type of warning light arrangement, as several types currently exist for different crossing applications. One example of this is the Schweizer Electronic Vamos crossing system, currently in use in the UK at User Worked Crossing installations (see Figure 9 below).

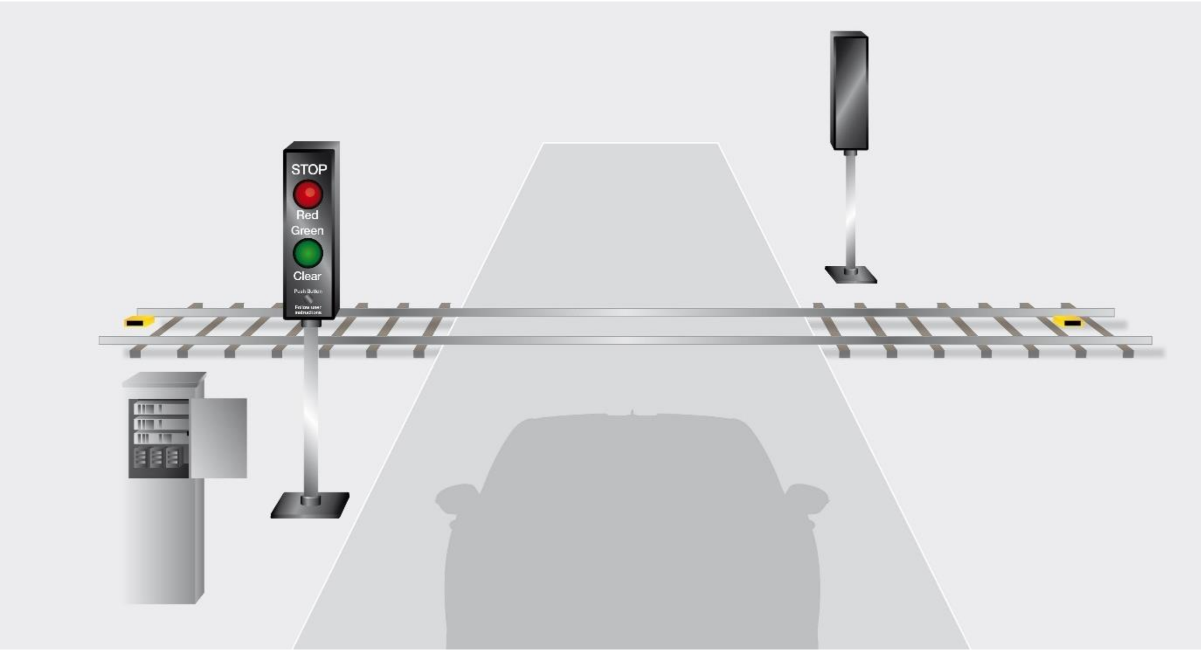


Figure 9 – Schweizer Electronic Vamos Crossing System (Source: Schweizer Electronic)

User Worked Crossings

An example of this arrangement would be Clarkes User Worked Crossing (see Appendix B1.2). This was a basic occupation crossing equipped with passive signage and metal gates. It is located on private land inaccessible to the public and connects agricultural land on one side of the crossing to a farm complex on the other.

Application of a Tram Train or Tram option could allow application of a basic signage based road interface solution, with give way indications for road vehicles. This would be dependent on current/anticipated usage of the adjacent fields, as there could be a risk of livestock accessing the rail alignment. Where fields are to be used for the purpose of grazing, etc. user worked gates would be a minimum requirement. Where gates are provided, it is anticipated that basic give way signage would be replaced with usage signage instructions, including details of penalties for not closing gates.

User Worked Crossings are standard on heavy rail infrastructure and it is not anticipated that such arrangements would differ greatly where a VLR vehicle option is applied on the route. There would need to be consideration of modifications to the VLR vehicle in terms of driver visibility, braking capability and impact protection. A worst case scenario would be a crossing with poor visibility in both directions, utilised regularly by long/slow vehicles. In a heavy rail context, this would normally be managed through the provision of telephones. Telecoms requirements add additional cost/complexity to projects, requiring alternatives to be considered.

One option is to provide a control centre/signal box number for users to call via a mobile phone. Given most of the crossing in question operate with nominated users, as opposed to general public, it would not be unreasonable to expect users to be equipped with mobile phones. Another covers use of remote GSM-R public call technology. This concept uses standalone solar/battery powered

GSM-R handsets installed at crossings, to provide contact with the signaller/controller in the event of poor mobile phone coverage. This technology is already in use successfully at several locations on the UK heavy rail network.

Figure 10 – Typical UWC installation on Wisbech Branch Route (Photo: Alex Dodds)

5 Optioneering

5.1 Minimum Intervention

Option Overview

Baseline optioneering for a light rail proposal assumes the Client base specification of up to 2 services each way per hour. To allow for expansion as allowance has been made for up to 3 services per hour. This assumes an approximate 20 minute journey time incorporating any additional intermediate stops. Requirements for infrastructure provision will ultimately be dependent on the attained journey time and service schedule, however as a minimum this would include a single/double platform station/tram stop on the edge of Wisbech town centre and an intermediate mid-point passing loop on an otherwise single track route.

The route would be largely self-contained, with a signalised interface at the southern end, where the freight only line to Whitemoor connects with the Peterborough-Ely through lines at March Station. Given this limited heavy rail interface, it is assumed that the service would be implemented as a Tram Train/hybrid light rail operation. With the heavy rail interface limited to a single interlocking transition, scope for utilising Very Light Rail vehicles may be possible, subject to application of route separation/lockout arrangements[4] provided in the Whitemoor Junction/March Station area. However, Tram Train rolling stock offers greater flexibility for service extension onwards from March on existing heavy rail.

Proposed Infrastructure

[4] Designation of the VLR vehicle as a tram train may avoid the need for this

The minimum intervention option reduces the cost of initial construction through limiting the infrastructure requirement. It is proposed that a station site located on the edge of Wisbech town centre be utilised for commencement of service. This option would require minimal land take and would run through a former industrial corridor up to a site south of the Nestlé Purina factory. The station would be located on the existing factory site staff car park. This would require relocation of these facilities elsewhere, however this would not be unfeasible due to the varying industrial land uses around the site (with some adjacent plots being semi-derelict at the time of writing).

It is recommended that the station site incorporates a single platform, limited light rail signalling infrastructure, a singe track and platform, with associated light rail based facilities. This initial option is outlined in Figure 11 below. As noted in the Option Overview, in the event a minimum intervention station option was not sufficient to meet anticipated demand, or proposed service schedule, scope exists for a second platform on the same site. It is recommended that provision be made for conversion of the single platform into an island, should future demand warrant (see Figure 11 below). This would require the initial build to be of a suitable width, possibly with platform copers pre-installed.

Provision of parking facilities is also recommended, due to the station's location within the wider urban area, and the potential for use of the town as a railhead for outlying rural areas in the vicinity. Options for a car park on the site are shown in Figure 11 and Figure 12. An alternative option to provide sufficient parking for rail users avoiding additional traffic through the town is to include a park and ride stop at the A47 crossing

One of the disadvantages of the Nestlé Purina site is the potential impact on pedestrian connectivity. In this instance the proposed site offers significant potential for enhanced pedestrian connectivity, with only minor intervention. There are five potential pedestrian corridors that could be constructed/enhanced to provide pedestrian connectivity in all geographic directions from the station. These are listed in clockwise order as follows:

- North footway skirting Nestlé Purina factory (main pedestrian connection to town centre)
- East connection to Victory Road and east side residential areas
- South connection to Weasenham Lane and industrial/commercial district
- South West pedestrian access via Oldfield Lane
- West connection to Cromwell Road through existing footway adjacent to Nestlé Purina factory

Figures 11 and 12 outline pedestrian access provision in brown, with potential light rail style pedestrian crossings denoted in yellow.

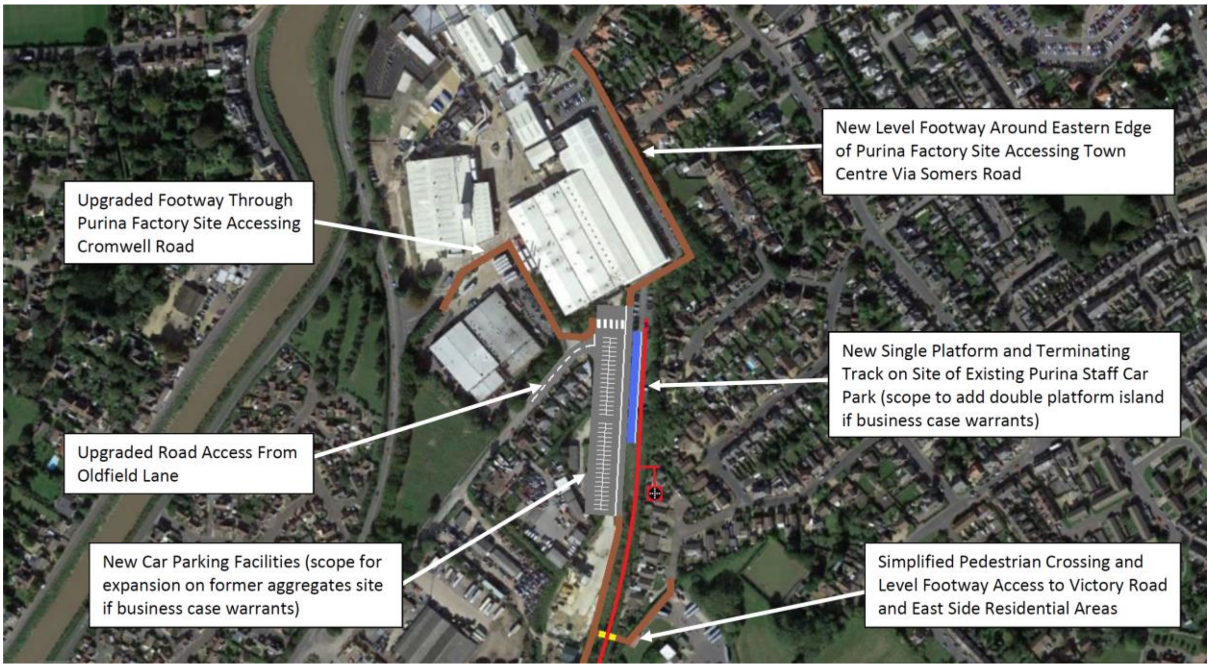


Figure 11 – Proposed Purina Factory Car Park Station Site

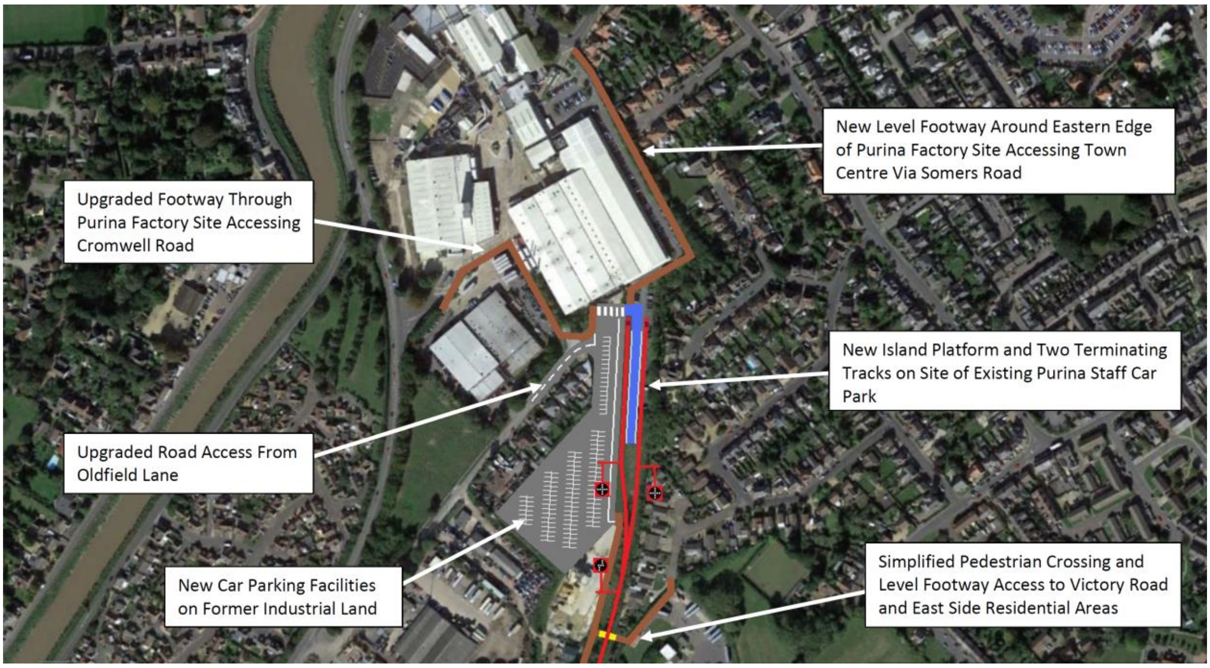


Figure 12 – Proposed Purina Factory Car Park Station Site

Regarding core route infrastructure a minimum light rail intervention for the route would incorporate a single track with a mid-point passing loop (outlined in Figure 13 below). This would allow for a minimum 20 minute peak service provision, assuming that trains would be scheduled to pass in the loop on an out and back basis. If additional contingency time, or extended layovers were required at Wisbech, a second platform would be required for operational flexibility and to accommodate potential service disruption. Signalling interventions include a simplified light rail based single line occupation system. This is similar to examples seen on tram networks throughout the country, with a specific example being the single track Meadowhall Interchange line on the Sheffield Supertram network (see Figure 14 below).

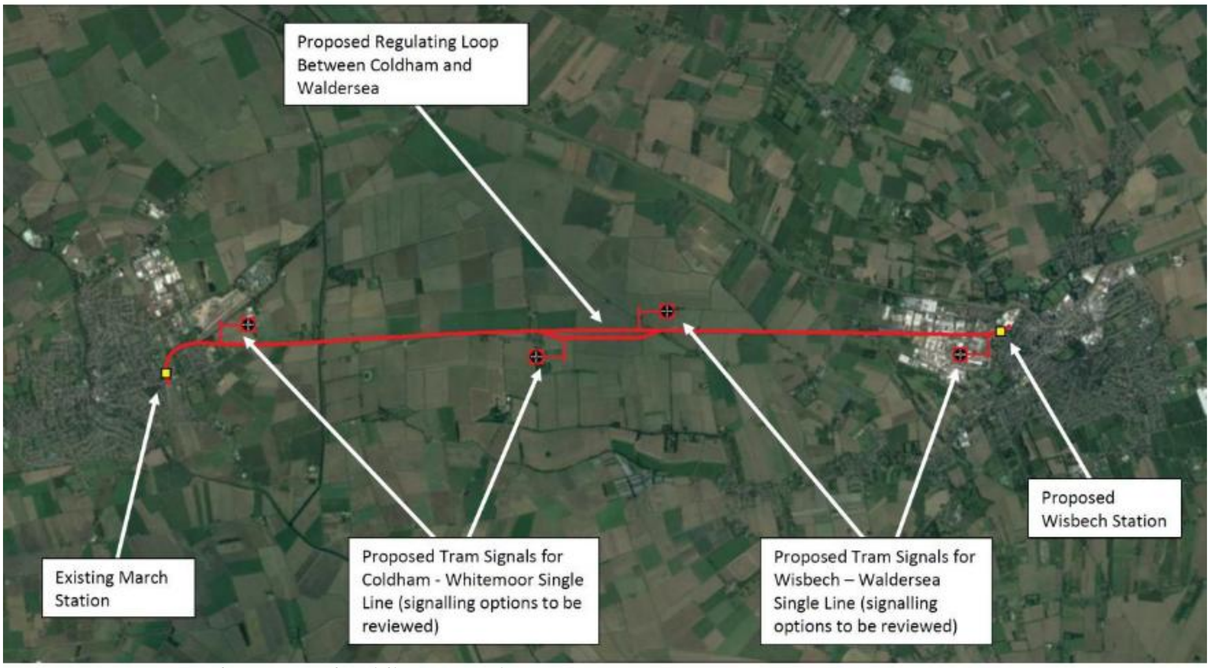


Figure 13 – Proposed Route and Coldham Regulating Loop Location

Figure 14 – Example Single Line Occupation Tramway Controls at Meadowhall Interchange, Sheffield (Source: Ian Ambrose)

Where light rail and heavy rail lines interface a signalling arrangement like that on the Tinsley Chord Tram Train connection in Sheffield is recommended. This incorporates a single main aspect signal on the approach to Whitemoor Junction. This would be designated as the transition point from light rail to heavy rail infrastructure. A corresponding train crew instruction sign would be provided in the opposing direction at the signal denoting 'Start of Line of Sight Infrastructure'. This would be the point that drivers switched to the light rail line of sight operation on the single track section. This arrangement is outlined in Figure 15.

It is recommended that an approach berth or annunciation be provided on the single line, to advise the Network Rail signaller of approaching light rail vehicles. Figure 17 outlines the simplified transition arrangements applied by the Sheffield Tram Train project. It is assumed that in this case, drivers would receive a cautionary aspect for movements towards light rail infrastructure, as is the case on Sheffield Tram Train. The ownership, operation and maintenance responsibility of the light rail infrastructure will need to be agreed. With formal boundaries established if the light rail section is not the responsibility of Network Rail.

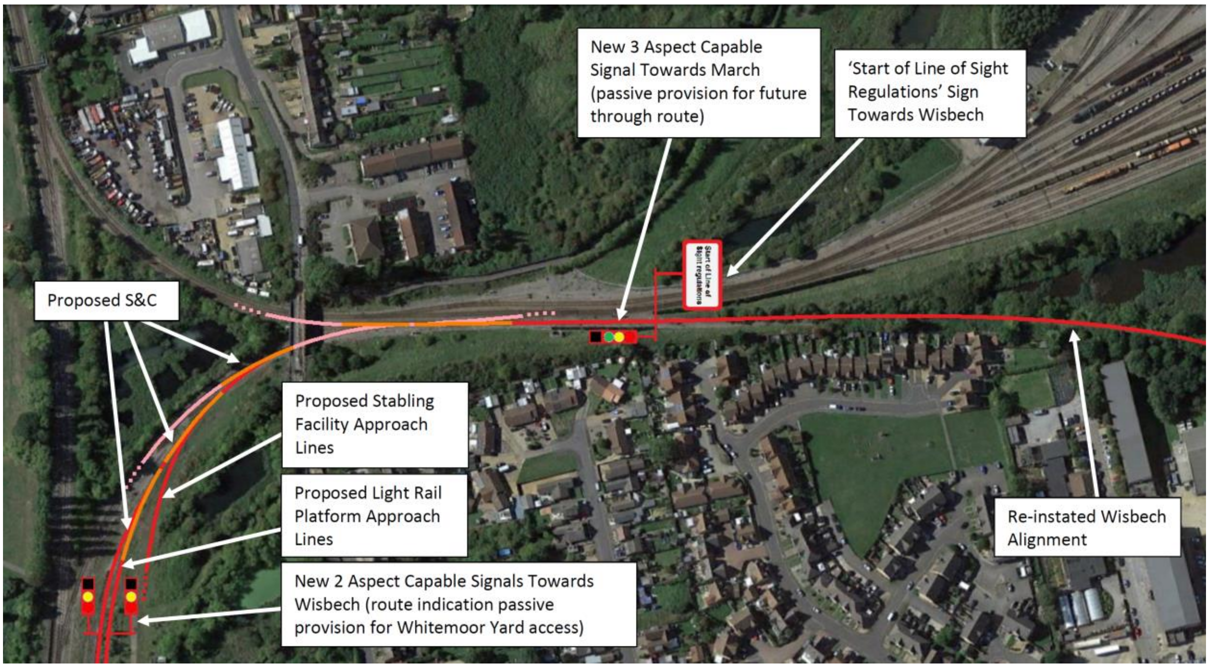


Figure 15 – Proposed March East Curve Connection

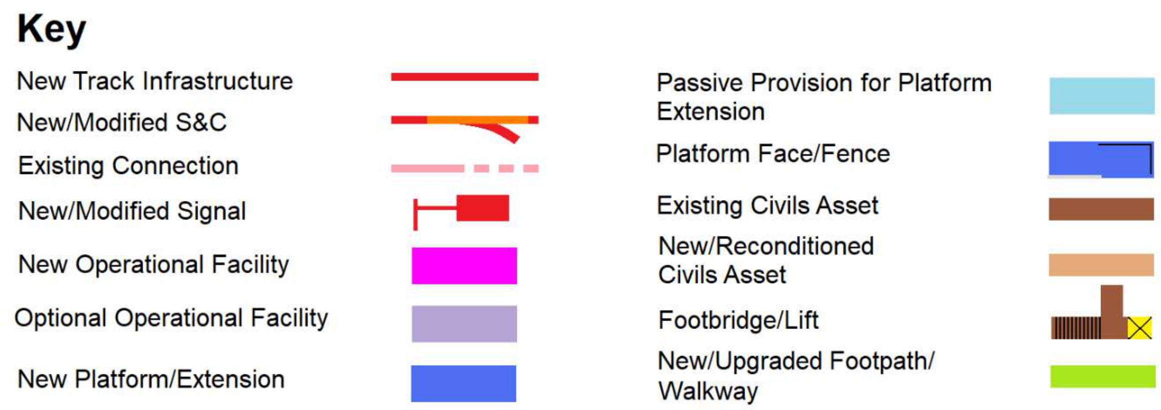


Figure 16 – Key to Aerial Image Overlay Diagrams (Figures 14, 18, 22, 24 and 25)

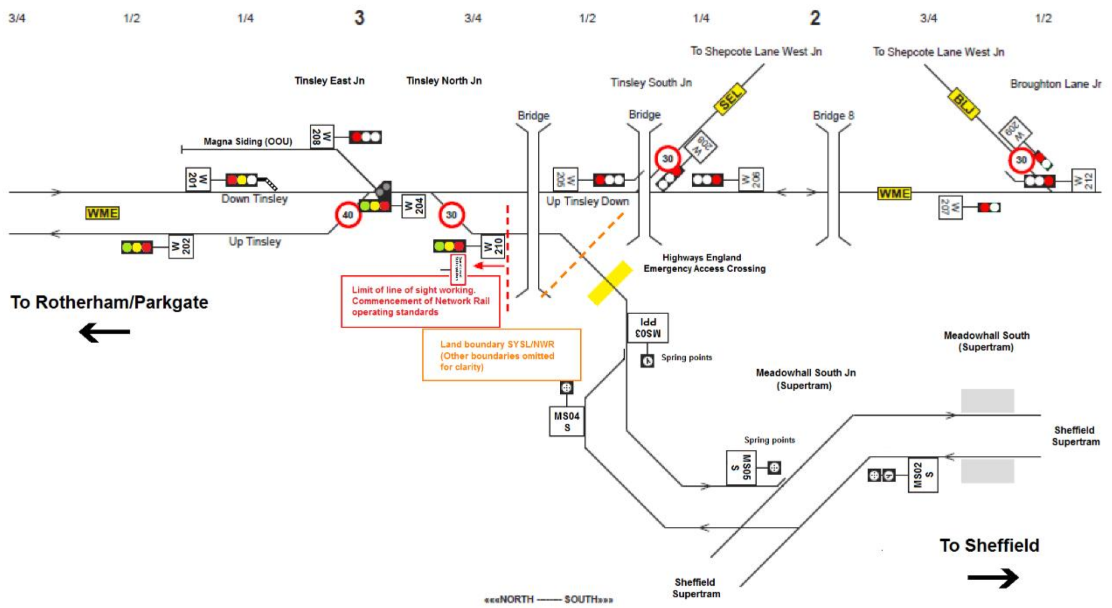


Figure 17 – Simplified Heavy Rail Interface Signalling at Tinsley Chord on Sheffield Tram Train Extension

Access to March Station is assumed to be via the existing West Curve connection to/from Whitemoor Yard. This would require limited shared running on heavy rail infrastructure, with the integrity of the interlocking providing suitable light rail vehicle separation. In addition to re-instating existing S&C towards the Wisbech alignment, a new turnout would be required from the curve towards a proposed platform and depot facility in the current disused area of March Station. Figure 18 shows the indicative layout for two platforms on the disused through alignment. Potential cost savings could be made through temporary frangible decking over the eastern end (shown in yellow), to permit passenger circulation and level access to the north side car park, without re-instating the currently disused portion of station footbridge.

