Pre-Strategic Outline Business Case

A1307 Haverhill to Cambridge

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1 Introduction

This document is the Pre Strategic Outline Business Case (Pre-SOBC) for the A1307 Haverhill to Cambridge dualling scheme. The Pre-SOBC explains the Strategic and Economic case for the proposed scheme, in alignment with the principles of the Department for Transport's Business Case Guidance.

1.1 Overview of the scheme location

The location of the A1307 Haverhill to Cambridge scheme is shown in Figure 1-1 below. The extent of the routes considered are from the west of the A1017 / A1307 junction, west of Haverhill, to the Fourwentways junction (the A1307 / A11 junction).

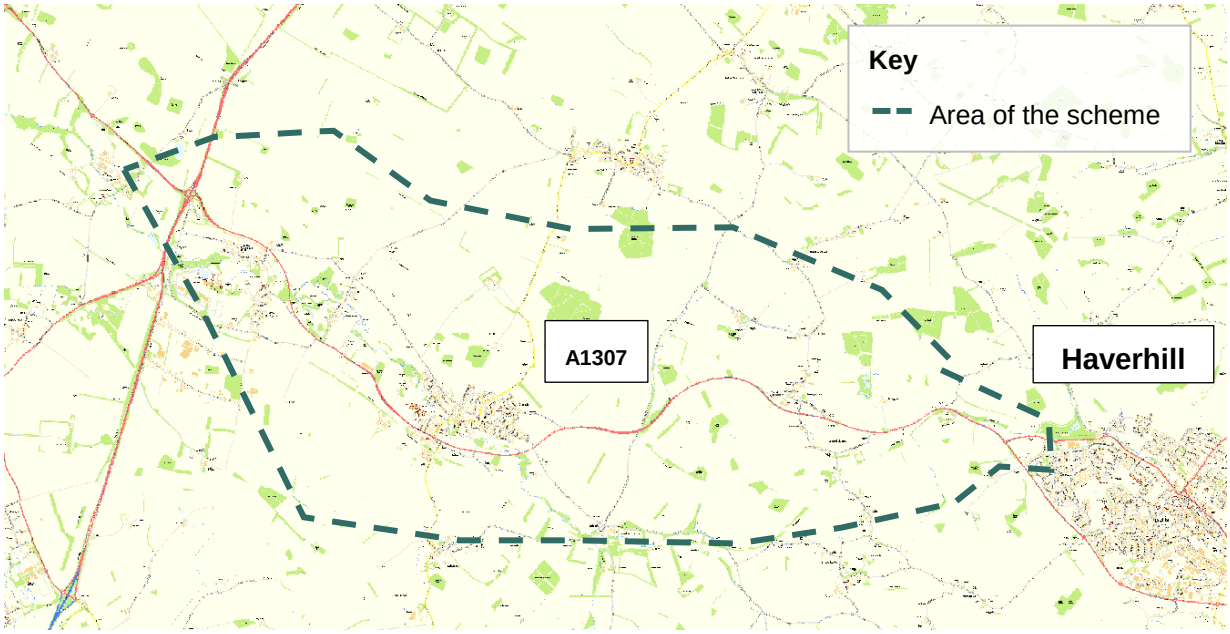

Figure 1-1: Location of the scheme

The A1307 Haverhill to Cambridge corridor is one of the key radial routes into Haverhill and Cambridge and suffers from congestion during peak periods, particularly at the junction with the A11 (Fourwentways) and around the village of Linton, the largest settlement on the corridor.

The corridor is over 16km in length and connects a large number of important settlements and key employment areas.

1.2 Description of the Scheme

Two approximate route options have been estimated for the dualling of the A1307 between Haverhill and the Fourwentways junction. These options are located to the north (shown in red) and south (shown in blue) of the existing A1307 and are illustrated in Figure 1-2 below.

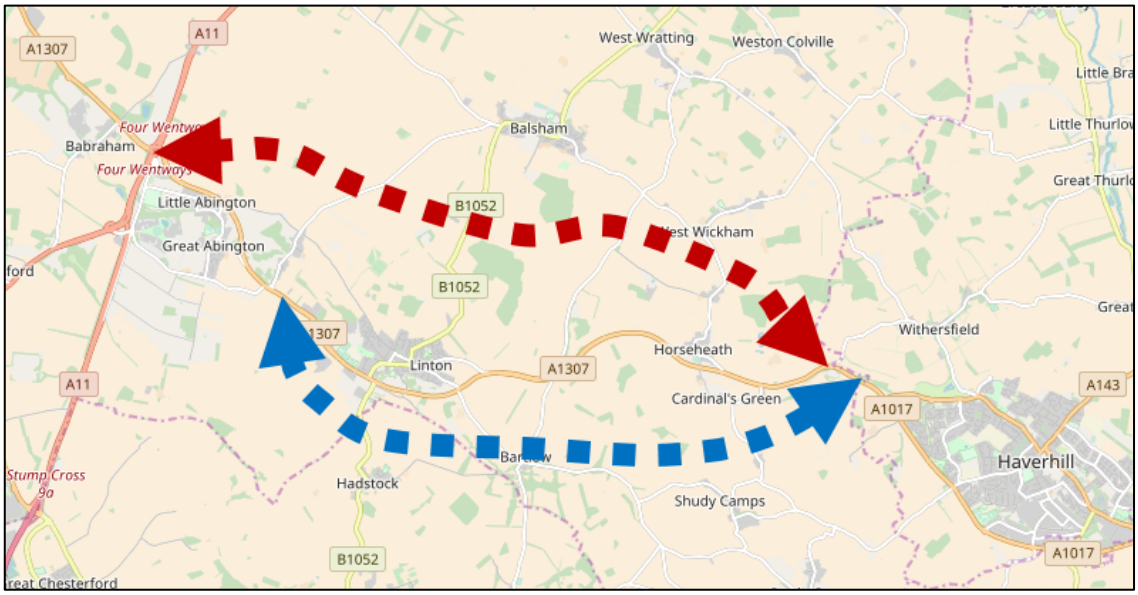

Figure 1-2: Northern and Southern Scheme Options

The northern option (red) is approximately 12km long and 4 locations have been identified where an overbridge will be required (overbridges to be 7.3m wide and to have an overall span of 22m):

- Streetly End
- Dean Road
- B1052
- North of Hildersham Road

The southern option (blue) is approximately 11km long and 4 locations have also been identified where an overbridge will be required (overbridges are to be 7.3m wide and to have an overall span of 22m):

- South of Horseheath Green
- Dean Road
- Barlow Road
- B1052

It should be recognised that route design work not included in the project scope and as such the coloured lines are potential route options rather than designed routes, and have been determined for modelling and broad cost purposes only. It would be expected that the routes are designed to feasibility stage at the next project stage, in line with design standards and environmental requirements.

1.3 Cost of the Scheme

The estimated cost of the two scheme options (north and south) are shown in Table 1-1. These costs are at 2017:Q3 prices, but exclude future inflation, demolitions, major contamination/ground condition issues, legal issues and non-recoverable VAT.

The estimated costs include a 45% optimism bias at this early stage prior to detailed design, with large value risk items (where known) included separately.

Further work will need to be undertaken to refine these cost estimates as the study progresses to the next stage of scheme development and route design.

Option	Approximate Total Costs
A1307 Dualling - Northern	**£190,000,000**
A1307 Dualling - Southern	**£180,000,000**

Table 1-1: Estimated costs of the proposed scheme options

1.4 Overview of the Business Case for the Proposed Scheme

This report is the Pre-SOBC and is made up of a Strategic and Economic Case. The aim of each of the case is as below:

- The **strategic case** determines the business need for the investment, demonstrating the clear rationale behind it and its strategic fit; and
- The **economic case** assesses the available options, identifying all their impacts and their resulting value for money. All economic, environmental, social and distributional impacts are examined using qualitative, quantitative and monetised information.

An OBC, as prescribed in the DfT business case guidance and HM treasury Green Book, also includes a Finance, Commercial and Management case, however these are not included in the project scope.

1.5 Summary of the Strategic Case

1.5.1 Strategic fit

The proposed A1307 dualling scheme is closely aligned with national, regional and local transport plans and policies, including:

- Cambridgeshire Transport Delivery Plan 2016-2019
- Cambridgeshire Transport Investment Plan (TIP)
- Haverhill Local Plan Vision 2031
- Haverhill Infrastructure Delivery Plan Vision (IDP) 2031

Together, these set out a vision for economic growth and regeneration in Cambridgeshire and Suffolk dependent on high quality road infrastructure, providing good quality connectivity to major national road arteries. The A1307 improvement

scheme is part of this vision, reducing congestion within the local area and improving safety for highway users.

1.5.2 Problems

The main problems which have led to the assessment of this improvement scheme are:

- Accidents on the A1307 including a number of fatalities; and
- Congestion issues particularly at the junction with the A11 and around the village of Linton.

1.5.3 Aims and objectives

The overall aim of the proposed scheme is therefore:

To improve the reliability, safety and speed of movement along the A1307 corridor, whilst supporting economic growth along the corridor.

The specific objectives of the scheme are:

- To facilitate growth in housing and employment along the corridor;
- To reduce accidents rates;
- To reduce congestion and journey delay;
- To improve journey time reliability;
- To improve the connectivity with surrounding villages and places of employment along the corridor; and
- To reduce community severance.

