SKANSKA

Phase 1 Report

Wisbech Access Study

August 2017

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Wisbech Access Study

Phase 1 Report

Cambridgeshire County Council / Fenland District Council

August 2017

This document and its contents have been prepared and are intended solely for Cambridgeshire County Council / Fenland District Council's information and use in relation to the Wisbech Access Study.

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1. Introduction

The Wisbech Access Study

The Wisbech Access Study is a large scale option assessment of multiple highway improvement schemes, at numerous locations within the vicinity of Wisbech, Cambridgeshire.

The purpose of the options assessed is to facilitate the growth sites identified within Fenland District Council's Local Plan (adopted May 2014).

The Wisbech Access Study has been divided into two distinct phases.

Phase 1 is a series of individual option studies and scheme assessments that consider a range of potential highway improvement options to facilitate the Local Plan growth agenda.

The outcome of Phase 1 is a range of options that have been demonstrated to operate to an acceptable standard, either on their own, or to have potential to operate well in conjunction with other schemes. It is these options that will be incorporated into a series of packages and progressed to Phase 2 of the study.

Phase 2 is the packaging assessment which develops, and tests multiple packages of schemes (identified from Phase 1 of the study), to determine which is the preferred package, and should be and progressed to an Outline Business Case for funding.

The areas of focus for the Wisbech Access Study have been identified by previous transport modelling work undertaken up until March 2015, and have been defined within the study brief. These are set out beneath.

Phase 1: Individual Scheme Assessments

The individual scheme areas that have been considered within the Wisbech Access Study are:

1. The operation of:
    - Cromwell Road;
    - Elm High Road;
2. Freedom Bridge Roundabout;
3. Wisbech Bus Station;
4. New River Crossing ;
5. Western Link Road;
6. Southern Access Road;
7. New A47 Junctions;
    - East – in the vicinity of Broad End Road Junction; and,
    - South – in the vicinity of New Bridge Lane.

The study structure and component parts are shown in Figure 1.1 beneath.

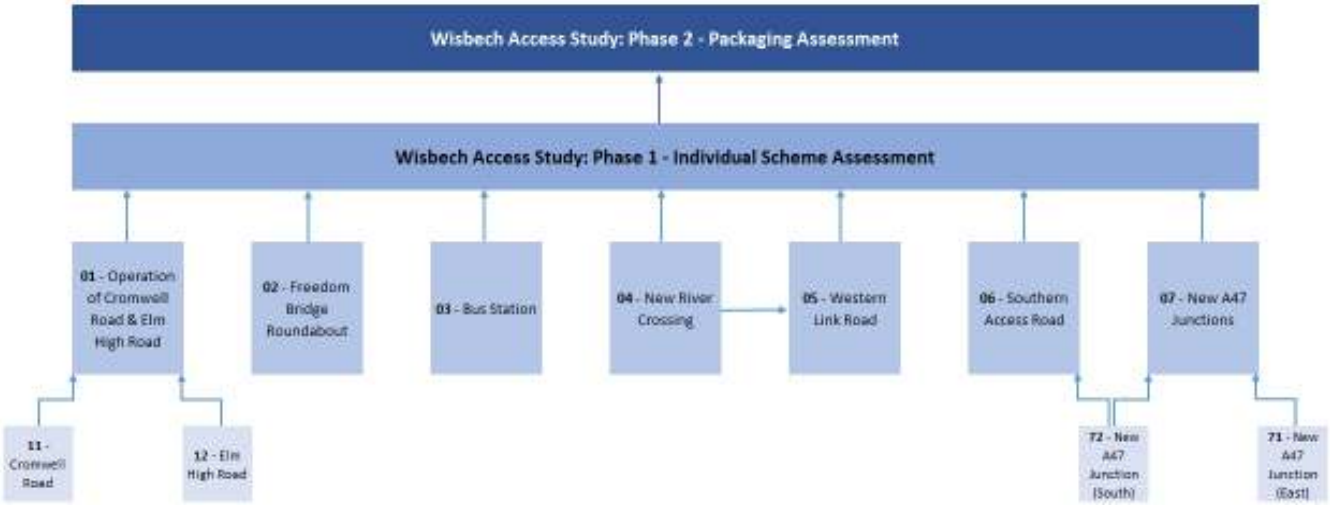


Figure 1.1: Wisbech Access Study – Project Structure

Each of the individual scheme areas listed above are outlined within specific chapters within this overarching report, with further detail provided within a dedicated individual scheme report which accompanies this Phase 1 Report.

Study Report Structure

The Wisbech Access Study is a large study with many component parts, including supporting reports and technical notes. The Figure below sets out how the accompanying reports fit within the context of the study.

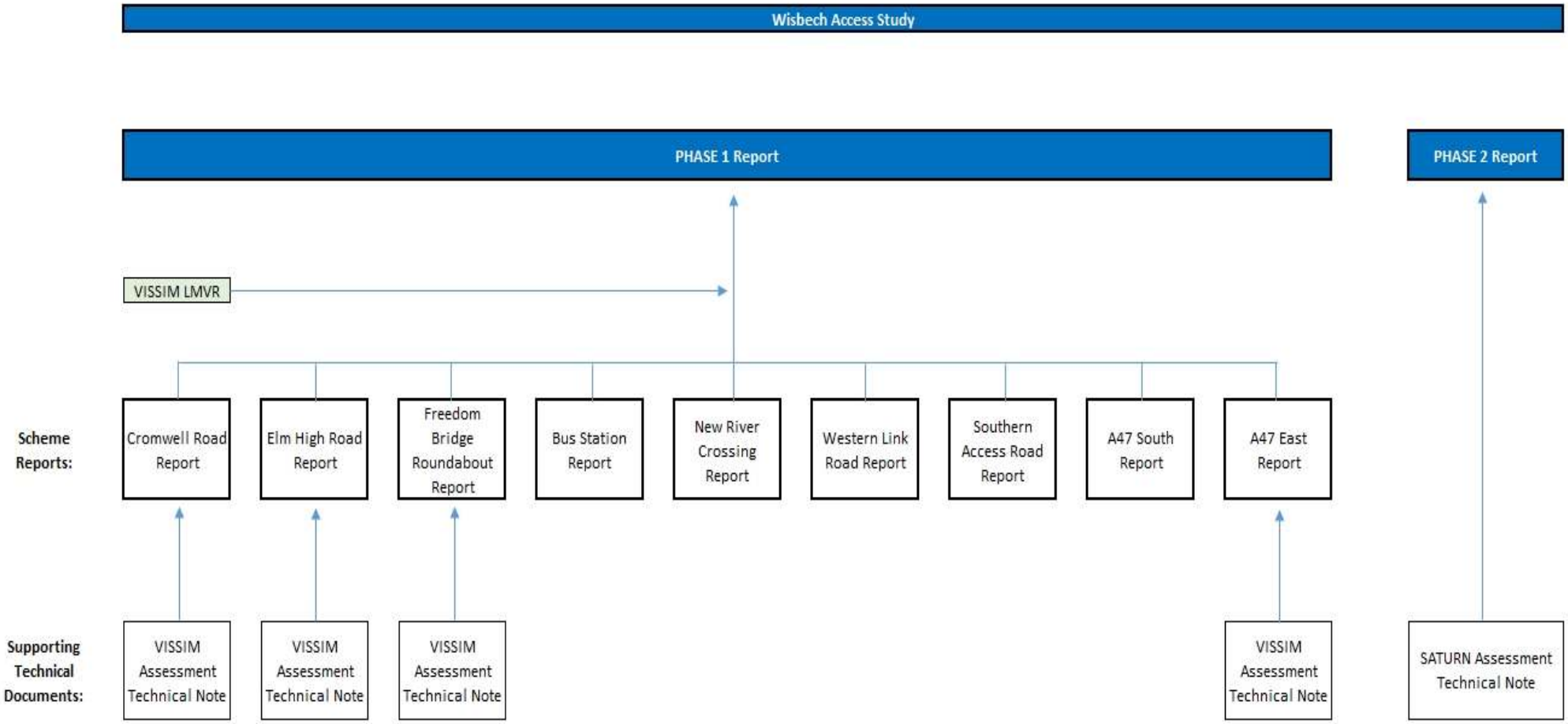


Figure 1.2: Wisbech Access Study – Report Structure

The Phase 1 Report

This is the overarching Phase 1 Report. The purpose of the Phase 1 Report is to provide the overarching context for each of the individual option assessments, as well as to provide the policy context and detail the data collection programme that has informed this study.

The Phase 1 Report includes a chapter for each of the individual scheme assessments, providing a headline summary of the existing issues, how options have been developed and assessed, and the high level results of the option testing. Further detail on each of these individual areas is provided within the standalone reports that accompany this Report.

This Phase 1 Report is structured as follows:

1. **Introduction** – An explanation of the purpose and structure of the Wisbech Access Study, and this Report;
2. **Policy Context** – An explanation of the policy context, development aspirations and key drivers for Wisbech;
3. **Data Collection** – Detail of the data collection programme that has been used to inform this study, including traffic counts, car park occupancy surveys and Satellite Navigation data;
4. **Existing Conditions** – A summary of the existing conditions within Wisbech based on the data collection described in the preceding chapter;
5. **Assessment Approach** – A summary of the general approach to scheme assessment. Details regarding the specific assessment of each of the schemes are contained within the relevant scheme reports.
6. **Highway Design** – A summary providing details on the level of highway design and cost estimates undertaken.
7. **Cromwell Road** – A summary providing details of the Cromwell Road scheme assessment, with further detail provided in a dedicated report;
8. **Elm High Road** – A summary providing details of the Elm High Road assessment, with further detail provided in a dedicated report;
9. **Freedom Bridge Roundabout** – A summary providing details of the Freedom Bridge Roundabout assessment, with further detail provided in a dedicated report;
10. **Bus Station** – A summary providing details of the Bus Station assessment, with further detail provided in a dedicated report;
11. **New River Crossing** – A summary providing details of the New River Crossing assessment, with further detail provided in a dedicated report;
12. **Western Link Road** – A summary providing details of the Western Link Road assessment, with further detail provided in a dedicated report;

13. **Southern Access Road** – A summary providing details of the Southern Access Road assessment, with further detail provided in a dedicated report;

14. **A47 East Junction** – A summary providing details of the A47 East Junction assessment, with further detail provided in a dedicated report;

15. **A47 South Junction** – providing a summary of the A47 East Junction assessment, with further detail provided in a dedicated report; and,

16. **Phase 1 Summary** – A summary of the Phase 1 Assessment.

Previous Work

The Wisbech Access Study builds upon previous transport assessments undertaken to date, including:

Wisbech Area Transport Study (2008 – 2013)

The Wisbech Area Transport Study (WATS) was completed between 2008 and 2013. As part of the study a traffic model was built to test different scales of housing and job growth around Wisbech, ultimately informing the Fenland Local Plan (2014). The WATS Study also included a Wisbech Transport Mitigation Strategy to ensure that transport issues associated with the growth agenda could be addressed.

The work and subsequent results were reported in a series of technical notes, all of which are available on Fenland District Council's website at the following location:

http://www.fenland.gov.uk/article/7085/Wisbech-Area-Transport-Study

The technical notes are summarised beneath:

- **Technical Note A** - A summary of the original traffic modelling undertaken in 2009;
- **Technical Note B** - Analysing the future year trip distribution. This note contains the results of further analysis that was undertaken on the traffic modelling that forms part of technical note A;
- **Technical Note C** - Public Transport Choice Modelling;
- **Technical Note D** - Traffic modelling results from 2011 based on the Shaping Fenland's Future Options;
- **Technical Note E** - Traffic modelling results from February 2012 based on the Neighbourhood Planning Options;
- **Technical Note F** - Traffic modelling results from December 2012 which includes the Neighbourhood Planning Options from Technical Note E and the solutions set out in the Wisbech Transport Mitigation Strategy (See Technical Note G)
- **Technical Note G** - The Wisbech Transport Mitigation Strategy - setting out the options that were considered to address the transport issues associated with housing and employment development in Wisbech.
- **Technical Note H** - Traffic modelling results from August 2013 focusing on options for the location of 550 homes around Wisbech.

- **Technical Note I** - 2014 traffic modelling showing the results of the sensitivity testing. This testing focused on the effects of longer distance journeys and additional traffic onto the A47. It should be noted that it was this project which identified the scheme areas which are now defined in the Wisbech Access Study.

Wisbech Traffic Modelling Update and Test (2015)

This work updated the results of the Wisbech Area Transport Study after the adoption of the Fenland Local Plan (May 2014). Details on this work are also available on Fenland District Councils website at:

http://www.fenland.gov.uk/article/7085/Wisbech-Area-Transport-Study

WATS Model Update (2015 – 2017)

The traffic model built as part of the WATS Study discussed above was originally built to a 2008 base year. Traffic models typically only have a shelf life of 5 years, and so further work was undertaken between 2015 and 2017 to update this model to a 2015 base year, to ensure that it could continue to be used for future assessments.

The model update is described within the Local Model Validation Report (LMVR) and the Forecasting Report, both of which are available at http://www.fenland.gov.uk/.

The updated WATS model has been used to provide the future year traffic flows, including forecasts for the Fenland Local Plan development sites.

Wisbech Pedestrian Audit (2016)

Skanska undertook a pedestrian audit of key routes throughout Wisbech in early 2016. The report identifies improvements which could enhance the pedestrian and cyclist environment on routes across the town, which would ultimately benefit additional users such as mobility and visually impaired users.

To help identify improvements, the routes were broken down into street sub-sections and a walking audit was undertaken, including video capture. The audit included an assessment of the footway quality, condition, width, street clutter and capacity. In addition an appraisal of crossings, wayfinding routes, cycle provision and the general environment, including perceived safety was undertaken.

The findings of this study have been incorporated into scheme designs within the Wisbech Access Study where the two overlap. The routes audited as part of audit are shown in the figure beneath.

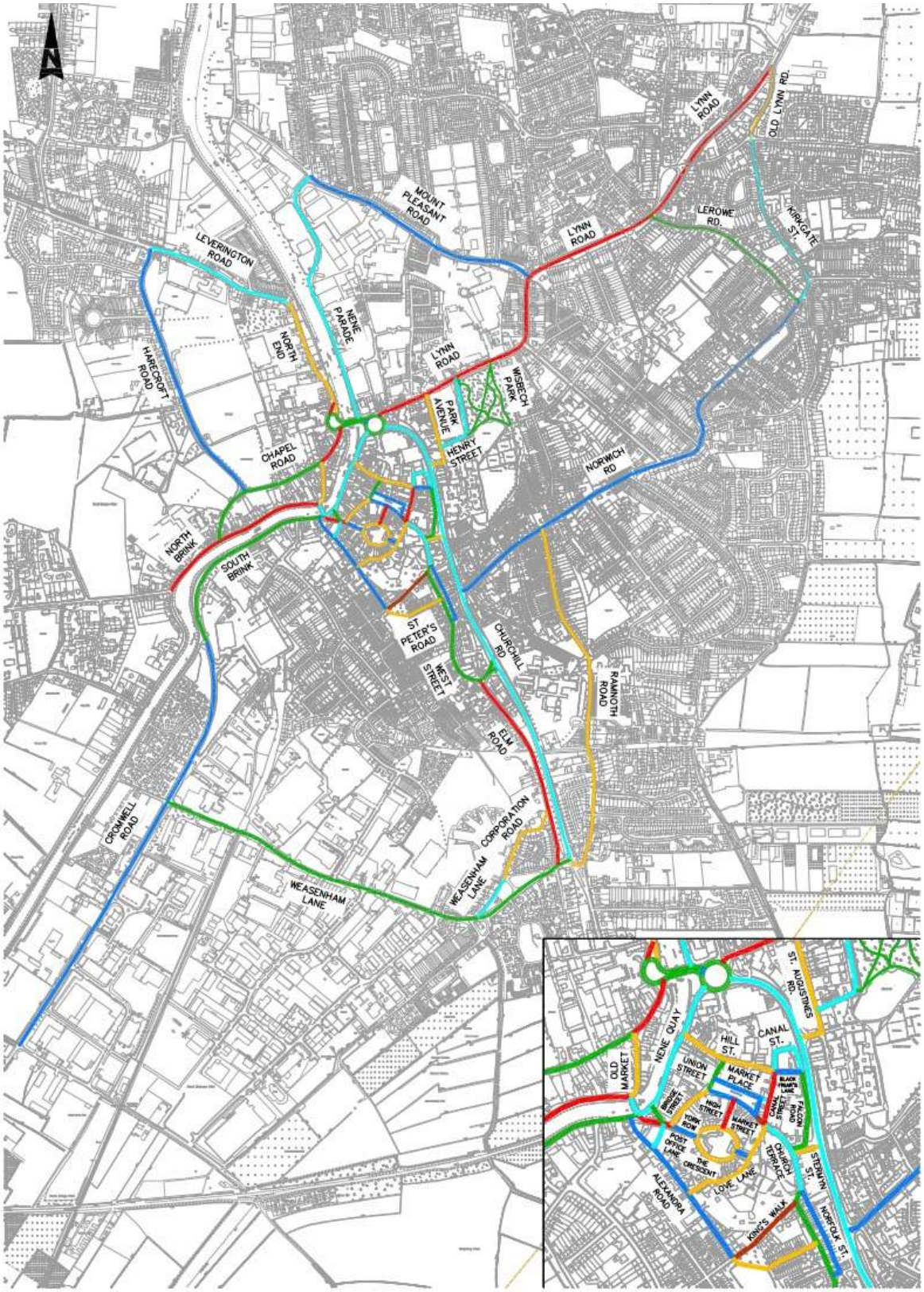


Figure 1.3: Wisbech Walking Audit Routes

2. Policy and Growth Context

Introduction

This chapter sets out the policy context for the Wisbech Access Study and summarises the local and regional policy that frames the Wisbech Access Study, as well as introduces local growth aspirations.

Business Strategy

The vision of Fenland District Council is set out within the Local Plan (2014), which aims 'to maximise the potential of the area and deliver jobs, skills, improved housing and new infrastructure', making Fenland 'a better place to live, work and visit'.

The vision of the Local Plan is supported by seven overarching objectives, and four strategic planning policy areas, which will achieve the aims set for the local document. Of the four policy areas, the two with the most relevance to the Wisbech Access Study are:

- Proposals for Place; and,
- Delivering Infrastructure.

Both policy areas are summarised below. Information below has been extracted from the Local Plan (2014), which can be found using the following link:

http://www.fenland.gov.uk/core-strategy.

Proposal for Place – LP8 Wisbech

Wisbech is the main focus for housing, employment and retail growth. All development will promote Wisbech as a strong market town, which preserves and enhances its unique historic character to benefit regeneration and sense of place.

All developments proposed for the market town require an exceptionally strong focus on the provision of transport infrastructure that will encourage a model shift to sustainable modes, for residents and workers of new and existing developments.

Policy LP8 identifies three strategic growth sites around the town. These three sites are:

East Wisbech: Consisting of approximately 1,550 residential units split across Fenland District Council (FDC) and Kings Lynn and West Norfolk District Council (KLWNDC) land.

South Wisbech: This growth area will consist of predominantly business and industrial development, with a limited housing allocation at the eastern end.

West Wisbech: Likely to consist of approximately 750 residential units as well as some business and industrial development.

The approximate location of these three strategic allocation sites are shown in Figure 2.1, and further information of each site, in relation to site proposals and assumptions, is outlined within the remainder of this chapter.

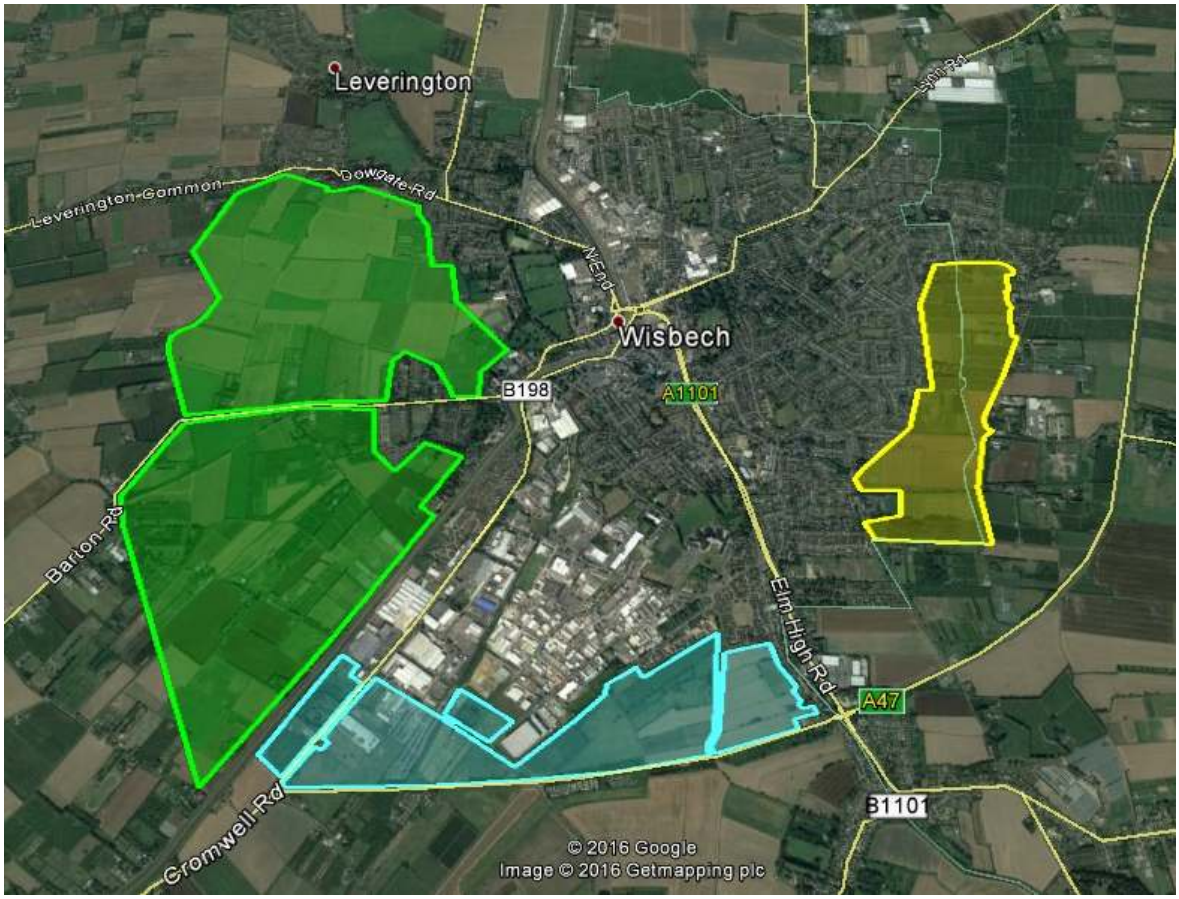


Figure 2.1: Broad Location of Strategic Growth Sites

The policy for Delivering Infrastructure is summarised beneath.

Delivering Infrastructure

Proposed levels of growth for Fenland is expected to place increased demand on the existing infrastructure and services across the district, therefore leading to a requirement for new and improved provision.

In order to gain a sufficient understanding of the strategic infrastructure requirements that are necessary the vision for Fenland and ensure timely provision of infrastructure, the council has prepared an **Infrastructure Delivery Plan (IDP).**

The IDP sets out costed, phased and prioritised programmes that respond to the economic and housing growth.

Under Policy **LP15** 'Facilitating the Creation of a More Sustainable Transport Network in Fenland', the following objectives, which are relevant to this study, are:

A) The Vision for a Sustainable Transport Network in Fenland:

- Seek to deliver an integrated approach to transport in Fenland that is; sustainable, facilities growth, links town and country, encompasses across boundary transport issues and improves accessibility for all modes of transport.

B) Delivering New Transport Related Infrastructure:

- Improve and better manage the strategic road network, including the A47 and A1101, to increase capacity where appropriate and viable;
- Improve and better manage the wider road infrastructure, including key transport links in Market towns, to benefit the local communities, and;
- Assist with the delivery of transport hubs that improve links to wider transport networks, offering realistic interchange opportunities between buses, trains, taxis, walking, cycling and car.
- Deliver flexible transport services that combine public and community transport needs, using local approaches.