Figure 18 makes provision for two platform lines; however one may be acceptable to reduce cost or align with the service specification. This would require as a minimum, full reconditioning of the current disused platform faces (dark blue) and associated remedial work to structures adjacent to circulation areas. A recent site visit noted severe deterioration in station canopies and supporting metalwork, which may require addressing separately as part of a wider package of station enhancements[5]. Passive provision is made for future platform extensions (light blue) if the business case warranted, or a single extended platform to hold up to two 35-40m vehicles. Signals shown are two aspect with route indication, however the latter may be dispensed with if only one route is to be made available towards the Wisbech branch.

The current land area north of the station site appears to be utilised by Network Rail/contractors for storage of materials and vehicle access. This may permit the optional construction of a two road stabling area for light rail vehicles, and optional maintenance shed (highlighted in pink in Figure 18). This would require re-allocation of maintenance/operational use into a smaller compound area east of the existing site. A standard Ground Position Light signal is assumed to be acceptable for such a facility in this instance

[5] Upgrade work to March station has been approved and is underway. Proposed access to the island platform needs to be confirmed

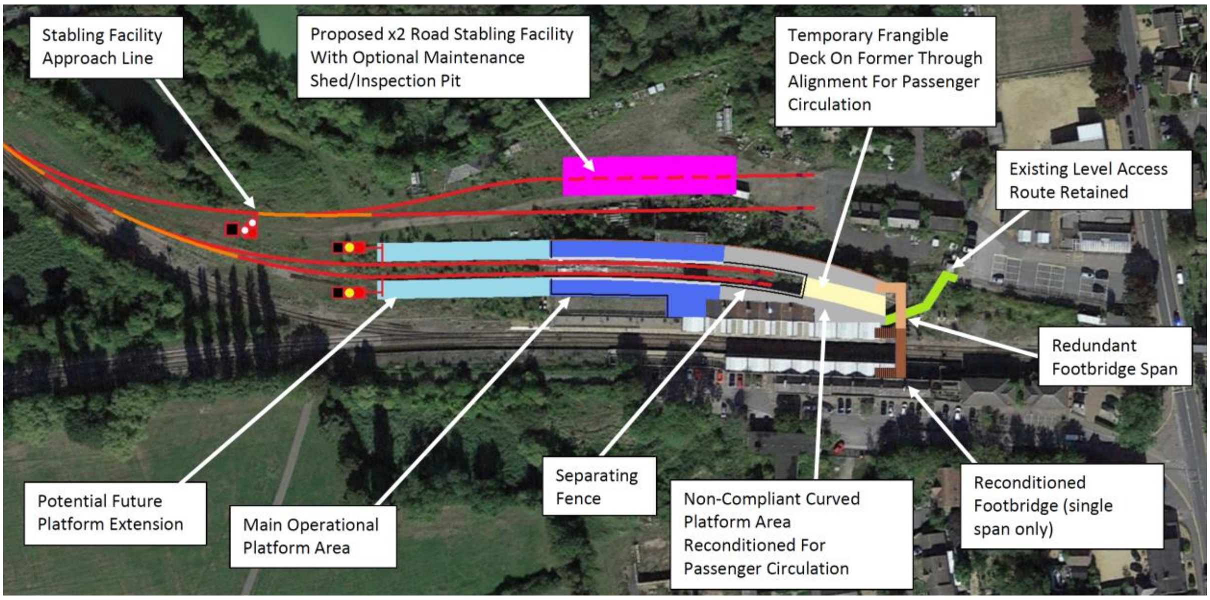


Figure 18 – Proposed March Station Terminating Platforms

Additional Requirements

Additional considerations for the proposed route include level crossings outlined separately in Section 4. Light Rail optioneering offers significant potential cost savings over heavy rail, due to the greater reliance on vehicle capability for managing road rail interfaces. Vehicles intended for tramway operation are normally fitted with track brakes, enhanced standard braking capability, improved driver visibility, and crash energy management. As such, level crossing equipment provision can be substantially reduced over equivalent heavy rail options. None of the existing level crossing equipment provided on the route would be satisfactory for a modern passenger operation, and it is proposed that each crossing be re-assessed for operation with a light rail hybrid service.

A minimum provision on tramway networks is un-signalled crossings. These simply incorporate advisory signage and assume standard road junction compliance. This may be acceptable for several of the user worked crossings on the route, however it is recommended that gates be retained for control of livestock from adjacent fields. Telephones are not normally provided on tramway crossings, however in this instance individual risk assessment may require some form of permission based crossing, in the event of frequent slow traffic/poor sighting/visibility. Technology exists to provide remote GSM-R solar powered communications to rural crossings, which may assist in improving safety without a disproportionate impact on cost. It should be noted that Signal Post Telephones are not proposed for light rail infrastructure, with all traffic based communications being managed by radio, preferably from a central control. Further detail on level crossing interventions can be found in Section 4.4.

Examples of light rail and simplified crossings are shown in Figure 19 (traffic light control interlocked with tram signal indicators) and Figure 20 (simplified light weight barriers).

Figure 19 – Standard Tramway Traffic Light Road Junction Crossing (Source: YouTube/MrCrompton 33012)

Figure 20 – Simplified Light Rail Barrier Crossing on Isle of Man Steam Railway (Source: YouTube/Perryd Pelle)

For a self-contained light rail service (March-Wisbech only) traction power is assumed to be battery. This would require as a minimum, charging points at both terminus stations, and provision of shore supply in any depot facility constructed. Two options are available for charging facilities including four foot mounted charging grids and overhead conductor bars. Currently no UK market Tram Train vehicles are equipped for four foot mounted charging grids, however the two vehicle types currently in production (Class 398 and Class 399) are both capable of overhead charging.

If a self-contained network is preferred other potential rolling stock could include Very Light Rail (VLR) vehicles. Examples such as the Revolution VLR can be provided with both battery and diesel powerpacks and are proposed to accommodate fast charging from lineside infrastructure.

5.2 Wisbech Town Centre Interchange

Option Overview

The application of light rail vehicles offers the opportunity for the service to run closer into Wisbech town centre. This would require street running to access a more central location and would potentially extend journey times beyond the assumed 20 minutes of a segregated edge of town station alignment. If the aspiration was to assume a minimum of 2, 3 or 4 tph (see section 4.1) this would require additional route capacity in the urban area to accommodate the extended journey time. Requirements for flexibility of operation, brought about by issues over service reliability/road traffic interface, may dictate a need for additional passing loops/double track infrastructure in the main route corridor.

As per the Minimum Intervention Option outlined in Section 5.1, the core route would be largely self-contained, with a signalised interface at the southern end, where the freight only line to Whitemoor connects with the Peterborough-Ely through lines at March Station. Given this limited heavy rail interface, it is assumed that the service would be implemented as a Tram Train operation, accounting for the extended street tramway interface at the Wisbech end of the route. This would also offer greater flexibility for service extension onwards from March on existing heavy rail if the business case warranted.

Proposed Infrastructure

The required infrastructure for a Wisbech town centre tramway connection would largely mirror that outlined in the Minimum Intervention Option in Section 5.1. The core route infrastructure and March Station options would be the same, excepting potential capacity based interventions associated with the operation of a street tramway service. The most notable difference is the addition of approximately 1.1 miles of unidirectional embedded rail double track street tramway between Weasenham Lane and Horse Fair Shopping centre (see Figure 21 below). This alignment has been identified as the most direct to the main shopping precinct however is only enabled by direct incorporation of the rail alignment into the existing two lane roadway.

Formal signalisation will be required at each major road junction dissected by the tramway alignment, with corresponding tram signal indicators specifically for light rail vehicle movements. There is scope for tram stops to be added along the line of route, in both high level and low level platform configuration. High level platforms offer greater flexibility for onward connection and are slightly more complex to implement in an urban environment. Space does exist in certain locations (such as land in front of the Nestlé Purina factory), where tracks could be gauntleted to provide a segregated high level platform stopping point for light rail vehicles in each direction.

One of the most significant interventions of this proposal would be the construction of a two platform terminus station at the Horse Fair Shopping Centre. This would break off from the street alignment, avoiding the Horse Fair Roundabout and terminating in the ground level of the existing Horse Fair multi-storey car park. Two platforms are assumed to be the minimum intervention in this instance due to the potential performance impact associated with street running discussed in the Option Overview.

A scissors crossover would be required to regulate traffic between the two platforms, and this would need to be clear of the active roadway, to avoid damage to the S&C. The only suitable alignment in this instance runs through part of the current Job Centre site, which would need to be partially re-developed to facilitate a segregated alignment. It is assumed that tram signals and points indicators would be installed as per standard installations for tramways in other mainland UK cities. Additional traffic management interventions, such as road traffic lights, junction stand backs and yellow box hatching would be required on the approach to Horse Fair Roundabout, to ensure adequate traffic management in an already congested part of the town.

The existing Horse Fair multi storey car park structure may not incorporate suitable vertical clearance for Tram Train style vehicles. Thus, potential partial or full reconstruction of the upper parking deck to accommodate Tram Train vehicles below may be required. Construction of buildings and car par structures above active tramways is not uncommon, and scope may exist for incorporating 'air rights' development above the station site and above the partially demolished Job Centre site.

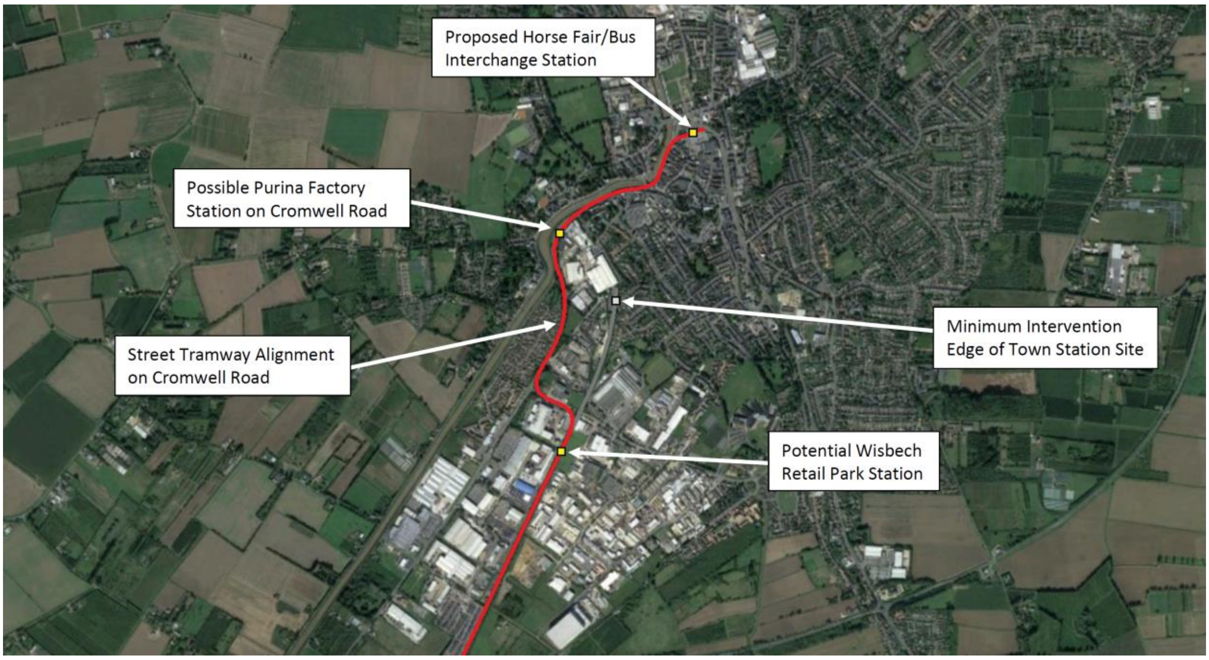


Figure 21 – Proposed Wisbech Street Tramway Route Alignment to Horse Fair Interchange

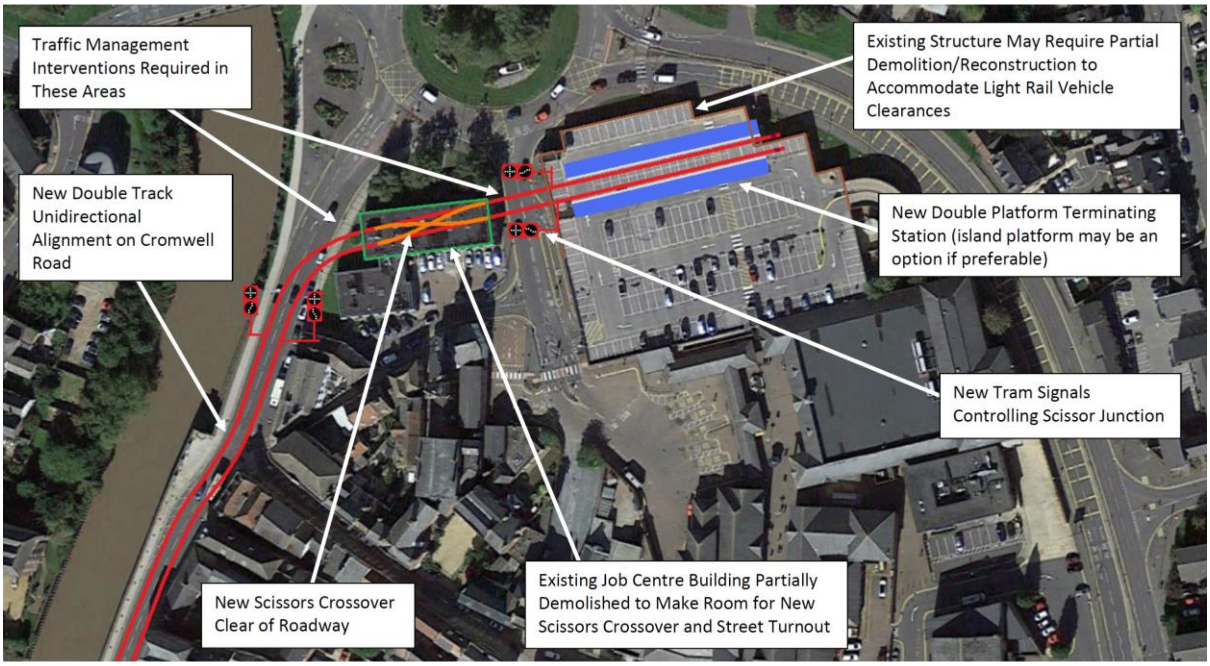


Figure 22 – Proposed Horse Fair Interchange Town Centre Station

As noted earlier in this section additional track infrastructure along the core line of route may be required, to provide enhanced service resilience for interface with a street tramway. It is assumed this would take the form of at least two regulating loops in each direction, between Chain

Bridge/Coldham South and Waldersea/Redmoor (see Figure 23 below). This would provide capacity to pass services at one third intervals along the route, and could be utilised both for contingency pathing, and future enhanced service if the demand warranted.

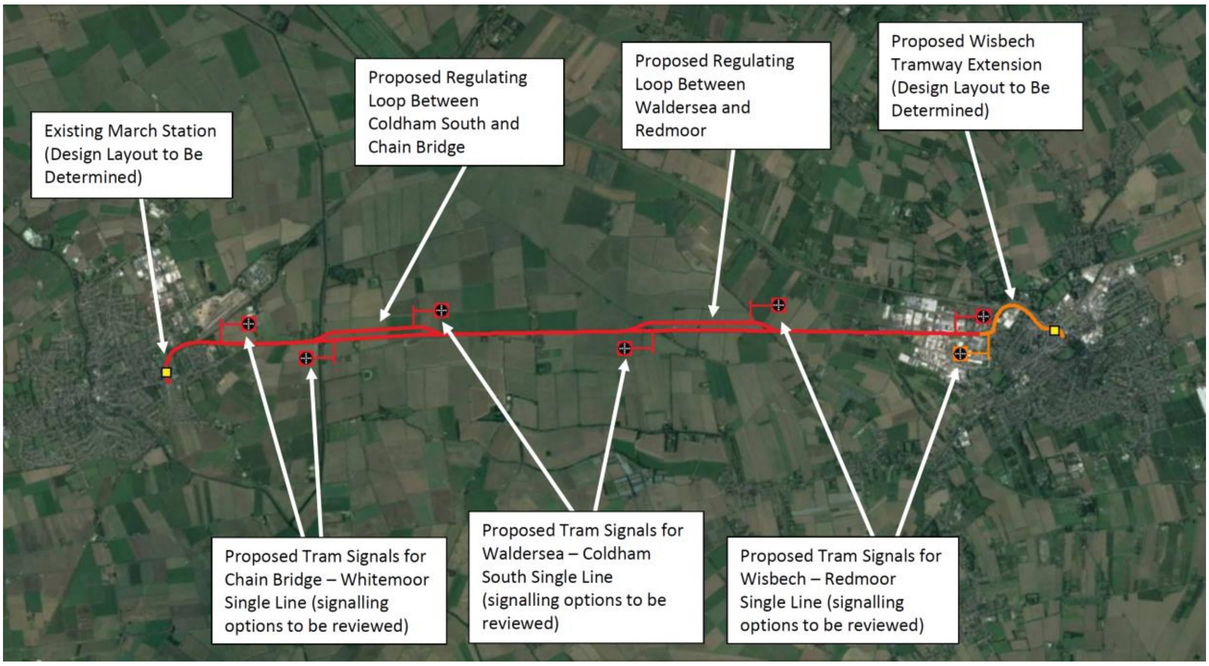


Figure 23 – Proposed Route and Chain Bridge/Waldersea Double Regulating Loop Location

Additional Requirements

Additional considerations remain largely the same for this proposal, as per the Minimum Intervention Option covered in Section 5.1. One of the key differences is anticipated to be the use of embedded rail on the street running sections of route. This would need to be taken into consideration from a procurement and installation perspective, as well as for long term maintenance of the asset. Such a small amount of a very specific infrastructure may add cost/complexity to the project, however larger combined procurement initiatives may be possible through industry organisations such as UKTram. The ownership, operation and maintenance of the on-street sections would need to be established.

Another key difference from the Minimum Intervention Option concerns rolling stock. Integration of a street tramway into the system operation requires the use of a tram or Tram Train type vehicle. For a self-contained network, some form of modified 'off the shelf' tram design may be adequate for the limited interlocking segregation proposed at the Whitemoor Junction. An example being the M5000 tram design used in Manchester. Where onward heavy rail connectivity is being considered in the long term the available option is a Tram Train

6 Future Considerations

6.1 Increase in Service Provision

Heavy Rail Connectivity Beyond March

While the client's baseline requirement is for a dedicated shuttle service between March and Wisbech there is the opportunity, and longer term aspiration, to extend the service beyond March to Peterborough, Ely and/or Cambridge. This section discusses the potential requirements at March to enable such a service extension.

As noted in Section 5 Optioneering, such service extension places a limitation on the type of rail vehicle that can be used in all feasible scenarios, namely Tram Train. Loading gauge restrictions and a lack of electrification limits any chosen vehicle to a battery hybrid option. Due to the presence of electrification on the fringes of the route (Ely-Cambridge, and Peterborough), it is recommended that consideration be given to a 25kV charging capability from overhead catenary. This does not rule out alternative ground based charging provision previously discussed, with charging grids installed in the four foot at the respective terminals. Alternative options exist for onward heavy rail operation beyond March; however these are limited to the semi segregated mode of operation outlined in the Minimum Intervention Option in Section 5.1.

March Station

An extended service enables opportunities for stabling and maintenance of Tram Train/light rail vehicles at existing depot facilities. This would avoid the stabling/maintenance facilities shown in Figure 25. Figure 25 highlights the key changes required to permit light rail vehicle access to the main running lines east of the station. It is assumed that the existing east end freight connection would remain in situ, with the platform lines being designated for Tram Train use only. This would require reconfiguration of the existing level access arrangements for the north side Platform 2.

As a minimum, this proposal recommends significant rehabilitation of the existing footbridge structure (shown in dark brown), which is not PRM compliant and in poor condition. To obtain full PRM compliance lifts would be required. This proposal recommends the construction of a new central footbridge on the site of the existing long stay car park, and former terminating bays in the central island (shown in light brown with lifts in yellow). This would provide a significant enhancement in overall station accessibility, in addition to PRM compliance, and may permit removal of the existing footbridge structure if the asset condition is poor enough to warrant[6].

More complex signalling arrangements would also be required for the new routes created, with a new single lead spur from the existing main lines connecting to up to two platform lines. In order to accommodate the new S&C on approach to the level crossing, the existing crossover S&C may require partial re-alignment to permit parallel movements. It is assumed that the platform spur would be served by an additional crossover east of the level crossing, within the limits of the existing goods loops. A minimum of two new two aspect signals would be required as starters for the proposed additional platforms, with consideration given to application of standard heavy rail overlaps. It should be noted that this would require changes to the main line interlocking along with additional indications/approach controls on signals controlling westbound movements towards the station.

The layout shown in Figure 24 covers future service provision eastbound towards Ely and Cambridge. It is recommended that consideration be given to service provision towards Peterborough. The site constraints of the existing station, and its defined location make the

[6] This may be partially resolved in the current station refurbishment programme. The plans for the footbridge need to be confirmed

question of westbound connectivity somewhat of a challenge. Figure 25 below outlines two potential proposals for a Peterborough service, with both requiring additional infrastructure intervention and potential operational compromise.

The first and most technically complex option would be for an additional spur line connecting one or more of the proposed re-instated through platforms at the western end of the station. This would require a platform reversal in March Station for services proceeding towards Peterborough. This would potentially add additional time to schedules and tie up a platform for the duration of the change procedure. The west chord would connect at the existing March West Junction, in order to utilise the existing crossover for the single lead freight curve and shorten the junction lead times on the main line. This would require enhancement to the basic proposed signalling provision, with one or more west facing signals requiring full aspect sequence and route provision.

It should be noted that while a second platform connection may be desirable in flexibility/ performance terms, this has the potential to add technical complexity/maintenance issues to the intervention. This is due to the requirement for up to two non-standard cast crossing diamonds on an existing track curve.

The second option covered in Figure 25 covers installation of a separate platform on the existing West Curve freight alignment to Whitemoor Yard (shown in blue). This would potentially free up capacity in the main station area for Cambridge services and terminating shuttles from Wisbech, while also permitting through journeys not requiring a reversal. This option would permit fewer signalling infrastructure interventions to enable a Peterborough service, with only minor alterations to the existing freight line required to install TPWS/AWS/overlaps to passenger standards. A walkway could be constructed across apparently unused land to reach the main station site, with PRM compliant access to the main station assumed to be via the proposed new footbridge structure in the centre of the site. An optional connection could also be included to Norwood Road to improve station accessibility if the business case warranted.

It should be noted that for the West Curve platform connection, standards limitations on station design may require some form of deviation or may limit application entirely. One of the key issues concerns platform stepping distances. These would be non-standard for any platform structure installed on a curve of that specific radius. It is however anticipated that any light rail vehicle used for the service would incorporate some form of retractable step system to mitigate this issue. This would render the platform unfit for use by standard heavy rail vehicles. Another standards issue to consider would be the issue of wayfinding within the station site. The West Curve is located some distance away from the main station complex, and even with a PRM compliant walking route, the location may be difficult to find for customers not used to the arrangements. Signage and wayfinding innovations can mitigate against such issues, however the distance between the two sites may be a challenge for persons with reduced mobility in general.

