

# The Lake Lothing (Lowestoft) Third Crossing Order 201[\*]

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Lake Lothing  
**THIRD  
CROSSING**

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## **Document 7.4: Outline Business Case**

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**Planning Act 2008**

**Infrastructure Planning**

**The Infrastructure Planning (Applications: Prescribed Forms and Procedure)  
Regulations 2009**

Regulation Number: 5(2)(q)

PINS Reference Number: TR010023

Author: Suffolk County Council

Document Reference: 7.4

Date: June 2018

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## Outline Business Case

### **Lake Lothing Third Crossing, Lowestoft**

24 December 2015

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# Document Control Sheet

Project Title            Lake Lothing Third Crossing Outline Business Case

Report Title            Outline Business Case

Report ref no.

Version                7.0

Status                 Final

Report Date            24 December 2015

## Record of Issue

Version	Status	Author	Date	Checked by	Date	Approved by	Date
7.0	Final	Rob Surl Ian Baker Thomas Diver R. Santhakumar	15/12/2015	Joanna Lyon Rob Surl Ian Baker Thomas Diver	24/12/2015	Joanna Lyon	24/12/2015

## Distribution

Date	Organisation	Contact	Format	Copies
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## Executive Summary

This document is the Outline Business Case for the Lake Lothing Third Crossing. It has been prepared on behalf of Suffolk County Council (SCC) and New Anglia Local Enterprise Partnership (NALEP), the scheme promoters, for consideration by the Department for Transport (DfT).

The crossing will follow a north / south alignment from a new roundabout on Denmark Road, east of the existing Peto Way / Denmark Road roundabout, and span both the railway line and Lake Lothing, connecting to Riverside Road to the south of the Lake. The new infrastructure will support traffic movements between the Northern Spine Road (Peto Way) and the Southern Link Road (Tom Crisp Way).

The crossing will consist of a bascule (lifting) bridge to allow the passage of boats within the inner harbour of Lake Lothing, and will have a clearance of 12m to allow smaller boats to pass underneath to minimise lifting. The crossing will be a single carriageway, with segregated footways and cycle paths, linked to existing networks on the northern and southern borders of Lake Lothing.

The cost of the scheme preparation and construction, excluding inflation, client costs and non-recoverable VAT is £80,347,000 at 2015 prices. The scheme expected outturn cost will be £91,733,000 (which includes inflation). Subject to funding approvals and consents, construction of the third crossing will begin in February 2018 and be delivered in November 2020.

The scheme offers a very high value for money, with a Benefit-Cost Ratio (BCR) of 8.08. The monetary benefits are predominantly derived from journey time savings to commuters and business, as well as savings to vehicle operating costs. Lowestoft will benefit from reduced congestion, faster journeys and improved journey time reliability. This will support local development and regeneration and Lowestoft's economy. Furthermore, there will be accident and casualty savings, and savings associated with the increased use of active modes (walking and cycling) as a result of the scheme.

The scheme will be funded through a combination of Government funding and a Local Contribution in an 80/20 split.

The scheme is commercially viable with a robust contracting and procurement strategy. This includes the use of the OJEU 'restricted procedure' procurement tendering process, using a 'traditional' approach, with the NEC3 Engineering and Construction (ECC) form of contract.

In summary the scheme is financially affordable, commercially viable achievable and offers high value for money.

# 1 Introduction

## 1.1 Overview

This document is the Outline Business Case (OBC) for the Lake Lothing Third Crossing. It has been prepared on behalf of Suffolk County Council (SCC) and New Anglia Local Enterprise Partnership (LEP) for consideration by the Department for Transport (DfT). The form of and content of the business case follows guidance from the government<sup>1</sup> and the LEP.

The OBC explains why the proposed scheme should receive support, and provides a clear audit trail for the purposes of public accountability.

The OBC is not just a bid for financial support, although this is of course important. Rather, it explains how and why the decision has been made to put the proposal forward in its current form, and at the present time. It shows that the decision is based on a realistic analysis of the current situation, a clear vision of how things should be in the future, and a robust assessment of the potential options for the scheme and for the way it is delivered.

## 1.2 Location of the scheme

The proposed scheme is a new road crossing over Lake Lothing, a large saltwater lake which flows into the North Sea. The lake is approximately 180m across at its widest point, and forms the inner harbour of the Port of Lowestoft. This area has suffered greatly from the decline of shipbuilding and traditional industries, and is a key area for regeneration. The scheme will support regeneration by improving access to the lake area and by relieving congestion in, and around, the town centre.



*Figure 1-1: Lake Lothing, viewed from the east*

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<sup>1</sup> The Transport Business Cases, Department for Transport (January 2011)



Figure 1-2: Location of the scheme in the context of the Lowestoft town centre

Figure 1-2 shows the area of the scheme in relation to the town and the local road network. Lake Lothing separates the north and south parts of the town. The A12 forms a north-south route on the eastern (seaward) side of Lowestoft, providing access to the town centre (on the north side) and crossing Lake Lothing by means of a bascule bridge at the entrance to the inner harbour. The southern section of the A12 (the Southern Access Road) is a trunk road. To the west, another north-south route is provided by the A1177 (the Northern Spine Road) which crosses Lake Lothing by means of another lifting bridge at Mutford Lock, and the A146. There are no other road crossings. The two north-south routes are linked by the A1144 and

Denmark Road (north of Lake Lothing) and a section of the A146 (south of Lake Lothing).

The A146 links Lowestoft to Norwich with its international airport. The A12 runs northwards to Great Yarmouth, and southwards towards the A14 for Ipswich and Felixstowe, and to London.

### **1.3 The need for a third crossing**

Over the past 35 years, much of Lowestoft's rich and proud industrial heritage has gone. The fishing industry has declined dramatically, industries have closed, and there has been a move away from home-based tourism. There is an urgent need for inward investment and regeneration, but poor infrastructure hampers attempts to attract new businesses to the area.

Lake Lothing divides Lowestoft between north and south. The road crossings in the east and west are inadequate for existing traffic demand. The problem of congestion has blighted the town for years, and Lowestoft's inadequate road network is a serious disincentive to people coming to the town. Congestion causes real problems for business; it discourages existing firms from expanding and discourages new businesses from moving into the area. There have been improvements to local roads in recent years, but the third crossing remains a missing link. Provision of an extra crossing will reduce severance, and allow the road network to operate efficiently, providing vital extra capacity. It will reduce congestion, helping Lowestoft to attract investment and achieve its full potential as a place in which to live and work.

### **1.4 Description of the scheme**

The proposed scheme is illustrated in Figure 1-3. It starts at a new roundabout on Denmark Road, east of the existing Peto Way / Denmark Road roundabout, and spans both the railway line and Lake Lothing on a north – south alignment.

On the southern shore, the new crossing follows the line of Riverside Road, initially at a high level, descending to a new roundabout at the junction of Riverside Road and Waveney Drive, west of the Lings Motor showroom.

Improvements between this roundabout and the existing Waveney Road / Tom Crisp Way roundabout will provide access to the A12. Local roads which presently connect directly to Riverside Road will be served in the main from a new connection to Waveney Drive.

The choice of a "central" corridor for the third crossing means that traffic can travel easily between the Northern Spine Road (Peto Way) and the Southern Link Road (Tom Crisp Way) without using either of the existing bridges, helping to reduce congestion and reduce community severance.

A bascule (lifting) bridge will be constructed to allow the passage of shipping within the inner harbour. When closed, the bridge will have a clearance of at least 12m. This will enable smaller boats to pass under the bridge. This, and its location west of

some of the docks, means that it will have to open less frequently than the existing Bascule Bridge at the harbour entrance.

The new bridge will be a single carriageway, with separate footways and cycle tracks, linked to existing networks.



*Figure 1-3: Proposed scheme*





Figure 1-4: Conceptual 3D image of the scheme

## 1.5 The Five Cases

The OBC is made up of five separate cases. Together these show that the scheme is:

- Closely aligned to wider strategies and objectives – the **strategic case**.
- Best value for money – the **economic case**.
- Achievable in commercial terms – the **commercial case**.
- Affordable – the **financial case**.
- Achievable in practical terms – the **management case**.

## 1.6 Summary of the Strategic Case

### 1.6.1 *Strategic fit*

The proposed Lake Lothing Third Crossing scheme is closely aligned with national, regional and local transport plans and policies. Together these set out a bold vision for economic growth and regeneration in Lowestoft, with a specific focus on the area around Lake Lothing. The proposed third crossing is part of that vision. By addressing Lowestoft's reputation for chronic congestion, it will help to attract more inward investment, and support and stimulate growth.

### 1.6.2 *Development plans*

The Area Action Plan identifies the specific site allocations within the area which need to be developed to realise the regeneration and revitalisation of the Lake Lothing and Outer Harbour area. The third crossing will improve access to key areas, including Kirkley Waterfront and the proposed Sustainable Urban Neighbourhood.

### 1.6.3 *Problems*

The main problems which have led to the proposed scheme being developed are:

- The loss of traditional industries and employment;
- Difficulty accessing potential regeneration sites;
- Community severance;
- Congestion;
- Barriers to walking and cycling;
- Difficulties for local bus services; and
- Accidents.

If a third crossing is not provided, these problems are expected worsen. Regeneration and growth in Lowestoft will come at the price of increased congestion

and community severance. It will be hard for the town to shake off its image as a place characterised by congestion and poor accessibility, and there is a real risk that these perceptions will prevent the town from achieving its true potential for growth.

In contrast to this, tackling the problems of congestion and severance with a bold new scheme will send a clear message that Lowestoft is embracing the challenges of regeneration and growth.

#### 1.6.4 *Aims and objectives*

The overall aim of the proposed scheme is therefore:

**To stimulate regeneration, sustain economic growth, and enhance Lowestoft as a place to live and work in, and to visit.**

The specific objectives of the scheme are:

- To open up opportunities for regeneration and development in Lowestoft.
- To provide the capacity needed to accommodate planned growth.
- To reduce community severance between north and south Lowestoft.
- To reduce congestion and delay on the existing bridges over Lake Lothing.
- To reduce congestion in the town centre and improve accessibility.
- To encourage more people to walk and cycle, and reduce conflict between cycles, pedestrians and other traffic.
- To improve bus journey times and reliability.
- To reduce accidents.

#### 1.6.5 *Constraints*

In developing the scheme, account has been taken of physical, environmental, financial, contractual and public acceptability constraints, especially the need to fit in with the operation of the port.

#### 1.6.6 *Support for the scheme*

There is very strong public support for a scheme, with over 93% of people believing that a new crossing is needed. Local businesses consider that the scheme will stimulate increased turnover and higher levels of employment.

#### 1.6.7 *Option assessment and selection of preferred scheme*

A comprehensive and robust option selection process was adopted to generate and assess options for the scheme. An initial long-list of 15 options, including non-road options, was assessed and reduced to a short list of three.

The preferred scheme is the Central Bridge option. It is the least expensive of the short-listed options, it produces the highest benefits, is most likely to deliver the objectives, and has a high level of public and business support.

## 1.7 Summary of the Economic Case

An analysis of the monetised benefits of the proposed scheme demonstrates that it offers **very high** value for money with a BCR of **6.85**. Most of the benefits result from savings in journey time and vehicle operating costs. Accident savings and savings associated with increased use of active modes also contribute to the benefits. Inclusion of reliability benefits increases the BCR further to **8.08**. Sensitivity testing with a range of growth scenarios shows that the scheme would still offer very good value for money in a low growth scenario. Analysis of social and distributional impacts shows that areas of Lowestoft with lower average incomes will benefit most.

About half of the forecast time and vehicle operating cost savings are identified as benefits to business. Business will benefit from reduced congestion, faster journeys and improved journey time reliability, with reduced costs and better access to markets, 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 and the regeneration of Lowestoft's economy.

Impacts on the environment have been assessed and range from neutral to moderate adverse. These will be reviewed for the Full Business Case in the light of more detailed assessment and consideration of measures to mitigate, manage or compensate for the impacts. The scheme is expected to lead to a reduction in greenhouse gas emissions; these have been monetised and included in the BCR.

The results of the appraisal are summarised in an Appraisal Summary Table.

## 1.8 Summary of the Financial Case

### 1.8.1 Costs

The cost of the scheme preparation and construction has been estimated by Suffolk County Council's consultant, Mouchel Consulting. The estimated capital cost of the scheme is £80,347,000 at current (2015) prices, excluding inflation, client costs and non-recoverable VAT. Subject to funding and consents, the scheme will be delivered by financial year 2020-2021. Including inflation, the expected capital costs will be **£91,733,000**.

### 1.8.2 Risk

Risk allowance is a factor applied to project costs to act as a contingency for unforeseen circumstances. The cost of delivering the scheme will not be fully known until the detailed design has been completed, land purchased, and tender prices have been received. To reflect the uncertainty associated with known risks, a quantified risk assessment (QRA) has been undertaken. The allowance for risk is **£25,546,000** at 2015 prices, and is included in the scheme costs above.

### 1.8.3 *Funding*

It is likely that the scheme will be funded entirely from public finances.

The largest contribution to the scheme costs would be provided by the Government's Department for Transport.

20% of the costs will be covered by a local contribution. Potential sources for this are identified in the Financial Case. The exact composition cannot be finalised at this stage – details of the local funding mechanism will be clarified as the scheme is developed. Suffolk County Council will underwrite this cost, and this is confirmed in a letter of intent, written by the Council's Section 151 officer. The Council is also prepared to enter into credit arrangements under the prudential borrowing powers from the Local Government Act 2003.

In addition to underwriting the 20% contribution, the letter also confirms that the Council will underwrite any potential increase in scheme costs.

### 1.8.4 *Whole life costs*

The scheme will give rise to additional revenue liabilities for capital renewals and maintenance and for the cost of day to day operation of the bridge. All maintenance obligations will be met as part of the maintenance regime operated by Suffolk County Council.

The following whole life costs (given at 2015 prices) have been factored into the economic appraisal

- **£1.5 million** (over a 60 year period) for resurfacing / renewing the new highway infrastructure (including the bridge approaches and bridge surface);
- **£1.5 million** (over a 60 year period) for bridge repair and rehabilitation;
- **£10,000** (per year) for annual highways maintenance liabilities; and
- **£132,000** (per year) for bridge maintenance (including operation and maintenance of the bascule bridge).

## 1.9 **Summary of the Commercial Case**

### 1.9.1 *Procurement*

The scheme is commercially viable with a robust contracting and procurement strategy. It will use an OJEU 'restricted procedure' procurement tendering process, which has been utilised by the Council on a number of previous large-scale transport infrastructure schemes. Details are given in the Commercial Case. The scheme will be procured using a 'traditional' approach as opposed to 'design and build'.

### 1.9.2 *Form of contract and sourcing.*

The Council will use the NEC3 Engineering and Construction (ECC) form of contract which is the standard form of contract used for construction works in the UK. The

“priced with activity schedule” option will be selected in order to provide increased levels of cost certainty. The scheme will be sourced through advertisement in the Official Journal of the European Union (OJEU) due to its value. This will allow companies from across the EU to bid for the work.

#### **1.9.3** *Risk allocation and transfer*

The construction contract will include clauses to facilitate the transfer of appropriate risks from the Council to the contractor, such as risks associated with construction costs increasing above those predicted in the financial case.

### **1.10 Summary of the Management Case**

The Management Case describes how the scheme will be delivered through project management best practice, confirming that the timescales are realistic, and demonstrating that an appropriate governance structure is in place to oversee the project.

#### **1.10.1** *Evidence of similar projects;*

The delivery of the scheme will build upon experience gained with a number of major highway and transport schemes delivered by Suffolk County Council in recent times.

#### **1.10.2** *Programme and project dependencies*

The Third Crossing scheme is a ‘stand-alone’ scheme, which can be delivered as designed and costed independently. It is not dependent upon any other scheme or project. Similarly, no other future projects or schemes are dependent upon it. It is, however, dependent upon a number of other activities which are outlined within the Project Programme, and is subject to risks, which are set out in the Risk Register.

#### **1.10.3** *Governance*

A well-functioning governance structure will be crucial to the successful delivery of the scheme. Suffolk County Council (SCC) will therefore establish a Project Board, a Project Delivery Team and a Stakeholder Group to work together to deliver the scheme. Details are given in the Management Case.

#### **1.10.4** *Programme*

Construction is programmed to commence in February 2018 and will be completed in November 2020, subject to approvals and funding.

A project programme has been developed setting out all the key project tasks and their duration, the interdependencies between each of the tasks, and key milestones and gateways.

The programme will be a live document, with progress on planned task completion being monitored against actual progress on a weekly basis by the project manager.

A greater level of detail will be introduced into the programme during the Full Business Case production, as detailed design of the scheme progresses and as risk quantification and impacts change.

#### 1.10.5 *Stakeholder management*

Stakeholders have been consulted on the project to highlight issues and constraints which led into the development of the preferred option. A project steering group was formed to facilitate this process, and two key engagement events have been held, as well as public and business consultations. A website has been developed for the scheme. Details are given in the Management Case.

Stakeholders will continue to have an important role as the scheme is developed. Representatives from the key statutory stakeholders (the DfT, Network Rail, Highways England and Association of British Ports (ABP)) and project partners (i.e. Waveney District Council, Suffolk and Waveney Chamber of Commerce and the New Anglia LEP), and Peter Aldous, the Member of Parliament for Waveney will be invited by the promoter (Suffolk County Council) to form a **stakeholder group** for the scheme, based on the existing Steering Group. This group will identify key constraints to scheme delivery, capture wider stakeholder opinion and disseminate information to other stakeholders and the wider public.

#### 1.10.6 *Risk management*

The Management Case details the approach to Risk Management, including the development of response plans. Reviews of the status of scheme risk assessments and their related response plans (as part of project reporting) will be an integral part progress meetings (and at the Project Board) during progression of detailed design and the construction period. All key risks will be formally reviewed at key decision points in the scheme lifecycle.

#### 1.10.7 *Benefits realisation*

It is important to demonstrate that the scheme is successful in delivering its objectives. A Benefits Realisation Plan will be developed, closely linked to the Monitoring and Evaluation Plan.

## 2 The Strategic Case

### 2.1 Introduction

The Strategic Case is the foundation of the Business Case. It demonstrates that the proposed scheme has not been developed in isolation, but as part of a broader strategy for Lowestoft and the local area, in response to real problems and with clear aims and objectives.

The overarching theme is the need for Lowestoft to attract more inward investment and take advantage of the opportunities for economic growth, reversing the tide of industrial decline. Traffic congestion and the inadequacy of the town's local road network are seen by local people and businesses as the main obstacles to growth. The inner harbour, Lake Lothing, divides the town in two, making local travel difficult and journey times unpredictable.

Specific problems addressed in the Strategic Case are:

- The loss of traditional industries and employment;
- Difficulty accessing potential regeneration sites;
- Community severance;
- Congestion;
- Barriers to walking and cycling and gaps in local cycling and pedestrian networks;
- Difficulties for local bus services due to lack of routes across Lake Lothing and congestion at the existing bascule bridge; and
- Accidents.

The provision of a third crossing of Lake Lothing is a key element of the strategy to provide Lowestoft with the infrastructure it needs to support growth. It will enable the local road network to operate efficiently by reducing congestion, improving predictability of journey times, and providing capacity for growth. For these reasons, there is a long held local aspiration to provide a third crossing which will make Lowestoft more attractive to inward investment and a better place in which to live and work.

The Strategic Case shows how these aspirations are in line with strategic aims and objectives. It then demonstrates how a scheme has been identified which is best able to deliver these objectives.



## 2.2 Overview

The Strategic Case is structured in line with government guidance<sup>2</sup>. 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**.
- The **objectives** of the scheme.
- 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.
- 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.

A summary of the strategic case is given in Section 2.14.

## 2.3 Policy Background – The Business Strategy

The proposed Lake Lothing Third Crossing is closely aligned with national, regional and local transport plans and policies.

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<sup>2</sup> The Transport Business Cases, Department of Transport (January 2011)

### 2.3.1 *National plans and policies*

The **National Infrastructure Plan** (December 2014) is based on the principle that “high-quality infrastructure boosts productivity and competitiveness, allowing businesses to grow and enabling them to reach suppliers, deepen labour and product markets, collaborate and innovate, and attract inward investment”<sup>3</sup>.

The government’s aim is “to create a national road network fit for the 21<sup>st</sup> century, which improves economic productivity and supports jobs and growth across the country. It seeks to increase capacity, tackle congestion, support development, strengthen connectivity, improve reliability and resilience, and ensure a road network of the best possible quality”.

The National Infrastructure Plan recognises the role of government in funding improvements to the Strategic Road Network (SRN), and aims for “a transformation of the nation’s road network over the next quarter of a century, with the aim of putting the nation’s SRN back in the top ten globally”.

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.

The A12 and the existing eastern crossing of Lake Lothing are part of the SRN. Other roads around the inner harbour are part of the local road network.

The proposed Lake Lothing Third Crossing will help 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.

### 2.3.2 *Regional plans and policies*

The strategic case for the scheme is underpinned by key regional economic and spatial policies, including:

- New Anglia Strategic Economic Plan;
- Assisted Area Designation;

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<sup>3</sup> National Infrastructure Plan, H. M. Treasury (December 2014)

- Lowestoft-Great Yarmouth Enterprise Zone and Simplified Planning Zone; and
- Suffolk Local Transport Plan 2011-2031.

### 2.3.3 *New Anglia Strategic Economic Plan (2014)*

The **New Anglia Strategic Economic Plan (SEP)**<sup>4</sup> covers the area illustrated in Figure 2-1 below:



Figure 2-1: The Norfolk and Suffolk region covered by New Anglia LEP (Source: New Anglia SEP)

<sup>4</sup> New Anglia Strategic Economic Plan, New Anglia LEP (March 2014)

The SEP casts a vision for a transformation of the economy of Norfolk and Suffolk which will establish New Anglia as a centre of global business excellence. It seeks to deliver more jobs, new businesses, new housing, and increased 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**<sup>5</sup> with the LEP in July 2014.

Lowestoft is identified as a larger economic sub-region in the north east of the area, with a strong base in manufacturing and food and drink processing and strong tourism and leisure industries, all of which have potential for growth.

The area's main growth opportunity is in the energy sector, for which it has been designated one of six Centres for Offshore Renewable Engineering (CORE) and will receive a comprehensive package of business support. The Port of Lowestoft is important to the offshore energy industry. It also has an established reputation as a centre for servicing the offshore oil and gas industry, and more recently for the construction, operation and maintenance of North Sea wind farms. It is the closest port to the East Anglia Array Wind Farm, consisting of up to 1,800 wind turbines, 14km off the coast. Plans are also being developed for the Galloper Wind Farm, 27km off the Suffolk Coast.

The SEP identifies eight **growth locations** – areas which are expected to grow by at least 1,000 jobs and 1,000 dwellings<sup>6</sup>. These include *Lowestoft and Great Yarmouth*. Transport performs a pivotal role in connecting and accessing these growth locations, and a programme for New Anglia's strategic transport infrastructure investment is essential to deliver the objectives of the SEP. For this reason, most of the strategic interventions in the SEP are transport-related, and include:

- Improvements on national trunk roads in the area;
- Schemes to directly unlock employment or housing growth; and
- Sustainable urban transport packages – public transport, walking and cycling schemes, network management measures and maintenance schemes.

The SEP's transport priorities will directly support development and help prevent transport constraints from being a barrier to growth. The SEP notes<sup>7</sup> that the limited opportunities for traffic to cross Lake Lothing force traffic onto a few congested

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<sup>5</sup> New Anglia Growth Deal, 7 July 2014: <https://www.gov.uk/government/publications/new-anglia-growth-deal>

<sup>6</sup> Over the relevant Local Plan period

<sup>7</sup> SEP Paragraph 6.39

routes, and specifically identifies the existing Bascule Bridge as a bottleneck causing traffic congestion.

This lack of connectivity between the northern and southern parts of Lowestoft makes it more difficult to access potential employment sites and is one of the barriers to growth that needs to be tackled in the SEP infrastructure programme.

The SEP has therefore made the design of the Lake Lothing Third Crossing a priority for 2015, with a view to it being included in the national roads programme as soon as possible<sup>8</sup>.

The case for providing a third crossing in Lowestoft does not rest solely on its ability to solve problems in the immediate area of Lake Lothing, or even in Lowestoft as a whole. Great Yarmouth and Lowestoft are a natural sub-region with strongly interconnected travel to work areas. Unlocking congestion in Lowestoft will therefore help support economic growth in the wider area too.

#### 2.3.4 *Assisted Area Designation*

Since July 2014, parts of Lowestoft and Great Yarmouth have been designated as **Assisted Areas**, eligible to receive regional aid from the European Union between 2014 and 2020<sup>9</sup>. This builds on the existing incentives of the Enterprise Zone and the Centre for Offshore Renewable Engineering (CORE). The designation is for less advantaged local economies where there is the opportunity to increase growth.

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<sup>8</sup> SEP Paragraph 6.42, Transport Priorities

<sup>9</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/310089/2014-2020\\_UK\\_Map\\_A4.jpg](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/310089/2014-2020_UK_Map_A4.jpg)

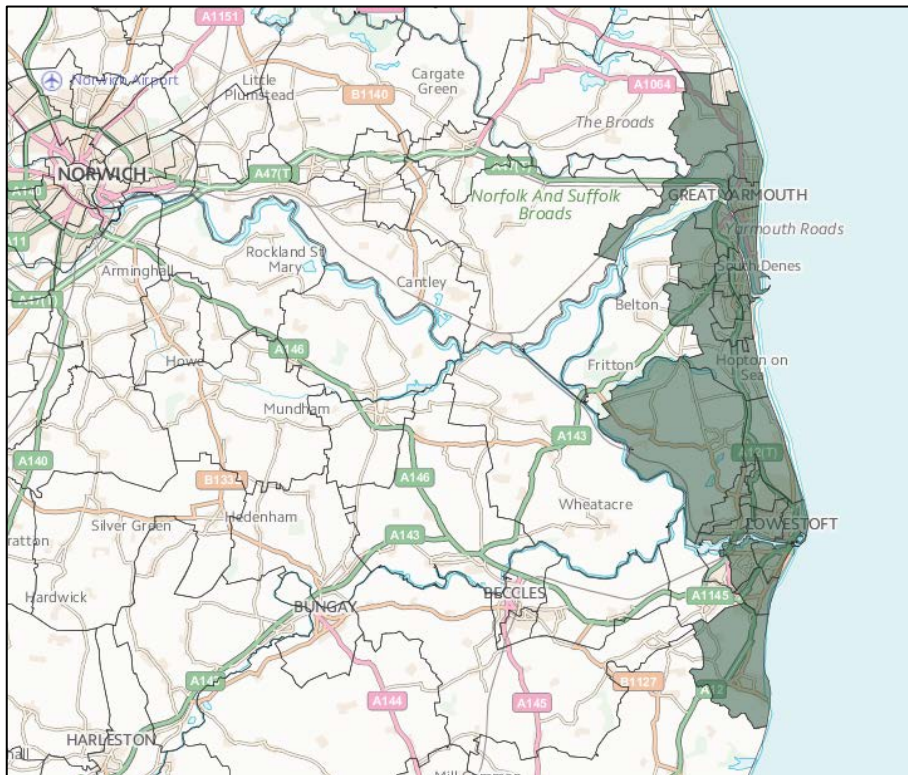


Figure 2-2: Region classed as 'Assisted Area' (Source: UK Assisted Areas Map<sup>10</sup>)

### 2.3.5 Lowestoft-Great Yarmouth Enterprise Zone

The **Lowestoft-Great Yarmouth Enterprise Zone** is one of 24 such zones created in England since 2011 in order to stimulate growth by providing a portfolio of strategic sites, with concessions offered to businesses locating there. These incentives include business rates relief, simplified planning regulations and central government support for the provision of super-fast broadband. Business rates growth within the zone for at least 25 years is retained by the LEP to support economic priorities. The zone crosses the boundary between Norfolk and Suffolk. It has been estimated<sup>11</sup> that the zone as a whole will create up to 9,000 direct jobs and 4,500 indirect jobs by 2025.

The Enterprise Zone includes five sites in Lowestoft, totalling over 70 hectares, designated for activities related to energy, offshore engineering, and ports and logistics. Of particular relevance to the proposed scheme is the **Riverside Road** site,

<sup>10</sup> UK Assisted Areas Map, <http://www.ukassistedareasmap.com/> (2014)

<sup>11</sup> Suffolk Growth Strategy (2013)  
<http://www.suffolk.gov.uk/assets/suffolk.gov.uk/Business/Business%20Services/Economic%20development/2013-05-08%20updated%20growth%20strategy.pdf>

a 4.5 hectare brownfield site beside Lowestoft Inner Harbour (Lake Lothing), shown in Figure 2-3.



Figure 2-3: Riverside Road, and Outer Harbour and PowerPark sites

The Riverside Road land has been allocated for B1 (light industrial / business), B2 (general industrial), or B8 (storage and distribution uses). A Local Development Order is in place which permits these uses without the need for planning permission, subject to certain constraints on the land. The land forms part of the wider mixed-use allocation known as Kirkley Waterfront.

### 2.3.6 Simplified Planning Zone

The **Outer Harbour and PowerPark**, a 24.5 hectare brownfield site beside Lowestoft Outer Harbour adjacent to Lowestoft railway station, is also part of an indicative Simplified Planning zone (SPZ). It surrounds the OrbisEnergy Centre and is envisioned as a centre for the renewable technology cluster. The SPZ sites are also illustrated in Figure 2-3.

### 2.3.7 Suffolk Local Transport Plan 2011-2031

DfT guidance on Local Transport Plans (LTPs) required local authorities to develop strategies and implement programmes to achieve five goals originally developed in the DfT's discussion document, 'Towards a Sustainable Transport System':

- 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.

In response, Suffolk County Council adopted a strategy intended to deliver first class transport infrastructure in the county. LTP3<sup>12</sup> sets out the authority's transport objectives, strategies and policies for the period 2011-2031. It shows how transport will play its part in supporting and facilitating future sustainable economic growth by:

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

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<sup>12</sup> Suffolk Local Transport Plan 2011-2031 (Part 1 – Transport Strategy and Part 2 – Implementation Plan), Suffolk County Council





Figure 2-4: LTP3 Strategic Transport Improvements (Lowestoft)

The LTP identifies 11 key transport issues for Waveney District. These include:

- Access to development sites south of Lake Lothing in Lowestoft;
- Impact of traffic in north Lowestoft;
- Lack of pedestrian / cycle bridges over Lake Lothing; and
- Pinch points for northbound / southbound traffic in Lowestoft.

The LTP describes a number of long-standing aspirations for highway improvements in Lowestoft. These include: completion of the northern spine road that will allow the re-routing of the A12 in North Lowestoft, the improvement of Denmark Road; a new access road south of Lake Lothing to unlock development sites in this regeneration area; additional pedestrian / cycle bridges across Lake Lothing; and, in the longer term a third vehicular bridge across Lake Lothing.

Of these planned improvements, shown in Figure 2-4, the A1177 Lowestoft Northern Spine Road (Phase V) was opened in March 2015. The Denmark Road improvements and the proposed pedestrian, cycle and vehicular crossings of Lake Lothing have not yet been delivered. The Southern Access Road is not being taken forward.

The proposed scheme for a third crossing would contribute to the LTP3 goals and would address the specific transport issues identified in the plan by reducing congestion and improving connectivity, access to jobs, and journey time reliability for customers, commuters and freight. It would provide an improved crossing for cycles and pedestrians as well as for cars and freight vehicles.

The LTP – which pre-dates the Growth Deal – identified the proposed third crossing of Lake Lothing in Lowestoft as a “much needed improvement for which there is a very strong desire in the local community but with, at present, no clear delivery mechanism”.

### 2.3.8 *Local plans and policies*

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

- Waveney Local Development Framework Core Strategy;
- Lake Lothing and Outer Harbour Area Action Plan;
- Lowestoft Transport Strategy (2011); and
- Lowestoft Transport and Infrastructure Prospectus (2013-2025).

### 2.3.9 *The Waveney Local Development Framework Core Strategy (2009)*

The Local Development Framework (LDF) covers Lowestoft and the whole of the administrative area of Waveney District, except that part lying within the Broads Executive Area. The LDF includes a **Core Strategy** and proposals map, site-specific allocations and policies, as well as generic development control policies.

The Core Strategy sets out a long-term spatial vision for the District, including Lowestoft, indicating where development should take place and the factors that will be taken into account when considering proposals. Consultation was undertaken on the vision, objectives and options for the Core Strategy in mid-2006, before the Strategy was submitted to Government in 2008 and adopted in 2009.

The Core Strategy envisages that Lowestoft will accommodate 70 – 80% of the housing growth planned for Waveney (CS01 and CS11), and 70 – 80% of the additional jobs in the district (5,000 jobs), providing an alignment between employment and housing growth. Most of this employment growth will take place in the Lake Lothing and Outer Harbour area of Lowestoft (Policy CS07), supporting port expansion, regeneration and economic diversification. An **Area Action Plan** has been prepared to help achieve this (Policy CS05). More information is given below.

Lowestoft will also be the focus for most of the retail and leisure growth in the District (Policy CS10). Retail development as part of mixed-use schemes will be important to the regeneration, including cultural and tourism, prospects for the town. The primary focus for delivery will be the town centre and to the south and east towards the water frontage of Lake Lothing and the outer harbour.

The Core Strategy identifies a range of transport measures (Policy CS15) which are integral to the regeneration of Lowestoft and the wider sub-region with Great Yarmouth. These include measures to reduce congestion, improve safety and enhance connectivity between north and south Lowestoft and with Great Yarmouth.

The Core Strategy states that “the District Council will continue to promote the creation of a third road crossing of Lake Lothing, as an integral part of dealing with transport problems and issues in Lowestoft and the sub-region”. It identifies the need for “new cycle / pedestrian crossings of Lake Lothing to increase accessibility between development sites in Lowestoft and employment sites, services and facilities”.

### 2.3.10 *Lake Lothing and Outer Harbour Area Action Plan, Lowestoft (2012)*

The **Area Action Plan** (AAP)<sup>13</sup> provides a detailed spatial policy framework for the regeneration of Lake Lothing and the Outer Harbour by identifying opportunities for a range of employment, residential, recreational, community, transport and

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<sup>13</sup> Lake Lothing and Outer Harbour Area Action Plan, Lowestoft (adopted January 2012)

environmental improvements. The area covered by the AAP is also identified as a Strategic Employment Location, in support of port development, employment-led regeneration and economic diversification.