C) Designing Development Schemes:

All development proposals should demonstrate the following criteria:

- Development on a site should be located and designed so that it can maximise accessibility and help to increase the use of non-car modes;
- Proposals which include new public highway should ensure such new highway complements and enhances the character of the area, possibly through the preparation of a public realm strategy for larger development schemes;
- Large development proposals (defined as 50 or more dwellings) in a market town should demonstrate how it will positively contribute to the delivery of the applicable Market Town Transport Strategy, and;
- Development schemes should provide well designed, safe and convenient access for all, by providing a network of pedestrian and cycle routes and green corridors.

The three Local Growth Plan sites set out in Policy LP8 are introduced beneath. These include the:

- East Wisbech Development Site;
- South Wisbech Development Site; and,
- West Wisbech Development Site.

East Wisbech Development Proposal

The East Wisbech development site covers an area of 180 acres, and spans across the administrative boundary of Fenland District Council (FDC) (Cambridgeshire) and Kings Lynn and West Norfolk District Council (Norfolk). The majority of the site forms the east strategic allocation of growth for Wisbech, as specified within the Fenland Local Plan (2014). The remainder of the site is identified within the Core Strategy of Kings Lynn and West Norfolk (KL&WN) (2011), which acknowledges that additional land to the east of the border is needed to aid the level of growth required for Wisbech.

The Broad Concept Plan (BCP) for the site will be jointly agreed by both councils. Figure 2.2 beneath highlights the division in land allocations across both councils.

It should be noted that ATLAS, the Homes and Communities Agency (HCA) team responsible for developing large scale planning applications, are assisting with this project on behalf of the two councils named above.

Figure 2.2: Location and Council Land Allocations of the East Wisbech Development Site

The proposed development will be predominantly residential and is planned to consist of:

- 900 / 1,000 dwellings allocated by FDC;
- 550 dwellings allocated by KL&WN;
- Improved A47 access;
- A primary school;
- A local centre;
- Pedestrian and cycle routes; and,
- Open space.

Access to and from the site onto the existing network is currently proposed to be via several points located around the development boundary, allowing traffic to distribute across Wisbech. The primary access linking the development to the strategic network (A47) will be via Sandy Lane and the Broadend Road Junction. The Broadend Road Junction with the A47 will require improvement to accommodate the forecasted increase in traffic resulting from the development.

Spatial Planning Workshop

A workshop was held on the 6th November 2015 and attended by members of the East Wisbech Steering Group. The purpose of the workshop was to establish development objectives and spatial concept plans for the site.

The outcome of the workshop was intended to inform further site-wide options and master planning work, including the BCP.

As a result of the workshop a spatial plan was produced based on the concept designs presented by three workshop groups. The spatial plan, as indicated in Figure 2.3, highlights common themes of housing, drainage, green routes and proposed local infrastructure.

Please note the figure shown below is not the BCP for the East Wisbech development.

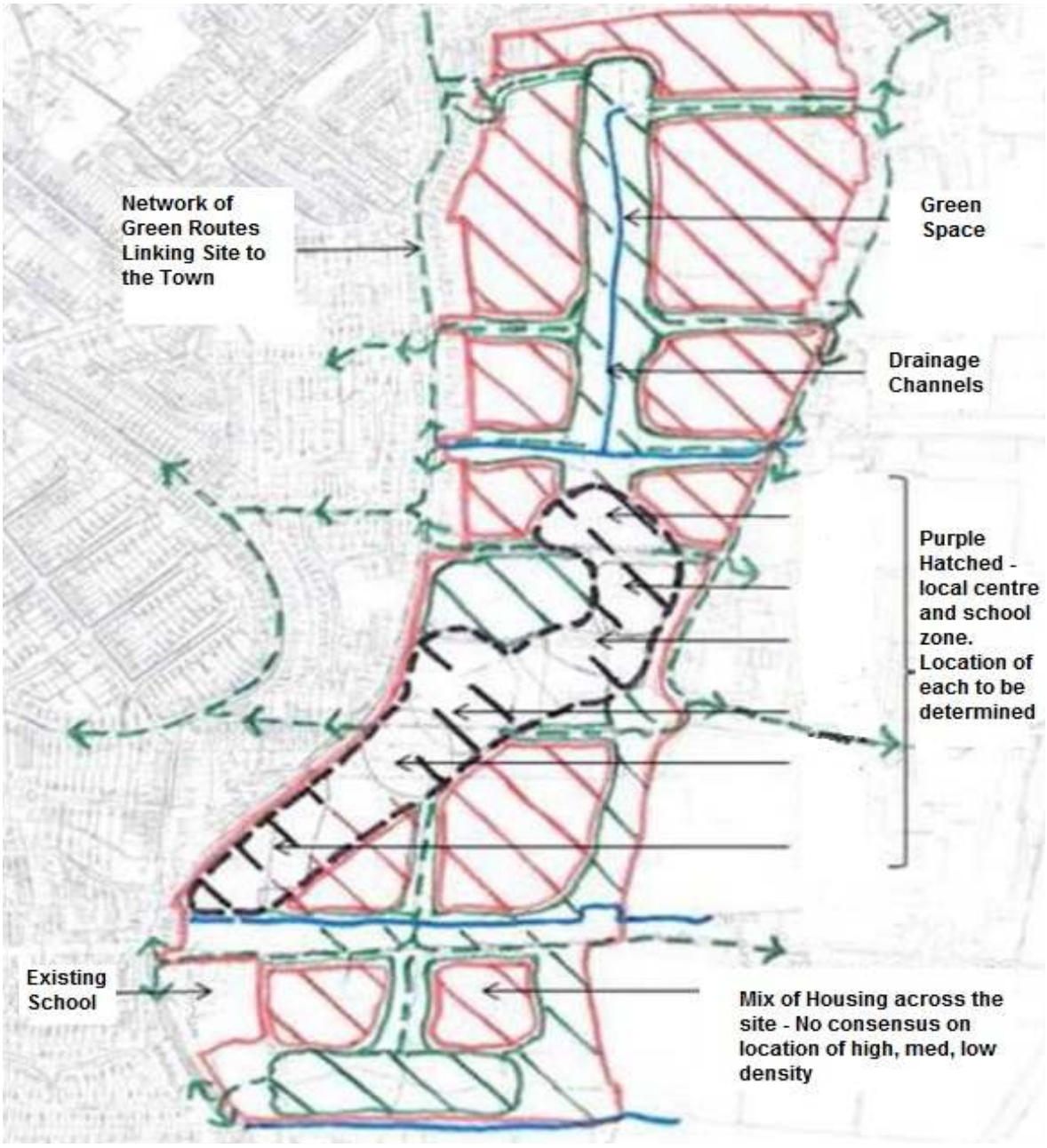


Figure 2.3: Workshop Spatial Plan for the East Wisbech Development Site

Proposed Development Phasing

The proposed phasing for the Wisbech East development Site is shown beneath, and highlights the proposed housing allocations for both councils of Fenland District Council and Kings Lynn and West Norfolk District Council.

Table 2.1 – Proposed Phasing for East Wisbech Development Site

Phasing Period	Fenland Allocation	Kings Lynn and West Norfolk Allocation
2016 - 2021	170	100
2022 - 2026	365	300
2027 – 2031	365	150

South Wisbech Development Proposal

The South West Wisbech broad location for growth is defined in Policy LP8 of the Fenland Local Plan (2014) and includes around 217 acres of land to the north of the A47, with the River Nene forming the western boundary of the site and Elm Low Road being the eastern boundary.

The Local Plan (2014) describes the South West Wisbech development site as follows:

"This area is located broadly to the north of the A47, south-east of New Drove, north and south of New bridge Lane, and along Cromwell Road between New bridge Lane and the A47/B198 roundabout. Will require improved east-west road links to relieve pressure on Weasenham Lane. This will form the basis of the Southern Access road also being investigated as part of the Wisbech Access study. The area will be predominantly for business purposes, though there is some potential for residential development. Existing areas of high quality woodland, including some mature orchards, should be retained and enhanced to serve as multifunctional public open space areas with amenity, biodiversity and community food value. Noise mitigation and screening measures should be provided along the A47, and between the residential and business areas as appropriate."

A BCP of the site was given in principal approval by the FDC Planning Committee in April 2015. The BCP shows the site is split into four phases, these are Phase 1, Phase 1A, Phase 2 and Phase 3. The BCP is shown within Figure 2.4 on the following page.

Note: the BCP assumes the provision of a new junction onto the A47 in the form of a four arm roundabout. This assumption is the focus of this study, which aims to determine what impact a junction at this location would take, and what form it would have.

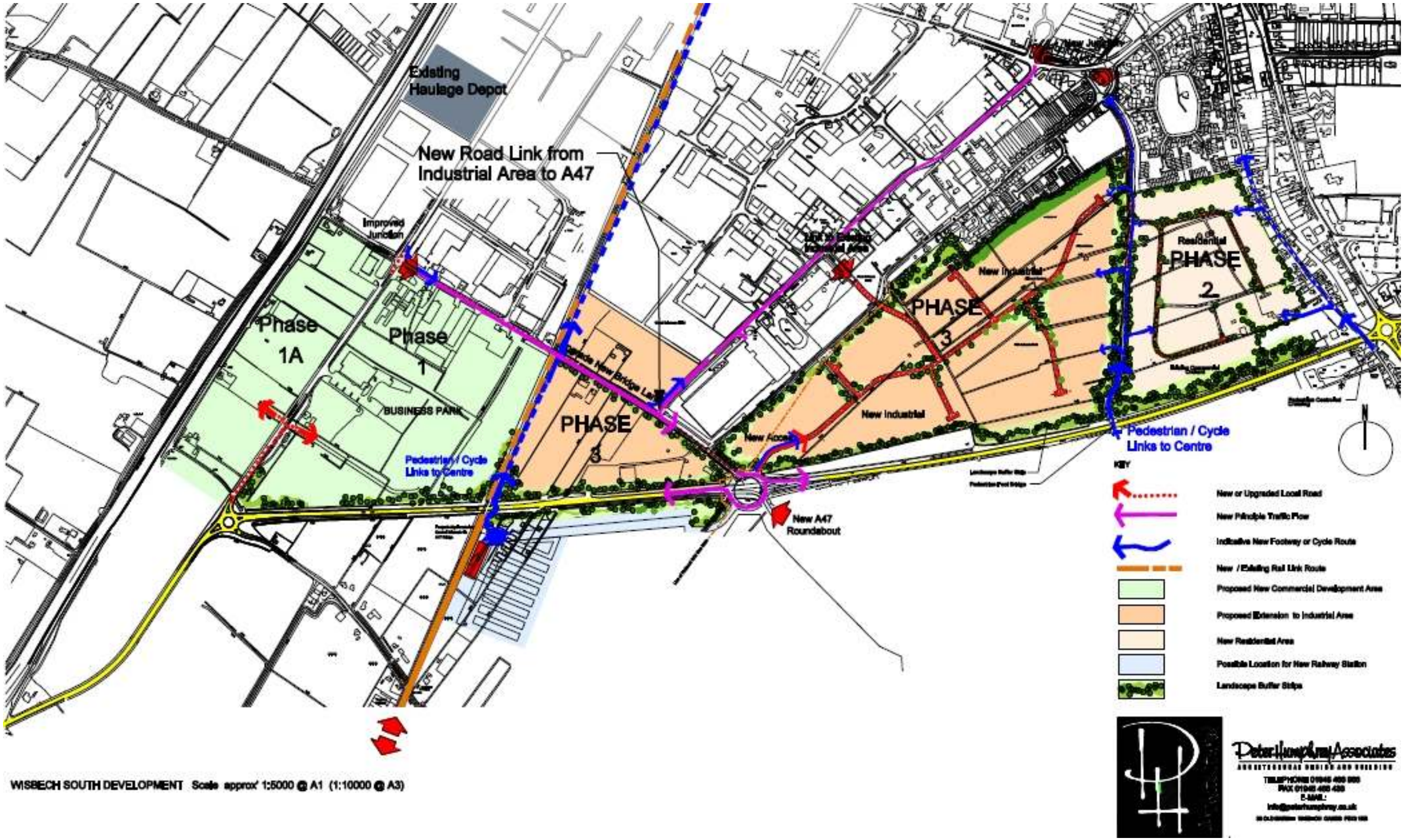


Figure 2.4: Broad Concept Plan for the South – West Wisbech Development Site

The composition of the four phases shown in the BCP for this site are detailed beneath.

Assumptions for Phase 1

Phase 1 consists of a series of land parcels:

- **Site A:** This site is about 2 ha and will consist of a mix of development split between office use (2,100 sq. m) and warehouse use (2,896 sq. m).
- **Site B:** The site is about 2.4ha with expected job creation of 134.
- **Site C:** This site is 4.7ha and will create around 380 jobs on a breakdown of 10% B1 office use, 60% B2 industry use and 30% B8 distribution use.
- **Site D** About 1.2ha site, with an assumed 10% B1 office, 60% B2 Industry use and 30% B8 Distribution use. This site also includes a Pub / Restaurant.
- **Access Assumptions:** The BCP shows access to Phase 1 via a new junction with Cromwell Road. Previous traffic modelling work undertaken by Atkins to inform the Local Plan (Wisbech Traffic Model, Strategic Development Sites: March 2015) has assumed that this junction is a four arm signalised junction providing access to / from Cromwell Road from the Phase 1 and Phase 1A sites.

  This assumption has been retained for the Wisbech Access Study and is included within this particular assessment by virtue of the traffic flows extracted from the WATS model and used in the Option Assessment.

  As well as an access point onto Cromwell Road, this assessment has also included an additional access onto Weasenham Lane at the existing junction with Salter's Way.

Assumptions for Phase 1A

Phase 1A will have one access point into and out of the site, as with Phase 1 this is assumed to be via a signalised junction with Cromwell Road. The site is about 10 ha of proposed commercial development.

Assumptions for Phase 2

Phase 2 has an indicative timeline of 2016 – 2031 and consists of 14.30 ha of residential land use. The current assumptions are for 25 houses per hectare and will be built at a rate of around 25 dwellings per year over the forecast period, with the total number of house estimated to be 357. The site will be accessed from New Drove / Half Penny Lane.

Assumptions for Phase 3

Phase 3 consists of approximately 35 ha of industrial land, which is forecasted to be developed between 2018 – 2031. This expected to generate 1,611 jobs between 2018 and 2025 (based on the same land use split as Phase 1), and a further 1,144 jobs between 2025 and 2031.

Access into Phase 3 has been assumed to be via three local access junctions along New Bridge Lane and Boleness Road.

Development Phasing

Table 2.2 beneath shows the proposed phasing of each of the sites, consisting of office, industrial, warehouse and residential units. Note that the green cells represent completion of a development phase.

Table 2.2 – Wisbech South Growth Profile

Phase	Total Allocation	Phasing		
		2021	2026	2031
1	Office (GFA)	3,752	-	-
	Industrial (GFA)	9,912	-	-
	Warehouse (GFA)	14,572	-	-
	Housing (dwellings)	-	-	-
1A	Office (GFA)	-	2,800	-
	Industrial (GFA)	-	8,400	-
	Warehouse (GFA)	-	16,800	-
	Housing (dwellings)	-	-	-
2	Office (GFA)	-	-	-
	Industrial (GFA)	-	-	-
	Warehouse (GFA)	-	-	-
	Housing (dwellings)	113	235	357
3	Office (GFA)		953	1,906
	Industrial (GFA)		5,714	11,428
	Warehouse (GFA)		2,858	5,717
	Housing (dwellings)	-	-	-
	Office (GFA)		2,223	4,446
	Industrial (GFA)		13,332	26,665
	Warehouse (GFA)		6,670	13,339
	Housing (dwellings)	-	-	-

West Wisbech Development Proposal

The West Wisbech Development Site forms one of three major allocations of growth across Wisbech, with the site boundary identified within the Local Plan (Policy LP8) as being situated North of Mile Tree Lane, south of the B1169 (Leverington Common) and east of Gadds Lane and Barton Road. Figure 2.5 below highlights this boundary.

Figure 2.5: Location and Boundary of the West Wisbech Development Site

The proposed development will be predominantly residential and is planned to consist of:

- 750 dwellings allocated by FDC;
- Small area of employment;
- Open space;
- New education facilities;
- Local convenience shopping facilities and community services; and,
- Direct pedestrian and cycle routes to key facilities, including the town centre.

The spatial location of these elements is currently unknown and will be determined by the production of a BCP, which requires detailed assessments of flood risk and transport infrastructure to inform its formation.

Policy LP8 of the Local Plan (2014) states that the transport infrastructure should consist of, “a link connecting the A1101 in the north to the B198 Cromwell Road in the south including a new river crossing”. The alignment and form of which is the subject of this

assessment. The primary junctions serving the development site are assumed to be roundabouts to provide an adequate level of accessibility into and out of the site.

In connection with this proposal Policy LP8 states "Transport infrastructure required to serve the area must ensure that there will be no unacceptable adverse impact on the local and strategic highway network, as well as the setting of nearby heritage assets (including listed buildings and Scheduled Ancient Monuments) located within the Leverington and Wisbech Conservation Areas".

Fit within Wider Transport Policy

The Wisbech Access Study fits within the following local transport policies.

Third Cambridgeshire Local Transport Plan / Wisbech Market Town Transport Strategy (2014)

The Transport strategy forms part of the **Third Cambridgeshire Local Transport Plan (LTP3**), and sets out transport priorities for Cambridgeshire County Council and Fenland District Council. Issues outlined within set priorities are existing and potential future transport issues in Wisbech and its surrounding area.

The LTP3 also makes reference to the Market Town Transport Strategies, including the Wisbech Market Town Transport Strategy (WMTTS). It can also be viewed online using the following link:

https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/transport-plans-and-policies/market-town-transport-strategies/.

Chapter 4 of the **WMTTS**, 'Access to Services and Pubic Transport in Wisbech', outlines the issue of poor accessibility via public transport as well as town centre congestion due to reliance on the private car. Action plans documented within this strategy which correspond to the Wisbech Access Study scheme elements are summarised below:

Strategic / Local Highway Improvements:

- SH1 – Technical study of options for new link road and/ or river crossing to the north and west of the town centre;
- SH2 – Upgrade the Broadend Road Junction with the A47;
- SH3 – A47 junction packages;
- SH4 – Traffic modelling studies to explore options for improving movement around Freedom Bridge Roundabout;
- SH5 – New road at Boleness Road/ New Bridge Lane;
- SH6 – Traffic management/ signals system at Lynn Road, Churchill Road and Cromwell Road up to Freedom Bridge Roundabout; and,
- LH1 - Investigate measure to improve traffic flow and safety on the A1101 Leverington Road.

Passenger Transport:

- PT1 / 4 – Extend town bus service and improve bus stops across Wisbech; and,
- PT3 – Investigate options to improve Bus Station facilities and access arrangements.

Walking and Cycling:

- WC10 – Assess existing footpaths and where appropriate designate existing footpaths as shared use and encourage developers to construct new shared use footpaths and cycle ways where appropriate.

Wisbech Area Transport Study (WATS) / The Transport Mitigation Study

WATS was completed between 2008 and 2013, and provides evidence of traffic models used to test transport implications of housing and employment growth for the area in and around Wisbech. In order to address transport issues raised by projected growth in Wisbech the Transport Mitigation Study was developed.

A key focus of The Transport Mitigation Study includes; bus station access changes and corresponding changes to Freedom Bridge Roundabout. The study aims to provide transport benefits whilst reducing traffic impacts and congestion.

The work and subsequent results were reported in a series of technical notes, all of which are available on Fenland District Council's website at the following location:

http://www.fenland.gov.uk/article/7085/Wisbech-Area-Transport-Study

Vision 2020

The Wisbech 2020 Vision is broken down into three elements; 'Making Wisbech a great place to work, live and visit'. This was created through analysis of eight themes led by different stakeholders and events:

- Future Economic Role of the Town;
- Transport and Infrastructure;
- Stronger Families;
- Housing;
- Education, Skills and Aspirations;
- Cohesion;
- Pride, Reputation and Image; and,
- Leisure, Culture, Cycling and Tourism.

Outlined within the Transport and Infrastructure action plan, it states 'we will continue to investigate opportunities to improve key junctions and routes around the town in line with those identified in the Market Town Transport Study. More information regarding the Wisbech 2020 Vision is available using the following link:

http://www.wisbech2020vision.co.uk/CHttpHandler.ashx?id=11795&p=0.

Greater Cambridgeshire Greater Peterborough Strategic Economic Plan

The Greater Cambridge Greater Peterborough Local Enterprise Partnership (LEP) is a business-led organisation focused on driving forward sustainable economic growth in the area – with local businesses, education providers, voluntary organisations and social enterprises, and the public sector working together to achieve this. Their role is to collaborate to create new jobs and the right conditions for enterprise growth, as well as to champion the area's potential.

The Greater Cambridge Greater Peterborough LEP, supported by the Local Transport Authorities submitted a Strategic Economic Plan (SEP) with substantial transport elements for consideration for funding from 2015/16 onwards. The SEP aims to release the area's significant potential for continued economic growth, through a targeted range of interventions.

The SEP identified a number of the strategic cross country routes have capacity constraints that have led to congestion and suppress planned growth. The A47 is the most important east - west route in the north of the LEP area, and carries up to 42,000 vehicles a day around Peterborough, and around 22.000 vehicles a day on the single carriageway stretch around Wisbech. The mix of functions and the varying quality of the route leads to delay and to unreliable journey times. Significant levels of growth along the route including housing and employment development at Wisbech and Kings Lynn are unlikely to come forward without improvements to the A47.

Information regarding the LEP can be found on the Greater Cambridge and Peterborough Local Enterprise Partnership website, using the following link:

http://www.gcgp.co.uk/our-area/fenland/.

3. Data Collection

Introduction

This chapter sets out the traffic data that has been collected in support of this study. Data has been gathered from a variety of sources, and for a variety of uses. The data collection programme has included:

- Junction Turning Counts – January 2016;
- Automatic Traffic Counts – January 2016;
- Car Park Occupancy Surveys – March 2016;
- Satellite Navigation Data – November 2015 – January 2016; and,
- WATS Data Collection – November 2015.

Each of these are discussed in greater detail beneath.

Junction Turning Counts (January 2016)

A series of Junction Turning Counts (JTCs) were undertaken on Thursday 14th January 2016 to provide the core base of traffic data for use in the WAS, and specifically to be used in the construction of the VISSIM Microsimulation models for Cromwell Road, Elm High Road and Freedom Bridge Roundabout.

These surveys recorded vehicle turning movements at each of the junctions shown beneath in Table 3.1. Queue lengths were also recorded at five of the sites to provide greater detail on conditions at these junctions and to assist with model valuation.

Table 3.1 – Location of Junction Turning Counts (January 2016)

Freedom Bridge (F)		Turning Count	Queue Length
F1	A1101 North End (Freedom Bridge) / Lynn Road / Churchill Road / Horse Fair / Nene Quay	✔	✔
F2	A1101 North End / North Street / Freedom Bridge / Aldi Access	✔	×
F3	Chapel Road / Old Market	✔	×
Cromwell Road (C)			
C2	B198 / Somers Road	✔	×
C3	B198 Cromwell Road / Coalwharf Road	✔	×
C4	B198 Cromwell Road / South Brink / Purina Access	✔	×
C5	B198 Cromwell Road / Weasenham Lane	✔	✔
C6	B198 Cromwell Road / Sandown Road	✔	×
C7	B198 Cromwell Road / Salters Way	✔	×
C9	A47 / B198 Cromwell Road / Redmoor Lane	✔	✔
C10	B198 Cromwell Road / Oldfield Lane	✔	×
Elm High Road (E)			
E1	A1101 Elm High Road / Stermyn Street / Church Terrace	✔	×
E2	A1101 Elm High Road / Norwich Road	✔	×
E3	A1101 Elm High Road / Elm Road	✔	×
E4	A1101 Elm High Road / Weasenham Lane / Ramnoth Road	✔	✔
E5	A1101 Elm High Road / Petrol Station / Supermarket Access	✔	×
E6	A1101 Elm High Road / A47	✔	✔
E7	A1101 Elm High Road / Whitby Street	✔	×
Other (O)			
O1	Weasenham Lane / New Drove	✔	×
O2	Weasenham Lane / Algores Way	✔	×
O3	Elm Road / West Street / John Thompson Road	✔	×
O4	Weasenham Lane / Boleness Road	✔	×
O5	A47 / Broadend Road	✔	✔

Note that the count at the A47 / Broadend Road (O5) was undertaken on Tuesday 19th January 2016, as opposed to Thursday 14th January 2016.