1.5.4 Support for the scheme

Suffolk County Council and Cambridgeshire County Council recognise that the scheme is important to local people, groups and businesses and therefore, the scheme proposal has sought to account for the views presented by interested parties during a public consultation.

1.5.5 *Option selection and preferred scheme*

In 2016 a study was undertaken to identify transport problems and investigate ideas for potential travel improvements in the A1307 area. A range of options were put forward including the dualling of the A1307 between Haverhill and Cambridge.

1.6 Summary of the Economic Case

An analysis of the monetised benefits of the proposed scheme demonstrates that the northern option offers **Low** value for money with a BCR of **1.0**, whilst the southern option offers **Poor** value for money with a BCR of **0.73**.

With a BCR of **1**, the northern route has the potential to be taken forward as a scheme within an Outline Business Case.

Business will be expected to benefit from reduced congestion, faster journeys and improved journey time reliability, whilst commuters will similarly benefit from shorter, more reliable, journeys to work. These benefits, which are included in the BCR calculations will support local development.

2 The Strategic Case

2.1 Introduction

The Strategic Case provides the strategic narrative for the scheme and this Pre-SOBC sets out: what transport and economic problems exist which are generated by current infrastructure / urban form; what the underlying policy objectives of Suffolk County Council, Cambridgeshire County Council and the Government are; and how a scheme has been developed to address these problems and how it aligns with the strategic policy objectives.

The overarching theme of the proposed scheme is safety and growth. The specific problems addressed in the Strategic Case (which are described in more detail within Section 2.4) are:

- Accidents on the A1307 including a number of fatalities; and
- Congestion issues particularly within the vicinity of the junction with the A11 and around the village of Linton.

There is a strategic need for improved connections between Haverhill and Fourwentways as additional travel demands within the corridor are likely to arise as a result of economic growth which the proposed scheme aims to address.

The improvements provided by the scheme will help to create an efficient highway network which will assist with the delivery of growth objectives including the delivery of new homes and jobs. An efficient highway network will help to improve journey time reliability, network resilience, safety and provide capacity for growth.

The Strategic Case shows how these aspirations are in line with the strategic aims and objectives of national, regional, and local policy. It demonstrates how a scheme has been identified which will ultimately be able to deliver and support these objectives.

2.2 Overview

The Strategic Case is structured in line with Government guidance[1]. It describes:

- The policy background against which the scheme has been developed – the **business strategy**;
- The specific **problems** which the scheme is designed to solve;
- What will happen if the scheme is not delivered – the **impact of not changing**;

[1] The Transport Business Cases, Department for Transport (January 2011)

- The **objectives** of the scheme; and
- How success will be **measured**.

The Strategic Case also considers strategic issues affecting the practical delivery of the scheme:

- The **scope** of the scheme – what it will, and will not, include;
- Any **constraints** (physical, financial, political etc.) which could have an impact on the delivery of the scheme;
- Key **interdependencies** – other factors that could affect the timely delivery of the scheme; and
- The role of **stakeholders** – what they require from the scheme, how they have been involved so far, and how they can support the delivery of the scheme.

Finally, the strategic case describes the range of **strategic options** that were considered for the scheme. It identifies the **key assumptions** that underpin the assessment of the options, and explains why the proposed scheme is recommended as the most appropriate solution.

2.3 Policy Background – The Business Strategy

The proposed scheme is closely aligned with national, regional and local transport plans and policies.

2.3.1 National Plans and Policies

2.3.1.1 National Planning Policy Framework

The Government's National Planning Policy Framework (NPPF) emphasises the importance of encouraging local authorities to plan proactively for the transport infrastructure necessary to support the growth and productivity of major generators of travel demand. The NPPF outlines 12 core principles that need to be followed in order to succeed. It also discusses the need to focus on sustainable modes of transport, whilst giving people choices and solutions to support this.

2.3.1.2 The National Infrastructure Plan

The **National Infrastructure Plan (2014)** ensured the UK had an "*integrated strategy for how it would prioritise, finance and deliver critical projects and programmes in the key economic infrastructure sectors".* However, the next step in national infrastructure planning brings the **National Infrastructure Delivery Plan (2016-2021)**, which comprises a new and more focused approach to longer term infrastructure planning and lays out *"£483 billion of investment in over 600 infrastructure projects up to 2021"*.

The Government claims *"a reliable and high-performing road network helps improve productivity*" and therefore their overarching aim is to *"address challenges by building a better network with smarter roads that use technology and modern road building techniques".*

The National Infrastructure Delivery Plan recognises the role of government in funding improvements to the Strategic Road Network (SRN) and so has set aside £12.6bn between 2016 and 2021 for investments in this network.

Local roads, which are not part of the SRN, are also a crucial part of the overall transport system. Local authorities are responsible for managing, maintaining and improving the local road network. The Government provides financial support for road maintenance and renewal schemes, and supports investment in new local transport schemes through Growth Deals, allocating Local Growth Fund through Local Enterprise Partnerships.

Recent Government publications have also consistently emphasised the synergies between the economy and modern, efficient transport systems. Following earlier publications such as 'Transport – an engine for growth' (2013) and 'Investing in Britain's Future' (2013), the document 'Fixing the Foundations' (2015) highlights that;

- Infrastructure expands the productive capacity of the economy by reducing transaction costs and by integrating and enlarging markets. It raises the returns on private investment and enables greater specialisation and economies of scale. Transport has a vital role to play by bringing businesses and people closer together and fostering the agglomeration economies that make cities work.

- Transport connects people to jobs and products to markets, it underpins supply chains and logistics networks, and it is fundamental to domestic and international trade. The connectivity, condition and capacity of a country's transport network is therefore critical for productivity.

The proposed dualling of the A1307 will help to deliver the government's aim of increasing capacity, tackling congestion, supporting development, strengthening connectivity, improving reliability and resilience, and ensuring that the road network (strategic and local) is of the best possible quality. This business case describes how it will achieve this and sets out the case for the scheme to receive financial support.

2.3.1.3 Department for Transport Local Transport White Paper 2011

The paper outlines the opportunities and benefits for choosing sustainable modes of transport that should be available locally and looks into:

- Current issues in local transport policy, focusing on the impact of people's choices in the way that they travel locally;

- Localism and the decentralisation of decision-making on local transport policy matters;
- Scope for policy to enable people to take sustainable travel decisions and make greater use of active travel;
- Making public transport more attractive;
- Traffic management to address congestion and carbon emissions; and
- The role of local transport in society.

2.3.2 Regional Plans and Policies

The Strategic Case for the scheme is underpinned by several key regional economic and spatial polices, these being:

- New Anglia Strategic Economic Plan (SEP);
- Suffolk Local Transport Plan 2011-2031;
- Cambridgeshire Local Transport Plan 2011-2031;
- Transport Strategy for Cambridge and South Cambridgeshire 2014 (TSCSC);
- The Greater Cambridgeshire and Greater Peterborough Local Enterprise Partnership (GCGP LEP) Strategic Economic Plan (SEP);
- Cambridgeshire Transport Delivery Plan 2016-2019 (TDP);
- Cambridgeshire Transport Investment Plan (TIP); and
- The Greater Cambridge City Deal.

Local authorities are required by DfT guidance on Local Transport Plans (LTPs) to produce strategies and programmes to achieve five goals laid out in the DfT's discussion document, 'Towards a Sustainable Transport System', these being:

- Maximising economic growth through competitiveness and productivity;
- Tackling climate change;
- Protecting people's safety, security and health;
- Improving quality of life; and
- Promoting greater equality of opportunity.

2.3.2.1 New Anglia Strategic Economic Plan 2014 (SEP)

The SEP illustrates the forthcoming transformation for the Suffolk economy, helping to establish New Anglia as a centre of global business excellence. It aims to provide increased jobs, businesses, housing, and productivity by 2026. The plan was submitted to the government by the New Anglia Local Enterprise Partnership (LEP) in March 2014. In response to the SEP, the government agreed a Growth Deal with the LEP in July 2014.

The SEP also identifies eight growth locations – areas which are expected to grow by at least 1,000 jobs and 1,000 dwellings. For this reason, most of the strategic interventions in the SEP are transport-related, and include improvements on roads in the area and schemes to directly unlock employment or housing growth. The A1307 duelling scheme is one of the necessary interventions required to support growth in the LEP area. Suffolk already positively contributes to the national economy and the new road scheme could help to further improve this position.

The A1307 connects the key growth areas of Haverhill and Cambridge, and the SEP recognises this, noting that Haverhill has strong economic links with Cambridge, with a large proportion of residents commute to work from this area into Cambridgeshire and also Essex. Specifically, the SEP distinguishes that the transport priorities for Haverhill are:

- Haverhill NW Relief Road to reduce congestion and unlock up to 1,000 houses; and
- Haverhill A1307 corridor improvements to reduce congestion and improve travel times.

2.3.2.2 Suffolk Local Transport Plan 2011-2031

For Suffolk County Council, further policy support can be found in the 'Suffolk Growth Strategy' which supplements the SEP, recognising the need for improvement in supporting its growth.