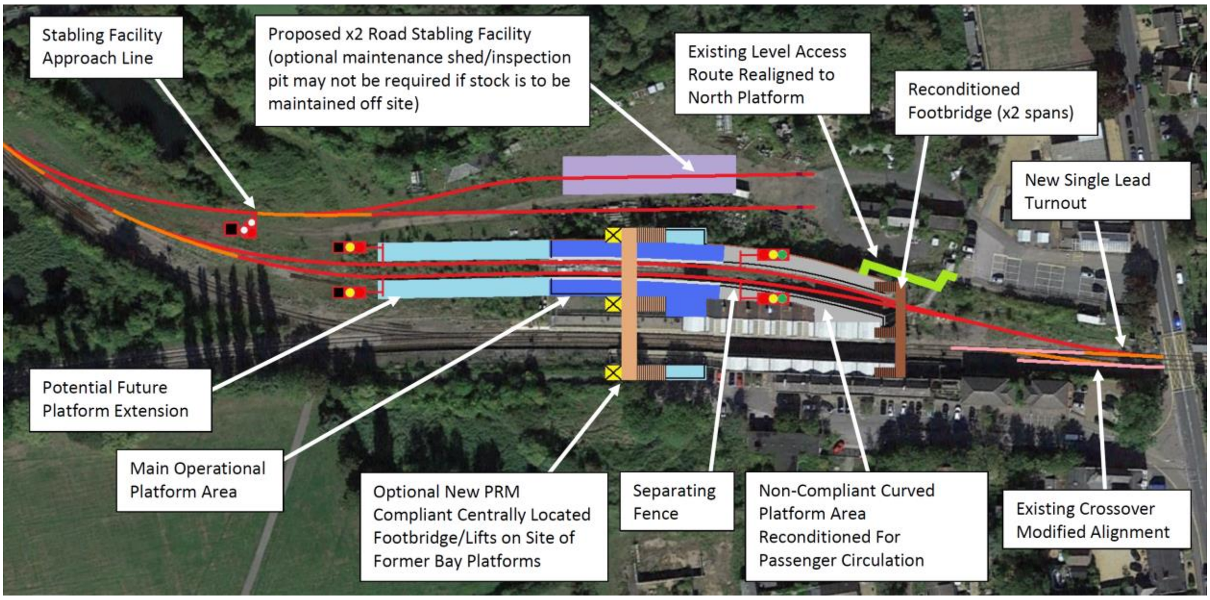


Figure 24 – Proposed March Station Additional Through Platforms

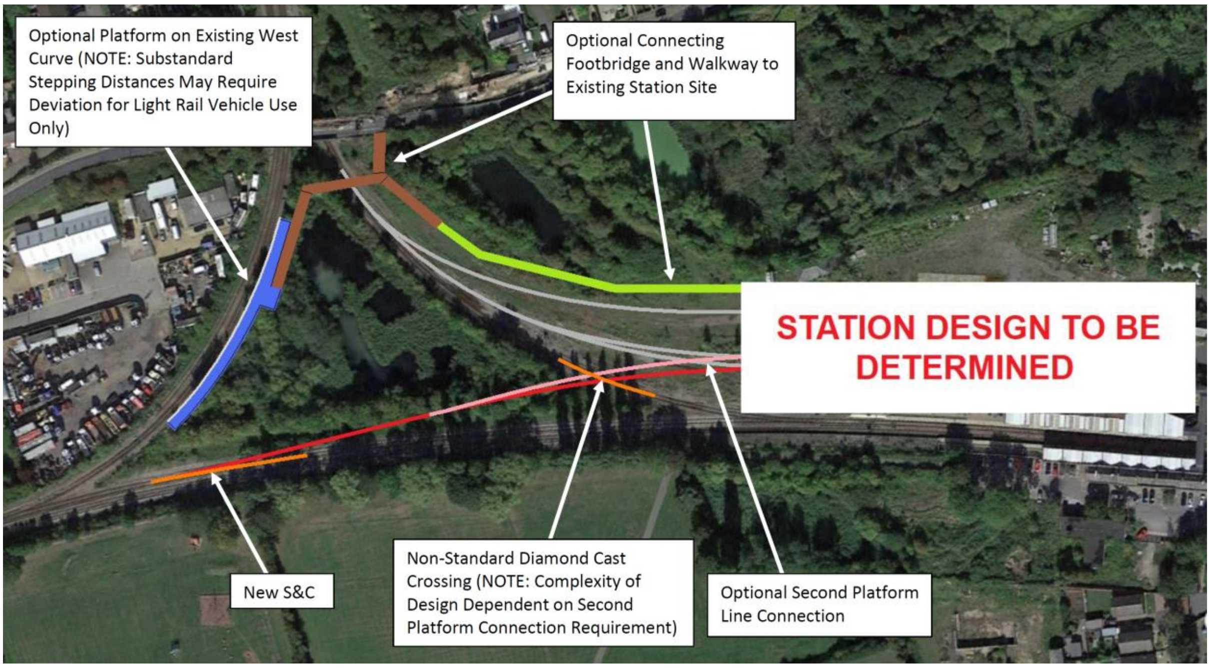


Figure 25 – Proposed March Station West End Access

Additional Considerations

A key consideration is the potential impact of the future West side Garden Town development proposed in Wisbech. The impact is currently difficult to quantify as detailed proposals are not advanced, however it is evident that passive provision for a western connection would be prudent. Figure 26 below outlines several potential high level route options, placed in the context of the detailed versions outlined in Section 5 Optioneering. From the West side Garden Town development perspective, this includes three potential routings for either a 'Y' shaped connection, separate terminating spur, or combination of the two to form some sort of 'loop' arrangement. This introduces the question of additional station stop provision on these routes and whether the business case for these would be enhanced by some additional requirement for route interchange.

It should be noted that Options 2A, 2B and 3A in Figure 26 all cover some form of tramway based street running as part of the high level proposal, limiting them to tram/Tram Train based vehicle applications. Option 1 (Core) and Option 3B do offer potential for other VLR/light rail vehicle types. This is covered with the caveat of a limitation on existing urban area penetration and does not rule out safeguarding of a segregated route through the proposed garden town district.

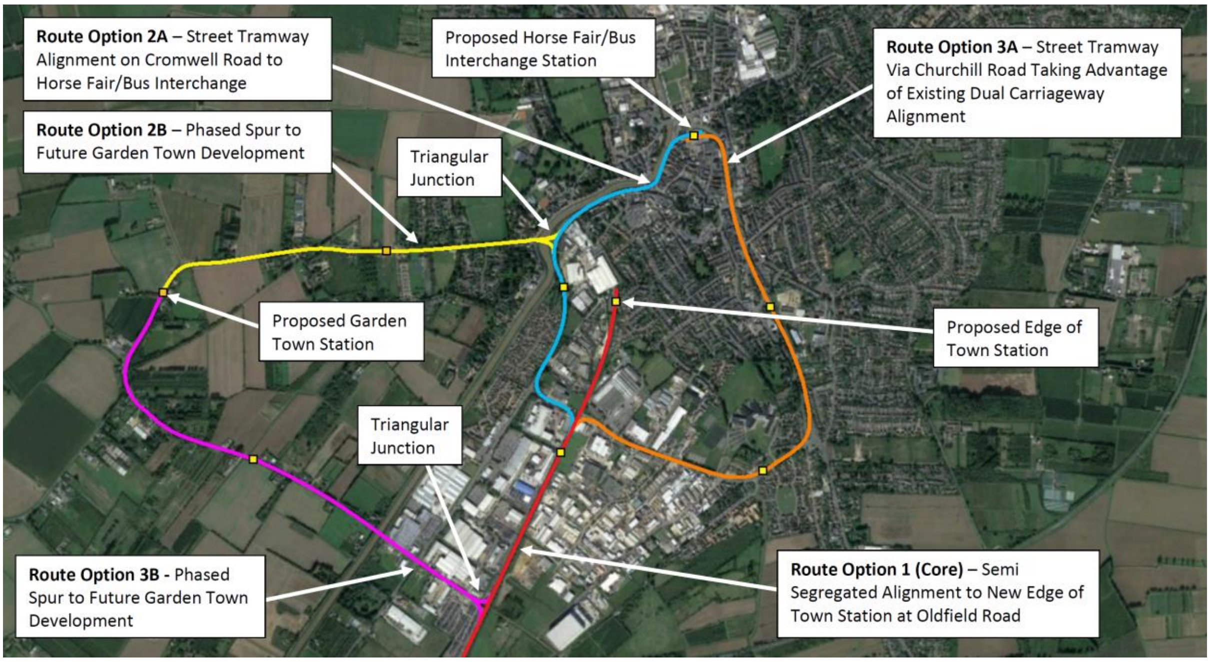


Figure 26 – Summary of Potential Wisbech Area Route Options

6.2 Heavy Rail Option

This section provides a summary of the requirements for a heavy rail solution. Its intent is to highlight the key areas of difference with the light rail options discussed elsewhere.

Operational standards and practices differ considerably between light and heavy rail systems, and this is particularly pertinent for train control and level crossings. The cheapest heavy rail option would be one that limits signalling intervention, which could be achieved through a system of One Train Working. One Train Working systems by nature are not suited to frequent passenger operations and could limit service options to hourly at best (assuming a 20 minute end to end journey time between March and Wisbech).

Adding additional capacity to a heavy rail single line would require formal signal interlocking protection where intermediate loops are provided. This could include some form of token working, or a fully track circuited single line section. Regardless, this would require provision of full heavy rail lineside signalling and supporting infrastructure such as TPWS and AWS. This in turn requires a robust signalling power supply to support system operation, along with a complex and extensive lineside cabling arrangement. There is also no guarantee that additional infrastructure would offer significant gains in capacity, due to the more stringent standards for train speeds and braking distances applied to heavy rail signalling design.

A crucial consideration when evaluating heavy rail options for route re-openings/re-instatements is the issue of level crossings. Current practice within the heavy rail sector is to seek closure/replacement of road/rail crossing interfaces where possible. Where crossings are retained as part of reopening projects, ORR best practice recommends application of full barrier crossings on main roads and/or urban/residential neighbourhoods. An example of such an arrangement is shown in Figure 25 below. There are seven active warning crossing sites on the Wisbech branch. Most are of the TMO/AOCL variety which are either considered non-preferred by modern day regulatory standards, or unsuitable for passenger service operation. There may be scope to retain the two semi-intact AHB crossings on the route, subject to suitable risk assessment. Standard practice however is currently to install MCB-OD full barrier crossings, in lieu of older automatic types. These are some of the most expensive and technically complex crossings in the national portfolio, second only to crossings equipped with remote CCTV control.

Figure 27 – Typical Full Barrier Heavy Rail Level Crossing (Source: NR Media Centre)

Additional factors to consider cover station design and construction, largely driven by heavy rail accessibility compliance. Light rail station stops are generally cheaper to build and are subject to differing design standards and guidance. Within the station fabric, integrated CIS systems, help points, station phones and TRTS. There are also end of route infrastructure requirements to consider such as heavy rail compliant buffer stops, compliant overruns, train crew walking routes and lighting. Finally, train control is an important long term requirement of any project, and where this takes place from will have a significant impact on cost, complexity and level of impact/disruption to existing infrastructure. In the case of the Wisbech Line, March East Junction Signal Box would be a reasonable assumption for initial line control. This location is however planned for future re-control into a ROC facility, and as such any signalling changes applied would need to be incorporated as part of future re-signalling schemes.

6.3 The Role of Technology

Improvements in battery technology within the last decade have enabled electric rail vehicles with practical ranges available to the mass market. Within the rail industry, VivaRail has a simple battery vehicle with a stated range of approximately 40 miles between charges. Further developments are currently in progress and an enhanced battery system with a 60 mile range is anticipated at the time of writing. Additionally, most tram manufacturers offer battery hybrid options which currently charge from the OLE, and alternatives are under consideration.

Other manufacturers are developing rail based battery systems, with Stadler leading innovation on inductive charging systems for the new MerseyRail fleet of vehicles. In parallel, infrastructure companies have been developing methods of safely delivering charging current to rail vehicles, and Furrer & Frey is known to be developing at least two of these. One is an overhead retractable charging system, currently being trialled for use on the Coventry VLR scheme, with the other being a four foot track mounted unit, currently being developed for use with the Revolution VLR vehicle.

One of the most important developments in the field of battery technology, after range, is the charging time capability. New 'fast charging' systems are currently being trialled or are under development in this field, with VivaRail currently offering an option for its battery vehicles capable of fully charging a unit in 10 minutes. Charging time is critical when considering service provision/options, as this greatly affects turnaround times and service recovery, in the event of disruption.

As the development of battery charging technology is moving apace with differing methods being trialled it will be important to understand the optimum solution as the vehicle and infrastructure specification is developed.

An important technological development within the rail industry relates to the future capability for interoperation of different types of rail vehicles. The current Level 2 crashworthiness standards for light rail vehicles have allowed operators like Tyne & Wear Metro/Stagecoach Supertram to run light rail services on shared infrastructure with heavy rail services. Both examples run with enhanced legacy signalling control provisions and associated safety systems ensuring traffic separation. Future developments in the field of Digital Railway technology are anticipated to bring additional flexibility to the control of legacy routes. One aspect of this covers application of ETCS operation to manage light/heavy rail vehicle separation. In effect, traffic separation on cab signalled vehicles could be 'programmed' based on vehicle type, with a 'virtual buffer' being placed around lower category light rail vehicles operating in the area. It is unclear at this stage how such technology would affect VLR vehicle operation on Network Rail main lines, however it may offer a practical/cost effective solution for limited heavy rail interfaces for future projects.

Another area of consideration is the current decarbonisation drive being promoted by the government. Rail has a potential role to play in transfer of freight. Early concepts have already been proposed for Freight VLR/Freight Tram Train vehicles, and consideration is already being given to practical routes these could be operated on. Light rail vehicles offer greater scope for urban penetration at an acceptable cost over heavy rail alternatives. Issues arise when interfacing with heavy rail main lines, and this highlights the need for effective transload capability and cargo transfer solutions. The Revolution VLR is being considered in a freight variant (see Figure 28 below).

Figure 28 – Proposed Freight VLR (Source: Transport Design International)

Further study will be needed to understand the feasibility of operating a VLR freight service on the Wisbech line, including any transhipment requirements at either end of the route.

7 Conclusion

This study has considered the suitability of light rail technology for the provision of passenger rail service between March and Wisbech. The study concludes that a light rail operation is feasible with several options of vehicle type available.

The potential vehicle options have been identified as:

- Very Light Rail
- Tram
- Tram Train
- Heavy Rail

Each vehicle option is dependent on the required service specification and influenced by the following key elements:

- Urban penetration within Wisbech town/Garden City development
- Location of Wisbech railhead
- Complexity of train control/signalling infrastructure
- Complexity of level crossing infrastructure/engineering intervention
- Provision of loops/regulating facilities within the corridor
- Station design/compatibility with existing infrastructure at March
- Cost/constructability considerations
- Onward connectivity to adjacent urban centres, e.g. Cambridge, Peterborough, etc.

Figure 29 is a summary of a comparative qualitative assessment of each vehicle option against the key elements. The RAG status provides an indication of the comparative complexity/degree of difficulty/whole system cost of each option. Note that VLR technology is at an earlier stage of development compared to the other modes. Further research is required to enable a greater level of assurance on the benefits of VLR compared to the other vehicle options.

	Tram	**Tram Train**	**Very Light Rail**	**Conventional Train**
Ability to access Wisbech town centre				
Compatibility with a future Garden Town extension				
Ability to service an edge of town Wisbech Station				
Comparative complexity of signalling control required				
Comparative complexity of level crossing interventions				
Complexity of station design/integration				
Ability to operate on the main line				
Comparative indicative capital cost				
Comparative indicative operating cost				

Figure 29: Indicative comparative analysis of possible rail vehicle types for deployment on the Wisbech to March line.

The comparative analysis indicates Tram Train as having the best potential for a light rail operation on the route. This is supported by the following key conclusions:

- The base service specification has a limited interface with heavy rail operations. This combined with the potential for a street tramway operation into Wisbech centre and the future possibility of for service extension onwards from March suggests a Tram Train would be an optimum solution.
- The number of level crossings on the route may make a full or hybrid light rail operation cheaper than a comparable heavy rail solution. Many of the current level crossing locations are considered substandard for a modern regular interval heavy rail passenger operation.
- Light rail vehicles operating on tramways are designed for highway interfaces (including track brakes and enhanced forward visibility). For these vehicles level crossing design can be optimised and the level of infrastructure required substantially reduced over equivalent heavy rail options.

The two development options outlined in Section 5 cover potential implementation of each light rail option identified, excluding heavy rail as outside the scope of this document. The Minimum Intervention option proposed in Section 5.1 is compatible with all light rail vehicle types assessed. This is due to its segregated nature and limited requirements for interoperation with heavy rail services. This would require novel operational process development and offers the most cost effective solution for enabling an initial service between March and Wisbech.

The use of any one vehicle type at commissioning should not preclude the future use of another. For example, initial deployment of a VLR vehicle would not preclude later application of a Tram Train. This assumes that a single floor height is selected for any vehicles used on the route. The Minimum Intervention option does not offer full urban penetration or connectivity with the existing bus interchange. This requires consideration of walkability of the station site from the town centre and how this and the applicable pedestrian routes are managed. This does avoid potential traffic congestion on the main north-south corridor into the town centre. It does not preclude phased development of additional light rail connections, as future travel needs are identified.

The Wisbech Town Centre Interchange option, proposed in Section 5.2 offers full urban penetration to the existing bus interchange. This is intended to take full advantage of light rail operational capability, and primarily focusses on application of a Tram or Tram Train vehicle solution. Further assessment is required of the capability of VLR technology to understand the potential of this mode to operate into the centre of Wisbech. The Tram Train option is a proven technology with the capability to operate on the main line, segregated light rail and on-street tramway routes. While this option may be more costly in initial outlay it offers greater flexibility for future system expansion.

8 Next Steps

This report has identified several actions that are recommended to be adopted as next steps in future development. These are summarised below:

Recommended Next Step 1

The legal status of all the former level crossings on the March to Wisbech line should be confirmed. Confirmation is required if the legal status needs to change if the route is to be used by light rail vehicles.

Establishing the existing rights and liabilities at each crossing will help inform the appropriate solution for each vehicle option.

Recommended Next Step 2

Options for the ownership, operations and maintenance responsibility for the route need to be identified and resolved prior to further development. This includes any on street system into Wisbech town centre or the extension to serve the Garden Town.

While Network Rail retains the freehold of the former railway alignment and associated land there are various options for the long term reinstatement of the route and service. Any extensions beyond the existing Network Rail land boundary create options for the delivery, operation and ownership of any assets.

Recommended Next Step 3

A detailed asset condition survey is required of the entire route. This will assist to confirm the level of remedial work required to reinstate any form of rail infrastructure. This survey to include March Station and the required alterations to create a fully accessible route to the Wisbech platforms.

The former railway infrastructure has not been fully maintained since the line was mothballed. A full asset condition survey will enable greater clarity on the scale and costs of any reinstatement of railway infrastructure.

Recommended Next Step 4

Continued analysis of the light rail rolling stock market and the opportunity for further development in areas such as stored energy and very light rail.

There are continuing technological developments in light rail that may provide further opportunities for the Wisbech to March route. The very light rail market is still emergent and the fully capability (and limitations) of this mode are not yet fully understood.

Recommended Next Step 5

Consider the requirements of providing a double track route between Wisbech and March.

The ability to provide a full double track route will confirm the maximum capacity of the route and determine the degree to which any future-proofing works are required should the initial phase of reopening be less than double track.

9 Appendices

Appendix A: Glossary

Acronym	Meaning
0m 00ch	Miles and Chains
ABCL	Automatic Open Crossing Locally Monitored
AC	Alternating Current
AOCL	Automatic Barrier Crossing Locally Monitored
AHBC	Automatic Half Barrier Crossing
AWS	Advanced Warning System
CIS	Customer Information System
DC	Direct Current
DfT	Department for Transport
DMU	Diesel Multiple Unit
DNO	Distribution Network Operator
EMU	Electric Multiple Unit
ETCS	European Train Control System
GRIP	Governance of Rail Investment Projects
GSM-R	Global Standard for Mobile communications - Railway
FOC	Freight Operating Company
FPC	Footpath Crossing
FTN	Fixed Telecoms Network
LRSSB	Light Rail Safety and Standards Board
MCB	Manually Controlled Barrier crossing
MCB-CCTV	Manually Controlled Barrier crossing – Closed Circuit Television
MCB-OD	Manually Controlled Barrier crossing – Obstacle Detector

OLE	Overhead Line Equipment
ORR	Office of Rail and Road
OTW	One Train Working
PRM	Persons with Reduced Mobility
ROC	Railway Operating Centre
ROGS	Railway and Other Guided transport Systems (Safety) Regulations
RSSB	Rail Safety and Standards Board
SEU	Signalling Equivalent Unit
S&C	Switches & Crossings
TfW	Transport for Wales
TMO	Traincrew Manually Operated (crossing)
TOC	Train Operating Company
tph	Trains per hour
TPWS	Train Protection Warning System
TRTS	Train Ready To Start
TSI	Technical Specifications for Interoperability
ULR	Ultra Light Rail
UWC	User Worked Crossing
VfM	Value for Money
VLR	Very Light Rail
WMG	Warwick Manufacturing Group

Appendix B: Route Level Crossing Assessment

B1 Level Crossings

This appendix provides a review of each of the main level crossings on the Wisbech line. The review is based on historic data and from a site visit conducted in June 2021. The site visit was a visual only survey of the current condition. The intent of this appendix is to provide an overview of the differing crossing types it is not a formal engineering assessment of current condition or future potential.

B1.1 Significant Road Crossing Interfaces

Elm Road Automatic Half Barrier (AHB) Crossing (WIG 86m 60ch)

This installation is located on the B1101 secondary road that runs between the Norwoodside district of March up to the Wisbech ring road. It should be noted that in this location the road name is Elm Road, however this changes multiple times on the alignment north of Friday Bridge.

An initial site assessment taken from historical imagery captured in 2018 identifies an elderly 'all in one' AHB installation, possibly from the 1970s, in poor condition. Original wooden laminate barrier arms are missing along with the entire Down side entry 'penguin' unit. The remaining incandescent light installations are in reasonable original condition. The "bomac" surface appears to have been recently removed and replaced with a patched tarmac fill. The rails remain in situ either side of the crossing with some light vegetation encroachment. Examination of imagery notes a former lineside speed sign on the Wisbech side of the crossing, denoting a former line speed of 25mph at this location.

The B1101 in this location appears in average surface condition with full road markings and standard lane width. The road has straight approaches on both sides of the crossing with street lighting either side. The road speed is 60mph at the crossing location and is bordered by a 30mph zone on the south side. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement. This would be subject to bridging/closure/diversion being discounted as practical options.

Figure AB1 – Elm Road Site Overview


Figure AB2 – Looking South Along B1101/Elm Road Towards March

Chain Bridge Automatic Half Barrier (AHB) Crossing (WIG 87m 31ch)

This installation is located on the B1101 secondary road that runs between the Norwoodside district of March up to the Wisbech ring road. This is north east of the Elm Road AHB crossing and intersects with an unclassified road at this location.