The locations of the JTCs is also shown beneath in Figure 3.1.

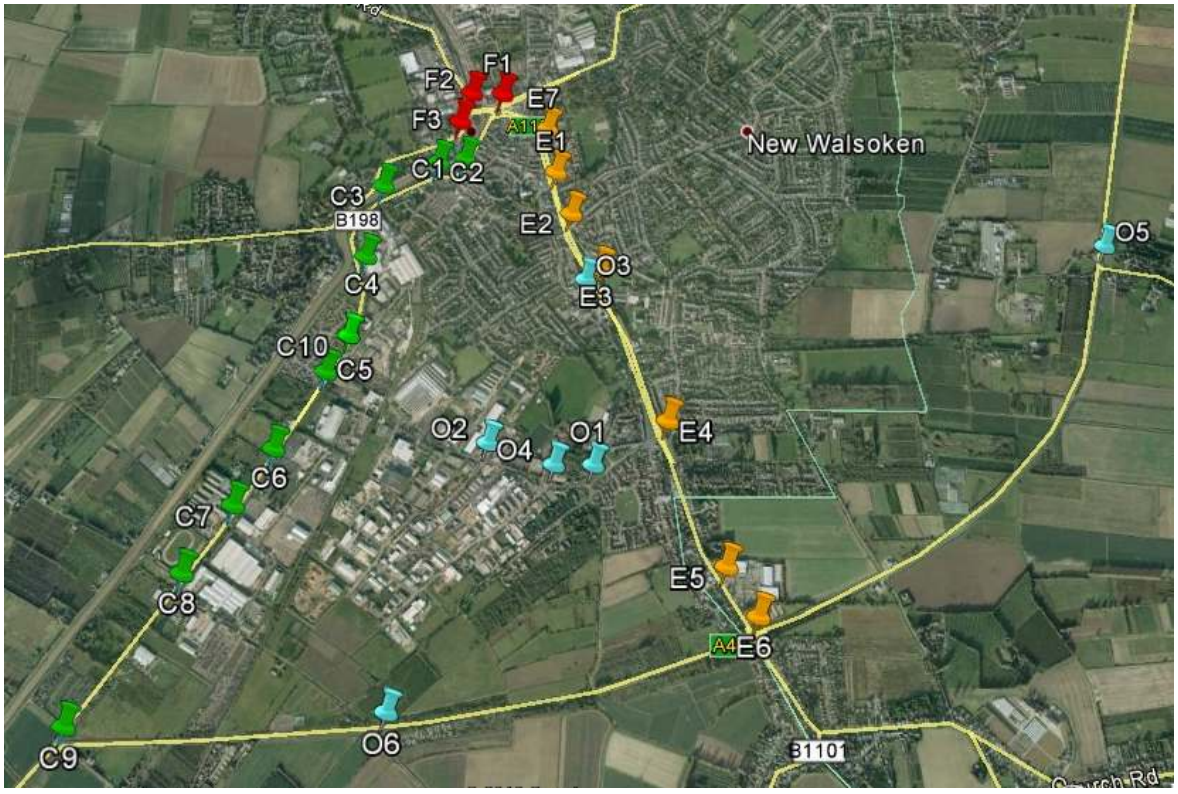


Figure 3.1: Location of Junction Turning Counts (January 2016)

The JTCs were undertaken for a twelve hour period, between 07:00 and 19:00, and turning movements were recorded in 15 minute intervals. Vehicles recorded during the surveys was classified using the following vehicle / user classes:

- Car;
- Light Goods Vehicle (LGV);
- Other Goods Vehicle 1 (OGV 1);
- Other Goods Vehicle 2 (OGV 2);
- Passenger Service Vehicle (PSV);
- Motorcycle (MC); and,
- Pedal cycle (PC).

Automatic Traffic Counts (January 2016)

Automatic Traffic Counts (ATCs) were conducted at the following locations (Table 3.2) for a period of two weeks, between Monday 11th January and Sunday 24th January 2016. These dates are inclusive of the survey date for the junction turning counts (Thursday 14th January). The purpose of the ATC surveys was to determine the normalcy of the survey date by validating the traffic flows and profiles against the other days in the two week period.

Table 3.2 – Location of ATC Surveys

ATCs (2 week duration)	
ATC 1	South Brink - between New Bridge Lane and Redmoor Lane
ATC 2	Cromwell Road - between the A47 roundabout and New Bridge Lane
ATC 3	Cromwell Road - between the South Brink junction and Oldfield Lane
ATC 4	Elm High Road - between Westmead Ave and the Morrison's Access
ATC 5	Elm High Road - between Stermyn Street and Whitby Street
ATC 6	Weasenham Lane - between Cromwell Road and Rega Road

The location of the ATC surveys are also shown in Figure 3.2 beneath.

Figure 3.2: Location of ATC Surveys

The ATC surveys recorded data in 15 minute intervals and by direction. Traffic flows were also classified by:

- Speed (in 5mph brackets); and,
- Vehicle type, specifically:
    - Motorcycle / Pedalcycle;
    - Cars;
    - LGVs / PSVs (2 axles);
    - OGV1 / PSVs (3 axles); and,
    - OGV 2.

Car Park Occupancy Surveys

Car park occupancy surveys were undertaken in support of the assessment into options for the Bus Station. The purpose of the surveys was to profile car parking demand against availability throughout a typical weekday, to understand what proportion of the existing car parking provision could be removed if needed.

The location of the Car Park Occupancy surveys (CPO) are shown in Figure 3.3 beneath.

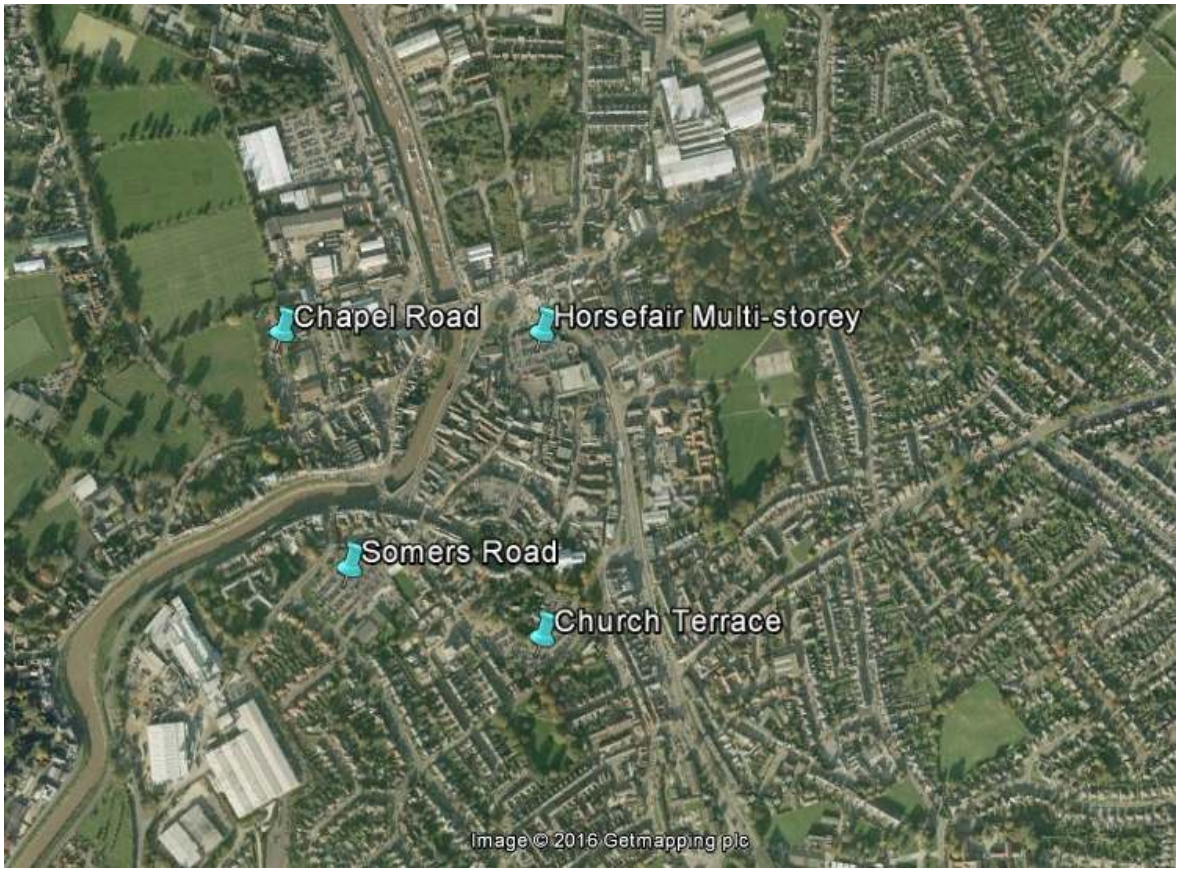


Figure 3.3: Location of Car Park Occupancy Surveys

Satellite Navigation Data (TomTom)

TomTom Traffic Data provides comprehensive and robust information on vehicle speeds and enables easy calculation of journey times. This data is based on information from Satellite navigation systems used within vehicles.

The area covered by the Wisbech TomTom dataset is shown in the map below:

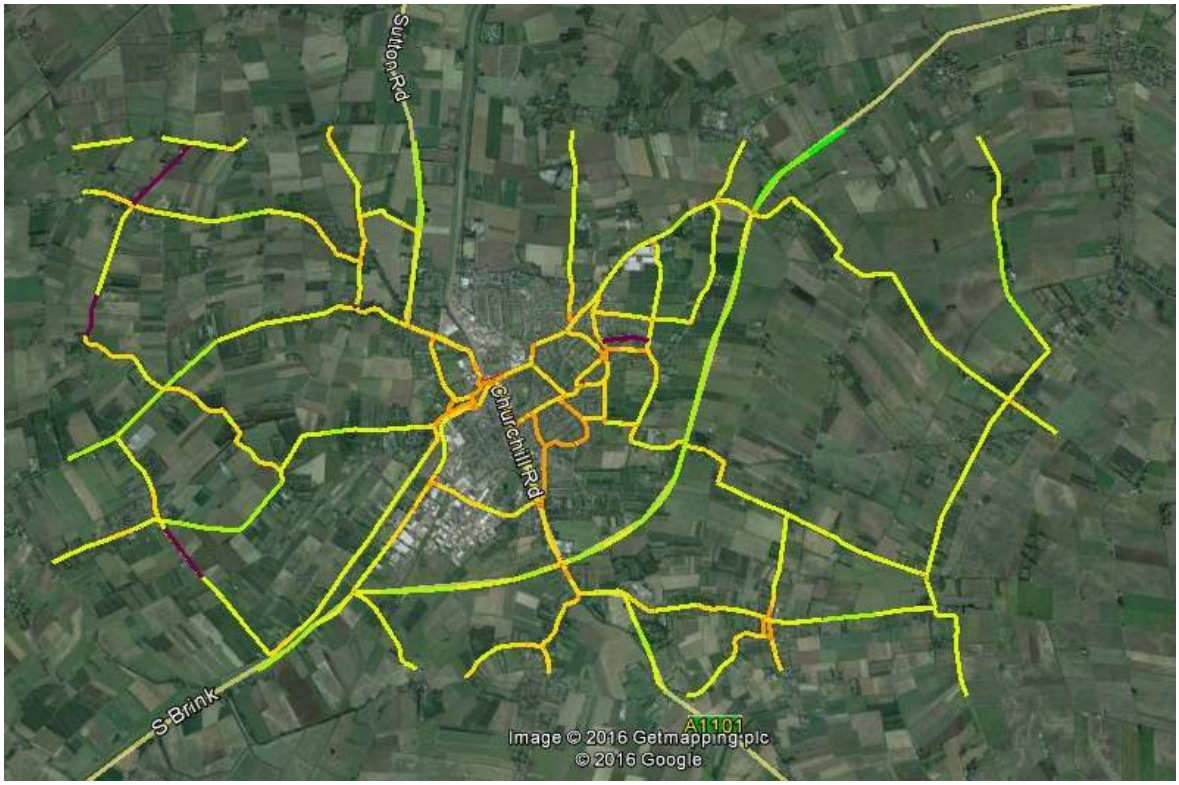


Figure 3.4: Extent of TomTom Dataset

The TomTom data provided for the study is for the calendar period from 2nd November 2015 to 22nd January 2016 but excludes weekends, banks holidays, school and Christmas holidays.

Data is provided for a number of different time periods to enable comparison of speeds and journey times throughout different parts of the day. These periods are:

- Free Flow – between the hours of 12am and 5am;
- AM Shoulder – between the hours of 7am and 8am;
- AM Peak – between the hours of 8am and 9am;
- Inter Peak – between the hours of 10am and 4pm;
- PM Shoulder – between the hours of 4pm and 5pm;
- PM Peak – between the hours of 5pm and 6pm; and,
- Evening – between the hours of 6pm and 10pm.

WATS Data Collection

The Wisbech Area Transport Study (WATS) model is a SATURN based strategic transport model of Wisbech and the surrounding area. The model was originally built with a 2008 base year and has been used extensively since then to assess the impact of various growth scenarios and highway improvements. This model has been updated independently to this study by a separate organisation, and traffic data collected in November 2015 was used to inform the model update.

Although the WATS model update and the WAS are separate exercises, the two run parallel to each other and once updated, information from the WATS model will be used to inform the WAS. Given the close relationship between both pieces of work, data for both studies has been exchanged, and data from 18 JTCs and 19 ATCs undertaken for the WATS model update has been used to compliment the data collection programme described above.

Note that the data collection for both studies was coordinated to avoid repetition.

Other Data Collection

Additional data on the following features has been gathered where appropriate for each of the individual assessments, and is discussed within the relevant reports:

- Accident Data;
- Highway Boundary / Land Ownership Queries;
- Flood Risk; and,
- Archaeology / Heritage.

4. Existing Conditions

Introduction

This chapter sets out the strategic significance of Wisbech on the transport network, and identifies some of the high level transport issues that the town currently experiences. The existing conditions for each of the specific scheme areas are discussed in detail within the respective reports.

Road Network

Wisbech is strategically located along the A47 trunk road route between Norfolk (to the east) and Leicester and the Midlands (to the west). The town is also located to the south of the A17 which is a key arterial route connecting Norfolk to Lincolnshire and the North. Due to its proximity to these two key routes, Wisbech is often used by traffic transferring between the A17 and A47, with vehicles passing through the town centre due to a lack of alternative routes around the periphery of the town.

Congestion

Analysis of the TomTom data has been undertaken to identify existing peak hour congestion within Wisbech. The TomTom dataset divides the road network into a series of segments and includes average travel times per segments.

The dataset also includes a ratio for every time period (except for the free flow period which acts as the base case) which compares the average travel time for the selected time period against the average travel time for the Free Flow period, providing an indicator of congestion.

For example, if the average travel time along a segment increases from 10 seconds in the Free Flow period to 50 seconds in the AM Peak period, it will have a ratio value of 5.0 as the AM Peak period average travel time is five times greater than in Free Flow conditions.

The following descriptions of thresholds have been used across independent scheme reports:

Where the average travel time during the AM or PM peak hour exceeds the average travel time during the Free Flow period by:

- A ratio of 10.0 or higher this is referred to as Category 4;
- A ratio that is between 5.01 and 10 is referred to as Category 3; and,
- A ratio of 2.01 to 5.00 is Category 2.

Note that this analysis does rank the congestion sites using the colour guide, but instead highlights the sites with the greatest reduction in journey times during the AM and PM peak hours when compared to the Free Flow period.

The Category 2, 3 and 4 congestion sites for the AM Peak Hour are shown beneath in Figure 4.1.

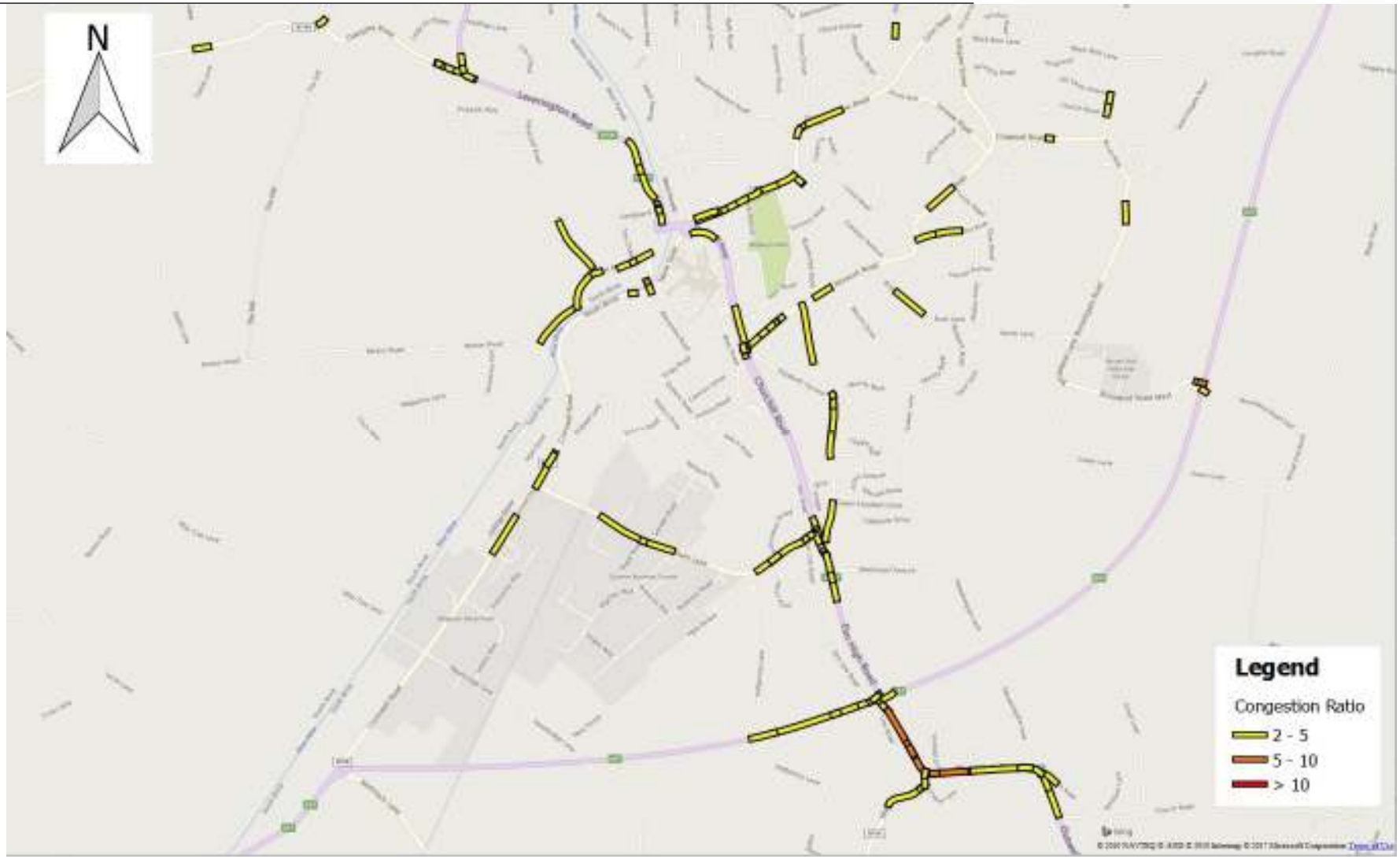


Figure 4.1: AM Peak Hour Category 2, 3 and 4 Congestion Sites

The figure shows that there is congestion on three of the approaches to Freedom Bridge Roundabout, the junction of A1101 Churchill Road / Norwich Road, the junctions at either end of Weasenham Lane and on several of the approaches to the A47 / A1101 Elm High Road Roundabout.

Most of these sites experience Category 2 congestion, where the journey time is between 2 – 5 times greater than the Free Flow speed. The greatest congestion experienced in the AM peak hour is on the northbound approach to Elm High Road Roundabout where journey times are between 5 – 10 times greater than the Free Flow speed.

The Category 2, 3 and 4 congestion sites for the PM Peak Hour are shown beneath in Figure 4.2.

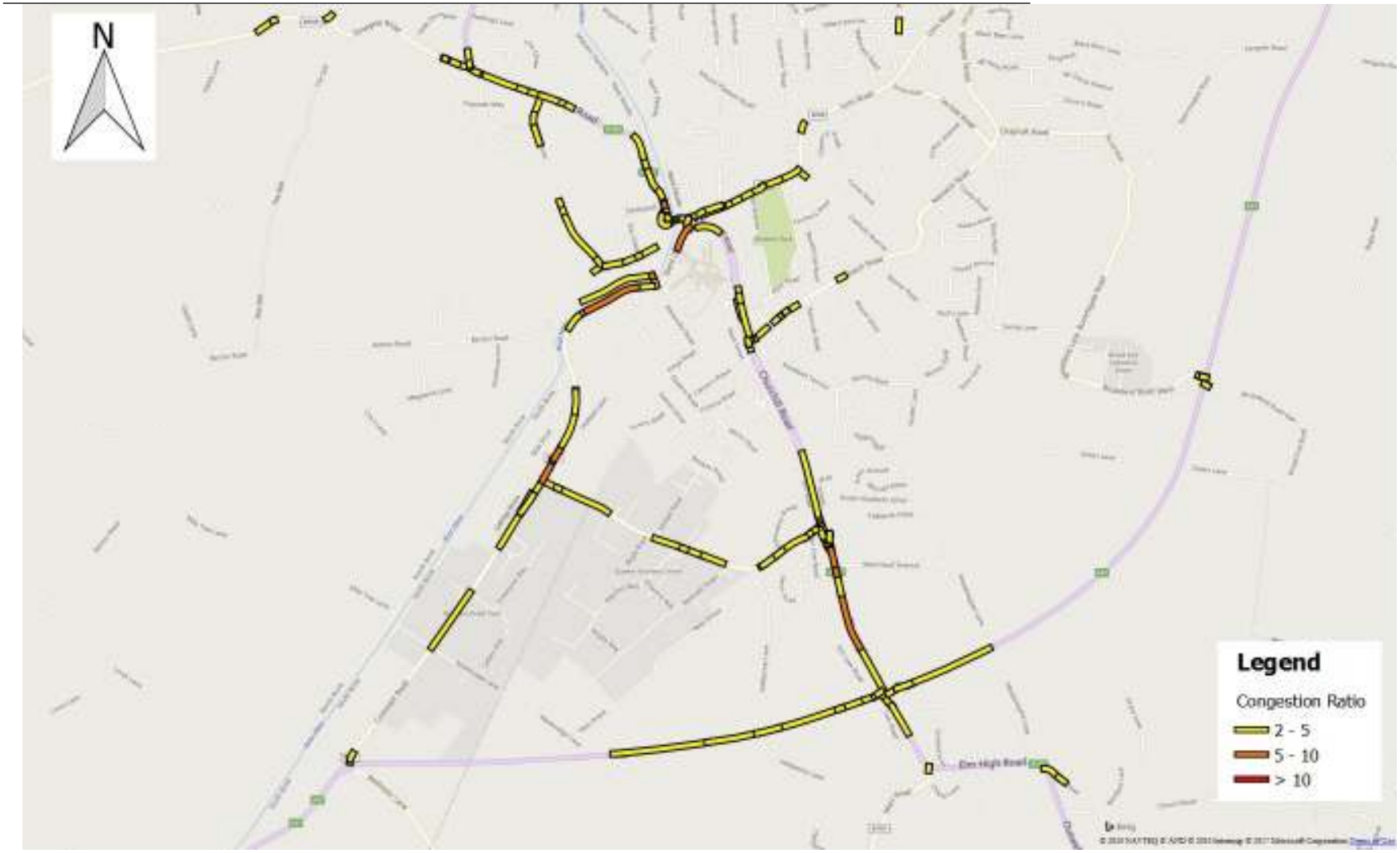


Figure 4.2: PM Peak Hour Category 2, 3 and 4 Congestion Sites

The figure shows that there is congestion on four approaches to Freedom Bridge Roundabout, the Town Bridge junction, the junction of B198 Cromwell Road / Weasenham Lane and the junction of A1101 Churchill Road / Norwich Road. There is also congestion on all of the approaches to both the A1101 Elm High Road junctions with Weasenham Lane and the A47.