Suffolk County Council has put together a transport strategy document to deliver new and improved transport infrastructure for the area. The Local Transport Plan (LTP) sets out the authority's transport objectives, strategies and policies for 2011-2031, showing how transport will both support and facilitate future sustainable economic growth through:

- Maintaining (and in future, improving) transport networks;
- Tackling congestion;
- Improving access to jobs and markets; and
- Encouraging a shift towards more sustainable travel patterns.

Table 2-1 demonstrates how the scheme objectives are well aligned with and support the delivery of the goals set out in the LTP:

Scheme Objectives	LTP Measures
• To identify areas along the corridor, and measures, where safety for all modes of travel can be improved • To improve the connectivity with surrounding villages and places of employment along the corridor	• Maintaining and improving transport networks • Tackling congestion • Improving access to jobs and markets

Table 2-1: How the scheme outcomes support the delivery of the LTP priority goals

The LTP confirms the need for a Haverhill NW relief road as an important, strategic transport improvement.

Figure 2-1, from the LTP, shows where the LTP has prioritised investment and one of the locations is Haverhill.

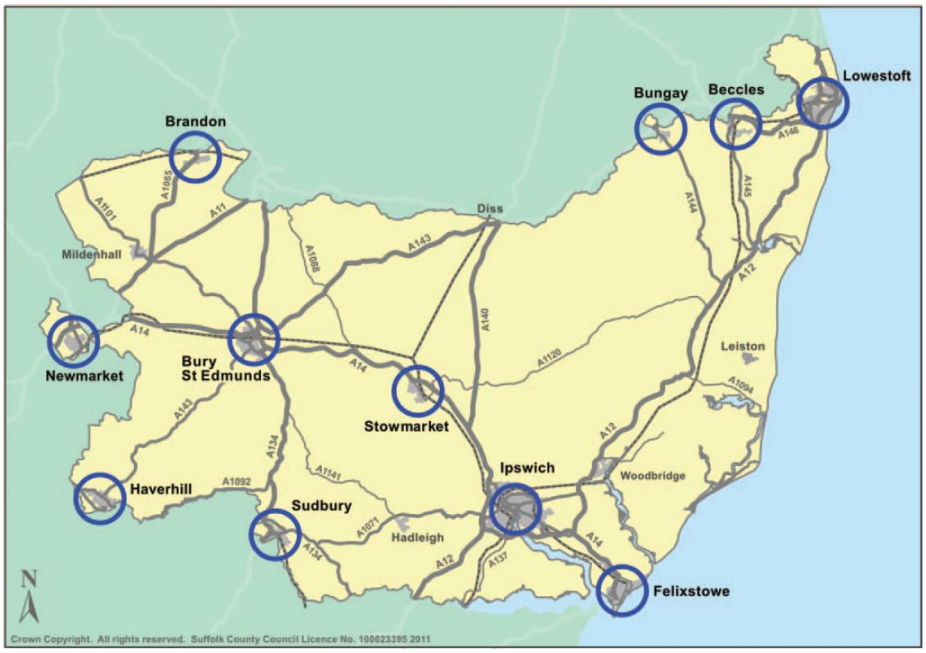

Figure 2-1: Suffolk Priority Investment Locations

The aim for the Haverhill investment is to *"support the sustainable development of the town"* as it looks to have significant employment and housing growth. The LTP states that Suffolk County Council will work with the relevant neighbouring authorities to find solutions to the A1307 corridor traffic issues, as transport issues do not stop at administrative boundaries. The LTP identifies the following challenges for Haverhill:

- Reducing the reliance on cars;
- Co-locate housing, key services and employment;

- Better networks for walking and cycling;
- Robust travel plans for new developments;
- Improve sustainable travel infrastructure;
- Provide better information to people about traveling; and
- Provide a north west relief road.

The proposed scheme for the dualling of the A1307 from Haverhill to Fourwentways would contribute to the LTP goals, as well as address specific transport and safety issues, through reducing congestion and increasing connectivity, access to jobs and journey time reliability for all road users.

2.3.2.3 Cambridgeshire Local Transport Plan 2011-2031 (LTP)

Cambridgeshire County Council's LTP set outs the transport objectives, policies and strategy for the county up to 2031. The LTP *"demonstrates how policies and plans for transport will contribute towards the County Council's vision – creating communities where people want to live and work: now and in the future"*. The plan has several focused strategic objectives which were brought forward from the previous LTP, as they were deemed still to be a good strategic fit for contributing to the Council's vision:

- Enabling people to thrive, achieve their potential and improve quality of life
- Supporting and protecting vulnerable people
- Managing and delivering the growth and development of sustainable communities
- Promoting improved skills levels and economic prosperity across the county, helping people into jobs and encouraging enterprise
- Meeting the challenges of climate change and enhancing the natural environment

There is a strong emphasis on improving the connectivity within the county, which in turn will support its economic growth. In particular the document identifies the importance of the A1307 transport corridor to both the local and regional economies and has allocated £39 million to deliver bus priority measures and a new park and ride facility.

2.3.2.4 Transport Strategy for Cambridge and South Cambridgeshire 2014 (TSCSC)

The TSCSC details the long term planning strategy for transport corridors and service areas for the area. The purpose of this strategy is to:

- Provide a detailed policy framework and programme of schemes for the area, addressing current problems and be consistent with the policies of the Third Cambridgeshire Local Transport Plan 2011-26.

- Support the Cambridge and South Cambridgeshire Local Plans and take account of committed and predicted levels of growth, detailing the transport infrastructure and services necessary to deliver this growth.

This strategy covers the district of South Cambridgeshire and the city of Cambridge, but also considers the transport corridors beyond the district boundaries. In addition to the detailed consideration of the Local Plan period to 2031, the strategy looks beyond this, and considers how the transport network and trip making patterns may develop in the longer term.

The TSCSC shows the seven transport corridors which feed into Cambridge; one of these is the A1307 to Haverhill. It is an alternative route to the A14 into west Suffolk, which is where Haverhill lies. The A14 has issues of its own, adding to congestion in the region.

Considerable development is planned for both ends of the corridor, with 4,260 homes planned for the Haverhill end between 2009 and 2031. This will lead to increasing pressure on the A1307 in the coming years. A weakness of the corridor include accidents on the A1307.

Policy TSCSC 12: Encouraging Cycling and Walking aims to *"provide direct, safe and accessible walking and cycling routes"* by means of creating and improving routes in the attempt to from *"high quality continuous networks"* linking key destinations along each corridor, including the A1307 to Haverhill.

2.3.2.5 The Greater Cambridgeshire and Greater Peterborough Local Enterprise Partnership (GCGP LEP) Strategic Economic Plan (SEP)

This SEP looks into the transport network and the role it has in guaranteeing a continued level of economic growth for the surrounding area. Several regions for investment are mentioned in the plan including:

- Smart technology and digital connectivity

- Additional commercial space

- Removing skills barriers

The plan was written with the intention to support a Local Growth Fund (LGF) bid, which was successful, and this helped the Greater Cambridge City Deal come to fruition. Numerous transport and skills based projects within the A1307 corridor received funding from the LGF, highlighting the significance of the area.

2.3.2.6 Cambridgeshire Transport Delivery Plan 2016-2019 (TDP)

The TDP falls out of the LTP for Cambridgeshire. This plan outlines all of the Council's planned highway and transport schemes over the stated timeframe. The TDP delivers on the Council's 'Highway Asset Management Strategy' and looks to the longer term when considering project investments and brings all transport programmes together in one document.

2.3.2.7 Cambridgeshire Transport Investment Plan (TIP)

The TIP lays out the necessary transport infrastructure and services, which will provide the backdrop for continued growth in Cambridgeshire. The plan details all transport schemes that Cambridgeshire County Council have identified for delivery. The TIP is used to identify and then prioritise projects to be added into the 'Transport Delivery Plan', as well as detecting funding gaps. The following are schemes within Haverhill or the A1307:

- Bus priority measures – A1307;
- Bus stop improvements – A1307 corridor between Addenbrooke's and Haverhill;
- Cycle and walking route improvements between Linton and Haverhill;
- Road safety improvements - A1307 corridor between Addenbrooke's and Haverhill; and
- New transport interchanges - A1307 corridor between Cambridge and Haverhill.

2.3.2.8 Greater Cambridge City Deal

Cambridge and South Cambridgeshire combine to become the Greater Cambridge area, creating a very connected region which has an increasing high demand for housing and reliable transport. In order to deliver both of these, the Greater Cambridge City Deal was put in place, supported by various Local Plans and Transport Delivery Plans, to allow the area to grow physically and for improved links to be formed between residential and commercial areas. It is planned that the City Deal will help provide 33,000 new homes, 400 apprenticeships, £1 billion in public sector investment, £4 billion in private sector investment and 45,000 jobs.