An initial site assessment identifies another elderly ‘all in one’ AHB installation, similar to the example at Elm Road, albeit in slightly better condition. Original wooden laminate barrier arms are partially/fully intact along with both integrated ‘penguin’ units. The incandescent light installations remain intact in reasonable original condition. The “bomac” surface also remains in situ, in remarkably good condition considering the time elapsed since abandonment. The rails remain in situ either side of the crossing with some light vegetation encroachment. This location presents a unique constraint being situated immediately next to the Twenty Foot River waterway. This restricts crossing equipment on the March side into a narrow strip between the road and riverbank, with the adjacent rail bridge running directly off the B1121 road.

The B1121 in this location appears in good surface condition with full road markings and standard lane width. The road has straight approaches on both sides of the crossing transitioning to a sharp diverging bend on the south side approximately 200m from the crossing. The road speed is 60mph at the crossing location, and lower advisory speeds may apply for the diverging bend on the south side. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement. This would be subject to bridging/closure/diversion being discounted as practical options.

Figure AB3 – Chain Bridge Site Overview

Figure AB4 – Looking South East Along B1101 Towards Wisbech

Coldham Traincrew Manually Operated (TMO) Crossing (WIG 89m 21ch)

This installation is located on the unclassified Station Road that connects with the B1101 at Coldham village. This is situated approximately half-way on the alignment between March and Wisbech, around 1.9 miles north of Chain Bridge AHB.

An initial site assessment identifies a former TMO crossing installation in remarkably good condition, considering the period of disuse. Both manual wooden gates and concrete posts were fully intact as of 2018, albeit somewhat overgrown. The original wooden "bomac" surface remains in situ, also in reasonable condition, with some historic light tarmac patching up to the outer sides of the rail. The rails remain in situ either side of the crossing with moderate to heavy vegetation encroachment. The Stop Boards relating to the TMO crossing operation also remain in place on their original posts. This location presents an interesting constraint being situated immediately next to residential properties in Coldham village. The two houses closest to the alignment appear to be relatively new build in comparison with other properties in the area. It is however unclear whether these sites were developed subsequent to formal route abandonment. The presence of these properties could present a restriction on development of a formalised remote/automatic crossing layout, with lights/barrier equipment possibly encroaching on their party land.

Station Road in this location appears in average surface condition, with minimal road markings and narrow lane width. Most of the markings are in poor faded condition, with the crossing stop marker on the Up side having been lost under a recent resurfacing effort. The road has straight approaches on both sides of the crossing however markings on the Down side only apply for 50m immediately before the crossing itself. The road speed on the Coldham village side is 30mph with the speed increasing to the 60mph national limit on the north side of the crossing immediately beyond the gates. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement due to the residential nature of the location. This would be subject to closure/diversion being discounted as practical options.

Figure AB5 – Coldham Site Overview

Figure AB6 – Looking West Along Station Road

Waldersea Traincrew Manually Operated (TMO) Crossing (WIG 90m 29ch)

This installation is located on Long Drove unclassified Road connecting Ring's End and Friday Bridge. This is situated approximately one mile north of the Coldham TMO crossing on the geographical rail alignment.

An initial site assessment identifies a former TMO crossing installation in remarkably good condition, considering the period of disuse. Both manual wooden gates and concrete posts were fully intact as of 2018, albeit somewhat overgrown. The Down side gate appears in markedly better condition than the Up side as the adjacent site is used by a heritage organisation.

The original alignment appears to have been installed with dock tramway style check rails with no "bomac" surface present. This arrangement remains in original condition however the flangeways have become degraded and blocked with debris over time. The rails remain in situ either side of the crossing with moderate to heavy vegetation encroachment north of the crossing. The south side remains clear, presumably due to intervention from the heritage operation. The Stop Boards relating to the TMO crossing operation also remain in place on their original posts. The sharp angle of this crossing could present a restriction on development of a formalised remote/automatic crossing layout, with lights/barrier equipment potentially located some distance from the actual alignment.

Long Drove Road in this location appears in average surface condition, with no road markings and substandard lane width with passing places. The road has straight approaches on both sides of the crossing however there is a slight kink on the Up side alignment, that could present a challenge for sighting unless some level of vegetation clearance was applied. The road speed is assumed to be a 60mph national limit in the absence of any other evident restriction signage. It is unclear what good practice guidance would recommend for this location, given the unclassified nature of the road and the immediate rural surroundings. As noted earlier any MCB-OD Mk2/CCTV installation at this location would require significant work to alter the alignment of the roadway and may have been one of the factors for not installing an AHB/AOCL originally. As referenced previously, any crossing control intervention would be subject to bridging/closure/diversion being discounted as practical options.

Figure AB7 – Waldersea Site Overview


Figure AB8 – Looking North East Along Long Drove Road

Redmoor Automatic Open Crossing Locally Monitored (AOCL) (WIG 92m 09ch)

This installation is located on the unclassified Redmoor Lane that runs between the South Brink district of Wisbech down to Begdale. This is approximately 2 miles north east of the Waldersea TMO crossing.

An initial site assessment identifies an elderly ABCL installation in moderate to poor condition, and with most original equipment largely intact. All four incandescent light installations remained intact as of 2018, in reasonable original condition. The original AOCL indicator lights are also intact in both directions. The "bomac" surface has been completely removed as part of recent resurfacing, with the edge kerb stones being all that remain as an outline. The rails appear to have been severed on both sides as part of this work. Beyond the severed points, the rails remain in situ either side of the crossing with some light vegetation encroachment. This location presents another unique constraint being situated immediately next to a form of drainage culvert on the north side of the crossing. This restricts crossing equipment on the Wisbech side into a narrow strip between the road and the edge of the culvert, with the adjacent rail bridge running directly off Redmoor Lane. The original REB installation is still present on the Wisbech side of the alignment however, this is not in a secure condition and appears to have been gutted of operational equipment.

Redmoor Lane in this location appears in moderate to poor surface condition with partial road markings in similar condition and narrow lane width. The road has straight approaches on both sides of the crossing. The road speed appears to be a 60mph national limit on both sides of the crossing, however the presence of residential properties in the area suggests that lower advisory speeds may be aspirational at some point in the future. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement. This would be subject to bridging/closure/diversion being discounted as practical options.

Figure AB9 – Redmoor Site Overview

Figure AB10 – Looking West Along Redmoor Lane

Wisbech Bypass Automatic Open Crossing Locally Monitored (AOCL) (WIG 92m 26ch)

This installation is located on the A47 Wisbech Bypass road that runs around the east side of Wisbech town. This is approximately 0.5 miles north of the Redmoor AOCL crossing.

An initial site assessment identifies the remains of another elderly ABCL installation in very poor condition, with most original equipment missing. All four incandescent light installations were missing as of 2018, with only the combination AOCL indicator light post and fittings remaining. The “bomac” surface has been completely removed as part of a recent resurfacing effort, with most traces of the original alignment being limited to a tarmac patch outline. The rails appear to have been severed on both sides as part of this work. Beyond the severed points, the rails remain in situ either side of the crossing with some moderate to heavy vegetation encroachment. The original REB installation is still present on the March side of the alignment and appears to be in a secure condition (although condition of interior components is unknown).

The A47 Wisbech Bypass in this location appears in moderate to good surface condition with full road markings, as would be expected of a major A road. The road has reasonably straight approaches on both sides of the crossing with the east side approach curving gently off to the north, without affecting sigh lines. The road speed is 60mph on both sides of the crossing, and direct observation indicates the route is used by several commercial and heavy goods vehicles. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement. This would be subject to bridging/closure/diversion being discounted as practical options. Given the A47's current designation, it may well be possible that a new heavy rail crossing installation would be unacceptable from a risk ranking point of view.

Figure AB11 – Wisbech Bypass Site Overview

Figure AB12 – Looking East Along A47 Wisbech Bypass

Weasenham Lane Traincrew Manually Operated (TMO) Crossing (WIG 93m 15ch)

This installation is located on Weasenham Lane unclassified Road connecting the B198 in the west to Churchill Road in the east. This is situated in an industrial estate area approximately one mile north of the A47 Wisbech Bypass AOCL crossing, on the geographical rail alignment.

An initial site assessment identifies a former TMO crossing installation in moderate to poor condition in line with the period of disuse. A single manual wooden gate and concrete posts remained intact on the Up side as of 2018. The Down side gate is missing completely, and no traces of the original post locations remain.

The original alignment crossing the roadway has disappeared completely, and there is no evidence of tarmac patching at the crossing site itself. This suggests that the road was resurfaced in its entirety at this location, since the original crossing structure was removed. The status of the rails south of the crossing is unknown due to substantial overgrowth between industrial units, however these are assumed to remain based on analysis of satellite imagery. The rails have been removed to the north of the crossing site, with only a dirt track and corrugated barrier indicating where the original alignment led. No other visible infrastructure remains, although this could feasibly be obscured by vegetation growth on the south side of the crossing.

Weasenham Lane in this location appears in average surface condition, with full road markings and standard lane width, albeit the markings are somewhat faded. The road has straight approaches on both sides of the crossing, however there is a gentle curve to the south on the Up side alignment which would not likely affect sighting. The road speed is assumed to be a 30mph limit for a built up industrial area, in the absence of any other evident restriction signage. Current good practice guidance for installation of new/upgraded level crossings for heavy rail project interventions, would likely recommend a full barrier MCB-OD Mk2/CCTV installation for this location as a minimum requirement due to the heavily commercialised/industrial nature of the location. This would be subject to closure/diversion being discounted as practical options.

Figure AB13 – Weasenham Lane Site Overview

Figure AB14 – Looking West along Weasenham Lane

B1.2 User Worked/Footpath Crossing Interfaces

Clarkes User Worked (UWC) Crossing (WIG 86m 48ch)

This location falls between Whitemoor Junction and Elm Road AHB. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and wooden crossing boards spanning the track. It is unclear if these are still actively maintained by the rail authority. The crossing appears to connect a local farm on the Up side of the alignment to adjacent fields on the Down side. The nearest identifiable landmark defined on Ordnance Survey map resources is Three Corner Cut.

Figure AB15 – Unnamed User Worked Crossing Site Overview

Sheldrach User Worked (UWC) Crossing (WIG 87m 10ch)

This location falls between Elm Road and Chain Bridge AHB crossings. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and a dirt road alignment spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ. The crossing appears to connect a local farm on the Up side of the alignment to the

B1101 Elm Road on the Down side. This appears to be the primary vehicular access for Elm Tree Farm as defined on Ordnance Survey map resources.

Figure AB16 – Unnamed User Worked Crossing Site Overview

Fishers User Worked (UWC) Crossing (WIG 87m 54ch)

This location falls between Chain Bridge AHB crossing and Coldham TMO crossing. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and a dirt road alignment spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to be missing or buried under dirt. The crossing appears to connect a local farm on the Up side of the alignment to adjacent fields on the Down side. This appears to be secondary vehicular access for Chain Bridge Farm as defined on Ordnance Survey map resources.

Figure AB17 – Unnamed User Worked Crossing Site Overview

Ballast Pit User Worked (UWC) Crossing (WIG 88m 21ch)

This location falls between Chain Bridge AHB crossing and Coldham TMO crossing. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and a dirt road alignment spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ. The crossing appears to connect a local farm on the Up side of the alignment to adjacent fields on the Down side. This appears to be secondary vehicular access for Rutlands Farm as defined on Ordnance Survey map resources.

Figure AC18 – Unnamed User Worked Crossing Site Overview

Crellins and Heads King User Worked (UWC) Crossings (WIG 89m 69ch and 90m 21ch)

These locations fall between Coldham and Waldersea TMO crossings. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and a dirt road alignment spanning the track at both locations. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ, although are heavily overgrown at the northernmost site. The crossings appear to connect a local farm on the Down side of the alignment to adjacent fields on the Up side. These appear to be secondary vehicular access for Fourscore Farm as defined on Ordnance Survey map resources.

Figure AB19 – Unnamed User Worked Crossings Site Overview

Co-Op No. 1 and No. 2 User Worked (UWC) Crossings (WIG 90m 42ch and 91m 00ch)

These locations fall between Waldersea TMO crossing and Redmoor Lane AOCL. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and wooden crossing boards/dirt road alignment spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ at both locations. The crossings appear to connect local farms and Bet Drove on the Up side of the alignment to adjacent fields on the Down side. The nearest identifiable landmarks appear to be Lillypool House, and Jew House Cottages as defined on Ordnance Survey map resources.

Figure AB20 – Unnamed User Worked Crossings Site Overview

Crooked Bank Road and Holly Bank User Worked (UWC) Crossings (WIG 91m 32ch and 91m 42ch)

These locations fall between Waldersea TMO crossing and Redmoor Lane AOCL. Analysis of satellite imagery does not indicate gates or crossing infrastructure at either location; however the southernmost site is heavily overgrown. The rails appear to remain in situ at both locations. The crossings appear to connect local farms and Belt Drove on the Up side of the alignment to adjacent fields on the Down side. The two crossings appear to serve formally defined tracks, these being Crooked Bank and Narrow Drove respectively, as defined on Ordnance Survey map resources.

Figure AB21 – Unnamed User Worked Crossings Site Overview

Broad Drove User Worked (UWC) Crossing (WIG 91m 78ch)

This location falls between Waldersea TMO crossing and Redmoor Lane AOCL. Analysis of satellite imagery indicates the presence of gates either side of the rail alignment and wooden crossing boards spanning the track. It is unclear if these are still actively maintained by the rail authority. The rails appear to remain in situ. The crossing appears to connect local farms on both sides of the alignment along a local dirt road known as Broad Drove. The nearest identifiable landmark appears to be Whitehouse Farm on the Down side, as defined on Ordnance Survey map resources.

Figure AB22 – Unnamed User Worked Crossing Site Overview

New Bridge Lane Footpath (FPC) Crossing (WIG 92m 44ch)

This location falls between the A47 Wisbech Bypass AOCL and the Weasenham Lane TMO crossing. The site appears to be a former road alignment that was historically downgraded to permit foot/cycle traffic only. Bollards and concrete blocks have been installed to restrict vehicle access, which appear to be a recent addition, possibly installed when the rail alignment was tarmacked over. This crossing is not listed on the historical Quail map shown in Figure 2, so the downgrade may have occurred on construction of the A47 Wisbech bypass, with traffic diverted accordingly.

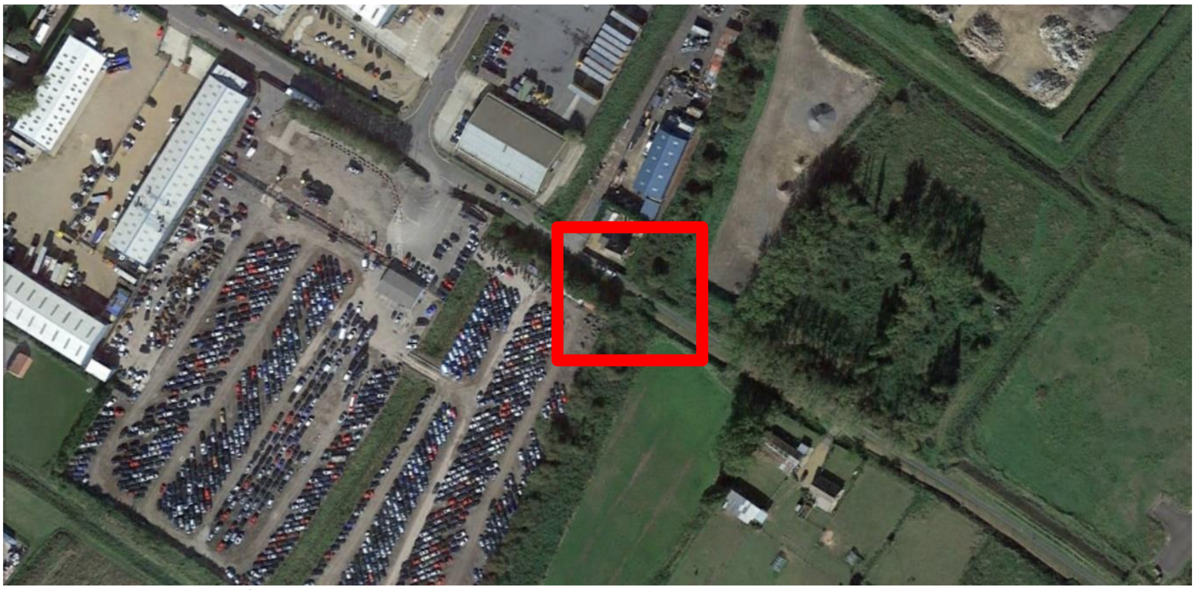


Figure AB23 – New Bridge Lane Site Overview


Figure AB24 – Looking East Along New Bridge Lane

CAMBRIDGESHIRE & PETERBOROUGH COMBINED AUTHORITY

Agenda Item No: 2.3

Snailwell Loop

To:	Transport and Infrastructure Committee
Meeting Date:	16 November 2022
Public report:	This report contains an appendix which is exempt from publication under Part 1 of Schedule 12A of the Local Government Act 1972, as amended, in that it would not be in the public interest for this information to be disclosed (information relating to the financial or business affairs of any particular person (including the authority holding that information). The public interest in maintaining the exemption outweighs the public interest in publishing the appendix.
Lead Member:	Mayor Dr Nik Johnson, Chair of the Transport Board
From:	Robert Jones, Transport Programme Manager
Key decision:	No
Forward Plan ref:	N/A
Recommendations:	The Transport and Infrastructure Committee is asked to consider the approach for Snailwell Loop, either to: a) Recommend to the Combined Authority Board to pause works on Snailwell Loop for a period of 6 months while there is on-going uncertainty about the Ely Area Capacity Enhancement EACE) scheme and slip the existing budget into 2023-24 , or. 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, or. c) Continue to work with local and regional partners to urge Government to support the EACE scheme
Voting arrangements:	For items c) A simple majority of all Members present and voting

For item a) and b) 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

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 The Combined Authority are 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 our communities. The potential improvements include Ely Area Capacity Enhancements (EACE) and Snailwell Loop schemes. These will enable more frequent services and make journeys quicker for passengers, whilst improving the potential for greater and more efficient freight movements, to, from and through our region

2. Background

2.1 East Cambridgeshire, and particularly Ely, is well-served by the rail network, with direct services to Kings Lynn, Cambridge, London, Norwich, Stansted Airport, Peterborough and the Midlands and the North West. However, some services, particularly on the Kings Lynn – Cambridge – London corridor especially during peak times, suffer from severe overcrowding. Whilst other services such as those to Ipswich are too infrequent (two hourly) and do not offer a genuine, realistic, and attractive options for many. In addition, the complex junctions north of Ely act as a key constraint on capacity and make it difficult to run additional train services for both passengers and freight. In order to truly realise the full potential of Soham Station, double tracking, and the provision of the Snailwell Loop is necessary to allow for direct hourly services to serve the community.

2.2 The EACE scheme would facilitate additional rail services to Cambridge, as well as additional services to Peterborough, Ipswich, and Norwich. The Combined Authority continue to work with Network Rail to deliver additional capacity through the Ely area for the benefit of passenger and freight services, whilst protecting the quality of life of residents in Queen Adelaide. The EACE project will help to deliver additional rail services, including to Cambridge, Kings Lynn, Peterborough, and Ipswich, and provide the capacity for any future services to Wisbech.

2.3 The scheme should ensure more reliable journeys for all passengers whilst providing additional capacity for freight services between Felixstowe and Nuneaton, hence reducing the need for freight to be transported by heavy goods vehicles along the A14. The benefits brought about the implementation of the EACE will be maximised by the double (twin) tracking of the Ely to Soham route. These two schemes will provide much-needed additional capacity, create new journey opportunities, and deliver faster, more frequent rail journeys for passengers, whilst maintaining highway access for residents and businesses in Queen Adelaide. These schemes form part of a rail package for the area that also includes the Snailwell Loop and Dullingham Loop.

2.4 The benefits of the Snailwell Loop cannot be released until the EACE scheme to the north is completed. The area around Ely currently acts as a significant bottleneck for rail services (passenger and freight). If both schemes can be delivered in tandem or simultaneously then efficiencies and value for money would be increased significantly. Introducing additional rail paths at Ely creates the opportunity for other Combined Authority rail schemes to be brought forward to capitalise on the removal of the log jam at Ely.

2.5 To progress this project the approved funding would be used by Network Rail to develop an options study, outline design, costing and Business Case. It is important that the Combined Authority are ready to progress key, regional and local schemes in a timely and effective manner. However, following the publication of the CPCA funded EACE report by Network Rail it would appear that this study and the scheme may not be progressed

2.6 The mayor has received a letter from the former Secretary of State for Transport, Grant Shapps MP, on the EACE Business Case advising that despite the very high BCR of 4.89, there is a significant amount of capital required to realise the benefit. The Combined Authority and stakeholders continue to lobby central government around the need for EACE for the benefit of the local, regional, and national community.

2.7 In light of the uncertainty surrounding the EACE scheme, the Committee is being asked to decide whether to pause further work on Snailwell Loop for 6 months, while retaining the funding allocation, or to progress the work as planned

Significant Implications

3. Financial Implications

3.1 The current MTFP has a capital budget of £500k subject to approval, one of the options being put to TIC is to approve £150,000 of this to be spent this financial year and the balance slipped into 2023-24. If the project is paused pending further work on EACE then the £500k capital allocation would be slipped into 2023-24

4. Legal Implications

4.1 None.

5. Public Health Implications

5.1 None.

6. Environmental and Climate Change Implications

6.1 There would be both Environmental and Climate change benefits from the Snailwell loop and its reliant EACE project. By opening up additional rail paths to the region for both passengers and freight services this would reduce road traffic.

7. Other Significant Implications

7.1 There are no known significant implications at time to preparing this paper.

8. Appendices

8.1 Exempt Appendix 1 – Secretary of State for Transport Grant Shapps MP Letter: EACE.

9. Background Papers

9.1 None

CAMBRIDGESHIRE
& PETERBOROUGH
COMBINED AUTHORITY

Agenda Item: 2.4

Bus Strategy

To:	Transport and Infrastructure Committee
Meeting Date:	16 November 2022
Public report:	Yes
Lead Member:	Mayor Dr Nik Johnson
From:	Tim Bellamy, Interim Head of Transport
Key decision:	No
Forward Plan ref:	N/A
Recommendations:	The Transport and Infrastructure Committee is recommended 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.
Voting arrangements:	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 and Peterborough City Council, or their Substitute Members

1 Purpose

1.1 The purpose of this document is to outline the programme undertaken to enable the development of an appropriate Bus Strategy for the region. This Strategy is strongly aligned to the vision, aims and objectives of the Local Transport and Connectivity Plan (LTCP) and feedback is sought from Members on the overarching vision and the draft document that will be presented to the Transport and Infrastructure Committee (TIC) in November.

1.2 In addition, the paper outlines the progress to date around some of the delivery mechanisms for the Bus Strategy, including work on the relative business cases for an Enhanced Partnership and Franchising; the Greater Cambridge Partnership's City Access work; and the development of the Bus Service Improvement Plan.

2 Background

2.1 Public transport is key to so many of the agendas that matter for the Combined Authority and its constituent Councils. Getting more people onto buses and public transport will reduce carbon emissions, enhance social inclusion, and improve air quality. It is important that new communities are well served and have the option of a good and reliable service. Despite the importance of bus use in so many of these areas it has been in decline across the country for a number of years/decades. It is therefore vital that this decline of the bus industry is addressed if we are to achieve our ambitions for climate change, air quality, social equity, accessibility, and public health. As a consequence, it is key for the Combined Authority to develop and implement its Bus Strategy as part of the LTCP suite of documents.

High Level Principles

2.2 A key component of the LTCP's suite of documents is the development of an appropriate Bus Strategy. This document articulates what the Combined Authority (CPCA) wants the bus network to look and feel like. Clear alignment with the emerging CPCA strategy will be required alongside a golden thread with the LTCP; the Sustainable Growth Ambition Statement; the Climate Change Commission recommendations; and the Devolution Deal.