The greatest PM peak hour congestion is experienced on the Nene Quay approaches to Town Bridge and Freedom Bridge Roundabout, the southbound approach to the Cromwell Road / Weasenham Lane Junction and southbound along the A1101 Elm High Road between the Weasenham Lane and A47 junctions. All of these sites experience PM peak hour average journey times that are between 5 – 10 times greater than the Free Flow speeds.

Accident Data

The figure beneath shows the location of the accident cluster sites across Wisbech. The data shown is taken from Cambridgeshire County Council's interactive mapping service.

The accident data includes all slight, serious and fatal accidents reported within the period 2011 – 2016. Note that this does not include data from Norfolk, which is relevant to the Broadend Road junction and the lower portion of Elm High Road, accident data relating to these sites is discussed within the relevant option reports.

Figure 4.3: Wisbech Accident Cluster Sites

Wisbech currently has three identified accident cluster sites, the largest of which is Freedom Bridge Roundabout. The other two sites are the junction of A1101 Churchill Road / Norwich Road, and along the A1101 Churchill Road adjacent to North Cambridgeshire Hospital.

There are a total of 82 sites on the accident cluster list throughout Cambridgeshire, including the three Wisbech sites. The position and score of the three Wisbech sites are shown beneath. The score is calculated by applying a weighting to the number of fatal, serious and slight accidents over a rolling three year period.

Table 4.1 – Wisbech Cluster Site Scores

Rank	Location	Accidents in 3 Years	Score
2	Freedom Bridge Roundabout	18	20
25	Churchill Rd Jn Norwich Rd, Wisbech	7	11
69	Churchill Road, Wisbech (part)	7	7

In addition to the defined accident clusters listed above, the following areas within the study area have been found to show smaller concentrations of accidents (majority being slight) within the period 2010 to 2016:

- A47 / B198 Cromwell Road Roundabout;
- B198 Cromwell Road / Weasenham Lane;
- A1101 Elm High Road / Weasenham Lane; and,
- B198 Lynn Road / De-Havilland Road.

5. Assessment Approach

Introduction

This section outlines the high level approach used for the scheme assessments within the Wisbech Access Study. The exceptions to this assessment approach are the Bus Station, and the New River Crossing, both of which have been subject to a qualitative assessment, with a strong structural focus on the latter. The Western Link Road has also been assessed in broader terms, as detailed within the Western Link Road Assessment Report.

The detail behind the assessment methodology used for each of the scheme areas is contained within each of the respective scheme reports. However, at a more general level, the transport modelling that has been undertaken has used the following approach:

Figure 5.1: Approach to Assessment

This section provides a general overview of each of these steps, including:

- Building and Validating **Base Models**;
- Building and Assessing **Do Minimum Models**; and,
- Building and Assessing **Do Something Models**.

Base Models (2015)

A Base Model has been built for each of the options. The Base Model reflects the existing infrastructure and uses observed traffic flows from the traffic counts described earlier in the report.

These Base Models have been validated against an independent source of data not used in the model build, to demonstrate that it accurately reflects the existing conditions and is fit for use as a platform to assess different options. The measures against which Base Models are typically validated against include journey times, delay or queue lengths.

The Base Models also provide an understanding of how the existing transport infrastructure is performing, and specifically model outputs against which future year scenarios (Do Minimum and Do Something) can be compared.

It is not possible to create a Base Model where infrastructure does not currently exist, such as for new junctions along the Western Link Road or Southern Access Road.

Do Minimum (SATURN)

Once a Base Model has been built, it is possible to build a Do Minimum Model. The Do Minimum Model includes the growth in traffic flows from development and background growth, but with very limited infrastructure improvements. It represents a scenario in which traffic flows have grown as forecasted, but the infrastructure improvement proposed (the options being assessed) have not been implemented. The outputs from the Do Minimum Model can then be compared to the outputs from the Base Model to understand the impact of growth.

The limited infrastructure improvements that occur within the Do Minimum Model should only include those which are physically required to enable traffic flow to effectively enter the model network, such as new accesses and roads from developments, or minor and limited localised improvements that would reasonably be carried out by the highway authority.

The Wisbech Access Study Do Minimum Network

The WAS Do Minimum Model network used for the Wisbech Access Study consists of the following improvements beyond the existing infrastructure improvements:

- **Scheme CR 2** – This is the signalisation of the Junction of the B198 Cromwell Road and New Bridge Lane, which provides the main access into the South Wisbech development site in the Do Minimum and Do Something Models. This option has been included to allow the proposed development traffic to exit the development zones and physically load onto the wider model network. Without including this improvement within the Do Minimum Model, the development traffic from South Wisbech would be 'stuck' at the edge of the network, and would not be fully accounted for within the model.
- **New Development Junction** – The New Development Junction is being assessed as a live planning application (January 2017) and is not a component part of the Wisbech Access Study. The form and location of the junction will be determined by the planning application process, it only features in the Wisbech Access Study to ensure that any surrounding schemes developed can be designed to work in connection with it. This has been included within the Do Minimum Model as it is considered likely to be implemented (in some form or the other) in the foreseeable future.
- **Scheme CR9** – This option consists of widening the B198 Cromwell Road to two lanes in each direction from New Bridge Lane to the roundabout with the A47. On the face of it, this appears to be quite a significant scheme to include within a Do Minimum Model, however with the inclusion of CR2 and the new development junction (each junction with two lane approaches in both directions), the length of single carriageway along this section is minimal and fragmented. The proximity of these junctions to each other, and the length of the approach lanes, mean that widening the remaining single carriageway to two lanes in each direction would be required from an operational, highway design and road safety perspective.

The Do Minimum Model also includes the physical structure of the Western Link Road and Southern Access Road. This is to allow new development traffic from Wisbech West and Wisbech South to access to the highway network as no roads currently exist to provide that connection. However, the full function and strategic significance of both of these roads has been prevented through the use of bans along certain links.

This means that development trips can use the two new roads to reach the nearest part of the existing highway network, but that longer distance or through trips are not possible on these roads in the Do Minimum scenarios.

These bans are then lifted in the Do Something Models to provide the benefit of these schemes.

This Do Minimum network has been reflected within the VISSIM Do Minimum Model where the two models share the same network extents.

Using Future Year Traffic Flows

Future year traffic flows have been extracted from the 2015 WATS model for use in Wisbech Access Study scheme assessments. The purpose of assessing future year scenarios is to ensure that a scheme is able to perform with the additional traffic expected from development and background growth, which has not yet materialised. The future years that have been assessed as part of the Wisbech Access Study are 2021, 2026 and 2031. These are in line with the Fenland District Council Local Plan (2014).

It is not possible to directly use traffic flows extracted from the WATS model, as the base year traffic flows within the WATS model may differ to the observed traffic flows used to validate the base models on which each of the options has been assessed. Instead the percentage of growth between the WATS base model and the WATS future year models is calculated for each turning movement, and then this percentage is applied to the observed traffic flows within the base models used in the option assessments. Where the percentage growth is less than 50% or greater than 150%, then absolute growth is used instead.

Do Something

Once a Do Minimum Model has been built and assessed to demonstrate the impact of the future year traffic growth without implementation of the scheme, it is then converted to a Do Something Model by adding the proposed highway improvements to the model network. The outputs from the Do Something Model are then directly compared to the outputs from the Do Minimum model to measure the benefit of the scheme.

6. Concept Highway Design

Introduction

This chapter outlines the level of design and cost to which the schemes have been developed, including any key assumptions that have been made. Further detail regarding scheme costs and design are included within each of the individual Scheme Reports.

Level of Design

The schemes within the Wisbech Access Study have been designed to concept design level. Designs are based on national and local highway standards, and make clear reference where departures from standards are proposed.

Concept designs shown within individual scheme reports have been designed to either the Design Manual for Roads and Bridges, the Manual for Streets 1 & 2 as well as Cambridgeshire Estate Road Specification.

Concept designs are adequate to undertake transport assessments, and to inform Outline Business Cases. Any further level of design would require highway surveys, including topographical surveys.

Scheme designs have been informed by an initial STATs search, to identify if any public utilities would be affected by the scheme which may compromise scheme delivery.

Road Safety Review

All of the schemes progressed from Phase 1 of the Study have been subject to an independent Road Safety Review by Cambridgeshire County Council, to ensure that any potential safety issues are identified early and can be addressed. The comments from the Road Safety Reviews, and the measures taken to mitigate them, are documented within each of the Scheme Reports.

Note that this review was for initial comment only, and does not constitute a formal Road Safety Review (RSA 1, RSA 2 or RSA 3) which would be required once the scheme designs are progressed to further detail.

Schemes that fall within the jurisdiction of Norfolk County Council or Highways England will also need to satisfy their Road Safety Requirements as part of any further design process.

Pedestrians and Cyclists

Scheme designs have also included provision for pedestrians and cyclists where appropriate. This includes the creation of new footways, improved pedestrian crossing facilities and enhancements to pedestrian connectivity. Pedestrian improvements have not been incorporated into the schemes along the A47 route, or in remote areas as such as for the Western Link Road.

The scheme designs have also been mindful of the Wisbech Pedestrian Audit published in March 2016, and improvements from this audit have been incorporated into the options assessed within this study where appropriate.

Scheme Cost Estimates

Cost estimates have been produced for each of the schemes identified for progression from the Phase 1 Assessment. These cost estimates have been based on the Concept Design Drawings contained with each of the Scheme Reports.

The purpose of the estimates to inform any economic assessment taken as part of future business case development. More detailed cost estimates should be produced once further design detail is available, and prior to procurement.

The cost estimates include the following items:

- Drainage;
- Carriageway;
- Junctions;
- Footpaths;
- Street Lighting;
- Signing and Lining;
- Preliminaries, including design (10% const. cost) and supervision (20% const. cost);
- Traffic Management;
- Land purchase and compulsory purchase estimates;
- Demolition;
- Land Acquisition, and,
- Optimism Bias @ 45%.

The estimates also include specific elements for certain schemes such as bus borders and shelters for the Bus Station options, and structural elements for the New River Crossing.

The cost estimates exclude the following items:

- Services Diversions;
- Contaminated Land Treatment; and,
- Local Planning Fees.

As shown above the scheme costs include 45% Optimism Bias. This is an uplift that is applied to the final scheme cost in line with DfT guidance on preparing scheme cost estimates. The DfT describe Optimism Bias in their WebTag note A1.2 Scheme Costs (November 2014) as:

Optimism bias is the demonstrated systematic tendency for appraisers to be overly optimistic about key parameters. Theories on cost overrun suggest that optimism bias could be caused by the organisation of the decision-making process and strategic behaviour of stakeholders involved in the planning and decision-making processes.

Different levels of Optimism Bias should be applied to scheme costs depending on the nature of the scheme (Road, Rail, ITS etc.) and how developed proposals or designs are. The schemes costed as part of this study are road schemes and are all at the first stage of scheme development. As a result of this an Optimism Bias of 45% is applied to the highway scheme costs. The appropriate Optimism Bias for 'Fixed Links' (which includes bridges) is 66% for this level of design, and this has been applied to the new river crossing accordingly.

Cost estimates for each of the schemes, including Optimism Bias, are summarised in Table 6.1 beneath. More detailed breakdowns of the costs are provided within each of the individual scheme reports.

Table 6.1 – Outline Scheme Cost Estimates

Option	Description	Cost (£ m)	Cost inc. OB (£ m)
EH1	A47 / Elm High Road Capacity Enhancements	£743,357	£1,081,468
EH3	A47 / Elm High Road Roundabout Relocation	£7,526,824	£10,925,145
EH4	Elm High Road / Weasenham Lane Signals Upgrade	£662,288	£960,317
EH7A	Elm High Road / Weasenham Lane Roundabout	£2,094,261	£3,036,678
EH9	COWA Site Proposal	Not costed	Not costed
CR2	Cromwell Road / New Bridge Lane Signalisation	£492,455	£714,060
CR7C	A47 / Cromwell Road Roundabout Upgrade	£2,765,605	£4,013,727
CR8	Cromwell Road / Weasenham Lane Roundabout	£1,918,007	£2,781,111
FB5b	Freedom Bridge Roundabout Improvements	£1,978,296	£2,868,529
BS1A	Reconfiguration of the existing Bus Station and access	£1,195,847	£1,733,978
BS2A	Creation of a new Bus Station and accesses	£1,643,010	£2,382,365
NRC	New River Crossing	£3,820,838	£6,342,591
WLR1D	Western Link Road (excluding New River Crossing)	£32,519,723	£47,153,599
SAR1	Southern Access Road – without A47 Roundabout	£1,120,575	£1,579,246
SAR2	Southern Access Road – with A47 Roundabout	£5,825,799	£8,447,409
	Cost of new A47 Roundabout in isolation (SAR2 - SAR1)	£4,705,225	£6,868,163
BER1	A47 / Broadend Road – Conventional Roundabout	£2,434,341	£3,529,794
BER2	A47 / Broadend Road – Enhanced Roundabout	£2,354,443	£3,416,912

Note that these costs assume schemes are delivered in isolation, and do not reflect the potential cost savings that may be associated with delivering adjacent or overlapping schemes at the same time.

The costs for delivering different packages of schemes, including any efficiencies derived from constructing schemes in parallel or in adjoining locations, are discussed within the *Phase 2 Packaging Assessment Report*.

7. Cromwell Road

This chapter briefly outlines the assessment of Cromwell Road as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying Cromwell Road Scheme Report.

Operation of Cromwell Road

The brief for this element of the Wisbech Access Study was to:

Consider the operation of Cromwell Road including the associated junctions along the road including connections to the A47.

Description

The B198 Cromwell Road provides the main gateway into Wisbech from the South West via the A47. The road runs from the A47 trunk road in the south, through largely commercial and industrial areas, to Freedom Bridge Roundabout in the north. Along its northern section, Cromwell Road becomes Nene Quay, and passes through the historic waterfront area of Wisbech. The road runs parallel to the River Nene and has several signalised junctions along the route.

Figure 7.1: Route of B198 Cromwell Road (including Nene Quay)

Relationship to other Schemes

Cromwell Road directly relates to multiple other option assessment areas within the Wisbech Access Study. The relationships are shown in the figure below and described beneath.

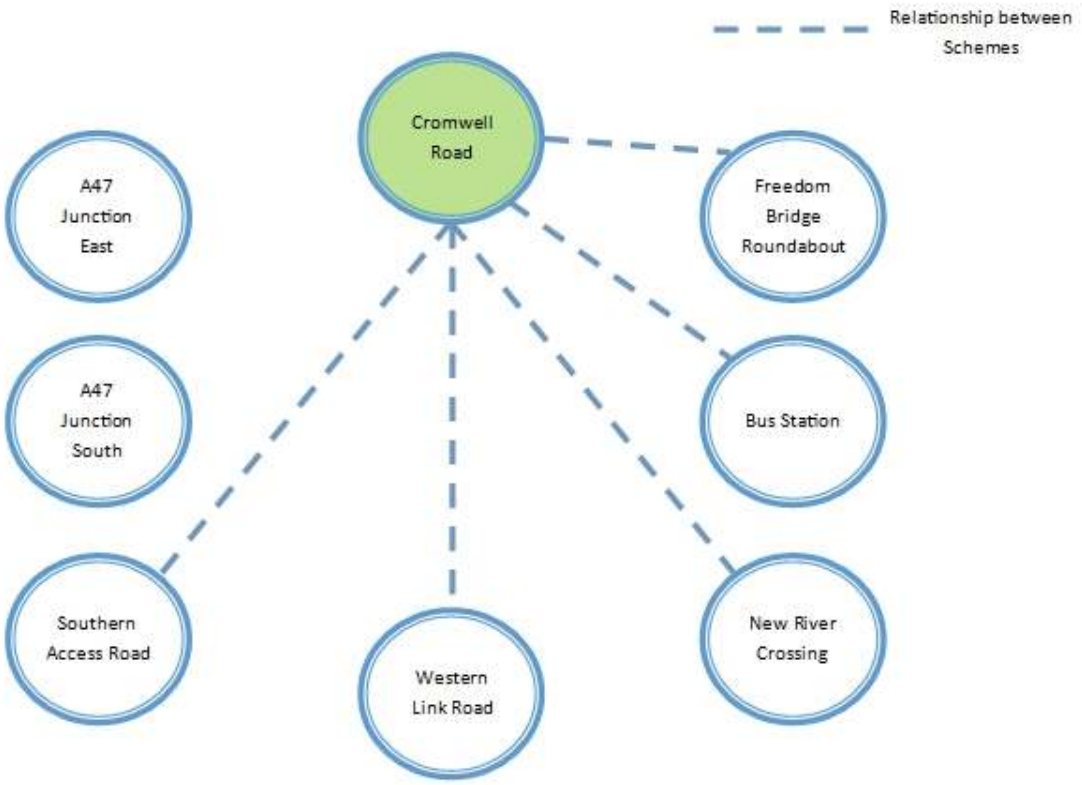


Figure 7.2: Relationship between Cromwell Road and other Study Elements

The Cromwell Road element of the study relates with:

- **Freedom Bridge Roundabout** – Cromwell Road connects to Freedom Bridge Roundabout via Nene Quay to the north. Improvements can be undertaken at either location without directly impacting the other, however some improvement options identified at Freedom Bridge Roundabout require the closure of Horsefair and the creation of a new signalised junction along Nene Quay to provide access to the Bus Station.
- **Bus Station** – Although improvements along Cromwell Road will have little impact on the Bus Station element of the study, there are several options to re-configure the Bus Station which will impact on Cromwell Road by creating a new signalised junction to provide access to the Bus Station.
- **New River Crossing** - Provision of a new crossing over the River Nene will require a physical tie into the road network close to, or directly onto Cromwell Road.
- **Western Link Road** – Creation of a Western Link Road will also require a physical tie into the road network close to, or directly onto Cromwell Road, using the New River Crossing to form part of its alignment. Options for improvements along the southern end of Cromwell Road, particularly at its junction with the A47, have been designed to accommodate the Western Link Road in future should it be required.
- **Southern Access Road** – The Proposed Southern Access Road forms a new east – west route through Wisbech using New Bridge Lane and Boleness Road. New Bridge Lane joins Cromwell Road towards its southern end and will provide one of the key access points into the Wisbech South Development Site. Any proposals for the Southern Access Road will require improvements to the junction between New Bridge Lane and Cromwell Road, and any improvements considered

along this section of Cromwell Road should be designed to accommodate traffic growth generated by the Wisbech South Development and the New Bridge Lane access.

Relationship to the Proposed Rail Way Line

Note: Despite proposals for a new railway line (to be positioned south of the town centre) being beyond the scope of the Wisbech Access Study, the impact and relationship on schemes included within the study have been considered.

Railway line proposals may impact the operation of Cromwell Road, as indicated below:

- **Cromwell Road / Weasenham Lane Junction** – If the railway line is to sever the proposed Southern Access Road scheme of this study and / or Weasenham Lane, the operation of this junction will be impacted and likely to operate over capacity, therefore requiring junction improvements.

Main Issues

The main issues that have been identified along Cromwell Road are:

- Uncoordinated approach to development along the southern end of Cromwell Road, resulting in successive signalised junctions;
- Peak hour delay at the signalised junction with Weasenham Lane;
- Lack of capacity to support future growth, including the Wisbech South Development adjacent to the southern end of Cromwell Road; and,
- Lack of capacity at the A47 / Cromwell Road Roundabout to support future growth, of the West Wisbech Development site.

Option Development

Potential options to address these issues were devised during several workshops, undertaken in March 2016 (Option Development) and October 2016 (Option Review). The number of attendees varied across the two workshops, however both consisted of officers from Fenland District Council, Cambridgeshire County Council, and neighbouring authorities. There were also representatives from Highways England as well as Transport Planners, Traffic Modellers and Highway Engineers from Skanska.

The workshops presented the current issues and future challenges associated with Cromwell Road to delegates, and then used the delegates' collective experience and expertise to develop a series of improvement options for assessment within the Wisbech Access Study.

The options developed for Cromwell Road include:

- **CR 1** – Divert general northbound traffic onto South Brink and create a new gateway into Wisbech along the River;
- **CR 2** – Remove the signalised junction at Tesco's, reconfigure the Tesco access to form a new signalised junction with New Bridge Lane;
- **CR 3** – Close Salters Way access onto Cromwell Road, providing sole access via New Bridge Lane;
- **CR 4** – Close residential access from Reason Homes estate on Cromwell Road (providing access only from South Brink) to reallocated signal time to Cromwell Road and Weasenham Lane;
- **CR 5** – Landscaping and pedestrian facility upgrade along the length of the west corridor;
- **CR6 –** Create a larger, enhanced capacity A47 / Cromwell Road roundabout that could also facilitate the Western Link Road.

(Note, several options for CR 6 were discussed and this eventually evolved into Option CR7 before any assessment had been undertaken)

- **CR 7a** – Variation of Option 7, capacity enhancements through geometry changes;

(Option CR 7a underwent several variations and refinements within the Option Assessment process to respond to the results from the traffic modelling and highway design input. Option shortlisted is referred to as Option CR 7C).

- **CR 8** – Further junction improvements to Cromwell Road / Weasenham Lane;
- **CR 9** – Widening of Cromwell Road to two lanes in each direction between the A47 and New Bridge Lane;
- **CR 10** – Junction improvements to Nene Quay / Town Bridge / South Brink; and,
- **CR 11** – Re-route the A47 to avoid Cromwell Road roundabout and instead link with a new A47 roundabout which serves the Wisbech South Development site.

Method of Assessment

The options identified for Cromwell Road have been assessed using the Wisbech VISSIM Micro Simulation Model. This model was built specifically for this study, as a tool for undertaking operational assessments of the options generated.

Full details of the model construction are provided within the accompanying *Wisbech VISSIM Local Model Validation Report.*

Full details of the use of the model for the option assessment are provided within the accompanying *Cromwell Road Report.*

Option Assessment Summary

Following initial assessment, Options CR 7C and CR 8 were retained for further progression within the study. The tables below highlight the predicted performance of each of the retained options, in relation to the forecast years.

Full details of the assessment for this element are contained within the accompanying *Cromwell Road Report*.

Option CR 7C

Table 7.1: CR 7c Assessment Summary

	With WLR	
	2026	2031
AM Peak	All approaches to roundabout within capacity and performing better than DM. Cromwell Road marginally worse as a result of giving way to Western Link Road traffic. Junction LOS C.	All approaches to roundabout within capacity and performing better than DM. Cromwell Road marginally worse as a result of giving way to Western Link Road traffic. Junction LOS C.
PM Peak	All approaches to roundabout operating better than DM, although A47 (W) operating over capacity due to constraints in wider network. Junction LOS F.	All approaches to roundabout operating better than DM, although A47 (W) operating over capacity due to constraints in wider network. Junction LOS F.

Table 7.1 shows that this option is expected to operate within capacity, providing benefit over the Do Minimum network.

Results for the AM peak hour of both 2026 and 2031 show that the addition of the Western Link Road makes the operation of Cromwell Road slightly worse (than it currently does) due to the give way controls on the roundabout.

Due to network constraints, the A47 West approach is predicted to be operating over capacity, as vehicles cannot proceed onto the A47 eastbound due to queuing back from the next adjacent A47 junction to the east. Despite this being identified within the model, the junction is still performing better than the Do Minimum network.

