



Norfolk County Council

GREAT YARMOUTH THIRD RIVER CROSSING

Full Business Case





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1 INTRODUCTION

1.1 OVERVIEW

1.1.1. This document is the Full Business Case (FBC) for the Great Yarmouth Third River Crossing Scheme. It has been prepared on behalf of Norfolk County Council (NCC), the Scheme promoter, for consideration by the Department for Transport (DfT). The structure of the business case, and the appraisal described in it, follows published DfT guidance including Web-based Transport Analysis Guidance (WebTAG) and value for money guidance. It updates and builds on the Outline Business Case (OBC)¹ submission which was submitted to DfT in 2017.

DEVELOPMENT CONSENT ORDER

1.1.2. In February 2018, the Secretary of State (SoS) directed² that the Scheme, and any associated matters, should be treated as “development for which development consent is required”. Although not falling within the definition of a “nationally significant infrastructure project” (NSIP), the SoS was of the opinion that “the development by itself is of national significance” for the following reasons:

- Great Yarmouth Port (the Port) has a nationally significant role in the renewable energy sector and the offshore gas and oil industry, and the Scheme will substantially improve connectivity and resilience for port activities
- The Scheme will support the delivery of existing and potential renewable energy NSIPs
- Supports the Port’s role as an International Gateway

1.1.3. In addition, the SoS considered that the Scheme will:

- Improve the offer of the Port through better connectivity to the Enterprise Zone

1.1.4. NCC therefore needed to obtain a Development Consent Order (DCO) from the SoS, after public examination of the project by an Examining Authority (ExA).

1.1.5. NCC submitted DCO Examination documents to the National Infrastructure Directorate of the Planning Inspectorate in April 2019. The Public Examination took place between 24 September 2019 and 24 March 2020, with the hearings taking place in Great Yarmouth. Following the Examination in Public, the ExA issued a Recommendation Report to the Secretary of State on 24 June 2020.

1.1.6. The SoS’s decision to grant the DCO was announced on 24 September 2020, followed by a six-week period for potential legal challenge.

¹ Great Yarmouth Third River Crossing Outline Business Case (2017) <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

² SOS direction - Decision letter from DfT to NCC, 26 February 2018

UPDATING THE OBC

- 1.1.7. The OBC explained why the Scheme should receive support and provided a clear audit trail for the purposes of public accountability. It also explained how and why NCC had decided to put the Scheme forward in its current form and at the present time. It showed that the proposals were based on a realistic analysis of the current situation, a clear vision of how things should be in the future, a careful consideration of options, a robust appraisal of costs and benefits, and a clear plan for delivering the Scheme.
- 1.1.8. The OBC was approved, and funding of £98 million was confirmed in the Chancellor's Autumn budget in November 2019. Since then, a preferred contractor has been selected, and the costs and construction programme have been updated. This FBC revisits the OBC analysis in the light of these changes and updates the assessment of benefits.

1.2 LOCATION OF THE SCHEME

- 1.2.1. Great Yarmouth lies on Norfolk's North Sea coast, about 30 km east of the City of Norwich. It is further east than any other town in Britain, apart from Lowestoft. The Great Yarmouth urban area has a population of about 68,000 people³, and the wider Borough of Great Yarmouth a population of about 99,000⁴.
- 1.2.2. As shown in Figure 1-1, Great Yarmouth is connected to Norwich by rail, and by the A47 road which is part of the Strategic Road Network (SRN). It is linked to Lowestoft by rail, and by the A47 (formerly the A12)⁵ also part of the SRN. The other important road is the A143 to Bury St Edmunds which terminates in the town. By virtue of its location, Great Yarmouth is relatively isolated. Despite this, it is an important employment centre and tourist destination, with over 1 million staying visitors and about 4 million visitor trips each year, generating a direct and indirect spend of £532 million⁶.

³ Population 68,317 (ONS, 2002)

⁴ Population 99,370 from Great Yarmouth Borough Profile 2019, (GYBC 19 Nov 2019)

⁵ The A12 trunk road between Lowestoft and Great Yarmouth was re-numbered A47 in March 2017. This means that the A47 is now a continuous trunk road from Peterborough to Lowestoft, whereas the A12 is a continuous trunk road between Ipswich and London.

⁶ Source: Great Yarmouth Borough Council

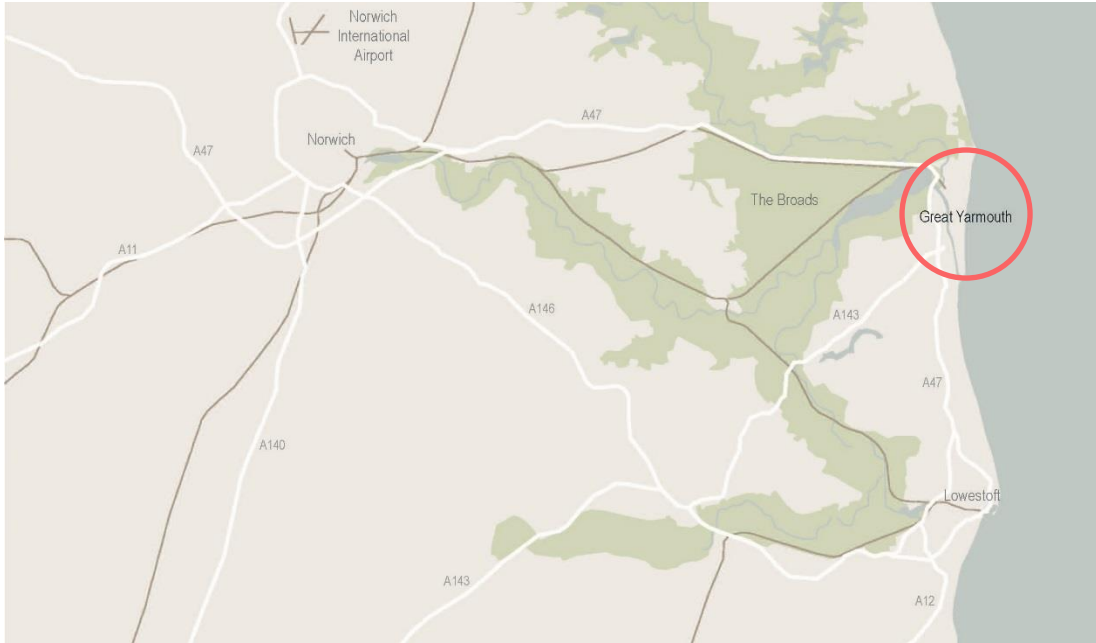


Figure 1-1 Location of Great Yarmouth

- 1.2.3. Great Yarmouth is located at the mouth of the River Yare, one of the main waterways providing access to the Norfolk Broads. As illustrated in Figure 1-2, the river divides Great Yarmouth in two, with the town centre, seafront, industrial areas and outer harbour located on the narrow, 4 km long, South Denes peninsula between the river and the sea, isolated from the rest of the town. To the west of the River Yare, Gorleston-on-Sea is just a few hundred metres away as the crow flies, but over 7km distant by road.
- 1.2.4. Great Yarmouth is considered to be England’s premier offshore support port. The deep-water outer harbour at the southern end of the peninsula is strategically located to serve the oil and gas fields of the southern North Sea, as well as existing and planned offshore wind developments off the UK east coast. It provides state-of-the-art facilities for the larger offshore vessels, complementing the long-established facilities for offshore operations and maintenance in the river port. Great Yarmouth is also an established general and cargo port, offering the shortest North Sea crossing between Great Britain and continental Europe. It handles a wide range of cargoes including aggregates, cement, grain, fertilisers, forest products and dry and liquid bulks.
- 1.2.5. The South Denes Business Park, Enterprise Zone and Great Yarmouth Energy Park are also located on the southern part of the peninsula, which is covered by a Local Development Order (LDO). The LDO provides freedoms and flexibilities to simplify and give certainty to the planning process, as a way of stimulating employment growth. The regeneration of this area is a key element of the Great Yarmouth Local Plan Core Strategy⁷.

⁷ Great Yarmouth Local Plan: Core Strategy 2013 – 2030. Adopted December 2015. (GYBC)



Figure 1-2 Location of the Scheme

- 1.2.6. Through traffic on the A47 crosses the River Yare on the Breydon Bridge, to the north of the town centre. Access to the peninsula from the south, and from the western part of the town is provided by the Haven Bridge which leads directly into the town centre, also at the northern end of the peninsula. Both are single carriageway lifting bridges. There are no crossings further south to give more direct access to the peninsula. As a result, the main industrial areas and deep-water outer harbour are up to 4 km from the nearest bridge. Access to the sea-front is similarly constrained, with all vehicles, cyclists and pedestrians having to use the bridges at the northern end.

- 1.2.7. The proposed Scheme will provide a third crossing of the River Yare, creating a direct link into the southern part of the peninsula. It will greatly improve access to the port, outer harbour, employment areas, the seafront and residential areas. It will bring the town's two main industrial areas closer together by creating a new route which avoids bottlenecks in the town centre. It will connect the peninsula to the strategic road network via the A47 Harfrey's roundabout and strengthen the synergies between Great Yarmouth and other centres such as Lowestoft.

1.3 THE NEED FOR A THIRD CROSSING

- 1.3.1. The existing river crossings do not provide adequate access to the port and employment areas in the southern part of the peninsula. The lack of a direct bridge means that traffic is forced onto unsuitable routes within the town centre, including the historic South Quay. Congestion, especially on the Haven Bridge, causes delays and makes journey times unreliable. The mixture of port-related and local traffic makes it more difficult for people to access the town centre, seafront, and leisure facilities. The lack of a direct river crossing makes Great Yarmouth seem remote and discourages inward investment. Bus users, cyclists and pedestrians have long, indirect journeys into the peninsula, which discourages commuting to work by more sustainable modes.
- 1.3.2. The South Denes Business Park is covered by the 136.3 hectare LDO and includes the 58.8 hectares Enterprise Zone site and 20 hectare Energy Park. These are key locations for regeneration and employment and need to attract new development and inward investment to capitalise on the potential growth in offshore energy and port-related activities. Good access is essential for this, and a new river crossing is needed to accommodate the traffic generated by this planned growth, to improve connectivity to the strategic road network, and to avoid making existing problems worse. Without a new crossing, the full potential for growth in the Enterprise Zone and LDO area, including the port and outer harbour, may not be fully realised.

1.4 DESCRIPTION OF THE SCHEME

- 1.4.1. The proposed Scheme is illustrated in Figure 1-3 and Figure 1-4. 3D visualisations of the Scheme are included in Appendix A.



Figure 1-3 Proposed Great Yarmouth Third River Crossing



Figure 1-4 Proposed Great Yarmouth Third River Crossing 3D Visualisation

OVERVIEW

- 1.4.2. The Scheme will provide a third crossing over the River Yare, creating a new, more direct link between the western and eastern parts of Great Yarmouth. Specifically, it will provide a connection between the Strategic Road Network (A47) and the South Denes Business Park, Enterprise Zone, Great Yarmouth Energy Park and the Outer Harbour, all of which are located on the South Denes peninsula.

THE NEW BRIDGE

- 1.4.3. A new lifting bridge will be provided to carry a dual carriageway road across the River Yare, opening when required to allow shipping to pass through. Traffic will be controlled by lifting barriers at either end of the bridge, and queueing space will be provided.



Figure 1-5 Proposed Bascule Bridge 3D Visualisation

- 1.4.4. The Scheme will feature an opening span double leaf bascule (lifting) bridge across the river, involving the construction of two new 'knuckles' extending the quay wall into the river to support the bridge. The Scheme will include a bridge span over the existing Southtown Road on the western side of the river, and a bridge span on the eastern side of the river to provide an underpass for existing businesses, enabling the new dual carriageway road to rise westwards towards the crest of the new crossing.
- 1.4.5. The new bridge will be operated on demand for commercial vessels and by agreement for recreational vessels at set times when requested in advance. The bridge is expected to be operational 24 hours per day and 365 days per year.
- 1.4.6. With the bridge fully lowered, and open to road traffic, the clearance below the structure will allow smaller vessels to pass under the new bridge without the need for it to be closed to road traffic.



Figure 1-6 Proposed New Roundabout and Bascule Bridge, Great Yarmouth

CONNECTIONS TO THE EXISTING ROAD NETWORK

- 1.4.7. On the western side of the River Yare, the new crossing over the river will connect into the existing highway network by means of a new five-arm roundabout. The existing William Adams Way dual carriageway will be realigned to form two of the five arms of the new roundabout. The William Adams Way western arm of the roundabout will form a short link connecting into the existing A47 Harfrey's roundabout. The William Adams Way eastern arm of the roundabout will form a link to the existing signalised junction of William Adams Way and Southtown Road. The other two arms of the new roundabout will form connections with the western end of Queen Anne's Road, where the Kings Centre and premises occupied by the Haven Veterinary Surgeons are located, and Suffolk Road. The fifth arm of the new roundabout will form the western approach to the new crossing.
- 1.4.8. Signal-controlled pedestrian and cycle crossing facilities will be provided across the William Adams Way eastern arm of the roundabout and across the arm connecting the new crossing to the roundabout. In addition, a signal-controlled crossing for pedestrians will be provided on the Suffolk Road arm of the roundabout.
- 1.4.9. At its eastern end, the new crossing over the river will connect into a new signalised junction with South Denes Road. The existing direction of one-way operation of Sutton Road and Swanston's Road will be reversed to ensure efficient operation of the new signalised junction. Signal-controlled crossing facilities will be incorporated into the new signalised junction.

ACCESS

- 1.4.10. On the western side of the river, a new junction on Southtown Road will provide vehicular and pedestrian access to the residential properties and MIND Centre and Grounds at the eastern end of Queen Anne's Road. In addition, a new private access will be provided north of the new public realm on Bollard Quay for vehicles to exit Bollard Quay and join the southbound carriageway of Southtown Road.

- 1.4.11. On the eastern side of the river, new private access arrangements will be provided including a new underpass to allow vehicular and pedestrian access between land north and south of the new road.

PROVISION FOR PEDESTRIANS AND CYCLISTS

- 1.4.12. As well as being an important link for vehicular traffic, the new bridge will also provide opportunities for more journeys by cycle and on foot. The Scheme will include:
- A 4.5m wide footway and two-way cycleway link from William Adams Way, across the northern side of the new bascule bridge, and linking to a new on-carriageway cycle lane on Sutton Road. This route also includes new Toucan crossing facilities at the William Adams Way roundabout, and the new traffic signal-controlled junction on South Denes Road
 - A 2.5m wide footway on the southern side of the link across the new bascule bridge
 - A new footway/cycleway link from the William Adams Way roundabout to Suffolk Road, and a new pedestrian crossing on Suffolk Road
 - A footway/cycleway link from William Adams Way to the Harfrey's roundabout
 - Enhanced public realm including a green gateway, pocket parks, enhanced surfacing and the creation of a more interactive public space using new viewing and waiting areas

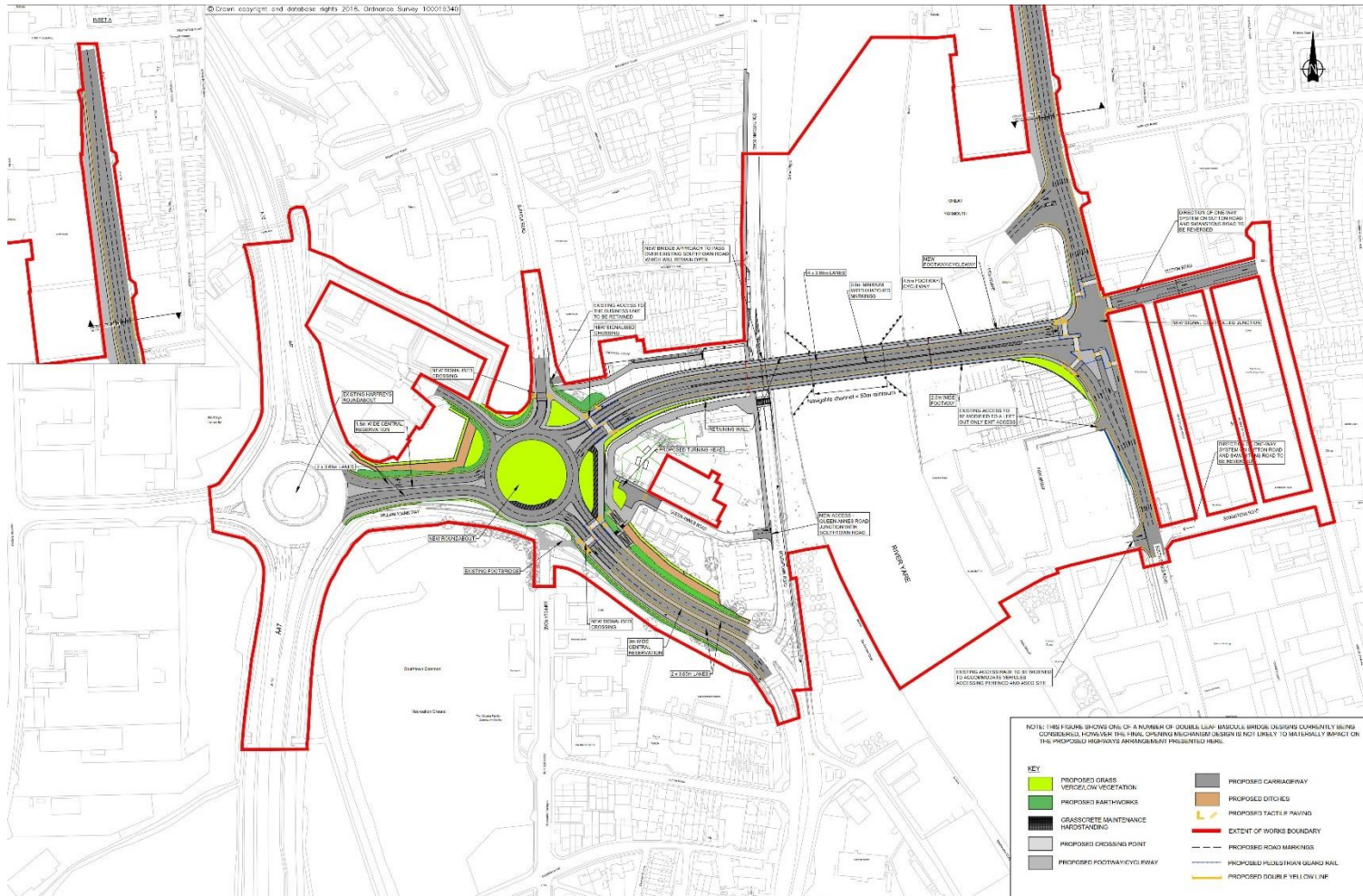


Figure 1-7 Connections and Alterations to Existing Roads

1.5 THE FIVE CASES

- 1.5.1. The business case is made up of five separate cases, as prescribed in DfT guidance⁸. These are:
- **The strategic case** which shows that there is a robust 'case for change', closely aligned to wider strategic and public policy objectives
 - **The economic case** which shows that the Scheme provides **high** value for money, based on a formal appraisal undertaken in line with DfT guidance
 - **The financial case** which explains how much the Scheme will cost and how it will be paid for, showing that it is affordable
 - **The commercial case** which shows that the Scheme is commercially viable
 - **The management case** which shows that the Scheme is achievable in practical terms and explains how the project will be managed to ensure it achieves its objectives

1.6 SUMMARY OF THE STRATEGIC CASE

- 1.6.1. The Strategic Case sets out the reasons why the Great Yarmouth Third River Crossing is needed. It shows how the proposed investment fits into a wider strategy for the regeneration of the town and surrounding region and demonstrates that it will further the strategic objectives of Norfolk County Council, Great Yarmouth Borough Council, and the New Anglia Local Enterprise Partnership. It describes how the proposed Scheme has been identified after consideration of a full range of options and consultation with stakeholders. The Strategic Case explains why this investment is needed now, in order to address existing problems and capitalise on opportunities for economic growth and development.

⁸ The Transport Business Cases, DfT, January 2013

POLICY BACKGROUND – THE BUSINESS STRATEGY

1.6.2. The strategic context is determined by national, regional and local policies and plans, including:

- National goals for transport
- The Government's Industrial Strategy (2017)
- International gateways and the Strategic Road Network (Report, 2017)
- Norfolk and Suffolk Local Industrial Strategy (Draft, 2019)
- The East of England Energy Zone
- The Great Yarmouth and Lowestoft Enterprise Zone (2012)
- New Anglia LEP Integrated Transport Strategy (2018)
- Connecting Norfolk: The Norfolk Local Transport Plan for 2026 (April 2011)
- The Norfolk Infrastructure Delivery Plan 2017 - 2027
- The Norfolk Strategic Planning Framework
- The Great Yarmouth Local Plan Core Strategy (Adopted Dec 2015)
- The Great Yarmouth Town Centre Regeneration Framework and Masterplan (GYBC, May 2017)
- The Great Yarmouth Transport Strategy (Consultation draft, 2019)
- The Great Yarmouth Economic Growth Strategy (2017-21)

1.6.3. Common themes in the above policies are:

- The need and opportunities for economic regeneration in Great Yarmouth
- The potential for growth associated with the offshore energy industry, especially in the Enterprise Zone and outer harbour
- The lack of adequate links between potential development areas on the peninsula and the strategic road network, especially to the A47 (south)
- The problem of heavy traffic on the existing bridges, and congestion in adjacent parts of the town centre
- The need for a third crossing of the River Yare to provide traffic relief, and better access to strategic routes, supporting regeneration and growth on the peninsula and the town centre

1.6.4. The shared vision for Great Yarmouth is for a once prosperous town to take advantage of the new opportunities for growth and regeneration afforded by offshore energy, commercial and port-related development, and tourism, by dramatically improving accessibility to employment areas and providing traffic relief to the historic centre, making Great Yarmouth a more prosperous and better place in which to live. The provision of a third crossing of the River Yare in Great Yarmouth would create opportunities for economic growth, regeneration and inward investment.

PROBLEMS IDENTIFIED

1.6.5. The Scheme will address the following problems:

- Inadequate access to employment areas and the harbour
- Traffic congestion, resulting in queuing and delays to journeys
- Difficulty in accessing the town centre, seafront and leisure facilities
- Inefficient and indirect bus services into the southern part of the peninsula
- Lack of direct walking and cycle routes into the southern part of the peninsula
- Community severance
- Impact of traffic on historic areas
- Impact of traffic on local air quality and CO₂ and greenhouse gas emissions
- Road accidents
- Lack of resilience in the local road network

1.6.6. All of these problems are related to the way traffic uses the existing road network.

FUTURE PROBLEMS

1.6.7. Traffic levels in Great Yarmouth are expected to increase from the present levels over the coming years. Without intervention to provide a new crossing into the South Denes peninsula, the problems will inevitably worsen, as more traffic is channelled over the existing bridges and through the town centre.

OBJECTIVES

1.6.8. The **desired high level or strategic outcomes** are:

- **To support Great Yarmouth as a centre for both offshore renewable energy and the offshore oil and gas industry**, enabling the delivery of renewable energy Nationally Significant Infrastructure Projects and enhancing the Port's role as an international gateway
- **To improve access and strategic connectivity between Great Yarmouth Port and the national road network** thereby supporting and promoting economic and employment growth (particularly in the Enterprise Zone)
- **To support the regeneration of Great Yarmouth**, including the town centre and seafront, helping the visitor and retail economy
- **To improve regional and local access** by enhancing the resilience of the local road network, reducing congestion and improving journey time reliability
- **To improve safety and to reduce road casualties and accidents**, in part by reducing heavy traffic from unsuitable routes within the town centre
- **To improve access** to and from the Great Yarmouth peninsula for pedestrians, cyclists and buses, encouraging more sustainable modes of transport and reducing community severance;
- **To protect and enhance the environment** by reducing emissions of greenhouse gases and minimising the environmental impact of the Scheme

1.6.9. The **specific, or intermediate, objectives** are:

- To provide traffic relief to Breydon Bridge and Haven Bridge
- To reduce congestion and delay in the town centre
- To improve journey time reliability
- To reduce traffic in historic areas
- To improve vehicular access to the South Denes peninsula and the outer harbour, especially from the A47 for cars, goods vehicles, buses, cyclists and pedestrians
- To reduce road accident casualties
- To reduce emissions of greenhouse gases
- To improve the resilience of the local road network

1.6.10. Extensive stakeholder and public consultation and engagement has identified strong support for the Scheme, which has been developed to achieve these objectives and contribute to the desired outcomes.

OPTIONS

1.6.11. A very comprehensive set of strategies, options, routes and route standards has been considered and subject to detailed appraisal. The proposed Scheme is the one which is best able to both deliver the objectives and give high value for money.

IMPACTS OF THE PROPOSED SCHEME AND ACHIEVEMENT OF OBJECTIVES

1.6.12. The Great Yarmouth Third River Crossing will have a significant and beneficial impact on traffic in the town, and this will give rise to a range of benefits, helping to deliver the Scheme's objectives.

- Traffic levels will be reduced on key links.
- The existing bridges will both experience a reduction in traffic
- Congestion will reduce
- Journey times on key routes will be reduced
- Journey time reliability will be improved
- Historic areas of the town will experience less traffic
- Vehicular access to South Denes and the Outer Harbour will be greatly improved
- Access for pedestrians, cyclists will be improved
- Bus users will benefit
- Road accidents will be reduced
- Greenhouse gas emissions will be reduced
- The resilience of the local road network will be enhanced
- The image of Great Yarmouth as a growing, ambitious town will be enhanced

1.6.13. In summary, the Great Yarmouth Third River Crossing is expected to achieve all of its specific objectives – in some cases with very large positive impacts. The improvements to accessibility and connectivity, and the reductions in travel times, will reduce transport costs and help to deliver the high level, strategic outcomes.

1.7 SUMMARY OF THE ECONOMIC CASE

1.7.1. 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, including those impacts which can be monetised.



VALUE FOR MONEY CATEGORY

- 1.7.2. An analysis of the monetised benefits of the proposed Scheme demonstrates that it offers **high** value for money.

PRESENT VALUE OF COSTS AND BENEFITS ASSESSED

- 1.7.3. The monetised costs and benefits assessed are set out in Table 1-1.

BENEFIT COST RATIO

- 1.7.4. The value for money category is based on the Benefit Cost Ratio (BCR). The initial BCR is **2.8**. Inclusion of reliability benefits and wider economic impacts gives an adjusted BCR of **3.9**.

Analysis of monetised costs and benefits	£,000 (2010 prices discounted to 2010)
Noise	-1,408
Local air quality	-386
Greenhouse gases	2,951
Physical activity (Active Mode Appraisal)	12,307
Accidents	947
Economic efficiency: consumer users (commuting)	42,125
Economic efficiency: consumer users (other)	95,815
Economic efficiency: business users and providers	77,213
Wider public finances (indirect taxation revenues)	-5,747
Present Value of Benefits (PVB)	223,817
Cost to broad transport budget	
Investment cost	74,581
Operating costs	4,172
Present Value of Costs (PVC)	78,753
Net Present Value (NPV)	145,064
Initial BCR	2.8
Wider impacts – Reliability	11,292
Wider impacts - Economic	68,338
Adjusted Present Value of Benefits (PVB)	303,448
Adjusted Net Present Value (NPV)	224,695
Adjusted BCR	3.9

Table 1-1 Present Value of Costs and Benefits Assessed

- 1.7.5. 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 Great Yarmouth's economy.
- 1.7.6. The Scheme is expected to lead to a reduction in greenhouse gas emissions; these have been monetised and included in the BCR.

NON-MONETISED IMPACTS ASSESSED

- 1.7.7. The non-monetised impacts assessed were townscape, historic environment, biodiversity and water environment. The impact in biodiversity is neutral, on townscape and water environment it is slight adverse, and on historic environment it is moderate adverse.
- 1.7.8. A qualitative assessment⁹ has been undertaken of the potential regeneration benefits to Great Yarmouth arising from the Scheme.

IDENTIFICATION OF RISKS, SENSITIVITIES AND UNCERTAINTIES

- 1.7.9. The financial impact of a range of risks has been considered in a Quantified Risk Assessment (QRA) and the costs included in the calculation of PVC have been adjusted for risk. The risk register and QRA are set out in Appendix E.
- 1.7.10. Further sensitivity testing with a range of growth scenarios shows that the Scheme would still offer **high** value for money in a low growth scenario, with alternative economic projections, and with an alternative carbon valuation.
- 1.7.11. Sensitivity tests show that the value for money category remains high, even with low growth assumptions.

SOCIAL AND DISTRIBUTIONAL IMPACTS

- 1.7.12. Analysis of social and distributional impacts shows that areas of Great Yarmouth with lower average incomes will benefit most from the Scheme.

1.8 SUMMARY OF THE FINANCIAL CASE

- The cost of delivering the Great Yarmouth Third River Crossing, including allowances for risk and inflation will be **£121,164,469**.
- A robust risk management strategy is in place to identify, quantify, manage and review risks, including financial risks.
- The Scheme will also give rise to costs for annual operation and maintenance, and for the long-term renewal of the infrastructure, with an annual average of **£70,715** per year (2010 prices, discounted to 2010). This amounts to £263,524 per annum at 2016 prices.
- Norfolk County Council is seeking a contribution of **£98,088,000** from the Government towards the capital costs of the Scheme, and the Council will support this with a further local contribution of **£21,076,461**.
- The Council will also meet the ongoing costs of operation, maintenance and renewal.

1.9 SUMMARY OF THE COMMERCIAL CASE

- 1.9.1. The Commercial Case provides evidence of the commercial viability of the proposed scheme. It provides evidence on the approach to risk allocation and transfer, contract and implementation timescales, and the approach to managing of the contract.

⁹ OBC Supporting Document 11 - Regeneration and Wider Impacts Report <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

- 1.9.2. NCC has completed the procurement process and a three-stage contract has been awarded and the Contractor appointed. This is in line with the approach identified and agreed as part of the OBC. The contract contains a break provision with specific tests that must be passed to permit a notice to proceed to be issued for Stage Two and Stage Three. These tests include the need for the Scheme to have secured all necessary planning approvals and funding agreements, and for the total of the Prices to be within budget.
- 1.9.3. **The Design and Build** form of contract involves the Contractor at an early stage to develop the design and help ensure that a buildable and affordable Scheme is available.
- 1.9.4. The contract also includes an initial operate and maintenance period of 1 year and 3 years respectively.
- 1.9.5. The three stages of the contract are:
- Stage One: the development of the detailed design by the Contractor, including support to NCC during the statutory consents process, completing such surveys and investigations as are required, and the setting of the total of the Prices for Stage Two
 - Stage Two: the construction of the Great Yarmouth Third River Crossing
 - Stage Three: the initial operation and planned maintenance of the bridge.
- 1.9.6. The form of contract is the **NEC4 Engineering and Construction Contract (ECC)**, using the following payment mechanisms:

Contract Stage	Payment Mechanism
Stage One (defined Scope activities)	Option A: Priced contract with activity schedule
Stage One (undefined Scope activities)	Option E: Cost reimbursable contract
Stage Two	Option C: Target contract with activity schedule
Stage Three	Option A: Priced contract with activity schedule

Table 1-2 Payment Mechanisms

- 1.9.7. The Commercial Case sets out the apportionment of risk between NCC and the Contractor.
- 1.9.8. The Commercial Case demonstrates that the Scheme is commercially viable, with a robust contracting strategy.

1.10 SUMMARY OF THE MANAGEMENT CASE

- 1.10.1. The Management Case demonstrates that the Great Yarmouth Third River Crossing scheme is capable of being delivered successfully in line with recognised best practice. It describes the processes that are being put in place to ensure that the project is effectively delivered, and properly evaluated.
- 1.10.2. NCC has extensive recent experience of delivering major infrastructure projects.
- 1.10.3. The Great Yarmouth Third River Crossing is a “stand-alone” scheme, which can be delivered independently of any other scheme or development. Similarly, no other future schemes or developments are dependent upon it.