2.3 Over the last 50 years the need to travel has become greater and more complex. Society has become organised around the car and average distances to work, learning, hospitals and shops increased. People experiencing, or at risk of, social exclusion typically face five types of barriers to getting to key services:

- The availability and physical accessibility of transport: For some people there is no public transport, or it doesn't go to the right places or at the right times, or it does not go often enough or reliably enough, or vehicles are not accessible to disabled people. People living in rural areas without access to a car can face particularly acute problems.
- Cost of transport: Some people find the costs of personal or public transport are high or unaffordable.
- Services and activities located in inaccessible places: Developments including housing, hospitals, business, and retail are often located in areas not easily accessible to people without a car.
- Safety and security: Some people are unwilling to use public transport or walk to key services because of fear of crime or antisocial behaviour, or fear of road accidents.

- Travel horizons: Some people are unwilling to travel long journey times or distances or may not know about or trust transport services.

2.4 Those living in rural areas without a car can face acute problems. Distances to key services are often greater and public transport may be infrequent or inadequate. Whilst in urban areas, despite a dense public transport network, buses tend to be focused on radial routes to centres rather than peripheral locations, and early morning, evening and weekend journeys are poorly served. Some groups in the population face particular disadvantage in their travel, including children and young people, older people, and disabled people.

2.5 The CPCA wants to address these significant transport related concerns around social exclusion and become a leader in public transport provision. Buses carry more people with less demand on road space. To ensure buses are not caught in congestion we need to provide new infrastructure. It is essential that we ensure that people can travel around the network safely, efficiently, and sustainably.

2.6 It is important that a bus network is created and maintained that responds to what people want, and are able to use, so that, as we emerge from the Covid-19 pandemic, we see growth in passenger journeys. It is proposed that this is done by improving the quality and reliability of bus services, so that people can get to more destinations quickly, comfortably, safely, and affordably.

2.7 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. We also need to work closely with operators to make this happen.

Bus Strategy Initial Draft

2.8 The initial draft of the Bus Strategy will be presented to the November TIC and subsequent CPCA Board. It is proposed that once approved and adopted, the Strategy would be reviewed every 18 months, to reflect changing circumstances and ensure that objectives and targets remain appropriate and ambitious.

2.9 Cambridgeshire and Peterborough is an economically successful, innovative, and desirable region to live and work in. However, our success and recent growth brings challenges, including pressure on our transport network, a need to tackle emissions locally, and contribute to the wider climate challenge response. And, in some parts of our area, people feel disconnected from the opportunities that exist in the wider region. Therefore, an appropriate, ambitious, and deliverable Bus Strategy is essential to ensure that opportunities are available for all within the region.

Bus Strategy: Alignment to National and Local Policy

2.10 The draft Bus Strategy fully reflects wider national and local policy aspirations.

2.11 Government published its *National Bus Strategy: Bus Back Better* in March 2021, setting out an ambitious vision for significant improvements to bus services to return usage to pre-COVID levels and then to build patronage further. It wants to see services that are:

- **More frequent,** with turn-up-and-go services on major routes and feeder or demand-responsive services to lower-density places.

- **Faster and more reliable**, with bus priority wherever necessary and where there is room.
- **Cheaper,** with more low, flat fares in towns and cities, lower point-to-point fares elsewhere, and more daily price capping everywhere.
- **More comprehensive**, with overprovision on a few corridors reduced to boost provision elsewhere and better services in the evenings and weekends, not necessarily with conventional buses.
- **Easier to understand**, with simpler routes, common numbering, co-ordinated timetable change dates, good publicity, and comprehensive information online.
- **Easier to use**, with common tickets, passes and daily capping across all operators, simpler fares, contactless payment, and protection of bus stations.
- **Better integrated** with other modes and each other, including more bus-rail interchange and integration and inter-bus transfers.

2.12 Locally, the CPCA are continuing to finalise the LTCP that aims for a transport system which:

- Is accessible and efficient for everyone;
- Increases the ability to access good jobs, travel to health appointments and access opportunities to improve life chances;
- Is affordable to use; and
- Addresses pollution that adversely impacts on people’s quality of life and health.

Bus Strategy: Contents

2.13 The <u>draft</u> vision is: *A comprehensive network of bus services across Cambridgeshire and Peterborough that people find convenient, easy to use, reliable and good value for money, that is inclusive and offers a viable alternative to the car.*

2.14 The CPCA want to create a more connected region, which will encourage active and sustainable travel, improve health and wellbeing, and reduce private vehicle journeys. The five key goals of the draft Bus Strategy are:

Bus Strategy: Measurement of Success

2.15 Success in achieving the vision will mean more travel by bus and less reliance on car travel. This in turn will help us maintain economic growth, care for the environment, and improve quality of life.

2.16 To realise the vision, this Strategy seeks to achieve the following:

- A comprehensive bus network, better connecting people to places across all parts of the region and beyond.
- Buses are part of a fully integrated and planned transport system.

- A more affordable network, with simplified fares and capping across the network
- Transitioning to new, low emission vehicles, providing all the benefits of modern bus travel
- A more understandable bus network, services and fares, with clear information and easy ticketing.
- Faster and more reliable journeys by bus, delivered with more, effective bus priority measures.
- High quality passenger waiting facilities.
- Good quality services with high levels of satisfaction amongst customers.
- A doubling of bus passengers (based on 2019/20 levels) by 2030.
- Less traffic and congestion by attracting car users to buses.
- Better bus infrastructure, including bus shelters and wider real time information coverage.

Bus Strategy: Consultation

2.17 Following approval of the draft Bus Strategy at the TIC and subsequently at the CPCA Board, the document will need to be subjected to a public consultation period. Further work is required to ensure alignment and consistency with the LTCP and the work of constituent Councils and the Greater Cambridge Partnership to ensure full engagement with the public and stakeholders from across the region.

Bus Franchising Update

2.18 Since May 2019, the CPCA has been committed to assessing whether the concept of Bus Franchising would be the best way to deliver a customer-focused public transport network. However, the uncertainties created by the Covid-19 pandemic, particularly in respect of the recovery in bus patronage and revenue, made it difficult to assess the case for franchising. The situation is now becoming clearer, albeit that the new baseline of use remains lower on most services, compared with 2019. Given the large-scale challenges and complex spatial and economic geography of the area, the CPCA still considers that Franchising could deliver the best bus service for customers, rather than the current model of provision based on services determined by the commercial decisions of bus operators.

2.19 As the case for Franchising is developed further, the views of Members, stakeholders and the public will be widely sought and fed into the programme and a draft business case brought to Committee in early 2023.

Bus Service Improvement Plan (BSIP) Update

2.20 In response to the National Bus Strategy: Bus Back Better (March 2021), the CPCA produced a BSIP, which was submitted to DfT in October 2021 and sought funding for bus service improvements. The CPCA was unsuccessful in securing BSIP funding and lessons are being learned through dialogue with central government officials around areas for improvement. The DfT requires all LTAs to review progress against their BSIP ambitions in October each year.

2.21 Given the changing landscape of bus service provision and development of the draft Bus Strategy, the opportunity is being taken to revise the Cambridgeshire and Peterborough BSIP, which will be socialised with constituent council officers and Members. The revised BSIP will reflect the work undertaken on developing the draft Bus Strategy, the work of the GCP and our position regarding Franchising.

2.22 The CPCA continues to liaise with central government to outline the programme of work and how the BSIP is integral to the attainment of the Bus Strategy’s key aims and objectives. An extension to the BSIP review submission deadline has been provided by the DfT to allow for the various workstreams to align and be delivered in a timely manner whilst allowing for due governance to occur.

2.23 Further work is required to align the BSIP with the emerging Bus Strategy and the work for the LTCP on the 15% reduction in car mileage. An update will be provided to TIC and CPCA Board Members ahead of a submission to government. This submission will reflect on the experiences over the last year and in particular the instability of the network provided by our largest service provider.

Significant Implications

3 Financial Implications

3.1 None.

4 Legal Implications

4.1 The Transport Committee shall exercise the Combined Authority’s functions to, ‘*Oversee the development and maintenance of the Local Transport Plan and Bus Strategy and any other key strategies reserved to the Combined Authority Board, including overseeing consultation and engagement processes, and making recommendations to the Board’*, (Chapter 8, clause 3.2.1 of the Constitution for the Combined Authority).

5 Public Health Implications

5.1 As part of the LTCP suite of documents, the Bus Strategy will need to consider the objectives of the Plan. Fundamental to this is the consideration of health and safety and therefore it is imperative that the Bus Strategy demonstrates the golden thread with these objectives. The Bus Strategy will demonstrate how the deliverables will ensure better outcomes for the Combined Authority and partners in relation to public health at the local and more region-wide levels.

6 Environmental and Climate Change Implications

6.1 As part of the LTCP suite of documents, the Bus Strategy will need to consider the environmental and climate objectives – how it will provide a positive benefit for the area. The Bus Strategy will aim to improve the local and regional improvements in relation to the environment and climate. The Bus Strategy will demonstrate how the deliverables will ensure better outcomes for the Combined Authority and partners in relation to these implications at the local and more region-wide levels.

7 Other Significant Implications

7.1 None.

8 Appendices

8.1 Appendix 1 – Draft Bus Strategy.

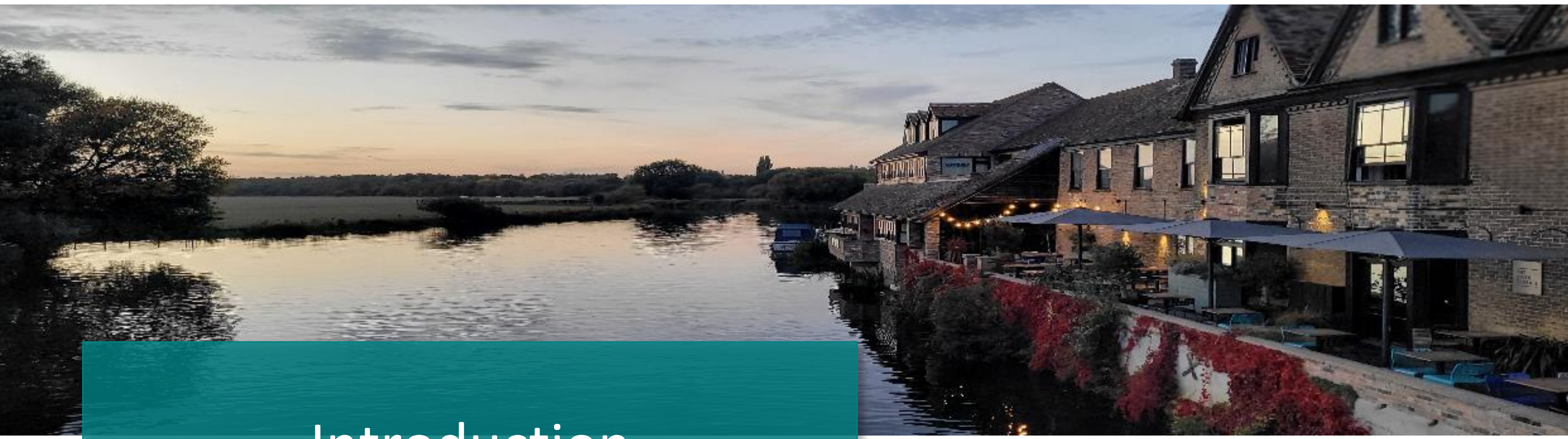
9 Background Papers

9.1 None.

CAMBRIDGESHIRE
& PETERBOROUGH
COMBINED AUTHORITY

Bus Strategy

October 2022



Introduction

Cambridgeshire and Peterborough are an economically successful, innovative, and desirable area to live and work. However, our success and recent growth brings challenges, including pressure on our transport network, a need to tackle emissions locally, and contribute to the wider climate challenge response. And, in some parts of our area, people feel disconnected from the opportunities that exist in the wider region.

Public consultations show that people want to see good public transport services, as these will benefit them personally and their communities. Whilst the Covid-19 pandemic has changed travel behaviour, we know that the bus offers the opportunity to make an important contribution to the way the region functions.

Local partners have acknowledged a climate change emergency and we need to reduce carbon emissions, tackle traffic congestion and improve air quality. An Independent Commission on Climate highlighted the need to reduce car miles in our region by 15% by 2030, advocating a switch to using public transport, walking and cycling. The Cambridgeshire and Peterborough Combined Authority has agreed this target.

Local authorities are making pledges to become carbon neutral. Promoting zero carbon transport means rethinking our transport systems and how we travel, with greater emphasis on buses, pedestrians and cyclists. We need to transform public transport, making it more attractive, such that it provides a real alternative to the car.

Our ambition is to see Cambridgeshire and Peterborough at the forefront of excellent public transport provision. Therefore, we are seeking to transform bus travel – offering high levels of convenience and connectivity – not just in our urban areas, but across the entire region, including rural areas and market towns; something not seen on such a scale anywhere else in the UK. We want to deliver a fully integrated bus network, serving the needs of the Cambridgeshire and Peterborough area. We want to make journeys quicker, cheaper and more reliable, delivering attractive, environmentally friendly services across our area. To do that, we will need improve the whole journey, ensuring off-bus infrastructure and services complement the on-bus travel experience

The Cambridgeshire and Peterborough Bus Strategy has been prepared by Cambridgeshire and Peterborough Combined Authority (CPCA). Working with its constituent authorities and other partners, and bus operators. It sets out the ways in which we want to make bus travel more convenient, very attractive and easy to use, such that it becomes the obvious way to make a journey. This means improving every aspect of the current service, building on the strong foundations already in place, including the Busway, Cambridge Park & Ride and demand responsive TING service.

This strategy sets out the main principles of how we will achieve our ambition and more than double bus patronage by 2030. More details of how we will deliver and fund this are set out in our Bus Service Improvement Plan (BSIP), reflecting our response to the National Bus Strategy: Bus Back Better, published in 2021. Our Strategy and BSIP will be regularly reviewed to reflect changing circumstances and to push continuous improvement.

The Cambridgeshire and Peterborough Combined Authority is committed to working with Government to deliver on our collective ambition, a London-style network across our geography.

Since 1986, bus operators have decided what services to run, including the routes, timetables and fares charged. Local authorities can pay operators to run other additional services that wouldn't otherwise be provided. Currently, the Combined Authority spends £Mx on the provision of such services across the region. Authorities are also responsible for providing bus priority measures, bus stop infrastructure, Park & Ride sites and the Busway. The Cambridgeshire and Peterborough bus network has generally declined over the period since 1986, although areas of partnership including the Cambridgeshire Busway and Cambridge Park & Ride network have delivered improvements.

The Combined Authority was established to champion sustainable economic growth across our region and the Mayor has additional powers for bus services, including the ability to assume control of the bus network, under certain conditions, through a franchising scheme (similar to the bus operation in London).

CPCA has already consulted on a new Local Transport and Connectivity Plan (LTCP). This Bus Strategy is a supporting document to the LTCP and reflects the ambition to reduce traffic and emissions and provide a much more sustainable transport network that benefits everyone.

We've already taken some positive steps to support bus services in the region. £Mx has been invested in the Busway and Park & Ride provision. Recently, a new demand responsive service, 'TING', was launched in rural West Huntingdonshire.

We need to do much more to improve our bus network and address some key challenges:

- Bus services do not offer a practical option for many journeys because they are not available, don't go to the right places at suitable times, or are too infrequent.
- They may not be co-ordinated to connect with other services and are perceived as being unreliable and offering no advantage over the private car
- Considered expensive by many and not value for money.
- The attractiveness of bus travel is hampered by inadequate information, difficult to understand timetables, complex fares and variable standards of services.
- Poor reliability – 65% of bus users want to see more reliable bus services, followed by more frequent services and faster bus journey times.
- Inconvenience – 58% of non-bus users cited inconvenience as the reason for not using the bus, seeing cars as a faster and cheaper way to travel.

Market research suggests a desire to see bus service improvements, with 80% of survey respondents (bus and non-bus users) showing support.[1] Bus users want to see greater reliability and less disruption on the road network, more frequent services connecting more places and more co-ordination, with services joining up better in terms of service timings, connections and fares. In more rural areas, there is particular desire to see buses linking more places, more often, including evenings and Sundays.[2]Non-bus users support wider range of improvements, including more frequent services, quicker journey times, more services connecting places, greater integration and good value fares.

[1] CPCA survey and market research (on-line and face-to-face with 4300 responses), 2019

[2] ECDC residents' survey (1400 responses), 2020

Background to the Bus Strategy

The story so far

In 2018, the Combined Authority commissioned an extensive review of all aspects of bus service delivery, examining the current state of play, drawing on engagement with stakeholders and operators, evidence and data. It took a close look at the different elements of the network, including city services, Park & Ride, Busway, inter-urban and rural services. It highlighted the pressures and constraints on each element and explored potential options and opportunities, including fares and ticketing, information and bus infrastructure.

The review highlighted the underperformance of the bus network and the challenges it faced, particularly declining usage and commercial viability, poor image, unreliability and inconsistent levels of service.

Seeing the need for a new approach, the Combined Authority agreed to use its powers under the Bus Services Act 2017 to consider different options, including the possibility of Bus Franchising. A notice of intent to undertake an assessment of Bus Franchising was published on 9 May 2019. In late 2019, extensive market research and stakeholder engagement took place to get a clear picture of what bus users and non-users wanted from the bus network. There was a desire for improvement, which was translated into a 'Vision for Bus', adopted by the authority in May 2020. This set out a desire for a world class bus network.

Consideration of bus franchising continued during 2020-21, but it was clear that the bus market was suffering greatly form the effects of the COVID-19 pandemic. Such uncertainty made it necessary to stall these considerations.

In response to the publication of the National Bus Strategy in 2021, the Combined Authority prepared a Bus Service Improvement Plan (BSIP) and submitted this to the Department for Transport. Given the uncertainties around the local bus market and inability to pursue bus franchising at that point, the BSIP did not attract Government funding. However, in a separate bid to the Government's ZEBRA scheme, funding was received towards the provision of 30 battery electric buses for Cambridge.

The landscape for bus provision across the region has changed markedly over the last couple of years, giving a need to revisit the strategy for taking the bus network forward. There are significant challenges – lower patronage, cuts in commercially-viable services and increasing unreliability due to traffic and driver shortages. Meanwhile, the ambitions for what the bus network needs to achieve are growing, as set out in the National Bus Strategy and locally through the new Local Transport and Connectivity Plan and Greater Cambridge Partnership's plans to dramatically boost bus provision and in parallel cut private vehicle travel by 15%. Achieving this will see bus patronage more than double, compared to 2019 levels, with some 60-75 million passenger journeys anticipated. Whilst some of this will be met by spare capacity, the implication is that there will need to be a significant uplift in bus provision, with more buses operating overall and for longer each day.

This Bus Strategy sets the scene for the way ahead – to transform the bus network through clear and decisive actions – to benefit all.

This Bus Strategy fully reflects wider national and local policy aspirations.

Government published its **National Bus Strategy: Bus Back Better** in March 2021, setting out an ambitious vision for significant improvements to bus services to return usage to pre-COVID levels and then to build patronage further. It wants to see services that are:

- **More frequent**, with turn-up-and-go services on major routes and feeder or demand-responsive services to lower-density places.
- **Faster and more reliable**, with bus priority wherever necessary and where there is room.
- **Cheaper**, with more low, flat fares in towns and cities, lower point-to-point fares elsewhere, and more daily price capping everywhere.
- **More comprehensive**, with overprovision on a few corridors reduced to boost provision elsewhere and better services in the evenings and weekends, not necessarily with conventional buses.
- **Easier to understand**, with simpler routes, common numbering, co-ordinated timetable change dates, good publicity, and comprehensive information online.
- **Easier to use**, with common tickets, passes and daily capping across all operators, simpler fares, contactless payment and protection of bus stations.
- **Better integrated** with other modes and each other, including more bus-rail interchange and integration and inter-bus transfers.

Locally, CPCA has developed a **Local Transport and Connectivity Plan** (LTCP), which aims for a transport system that:

- Is accessible and efficient for everyone
- Increases the ability to access good jobs, travel to health appointments and access opportunities to improve life chances
- Is affordable to use
- Addresses pollution that adversely impacts on people's quality of life and health

It responds directly to the Independent Commission on Climate's findings that the region experiences transport emissions that are 50% higher than the UK average, reflecting higher levels of traffic. In response, it recommended a reduction in car miles driven by 15% by 2030, advocating a switch to public transport and active travel modes. It recognised that this would require significantly better public transport services with greater connectedness.

The Plan links to a variety of other plans and strategies, a number of which highlight the need for improved public transport. The Employment and Skills Strategy notes the need for better public transport connectivity to improve access to colleges and universities and to ensure that travel costs are more affordable for young people.

The LTCP vision is of:

"A transport network that secures a future in which the region and its people can thrive."

This will be achieved by investing in a joined-up, net zero carbon transport system, which is high quality, reliable, convenient, affordable, safe, and accessible to everyone. Better, cleaner public transport will reduce private car use, and more cycling and walking will support both healthier lives and a greener region. Comprehensive connectivity, including digital improvements, will support a sustainable future for the region's nationally important and innovative economy.

Excellent public transport will support the achievement of the goals and objectives of the LTCP.

Productivity Giving both employers and people the means to achieve more of their potential, making them more efficient and innovative to create more prosperity	
Housing – – support new housing and development to accommodate a growing population and workforce, and address housing affordability issues	Easier to develop areas that are built around good public transport rather than the car. Bus offers a flexible way to meet the needs of new and growing communities.
Business and tourism – ensure all our region's businesses and tourist attractions are connected sustainably to our transport hubs, ports, and airports	Buses can connect communities to key destinations for the benefit of everyone
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	Buses can be routed and timed to meet the needs of employees. They are ideal for the provision of collective travel to key destinations, lessening the impact of travel peaks.
Resilience – build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability	Bus routes and levels of service can be varied at short notice to adapt to changing needs and demands. Dedicated priority measures allow bus journey times to be competitive and for services to run reliably
Connectivity – people and communities are brought closer together, giving more opportunity for work, education, leisure, and pleasure	
Accessibility – promote social inclusion through the provision of a sustainable transport network that is affordable and accessible to all	Buses can provide transport for all, both those with no alternative and those who would like to choose an alternative to the car
Digital – communities are digitally connected; innovative technologies are supported and there is improved connectivity and mobility across the region	Travel by bus offers the opportunity to stay digitally connected whilst on the move and for people to do other things whilst travelling
Health – improved health and wellbeing, enabled through better connectivity, greater access to healthier journeys and lifestyles, delivering stronger, fairer, more resilient communities	
Health and wellbeing – provide 'healthy streets and high-quality public realm that puts people first and promotes active lifestyles	Buses offer a more efficient use of road space, giving streets back to communities. Public transport is central to the provision of sustainable travel options and more active lifestyles. Collective travel provides a greater sense of belonging and community
Air quality – ensure transport initiatives improve air quality standards across the region, exceeding good practice standards	Zero emission buses help to improve air quality. Use of bus reduces other traffic and its harmful impacts
Safety – to prevent all harm by reducing risk and enabling people to use the transport system with confidence	
Safety – embed a safe systems approach into all planning and transport operations to achieve 'Vision Zero' – zero fatalities and serious injuries	Buses offer a safe form of transport, allowing stress-free travel
Environment – protecting and improving our green spaces and improving nature with a well-planned and good quality transport network	
Environment – deliver a transport network that protects and enhances our natural, historic, and built environments	More bus travel and fewer cars means that less space is needed for roads and car parks
Climate – successfully and fairly reducing emissions to 'net zero' by 2050	

Climate change – reduce emissions to ‘net zero’ by 2050 to minimise the impact of transport and travel on climate change	Zero emission buses contribute to the achievement of net zero. Use of bus reduces other traffic and its harmful impacts

The Combined Authority's Mayor sees **compassion, community and collaboration** at the heart of what the authority does to serve the region's population. Provision of a successful bus network is characterised by these facets. It contributes to a fairer and equal society, benefits everyone, brings people together and requires collaboration to make it work efficiently and effectively.