Option CR 8

Table 7.2: Option CR 8 Assessment Summary

	Cromwell Road Option 8		
	Without WLR		
	2021	2026	2031
AM Peak	All approaches to junction well within capacity with LOS A. Delays significantly reduced.	All approaches to junction well within capacity with overall LOS A. Delays significantly reduced.	All approaches to junction within capacity with overall LOS C. Delays significantly reduced.
PM Peak	All approaches operating within capacity and delays reduced. Overall LOS C.	All approaches to roundabout operating better than DM, junction operating at capacity due to constraints in wider network. Junction LOS E.	All approaches to roundabout operating better than DM, junction operating over capacity due to constraints in wider network. Junction LOS F.

Table 7.2 shows that this option is expected to operate within capacity, providing benefit over the Do Minimum network.

Results for the AM peak hour of both 2026 and 2031 show that the addition of the roundabout makes the operation of this Weasenham Lane Junction operate better, with a LOS A and C recorded. Delays during this forecast years are predicted to be significantly reduced.

In the PM peak hour in 2026 and 2031, all approaches operate better than the Do Minimum, however the junction is at capacity due to constraints elsewhere on the wider network.

8. Elm High Road

This chapter briefly outlines the assessment of Elm High Road as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying *Elm High Road Report.*

Operation of Elm High

The brief for this element of the Wisbech Access Study was to:

Consider the operation of Elm High Road including the associated junctions along the road including connections to the A47.

Description

The A1101 Elm High Road provides the main gateway into Wisbech from the South east via the A47. The road runs from the A47 trunk road in the south, through largely commercial and residential areas, to Freedom Bridge Roundabout in the north. From its junction with Weasenham Lane northward, the road becomes Churchill Road and is a dual carriageway following the alignment of the historic canal. The road has several signalised junctions along the route, and is a primary access route for several key services such as the hospital and the Thomas Clarkson Academy secondary school.

Figure 8.1: Route of A1101 Elm High Road (including Churchill Road)

Relationship to other Schemes

Elm High Road directly relates to multiple other option assessment areas within the Wisbech Access Study. The relationships are shown in the figure below and described beneath.

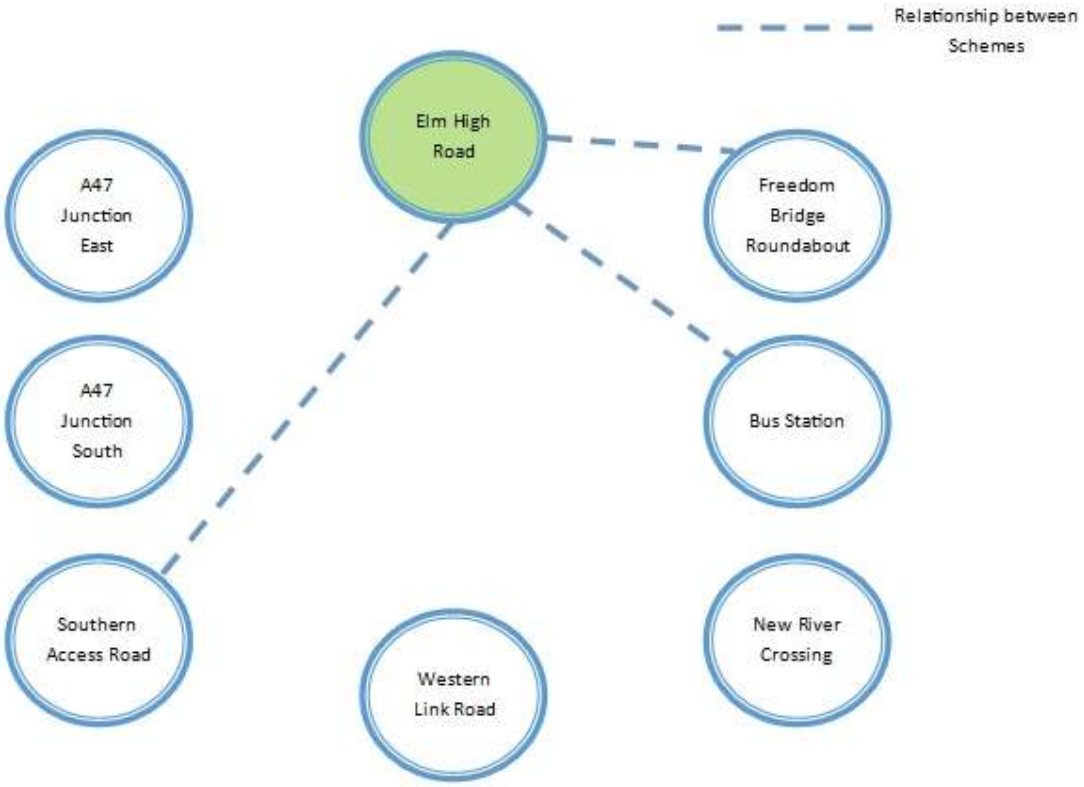


Figure 8.2: Relationship between Elm High Road and other Study Elements

The Elm High Road element of the study relates with:

- **Freedom Bridge Roundabout** – Elm High Road connects to Freedom Bridge Roundabout via Churchill Road to the north. Improvements can be undertaken at either location without directly impacting the other, however some improvement options identified at Freedom Bridge Roundabout require the closure of Horsefair and the creation of a new signalised junction along Churchill Road to provide access to the Bus Station. Options have also been considered for Freedom Bridge Roundabout that increase the exit from the junction onto Churchill Road to two lanes.
- **Bus Station** – Although improvements along Elm High Road will have little impact on the Bus Station element of the study, there are several options to re-configure the Bus Station which will impact on Churchill Road by creating a new signalised junction to provide access to the Bus Station. Relocation of the Bus Station to a site immediately adjacent to Churchill Road is also being considered within the Bus Station element of the study, and this would require upgrading an existing junction and creating a new junction with Churchill Road.
- **Southern Access Road** – the Proposed Southern Access Road forms a new east – west route through Wisbech using New Bridge Lane and Boleness Road. Boleness Road joins Weasenham Lane which feeds directly onto Elm High Road via a signalised junction. This route will provide one of the key access points into the Wisbech South Development Site. Any proposals for the Southern Access Road will likely require improvements to the eastern end of Weasenham Lane and it's junction with Elm High Road. Any improvements considered along Elm High Road should be designed to accommodate the traffic growth generated by the Wisbech South Development.

Relationship to the Proposed Rail Way Line

Note: Despite proposals for a new railway line (to be positioned south of the town centre) being beyond the scope of the Wisbech Access Study, the impact and relationship on schemes included within the study have been considered.

Railway line proposals may impact the operation of Elm High Road, as indicated below:

- **Elm High Road / Weasenham Lane Junction** – If the railway line is to sever the proposed Southern Access Road scheme of this study and / or Weasenham Lane, the operation of the Elm High Road / Weasenham Lane junction will be impacted and likely to operate over capacity, therefore requiring junction improvements.
- **A47 / Elm High Road Roundabout** – Although not directly impacted by the railway line, if the operation of the Weasenham Lane junction was to deteriorate knock on effects are likely to occur at the A47 roundabout.

Main Issues

The main issues that have been identified along Elm High Road are:

- Peak hour delay on the approach to Freedom Bridge Roundabout;
- Peak hour delay at the signalised junction with Weasenham Lane;
- Significant delay on the southbound approach to the A47 roundabout;
- Severance created by the dual carriageway section;
- Lack of capacity to support future growth, including the Wisbech South Development.

Option Development

Potential options to address these issues were devised during several workshops, undertaken in March 2016 (Option Development) and October 2016 (Option Review). The number of attendees varied across the two workshops, however both consisted of officers from Fenland District Council, Cambridgeshire County Council, and neighbouring authorities. There were also representatives from Highways England as well as Transport Planners, Traffic Modellers and Highway Engineers from Skanska.

The workshop presented the current issues and future challenges associated with Elm High Road to delegates, and then used the delegates' collective experience and expertise to develop a series of improvement options for assessment within the Wisbech Access Study.

The options developed for Elm High Road include:

- **EH 1** – Capacity enhancements to the existing A47 / A1101 Elm High Road Junction;
- **EH 1A** – Sensitivity test of Option 1, focusing on capacity enhancements of Elm High Road North approach only;
- **EH 2** – Provision of a pedestrian footbridge over the A47 to replace the at grade crossing on the A47 eastbound approach;
- **EH 3** – Re-locate the A47 / A1101 Elm High Road Junction further to the east and enhance capacity;
- **EH 4 –** Amendments to the existing signalised junction of A1101 Elm High Road / Weasenham Lane / Ramnoth Road;

- **EH 5** – Reduce Churchill Road to a single carriageway, and;
- **EH 6** - Weasenham Lane junction converted to a priority controlled roundabout.

(Note: that several options for EH 6 were discussed and this eventually evolved into **EH 7,** before any assessments had been undertaken)

- **EH 8** – Sensitivity test of Option 7, an enlarged roundabout with additional pedestrian facilities;
- **EH 9** – Weasenham Lane Junction (particularly in regards to Ramnoth Road) improvements based on COWA development proposal.

Method of Assessment

The options identified for Elm High Road have been assessed using the Wisbech VISSIM Micro Simulation Model. This model was built specifically for this study, as a tool for undertaking operational assessments of the options generated.

Full details of the model construction are provided within the accompanying *Wisbech VISSIM Local Model Validation Report.*

Full details of the use of the model for option assessment are provided within the accompanying *Elm High Road Report*.

Option Assessment Summary

Following initial assessments, Options EH 1, EH 3, EH 4 and EH 7A were retained for further progression within the study. The tables below highlight the predicted performance of each of the retained options, in relation to the forecast years 2021, 2026 and 2031.

Full details of the assessment for this element are contained within the accompanying *Elm High Road Report.*

Option EH 1

Table 8.1: EH 1 Assessment Summary

	Without WLR		
	2021	**2026**	**2031**
AM Peak	All approaches to Rbt operating within capacity, except A47 (W) which is over capacity, although delays reduced. Overall LOS E. Largest improvement at Elm High Road (S) approach.	A47 (W) and Elm High Road (S) operating over capacity. Overall junction LOS F. More traffic processed northbound which queues back from Weasenham Lane blocking the roundabout.	A47 (W) and Elm High Road (S) operating over capacity, A47 (E) operating at caapacity. Overall junction LOS F. More traffic processed northbound which queues back from Weasenham Lane blocking the roundabout earlier on than 2026.
PM Peak	Rbt operates over capacity with LOS F. A47 (W) approach still over capacity as no changes have been made to the approach. Largest improvement at Elm High Road (N) approach which significantly improves Weasenham Lane jct performance.	A47 (W) approach over capacity. Overall Junction LOS F. Largest improvement at Elm High Road (N) and A47 (E) approaches which significantly improves Weasenham Lane jct performance.	Two A47 approaches operating over capacity. Elm High Road (N) has the largest improvement. Junction LOS F.

The main benefit of this option concerns the improved operation of the Elm High Road North approach, which removes southbound congestion along the corridor, which in turn improves the performance of Weasenham Lane Junction as a greater number of vehicles

are able to exit the Weasenham Lane approach. This benefit is shown across all scenarios assessed.

In the AM peak, junction improvements allow more traffic to be processed northbound from Elm High Road South approach. Despite this benefiting this approach, it does however result in longer queues on the corridor extending back from Weasenham Lane. To address this issue of higher northbound demand, alterations were made to the signal timings allowing more green time for the Elm High Road South approach to the junction.

The A47 (W) approach is shown to operate over capacity across both peak hours, as no alterations to the approach are being made. Queue backs on this approach will impact the operation of the adjacent Cromwell Road roundabout.

Therefore, the conclusions from this assessment is that any improvements made to the roundabout, must be alongside an improvement scheme at Weasenham Lane Junction and on the A47 West approach.

Option EH 3b

Table 8.2: EH 3 Assessment Summary

	Without WLR		
	2021	2026	2031
AM Peak	All approaches to new Rbt operating within capacity and delays reduced. A47 (W) is at capacity. Overall LOS C. Queues can extend along the new Link Road from Weasenham Lane.	A47 (W) and Elm High Road (S) operating over capacity as a result of queuing back from Weasenham Lane, blocking the roundabout. Overall LOS F.	A47 (W) and Elm High Road (S) operating over capacity as a result of queuing back from Weasenham Lane, blocking the roundabout. A47 (W) performs worse than the DM. Overall LOS F.
PM Peak	All approaches to new Rbt operating well within capacity and delays reduced. Overall LOS C.	All approaches to new Rbt operating better than the DM. Overall LOS D. Processes significantly more traffic than DM.	All approaches to new Rbt operating well within capacity and delays reduced. Overall LOS C.

The relocation and enhancement of the A47 roundabout to the east of its existing location, helps to improve performance of the junction across all scenarios assessed. Note, that the amber shading indicates that this option is constrained by the operation of Weasenham Lane Junction.

The same constraint of ‘a higher northbound demand’ (as seen in Option EH 1) is shown to be relevant to this option, as more traffic is processed towards Weasenham Lane. This is shown to cause congestion along the Elm High Road North link road, extending back to the new roundabout. This is shown to be an issue for the AM peak hours of 2026 and 2031. The snowball effect associated with queue backs from Weasenham Lane is that the operation of the A47 West approach is decreased, with performance being worse than the Do Minimum scenario.

In the PM peak hour the roundabout is predicted to operate within capacity in all forecast years and performs better than the DM for all approaches, apart from the Elm High Road North approach in 2026 which performs marginally worse than the Do Minimum scenario.

The conclusion of this assessment is to combine this option with upgrades to Weasenham Lane Junction.

Option EH 4

Table 8.3: EH 4 Assessment Summary

	Without WLR		
	2021	2026	2031
AM Peak	All approaches to junction close to capacity with LOS D. Weasenham Lane is significantly better.	Ramnoth Road operating over capacity, but all arms performing better than Opt 1. LOS E overall.	Junction performs better than Opt 1 for all approaches, but still operating over capacity with LOS F.
PM Peak	All approaches operating within capacity and delays reduced. Overall LOS C. Churchill Rd performing marginally worse than Opt 1.	All approaches to new junction operating within or close to capacity and delays reduced. Overall LOS D.	All approaches to new junction operating within or close to capacity and delays reduced. Weasenham Lane operating at capacity with LOS E. Overall LOS D.

In order to quantify benefits for this scheme, it was necessary to incorporate the improvements to the Elm High Road Southbound approach to the A47 roundabout, see EH 1. Therefore, the results shown in Table 5.3 above have been compared back to the Option 1 results for this junction to provide a better understanding of benefits.

Results for the AM peak hour show all approaches are forecast to perform better than Option 1 in all years, although by 2031 the junction is forecast to operate over capacity.

The PM peak hour results show the junction operates within capacity in all years, but the Churchill Road approach is marginally worse than Option 1 in 2021 and 2031, and that Ramnoth Road performs worse in 2031 as a result of more traffic being processed from Weasenham Lane due to the introduction of the double right turn facility.

Option EH 7A

Table 8.4: EH 7A Assessment Summary - 2026

	Without WLR		
	2021	2026	2031
AM Peak	All approaches to new Rbt operating well within capacity. Overall LOS A.	All approaches to new Rbt operating well within capacity. Overall LOS B.	All approaches to new Rbt operating well within capacity. Overall LOS B.
PM Peak	All approaches to new Rbt operating well within capacity. Overall LOS B.	All approaches to new Rbt operating well within capacity. Overall LOS C. The Ramnoth Road left slip is at capacity as a result of the increased throughput of traffic from Churchill Road and Weasenham Lane.	All approaches to new Rbt operating well within capacity. Overall LOS C. The Ramnoth Road approach and left slip is at capacity as a result of the increased throughput of traffic from Churchill Road and Weasenham Lane.

Results for this option show that converting the signalised junction at Weasenham Lane significantly improves the performance of the junction, with the junction predicted to operate well within capacity across all scenarios assessed.

AM peak hour results so the Junction is predicted to operate under a LOS category A or B, which indicated free flowing traffic.

In the PM peak hour in 2026 and 2031, it should be noted that the operation of the Ramnoth Road approach is operating at capacity as a result of giving way to more vehicles being processed from Churchill Road and Weasenham Lane.

With a greater proportion of traffic being processed southbound from Weasenham Lane junction, improvements included within this option at the southbound approach to the A47 roundabout, enable the operation of the A47 roundabout to remain within capacity.

9. Freedom Bridge Roundabout

This chapter briefly outlines the assessment of Freedom Bridge Roundabout as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying *Freedom Bridge Roundabout Report*.

Improvements to Freedom Bridge Roundabout

The brief for this element of the Wisbech Access Study was to:

Identify possible improvement measures to Freedom Bridge Roundabout.

Description

Freedom Bridge Roundabout is a five arm roundabout located to the north of the town centre, which currently forms a pin point junction for vehicles travelling via Wisbech from the A17 (Lincolnshire) and the A47 (Cambridgeshire and Norfolk). The roundabout is positioned parallel to the River Nene, with the A1101 Freedom Bridge approach facilitating one of two river crossings alongside Town Bridge. The roundabout provides primary access for the Horsefair Bus Station, Albion House (Job Centre), Nene Waterfront Regeneration Area (via Bedford Street) and the Petrol Station.

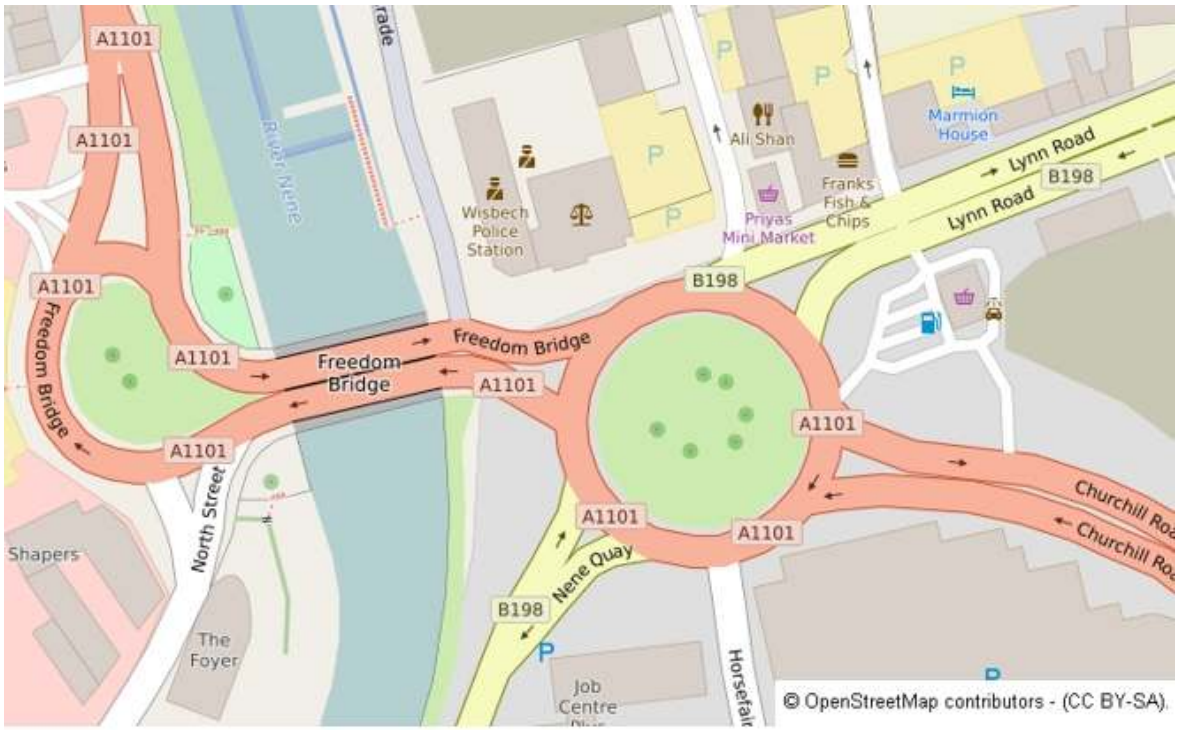


Figure 9.1: Freedom Bridge Roundabout

Relationship to other Schemes

Freedom Bridge Roundabout directly relates to two other option assessment areas within the Wisbech Access Study. The relationships are shown in the figure below and described beneath.

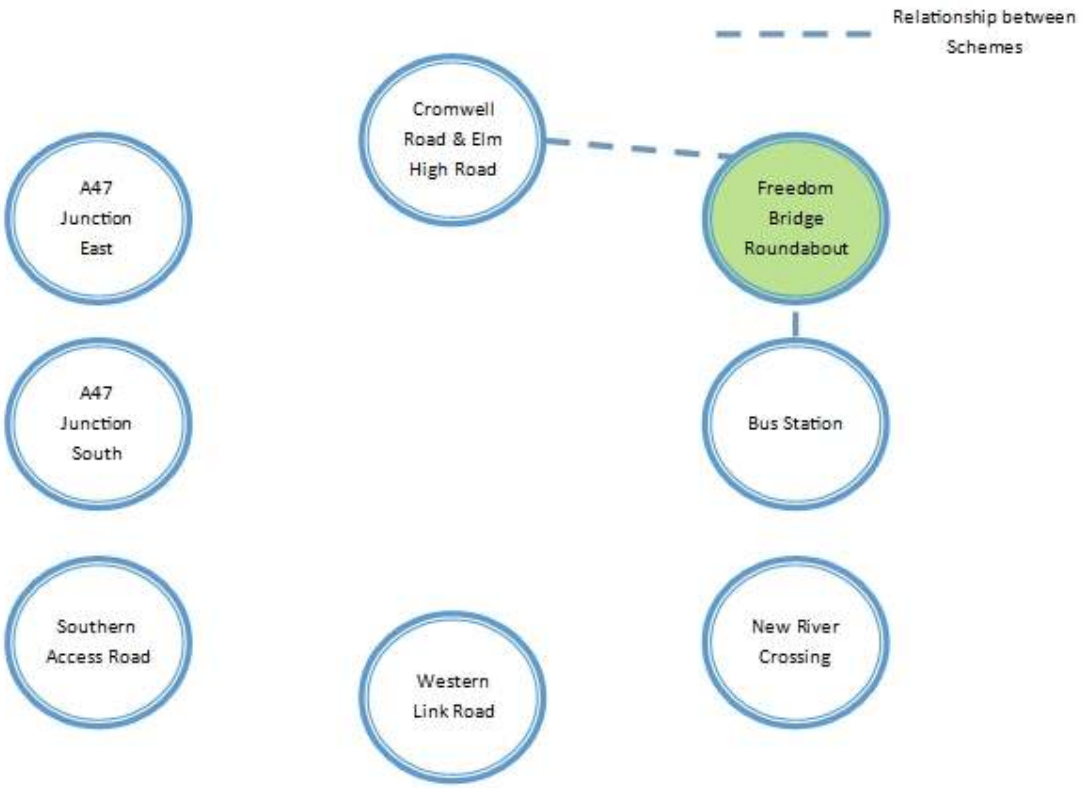


Figure 9.2: Relationship between Freedom Bridge Roundabout and other Study Elements

The Freedom Bridge Roundabout element of the study relates with:

- **Cromwell Road & Elm High Road** – Improvements to Freedom Bridge Roundabout will most likely have an impact on the form of Cromwell Road and Elm High Road. Options that have been considered to improve the roundabout consist of removing the Horsefair arm which provides access to the Bus Station, to replace this proposals have been considered that will create two new signalised junctions at the northern end of Cromwell Road (Nene Quay) and Elm High Road (Churchill Road) to provide access to a new Bus Station. Proposed improvements to either Cromwell Road / Nene Quay and Elm High Road / Churchill Road will not physically impact on Freedom Bridge Roundabout. The proposal to reduce Churchill Road to a single carriageway would still require a flared two lane approach to Freedom Bridge Roundabout.
- **Bus Station** – Most of the proposed improvement options for Freedom Bridge Roundabout include the removal of the Horsefair approach from the roundabout, which will either require the relocation of the Bus Station, or reconfiguration of the access arrangements via new junctions on Nene Quay and Churchill Road. Both the potential options that have been shortlisted as part of the Bus Station element of this study consist of the removal of the current access arrangements onto Freedom Bridge Roundabout, this is considered to be crucial to any improvement at this junction.

Main Issues

The main issues that have been identified at Freedom Bridge Roundabout are:

- Peak hour delay on all approaches;
- Poor lane discipline and inconsistent lane use around the circulatory, compromising safety and capacity;
- Currently provides poor access arrangements to the Bus Station, and buses regularly experience delay when exiting the station onto the roundabout; and,
- Poor pedestrian connectivity around the roundabout.