The AAP is the result of detailed master planning, option assessment and consultation between 2006 and 2012. Transport and its associated infrastructure will perform a key role in the delivery of a revitalised area. The extent of the AAP is illustrated in Figure 2-5 below.

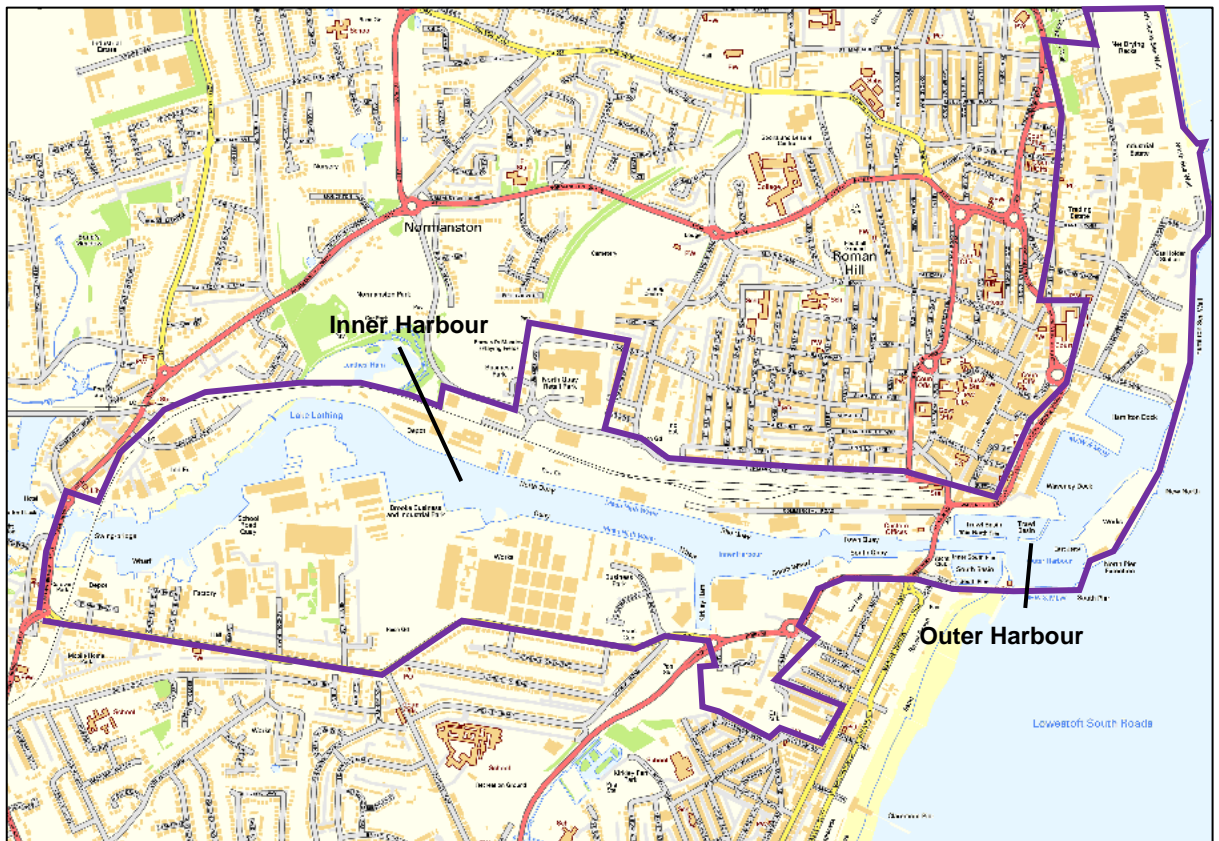


Figure 2-5: Lake Lothing and Outer Harbour AAP boundary

Lake Lothing creates a significant barrier to movement within the AAP area and across the wider town. This splits the town in two, with the main employment area located to the northern side and a sizeable residential population to the south. Crossing Lake Lothing constrains the transport options within the town, with two lifting bridges crossing at the eastern and western ends of the town, forming bottlenecks where several roads merge into one.

The AAP states that “in order to facilitate development a series of road improvements will be required, dependent on securing appropriate levels of funding from central government and developments within the town. These improvements are set out within the Lowestoft Transport Strategy. As a long term ambition for the town a third crossing has been identified to provide a further vehicular connection across Lake Lothing”. The AAP assumes that developers will work with the Council to ensure that development proposals do not restrict the potential for a third crossing.

### 2.3.11 *Lowestoft Transport Strategy (2011)*

The Lowestoft Transport Strategy, produced by Suffolk County Council in 2011, complements the LTP and the Area Action Plan. It notes that plans for further regeneration of Lowestoft could lead to significant growth in housing and employment over the next 20 years, with a likely growth of 2,200 homes and up to 5,000 jobs. This will add to congestion if current travel trends continue. The focus for growth is around Lake Lothing, and could lead to long-term changes in the area and its land uses. However, there are only roads crossing Lake Lothing: the A12 via the Bascule Bridge (the point at which it becomes a trunk road) and the A1117 over Mutford Lock. The constricted nature of these two opening bridges can create congestion, especially when the Bascule Bridge is opened to allow access to the quayside. The congestion is exacerbated when the level crossing near Oulton Broad North railway station is closed to traffic.

The strategy seeks to address problems by encouraging more sustainable modes of travel in the area. It also identifies a number of infrastructure improvements.

The Lowestoft Transport Strategy confirmed the County Council's support for the then Highways Agency "in developing and securing funding in the longer term for a third river crossing of Lake Lothing for motorised traffic".

### 2.3.12 *Lowestoft Transport and Infrastructure Prospectus (2013 – 2025)*

In 2013, a partnership of key public and private sector bodies<sup>14</sup> published **Moving Lowestoft Forward**, a comprehensive prospectus for transport and infrastructure in Lowestoft. Its vision is simply "*that the transport and infrastructure provisions within and serving the town of Lowestoft will be appropriate for the present and future needs of businesses, residents and visitors to the town*".

The prospectus sets objectives for road infrastructure as well as for sustainable transport, rail infrastructure, port infrastructure, and flood protection. Objectives for road infrastructure include:

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<sup>14</sup> A steering group led by Peter Aldous MP together with representatives from the New Anglia Local Enterprise Partnership (NALEP), Suffolk County Council (SCC), Waveney District Council (WDC), Environment Agency (EA), the Suffolk Chamber and the Lowestoft and Waveney Chamber ("The Partners") was formed to produce a prospectus supporting the planned development and delivery of comprehensive proposals to improve the transport and infrastructure both within and serving Lowestoft. Development of the proposals contained within the prospectus has been assigned to a Lowestoft Transport & Infrastructure Major Projects Team formed from representatives of The Partner organisations with support from key stakeholders including Associated British Ports (ABP), Highways Agency (HA), Network Rail (NR), Marine Management Organisation (MMO) and Anglian Water (AW).

- Improving the movement of traffic through and within the town centre, particularly around the bascule bridge area;
- Improving the junction between Commercial Road and the A12;
- Facilitating re-routing of through traffic to the west of Lowestoft's town centre and remove the pinch point at Bentley Drive;
- Improving connectivity to Lowestoft via Great Yarmouth and the A11 to the north and Ipswich and the A14 to the south;
- Reducing journey times, improve reliability and protect and enhance the environment along key routes serving Lowestoft;
- Improving safety for those travelling on and those residing beside key routes serving Lowestoft;
- Improving the connectivity between the town centre, Belvedere Road and the seafront;
- Reducing the cost and time taken when transporting goods to and from Lowestoft; and
- Providing improved access to major housing development sites.

The transport and infrastructure prospectus crystallises a view of the proposed third crossing scheme which is very characteristic of the other policies reviewed in this business case. It states that:

*“Significant work has been done in recent years to understand the feasibility and costs of a new north – south road, which would have to cross Lake Lothing and the railway. It is clear that the scale of such a project, which would cost around £100 million, means that delivery has to be seen as a long term proposal for which the majority of funding would have to come from central Government. Therefore the partners have taken the approach that whilst a third crossing remains a high priority, and any opportunities that may arise to advance its delivery should be taken, there are a number of other interventions that could be made in the short to medium term to improve and increase travel opportunities in Lowestoft in order to support the town's growth and ensure its prosperity.”*

The prospectus includes a range of short, medium and longer term infrastructure proposals, including road improvements. These include, as a longer term proposal:

*“Subject to option appraisals and development of proposals carried out in the short / medium term, deliver the preferred option for the replacement / relocation of the Bascule Bridge and / or the provision of a third crossing.”*

The prospectus also illustrates a number of options for a new crossing. Further option appraisal has since been undertaken, as described in Appendix A.

The prospectus considers the likely potential sources of funding for each of its proposals and concludes that, to deliver the Lake Lothing Third Crossing scheme, funding would be required from the New Anglia LEP and from central government.

This OBC explains, in line with government guidance, why the proposed scheme should now receive support, and provides a clear audit trail for the purposes of public accountability.

### 2.3.13 *Summary of the Business Strategy and Policy Background*

The proposed Lake Lothing Third Crossing is closely aligned with national, regional and local transport plans and policies.

It reflects the government's view, in the **National Infrastructure Plan**, that high quality infrastructure is needed to improve productivity and support jobs and growth. 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 **Strategic Economic Plan** identifies opportunities for growth in Lowestoft. The limited opportunities to cross Lake Lothing are seen as a barrier to growth, and the plan therefore supports the development of the scheme. The area around Lake Lothing is part of the Lowestoft-Great Yarmouth **Enterprise Zone** and has **Assisted Area** status from the EU, in recognition of the urgent need for regeneration and growth. The proposed scheme will improve access and connectivity, supporting regeneration. The **Local Transport Plan** identifies the third crossing as a "much needed improvement for which there is a very strong desire in the local community but with, at present, no clear delivery mechanism".

The **LDF Core Strategy** sets out spatial policies for regeneration growth and states that "the District Council will continue to promote the creation of a third road crossing of Lake Lothing, as an integral part of dealing with transport problems and issues in Lowestoft and the sub-region". The **Area Action Plan** notes that Lake Lothing creates a significant barrier to movement within the AAP area and across the wider town and identifies a third crossing as a longer term ambition. Suffolk County Council's **Lowestoft Transport Strategy** notes that whilst the focus for growth will be around Lake Lothing, congestion is problem. It gives support to developing and securing funding in the longer term for a third river crossing of Lake Lothing for motorised traffic. The **Lowestoft Transport and Infrastructure Prospectus** consolidates the views of key public and private sector bodies by clearly identifying the transport infrastructure needed to support growth and regeneration. It considers options for a third crossing of Lake Lothing and confirms this as a high priority for which central government support will be needed.

The case for providing a third crossing in Lowestoft does not rest solely on its ability to solve problems in the immediate area of Lake Lothing, or even in Lowestoft as a whole. Unlocking congestion in Lowestoft will help support economic growth in the wider area too.

## **2.4 Opportunities for growth, regeneration and inward investment**

A common theme running through the policies and strategies detailed above is a bold vision for economic growth and regeneration in Lowestoft, with a very specific focus on the area around Lake Lothing.

The proposed third crossing is part of that vision and as a key part of the transport infrastructure needed to deliver it quickly and sustain it for the long term. Regeneration depends on creating the right climate for inward investment. By addressing Lowestoft's reputation for chronic congestion, the third crossing will help to attract more inward investment, and support and stimulate growth.

The vision for growth is not just aspirational; it is related to site specific proposals and opportunities for investment in new jobs, new homes and new transport, leisure and cultural facilities which together have the potential to regenerate the area.

The Area Action Plan identifies specific site allocations within the area which need to be developed to realise the regeneration and revitalisation of the Lake Lothing and Outer Harbour area.

<b>SSP1</b>	PowerPark
<b>SSP2</b>	Peto Square and South Quay
<b>SSP3</b>	Kirkley Waterfront and Sustainable Urban Neighbourhood
<b>SSP4</b>	East of England Park
<b>SSP5</b>	Kirkley Rise
<b>SSP6</b>	Western end of Lake Lothing
<b>SSP7</b>	Oswald's Boatyard
<b>SSP8</b>	The Scores (east of historic High Street)
<b>SSP9</b>	Peto Way / Denmark Road Corridor

These sites are shown in Figure 2-6.



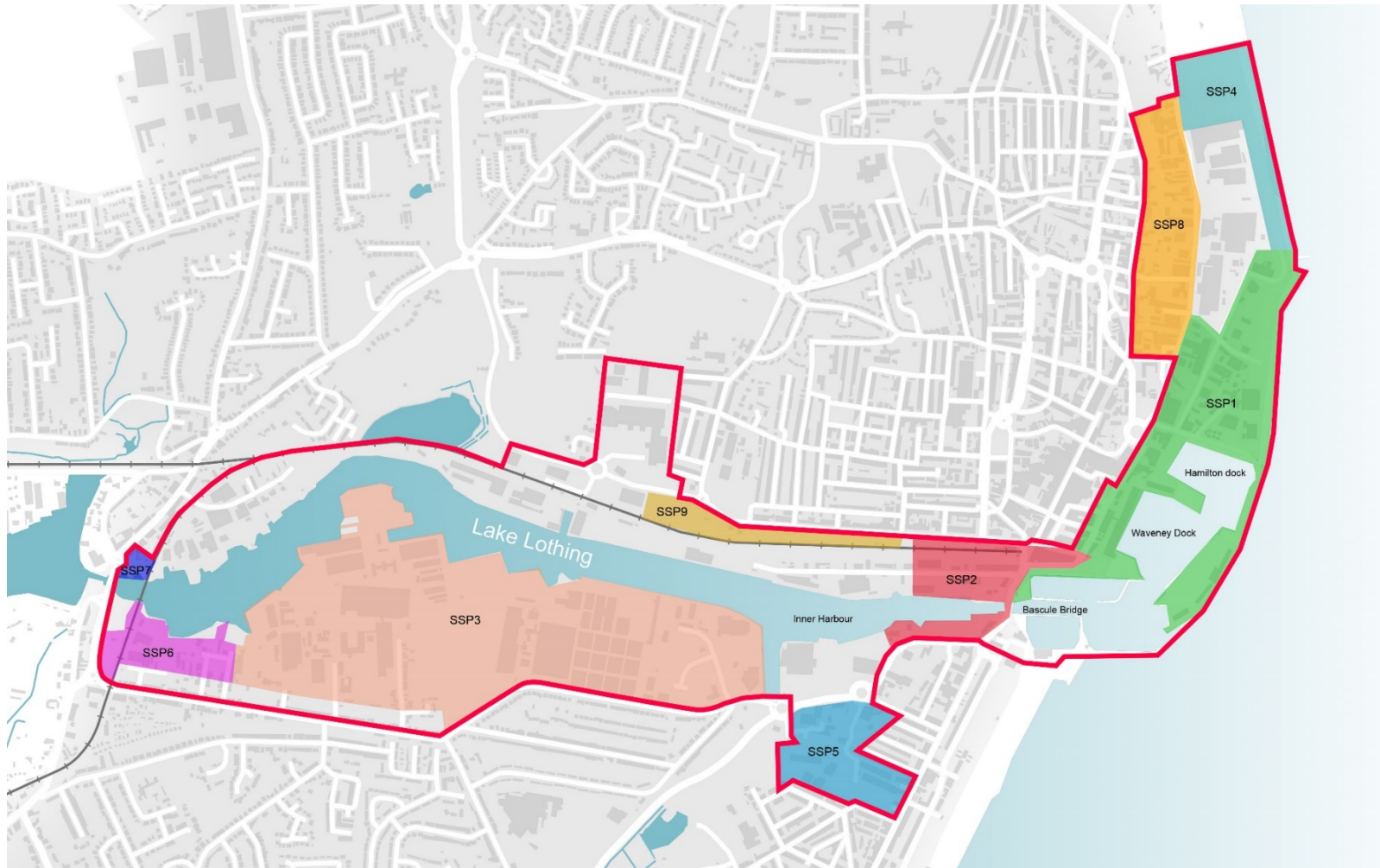


Figure 2-6: Area Action Plan Site Allocations

The creation of an additional crossing of Lake Lothing will help to stimulate the regeneration of these sites, by providing the high quality transport infrastructure needed to access new developments and by reducing congestion on the existing bridges and local road network.

Equally, as the sites are developed, they will generate additional demand for travel by car, cycle, and bus, and on foot. The third crossing will help to meet this demand without putting additional pressure on the existing transport networks. However, because regeneration is the main driver for the scheme, these developments are treated in this OBC as opportunities, not problems.

Full details and plans of all the AAP site allocations shown in Figure 2-6 are given in Appendix B. A summary description of each site, and its potential relationship to the proposed third crossing scheme, is set out below.

#### 2.4.1 *PowerPark (SSP1)*

The PowerPark is the area around the Outer Harbour, including Hamilton Dock, Waveney Dock, and parts of the Trawl Dock. It is adjacent to, but does not include, the 10 ha site of Birds Eye – a major local employer. Much of the site is occupied by the Beach Industrial Estate, which comprises a mixture of industrial, office and retail wholesale premises. Much of the estate is poorly maintained with an ageing building stock. However, it is also home to the recently opened OrbisEnergy Centre which provides a start-up space for businesses focused on the energy sector, and to the 2.75 mw Gulliver demonstrator wind turbine.

The PowerPark will provide some 24.7 ha of reconfigured employment land (B1, B2 and B8). A Relocation Strategy (2010) has been developed to ensure that existing businesses are not adversely affected. The strategic aim is to continue developing the PowerPark as a centre of excellence in the marine engineering and energy sectors, focusing on<sup>15</sup>:

- Offshore wind operations and maintenance;
- Offshore marine research and development;
- Existing traditional marine and underwater engineering;
- Other energy-related activities, including:
  - Carbon Capture Storage;

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<sup>15</sup> PowerPark Demand and Need Report (Phase 2, 2009 & Phase 2, 2020) quoted in the Area Action Plan

- Support to the nuclear industry;
- Gas storage;
- Training for the energy sectors; and
- Offshore assembly and component development.

It is estimated that an additional 950 direct and almost 4,000 indirect jobs could be created by 2020. The economic benefit from offshore wind operations and maintenance is tentatively estimated to be worth £3 million to the sub-regional economy by 2020.

The proposed Lake Lothing Third Crossing scheme will support the development of the PowerPark by reducing congestion in the road network around the existing Bascule Bridge, thereby improving accessibility by car, cycle, bus and on foot, and for freight.

#### 2.4.2 *Peto Square and South Quay*

Peto Square and South Quay are immediately north and south of the existing Bascule Bridge.

On the north side, the 6.6 ha strategic Peto Square site, which includes the Railway Station, Station Square and Commercial Road, will be the main focus for development. The area includes a range of secondary town centre related services, retail and catering businesses within an important, though badly degraded, historic townscape. It suffers from the effects of through-traffic on the A12, and most buildings are in a poor condition and underutilised. The improvements include:

- Improving the station and surrounding area;
- Refurbishment of key buildings;
- Retail and leisure developments;
- Improvements for pedestrians and cyclists;
- Junction improvements; and
- Environmental enhancements.

To the south, 2.4 ha of land between Belvedere Road and South Quay will be developed and enhanced for commercial and port related activities with improved public realm.

The proposed Lake Lothing Third Crossing scheme will support the development of Peto Square and South Quay by reducing congestion in the road network around the

existing Bascule Bridge, reducing the impacts of traffic on the townscape and improving accessibility by car, cycle, bus and on foot, and for freight.

#### 2.4.3 *Kirkley Waterfront and Sustainable Urban Neighbourhood (SSP3)*

Kirkley Waterfront and the proposed Sustainable Urban Neighbourhood comprise 59.8 ha of largely under-utilised or unoccupied brownfield land on the south side of Lake Lothing, between the waterfront and Victoria Road and Waveney Drive. The area is shown in Figure 2-7 and Figure 2-8.

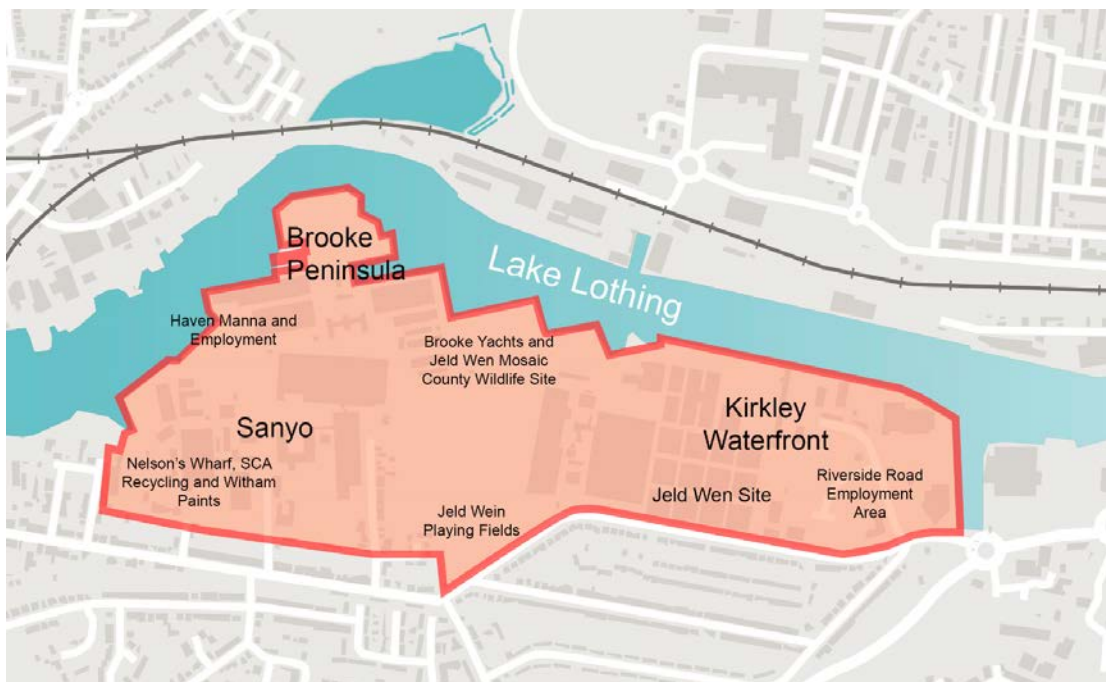


Figure 2-7: *Kirkley Waterfront and Sustainable Urban Neighbourhood*

The area includes the premises of the former Jeld Wen timber company, which has extensive waterfront with scope for future port activities. The Riverside Road employment area is a mix of active businesses and vacant land. Brooke Peninsula (12.1 ha) is the site of a former boat yard which is now under-utilised, having a range of small and medium sized businesses with low employment density. The former Sanyo sites (8 ha) are currently vacant. To the north-west is the Haven Marina and a range of newer businesses, which would be retained. To the west are the SCA Recycling and Witham Paints which may provide scope for redevelopment. The area also includes areas of open space, including a County Wildlife Site.



*Figure 2-8: Kirkley Waterfront and Sustainable Urban Neighbourhood – aerial view*

The strategic aim is to regenerate the area as a new residential community, comprising around 1,380 homes at densities of 50 – 90 per hectare, together with about 12 ha of reconfigured employment land, at least 3 ha of new open space, a primary school and other community facilities, together with waterfront and marina facilities. Significant new transport infrastructure will be needed to facilitate these developments.

The proposed Lake Lothing Third Crossing will help to encourage inward investment and support the regeneration of this important area by greatly improving accessibility by car, cycle, bus and on foot, and for freight. It will link this site to strategic routes and provide improved access between this site, the town centre and residential areas to the north and south of Lowestoft.

#### *2.4.4 East of England Park (SSP4)*

Located to the north of the PowerPark, on the seafront, the East of England Park presents the opportunity to reinvent a neglected and under-utilised open space to the north of the Birds Eye factory as a major new contemporary park including the most easterly point of England (Ness Point). The improvements will include better pedestrian and cycle links to the town centre.

#### *2.4.5 Kirkley Rise (SSP5)*

The Kirkley Rise area lies between the southern shore of Lake Lothing and the Kirkley waterfront, and has a mix of employment, car parking and residential uses. There are a number of vacant sites with development opportunities.

The strategic vision for this 8.3 ha area is to link Lothing waterfront with the Kirkley District shopping centre. There are opportunities to expand the shopping centre and

provide a new health centre, market, housing and employment floor space, retaining existing employment sites and, possibly, providing more public car parking.

The proposed Lake Lothing Third Crossing will support the regeneration of this area by reducing congestion in the road network south of the existing Bascule Bridge, reducing the impacts of traffic on the townscape and improving accessibility by car, cycle, bus and on foot, and for freight. It will improve connectivity between Kirkley Rise and strategic routes, and residential and employment areas on the north side of Lowestoft.

#### 2.4.6 *Western end of Lake Lothing (SSP6)*

This 4.9 ha area is characterised by small scale industrial uses, under-utilised employment land and residential development.

There are opportunities in this area to provide about 57 new homes, additional employment focused on marine-based activities and waterfront tourism.

The proposed Lake Lothing Third Crossing scheme will support the development of the PowerPark by reducing congestion in the road network around the existing lifting bridge, thereby improving accessibility by car, cycle, bus and on foot, and for freight.

#### 2.4.7 *Oswald's Boatyard (SSP7)*

Located on the north shore of Lake Lothing, at its western end, this site comprises a disused boat yard, cottages and a library. It will be developed for about 50 high density residential units, a replacement library and community facilities.

The proposed Lake Lothing Third Crossing scheme will support the development of the PowerPark by reducing congestion in the road network around the existing lifting bridge, thereby improving accessibility by car, cycle, bus and on foot, and for freight.

#### 2.4.8 *The Scores (east of historic High Street) (SSP8)*

The area east of the historic High Street is characterised by a network of alleyways which are important historic features that linked the town with the original fishing port. The AAP seeks to improve linkages within this area between the High Street and key intervention areas including the East of England Park, PowerPark and Peto Square. Residential development will be favoured in this location to assist in the wider regeneration of this highly attractive location.

The proposed Lake Lothing Third Crossing scheme will support the development of The Scores by reducing congestion road network in and around the town centre.

#### 2.4.9 *Peto Way / Denmark Road Corridor (SSP9)*

This area has seen considerable investment in recent years facilitated by the construction of Peto Way which provides a primary route into the AAP area from the North. This has included the development of the North Quay retail park and the Quay View Business Park.

Approximately 3.1 ha of space within the vicinity of Peto Way / Denmark Road corridor is allocated for employment development. This location will be used as priority relocation space for appropriate businesses that will be displaced by other strategic site proposals in the AAP.

The proposed Lake Lothing Third Crossing will support the regeneration of this area by greatly improving accessibility by car, cycle, bus and on foot, and for freight.

Full details and plans of all the AAP site allocations described above are given in Appendix B.

## 2.5 Problems

There are a number of specific problems in Lowestoft, especially in the area around Lake Lothing, which are key drivers for the proposed scheme.

- Loss of traditional industries and employment;
- Difficulty accessing potential regeneration sites;
- Community severance;
- Congestion;
- Barriers to walking and cycling, and gaps in pedestrian and cycling networks;
- Difficulties for local bus services; and
- Accidents

### 2.5.1 *Problem: loss of traditional industries and employment*

Lowestoft is an area of significant deprivation and has been since the demise of the fishing industry. Lake Lothing used to be the industrial heart of the town, an important centre for shipbuilding and other traditional industries, but these have declined sharply, leaving the area in urgent need of regeneration and growth.

The decline in employment in key industries has been a problem for over 20 years. The last shipyard closed in the mid-1990s and from a peak in the 1950s and 1960s, Lowestoft's offshore fishing fleet is now reduced to only a small number of inshore vessels. The manufacturing sector has continued to fall and employment has depended increasingly upon a small number of larger employers, particularly in engineering and food processing such as Birds Eye. The decline in oil and gas exploration in UK waters had impacted on economic and employment levels but the growth of offshore renewable energy generation provides significant potential.

Compensatory growth employment is also occurring in retail, tourism, service, construction and public service sectors<sup>16</sup>.

The proportion of people claiming Job Seeker's Allowance is 4.6%, compared to 2.3% in Suffolk and 3.1% in England<sup>17</sup>. The Waveney Core Strategy highlights the problem of long-term unemployment and the high proportion of low skilled jobs.

According to the Index of Multiple Deprivation (2010), the level of employment deprivation in Lowestoft is relatively high. Parts<sup>18</sup> of the Kirkley, Harbour and Normanston wards are among the 5% most deprived in England. All parts of these wards are amongst the 35% most deprived in England. Figure 2-9 shows the locations of the most deprived parts of Lowestoft, based on employment<sup>19</sup>. Table 2-1 below gives national rankings of all parts of these wards.

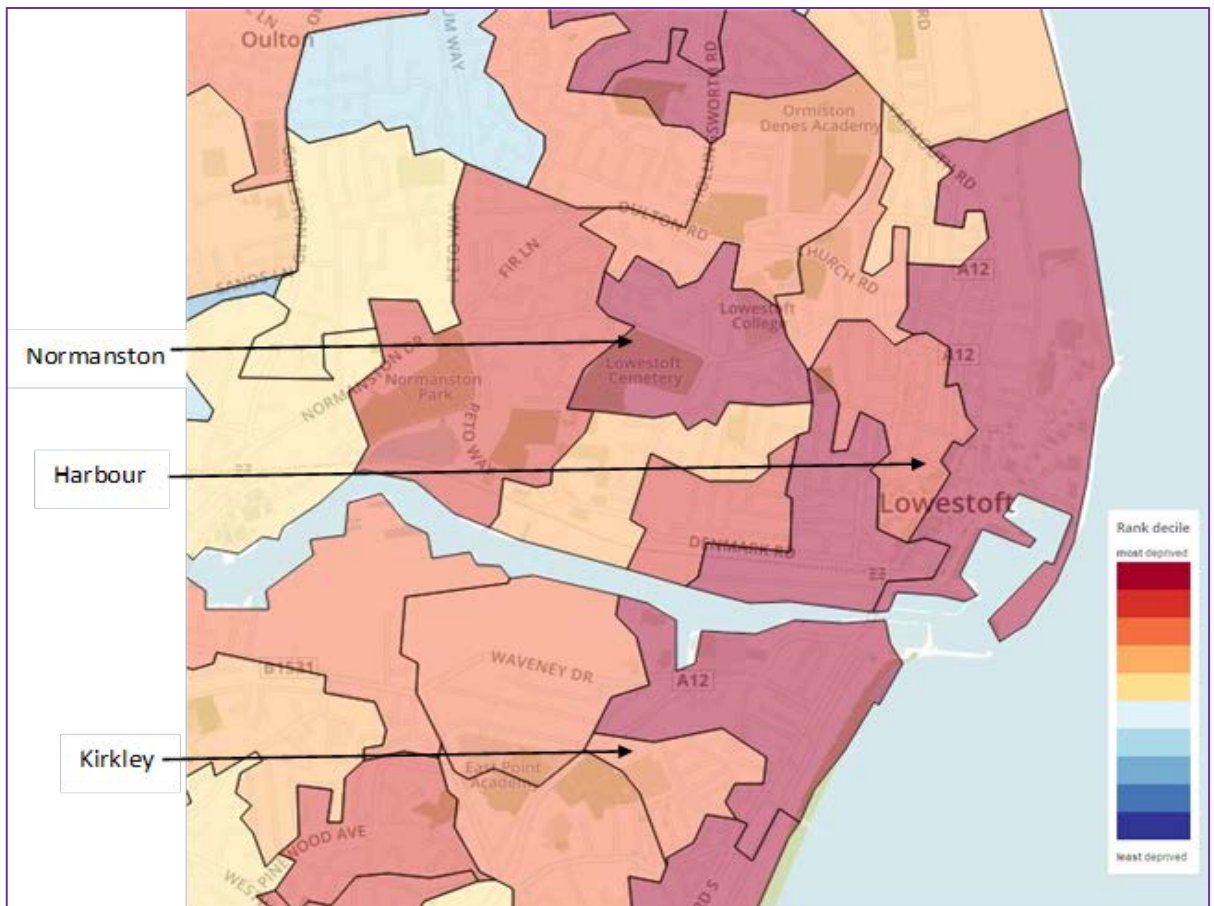


Figure 2-9: Most deprived areas of Lowestoft based on employment

<sup>16</sup> Waveney District Council Economic Regeneration Strategy, pages 104-122

<sup>17</sup> JSA claimants data for 2013

<sup>18</sup> Parts = Super Output Areas (SOAs) ranked according to the Employment domain

<sup>19</sup> Data from OpenDataCommunities © Mapbox © OpenStreetMap



Ward	LSOA Code	Employment Score	National Rank (out of 32482)	Percentile	Average percentile
Harbour	E01030247	0.28	592	1.8%	14.3%
	E01030250	0.22	2030	6.2%	
	E01030249	0.19	3410	10.4%	
	E01030246	0.14	7636	23.3%	
	E01030248	0.12	9834	29.9%	
Kirkley	E01030258	0.39	57	0.2%	16.8%
	E01030256	0.21	2265	6.9%	
	E01030254	0.14	7471	22.7%	
	E01030257	0.13	8817	26.8%	
	E01030255	0.13	8949	27.2%	
Normanston	E01030261	0.26	915	2.8%	18.7%
	E01030263	0.17	4827	14.7%	
	E01030265	0.16	5757	17.5%	
	E01030262	0.13	8405	25.6%	
	E01030264	0.11	10784	32.8%	

Table 2-1: Employment scores and ranks of the three most deprived wards in Lowestoft

### 2.5.2 Problem: difficulty accessing potential regeneration sites

For Lowestoft to experience more inward investment, regeneration and growth, it is essential that brownfield sites – especially those vacated by declining industries in the area around Lake Lothing – are redeveloped to attract new investment, create new jobs and enhance the built environment. For these developments to be successful and sustainable in the long term, they need high quality infrastructure, including excellent transport facilities – roads, public transport, and provision for people walking and cycling – within an attractive and inspiring environment.

The main potential regeneration sites have been described in detail in in Section 2.4 above and Appendix B.