- 1.10.4. NCC will continue to liaise very closely with Highways England (HE) as the Scheme is taken forward and will actively co-operate with any further appraisal or design work that HE may decide to undertake in relation to improvements to the A47 trunk road.
- 1.10.5. NCC has established and will continue to resource the following bodies:
- Project Board
 - Project Delivery Team
 - Stakeholder Groups
- 1.10.6. The Management Case describes the membership, responsibilities and accountability of these groups including the relationship between them.
- 1.10.7. The Scheme continues to be programmed to open to traffic in 2023. The detailed project programme is included in Appendix B.
- 1.10.8. The Management Case details how stakeholders have been involved in the development of the Scheme and how they will continue to be involved as the Scheme moves into the construction phase.

1.11 THE CORONAVIRUS (COVID-19) PANDEMIC

- 1.11.1. At the time of preparing this Business Case, the global coronavirus (COVID-19) pandemic is affecting every aspect of life in the UK. Traffic levels fell in the Spring of 2020, and it is not known when, or indeed whether, they will return to the levels they were before the pandemic. Patterns of economic activity, travel to work and mode choice have changed, and may have been affected for the long term. An economic recession is anticipated, but its severity and duration cannot be predicted.
- 1.11.2. The potential impacts of COVID-19 are reflected in this Business Case in a number of ways:
1. Potential pressures on the cost of delivering the Scheme are taken into account in the Quantified Risk Assessment (QRA)
 2. An allowance for the effects of COVID-19 has been made in the out-turn price adjustment (inflation) of the Scheme cost
 3. The existing construction contract will be tailored to include acceptable levels of liability for NCC and the Contractor
 4. Sensitivity testing has been undertaken to establish the impact of changes to long-term economic projections on the economic benefits of the Scheme. These suggest that, with alternative economic projections, the calculated benefits of the Scheme would be reduced but it would still be in the high value for money category.
- 1.11.3. The Scheme is expected to provide a much-needed stimulus to the local economy by reducing congestion and improving connectivity between the Port, regeneration areas and the Strategic Road Network. As Great Yarmouth recovers from the effects of the pandemic, investment in this key item of infrastructure will help to build business confidence and attract new employment to the town.

2 THE STRATEGIC CASE

2.1 INTRODUCTION

- 2.1.1. The Strategic Case sets out the reasons why a third river crossing is needed in Great Yarmouth. It shows how the proposed investment fits into a wider strategy for the regeneration of the town and surrounding region and demonstrates that it will further the strategic objectives of NCC, GYBC, and the New Anglia LEP. It describes how the proposed Scheme has been identified after consideration of a full range of options and consultation with stakeholders. Together with the other four cases in the Full Business Case (FBC), the Strategic Case explains why this investment is needed now, in order to address existing problems and capitalise on opportunities for economic growth and development.
- 2.1.2. Figure 2-1 shows the local road network and features referred to in the Strategic Case.

2.2 OVERVIEW

- 2.2.1. This chapter covers:
- The policy background and business strategy for the Scheme
 - Opportunities for growth, regeneration and inward investment
 - The existing problems which the Scheme needs to address
 - Future problems - the impacts of not changing
 - The aims and objectives of the Scheme
 - Measures for success
 - The scope of the Scheme
 - Constraints
 - Interdependencies
 - Stakeholders
 - Options considered
 - The proposed Scheme
 - The impacts of the proposed Scheme and the achievement of objectives

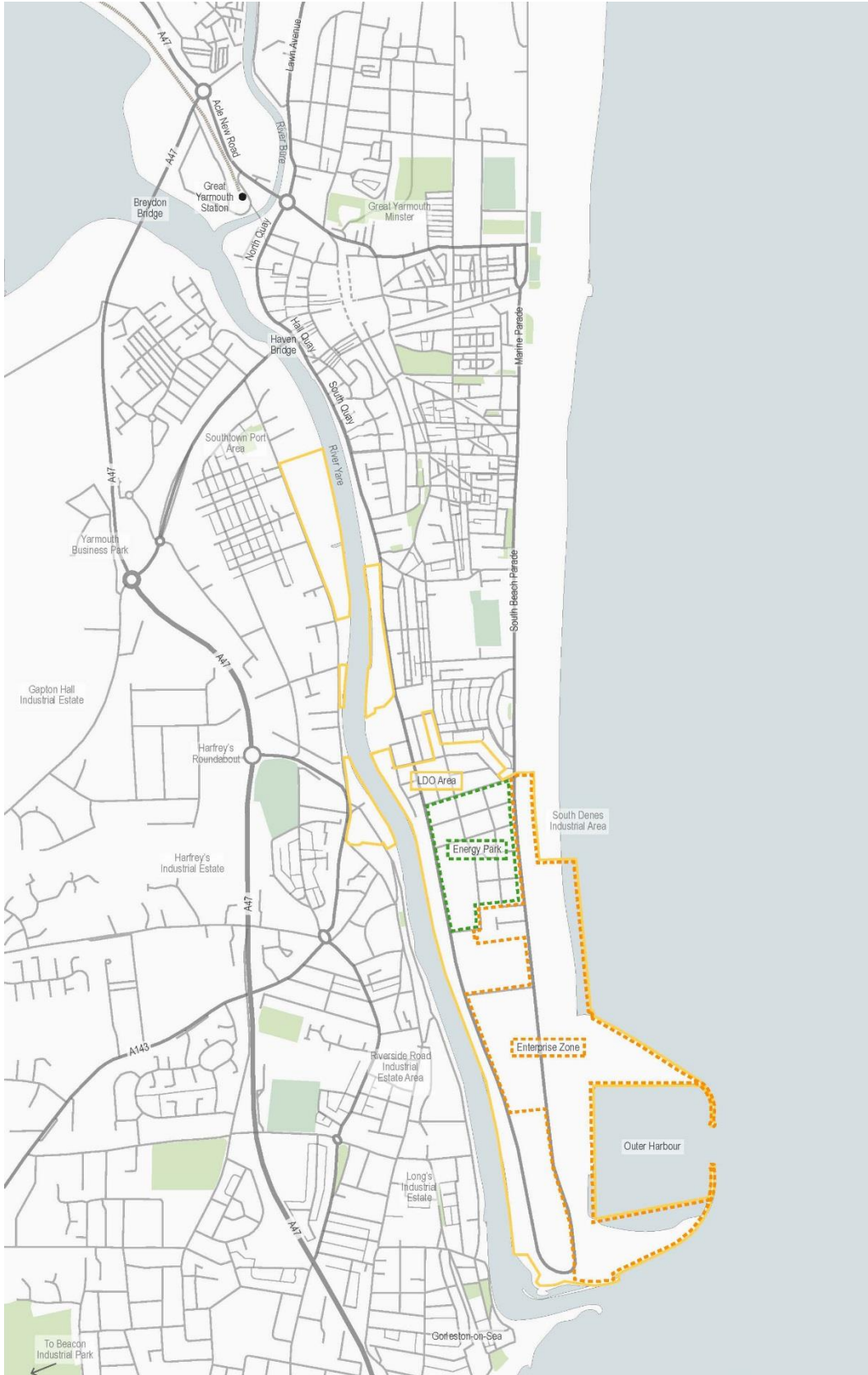


Figure 2-1 Local Road Network and Key Features

2.3 POLICY BACKGROUND – THE BUSINESS STRATEGY

2.3.1. The strategic policy context is determined by national, regional and local policies as set out below:

NATIONAL POLICIES AND PLANS

- National goals for transport
- The Government's Industrial Strategy (2017)
- International gateways and the Strategic Road Network (Report, 2017)

REGIONAL POLICIES AND PLANS

- Norfolk and Suffolk Local Industrial Strategy (Draft, 2019)
- The East of England Energy Zone
- The Great Yarmouth and Lowestoft Enterprise Zone (2012)
- New Anglia LEP Integrated Transport Strategy (2018)

LOCAL POLICIES AND PLANS

- Connecting Norfolk: The Norfolk Local Transport Plan for 2026 (April 2011)
- The Norfolk Infrastructure Delivery Plan 2017 - 2027
- The Norfolk Strategic Planning Framework
- The Great Yarmouth Local Plan Core Strategy (Adopted Dec 2015)
- The Great Yarmouth Town Centre Regeneration Framework and Masterplan (GYBC, May 2017)
- The Great Yarmouth Transport Strategy (Consultation draft, 2019)
- The Great Yarmouth Economic Growth Strategy (2017-21)

NATIONAL GOALS FOR TRANSPORT

2.3.2. The national goals for transport¹⁰, set by government, are:

- To ease congestion and provide upgrades on important national, regional or local routes
- To unlock economic and job creation opportunities
- To enable the delivery of vital new housing developments

2.3.3. The proposed third river crossing will contribute to the first, and especially the second, of these objectives.

Easing congestion and upgrading important routes: By creating an additional river crossing, the Scheme will remove traffic from the existing bridges, especially the Haven Bridge. This will ease congestion on the roads around the existing bridges, and in the town centre generally. It will provide additional capacity, improving the resilience of the local road network and improving journey time reliability. The new bridge will significantly enhance the connectivity between Great Yarmouth's deep-water harbour, and the national, regional and local routes to and from the town, including the A47 and the A143.

¹⁰ Roads Funding: Written statement to Parliament (HCWS286) by Secretary of State for Transport (28 November 2016)

Unlocking economic and job creation opportunities: The proposed Scheme will provide a new, direct, high capacity access into the South Denes Industrial area, part of which is designated as an Enterprise Zone. The Third River Crossing is part of a wider strategy to promote this area as a centre for the offshore renewable energy industry, attract new businesses and create new jobs. It will help businesses to reduce their transport costs and bring more people within easy reach of employment opportunities, including people travelling by sustainable modes. It will also provide an important connection between the main industrial areas of the town as well as to key employment centres nearby such as Lowestoft and Norwich.

Enabling housing delivery: Currently planned housing developments in Great Yarmouth are not directly dependent on the provision of a Third River Crossing. However, the Local Plan Core Strategy (see below) identifies a strategic key site for approximately 1,000 new homes in the Great Yarmouth Waterfront Area, of which at least 350 are to be provided in the Plan period (2013 – 2030). The new bridge will provide long term traffic relief to this area, improving accessibility, and enhancing Great Yarmouth as a place in which to live.

2.3.4. These opportunities and benefits are described in more detail in the sections below.

THE GOVERNMENT'S INDUSTRIAL STRATEGY

2.3.5. The Government's Industrial Strategy¹¹ (November 2017) sets out a long-term plan to boost the productivity and earning power of people throughout the UK. The five foundations of the strategy are:

- Ideas: the world's most innovative economy
- People: good jobs and greater earning power for all
- Infrastructure: a major upgrade to the UK's infrastructure
- Business Environment: the best place to start and grow a business
- Places: prosperous communities across the UK

2.3.6. The Industrial Strategy seeks to maximise the advantages for UK industry of the global shift to clean growth. It aims to build on the UK's world-leading capability in offshore wind energy, working closely with the industry to further drive down the cost of clean power, while also building UK supply chains. It is supported by Sector Deals – partnerships between government and industry to boost productivity, employment, innovation and skills in key sectors. The Offshore Wind Sector Deal¹² identifies Great Yarmouth as a hub of activity for construction, operations and maintenance to support a growing number of offshore wind farms off the east coast.

2.3.7. The Industrial Strategy presents an opportunity for Great Yarmouth to develop its offshore energy cluster further, by building on the existing offshore oil, gas and decommissioning activities, while capitalising on the low carbon agenda with continued investment in offshore wind. If Great Yarmouth is to realise this opportunity, transport connectivity improvements, including the Third River Crossing, will be needed to support the growth of the sector and ensure its future success.

¹¹ Industrial Strategy: building a Britain fit for the future. November 2017

¹² Industrial Strategy: Offshore Wind Sector Deal (March 2019)

- 2.3.8. In 2011, the government established six Centres for Offshore Renewable Engineering (CORE) across the UK, one of which covered Great Yarmouth and Lowestoft. CORE's aim was to maximise the ability of areas to benefit from opportunities in offshore engineering. The inclusion of Great Yarmouth showed that it was clearly part of the Government's strategy, and it continues to be included in strategic conversations. This includes the establishment of one of the largest Enterprise Zone sites, offering simplified planning regimes and enhanced capital allowances, among other incentives, as discussed further in Paragraph 2.3.18 below.
- 2.3.9. The Industrial Strategy also commits to agreeing Local Industrial Strategies that build on local strengths and deliver economic opportunities. The Norfolk and Suffolk Industrial Strategy (Paragraph 2.3.10 below) sets out an integrated approach to infrastructure and inter-regional connectivity designed to maximise clean growth, including support for the Great Yarmouth Third River Crossing.

NORFOLK AND SUFFOLK LOCAL INDUSTRIAL STRATEGY (2019)

- 2.3.10. The draft Norfolk and Suffolk Local Industrial Strategy¹³ highlights the importance of the offshore energy sector to the region. It notes that roughly half of the Sector Deal's ambition to create a 30GW offshore wind generating capacity will be delivered off the east coast close to Norfolk and Suffolk. The ports of Great Yarmouth and Lowestoft are positioning themselves as England's premier energy ports, with potential for further growth in operations and maintenance, manufacturing and assembly. It highlights the importance of the Great Yarmouth Third River Crossing as part of the foundational infrastructure needed to deliver productivity gains and green growth, and to create places where people want to live and work.

INTERNATIONAL GATEWAYS AND THE STRATEGIC ROAD NETWORK (2016)

- 2.3.11. In 2016, Highways England (HE) commissioned a report¹⁴ on key international gateways (ports and airports) and their importance to England's economy, and the role of the SRN in supporting this critical infrastructure. It noted that:
- Ports serve manufacturing sectors and are key inter-modal points for the logistics and distribution sector
 - Ports are highly dependent on road connectivity for the movement of freight
 - Ports are significant employment areas
 - Congestion, causing increased travel times and reduced journey time reliability, can increase freight costs and diminish the competitive advantage of parts of the UK, by reducing the effective catchment area of a port

¹³ Draft Norfolk and Suffolk Industrial Strategy (New Anglia LEP 2019)

¹⁴ "International gateways and the strategic road network". Commissioned by Highways England to inform the emerging Strategic Economic Growth Plan. (Atkins, for HE, 2016)

2.3.12. In 2015, the port of Great Yarmouth handled over 1 million tonnes of traffic including oil and other bulk liquids (195,000 tonnes), agricultural products and other dry bulk products (726,000 tonnes) and general cargo (174,000 tonnes)¹⁵. Although it is smaller than the major ports on which the HE report focuses, the principles hold true. The port of Great Yarmouth, especially the new deep-water outer harbour, does not enjoy good access to the strategic road network. A Third River Crossing would greatly improve the port's connectivity to the A47 trunk road and the SRN, helping to improve its efficiency and viability, and stimulate port-related growth.

EAST OF ENGLAND ENERGY ZONE

2.3.13. The East of England Energy Zone (EEEZ) has been established to promote the area for energy related inward investment, to manage enquiries and to enhance the assets available to attract investment and development of the energy sector in Norfolk and Suffolk. The partners are: Norfolk and Suffolk County Councils, Great Yarmouth Borough Council, East Suffolk Council, North Norfolk District Council, East of England Energy Group, the New Anglia LEP and the Norfolk and Suffolk Chambers of Commerce. The EEEZ brings political and business support, along with access to the regional industry body, the East of England Energy Group. It promotes investment in:

- **Offshore wind:** Some of the world's biggest wind farms are being built a few miles off the Norfolk and Suffolk coastline including East Anglia ONE, East Anglia TWO, East Anglia ONE North, East Anglia THREE, Norfolk Boreas and Norfolk Vanguard, while other UK Round 3 developments, Dogger and Hornsea, as well as Dutch offshore wind developments are easily accessible from EEEZ deep-water harbours, including Great Yarmouth. A new Round 4 has been announced which will also be focussed in the Southern North Sea and also Round 2 projects are likely to be upgraded and enhanced. Scroby Sands, one of the first commercial offshore wind farms in the UK is operated and maintained from Great Yarmouth. Great Yarmouth has played a vital role in many Round 2 wind farms, including the construction of the Sheringham Shoal and Lincs offshore wind farms. Great Yarmouth hosts the operations and maintenance for the Dudgeon Offshore Wind Farm, and a purpose-built base in the river port was opened in 2016. Swedish energy company Vattenfall and Peel Ports have agreed to reserve space at Great Yarmouth for an operations base for the Norfolk Vanguard and Norfolk Boreas projects, with a combined capacity of 3.6GW and an operating life of at least 25 years. The County and Borough Councils and the LEP are also working closely with Peel Ports to establish an Operations and Maintenance Campus. This involves enhancing quay capacity, introducing pontoons, and creating space for new buildings and storage. More details are given in Section 2.6.
- **Offshore oil and gas:** The East of England is the leading centre for offshore gas exploration and extraction in the Southern North Sea (SNS). Work by the Oil and Gas Authority suggests a further 8 trillion cubic feet of prospects are still to be discovered and the SNS remains an attractive basin for further investment. The area is recognised as a global centre of excellence, having had oil and gas at the cornerstone of its economy since the early 1960s.

¹⁵ Source: Port Freight Statistics PORT0418 (DfT Statistics, 2015)

- Decommissioning:** Ageing infrastructure needs to come onshore for recycling and disposal. Just ten percent of the North Sea’s fields and production facilities has been removed so far, and there is a potential market of £30bn over the next 30 years. The EEEZ has an opportunity to become a centre of excellence for SNS decommissioning. A purpose-developed facility in the Great Yarmouth Outer Harbour is already handling SNS recycling projects and is poised for the industry’s peaks in the 2020s.

2.3.14. The EEEZ recognises the potential for Great Yarmouth as one of Europe’s leading locations for offshore energy. It notes that the Great Yarmouth Energy Park (Paragraph 2.3.15 below) is ideally located for access to the deep water Outer Harbour and the quays and wharfs along the river bank. The Third River Crossing will provide a critical link between the Energy Park and the Strategic Road Network.

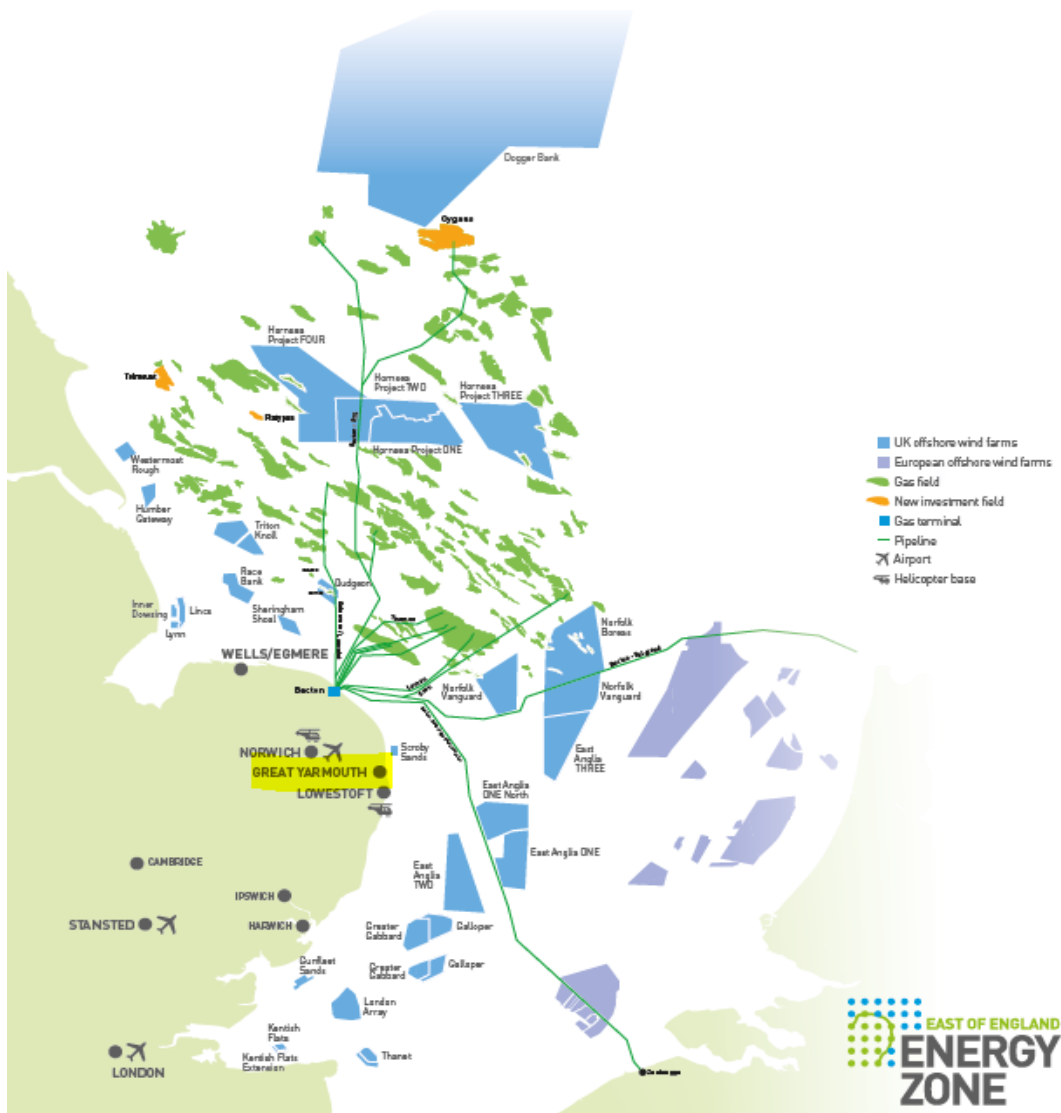


Figure 2-2 East of England Energy Zone

GREAT YARMOUTH ENERGY PARK

- 2.3.15. The Great Yarmouth Energy Park covers 20 hectares on the South Denes peninsula, near to the river port and the deep-water outer harbour. It is a project run by GYBC which owns much of the freehold with support from NCC, with the aim of unlocking and accelerating economic development opportunities.
- 2.3.16. It is being established to ensure that businesses related to the offshore energy sector continue to have suitable land available close to the river port and Outer Harbour so the area is best placed to capture these anticipated future jobs, investment, economic growth and regeneration opportunities. Its location in relation to the proposed Third River Crossing is shown in Figure 2-3.
- 2.3.17. The proposed Third River Crossing will provide a critical road link between the Energy Park and the SRN.

GREAT YARMOUTH AND LOWESTOFT ENTERPRISE ZONE (2012) AND LOCAL DEVELOPMENT ORDER

- 2.3.18. The Great Yarmouth and Lowestoft Enterprise Zone was created by New Anglia LEP in April 2012 to encourage offshore energy, port and logistics activity and partners at six sites in and around Great Yarmouth and Lowestoft. It is estimated that the Enterprise Zone will create up to 9,000 direct jobs and 4,500 indirect jobs by 2025.
- 2.3.19. The Enterprise Zone includes both the South Denes and Beacon Park commercial areas of Great Yarmouth. Businesses in these areas benefit from time limited business rate relief, a simplified planning process and superfast broadband.
- 2.3.20. At the same time, GYBC created a Local Development Order¹⁶ (LDO) which allows greater permitted development rights for new development associated with the Port and energy industries in the South Denes. The South Denes LDO comprises 136.3 hectares of land, of which 58.8 hectares are part of the Enterprise Zone.
- 2.3.21. The locations of the Enterprise Zone site and the LDO area in relation to the Energy Park and the proposed Third River Crossing are shown in Figure 2-3 below.
- 2.3.22. The proposed Third River Crossing will provide a critical road link between the Enterprise Zone on the South Denes peninsula and the SRN. It will also improve connectivity between the South Denes and Beacon Park Enterprise Zone sites (Figure 2-3 inset).

¹⁶ Local Development Order for South Denes, Great Yarmouth. Adopted 15 May 2012. GYBC



Figure 2-3 Energy Park, Enterprise Zone and Local Development Order, South Denes, Great Yarmouth

INTEGRATED TRANSPORT STRATEGY FOR NORFOLK AND SUFFOLK (2018)

- 2.3.23. The Integrated Transport Strategy for Norfolk and Suffolk¹⁷ was published in 2018 to provide a robust foundation for the sub-national transport forum, Transport East. Great Yarmouth is identified as a Priority Place in the strategy – an area where evidence shows significant opportunities and commitment for continued growth.
- 2.3.24. The Strategy considers that reliable and resilient networks are fundamental building blocks for the ongoing success of the region's economy and for achieving the ambitions of in the Norfolk and Suffolk Economic Strategy. However, the region's potential is sometimes constrained by journey times and capacity which compound the perception that it is a 'long way' from the rest of the country. Therefore, the Strategy commits to working with partners to:
- Facilitate better connectivity which provides more reliable and resilient journey times within and between our Priority Places through making the strategic case for and the delivery of infrastructure investment, including a new river crossing in Great Yarmouth ... prioritising infrastructure that will facilitate the delivery of significant housing and jobs growth
 - Ensure the success of our Enterprise Zones ... and key sectors by working to resolve infrastructure constraints
 - Facilitate place-making by improving public realm, tackling air quality and other environmental issues and delivering joined-up cycling ... and walking networks in our Priority Places ...
- 2.3.25. The Third River Crossing will help deliver all these aspects of the Integrated Transport Strategy.

CONNECTING NORFOLK – THE NORFOLK LOCAL TRANSPORT PLAN FOR 2026 (LTP)

- 2.3.26. Norfolk's third Local Transport Plan¹⁸ (LTP) identifies six strategic aims for transport:
- Maintaining and managing the highway network
 - Delivering sustainable growth
 - Enhancing strategic connections
 - Reducing emissions
 - Improving road safety
 - Improving accessibility
- 2.3.27. The LTP (Policy 7) identifies strategic connections to Norfolk's gateways, Norwich Airport and the ports at King's Lynn and Great Yarmouth.
- 2.3.28. The LTP notes the importance of enhancing connections to Norfolk's three international gateways: Norwich Airport and the ports at Kings Lynn and Great Yarmouth. At Great Yarmouth, the focus is on achieving a sustainable distribution of freight journeys to and from the port, including provision of a future third crossing of the River Yare, which will provide an enhanced link to the port from the strategic road network and help remove traffic from the town centre.

¹⁷ Integrated Transport Strategy for Norfolk and Suffolk: A Strategy for Growth and Opportunity. (New Anglia LEP), May 2018

¹⁸ Connecting Norfolk. Norfolk's Transport Plan for 2026 NCC April 2011

- 2.3.29. The current LTP Implementation Plan¹⁹ covers the period up to 2021 and provides information on the delivery of the LTP. It reports on the development of the Third River Crossing Scheme and the safeguarding of the route from inappropriate development. It confirms that a priority will be to work with government towards delivery in the early 2020s and makes provision for this in the indicative capital programme.

THE NORFOLK INFRASTRUCTURE DELIVERY PLAN 2017 – 2027

- 2.3.30. The Infrastructure Delivery Plan²⁰ (IDP) pulls together information on the key infrastructure needed to deliver economic growth over a 10-year period to 2027.
- 2.3.31. The IDP includes the most strategic projects on which NCC and its partners are working, with a recognised route towards delivery. Projects were identified in collaboration with stakeholders including internal county council departments, district councils, utility companies and government agencies. They align with the County Council's priority for improved infrastructure and the ambitions of the Norfolk and Suffolk Economic Strategy, Local Plans and other NCC priorities.
- 2.3.32. All of the infrastructure projects align with the Industrial Strategy, which identifies growth as being clustered around centres of skills and ideas. They will deliver the physical infrastructure that is essential to promote these economic growth locations.
- 2.3.33. The Great Yarmouth Third River Crossing is identified as a key part of the transport and economic strategy for the Great Yarmouth area. It seeks to provide the capacity to accommodate growth and contributes to an infrastructure network which will operate with reduced congestion, better transport reliability, shorter journey times and a reduction in traffic within the historic areas.

NORFOLK STRATEGIC PLANNING FRAMEWORK (2018)

- 2.3.34. The Norfolk Strategic Planning Framework²¹ sets out shared spatial objectives for Norfolk. Some 28 strategic organisations, including local councils, were involved in its preparation.
- 2.3.35. The Framework states that GYBC, NCC, HE and the New Anglia LEP have cooperated closely on developing the road transport infrastructure to support the growth of the offshore energy sector in Great Yarmouth, with particular focus on bidding for a third river crossing, to provide direct access to the Port from the trunk road network, rather than through the heart of the town as at present, and improving the A47 link to the rest of the country. It confirms the Great Yarmouth Third Crossing as a priority road project for promotion, with an estimated start date of 2021.

¹⁹ Connecting Norfolk Implementation Plan for 2015-2021, NCC

²⁰ Norfolk Infrastructure Delivery Plan 2017-2027. Published by NCC and partners including the New Anglia LEP, Norwich City Council and District/Borough Councils

²¹ Norfolk Strategic Planning Framework: Shared Spatial Objectives for a Growing County and Emerging Statement of Common Ground. NCC, Breckland Council, Broadland Council, Broads Authority, GYBC, Kings Lynn and West Norfolk BC, North Norfolk DC, Norwich City Council, South Norfolk Council, Natural England, Environment Agency, Anglian Water, New Anglia LEP, Greater Cambridge & Greater Peterborough Enterprise Partnership. March 2018

GREAT YARMOUTH LOCAL PLAN CORE STRATEGY

- 2.3.36. The Great Yarmouth Local Plan Core Strategy²² is the main document in Great Yarmouth Borough Council's Local Plan (2013 – 2030). It establishes the spatial vision and objectives for how the borough will develop and grow in the future. It also sets out strategic policies and site allocations, called 'Core Policies' and 'Key Sites', which provide the strategic context for other Local Plan Documents, Supplementary Planning Documents and Neighbourhood Development Plans.
- 2.3.37. The Core Strategy sets out a vision for the borough as a more attractive and aspirational place to live, work and play, with strong links to Lowestoft, the Broads, Norwich, rural Norfolk and the wider New Anglia Local Enterprise Partnership area. It notes that Great Yarmouth will continue to have a thriving relationship with Lowestoft and describes a complementary and integrated approach to the regeneration of the two towns, taking advantage of the huge growth potential in the renewable energy and port sectors to create thousands of new jobs.
- 2.3.38. A third river crossing over the River Yare is envisioned in the Core Strategy, along with improvements to public transport and the creation of attractive walking and cycling routes from the train station to the waterfront, town centre and seafront, which will relieve congestion and provide essential links to key facilities and services, including the outer harbour.
- 2.3.39. The Core Strategy sets seven strategic objectives:
- SO1 Minimising impact on the environment
 - SO2 Addressing social exclusion and reducing deprivation
 - SO3 Accommodating a growing population
 - SO4 Strengthening the competitiveness of the local economy
 - SO5 Capitalising on the successes of the local visitor economy
 - SO6 Protecting and enhancing the quality of the local environment
 - SO7 Securing the delivery of key infrastructure
- 2.3.40. Under Objective SO7, the Core Strategy aims to encourage efficient patterns of movement by recognising the strategic role that the A47, a third river crossing, the river port, outer harbour and rail corridor (including a rail freight interchange) will play in meeting the borough's needs.
- 2.3.41. The Core Strategy envisages provision of 1,000 new homes at the Great Yarmouth Waterfront area (at least 300 during the plan period), and:
- Encourages the redevelopment and intensification of existing employment sites, and exploring the potential to develop 22 hectares of land reclamation north of the Outer Harbour at South Denes (Policy CS6: Supporting the local economy)
 - Supports development proposals related to the Outer Harbour and river port
 - Encourages a greater presence of higher value technology and energy-based industries, including offshore renewable energy companies
 - Supports the local visitor and retail economies

²² Great Yarmouth Local Plan: Core Strategy 2013 – 2030. Adopted December 2015. (GYBC)

- 2.3.42. In safeguarding 118 hectares of existing employment land at South Denes, including the Outer Harbour and South Quay, the Core Strategy considers that there is considerable scope for the already thriving energy and port-related sectors to expand as a result of the Enterprise Zone (EZ) and Local Development Orders.
- 2.3.43. South Denes is a priority area for industrial and warehousing development, attracting businesses operating in, or providing essential support services to the energy, offshore engineering and ports & logistics sectors. The development of the Outer Harbour is of strategic importance to the borough's economy and is a key driver for the regeneration of Great Yarmouth. It complements the existing river port and increases its overall operating capacity. The prospects for new business for the port are starting to be realised with investment for handling grain, aggregates and wind farm maintenance. The Outer Harbour has the potential to accommodate a large range of vessels and operations, including freight ferries, general and bulk cargo, oil and gas, decommissioning and special projects, including offshore wind.
- 2.3.44. The Core Strategy recognises the challenges of Great Yarmouth's unique geography, noting that the seafront, central shopping area and outer harbour are on a peninsula, separated from a high percentage of the resident population by the River Yare. The existing river crossings are subject to high traffic flows and become severely congested in peak hours. Great Yarmouth and Gorleston also experience a dramatic increase in traffic flows in the holiday season. The extra traffic conflicts with town centre, port and commercial traffic, creating congestion on the road network, particularly on the A47, South Quay, North Quay, Fullers Hill and Lawn Avenue.
- 2.3.45. For these reasons the Core Strategy (Policy CS16) specifically supports the development of a third river crossing to reduce congestion within the heritage area of North Quay and South Quay, reducing pressure on Haven Bridge and generally improving access across the River Yare, and to help the Outer Harbour realise its long-term potential.
- 2.3.46. The Core Strategy identifies two strategic sites that are deemed to be central to the delivery of the Local Plan:
- Regenerating Great Yarmouth's Waterfront (Policy CS17)
 - Extending the Beacon Park development (Policy CS18)
- 2.3.47. The development at Beacon Park is already underway (Policy CS18). In accordance with a clear masterplan it will deliver over 1,000 new homes, new employment land and related development.