The LTCP sets out the clear need for a comprehensive and excellent bus network to tackle car dependency and encourage a shift away from car use to public transport use. Accessible, affordable, reliable and frequent public transport will be a crucial part of realising the vision. New services will be needed to better connect people to jobs and facilities.

Large-scale investment in bus services will be needed in the Greater Cambridge area, where the aim is to reduce traffic levels in the city by 10-15% on 2011 levels in order to improve journey times and reduce pollution.

Other local strategies set out in the LTCP support making improvements to public transport, including more connectivity, increased frequencies and greater availability.

The LTCP will be developed further in the light of consultation responses and adopted in early 2023.

Case Study – Excel First

Excel – First has developed an 83 mile long service that links Peterborough and Norwich every thirty minutes via a series of important market towns across the broad plains of East Anglia. Regularly refreshed and updated, the Excel service uses high-spec double-deckers run a service that is fast, reliable and highly regarded by passengers – it has also become a successful alternative to the Beeching-cut Peterborough – Wisbech – Kings Lynn rail service, and operates via Peterborough rail station to provide onward bus-rail connections

A Bus Strategy for Cambridgeshire and Peterborough - Vision

The vision is for a comprehensive network of bus services across Cambridgeshire and Peterborough that people find convenient, easy to use, reliable and good value for money, that is inclusive and offers a viable alternative to the car.

We want to create a more connected region, which will encourage active and sustainable travel, improve health and wellbeing and reduce private vehicle journeys.

BUS STRATEGY GOALS

Attracts car users	Supports sustainable growth	Protects and enhances the environment	Supports community health and wellbeing	Opens up opportunity for all

Success in achieving the vision will mean more travel by bus and less reliance on car travel. This in turn will help us maintain economic growth, care for the environment and improve quality of life.

To realise the vision, this Strategy seeks to achieve the following:

- A comprehensive bus network, better connecting people to places across all parts of the region and beyond.
- Buses are part of a fully integrated and planned transport system.
- A more affordable network, with simplified fares and capping across the network
- Transitioning to new, low emission vehicles, providing all the benefits of modern bus travel
- A more understandable bus network, services and fares, with clear information and easy ticketing.
- Faster and more reliable journeys by bus, delivered with more, effective bus priority measures.
- High quality passenger waiting facilities.
- Good quality services with high levels of satisfaction amongst customers.
- A doubling of bus passengers (based on 2019/20 levels) by 2030.
- Less traffic and congestion by attracting car users to buses.
- Better bus infrastructure, including bus shelters and wider real time information coverage

Achieving these outcomes will rely on the delivery of a programme of interventions across the Cambridgeshire and Peterborough geography. Bold decisions, with appropriate levels of funding, will be needed, backed by a steady, consistent and determined approach to delivering a better bus network for all.

Bus Strategy - Aims

The Bus Strategy aims to set out how bus services will be improved to deliver the goals and objectives of the Combined Authority's Local Transport and Connectivity Plan and Greater Cambridge Partnership's transformation of the public transport network.

The aim of the Bus Strategy is to pave the way for a bus network that is convenient, attractive and easy to use, characterised by all of the following attributes:

CONVIENENT	• Routes connecting to places and activities that people want to get to. • All areas are well served by bus. • Direct routes with little deviation. • Frequent services with limited waiting time in-between. • Services are available all day and into the evening, every day. • Range of tickets to meet different needs.
ATTRACTIVE	• The network is simple and easy to understand. • Buses enjoy a great public image and everyone is happy to use them. • Services can be relied upon and run to time, without delay. • Cost of using a bus is considered good value for money, with targeted fares offers that incentivise some groups. • Buses run direct and quick. • Buses are clean, comfortable and pleasant to ride on. • Services are well marketed and there is plenty of clear information in a range of formats, available via different media. • Waiting environments are attractive, offer seating and information, and people feel safe using them. • Pleasant and helpful drivers, able to assist when needed. • Zero emission buses, offering a quiet and smooth ride. • A network that evolves in response to changing needs and demands.
EASY	• A single understandable network that functions as one, with connecting services, branding and system-wide ticketing. • Ability for people to transfer between bus and other travel modes (walk, cycle, e-scooter, car, coach, train). • A clear service offer, backed by a Passenger Charter. • Buses run at regular time intervals and with consistent frequencies. • Stable services with minimal changes, removing uncertainty and confusion. • Simple fares with payment through a range of methods. • A system that is accessible and can be used by all. • Plenty of information is readily available.

Four main principles underpin our approach to delivering the bus service improvements in this Strategy:

1. *Achieving a continuous cycle of passenger growth and service improvement*

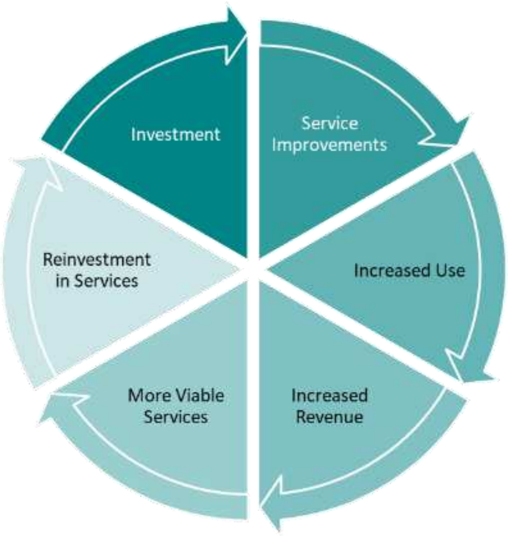


Figure 1 - needs a caption

2. *Using the best operational model of provision to achieve the necessary step change in the most effective way*

We believe that bus franchising could be the best way of delivering a modern, integrated transport system across Cambridgeshire and Peterborough with a fully accessible, low emission, bus network providing affordable, inclusive and integrated travel opportunities.

Bus services are currently provided within a deregulated environment. Commercial operators decide what routes and timetables they are going to offer and the fares they will charge. Where services do not exist or are considered deficient, the Combined Authority can seek to contract with operators and subsidise the provision of additional services.

Recognising that the fully deregulated provision of bus services doesn't work, the Government's National Bus Strategy required areas to introduce Enhanced Partnerships. These involve local authorities and bus operators working in partnership to jointly improve bus services. Enhanced Partnership Plans and Schemes set out how the bus network will be improved, including legally binding commitments by the authority to provide facilities and measures; in return, operators commit to service improvements, such as newer buses. Through such partnerships, authorities gain more influence of the network, although operators still operate within a deregulated environment.

Locally, there are concerns that the current approach does not deliver the best service for the whole Cambridgeshire and Peterborough region. Therefore, the Combined Authority is currently assessing whether introducing bus franchising would be beneficial. This would mean that the Combined Authority would specify all routes, timetables and ticketing arrangements, inviting bus operators to tender for contracts to operate those services.

Franchising itself will not deliver new or improved services, greater reliability or lower fares. These can only be achieved through increased investment in the network. However, what franchising could offer is greater network stability and control over the design and delivery of an improved network of services with a sense of single, integrated system and identity.

3. *Partnership*

Delivering an effective and attractive public transport service will rely on different parties working together from the private, public and voluntary sectors. Central to this will be the Bus Operator Forum, which brings together authorities, operators and different stakeholders.

The overall ambition is for better bus services. These may be provided by a range of different operators, both large and small. Equally, they might be run by the commercial or voluntary sectors, or even by the authority itself. Regardless of how or who runs the services, the network will be seen as a single entity, promoted and delivered as one.

4. *Integration*

Whilst the Bus Strategy is all about the public bus network, it is intended that this be provided in the most effective and efficient way. The comprehensive and extensive nature of the bus network will mean that it should be able to cater for many different needs, including pupils going to school and patients attending hospital appointments. Therefore, the network will be planned to co-ordinate with those other more specialist types of transport, with the aim of achieving economies of scale and best use of all vehicle resources.

The foundation of the Strategy is the transformation of the bus network to offer more buses to more places. The comprehensive network will comprise:

- Services radiating out in all directions from Cambridges and Peterborough to market towns and villages. Some of these will offer more direct routes with fewer stops, making journeys faster.
- City services within Cambridge and Peterborough, including orbital routes offering direct links to peripheral employment and education sites.
- Services connecting market towns.
- Other local services in rural areas, including flexible services that run on demand with app booking, and community-based transport using minibuses and volunteer cars.

This coordinated, planned network will offer levels of connectivity across the region that have never existed before. The simplicity of the network and consistent levels of service will be important in helping everyone understand and use it. Different types of services will run at frequencies shown in the table below, with all services operating at least once an hour. The most frequent will run every 6 minutes. All services will run from early morning through to the evening and on 7 days per week. The intention is to create a network that offers a real alternative to the car.

Wherever possible, measures will be put in place to prioritise road space for buses, or provide new dedicated infrastructure for buses to use, so they can travel unhindered and quickly. Not only will this give faster journeys for passengers, but it also means more efficient use of buses and drivers, allowing more services to be offered with the same resources.

The successful Park & Ride that has served Cambridge well for many years, will continue. However, the more comprehensive overall bus network will mean that more people will be able to make their whole journey by bus, rather than having to drive to a Park & Ride site and change.

It is also intended to maximise use of the Busway, with very frequent services, with links from surrounding areas connecting to it.

The density of services and high frequency will make connections between routes easy to make and with minimal waiting time. This will open up travel opportunities to even more destinations, aided by the ability to use one ticket for the whole journey. Less frequent services will be timed to connect with one another at designated interchange points, where pleasant waiting facilities will be provided for passengers.

Case Study – Cambridgeshire Busway

16 miles of reserved track stretch from St Ives in the north west to Addenbrookes and Trumpington south of Cambridge. With 18 new guided buses refreshing the fleet at the start of 2020, including a dozen unique three axle 100-seater double-deckers to deal with peak loadings and reduce standees, the Busway, largely running on reserved track at steady 56mph, contributes considerably to reducing congestion along the A14 corridor and around the Addenbrookes Biomedical campus. It is a BRT system that exploits all the best features of guided busways.

The ability to reach a range of facilities and services quickly and easily is important for people living in rural areas. This requires a more comprehensive bus network to be put in place, offering links to, from and between more places. Equally, services will be sufficiently frequent and run as directly as feasible.

Dispersed travel demands and spares population mean that it may not always be appropriate to run conventional fixed route bus services. Therefore, other types of services, including demand responsive and community transport provision will be part of the solution. Furthermore, efficiency in the operation of services will be achieved by integrating different travel requirements, including education, social care and health transport.

Case Study - TING

This innovative wide area demand responsive transport scheme uses four vehicles to maintain an anywhere to anywhere bus link in real time across 360 sq. km of west Huntingdonshire. The three conventional bus services in this area (each running 1 – 4 round trips daily) are to be merged into the Ting service by registering significant turn-up-and-go flows as part of the DRT offering to create better journey aggregation and reduce expenditure. This service directly supports our Vision for Bus, giving access for everyone to quick and easy travel. As part of its tender renewal after 12 months of trial operation, two of the vehicles to be used will be new electric minibuses.

Buses need to be able to run without hold-ups and unhindered by traffic. The overall aim of reducing other traffic on the road system, through measures such as road charging, will help buses. However, more will need to be done. Therefore, every bus route will be assessed to identify specific measures that will help buses run faster and more efficiently. Measures including bus lanes, traffic signal priority for buses and introducing restrictions on parking or loading will be considered. Furthermore, traffic restraint measures will be introduced to discourage private transport use and encourage people to swap to the bus. These will include road charging measures, as currently put forward in the Cambridge area.

Processes will be put in place to better manage roadworks and temporary road closures, to minimise any impact on bus services and passengers.

Working with planning authorities, steps will be taken to encourage new development on existing public transport routes and to provide infrastructure that facilitates efficient bus service provision and encourages bus use.

Whilst regular users of buses often consider bus fares to represent reasonable value for money, particularly where attractive day or season tickets exist, non-users perceive bus travel to be costly. Clearly, cost and ticketing can be a barrier to using the bus. Therefore, simple fares and ticketing system play a crucial part in making bus use attractive.

Just one ticket range will be made available, allowing travel on any bus, providing ease of use and flexibility. Tickets will include single, day, week, month and year, along with bundles, such as 10 tickets for use over a 1-month period.

Payment will be available on-bus (cask or contactless) or via app, with payment automatically capped to offer the best ticket deal, providing the cheapest travel option.

Recognising that young people up to 25 years are dependent on buses, but equally have low incomes, they will be offered discounted fares to bridge the transition from child to adult fares.

The comprehensive network of bus services will be promoted as a single, joined up system. There will be a single source of information about all routes, times and tickets, regardless of different operators running services. A simple identifiable brand will be used across the region's bus network and on all information. Simplicity of the information will be aided by the easily understood network and regular timetables. Clear, comprehensive information will be provided on-line, via app and at bus stops, including real time displays indicating when the next bus is due.

There will be strong marketing campaigns encouraging bus use via a range of media, including targeted communications aimed at particular groups of potential users.

Information will be available before and during travel, helping people to plan their journeys and be informed about other details on the way. On-bus audio-visual displays will provide information on journey progress, next stops, delays and other information, such as connections with other services at points ahead.

Travel by bus will be pleasant and comfortable. Passengers will feel safe at all stages of their journeys.

Buses will offer design features that delight customers, including the ability to move around the bus, sit in comfort and have a clear view out of the windows. USB charging will be available at all seats. All buses will be equipped with on-bus CCTV.

Drivers will be trained in smooth driving and customer care.

Bus stops and the walking routes to them will be well maintained and lit. Where feasible, CCTV will be provided. Bus stops will, wherever possible, have shelters, along with seating and information displays. Stops will be kept clear of other vehicles, allowing buses to pull up right at the kerb, enabling easy access on to and off buses. Bus stations and interchanges will be enlarged to accommodate more buses and will offer safe and pleasant waiting environments for customers.

Surveys will be undertaken regularly to measure customer satisfaction with different aspects of the bus network, identifying potential areas for improvement.

Buses make efficient use of road space. A bus can carry the same number of people as up to 70 cars. Modern diesel engines mean much lower emissions and introduction of zero emission electric buses will make for a very clean, smooth and quiet way of travelling.

The aim is for a new, modern fleet of zero emission buses to run services across the region. These will also provide a high standard of comfort for customers, in terms of décor, lighting, temperature and seating.

New bus depots will be established to provide suitable electric charging facilities for the fleet, as well as excellent vehicle maintenance and cleaning facilities and staff accommodation.

Case Study – Electric Buses

The first two electric double-deckers arrived in December 2019 for trial running whilst our successful ZEBRA bid was compiled. The successful bid is now being actioned and will replace all the Park & Ride buses with thirty zero emission double-deckers in Spring 2023. These will dramatically cut NOx and particulates in Cambridge City Centre. By operating many short journeys in the core they will maximise the benefits of the

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Agenda Item No: 2.5

Demand Responsive Transport

To:	Transport and Infrastructure Committee
Meeting Date:	16th November 2022
Public report:	This report does not contain appendices which are exempt from publication under Part 1 of Schedule 12A of the Local Government Act 1972, as amended,
Lead Member:	Mayor Dr Nik Johnson
From:	Oliver Howarth, Bus Strategy Manager
Key decision:	No
Forward Plan ref:	N/A
Recommendations:	The Transport and Infrastructure Committee is recommended to: a) Retrospectively authorise the expenditure to continue to procure the Ting service for the period 17 July to 16 October 2022; and b) Retrospectively authorise the tender and award of a new Ting DRT bus service contract in West Huntingdonshire starting 27 November 2022 for up to three years (1 year + 1 year + 1 year) at a cost of £424,950 per annum.
Voting arrangements:	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 <u>and</u> Peterborough City Council, or their Substitute Members

1 Purpose

1.1 This paper is to outline the outcomes of the Ting trial in West Huntingdonshire, with the Transport and Infrastructure Committee (TIC) asked to retrospectively award a new Ting DRT bus service contract in West Huntingdonshire starting 27th November 2022 for up to three years (1 year + 1 year + 1 year) at a cost of £425,000 per annum.

1.2 In addition, this paper provides information around the need to retrospectively authorise the expenditure to continue to procure the Ting service for the period 17th July to 16th October 2022.

2 Background

2.1 The Ting Demand Responsive Transport (DRT) service commenced running across 360 square km of west Huntingdonshire in October 2021. This is a trial of technology and of operating principles and the service performs much better than anticipated. The service also meets the Authority's Vision for Bus by giving far more travel options to rural residents

2.2 A report to the Combined Authority Board in March 2022 explained that patronage was well ahead of expectations and permission was granted to continue the trial. This decision was based on a sound commercial basis.

2.3 Subsequently the operation rolled forward and continued to operate without formal sanction for payment from July to October (although the Bus Trials budget, which exists for such purposes was more than adequate for funding it). Retrospective sanction by TIC is requested.

2.4 The service is carrying significant passenger numbers (nearly 30,000 per annum) and contributing to modal shift with excellent customer feedback (see information later within the report). Officers made the decision to retender the service from 16th October, rather than allow for its withdrawal. This was an error, as confirmation and approval should have been sought through the TIC in a timely manner. A management review of governance and decision making for the Ting project was commissioned in October to look at this issue and the matter highlighted in Paragraph 2.3.

2.5 Much work is required to create the appropriate legal framework for procurement and the necessary time is considerable. The full procurement process was followed by the ten-day standstill period and the conclusion was that Vectare would provide the service. In order to ensure the smooth transition from the current provider, Stagecoach, to Vectare it was agreed through an Officer Decision Notice (ODN 368/2022) to create the necessary time by obtaining a 6-week extension for Stagecoach, from 16th October to 27th November. It is intended that following the agreement by the TIC that Vectare will set up and commence the Ting service by 28th November.

2.6 Having considered the reduced cost of the service, the cost per passenger being not far from average for a supported service, and the improved customer offer, including the trial use of two zero emission electric vehicles, this report also requests formal authority for the award of a new contract to Vectare for Ting for a period of 1 + 1 + 1 years, at a price of £424,950 per annum.

Ting performance

2.7 The decision to retender the Ting service was informed by an analysis of how the service has been performing since October 2021. The key points from that analysis are set out below:

Number of passenger journeys was 29,600 in this first year October 2021 to October 2022, expected to rise to over 36,000 in Year Two (November 2022 to November 2023).

- Fare income: £35,272 in Year One, expected to rise to £47,000 in Year Two.
- Cost per passenger journey was £14.35 in Year One, (Oct 21 to Oct 22) expected to fall significantly in Year Two. As of 1 October 2022, this figure placed Ting 30th out of CPCA's 46 bus services when ranked by cost per passenger.
- Performance information – People booking immediate transport on the app are typically being picked up within 17 minutes. Every journey length will vary even when the passenger is on the bus and therefore is not measured.
- Usage information – A survey of 296 Ting passengers was conducted in February 2022 and at the same time we conducted face to face interviews with 96 passengers on our conventional bus services in the Ting operating area, which are 150 Tilbrook to St Neots, and the 400/401 Huntingdon rural circulars.

2.8 The market research shows a significant breakthrough into carrying teenagers and young adults on Ting, and that the service was carrying significantly more people to work and school.

2.9 The Market Research indicates clearly that Ting is opening a new demographic for public transport in line with the Authority's remit and our Vision for Bus, and is delivering modal shift, indicated by the number of 16–20-year-olds using Ting and the 121 passengers commuting to/from work. The numbers indicate that the Ting service is generating new traffic in significant volumes.

Market research outputs for Ting v Conventional buses (150, 400, 401)

Age Group, Ting	**16-18**	**19-20**	**21-34**	**35-59**	**60+**
Number of pass	39	21	61	117	57
% of total	13%	7%	21%	40%	19%
Age group, conventional	**16-18**	**19-20**	**21-34**	**35-59**	**60+**
Number pf passengers	3	0	13	18	59
% of total	3%	0%	14%	19%	63%

What is the purpose of your travel on Ting?

Commuting to / from work	Education	Health services	Daily errands	Childcare	Govt or social svcs	Leisure activities	Other
121	34	39	98	10	8	111	30
27%	8%	9%	22%	2%	2%	25%	7%
and on Conventional services							
8	6	2	55	2	3	17	0
9%	6%	2%	59%	2%	3%	18%	0%

Given a choice, would you prefer EITHER a normal bus service OR Ting?

View of Ting passengers		
Normal bus service	15	5%
No answer	2	1%
Ting	279	94%
Total	296	

View of conventional passengers

If only Ting was available, would you use Ting?

Yes	74	80%
No	19	20%

2.10 The statistics above indicate it would have been very disadvantageous to our passengers to have not extended the Ting service contracts.

Significant Implications

3 Financial Implications

3.1 The cost of the Ting service in year 1 was £479,500 which was funded out of the Bus Trial Services budget line. The annual cost of Ting on the new contract from 28th November 2022 will be £424,950, a saving of around £55,000 per annum. It is funded by the Bus Trial Services budget to end of this financial year.

3.2 In 2023/24 onwards the Ting service will be part of the Bus Service Support Budget within the MTFP. The funds to operate the service for the initial 12 months to November 2023 are confirmed to be available.

3.3 It is intended to release £260,000 of Section 106 money for operating Ting around St Neots as the DRT format meets all the local service requirements in a single package. When this happens, it will reduce the cost-of-service provision over three years.

4 Legal Implications

4.1 A new contract with Vectare will be entered into from 27th November 2022 for a period of up to 3 years to deliver the TING service.

5 Public Health Implications

5.1 There are no public health implications

6 Environmental and Climate Change Implications

6.1 CPCA is considering the opportunity to agree to two of the new Ting fleet being small zero emission electric minibuses.

7 Other Significant Implications

7.1 None

8 Appendices

8.1 None

9 Background Papers

Combined Authority Board reports 25 November 2020

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Agenda Item: 2.6

Transforming Cities Fund

To:	Transport and Infrastructure Committee
Meeting Date:	16 November 2022
Public report:	Yes
Lead Member:	Mayor Dr Nik Johnson
From:	Tim Bellamy, Interim Head of Transport
Key decision:	No
Forward Plan ref:	N/A
Recommendations:	The Transport and Infrastructure Committee is recommended 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.

Voting arrangements: Item a) is for Noting only.

For item b) c) and d) 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

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 The purpose of this paper is to set out the expected (forecasted) spend in relation to the Transforming Cities Fund (TCF) and agree the capital replacement schemes that will be undertaken to take up the shortfall. The paper outlines those schemes that cannot be delivered in full against the DfT's fund requirement. The process and criteria used to bring forward potential replacement schemes, and the final TCF list of schemes for submission to the Board and subsequently the Department for Transport (DfT).

1.2 Officers from Cambridgeshire County and Peterborough City Councils have provided input into the capital replacement scheme prioritisation exercise. This exercise and subsequently this report have incorporated suggestions and comments from constituent Councils' Chief Executives and Leaders following a series of meetings in August.

2 Background

2.1 The TCF is a 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. Unlike the large city regions where the application was expected to focus on urban areas, the funding allocated in this region was to improve the quality of life for those within the whole of Cambridgeshire and Peterborough. (i.e., across the urban and rural area) – the fund is not restricted to cities but has to be spent within the boundaries of the Combined Authority.

2.2 The aims of the TCF are to:

- Improve access to good jobs;
- Encouraging an increase in journeys made by low-carbon and sustainable modes;
- Tackling air pollution;
- Access to good jobs;
- Delivering more homes;
- Delivering apprenticeships and improving skills investments; and
- Encouraging the use of new mobility systems and technology as part of the Future of Mobility Grand Challenge established in the Industrial Strategy.