Option Development

Potential options to address these issues were devised at workshop in March 2016. The workshop consisted of officers from Fenland District Council, Cambridgeshire County Council, and neighbouring authorities. There were also representatives from Highways England as well as Transport Planners, Traffic Modellers and Highway Engineers from Skanska.

The workshop presented the current issues and future challenges associated with Freedom Bridge Roundabout to delegates, and then used the delegates' collective experience and expertise to develop a series of improvement options for assessment within the Wisbech Access Study.

The options developed for Freedom Bridge Roundabout include:

- **FB 1** – Roundabout signalisation. Idea abandoned and replaced with Option 5;
- **FB 2** – Divert Horsefair onto Nene Quay via School Lane, and signalise the roundabout on an anti-clockwise staging (based on Cuckoo Corner- Southend);
- **FB 3** – Signalised contra-flow implemented to the north of the existing circulatory for vehicles travelling between Lynn Road and the A1101 Freedom Bridge approaches, with the southern half of the roundabout retained under the existing layout with give way approaches;
- **FB 4** – Large gyratory system spanning both sides of the river;
- **FB 5** – Creation of an east-west bus station link between Nene Quay and Churchill Road, and the reconfiguration of the circulatory minus the Horsefair approach; and,
- **FB 5A** – A series of network improvements to the roundabout and surrounding area, following the inclusion of several elements of Option 4 and 5.

Method of Assessment

The options identified for Freedom Bridge Roundabout have been assessed using the Wisbech VISSIM Micro Simulation Model. This model was built specifically for this study, as a tool for undertaking operational assessments of the options generated.

Full details of the model construction are provided within the accompanying *Wisbech VISSIM Local Model Validation Report.*

Full details of the use of the model for option assessment are provided within the accompanying report *Freedom Bridge Roundabout Report.*

Option Assessment Summary

Following initial assessments, Options FB 5A was retained for further progression within the study. The tables below highlight the predicted performance of this option, in relation to the forecast years 2021, 2026 and 2031.

Full details of the assessment for this element are contained within the accompanying *Freedom Bridge Roundabout Report*.

Option FB 5b

Table 9.1: FB 5A Assessment Summary

	Freedom Bridge Roundabout Option 5b Without WLR		
	2021	**2026**	**2031**
AM Peak	All approaches to FB operating within capacity. Overall LOS B. Approaches to Aldi junction operate better than DM.	All approaches to FB operating within capacity. Overall LOS C.	All approaches to FB operating within capacity. Overall LOS C.
PM Peak	All approaches to FB operating within capacity with LOS D and delays reduced. Significant improvement at A1101. North St worse, LOS E, due to merging and queues at Aldi.	Churchill Road operating over capacity and Nene Quay at capacity. FB Operating at LOS E. Merge issues causing congestion back to Freedom Bridge blocking the circulatory of the roundabout. A1101 operating within capacity and significantly better than DM.	All approaches to FB operating over capacity with LOS F and at all surround junctions. However, the scheme provides benefits over the DM.

Results from the assessments shows that Option FB 5B is predicted to provide benefit to both peak hours of each forecast year, with delay along the A1101 approach being reduced when compared against the Do Minimum scenario.

Weaknesses within this option concerns the operation of the Aldi Junction, which operates worse than existing in 2031 PM peak, due to the change in signal timings and additional green time given to the A1101 approach. Benefits of this option for the A1101 greatly outweighs the delay at the Aldi Junction.

The one ahead lane on the A1101 Churchill Road eases issues when merging on the western gyratory, however moves the congestion and delay on both Churchill Road itself and Lynn Road

10. Bus Station

This chapter briefly outlines the assessment of Wisbech Bus Station as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying *Wisbech Bus Station Report.*

Reconfiguration or Relocation of the Wisbech Bus Station

The brief for this element of the Wisbech Access Study was to:

Consider the current Bus Station operation including a new access from Nene Quay and consideration of a new site for Wisbech Bus Station.

Description

Horsefair Bus Station has six operational stands which are configured in a Drive in Reverse out (DIRO) system. The bus station is positioned centrally within the town, providing convenient public access to Horsefair shopping centre and wider services such as healthcare. The bus station access off Freedom Bridge Roundabout provides strong connectivity to the wider transport network (including Peterborough, March, King's Lynn and Norfolk), for both the short and long distance services in operation.

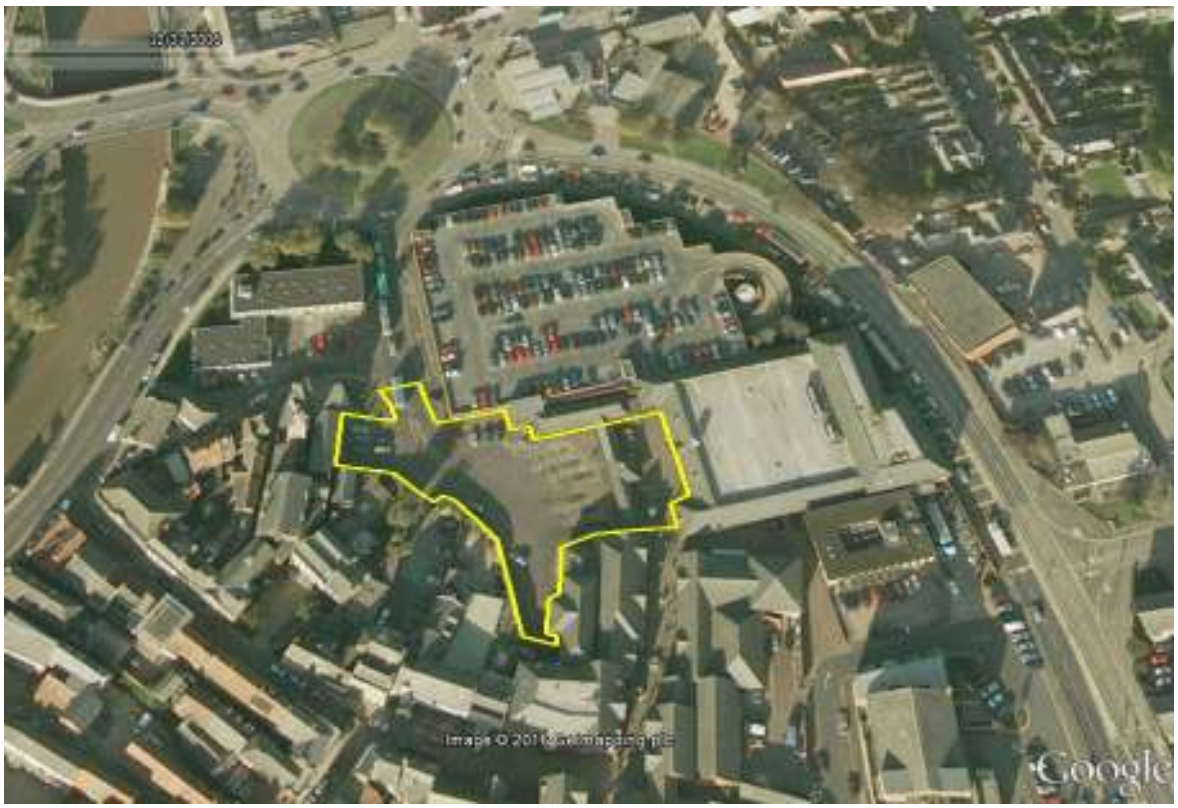


Figure 10.1: Wisbech Bus Station

Relationship to other Schemes

The Bus Station directly relates to two other option assessment areas within the Wisbech Access Study. The relationships are shown in the figure below and described beneath.

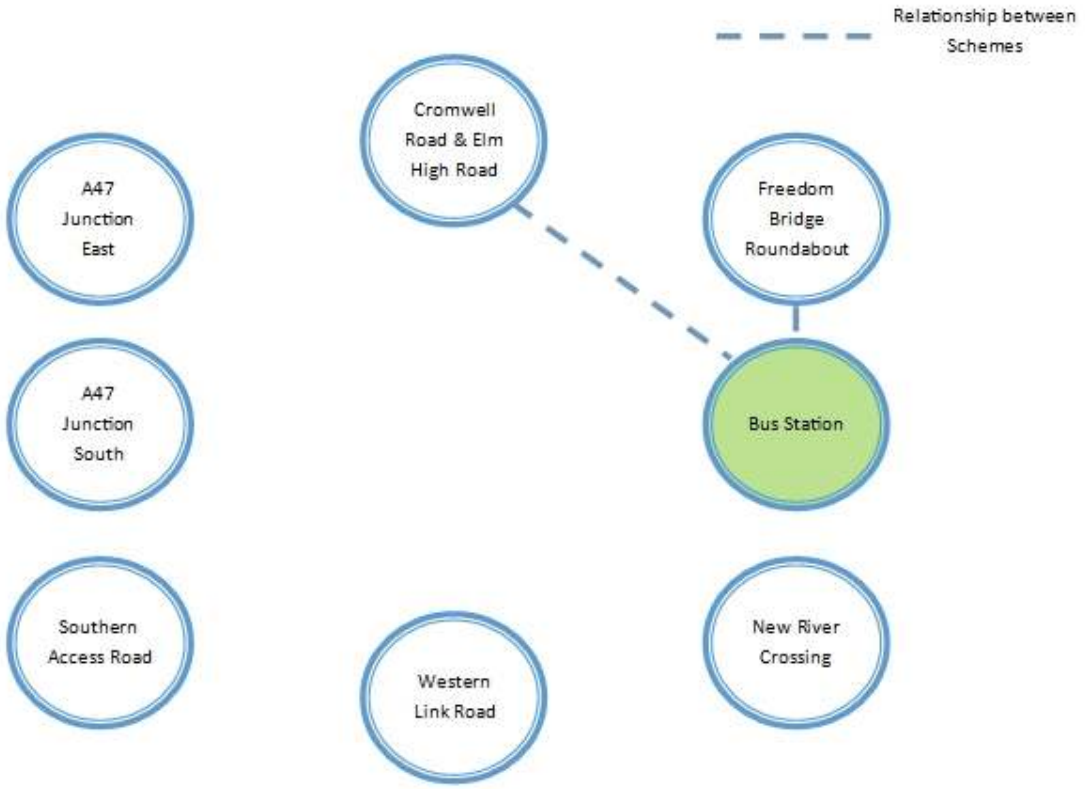


Figure 10.2: Relationship between the Bus Station and other Study Elements

The Bus Station element of the study relates with:

- **Cromwell Road & Elm High Road** – Several improvements options considered for the Bus Station consist of removing the Horsefair arm from Freedom Bridge Roundabout which currently provides access to the Bus Station, and instead creating new signalised junctions along Nene Quay and Churchill Road.
- **Freedom Bridge Roundabout** – Most of the proposed improvement options for Freedom Bridge Roundabout include the removal of the Horsefair approach from the roundabout, which will either require the relocation of the Bus Station, or reconfiguration of the access arrangements via new junctions on Nene Quay and Churchill Road. Both the potential options that have been shortlisted as part of the Bus Station element of this study consist of the removal of the current access arrangements onto Freedom Bridge Roundabout, this is considered to be crucial to any improvement at this junction.

Main Issues

The main issues that have been identified at the Bus Station are:

- Difficulty for buses joining Freedom Bridge Roundabout, resulting in service delay;
- User conflict arising from multiple user groups within a confined space;
- Constrained site, offering no opportunity for growth in services; and,
- Poor quality environment for pedestrians and bus users, does not present an inviting gateway to Wisbech.

Option Development

Potential options to address these issues have been devised by a steering group consisting of staff from Fenland District Council, Cambridgeshire County Council and Skanska from a range of disciplines including transport planning, highway engineering, public transport and economic growth and regeneration.

The steering group has met over successive workshops throughout 2016 and devised a long list of potential options, which have then been shortlisted over several iterations of review and challenge.

The options developed for the Bus Station include:

- BS 1A – Retaining the existing bus station coupled with land take of Albion House to accommodate a new access via Nene Quay and layover bays;
- BS 1B – Retaining the existing bus station and relocating the taxi rank to Canal Street;
- BS 1C – Variation of Option 1A, with a creation of a through road connecting the bus station with Union Street to enable a one-way system operation for buses;
- BS 1D – Hybrid option to reconfigure the existing bus station, combining elements of 1A and 1C;
- BS 2A – Creation of an east / west route with on-street bus bays and reconfigured junction access on Nene Quay and Churchill Road. Demotion of Albion House and the Multi-storey car park are required;
- BS 2B – Variation of Option 2A, with access from the west remaining via Freedom Bridge Roundabout;
- BS 3 – Relocating the bus station to the Nene Waterfront Regeneration area north of Freedom Bridge Roundabout. Access on Bedford Street to be improved;
- BS 4 – Relocating the bus station to Chapel Road Car Park;
- BS 5 – Relocating the bus station to Somers Road Car Park;
- BS 6 – Relocating the bus station to Church Terrace Car Park;
- BS 8 – Creating on –street bus bays along the Market Square and The High Street; and,
- BS 9 – Relocating the bus station to Canal Street using land take of the Empire Theatre.

Method of Assessment

A qualitative assessment, facilitated by scheme workshops, was used to review the options devised for the Wisbech Bus Station scheme. Group discussions were used to gather the steering group's collective opinion in regards to; option strengths / weaknesses and required design amendments (where appropriate). This assessment therefore informed decisions to either retain or discard options from further progression within the study challenge / sifting processes.

A detailed overview of scheme workshops and associated option outcomes are provided within the *Wisbech Bus Station Report.*

Option Assessment Summary

Out of the options devised for the bus station, Option 1A has been identified as the preferred option. This option was chosen as the strongest option to improve the conditions within the existing bus station in the immediate future. A description of the finalised option is beneath:

“This option retains the existing bus station location, bay and taxi rank configuration, and uses land currently occupied by Albion House to facilitate a new access onto Nene Quay, as well as provides additional layover bays and a segregated car park entry / exit points”. .

Full details of the assessment for this element are contained within the accompanying *Wisbech Bus Station Report.*

11. New River Crossing

This chapter briefly outlines the assessment of the New River Crossing as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying *New River Crossing Report.*

New River Crossing

The brief for this element of the Wisbech Access Study was to:

Consider a new river crossing to the west of the town centre.

Description

There are currently two highway crossings over the River Nene within Wisbech, both of which are within the Town Centre. The more northern of the two is over the A1101 Freedom Bridge approach, which forms a central part of Freedom Bridge Roundabout, and the second is approximately 300m south over Town Bridge. Both crossings are currently congested during peak hour periods.

To address the congestion at these existing crossings, and to ensure that there is capacity for future growth within Wisbech, a Western Link Road has been proposed to provide an alternative north-south route to the west of the river and town. This link road would also serve to provide access to the proposed West Wisbech Development site. The proposed Western Link Road would require a new river crossing to re-join the main strategic highway network to the east of the river, and the location and form of this structure is the subject of this assessment.

Figure 11.1: Area of Search for a New River Crossing

Relationship to other Schemes

The New River Crossing directly relates to two other option assessment areas within the Wisbech Access Study. The relationships are shown in the figure below and described beneath.

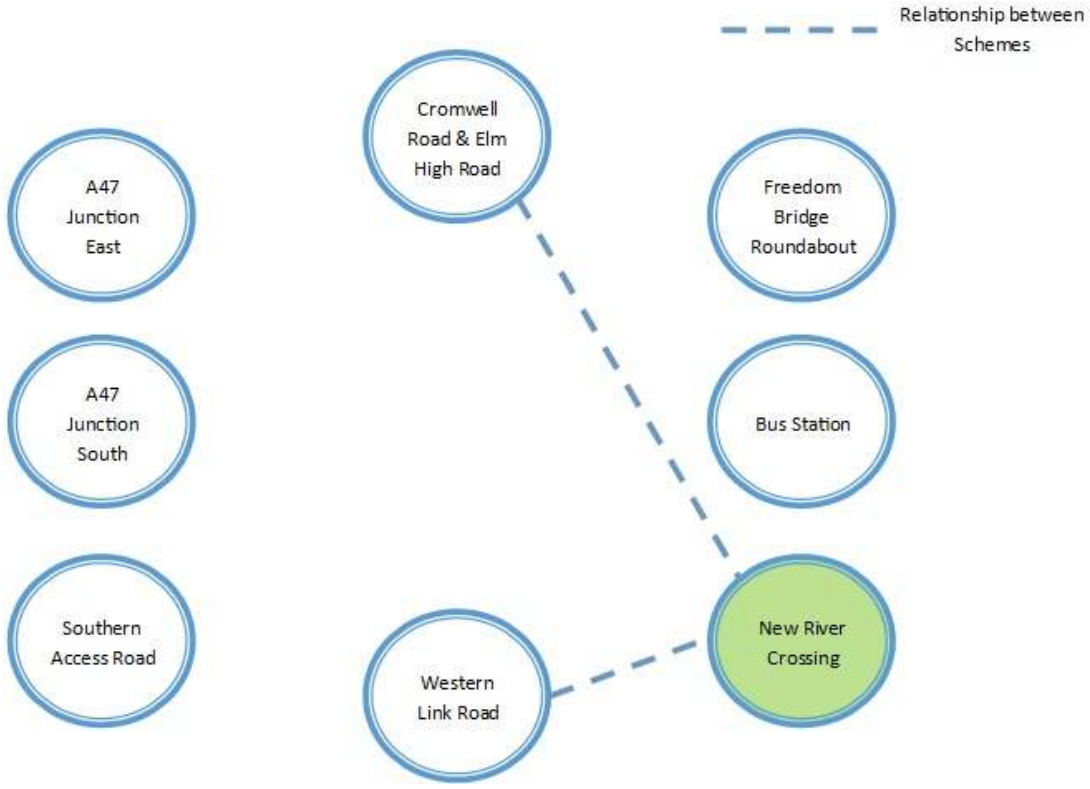


Figure 11.2: Relationship between the New River Crossing and other Study Elements

The New River Crossing element of the study relates with:

- **The Western Link Road** – The proposed Western Link Road forms a north – south route positioned to the west of the town centre. As part of this alignment a river crossing is required to connect the link road with the strategic highway network east of the river. The river crossing will serve the southernmost junction along the alternative route.
- **Cromwell Road & Elm High Road** – Cromwell Road will facilitate the highway connection for both the river crossing and Western Link Road schemes. Three locations have been assessed to accommodate the physical tie onto Cromwell Road. Any proposals for the river crossing need to consider the potential impact on Cromwell Road and the associated heritage assets positioned along the corridor.

Main Issues

Existing constraints to consider for the location of the New River Crossing include:

- Flood Risk and differing heights of the flood wall (which runs parallel to the road) along the length of the corridor;
- Interference with North and south Brinks, due to structural requirements for the bridge such as ramps;
- Impact on surrounding development and issues with land ownership; and,
- Impact on the Wisbech Conservation Area, particularly with the two crossing locations further north along the corridor.

Option Development

Potential locations that can facilitate a river crossing have been devised by structural engineers on behalf of Skanska. Site visits were initially undertaken in 2016 to establish suitable sites along the corridor and to identify existing constraints at each location. The location for sites was considered alongside the broad alignments proposed for the Western Link Road scheme. Once a list of potential options was devised, it was later shortlisted through a review and challenge process.

The options developed for the New River Crossing include:

- Barton Road Crossing;
- New Bridge Lane Crossing; and,
- Southern Crossing located close to the A47 / Cromwell Road Roundabout;
- Crossing between Coalwharf Road (east bank) and Chapel Road (west bank);
- Crossing between South Brink and Magazine Lane (west bank); and,
- Crossing on the alignment of Weasenham Lane (east bank).

The progression of sites was based on the criteria of; the ability to serve the West Wisbech development site, ability to connect with Cromwell Road and South Brink, as well as the availability of space on either bank to cater for approach ramps and associated infrastructure.

Method of Assessment

The suitability of options identified for the New River Crossing have been assessed using the following assessments:

- Structural Assessment – Used to assess the different types and forms of bridge that would be appropriate at each location, as well as different structures that would enable the bridge to connect to the highway network at each of the locations; and,
- Operational Assessment - Used to determine the likely impact a bridge at each of the locations would have on the transport network and traffic movements around Wisbech.

Full details of the structural assessment are provided within the accompanying *New River Crossing Report.*

Option Assessment Summary

The assessment indicates that the southern crossing location is the best value option.

Due to the high profile location of the proposed structure, adjacent to the A47 and one of the main gateways into Wisbech from the South, consideration has been given to both an iconic and a utilitarian structure.

Engagement with Wisbech Town Councillors, Fenland District Councillors and Cambridgeshire County Councillors has identified that a utilitarian structure would be preferred over an iconic structure at this location to reduce costs and match the nature of the surrounding development. A utilitarian bridge would take the form of a precast concrete or steel composite bridge, creating a consistent appearance with the two existing structures in Wisbech town centre.

A precast concrete or steel composite bridge would present a simple solution which would result in a deck that was between 1.7 and 2.0m deep. In turn the approach ramps would be between 56 and 88m long depending on the nature of the road construction and the height of any highway embankment on the approaches. A simple bridge does not necessarily mean an inelegant one, and undertaking a preliminary design would allow the interaction between the landscape, flood defences and bridge form to be investigated in greater detail.

Full details of the assessment for this element are contained within the accompanying *New River Crossing Report.*

12. Western Link Road

This chapter briefly outlines the assessment of the Western Link Road as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying *Western Link Road Report.*

Western Link Road

The brief for this element of the Wisbech Access Study was to:

A new link road to the west of the town centre.

Description

The Western Link Road scheme will create an alternative north-south route, to the west of the town centre and River Nene. The proposed boundary for this scheme ranges from Little Ramper in the north and the A47 / Cromwell Road roundabout in the south. The dual purpose of the link road will be to provide access into the West Wisbech Development area, whilst alleviating town centre congestion. To make the Western Link Road viable a new river crossing is required, providing a connecting point to the strategic highway network east of the river.

Heritage assets of listed buildings, Scheduled Ancient Monuments and conservation areas need to be considered alongside the alignments of the Western Link Road.

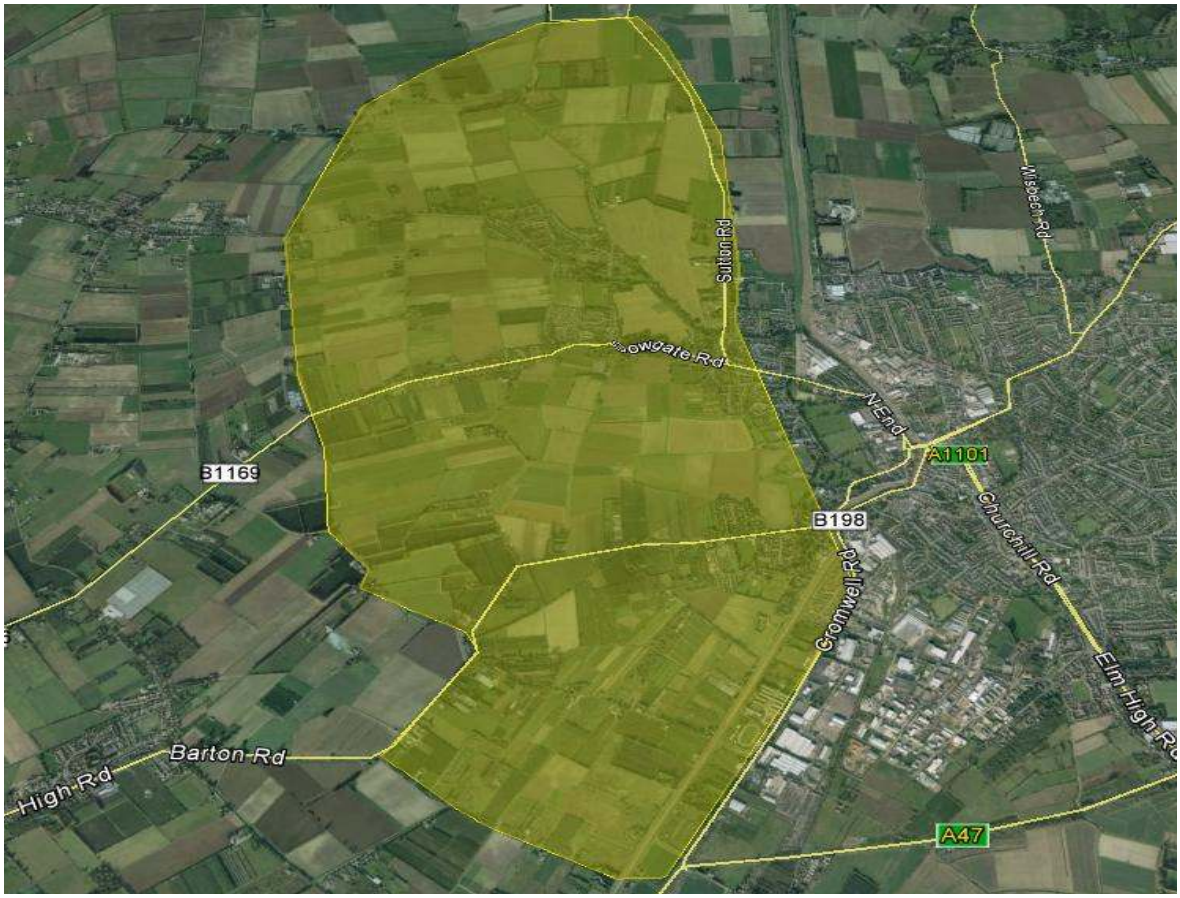


Figure 12.1: Boundary for the Western Link Road

Relationship to other Schemes

The Western Link Road directly relates to two other option assessment areas within the Wisbech Access Study. The relationships are shown in the figure below and described beneath.