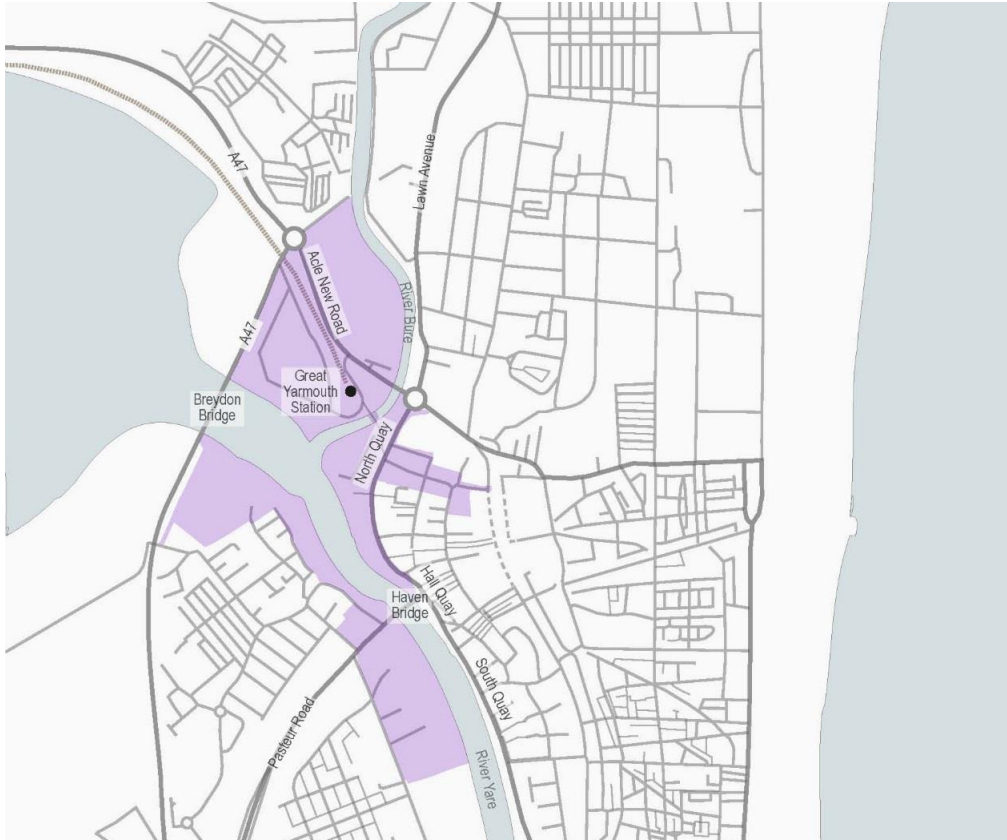


Figure 2-4 Waterfront Regeneration Area, Great Yarmouth

- 2.3.48. The regeneration of Great Yarmouth’s Waterfront (Policy CS17) is more challenging but remains a key ambition. It includes the comprehensive redevelopment of the North Quay, which complements the Town Centre Masterplan (Paragraph 2.3.50 below). The aim is to transform this key riverside and gateway site to Great Yarmouth and create a vibrant waterfront development adjacent to the town centre. A Supplementary Planning Document²³ was adopted in May 2020 to shape development, which is likely to take place towards the end of the plan period and later.
- 2.3.49. The provision of the Third River Crossing will remove through traffic, including heavy vehicles travelling to and from the Port and industrial areas, from the Haven Bridge which links the two parts of the Waterfront area. It will also reduce traffic on other roads in the area, creating more attractive conditions for regeneration.

THE GREAT YARMOUTH TOWN CENTRE REGENERATION FRAMEWORK AND MASTERPLAN (2017)

- 2.3.50. GYBC’s Town Centre Masterplan²⁴ covers the area between the seafront, the Yare riverfront, and the old town walls. Its vision is for new investment and employment in the town centre, generating renewed pride in Great Yarmouth and building confidence for the future.

²³ North Quay Supplementary Planning Document. GYBC May 2020

²⁴ Great Yarmouth Town Centre Regeneration Framework and Masterplan. GYBC May 2017

2.3.51. The plan aims to deliver this vision by focusing on six interconnected objectives, which have been developed in consultation with stakeholders and the general public:

- Strengthening the heart of the town centre
- Improving the market and the Market Place
- Transforming the Conge
- Creating a sense of arrival at the train station
- Unlocking the potential of Hall Quay
- Linking it all together

2.3.52. The Masterplan envisaged three phases of improvement, with the third phase (2021 – 2024) linked to the provision of the Great Yarmouth Third River Crossing. The Local Growth Fund allocated £1m in both 2017/18 and 2018/19 to invest in the link from Great Yarmouth's rail station via The Conge to the Market Place.

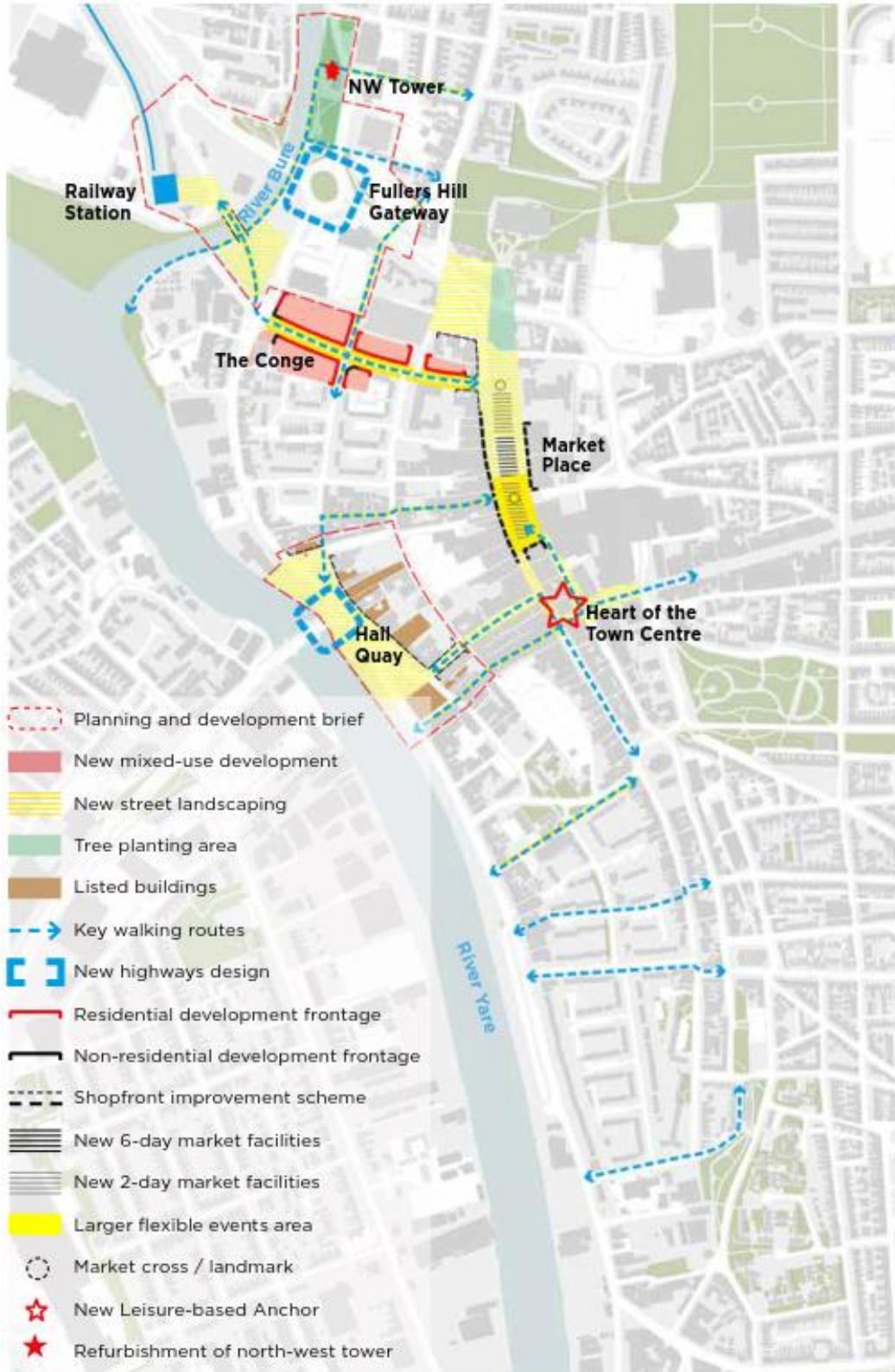


Figure 2-5 Town Centre Masterplan Investment Area (Source: GYBC)

- 2.3.53. The Masterplan concludes that no single investment is likely to do more to boost the regeneration of the town centre than the proposed Great Yarmouth Third River Crossing, as it has the potential to significantly relieve the town centre of port-related traffic. The challenge for the town centre will then be to take the opportunity to reallocate road space and invest in the public realm. This has the potential to unlock the value of what were historically the town's most prosperous areas with its finest buildings, along the riverside from Fullers Hill to Hall Quay and South Quay.
- 2.3.54. Of the six objectives, the regeneration of Hall Quay is most closely linked to the provision of the third river crossing as it will benefit directly from the reduction in traffic using Haven Bridge. There is potential for high quality public realm improvement, and the regeneration of buildings for leisure uses. Following consultation, the Masterplan reports that there is a shared vision for the future of Hall Quay amongst the general public and stakeholders in the context of the planned Third River Crossing, as well as significant commercial interest in investing in Hall Quay as a location for leisure-based development.

GREAT YARMOUTH TRANSPORT STRATEGY (DRAFT, 2019)

- 2.3.55. The Great Yarmouth Transport Strategy²⁵ has been developed to support the vision, strategic objectives and planned growth set out in the Great Yarmouth Local Plan and the vision and objectives of the Great Yarmouth Town Centre Regeneration Framework & Masterplan and Norfolk's Local Transport Plan. It builds on the work undertaken by NCC, GYBC and New Anglia LEP to support economic growth within the town.
- 2.3.56. The objectives of the Strategy are to:
- Manage traffic congestion in Great Yarmouth
 - Capitalise on the infrastructure and investment opportunities presented by the Great Yarmouth Third River Crossing
 - Support sustainable housing and economic growth
 - Provide a safe environment for travel by all modes
 - Improve opportunities to use sustainable modes within Great Yarmouth by providing viable alternatives to car use
 - Increase active travel mode share for short journeys
 - Reduce harmful emissions and air quality impacts
- 2.3.57. The Transport Strategy notes that the limited number of existing crossings of the River Yare create a pinch point on the local highway network. It anticipates that the Third River Crossing will help alleviate these pinch points on the network and help reduce traffic and congestion to the north of Great Yarmouth. The Strategy also notes that the Third River Crossing is expected to lead to a significant redistribution of traffic on the local and strategic road networks in Great Yarmouth.
- 2.3.58. The Transport Strategy identifies about 50 potential short, medium and long-term improvement Schemes, including Schemes (presently non-committed and unfunded):
- To encourage the use of public transport
 - To encourage journeys to be made by foot and bicycle
 - To encourage journeys to be made by rail

²⁵ Great Yarmouth Transport Strategy – (version 4, draft for Consultation) WSP for NCC and GYBC, August 2019

- To encourage travel by smarter choices
- To better manage traffic on the local and strategic highway network
- To reduce delay and traffic congestion on the local highway network
- To better manage parking

2.3.59. These include potential public realm improvements at Hall Quay (supporting the Town Centre Masterplan), and potential capacity improvements at the A47 Harfrey's roundabout (being considered by HE).

2.3.60. The proposed Third River Crossing is an integral part of the Transport Strategy, whilst the Strategy demonstrates a clear vision to build on the benefits of the Scheme through a multi-modal approach which encourages sustainable transport choices.

THE GREAT YARMOUTH ECONOMIC GROWTH STRATEGY 2017-2021

2.3.61. The Great Yarmouth Borough Council's Economic Growth Strategy²⁶ identifies the key sectors best placed to deliver employment growth:

- Energy, Engineering and Advanced Manufacturing
- Port and Logistics
- Tourism, Culture and Heritage

2.3.62. The strategic aims include:

- A prosperous physical environment and improved infrastructure

2.3.63. The strategy concludes, *inter alia*, that "Creating prosperous and sustainable communities can only be done if the necessary infrastructure is in place. Effective and co-ordinated investment in the right infrastructure, of the right quality and at the right time, is essential".

2.3.64. The strategy identifies the **Great Yarmouth Third River Crossing** as a key component of the infrastructure required to support new development.

SUMMARY OF THE POLICY BACKGROUND AND BUSINESS STRATEGY

2.3.65. Common themes in the above policies are:

- The need, and opportunities, for economic regeneration in Great Yarmouth
- The potential for growth associated with the offshore energy industry, especially in the Enterprise Zone and outer harbour
- The lack of adequate links between potential development areas on the peninsula and the strategic road network, especially to the A47 (south)
- The problem of heavy traffic on the existing bridges, and congestion in adjacent parts of the town centre
- The need for a third crossing of the River Yare to provide traffic relief, and better access to strategic routes, supporting regeneration and growth on the peninsula and the town centre

2.3.66. Overall, the vision for Great Yarmouth is for a once prosperous town to take advantage of the new opportunities for growth and regeneration afforded by offshore energy, commercial and port-related

²⁶ Great Yarmouth Economic Growth Strategy 2017-2021 (GYBC)

development and tourism by dramatically improving accessibility and providing traffic relief to the historic centre, making Great Yarmouth a more prosperous town and a better place in which to live.

2.4 PROBLEMS IDENTIFIED

2.4.1. This section identifies the problems which the Scheme will address. It presents evidence of their severity and impact and sets out the reasons why the intervention is needed. The problems are listed below and described in more detail in the rest of Section 2.4 and 2.5.

- Inadequate access to employment areas and the harbour
- Traffic congestion, resulting in queuing and delays to journeys
- Difficulty in accessing the town centre, seafront and leisure facilities
- Inefficient and indirect bus services into the southern part of the peninsula
- Lack of direct walking and cycle routes into the southern part of the peninsula
- Community severance
- Impact of traffic on historic areas
- Impact of traffic on local air quality and CO₂ and greenhouse gas emissions
- Road accidents
- Lack of resilience in the local road network

2.4.2. All of these problems are related to the way traffic uses the existing road network.

2.4.3. The existing road network is illustrated in Figure 2-1 above, and the existing peak traffic flows (from the calibrated base year SATURN model) are illustrated in Figure 2-6 and Figure 2-7 below. The volume of traffic in each direction is indicated by the width of the green line.

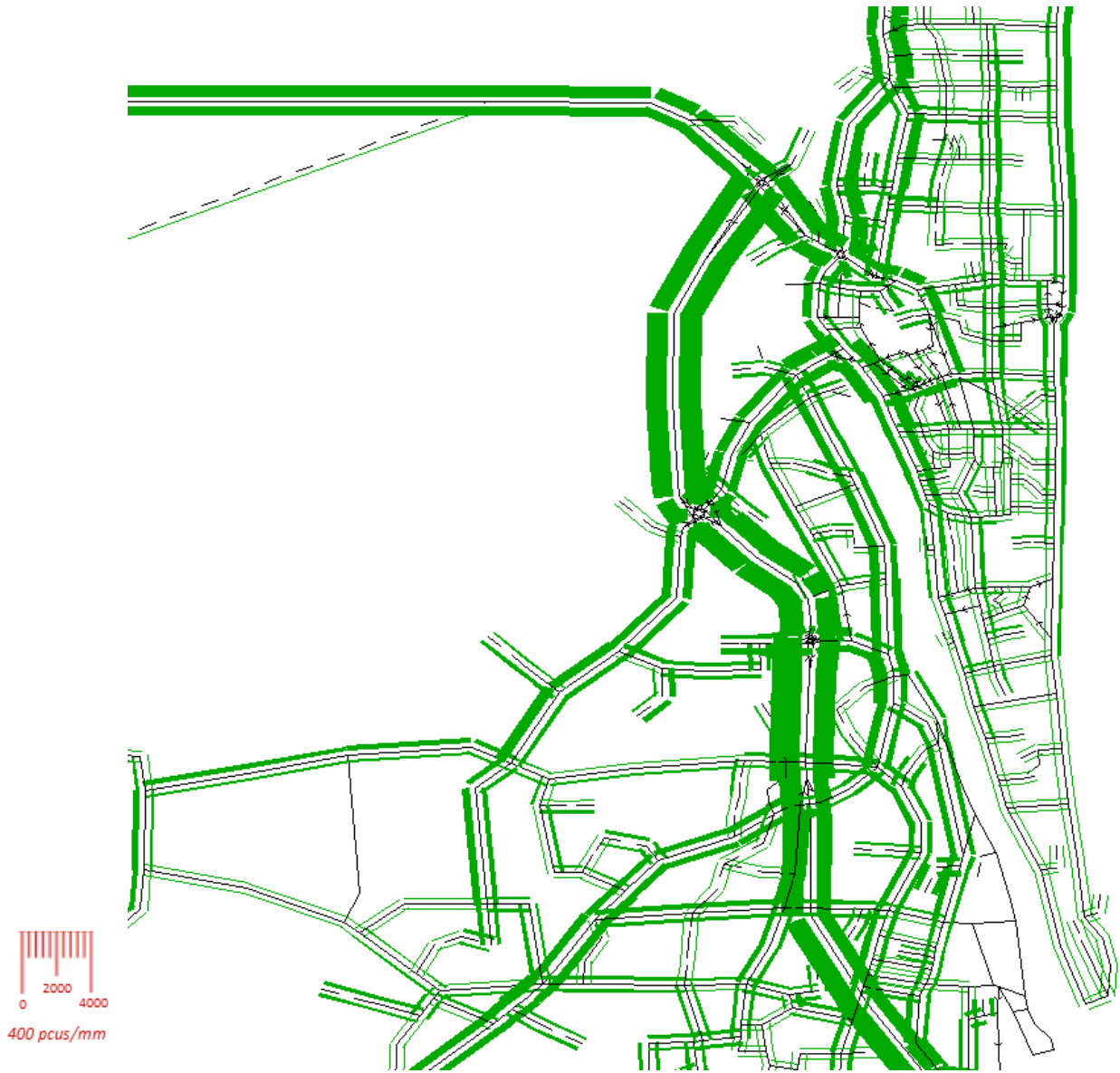


Figure 2-6 Traffic flows, AM Peak Hour 2018 (from SATURN Model)

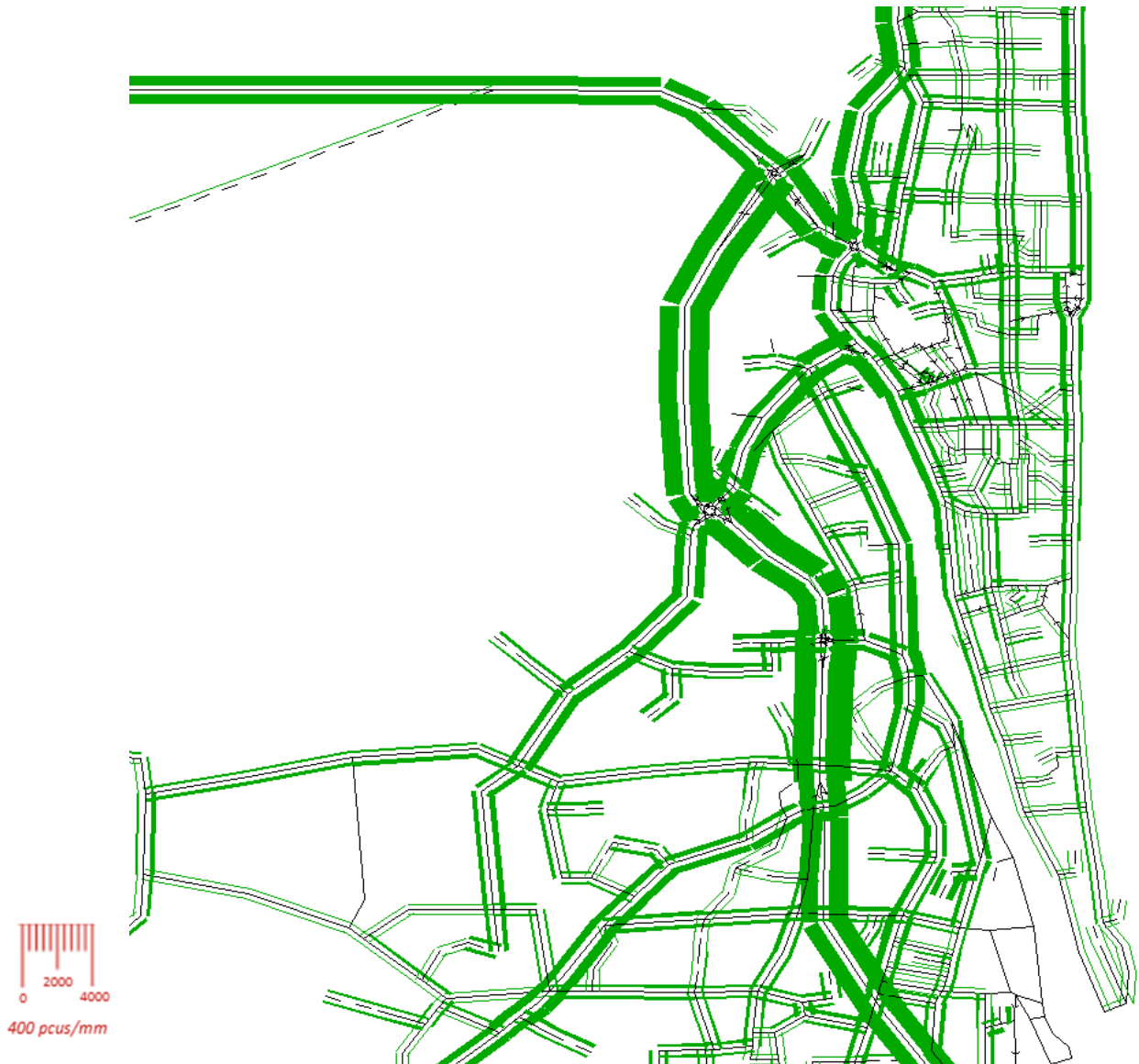


Figure 2-7 Traffic Flows PM Peak Hour 2018 (from SATURN Model)

PROBLEM: INADEQUATE ACCESS TO EMPLOYMENT AREAS AND THE HARBOUR

- 2.4.4. Figure 2-8 shows the principal employment areas and port and harbour facilities in relation to Great Yarmouth’s road network.
- 2.4.5. For most of its history, Great Yarmouth has been a river port, with facilities on both sides of the River Yare. The town grew up around the port, with industrial development on both sides of the river. The South Denes Industrial Estate occupies the southern part of the peninsula. There are two road bridges, the Haven Bridge in the town centre, and the newer A47 Breydon Bridge further north. This means that all traffic to and from the peninsula, including traffic to and from the South Denes Industrial Estate, has to pass through the town centre. This leads to congestion and delay and adds to the perception that the eastern part of Great Yarmouth is remote and inaccessible.



Figure 2-8 Principal Employment Areas, Port and Harbour Facilities

- 2.4.6. The decline in the fishing industry led to a decline in related employment, and many sites around the port fell vacant. However, the advent of North Sea oil and gas exploration, extraction and servicing brought new industry to the town in the 1960s. New businesses took over the vacated fish processing sheds and warehouses on the peninsula. Similarly, growth occurred to the north of the Haven Bridge and on the west bank of the river, extending southwards towards Gorleston. Growing demand in the 1970s led to the creation of new industrial areas at Gapton Hall and Harfrey's, both west of the river, and demand for premises in these areas remains strong.
- 2.4.7. The area to the east of the river, the peninsula, is characterised by older, poor quality industrial buildings which can be less attractive to new businesses. However, some existing firms have relocated west of the river, and have more recently been replaced by newer businesses associated with the energy sector. In recent years, the offshore wind power industry has provided a further stimulus. Several energy-related firms (BH Bus, STATOIL, Petersons and Seajacks) have recently located to the peninsula and others are considering moving there. The County and Borough Councils are actively pursuing the regeneration of the area, establishing the Enterprise Zone, Local Development Order and Energy Park.
- 2.4.8. The new outer harbour, completed in 2010, has the potential to further stimulate growth on the eastern side of the town. It has transformed Great Yarmouth from a declining river port into a modern deep-water port. Peel Ports began operations in Great Yarmouth in December 2015. The decision by Siemens and Scottish Power Renewables to use the new harbour as their construction and marshalling point for North Sea operations (most recently the EA 1 project) has been highly significant. A £7 million investment by Siemens, their main contractor, means that the port is now very busy with contractors' vehicles, and further growth is expected.
- 2.4.9. NCC is in discussion with Department for International Trade to explore whether the Port could be a location to host multiple manufacturing and assembly projects. Current Government thinking suggests new manufacturing capacity can only be attracted to the UK if there is co-location with assembly. No port with the necessary deep-water access such as the Gt Yarmouth outer harbour provides enough space, so investment will be needed. Factories to produce ever larger components – towers, foundations, blades, cables, or turbines – require a lot of space which needs to be adjacent to enough land to accommodate marshalling and assembly. Local partners are working with Government to see which ports can provide viable options. The alternative will be to continue to import most components and to carry on using ports such as Gt Yarmouth for marshalling and assembly. The Third River Crossing will strengthen local supply chains.
- 2.4.10. Vattenfall are a Swedish-owned Tier 1 company for offshore windfarms. Development consent was granted in July 2020 for Vattenfall to build one of the world's largest windfarms - the Norfolk Vanguard project and its sister project Norfolk Boreas wind farms. The combined installed capacity of these proposals is 3.6GW – enough electricity to meet the current demand of 2.6 million UK households, almost 10% of UK household demand. In 2018 Vattenfall agreed a Memorandum of Understanding with Peel Ports, should consent be granted, to locate their Norfolk Operations and Maintenance base in Great Yarmouth (see Section 2.6). Between 300 and 400 jobs would be created during construction, while up to 150 local technicians would be expected to maintain the wind farms once operational. The base will be operational for at least 25 years. Being the closest deep-water port to the East Anglia Array, Galloper and Dudgeon wind farms, Great Yarmouth's favourable location presents a huge opportunity to reap the benefits of the diversifying and expanding offshore energy sector.

2.4.11. As a strategically located port, Great Yarmouth is evidently attractive to potential businesses, but the present reality is that land-based transport links to the new deep-water harbour and potential employment sites in South Denes are not at all good. Supply chain businesses have to make regular journeys across the river, but the only route into the area is through the town centre, and is slow, congested and unreliable. The Great Yarmouth Economic Growth Strategy (2017) identified “poor strategic transport infrastructure” as a threat to growth, highlighting the third river crossing as necessary to resolve congestion and provide new access to development sites.



Figure 2-9 Outer Harbour

2.4.12. Employees live on both sides of the river, so there is regular commuting in both directions. There are long delays every day on the A47 as drivers enter the town for work. Lack of a more direct access into the peninsula also means that most journeys are longer than they could be, discouraging people from walking or cycling to work.

2.4.13. Figure 2-10, derived from the 2018 SATURN base model – illustrates the routes currently taken by traffic travelling to and from the South Denes peninsula in the PM peak period. Haven Bridge is the main route into the peninsula.

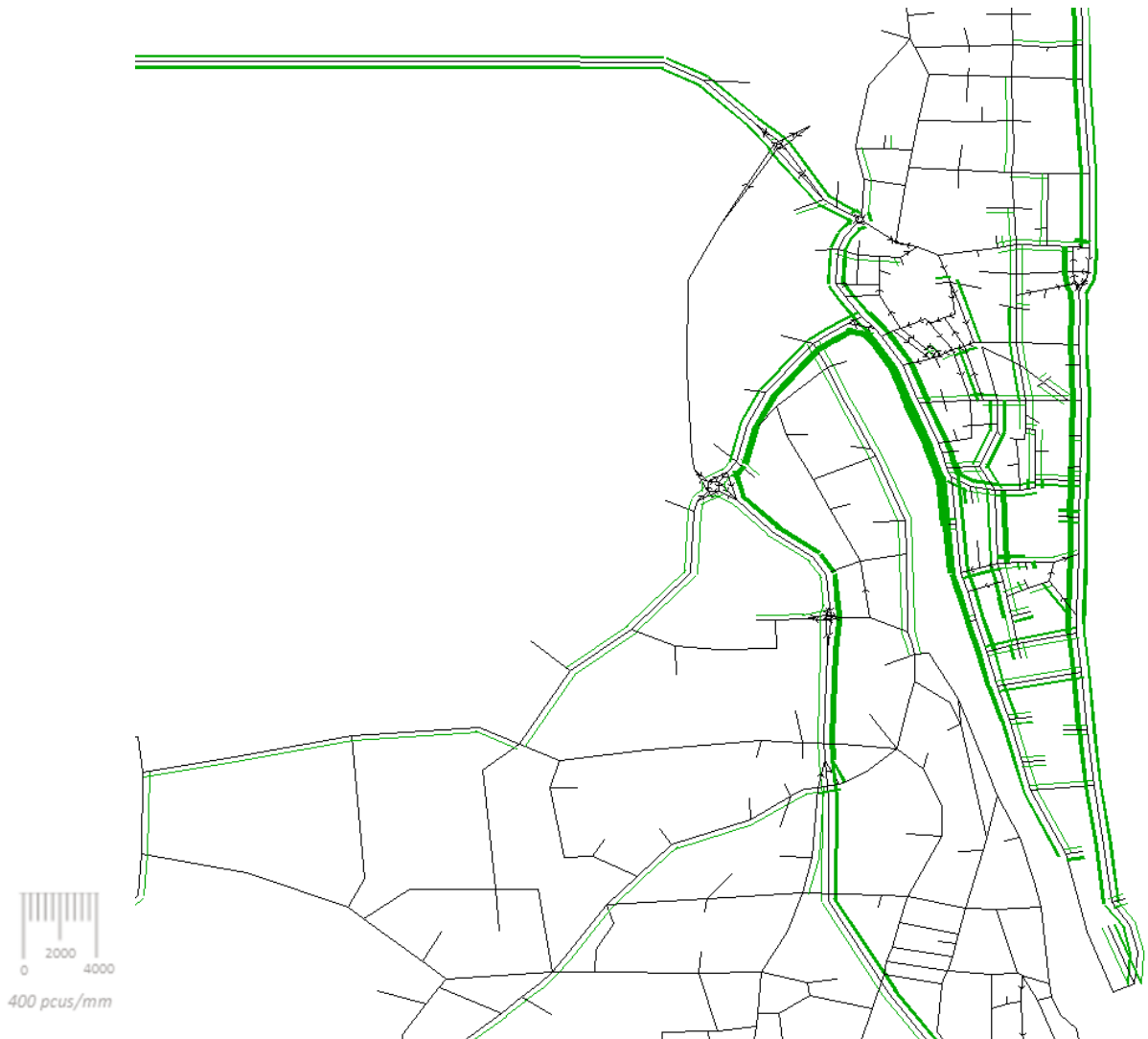


Figure 2-10 Traffic to and from South Denes Peninsula PM Peak 2018 (from SATURN MODEL)

2.4.14. Provision of a third river crossing would create a new, direct link into the South Denes Industrial Estate and the Enterprise Zone. It would provide both the river port and the deep-water harbour with excellent links to the strategic road network. It would improve supply chain access between businesses on the east and west sides of the river and bring more people within easier reach of new employment opportunities. It would support regeneration and help Great Yarmouth to benefit from growth in the offshore energy sector. A more direct crossing would also enable some journeys to be made by cycle or on foot, instead of by car.