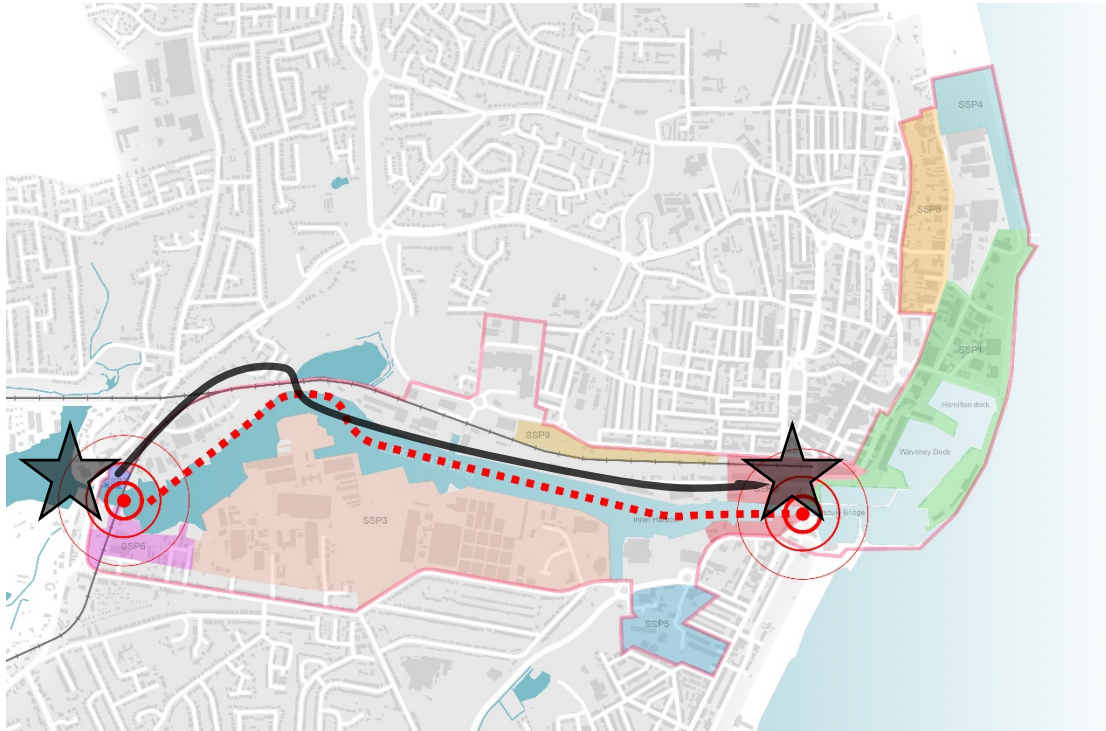


Figure 2-10: Potential regeneration sites (AAP allocations) – bottlenecks and barrier to movement

The great challenge for Lowestoft is that the area in most need of regeneration and inward investment – the area around Lake Lothing – is also an area where the transport networks have significant problems, due to the limited crossing opportunities and congestion at the existing bridges, as illustrated in Figure 2-10.

Lowestoft cannot afford to miss out on these opportunities for regeneration. The need for new jobs and inward investment is very urgent. For this reason, the various policies and strategies detailed in Section 2.3 have, without exception, been pragmatic about the prospects for the provision of a third crossing; they all present it as a highly desirable, longer term project, part of a complete vision for a prosperous and growing town with a transport network that is fit for purpose in the 21<sup>st</sup> century.

New development will lead to an increase in overall travel and trip making. More people will need to travel to work, the regenerated sites will need to be serviced and goods will have to be transported in and out. To minimise the traffic impacts of new development, the Lowestoft Transport Strategy emphasises the need to reduce the need to travel. Developers will be expected to actively promote walking, cycling and bus use. Travel plans, with robust targets for parking and car use, enforced through the planning process, will form the basis of this approach, and sustainable transport infrastructure will be improved, where possible, through development and the Local Transport Plan. Nevertheless, new development on this scale will inevitably also produce a net increase in vehicular traffic, with more car and commercial vehicle trips using local roads. As this happens, the problems identified above will tend to worsen over time.

A third crossing of Lake Lothing would address this issue, and greatly improve access to the proposed development. The traffic modelling which underpins the Economic Case (Section 3) takes account of the trip generation from the proposed developments. The improved accessibility to regeneration sites resulting from the new crossing (and the problems that may occur without it) are therefore taken into account in the calculation of the transport economic efficiency (TEE) and benefit cost ratio (BCR) calculations.

### 2.5.3 *Problem: community severance*

Community severance can generally be described as the separation of residents from the places they visit within their community caused by a busy road or other transport link such as a railway<sup>20</sup>. In Lowestoft, severance is caused by Lake Lothing itself, the railway line, and congestion at the two existing crossings.

Despite being at the heart of the town, Lake Lothing divides Lowestoft into two halves, similar in size but different in character. The area to the north of the lake is home to about 36,180 people<sup>21</sup>, and includes the main shopping centre and marina. The area to the south is home to about 26,041 people<sup>14</sup> and includes the main seafront, pier and beach.

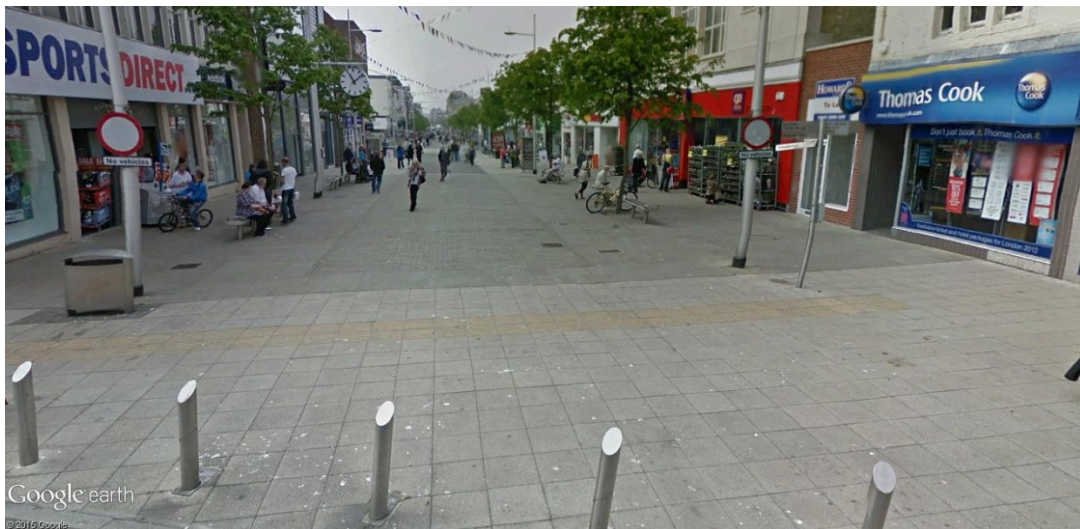


Figure 2-11: Shopping centre, north Lowestoft

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<sup>20</sup> Dyett, L. (2010) Community severance on the A4 Great West Road. Unpublished MSc. thesis, University of Westminster.

<sup>21</sup> Office for National Statistics (ONS) Mid-2013 Population Estimates



*Figure 2-12: Sea front, south Lowestoft*

There are only two road bridges over Lake Lothing, separated by a distance of nearly 3km, as well as a railway bridge. These provide the only connections between the north and south of the town. All the bridges have to close periodically to allow the passage of shipping, which further increases journey times between the north and south of the town.



Figure 2-13: Bascule Bridge at the eastern end of Lake Lothing



Figure 2-14: Lifting bridge and railway swing bridge at Mutford Lock, at the western end of Lake Lothing

The geography of the town, and the lack of any other road crossings of Lake Lothing creates a significant severance problem for people in Lowestoft. For example, a

resident of Beechwood Gardens, in the southern part of the town, wanting to travel to the North Quay Retail Park – a distance of less than a mile “as the crow flies” – would have to drive for 2.8 miles to get there by the quickest route (via the bridge at Mutford Lock). For a pedestrian, the trip would take about 28 minutes.

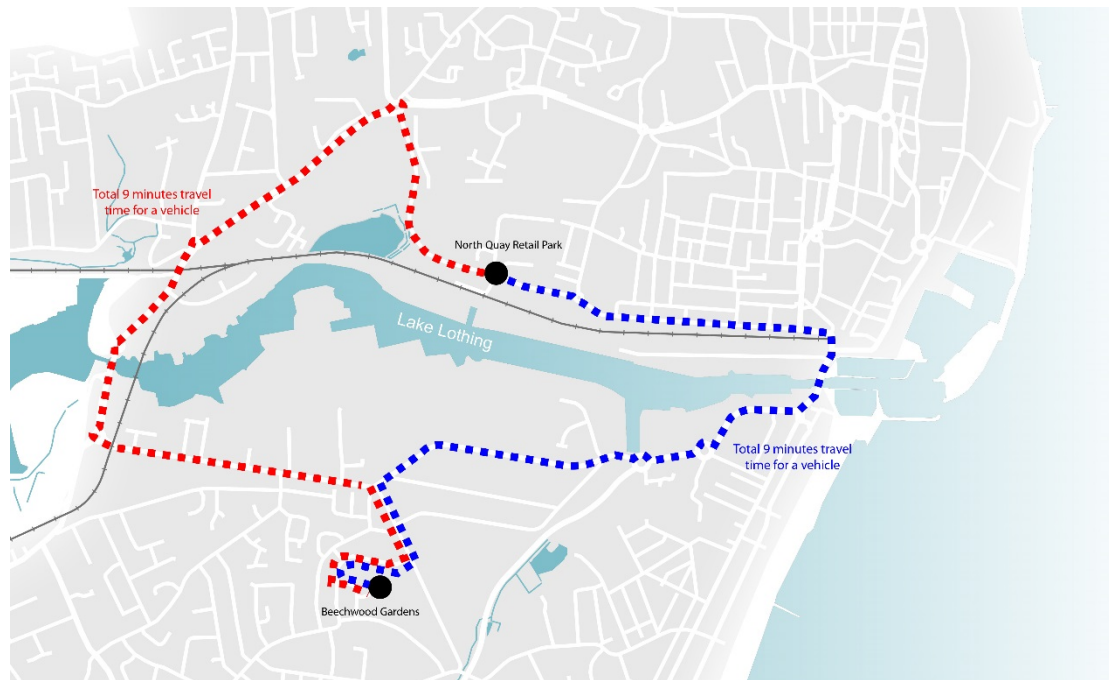


Figure 2-15: Lake Lothing severs the town and increases journey length for local trips

Community severance on this scale has several undesirable impacts:

- It increases the length of journeys to work, increasing fuel consumption and emissions for car trips;
- It makes non-car modes of travel, such as walking and cycling, less attractive for work and other trips;
- It reduces people's access to local services, as in the example above;
- It creates a physical separation between the businesses within the AAP area, despite their apparent proximity, making it harder for the area to function as a coherent whole.

#### 2.5.4 Problem: congestion

Because of the limited number of crossings, there is significant congestion at the existing road bridges, especially at peak times, and this increases traffic delays and worsens the severance impacts described above.

A very simple overview of the congestion problem can be obtained by examining the peak hour traffic speeds shown in Google Maps. These use floating vehicle data to estimate traffic speeds on the road network using anonymous real-time data from mobile phone networks and other GPS-enabled devices.

Typical traffic speeds (rated as slow, average or fast) on a Tuesday morning peak and a Wednesday evening peak are illustrated in Figure 2-16 and Figure 2-17 below.



Figure 2-16: Typical Tuesday morning (8:30 a.m.) floating vehicle data on the approaches to the existing lake crossings (Source: Google Maps)



Figure 2-17: Typical Wednesday evening (5:15 p.m.) floating vehicle data on the approaches to the existing lake crossings (Source: Google Maps)

In the morning peak, there is slow-moving traffic on the northbound approaches to both the lifting bridge at Mutford Lock and the bascule bridge. In the evening peak, traffic moves slowly on both the northbound and southbound approaches to each bridge.

The problem of congestion at the bridges is, of course, much worse when they have to be periodically raised to allow shipping to pass through Lake Lothing. The majority of bridge openings are planned to occur outside of peak periods of demand, but many openings are unplanned and unscheduled and can occur at any time (for larger vessels that can request opening upon arrival at the Port). This has an additional negative effect on journey time reliability. Another factor affecting congestion and delay is the level crossing just north of the lifting bridge at Mutford Lock.



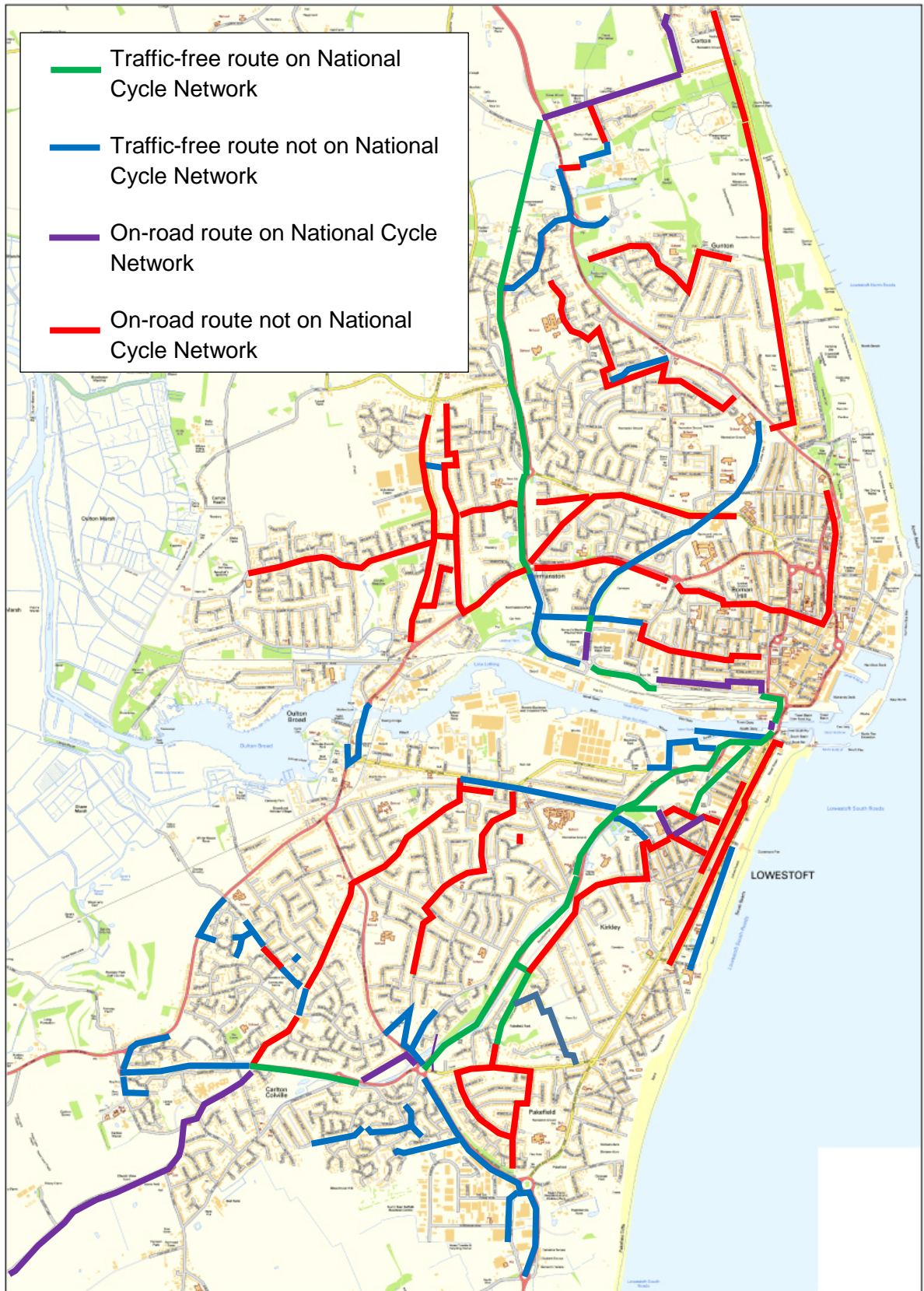


Figure 2-18: Local cycle network, Lowestoft

### 2.5.5 *Problem: barriers to walking and cycling*

As discussed above, the limited number of road crossings of Lake Lothing, and the distance between them, increases the length of some cycling and walking journeys, making these sustainable modes of travel less attractive. This is a potential problem for people in future wanting to cycle or walk between Kirkley Waterfront – the proposed sustainable urban neighbourhood – and the town centre, or residential areas in north Lowestoft.

For a pedestrian or cycle route to be attractive, it needs to be direct (between key origins and destinations), safe, secure and pleasant to use. The limited opportunities to cross Lake Lothing by cycle or on foot is a serious weakness in the town's cycle network which means it is unlikely to fulfil its potential to carry a greater proportion of work, leisure and other trips. The existing bridges do not have adequate facilities for cyclists. At Mutford Lock there is a shared pedestrian / cycle path on the southbound side only, whilst the Bascule Bridge to the east has footpaths on both sides but no cycle facilities.

Lowestoft's wider cycle network (Figure 2-18) comprises sections of National Cycle Network Route 517, and the Regional Cycle Network, as well as other signposted on-road cycle routes, advisory cycling routes and some traffic free cycle routes.

The lack of opportunities to cross Lake Lothing by cycle or on foot means there are significant gaps in this network, and in the accessibility of the potential regeneration sites around the Lake. For this reason, there has been a long standing aspiration to provide an additional pedestrian and cycle crossing of Lake Lothing, either as part of a new road crossing or as a stand-alone scheme.

The proposed third crossing would include segregated cycle facilities and links to existing cycle routes, and would create attractive opportunities for new north-south cycle trips.

### 2.5.6 *Problem: difficulties for local bus services*

Due to its size and prominence as a key service centre Lowestoft has a mostly commercially operated bus network. The bus services cover key corridors through the town, with all serving the town centre from outer lying areas. Key service provision is between 0700 hours and 1900 hours with fewer services operating outside of these periods. Services between the north and south of the town, or from the south to the town centre, can suffer from severe delay to their journey when traffic is disrupted by congestion around the Bascule Bridge.

The public transport network has evolved around the two existing bridges, which means that north-south services tend to be peripheral to the built-up area (and especially to the area around Lake Lothing). A third crossing could open up opportunities for services that serve this area more efficiently as it grows.



Figure 2-19: Bus services in Lowestoft (from: [www.suffolkonboard.com](http://www.suffolkonboard.com))

2.5.7 Problem: accidents

Figure 2-20 shows the locations of all injury accidents in the area surrounding Lake Lothing in the five year period 2010 to 2014<sup>22</sup>. There are noticeable clusters of accidents focused on:

- the Bascule Bridge and its approaches;
- the A12 at Horn Hill; and
- the northern approach to the lifting bridge at Mutford Lock.

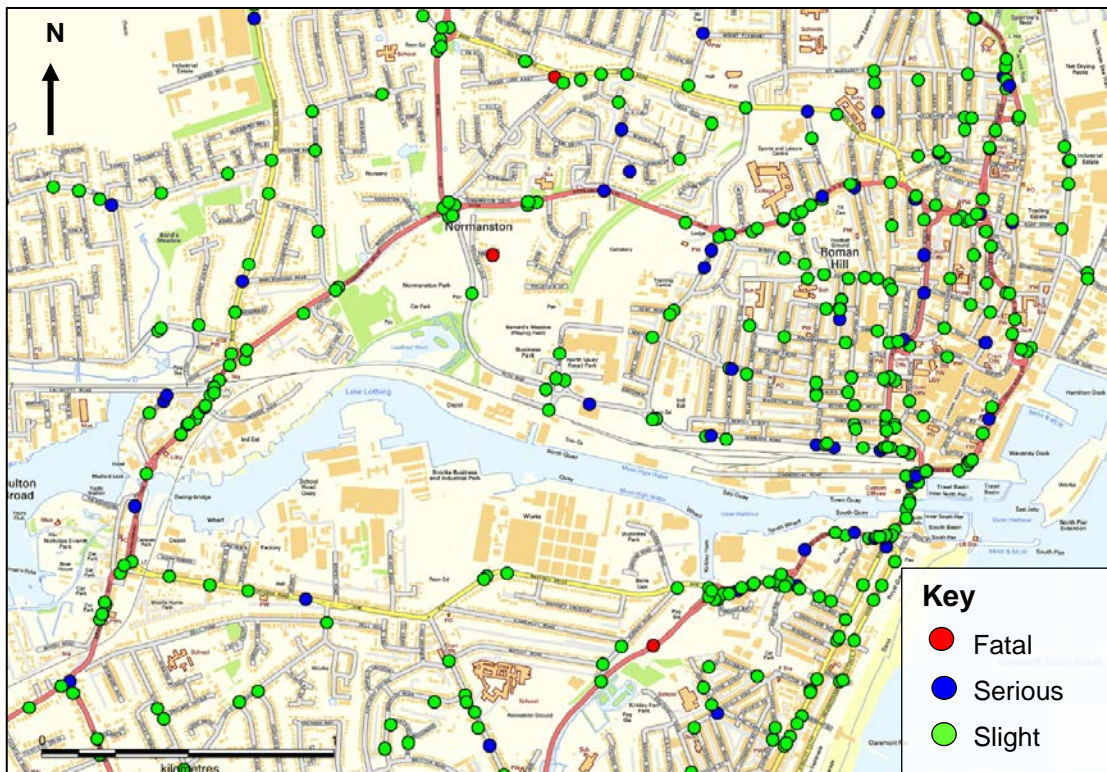


Figure 2-20: Accidents by severity in the Lake Lothing area, between 2010 and 2014

There are also significant numbers of accidents on the busy routes leading to and from the existing crossings, especially on the A12 via the Bascule Bridge, which is part of the Strategic Road Network and a major through route within Lowestoft.

An analysis has been undertaken of the 1.6km section between the A146 / Tom Crisp Way Roundabout and Battery Green Road / Old Nelson Street Roundabout via the Bascule Bridge. Most strategic traffic uses this route to cross Lake Lothing.

<sup>22</sup> STATS 19 data, January 2010 – December 2014



Figure 2-21: Accidents in area of existing Bascule Bridge between 2010 and 2014

Between January 2010 and December 2014, there were 59 recorded injury accidents on this route, including 4 on the Bascule Bridge itself:

- A12 Bascule Bridge (4 accidents);
- A146 / A12 Tom Crisp Way Roundabout (7 accidents);
- A12 Horn Hill / Belvedere Road Roundabout (7 accidents);
- A12 Pier Terrace / London Road South junction (14 accidents); and
- A12 Station Square / Commercial Road junction (8 accidents).

The A12 Pier Terrace / London Road South junction is ranked as the 6<sup>th</sup> most serious for accidents in Suffolk.

Of the 57 accidents recorded on this route:

- 68 casualties were reported;
- 15% of accidents were serious and 85% slight. There were no fatal accidents;
- 9% of all accidents involve pedestrians, and 25% involve cyclists;
- 40% of all pedestrian-related accidents were serious;

- 20% of all cyclist-related accidents were serious;
- 7% of all accidents occur during the extended morning peak (07:00-10:00); and
- 27% of all accidents occur during the extended evening peak (16:00-19:00)

Within the same period there were 18 recorded injury accidents on the 1km section of the A1117 between Saltwater Way / Victoria Road Roundabout and Normanston Drive / Gorleston Road Roundabout, via Mutford Lock and the lifting bridge.

The traffic modelling which underpins the Economic Case (Section 3) takes account of these accidents, as well as those in larger area of the highway network in Lowestoft. Accident reductions resulting from the new crossing are therefore taken into account in the calculation of the transport economic efficiency (TEE) and benefit cost ratio (BCR) calculations.

#### 2.5.8 *Summary of problems identified:*

The main problems which have led to the proposed scheme being developed are:

- **The loss of traditional industries and employment.** This gives rise to an urgent need for regeneration of the area around Lake Lothing.
- **Difficulty accessing potential regeneration sites.** It is essential that sites are brought forward for redevelopment to attract inward investment and create jobs. Sustainable travel will be encouraged. However, the scale of growth planned also requires provision of excellent highways infrastructure as the potential for growth is fully realised.
- **Community severance.** Lake Lothing divides the town in half and makes many journeys difficult for local people.
- **Congestion.** The limited number of crossing points causes traffic congestion at the existing bridges, and on roads in the town centre.
- **Barriers to walking and cycling** and gaps in local cycling and pedestrian networks, due to the lack of opportunities to cross Lake Lothing.
- **Difficulties for local bus services** due to lack of routes across Lake Lothing and congestion in the town centre and at the existing bascule bridge.
- **Accidents.** There are significant concentrations of injury accidents on the existing crossing points. The A12 route via the Bascule Bridge has high numbers of accidents.

## 2.6 **The impacts of not changing**

If a third crossing is not provided, the problems described in Section 2.5 above are expected to get worse. Specifically:

- **Congestion will increase**

Lowestoft already suffers significant congestion and delay. This is a consequence of the lack of opportunities to cross Lake Lothing, forcing traffic onto a limited number of routes. Without a third crossing, any further traffic growth will make the problem worse. The congestion impacts of traffic growth with and without the proposed scheme are taken into account in the calculation of the transport economic efficiency (TEE) and benefit cost ratio (BCR) calculations. Congestion will affect journeys by public transport and commercial vehicles, as well as those by car, adding to travel costs and making journey times less reliable.

- **There is a risk that existing businesses will continue to decline, and some may re-locate away from Lowestoft.**

In a survey of 151 local businesses, 83% rated traffic problems as a “significant or very significant” problem to their business. One correspondent stated that failure to build a new crossing would threaten the existence of their firm, and a majority (99) predicted that the number of people they would employ would either decrease or at best remain static. Only 27 firms predicted a growth in employment without a new crossing. By contrast, firms forecast an average increase of 8 full time equivalent employees if a new crossing was provided.

Statements made in response to the survey include the following:

*“We have lost 3 clients from energy industry who have re-located out of area, reducing our annual revenue by a further £4,000. ... If [large company] join the migration we will lose approximately £5,000 more per annum.”*

*“I have made the decision to move my business mainly down to London since September 2012. This decision was partly due to the infrastructure problems in Lowestoft making travel to Great Yarmouth difficult and therefore increasing the costs of providing services to the Oil and Gas sector in Great Yarmouth. It is easier not to travel north of the river. I know many individuals who are doing the same... money and businesses are moving out of the area and infrastructure issues are a contributory factor behind this.*

*“Our customers simply do not want to face the traffic problems, and time wasting issues that are involved with attempting to get from south Lowestoft to north Lowestoft. I have spoken to many customers over the years who consider shopping in Lowestoft as a last option behind Norwich and even Beccles. Therefore, however much we spend on advertising and new products and services, there is a huge percentage of potential customers who will not want to travel, visit and shop with us, simply because of the traffic.*

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

As previously noted, the need for regeneration in Lowestoft is so urgent that it cannot be put off until a third crossing has been provided. Massive efforts are being made to promote new development. Potential sites have been identified in the Area Action Plan, whilst the inclusion of key sites in the Enterprise Zone and the Simplified Planning Zone will be a further incentive for these to be developed. Growth in the offshore energy sector will also lead to development and increased use of the port. As this growth, welcome though it is, occurs it will inevitably lead to additional traffic demand, including journeys to and from work, business travel, deliveries and servicing traffic.

If a third crossing is not provided, this additional demand will result in increased congestion at the two existing bridges and the routes leading to them. Given the perceptions already existing that Lowestoft's traffic congestion is a hindrance to business and enterprise, there is a risk that increased congestion will eventually inhibit growth and regeneration.

- **It will become more difficult to encourage sustainable travel to work.**

The lack of a third crossing is even more of a problem for people walking and cycling to work than it is for drivers, since these active modes depend on the availability of short, safe convenient routes. As has been demonstrated, some journeys between residential and commercial areas north and south of Lake Lothing could be up to three times longer in distance without a new bridge. In these circumstances it may be difficult to encourage more people to walk or cycle to new or existing employment areas.

- **Severance between north and south Lowestoft will increase.**

Travel between the north and south of Lowestoft is already not easy, but as traffic and congestion increase it will become even more difficult without a new crossing. Many people will, effectively, become less connected to places of work and community facilities on the "other" side of the Lake. The sense of separation between the town centre and the seafront will become more apparent, with adverse implications for tourism and community coherence.

To summarise, if a third crossing is not provided, regeneration and growth in Lowestoft will come at the price of increased congestion and community severance. It will be hard for the town to shake off its image as a place characterised by congestion and poor accessibility, and there is a real risk that these perceptions will prevent the town from achieving its true potential for growth. In contrast to this, providing first class infrastructure and tackling the problems of congestion and severance with a bold new scheme will send a clear message that Lowestoft is



embracing the challenges of growth and development and ready to take full advantages of the opportunities for regeneration.

## 2.7 Objectives

The overall aim of the proposed scheme is therefore:

**To stimulate regeneration, sustain economic growth, and enhance Lowestoft as a place to live and work in, and to visit.**

The specific objectives of the scheme are:

- To open up opportunities for regeneration and development in Lowestoft.
- To provide the capacity needed to accommodate planned growth.
- To reduce community severance between north and south Lowestoft.
- To reduce congestion and delay on the existing bridges over Lake Lothing.
- To reduce congestion in the town centre and improve accessibility.
- To encourage more people to walk and cycle, and reduce conflict between cycles, pedestrians and other traffic.
- To improve bus journey times and reliability.
- To reduce accidents.

The objectives relate closely to the policies, opportunities and problems described in Sections 2.3, 2.4 and 2.5 above.

## 2.8 Measures for success

### 2.8.1 *Causality*

It is important to be able to demonstrate that the scheme, when complete, is performing as expected and that it is delivering the strategic aims and objectives set out in Section 2.7. In a complex world, it is often difficult to demonstrate 'cause and effect', as there are many other factors (such as the state of the national economy) which may affect the achievement of the objectives. The causal chain (logic) diagram in Figure 2-22 shows how the proposed scheme is expected to deliver the objectives, and also indicates how success can be measured, either directly or indirectly.

### 2.8.2 *Monitoring and Evaluation*

A Monitoring and Evaluation Plan (described in Section 6.10) sets out in detail the data which the Council will collect and analyse to determine whether the scheme is achieving its objectives.

**Lake Lothing Third Crossing, Lowestoft – Causal chain diagram and monitoring of key impacts and outcomes**

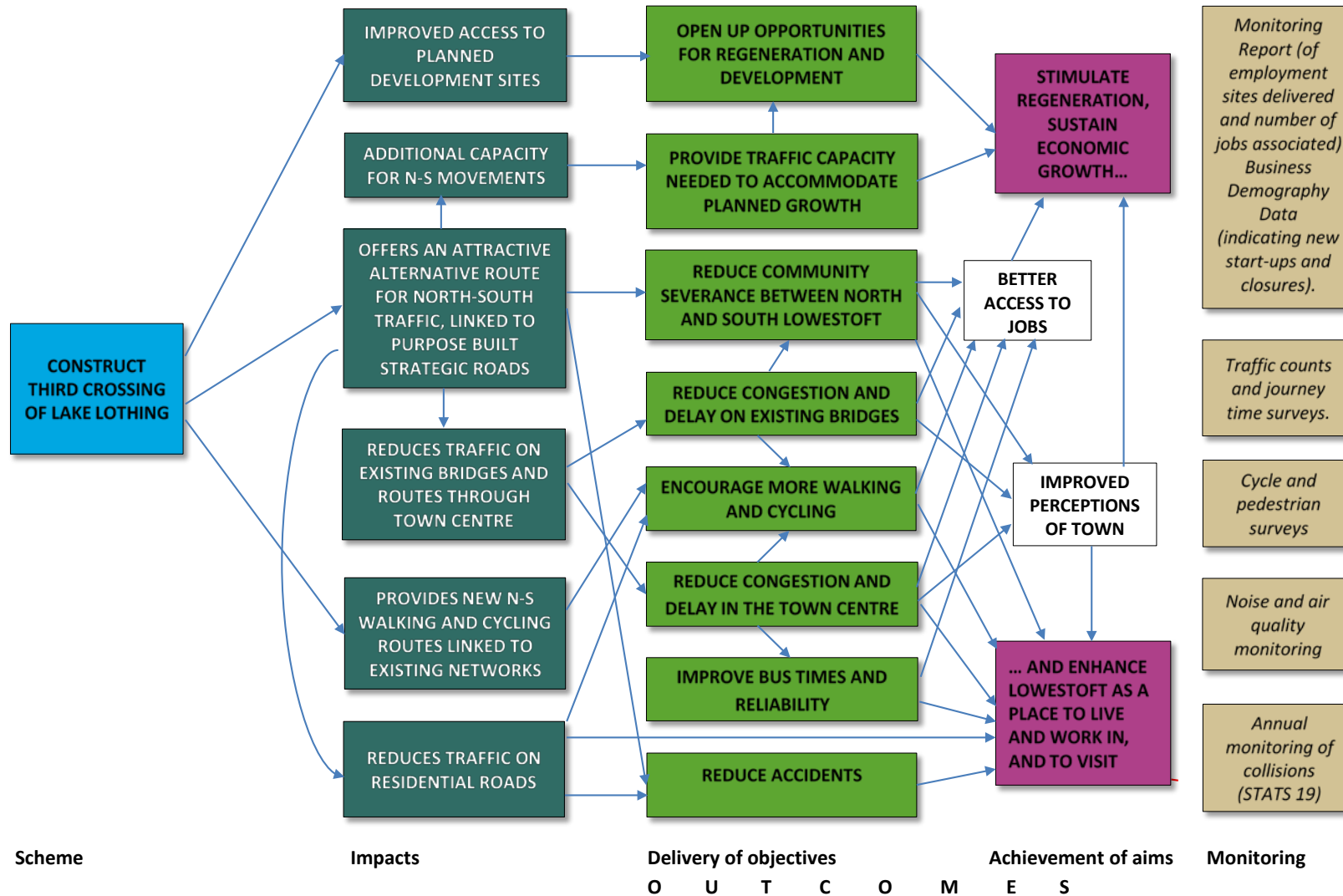


Figure 2-22: Causal chain diagram (logic map)

## 2.9 Scope of the scheme

The scope of the scheme is the construction of a new bridge over Lake Lothing, Lowestoft, linking the northern and southern halves of the town. The bridge will be a 7.3m wide single carriageway, with footways and an off-carriageway cycle lane. The scheme includes alterations to existing junctions to form new at-grade roundabouts at each end of the bridge. Accesses will be maintained to existing and planned development north of Waveney road. The bridge will include a central lifting section (Bascule Bridge) together with the necessary operating and control systems and infrastructure. When lowered, the bridge will have a vertical clearance of 13.5m above mean sea level.