2.3.3 Local Plans and Policies

The Strategic Case is also closely aligned with key local economic and spatial strategies, including:

- Haverhill Local Plan Vision 2031
- Haverhill Infrastructure Delivery Plan Vision 2031 (IDP)
- St. Edmundsbury Local Development Framework Haverhill Transport Impacts (LDF)

2.3.3.1 Haverhill Local Plan Vision 2031

The Haverhill Local Plan, also known as Haverhill Vision 2031 was put together by St. Edmundsbury Borough Council and is *"a comprehensive plan to guide the overall direction of future service provision and the management of growth in the town for the next 20 years and beyond"*. It provides a framework for managing growth in Haverhill, within the St. Edmundsbury Core Strategy. The plan puts forward 9 objectives, some of which are relevant to the proposed scheme:

- Ensure the necessary infrastructure required to meet the needs of new developments is provided
- Ensure developments are accessible to services and facilities to help reduce the need to travel unsustainably
- Support and encourage all means of suitable and safe public transport improvements

A total of seven 'visions' are also include in the plan, which include:

- Long term sustainable transport solutions will be developed to mitigate the difficulties of accessing strategic road networks along the A1307, A1017 and A143

The plan below (Figure 2-2) shows the strategic growth for Haverhill. Within the Haverhill Town Centre Masterplan, potential residential developments and increased accessibility are proposed. Additionally, the A1307 is identified as a barrier to cross town which encourages car use.

The M11 and the A1307 both have poor accident records. Additionally, there is severe congestion at Linton at peak times and gaining access to the A1307 can be problematic.

Figure 2-2: Haverhill Strategic Growth Map

2.3.3.2 Haverhill Infrastructure Delivery Plan Vision 2031 (IDP)

The IDP document supports the Haverhill Local Plan and is used to identify what infrastructure is needed to meet the planned growth levels, in line with the NPPF. The aims of the IDP are as follows:

- To review the existing provision and coverage of infrastructure, including any gaps or deficiencies;
- Identify the infrastructure capacity required to serve the growth set out in the Vision Document;
- Ensure that infrastructure is provided in a timely manner over the plan period to 2031;
- Engage with the providers of infrastructure and keep those bodies informed of the scale and locations of the borough's growth;
- Provide information on the range of infrastructure providers and how their plans and programmes relate to the Council's own strategy; and
- Establish responsibilities, funding and timescales for delivery.

2.3.3.3 St. Edmundsbury Local Development Framework Haverhill Transport Impacts (LDF)

The objectives of the study are as follows:

- To provide a robust evidence base related to transport and access issues to inform the LDF process;
- To draw conclusions on the spatial strategy for Haverhill;
- To examine the broad location and allocation put forward in the Core Strategy Spatial Options housing provisions Policy CS12, and assess their possible transport facilities and infrastructure requirements, including wider traffic impacts on the A1307; and
- To consider the methods for delivering the transport requirements.

The LDF considers the development of 2,500 houses in Haverhill by 2031.

The following junctions on the A1307 were deemed to be 'potentially problematic' after trip rates were generated with the growth planned for Haverhill:

- A1307 / A11 junction;
- A1307 / A1017 3-arm roundabout to the west of Haverhill town centre;
- A1307 Withersfield Road / Meldham Bridge roundabout; (the new junction with the Queens
- Road to Withersfield, and the western end of the north west relief road);
- A1307 / A143 double mini roundabout junction in town centre (locally known as the Cangle junction) – recently remodelled as part of the new Tesco supermarket development; and
- A1307 / Sturmer Road to the east of Haverhill.

2.3.4 Summary of the Business Strategy

The proposed dualling of the A1307 between Haverhill and Fourwentways is closely aligned with national, regional and local transport plans and policies.

The government's views in the **National Infrastructure Plan**, that high quality infrastructure is needed to improve productivity and support jobs and growth, are reflected in the proposed scheme. The scheme will increase capacity, tackle congestion, support development, strengthen connectivity, improve reliability and resilience and improve the quality of the local road network.

The **New Anglia SEP** recognises the various opportunities for growth along the A1307 transport corridor. The **Suffolk LTP** confirms the need for a Haverhill NW relief road as an important, strategic transport improvement, as well as improvements to the A1307. The **Cambridgeshire LTP** notes that there is a strong

emphasis on improving the connectivity within the county, which in turn will support its economic growth. In particular the document identifies the importance of the A1307 transport corridor to both the local and regional economies.

2.4 Problems

There are a number of specific problems along the A1307 which have been identified and are the key drivers for this dualling scheme. These are summarised below and described in greater detail in the text that follows:

- Accidents on the A1307 including a number of fatalities.
- Congestion issues particularly at the junction with the A11 and around the village of Linton; and

2.4.1 Accidents on the A1307

An analysis of accidents for the A1307, from the Addenbrooke's Hospital access roundabout located south of Cambridge up to west of Haverhill has been conducted. These accidents and the study area can be found in Figure 2-3. The accident distribution per year and severity is shown in Table 2-2. The accident data was obtained directly from the Police and is the latest and most up to date data available.

Year	Accidents			
	Slight	Serious	Fatal	Total
2011	23	7	1	31
2012	32	8	0	40
2013	22	7	0	29
2014	26	5	1	32
2015	32	4	0	36
2016	26	6	1	33
2017 (January only)	1	0	1	2
Total	**162**	**37**	**4**	**203**

Table 2-2: Accidents by year and by severity

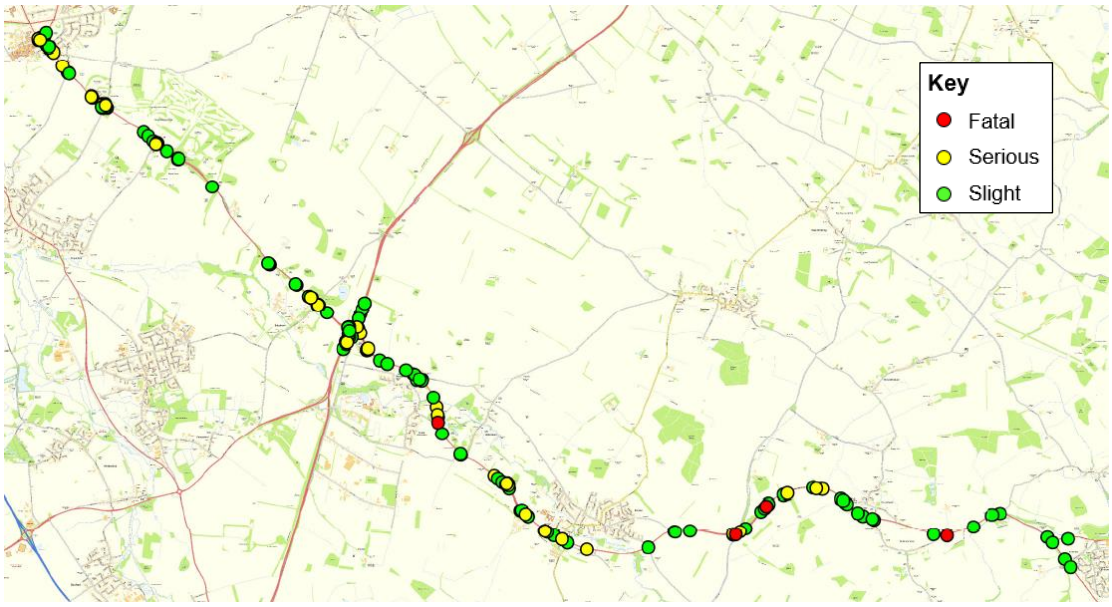

Figure 2-3: Summary of personal injury accidents on the A1307 between Cambridge and Haverhill over a six year period.

The accident analysis demonstrates that in the six year period between January 2011 and January 2017 there were 203 injury accidents, of which 4 were fatal and 37 serious.

The accident analysis shows that:

- Approximately half of all injury accidents occurred in the extended morning (07:00-10:00) and evening (16:00-19:00) peaks on weekdays, with 24% of all accidents occurring in the AM peak, with 25% occurring in the PM peak.
- There were 4 fatal accidents accounting for 2% of total accidents, 37 serious injury accidents accounting for 18% of total accidents and the remaining 162 slight injury accidents were 80% of the total.
- A total of 3% of the accidents involved pedestrians, 15% involved pedal cyclists and 13% involved motorcycles.
- A total of 6% of accidents involved children.

Whilst the recorded injury accidents are distributed along the entire route of the A1307, accident clusters within the study area were identified in the following locations:

Location	Accidents			
	Slight	Serious	Fatal	Total
A1307 / A11 roundabout	6	2	0	**8**
A1307 (Cambridge Road) / Granta Park Access Road T-junction	6	2	0	**8**
A1307 (Cambridge Road) / Hildersham Road Staggered Junction	5	0	0	**5**
A1307 section between Hildersham Road and Linton Road	1	2	1	**4**
A1307 (Cambridge Road) / Dalehead Foods Access Road Junction	10	2	0	**12**
A1307/ Dean Road Staggered Junction	3	3	1	**7**
A1307 / Horseheath Lodge Access Road Junction	4	0	1	**5**
A1307 / Mill House Private Entrance Junction	1	3	0	**4**
A1307 / Linton Road Junction	4	0	0	**4**

Table 2-3: Accident clusters by severity

Most of these clusters were located on junctions with one exception of a single carriageway section between Hildersham Road and Linton Road. A description of these accident clusters and maps showing the location of these clusters in provided at Appendix A.

The only fatal injury accident that was not part of an accident cluster took place just west of Horseheath Park Farm entrance near Haverhill. During daylight and rainy weather conditions a car moving westbound skidded and crashed with a goods vehicle of unknown weight coming from the opposite direction.