PROBLEM: TRAFFIC CONGESTION RESULTING IN QUEUING AND DELAYS TO JOURNEYS

2.4.15. A survey of local residents²⁷ in 2009 identified traffic congestion as the most serious transport problem to be tackled, by a considerable margin, as shown in Figure 2-11.

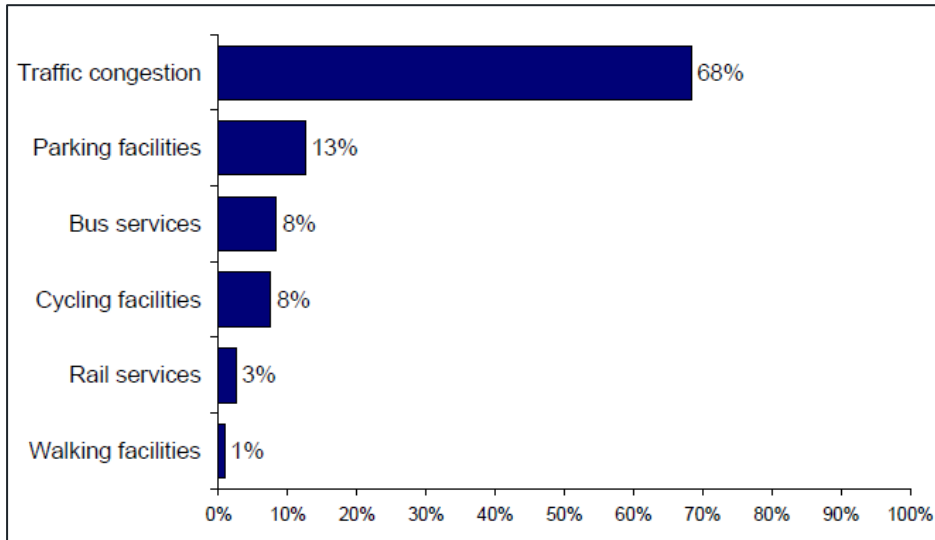


Figure 2-11 Residents' Survey (2009) on Aspects of Transport most Important to Improve

2.4.16. As it can be quite difficult to measure congestion in absolute terms, a range of survey results, open source data, and model investigations have been used to illustrate the severity of queuing and delay on town centre roads. Taken together, these provide evidence that congestion is a very real problem for people in Great Yarmouth, not just a perception.

2.4.17. Detailed classified traffic counts and queue length surveys were undertaken at key locations in the vicinity of the Haven Bridge and town centre in March 2018. The survey locations are shown in Figure 2-12 and the observed maximum queue lengths are set out in Table 2-1.

²⁷ Survey for the Great Yarmouth and Gorleston Area Transport Strategy, 2009

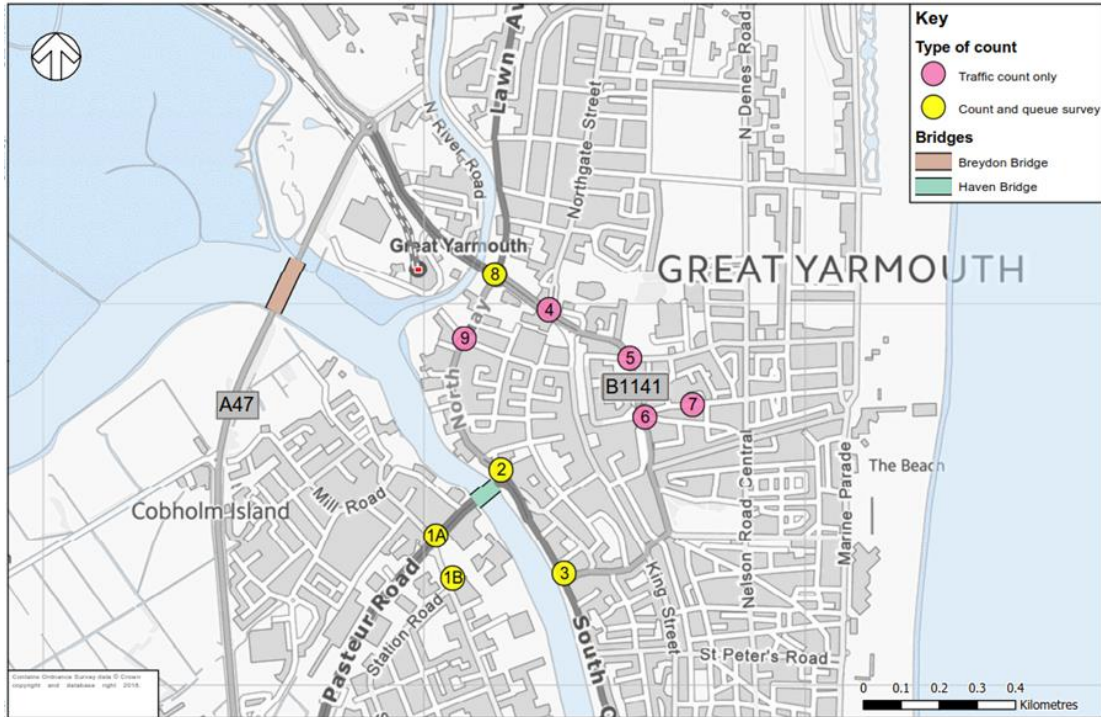


Figure 2-12 Traffic Counts and Queue Survey Locations (March 2018)

Location	Direction	Maximum Queue (m)
1A	From Pasteur Road	>150
1A	From Bridge Road	124
1A	From Southtown Road	110
2	From North Quay	73
2	From South Quay	74
2	From Bridge Road	>150
3	From the north	>150
3	From the south	68
8	From Acle New Road	88
8	From North Quay (north)	>150
8	From Fullers Hill	39
8	From North Quay (south)	72

Table 2-1 Maximum Queue Lengths Observed (March 2018)

2.4.18. This queuing is associated with the high volumes of traffic using the Haven Bridge and nearby roads, as shown in Table 2-2.

2-Way Traffic Flows March 2018	12 hrs (7 am – 7 pm) All Traffic
A1243 Haven Bridge (across River Yare)	22,354
South Quay, south of Haven Bridge	23,308
North Quay, north of Haven Bridge	13,436
Acle New Road (across River Bure)	24,746
Fullers Hill	9,392

Table 2-2 Traffic Volumes, March 2018

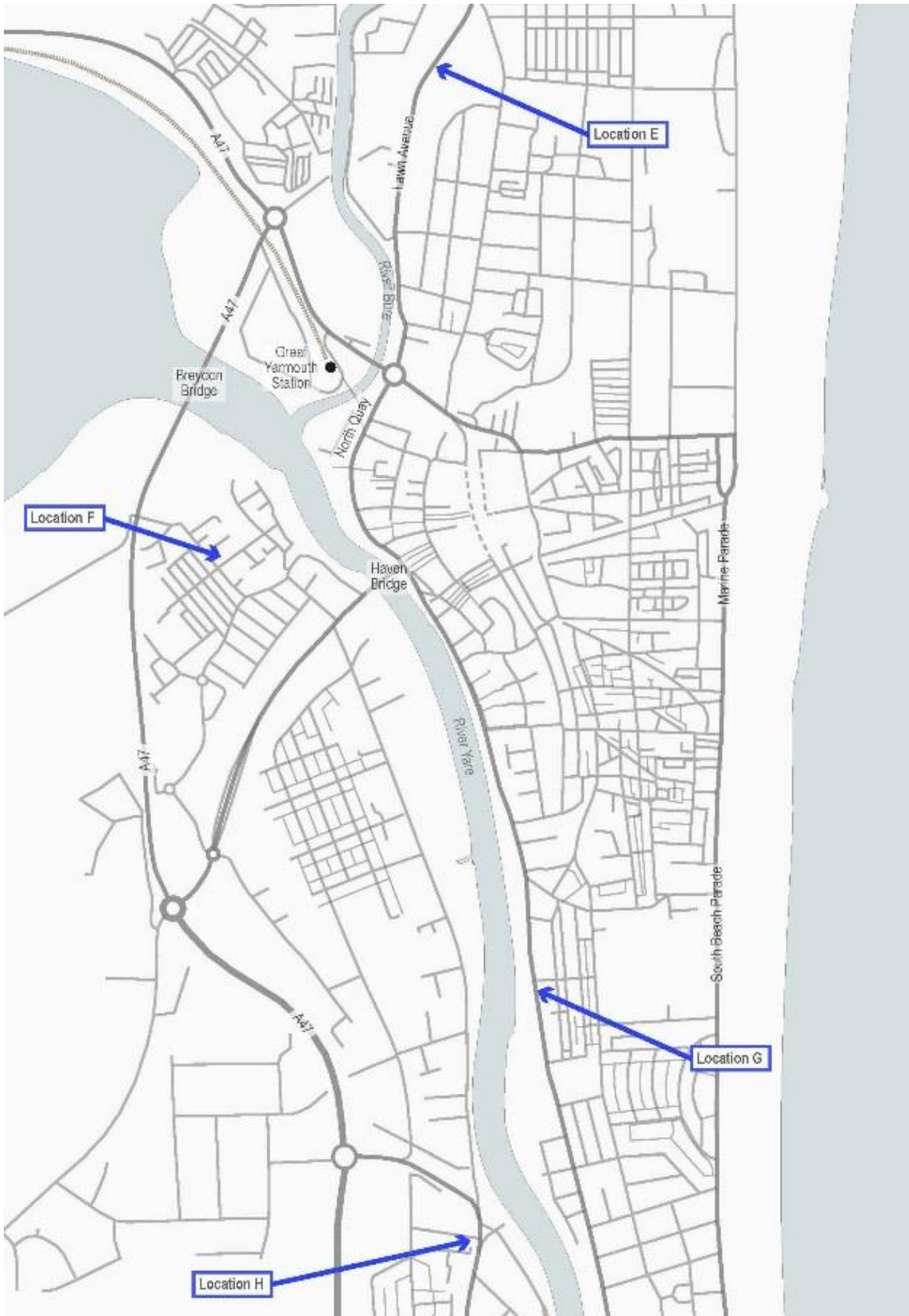


Figure 2-13 Journey Time Start/Finish Locations

2.4.19. Journey times are significantly longer in peak periods than in the off-peak. Open access mapping data was used to compare journey times on various routes at different times of the day in November 2016. The start and end points of these routes, all of which cross Haven Bridge, are illustrated in Figure 2-13 and the difference between peak and off-peak journey times is set out in Table 2-3.

From	To	To E AM	To E OP	To E PM	To F AM	To F OP	To F PM	To G AM	To G OP	To G PM	To H AM	To H OP	To H PM
E	Minutes				14	10	12	10	7	8	14	12	14
E	% over OP				40%		20%	43%		14%	17%		17%
F	Minutes	7	7	8				6	6	7	5	5	5
F	% over OP	0%		14%				0%		17%	0%		0%
G	Minutes	6	6	7	6	6	7				8	8	9
G	% over OP	0%		17%	0%		17%				0%		13%
H	Minutes	9	9	10	6	5	9	10	9	14			
H	% over OP	0%		11%	20%		80%	11%		56%			

Table 2-3 - Journey Times (from open source data)

- 2.4.20. A similar exercise was undertaken for routes using the Breydon Bridge and the results are set out in the 2016 Options Assessment Report²⁸.
- 2.4.21. The microsimulation model of Great Yarmouth, developed for the final phase of option assessment provides, a further insight into the location of congestion hotspots in and around the town centre. Figure 2-14 is a congestion “heat map” for the calibrated base year (2018) model, providing a snapshot of the locations and intensity of congestion on the local road network in the morning peak period.

²⁸ Options Assessment Report (2016) Great Yarmouth Third River Crossing Outline Business Case Supporting Document 1, <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

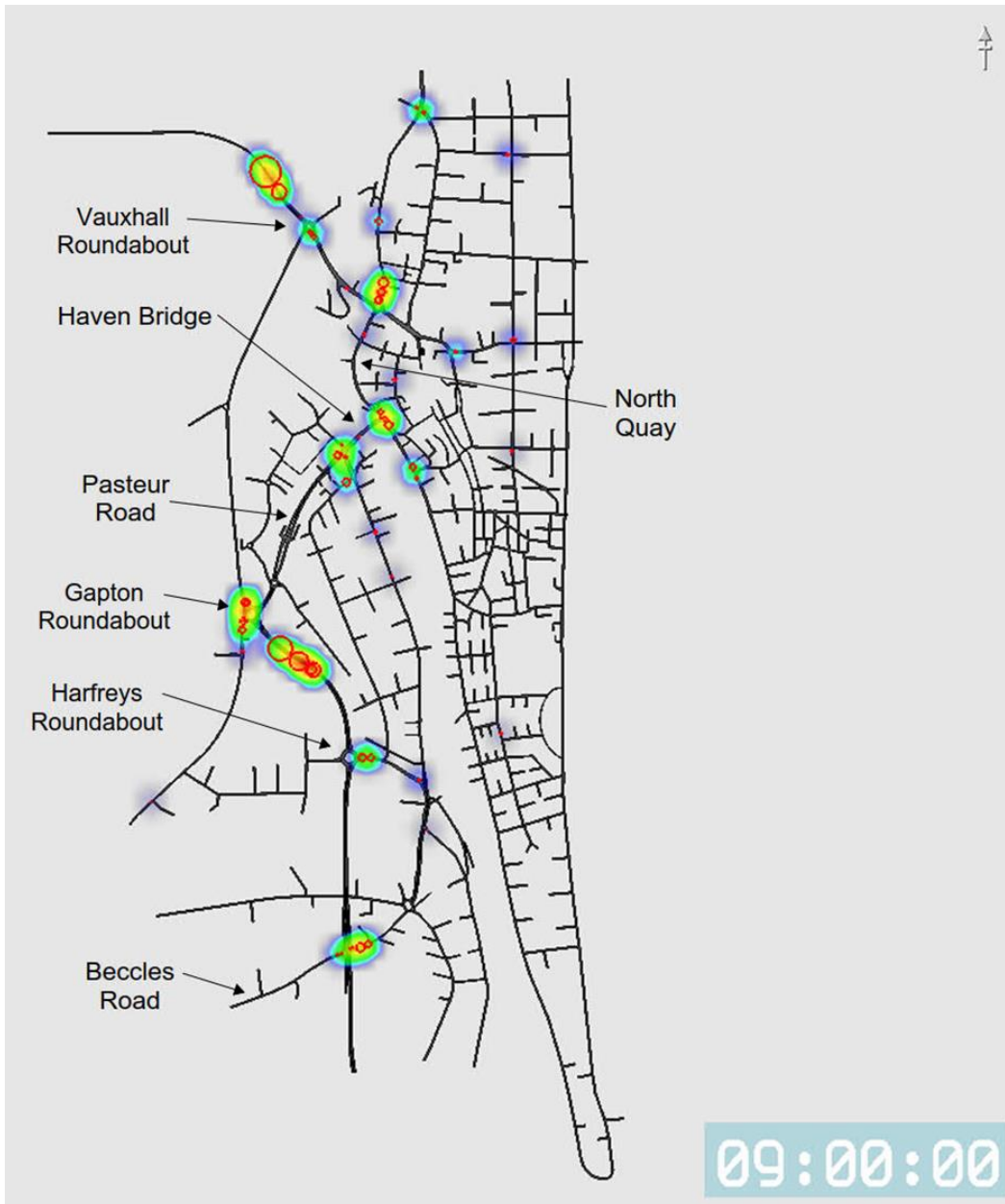


Figure 2-14 Congestion "Heat Map" AM Peak 2018 (from Paramics Microsimulation Model)

2.4.22. Because the heat map can only represent an instant of time, it should be seen as illustrative only, but it does give a further insight into which parts of the network are affected most by congestion. The results from the microsimulation model generally correspond with other surveys and anecdotal reports of congestion.



Figure 2-15 Congestion on Approach to Haven Bridge

- 2.4.23. Congestion is a problem in peak periods throughout the year, but also occurs during the summer when many tourists visit the town centre, pleasure beach and seafront attractions. An estimated 4 million people visit the resort every year, including about 1 million staying visitors per year with an estimated visitor spend of £398 million²⁹. Seasonal events, such as festivals, fireworks displays and horse races are all associated with increased congestion and traffic delay. On days with especially fine weather, increased numbers of day trippers add to the traffic demand and congestion. The raising of the bridges to allow shipping to pass through creates further significant delays and long queues which can take a very long time to clear. The proposed third crossing, whilst also a lifting bridge, will provide additional network capacity, reducing overall traffic on Haven Bridge and the build-up of queues – in effect increasing resilience.
- 2.4.24. As already noted, congestion at the bridges makes it difficult to provide adequate access to the important employment areas in the South Denes Enterprise Zone, including the new deep water outer harbour.
- 2.4.25. Congestion affects bus users and cyclists, as well as car users. Pedestrians are also affected by the long traffic signal cycle times needed to handle demand at junctions.

²⁹ 2011 Statistics, Local Plan Core Strategy, Great Yarmouth Borough Council

PROBLEM: DIFFICULTY IN ACCESSING THE TOWN CENTRE, SEAFRONT AND LEISURE FACILITIES

- 2.4.26. The town centre, seafront and the majority of leisure facilities are located on the Great Yarmouth peninsula. Access to these areas from the major routes in the south and east is limited by the bridges at the northern end of the peninsula – Haven Bridge over the River Yare, the A47 (former A12) Breydon Bridge, and A149 Acle New Road over the River Bure via the Fullers Hill roundabout.
- 2.4.27. Haven Bridge, Breydon Bridge and Fullers Hill roundabout carry heavy traffic flows and are regularly congested at peak times. The narrower streets within the town centre are subject to a one-way system. They can suffer significant congestion when minor disruptions occur, or when there is seasonal extra traffic into the town centre and seafront.



Figure 2-16 Traffic on South Quay

- 2.4.28. Figure 2-17 below is a visual representation of the modelled traffic flows on and around the Haven Bridge in the morning peak period in 2018. Traffic flow is indicated by both the width and colour of the line.
- 2.4.29. Figure 2-18 is a visual representation of the modelled traffic delays in the same area during the morning peak period. In this diagram, the delays are indicated by both the width and colour of the line.
- 2.4.30. The amount of traffic using Haven Bridge, the lack of alternative routes and the limited capacity of the road network around the bridge and in the town centre is a major cause of congestion in Great Yarmouth's town centre and makes it more difficult to access the seafront and other facilities on the South Denes peninsula.

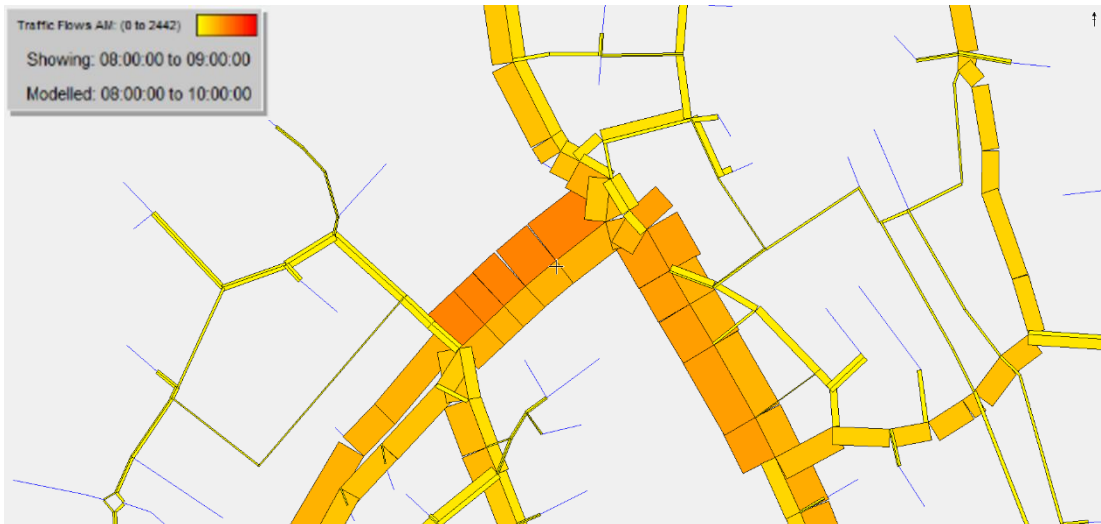


Figure 2-17 Traffic Flows around Haven Bridge, AM peak, 2018 (from Paramics Microsimulation Model)

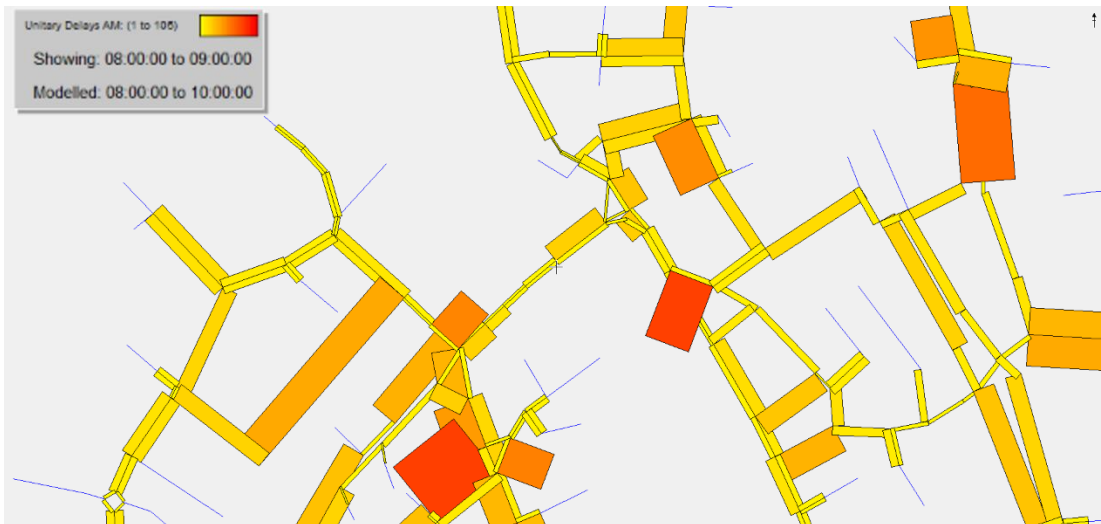


Figure 2-18 Link Delays, AM Peak, 2018 (from Paramics Microsimulation Model)

- 2.4.31. The town centre has experienced decline in the past 5-10 years. In January 2015 the Marks & Spencer store in King Street closed and moved to an out-of-town site at Gapton Hall Retail Park – a significant loss to the vitality of the traditional centre.
- 2.4.32. The popularity of out-of-town shopping with free car parking has added to the problems of access to the traditional town centre. At peak times and at weekends, traffic queues build up on the A47 (former A12) between the Harfrey's and Gapton Hall roundabouts, causing significant delays on Pasteur Road, the main route into the town centre via Haven Bridge.

- 2.4.33. The result is that Great Yarmouth town centre is seen as inaccessible by potential shoppers and visitors. At a consultation event held in Market Gates Shopping Centre (for the emerging Great Yarmouth Town Centre Masterplan) a number of residents remarked on the relative ease of travel to Lowestoft, or even Norwich via the A143 and A146 for their main food and comparison-shopping needs, rather than endure congestion in Great Yarmouth. This 'leakage' of expenditure to other major retailing centres such as Norwich or Lowestoft was also noted in the Borough Council's 2012 Retail Study.
- 2.4.34. There is now a real concern that some local people no longer recognise Great Yarmouth Town Centre as their principal destination for retailing or other town centre needs. This conflicts with the Local Plan Core Strategy's Retail Hierarchy, which classifies the town centre as the focus for future retail development and investment.
- 2.4.35. The Borough Council has undertaken a range of improvements to the town centre, and has taken other steps through a wider town centre initiative to improve its attractiveness, such as a revitalised market place, grants for shop frontages, and free parking in short stay car parks after 4 p.m.
- 2.4.36. The seafront suffers from the same access problems as the town centre and has also suffered decline. Recent investment in the public realm has led to major improvements to the northern part of the seafront. In contrast, the southern, less accessible part is desolate and unfrequented by visitors.
- 2.4.37. A third river crossing into the peninsula would complement recent investment in both the town centre and seafront by improving accessibility for all modes of transport. It would reduce adverse impacts of traffic and help dispel perceptions that Great Yarmouth is remote and inaccessible to visitors. It would help to recapture shopping expenditure from more distant centres, strengthen the role of Great Yarmouth as the main town in the borough, and improve its economic vitality. The stimulus which the proposed bridge will bring to employment would also have a positive impact on the economy of the town centre.

PROBLEM: INEFFICIENT AND INDIRECT BUS SERVICES INTO THE SOUTHERN PART OF THE PENINSULA

- 2.4.38. Existing bus routes in Great Yarmouth are illustrated in Figure 2-19. The main bus terminus is at the Market Gates shopping centre. Frequent delays at the Haven Bridge, and congestion associated with the traffic signals at either end of the bridge, pose particular problems for scheduled bus services in the area. When the Haven Bridge is raised, for river traffic, buses can be delayed for up to 20 minutes. Services may have to be cancelled, and delays can affect services throughout the day.
- 2.4.39. Efforts have been made to encourage tourists to use bus services from the holiday villages of Hemsby, Caister-on-Sea and Hopton, but it is difficult to grow this trade when services are badly affected by congestion.
- 2.4.40. Two existing bus routes penetrate part of the way into the South Denes area. In common with routes into the town centre, these services are affected by congestion at the existing bridges.

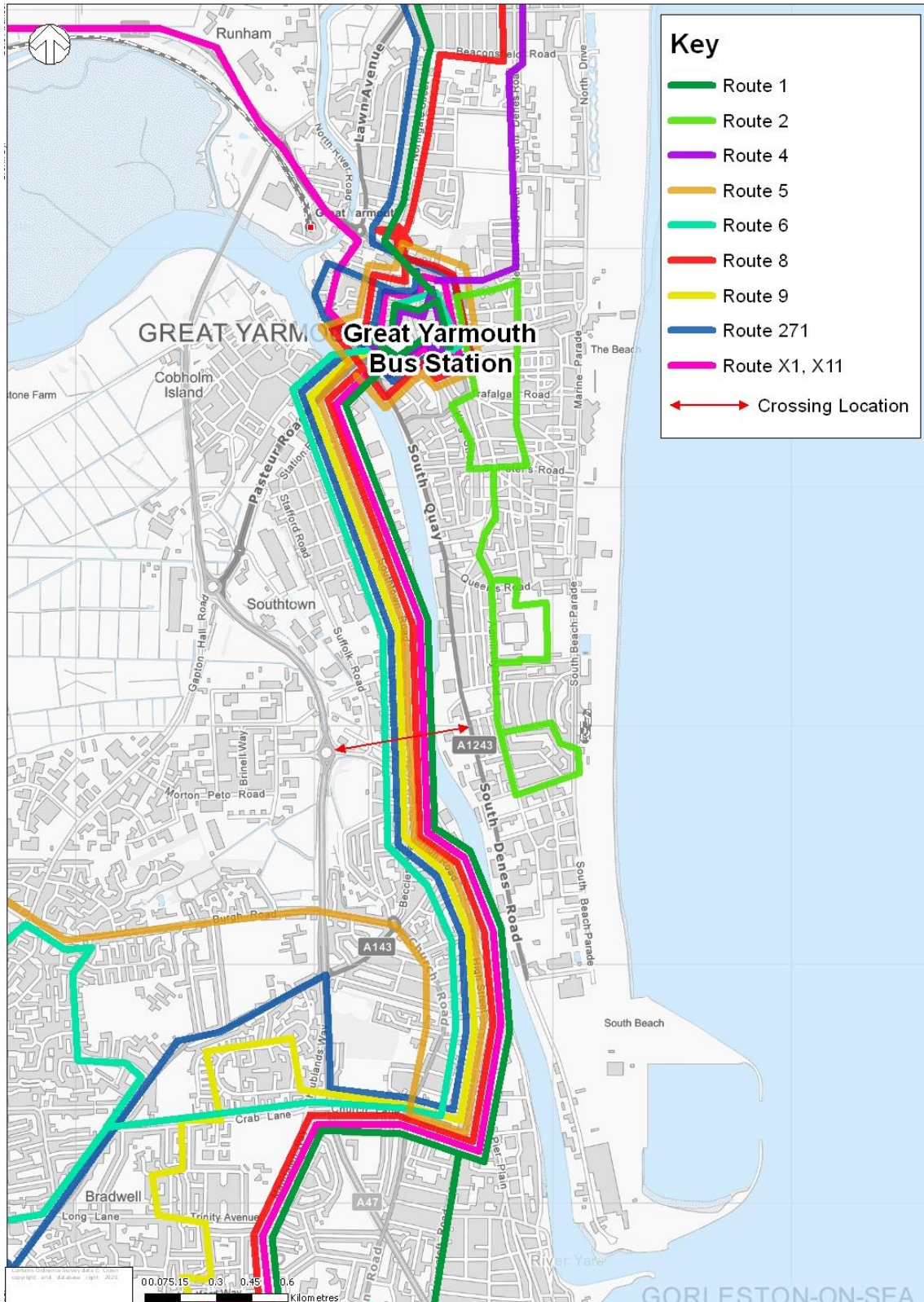


Figure 2-19 Bus Routes

- 2.4.41. Provision of a Third River Crossing would ease this congestion and could allow the development of more efficient services incorporating the new crossing. Discussions with the main bus operators have indicated that they would make use of the Third Crossing to provide more direct services to the town centre.