The scheme is described in more detail in 1, Paragraph 1.4.

## 2.10 Constraints

This section considers the factors which could constrain the ability to deliver the scheme, or which could affect the choice of options or the timescale. The following types of 'high level' constraint are considered:

- Physical constraints;
- Environmental constraints;
- Financial constraints;
- Contractual constraints; and
- Public acceptability constraints.

### 2.10.1 *Physical constraints*

The key physical constraints are:

- **Operation of the port.** Lake Lothing is part of an operating port, and the new crossing will be designed to accommodate this. The scheme needs to allow continued access to existing docks by ships and vehicles. In particular, any structure needs to be clear of the designated turning circle for large ships.
- **Bridge height and width of channel.** A lifting bridge is proposed, so it will not impose a constraint on the air draught of ships passing through it. However, a potential advantage of a new bridge over the existing bridges is that it could be high enough to allow smaller vessels to pass through it without opening. A clearance in the centre of the channel of 12m above high actual tide level has been adopted as a design objective. The channel width under the existing Bascule Bridge is approximately 23.4m. A channel width of 25m has been adopted as a design objective, to future-proof the scheme.
- **Railway bridge.** Any new bridge will require a clearance of 6m over the railway tracks on the north side of Lake Lothing.

- **Connections to existing road network.** The ability to connect to existing roads is determined by the vertical and horizontal alignment of the scheme. This has been designed in accordance with Manual for Streets 2 with reference to the Design Manual for Roads and Bridges (DMRB), Volume 6, Road Geometry.
- **Existing development.** The scheme has been designed to minimise impacts on existing buildings, and ensure that they can continue to be accessed.
- **Planned development.** The scheme needs to accommodate the potential development envisaged in the Area Action Plan, and ensure that regeneration sites can be accessed satisfactorily.

### 2.10.2 Environmental constraints

The principal environmental constraints are:

- **Leathes Ham Local Nature Reserve**



Figure 2-23: Leathes Ham Local Nature Reserve

Leathes Ham is a small freshwater lake, located to the west of Peto Way and sandwiched between Normanston Park and Lake Lothing. The reserve has a reedbed, a dyke network and marshes which are breeding sites for wildfowl. In assessing options for a third crossing, the need to protect the nature reserve limited the options for connecting to Peto Way.

- **Visual impact of a new bridge.** A new bridge across Lake Lothing will be a significant feature in its own right. In appraising options, and in developing the preferred scheme, the potential visual impact on the townscape has been an important consideration.
- **Flood risk.** Lowestoft is subject to periodic flooding, both from the sea and from the river. This needs to be taken account of in the design of the scheme, and was a particular constraint on the tunnel alignments considered at the Option Development stage.

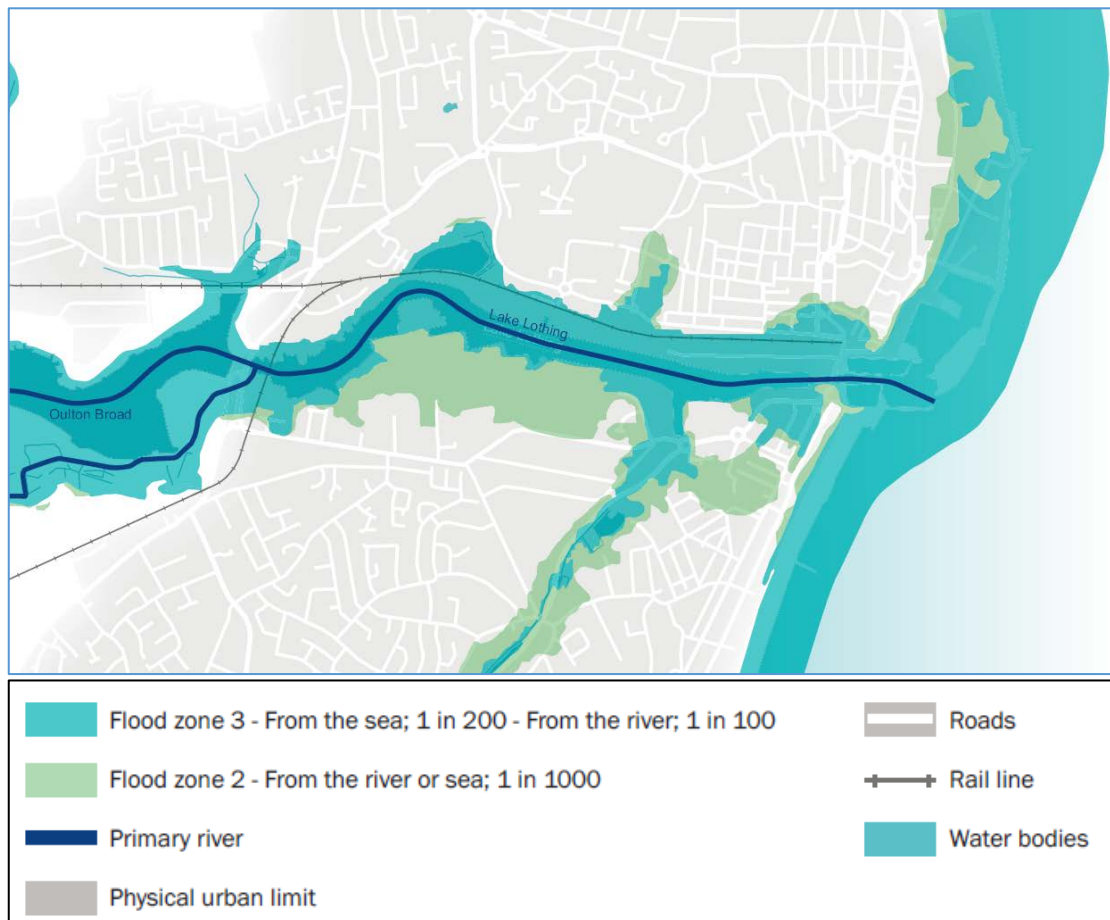


Figure 2-24: Flood risk map

- **Historic environment.** The proposed scheme does not affect the conservation area or any listed buildings. The existing Bascule Bridge is within the conservation area, whilst to the north, the main A12 route also passes through the conservation area and close to a large number of listed buildings. The proposed scheme is expected to reduce traffic in this part of the conservation area.

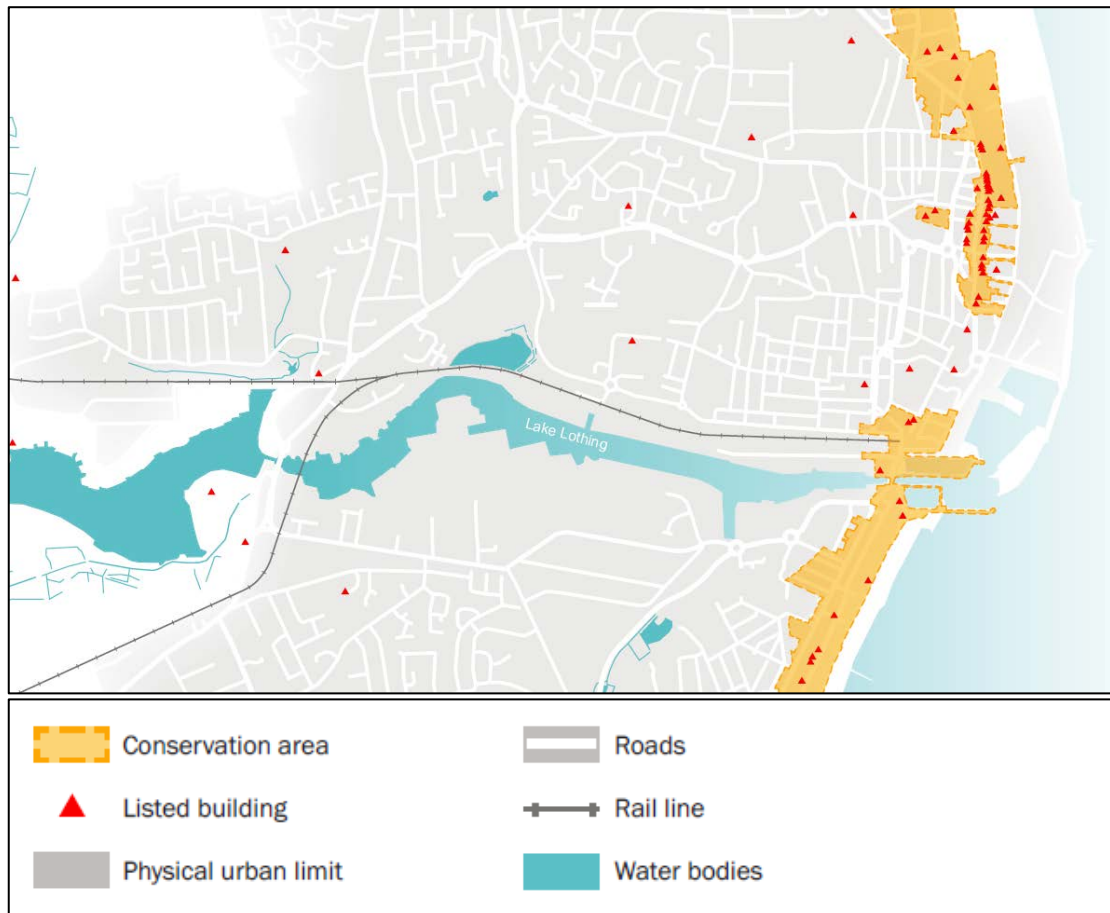


Figure 2-25: Historic environment

### 2.10.3 Financial constraints

Details of the way the scheme is to be financed are given in the Financial and Commercial Cases (Sections 4 and 5). Apart from the fact that the scheme requires government funding, there are no financial constraints on its delivery. The scheme is expected to be eligible for the new 'Local Majors Fund' and was referred to in the Chancellor's announcement of this new funding stream. More information on the funding profile, including confirmation of the local contributions, is given in Section 4, the Financial Case.

### 2.10.4 Contractual constraints

Details of the arrangements for delivery of the scheme are given in the Management Case (Section 6). There are no particular constraints on its delivery.

### 2.10.5 Public acceptability constraints

There is strong public support for the provision of a third crossing of Lake Lothing. However, a public consultation exercise in 2014 demonstrated that support was very dependent on the location of a proposed third crossing.

In response to the question: "Do you think a new road crossing of Lake Lothing is needed for Lowestoft, over 93% of people answered "yes":

Response	Percentage
Yes	93.71%
No	2.86%
No response	3.43%
<b>Total</b>	<b>100.00%</b>

But in response to a question about the location of a potential crossing, a clear preference was stated for a “central” option:

Preferred location	Percentage
West	23.9%
Central	60.6%
East (3 options)	8.3%
Other	4.4%
No response	2.8%
<b>Total</b>	<b>100.00%</b>

These results suggest that public acceptability is unlikely to be a constraint on the scheme in principle, but that it would be difficult to gain public support for an “eastern” option, especially if other options were available.

#### 2.10.6 *Summary of constraints*

Physical constraints on the delivery of the scheme relate mainly to the need to maintain port operations and provide for the safe passage of shipping. The need to provide clearance to the Lake and the adjacent railway line, whilst meeting standards for vertical and horizontal alignment, constrain the ways in which a new crossing can connect to the existing road network. Similarly, the alignment needs to minimise the impact on existing and planned development. There are few major environmental constraints, except for the Leathes Ham Local Nature Reserve, but care needs to be taken to manage the visual impact of a large new structure within the town. There are no significant contractual or financial constraints, apart from the need for government financial support. There is strong public and stakeholder opinion support for the scheme in principle, though this does not extend to all possible options.

## 2.11 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; and
- Statutory processes.

### 2.11.1 *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:

- **Denmark Road improvement scheme**  
The Local Transport Plan includes a scheme to improve Denmark Road between Rotterdam Road and Katwijk Way. Without a third crossing, Denmark Road, a residential street, is the only direct route between the Northern Spine Road (Peto Way) and the existing Bascule Bridge. The scheme is not currently programmed and the need for this improvement will be reviewed in the light of the proposal for a third crossing.

### 2.11.2 *Major developments*

There are no major developments on which the scheme is considered to be dependent, or which depend completely upon it. However, congestion and the lack of a third crossing are considered to be a constraint on development. The proposed scheme will provide improved access to development sites around Lake Lothing identified in the Area Action Plan and supports the ambitious plans for regeneration in Lowestoft.

### 2.11.3 *Statutory processes*

Delivery of the scheme depends on the successful completion of statutory processes. As the scheme needs to be delivered by 2020 (the timeframe set by the government) the time limited aspects of the Development Consent Order (DCO) process are the preferred means of delivering these.

A DCO is the means of obtaining permission for Nationally Significant Infrastructure Projects (NSIPs), in place of individual consents such as planning permission, listed building consent and compulsory purchase orders. The process is set out in more detail below:

1. **Pre-application:** The applicant has full responsibility for developing the project. The development consent regime is a front-loaded process – the proposal has to be fully scoped and refined before being submitted to the Planning Inspectorate. It is at this stage that the applicant must formally consult with all statutory bodies, community, local authority or affected



persons. There is very little scope for change once the application has been submitted. The applicant will take into account all relevant responses received during formal consultation. This stage is driven by the applicant.

2. **Acceptance:** At this stage, the application is fully submitted to the Planning Inspectorate, who must decide within 28 days whether all relevant documents have been submitted to enable the application to proceed. There is a 6-week window for the applicant to challenge if acceptance is refused.
3. **Pre-examination:** The applicant must publicise that the Planning Inspectorate has accepted the application and include when and how parties can register to become involved as interested parties. A single Inspector or a Panel of Inspectors will be appointed to examine the application. A preliminary meeting will then be held to discuss procedural issues and the timetable for examination. All interested parties will be notified of the date of the preliminary meeting. The close of the meeting marks the close of the pre-examination stage.
4. **Examination:** The examination begins the day after the preliminary meeting, at which point the examining authority has 6 months to examine the application. The examination is primarily conducted through written representations, however, hearings can also be held.
5. **Recommendation and Decision:** During this time, the examining authority has 3 months to write its recommendation and submit it to the relevant Secretary of State, who has 3 months to make a decision about whether to grant consent or not.
6. **Post decision:** This is a 6-week window in which the Secretary of State's decision may be challenged in the High Court.

This assumes that the Secretary of State will formerly designate the scheme as a NSIP. This request for NSIP designation would be issued following confirmation that the scheme should proceed to Full Business Case stage, this decision being likely taken by the Government in the Summer Budget (April 2016). Should NSIP designation not be forthcoming, a traditional approach to planning and obtaining consent would be adopted.

In addition, Traffic Regulation Orders (TROs) will be required. TROs will be processed in parallel with the DCO, as indicated in the project programme (see Section 6, the Management Case). A Harbour Revision Order (HRO) may also be required.

#### 2.11.4 *Summary of interdependencies*

The scheme can be delivered independently of any other transport or major development proposals. Statutory orders will be delivered by means of the DCO process. The project programme allows for this, and the processing of TROs.

## 2.12 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 the decision making processes.

### 2.12.1 Stakeholders

The main stakeholders include:

#### *Local authorities*

- Suffolk County Council (scheme promoter)
- Waveney District Council
- Adjacent Councils

#### *Statutory bodies*

- The Environment Agency
- Highways England

#### *Transport operators*

- Associated British Ports (ABP)
- Network Rail
- Local Bus operators

#### *Business organisations*

- Suffolk Chamber of Commerce
- Lowestoft and Waveney Chamber of Commerce
- Kirkley Business Association
- Lowestoft Harbour Maritime Business Group
- Lowestoft Vision

#### *Other stakeholders*

- Centre for Environment, Aquaculture and Fisheries Science (CEFAS)
- Other environmental groups
- Individual local businesses, including maritime businesses

### 2.12.2 *Engagement to date with local businesses*

An extensive engagement exercise was undertaken with local businesses in September 2015, involving an online survey and a business consultation event in Lowestoft. 151 businesses responded to the online survey and 77 business people attended the consultation events, representing a broad range of local businesses of all sizes and from a variety of sectors.

A large majority of respondents reported that traffic causes “very significant problems” to their business.

Businesses expected to see, on average, 23% growth in turnover in the next five years if the scheme is provided, but only 5% if it is not provided. Businesses also forecast average growth in employment of 8.1 full time equivalent posts if the scheme is provided, but only 0.02% if it is not provided.

Even allowing for the subjectivity of this approach, it is clear from these results that businesses believe a new crossing would bring very great economic benefits to their organisations. The full results of the engagement, including individual comments from respondents, are given in Appendix C.

Amongst the businesses surveyed, support for the provision of a third crossing was nearly universal. The proposed scheme was the most popular of the various options discussed, and was the first or second preference of over 90% of those responding.

### 2.12.3 *Stakeholder engagement*

A stakeholder management plan will be developed, as described in Section 6, the Management Case.

Engagement with ABP will be critical to the successful delivery of the project. Discussions have taken place during the option assessment phase, and regular liaison will be scheduled throughout the design and implementation phases. This will cover:

- Access to docks during and after construction;
- Impact on shipping during construction;
- Future plans for the port; and
- Operation of the bascule bridge.

## 2.13 **Options**

A comprehensive and robust process was adopted for generating and shortlisting options for the scheme, leading to the selection of the preferred option. This is described in detail in the Options Assessment (Appendix A) and summarised briefly below.

### 2.13.1 Option generation (long list)

An initial long list of 15 options for a third crossing was compiled. This included a number of options described in historic studies, together with additional options generated by means of desktop studies, site observations and an options workshop. The long list included bridge, tunnel, non-road and low-cost options, as summarised below:

	Type	From (N)	To (S)	Notes
W1	Bascule bridge	Peto Way	Waveney Drive	
W2	Bascule bridge	Peto Way/Denmark Rd	Waveney Drive	
W3	Bascule bridge	Peto Way/Denmark Rd	Waveney Drive / Riverside Rd	
C1	Bascule bridge	Peto Way/Denmark Rd	Waveney Drive / A12 Horn Hill	Affects Kirkley Ham basin
C3	Bascule bridge	Denmark Road	Waveney Drive / A12 Horn Hill	Via Riverside Avenue
C4	Bascule bridge	Denmark Road	Waveney Drive / A12 Horn Hill	Via Riverside Avenue
E1	Bascule bridge	Commercial Road	Belvedere Road	No railway bridge
E2	Bascule bridge	Katwijk Way/Denmark Rd	Belvedere Road	Relocate station
E3	Bascule bridge	Katwijk Way	Belvedere Road	Bridge over station
E4	Bascule bridge	Commercial Road	Belvedere Road	With railway bridge to Denmark Rd
L1	Lock / flood barrier with lifting bridges	Denmark Road	Waveney Drive / A12 Horn Hill	Two bridges and lock
T1	Road tunnel	Peto Way / Denmark Rd	Waveney Drive / A12 Horn Hill	Alternatives to be considered
J1	Junction improvements	A package of measures to increase capacity and improve traffic flow at problem junctions throughout Lowestoft without a third crossing.		As alternative to a third crossing.
S1	Smarter Choices	A package of "Smarter Choices" measures, to encourage people to make fewer journeys by private car.		As alternative to a third crossing.
P1	Road pricing	Introduction of road pricing to discourage traffic from congested routes and encourage people to make fewer journeys by private car.		As an alternative to a third crossing.

Table 2-2: Long-listed options

Each long-listed option is illustrated and described in more detail in the Options Assessment, Appendix A.

### 2.13.2 Options considered, but not included in the long list.

The following were excluded from the long list:

- **Fixed bridge options.** A bridge high enough to remain open to both traffic and shipping at all times would need 35m clearance. It would be visually

intrusive, expensive and very difficult to tie back into the existing roads due to the levels involved.

- **Floating bridge options.** A floating bridge would not be feasible for this scheme because of the railway line on the north shore. It would not be possible to achieve sufficient clearance over, or under, the tracks from a bridge just above water level, and a level crossing would not be acceptable to Network Rail.
- **Dual carriageway options.** Lowestoft's major road network has been developed exclusively with new single carriageway roads (e.g. Northern Spine Road, Southern Relief Road). A dual carriageway crossing was excluded from the long list on the grounds of route consistency and cost.

### 2.13.3 *Initial sifting*

Having identified a long list of fifteen options, the next stage was to identify any which do not represent realistic solutions. An initial sift was therefore undertaken to identify any "showstoppers" which are sufficiently serious to rule an option out.

The initial sifting was undertaken in two stages. Firstly a subjective assessment was made of each option against the scheme objectives set out in Section 2.7 above. Each option is allocated to one of the following categories:

- Significant contribution to achievement of objective
- Some contribution to achievement of objective
- Minimal or no contribution to achievement of objective

The second stage of the initial sift then involved **discarding** any options which:

- Did not achieve five or more scheme objectives (from first stage);
- Did not fit with existing local or national strategies and priorities;
- Would have significant adverse impacts (economic, environmental, geographical or social);
- Were considered not to be technically sound;
- Were unlikely to be affordable; and
- Were unlikely to be acceptable to stakeholders and the public.

This was undertaken as a desktop exercise, informed by site inspections, a technical workshop and the findings of earlier studies. Full details of the initial sift are given in the Options Assessment, Appendix A.

### 2.13.4 *Short-listed options*

Following the initial sift, a short list of three options was identified comprising:

- A bascule bridge in the western corridor;
- A bascule bridge in the central corridor; and
- An immersed tube tunnel in the western corridor.

Full details of the three short-listed options are given in the Options Assessment, Appendix A. Further investigation and design work was undertaken for each of the short-listed options with the aim that each should represent the best available scheme of its type in each corridor. This helps to ensure that the subsequent assessment is as fair as possible.

In order to compare the three short-listed options and determine a preferred scheme, a further appraisal was undertaken, based on assessment of the following issues:

- **Delivery of scheme objectives** – updated from the initial assessment;
- **User benefits**, calculated using the traffic model and TUBA;
- **Cost of construction**, estimates based on advance design work ;
- **Benefit - cost ratio (BCR)**;
- **Traffic impacts** – the effectiveness of each option in reducing traffic at the two existing bridges, using the traffic model;
- **Environmental impacts**;
- **Public support** – based on earlier studies; and
- **Stakeholder support** – based on the 2015 stakeholder consultation.

This was considered a proportionate approach in view of the information available at this stage and will enable a clear distinction to be made between the three options.

Full details of the appraisal are set out in the Options Assessment, Appendix A. The results are summarised below. An overall score is given for each assessment area, based on a colour coded 5 point scale:



This very simplified approach allows the differences between the three options to be seen very clearly.

Assessment areas	Western bridge option		Central Bridge option		Tunnel option	
Delivery of scheme objectives	Less relief to existing bridges	●	<b>Significant contribution</b>	●	Less relief to bridges, No cycle /ped provision	●
User benefits (PVB)	£338 .7 million	●	<b>£453.3 million</b>	●	£338.3 million	●
Cost (£ million)	£85 million	●	<b>£79 million</b>	●	£118 million	●
Benefit-cost ratio (BCR)	5.90	●	8.50	●	4.27	●
Traffic impacts Bascule Bridge Mutford Bridge	a.m. / p.m. -15% / -13% -30% / -22%	●	a.m./p.m. <b>-34% / -33%</b> <b>-34% / -22%</b>	●	a.m./p.m. -15% / -15% -31%/- <b>26%</b>	●
Environmental impacts	Moderate/severe adverse	●	Slight/moderate adverse	●	Moderate/severe adverse	●
Public support	23.9%	●	<b>60.6%</b>	●	Unknown	?
Stakeholder support	40%	●	<b>48%</b>	●	Unknown	?

Table 2-3: Assessment of short-listed options

The estimated economic costs and benefits of each option shown above are based on the interim traffic model and data available at the option assessment stage. They exclude accident benefits and benefits arising from active mode appraisal, but these are included in the assessment of the preferred option in the economic case. Similarly, the design of the preferred option has been refined, and cost estimates improved, as set out in Section 4, the Financial Case. For these reasons the economic costs and benefits for the preferred scheme in the economic case are different from the figures above which are based on similar levels of detail for each option, as appropriate for comparing the different options.

### 2.13.5 Preferred scheme

On the basis of the above assessment, it was concluded that the Central Bridge option should be the preferred scheme. It is the least expensive, it produces the highest benefits, is most likely to deliver the objectives, and has a high level of public and business support.



Figure 2-26: Preferred scheme: Central bridge option

The preferred scheme is illustrated above, and described in more detail in Section 1 of this business case. More detailed cost estimates have been prepared, and are set out in Section 4, the Financial Case. The economic appraisal has been further developed to include consideration of accident and active modes benefits with the preferred scheme, and is set out in Section 3, the Economic Case.

As the preferred scheme had clearly perform better across a range of assessment criteria than either of the other options, it is not considered necessary to re-visit the appraisal at this stage.

## 2.14 Summary of the Strategic Case

### 2.14.1 Strategic fit

The proposed Lake Lothing Third Crossing scheme is closely aligned with national, regional and local transport plans and policies, including:

- National Infrastructure Plan;
- Strategic Economic Plan (SEP);
- Local Transport Plan (LTP);
- Lowestoft-Great Yarmouth Enterprise Zone;
- Assisted Areas;
- Local Development Framework (LDF);
- Area Action Plan;
- Lowestoft Transport Strategy; and
- Lowestoft Transport and Infrastructure Prospectus.



Together, these set out a bold vision for economic growth and regeneration in Lowestoft, with a specific focus on the area around Lake Lothing. The proposed third crossing is part of that vision. By addressing Lowestoft's reputation for chronic congestion, it will help to attract more inward investment, and support and stimulate growth.

#### 2.14.2 *Development plans*

The Area Action Plan identifies the specific site allocations within the area which need to be developed to realise the regeneration and revitalisation of the Lake Lothing and Outer Harbour area. The third crossing will improve access to key areas, including Kirkley Waterfront and the proposed Sustainable Urban Neighbourhood.

#### 2.14.3 *Problems*

The main problems which have led to the proposed scheme being developed are:

- The loss of traditional industries and employment.
- Difficulty accessing potential regeneration sites.
- Community severance.
- Congestion.
- Barriers to walking and cycling and gaps in local cycling and pedestrian networks
- Difficulties for local bus services
- Accidents.

If a third crossing is not provided, these problems are expected to get worse. Regeneration and growth in Lowestoft will come at the price of increased congestion and community severance. It will be hard for the town to shake off its image as a place characterised by congestion and poor accessibility, and there is a real risk that these perceptions will prevent the town from achieving its true potential for growth.

In contrast to this, tackling the problems of congestion and severance with a bold new scheme will send a clear message that Lowestoft is embracing the challenges of regeneration and growth.

#### 2.14.4 *Aims and objectives*

The overall aim of the proposed scheme is therefore:

**To stimulate regeneration, sustain economic growth, and enhance Lowestoft as a place to live and work in, and to visit.**

The specific objectives of the scheme are:

- To open up opportunities for regeneration and development in Lowestoft.
- To provide the capacity needed to accommodate planned growth.
- To reduce community severance between north and south Lowestoft.
- To reduce congestion and delay on the existing bridges over Lake Lothing.
- To reduce congestion in the town centre and improve accessibility.
- To encourage more people to walk and cycle, and reduce conflict between cycles, pedestrians and other traffic.
- To improve bus journey times and reliability.
- To reduce accidents.

#### 2.14.5 *Constraints*

In developing the scheme, account has been taken of physical, environmental, financial, contractual and public acceptability constraints, especially the need to fit in with the operation of the port.

#### 2.14.6 *Support for the scheme*

There is very strong public support for a scheme, with over 93% of people believing that a new crossing is needed. Local businesses consider that the scheme will stimulate increased turnover and higher levels of employment.

#### 2.14.7 *Option selection and preferred scheme*

A comprehensive and robust option selection process was adopted to generate and assess options for the scheme, leading to the clear identification of a preferred option. The preferred scheme was the Central Bridge option. It is the least expensive of the short-listed options, it produces the highest benefits, it is most likely to deliver the objectives, and it has a high level of public and business support.

## 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 which can be monetised, as well as quantitative and qualitative impacts that cannot be monetised. The economic case considers the extent to which the scheme's benefits will outweigh its costs.

This section covers:

- Options appraised;
- Overview of methodology and assumptions;
- Scheme costs;
- Transport economic efficiency (TEE);
- Safety impacts;
- Active modes impacts;
- Reliability benefits;
- Wider impacts;
- Social and distributional impacts;
- Environmental impacts;
- Value for money statement;
- Sensitivity testing;
- Appraisal Summary Table (AST); and
- Summary and conclusion.

### 3.2 Options appraised

A comprehensive and robust process was adopted for the generation and short-listing of options for the scheme. This is described in Appendix A (Options Assessment) and summarised in the Strategic Case.

An initial long list of 15 options was compiled. These were assessed against the scheme objectives, to give a short-list of three options, which were subsequently refined and assessed in more detail. The short-listed options were:

- Western Bridge option;
- Central Bridge option; and
- Tunnel option.

The appraisal of the short-listed options is described in Appendix A (Options Assessment) and summarised in the Strategic Case. A simplified cost-benefit analysis was undertaken. Based on this, and other criteria, the Central Bridge option clearly emerged as the preferred option.

The more detailed appraisal described in this section therefore concerns the preferred route only, as described in Section 0. This comprises a new road linking Denmark Road (west of Katwijk Way) to Riverside Road and Waveney Drive. It includes a new bridge over the railway, a bascule bridge over the main channel of Lake Lothing and connections to local roads, cycle ways and footways.

### **3.3 Overview of methodology and assumptions**

#### **3.3.1 Methodology**

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

- TAG Unit A1 cost-benefit analysis;
- TAG Unit A2 economic impacts;
- TAG Unit A4 social and distributional impacts; and
- TAG Unit A5-1 Active Mode Appraisal.

The methodology is based on the DfT Value for Money Note (December, 2013) and follows the process described in the Appraisal Specification Report (ASR). The basic steps are described below and illustrated in Figure 3-1.

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. An active mode appraisal is undertaken to determine the economic benefits of increases in active travel resulting from the scheme.

An initial benefit-cost ratio (BCR) is calculated. Other monetarised benefits – reliability and wider impacts – are then taken into consideration, producing an adjusted present value of benefit (PVB), which is used to calculate a final adjusted BCR and value for money category.

Other impacts which are not capable of being fully monetarised – social and distributional impacts and environmental impacts – are then assessed using the qualitative assessment techniques referred to in the DfT Value for Money note (December, 2013). These are not included in the BCR, but are used, together with the final BCR, to determine a final value for money category for the scheme.

Many of the impacts assessed are based on outputs from the Lowestoft Highway Assignment Model. The SATURN model has been developed and used as outlined in the Appraisal Specification Report. The development of the model is described in the Data Collection Report (Appendix D), Local Model Validation Report (Appendix E) and the Forecasting Report (Appendix F).

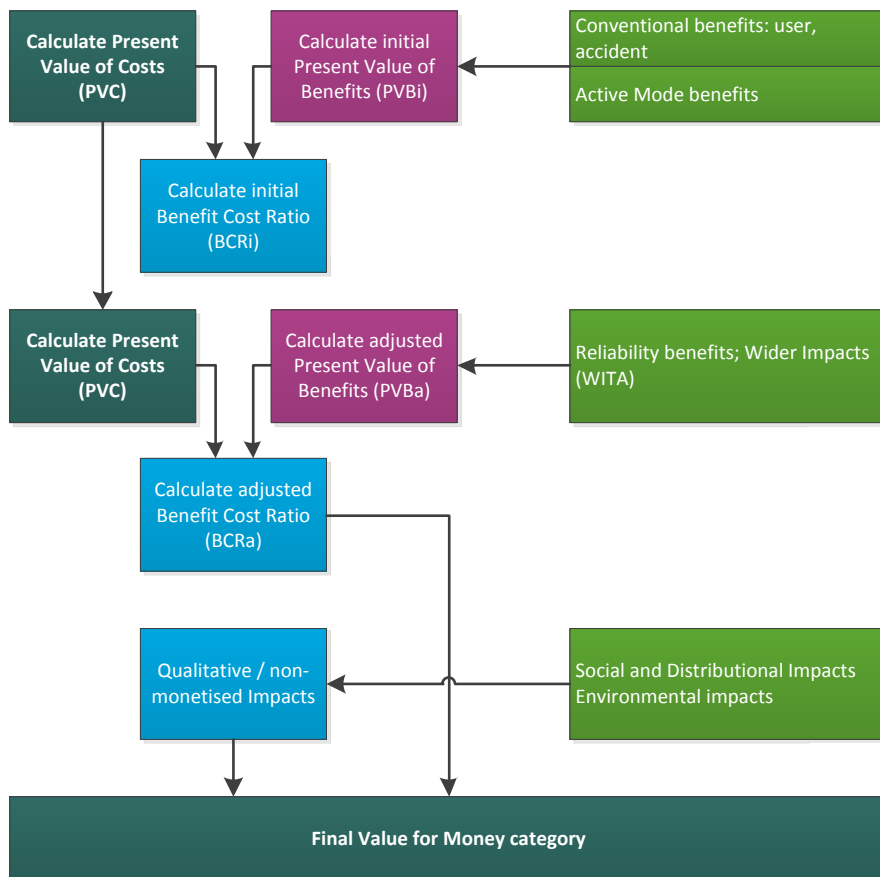


Figure 3-1: Summary of calculation of BCR and VFM score

### 3.3.2 Assumptions

The full list of assumptions related to model development and forecasting are set out in the LMVR and Forecasting Report. Key assumptions are summarised below:

The modelled assessment years are:

- Base year (2015); and
- Opening year (2020).

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.

The following assumptions were made in relation to the modelling of the bridges within the SATURN highway assignment model:

- The proposed new bridge will open at the same frequency as the existing bascule bridge<sup>23</sup>; and
- The frequency of bridge openings will not increase in the future<sup>24</sup>.