Accidents have a number of impacts, in addition to the direct impact on those directly involved in the collision. Other impacts include financial costs associated with the police, insurance and court proceedings in addition to impacts on local businesses and commuters as a result of associated delays. Accident savings for the defined study area are accounted for in the economic appraisal of the savings within the Economic Case (Chapter 3) – forming part of the Present Value of Benefits (PVB) and benefit-cost ratio (BCR) calculations.

2.4.2 Congestion Issues

The existing A1307 is characterised by alternating sections of single and dual carriageway, with a number of side roads. This creates congestion points along the route.

The key congestion points are around the village of Linton and at the junction with the A11. Table 2-4 shows the 2014 AADT (Annual Average Daily Traffic) flows taken from actual observed traffic count survey sites along the A1307:

Location	2014 AADT
Haverhill (A1017 Junction – Horseheath)	14,969
Horseheath - Linton	13,670
Bartlow Road – High Street (Linton)	16,796
Linton to Great Abington	17,756
Great Abington to Granta Park Junction	18,459
Granta Park Junction to A11 Junction	20,112

Table 2-4: 2014 AADT flows on A1307

The AADT flows above show that along the A1307 between Haverhill and the Fourwentways junction currently exceed the minimum AADT for a dual 2 lane all-purpose road (11,000 AADT). These high traffic flows demonstrate a need for dualling the entire A1307 Cambridge and Haverhill route.

2.4.2.1 AM and PM Peak Hour Flows

A series of Manual Classified Turning Counts (MCC) and Automatic Traffic Counts (ATC) were undertaken along the A1307 corridor in June 2014. The A1307 total network flows have been analysed and the weekday peak hours established as:

- AM Peak Hour: 07:30-08:30 hours; and
- PM Peak Hour 17:00-18:00 hours.

AM Peak Hour Flows

The traffic count data indicates that in the AM peak hour between 07:30 and 08:30 the prevalent movement is towards Cambridge. On the section between Haverhill and the Fourwentways junction the AM peak hour flows range between 1,130 and 1,273 vehicles per hour. On the opposite direction the flows fluctuate between 470 and 755 vehicles per hour.

At the A11 roundabout the movement with the highest flow is towards Cambridge (724 vehicles). Other relatively heavy flows are the left turn onto the A11 from the A1307 (388 vehicles), the turns towards the A1307 to Cambridge from the A11 south (443 vehicles) and A11 north (359 vehicles).

PM Peak Hour Flows

In the PM peak hour (17:00 – 18:00), the dominant movement is eastwards towards Haverhill, with flows ranging on the section from the Fourwentways junction to the Haverhill section being between 1,028 and 1,350 vehicles per hour. On the opposite direction the flows vary between 492 and 803 vehicles per hour.

At the A11 roundabout the prevalent movement is the eastbound flow towards Haverhill (665 vehicles). There is also a relatively heavy right turn flow from the south arm of the A11 to the A1307 (595 vehicles). The combination of these two

movements results in a relatively high eastbound flow of 1,381 vehicles per hour on the A1307.

2.4.2.2 ANPR Data (Origin – Destination movements)

Automatic Number Plate Recognition (ANPR) surveys were undertaken in October 2016. Figure 2-4 shows the extent of the A1307 corridor included in the ANPR network. The raw data matches were processed into origin-destination matrices for all sites. The OD matrices summarise the origin and destination of vehicle trips by each half hour time period.

Figure 2-4: ANPR Sites along A1307 Corridor

Table 2-5 and Table 2-6 summarises the distribution of vehicle trips from Haverhill in the AM peak hour and towards Haverhill in the PM peak hour, respectively.

Route	Origin	Destination	Percentage Distribution
1	A1307 Horseheath to Haverhill	West Wickham Road, Horseheath	23.6%
2	A1307 Horseheath to Haverhill	Unnamed road south of A1307 near Bartlow Road	6.6%
3	A1307 Horseheath to Haverhill	B1062 south of A1307, Linton	29.9%
4	A1307 Horseheath to Haverhill	B1052 Balsham Road, Linton	2.8%
5	A1307 Horseheath to Haverhill	A11 at Worsted Lodge Farm	4.9%
6	A1307 Horseheath to Haverhill	High Street, Babraham	18.4%
7	A1307 Horseheath to Haverhill	Unnamed Road, north of Hildersham Road junction	0.0%
8	A1307 Horseheath to Haverhill	A11 between A505 and A1307	2.8%
9	A1307 Horseheath to Haverhill	A1307 between A11 and Babraham Institute access	11.1%

Table 2-5: Origin of car trips from Haverhill in the AM Peak (17:00 to 18:00)

Route	Origin	Destination	Percentage Distribution
1	West Wickham Road, Horseheath	A1307 Horseheath to Haverhill	36.7%
2	Unnamed road south of A1307 near Bartlow Road	A1307 Horseheath to Haverhill	2.8%
3	B1062 south of A1307, Linton	A1307 Horseheath to Haverhill	4.4%
4	B1052 Balsham Road, Linton	A1307 Horseheath to Haverhill	9.1%
5	High Street, Babraham	A1307 Horseheath to Haverhill	0.9%
6	Unnamed Road, north of Hildersham Road junction	A1307 Horseheath to Haverhill	0.0%
7	A11 between A505 and A1307	A1307 Horseheath to Haverhill	6.4%
8	A1307 between A11 and BRC access	A1307 Horseheath to Haverhill	35.4%
9	A11 (N of A1307) at Worsted Lodge	A1307 Horseheath to Haverhill	4.3%

Table 2-6: Destination of car trips to Haverhill in the AM Peak (17:00 to 18:00)

The destination for the majority of car movements originating from Haverhill in the AM and PM peaks are from Horseheath, Linton and A1307 west of the A11. In the AM peak 11.1% of all vehicles originating from Haverhill travel on the A1307 to the west of the A11. In the PM peak 35.4% of vehicle trips travelling on the A1307 towards Haverhill have an origin west of A11.

2.4.2.3 Link Capacity

The Congestion Reference Flow (CRF) has been calculated for the A1307 and compared against the AADT flows (as shown in Table 2-4) in order to estimate the current link performance along the A1307.

The link capacity has been calculated by comparing the ratio of the AADT flow to the CRF capacity. The link capacity is the flow of traffic that can be accommodated on a particular stretch of road/road type. The capacity of a link is expressed in terms of a Congestion Reference Flow (CRF).

Links with a capacity of 0% to 85% will typically operate with free flow conditions with reductions in vehicle speeds and queuing towards the 85% level. Links with a capacity of 85% to 100% will experience frequent reductions in vehicle speeds and queuing during the peak hours. Links operating over 100% capacity will experience significant queuing and congestion on a daily basis, with small incidents likely to cause considerable journey delays.

Using the 2014 observed traffic flow data, Figure 2-5 shows the predicted Ratio of Flow to Capacity of the A1307.

Figure 2-5: A1307 Ratio of Flow to Capacity

Figure 2-5 shows that the dual carriageway sections provide high levels of capacity where no delays or queuing likely to occur in the peak periods.

Between Haverhill and Horseheath the A1307 is shown to be operating close to full capacity which may result in reduced vehicle speeds and delays during the peak hours.

Around Linton the highest levels of stress (101%-114%) will likely result in significant delays and congestion during the peak travel periods.

The A1307 around Abington and on the east approach to the A11 roundabout is also shown to be operating under high levels of stress (101%-114%) which may result in significant queuing and congestion in the peak hour periods.

2.5 The Impacts of Not Changing

If the A1307 dualling scheme is not provided, the problems described in Section 2.4 above are expected to get worse. Specifically:

- **Accident potential will increase**

Without an improved route between Haverhill and Fourwentways, there will potentially be an increase in accidents at this location due to the additional flows along the A1307 and the lack of any mitigation measures. Any increase in accidents would also result in direct and indirect economic disbenefits associated with accident and injury damage, and increased congestion and delays (at the time of the accidents), impacting the resilience of the local network.

- **Congestion will increase**

The A1307 corridor is one of the key radial routes to the A11 and Cambridge and suffers from congestion during peak periods, particularly at the Fourwentways junction and around the village of Linton.

Significant economic growth planned for the A1307 corridor and in a wider context, may interact with the A1307 corridor through their connections to the A505, and A11. This will lead to increased transport demand to/from Haverhill which will lead to increased congestion and make the problem worse. Congestion will affect journeys by public transport and commercial vehicles, as well as those by car, adding to travel costs.

These issues will affect journeys by adding to travel costs and making journey times less reliable, negatively impacting productivity.

- **Traffic growth associated with regeneration and new development will add to existing congestion problems, and may inhibit further economic growth.**

If the scheme is not brought forward this additional demand will result in increased congestion and there is a risk that this will inhibit growth and regeneration.

2.6 Objectives

The specific objectives of the scheme are:

- To facilitate growth in housing and employment along the corridor;
- To reduce accidents rates;
- To reduce congestion and journey delay;
- To improve journey time reliability;
- To improve the connectivity with surrounding villages and places of employment along the corridor; and
- To reduce community severance.

2.7 Measures for Success

The successful delivery of the scheme will be judged by the following expected outcomes:

- A reduced number of accidents along the A1307 and its accompanying junctions.
- The removal of congestion, delay and pinch-points along the A1307 between Haverhill and Fourwentways; and
- Improvement to the journey times along the A1307 between Haverhill and Fourwentways.