Figure 2-20 Haven Bridge

PROBLEM: LACK OF DIRECT WALKING AND CYCLE ROUTES INTO THE SOUTHERN PART OF THE PENINSULA

- 2.4.42. Similarly, pedestrians and cyclists from other parts of Great Yarmouth, or from the south or west have to use the Haven Bridge to access the town centre, seafront and employment areas. Existing facilities are illustrated in Figure 2-21. A dedicated off-road cycle route has recently been provided as part of the improvements to Marine Parade; there is a new off-road cycle/pedestrian route on the western side of Southtown Road between Queen Anne’s Road towards Boundary Road, advisory on-road cycle lanes on the remainder of Southtown Road, part of a network of advisory or traffic calmed routes on both sides of the river.
- 2.4.43. A third river crossing to the southern part of the peninsula, with dedicated cycle facilities, would enable these routes to be linked to form a greatly improved cycle network. It would make it easier to encourage people to walk or cycle to work from locations that are presently too far apart.

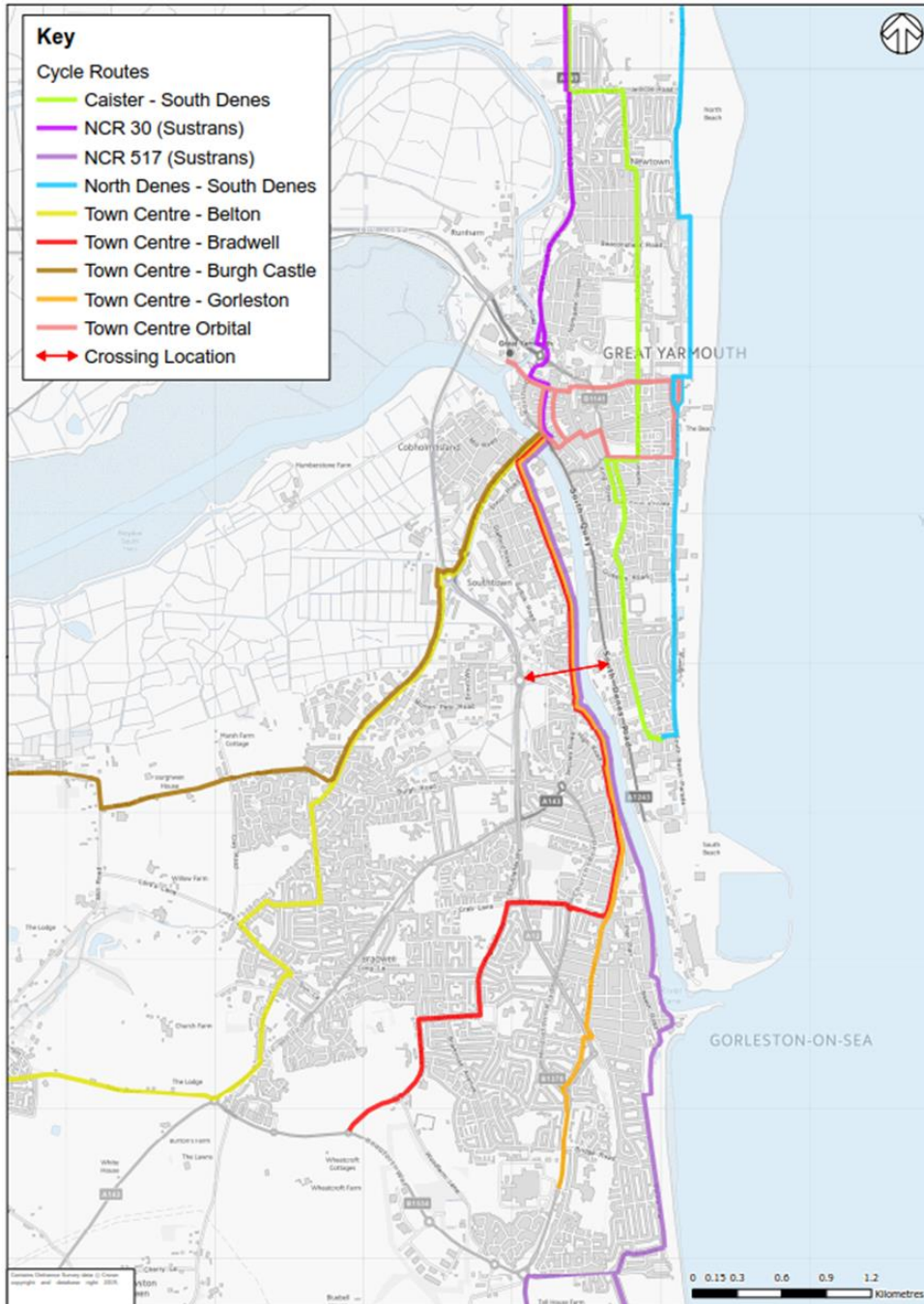


Figure 2-21 Cycle Routes

PROBLEM: COMMUNITY SEVERANCE

2.4.44. Great Yarmouth is split into two by the River Yare. The Haven Bridge is about 4 km from the river mouth and harbour, and whilst both the east and west sides of the 80m wide estuary are fully developed, the two communities are physically separate. The South Denes peninsula has a large resident population as well as significant industrial and port related development. The lack of a southern river crossing means that the community on the peninsula is isolated from the western parts of the town.

- 2.4.45. The Nelson Ward, which covers the peninsula, suffers from high levels of multiple deprivation and falls within the most deprived ten percent nationally in terms of income, education and employment. Residents are less likely to have access to private means of transport, or have the purchasing power for public transport, making it more difficult for them to access employment. For example, a resident of Pegotty Road on the South Denes peninsula would have to travel 2.5 miles to access employment at Harfrey's Industrial Estate, even though the two locations are physically less than 0.6 miles apart.
- 2.4.46. The economic community at South Denes comprises the Great Yarmouth South Denes Enterprise Zone, which includes the Great Yarmouth Outer Harbour, the South Denes Business Park, and, slightly further to the north, the Great Yarmouth Energy Park. The entire area has the benefit of a Local Development Order and is strategically positioned to capitalise on the burgeoning offshore energy sector. The employment opportunities in these areas are relatively inaccessible to people living in the western part of the town. For example, a person living on Riverside Road, Gorleston, would have to travel 6 miles to reach a place of work on South Denes Road which is physically less than a quarter of a mile away.
- 2.4.47. The same geographical constraints mean that the other Enterprise Zone site in Great Yarmouth (Beacon Park in Gorleston) is effectively more distant from the South Denes Enterprise Zone site and the Outer Harbour, whilst the routes between them are often congested. This is a problem, as it is essential to have good links between the energy sector businesses in the office-driven business park and the more industrial South Denes site.
- 2.4.48. The provision of a third river crossing would greatly reduce the severance of the residential and business communities on the peninsula from the rest of the town and local area. A new crossing would bring more people within walking and cycling distance of important industrial areas, expanding employment opportunities for people without access to a car. Residents would have much better access to Gorleston High Street. A new crossing would therefore help to socially integrate communities within Great Yarmouth, a key aim of the Local Plan Core Strategy. It would also reduce journey times for people and goods, and improve connectivity to destinations such as Felixstowe, Harwich and London via the A12, and to Norwich and the Midlands via the A47.

PROBLEM: IMPACT OF TRAFFIC ON HISTORIC AREAS

- 2.4.49. Traffic detracts from the enjoyment of the most important historic areas in Great Yarmouth.
- 2.4.50. The first Haven Bridge was erected in 1427 at South Quay, connecting Yarmouth with Southtown. South Quay, together with North Quay and Hall Quay (previously called Broad Quay) form the historic heart of the town, described by Daniel Defoe in the 18th century as "the finest key in England, if not in Europe, not inferior even to that of Marseilles itself".

2.4.51. South Quay is a conservation area³⁰, with a significant cluster of listed buildings including former merchants' houses with mediaeval origins (now the Elizabethan House Museum, and Nelson Museum) and the historic frontages of the former Port Authority building (1746) and the Port & Haven Commissioners Office (1909). There are links from South Quay to the Time and Tide Museum, which occupies a former fish curing works (1880), the Greyfriars Franciscan Friary (parts of which date from the 14th century) and a 12th century Toll House.



Figure 2-22 Historic Merchant Houses and Town Hall, South Quay

- 2.4.52. South Quay is currently the main route for all traffic, including heavy goods vehicles, to the South Denes industrial area and the outer harbour. As such, it carries heavy traffic in the morning peak hour. This, together with the associated signing and other street furniture seriously detracts from the setting of the historic buildings and the enjoyment of important cultural assets.
- 2.4.53. Table 2-4 sets out the traffic flows on Haven Bridge, North and South Quay from the calibrated 2018 SATURN model.

³⁰ [http://www.heritage.norfolk.gov.uk/record-details?TNF2259-Great-Yarmouth-South-Quay-Heritage-Trail-\(Heritage-Trail\)](http://www.heritage.norfolk.gov.uk/record-details?TNF2259-Great-Yarmouth-South-Quay-Heritage-Trail-(Heritage-Trail))

	2018 AM Peak Traffic (2 way)	2018 PM Peak Traffic (2 way)
North Quay	700	1,158
Haven Bridge	1,758	1,805
South Quay	1,649	1,636

Table 2-4 Traffic Flows near Haven Bridge AM and PM Peak Hour 2018 (from SATURN Model)

2.4.54. The historic Hall Quay is directly opposite the Haven Bridge and is dominated by the heavy traffic using the bridge. Traditionally the civic heart of the town, Hall Quay is framed by the waterfront, the listed Town Hall (1882), and several banks with attractive listed frontages. In recent years, most of the banks have relocated, leaving prominent historic buildings vacant.



Figure 2-23 Town Hall and Traffic Turning from Haven Bridge

2.4.55. The emerging Great Yarmouth Town Centre Masterplan identifies this area as having potential to regenerate as a new premium leisure-based quarter for Great Yarmouth town centre, capitalising on its historic setting, the quality and stock of existing listed buildings and its west-facing vantage over the River Yare and towards the Broads. This is an important economic opportunity for the town, with the potential to broaden the offer and functionality of the town centre and to reduce the seasonality of the tourism economy.



Figure 2-24 Star Hotel and Bank Buildings, Hall Plain

- 2.4.56. These historic areas are unlikely to achieve their potential without a reduction in the current levels of traffic and congestion. A third river crossing would provide an attractive alternative route to the industrial areas and outer harbour. It would significantly reduce the amount of traffic, including heavy goods vehicles, using the Haven Bridge, Hall Quay and South Quay, supporting the regeneration of these areas and improving the local economy.

PROBLEM: IMPACT OF TRAFFIC ON LOCAL AIR QUALITY AND EMISSIONS OF CO₂ AND GREENHOUSE GASES

- 2.4.57. The scientific consensus is that increases in carbon dioxide (CO₂) and other greenhouse gases are causing climate change. Other emissions, especially particulates, are associated with serious risks to health. Transport is a major source of CO₂ and other emissions. Changes in the volume and type of road traffic, and the performance of the local road network, will therefore have a significant impact on local air quality and the emission of greenhouse gases.
- 2.4.58. By local air quality we mean the ambient air quality outside people's homes, or in areas where people spend a large amount of time. Poor air quality is caused by increased concentrations of gases such as nitrogen dioxide (NO₂) or particles (PM) that are harmful to people and habitats, causing harm to health and, as a consequence of climate change, more extreme weather and flooding.
- 2.4.59. Local air quality is dealt with under the Local Air Quality Management (LAQM) Regime, introduced under Part IV of the 1995 Environment Act. Great Yarmouth Borough Council produces an Annual Status Report (ASR) on air quality, as required by the 1995 Act. The Council undertakes type-approved real time monitoring of air quality in line with LAQM requirements but is currently not obliged to monitor greenhouse gases.

- 2.4.60. The 2019 ASR³¹ did not reveal any exceedance of air quality standards and did not predict any exceedance over the following year. Therefore, the Borough does not have any Air Quality Management Areas (AQMA). However, the possible need for an AQMA for NO₂ at a future date was predicted when the original Outer Harbour was proposed. The 2019 ASR therefore confirms the need for a “watching brief” on the development of the Outer Harbour and new industry in the Enterprise Zone.
- 2.4.61. Great Yarmouth Borough Council considers that the people most likely to be affected by poor air quality in Great Yarmouth are those who live alongside the quayside (between North Quay and the Outer Harbour), Runham Vauxhall, Southtown, Cobholm, and Pasteur Road/Southtown Road/Bridge Road. These areas are characterised by a large proportion of rented accommodation, and many residents who are young, elderly, sick or socially or economically disadvantaged.
- 2.4.62. The 2019 ASR sets out a number of measures that are expected to improve air quality and reduce the exposure of the public to adverse air quality. The proposed third river crossing is identified in the ASR as a measure which will reduce vehicle use in town and improve air quality.
- 2.4.63. A third river crossing will change traffic patterns over a large area. The impacts on air quality will be monitored, together with the longer-term impacts of growth and regeneration. By offering shorter, more reliable journeys and less queuing and congestion, the Scheme is expected to reduce fuel consumption and emissions of NO₂, PM, CO₂ and greenhouse gases.

PROBLEM: ROAD ACCIDENTS

- 2.4.64. In the five years from 2014 to 2018, there were 390 recorded collisions in the Great Yarmouth area, involving 489 casualties.
- 2.4.65. Of the 489 casualties, 107 (22%) were pedestrians and 64 (13%) were cyclists with 54 casualties (11%) involving motorcycle accidents. There are clusters of accidents on the approaches to the existing bridges, including at North Quay.

	Collisions	Casualties
Fatal	3	3
Serious	64	81
Slight	323	405
Total	390	489

Table 2-5 Collisions and Casualties 2014-2018

- 2.4.66. In the five years from 2014 to 2018, collisions on key links and junctions in the town centre were recorded as set out below:

³¹ 2019 Air Quality Status Report (ASR) Great Yarmouth Borough Council (December 2019)

Location	Fatal	Serious	Slight	TOTAL	Peds	Cyclists
Links - Pasteur Road and Bridge Road	0	3	7	10	2	4
Links - Southtown Road	1	2	13	16	3	6
Links - South Quay and Southgates	0	1	9	10	1	2
Links - William Adams Way	0	0	2	2	0	1
Junctions - A12/Pasteur Road	0	0	7	7	0	0
Junctions - A12 William Adams Way	0	0	9	9	0	0
Junctions - Bridge Road/Hall Quay	0	0	4	4	1	0

Table 2-6 Accident Locations 2014-2018

- 2.4.67. On Pasteur Road and Bridge Road, accidents are grouped around the Pasteur Road/Thamesfield Way roundabout (2 slight) and the Bridge Road link between Southtown Road and Hall Quay signals (1 serious, 3 slight). Of most concern is the prevalence of accidents involving vulnerable road users on Pasteur Road/Bridge Road. Six accidents involved vulnerable road users suggesting problems in this motor vehicle dominated environment around the existing crossing of the River Yare.
- 2.4.68. Of the 16 accidents recorded on Southtown Road, 3 occurred at the junction with Gordon Road, 2 at the junction with Portland Court and 2 at the junction with Station Road.
- 2.4.69. A third crossing is expected to reduce overall distances travelled in and around the town, and therefore reduce exposure to accident risk, leading to a net reduction in casualties. As traffic transfers from routes with higher than average accident rates to safer routes, further reductions may occur. The new bridge and approach roads will be designed to reduce accident risk, following a full safety audit. Accident reductions have been forecast using the traffic model and the assessment is included within the Economic Case, rates will be monitored before and after the Scheme construction.

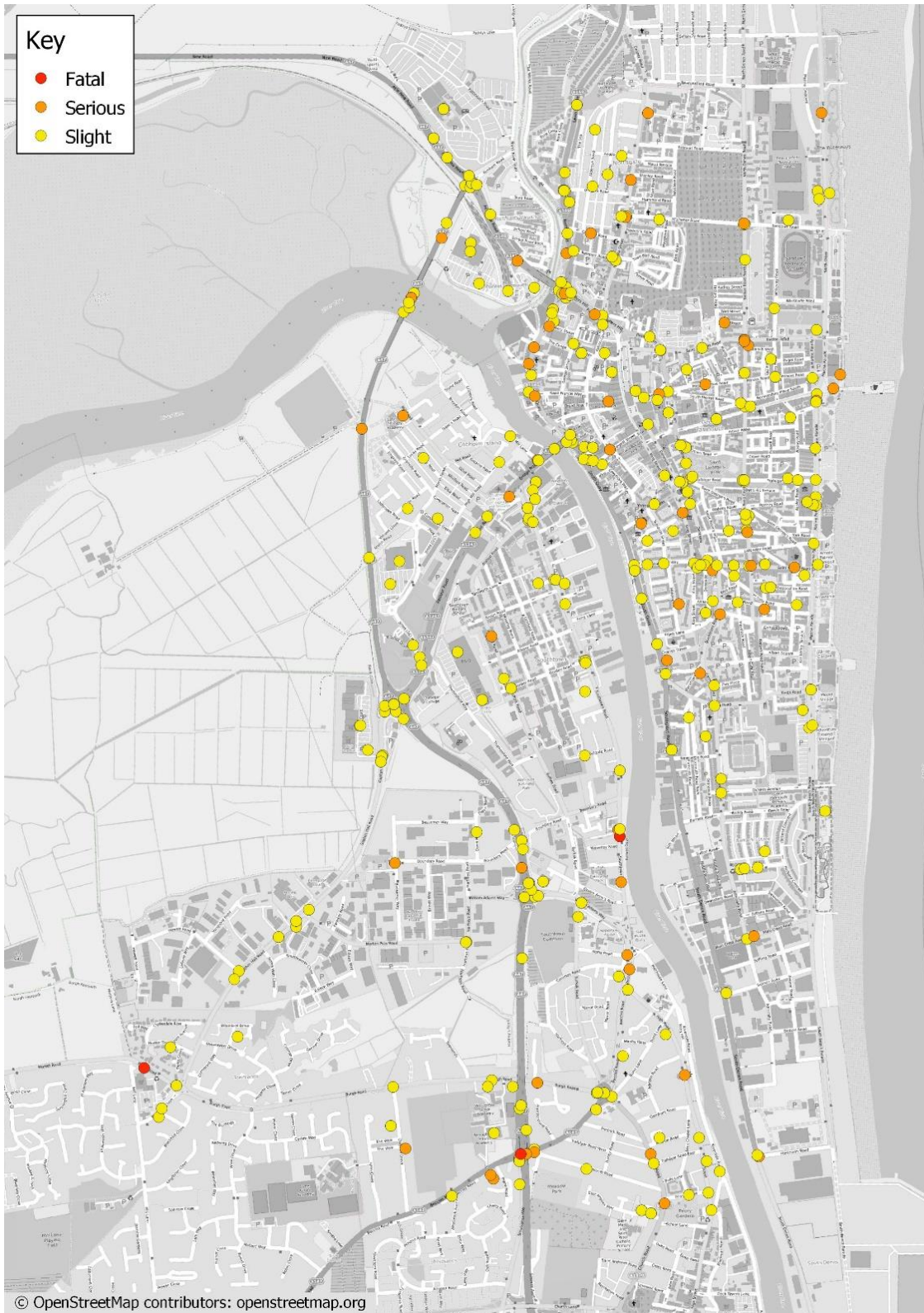


Figure 2-25 Injury Accidents 2014-2018

PROBLEM: LACK OF RESILIENCE IN THE LOCAL ROAD NETWORK

2.4.70. Resilience in a transport network has been defined³² as “the ability to absorb shocks gracefully”. It may be understood in terms of the way different components of the network work complement each other:

- **Redundancy** Different components serving the same function
- **Diversity** Components are functionally different
- **Efficiency** Network performance is optimised
- **Autonomy** Components are able to function separately
- **Strength** Ability to withstand a disruptive event
- **Collaboration** Information and resources shared amongst components
- **Adaptability** Flexible, able to learn from past experiences
- **Mobility** Ability to reach a chosen destination with an acceptable level of service
- **Safety** Exposes fewer users to hazards
- **Recovery** Level of service can be restored quickly

2.4.71. Lack of resilience is a problem if a transport network is unable to cope with disruptive events, such as surges in demand, accidents, extreme weather conditions or road works. The more common the event, the more important it is for the network to be able to recover quickly in order to restore an acceptable level of service and avoid compounding the problem.

2.4.72. Lack of resilience is a serious problem in Great Yarmouth as a result of:

- The frequent, but irregular, openings of the Haven and Breydon Bridges to allow passage of river traffic
- A lack of alternative routes to and from the South Denes Industrial Estate and Outer Harbour
- Seasonal and weather-related variations in traffic demand from visitors
- The high risk of flooding affecting the Haven Bridge

2.4.73. The problems arise because of the frequency, or severity of the disruptive events combined with the inability of the existing network to cope and recover.

2.4.74. When the Haven Bridge is raised to allow ships to pass through, it is very difficult for traffic to divert to alternative routes. The traffic signals at either end of the bridge generate long tailbacks of traffic which is typically stationary for about 10 minutes on each occasion. It can take up to 20 minutes for the queues to clear and for traffic to return to normal. During these times, buses can be severely

³² Resilience Theory and System Evaluation, Verification and Validation of Complex Systems: Human Factor Issues, Vol.1 10, p35-60, Harold Foster (1993)

delayed, but they are unable to divert away from their scheduled routes. The A47 Breydon Bridge is an unsuitable alternative route for pedestrians and cyclists.

- 2.4.75. There is a further problem in that the Haven Bridge is ageing, and utilities (such as water, gas electricity mains) are affected by corrosion. Power supplies to the traffic signals are frequently disrupted, which causes traffic disruption over a wide area.
- 2.4.76. Pipes and cables occupy a limited space and are not easy to maintain efficiently. It can be difficult to locate faults quickly, and work on one utility often exacerbates problems with another. It is difficult to plan repairs and renewals efficiently, reducing the resilience of the power and water supply networks as well as increasing the frequency of road closures.
- 2.4.77. The Haven Bridge is in an area which is susceptible to flooding. It is the first area of the town to be closed to traffic during flooding incidents³³.
- 2.4.78. In January 2017 a tidal surge led to the evacuation of parts of the town. When water overtops the flood barriers the existing bridges have to be closed to traffic. Salt water ingress associated with flooding also causes damage to traffic control equipment and corrodes pipes and cables, increasing the need for maintenance and renewal.
- 2.4.79. The issue in Great Yarmouth is not that such disruptions occur, as they are often unavoidable. Rather, it is the network's inability to cope well with these common, though unpredictable, disruptions because of the lack of capacity for extra traffic in the town centre, and the lack of alternative routes to important destinations on the peninsula.
- 2.4.80. The provision of an additional river crossing would greatly increase the resilience of the local transport network. In terms of the factors identified above, it would provide:

- **Redundancy** **An alternative, more direct route into the peninsula**
- **Diversity** **A bridge in a different location**
- **Efficiency** **Shorter, more direct routes for many journeys**
- **Autonomy** **The bridges would open independently of one another**
- **Strength** **The new bridge would be less susceptible to flooding**
- **Collaboration** **Traffic would be directed to the new bridge if the Haven bridge has to be closed for maintenance**
- **Adaptability** **The new bridge would have capacity to cope with a present and future traffic demand**
- **Mobility** **The new bridge would provide much more reliable access to the harbour and Enterprise Zone**
- **Safety** **Shorter journeys on a bridge and junctions designed to modern standards reduces exposure to accident risk**

³³ Flooding near Haven Bridge, © 2007 EN news EN pics (01603) 772435

- **Recovery** **Increased total river crossing capacity would enable a normal level of service to be restored quickly after an incident**



Figure 2-26 Flooding in the Vicinity of Haven Bridge

2.5 FUTURE PROBLEMS - THE IMPACTS OF NOT CHANGING

- 2.5.1. **Traffic levels** in Great Yarmouth are expected to increase from the present levels over the coming years. Figure 2-27 illustrates the forecast traffic growth from 2018 to the opening year (2023) and design year (2038) on the local road network in Great Yarmouth. Without intervention to provide a new crossing into the South Denes peninsula, the problems described in Section 2.4 will inevitably worsen, as more traffic is channelled over the existing bridges and through the town centre.

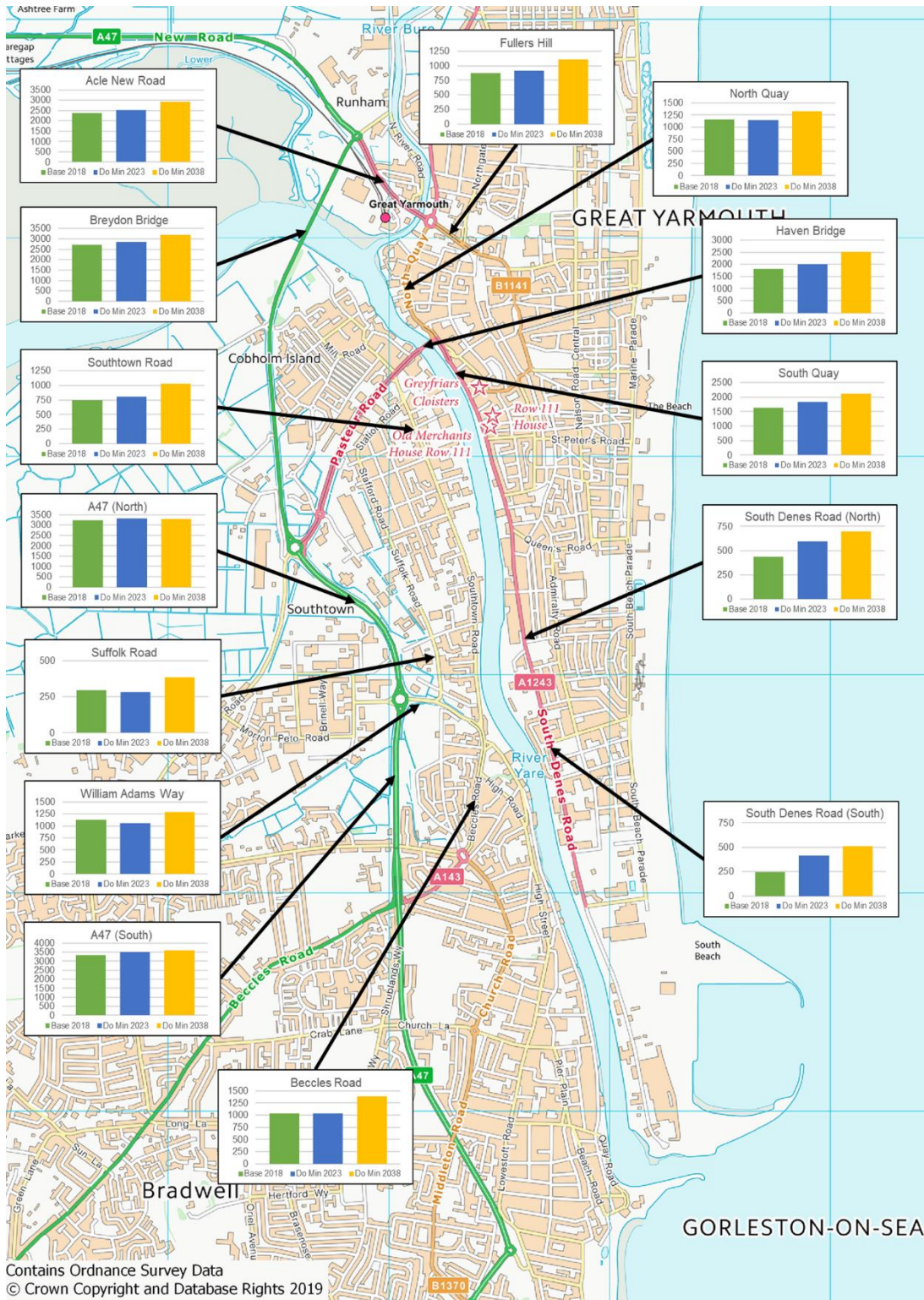


Figure 2-27 Forecast Traffic Growth 2018 to 2023 and 2038, PM peak hour, from SATURN Model

2.5.2. **Congestion** is expected to increase. Figure 2-28 shows visual representations of congestion in 2018 and 2038 (PM peak) showing the increasing number and intensity of congestion hotspots.

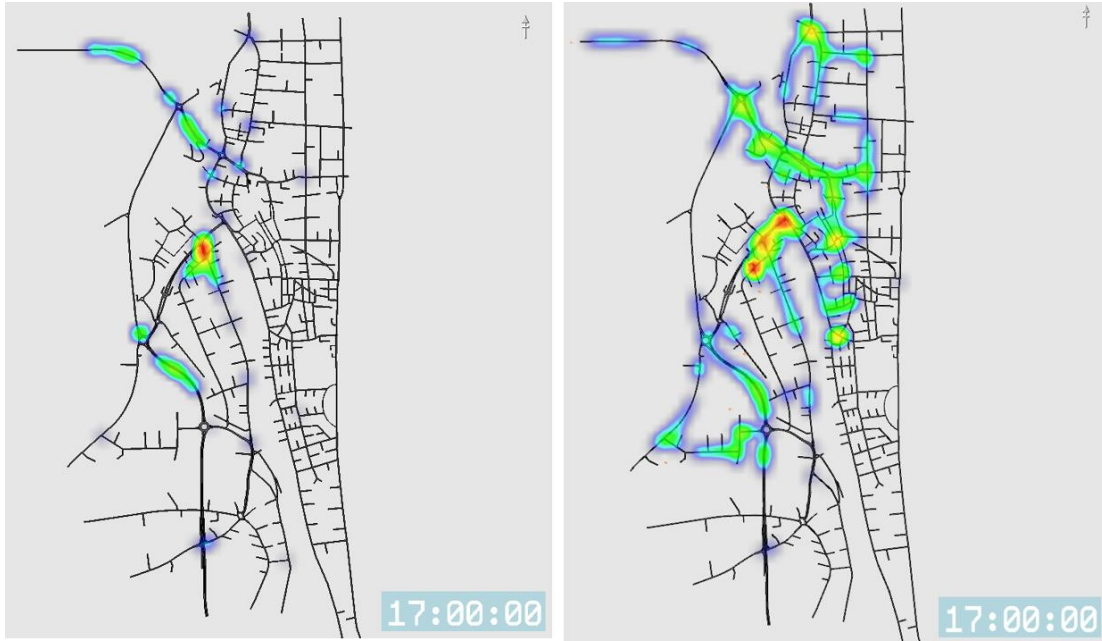


Figure 2-28 Forecast Congestion Changes 2018 to 2038, PM Peak Hour from Microsimulation

2.5.3. **Historic areas** of the town will suffer the adverse impacts of extra traffic. Traffic will increasingly dominate these areas, and it will not be possible to improve them to their full potential. Forecast increases in traffic on Haven Bridge and North and South Quay (based on modelling undertaken in 2019) are set out in Table 2-7 below.

Traffic Flow (2 way) PM Peak	2018	2023 DM	2038 DM
North Quay	1,151	1,317	1,476
Haven Bridge	1,805	2,304	2,783
South Quay	1,636	2,221	2,731

Table 2-7 Forecast Traffic Growth near Haven Bridge PM Peak Hour (from SATURN Model)

2.5.4. These are significant increases and will lead to increased congestion and delay and a range of other adverse impacts (e.g. noise, emissions, quality of the public realm etc.) on this sensitive part of the town.

2.5.5. Journeys will experience **longer delays**, and journey times will become less reliable.

2.5.6. **Greenhouse gas emissions** will increase, and air quality will become worse as traffic and congestion increase.

2.5.7. The **relative isolation** of the harbour, Energy Park, Enterprise Zone and industrial areas on the South Denes peninsula will become worse, because of the impacts of extra congestion on the already poor and indirect access to the A47 and strategic road network.

2.5.8. As a result:

- It will be more difficult to attract new investment.

- The South Denes peninsula will remain relatively inaccessible for pedestrians, cyclists and users of public transport, and it will be more difficult to encourage more people to use active modes of transport.
- Great Yarmouth will remain a physically divided town, both in terms of community severance and with key industrial areas separated by the river, unable to exploit potential synergies.