2.3 This was reiterated through the Grant Determination of March 2018, that stated that the purpose of the TCF was to boost productivity, transform intra-city connectivity and reduce congestion through investment in public and sustainable transport in Cambridgeshire and Peterborough. It is therefore imperative that all TCF projects meet at least one or more of these objectives.

2.4 Around half of the TCF (£1.08 billion) was allocated to six Mayoral Combined Authorities (MCAs) on a per capita and devolved basis. Cambridgeshire and Peterborough Combined Authority area allocated £95 million.

2.5 In Cambridgeshire and Peterborough, the TCF has been devolved to the Combined Authority. Decisions about how to invest the fund are taken by the Combined Authority Board in accordance with the aims for the Fund set out in the devolution agreement, the Authority's Constitution, Assurance Framework, and strategic policy framework.

2.6 Within the TCF guidance, government outlined that it recognises Local Authorities were best placed to identify the types of projects to deliver and seeks to partner to develop packages of proposals that deliver transformative improvements in connectivity.

What are the key issues?

2.7 In the March Combined Authority Board Paper, it was stated that projects included within the original Delivery (Implementation) Plan have been delayed for a number of factors including:

- Significant policy changes both nationally and regionally;
- Upgrading LTN 120 / Gearchange compliance within stage design;
- Environmental design additions due to climate change policy changes; and
- Road space clashes with Strategic Road Network schemes.

2.8 As a result, this has resulted in a need for a revision to the way business cases are delivered from their stage inception.

2.9 The paper stated that the Combined Authority will approach the DfT to discuss a potential extension to the delivery completion date due to the delays to project due to COVID impacts on delivery and materials availability. In addition, the paper outlined that, in agreement with DfT colleagues' and Combined Authority Board Members, recommendations would come back to the Combined Authority Board to propose replacing existing projects that are likely to underspend or slip further in 2022/23 with new projects which would be able to deliver within the required timescales.

Current Funding Position: 2022/23

2.10 The total budget for TCF is £95m for Cambridgeshire and Peterborough.

2.11 At the July CPA Board Meeting £347,000 grant funding was approved from the Transforming Cities Fund budget for the North Cambridgeshire Training Centre, located within the Fenland district. Since this was agreed, a further £140,000 has been sought to finalise the project, which is reflected in the cost profiles outlined in Table 1.

2.12 The cost for the Regeneration of the Fenland Railway Stations is expected to increase to £3.67m with expenditure for this year projected to be £267,000.

2.13 Following a robust, thorough review of the programme, it has emerged that there is likely to be an underspend, in the region of £3m (difference between £95m and forecasted spend of £92m detailed in Table 1). The table below illustrates the current position and expected forecast. In order to fully utilise the funding stream, the Combined Authority will be over-programming to £97m to ensure the maximisation of the funding, with the potential to move funding from Gainshare to pay a proportion of the Kings Dyke project (in the region of £2m).

Project title	Spend to Q2 22/23 £'000	22-23 still to spend £'000	23-24 forecast spend £'000	24-25 forecast spend £'000	Total TCF budget £'000	Budget changes £'000	Ref
A1260 Nene Parkway Junction 15	**1,851**	7,111	900	-	**8,960**	**-**	
A1260 Nene Parkway Junction 32/3	**832**	711	5,850	-	**7,387**	**4**	
A141 & St Ives	**276**	1,737	5,715	-	**7,728**	**(848)**	**1**
A16 Norwood Dualling	**634**	227	1,200	-	**1,960**	**(11,220)**	**2**
A505 Corridor	**451**	135		-	**544**	**1**	
Coldhams Lane Roundabout Improvements	**367**	-	-	-	**367**	**(2,434)**	**3**
Fengate Access Study - Eastern Industries Access - Phase 1	**937**	155	11,006	-	**12,025**	**5,672**	**4**
Fengate Access Study - Eastern Industries Access - Phase 2	**392**	1,322	448	250	**2,386**	**230**	**5**
March Junction Improvements	**2,897**	2,114	5,573	-	**10,159**	**3,966**	**6**
Regeneration of Fenland Railway Stations	**3,400**	-	267	-	**3,667**	**(407)**	**7**
Soham Station	**18,584**	175		-	**18,715**	**(2,093)**	**8**
Wisbech Access Strategy	**275**	-		-	**275**	**-**	
Wisbech Rail	**1,600**	241	80	-	**1,899**	**(5,607)**	**9**
ZEBRA capital funding	-	1,963		-	**1,963**	**-**	
A10 Upgrade	-	-	2,000	-	**2,000**	**-**	
North Cambridgeshire Training Centre Roundabout	-	487	-	-	**487**	**140**	**10**
A605 Oundle Rd Widening - Alwalton	**1,006**				**1,006**	**-**	
Cambridge South Station	**1,384**				**1,384**	**-**	
A47 Dualling	**650**				**650**	**-**	
Queen Adelaide Level Crossing	**183**				**183**	**-**	
Transport Services	**66**				**66**	**-**	
King's Dyke	**6,480**	1,700			**8,180**	**(1,509)**	**11**
TCF projects total	**42,265**	**19,861**	**33,039**	**250**	**91,991**		

Table 1: TCF Financial Forecast (£000s)

N.B. grey rows are completed projects; budget changes are relative to the capital programme as amended by the September 2022 CA Board

Reference Number	Scheme	Updated Position (Committee / Board)
1	A141 & St Ives Improvements	July 2022 Board Meeting
2	A16 Norwood	November 2022 TIC Meeting
3	Coldhams Lane Roundabout Improvements	April 2020 TIC Meeting
4	Fengate Access Study - Eastern Industries Access - Phase 1	October 2022 Board Meeting
5	Fengate Access Study - Eastern Industries Access - Phase 2	January 2022 Board Meeting
6	March Junction Improvements	October 2022 Board Meeting
7	Regeneration of Fenland Railway Stations	Included within this paper
8	Soham Station	January 2021 Board Meeting
9	Wisbech Rail	November 2022 TIC Meeting
10	North Cambridgeshire Training Centre Roundabout	November 2022 TIC Meeting
11	King Dyke	October 2022 Board Meeting

Table 2: Governance Position on TCF Schemes

2.13 As a result, there is a need for a revised programme. The process undertaken to determine the capital replacement schemes is outlined below.

Need for a revised programme

2.14 Following a thorough review of the programme it became evident that a number of schemes will not be delivered to the original timescales and costs. This includes the A16 Norwood dualling scheme where significant concerns remain around the possibility of delivering the scheme to the appropriate timescales for TCF. The Combined Authority remain committed to the scheme and have £1.2 million has been assigned from the TCF to continue work on the development of the Full Business Case (pipeline scheme). Therefore, due to the time limited nature of the TCF it was necessary to recycle and reallocate a significant proportion of the funding within the TCF pot.

2.15 Due to a number of concerns remaining around the deliverability of the initial TCF schemes in the timescales, and corresponding potential for a significant underspend, the Combined Authority with partners (Cambridgeshire County Council and Peterborough City Council) have identified and evaluated potential alternative projects which are deliverable in the short term. An initial assessment was undertaken to ensure that the potential capital replacement schemes are deliverable ahead of the March 2024 deadline (previously outlined to central government the deliverability expectations and limitations). Following this evaluation, the proposed replacement schemes were assessed against its good strategic fit against the goals, aims and objectives of the TCF and the emerging Local Transport and Connectivity Plan. This assessment was undertaken by the Combined Authority, Cambridgeshire County and Peterborough City Councils as the Strategic Transport and Highways Authorities.

2.16 Alternative funding sources and delivery programmes will be continually explored for those initial TCF schemes that are not able to be finalised during this financial year. Projects removed from the TCF programme through this exercise cannot be guaranteed alternative funding from within the CPCA's resources.

Replacement projects (including forecasted costs)

2.17 The recommended additional capital replacement schemes that will be funded utilising TCF are:

Scheme	Cost (£m)	District/City
Centre for Green Technology	£2.500	Peterborough
County-wide speed reduction	£0.800	County-wide
Smaller Road Safety Measures including School Streets	£0.100	County-wide
The Brook Crossing, Sutton	£0.225	ECDC
Northstowe Park and Ride Link	£0.500	SCDC
Mill Road, Cambridge	£0.150	CCiC
East Park Street Crossings, Chatteris	£0.260	FDC
Carlyle Road Crossing	£0.225	CCiC
A603 Barton Rd - Driftway Junction	£0.400	CCiC
Addenbrookes Roundabout	£0.200	CCiC
	£5.360	

Table 3: Capital Replacement Schemes

2.18 Effective management of the pipeline of schemes is essential and some ability to flex will be necessary. Firstly, this will allow for any replacement schemes necessary to immediately take up slippage in the programme. In addition, it will also ensure that as and when new, alternative funding sources emerge then the Combined Authority and its partners are in a stronger position to submit robust applications and bids.

Critical project management

2.19 Monitoring and evaluation on the TCF schemes has been and will continue to be carried out in line with the Combined Authority's Monitoring and Evaluation Framework. All projects are subject to robust project management arrangements including monthly highlight reporting – the outputs from which are shared with Members. All projects are required to have a logic model and evaluation plan.

2.20 In addition, we are a partner in the independent gateway review of TCF and are engaging with the independent review team appointed by DfT.

Liaison with central government

2.21 Officers continue discussions with the DfT officials to fully understand government's expectations around the TCF with regards to our spend profile, the potential for project replacements (based on the themes outlined above) and deadline for delivery. Appendix 1 outlines the update provided to DfT by the Combined Authority in October.

2.22 Central government have reiterated that projects need to be delivered by March 2024 (at the latest). It is the Combined Authority's expectation that central government will provide the full £95m budget for TCF, utilising the conditions previously outlined. However, it is important that the Combined Authority and partners continue to build confidence that the programme (including revisions) will be delivered to time and budget. Therefore, the Combined Authority are having regular contact with government to outline the ongoing, robust programme management.

Timescales

2.23 Following approval by this Transport and Infrastructure Committee, the potential revised programme will need to be agreed by the Combined Authority Board later this month to allow sufficient time to deliver the schemes to time and budget.

Significant Implications

3 Financial Implications

3.1 The financial implications are dealt with in the main body of the paper.

4 Legal Implications

4.1 Grant funding agreements will only be completed once the potential revised programme receives approval from DfT and confirmation of funding is also provided.

5 Public Health Implications

5.1 Key components of the TCF objective assessment included an understanding around how the potential capital replacement schemes would improve access to good jobs and skills, as well as tackling air pollution (quality).

6 Environmental and Climate Change Implications

6.1 Key components of the TCF objective assessment included an understanding around how the potential capital replacement schemes would encourage an increase in journeys made by low-carbon and sustainable modes; and tackling air pollution (quality).

7 Other Significant Implications

7.1 None.

8 Appendices

8.1 Appendix 1 – CPCA Update to DfT.

8.2 Appendix 2 – Capital Replacement Scoring Mechanism.

8.3 Appendix 3 – Prioritised (Scored) Capital Replacement Schemes.

9 Background Papers

9.1 None.

TRANSFORMING CITIES FUND

October 2022

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Contents

Introduction

The TCF is a 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. Unlike the large city regions where the application was expected to focus on urban areas, the funding allocated in this region was to improve the quality of life for those within the whole of Cambridgeshire and Peterborough. (i.e., across the urban and rural area).

The aims of the TCF are to:

- Improve access to good jobs;
- Encouraging an increase in journeys made by low-carbon and sustainable modes;
- Tackling air pollution;
- Delivering more homes;
- Delivering apprenticeships and improving skills investments; and
- Encouraging the use of new mobility systems and technology as part of the Future of Mobility Grand Challenge established in the Industrial Strategy.

The Grant Determination of March 2018 stated that the purpose of the TCF was to boost productivity, transform intra-city connectivity and reduce congestion through investment in public and sustainable transport in Cambridgeshire and Peterborough. It is therefore imperative that all TCF projects meet at least one or more of these objectives.

Around half of the TCF (£1.08 billion) was allocated to six Mayoral Combined Authorities (MCAs) on a per capita and devolved basis. Cambridgeshire and Peterborough Combined Authority area received £95 million.

In Cambridgeshire and Peterborough, the TCF has been devolved to the Combined Authority. Decisions about how to invest the fund are taken by the Combined Authority Board in accordance with the aims for the Fund set out in the devolution agreement, the Authority's Constitution, Assurance Framework, and strategic policy framework.

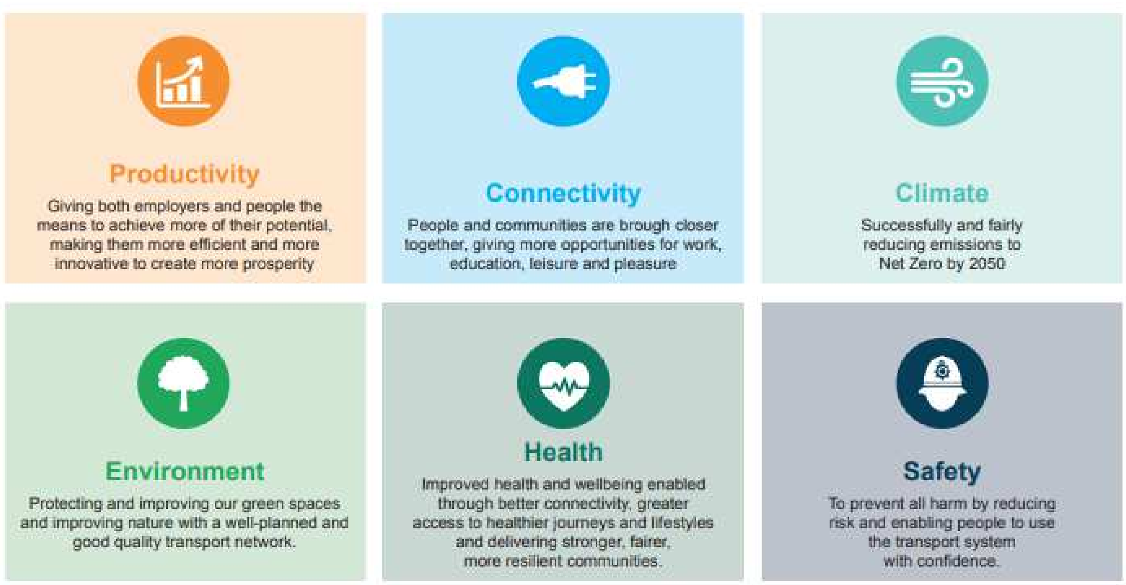
Within the TCF guidance, government outlined that it recognises Local Authorities were best placed to identify the types of projects to deliver and seeks to partner to develop packages of proposals that deliver transformative improvements in connectivity

Alignment with Local Transport and Connectivity Plan

The TCF schemes have and will continue to enable the Combined Authority to deliver its vision for transport. The revised Local Transport and Connectivity Plan (LTCP) is currently being finalised following an extensive 12-week public consultation and engagement exercise. The final LTCP will be published early in the new year.

The revised vision and objectives are outlined below:

> **A transport network which secures a future in which the region and its people can thrive.**
>
> **It must put improved public health at its core, it must help create a fairer society, it must respond to climate change targets, it must protect our environment and clean up our air, and it must be the backbone of sustainable economic growth in which everyone can prosper.**
>
> **And it must bring a region of cities, market towns and very rural areas closer together.**
>
> **It will be achieved by investing in a properly joined-up, net zero carbon transport system, which is high quality, reliable, convenient, affordable, and accessible to everyone. Better, cleaner public transport will reduce private car use, and more cycling and walking will support both healthier lives and a greener region. Comprehensive connectivity, including digital improvements, will support a sustainable future for our region's nationally important and innovative economy.**



In addition, the Combined Authority's Sustainable Growth Ambition Statement outlines that the investment programme recognises six themes, all of which are anchored in the devolution deal. We aim to build up the capital stock of Cambridgeshire and Peterborough across the six dimensions of:

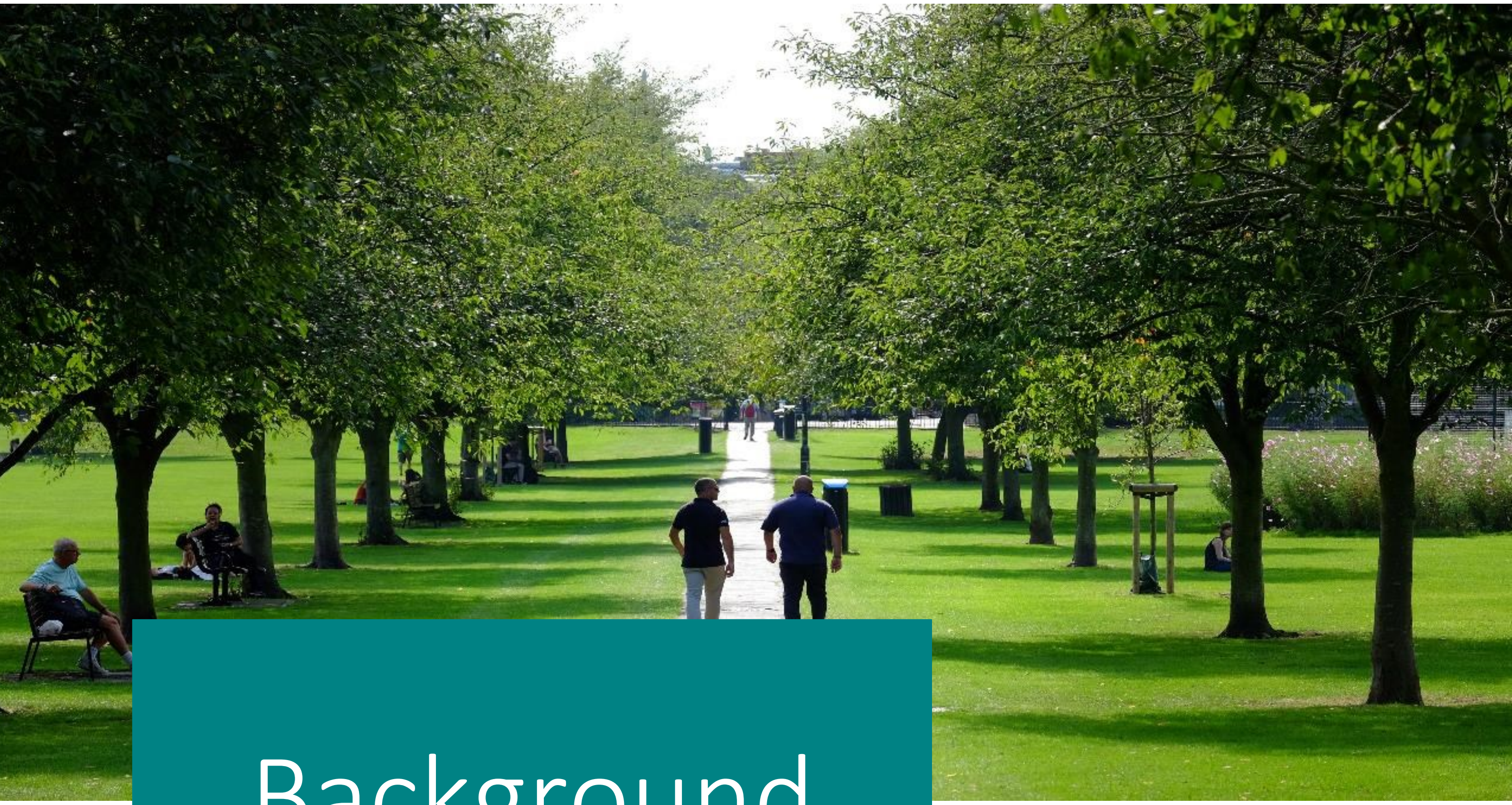
- **People:** building human capital - the health and skills of the population - to raise both productivity and the quality of life so that that people in our region are healthy and able to pursue the jobs and lives they want;
- **Climate and Nature:** restoring the area's depleted natural capital and addressing the impact of climate change on our low-lying area's special vulnerabilities, and encouraging businesses to come up with solutions;

- **Infrastructure:** from digital and public transport connectivity to water and energy, building out the networks needed to support a successful future;
- **Innovation:** building on our reputation for new thinking, new technology and new ideas in Cambridgeshire and Peterborough to ensure this area can continue to be one of the most dynamic and knowledge economies in Europe;
- **Reducing Inequalities:** investing in the community and building social capital to complement improved skills and connectivity as part of the effort to narrow the big gaps in life expectancy and people's income between places;
- **Financial and Systems:** improving the institutional capital – the ways we work, organise, and fund ourselves - which supports decision-making and delivery.

The utilisation of this approach in prioritising spends and schemes will allow the Combined Authority and partners to monitor more outcomes than simply GVA growth (data which is anyway only available from the ONS with a two-year time lag). Progress will be tracked on outcome indicators such as the gap in healthy life expectancy, employment, land use for nature, CO_2 emissions, and earnings gaps and therefore the TCF schemes will assist the achievement of these goals.

As can be seen from the diagram below, there is clear alignment between the TCF objectives, those contained within the LTCP and the six capitals of the Cambridgeshire and Peterborough's Sustainable Growth Ambition Statement.

TCF Objectives	LTCP Objectives	Six Capitals
Improve access to good jobs	Productivity and Connectivity	Reducing Inequalities
Encouraging an increase in journeys made by low-carbon and sustainable modes;	Climate and Environment	Health and Skills
Tackling air pollution;	Environment	Climate and Nature
Delivering more homes;	Productivity	Infrastructure
Delivering apprenticeships and	Productivity	Health and Skills
Encouraging the use of new mobility		Innovation



Background

In Cambridgeshire and Peterborough, the TCF was devolved and decisions about how to invest the fund are taken by the Combined Authority Board in accordance with the aims for the Fund set out in the devolution agreement, the Combined Authority's Constitution, Assurance Framework, and strategic policy framework.

The delivery of an appropriate transport network plays a key, critical role in the realisation of the Combined Authority's ambitions. The programme of measures offers a coherent package of integrated interventions that will transform connectivity across the region and on specific key commuter routes within Cambridgeshire and Peterborough. The Combined Authority is continually challenging the status quo and looking for new, innovative approaches (such as new technologies, engineering solutions and delivery models) to deliver the necessary improvements across the region.

Transport is a key enabler to economic and housing growth. There is strong alignment between the Government's ambitions to transform connectivity through improved public transport and active travel infrastructure, reducing congestion and enhancing air quality, and the aims of the LTCP, and the Combined Authority reflects those priorities in its own arrangements for scheme prioritisation.

The TCF grant is treated as part of the Combined Authority's Investment Fund. Decisions about its allocation to individual projects in support of the overall aims of the Fund and of the Combined Authority are made by the Combined Authority and subject to its local Assurance Framework.