A measure of these outcomes will need to be monitored as part of the post-opening scheme evaluation. A Monitoring and Evaluation Plan will need to be developed, should the proposed scheme progress to Outline Business Case stage. This will establish a programme of monitoring from pre-construction, through scheme construction and for a suitable period post-opening of the scheme, focused on analysing the actual delivery of the scheme, as well as the schemes impacts and benefits.

2.8 Scope of the Scheme

The proposals present two options (north and south of the A1307) for a dual carriageway link between Haverhill and Fourwentways. The proposed northern and southern route options are described in more detail in Section 1.2 and are illustrated in Figure 1-2.

The scheme aims to relieve the existing A1307 congestion, improve journey times and improve safety. In addition to this the proposed scheme will be expected to encourage investment and growth. It will aim to provide capacity for forecast traffic growth and increased growth proposed for the area.

It is currently assumed that overbridges will be provided where the routes cross existing roads, however, the type of access will be confirmed at scheme design stage in line with DMRB standards.

2.9 Constraints

It is important to acknowledge the constraints which could affect the delivery of the scheme. This section pulls together the elements, which in some circumstances could constrain the capacity to undertake the scheme, or which could alter either the timescale or the range of route options available. The following types of constraints are considered:

- Physical constraints;
- Environmental constraints; and
- Financial constraints.

2.9.1 Physical constraints

There are physical constraints that could impact the Proposed Scheme. These are identified below.

2.9.1.1 Existing developments

There are numerous dwellings, businesses and settlements contained within the study area which would need to be fully considered as part of the scheme design work.

2.9.1.2 Listed Buildings

There are a number of listed buildings in close proximity to the A1307 including:

- 8 Cambridge Road (near the A1307 / Hildersham Rd junction);
- South Lodge to Hildersham Hall (near the A1307 / Pampisford Rd junction); and
- Multiple listed buildings in Linton and in Horseheath.

The potential impact of the proposed scheme on the listed buildings would need to be considered as part of the scheme design work.

2.9.2 Environmental constraints

There are environmental constraints that could impact the proposed scheme. These are identified below.

2.9.2.1 Air quality

The air quality impacts of the new route would need to be fully considered at Outline Business Case stage, particularly with regard to its impact on existing settlements.

2.9.2.2 Cambridge Green Belt

The green belt that encompasses the city of Cambridge extends as far as the Fourwentways junction and this which would need to be fully considered as part of the next stage scheme design work.

2.9.2.3 Sites of Special Scientific Interest (SSSI)

There are several Sites of Special Scientific Interest in close proximity to the proposed scheme. They are described below:

- The Roman Road is located 1km to the north of the A1307 and runs roughly parallel to it up to the village of Linton;
- Alder Carr is situated 1km north of the A1307 in Hildersham;
- Furze Hill is situated 1km north of the A1307 in Hildersham, west of Alder Carr SSI;
- Hildersham Wood is located 2km south of A1307 and Pampisford junction;
- Balsham Wood is situated 2.5km north of Dean Road junction; and
- Over and Lawn Woods is 1km located north of A1307 close to Haverhill.

The potential impact of the scheme on the SSSI would need to be considered as part of the scheme design work.

2.9.2.4 Utility infrastructure

There is a national transmission high pressure gas main pipe running to the west the Fourwentways junction. Whilst the gas main is expected to be of reinforced heavy wall construction pipe, there is a risk of triggering stopple charges during the implementation of the scheme. Detailed statutory undertaker searches would need to be completed as part of the scheme design work.

2.9.2.5 Trees and hedges

There are several mature trees and hedges within the highway verges of the A1307 that could be impacted by the proposed scheme. They may have habitat potential for protected species and there are grazing marshes and deciduous woodland to the north of the A1307 at the south east edge of Linton. A tree condition survey is recommended prior to the submission of an Outline Business Case to fully understand the level of protection required in relation to the highway trees.

2.9.3 Financial constraints

The source of scheme funding is not yet known, however it is likely that the scheme will primarily be funded from public finances with appropriate developer contributions where available.

2.10 Interdependencies

This section identifies factors on which the delivery of the scheme is dependent, or which could affect (or be affected by) its delivery. These include:

- Other transport proposals;
- Major developments;
- Statutory planning processes;
- Scheme design; and
- Stakeholder support.

2.10.1 Other transport proposals

There are no other transport proposals on which the scheme is considered to be dependent, or which depend upon it. However the following scheme should be noted:

- **Park and Ride at Fourwentways**
  Cambridge County Council is looking at building a park & ride at Four Wentways near the A1307/A11 junction and connecting this to Cambridge with high-speed public transport. This could involve a guided bus route designed for ease of entry and exit for all local bus services.

2.10.2 Major developments

There are no major developments on which the scheme is considered to be currently dependent on, or which depend completely upon it.

The proposed scheme will be expected to provide improved access to development sites to/from Haverhill and support the housing growth outlined in ‘The Vision 2031

Strategy of St Edmondsbury' which opens the door to creating a further 3,500 homes in Haverhill. In addition to this, significant economic growth is planned for the A1307 corridor and in a wider context, proposed developments within the Greater Cambridge area may also interact with the A1307 corridor through their connections to the A505 and A11.

2.10.3 *Statutory planning processes*

Delivery of the scheme depends on the successful completion of statutory processes. Most of the land that the proposed scheme will route through is currently under the ownership of other parties. The Council would need to enter negotiations with these landowners with regards to purchasing the land and would be expected to use CPO as required, in order to enable the scheme to be delivered.

It is expected that the time limited aspects of the Development Consent Order (DCO) process are the preferred means of delivery. A DCO is the means of obtaining permission for Nationally Significant Infrastructure Projects (NSIPs), in of place of individual consents such as planning permission, listed building consent and compulsory purchase orders.

2.10.4 Scheme design

The delivery of the scheme will require the completion of safe and effective design of all the scheme components. At detailed design stage, the actual constraints, such as location of utility apparatus and land limitations will need to be accurately defined. This will allow the most cost effective option to be fully developed and enable contingency costs to be reduced.

The design will be subject to normal assessment and checking process including safety audit, to ensure that it is fit for purpose.

2.10.5 Stakeholder support

Stakeholder support is essential to ensure buy-in to not only the scheme itself, but also to support its introduction (during and post construction). Details of stakeholders affected by the scheme and how they have been consulted is described in more detail below.

2.11 Stakeholders

This section identifies the main stakeholders who are affected by the proposed scheme, or who are involved in some way with its delivery and / or the decision making processes.

2.11.1 List of Stakeholders

The main stakeholders include:

Local authorities:

- Suffolk County Council
- Cambridgeshire County Council
- South Cambridgeshire District Council
- St Edmundsbury Borough Council
- Cambridge City Council
- Haverhill Town Council

Statutory bodies:

- Greater Cambridge City Deal Executive Board

Business organisations:

- Suffolk Chamber of Commerce
- Greater Cambridge Greater Peterborough Enterprise Partnership

Other stakeholders:

- A1307 Action Group
- A1307 Strategy Board
- Cambridgeshire Research Group
- Queen Edith's Community Forum
- Trumpington Residents' Association
- University of Cambridge
- Individual local businesses

2.11.2 Stakeholder engagement and public consultations

Cambridgeshire County Council ran a pre-consultation event in July 2015 regarding developing options for the A1307 corridor, in preparation for a wider public consultation event taking place in early 2016. The first consultation was delivered to key stakeholders within the local community and from local businesses, not to the public. In total, 193 comments were received. The events aimed to determine:

- Opinions for and against investment in the A1307 corridor;
- Any areas of concern that Cambridgeshire County Council were not already aware of; and
- Additional options for corridor improvements.

The pre-consultation revealed there was not one or two overriding existing issues, but instead several, spread along the corridor. However, issues of speeding and road safety along the A1307 were raised by the stakeholders as of particular concern. Congestion was the most dominant issue across the corridor, especially for Linton and Haverhill.

The public were then consulted between the 16th June and the 1st August 2016, with the aim of gathering feedback on a shortlist of 11 concepts for other possible improvements to the A1307 Haverhill to Cambridge transport corridor, not including a major rail, bus or road scheme. These were presented in the WSP | PB Draft Concepts report from January 2016. In total, seven events were held at various points along the corridor, with 1489 responses received (over 10% response rate).

Respondents were deemed to have a ‘very high level of support’ for the concept options presented. For example the concepts of improving cycling, walking and buses were either ‘supported’ or ‘strongly supported’ by 83.3%.

The full results of the engagement, including individual comments from respondents, are given in Appendix B.

After the Greater Cambridge City Deal (GCCD) Joint Assembly identified the A1307 corridor as a key investment area in March 2017, they endorsed a second public consultation to take place and further transport modelling as part of this Pre-Strategic Outline Business Case, looking into dualling the A1307.

2.12 Option selection process

A comprehensive process was adopted for generating and shortlisting other options for the A1307 corridor as summarised briefly below.

2.12.1 Initial option sifting

Key stakeholders were engaged in developing a range of other potential transport options for the A1307 transport corridor, with the aim of supporting the various

objectives laid out in related LTPs and policy documents for the areas covering the corridor. Issues covered include congestion, road safety, walking, cycling, and public transport. An initial long list of 29 concepts was then extended to 42 concepts, through the information gathered from the pre-consultation event and transport strategies for the area.