2.5.9. Traffic growth will bring significant problems, the impacts of which have yet to be experienced. Whilst the job of delivering other strategic objectives will continue, it will undoubtedly become more difficult, and it is likely that some opportunities to regenerate Great Yarmouth and make it more attractive as a place in which to live and work, or to visit, will not be fully realised.

2.6 OPPORTUNITIES FOR GROWTH, REGENERATION AND INWARD INVESTMENT

2.6.1. The provision of a third crossing of the River Yare in Great Yarmouth will create opportunities for growth, regeneration and inward investment by:

- Providing a new direct route into the South Denes Enterprise Zone, including the new Outer Harbour, from the A47 (south) including Lowestoft, the A143, the A47 (west) including Norwich, and the A129 to the north
- Providing the highway access and capacity needed to support employment growth in the Great Yarmouth peninsula and Outer Harbour, encouraging new investment in the offshore renewable energy sector within the Energy Park, the South Denes Business Park, the Enterprise Zone and wider LDO area
- Provide a more direct route into the southern part of the peninsula for pedestrians, cyclists and buses, enabling more people to access employment opportunities in the Enterprise Zone at South Denes
- Similarly, providing a more direct route for people living in residential areas on the peninsula to access employment in other parts of the town, including the Enterprise Zone at Beacon Park
- Removing the damaging perception that parts of Great Yarmouth are remote, congested and inaccessible, helping to encourage inward investment
- Improving access to the seafront and leisure facilities on the peninsula
- Reducing delays and improving the reliability of journey times for business journeys and freight, helping to reduce costs
- Improving supply chain connectivity between the South Denes Industrial Estate and other employment areas in Great Yarmouth, especially Beacon Park, as well as key employment centres at Lowestoft and Norwich (airport)

2.6.2. Figure 2-29 shows the Scheme in relation to the identified regeneration and development areas on the South Denes peninsula, together with the seafront and residential areas.

2.6.3. The Scheme will also support regeneration in the town centre by:

- Improving accessibility of town centre shops and businesses, and reducing the impact of traffic in historic areas, encouraging regeneration and refurbishment of buildings for new uses, especially in the Waterfront area



Figure 2-29 Key Areas of the South Denes Peninsula in Relation to the Scheme

- 2.6.4. NCC, together with GYBC and the Great Yarmouth Port Authority are seeking funding to develop for a new Operations and Maintenance campus at the southern extremity of the South Denes peninsula. It would be a shared facility supporting businesses that operate and maintain offshore energy technologies and could include offices, workshops, storage space, quay access and parking.
- 2.6.5. This project may be brought forward, subject to securing additional funding from New Anglia Local Enterprise Partnership, as part of a June 2020 capital call for projects from MHCLG. The Great Yarmouth Operations and Maintenance Campus has been shortlisted, by New Anglia LEP, for government funding.
- 2.6.6. A masterplan has been developed which envisages three phases of development. The potential full development is illustrated in Figure 2-30. As already noted, the Third Crossing Scheme will transform this location from a place that is relatively isolated to one that is very well connected to the rest of the town and the SRN.

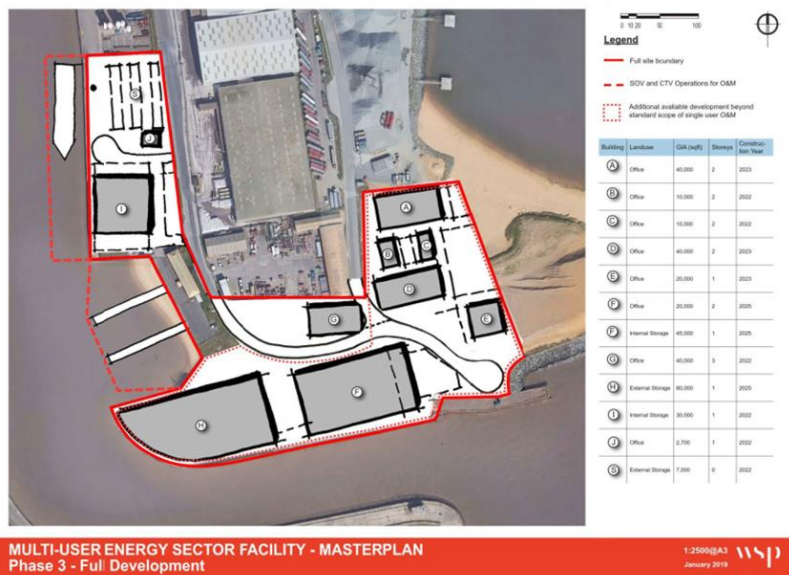


Figure 2-30 Potential Multi-User Energy Facility, South Denes

2.7 OBJECTIVES

2.7.1. In order to achieve the Council’s strategic aims, and in response to the opportunities and problems identified, clear objectives have been established for the Scheme. In line with WebTAG³⁴, we have distinguished between the desired high level or strategic outcomes, the specific or intermediate objectives, and the operational objectives:

2.7.2. The **desired high level or strategic outcomes** are:

- **To support Great Yarmouth as a centre for both offshore renewable energy and the offshore oil and gas industry**, enabling the delivery of renewable energy Nationally Significant Infrastructure Projects and enhancing the Port’s role as an international gateway
- **To improve access and strategic connectivity between Great Yarmouth port and the national road network** thereby supporting and promoting economic and employment growth (particularly in the Enterprise Zone)
- **To support the regeneration of Great Yarmouth**, including the town centre and seafront, helping the visitor and retail economy
- **To improve regional and local access** by enhancing the resilience of the local road network, reducing congestion and improving journey time reliability
- **To improve safety and to reduce road casualties and accidents**, in part by reducing heavy traffic from unsuitable routes within the town centre
- **To improve access** to and from the Great Yarmouth peninsula for pedestrians, cyclists and buses, encouraging more sustainable modes of transport and reducing community severance;
- **To protect and enhance the environment** by reducing emissions of greenhouse gases and minimising the environmental impact of the Scheme

³⁴ Transport Analysis Guidance (TAG) - The Transport Appraisal Process: Guidance for the Technical Project Manager (DfT, January 2014)

2.7.3. The **specific, or intermediate, objectives** are:

- To provide traffic relief to Breydon Bridge and Haven Bridge
- To reduce congestion and delay in the town centre
- To improve journey time reliability
- To reduce traffic in historic areas
- To improve vehicular access to the South Denes peninsula and the outer harbour, especially from the A47 for:
 - Cars
 - Goods vehicles
 - Buses
 - Cyclists
 - Pedestrians
- To reduce road accident casualties
- To reduce emissions of greenhouse gases
- To improve the resilience of the local road network.

2.7.4. The **operational objectives** are:

- To provide an additional river crossing for vehicles, cyclists and pedestrians
- To reduce overall journey times and vehicle kilometres in Great Yarmouth
- To minimise environmental impact, compulsory purchase and demolition of residential and commercial property
- To achieve a balance between the needs of road and river traffic

2.7.5. The intermediate and operational objectives are specific, measurable, realistic and time-bound (SMART). Delivering these will help to achieve the desired strategic outcomes. The next section describes how we will measure how successful the Scheme is in delivering the objectives. Further details are given in the Monitoring and Evaluation Plan and the Benefits Realisation Plan.

2.8 MEASURES FOR SUCCESS

2.8.1. It is important to consider from the outset what constitutes successful delivery of the objectives, as this informs the development and appraisal of the Scheme, the selection of the preferred option, and the monitoring and evaluation of the Scheme's performance after construction.

CAUSE AND EFFECT

2.8.2. Figure 2-31 is a Logic Map or Causal Chain Diagram which shows the expected relationship between the outputs of the Scheme, the achievement of objectives, and the delivery of the strategic outcomes.

2.8.3. In general, it is easier to measure achievement of the objectives (e.g. changes in traffic volume or journey time) than the strategic outcomes (e.g. support regeneration) because the latter often take time to achieve and can be influenced by factors other than the proposed river crossing.

ACHIEVEMENT OF OBJECTIVES

2.8.4. The specific objectives will have been achieved if the Scheme leads to:

- Less traffic on the existing bridges

- Less traffic on existing routes, especially in historic areas
- Fewer road accident casualties
- Less congestion and delay, especially in the town centre
- Reduced journey times on key routes
- Improved accessibility to the South Denes peninsula from the A47, and from western parts of the town, for vehicles, buses, cycles and pedestrians
- Reduced transport costs for businesses
- Reduced greenhouse gas emissions
- Improved reliability

2.8.5. All except the last three of these can be measured directly. Business costs, greenhouse gas emissions and reliability are less easy to measure but, as the causal chain diagram shows, improvements are logical consequences of reduced traffic, congestion and delay and the availability of shorter routes.

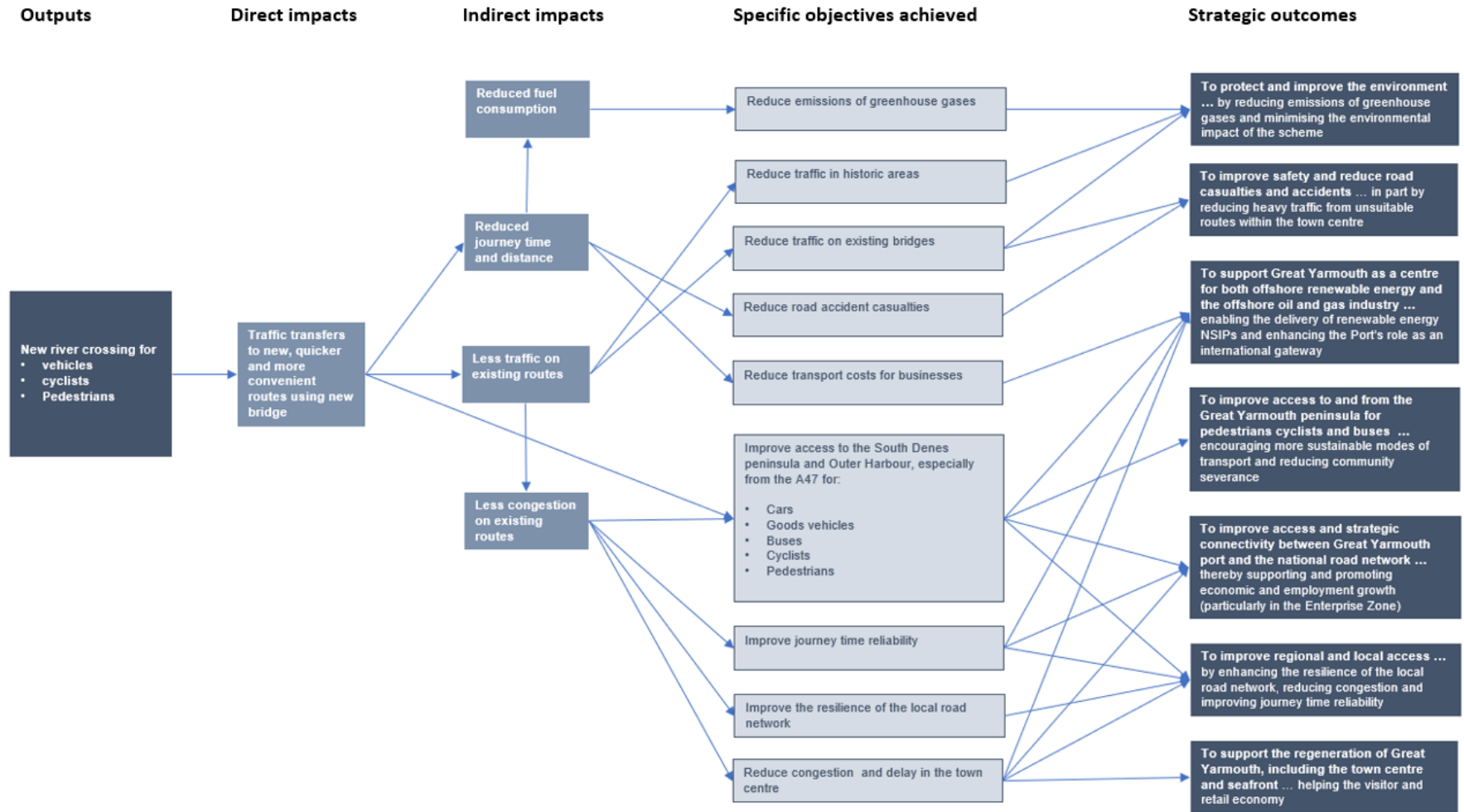


Figure 2-31 Causal Chain Diagram (logic map)

MONITORING AND EVALUATION

- 2.8.6. The Monitoring and Evaluation Plan (Supporting Document 8) and Benefits Realisation Plan (Supporting Document 9) have been prepared in accordance with DfT guidance set out in Monitoring and Evaluation Framework for Local Authority Major Schemes (September 2012).
- 2.8.7. The monitoring and evaluation process will be split into three stages:
- Pre-construction and during construction (monitoring)
 - One-year after opening (monitoring and evaluation)
 - Five-years after opening (monitoring and evaluation)
- 2.8.8. The following standard measures will be monitored:
- Scheme build
 - Scheme costs
 - Delivered Scheme
 - Scheme objectives
 - Travel demand
 - Travel times and reliability
 - Impact on the economy
 - Carbon
 - Noise
 - Local air quality
 - Accidents
- 2.8.9. In addition, an assessment will be undertaken to determine the extent to which the Scheme has delivered the forecast Value for Money (VfM).
- 2.8.10. The Monitoring and Evaluation Plan describes how each of the standard measures will be monitored, using a combination of historic and published traffic and economic data, together with new surveys of traffic, cycle and pedestrian flow, and journey time surveys.
- 2.8.11. As noted above, greenhouse gas emissions and improved reliability are difficult to measure directly but are predictable consequences of reduced traffic, congestion and delay and the availability of shorter routes. Strategic outcomes are not easy to measure directly but can be seen to be logical consequences of achieving the specific objectives. Longer-term monitoring of local development, business growth and relocations, tourist numbers and revenue, employment, air quality and deprivation will continue to take place, and will contribute to an understanding of the success of the Scheme.
- 2.8.12. A 'One Year After' evaluation report will be produced within two years of the Scheme opening, followed by a 'Five Years After' report within six years of the Scheme opening. These reports will be published on NCC's website for the purposes of local accountability and transparency. The DfT may also provide links to it from their own website.

2.9 SCOPE OF THE SCHEME

- 2.9.1. The Scheme will provide a third crossing over the River Yare, creating a new, more direct link between the western and eastern parts of Great Yarmouth. Specifically, it will provide a connection between the Strategic Road Network (A47) and the South Denes Business Park, Enterprise Zone, Great Yarmouth Energy Park and the Outer Harbour, all of which are located on the South Denes peninsula.
- 2.9.2. The key infrastructure outputs to be delivered include:
- a new dual carriageway road, including a road bridge across the River Yare, linking the A47 at Harfrey's roundabout to the A1243 South Denes Road
 - an opening span double leaf bascule bridge with two new 'knuckles' extending the quay wall into the river to support the bridge
 - a bridge span over the existing Southtown Road on the western side of the river
 - a bridge span on the eastern side of the river to provide an underpass for existing businesses
 - lifting barriers at either end of the bridge
 - a new five arm roundabout at William Adams Way, connecting into the existing A47 Harfrey's roundabout, Queen Anne's Road, Suffolk Road and the new river crossing
 - Signal-controlled pedestrian and cycle facilities on William Adams Way and Suffolk Road
 - A new signal-controlled junction with South Denes Road
 - Reversal of the one-way operation on Sutton Road and Swanston's Road
 - A new junction on Southtown Road providing vehicular access to residential and other properties
 - A new private access from Bollard Quay to Southtown Road
 - A new underpass on the eastern side of the river to allow vehicular and pedestrian access between land north and south of the new road
 - Pedestrian and cycle facilities including:
 - A 4.5m wide footway and two-way cycleway link from William Adams Way, across the eastbound side of the new bascule bridge, and linking to a new on carriageway cycle lane on Sutton Road. This route also includes new Toucan crossing facilities at the William Adams Way roundabout, and the new traffic signal-controlled junction on South Denes Road
 - A 2.5m wide footway on the westbound side of the link across the new bascule bridge.
 - A new footway/cycleway link from the William Adams Way roundabout to Suffolk Road, and a new pedestrian crossing on Suffolk Road
 - A footway/cycleway link from William Adams Way to Harfrey's roundabout

2.10 CONSTRAINTS

PHYSICAL CONSTRAINTS

- 2.10.1. The main physical constraints are:
- Development on either side of the River Yare means there are only a limited number of locations where a third crossing could be constructed
 - The need to tie into the existing SRN. The simplest location is for a tie in to the A47 at Harfrey's roundabout
 - The need to acquire land for the construction of the Scheme, in addition to the land already acquired by the Council

- The need to maintain access for shipping. Previous studies indicate the need for a clear navigable width of at least 50m for a bridge. Also, a bridge would either need sufficient clearance above the Mean High Water Spring Tide level for vessels to pass under or be able to open to allow the largest vessels to pass through. The clearance when closed will determine the size (and hence the number) of small craft able to pass under a lifting bridge, reducing the number of times it would need to be opened
- The need to minimise adverse impact on existing port activities
Detailed engagement took place with Peel Ports and other port users prior to the application for Development Consent and the Examination in Public

ENVIRONMENTAL CONSTRAINTS

- 2.10.2. The environmental constraints are illustrated in the Environmental Constraints Plan³⁵ and detailed in the Environmental Options Assessment Report³⁶.

FINANCIAL CONSTRAINTS

- 2.10.3. The OBC made it clear that the Council does not have the resources to deliver a Third River Crossing without funding support from the Government. The New Anglia LEP's guideline threshold is £75 million. Schemes costing more than this cannot be funded from regular Growth Deal funding. It would not be possible to deliver a Scheme meeting the objectives for less than £75 million. For this reason, the delivery of the Scheme is dependent upon funding from the Government's Local Majors Fund. DfT funding was provisionally confirmed by DfT following acceptance of the OBC. The Council will contribute towards the capital cost of the Scheme and is able to meet the anticipated future operating and maintenance costs. Details are given in the Financial Case.

CONTRACTUAL CONSTRAINTS

- 2.10.4. The Commercial Case describes the type of contract proposed. There are no contractual constraints which would inhibit delivery of the Scheme.

PUBLIC ACCEPTABILITY CONSTRAINTS

- 2.10.5. The Scheme has a high degree of acceptance amongst local stakeholders and the public. Public consultation in August 2009 revealed that 92% of people supported provision of a new river crossing. Key stakeholders were also consulted. Full details are set out in the Consultation and

³⁵ Environmental Constraints Plan, DCO Document 6.4A Natural Environmental Constraints Plan <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application>

³⁶ Environmental Options Assessment Report, Great Yarmouth Third River Crossing Outline Business Case Supporting Document 12 <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

Stakeholder Engagement Report³⁷ and the Pre-application Consultation Report³⁸, and a summary is given in Paragraph 2.12.7.

2.11 INTERDEPENDENCIES

OTHER TRANSPORT PROPOSALS

- 2.11.1. The Great Yarmouth Third River Crossing is a “stand-alone” Scheme, which could be delivered independently of any other Scheme or development. Similarly, no other future Schemes or developments are dependent upon it.
- 2.11.2. In autumn 2017, subsequent to Scheme development and appraisal work and public consultation, Highways England (HE) announced a preferred route for improvements to junctions on the A47 Trunk Road. This was part of the government’s Road Investment Strategy for 2015-2020 (RIS 1). These improvements were at two locations in Great Yarmouth illustrated in Figure 2-32 below:

A47 Vauxhall Roundabout and Station Approach

- Enlarged roundabout
- Widening and realignment of approaches
- Possible improvements for non-motorised users
- Minor improvements to existing layout and signals, and reinstated right turn at Station Approach

A47 Gapton Roundabout

- Signalisation of roundabout
- Possible improvements for non-motorised users

³⁷ Consultation and Stakeholder Engagement Report (March 2017) OBC Supporting Document 13 <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

³⁸ Pre-application Consultation Report DCO Document 5.1 Consultation Report <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application>

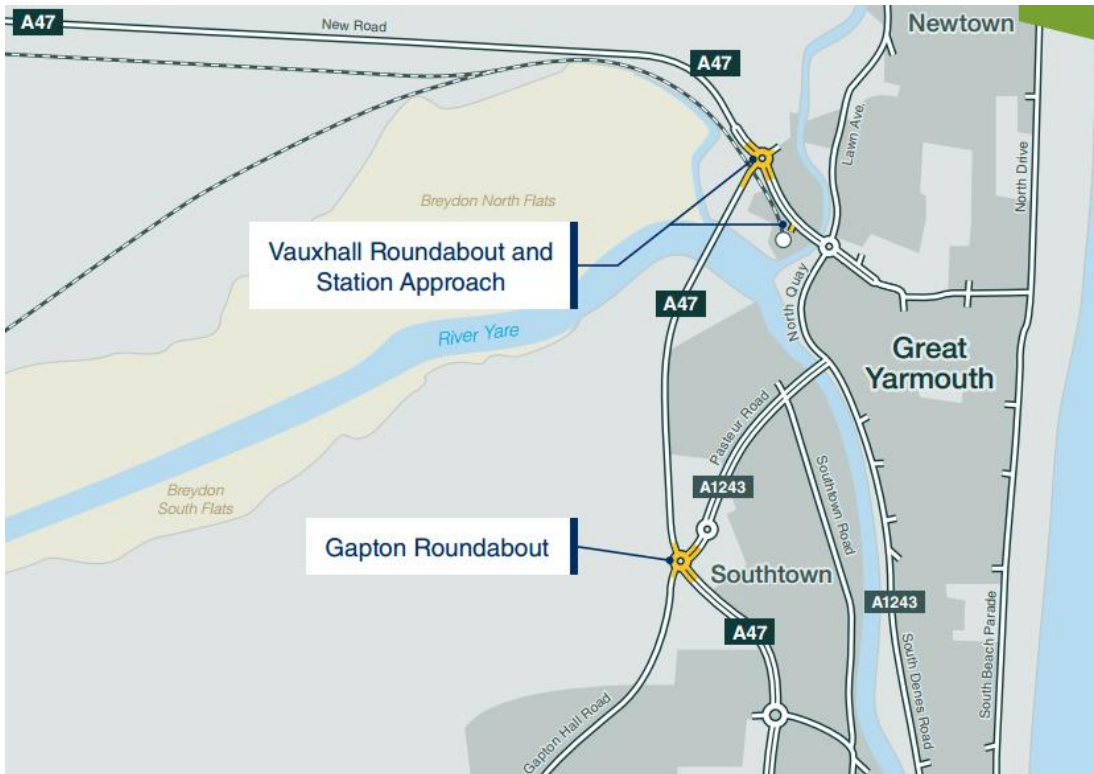


Figure 2-32 Planned RIS - 2 Junction Improvements (Source: HE)

- 2.11.3. When HE was carrying out the development and appraisal work for the A47 Great Yarmouth junctions Scheme, there was no certainty of funding for the Great Yarmouth Third River Crossing. In view of this and following WebTAG guidance the A47 Great Yarmouth junctions Scheme appraisal did not take account of the impact of the Third River Crossing as its status was only “reasonably foreseeable”.
- 2.11.4. After the Outline Business Case was accepted for the Third River Crossing, working together with HE the County Council carried out further detailed modelling and appraisal to investigate the suitability of the HE preferred route announcement A47 Great Yarmouth junctions Scheme. This work indicated that, no changes were required at the Gapton Hall roundabout and that a different Scheme would be needed at Vauxhall roundabout that provided a better balance of flows between the approaches. It also indicated that because of the flow changes brought about by the Third River Crossing, an improvement at Harfreys roundabout in combination with a Vauxhall improvement would provide a better overall Scheme for the A47 Trunk Road.
- 2.11.5. In light of these findings, HE and the DfT agreed to cease taking forward the preferred route announcement Scheme. The stated position of HE and DfT is that a revised Scheme should be prepared such that construction could commence shortly after the Third River Crossing is opened in 2023 as part of the next RIS programme period.
- 2.11.6. As such there is no inter-dependence between the revised RIS Scheme and the proposed Third River Crossing. The County Council will continue to liaise very closely with HE as their respective projects are developed and taken forward.
- 2.11.7. As noted above, part of the HE original preferred route announcement RIS Scheme was a minor improvement to the existing layout and signals and a reinstatement of a right turn at Station

Approach. This benefitted the Vauxhall Roundabout by removing U-turn movements but in other respects was standalone and remote from the Vauxhall roundabout. This Scheme was designed and constructed by the County Council on behalf of HE in conjunction with other highway improvements, notably the one at Fullers Hill roundabout as part of the LEP funded enhancements and opened in spring 2018.

LEP Funded Enhancements

- 2.11.8. The New Anglia Local Enterprise Partnership Growth Deal allocation for 2016 to 2021 includes £9m funding for Great Yarmouth to help tackle congestion and create attractive alternatives to the car by improving facilities for public transport users, walking and cycling.
- 2.11.9. NCC, working with partners, is leading the development of these enhancement projects. Improvement Schemes for Fuller’s Hill roundabout, The Conge and access to the railway station have been implemented, and a package of sustainable transport measures has been devised.
- 2.11.10. The development of all Schemes has involved widespread consultation and engagement with local stakeholders and wherever possible this has been combined with the consultation and engagement activities undertaken on the third river crossing.
- 2.11.11. These Schemes have been delivered independently of the Great Yarmouth Third River Crossing and were included where appropriate in the “Do Minimum” scenarios.

MAJOR DEVELOPMENTS

- 2.11.12. The Scheme does not depend on any other developments.

STATUTORY PROCESSES

- 2.11.13. Delivery of the Scheme depends on the successful completion of statutory processes.
- 2.11.14. In February 2018, the Secretary of State (SoS) directed³⁹ that the Scheme, and any associated matters, should be treated as “development for which development consent is required”. Although not falling within the definition of a “nationally significant infrastructure project” (NSIP), the SoS was of the opinion that “the development by itself is of national significance” for the following reasons:
 - The Port has a nationally significant role in the renewable energy sector and the offshore gas and oil industry, and the Scheme will substantially improve connectivity and resilience for port activities
 - The Scheme will support the delivery of existing and potential renewable energy NSIPs
 - Supports the Port’s role as an International Gateway
- 2.11.15. In addition, the SoS considered that the Scheme will:
 - Improve the offer of the Port through better connectivity to the Enterprise Zone
- 2.11.16. NCC therefore needed to obtain a Development Consent Order (DCO) from the SoS, following Examination in Public by an Examining Authority (ExA).
- 2.11.17. NCC submitted DCO Examination documents to the National Infrastructure Directorate of the Planning Inspectorate in April 2019. The Examination in Public took place between 24 September

³⁹ SOS direction - Decision letter from DfT to NCC, 26 February 2018

2019 and 24 March 2020, with the hearings taking place in Great Yarmouth. Following the Examination in Public, the ExA issued a Recommendation Report to the Secretary of State on 24 June 2020.

2.11.18. The Secretary of State's decision to grant the DCO was announced on 24 September 2020, followed by a six-week period for potential legal challenge.

2.12 STAKEHOLDERS

STAKEHOLDERS

2.12.1. A list of the main stakeholder groups, together with a summary of their specific interests, is set out in Table 2-8 below.

Stakeholders	Summary of Interests
Public, residents and community organisations	Interested in issues surrounding all aspects of the Scheme, such as noise pollution, traffic implications, and traffic management, construction issues, planning issues and procedures and environmental issues, environmental enhancement and design. Effects on local community interests.
Norfolk and Waveney MIND Centre and Grounds	Interest in how the TRC directly or indirectly affects the MIND Community ROOTS garden project close to the TRC.
Hope (Borough of Great Yarmouth)	Interest in how the TRC directly or indirectly affects the Kings Centre community site close to the TRC.
Great Yarmouth and Gorleston Allotment Association	Interest in how the TRC directly or indirectly affects the allotment sites close to the TRC.
Organisations for people with disabilities	Interested in creating a more accessible environment through Scheme development and design.
Directly affected landowners and businesses (including marine businesses)	Interest in detailed engineering and construction aspects of the Third River Crossing and how this will impact upon them.
Indirectly affected landowners and businesses (including marine businesses)	Interest in engineering and construction aspects of the TRC and the impact on businesses not directly affected.
Great Yarmouth Port Authority and Great Yarmouth Port Company (Peel Ports)	Impact on port activities directly and indirectly including construction phase. Design and alignment, business impact, construction impact. Great Yarmouth Port Company manages and operates the Port on behalf of the Great Yarmouth Port Authority.
Great Yarmouth Port Users Association	Impact on port activities directly and indirectly including construction phase. Design and alignment, business impact, construction impact.
Royal Yacht Association	Impact on river activities directly and indirectly including construction phase. Design and alignment, business impact, construction impact.
Business organisations (Chambers of Commerce,	Interest in how the TRC directly or indirectly affects the businesses in Great Yarmouth and Gorleston.

Stakeholders	Summary of Interests
Federation of Small Businesses)	
New Anglia LEP	Interest in all aspects of the Scheme.
Emergency services	Impact of the Scheme on response times.
Public Utilities	Affected Utilities.
Department for Transport	Interest in the detailed engineering layout, development of the full business case and submission, funding and planning.
Natural England	Issues relating to pollution control, protection of natural environments. Protected Species.
Historic England	Interest in issues relating to pollution control, protection of natural environments in and around the site of the TRC and the enhancement of areas in the masterplan where traffic will be removed due to the TRC.
Environment Agency	Works in, over, under or adjacent to river, port, environmental legislation relevant to construction, air quality, noise and flooding issues.
Norfolk County Council (County Planning Authority)	Interest in issues relating to planning applications in Norfolk, in respect of infrastructure, waste and the environment.
Highways England	Access to the strategic road network and the improvements to the surrounding junctions; Gapton Roundabout, Vauxhall Roundabout and Harfrey's Roundabout.
Broads Authority	Interests in issues relating to conservation and navigation in the Broads National Park.
Marine Management Organisation	Interest in issues relating to construction, deposits and dredging that may have an environmental, economic or social impact.
Waveney, Lower Yare & Lothingland Internal Drainage Board	Interest relating to internal land drainage and water levels.
Anglian Water	Disposal of effluent to sewer/surface water drain/watercourse.
Local authorities (GYTRC and adjacent authorities)	Interested in all aspects of Scheme, especially its impact on delivery of Local Plan policies.
Brandon Lewis, MP for Great Yarmouth	Interest in all aspects of the Scheme that will have an impact on constituents.
County and Borough Councillors	Interest in all aspects of the Scheme that will have an impact on constituents.

Stakeholders	Summary of Interests
Cycle Groups	Impact on cycle routes.
Transport operators	Interest in issues surrounding bus companies such as route changes.
Freight organisations	Interest in issues surrounding transport companies such as route changes.
Local and national media	All issues relating to the Third River Crossing that may be of public interest.

Table 2-8 Stakeholders and Summary of Interests

STAKEHOLDER ENGAGEMENT

- 2.12.2. Stakeholders have a crucial role in the successful delivery of the Scheme. Effective engagement and consultation give stakeholder groups a voice that is heard, allowing concerns to be addressed at an early stage.
- 2.12.3. NCC has engaged with a wide range of stakeholders throughout the development of the Scheme. A variety of communications methods have been employed to ensure that information about the Scheme has been widely disseminated, and the views and interests of stakeholders taken into account at each stage.
- 2.12.4. A 3-stage consultation strategy was adopted in advance of the DCO application:
- **Stage 1:** Initial Engagement Consultation (November 2016 - January 2017): Non-statutory consultation to understand views on congestion, share emerging proposals and understand level of support for the Scheme
 - **Stage 2:** Scheme Development Consultation (September 2017 - October 2017): Non-statutory consultation to provide an update on progress of the Scheme and understand views on the development work so far
 - **Stage 3:** Statutory Pre-application Consultation (August 2018 - October 2018): Statutory consultation to present details of the proposed Scheme and obtain views on it before making an application for a Development Consent Order
- 2.12.5. Details of stakeholder consultation and engagement over a ten-year period from 2009 to 2019 are comprehensively set out in the Pre-application Consultation Report⁴⁰ which supported NCC's DCO application. The report identifies all the stakeholders who were consulted, or who made representations to NCC, during this period, together with details of the methods used, responses, meetings and correspondence with stakeholders.