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<sup>23</sup> This is a ‘worst case’ assumption. As the new bridge will be higher than the existing bascule bridge, enabling smaller vessels to pass under it, the frequency of opening will be significantly less. Furthermore, the position of the new bridge is to the west of the ship turning circle in Lake Lothing. This would result in the new bridge opening less often than the existing Bascule Bridge which is at the mouth of the inner harbour.

<sup>24</sup> This also offers a conservative estimate / assumption in terms of the benefits of an additional bridge. The recently announced Galloper and East Anglia ONE investment and proposed re-occupation of port buildings, along with other potential investment, will increase the number of bridge openings required. Port traffic is expected to treble in the Inner Harbour over the medium to long term.

Additional ship monitoring and analysis of opening times, together with a boat simulation, will be undertaken as part of the Full Business Case, and bridge opening times will be adjusted accordingly in the model, which is expected to enhance the scheme benefits.

### 3.4 Costs

#### 3.4.1 *Scheme preparation and construction*

The cost of the proposed scheme has been estimated at 2015 (Q4) prices, as set out in detail in Section 4, the Financial Case. It includes all costs associated with scheme preparation and construction.

Q4 2015 prices, including QRA	Costs (£M)						
	15/16	16/17	17/18	18/19	19/20	20/21	TOTAL
Scheme preparation	1.495	3.184	0.974	0.325	0.325	0.195	4.061
Cost of construction	0	0	2.031	14.214	16.245	8.122	40.612
<b>TOTAL excluding QRA</b>	<b>1.495</b>	<b>5.202</b>	<b>5.023</b>	<b>16.976</b>	<b>16.976</b>	<b>9.129</b>	<b>54.801</b>
<b>Quantified risk (QRA)</b>	<b>0.697</b>	<b>2.425</b>	<b>2.342</b>	<b>7.913</b>	<b>7.913</b>	<b>4.256</b>	<b>25.546</b>
<b>Risk adjusted TOTAL</b>	<b>2.191</b>	<b>7.627</b>	<b>7.365</b>	<b>24.889</b>	<b>24.889</b>	<b>13.385</b>	<b>80.347</b>

Table 3-1: Scheme preparation and construction costs (Q4 2015 prices)

The above costs include an allowance for risk, in the form of a quantified risk assessment (QRA). This is presented in Section 6, the Management Case. For the purposes of the Economic Assessment, these costs have been adjusted to 2010 prices using WebTAG data book values as set out below:

	2010	2011	2012	2013	2014	2015	2016
Increase on 2010	100.00	102.31	103.45	105.23	107.65	109.37	111.34

Table 3-2: Adjustment to 2010 prices

#### 3.4.2 *Maintenance and renewal*

The estimated cost of maintenance, renewals and bridge operation have been estimated, as set out below. For the purposes of the economic assessment, these cost estimates have been adjusted to 2010 prices.

	Costs (£) Q4 2015 prices	Costs (£) 2010 prices
Annual cost	142,000	129,830
15 <sup>th</sup> year after opening	356,000	325,489
30 <sup>th</sup> year after opening	356,000	325,489
45 <sup>th</sup> year after opening	1,972,000	1,802,990
60 <sup>th</sup> year after opening	356,000	325,489
Total (60 years)	11,703,000	10,213,376

Table 3-3: Maintenance, renewal and operating costs

### 3.4.3 Optimism bias (OB)

In line with the guidance in TAG Unit A1.2, an optimism bias of 23% has been applied to all costs. This is the recommended uplift for a fixed link scheme at Outline Business Case stage (Stage 2, conditional approval). The purpose of OB is to ensure that the cost-benefit analysis is robust. Optimism bias is only applied to costs in the economic assessment and is not included in the forecast out-turn costs in the financial or commercial cases.

### 3.4.4 Present Value of Costs (PVC)

Finally, the costs at 2010 price base are discounted to 2010 at an annual discount rate of 3.5% for the first 30 years after opening and 3% for years 31 to 60. This represents the assumption that costs (and benefits) incurred at a future date are less valuable than costs incurred in the present.

The total discounted value of costs (PVC) is **£64.909 million**.

Costs (£)	Scheme preparation and construction cost (risk adjusted)	Maintenance, renewal and operational cost (risk adjusted)	Total risk adjusted cost
2015 Q4 price base	80,347,000	11,703,000	92,050,000
2010 prices	73,463,473	10,213,376	83,676,849
2010 prices including optimism bias (23%)	90,360,071	12,562,452	102,922,523
<b>Present Value of Costs (PVC)</b>	<b>61,917,897</b>	<b>2,991,451</b>	<b>64,909,348</b>

Table 3-4: Present Value of Costs

## 3.5 Transport Economic Efficiency

The Transport Economic Efficiency (TEE) benefits consist of:

- Travel time and Vehicle Operating Costs (VOC) benefits as a result of the scheme; and



- Travel time and Vehicle Operating Costs (VOC) benefits as a result of maintenance activities.

Travel time and Vehicle Operating Costs (VOC) disbenefits as a result of construction activities will be assessed and included in the Full Business Case.

User benefits 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 *WebTAG Unit A1*. TUBA calculates the benefits related to journey time savings, vehicle operating cost savings, carbon emissions and fuel tax revenue. The current version of TUBA is 1.9.5, which includes the latest parameter values as published in the WebTAG databook (November 2014).

Annualisation factors for the three modelled time periods were based on values obtained from local traffic survey data. Scheme appraisal was undertaken for a 60-year period from opening, in accordance with HM Treasury's Green Book.

The results of the TUBA assessments, used to create the Transport Economic Efficiency Table (TEE) are presented below. The total transport economic efficiency benefit is **£427.915 million**. The TEE, PA and AMCB tables are included within Appendix G.

Benefits		
Consumer – commuting user benefits	Travel time	£48,158,000
	Vehicle operating costs	£2,925,000
	<b>Subtotal</b>	<b>£51,082,000</b>
Consumer – other user benefits	Travel time	£143,324,000
	Vehicle operating costs	£11,298,000
	<b>Subtotal</b>	<b>£154,622,000</b>
Business benefits	Travel time	£207,343,000
	Vehicle operating costs	£14,868,000
	<b>Subtotal</b>	<b>£222,211,000</b>
<b>Total TEE benefit</b>		<b>£427,915,000</b>

Table 3-5: Transport User Benefits

An appraisal of Transport User Benefits are described in more detail in Transport User Benefits report (Appendix H).

This report sets out the appraisal of user benefits undertaken using the DfT's TUBA software.

The benefits by time period are also summarised in Table 3-6 below:

Time Period	Benefits
AM peak	£65,257,000
PM peak	£87,969,000
Inter peak	£212,539,000
Off peak	£17,530,000
Weekend	£34,072,000

Table 3-6: TUBA benefits by time period

A number of sensitivity tests were performed on the TUBA results. These are described in Section 3.14 below.

### 3.6 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 2014.3 (released 10<sup>th</sup> November 2014).

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 Lake Lothing Third Crossing 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 Lowestoft between 1<sup>st</sup> January 2010 and 30<sup>th</sup> December 2014. COBALT default accident rates were used across the COBALT network except for links within Lowestoft for which the actual observed accidents were applied.

The assessment was based on a comparison of accidents by severity using 'Without-Scheme' and 'With-Scheme' forecasts from the SATURN 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 (2020 to 2080) with an opening year of 2020 and design year of 2035.

The COBALT analysis estimates that 289 accidents will be saved by 2080 as a result of the scheme, as shown in the following table:

	'Without' Scheme Accidents	'With' Scheme Accidents	Reduction in accidents
Accidents in 60 years	29,177	28,888	289

Table 3-7: 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 the following table.

	'Without' Scheme Casualties			'With' Scheme Casualties			Reduction in casualties		
	Slight	Serious	Fatal	Slight	Serious	Fatal	Slight	Serious	Fatal
<b>Casualties</b>	34,037	4,069	272	33,678	4,036	270	358	32	2

Table 3-8: Casualty savings over 60 years

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:

	'Without' Scheme (£,000)	'With' Scheme (£,000)	Accident savings (£,000)
<b>Accident cost</b>	1,582,550	1,567,562	14,985

Table 3-9: Present value of accident savings over 60 years (2010 prices, discounted to 2010)

The total accident benefits using this assessment method are **£14.985 million**.

### 3.7 Active Modes Benefits

A full report on the calculation of active modes benefits is contained in Appendix I.

The active mode appraisal has been conducted over a 30 year appraisal period, in line with TAG. The benefits have been discounted and reported in present values using the schedule of discount rates provided in the TAG Databook. As the appraisal has taken place in 2015, a discount rate of 3.50% per year has been applied until 2045, with a rate of 3.00% thereafter. Again, in line with TAG, the values have included real growth in line with forecast GDP/capita.

The opening year benefits for each active mode impact are summarised for the Core Scenario in Table 3-10 and the 30 year appraisal results in Table 3-11.

Impact	Pedestrian	Cycle user	Total
Physical Activity (Health)	£180,623	£78,836	£259,458
Absenteeism	£10,221	£5,093	£15,314
Journey Quality/Ambience	£62,356	£62,164	£124,520
Journey Time	£14,204	£1,475	£15,679
<b>Total</b>	<b>£267,404</b>	<b>£147,567</b>	<b>£414,970</b>

Table 3-10: Summary of Opening Year Active Mode Impacts Core Scenario (2010 prices)

Table 3-11 summarises the PVB for each active mode impact for the Core Scenario over the 30 year appraisal period. The total discounted active modes benefit is **£8.498 million**.

Impact	Pedestrian	Cycle user	Total
Physical Activity (Health)	£3,699,115	£1,614,533	£5,313,648
Absenteeism	£209,319	£104,300	£313,620
Journey Quality / Ambience	£1,277,032	£1,273,103	£2,550,135
Journey Time	£290,894	£30,199	£321,093
<b>Total</b>	<b>£5,476,361</b>	<b>£3,022,135</b>	<b>£8,498,496</b>

Table 3-11: Summary of Active Mode Impacts over 30Yr Appraisal Period (2010 prices and value)

### 3.8 Reliability benefits

A full report on the calculation of reliability benefits is contained in Appendix J.

Reliability has been assessed in line with *WebTAG Unit A1.3, Section 6.3 (Reliability – urban roads)* using the following relationships, based on calculation of the standard deviation of journey times from journey time and distance for each O-D (origin-destination) pair:

$$\text{Reliability benefit} = - \sum \Delta\sigma_{ij} \left( \frac{T_{ij}^2 + T_{ij}^1}{2} \right) \times 0.8 \times VOT$$

$$\text{Where: } \Delta\sigma_{ij} = 0.0018 \left( (t_{ij}^2)^{2.02} - (t_{ij}^1)^{2.02} \right) d_{ij}^{-1.41}$$

VOT = value of time (£/sec)

T = number of trips (1 = before improvement, 2 = after improvement)

t = journey time (s) (1 = before improvement, 2 = after improvement)

d = distance (km)

i,j = subscript denoting quantity from zone I to zone j

The results from the reliability assessment are summarised below:

- The benefit calculated for the year 2020 is £1.46 million. Applying a discount rate of 3.5% this value is equivalent to £1.03 million in 2010 prices;
- The benefit calculated for the year 2035 is £4.9 million. With a discount rate of 3.5% this value is equivalent to £2.07 million in 2010. For the calculation of benefits, a linear trend between 2020 and 2035 is assumed, which is then flat thereafter; and
- The total benefit calculated for the 60 years (2020-2079) is equal to **£79.75 million** (2010 prices), using a discount rate of 3.5% from 2010 to 2049 and 3.0% from 2050 onwards.

### 3.9 Wider Impacts (WITA)

An assessment had been made of wider transport impacts, using the WITA software referred to in the Wider Impacts section of the DfT Value for Money Note (December,

2013). The WITA assessment indicated very high transport benefits of **£421 million**. However, this value is not considered plausible, with WITA benefits typically accounting for up to 10-20% of the Transport User Benefits. Additionally, the WITA software is not currently supported by the provider, restricting the ability for more detailed investigation and testing, but the software will be supported in the New Year (2016). These benefits have therefore not been included within adjusted BCR calculation (as they are not required to demonstrate high value for money). They will however be further interrogated and assessed within the Full Business Case, should the scheme proceed through the Conditional Approval gateway.

### **3.10 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 Outline Business Case stage. This is partly because the quantitative environmental analysis required for noise and air quality has not yet been undertaken (and will be undertaken during the production of the Full Business Case). In addition a number of the impacts which can be assessed, such as severance, physical activity, accessibility, have already been accounted for (and benefits taken) in the active mode analysis. As such they have not been included here so as not to “double count” these benefits.

#### *3.10.1 Distributional analysis of user benefits*

Income is unevenly distributed in Lowestoft, with the most deprived areas being in the east of the town, around Lake Lothing and the outer harbour, with higher incomes in other areas. This means that different income groups may experience the benefits of the scheme differently.

The distribution of income between the modelled zones, using data from the Index of Multiple Deprivation<sup>25</sup> is illustrated below:

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<sup>25</sup> <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>

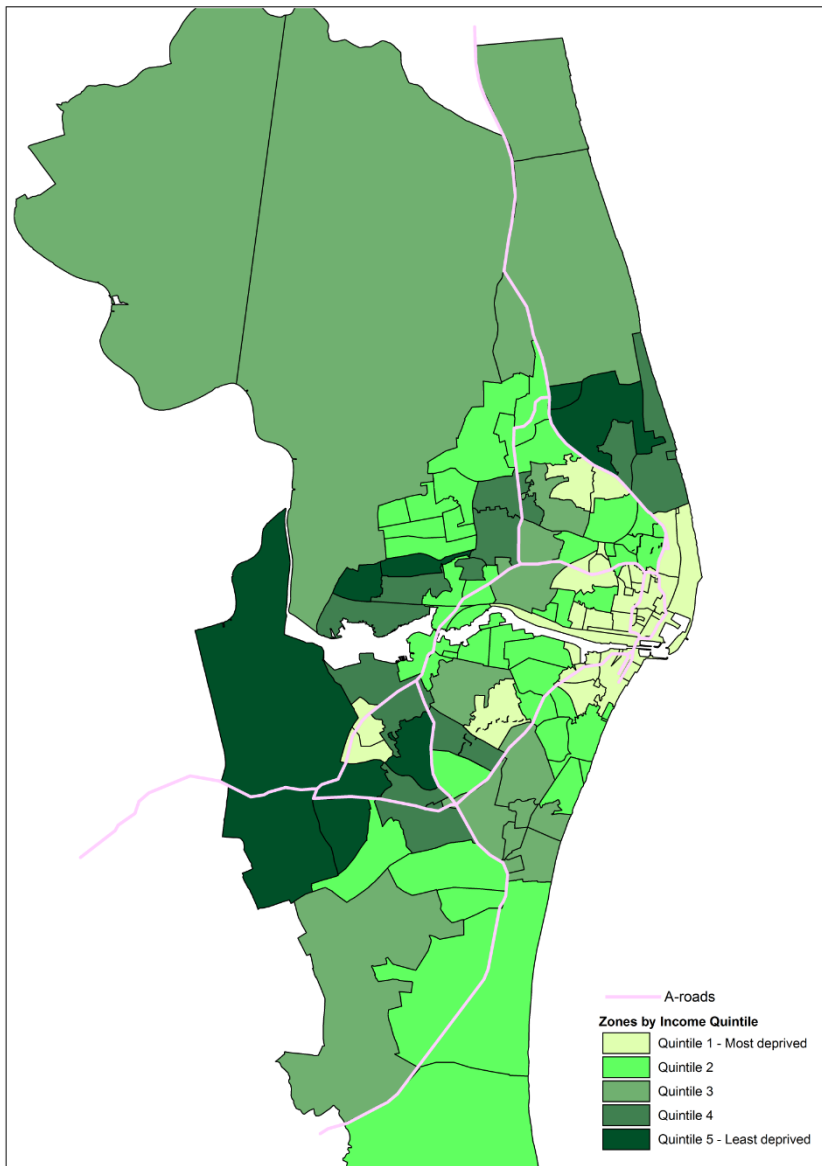


Figure 3-2: Model zones categorised by income quintiles

The distribution of user benefits between different income groups is analysed in the tables below.

<b>User Benefits (£M) - Distributional Analysis - AM</b>						
Benefits/ Disbenefits	IMD Income Domains - Quintiles (£M)					Total
	Q1 (0% < 20%)	Q2 (20% < 40%)	Q3 (40% < 60%)	Q4 (60% < 80%)	Q5 (80% < 100%)	
Total User Benefits	6.25	11.43	2.94	2.63	1.62	24.86
Total User Disbenefits	0.00	-0.12	0.00	0.00	-0.01	-0.13
Net User Benefit	6.25	11.31	2.94	2.63	1.61	24.73
Net User Disbenefit	0.00	0.00	0.00	0.00	0.00	0.00
Share of Net User Benefits	25%	46%	12%	11%	6%	100%
Share of Net User Disbenefits	0%	0%	0%	0%	0%	0%
Share of Population	22.0%	35.1%	16.2%	17.1%	9.6%	100.0%
Assessment	✓✓	✓✓✓	✓✓	✓	✓✓	

Table 3-12: Distributional Analysis for Users Benefits -AM period

<b>User Benefits (£M) - Distributional Analysis - IP</b>						
Benefits/ Disbenefits	IMD Income Domains - Quintiles (£M)					Total
	Q1 (0% < 20%)	Q2 (20% < 40%)	Q3 (40% < 60%)	Q4 (60% < 80%)	Q5 (80% < 100%)	
Total User Benefits	12.36	14.39	4.56	3.21	1.65	36.17
Total User Disbenefits	0.00	0.00	0.00	0.00	0.00	0.00
Net User Benefit	12.36	14.39	4.56	3.21	1.65	36.17
Net User Disbenefit	0.00	0.00	0.00	0.00	0.00	0.00
Share of Net User Benefits	34%	40%	13%	9%	5%	100%
Share of Net User Disbenefits	0%	0%	0%	0%	0%	0%
Share of Population	22.0%	35.1%	16.2%	17.1%	9.6%	100.0%
Assessment	✓✓✓	✓✓✓	✓✓	✓	✓✓	

Table 3-13: Distributional Analysis for Users Benefits -IP period

<b>User Benefits (£M) - Distributional Analysis - PM</b>						
Benefits/ Disbenefits	IMD Income Domains - Quintiles					Total
	Q1 (0% < 20%)	Q2 (20% < 40%)	Q3 (40% < 60%)	Q4 (60% < 80%)	Q5 (80% < 100%)	
Total User Benefits	31.02	33.03	8.13	6.00	4.01	82.19
Total User Disbenefits	0.00	0.00	0.00	0.00	0.00	0.00
Net User Benefit	31.02	33.03	8.13	6.00	4.01	82.19
Net User Disbenefit	0.00	0.00	0.00	0.00	0.00	0.00
Share of Net User Benefits	38%	40%	10%	7%	5%	100%
Share of Net User Disbenefits	0%	0%	0%	0%	0%	0%
Share of Population	22.0%	35.1%	16.2%	17.1%	9.6%	100.0%
Assessment	✓✓✓	✓✓	✓	✓	✓✓	

Table 3-14: Distributional Analysis for Users Benefits -PM period

The user benefits are mainly distributed among the quintiles 1 and 2 (being Q1 the most deprived) which represents around 57% of the population in the considered area of analysis. This pattern is consistent across the AM, IP and PM periods of travel demand. The distributional impact shows that the scheme mainly benefits the less well-off sectors of the local population.

### 3.10.2 *Distributional analysis of accident benefits*

The distribution of accident benefits was also investigated using the guidance set out within *TAG Unit 4-2*.

As shown in Table 3-15, none of the links identified in the analysis area have more than 50 casualties in a period of 5 years (2010-2014). Therefore, a detailed analysis is not required by WebTAG. A summary of existing data by age and mode of transport is provided below.

Description	No of Casualties
A1117	42
A1144	15
A1145	4
A12	47
A146	8
B roads	6
C roads	14
Local roads (145 links)	50
<b>Total</b>	<b>186</b>

Table 3-15: Description of Screened Lowestoft links and number of casualties

The distribution of road accident casualties by age group and mode of transport is shown in the tables below:

Group	Total	% in Lowestoft analysis area (2010-2014)	% in accidents (national average)
Children (under 16 years old)	22	12%	9%
Young People (16-24)	60	32%	25%
Older People (65+)	10	5%	9%
Other ages	94	51%	58%
<b>Total</b>	<b>186</b>	<b>100%</b>	<b>100%</b>

Table 3-16: Casualties by age group



Group	Total	% in Lowestoft analysis area (2010-2014)	% in accidents (national average)
Pedestrian	23	12%	13%
Cyclist	39	21%	11%
Motorcycle	20	11%	10%
Other (Inc. car drivers, passengers)	104	56%	66%
Total	186	100%	100%

Table 3-17: Casualties by mode

These values are based on existing road data, and show that the proportion of the vulnerable group casualties on the affected links is higher in comparison with the national average for some categories.

### 3.11 Environmental Impacts

This section summarises the expected impacts of the proposed scheme on the environment.

The impacts are discussed in more detail in the Environmental Options Appraisal Report (Appendix K). This was prepared to inform the appraisal of short listed options, as described in the Options Appraisal (Appendix A), and – for the avoidance of doubt – the Central (C11) option in those reports equates to the proposed scheme.

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 be updated for the full business case, and will include fully quantified and monetarised assessments where required by WebTAG.

The assessed environmental impacts are:

- Noise;
- Air quality;
- Greenhouse gases;
- Townscape;
- Historic environment;

- Biodiversity; and
- Water environment.

### 3.11.1 Noise

The noise impacts depend on the number of dwellings and other sensitive receptors (e.g. education, health and community facilities, and noise important areas identified by Defra) close to the scheme, and on changes in the volume of traffic on the local road network as a result of the scheme. These are detailed in Table 3-18 below:

	Banding Zones			
	0-50m	50-100m	100-200m	200-300m
Dwellings	54	162	446	887
Sensitive receptors	2	3	3	4
Defra noise important areas	0	0	0	0

Table 3-18: Noise sensitive receptors.

The noise impacts of traffic flow changes have **not** been quantified at this stage.

In general, the proposed scheme will relieve congestion on the wider Lowestoft road network, and this will lead to a reduction in noise impacts on many existing roads. However traffic flow will increase on some roads in the vicinity of the scheme (e.g. Peto Way and Tom Crisp Way) which could increase noise levels for adjacent receptors.

At this stage, an overall assessment of **Slight Adverse** has been given, as there will be noise impacts on sensitive receptors close to the scheme. This may change when the noise impact on the wider network has been quantified. It may also change as a result of measures to mitigate noise impact, as the design is developed.

### 3.11.2 Air quality

The air quality impacts depend upon changes in traffic flows, composition, speeds and distance travelled as a result of the scheme.

Emissions of oxides of Nitrogen (NO<sub>x</sub>) and particulates with an aerodynamic diameter of 10µm or less (PM<sub>10</sub>) are of particular concern in urban areas.

Sensitive receptors for air quality include:

- Residential dwellings;
- Designated ecological sites;
- Nurseries and care homes;
- Hospitals; and

- Schools.

A high level, qualitative review of potential air quality impacts of the scheme has been undertaken, based on initial traffic forecasts for the opening year (2020). Links with a forecast change in daily traffic changes in traffic flow of 1,000 or more were identified, and the number of sensitive properties counted.

AADT change	Air quality impacts	
	Number of links	Number of Receptors within 200m
Increase $\geq 1,000$	13	8,532
Decrease $\geq 1,000$	48	13,236
+/- <1,000	170	60,866
<b>Total</b>	<b>231</b>	<b>82,634</b>

Table 3-19: Air quality impacts

More receptors experience a reduction in traffic than an increase as a result of the scheme. At this stage, however, an overall assessment of **neutral** has been given. A more detailed appraisal will be undertaken, and the assessment category reviewed for the Full Business Case.

### 3.11.3 Greenhouse gases

Greenhouse gas impacts depend upon changes in traffic flows, composition, speeds and distance travelled as a result of the scheme. As such, the proposed scheme is expected to have an impact on levels of greenhouse gas emissions.

As defined by the Intergovernmental Panel on Climate Change, GHG emissions are expressed as tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) for the purposes of this appraisal.

The UK is legally bound by the Climate Change Act 2008 to achieve a target to reduce GHG emissions to at least 80% below base year (1990) levels by 2050.

For the purposes of the OBC, the Transport User Benefit Appraisal (TUBA) software program was used to assess the impacts of the scheme over a 60 year appraisal period (2020 – 2079). TUBA calculates and evaluates the discounted present value of changes in CO<sub>2</sub>e for non-traded (i.e. petrol, diesel, fuel oil) and traded (e.g. electricity) fuel consumption. The results are shown in Table 3-20 below.

Emissions Class	Appraisal Period GHG Emissions (tCO <sub>2</sub> e)		Change (tCO <sub>2</sub> e)	Net Present Value
	Do Minimum	Do Something		
<b>Non-traded</b>	18,781,302	18,696,541	-84,760	£3,916,000
<b>Traded</b>	39,246	39,102	-144	

Table 3-20: Change in greenhouse gas emissions (TUBA outputs)

The proposed scheme is expected to reduce greenhouse gas emissions. The forecast reduction in non-traded emissions (84,760 tCO<sub>2</sub>e) equates to a NPV benefit of £3,916,000.

#### 3.11.4 *Townscape*

Townscape covers the physical and social characteristics of the built and non-built urban environment and the way in which people perceive those characteristics. The methodology used for appraising the impact of the scheme on townscape is based on a qualitative approach and uses the standard Townscape Worksheet from *WebTAG Unit A3*.

The quality of urban form surrounding Lake Lothing is fragmented. Its northern edge is flanked by the town's railway, which separates a prominent industrial lake margin from the residential and retail fringes of north Lowestoft. To the south of the lake is a mix of maritime related industry, large tracts of vacant land and areas of new retail and commercial development. It is a townscape in transition, the area having been identified for significant regeneration within the Lowestoft Lake Lothing and Outer Harbour Area Action Plan (AAP). The AAP aims to deliver a new, more diverse mixed-use townscape, with public access to the water frontage and public spaces for people to meet and play, the water space being a primary focus and driver for this regeneration.

The road crossing would introduce a new feature in the existing townscape pattern. It would influence to some degree the future regeneration layout in respect of the Area Action Plan, although the existing road framework and adjacent built development would not alter significantly. The new bridge and elevated approaches would have a minor influence on the sense of open scale associated with the lake setting, and would become a townscape feature in their own right.

At this stage, an overall assessment of **Slight Adverse** has been given, as the bridge will clearly have an impact on the townscape.

#### 3.11.5 *Biodiversity*

Biodiversity has been assessed using the qualitative and quantitative techniques set out within WebTAG using the standard TAG Worksheet. It addresses the potential impacts of the scheme on ecological receptors, including direct impacts resulting from activities integral to the project, indirect impacts and cumulative impacts. A desk study and Phase I Habitat Survey was undertaken to inform the appraisal of options for this business case, in order to identify changes to known biodiversity resources previously identified by other studies and to identify any new features.

The route passes through suitable reptile and nesting bird habitat, and is within 0.5km of known populations of reptiles. There are also buildings with 50m of the proposed alignment that could offer suitable bat roosting sites. These protected species may therefore be affected.

At this stage, an initial assessment of **Moderate Adverse** has been given. However, once assessment of these populations have been made and potential mitigating activities completed the overall result should not exceed a **Slight Adverse** effect.

#### 3.11.6 *Historic environment*

The Historic Environment comprises buildings and sites of architectural and historic significance. The impact of the scheme on historic environment has been appraised qualitatively using the standard WebTAG Worksheet.

The scheme would bisect Lake Lothing resulting in a moderate adverse impact on the character of the historic landscape and a slight adverse impact on the setting of the Port House.

The scheme would have neutral impact on a listed building located c.300m to the north. It also has the potential to have a major adverse impact on unknown sub-surface heritage assets including palaeoenvironmental remains.

At this stage, an overall assessment of **Slight Adverse** has been given. This may change as the design is refined, and as studies and site investigations are undertaken.

#### 3.11.7 *Water Environment*

The potential impacts on the water environment cover effects on surface hydrology and quality; groundwater quality and hydrogeology; and fluvial geomorphology. A desk study of the hydrological and hydrogeological features associated with the proposed alignments has been undertaken and a site walk-over was carried out to supplement the desk study.

The scheme consists of a bridge structure spanning Lake Lothing's Inner Harbour. At this location the water body is approximately 100m wide and is characterised as a heavily modified water body, with artificial, developed banks and a tidal flow regime.

The main impact is related to the floodplain. Approximately 500m of flood plain is crossed and the southern connection with the existing road network crosses areas of flood zone 2. The flood plain is heavily developed with urban environments and artificial surfaces where the scheme crosses land. Major compensation of the flood plain is likely to be required.

At this stage an overall assessment of **Moderate Adverse** has been given. This will be reviewed as the scheme and mitigation and management proposals are developed for the Full Business Case.

### 3.12 **Regeneration impacts**

The DfT Value for Money note (2013) permits the use of regeneration benefits in the calculation of the adjusted BCR. Regeneration benefits are not included in the calculation of the adjusted BCR here, and are reported as qualitative benefits. This is because there is no "dependent development" associated with the scheme, and

therefore no direct land value uplift (planning gain) that is directly attributable. The benefits captured in the other assessments above are considered to include regeneration benefits already. Inclusion of *additional* regeneration benefits would therefore “double-count” these benefits. This is considered a conservative approach to the calculation of scheme benefits. A summary of the regeneration aspects of the scheme are outlined below, which were considered as part of a regeneration review.

The regeneration benefits of a third crossing in Lowestoft are considered in qualitative terms looking at the future growth trajectory of the town in addition to the consequences should a third crossing not be delivered. The analysis of the local economy points to an area with future prospects for growth in jobs and economic activity. These are anchored in the energy sector (mainly growth in the offshore wind sector), investments in the Great Yarmouth and Lowestoft Enterprise Zone, as well as growth encouraged through the Lowestoft Lake Lothing and Outer Harbour AAP.

The review identified the following types of benefits the scheme could generate, including:

- Benefits associated with improved journey times and reduced congestion;
- Benefits associated with improved access to development sites and premises directly resulting from a third crossing;
- Benefits resulting from enhanced accessibility (and therefore enhanced marketability and take up) of sites and premises; and
- Benefits associated with the improvement in Lowestoft (both real and how the town is perceived) as a place to live, work and invest in.

Many of these benefits are already captured within the transport modelling and economic appraisal described in the previous chapter, and including these as additional scheme benefits could be considered to be “double counting” the benefits.

#### **3.12.1.1 Current and Upcoming Investments in Lowestoft**

Lowestoft and the surrounding areas are expected to benefit from a number of investments over the next 10-20 years, independent of whether a third crossing is delivered or not. These opportunities will generate additional traffic and the movement of people and goods, and may exacerbate current problems in the town unless investments aimed at addressing the town’s congestion and resilience are implemented.

The energy sector is expected to become more important over the next decade or so, both in terms of employment numbers as well as the transformative impact it will have on Lowestoft. The New Anglia LEP’s SEP estimates that around £50 billion will be invested in the onshore and offshore wind and oil and gas sectors across the county over the next 10 years, securing hundreds of jobs directly and in their supply

chain. In addition, the £14 billion investment at Sizewell C (to the south of Lowestoft) is likely to require port support for which Lowestoft is ideally positioned.

The Lowestoft Lake Lothing and Outer Harbour AAP (which includes the PowerPark and parts of the Lowestoft and Great Yarmouth Enterprise Zone) is expected to generate a number of opportunities for the town. The PowerPark is expected to focus on energy-related growth.

Elsewhere, the Riverside Road and South Lowestoft Industrial Estate Enterprise Zone sites are expected to offer further opportunities for growth and investment in the town over the next decade or so. Overall, the Enterprise Zone is expected to cover over 120 hectares of developable land, supporting between 150 and 200 businesses and enabling the creation of around 9,000 direct jobs (and a further 4,500 indirect and induced jobs). An added benefit of the Enterprise Zone in Lowestoft has been the improvements to the town's fabric and appearance, in addition to increased demand for employment land. The outputs and outcomes from resulting from the Enterprise Zone has already been counted as part of its application, and should therefore not be counted as additional benefits (under the regeneration case) unless there is a very strong case for additionality.

### *3.12.2 Lowestoft Town Centre and Employment Space*

Congestion is currently a key issue in Lowestoft and the development of a third crossing will need to be accompanied by other interventions across the road network. A recent survey of members of the Suffolk Chamber of Commerce has highlighted the time lost to congestion as a major issue for many businesses in Lowestoft, especially those located south of the Inner Harbour.

A third crossing over the Inner Harbour has the potential to increase local basket spend, resulting in increased turnover and jobs creation for businesses in the town centre. In addition, a third crossing will help regenerate the town centre and bring more areas in South Lowestoft closer to it.

Vacancy rates in the town centre is a key issue and many believe that a third crossing will help address this by making Lowestoft more marketable and encouraging more people to visit. A spin-off of lower vacancy rates would be the possibility of attracting a higher-value brand into the town centre which in turn would have the potential to attract even more people to Lowestoft. Furthermore, this has the potential to change people's perception of the town centre. Ultimately these improvements will help the town centre compete better with its local competitors which include the North Quay Retail Park and Beccles town centre.

From the perspective of employment land, a third crossing is expected to open up land for development by making it more accessible (in terms of time savings) and more marketable. In reality, no new land will be opened following the construction of a third crossing – also referred to as “dependant development”.

Finally, a third crossing over the Inner Harbour is expected to improve Lowestoft's relationship with Great Yarmouth. This will lead to the overall growth of the sub-region, creating a stronger (energy-related) hub in the context of the North Sea and Europe, capable of benefitting from increased opportunities elsewhere.

### 3.12.3 *The Demand for Labour*

All the changes discussed above are expected to lead to the creation of new jobs in Lowestoft.

The new jobs that will be created as a result of current and upcoming investments in Lowestoft as well as those created following the construction of a third crossing are expected to be in a mix of sectors and will require a mix of skills. Data from the 2011 Census of Population identifies Lowestoft as having a higher proportion of its population with no qualifications when compared with Suffolk, New Anglia and England.