2.12.2 Haverhill to Cambridge A1307 Corridor Concepts

Three of the concepts, which were considered to be major, needed further assessment to determine their viability and cost benefit analysis in the form of three separate business cases, these being:

- The re-opening of the disused rail corridor as either a single or twin-track railway;
- Using the disused rail corridor to implement a busway scheme along the whole route; and
- Improving the whole A1307 carriageway.

The third concept listed above is the focus for this Pre-SOBC, after key stakeholders, namely the A1307 action group have called for substantial improvements to the carriageway, in light of the impending large-scale developments along the corridor and a number of fatal accidents.

2.12.3 Other short-listed options

A short list of alternative options to the Haverhill to Cambridge A1307 whole road improvement, was compiled by WSP | PB using the DfT's Early Appraisal and Sift Tool (EAST). These were recommended for further consideration and to be taken forward for engagement (with indicative costs at 2015 prices). These other options could be used alongside the whole carriageway improvements to fit in with guidelines to encourage sustainable and multi-modal travel:

Park & Ride

- Concept 1A - Babraham Road Park & Ride – redevelopment and expansion of the Park & Ride site to cater for committed and future growth within the Addenbrooke's Hospital / Cambridge Biomedical Campus area. The indicative cost is £2.5m; and
- Concept 1B – A11 Park & Ride Site – new Park & Ride adjacent to the A11 Fourwentways junction. The indicative cost is £12m.

Rapid Transit

- Concept 2A – Granta Park to Addenbrooke's Hospital / Cambridge Biomedical Campus (off highway) – segregated, off highway rapid transit

from Granta Park via a new A11 Park & Ride, Babraham Research Campus to Addenbrooke's Hospital / Cambridge Biomedical Campus. Potential for guided Busway, dedicated public transport road or other method of rapid transit. Additional walking, cycling and equestrian improvements provided alongside. The indicative cost is £98m;

- Concept 2B – Granta Park to Addenbrooke's Hospital / Cambridge Biomedical Campus (on highway) – segregated, on highway rapid transit from Granta Park via new A11 Park & Ride, Babraham Research Campus, Babraham Road Park & Ride to 3 A1307 Haverhill to Addenbrooke's Hospital / Cambridge Biomedical Campus. Additional walking, cycling and equestrian improvements provided alongside. The indicative cost is £25m;

- Concept 2C – Linton Bus Priority – on highway bus priority improvements through Linton. Additional transport and public realm improvements alongside. The indicative cost is £5m;

- Concept 2D – Babraham Road Park & Ride to Addenbrooke's Hospital / Cambridge Biomedical Campus (off highway) – segregated, off highway, rapid transit from Babraham Road Park & Ride to Addenbrooke's Hospital / Cambridge Biomedical Campus from the west. Additional walking, cycling and equestrian improvements alongside. The indicative cost is £30m; and

- Concept 2E – Babraham Road Park & Ride to Addenbrooke's Hospital / Cambridge Biomedical Campus (on highway) – segregated, on highway, rapid transit from Babraham to Addenbrooke's Hospital / Cambridge Biomedical Campus from the east. Additional transport and public realm improvements alongside. The indicative cost is £15m.

Walking & Cycling

- Concept 3A – Three Campus Cycling & Walking Route (off highway) – segregated, off highway, route from Granta Park via new A11 Park & Ride, Babraham Research Campus with a connection to National Cycle Network (NCN) 11. The indicative cost is £10m;

- Concept 3B – Three Campus Cycling & Walking Route (on highway) – segregated, off highway, route from Granta Park via new A11 Park & Ride, Babraham Research Campus and along the A1307 through to Babraham Road Park & Ride and Addenbrooke's Hospital/ Cambridge Biomedical Campus. The indicative cost is £6m;

- Concept 3C – Haverhill to Three Campus Route (on highway) – segregated, on highway route from Haverhill via Horseheath and Linton linking to the Three Campus cycle route at Granta Park. The indicative cost is £8m; and

- Concept 3D – Haverhill to Three Campus Route (off highway) – segregated, on highway route from Haverhill along the disused railway corridor to Linton and Granta Park linking to the Three Campus cycle route at Granta Park. The indicative cost is £13m.

Other Schemes

- Public Realm Improvements - Ensure all schemes incorporate appropriate public realm improvements to meet with the objectives of the City Deal (included within the concept costs);

- Bus Stop Accessibility Improvements - Ensure all bus stops along the corridor are fully accessible and meet the latest guidance for bus stops. The indicative cost is £1m; and

- Road Safety Improvements - Additional road safety improvements are proposed for a number of locations on the corridor, outside the major concept areas, to deliver a consistent route length approach.

2.12.4 Initial Pre-SOBC Optioneering

In 2017 the A1307 Strategy Board commissioned this Pre-Strategic Outline Business Case to be produced. Initially two long route options (north and south) were considered - between Cambridge and Haverhill. The options ran from the A1017 junction west of Haverhill to the south arm of Addenbrooke's Hospital site access Roundabout on Hills Road in Cambridge. The indicative routes are shown below in red and blue (Figure 2-6).

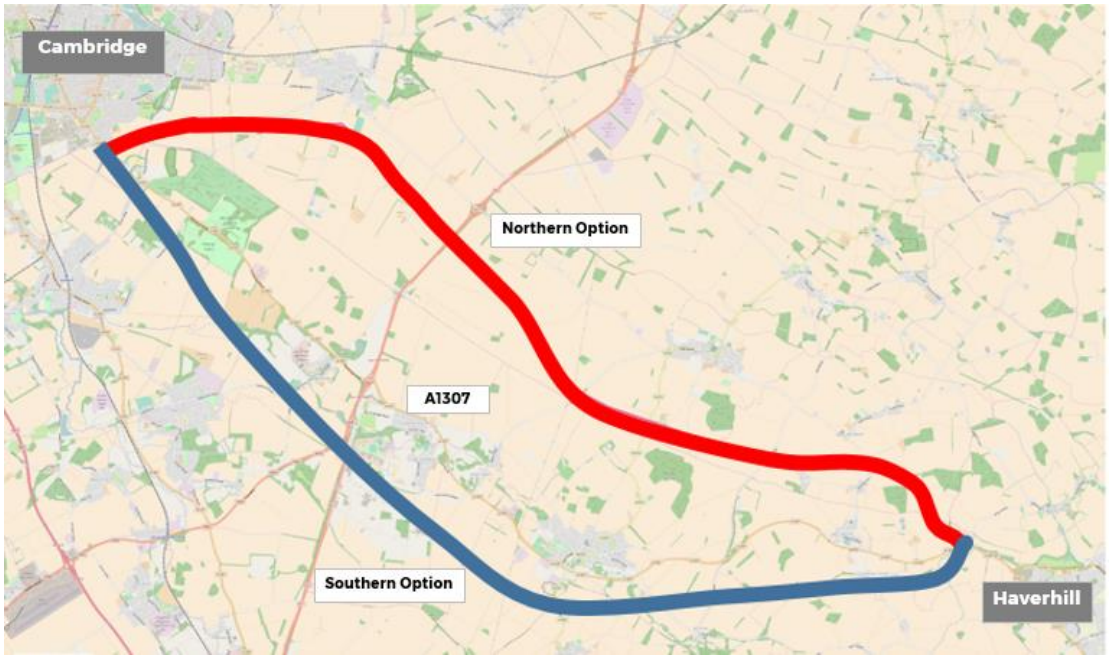

Figure 2-6 Initial northern and southern scheme options

The northern route was 22km long and had a cost of £290 million, whilst the southern route was 20km long and had a cost of £260 million (2017:Q2 prices).

Due to the low initial calculations of the BCRs for both the northern and southern route of 0.563 and 0.686 respectively, and high scheme costs, these routes were revised in September 2017. The revised northern and southern routes schemes, as featured in this current Pre-SOBC have shorter distances of approximately 12km (northern) and approximately 11km (southern) and accordingly have achieved lowers costs and higher BCRs.

2.13 Summary of the Strategic Case

The proposed dualling scheme aims to improve overall accessibility, journey time reliability, productivity, safety as well as reduce congestion. It will also enable the allocation of new areas of growth as part of the current Local Plan reviews, supporting the future economy of Suffolk, Cambridge and wider areas in addition to benefiting existing businesses and jobs, in line with local and national policies.

The proposed northern and southern road improvement options both offer a permanent solution to the identified problems and fit well with wider strategic and economic policies. Failure to deliver the scheme could potentially limit the growth and development of Cambridge and Haverhill.

3 The Economic Case

3.1 Introduction

The Economic Case identifies and assesses all the impacts of the scheme to determine its overall value for money. It takes account of the costs of developing, building, operating and maintaining the scheme, and a full range of its impacts. These include those impacts that cannot be monetised. The Economic Case considers the extent to which the scheme's benefits will outweigh its costs.

This section covers:

- Overview of approach to assessment;
- Scheme costs;
- Scheme benefits;
- Transport economic efficiency (TEE);
- Safety benefits;
- Value for money statement;
- Environmental impacts;
- Social and distributional impacts;
- Appraisal Summary Table (AST); and
- Summary and conclusion.

3.2 Overview of approach to assessment

3.2.1 Methodology

The economic assessment of the scheme has been undertaken in accordance with current DfT WebTAG guidance, including:

- TAG Unit A1 cost-benefit analysis; and
- TAG Unit A2 economic impacts.