⁴⁰ Great Yarmouth Third River Crossing Pre-application Consultation Report DCO Document 5.1 Consultation Report
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application>

2.12.6. More information is given in the Management Case, and in the Consultation and Stakeholder Engagement Report⁴¹.

PUBLIC AND STAKEHOLDER SUPPORT

2.12.7. Public consultation in August 2009 revealed that **92%** of people supported provision of a new river crossing. Key stakeholders were also consulted. The Highways Agency (now Highways England) indicated a preference for a bridge option, as did 1st East, the Great Yarmouth Waterfront Regeneration Company, and GYBC.

2.12.8. Details of the 2009 consultation are set out in the 2016 Options Assessment Report⁴². The 2017 Consultation and Stakeholder Engagement Report gives details of subsequent public and stakeholder engagement activity and reveals that there is strong support for the provision of a third river crossing.

2.12.9. In public consultation (Stage 1 in 2016 – 2017) the results of a questionnaire survey showed that **81%** of residents would be either likely, or very likely, to use a third river crossing.

2.12.10. Analysis showed that residents and businesses in Great Yarmouth suffer from congestion, with **71.4%** of respondents seeing this as either a serious or a very serious issue, with many being delayed for lengthy periods of time.

2.12.11. The Third River Crossing is clearly seen by respondents to the questionnaire as an important piece of infrastructure that will contribute to the revitalisation of Great Yarmouth and help create jobs, improve quality of life, ease congestion and generate business. Specifically:

- **89.2%** of respondents either strongly agree or agree that access to the port would be improved by a Third River Crossing
- **78.9%** either strongly agree or agree that a new crossing would make journey times shorter
- **80%** either strongly agree or agree congestion would be reduced
- **74.6%** of respondents would either strongly agree or agree that a new Third River crossing would encourage businesses to invest in the area
- **70.8%** either strongly agree or agree that the bridge would help create new jobs in the area
- **75.6%** either strongly agree or agree that the bridge would improve their quality of life
- **60.3%** either strongly agree or agree that the bridge would encourage visitors into Great Yarmouth

⁴¹ Great Yarmouth Third River Crossing Consultation and Stakeholder Engagement Report (March 2017) OBC Supporting Document 13
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁴² Great Yarmouth Third River Crossing Options Assessment Report (2016) OBC Supporting Document 1
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

2.13 OPTIONS

- 2.13.1. The proposed Scheme has been identified only after consideration of a wide range of options. An initial long list of potential solutions was drawn up, and these have been, sifted, refined and evaluated to ensure that the proposed Scheme is the best possible option.
- 2.13.2. The process of generating, refining and appraising options is detailed in the 2016 Options Assessment Report OAR⁴³. The OAR was submitted with the application for Scheme development costs, and describes assessments undertaken in 2007 (Stage 1)⁴⁴ and 2009 (Stage 2)⁴⁵. The OAR identified a preferred corridor for the Scheme. Subsequent work to identify the best Scheme within this corridor is described in a further Final OAR⁴⁶.
- 2.13.3. At each stage of the assessment, use has been made of the analytical tools available at that time. The models used to determine Scheme impacts have been progressively improved, giving increasing confidence in the results, and this process is still continuing. Having identified a preferred Scheme in a robust, but simplified assessment, it has now been subject to a more detailed appraisal to determine its value for money.
- 2.13.4. The Economic Case (Chapter 3) describes the most recent assessment of the proposed Scheme using models and analytical tools developed subsequent to the OAR.
- 2.13.5. The options appraisal process is briefly summarised below:

AREA OF INTEREST

- 2.13.6. An area of interest for a third river crossing was identified. Due to the constraints of existing development, the only practical tie-in on the western side is at Harfrey's roundabout on the A47. The southern limit was determined by consideration of shipping movements to the port – a bridge further south would need to open more often than one further north. The northern limit was constrained by existing development and the need to avoid a structure on the curve of the river.

INITIAL OPTION GENERATION (LONG LIST)

- 2.13.7. Within the area of interest, three broad alignment corridors were considered: northern, central and southern. In each corridor, a high level and low-level bridge option (on similar alignments) and a tunnel option were devised, giving nine different options. Both the high and low-level bridge options

⁴³ Great Yarmouth Third River Crossing Options Assessment Report (2016) OBC Supporting Document 1

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁴⁴ Great Yarmouth Third River Crossing – Stage 1 Scheme Assessment Report, March 2007. Mott Macdonald for Norfolk County Council

⁴⁵ Great Yarmouth Third River Crossing – Stage 2 Scheme Assessment Report, September 2009. Mott Macdonald for Norfolk County Council

⁴⁶ Great Yarmouth Third River Crossing Final Options Assessment Report (2017) OBC Supporting Document 2

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

were for lifting bridges, but some small vessels would be able to pass under a high-level bridge without it opening.

2.13.8. The nine initial crossing options are described in more detail in the 2016 OAR⁴⁷ and the Stage 1 Scheme Assessment Report.⁴⁸

NON-ROAD OPTIONS

2.13.9. The OAR identified a number of non-road options which might be considered an alternative to a major highway Scheme, either separately or in combination:

- **Traffic restraint** – physically restricting movement in sensitive areas by traffic management or traffic calming to reduce capacity and encourage people to choose alternative routes or alternative modes of travel, or to reduce demand overall
- **Charging** – for use of the existing bridges, to encourage traffic to choose alternative routes or alternative modes of travel, or to reduce demand overall
- **Improving the existing network** – e.g. increasing the capacity of the existing bridges to accommodate existing and forecast demand without a new bridge
- **Improving other modes** – e.g. improvements to public transport, cycling and walking without a new bridge

2.13.10. The OAR concluded that, in the particular context of Great Yarmouth and its needs, the non-road options could not by themselves achieve the objectives of the Scheme, as set out in the Strategic Case. The reasons were:

- The Scheme objectives focus on improving the connectivity of the Great Yarmouth peninsula so as to support employment growth and the regeneration of the port, the town centre and the resort. Traffic restraint or charging would generally make the peninsula less accessible and less attractive to development
- Improvements to the existing bridges, even if that were feasible, would not significantly improve access to the port in the south of the peninsula, but would instead exacerbate the current traffic problems in and around the town centre
- Improvements for other modes, whilst very desirable in themselves, would not significantly improve the connectivity of the port and new or existing industry to suppliers and markets. Furthermore, there are limits on what could be achieved in terms of road space reallocation to sustainable modes without the removal of through traffic that a third crossing would achieve

2.13.11. For these reasons, non-road options were not considered further in the initial sifting of options (Stage 1 Assessment). Complementary improvements to the wider network, the management of traffic, and provision for more sustainable modes have instead been considered in the context of, and to support, a third river crossing Scheme.

⁴⁷ Great Yarmouth Third River Crossing Options Assessment Report (2016) OBC Supporting Document 1

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁴⁸ Great Yarmouth Third River Crossing – Stage 1 Scheme Assessment Report, March 2007. Mott Macdonald for Norfolk County Council

INITIAL SIFTING (STAGE 1 ASSESSMENT)

2.13.12. A sifting exercise was undertaken to determine which of the nine crossing options should be taken forward for further development and assessment. The criteria were:

- Cost
- Environmental impact
- Traffic impact
- Benefit-cost ratio (BCR)
- Accident savings

2.13.13. As described in the Stage 1 Scheme Assessment Report, the initial sifting exercise was simplified and focused primarily on understanding the environmental impacts of a third crossing. The criteria were applied as set out below:

Corridor	Type	Cost	Env	Traffic	BCR	Accs
Northern	High level bridge	●	●	●	●	●
Northern	Low level bridge	●	●	●	●	●
Northern	Tunnel	●	●			
Central	High level bridge		●			
Central	Low level bridge		●			
Central	Tunnel		●	●	●	●
Southern	High level bridge	●	●	●	●	●
Southern	Low level bridge	●	●	●	●	●
Southern	Tunnel	●	●			

Table 2-9 Initial Sifting (simplified)

Initial Cost Estimates

2.13.14. Initial cost estimates were prepared for options in the northern and southern corridors, as this was considered sufficient to obtain an indication of the range of costs for the Scheme. Indicative construction costs at 2015 prices, excluding land, are set out in Table 2-10.

Estimated Construction Cost (2015)	Northern Corridor	Southern Corridor
High level bridge	£74,774,000	£68,228,000
Low level bridge	£70,542,000	£66,997,000
Tunnel	£131,181,000	£185,555,000

Table 2-10 Initial Cost Estimates for Option Assessment

2.13.15. There was relatively little difference between the costs of a high level and low-level bridge, but both tunnel options were significantly more expensive than any of the bridge options.

Stage 1 Environmental Impact Assessment

2.13.16. The Stage 1 Environmental Impact Assessment⁴⁹ considered each of the nine route options. It reported that the Scheme would have numerous impacts on the local environment, some of which would be beneficial and others adverse. In some cases, an adverse impact on the study area could have a corresponding beneficial impact on other parts of Great Yarmouth.

2.13.17. The findings of the Stage 1 EIA are reported in the OAR, and summarised below:

Local air quality	All routes would have a minor adverse impact locally. Options in the central corridor would affect fewer properties; the southern corridor would affect more. All would lead to improved air quality in the town centre due to reduced traffic.
Cultural heritage	Minor impacts only locally with all routes. Potential benefits in the town centre due to reduced traffic.
Construction impacts	Impacts due to noise, vibration, air quality, water quality, drainage, ecology and nature conservation. Partial mitigation of these impacts should be possible.
Landscape and townscape	High-level bridge likely to have greatest impact, though not out of place in an industrial townscape. A tunnel would mean less visual intrusion from traffic, but approach ramps could affect residential areas more than the bridge options.
Land use	Adverse impacts due to demolition of buildings. All routes would have a similar impact.

Stage 1 Traffic Assessment

2.13.18. Three of the options identified at Stage 1 were tested in 2007 using the 2003 Great Yarmouth SATURN model. Full details of this model are set out in the Local Model Validation Report (LMVR)⁵⁰ and technical notes⁵¹ prepared in 2003 and summarised in the 2007 Stage 1 Traffic and Economic Appraisal Report. A brief description is given below.

2.13.19. The model covers the urban area of Great Yarmouth and Caister-on-Sea in detail, and the rest of the County’s roads as a buffer network. The zoning structure includes the whole of the UK, but the model only includes trips to and from Great Yarmouth, recorded in roadside interviews (RSIs). The model covers three time periods (a.m. peak, inter-peak and p.m. peak). The model uses general purpose trip matrices for light and heavy vehicles, which were split into five user classes (3 car user classes, light goods and other goods vehicles) using RSI data. Car trips were split into three purposes (commuting, employers’ business and other) based on WebTAG. The base model was validated against independent counts.

⁴⁹ Great Yarmouth Third River Crossing – Stage 1 Environmental Impact Assessment Report. (Mott Macdonald for Norfolk County Council, 2007)

⁵⁰ Great Yarmouth Area Transport Strategy Local Model Validation Report, (Mott Macdonald for Norfolk County Council, 2003)

⁵¹ Great Yarmouth Area Transport Strategy Summer Traffic Model Technical Note, (Mott Macdonald for Norfolk County Council, 2003)

2.13.20. For the Stage 1 Assessment, an opening year of 2015 and a design year of 2030 were assumed. The 2003 trip matrices were adjusted to 2015 using planning data provided by Great Yarmouth Borough Council (GYBC) and TEMPRO forecasts. Overall growth was constrained to the National Trip End Model (NTEM) forecasts for 2015 and 2030. The future Do Minimum network includes two Schemes: signalisation of the entrance to ASDA and the railway station, and enhancement Schemes on Marine Parade and the Pleasure Beach.

2.13.21. Three representative options were tested:

- Northern corridor, bridge option
- Southern corridor, bridge option
- Central corridor, tunnel option

2.13.22. At this stage, no distinction was made between the high and low level bridge options. A dual carriageway bridge was assumed, with a speed limit of 50 km/hr.

The results of the model tests are set out in the Stage 1 Traffic and Economic Appraisal Report and summarised in the 2016 OAR. Forecast traffic flows for the existing and new crossings in 2030 are set out in Table 2-11 below.

Two-Way Traffic Flow	Do Minimum 2030 AADT	Northern bridge 2030 AADT	Southern bridge 2030 AADT	Central tunnel 2030 AADT
Breydon Bridge	35,400	32,200	33,000	32,600
Haven Bridge	35,000	20,500	24,100	26,500
Third river crossing	-	28,300	24,400	18,900
TOTAL	70,400	81,000	81,500	78,000

Table 2-11 Traffic Impacts of Options (2016 OAR)

2.13.23. A bridge in the northern corridor would provide the greatest relief to the existing river crossings and would be carry more traffic than a tunnel or a bridge further south.

Stage 1 Accident Assessment

2.13.24. Based on the forecast traffic flows, accidents and casualties in the study area were predicted over a 60-year assessment period using COBA. Expected reductions are set out in Table 2-12 below:

	Total	Change over 60 years	Change over 60 years	Change over 60 years
	Base	Northern bridge	Southern bridge	Central tunnel
Accidents	44,398	-2,260	-2,644	-2,385
Casualties	61,270	-3,092	-3,619	-3,230

Table 2-12 Accident Impacts of Options (2016 OAR)

2.13.25. All of the options would produce savings in accidents and casualties, and little difference was found between them. By a small margin, the southern bridge option was found to produce the greatest accident savings.

Stage 1 Economic Assessment

2.13.26. Economic benefits arise mainly from savings in time, fuel and vehicle operating costs and other monetised benefits attributable to the Scheme. An economic assessment was undertaken using TUBA, including accident benefits calculated using COBA. All the options tested showed a positive cost-benefit ratio, as set out in Table 2-13 below.

Benefits/Disbenefits/Costs	Northern Bridge £,000	Southern Bridge £,000	Central Tunnel £,000
Consumer user benefits	112,727	121,295	78,468
Business user benefits	110,153	117,174	83,266
Private sector provider impacts	0	0	0
Carbon benefits	1,501	1,696	987
Accident benefits	85,611	96,844	88,551
Present value of benefits (PVB)	309,992	337,009	251, ² 72
Investment costs	61,674	57,544	109,971
Indirect tax revenue	10,189	11,475	6,714
Present Value of Costs (PVC)	71,863	69,019	116,685
Benefit-cost ratio (BCR)	4.3	4.9	2.2

Table 2-13 Stage 1 Economic Assessment (2016 OAR)

2.13.27. A bridge in the southern corridor was found to offer the greatest monetised benefits and, because it was also likely to be the least expensive option, generated the highest BCR.

2.13.28. The representative tunnel option tested produced significantly lower monetised benefits and, being considerably more expensive than either of the bridge options, produced a BCR that, although still positive, was much less than what could be achieved with a bridge.

Conclusions of the Initial Sifting (Stage 1 Appraisal)

2.13.29. The Stage 1 appraisal was a limited exercise, based on advance design work and a number of simplifying assumptions. Land costs were excluded. Only a representative sample of options was subject to modelling and economic assessment at Stage 1.

2.13.30. Though simplified, the Stage 1 appraisal served to show that a third river crossing was feasible and highlighted the main design and environmental issues involved. Although a bridge was likely to be

more cost-effective than a tunnel, the appraisal showed that both bridge and tunnel options would produce benefits in excess of their likely costs.

- 2.13.31. The Stage 1 appraisal did not differentiate between high and low bridge heights, nor did it assess the impact of the higher frequency of openings required for a southern bridge option.
- 2.13.32. The Stage 1 Assessment Report⁵² (2007) recommended further, more detailed, consideration of the crossing location, highlighting the need to balance the benefits of relieving congestion in the north and improving access to development in the south. It recommended further consideration of a potential immersed tube tunnel aligned on observed traffic desire lines (NW to SE), as well as more detailed investigation of high and low level bridge options.

FURTHER DEVELOPMENT OF POTENTIAL OPTIONS

- 2.13.33. The next stage of the appraisal is described in detail in the Stage 2 Assessment Report⁵³ (2009) and is summarised below.

Alternative forms of crossing

- 2.13.34. Further investigation was undertaken into a range of different forms of crossing:

- Fixed bridge
- Swing Bridge
- Lift Bridge
- Bascule Bridge
- Tunnel

- 2.13.35. The detailed investigation of these options was described in a Structural Options Working Paper⁵⁴ (2009) and summarised in the OAR (2016). This investigation led to the rejection of the fixed bridge, swing bridge and lift bridge options on grounds including construction and maintenance costs, visual impact, and risks from collision by ships. It concluded that a bascule bridge would be the most appropriate type of bridge for this Scheme. Detailed data on commercial vessel movements within the inner harbour was used to determine the likely number of bridge openings required for different locations. It concluded that a bridge on the shortest route across the river, from Harfrey's Roundabout would require about six openings each day. Further south, the number of openings would be greater. Further north, the cost of construction would be higher.

- 2.13.36. In light of the findings of the Stage 1 Assessment, an improved tunnel alignment was identified, running generally from SW to NE. It was found that this alignment would attract about 35% more traffic than a NW to SE alignment. Technically, the only feasible form of construction would be an immersed tube tunnel, or a tunnel cast in situ on the river bed, due to poor ground conditions. It would have a significant physical impact on the operation of the harbour during construction.

⁵² Great Yarmouth Third River Crossing – Stage 1 Scheme Assessment Report, March 2007. Mott Macdonald for Norfolk County Council

⁵³ Great Yarmouth Third River Crossing – Stage 2 Scheme Assessment Report, September 2009. Mott Macdonald for Norfolk County Council

⁵⁴ Great Yarmouth Third River Crossing – Structural Options Working Paper, 2009. Mott Macdonald for Norfolk County Council

Assessment of Short-Listed Options

2.13.37. Three crossing options were therefore shortlisted for further assessment:

- **Bridge option 1: Bascule bridge with roundabout on Southtown Road**
 - This option would provide a dual carriageway bascule bridge between the A12 (now A47) Harfrey's Roundabout over Southtown Road and the River Yare to a new three-arm roundabout on South Denes Road between Sutton Road and Swanston's Road. This would give a headroom clearance of 5.3m on Southtown Road and 7.5m clearance to mean high tide level when closed. Other changes to the road network would also be necessary to accommodate the bridge. Beccles Road will be stopped up at its junction with Southtown Road, whilst Queen Anne's Road will also be closed from its junction with Suffolk Road. A new roundabout will be provided on Southtown Road beneath the bridge and slip roads will be provided from this junction into the link to Harfrey's Roundabout
- **Bridge option 2: Bascule Bridge with T-junction on Southtown Road**
 - This option would provide a dual carriageway bascule bridge between Harfrey's Roundabout over Southtown Road and the River Yare to a new three-arm roundabout on South Denes Road between Sutton Road and Swanston's Road. This would give a headroom clearance of 5.3m on Southtown Road and 7.5m clearance to mean high tide level when closed
 - Beccles Road would remain open from its junction with Southtown Road, but would provide a westbound one-way link towards the A12 (now A47). Queen Anne's Road would be closed to vehicle traffic from its junction with Suffolk Road. An eastbound off-slip would be provided from the bridge into Southtown Road
- **Tunnel option: Tunnel from A12 (now A47) onto Southgates Road**
 - This option would provide a dual carriageway tunnel between the A12 (now A47) south of the existing Harfrey's Roundabout and a new three arm roundabout at the junction of South Quay, Queens Road and Southgates Road. It would also provide improvements to Southgates Road and South Denes Road between Queens Road and Sutton Road
 - The existing access into the Fish Wharf would be replaced and the northbound carriageway of South Denes Road would run through the area. The tunnel portal would be located between Barrack Street and Newcastle Road
 - A replacement roundabout to the south of the existing Harfrey's Roundabout would be provided with diversions to the existing Beccles Road and Harfrey's Road to link into the new junction. The existing roundabout would be removed. On and off-slips would be provided onto Southtown Road to retain access to the trunk road
 - There would be no pedestrian provision through the tunnel, but cyclists could use the tunnel by travelling on-carriageway with other traffic

2.13.38. The three shortlisted options are illustrated in Figure 2-33 below.

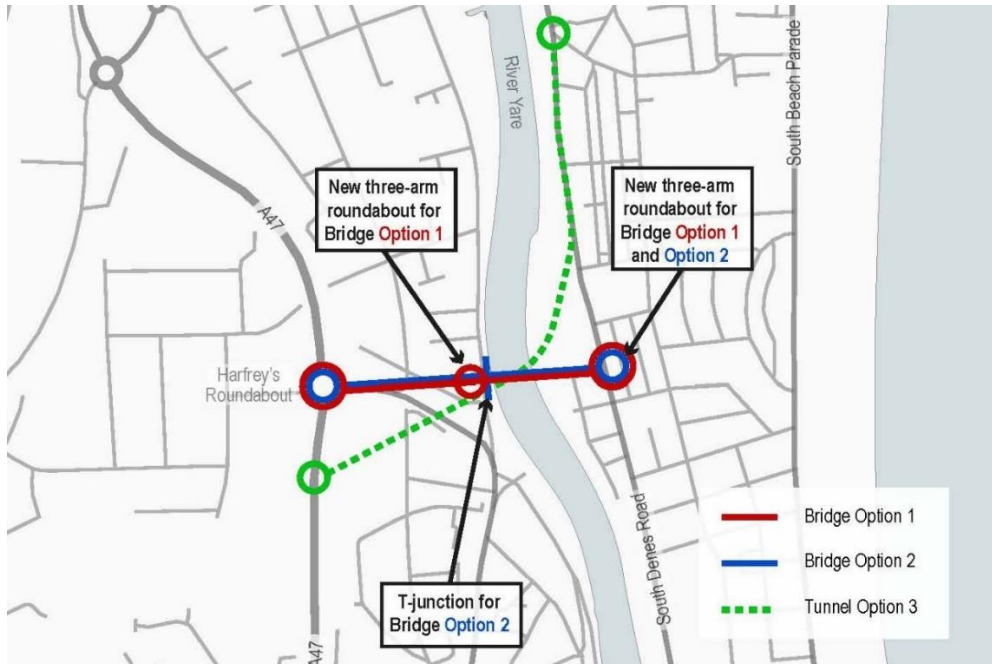


Figure 2-33 Shortlisted Options (from Options Assessment 2016)

2.13.39. At this stage it was assumed that both bridge options would have a dual carriageway, with a bridge height when closed of 7.5m above mean high tide level, and a clearance of 5.3m above Southtown Road. A tunnel would require a level change of about 16m, requiring longer approach roads than the bridge options.

2.13.40. A more detailed plan of each option is given in the OAR⁵⁵ (2016).

FURTHER ASSESSMENT OF SHORTLISTED OPTIONS

2.13.41. The assessment of the short-listed options is described in detail in the Stage 2 Assessment Report⁵⁶ (2009), and in the Stage 2 Simple Environmental Assessment Report⁵⁷ (2009). The findings were summarised in the OAR (2016) and are further summarised briefly below.

Cost

Option	Bridge Option 1	Bridge Option 2	Tunnel
Cost (2015 out-turn)	£121.676 million	£112.301 million	£375.828 million

⁵⁵ Great Yarmouth Third River Crossing Options Assessment Report (2016) OBC Supporting Document 1
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁵⁶ Great Yarmouth Third River Crossing – Stage 2 Scheme Assessment Report, September 2009. Mott Macdonald for Norfolk County Council

⁵⁷ Great Yarmouth Third River Crossing – Stage 2 Environmental Assessment Report, 2009. Mott Macdonald for Norfolk County Council

Environmental Impacts

2.13.42. The results of the Stage 2 Simple Environmental Assessment are summarised in the OAR⁵⁸ (2016). No “show stoppers” were identified, and the differences between the two bridge options were fairly small. The tunnel option would have a bigger impact during construction, and in terms of land-take, but fewer impacts during operation.

Traffic Impacts

2.13.43. Tests with the Great Yarmouth SATURN model showed that all of the options would reduce traffic on the existing bridges, especially the Haven Bridge.

2030 AADT (two way)	Do Minimum	Bridge Option 1	Bridge Option 2	Tunnel
Breydon Bridge	41,398	39,857	39,347	37,648
Haven Bridge	39,650	27,934	27,341	28,515
Third river crossing	-	26,879	26,957	25,825
TOTAL	81,048	94,670	93,645	91,988

Table 2-14 Traffic Impacts of Options on Bridge Traffic

2.13.44. The bridge options are more effective than the tunnel in reducing traffic on Haven Bridge, but a tunnel would produce the biggest reductions on Breydon Bridge.

Economic Assessment

2.13.45. An economic assessment of the short-listed options was undertaken using TUBA. All of the options tested showed a positive benefit-cost ratio, as set out below:

- Bridge (Option 1) 4.5
- Bridge (Option 2) 4.8
- Tunnel 1.5

2.13.46. Details of the assessment are set out in the Options Appraisal Report (2016). In simple terms, the economic benefits of a tunnel are nearly as high as those of the bridge options, but the costs would be much higher, producing a low BCR, whereas both bridge options had a BCR of more than 4.0 at this stage of the assessment. Based on DfT guidance⁵⁹ they offered very high value for money.

Views of the Public and Stakeholders

2.13.47. Public consultation in August 2009 revealed that 92% of people supported provision of a new river crossing. Key stakeholders were also consulted. The Highways Agency (now Highways England)

⁵⁸ Great Yarmouth Third River Crossing Options Assessment Report (2016) OBC Supporting Document 1
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁵⁹ Value for Money Assessment: Advice Note for Local Transport Decision Makers. (DfT, December 2013)

indicated a preference for a bridge option, as did 1st East, the Great Yarmouth Waterfront Regeneration Company, and Great Yarmouth Borough Council. Details of the 2009 consultation are set out in the Options Assessment Report⁶⁰ (2016).

PREFERRED ROUTE CORRIDOR

2.13.48. In December 2009, Norfolk County Council’s Cabinet⁶¹ considered the findings of the technical studies and the public and stakeholder consultation. The Cabinet’s conclusion was that:

- “Evidence from all of the technical work to date and the results from the public consultation indicate that the bridge option with a dual carriageway link utilising a 50m span bascule bridge over the river is the best option for a preferred route
- “The decision on whether the bridge Scheme has a roundabout or a T-junction on Southtown Road can be decided during the detailed design”

2.13.49. The Cabinet decided to adopt a preferred corridor for the bridge option – between Harfrey’s Roundabout and South Denes Road, as illustrated in Figure 2-34 below. They also authorised the purchase of properties subject to blight notices and agreed to investigate funding options for the Scheme.



Figure 2-34 Preferred Route Corridor (from 2016 OAR)

SCHEME OPTIONS WITHIN PREFERRED ROUTE CORRIDOR

2.13.50. The next stage of option assessment was undertaken in 2016/17. Details are set out in the Final Options Assessment Report (2017) (Supporting document 2). Focusing now on the preferred corridor, a further long-list of options was produced based on different combinations of criteria

⁶⁰ Great Yarmouth Third River Crossing Options Assessment Report (2016) OBC Supporting Document 1

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁶¹ Great Yarmouth Third River Crossing Preferred Route, NCC Cabinet, 7 Dec 2009

including the location, form and geometry of the western and eastern tie-ins to the local road network, the bridge height and the carriageway.

Location of the Western Tie-In

2.13.51. There are three places where new bridge infrastructure could be connected to the existing highway network on the western side of the river:

- A: Harfrey's Roundabout
- B: Suffolk Road
- C: Southtown Road

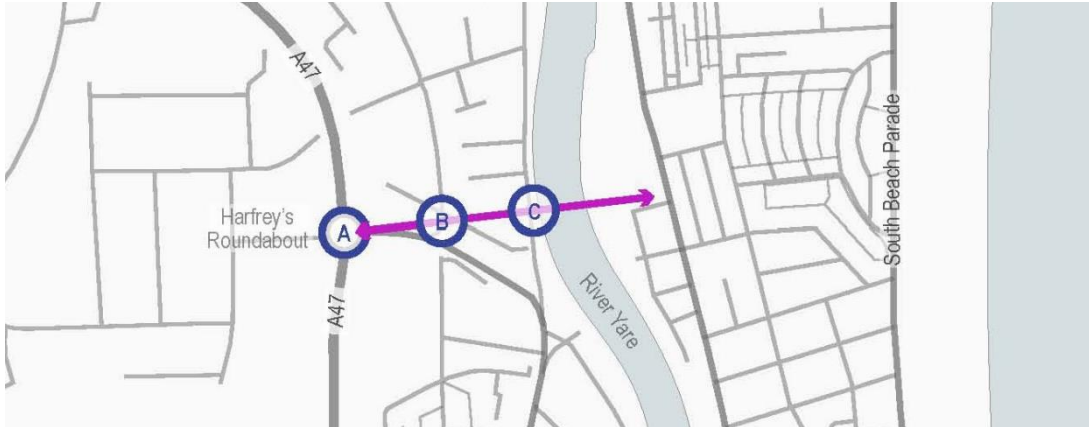


Figure 2-35 Potential Locations for Western Tie-In (from OAR 2017)

Form of the Eastern Tie-In

2.13.52. Two options were identified for the eastern tie-in to South Denes Road, and tested as stand-alone elements of the Scheme:

- Roundabout
- Traffic signals

Bridge Height

2.13.53. Two possible bridge heights were considered:

- Low: Minimum clearance 3.0m, allowing a direct tie-in to Southtown Road
- High: Minimum clearance 7.0m, requiring a bridge over Southtown Road

Carriageway Standard

2.13.54. Three main options were considered:

- 2-lane single carriageway
- 3-lane single carriageway
- Dual carriageway with 2 lanes in each direction

2.13.55. Full details of these options are set out in the Final Options Assessment Report⁶² (2017). The process of sifting and prioritising the 40 options to identify a single preferred Scheme is described fully in the report and summarised briefly below.

2.13.56. Not all of the theoretical combinations are feasible in design terms, which simplified the assessment. However, other minor variants were identified as part of the design investigations, leading to an interim long list of 40 options, all broadly within the preferred corridor.