Growth in the energy sector and port-related activities is expected to lead to a greater demand for a highly skilled workforce. However, unless there is a change in the way young people are prepared for the workforce in addition to making it easier for people already in employment to access further training, Lowestoft's population will not be able to benefit from the new jobs that are created in the area. Things are however starting to change. Organisations and large businesses (such as ABP) are starting to work with higher and further education institutions to identify any local skills gaps in the current workforce whilst also better preparing it for future opportunities.

The table below lists the effects discussed above and identifies the timescales over which these are expected to be delivered which include the short (1-2 years), medium (2-5 years) and long (5 years and over) terms.

	Short term	Medium term	Long term
The need for more and better employment land		x	x
Changes in property values		x	x
Growth in the energy sector (incl. offshore wind and civil nuclear)		x	x
Investment in port facilities by ABP		x	x
Developments progressed through AAP (incl. PowerPark)		x	x
Growth Great Yarmouth and Lowestoft Enterprise Zone sites (incl. Riverside Road and South Lowestoft Industrial Estate)	x	x	
Reduction in congestion	x	x	
Inward investment	x	x	
Regeneration of town centre		x	x
Increase in town centre footfall		x	



	Short term	Medium term	Long term
Reduction in vacancy rates		x	
Rebalancing differences between North and South Lowestoft			x
Demand on larger workforce			x
Demand on better skilled workforce		x	x

Table 3-21: Expected effects of a third crossing and timescales over which these are expected to be delivered

### 3.13 Value for Money Statement

The Value for Money assessment of the proposed scheme has been undertaken in line with WebTAG and is based on assessment of the economic, social distributional and fiscal impacts as described above.

#### 3.13.1 Benefit-Cost Ratio (BCR)

The Benefit-Cost Ratio (BCR) is defined by dividing the Present Value of Benefits (PVB) by the Present Value of Costs (PVC).

The initial value of BCR includes monetised benefits of accident savings, greenhouse gas reductions (see Environmental Impacts below) and indirect taxation impacts, but does not include benefits accruing from reliability or wider impacts. The calculation of initial BCR is set out below.

Analysis of monetised costs and benefits (Initial BCR)	(2010 prices discounted to 2010)
Greenhouse Gases	£3,916,000
Physical Activity (Active Mode Appraisal)	£8,498,496
Accidents	£14,985,100
Economic Efficiency: Consumer Users (Commuting)	£51,083,000
Economic Efficiency: Consumer Users (Other)	£154,622,000
Economic Efficiency: Business Users and Providers	£222,211,000
Wider Public Finances (Indirect Taxation Revenues)	-£10,603,000
<b>Present Value of Benefits (PVB)</b>	<b>£444,712,596</b>
<b>Cost to Broad Transport Budget</b>	
Investment cost	£61,917,897
Operating costs	£2,991,451
<b>Present Value of Costs (PVC)</b>	<b>£64,909,348</b>
<b>Net Present Value (NPV)</b>	<b>£379,803,248</b>
<b>Initial BCR</b>	<b>6.85</b>

Table 3-22: Initial BCR calculation

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.

Based on the Analysis of Monetised Costs and Benefits (AMCB) the total monetised benefits exceed the costs by more than £379 million. The BCR of the scheme is **6.85**. This means that the value for money category is **very high**.

Given an initial BCR of more than 4.0, it is not necessary to demonstrate further economic benefits from a formal assessment of wider impacts. However, as improved reliability is an important outcome from the scheme, the effect of including reliability benefits, as calculated above, has been used to produce an adjusted BCR, as set out below.

Adjusted BCR	(2010 prices discounted to 2010)
Initial PVB	£444,712,596
Wider Impacts – Reliability	£79,752,211
<b>Adjusted Present Value of Benefits (PVB)</b>	<b>£524,464,807</b>
<b>Cost to Broad Transport Budget</b>	£0.00
Investment cost	£61,917,897
Operating costs	£2,991,451
<b>Present Value of Costs (PVC)</b>	<b>£64,909,348</b>
<b>Net Present Value (NPV)</b>	<b>£459,555,459</b>
<b>Adjusted BCR</b>	<b>8.08</b>

Table 3-23: Adjusted BCR calculation

Following this adjustment, the BCR increases to **8.08** and still within the **very high** value for money category.

Analysis of social and distributional impacts shows that areas of Lowestoft with lower average incomes will benefit most.

Impacts on the environment have been assessed and range from **neutral** to **moderate adverse**.

### 3.14 Sensitivity Testing

In order to understand how sensitive the benefits described above are to a range of alternative parameters, a number of sensitivity tests have been performed. These are described below. A greater level of detail on these tests is provided within the TUBA report found in Appendix H.

#### 3.14.1 TUBA sensitivity tests

The results provided above were presented for a 'core growth scenario'. In order to illustrate how well the model and resultant benefits are affected by alternative assumptions, three sensitivity tests were undertaken:

- Alternative growth scenarios;
- National Trip End Model constraint; and
- Non-modelled time periods.

##### 3.14.1.1 Alternative growth scenarios sensitivity test

The first sensitivity test undertaken was a standard high and low growth scenario sensitivity test. These sensitivity tests are provided below:

Benefits		Low growth	Core	High growth
Consumer – commuting user benefits	Travel time	£33,008,000	£48,158,000	£63,973,000
	Vehicle operating costs	£2,022,000	£2,925,000	£3,794,000
	<b>Subtotal</b>	<b>£35,030,000</b>	<b>£51,082,000</b>	<b>£67,767,000</b>
Consumer – other user benefits	Travel time	£97,959,000	£143,324,000	£188,180,000
	Vehicle operating costs	£6,474,000	£11,298,000	£12,777,000
	<b>Subtotal</b>	<b>£104,433,000</b>	<b>£154,622,000</b>	<b>£200,957,000</b>
Business benefits	Travel time	£139,523,000	£207,343,000	£274,045,000
	Vehicle operating costs	£8,714,000	£14,868,000	£25,861,000
	<b>Subtotal</b>	<b>£148,238,000</b>	<b>£222,211,000</b>	<b>£299,906,000</b>
<b>Total TEE benefit</b>		<b>£287,701,000</b>	<b>£427,915,000</b>	<b>£568,630,000</b>

Table 3-24: High, Core and Low Growth scenario TUBA benefits sensitivity tests

##### 3.14.1.2 National Trip End Model Constraint (sensitivity test)

As specified within the Traffic Forecasting Report (Appendix F), the quanta of development, particularly with regards to employment, anticipated in the area by Waveney Borough Council and Suffolk County Council do not correspond with the assumptions contained within the National Trip End Model (NTEM), which has not been updated to reflect recently changes in planning assumptions (most recently and importantly the Galloper and East Anglia ONE decision to base themselves in the

port of Lowestoft). Consequently, there is a significant discrepancy when considering the growth in traffic shown by TEMPRO. This is illustrated below.

Year	Metric	NTEM	District	Difference
2020	Households	1878	3070	1192
	Jobs	174	3157	2983
2035	Households	5891	3304	-2587
	Jobs	-611	3157	2546

Table 3-25: Local change in planning data from Waveney District

In developing the core growth scenario, *TAG Unit M4* (November 2014) relating to forecasting was followed, namely controlling background growth to NTEM totals through the Alternative Planning Assumptions tool in TEMPRO. Since there is insufficient planned growth in Waveney District, the balance was removed from the wider Suffolk County TEMPRO zone. However, since the model does not cover the whole of Suffolk, the impact on growth within the study of adjusting the county-wide planning assumptions is minimal.

*TAG Unit M4* paragraph 7.3.7 (November 2014) sets out a step-by-step guide on producing Reference Case matrices. The final point requests that modellers “check and report the total trip ends. These should be very close to the NTEM total for the given NTEM zone”. Due to a combination of the discrepancy between NTEM forecasts and planned developments, the adjustment made at a higher level than that covered by the model, and the use of development-specific trip rates, growth in trips in the model forecasts is significantly different to the growth in trips predicted by NTEM, despite constraining growth in planning data to NTEM totals.

Given these points, the core scenario as developed is considered to be the most accurate and realistic forecast of future growth within the study area. However, to demonstrate the robustness of the scheme, a series of alternative Reference Case matrices were developed, where growth in trips is constrained to NTEM forecasts.

The component elements of the Reference Case matrices are shown below compared against target totals from NTEM calculated by applying factors extracted from TEMPRO without applying any alternate planning assumptions.

Year	Time Period	Base	Background growth	Modelled developments	Reference case total	NTEM Target
2020	AM	13,627	13,900	3,909	17,809	14,042
	IP	12,052	12,803	2,214	15,017	12,932
	PM	14,680	15,395	3,656	19,052	15,565
2035	AM	13,267	15,986	4,216	20,202	16,155

	IP	12,052	15,303	2,347	17,650	15,468
	PM	14,680	17,772	3,820	21,592	17,985

Table 3-26: Core Scenario Reference Case matrix totals and NTEM targets

Three principal methods to constrain total growth to match the NTEM target were considered:

- Factor background growth only, preserving development trip totals;
- Factor development trips only, preserving background growth totals; and
- Apply equal factor to both background and development trips.

Since each of these three methods of adjusting the matrices has a very different impact on trip patterns, all three methods were tested. Separate factors were applied to each user class based on the relevant user class totals to create a series of alternate Reference Case matrices. These were then input into the DIADEM model in the same manner as the other forecast scenarios to generate the relative Do Minimum and Do Something models. TUBA analysis was then undertaken for the three alternative NTEM-constrained forecasts.

Results of the TUBA analysis are presented in Table 3-27.

Benefits		Factor background growth	Factor development trips	Factor whole matrix
Consumer – commuting user benefits	Travel time	£25,189,000	£20,211,000	£23,939,000
	Vehicle operating costs	£1,512,000	£1,546,000	£1,569,000
	<b>Subtotal</b>	<b>£26,702,000</b>	<b>£21,758,000</b>	<b>£25,508,000</b>
Consumer – other user benefits	Travel time	£88,282,000	£80,324,000	£85,965,000
	Vehicle operating costs	£5,755,000	£5,476,000	£5,711,000
	<b>Subtotal</b>	<b>£94,037,000</b>	<b>£85,799,000</b>	<b>£91,676,000</b>
Business benefits	Travel time	£140,523,000	£126,047,000	£136,941,000
	Vehicle operating costs	£8,384,000	£8,135,000	£8,310,000
	<b>Subtotal</b>	<b>£148,906,000</b>	<b>£134,182,000</b>	<b>£145,251,000</b>
<b>Total TEE benefit</b>		<b>£269,645,000</b>	<b>£241,739,000</b>	<b>£262,435,000</b>

Table 3-27: User benefits from NTEM-constrained forecasts (£, 2010 prices, discounted to 2010)

These show that even though these alternative NTEM-constrained forecasts do not align with the expectations of Waveney District Council or Suffolk County Council, the scheme still generates a significant benefit far in excess of the scheme cost. Furthermore, the Waveney District Council / Suffolk County Council provided

development information is considered more realistic than the TEMPRO data, for reasons already discussed (related to newly secured investment and jobs).

### 3.14.1.3 Non-modelled time periods

The TUBA results included all 8,760 hours in a year based on factors applied to existing matrices to generate models for the non-modelled time periods. In part, this is to comply with TAG Unit A3 (November 2014). However, in the case of the off-peak and weekend periods, it is possible that applying a simple factor to the interpeak to represent what may be a significantly different and varied set of traffic conditions may be considered an oversimplification.

Since there are no validated models for these time periods, this cannot be determined with any certainty. Benefits from the core TUBA results disaggregated into the separate time periods have been presented in Table 3-6, but for completeness, an alternative set of TUBA results has been undertaken that excludes the off peak and weekend periods completely. These are shown in Table 3-28, and should be compared to the full version in Table 3-5.

Benefits		
Consumer – commuting user benefits	Travel time	£44,707,000
	Vehicle operating costs	£2,753,000
	<b>Subtotal</b>	£47,460,000
Consumer – other user benefits	Travel time	£120,767,000
	Vehicle operating costs	£8,839,000
	<b>Subtotal</b>	£129,605,000
Business benefits	Travel time	£184,193,000
	Vehicle operating costs	£13,902,000
	<b>Subtotal</b>	£198,094,000
<b>Total TEE benefit</b>		£375,159,000

Table 3-28: TEE benefits excluding off peak and weekends (£, 2010 prices, discounted to 2010)

These results demonstrate that the off peak and weekend do not contribute a significant level of benefits to the overall scheme assessment. The analysis therefore does not rely heavily on time periods using unvalidated models.

### 3.14.2 Active Mode Appraisal Sensitivity Testing

As recommended in TAG Unit A5.1, the potential differences in uplift for pedestrians and cycle users as a result of the scheme has been considered, and this has been reflected in a high and low growth sensitivity test, which is provided alongside the core scenario presented above. The table below summarises the proportions of forecast pedestrian and cycling demand used in the sensitivity tests to generate Active Mode benefits.

Assumptions and Results	Scenario Tests		
	Low	Core	High
Pedestrian Uplifts	5%	10%	15%
Cycle user Uplift	5%	17.5%	30%
Pedestrians Benefits	£3,809,865	£5,476,361	£6,842,421
Cycle users Benefits	£2,406,688	£3,022,135	£5,165,786
<b>Total Benefits</b>	<b>£6,216,554</b>	<b>£8,498,496</b>	<b>£12,008,207</b>

Table 3-29: Low and High Uplift Sensitivity Test Results (rounded to nearest £1)

### 3.15 Appraisal Summary Table (AST)

The AST presents in a single table all the evidence from the economic appraisal. It records all the impacts which have been assessed and described above – economic, fiscal, social distributional and environmental impacts – assessed using monetised, quantitative or qualitative information as appropriate. The AST is included at Appendix L.

### 3.16 Summary and conclusion

An analysis of the monetised benefits of the proposed scheme demonstrates that it offers **Very High** value for money with a BCR of **6.85**. Inclusion of reliability benefits increases this still further to **8.08**. Sensitivity testing with a range of growth scenarios shows that the scheme would still offer very good value for money in a low growth scenario. Analysis of social and distributional impacts shows that areas of Lowestoft with lower average incomes will benefit most.

About half of the forecast time and vehicle operating cost savings are identified as benefits to business. Business will benefit from reduced congestion, faster journeys and improved journey time reliability, with reduced costs and better access to markets, 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 and the regeneration of Lowestoft's economy.

Impacts on the environment have been assessed and range from neutral to moderate adverse. These will be reviewed for the Full Business Case in the light of more detailed assessment and consideration of measures to mitigate, manage or compensate for the impacts. The scheme is expected to lead to a reduction in greenhouse gas emissions; these have been monetised and included in the BCR.

## 4 The Financial Case

### 4.1 Introduction

This chapter sets out the financial case for the proposed scheme to demonstrate its affordability. This chapter describes:

- How much the proposed scheme is expected to cost, and how this has been calculated;
- Risks that could affect the cost of the scheme;
- How the scheme will be paid for and by whom; and
- The anticipated profile of expenditure over time (whole life costs).

This chapter deals with costs and accounting issues. The question of value for money is dealt with separately in the Economic Case.

### 4.2 Costs

The estimated capital cost of the scheme, at 2015:Q4 prices, but excluding future inflation, client costs and non-recoverable VAT, is:

Scheme	Costs
Lake Lothing Third Crossing	<b>£80,346,702</b>

*Table 4-1: Estimated capital costs of the proposed scheme*

The build-up of the cost estimate and spend profile over time is demonstrated in Table 4-2.



Scheme Element	Total Cost at 2015 Q4 prices	Spend Profile by Financial Year					
		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Construction Contracts	£40,612,000	£0	£0	£2,030,600	£14,214,200	£16,244,800	£8,122,400
Statutory Undertakers Works	£4,061,000	£0	£203,050	£203,050	£2,436,600	£406,100	£812,200
Land	£3,630,000	£0	£1,815,000	£1,815,000	£0	£0	£0
Design Investigations, Surveys, Procurement, Supervision etc.	£6,498,000	£1,494,540	£3,184,020	£974,700	£324,900	£324,900	£194,940
<b>Total Cost (Excluding quantified risk and optimum bias)</b>	<b>£54,801,000</b>	<b>£1,494,540</b>	<b>£5,202,070</b>	<b>£5,023,350</b>	<b>£16,975,700</b>	<b>£16,975,800</b>	<b>£9,129,540</b>
Quantified Risk (P85 value)	£25,545,702	£696,686	£2,424,965	£2,341,654	£7,913,290	£7,913,336	£4,255,771
<b>Risk-adjusted total Cost (Excluding optimum bias)</b>	<b>£80,346,702</b>	<b>£2,191,226</b>	<b>£7,627,035</b>	<b>£7,365,004</b>	<b>£24,888,990</b>	<b>£24,889,136</b>	<b>£13,385,311</b>
<b>Total Cost @2015 prices</b>	<b>£80,346,702</b>	<b>£2,191,226</b>	<b>£7,627,035</b>	<b>£7,365,004</b>	<b>£24,888,990</b>	<b>£24,889,136</b>	<b>£13,385,311</b>
<b>Adjustment to out-turn (inflation)</b>	<b>£5,218,740</b>	<b>-</b>	<b>£137,380</b>	<b>£275,422</b>	<b>£1,447,325</b>	<b>£1,986,671</b>	<b>£1,371,942</b>
<b>Construction inflation above GDP</b>	<b>£6,167,828</b>	<b>-</b>	<b>£282,107</b>	<b>£502,617</b>	<b>£1,659,406</b>	<b>£2,211,918</b>	<b>£1,511,780</b>
<b>Scheme Cost (out-turn prices)</b>	<b>£91,733,270</b>	<b>£2,191,226</b>	<b>£8,046,522</b>	<b>£8,143,044</b>	<b>£27,995,721</b>	<b>£29,087,725</b>	<b>£16,269,033</b>

Table 4-2: Breakdown of scheme costs for the Third Crossing scheme

#### 4.2.1 *Scheme preparation and construction*

The cost of the scheme preparation and construction has been estimated by Suffolk County Council's consultant, Mouchel Consulting.

#### 4.2.2 *Risk budget*

The cost of delivering the scheme will not be fully known until the detailed design has been completed, land purchased, and tender prices have been received. To reflect the uncertainty associated with known risks, a quantified risk assessment (QRA) has been undertaken<sup>26</sup>. Detail of the QRA is presented in Section 6.8.

#### 4.2.3 *Spend Profile*

The assumed annual profile of expenditure is shown below.

Scheme Element	Annual Spend Profile					
	FY15-16	FY16-17	FY17-18	FY18-19	FY19-20	FY20-21
Construction Contract	0%	0%	5%	35%	40%	20%
Statutory Undertakers Works	0%	5%	5%	60%	10%	20%
Land	0%	50%	50%	0%	0%	0%
Design, Investigations, Surveys, Procurement, Supervision etc.	23%	49%	15%	5%	5%	3%

Table 4-3: Annual spend profile

#### 4.2.4 *Out-turn price adjustment*

The cost estimates assume a price base of 2015 Q4. An allowance is therefore made for expected inflation between the date of the estimate and the date when the expenditure is expected to occur. This depends on the profile of expenditure, as set out in Table 4-3. The uplift factors<sup>27</sup> to reflect price inflation have been estimated based on the GDP deflator methodology recommended by WebTAG, with a further allowance made based on the Building Cost Information Services (BCIS) five-year forecast for increases in tender prices and construction costs associated with construction inflation over and above the WebTAG GDP index.

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<sup>26</sup> Risk allowance is a factor applied to project costs to act as a contingency for unforeseen circumstances. At the concept stage, the risks of being able to accurately assess cost is deemed high, and this reduces throughout the scheme's lifecycle

<sup>27</sup> WebTAG Data book - <https://www.gov.uk/government/publications/webtag-tag-data-book-november-2014>

Scheme Option	Allowance
Adjustment to out-turn (Inflation)	£5,218,740
Construction inflation above GDP	£6,167,828

Table 4-4: Inflation allowance for the scheme option

## 4.3 Budgets / Funding Cover

### 4.3.1 Funding

It is likely that the scheme will be funded entirely from public finances, and it is not clear at this stage whether any private financial contribution will be available.

The largest contribution to the scheme costs would be provided by the Government's Department for Transport. A local contribution, underwritten by Suffolk County Council, will account for 20% of the scheme costs. This is confirmed in a letter of intent, written by the Council's Section 151 officer contained in Appendix M. In addition to underwriting the 20% contribution, the letter also confirms that the Council will underwrite any potential increase in scheme costs above those set out below.

The exact composition of this local contribution has not yet been finalised, given the uncertainty around available funding mechanisms, such as the potential devolution infrastructure fund which would be available to NALEP and Suffolk County Council. However, this 20% local contribution would come from a combination of the following sources:

- Rates retention from the Lowestoft and Great Yarmouth Enterprise Zone;
- Pooled business rates;
- Future arrangements for business rates retention;
- A potential infrastructure fund resulting from potential successful local devolution proposal;
- Private sector contributions from Community Infrastructure Levy (CIL) / Section 106 contributions; and
- Potential Long term NALEP Growth Deal funding.

In view of the uncertainties around the sources of the local contribution Suffolk County Council will underwrite this cost. The details of the local funding mechanism will be clarified as the scheme is developed.

The Council is also prepared to enter into credit arrangements under the prudential borrowing powers from the Local Government Act 2003.

#### 4.3.2 *Budgetary Impact*

An estimated budgetary impact summary outlined in Table 4-5 is split by the financial year. Of an estimated scheme cost of £91.73m, a fixed sum of £73.39m is being sought from Department for Transport. The remaining £18.35m will be funded by the local contribution. The assumed spend profile and drawdown profile are aligned.

Source	Budgetary Impact Summary (£m)						
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Total
Government / DfT Funding	1.75	6.44	6.51	22.40	23.27	13.02	73.39
Local Contribution	0.44	1.61	1.63	5.60	5.82	3.25	18.35
<b>Total</b>	2.19	8.05	8.14	28.00	29.09	16.27	91.73

Table 4-5: *Budgetary Impact Summary*

#### 4.4 **Whole Life Costs**

The Lake Lothing Third Crossing scheme will give rise to additional revenue liabilities for capital renewals and maintenance and for the cost of day to day operation of the bridge, when compared to a future scenario in which the Lake Lothing Third Crossing does not exist. All maintenance obligations will be met as part of the maintenance regime operated by Suffolk County Council.

##### 4.4.1 *Capital Renewal Costs*

Approximately £1.5 million (at current 2015 price base) will be required for the purposes of resurfacing / renewing the new highway infrastructure (including the bridge approaches and bridge surface) over a 60 year period. It is anticipated that the surface and binder courses would need to be replaced every 15 years after scheme opening, with a full depth reconstruction after 45 years.

Approximately £1.5 million (at current 2015 price base) will be required for the purposes of bridge repair and rehabilitation costs over a 60 year period. This includes the costs incurred to avoid structural corrosion, painting the structure and make structural repairs with an allowance for the bridge parapets to be replaced after 45 years.

##### 4.4.2 *Annual Maintenance and Operating Costs*

Approximately £10,000 (at current 2015 price base) will be required to meet annual highways maintenance liabilities including communications equipment, drainage clearance, road and street lighting operation, winter maintenance (i.e. application of salt and snow clearance) and infrastructural and safety inspections.

Approximately £132,000 (at current 2015 price base) will be required to meet annual bridge maintenance liabilities. These costs are mainly comprised of operation and maintenance of the bascule bridge.

The whole life costs identified above have been factored into the economic appraisal, contained within the Economic Case and have therefore had an impact on the estimated BCR and NPV.

A breakdown of annual maintenance and capital renewal costs is presented in Table 4-6 below.

	Central Option Highways Costs (2015 prices)	Central Option Bridge Costs
Annual	£10,000	£132,000
15 Years	£293,000	£63,000
30 Years	£293,000	£63,000
45 Years	£664,000	£1,308,000
60 Years	£293,000	£63,000

*Table 4-6: Breakdown of annual maintenance and capital renewal costs, by highways and bridge costs*

## 5 The Commercial Case

This chapter outlines the commercial viability of the scheme, and the procurement strategy which will be used to engage the market. It provides the intended approach to risk allocation and transfer, contract and implementation timescales, as well as how the capability and technical expertise of the team delivering the project will be secured.

### 5.1 Introduction

The scheme is commercially viable with a robust contracting and procurement strategy. It will use an OJEU 'restricted procedure' procurement tendering process, which has been utilised by the Council on a number of previous large-scale transport infrastructure schemes. It has been developed in full accordance with the Council's procurement systems and processes<sup>28</sup>, with the Council's Senior Procurement Officer consulted and agreeing the approach.

The procurement route includes risk management as a core principle, using strategies of risk allocation and transfer to the contractor, including the use of disincentives to achieve delivery on time to the required quality (such as the use of penalties for programme overruns / missing key delivery milestones in the programme).

There is a well-developed market for the proposed procurement approach and it is anticipated, based on previous evidence of procuring large infrastructure schemes in the County (such as the Stowmarket Relief Road, the Lowestoft Southern Relief Road and the Lowestoft Northern Spine Road), that there will be a high demand and strong competition amongst engineering contractors to secure the contract for the construction of this scheme.

The Council have confidence that the contractual and commercial arrangements proposed are appropriate and workable, having applied the arrangements in the aforementioned schemes. The Council are currently procuring the Bury St Edmunds Eastern Relief Road in the same manner.

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<sup>28</sup> SCC Procurement Rules (2015), <https://www.suffolk.gov.uk/assets/suffolk.gov.uk/Business/Supplying%20Us/2015-03-19,%20Suffolk%20County%20Council%20Procurement%20Regulations%20v1%208Final.pdf>, SCC Sustainable Procurement Strategy (2012-2014), <https://www.suffolk.gov.uk/assets/suffolk.gov.uk/Business/Supplying%20Us/2012-10-10Procurement%20Strategy%20Large%20Font%2012-14V1%202.pdf>

## **5.2 Procurement Strategy**

### **5.2.1 Available procurement procedures**

The Official Journal of the European Union (OJEU) is the publication in which all public sector tenders valued above £4,104,394<sup>29</sup> (for infrastructure projects) must be advertised.

There are several procurement procedures available to schemes to which the OJEU values apply. These each have particular benefits and use cases, as follows:

#### **5.2.1.1 Open Procedure**

This procedure allows an unlimited number of interested parties to tender against defined parameters. There are no restrictions (e.g. pre-qualification) on the parties who are permitted to tender, meaning that some parties may not be suitable to carry out the work. This procedure is straightforward and transparent but can attract a large number of potential bidders (which will require a greater degree of assessment and resource requirements). This route is not usually recommended for construction projects due to the high number of tenders that could be expected and the particular skills and experience that may be required of potential bidders.

#### **5.2.1.2 Restricted Procedure**

This is a two-stage procedure. The first stage allows the contracting authority to set the minimum criteria relating to technical, economic and financial capabilities that the potential bidders have to satisfy. Following evaluation of the responses to the first stage a minimum of five bidders (unless fewer qualify) are invited to tender in the second stage. This process is typically used to appoint consultants or contractors on traditionally procured projects.

#### **5.2.1.3 Accelerated Restricted Procedure**

This procedure is only intended for use where, for reasons of urgency, the contracting authority must procure the contract in a reduced time frame. Any contracting authority wishing to use this procedure must be able to demonstrate the reasons of urgency that necessitate its use. It is identical to the Restricted Procedure except that the timescales for each stage are reduced.

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<sup>29</sup> Effective from 1st January 2016. This figure is currently £4,322,012 effective from 1st January 2014 until 31st December 2015.

#### 5.2.1.4 Competitive Dialogue Procedure

This procedure is appropriate for complex contracts where contracting authorities:

- are not objectively able to define the technical means capable of satisfying their needs or objectives; and / or
- are not objectively able to specify the legal and/or financial make-up of a project.

This is a multi-stage procedure. The first stage is a pre-qualification to select the potential bidders to participate in the dialogue. In the second stage the contracting authority enters into a dialogue with the potential bidders to identify and define the means best suited to satisfying their needs. Any aspect of the contract may be discussed, including technical requirements for the works to be delivered and the commercial / contractual arrangements to be used. The dialogue may be conducted in successive phases with the remaining bidders being invited to tender. By the end of the dialogue phase the contracting authority's requirements will have been determined such that the scheme can be tendered. In the final stage, the remaining bidders from the dialogue phase are invited to tender for the scheme.

#### 5.2.1.5 Competitive Procedure with Negotiation

This relatively new procedure is intended to be used where minimum requirements are able to be specified but negotiations with bidders may be needed to improve the initial tenders. The grounds for using this procedure are as follows:

- Where needs cannot be met without adaptation of readily available solutions;
- Where the contract includes design or innovative solutions;
- Where the requirement is complex in nature, in its legal and financial make-up or because of its risks;
- Where the technical specifications cannot be established with sufficient precision; or
- In the case of unacceptable/irregular tenders.

Within this procedure, bidders initially submit tenders based on the information issued by the contracting authority. The contracting authority is then able to review the tenders it has received and negotiate with the bidders, following which the tenders will be resubmitted. This procedure may therefore be useful where the requirements are well developed initially and full tender documents can be produced but it is felt that there may be advantage in retaining the ability to hold negotiations if there are certain aspects which bidders raise.

#### 5.2.2 Preferred procurement procedure

This scheme will likely be procured using the Restricted Procedure due to the fact that it will be possible to publish a well-defined tender package for bidders to price



against although variant tenders would be accepted in order to allow bidders to propose alternative solutions. The Restricted Procedure also has defined timescales for each stage which will allow the Council to ensure that the tenders can be received by the dates required by the overall project programme.

The Council currently uses the Restricted Procedure for procuring highway engineering schemes and is well-practised in its use. However, the Council will also consider the use of the Competitive Procedure with Negotiation as it may offer benefits, such as being able to discuss initial tenders with the bidders if they identify elements of the scheme that could be improved if carried out differently from the tender proposals. The selected procedure will be confirmed in the Full Business Case.

The information required from the bidders during the PQQ and ITT stages will ensure that the objectives set out within the Economic Case are achieved, particularly the timely completion of the works in order to realise the economic benefits to the public arising from the provision of the new crossing.

5.2.3 *Details of preferred procurement procedure*

The following flowchart outlines the Restricted Procedure:

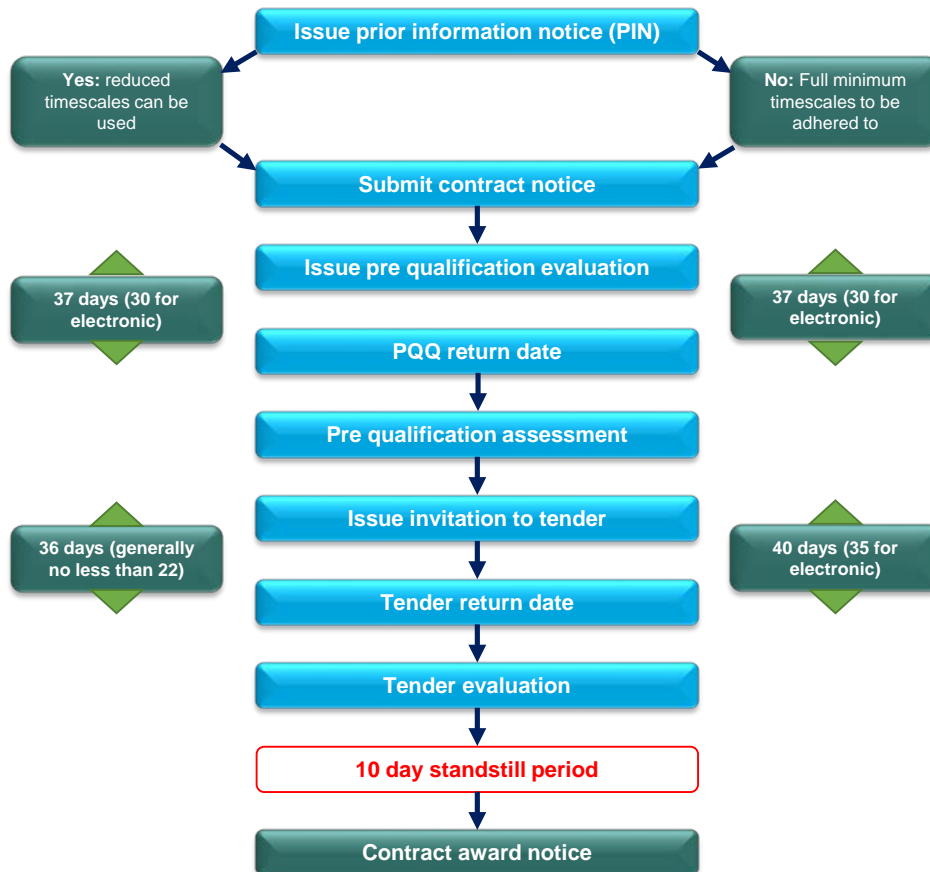


Figure 5-1: Restricted Procedure Flowchart <sup>30</sup>

Summarising the key processes within this procedure, a Pre-Qualification Questionnaire (PQQ) will be issued, which will allow potential bidders to be scored on a range of commercial, financial and technical criteria as well as on their processes for dealing with quality, health and safety, environmental management and compliance with statutory legislation. The responses received from potential bidders will be scored according to pre-determined criteria in order to identify those who will be eligible to participate in the tender. Of the eligible bidders, a minimum of 5 would be selected to continue to the ITT stage, unless there are fewer than 5 eligible bidders in which case they would all continue.

The bidders who are successful at PQQ stage will issued with the Invitation to Tender (ITT) documentation which will include the following documents:

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<sup>30</sup> Reproduced from A User's Guide to EU Procurement Rules, Sweett Group, May 2012, [https://www.apm.org.uk/sites/default/files/open/EU%20Procurement%20Guide\\_May%202012.pdf](https://www.apm.org.uk/sites/default/files/open/EU%20Procurement%20Guide_May%202012.pdf)

- Instructions for Tendering and Guidance Notes;
- Contract Data part one;
- Form of Tender, Form of Agreement, Contract Data part two;
- Works Information;
- Contract Drawings;
- Bill of Quantities;
- Site Information; and
- Pre-Construction Information.