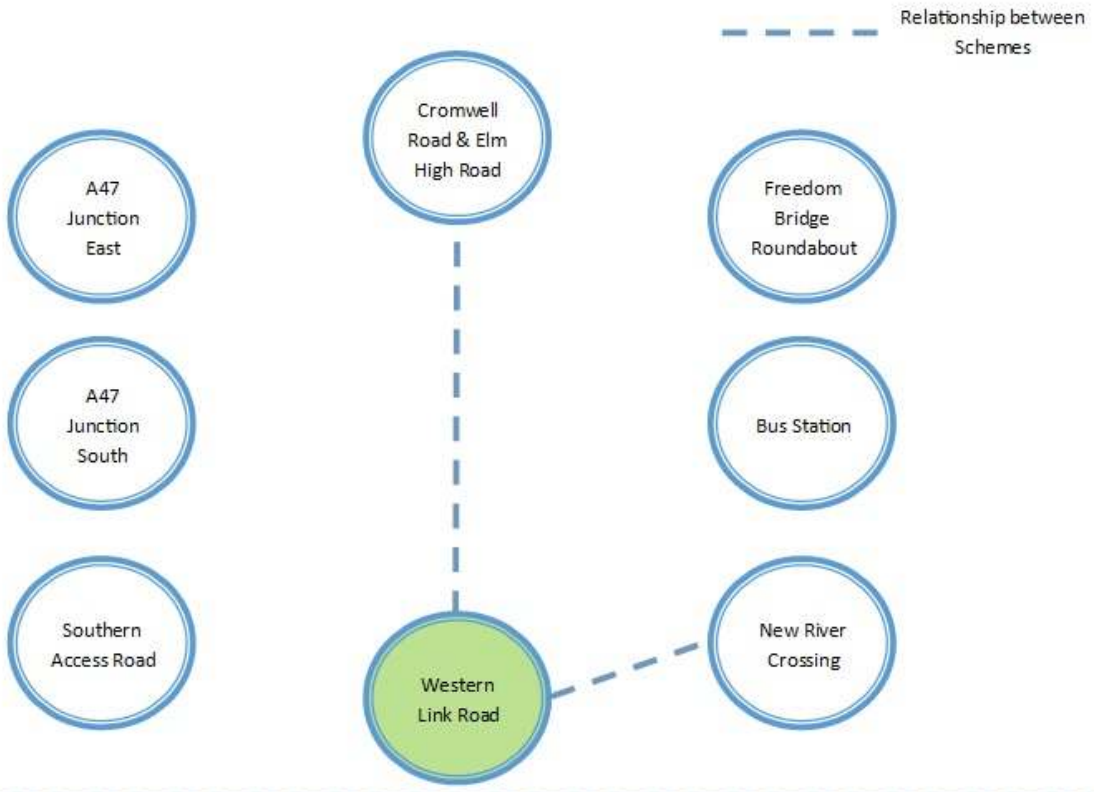


Figure 12.2: Relationship between the Western Link Road and other Study Elements

The Western Link Road element of the study relates with:

- **Cromwell Road & Elm High Road** – Cromwell Road will provide a physical connection to the highway network for the Western Link Road, using a New River Crossing as part of its alignment. Options for improvement along the southern end of Cromwell Road, particularly at its junction with the A47, have been designed to accommodate the Western Link Road in the future if it be required.
- **New River Crossing** – A river crossing is required to facilitate the Western Link Road, in turn unlocking growth on the West Wisbech Development site. The New River Crossing and Western Link Road scheme are directly linked within the study.

Main Issues

The main issues that have been identified within the proposed Western Link Road boundary are:

- Site spans across two conservation areas of Wisbech and Leverington;
- A significant number of listed buildings (varying grades) are present across the site. Mitigating impact and providing adequate buffer zones needs to be considered with this scheme; and,
- High flood risk is associated with the proposed site.

Option Development

Potential options that were devised for the Western Link Road scheme, were initially informed by the Option Appraisal Report for the New River Crossing scheme. The river crossing directly links to the provision of the Western Link Road. Once potential alignments were known, meetings with Conservation Officers from Fenland District Council and the West Wisbech Broad Concept Plan (BCP) Members Group meant the issues noted above could be mitigated against at an early stage within the scheme assessments.

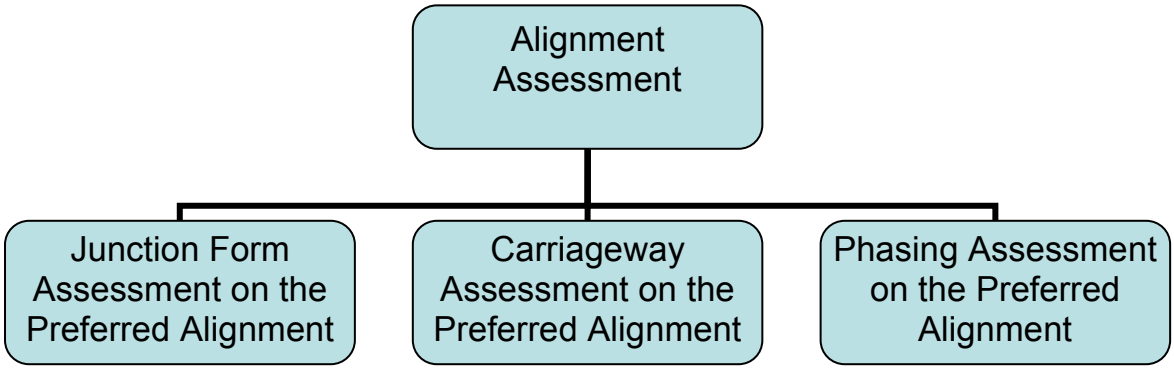
The BCP members group consisted of officers from Fenland District Council and Cambridgeshire County Council, as well as representatives from Highways England, the Local Flood Authority and numerous land owners or their representatives.

The options developed for the Western Link Road include:

- Alignment 1A – Southern River crossing, with central alignment south of Leverington Road, and new infrastructure connecting the A1101 with Leverington Road to the north;
- Alignment 1B – Southern river crossing, with central alignment south of Leverington Road, circles west of Leverington re-joining to network at Little Ramper;
- Alignment 1C – Southern river crossing, with central alignment which uses existing infrastructure of Leverington Road and the A1101 / Sutton Road Junction;
- Alignment 1D – Southern river crossing, with central alignment which then deviates to the west of Leverington before re-joining the A1101 at Little Ramper, assuming no demolition of property;
- Alignment 1E – 1D alignment, however assumes some demolition of property;
- Alignment 2A – New Bridge Lane river crossing, with central alignment south of Leverington Road, and new infrastructure connecting the A1101 with Leverington Road;
- Alignment 2B – New Bridge Lane river crossing, with central alignment south of Leverington Road, and then circles to the west of Leverington re-joining to network at Little Ramper;
- Alignment 2C - New Bridge Lane river crossing, with an alignment using existing infrastructure of Gadd's Lane, then continuing to use Leverington Road and the A1101/ Sutton Road junction;
- Alignment 2D - New Bridge Lane river crossing, with central alignment which uses existing infrastructure of Leverington Road and the A1101 / Sutton Road Junction;
- Alignment 3A – Barton Road river crossing, with reduced alignment south of Leverington Road, and new infrastructure connecting the A1101 with Leverington Road to the north;
- Alignment 3B – Barton Road River crossing with reduced alignment south of Leverington Road. Circles to the west of Leverington re-joining to network at Little Ramper in the north. New infrastructure north of Leverington Road is required; and,
- Alignment 3C - Barton Road river crossing with reduced alignment, which uses existing infrastructure of Leverington Road and the A1101 / Sutton Road Junction.

Method of Assessment

The assessment of the Western Link Road has been broken down into the following phases:



Within each of these assessment phases, the Wisbech Access Transport Study (WATS) model (2015 base) has been used. The model itself is a SATURN based strategic transport model of Wisbech and the surrounding area. Data (of various forms) has been extracted from the model to inform the user where changes on the network are required to accommodate traffic growth associated with the West Wisbech Development area.

In addition to the WATS model, the Junction Form phase assesses the associated junctions on the Western Link Road using the modelling packages PICADY (Priority Junctions) and ARCADY (Roundabouts). Both modelling packages use the empirical TRL / Kimber framework which links junction geometry (entry width, approach width, flare length, conflict angle, and inscribed circle diameter and entry radius).to driver behaviour, in order to predict capacities, queue lengths and delay at the junction.

Full details of the assessment phases and methods used, are provided within the accompanying *Western Link Road Report*.

Option Assessment Summary

Of the twelve alignments devised and assessed as part of this scheme, Alignment 1D was identified as the best performing alignment to facilitate a Western Link Road. This alignment is predicted to provide a good trip diversion away from the town, whilst minimises the impact on heritage assets and the need for demolition.

The decision to make Alignment 1D the preferred option, was supported by the River Crossing report, which highlights the Southern River Crossing is the most suitable location to facilitate a crossing due to zero site constraints and minimal impact on the wider network.

Full details of the assessment for this element are contained within the accompanying *Western Link Road Report.*

13. Southern Access Road

This chapter briefly outlines the assessment of the Southern Access Road as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying *Southern Access Road Report*.

Southern Access Road

The brief for this element of the Wisbech Access Study was to:

A new east-west access road to primarily serve the South Wisbech Development Site.

Description

The Southern Access Road scheme would create an east – west route through the southern half of Wisbech, using existing infrastructure of New Bridge Lane and Boleness Road. Connections onto the existing road network will include Cromwell Road, Weasenham Lane and the A47. The dual purpose of the Southern Access Road would be to facilitate access to the South Wisbech Development site and alleviate congestion from alternative routes within the town centre, namely Weasenham Lane.

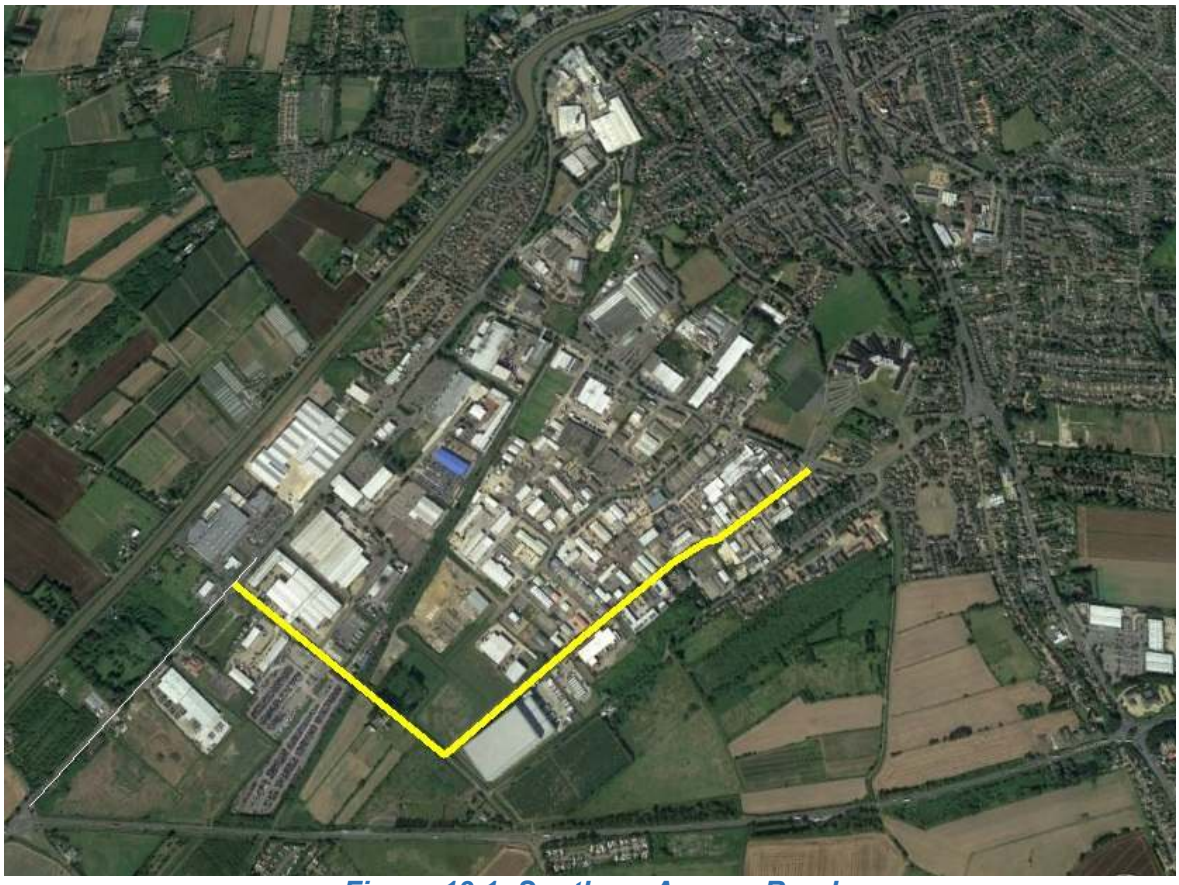


Figure 13.1: Southern Access Road

Relationship to other Schemes

The Southern Access Road directly relates to two other option assessment areas within the Wisbech Access Study. The relationships are shown in the figure below and described beneath.

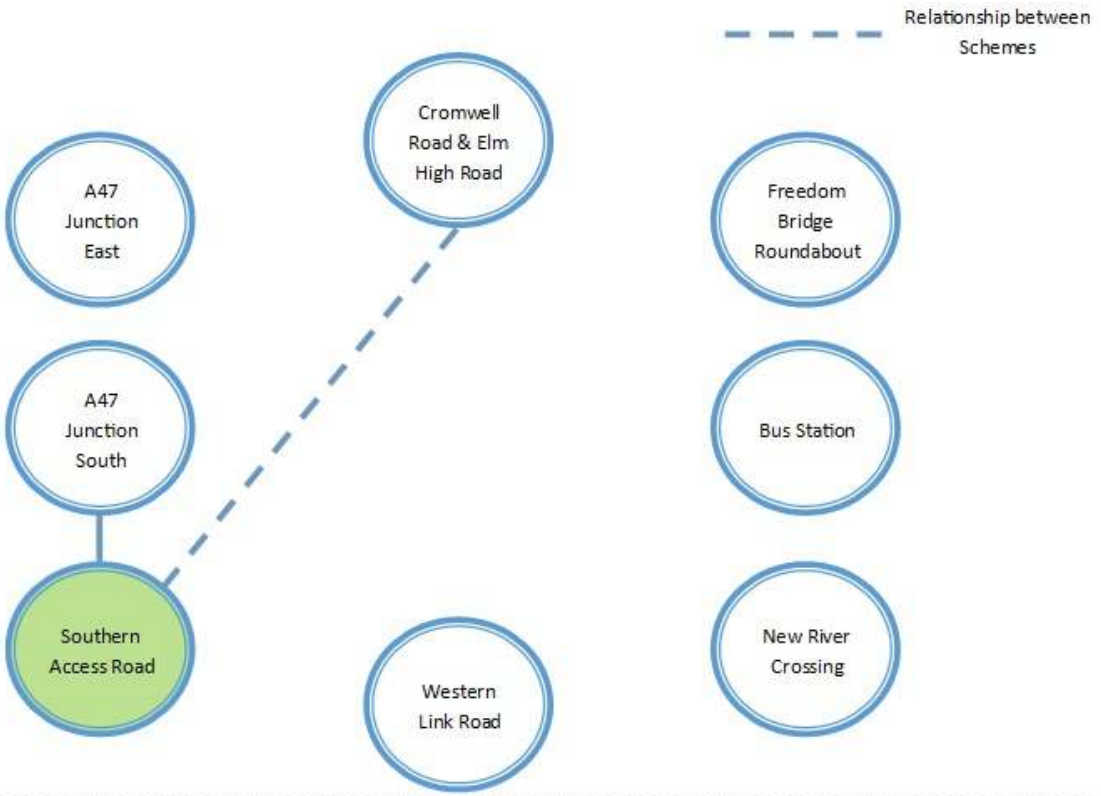


Figure 13.2: Relationship between the Southern Access Road and other Study Elements

The Southern Access Road element of the study relates to the:

- **Cromwell Road & Elm High Road** –. Both the east and west corridors into Wisbech will accommodate traffic growth from the South Wisbech Development site. Boleness Road joins Weasenham Lane which feeds directly onto Elm High Road via a signalised junction. This route will provide one of the key access points into the Wisbech South Development Site. Like New Bridge Lane will feed directly onto Cromwell Road via a signalised junction.

  Any proposals for the Southern Access Road will likely require improvements to the eastern end of Weasenham Lane and it's junction with Elm High Road. Any improvements considered along Elm High Road should be designed to accommodate the traffic growth generated by the Wisbech South Development.

- **A47 South Junction** – The A47 South Junction provides a direct overlap with the Southern Access Road scheme. The south roundabouts proposed location between the A47 Elm High Road and Cromwell Road roundabouts, has been included into the option assessment phases, providing a connect with the new east-west route.

Relationship to the Proposed Rail Way Line

The proposals for a new railway line (to be positioned south of the town centre) are beyond the scope of the Wisbech Access Study, however, the impact and relationship on schemes included within the study have been considered.

Railway line proposals will directly impact both the form and operation of the Southern Access Road. If the railway line is implemented to the south of the town centre, the Southern Access Road joining New Bridge Lane and Boleness Road will be severed on

New Bridge Lane. A level crossing would be proposed for this location however the stopping time associated with the crossing would impact the operation of the east – west route and therefore impede on the industrial and employment units planned for the South Wisbech Development site.

To ensure that the Wisbech Access Study is flexible enough to respond to the latest proposals for the alignment of the railway line and location of a potential station, Southern Access Road options have been considered for both 'with railway' and 'without railway', which refers to a railway line that severs New Bridge Lane, and one which does not.

Main Issues

The main issues that have been identified within the Southern Access Road are:

- Lack of capacity on the southern sections of both Elm High Road and Cromwell Road corridors (especially at the A47 roundabouts), to support the proposed development growth on the South Wisbech Site;
- Lack of capacity at Weasenham Lane (East) Junction to facilitate traffic growth;
- Issues with adding delay to the A47 Trunk Road; and,
- Issues within the proposed site include on-street parking, drainage, dis-used level crossing and deficiency of existing infrastructure.

Option Development

Potential options that were devised for the Southern Access Road scheme, were initially informed by the South Wisbech Broad Concept Plan for the proposed site, as well as a site visit undertaken in February 2016 by the project team. Both these elements helped to determine the use of existing infrastructure, alongside the location and form of the junctions that the various development sites would use to access the road.

The project team who undertook the site visit consisted of officers from Fenland District Council, as well as representatives from Skanska, including Highway engineers and Transport Planners.

Junction locations identified for the Southern Access Road scheme include:

- **Access Junction 1** – New Bridge Lane / Salters Way / Development Access;
- **Access Junction 2** – New Bridge Lane / Development Access;
- **Access Junction 3** – New Bridge Lane / Boleness Road / Development Access; and,
- **Access Junction 4** – Boleness Road / Development Access. Summary of Phase 1 Assessments.

Based on the above junction locations, options devised for the Southern Access Road include:

- Option 1 – Creates a connection between New Bridge Lane and Boleness Road, including the four development junctions;
- Option 2 – Creates a connection between New Bridge Lane and Boleness Road, as well as a connection onto the A47 via a new A47 Junction, also including the four development junctions.
- Option 3 – Creates a connection between Boleness Road and the A47 via a new A47 Junction, but without a connection onto New Bridge Lane. Also including the four development junctions.
- Option 4 – Creates a connection between New Bridge Lane and the A47 via a new A47 Junction, but without a connection onto Boleness Road. Also including the four development junctions.
- Option 5a – Creates a connection between Boleness Road and New Bridge Lane, however New Bridge Lane is severed between development junctions 1 and 2 due to the railway line; and,
- Option 5b – Creates a connection between Boleness Road and the A47 via a new A47 Junction, New Bridge Lane is severed between development junctions 1 and 2 due to the railway line.

Method of Assessment

Options for the Southern Access Road were firstly coded into the Wisbech Access Transport Study (WATS) model (a SATURN based strategic transport model of Wisbech and the surrounding area). Once coded an assignment run for the future year 2031 scenario was run, for both the AM and PM peak hour matrices. This enabled the extraction of traffic flows (including development growth), which were later used to inform local junction assessments.

Junction assessments for the scheme options have been assessed using the modelling packages PICADY (Priority Junctions) and ARCADY (Roundabouts). Both modelling packages use the TRL / Kimber framework which links junction geometry to driver behaviour, in order to predict capacities, queue lengths and delay at the junction.

Full details of the scheme assessment and methods used, are provided within the accompanying *Southern Access Road Report*.

Option Assessment Summary

From the results obtained from the modelling assessment, it is apparent that all options operate satisfactorily and could be implemented as the Southern Access Road. However these options are dependent on various other schemes taking place on the network surrounding the Southern Access road, most notably at Elm High Road roundabout, Elm High Road / Weasenham Lane junction and Cromwell Road/Weasenham Lane junction.

Due to the fact that the Southern Access Road options are dependent on other schemes, both options 1 and 2 are to be progressed to the package modelling phase. At this phase options 5a and 5b will also be included to provide evidence and assessment of the impact a new railway line between Wisbech and March would have on the local road network around the Wisbech South Development.

Full details of the assessment for this element are contained within the accompanying report *Southern Access Road Report*.

14. A47 East Junction

This chapter briefly outlines the assessment of the A47 East Junction as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying *New A47 East Junction Report*.

A47 East Junction

The brief for this element of the Wisbech Access Study was to:

Create a new roundabout on the A47, replacing the staggered junction at Broadend Road.

Description

Broadend Road Junction located between the A47 / Elm High Road roundabout in the south, and the A47 Walton Highway / Lynn Road Roundabout in the north, currently provides access to a small number of residential and industrial units. As part of the A47 strategic transport link, this junction provides a point of access for Wisbech to the wider transport network including Peterborough, March, King's Lynn and Norfolk.

This junction will provide the primary access linking the East Wisbech Development Site to the strategic network (A47).