The methodology is based on the DfT Value for Money Note (December, 2013). The basic steps are described below.

The present value of cost (PVC) is calculated using the discounted whole life costs of the scheme.

TUBA (Transport User Benefit Analysis) is used to calculate the user benefits due to time and vehicle operating cost savings resulting from the scheme. COBALT (Cost and Benefit to Accidents – Light Touch) is used to assess benefits arising from changes in accidents with the scheme.

Using the costs and the benefits associated with the scheme an initial benefit-cost ratio (BCR) is calculated.

3.2.2 Assumptions

Key assumptions are summarised below:

The modelled assessment years are:

- Base year (2015); and
- Opening year (2021).

The future year travel scenario includes the planned developments described in the Strategic Case, and other individual developments as contained in an 'uncertainty log'. See Appendix C for the list of sites included within the 'uncertainty log'.

The modelled time periods are:

- AM peak (08:00 – 09:00);
- Average interpeak (10:00 – 16:00); and
- PM peak (17:00 – 18:00).

This is consistent with advice presented in Section 2.5 of TAG Unit M3.1 (January 2014).

The following user classes are modelled:

- UC1: Car – Commuting;
- UC2: Car – Employer's Business;
- UC3: Car – Other;
- UC4: LGV; and
- UC5: HGV.

3.3 Scheme Costs

3.3.1 Cost estimates

The cost of the proposed scheme options has been estimated at 2017 (Q3) prices.

Route	Total Costs
Northern Route	£190,000,000
Southern Route	£180,000,000

Table 3-1: Scheme preparation and construction costs

3.3.2 Optimism Bias

The purpose of optimism bias is to ensure that the cost-benefit analysis is robust and as such optimism bias has been applied in the BCR calculations.

The costs are inclusive of optimism bias, at a rate of 45%. This is a typical rate applied to work at Pre/Strategic Outline Business Case Stage in line with the DfT's Optimism Bias guidance.

3.3.3 Present Value of Costs (PVC)

The costs have been firstly converted to 2010 prices, and then a 3.5% discount rate has been applied in order to represent the assumption that costs (and benefits) incurred at a future date are less valuable than costs incurred in the present. The discounted costs of each scheme are presented below in Table 3-2.

	Route	
	Northern	Southern
Discounted Costs (£M)	**138.6**	**131.3**

Table 3-2: Discounted costs

3.4 Scheme Benefits

This section describes the benefits which the scheme is expected to produce. Where these can be monetised, they are used to calculate the Present Value of Benefits (PVB) and then, along with the PVC, the Benefit Cost Ratio (BCR) for the scheme. Benefits which cannot be monetised are, where possible, quantified, but are otherwise described qualitatively.

3.4.1 Transport Economic Efficiency (TEE)

The Transport Economic Efficiency (TEE) benefits (or disbenefits) consist of travel time and Vehicle Operating Cost (VOC) benefits (or disbenefits) as a result of the scheme and maintenance activities.

These have been assessed using the DfT's Transport Users Benefit Appraisal (TUBA) software, an industry-standard method of assessing economic benefits from transport schemes, in accordance with guidelines set out in *TAG Unit A1*. Using outputs from the Saturn traffic model, TUBA calculates the benefits (or disbenefits) related to journey time savings, vehicle operating cost savings, carbon emissions and fuel tax revenue. The current version of TUBA is 1.9.8, which includes the latest parameter values as published in the TAG Databook (July 2016).

The results of the TUBA assessments are presented below.

Benefits (£M)		
Benefit category	**Northern Option**	**Southern Option**
Consumer – commuting user benefits	£38.6	£20.3
Consumer – other user benefits	£35.6	£22.1
Business benefits	£48.3	£37.9

Table 3-3: Transport user and business benefits

3.4.2 Safety Benefits

The assessment of scheme safety benefits was undertaken using COBALT (Cost Benefit Analysis Light Touch), the DfT's cost-benefit analysis software for accident savings. The appraisal used the latest COBALT parameter file 2016.2 (released 16th December 2016).

COBALT assesses the safety aspects of road schemes using detailed inputs of either (a) separate road links and road junctions that would be impacted by the scheme; or (b) combined links and junctions. For the A1307 dualling scheme, combined links and junctions were assessed. As COBALT does not accept links with a 20mph speed limit, a speed of 30mph was assigned to links in both the Do Minimum and Do Something networks which were below this threshold.

Five year accident data was obtained for the model area between 1st February 2012 and 31st January 2017. Benefits were assessed over the whole model area.

The assessment was based on a comparison of accidents by severity using Without-Scheme' and 'With-Scheme' forecasts from the Saturn traffic model, using details of link characteristics, relevant accident rates and costs and forecast traffic volumes by link. The COBALT assessment was undertaken to assess the scheme over a 60 year period.

The COBALT analysis estimates that 319 accidents will be saved over the 60 year appraisal period as a result of the Northern Scheme and 279 as a result of the Southern Option, as shown in Table 3-4:

Accident Summary over 60 Years			
Scheme	**Total 'Without' Scheme Accidents**	**Total 'With' Scheme Accidents**	**Total Accidents Saved by Scheme**
Northern Option	145,454	145,135	319
Southern Option	145,453	145,174	279

Table 3-4: Accident savings over 60 years

COBALT also provides a summary of the number of casualties saved as a result of the scheme, as shown in Table 3-5 and 3.6.

Casualty Summary over 60 Years			
Type	**Total 'Without' Scheme Casualties**	**Total 'With' Scheme Casualties**	**Total Casualties Saved by Scheme**
Fatal	2,397	2,393	4
Serious	21,893	21,824	69
Slight	176,092	175,745	347

Table 3-5: Casualty savings over 60 years – Northern Option

Casualty Summary over 60 Years			
Type	**Total 'Without' Scheme Casualties**	**Total 'With' Scheme Casualties**	**Total Casualties Saved by Scheme**
Fatal	2,397	2,394	3
Serious	21,989	21,827	162
Slight	176,091	175,813	278

Table 3-6: Casualty savings over 60 years – Southern Option

The economic benefits of the accident savings is calculated by comparing the cost of accidents over the 60 year appraisal period, with and without the scheme, at 2010 prices, discounted to 2010, as detailed below:

Economic Summary over 60 Years			
Scheme	**'Without' Scheme Accident Costs (£000's)**	**'With' Scheme Accident Costs (£000's)**	**Total Accident Benefits Saved by Scheme (£000's)**
Northern Option	7,898,491	7,879,793	18,698
Southern Option	7,898,446	7,882,129	16,317

Table 3-7: Present value of accident savings over 60 years (2010 prices, discounted to 2010)

The total accident benefits using this assessment method are **£18.7 million** for the Northern Scheme and **£16.3 million** for the Southern Scheme.

3.5 Value for Money Statement

3.5.1 Benefit-Cost Ratio (BCR)

According to WebTAG, Value for Money categories are defined as follows:

- Poor VfM if BCR is below 1.0;
- Low VfM if the BCR is between 1.0 and 1.5;
- Medium VfM if the BCR is between 1.5 and 2;
- High VfM if the BCR is between 2.0 and 4.0; and
- Very High VfM if the BCR is greater than 4.0.

The current indicative BCRs show that the northern option provides **Low** value for money, whilst the southern option provides **Poor** value for money as set out below in Table 3-8.

Analysis of monetised costs and benefits (£000's)	Northern Route	Southern Route
Initial BCR	1.008	0.731

Table 3-8 BCR

3.6 Environmental Impacts

At this stage, the only impacts to have been monetarised are greenhouse gas emissions, which are extracted from the TUBA analysis.

The Environmental Appraisal of the proposed scheme will need be assessed at Full Business Case stage, and will include fully quantified and monetarised assessments where required by WebTAG.

The full business case will include an assessment of the following environmental impacts:

- Noise;
- Air quality;
- Greenhouse gases;
- Townscape;
- Historic environment;
- Biodiversity; and
- Water environment.

3.7 Social and Distributional Impacts

Of the Social and Distributional Impact analysis that can be undertaken, as set out in *TAG Unit A4-1 and A4-2*, only User Benefits and Accident analysis has been undertaken at this Pre-Strategic Outline Business Case stage. This is partly because the quantitative environmental analysis required for noise and air quality has not yet been undertaken (in line with the project scope and will be undertake during the production of the Full Business Case).

3.8 Summary of the Economic Case

An analysis of the monetised benefits of the proposed scheme demonstrates that the northern option offers **Low** value for money with a BCR of **1.0**, whilst the southern option offers **Poor** value for money with a BCR of **0.73**.

With a BCR of **1**, the northern route has the potential to be taken forward as a scheme. The BCR is currently based on an AM and PM peak model only, with potential further off peak benefits to be realised, alongside wider benefits. The BCR could further increase if the A1307/A11 Fourwentways junction was improved – as it is at maximum capacity in the model, as currently designed, and therefore constrains the growth of traffic on the new road.

If the off peak model benefits, Fourwentways improvements and wider benefits were taken into account a BCR of **1.5-2** could potentially be achieved, which would present a **medium** value for money scheme.

4 Appendices

Appendix A – Accident Analysis: Cluster Locations

Appendix B – Consultation report

Appendix C – Uncertainty Log