TCF: Revised Profile

Project title	Sept Budget £'000	Actuals YTD £'000	FO Spend £'000	STA O/S & future years	RAG YTD	RAG FO £	RAG Project	Finance commentary
A1260 Nene Parkway Junction 15	8,011	451	7,143	8,960	RED	AMBER	GREEN	On site - construction underway - to be completed by March 2023. Some issues with invoicing and therefore a red RAG rating for YTD
A1260 Nene Parkway Junction 32/3	192	3	27	7,549	AMBER	AMBER	GREEN	Report going to Board in November for drawdown of funds
A141 & St Ives	1,900	-	1,737	7,728	RED	AMBER	AMBER	Work starting to complete by March 2024. Slippage on 2023 spend as none spent to date. Total cost of project to be £8.3 million (if TCF conditions allow, a further £600k will be sought from TCF)
A16 Norwood Dualling	227	51	227	1,200	AMBER	AMBER	RED	OBC completed, FBC to board in Nov at a cost of £1.2m. STA £10m risk. Scheme will not be delivered due to issues with developers and timing of necessary decisions
A505 Corridor	134	21	134	544	AMBER	AMBER	AMBER	Work paused on the A505 ahead of LTCP publication and single prioritised list of schemes
Coldhams Lane roundabout improvements	234	-	-	367	RED	AMBER	RED	Project paused, due to the lack of available funds from partner organisations
Fengate Access Study - Eastern Industries Access - Phase 1	109	37	109	11,837	GREEN	GREEN	GREEN	FBC complete in December, construction to be complete by March 2024
Fengate Access Study - Eastern Industries Access - Phase 2	1,342	14	1,336	2,149	RED	AMBER	AMBER	FBC complete Dec spend to complete by March 2024
March Junction Improvements	2,493	212	2,114	10,159	RED	GREEN	GREEN	Broad St. FBC to Jan board spend completed by March 2024 March walk/cycle approval at Board in October 2022 and spend to be complete by March 2024 Risk contingency to be reallocated c.£252K
Regeneration of Fenland Railway Stations	-	-	-	3,667	GREEN	GREEN	BLUE	Completed project
Soham Station	2,268	22	175	18,715	GREEN	GREEN	BLUE	Completed project with underspend reinvested
Wisbech Rail	241	11	241	3,089	AMBER	AMBER	AMBER	Paper to November board for rail modelling. Cost of £350K
ZEBRA capital funding	6,258	-	6,258		RED	GREEN	GREEN	Purchase of E-buses - confident will spend
Local Transport Plan	-	22	100	100	GREEN	GREEN	GREEN	Spending against STA value
A10 Upgrade				1,726	GREEN	GREEN	GREEN	Project continuing using alternative funding
A605 Oundle Rd Widening - Alwalton			1,006	1,006	GREEN	GREEN	GREEN	Study finalised
Cambridge South Station			1,384	1,384	GREEN	GREEN	GREEN	Study finalised
A47 Dualling			650	650	GREEN	GREEN	GREEN	Study finalised
Queen Adelaide Level Crossing			183	183	GREEN	GREEN	GREEN	Study finalised
Transport Services			66	66	GREEN	GREEN	GREEN	Assistance with strategy and scheme development (register)
Kings Dyke			1,700	3,209	GREEN	GREEN	GREEN	Scheme delivered ahead of schedule (6 months) - case study within main document provides more information
TCF projects	**23,409**	**843**	**19,601**	**84,288**				

(Note: the re-forecast and revised programme is subject to Board approval in November; however, Leaders have been engaged and understand the need and changes expected). 7

Current Assessment: Key Issues

Some schemes such as Soham Station have been delivered to less than the cost originally envisaged (savings) and these funds have been reinvested within the overall TCF pot for Cambridgeshire and Peterborough.

In addition, a number of projects included within the original Delivery (Implementation) Plan have been delayed for a number of factors including:

- Significant policy changes both nationally and regionally;
- Upgrading LTN 120 / Gearchange compliance within stage design;
- Environmental design additions due to climate change policy changes; and
- Road space clashes with Strategic Road Network schemes.

Due to the number of concerns, outlined above, around the deliverability of the initial TCF schemes in the timescales, resulting in a potential underspend of £11m; the Combined Authority with partners (Cambridgeshire County Council, Peterborough City Council, and the Greater Cambridge Partnership) have been, and will continue to, identify potential alternative projects which are deliverable in the short term.

Any proposed replacement scheme needs to demonstrate a good strategic fit with the goals, aims and objectives of the TCF itself, the emerging Local Transport and Connectivity Plan and the six capitals of the Sustainable Growth Ambition Statement. These schemes are categorised by themes that align closely with the LTCP, namely road safety; active travel; supporting growth; public transport and active travel; footway improvements; and public rights of way.

The recommended (prioritised) capital replacement schemes will seek approval at the Transport and Infrastructure Committee and subsequent Combined Authority Board meetings in November, thereby ensuring their effective delivery within the timescales of the fund.

In the meantime, Combined Authority officers will continue to liaise with the Department for Transport (DfT) to build confidence around the deliverability of the overarching programme. As part of this process, officers will be demonstrating the appropriate governance and programme management measures that are in place to ensure the effective management of the revised TCF programme.

Case Study: Soham Station

Total Cost: £18.75m

Cost Saving (on estimate): £1.918m

Opened: 13th December 2021

Key Facts: Greater Anglia's first passenger train called at Soham station at 06:57 on Monday 13th December making it the first service since 1965 to serve Soham.

Delivery

Funded through a TCF £18.6million investment, the Cambridgeshire & Peterborough Combined Authority delivered a new railway station for the community, reconnecting Soham to the rail network for the first time in 56 years. The opening of the new station is the realisation of a long campaign to rebuild the station which was closed and demolished in the mid-1960s. The new station provides residents and local businesses with better connections and will help support more investment as part of the Council's vision for the wider area.

Why was it important?

- Soham is a growing market town, with housing and job opportunities increasing quickly;
- Without a rail connection this growth would have been stifled or have placed extra pressure on roads, buses, and the local environment;
- We are committed to providing practical links to public transport networks across the region, to help people travel in a sustainable and convenient way; and
- Without a rail connection to nearby towns, job opportunities for the people of Soham were fewer, holding back economic growth.

What difference is the project making?

Reopening the station in Soham has had major impact:

- Making rail travel easy for people in Soham and the nearby villages;
- Encouraging growth, housing, and jobs in the area; and
- Linking Soham to nearby communities.

Soham Station Footbridge installation video

Soham Station construction timelapse

The new station at Soham includes

- A single 99 metre platform to accommodate four car train services including waiting shelters, lighting, information screens and a public address system;
- A stepped footbridge across the railway to connect to an existing public right of way, designed for future installation of lifts if a second platform is constructed;
- A car park to accommodate 50 vehicles and four spaces for blue badge holders, as well as lighting masts and a drop off/pick up area; and
- Cycle parking and ticket vending machines on the station forecourt

MAYOR'S BLOG: PLATFORM FOR THE FUTURE

Case Study: Kings Dyke

Opened: 11th July 2022

Key Facts: Opened six months ahead of schedule

The A605 is an important east-west route between the Fens and Peterborough, providing connections to the A1(M) and the A47 via the Peterborough Parkway Network. It currently suffers significant congestion during closures at the level crossing which services approximately 120 daily train movements. The scheme's objective is to remove this road-rail conflict.

For some fifty years, people around Fenland and the market town of Whittlesey have campaigned for a solution to rising delays at the notorious crossing.

The main contractor, Jones Bros Civil Engineering UK, was appointed for the construction phase which commenced on 15th June 2020. The scheme is forecast to complete in December 2022 and the project remains on programme to achieve this.

The new road scheme was opened, including a bridge over the Ely to Peterborough railway line as well as two new roundabouts. The new layout, chiefly funded by the Combined Authority and delivered by Cambridgeshire County Council, has cost £32 million and is designed to end the blockage caused by the King's Dyke Level Crossing which will be closed and removed in the ensuing last stage of the construction.

The major project was delivered thanks to the support of several partners, including Fenland District and Whittlesey Town Councils and the Cambridgeshire and Peterborough Combined Authority, which provided the lion's share of the funding.

Feedback from members, including the mayor

"This is a triumph for everyone who has worked to make it happen. Helping get landmark projects like this off the ground is exactly what the Combined Authority was created for.

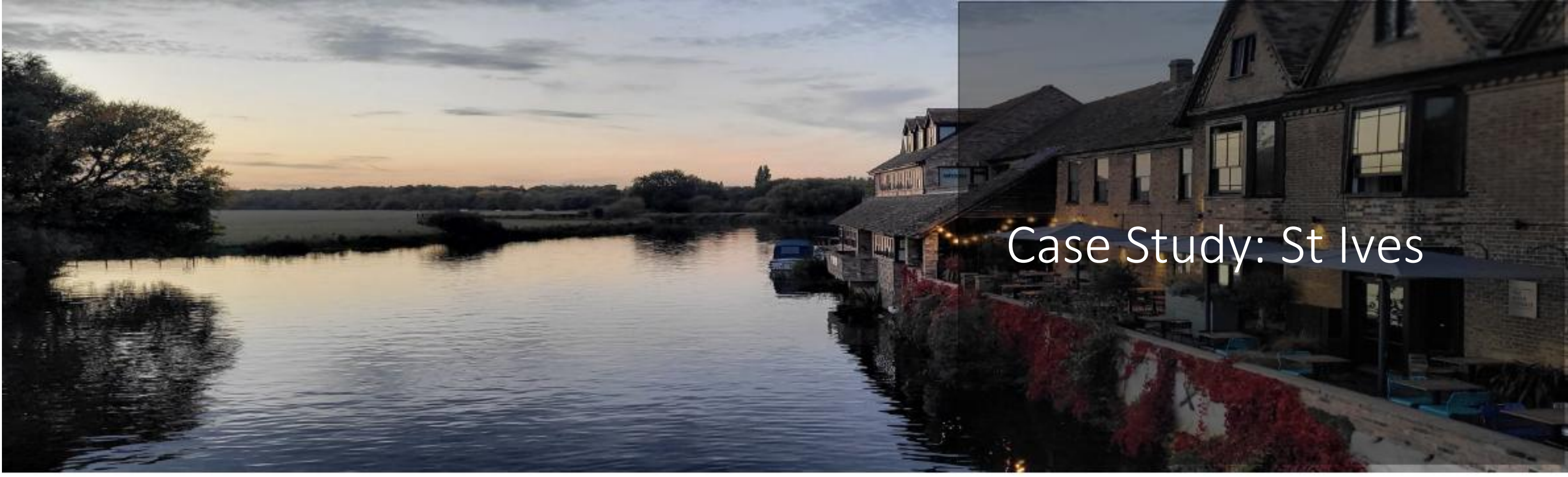
"We're here to support ambitious schemes that will benefit all the community and turn sustainable growth into reality for all. With Combined Authority backing, Cambridgeshire and Peterborough can think big and deliver real change for the wider public good."

Overall, the King's Dyke scheme will support sustainable housing and job growth within Whittlesey, as well as reducing the unnecessarily long journey times that have for so long added costs to business, emissions to the environment, and stress to motorists. In peak periods, the level crossing barrier can be down for up to 23 minutes an hour – and future rail plans mean the number of trains travelling along the route may well increase. "

Mayor of Cambridgeshire & Peterborough Dr Nik Johnson

"This is a momentous day and one which has only been made possible thanks to the hard work of so many people".

Cllr Chris Boden, Leader of Fenland District Council, and local County Council member for Whittlesey North



Case Study: St Ives

In April 2018, the A141 Huntingdon Capacity Study (commissioned by the Combined Authority) and the St Ives Area Transport Study (commissioned by Cambridgeshire County Council) commenced as a joint delivery study to consider the capacity challenges in the area. Following this, in March 2019, the Combined Authority approved the commissioning of a Huntingdon Third River Crossing feasibility study to also consider how that proposal might address the capacity challenges in the area.

In January 2020 the Combined Authority's Transport and Infrastructure Committee and Combined Authority Board agreed as part of the overall package to develop and implement an identified programme of St Ives improvements that included pedestrian and cycle accessibility improvements, junction improvements and further traffic management initiatives.

Whilst work is continuing on the business case work for the St Ives scheme (SOBC and subsequently OBC) the cost for the combined A141 and St Ives work is estimated to be in the region of £6 million and take two years to deliver. As a key component of the overall package of measures the St Ives Local Scheme Improvements have been agreed and work has started costing £2.3 million. The schemes build on the Options Appraisal report from 2020 and these are due to be in delivery imminently.

This includes work on:

- Package 1 – St Ives Town Centre – Package of schemes
- Package 2 – Silvaco West Roundabout Improvement (A1123 / B1040) and right turn ban Needingworth Road to A1123 Audrey Lane
- Package 3 – Bus Stop Improvements
- Package 4 – Walking and Cycling Signage Improvements
- Package 5 – Non-Motorised User (NMU) Routes Development Study

Capital Replacement Scheme

Potential Use of Funds – Capital Replacement Scheme

As outlined previously, the Combined Authority is looking at key schemes that can be delivered in short order by way of capital replacement to utilise the potential £11m underspend in the TCF programme. One of the schemes that is likely to be funded is the *Centre for Green Technology* in Peterborough (subject to Member approval). This scheme is not a traditional transport scheme and has emerged as a priority following effective engagement and cross directorate working within the Combined Authority.

Centre for Green Technology

The Centre for Green Technology is a core, priority project identified at a strategic level within the Peterborough City Council Town Investment Plan, and the Inspire Education Group Estates Strategy. The objective is to provide learning space to increase capacity for skills development in green technologies. This Outline Business Case (OBC), building on the previously prepared Strategic Outline Business Case (SOBC), seeks to determine the type and format this provision of increased skills development capacity should take.

This project seeks support to deliver a three-storey specialist educational building at Peterborough College to provide qualifications for students aged 14 to adult. The building equates to approximately 10% of the site's GIFA. The curriculum offer will cover motor vehicle and construction areas, providing specific green technologies skills for the current and future workforce. The need for both the building and the new curriculum offer has been clearly demonstrated in the business case written by independent consultants for the Peterborough Town's Fund.

The proposed project aligns closely to the issues identified as the case for change and the vision and objectives, in particular, it will:

- Support economic recovery from Covid 19 and reducing the risk of unemployment.
- Improving accessibility to vocational and technical qualifications.
- Contribute to achieving net zero, both through provision of a high-quality low carbon buildings and via the development of green technology skills within the labour force; therefore, overcoming challenges linked to IEG's existing estate at Peterborough College.
- Reduce inequality and regional disparity in educational standards allowing young people in Peterborough the same opportunities as young people elsewhere; particularly in high growth sectors including 'green' construction and automotive/engineering which currently suffer from skills shortages.
- Raise productivity levels through enhanced human capital, culminating in access to higher value employment and higher salaries and therefore helping to alleviate socioeconomic challenges linked to unemployment.
- Meet growing local demand for skilled workforce in the 'green' construction and automotive/engineering sectors.
- Ensure Peterborough and its labour market is prepared for the major programme of inward investment forecast over the next twenty years (i.e., £600m of investment, 19,440 new homes, 76ha employment land and 17,600 new jobs).
- Foster closer collaboration between stakeholders in the education and green technology sectors to support pathways to learning and employment and promote growth in key training areas.

Scheme Information				Deliverability Assessment		Political
Ref #	Scheme Name	Promoter	Local Area Covered (District[s])	Deliverability (Deadline Date)	Deliverability (RAG - confidence)	Level of political commitment
1						
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Ref #	TCF Objectives											
	Improve access to good jobs		Increase in journeys made by low-carbon and sustainable modes		Tackling air pollution		Delivering more homes		Delivering apprenticeships and improving skills investments		Encouraging the use of new mobility systems and technology	
	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment
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Ref #	LTCP Objectives																					
	Productivity								Connectivity				Health				Safety		Environment		Climate	
	Housing		Employment		Business & Tourism		Resilience		Accessibility		Digital		Health & Wellbeing		Air Quality		Safety		Environment		Climate	
	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment	Score (1-5)	Comment
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Ref #	Scheme Name	Promoter	Cost (£m)	Comment	Local Area Covered (District[s])	Deliverability (RAG - confidence)	TCF Objectives: Improve access to good jobs – Score (1-5)	Comment	Increase in journeys made by low-carbon and sustainable modes – Score (1-5)	Comment	Tackling air pollution – Score (1-5)	Comment	Delivering more homes – Score (1-5)	Comment	Delivering apprenticeships and improving skills investments – Score (1-5)	Comment	Encouraging the use of new mobility systems and technology – Score (1-5)	Comment	TOTAL (/30)	TOTAL (%)
1	Centre for Green Technology	CPCA	2.500		Peterborough	Green	4	Indirect - but the skills learned at the CGT will access to better quality jobs	5	Indirect - but the skills learned at the CGT will enable this in the longer term. The objective is to provide learning space to increase capacity for skills development in green technologies	4	Indirect - but the skills learned at the CGT will enable this in the longer term	3	Neutral	5	Specialist educational building at Peterborough College to provide qualifications for students aged 14 to adult. Improving accessibility to vocational and technical qualifications	5	CGT aims to improve the skills and innovate to encouragage the use of new systems and technology	26	87%
5	County-wide speed reduction	CCC	0.800	£1m - seeking annual renewal	County-wide	Green	4	Indirect - area-wide improvement	5	County-wide speed reduction will improve conditions for cyclists, predestrians and encourage sustainable modes.	5	County-wide speed reduction will improve conditions for cyclists, predestrians and encourage sustainable modes, and reduce through traffic	4	Indirect - County-wide improvement	3	CCC has an established apprenticeship scheme and encourages supply chain.	3	No new mobility improvements	24	80%
6	Smaller Road Safety Measures including School Streets	CCC	0.100		County-wide	Green	4	Indirect - area-wide improvement	5	Encourages sustainable travel to schools County-wide	5	Encourages sustainable travel to schools County-wide	4	Indirect - County-wide improvement	3	CCC has an established apprenticeship scheme and encourages supply chain.	3	No new mobility improvements	24	80%
26	The Brook Crossing, Sutton	CCC	£0.225	Outline design complete, detailed design to be complete Feb 23. Waiting on stakeholder feedback (no issues anticipated). Fine for delivery in TCF window.	ECDC	Green	5	Improves sustainable transport between housing, employment areas and schools	5	Improves pedestrian & cycle access to centre/school and promotes active travel and walking to school	4	Encourages sustainable travel to schools	3	Neutral	3	CCC has an established apprenticeship scheme and encourages supply chain.	4	Modern signal technology will be used to allow efficient use of crossing.	24	80%
8	Northstowe Park and Ride Link	CCC	0.500	125k s106	SCDC	Green	4	Improves PT and active travel access to future employment area and PT hub on strategic growth site.	5	Improves PT and active travel access to and PT hub on strategic growth site.	4	Improves PT and active travel access.	5	Improves PT and active travelroutes by filling a 'missing gap' at the Northstowe strateic growth site.	3	CCC has an established apprenticeship scheme and encourages supply chain.	3	No new mobility improvements	24	80%
11	Mill Road, Cambridge	CCC	0.150		CCiC	Green	4	Improves sustainable transport between housing and employment areas	5	Sustainable transport improvements	5	Sustainable transport	4	Indirect - supports growth in the area	3	CCC has an established apprenticeship scheme and encourages supply chain.	3	No new mobility improvements	24	80%
24	East Park Street Crossings, Chatteris	CCC	£0.260	Outline design complete, detailed design to be complete Feb 23. Waiting on stakeholder feedback (no issues anticipated). Fine for delivery in TCF window.	FDC	Green	5	Improves sustainable transport between housing and employment areas	5	Improves pedestrian & cycle access to centre and promotes active travel	5	Sustainable transport improvements to local businesses and schools	3	Neutral	3	CCC has an established apprenticeship scheme and encourages supply chain.	3	No new mobility improvements	24	80%
25	Carlyle Road Crossing	CCC	£0.225	Outline design complete, detailed design to be complete Feb 23. Waiting on stakeholder feedback (no issues anticipated). Fine for delivery in TCF window.	CCiC	Green	5	Improves sustainable transport between housing and employment areas	4	Improves pedestrian & cycle access to centre and promotes active travel	5	Sustainable transport improvements at an accident cluster site	3	Neutral	3	CCC has an established apprenticeship scheme and encourages supply chain.	4	Modern signal technology will be used to allow efficient use of crossing.	24	80%
21	A603 Barton Rd - Driftway Junction	CCC	0.400	Signal and cyclepath upgrades. Work due to start on site end of Feb 23.	CCiC	Green	5	Improves sustainable transport between housing, employment areas and schools.	4	Improves pedestrian & cycle access to centre and promotes active travel	5	Sustainable transport improvements	3	Neutral	3	CCC has an established apprenticeship scheme and encourages supply chain.	4	Modern signal technology will be used to allow efficient use of crossing. Advanced signal heads with cycle phases	24	80%
7	Addenbrookes Roundabout	CCC	0.200		CCiC	Green	4	Indirect - supports growth in the area	5	Measures to improve cycling permeability and safety	5	Sustainable transport	4	Indirect - supports growth in the area	3	CCC has an established apprenticeship scheme and encourages supply chain.	3	No new mobility improvements	24	80%

Ref #	LTCP Objectives – Productivity: Housing – Score (1-5)	Comment	Productivity: Employment – Score (1-5)	Comment	Productivity: Business & Tourism – Score (1-5)	Comment	Productivity: Resilience – Score (1-5)	Comment	Connectivity: Accessibility – Score (1-5)	Comment	Connectivity: Digital – Score (1-5)	Comment	Health: Health & Wellbeing – Score (1-5)	Comment	Health: Air Quality – Score (1-5)	Comment	Safety: Safety – Score (1-5)	Comment	Environment: Environment – Score (1-5)	Comment	Climate: Climate – Score (1-5)	Comment	Political: Level of political commitment
1	1	N/A	4	Raise productivity levels through enhanced human capital, culminating in access to higher value employment and higher salaries and therefore helping to alleviate socioeconomic challenges linked to unemployment.	1	N/A	3	Meet growing local demand for skilled workforce in the 'green' construction and automotive/engineering sectors	5	Reduce inequality and regional disparity in educational standards allowing young people in Peterborough	3	Increase access to digital technology through the provision of equipment at the college - allowing those previously without access to digital infrastructure to gain	1	N/A	3	The objective is to provide learning space to increase capacity for skills development in green technologies thereby offering benefits to the local community in the longer term	1	N/A	5	The objective is to provide learning space to increase capacity for skills development in green technologies - thereby offering benefits to the local community in the longer term	5	Contribute to achieving net zero, both through provision of a high-quality low carbon buildings and via the development of green technology skills within the labour force; therefore, overcoming challenges linked to IEG's existing estate at Peterborough College.	Very High
5	3		3		3		3		4		1		5		5		5		5		5		Very High
6	3		3		3		3		5		1		5		5		5		5		5		Very High
26	4		4		3		3		4		3		3		3		5		4		4		
8	5		5		3		3		5		1		3		3		4		3		3		
11	3		3		5		3		4		1		5		5		4		5		5		Very High
24	4		4		3		3		4		3		4		4		4		4		4		
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21	4		4		3		3		4		1		4		4		4		4		4		
7	3		3		3		2		4		1		5		5		4		5		5		

Scheme	Cost (£m)	District/City
Centre for Green Technology	£2.500	Peterborough
The Brook Crossing, Sutton	£0.225	ECDC
Babraham Park and Ride Extension, Cambridge	£1.300	SCDC, CCiC
Northstowe Park and Ride Link	£0.500	SCDC
Mill Road, Cambridge	£0.150	CCiC
East Park Street Crossings, Chatteris	£0.260	FDC
Carlyle Road Crossing	£0.225	CCiC
Huntingdonshire - Rights of Way network improvements	£0.012	HDC
Maids Causeway / Victoria Avenue	£0.240	CCiC
	£5.412	

Scheme	Cost (£m)	District/City
Centre for Green Technology	£2.500	Peterborough
County-wide speed reduction	£0.800	County-wide
Smaller Road Safety Measures including School Streets	£0.100	County-wide
The Brook Crossing, Sutton	£0.225	ECDC
Northstowe Park and Ride Link	£0.500	SCDC
Mill Road, Cambridge	£0.150	CCiC
East Park Street Crossings, Chatteris	£0.260	FDC
Carlyle Road Crossing	£0.225	CCiC
A603 Barton Rd - Driftway Junction	£0.400	CCiC
Addenbrookes Roundabout	£0.200	CCiC
	£5.360	

	Number	Budget
PCC	1	2.500
Cambridge	3	£1.68
Fenland	2	#REF!
South Cam	2	1.800
East Camb	1	£0.225
Huntingdo	1	0.012