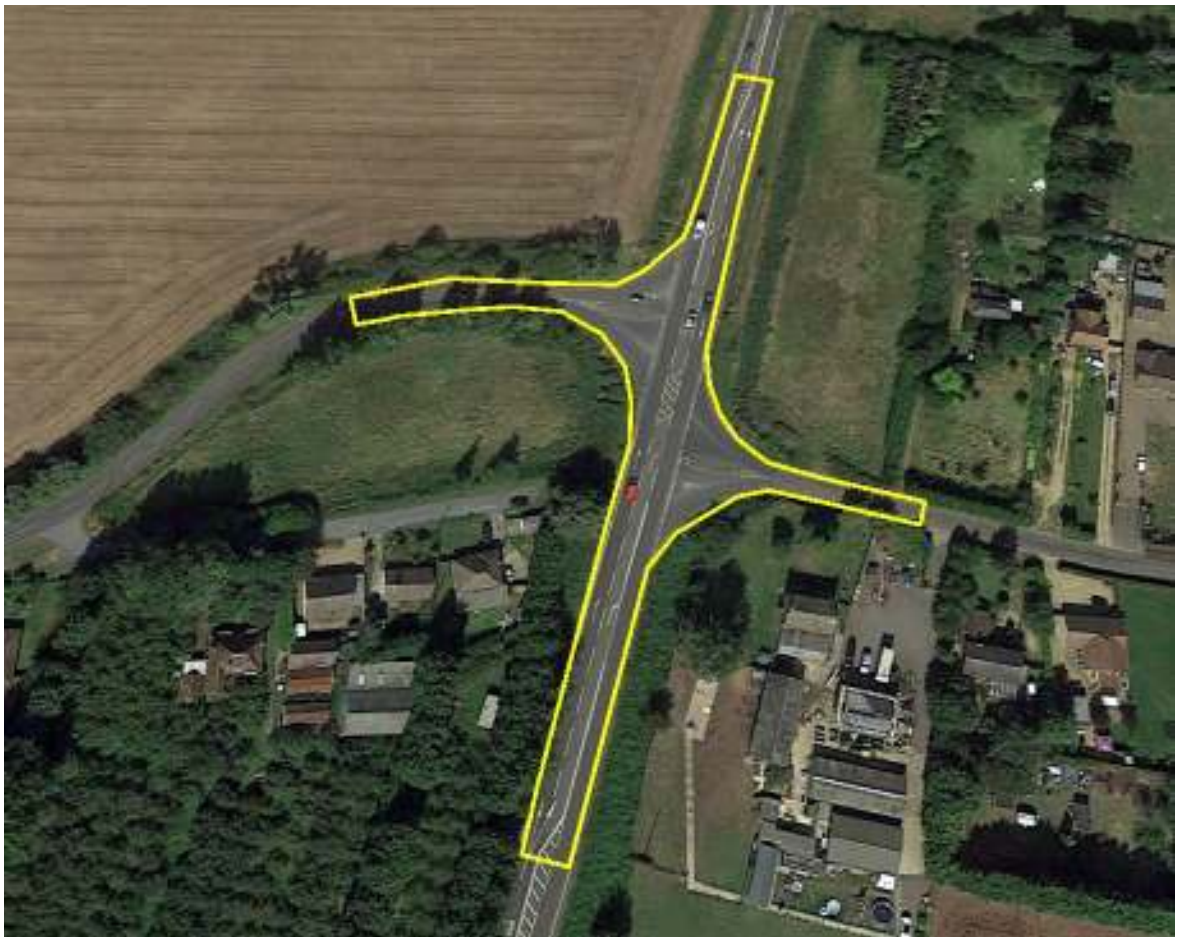


Figure 14.1: A47 East Junction

Relationship to other Schemes

The A47 East Junction does not directly relate to any other scheme element included within the Wisbech Access Study.

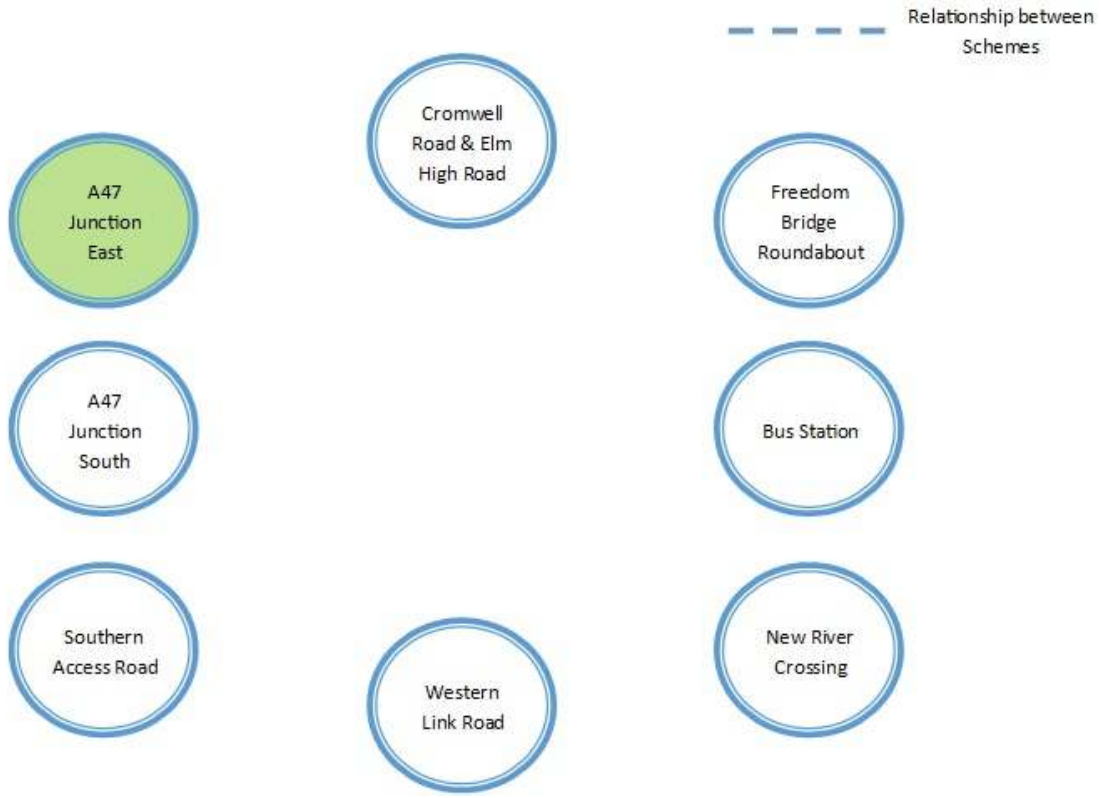


Figure 14.2: Relationship between the A47 East and other Study Elements

The A47 East scheme is considered as a standalone element of the Wisbech Access Study, with the upgrades to the junction predicted to have zero impact on the remaining six study elements. It's believed this scheme which facilitates growth as outlined in the Local Plan (2014) can be easily incorporated within the packaging assessment phases.

Main Issues

The main issues that have been identified for the existing staggered junction are:

- Safety concerns and high accident record associated with the existing staggered junction layout;
- Local perception of limited gap availability for vehicles pulling out of side roads, issues heightened by poor visibility, high traffic speeds and the section of the road being straight; and,
- Lacks capacity to cater for development growth associated with the East Wisbech site.

Option Development

Potential options to address these issues were devised at workshop in January 2016. The workshop consisted of officers from Fenland District Council, Cambridgeshire County Council, and neighbouring authorities. There were also representatives from Highways England as well as Transport Planners from Skanska.

The workshop presented the current issues with Broadend Road Junction to delegates, and then used the delegates' collective experience and expertise to assess a series of junction forms that could potential be implemented at the scheme location.

Junction forms that were shortlisted as a result of the workshop include a priority junction (which operates as a Do Minimum option which provides a basis for option comparison), a simple roundabout and an enhanced roundabout.

Based on the above junction forms, options devised for the A47 East Junction include:

- **DM Scenario** – Existing junction infrastructure, assessed against forecasted traffic flows to provide a base scenario against which the options could be measured;
- **Option 1** – Simple roundabout with a 40 m ICD and single lane approaches, using a standard set of geometry;
- **Option 2** – Simple roundabout with a 40 m ICD and single lane approaches with 30 m flares, using a standard set of geometry; and,
- **Option 3** – Enhanced roundabout with a 50 m ICD and two lane entries along the A47 approaches.

Method of Assessment

Junction forms of a Priority Junction and a Roundabout were firstly coded into the Wisbech Access Transport Study (WATS) model. Once coded an assignment run for the future years 2021, 2026 and 2031 scenarios were run, for both the AM and PM peak hour matrices. This enabled the extraction of traffic flows (including development growth), which were later used to inform local junction assessments.

Junction assessments for the scheme options have been assessed using the modelling packages PICADY (Priority Junctions) and ARCADY (Roundabouts). Both modelling packages use the TRL / Kimber framework which links junction geometry to driver behaviour, in order to predict capacities, queue lengths and delay at the junction.

Full details of the scheme assessment and methods used, are provided within the accompanying *New A47 East Junction Report*.

Once the preferred Option was identified a further assessment was undertaken using the Wisbech VISSIM Micro Simulation Model. This model was built specifically for this study, as a tool for undertaking operational assessments of the options generated.

Full details of the model construction are provided within the accompanying *Wisbech VISSIM Local Model Validation Report.*

Option Assessment Summary

Following initial assessments, Option 3 was identified as the preferred option to implement within this scheme location. The tables below highlight the predicted performance of this option, in relation to the forecast years 2021, 2026 and 2031.

Full details of the assessment for this element are contained within the accompanying report *New A47 East Junction Report*.

Table 14.1: Option 3b Assessment Summary

	Broadend Road Option 2		
	2021	2026	2031
AM Peak	All approaches to new Rbt operating well within capacity. Overall LOS A.	All approaches to new Rbt operating well within capacity. Overall LOS A.	All approaches to new Rbt operating well within capacity. Overall LOS A.
PM Peak	All approaches to new Rbt operating well within capacity. Overall LOS A.	All approaches to new Rbt operating well within capacity. Overall LOS A.	All approaches to new Rbt operating well within capacity. Overall LOS A.

Option 3b is predicted to operate within capacity across peak hours and forecast years assessed. A LOS 'A' highlights the expected free flowing nature of this junction.

The main benefit of this option concerns the Broadend Road approaches which have increased access to the A47 trunk road. The operation of the Broadend Road West approach is shown to be significantly improved over the Do Minimum Model, flowing the increased traffic demand from the East Wisbech Development Site.

15. A47 South Junction

This chapter briefly outlines the assessment of the A47 South Junction as part of the Wisbech Access Study. Full details of this assessment are included within the accompanying report *New A47 South Junction Report*.

A47 South Junction

The brief for this element of the Wisbech Access Study was to:

Create a new roundabout on the A47, with the primary purpose of providing access to the South Wisbech Development Site.

Description

The proposed South Junction will be located within the vicinity of New Bridge Lane, positioned along the A47 between Elm High Road roundabout in the east and Cromwell Road roundabout to the west. The purpose of the new roundabout will be to provide access to the South Wisbech Development site, whilst providing access to the wider strategic network including areas of Peterborough, March, King's Lynn and Norfolk.

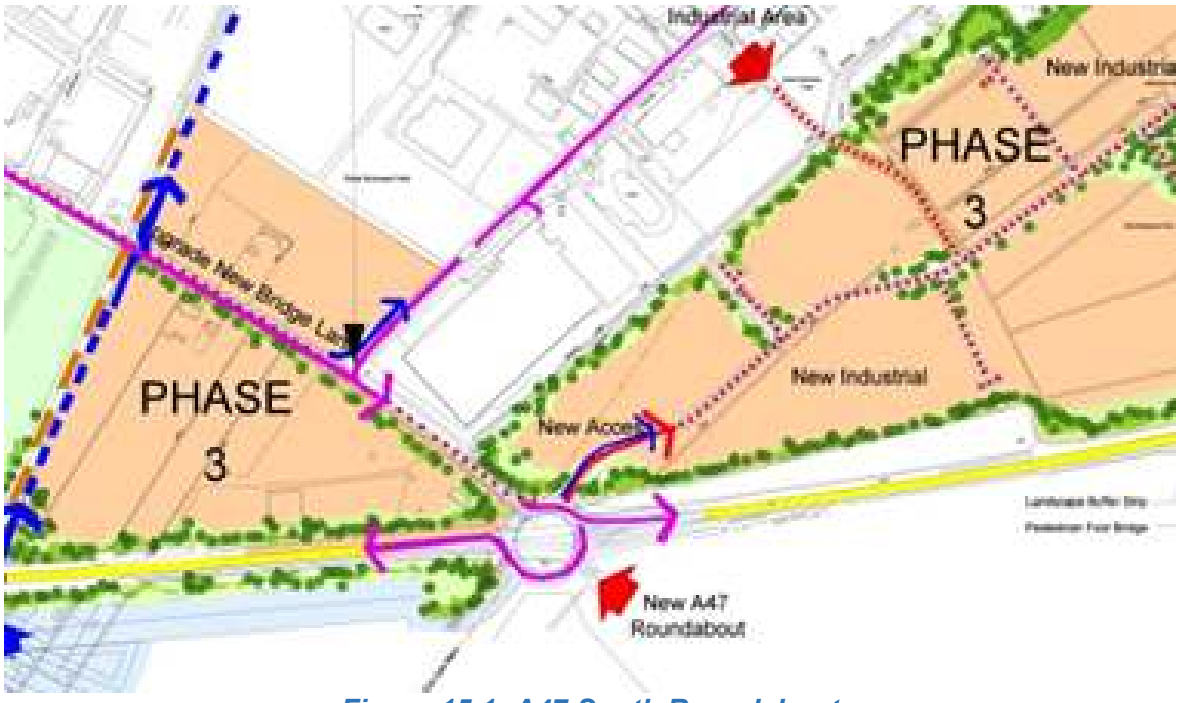


Figure 15.1: A47 South Roundabout

Relationship to other Schemes

The A47 South Junction relates directly to one other scheme element included within the Wisbech Access Study. The relationships are shown in the figure below and described beneath.

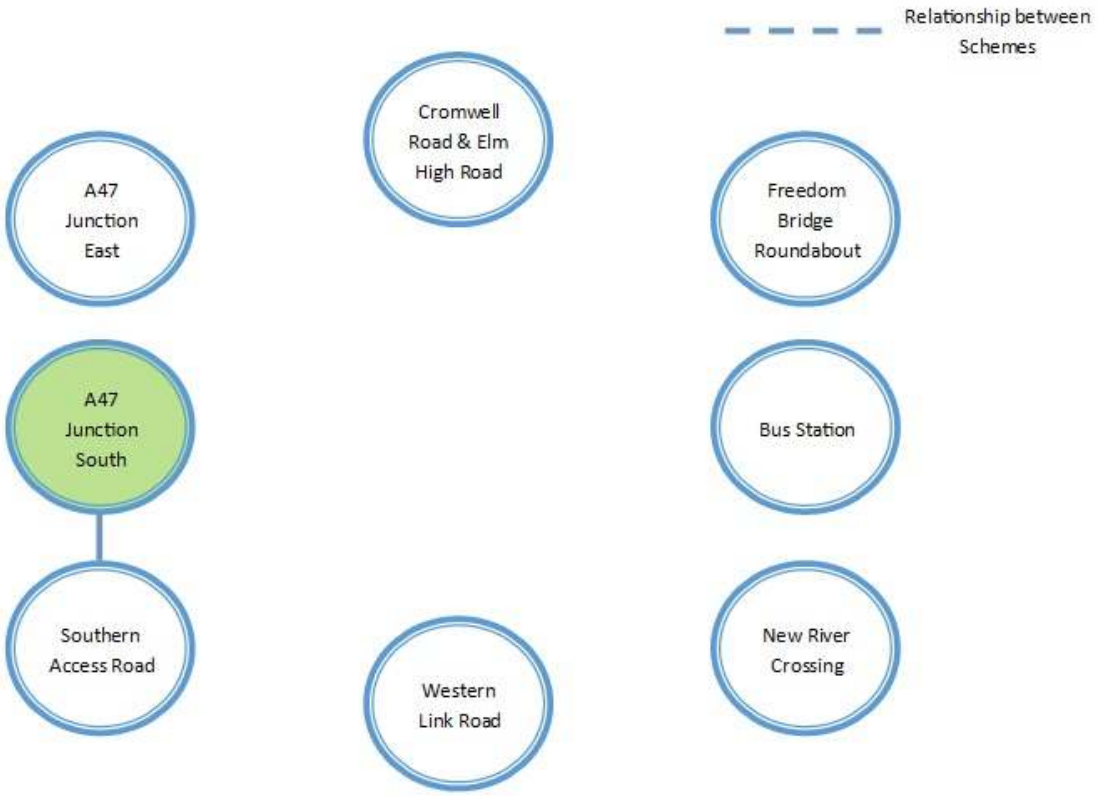


Figure 15.2: Relationship between the A47 South Junction and other Study Elements

The A47 South Junction element of the study relates to the:

- **Southern Access Road** – The Southern Access Road provides a direct overlap with the A47 South Junction scheme. The Southern Access Road has been assessed with a connection onto the A47 via the new A47 South Roundabout. The predicted growth of the South Wisbech Development Site will inform the junction assessments of the proposed roundabout.

Main Issues

The main issues that have been identified for the A47 South Junction scheme are:

- The requirement to mitigate against delay on the A47 trunk road; and,
- Potential scheme impact on surrounding junctions of the A47 / Elm High Road roundabout, A47 Cromwell Road Roundabout and Weasenham Lane Junction.

Option Development

Potential options to address these issues were devised at workshop in January 2016. The workshop consisted of officers from Fenland District Council, Cambridgeshire County Council, and neighbouring authorities. There were also representatives from Highways England as well as Transport Planners from Skanska.

The workshop presented the current issues with Broadend Road Junction to delegates, and then used the delegates' collective experience and expertise to assess a series of junction forms that could potential be implemented at the scheme location.

Junction forms that were shortlisted as a result of the workshop include a priority junction (which operates as a Do Minimum option which provides a basis for option comparison), and a roundabout.

Based on the above junction forms, options devised for the A47 South Junction include:

- **DM scenario –** Existing infrastructure with no new junction for access to the development;
- **Option 1** – Priority Junction;
- **Option 2** – Roundabout with a 45m ICD, including 30m approach flares;
- **Option 3** – Roundabout with a 60m ICD, including 30m approach flares; and,
- **Option 4** – Roundabout with a 60m ICD and two lane entries on the A47 approaches.

Method of Assessment

Junction forms of a Priority Junction and a Roundabout were firstly coded into the Wisbech Access Transport Study (WATS) model. Once coded an assignment was run for the future years 2021, 2026 and 2031 scenarios, for both the AM and PM peak hour matrices. This enabled the extraction of traffic flows (including development growth), which were later used to inform local junction assessments.

Junction assessments for the scheme options have been assessed using the modelling packages PICADY (Priority Junctions) and ARCADY (Roundabouts). Both modelling packages use the TRL / Kimber framework which links junction geometry to driver behaviour, in order to predict capacities, queue lengths and delay at the junction.

Once the preferred option was identified additional sensitivity tests were undertaken using the SATURN based strategic WATS model. A total of seven scenarios were assessed in order to understand the impact of a new A47 roundabout on the adjacent roundabouts of Cromwell Road and Elm High Road, with results extracted from the model highlighting both VC Ratios (capacity) and journey times and delay.

Full details of the scheme assessment and methods used, are provided within the accompanying *New A47 South Junction Report*.

Option Assessment Summary

Within the option development and assessment phases of this scheme, Option 4 (listed above) was identified as the optimum performer. This option is predicted to operate within capacity under both peak hours of 2031, and would be able to accommodate the scale of traffic growth associated within the South-west Wisbech Development area. This option was later incorporated into the sensitivity tests.

All sensitivity test scenarios completed highlighted a reduction in congestion along the A47, when compared against the Do Minimum scenario (existing network). However, differences within the results showed that several schemes benefited the Elm High Road roundabout, whilst other benefited the Cromwell Road roundabout.

Test scenarios that did not include a new A47 South junction demonstrated a necessity for improvement works at Weasenham Lane Junctions as well as both the Cromwell Road and Elm High Road corridors. With this said test scenarios that included an A47 were shown to reduce congestion and delay however has an impact on Boleness Road as a result.

Conclusions made from results is that the inclusion of an A47 roundabout is dependent on which accompanying schemes are delivered within the Wisbech Access Study.

Full details of the assessment for this element are contained within the accompanying report *New A47 South Junction Report*.

16. Phase 1 Summary

The Wisbech Access Study is a large scale option assessment of multiple highway improvement options, at numerous locations within the vicinity of Wisbech, Cambridgeshire. The purpose of the study is to identify, test and develop potential schemes to a stage from which they can be progressed to an Outline Business Case for scheme funding.

The Wisbech Access Study has been divided into two distinct stages, known as Phase 1 and Phase 2. The purpose of Phase 1 is to complete a series of option feasibility studies and scheme assessments, which consider a range of potential highway improvement options that address existing transport issues within Wisbech, or to facilitate the local growth agenda. The outcome of Phase 1 is a package of preferred schemes which have been demonstrated to operate to an acceptable standard, which are then progressed to the second phase of the study.

The areas of focus for Phase 1 individual scheme assessments include:

- The operation of:
    - Cromwell Road;
    - Elm High Road;
- Freedom Bridge Roundabout;
- Wisbech Bus Station;
- New River Crossing ;
- Western Link Road;
- Southern Access Road;
- New A47 Junctions;
    - East – in the vicinity of Broad End Road Junction; and,
    - South – in the vicinity of New Bridge Lane.

The preferred options (and associated scheme costs) identified within this phase of the study are summarised in the table below. These are the options that will be progressed to Phase 2 of the study, which is the Packaging Assessment.

Please note costs included within the Table beneath incorporate Optimism Bias.

Table 16.1 – Preferred Scheme Summary

	Option	Description	Cost
CWR	CR 7c	An enhanced roundabout with a 60 metre ICD, three lane circulatory and three lane approaches on both the A47 arms.	£4,013,727.27
	CR 8	Changes made to the Cromwell Road / Weasenham Lane Junction, from signalisation to a roundabout.	£2,781,111.34
EHR	EH 1	Upgrade the A47 / Elm High Road Roundabout. Changes to Weasenham Lane junction signal timings.	£338,110.65
	EH 3b	Relocation of the A47 / Elm High Road Roundabout approximately 300 metres to the east of the existing location. Changes to Weasenham Lane junction signal timings.	£10,925,144.80
	EH 4	Upgrade of the Elm High Road / Weasenham Lane Junction. Improvements to the southbound approach to the A47 roundabout are also included.	£960,316.88
	EH 7a	Proposed reconfiguration of the Elm High Road / Weasenham Lane Junction from signals to a standard four arm priority controlled roundabout. Improvements to the southbound approach to the A47 roundabout are included.	£3,036,678.45
FBR	FB 5b	A series of network improvements focused on enhancing the capacity of approaches, whilst reducing the number of approach arms either directly opening onto the circulatory or positioned within the close vicinity of the roundabout (and the west gyratory)	£2,868,529.35
Bus Station	BS 1a	Retains the existing bus station bay and taxi rank configuration, and uses land currently occupied by Albion House to facilitate a new access onto Nene Quay, as well as providing layover bays and, segregated car park.	£1,733,978.30
NRC	NRC	A bridge located in the southern river crossing location. Bridge design will utilitarian taking the form of a precast concrete or steel composite bridge, creating a consistent appearance with the two existing structures in Wisbech town centre.	£6,342,590.52
WLR	1D	A single carriageway road which connects the A47 / Cromwell Road Roundabout to Little Ramper in the north.	£49,347,393
SAR	SAR 1	Creates a connection between New Bridge Lane and Boleness Road, including the four development junctions.	£1,579,246.28
	SAR 2	Creates a connection between New Bridge Lane and Boleness Road, as well as a connection onto the A47 via a new A47 Junction, also including the four development junctions.	£8,447,409.09
	SAR 5a	Creates a connection between Boleness Road and New bridge Lane, however New Bridge Lane is severed between development junctions 1 and 2 due to the railway line.	£1,625,000,00
	SAR 5b	Creates a connection between Boleness Road and the A47 via a new A47 Junction, New Bridge Lane is severed between development junctions 1 and 2 due to the railway line.	£8,448,000.00
A47 S	Option incorporated into the Southern Access Road Options.		£6,822,575.56
A47 East	BER2	An unconventional oval shaped roundabout.	£3,416,911.77