The bidders will be expected to return the following information within their tender:

#### 5.2.3.1 Quality Statement

The following information will be required in the Quality Statement:

- Key staff and contract management – details of key individuals, including CVs with their skills and experience. The site management and supervisory arrangements, contract management arrangements and arrangements for the management of sub-contractors.
- Programme, including risk – detailed programme including the pre-construction, construction and commissioning/handover phases of the project with critical path analysis.
- Construction – details of how the scheme would be constructed, taking the site constraints into account. Evidence of experience undertaking similar projects. Descriptions of how the safe operation of the construction site(s) will be managed (including reference to traffic management).
- Financial management – including details of any mitigation and avoidance strategies to reduce risks to time, cost and quality, and any value engineering efficiencies which have enabled the costs to be kept down.
- Stakeholder management and communication – description of the bidder's approach to stakeholder engagement and management, including the use of electronic and social media.
- The completion of a Health and Safety questionnaire, provided by the Council.
- Insurance – details of insurance policies, including a statement undertaking responsibility for dealing with claims, or parts of such claims, within the excess amount.

Bidders will be given the opportunity to submit alternative designs (where improvements to quality, cost, or delivery can be identified) as variant bids. If they intend to do this, they will be requested to supply the following information:

- The revised plans, drawings and documentation;
- Schedule of changes from the original design;
- Report on the Environmental Impact of the alternative design, including mitigation measures;
- A statement on how the outline Health & Safety Plan would change resulting from the alternative design;
- The following completed documents:
  - Approval in Principle forms for each alternative structure;
  - Addendum Approval in Principle Forms;
  - Stage 1 Safety Audit Certificate.

#### **5.2.3.2 Financial Statement**

The following information will be required in the Financial Statement:

- Completed Form of Tender;
- Fully priced bill of quantities; and
- Completed Contract Data part two.

If a variant bid is submitted in Part A then the following additional information will be required:

- A fully priced extension to the bill of quantities;
- A statement setting out the cost savings; and
- All other information required to be submitted at the tender stage.

Each tender will be assessed by pre-determined weightings to the sections of information provided in the Quality and Financial Statements. A final assessment will require the three top-scoring bidders to make a presentation to a tender assessment panel and answer questions, usually based on the quality aspect of their submission.

#### **5.2.4 Procurement method**

The Council, with the services of Mouchel Consulting, has developed the scheme through to preferred option stage during the production of this Outline Business

Case. Mouchel Consulting will be retained to produce the Full Business Case and associated tasks, which will include undertaking the detailed design and preparing the documents required for the NSIP / DCO process. This ensures continuity of approach and retains invested scheme knowledge to build a robust defence against any potential objections.

Considering that the detailed design will have been completed in order for the construction contract to be tendered, allowing determination of the costs required for inclusion in the Full Business Case, this scheme will be procured using a 'traditional' approach as opposed to 'design and build'. This allows for a more efficient overall programme and price, as it removes the need for the selected contractor's designer to take on the design. If this were to happen there would be a period following contract award during which the contractor's designer would need to appraise the design and satisfy themselves with it, in order to adopt it as their own. This would delay the start of the construction works. There would also be additional costs, both in terms of the designer's fees and in the contractor taking on design liability.

#### 5.2.5 *Form of contract*

The Council will use the NEC3 Engineering and Construction (ECC) form of contract which is the standard form of contract used for construction works in the UK. The NEC3 ECC consists of a set of Core Clauses to which is added one of the following Options A to F:

- Option A: Priced with activity schedule;
- Option B: Priced with bill of quantities;
- Option C: Target cost with activity schedule;
- Option D: Target cost with bill of quantities;
- Option E: Cost reimbursable; and
- Option F: Management contract.

Option A will be selected for this contract in order to provide increased levels of cost certainty.

### 5.3 **Sourcing Options**

As described in Section 5.2, the scheme will be sourced through advertisement in the Official Journal of the European Union (OJEU) due to its value. This will allow companies from across the EU to bid for the work.

### 5.4 **Payment mechanisms**

Payment would be made to the contractor by monthly valuation with a BACS payment within 28 days of issue of the initial valuation.

## 5.5 Pricing Framework and Charging Mechanisms

As discussed in Section 5.2.5, the NEC3 ECC contract will be used with Main Option A. The contractor will therefore submit a priced activity schedule for the works at tender stage which will be reviewed at each assessment date and payment made for completed activities.

Secondary Option X7 will be included in the contract, defining the financial penalties to be levied against the contractor if the works run beyond the completion date shown in the accepted programme.

## 5.6 Risk Allocation and Transfer

The construction contract will include clauses to facilitate the transfer of appropriate risks from the Council to the contractor, such as risks associated with construction costs increasing above those predicted in the financial case.

The scheme costs currently include optimism bias and contingency associated with risk, following the Quantified Risk Assessment (in alignment with the DfT guidance on the production of Outline Business Cases). The detailed description of this process is outlined with Section 6.8 in the Management Case. The risk of costs being higher than currently predicted remains until the tendering process is complete, which is the point that this risk can be transferred to the contractor.

The indicative allocation of risks resulting from the contractual and procurement arrangements is summarised in the following table. At this Outline Business Case stage, ticks have been provided to indicate where each risk type rests: with the public sector (the Council / Government Treasury) or the private sector (the consultants and contractors), or whether these risks are shared between the two. At Full Business Case stage, once the procurement and contractual arrangements have been finalised, these ticks will be converted into percentages.

Risk Category	Public	Private	Shared
Design risk		✓	
Construction risk		✓	
Transition and implementation risk			✓
Operating risk	✓		
Termination risks			✓
Financing risks	✓		
Legislative risks	✓		

Table 5-1: Indicative Risk Allocation Table

## 5.7 Contract Length

The tender invitations will assume a construction period of 28 months. It is possible that tender submissions will propose a shorter period than this, as the programme contains elements of contingency following the risk assessment.

The contract programme is considered in further detail within the Management Case, (Section 6). The key contract dates are included in Table 5-2.

Programme Activity	Start Date	End Date
Prequalification period	June 2016	May 2017
Tender period (culminating in Council's appointment of the Preferred Bidder)	May 2017	September 2017
Development Consent process (including NSIP decision)	June 2016	February 2018
Award of Contract	-	February 2018
Detailed design (including technical approval by the Council)	May 2016	April 2017
Construction period (including mobilisation and commissioning/handover)	February 2018	November 2020
Third Crossing Opening	-	November 2020

Table 5-2: Key Contract Dates

## 5.8 Human Resource Issues

No significant human resources issues have been identified that could affect the deliverability of the scheme. Further details of the required capabilities and assigned resources are set out in the Management Case (Section 6).

However, the Suffolk County Council Project Manager for the scheme, identified within the Management Case will need to be appointed. This appointment would be initiated following approval to proceed to Full Business Case stage. The Council do not anticipate any difficulties or delays in being able to appoint a resource to this position. Furthermore, staff from either Suffolk County Council or the term contract consultant (Mouchel Consulting or the wider Kier Group) could be placed in this role in an interim basis whilst the appointment was being finalised.

## 5.9 Contract Management

The form of contract selected (Option A – Priced with activity schedule) provides the Council with a suitable contract at construction to minimise risk, but with increased ability to bring forward the detailed design process in the programme.

The Council will also provide officers to perform the role of contract manager and create a small site supervision team.

# 6 The Management Case

## 6.1 Introduction

This chapter forms the management case for the Lake Lothing Third Crossing scheme. It describes how the scheme will be delivered through project management best practice, confirming that the timescales are realistic, and demonstrating that an appropriate governance structure is in place to oversee the project.

Specifically the section provides and sets out:

- evidence of similar projects;
- programme and project dependencies
- the governance structure (management framework);
- the scheme / project scheduling (i.e. the development of the project programme, and the process for monitoring progress against the milestones within the programme);
- the stakeholder management process (how stakeholders have been identified, and their influence on the project managed);
- the risk management process; and
- how the benefits set out in the economic case will be monitored and realised.

## 6.2 Evidence of Similar Projects

The delivery of the scheme will build upon experience gained with a number of major highway and transport schemes delivered by Suffolk County Council in recent times.

A selection of key schemes have been listed in Table 6-1, summarising the scope of works, capital costs, time scales for implementation and the procurement strategy employed. Opportunities will be taken, wherever possible, to improve delivery processes, through acting upon lessons learnt.



No.	Contract	Description	Works Date	Form of Contract	Approximate Value	Project Delivered Successfully
1	Suffolk Highways Services Contract	Fabrication, construction and installation of a new pedestrian and cycle bridge over the A14 at Bury St Edmunds (Thingoe Hill to Northgate Avenue).	April 2014 – September 2014	Through the Support Services Contract (NEC)	£1,500,000	Yes
2	Suffolk Highways Services Contract	Construction of a flood alleviation scheme on the A12 at Blythburgh which included the installation of 800m of steel sheet piling and earth embankments.	May 2014 – September 2014	Through the Support Services Contract (NEC)	£800,000	Yes
3	Competitive Tender	The B1115 Stowmarket Relief Road was a major transport scheme consisting of a new road and alterations to the existing Stowmarket inner relief road (Gipping Way) to help to relieve congestion around the town centre, and to integrate new developments on the outskirts of the town with the town centre. It also included the provision of a bridge over the Norwich to London railway line and removal of a level crossing.	May 2008 – August 2010	NEC Option C	£12,000,000	Yes

No.	Contract	Description	Works Date	Form of Contract	Approximate Value	Project Delivered Successfully
4	Suffolk Highways Services Contract / OGC Framework / Competitive Tender	<p>'Ipswich Transport Fit For the 21<sup>st</sup> Century' (Travel Ipswich scheme) was an integrated scheme involving:</p> <ul style="list-style-type: none"> <li>• competitive tender for reconstruction of two bus stations (Old Cattle Market and Tower Ramparts), one junction and associated works;</li> <li>• OGC Framework Contract for provision of Variable Message Signing and Real Time Passenger Information system;</li> <li>• Suffolk Highways Services Contract for the modernisation of traffic signal junctions and connection into and implementation of an Urban Traffic Management and Control system.</li> </ul> <p>The scheme also included a detailed programme of improvements to walking and cycling routes and crossings in and around the town centre.</p>	July 2012 – September 2015	NEC Option B and Through the Support Services Contract	£21,000,000	Yes

No.	Contract	Description	Works Date	Form of Contract	Approximate Value	Project Delivered Successfully
5	Lowestoft Southern Relief Road	<p>Construction of a new 3km single carriageway relief road, as well as 750m of 'on-line' widening and other improvements to the existing carriageway in order to maximise key brownfield sites to the south of Lake Lothing. It also provides an Urban Traffic Management and Control (UTMC) system, including:</p> <ul style="list-style-type: none"> <li>• SCOOT traffic signals;</li> <li>• Bus priority measures;</li> <li>• Real time passenger information;</li> <li>• Variable Message Signing;</li> <li>• Air Quality monitoring.</li> </ul> <p>The associated traffic management measures were completed in early 2007, following the construction of the main relief road (Tom Crisp Way) in June 2006.</p>	January 2005 – February 2007	NEC Contract	£31,000,000	Yes
6	Mutford Lock Refurbishment (Competitive Tender)	Construction of Mutford Lock lift bridges comprising a 12m span steel bascule bridge with fixed approach spans on both approaches and an 8.6m span	1992	ICE Conditions of Contract	£6,000,000	Yes

No.	Contract	Description	Works Date	Form of Contract	Approximate Value	Project Delivered Successfully
		timber overhead bascule pedestrian bridge, together with associated approach road / junction improvements and reconstruction of adjacent railway level crossing.				
7	Eastern Highways Alliance Framework 1	The Lowestoft Northern Spine Road Phase 5 construction of a 1.5km section of single carriageway road with one associated roundabout connecting in to the Trunk Road network.	July 2014 – March 2015	NEC Option B	£5,000,000	Yes

Table 6-1: Evidence of similar projects

#### 6.2.1 *Contractor experience*

As important as the promoter's experience in delivering the scheme will be the selection of a contractor with significant experience of delivering similar large-scale, complex bridge and highway construction projects. The selection and procurement of the contractor is summarised in the Commercial Case, but the management of the contractor is discussed within the project governance section below.

### 6.3 **Programme / Project Dependencies**

The Third Crossing scheme is a 'stand-alone' scheme, which can be delivered as designed and costed independently. It is not dependent upon any other scheme or project. Similarly, no other future projects or schemes are dependent upon it.

The scheme is, however, dependent upon a number of other activities (outlined within the Project Programme), stakeholders and is subject to risks (as set out in the Risk Register). The scheme is also dependent upon the receipt of Government Funding, which could include the Local Majors Fund (announced in the Chancellors Budget Statement, 25<sup>th</sup> November 2015). If the value for money of the scheme cannot be demonstrated, it will not proceed past gateway points at Outline Business Case Stage (Conditional Approval), or Full Business Case Stage (Full Approval), as discussed in Section 6.6).

### 6.4 **Project Governance, Organisation Structure and Roles**

A well-functioning governance structure will be crucial to the successful delivery of the scheme. Suffolk County Council (SCC) will therefore establish a Project Board, a Project Delivery Team and a Stakeholder Group to work together to deliver the scheme. This organisational and governance structure is illustrated in Figure 6-1.

#### 6.4.1 *Project Board*

The Project Board's primary function is decision-making and review, and will provide strategic governance, as opposed the technical input of the Delivery Team. The Board will be responsible for:

- Managing the scheme and ensuring its successful delivery;
- Keeping track of the contractor's adherence to the project programme and completion of milestones, ensuring the scheme is delivered within the constraints of time and budget;
- Providing guidance and support to the Project Manager;
- Authorising necessary funds and spending (to the Contractor);
- Stakeholder management; and
- Managing risks (a shared responsibility with the contractor).

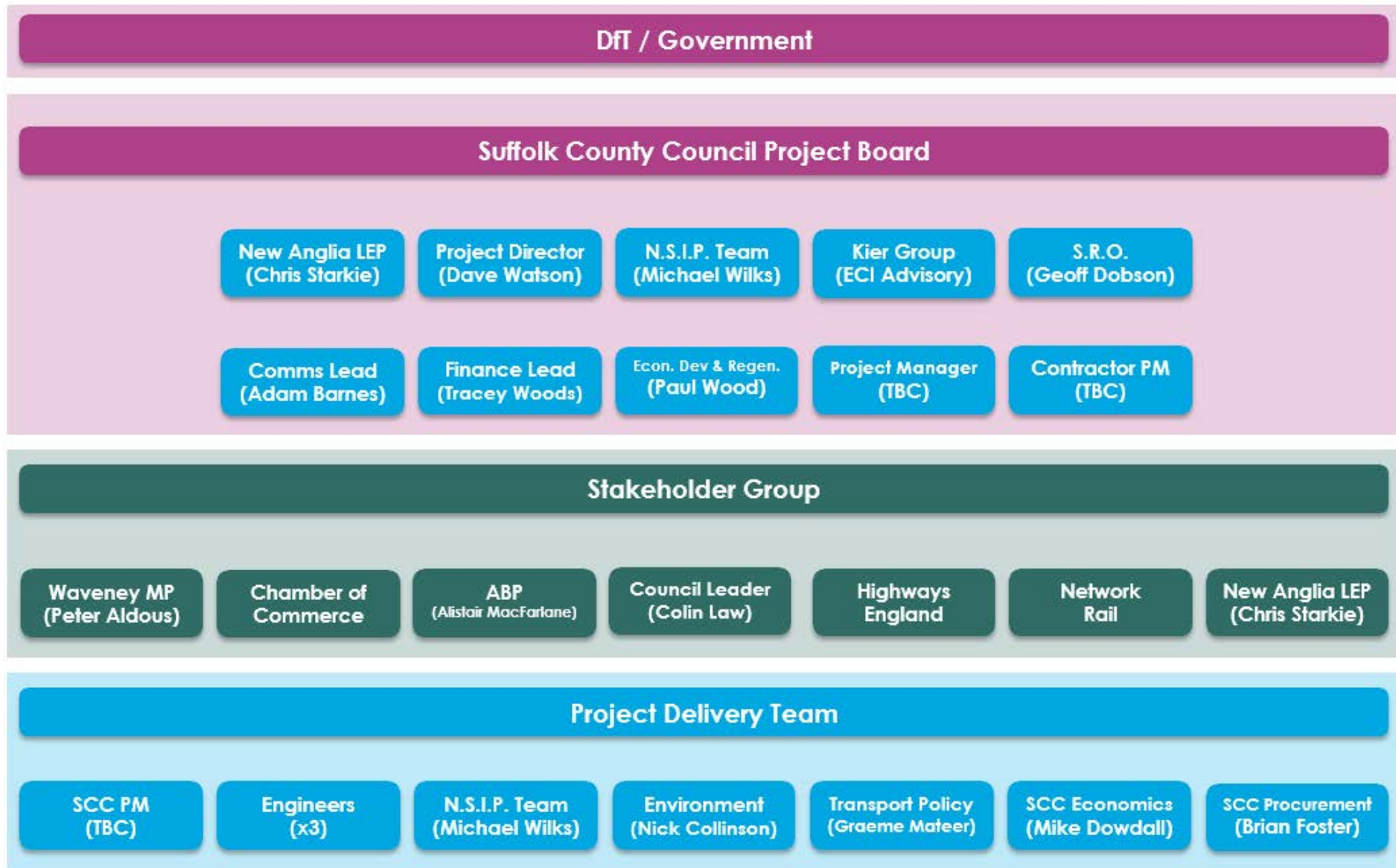


Figure 6-1: High-level governance structure for the Third Crossing project

The Senior Responsible Officer (SRO) will be Geoff Dobson, Director of Resource Management at Suffolk County Council. The SRO will be responsible for chairing meetings and providing guidance and support to the Project Manager as required. The SRO will ensure that the scheme is progressing in line with the originally envisaged project programme and that key deliverables and milestones agreed by the Project Board are achieved. Other members of the Project Board include the SCC Project Director and Project Manager, the contractor's Project Manager and representatives of the LEP. Board Membership is set out in Table 6-2 below.

Individual	Role	Role in Own Organisation
Geoff Dobson	Senior Responsible Officer	Director of Resource Management, Suffolk County Council
Dave Watson	Project Director	Transport Strategy Manager, Suffolk County Council
TBC	Project Manager	New Third Crossing PM role to be created
TBC	Contractor's Project Manager	Contractor's Project Manager for the Third Crossing
Michael Wilks	NSIP Team Representative	Planning Project Manager, Suffolk County Council
Chris Starkie	New Anglia LEP Representative	Managing Director, New Anglia LEP
Paul Wood	Economic Development and Regeneration Representative	Head of Economic Development and Regeneration, East Suffolk Councils
Adam Barnes	Stakeholder Communications Manager	Senior Strategic Communications Officer, Suffolk County Council
Tracey Woods	Suffolk County Council Finance Representative	Chief Accountant, Financial Control

Table 6-2: The Project Board

#### 6.4.2 Project Delivery Team

The Project Delivery Team responsible for the delivery of this project is set out in Table 6-3, contains Officers from Suffolk County Council and Waveney District Council. Some members of this group will overlap with the Project Board to provide efficient communication.

Individual	Role	Role in Own Organisation
TBC	Suffolk County Council Project Manager	New 3 <sup>rd</sup> Crossing PM role to be created
Engineers x 3	Suffolk County Council Engineering Leads	Highways/Structures Engineers
Graeme Mateer	Suffolk County Council Transport Policy Lead	Transport Policy Specialist Transport Strategy Strategic Development
Mike Dowdall	Suffolk County Council Economic Development lead	Economic Development Manager
Brian Foster	Suffolk County Council Procurement lead	Senior Officer – Procurement and Contract Management
Michael Wilks	NSIP Team Representative	Planning Project Manager, Suffolk County Council
Nick Collinson	Suffolk County Council Environment lead	Natural Environment Manager

Table 6-3: Project Delivery Team

Additional discipline specialist expertise will be requested to attend the Delivery Team as and when required.

#### 6.4.3 Stakeholder Group

Representatives from the key statutory stakeholders (the DfT, Network Rail, Highways England and Association of British Ports (ABP)) and project partners (i.e. Waveney District Council, Suffolk and Waveney Chamber of Commerce and the New Anglia LEP), and Peter Aldous, the Member of Parliament for Waveney will be invited by the promoter (Suffolk County Council) to form a stakeholder group<sup>31</sup> for the scheme. This group will identify key constraints to scheme delivery, capture wider stakeholder opinion and disseminate information to other stakeholder and the wider public.

#### 6.5 Programme / Project Plan

A project programme has been developed for this Outline Business Case setting out all the key project tasks and their duration, the interdependencies between each of the tasks, and key milestones and gateways. Certain elements of the programme have built in tolerance / contingency to account for risks identified within the risk register (which could have an impact upon the programme).

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<sup>31</sup> This group up until this point have formed the Steering Group for the scheme (discussed in subsequent sections).



The programme will be a live document, with progress on planned task completion being monitored against actual progress on a weekly basis by the project manager. The Project Manager will report progress against plan to the Project Board.

A greater level of detail will be introduced into the programme during the Full Business Case production, as detailed design of the scheme progresses and as risk quantification and impacts change.

Construction is programmed to commence in February 2018 and will be completed in November 2020. The programme key stages, developed in MS Project, are illustrated in Figure 6-2.

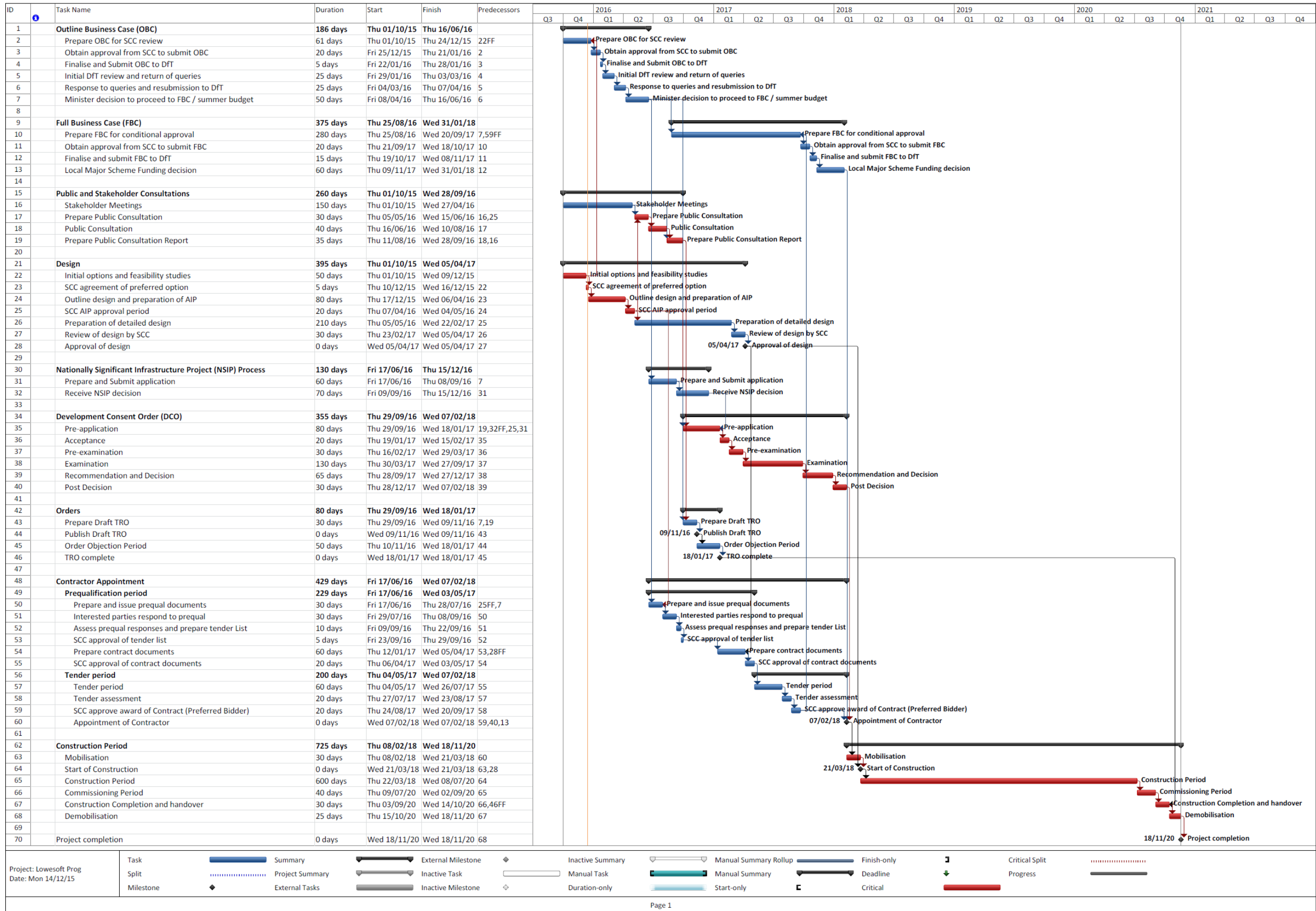


Figure 6-2: Project Programme

## 6.6 Assurance and Approvals Plan

Responsibility for the assurance and approval of the Outline and Full Business Cases rests initially with the DfT, who will assess the technical content of the business cases against appropriate business case and transport appraisal guidance in order to confirm that the scheme represents value for money to the taxpayer. The DfT will then advise Transport Ministers to approve (or decline) the Business Case and scheme.

The DfT typically follow a three-staged gateway process of funding approval:

**Programme Entry.** The Government's commitment to the investigation of the feasibility of the Lake Lothing Third Crossing scheme and the request to produce an Outline Business Case, following earlier assessment, acted as the programme entry agreement. This assessment was backed the New Anglia LEP.

**Conditional Approval** will occur following the DfT's acceptance / approval of the Outline Business Case (including its value for money). It is the gateway to proceed to the development of the Full Business Case but does not guarantee full funding or commitment to the scheme. It does provide the mandate for Suffolk County Council to begin the process of obtaining the requisite statutory powers to construct the scheme (including the NSIP / DCO / planning consents / compulsory purchase etc.).

**Full Approval** occurs after the selection of a preferred contractor following the procurement process, which will achieve a fixed scheme cost and increased scheme cost certainty. The Full Business Case will be submitted at this point and if approved, Suffolk County Council will be able to start drawing down funding and begin construction.

The promoter will liaise with the DfT and the New Anglia LEP to develop and agree the Assurance and Approvals plan during the development of the Full Business Case.

### 6.6.1 *Local Contribution Funding Approval*

The local funding contribution is discussed within the Financial Case. However, to confirm, Suffolk County Council's Section 151 Officer has underwritten the local contribution. As a member of the Steering Group, the S151 Officer will also approve the release of local funding, when satisfied and appropriate to do so.

## 6.7 Communications and Stakeholder Management Plan

Suffolk County Council's approach to developing and maintaining the active support and commitment of stakeholders and the community, to facilitate the timely and successful implementation of the project, is described below.

A stakeholder management methodology, as set out in the Office of Government Commerce (OGC) paper 'Category Management Toolkit – Stakeholder Management Plan' will be adopted. This involves the systematic identification and mapping of

stakeholders; assessing stakeholder impacts; and managing any negative influences and impacts.

The stakeholder management plan is closely linked with the risk management strategy outlined within Section 6.8.

#### 6.7.1 *Stakeholder Identification*

The following key stakeholders have the potential to influence the outcome of the scheme, the project programme or project costs, and were identified at project inception.

- Peter Aldous MP;
- Associated British Ports;
- Department for Transport;
- Environment Agency;
- Highways England;
- Lowestoft and Waveney Chamber of Commerce;
- Lowestoft Vision;
- Network Rail;
- New Anglia LEP;
- Suffolk Chamber of Commerce;
- Suffolk County Council; and
- Waveney District Council.

These stakeholders have been consulted on the project to highlight issues and constraints which fed into the development of options set out in the Option Appraisal.

In addition to this process, a project steering group was formed to maximise the flow of information and communication between statutory consultees, stakeholders and project partners, so that relevant project constraints could be quickly identified and mitigated against.

Other stakeholders contacted during the production of the business case include local business, detailed below:

- Arnolds Keys (Agent for Jeld Wen);

- Boston Putford Offshore Safety Limited;
- CEFAS;
- Dudman Limited;
- Excelsior Trust;
- Haven Marine Ship Management Limited;
- Holmans Marine Solutions;
- International Boat Training College;
- Kirkley Business Association;
- Lowestoft Cruising Club;
- Lowestoft Haven Marina;
- National Oilwell Varco Limited;
- Nexen Lift Trucks;
- Northgate Marine Limited;
- OGN Group;
- Peter Colby Commercials;
- Petans Limited;
- Sembmarine SLP; and
- Small & Co. (Marine Engineering) Limited.

Finally, two key stakeholder engagement events were organised to capture stakeholder opinion and to feed into the stakeholder analysis: a public consultation and a business consultation event.

#### 6.7.2 *Stakeholder Engagement – Public Consultation*

Public consultation events to disseminate information on the preliminary optioneering (option type, location and option development), to capture public opinion and degree of support for the scheme, and to record and measure responses, were undertaken on Friday 20<sup>th</sup> June and Saturday 21<sup>st</sup> June 2014. Full details of this consultation are contained in Appendix N.

A formal presentation of work undertaken to date was followed by question and answers. This format allowed the public an opportunity to debate the scheme with officers from Suffolk County Council and Waveney District Council. The public were also invited to complete a questionnaire to formally record their opinions for later processing and analysis.

The public consultation events were advertised in several local press releases in the local newspaper, and a poster was displayed at key locations around the town centre (e.g. Lowestoft Library, Council offices and 60+ club) throughout the consultation period.

For those members of the public unable to attend the consultation on the provided dates, display boards were exhibited in the Marine Customer Service Centre, Lowestoft, from Monday 23<sup>rd</sup> June to Sunday 20<sup>th</sup> July 2014. Copies of the display boards and the online questionnaire were also available online until Wednesday 30<sup>th</sup> July 2014.

Table 6-4 below summarises the responses of the public from 175 completed questionnaires and online submissions.

Preferred Location	Count	%
Western	43	23.9%
Central	109	60.6%
Eastern – Option A	4	2.2%
Eastern – Option B	6	3.3%
Eastern – Option C	5	2.8%
Other	8	4.4%
No response given	5	2.8%
<b>Total</b>	<b>180<sup>32</sup></b>	<b>100.0%</b>

*Table 6-4: Results of questionnaire regarding preferred location*

The results show that approximately 61% of the respondents favoured the central crossing option, with key reasons given for their choices being:

- It would link up to the Southern Relief Road and Peto Way; and

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<sup>32</sup> Count exceeds number of respondents as 5 individuals gave more than one preferred location

- It would free up the existing eastern bridge (the bascule bridge) for buses, taxis and local access.

The second most favoured option was the western option, which was supported by almost 24% of respondents. Key reasons for their choice are as follows:

- It would allow for more sea-berth development;
- It would make use of unoccupied industrial land;
- It would take traffic away from the town centre, reducing congestion; and
- The western part of town has seen major growth and the western crossing would cater for this increased traffic.

8.3% of respondents favoured a crossing in an eastern location (though no single option generated more than 3.3% of the responses), with key reasons being:

- This is considered to be the most convenient for linking the Southern Lowestoft Relief Road with the new Northern Spine Road and Denmark Road;
- It would leave the existing bridges for local traffic; and
- It could bridge the railway line to the north of the Lake (another barrier to travel and movement in the town).

4.4% of respondents did not favour any of the proposed locations, with responses for alternative options including:

- A fly-over bridge, crossing both the river and railway, starting from Peto Way roundabout;
- A crossing from Riverside Road across to Rotterdam Road;
- A four lane bridge to maximise bridge capacity; and
- A plan that does not involve a single lifting bridge.

This information was used in the development and refinement of further options, and in the formal option assessment process described and reported on in Section 2.13. The key outcome from this event was the clear preference for a crossing in the central location, and a clear vote against a crossing in an eastern location.

Should this business case proceed to Full Business Case stage (following sign-off from the DfT and Transport Ministers), further public consultation will be undertaken during the DCO process.

### 6.7.3 *Stakeholder Engagement – Business Engagement*

An extensive engagement exercise was undertaken involving local businesses in September 2015. The objectives were:

- to understand the impacts of congestion on existing business activities and the extent to which it constrains prospects for growth;
- to understand the likely value that a third crossing would add for local businesses; and
- to determine which route corridor would be most acceptable to local businesses.

The exercise was commissioned by Suffolk County Council and the Suffolk Chamber of Commerce and undertaken by the Suffolk Business School. It was also supported by Lowestoft and Waveney Chamber of Commerce, Lowestoft Vision, the Institute of Directors, the Federation of Small Businesses, New Anglia LEP Local Transport Board, Invest in Suffolk, and NWES, each of whom sent details of the survey to their members. Links to the survey and the event invitation were publicised on Twitter and LinkedIn as a way to attempt to reach as many businesses as possible. The exercise involved an online survey and a business consultation event in Lowestoft.

#### *Survey*

The survey was developed through the use of questions derived from Office for National Statistics and Scottish Executive guidance on the calculation of value-added in similar proposals. Three 'free text' questions were included to prompt respondents to explain the impact of the current situation and proposed changes to their business. 151 businesses responded to the online survey.

#### *Consultation event*

Businesses in the area were also invited to a consultation event at which the consultation and business case work were explained and at which discussions on the plans were held. 77 businesspeople attended representing a broad range of local businesses of all sizes and from a variety of sectors.

The full study report is included in Appendix C. Key results are summarised below.

#### *Key survey findings*

More than 70% of the responses were from businesses with fewer than 24 employees. The majority of respondents reported a turnover of over £1 million in the previous year, indicating that the responses are from business making a significant economic contribution to the area.

A majority of respondents reported that **traffic causes “very significant problems” to their business**, as illustrated in Figure 6-3 below.



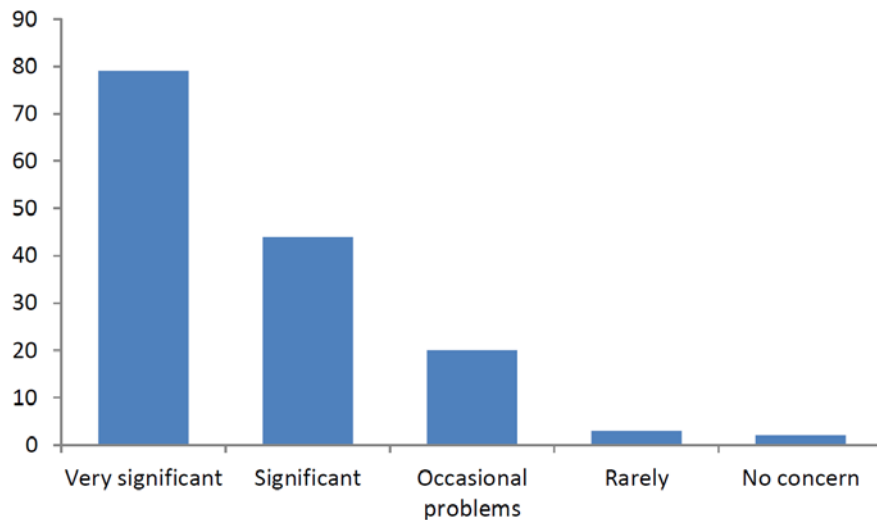


Figure 6-3: Degree to which traffic causes a problem to businesses

Businesses were asked to comment on growth in turnover:

- If there is NO new crossing of Lake Lothing, what is your best estimate for growth in TURNOVER over the next 5 years (as a percentage)?; and
- If there WAS a new crossing of Lake Lothing tomorrow, what is your best estimate for growth in TURNOVER over the next 5 years (as a percentage)?

The mean result in the first case (no crossing) was an expected turnover growth of 5%. The mean result in the second case (crossing exists tomorrow) was an expected turnover growth of 23%. It is clear from these results that businesses believe a new crossing would bring very great economic benefits to their organisations.

Businesses were also asked to comment on growth in employment:

- If there is NO new crossing of Lake Lothing, what is your best estimate for growth in EMPLOYMENT over the next 5 years (in full-time equivalents)?; and
- If there WAS a new crossing of Lake Lothing tomorrow, what is your best estimate for growth in EMPLOYMENT over the next 5 years (in full-time equivalents)?

The mean result of the first case (no crossing) indicates expected growth in employment of 0.02 full-time equivalents. Large numbers of respondents indicate no growth or a decline in employment – 99 respondents provide a prediction of 0 or less than 0, and a further 24 provided no response. Only 27 respondents indicate growth in employment without a new crossing.

In the second case (crossing exists tomorrow) the expected growth in employment is 8.1 full-time equivalents (FTE). It is clear that the presence of a new crossing is predicted to lead to much greater employment and is associated by respondents with

prosperity and economic growth. It is also worth noting that the size of responding businesses (see above) suggests that average increases of 8 FTE employees are very substantial indeed.

Survey Respondents were also asked to comment on the potential location of any new crossing. Three areas were indicated on a map and respondents were asked to rank their preferences. Some respondents also chose to comment on the reasons behind their selection.

Preferred Corridor	Most Preferred	Second Choice	Least Preferred
West	61 (40%)	61	20
Central	70 (48%)	66	5
East	18 (12%)	9	99
No response	0	13	25
<b>Total</b>	<b>149 (100%)</b>	<b>149</b>	<b>149</b>

Table 6-5: Business consultation (2015): the location of a new crossing

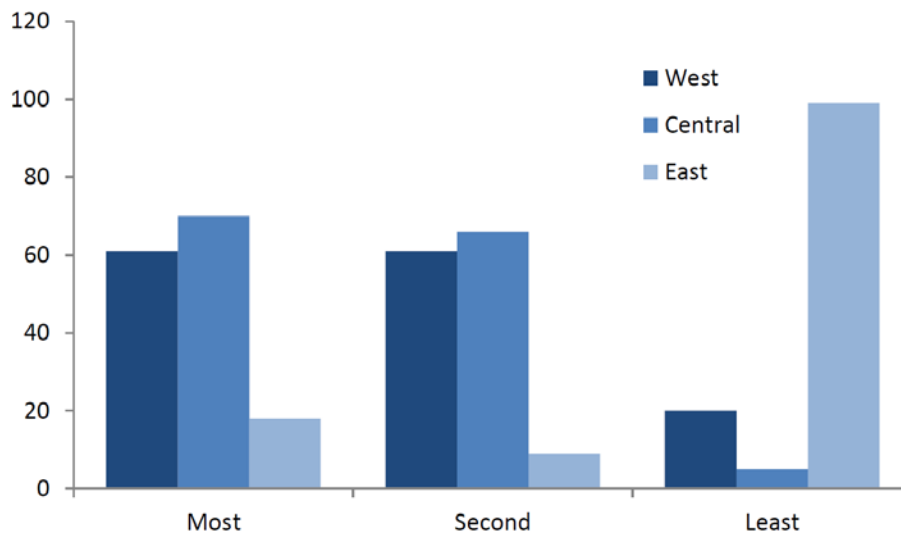


Figure 6-4: Business consultation (2015): the location of a new crossing

The responses show no clear preference between the west and central locations for the crossing, but a clear vote against the eastern location. Comments in favour of the central location mainly suggest that it offers the most obvious connection with existing road layouts. Comments against the easternmost location mainly suggest that it either adds to, or at least does not alleviate, the bottleneck that currently exists around the Bascule Bridge and the town centre.

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

#### 6.7.4 *Steering Group*

Representatives from the key statutory stakeholders (the DfT, Network Rail, Highways England and Association of British Ports (ABP)) and project partners (i.e. Waveney District Council, Suffolk and Waveney Chamber of Commerce and the New Anglia LEP), were invited by the promoter (Suffolk County Council) to form a steering group to oversee the development of the scheme. Individuals from the group will become the stakeholder group, described above during the development of the Full Business Case.

This group, chaired by Peter Aldous, the MP for Waveney and scheme champion, aims to identify key constraints to scheme delivery, capture wider stakeholder opinion, disseminate information to other stakeholder and the wider public, to steer the development of the scheme, and monitor progress of the scheme and development of the business case.

#### 6.7.5 *Association of British Ports (ABP)*

ABP has been consulted during the development of the initial design. However, before they could fully support the scheme, they would need to understand more detail of the potential impacts on the Port and how it may impact on their future plans, strategies and investment in Lowestoft. ABP will therefore be engaged monthly to identify specific design issues. This affords the opportunity for any designs, during the detailed design process, to be adapted to mitigate any potential adverse impact upon the Port.

It has been agreed already with the Steering Group and ABP that a 'boat simulation', using an ABP-assigned pilot, which will be developed by the boat college, will be undertaken to ascertain how the proposed bridge will impact upon vessel movement and activity.

In order to determine in detail the potential negative economic impact of the scheme on future investment plans by ABP, which might have the effect of slightly reducing the wider scheme benefits, the development of a bespoke methodology will be necessary. This will be discussed with the DfT and ABP during further development of the scheme. Given the small footprint of the bridge, and the mitigation strategies which will flow from the stakeholder group, this negative impact is considered to be minimal at this stage.

#### 6.7.6 *Lake Lothing Third Crossing website*

A website has been set-up in order to provide current and up-to-date information relating to the progress of the Lake Lothing Third Crossing project. This will update local residents and businesses on the progress of the transport business case, funding streams and approvals for the scheme, amongst other relevant information. This will ensure that all stakeholders and local residents are kept aware of the latest developments relating to the scheme. The website can be found at the following URL: [www.lowestoftcrossing.co.uk](http://www.lowestoftcrossing.co.uk).

6.7.7 *Resources*

The communication activities for this scheme will be resourced by both Suffolk County Council and Waveney District Council's Corporate Communications Team.

Adam Barnes is the Senior Strategic Communications Officer at Suffolk County Council and will be the named communications lead for this scheme. Phil Harris is the Communications Manager at Waveney District Council.

6.7.8 *Communication Protocols*

All communications regarding the scheme will be approved by the Council's Corporate Communications Team.

6.7.9 *Notice of works*

All requirements for the advance notice of works will be led by the contractor. The contractor will be required to identify all the communication activities necessary to support a proposed start of works date and ongoing construction milestones.

6.8 **Risk Management Strategy**

Risk management is the methodical approach to identifying, quantifying and managing risks that occur during the lifecycle of a project. The key to effectively mitigating risks is to develop a series of well-defined steps to support better decision-making through an understanding of the potential risks inherent to a scheme and their likely impact. Annex 4 of Treasury Green Book emphasises that *“effective risk management helps the achievement of wider aims, such as: effective change management; the efficient use of resources; better project management; minimising waste and fraud; and supporting innovation”*.

The Book recommends a four-stage process which is broadly cyclical (plan-do-review) requiring on-going review and update of risks to ensure that effective controls are implemented during scheme development and delivery. The risk management strategy is illustrated in Figure 6-5.



Figure 6-5: Risk Management Strategy

### 6.8.1 Risk management process

Risk management is seen as a key process underpinning good scheme governance and achievement of scheme objectives in a cost effective manner. *TAG Unit A1.2* requires all project related risks, which may impact on the scheme costs, to be identified and quantified in a Quantified Risk Assessment (QRA) to produce a risk-adjusted cost estimate.

The outcome of the QRA process is the prediction of an 'expected' risk value which is the average of all risk outcomes, factoring in the various probabilities of these risks materialising. This 'expected' value effectively becomes the 'risk adjusted cost estimate'. The risk assessment has been undertaken using the following four-stage process:

- Risk identification;
- Risk quantification;
  - Assessing the impacts of risk;
  - Assessing the likelihood of risk; and
- Managing risk.

This process is described below.

### 6.8.2 Risk identification

For this scheme, risks have been identified during multi-disciplinary discussions, including inputs from technical experts in highway and structural engineering, geotechnical, planning, transport planning, quantity surveyors and environmental disciplines. Suffolk County Council and Waveney District Council have also provided input for the risk identification process. These risks have been catalogued within a risk register, which is contained within Appendix O.

The scheme risks can largely be grouped into the following categories:

- Risks to the project programme;
- Political risks;
- Risks to scheme cost;
- Risks to scheme funding;
- Risks to the operation of the transport network;

- Design and information risks;
- Health and safety risks;
- Reputational risks; and
- The risk to impact on existing highway network.

### 6.8.3 *Quantification of risks*

#### 6.8.3.1 **Assessing the impact of risk (costs)**

Each risk has been evaluated in terms of the cost outcomes of the risk. Whilst DfT recommends<sup>33</sup> the use of empirical evidence to estimate a range of cost outcomes, wherever possible, it is noted that ‘common sense approximations’ should be used when such empirical data is not available, rather than aiming for unrealistic levels of accuracy. At this stage, the cost range associated with the consequences of each risk was estimated, where the 85<sup>th</sup> percentile is the most likely value. The estimates have been derived following input from each discipline specialist working alongside the Quantity Surveyor, to ensure estimates of cost (and probability, discussed within the next section) are complete and accurate, and consistent with the basis of the base cost estimate.

#### 6.8.3.2 **Estimating the likelihood of the outcomes occurring**

Having estimated the likely impact (in cost terms), the likelihood (probability) of the risk occurring also needs to be estimated. Assigning probabilities is not an exact science<sup>34</sup> and therefore the scheme team technical specialists, including Quantity Surveyors, have had to apply a degree of judgement based experience gained from working on other similar projects (as noted within Section 6.2).

Once the ‘impacts’ and ‘probabilities’ have been estimated, the risks were mapped onto a 5-point risk matrix (see Table 6-6) to generate an overall ‘risk score’.

Each risk has been assigned a likelihood rating, which is expressed in terms of a percentage. This has been multiplied by the estimated financial value of the risk occurring, to give an expected value. The sum of these expected values forms the total included in the financial case as the ‘cost of risks identified in quantified risk assessment’.

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<sup>33</sup> TAG Unit A1.2, p8, para 3.2.10

<sup>34</sup> TAG Unit A1.2 scheme Costs, p8, para 3.2.14

*The Risk Matrix*

<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td style="background-color: red; color: white;">HIGH RISK</td></tr> <tr><td style="background-color: orange;">MEDIUM RISK</td></tr> <tr><td style="background-color: green;">LOW RISK</td></tr> </table> </div> <div> <p><b>Overall Risk =</b> Impact x Probability</p> </div> </div>						HIGH RISK	MEDIUM RISK	LOW RISK	PROBABILITY □				
						HIGH RISK							
						MEDIUM RISK							
						LOW RISK							
						Negligible	Unlikely	Possible	Probable	Almost Certain			
Very Low	Low	Medium	High	Very High									
<5%	6-20%	21-50%	51-80%	>80%									
□	□	□	□	□									
IMPACT □	> 5%	> 20%	Major	Very High / Showstopper	□	5	10	15	20	25			
	3 to 5%	10 to 20%	Large	High	□	4	8	12	16	20			
	1 to 3%	5 to 10%	Moderate	Medium	□	3	6	9	12	15			
	0.5 to 1%	1 to 5%	Minor	Low	□	2	4	6	8	10			
	< 0.5%	< 1%	Minimal	Very Low	□	1	2	3	4	5			
	<b>Cost as % of Project cost (not just fees)</b>	<b>Time</b>	<b>Quality</b>	<b>Overall IMPACT</b>	<b>Score</b>	Cost / time and quality may be affected differently by a single risk. If overall risk is required, use the most severe affected component or give consideration to managing each separately.							

Table 6-6: Impact / Probability Matrix

**6.8.3.3 Deriving the probability distribution for the costs of the scheme**

As mentioned above, the outcome of the QRA process is the prediction of an ‘expected’ value which is the average (or a percentile) of all risk outcomes, weighted by the various probabilities of these outcomes materialising. It is to this ‘expected’ value, also known as the ‘mean’ or ‘unbiased’ risk adjusted outcome, that the optimism bias has been applied. A probability distribution around the costs of the scheme has been derived using @Risk v6.3<sup>35</sup> and is illustrated in Figure 6-6 and Figure 6-7 below.

These graphs provide the following values of risk. The mean cost has been used in the preparation of the overall scheme cost as it is the ‘expected value’ which represents the weighted average of all outcomes and probabilities<sup>36</sup>.

<sup>35</sup> @Risk v6.3 is a proprietary software that performs risk analysis using Monte Carlo simulation. The software carries out 10,000 iterations per run, randomly creates simulations of differing risk occurrence scenarios and estimates a range of risk costs

<sup>36</sup> TAG Unit A1.2: scheme Costs, p9, paragraph 3.2.18 (2014)

- Mean cost – £19,166,306;
- 50<sup>th</sup> percentile cost – £18,767,236; and
- 85<sup>th</sup> percentile cost – £25,545,702.

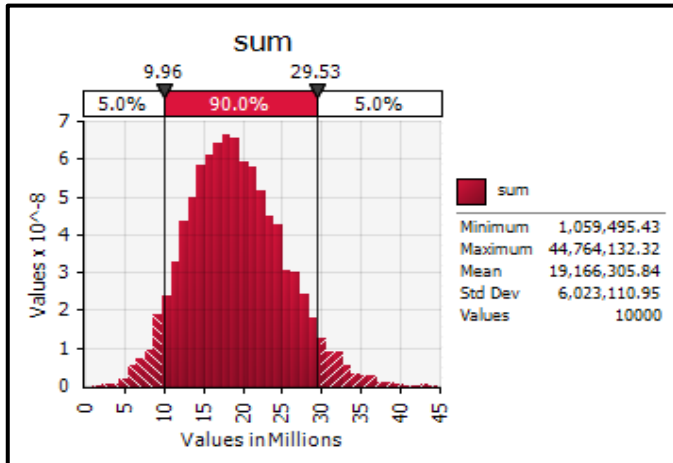


Figure 6-6: Distribution of total risk cost – 1

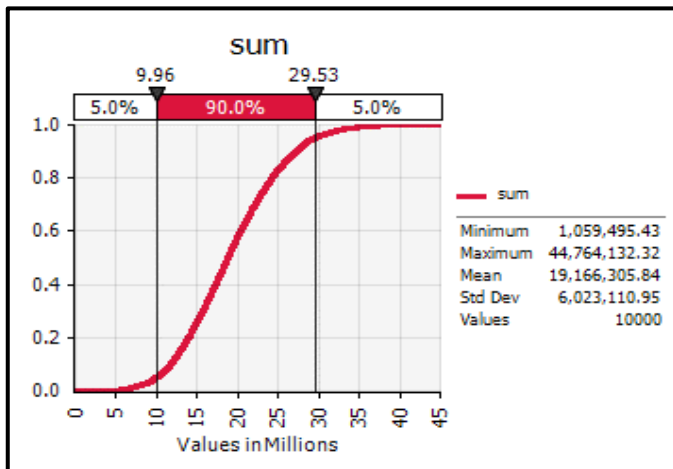


Figure 6-7: Distribution of total risk cost – 2

#### 6.8.4 Managing risks (response plans and mitigation)

Following the initial assessment of scheme risks, a systematic approach was adopted to respond to risks and allocate responsibility to the most appropriate party in line with governance arrangements set out in Section 6.4. One of the following four strategies is been adopted for each risk when developing a suitable response plan.

- **Accept or tolerate** consequences in the event that the risk occurs – In the event that a) the cost of taking any action exceeds the potential benefit gained; or b) there are no alternative courses of action available;



- **Treating** the risk – Continuing with the activity that caused the risk by employing four different types of control including preventative, corrective, directive and detective controls<sup>37</sup>;
- **Transferring** the risk – Risks could be transferred to a third party e.g. insurer or contractor; and
- **Terminating** the activity that gives rise to the risk.

Development of the response plans to manage risks have been undertaken only where the likelihood and of occurrence and impact can be risks can be cost effectively managed.

#### 6.8.5 *Implementation and review*

Effectiveness of the response plan is dependent on the proper implementation and review of the residual risk (including any secondary risk associated with implementation). Reviews of the status of scheme risk assessments and their related response plans (as part of project reporting) will be an integral part progress meetings (and at the Project Board) during progression of detailed design and the construction period. All key risks will be formally reviewed at key decision points in the scheme lifecycle.

#### 6.9 **Benefits Realisation Plan**

A Benefits Realisation Plan will be prepared for the Lake Lothing Third Crossing scheme. The plan is designed to enable benefits, and disbenefits, that are expected to be derived from the project, to be planned for, managed, tracked and realised. The plan will help demonstrate whether the scheme objectives identified in Section 2.7 are able to generate the desired ‘measures for success’. This can be assessed by tracking and realising the desired outputs and outcomes of the project.

Desired outputs are those tangible effects that are funded and produced directly as a result of the scheme. Desired outcomes are the final impacts brought about by the scheme in the short, medium and long-term. The scheme objectives, together with the desired outputs and outcomes, are summarised in Table 6-7.

Scheme Objectives	Desired Outputs	Desired Outcomes
To open up opportunities for regeneration and development in Lowestoft	A scheme that improves the traffic issues currently experienced by business	Reduced congestion on the approaches to the existing bridges

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<sup>37</sup> The Orange Book, HM Treasury (2004)

Scheme Objectives	Desired Outputs	Desired Outcomes
To provide the capacity needed to accommodate planned growth	users and residents by providing a third road crossing across Lake Lothing, and opens up areas for regeneration surrounding the Lake	Reduced journey time and improved reliability on the A12 corridor through Lowestoft, and on the routes incorporating the existing bridges
To reduce community severance between north and south Lowestoft	A scheme that integrates the surrounding transport network to deliver an overall improvement to reliability, resilience, accessibility and safety for transport users in Lowestoft	Alternative route choice for transport users
To reduce congestion and delay on the existing bridges over Lake Lothing		Increase in the use of active travel modes
To reduce congestion in the town centre and improve accessibility		Reduced number of accidents, and casualties, especially on the A12 corridor through Lowestoft.
To encourage more people to walk and cycle, and reduce conflict between cycles, pedestrians and other traffic		Improved local economy through regeneration and development
To improve bus journey times and reliability		
To reduce accidents		

Table 6-7: scheme objectives, desired outputs and desired outcomes

The Project Manager will develop a Benefits Realisation Plan, intrinsically linked to the Monitoring and Evaluation Plan set out in Section 6.10 below. The DfT guidance sets out a five-stage cycle for the evolution of benefits, their maintenance and monitoring during the lifecycle of a programme, highlighted in Figure 6-8.

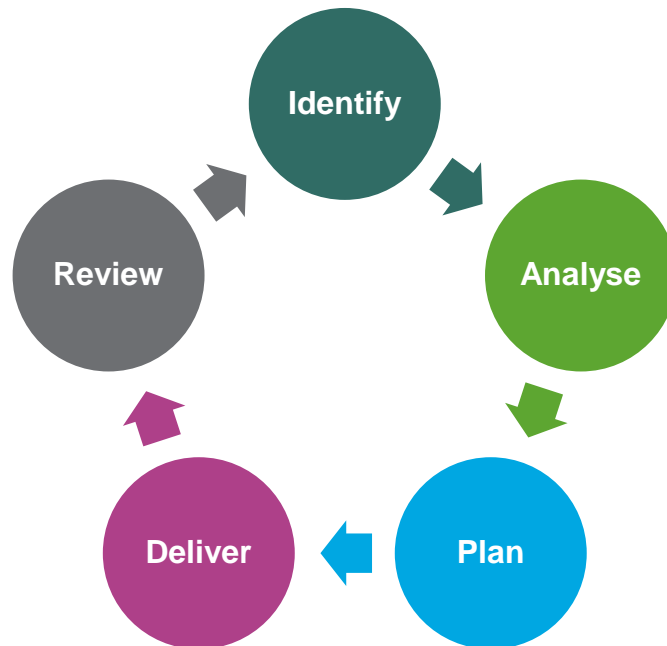


Figure 6-8: The Benefits Management Cycle (Source: DfT Programme and Project Management Portal)

The owner and partners will undertake a full assessment of potential benefits, in accordance with the DfT guidance set out above. Therefore, the process that should be upheld can be based on the following:

- **Identify** – the stakeholders impacted by the scheme, and the beneficiaries of each benefit; any additional enablers required over-and-above the proposed scheme; the responsible body or individual for delivering the benefits; target dates for the achievement of the anticipated benefits;
- **Analyse** – once the potential benefits have been identified, they need to be systematically analysed to calculate their financial value and the level of risk associated with the calculations;
- **Plan** – implement a clear timetable for delivering the Third Crossing. The timetable will be a live document throughout the delivery process and will be informed of any necessary steps that are planned to maximise the benefits;
- **Deliver** – the programme will ensure that the identified benefits are delivered by working closely with stakeholders and delivery partners; and
- **Review** – the benefits will be reviewed at pre-determined stages that fit into the wider programme delivery. This part of the process is where the monitoring and evaluation most clearly overlaps with the benefits realisation.

The owners will be responsible for tracking the identified benefits and for reporting any exceptions to the Senior Responsible Officer / Project Manager. This will allow early identification of any expected benefits that may become unrealised to be remedied.

## 6.10 Monitoring and Evaluation Plan

The HM Treasury Magenta Book provides the following definition of Monitoring and Evaluation<sup>38</sup>:

- **Monitoring** – seeks to check progress against planned targets and can be defined as the formal reporting and evidencing that spend and outputs are successfully delivered and milestones met; and
- **Evaluation** – is the assessment of the initiatives effectiveness and efficiency during and after implementation. It seeks to measure the causal effect of the scheme on planned outcomes and impacts and assessing whether the anticipated benefits have been realised, how this was achieved, or if not, why not.

The DfT has also published a document entitled, 'Monitoring and Evaluation Framework for Local Authority Major Schemes' (2012), designed to make the process as consistent and proportionate as possible. It also aimed to be complementary with the devolution of decision making. The document sets out three levels of monitoring and evaluation:

- Standard monitoring;
- Enhanced monitoring; and
- Fuller evaluation.

All schemes are required to conduct the 'standard monitoring' approach, whereas schemes costing more than £50 million are expected to follow the 'enhanced' guidance. Only selected schemes, identified by the DfT are expected to conduct 'fuller' evaluation. As the Third Crossing scheme will have an expected outturn cost of above £50 million, it will follow the DfT's enhanced monitoring guidance. It is expected that the scheme will undertake enhanced monitoring in addition to the standard measures. The measures that fall into the 'enhanced monitoring' category are summarised in Table 6-8.

Item	Stage	Collection Timing	Rationale	Information Required
Noise	Impact	Pre or during delivery / post opening (up to 5 years)	Accountability / Knowledge	Effect of the scheme on noise levels at important receptor locations and analysis of the difference

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<sup>38</sup> The Magenta Book, HM Treasury (2011)

Item	Stage	Collection Timing	Rationale	Information Required
				between outturn results and scheme forecasts
Local Air Quality	Impact	Pre or during delivery / post opening (up to 5 years)	Accountability / Knowledge	Effect of the scheme on local air quality in the area of interest and analysis of the difference between outturn results and scheme forecasts
Accidents	Impact	Pre or during delivery / post opening (up to 5 years)	Accountability / Knowledge	Effect of the scheme on traffic accidents in the area of interest and analysis of the difference between outturn results and scheme forecasts

Table 6-8: Enhanced monitoring measures

The Monitoring and Evaluation Plan for the Third Crossing project is set out below.

#### 6.10.1 Description

A full description of the scheme has been provided in 1.4.

#### 6.10.2 Logic Model

A logic model is shown in Figure 6-9. It provides an illustrative overview of the inputs and activities of the scheme, and refers to its outcome measures of performance.

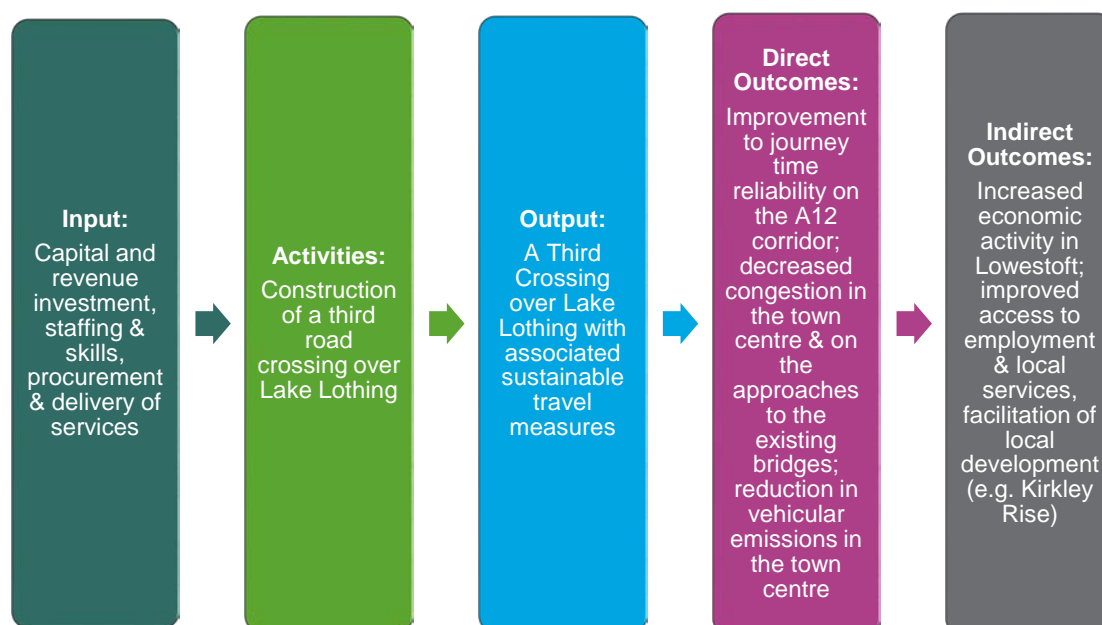


Figure 6-9: Logic Model

### 6.10.3 Type of Evaluation

The type of evaluation method proposed to evaluate the scheme will be an ‘outcome evaluation’. Outcome evaluations compare the existing situation, i.e. before the intervention (the Lake Lothing Third Crossing) has been introduced, against the situation with the intervention in place. Any observed changes (in the metrics described in Sections 6.10.4 and 6.10.5 below) are assumed to be the result of the intervention.

### 6.10.4 Data requirements

The metrics proposed for the Lake Lothing Third Crossing project, associated data collection requirements and frequency of data collection are as follows:

Metric	Frequency	Data
<b>INPUTS</b>		
Expenditure	Post Opening	Financial monitoring of project
Funding Breakdown	Post Opening	Financial monitoring of project
In kind resources provided	During delivery	Monitoring of resources delivering the project (use of project diary)
<b>OUTPUTS</b>		
Delivered scheme	Post Opening	Full description of implemented scheme outputs including design changes post funding approval with reasons for such changes, post scheme as built drawings of works completed
<b>OUTCOMES</b>		
Air quality	Pre and post construction, Annual up to 5 years post opening	Data from continuous monitoring stations located in the vicinity of the Third Crossing
Average daily traffic and by peak / non-peak periods	Pre and post construction, Years 1 and 5 post opening	Annual ATCs and turning counts, collected at junctions where interventions are and wider ATCs across the network
Average AM and PM peak journey time on key routes (journey time measurement)	Pre and post construction, Years 1 and 5 post opening	Journey time surveys and DfT Congestions Statistics on LA A Roads
Cycling and walking usage	Pre and post construction,	Mode share surveys (including walking, cycling and public transport – bus, rail & Park and Ride)

Metric	Frequency	Data
	Years 1 and 5 post opening	
Accident and casualty rates	Pre and post construction, Years 1 and 5 post opening	Annual monitoring of collisions (STATS 19)
Average annual CO <sub>2</sub> emissions	Pre and post construction, Years 1 and 5 post opening	DfT's Local Authority Carbon Toolkit

Table 6-9: Data requirements and frequency of data collection

#### 6.10.5 Sources of Data

The following surveys will be undertaken by Suffolk County Council and Waveney District Council:

- Journey times;
- Automatic Traffic Counts (ATCs);
- ANPR survey;
- Turning counts; and
- Mode share.

Other data will be collected by the Council on an annual basis including accidents (STATS19), financial and planning data (e.g. Annual Monitoring Report), retail sales and Lowestoft footfall figures.

#### 6.10.6 Implementation

##### *Resourcing*

The monitoring and evaluation for the Lake Lothing Third Crossing project will be undertaken by Suffolk County Council. The surveys cost will be calculated at Full Business Case stage and will be funded through Suffolk County Council's monitoring budget.

##### *Timing*

Prior to starting on site, any gaps in the required baseline evidence will be collected. A baseline evidence report will be completed by February 2018, prior to construction of the crossing. Regular monitoring reports will be provided on a quarterly basis to the New Anglia LEP / DfT in terms of progress against programme, costs and risks. In addition, an annual monitoring summary will be undertaken. Principles of

monitoring and evaluation will be in line with Highway England Post Opening Project Evaluation (POPE) requirements.

POPE for the scheme will use baseline data to be collected from 2016, which will include journey times, traffic flows, traffic speeds and accidents alongside planning data. Data will then be collected one year and five years post opening (2021 and 2025), which will be compared against the baseline data to quantify the extent of benefits realised. '1 year after' and '5 year after' evaluation reports will be produced, which contains the results of a meta-analysis of all scheme evaluations carried out so far, highlighting any interesting and emerging trends. It is, however, anticipated that wider economic benefits may take longer time frames to manifest. This would invariably have a bearing on the timing of surveys and subsequent reporting.

#### 6.10.7 Responsibility

Details of the individual responsible for implementing the monitoring and evaluation plan, at Suffolk County Council, are set out in Table 6-10 below.

<b>Name</b>	Dave Watson
<b>Address</b>	Endeavour House, 8 Russell Road, Ipswich, Suffolk, IP1 2BX
<b>Telephone</b>	01473 264822
<b>Email</b>	Dave.Watson@suffolk.gov.uk

Table 6-10: Details of the individual responsible for the monitoring and evaluation plan

#### Setting targets

The Council recognises the importance of setting specific indicators and targets, and accepts that the Monitoring and Evaluation Plan does not yet include these. The Plan will be updated in the Full Business Case to include these. It may be possible to involve stakeholders to take ownership of some parts of the monitoring and evaluation; this will become clearer after the consultation phase.

#### 6.10.8 Summary of analysis

The monitoring and evaluation will be used to answer the following key questions:

1. Have the anticipated outcomes and impacts been achieved?
  - To what extent are the observed changes additional to what would have happened in the absence of the intervention?
  - Were there any unanticipated impacts / displacement effects?
  - Which elements of the scheme were particularly influential in achieving the overall goals?
  - What lessons can be learnt for future scheme / policy development?
  - What is the contribution of the policy to the LEPs strategic goals?



2. To what extent did the anticipated costs and benefits match the actual outcome?
3. Has the scheme been successful? If not, why not?

The evaluation of the scheme will:

- Measure the level of traffic congestion on the existing network;
- Measure the level of traffic congestion on the improved network; and
- Measure the levels of accidents on the existing and improved network.

The initial one year impact assessment will be used to understand the impact mainly on journey times and travel patterns. There may be some evidence at this stage of the scheme impact in terms of developments and jobs. The 5 year assessment will look at longer term benefits including accidents, travel patterns and jobs / additional investment.

#### *6.10.9 Linking indicators to outcomes*

It is important to demonstrate how the proposed indicators relate to the desired outcomes. The Monitoring and Evaluation Plan will therefore be updated in the Full Business Case. A more detailed logic map / causal chain diagram was contained within the Strategic Case. This will show how interventions link to the achievement of objective is provided below, and how these can be monitored either directly or indirectly.

#### *6.10.10 Uses of evaluation*

With such emphasis on economic impact, the Monitoring and Evaluation will have to consider attribution of outcomes to the intervention and whether a clear link between the delivery of the scheme and the wider economic benefits can be achieved. As such, Suffolk County Council's partners will work with the LEP and DfT to consider any additional longer term evaluation work to undertake case studies or meta-analysis in order to further understand the economic benefits arising from the Third Crossing project, subject to availability of resources.

## 7 Appendices

## *Appendix A – Options Assessment Report*

*Appendix B – Lake Lothing and Outer Harbour  
Area Action Plan (AAP)*

## *Appendix C – Business Consultation Report*

## *Appendix D – Data Collection Report*

*Appendix E – Local Model Validation Report  
(LMVR)*

## *Appendix F – Forecasting Report*



## *Appendix G – TEE, PA and AMCB Tables*

*Appendix H – Transport User Benefits Appraisal  
(TUBA) Report*

*Appendix I – Active Mode Appraisal Technical  
Note*

## *Appendix J – Reliability Benefits*

*Appendix K – Environmental Options Appraisal  
Report*

*Appendix L – Appraisal Summary Table*

*Appendix M – Letter of Intent*

## *Appendix N – Public Consultation Report*



## *Appendix O – Risk Register*