SIFTING OF OPTIONS WITHIN THE PREFERRED CORRIDOR

2.13.57. A two-stage sifting process was undertaken, as illustrated below:

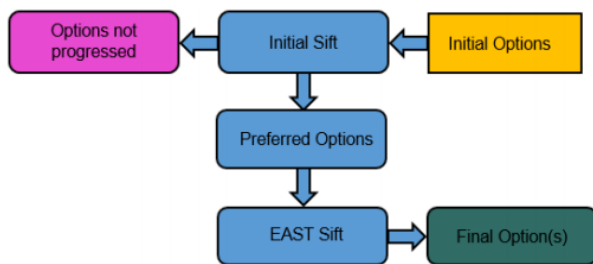


Figure 2-36 Sifting Process for Options within Preferred Corridor

2.13.58. An initial sift was undertaken of the potential options. By removing those that did not make significant contributions to meeting the defined objectives, did not resolve the identified problems, or are not deliverable or feasible, the list of 40 options was reduced to nine. The process is described in more detail in the Final Options Report (2017) and the results are set out in Table 2-15 below:

⁶² Great Yarmouth Third River Crossing Final Options Assessment Report (2017) OBC Supporting Document 2

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

Option	Western Tie-In	Bridge Height	Carriageway Standard
4	Existing Harfrey's roundabout	High	2 lane single carriageway
5	Existing Harfrey's roundabout	High	Dual carriageway
6	Existing Harfrey's roundabout	High	Three lane carriageway
31	New roundabout at Suffolk Road	High	2 lane single carriageway
32	New roundabout at Suffolk Road	High	Dual carriageway
33	New roundabout at Suffolk Road	High	Three-lane carriageway
37	At-grade junction with Southtown Road	Low	2 lane single carriageway
38	At-grade junction with Southtown Road	Low	Dual carriageway
39	At-grade junction with Southtown Road	Low	Three lane carriageway

Table 2-15 Short-Listed Options within Preferred Corridor (from Final OAR 2017)

- 2.13.59. All of the short-listed options involved a signalised T-junction with South Denes Road.
- 2.13.60. The nine options which successfully met the evaluation criteria within the initial sifting process were taken forward to the final stage of sifting, using the Department for DfT's Early Assessment and Sifting Tool (EAST). EAST is a decision support tool developed to summarise and present evidence on options quickly and in a clear and consistent format. It provides decision makers with relevant, high level, information to help them form an early view of how options perform and compare. It is consistent with Transport Business Case principles and follows the same five cases as the DfT Business Case model.
- 2.13.61. The EAST assessment identified the high level economic, environmental and social impacts of all nine options based on DfT's five case model approach. The process is described in detail in the Final Options Report (2017). In addition to the EAST assessment, operational assessment was undertaken of the remaining options. This was undertaken using the earlier SATURN models, available at the time of the assessment, as well as further consideration of the queuing of cars and goods vehicles on the bridge approaches.
- 2.13.62. The assessment process, which is described in more detail in the Final Options Report, resulted in the nine options being narrowed down further to three, which were tested in more detail using the

new PARAMICS microsimulation models developed in 2016-17 for the Outline Business Case. The models are described in the PARAMICS Local Model Validation⁶³ and Forecasting Reports⁶⁴.

2.13.63. The three options selected for further testing were:

- **Option 32** - Suffolk Road tie-in to the west (four-lane high-level bridge, roundabout as west tie-in and traffic signals to the east at South Denes Road)
- **Option 33** - Suffolk Road tie-in to the west (three-lane high-level bridge, roundabout as west tie-in and traffic signals to the east at South Denes Road)
- **Option 37** - Southtown Road tie into the west (two-lane low-level bridge with traffic signal junctions to the west and the east at South Denes Road)

2.13.64. The operational assessments, described in the Final Options Assessment Report⁶⁵ (2017), showed that Option 32 is forecast to perform better than the other options. Specifically, Option 32 provided:

- the best forecast journey time and distance savings
- shorter predicted queues than the other options

2.13.65. Separately, the road safety audits undertaken as part of the design investigations, indicated that Option 33, the 3-lane bridge, would perform least well in safety terms, due to its operational complexity. Option 37 would offer a less resilient solution and would have a bigger impact on residential properties on Southtown Road.

2.13.66. For these reasons, Option 32 was identified as the preferred option and taken forward for more detailed design and assessment.

2.14 THE PROPOSED SCHEME

2.14.1. The 3D visualisations of the proposed scheme are shown in Appendix A. The location of the proposed Scheme is illustrated in Figure 2-37 and its general layout is illustrated in Figure 2-38.

2.14.2. A more detailed drawing may be seen in Figure 1-7 in Section 1 above.

⁶³ Great Yarmouth Third River Crossing Paramics Local Model Validation Report OBC Supporting Document 4
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁶⁴ Great Yarmouth Third River Crossing Paramics Forecasting Report OBC Supporting Document 7 <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁶⁵ Great Yarmouth Third River Crossing Final Options Assessment Report (2017) OBC Supporting Document 2
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>



Figure 2-37 Location of the Proposed Scheme



Figure 2-38 Proposed Scheme

THE NEW BRIDGE OVER THE RIVER YARE

- 2.14.3. The Scheme consists of a new dual carriageway road, including a road bridge across the River Yare, linking the A47 at Harfrey's Roundabout on the western side of the river to the A1243 South Denes Road on the eastern side. The Scheme will feature an opening span double-leaf bascule (lifting) bridge across the river, involving the construction of two new 'knuckles' extending the quay wall into the river to support the bridge. The Scheme will include a bridge span over the existing Southtown Road on the western side of the river, and a bridge span on the eastern side of the river to provide an underpass for existing businesses, enabling the new dual carriageway road to rise westwards towards the crest of the new crossing.
- 2.14.4. Traffic will be controlled by lifting barriers at either end of the bridge, and queueing space will be provided.
- 2.14.5. The new bridge will be operated on demand for commercial vessels and by agreement for recreational vessels at set times when requested in advance. The bridge is expected to be operational 24 hours per day and 365 days per year.
- 2.14.6. It is anticipated that the bridge will open on average 15 times per day on a typical weekday. Individual opening durations will vary, however, traffic modelling undertaken for the Scheme has assumed that each opening will take on average approximately 5.5 minutes including vessel passage time, meaning that the crossing will be closed to traffic for approximately 82 minutes on a typical day.
- 2.14.7. With the bridge fully lowered, and open to road traffic, the clearance below the structure will allow smaller vessels to pass under the new bridge without the need for it to be closed to road traffic.



Figure 2-39 Visualisation of the Proposed Great Yarmouth Third River Crossing

CONNECTIONS TO THE EXISTING ROAD NETWORK

- 2.14.8. On the western side of the River Yare, the new crossing over the river will connect into the existing highway network by means of a new five-arm roundabout. The existing William Adams Way dual carriageway will be realigned to form two of the five arms of the new roundabout. The William Adams Way western arm of the roundabout will form a short link connecting into the existing A47 Harfrey's roundabout. The William Adams Way eastern arm of the roundabout will form a link to the existing signalised junction of William Adams Way and Southtown Road. The other two arms of the new roundabout will form connections with the western end of Queen Anne's Road, where the Kings Centre and premises occupied by the Haven Veterinary Surgeons are located, and Suffolk Road. The fifth arm of the new roundabout will form the western approach to the new crossing.
- 2.14.9. Signal-controlled pedestrian and cycle crossing facilities will be provided across the William Adams Way eastern arm of the roundabout and across the arm connecting the new crossing to the roundabout. In addition, a signal-controlled crossing for pedestrians will be provided on the Suffolk Road arm of the roundabout.
- 2.14.10. At its eastern end, the new crossing over the river will connect into a new signalised junction with South Denes Road. The existing direction of one-way operation of Sutton Road and Swanston's Road will be reversed to ensure efficient operation of the new signalised junction. Signal-controlled crossing facilities will be incorporated into the new signalised junction.

ACCESS

- 2.14.11. On the western side of the river, a new junction on Southtown Road will provide vehicular and pedestrian access to the residential properties and MIND Centre and Grounds at the eastern end of Queen Anne's Road. In addition, a new private access will be provided north of the new public realm on Bollard Quay for vehicles to exit Bollard Quay and join the southbound carriageway of Southtown Road.

2.14.12. On the eastern side of the river, new private access arrangements will be provided including a new underpass to allow vehicular and pedestrian access between land north and south of the new road.



Figure 2-40 Proposed New Roundabout and Bascule Bridge, Great Yarmouth

PROVISION FOR PEDESTRIANS AND CYCLISTS

2.14.13. As well as being an important link for vehicular traffic, the new bridge will also provide new opportunities for journeys by cycle and on foot. The Scheme will include:

- A 4.5m wide footway and two-way cycleway link from William Adams Way, across the eastbound side of the new bascule bridge, and linking to a new on carriageway cycle lane on Sutton Road. This route also includes new Toucan crossing facilities at the William Adams Way roundabout, and the new traffic signal-controlled junction on South Denes Road
- A 2.5m wide footway on the westbound side of the link across the new bascule bridge.
- A new footway/cycleway link from the William Adams Way roundabout to Suffolk Road, and a new pedestrian crossing on Suffolk Road
- A footway/cycleway link from William Adams Way to Harfrey's roundabout

2.15 IMPACTS OF THE PROPOSED SCHEME AND ACHIEVEMENT OF OBJECTIVES

2.15.1. The Great Yarmouth Third River Crossing will have a significant and beneficial impact on traffic in the town, and this will give rise to a range of benefits, helping to deliver the Scheme's objectives.

- 2.15.2. A detailed assessment of the forecast impact of the Scheme on traffic patterns is set out in the Transport Assessment⁶⁶ that formed part of the 2019 DCO Application.
- 2.15.3. The most significant impacts are summarised below.
- 2.15.4. **Traffic levels will be reduced on key links.** Figure 2-41 shows the forecast changes in traffic flow in the local road network – comparing “Do Something” (DS) and “Do Minimum” (DM) flows on key links in the opening year 2023 (pm peak).
- 2.15.5. Whilst there are some increases on the approaches to the new bridge, the general effect is to redistribute traffic between three, instead of two, river crossings, reducing the pressure of traffic in sensitive areas. This will contribute to the achievement of the Scheme’s objectives.

⁶⁶ Great Yarmouth Third River Crossing – Application for DCO. Document 7.2: Transport Assessment, NCC, 30 April 2019
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application>

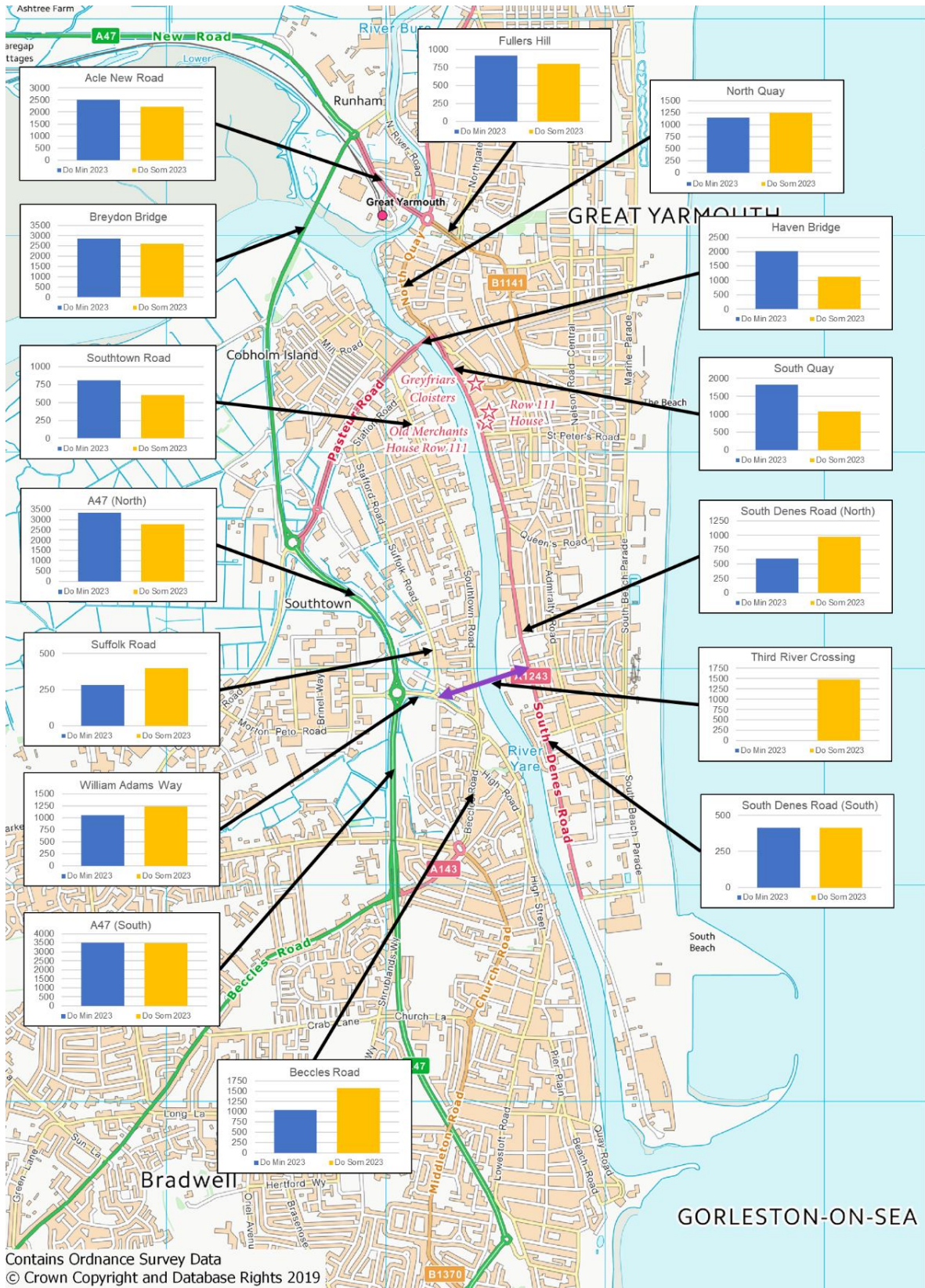


Figure 2-41 Traffic Flow Changes due to the Scheme 2023 PM Peak Hour

2.15.6. **The existing bridges will both experience a reduction in traffic** – one of the key objectives of the Scheme. Table 2-16 shows the impact of the Scheme on bridge crossing flows in 2023.

Traffic Flow (2 way) AADT	2023 DM	2023 DS	Difference (%)
A47 Breydon Bridge	33,710	30,459	-10%
A4123 Haven Bridge	24,136	12,110	-50%
Third River Crossing	-	19,351	-

Table 2-16 Forecast Traffic Changes on all Bridges Bridge AADT (from 2018 SATURN Model)

2.15.7. The most dramatic reduction is expected in the traffic on Haven Bridge, where there is forecast to be a 50% reduction upon the opening of the Third River Crossing – a large beneficial impact which will be felt immediately by people in the town. Of the three bridges, Haven Bridge will in future be the least busy by a significant margin.

2.15.8. It may be noted that the combined traffic flow over all three bridges is forecast to increase. This is not an unintended consequence but is a result of trips between A47 (N) and the peninsula using both the new crossing and the Breydon Bridge, thereby making better (and more appropriate) use of the A47 trunk road, rather than passing through the town centre and using neither bridge.

2.15.9. **Congestion will reduce.** Figure 2-42 shows visual representations (heat maps) of predicted congestion in 2038 (PM peak), showing the reduced intensity of congestion hotspots as a result of the Third River Crossing.

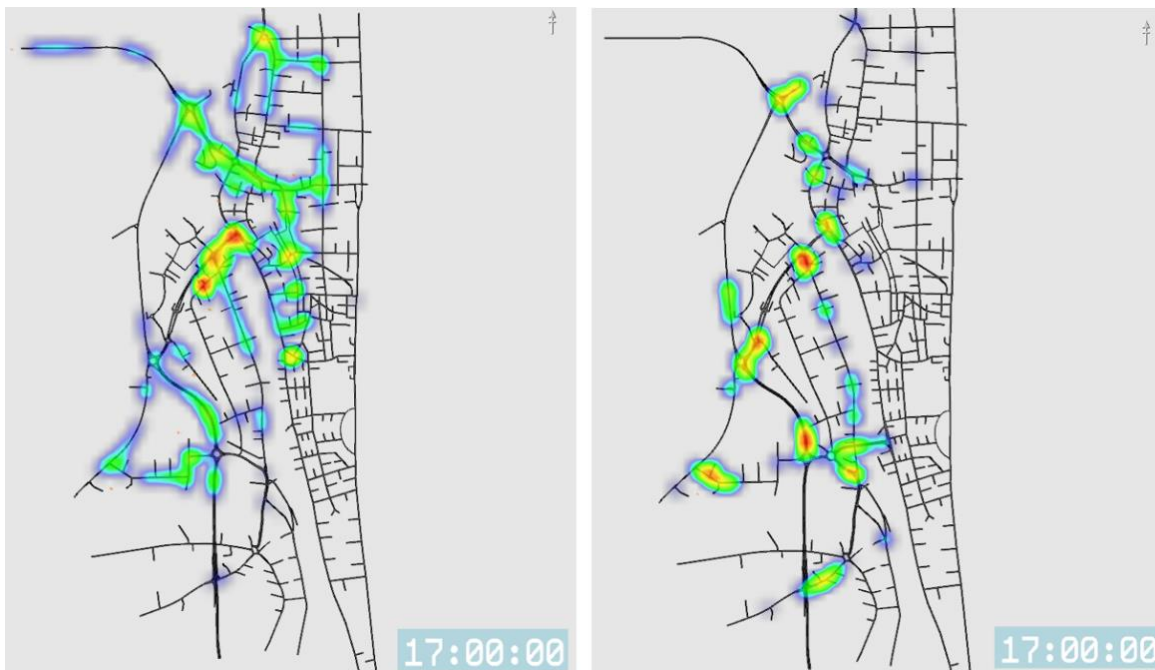


Figure 2-42 Congestion Hotspots 2038 PM Peak Hour in DM (left) and DS (right)

2.15.10. **Journey times on key routes will be reduced.** Table 2-17 and Table 2-18 show the dramatic impact that the Great Yarmouth Third River Crossing will have on the times for key journeys across the town, especially between the A47 (south) and locations in the South Denes peninsula. The origins and destinations are illustrated in Figure 2-43 below.

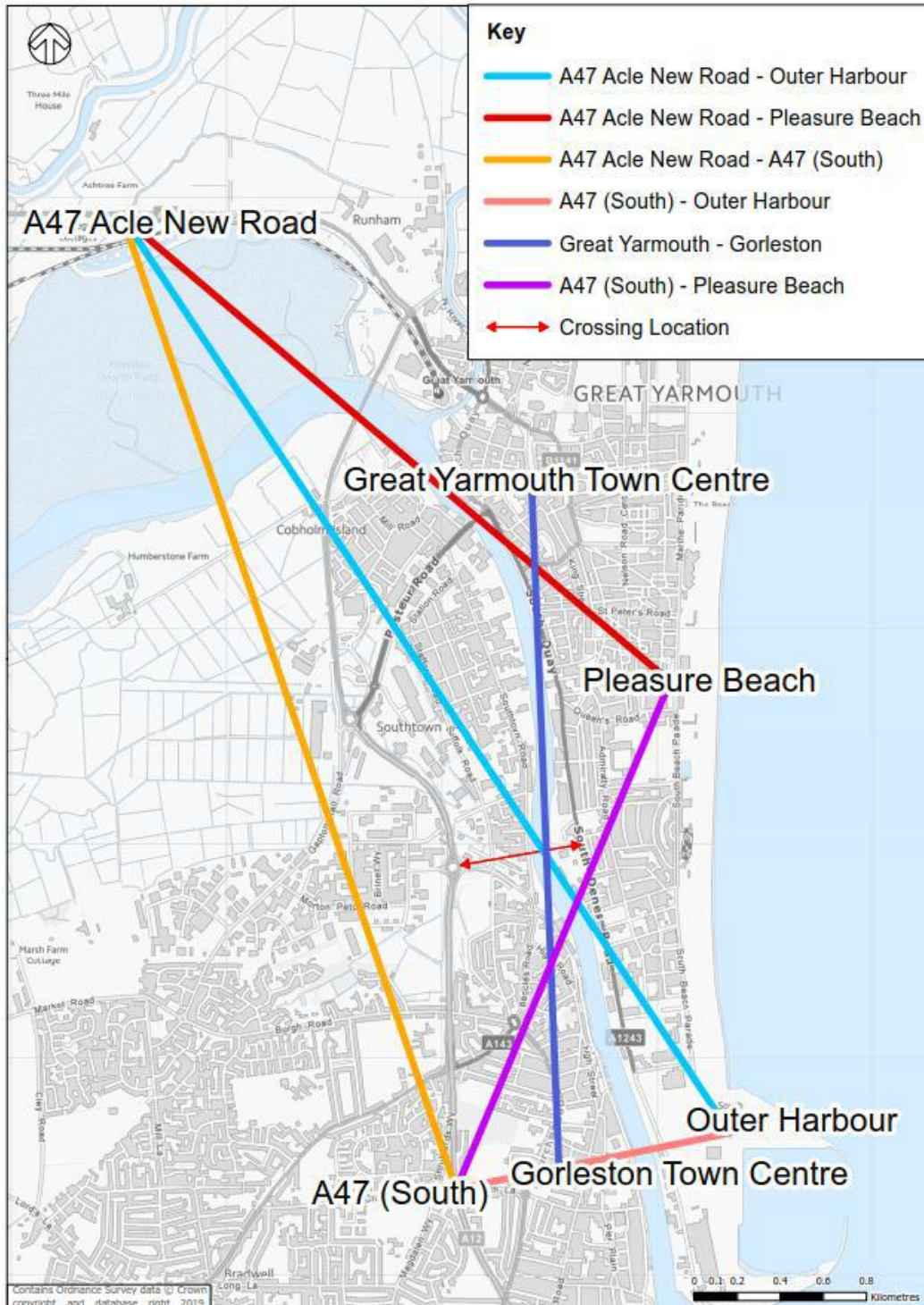


Figure 2-43 Origins and Destinations for Journey Time Forecasts

Average Time (Minutes) for Trips Between	Average Time (Minutes) for Trips Between	Do Minimum 2023 AM	With Scheme 2023 AM	Time Saving (minutes)
A47 Acle New Rd	Outer Harbour	8.8	8.1	0.7
A47 Acle New Rd	Pleasure Beach	7.4	6.9	0.5
A47 Acle New Rd	A47 (S)	6.4	6.3	0.1
A47 (S)	Outer Harbour	9.8	5.1	4.7
A47 (S)	Pleasure Beach	8.6	6.4	2.2
Gorleston Town Centre	Great Yarmouth Town Centre	9.0	7.9	1.1

Table 2-17 Forecast Journey Time Savings between Key Origins and Destinations 2023 AM Peak Hour

Average Time (Minutes) for Trips Between	Average Time (Minutes) for Trips Between	Do Minimum 2023 PM	With Scheme 2023 PM	Time Saving (minutes)
A47 Acle New Rd	Outer Harbour	10.1	8.8	1.3
A47 Acle New Rd	Pleasure Beach	8.6	7.1	1.5
A47 Acle New Rd	A47 (S)	7.3	6.3	1.0
A47 (S)	Outer Harbour	10.8	4.8	6.1
A47 (S)	Pleasure Beach	9.7	5.7	4.0
Gorleston Town Centre	Great Yarmouth Town Centre	9.3	7.8	1.5

Table 2-18 Forecast Journey Time Savings between Key Origins and Destinations 2023 PM Peak Hour

2.15.11. **Journey time reliability will also be improved**, as demonstrated in the Economic Case, as a result of these changes in traffic flow.

2.15.12. **Historic areas of the town will experience less traffic**. Forecast changes in traffic on Haven Bridge and North and South Quay are set out in Table 2-19. Traffic will reduce significantly on the historic South Quay.

Traffic flow (2 way) AADT	2023 DM	2023 DS	Difference (%)
North Quay	11,546	12,733	+10%
Haven Bridge	24,136	12,110	-50%
South Quay	22,167	12,112	-45%

Table 2-19 Forecast Traffic Changes near Haven Bridge AADT (from SATURN Model)

2.15.13. **Vehicular access to South Denes and the Outer Harbour will be greatly improved**, as the Third River Crossing will provide a much shorter route into the South Denes area for traffic from the SRN (A47).

2.15.14. **Access for pedestrians and cyclists will be improved**. The Third Crossing will provide a much more direct route for many trips. It will also be provided with excellent facilities for non-motorised modes.

2.15.15. Accessibility plots (Figure 2-44 and Figure 2-45) show the significant improvement in accessibility for pedestrians and cyclists respectively.

2.15.16. More information on benefits for users of active modes are set out in the Economic Case.

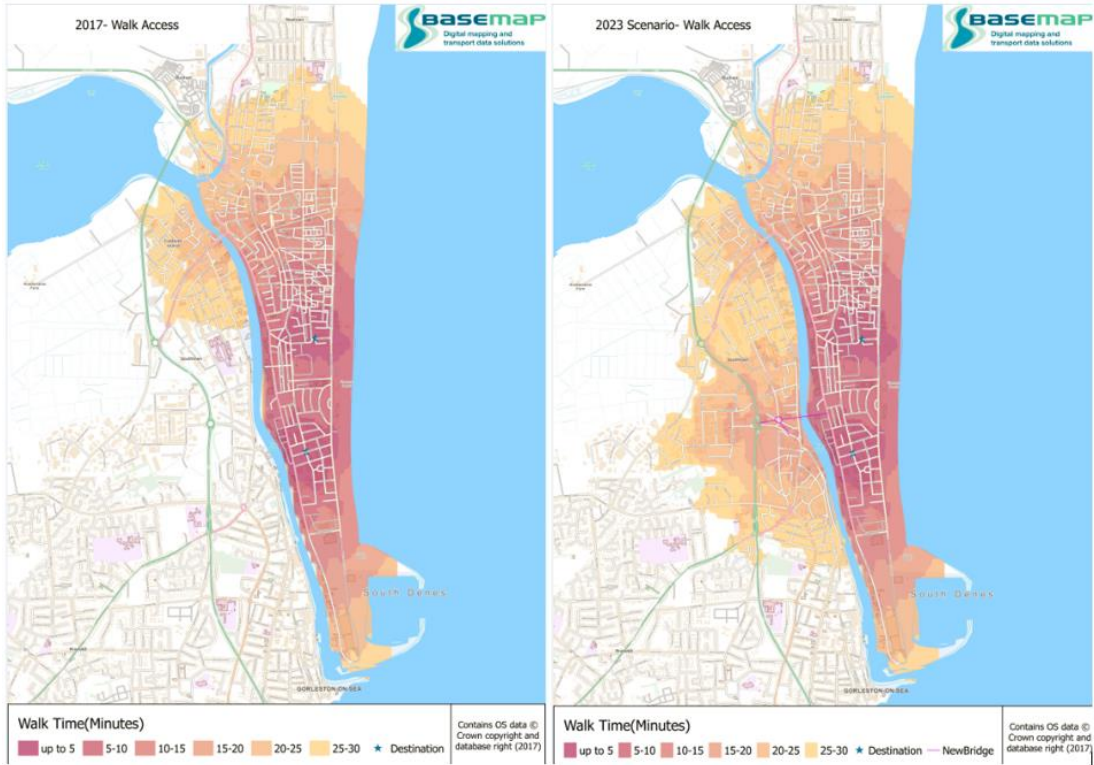


Figure 2-44 Accessibility for Pedestrians 2023 DM (left) and DS (right)

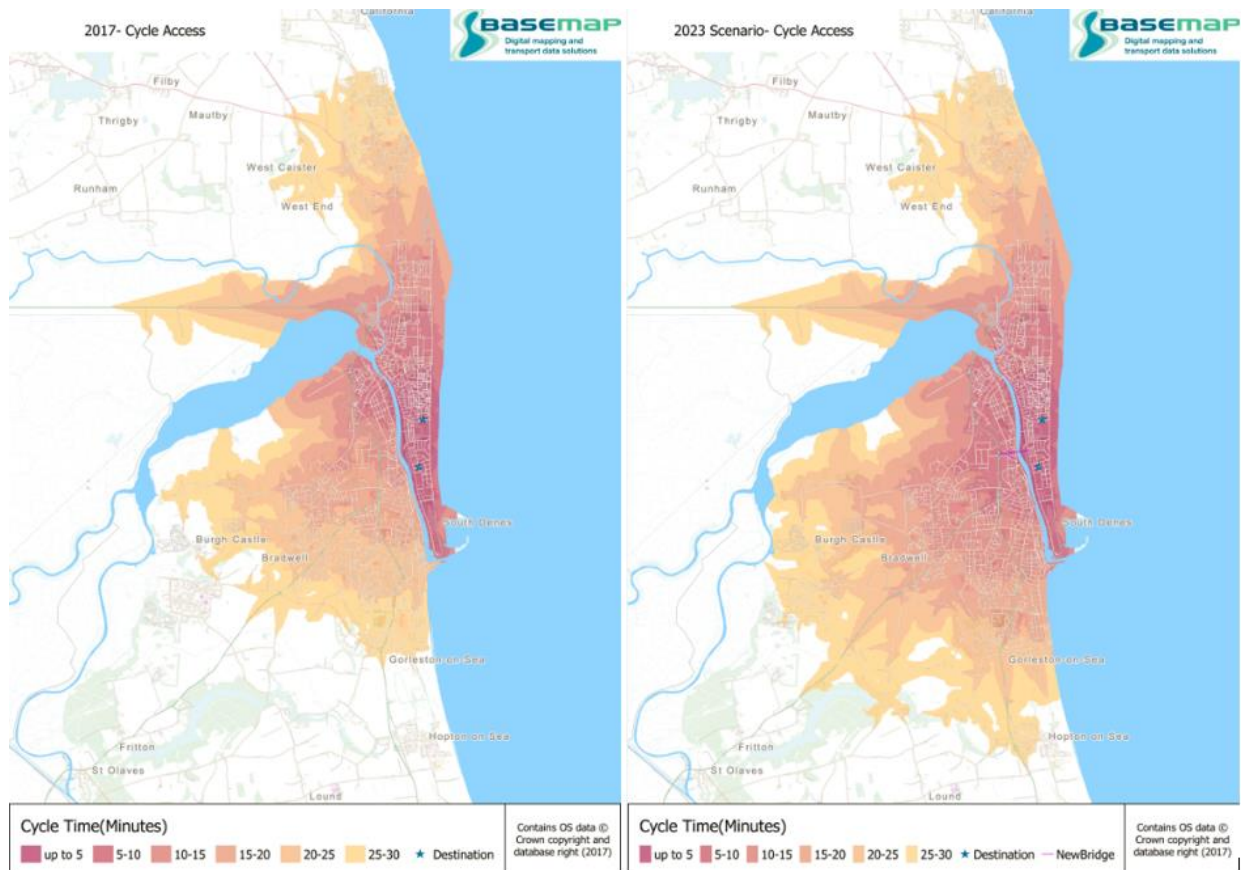


Figure 2-45 Accessibility for Cyclists 2023, DM (left), DS (right)

2.15.17. **Bus users will benefit** from:

- Less congestion on existing routes
- New waiting facilities near the Third River Crossing
- The opportunity to introduce new, more direct routes into the South Denes area

2.15.18. **Road accidents will be reduced**, as detailed in the Economic Case, and demonstrated using the DfT assessment tool, COBALT.

2.15.19. **Greenhouse gas emissions** will be reduced, as detailed in the Economic Case.

2.15.20. **The resilience of the local road network will be enhanced** by the provision of additional capacity overall, reduced congestion and additional route options (for example when roads are closed due to incidents), meeting the criteria set out in Paragraph 2.4.80, above.

2.15.21. The impacts of the Scheme will be monitored, as set out in the *Monitoring and Evaluation Plan (Supporting Document 8)*.

2.15.22. In summary, **the Great Yarmouth Third River Crossing is expected to deliver on all of the specific objectives** set out in Section 2.7 above – in some cases with very large positive impacts.

2.15.23. The improvements to accessibility and connectivity, and the reductions in travel times, will reduce transport costs and help to deliver the high level, strategic outcomes also set out in Section 2.7:

- Support the creation of new jobs (see the Regeneration and Wider Impacts Report⁶⁷).
- Support Great Yarmouth as a centre for Offshore Energy, and as a port
- Support the regeneration of Great Yarmouth, including the town centre and the seafront, helping the visitor and retail economy
- Improve strategic connectivity and reduce severance
- Protect and improve the environment

2.15.24. Further information on the achievement of Scheme objectives is set out in the *Benefits Realisation Plan* (Supporting Document 9).

⁶⁷ Great Yarmouth Third River Crossing Regeneration and Wider Impacts Report OBC Supporting Document 11
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

3 THE ECONOMIC CASE

3.1 INTRODUCTION

- 3.1.1. 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, including those impacts which can be monetised.
- 3.1.2. The results of the assessment are set out in detail in the Appraisal Summary Table (Appendix C) and summarised in the Value for Money Statement (Section 3.14).

These demonstrate that the benefits of the Scheme will outweigh its costs, offering **high** value for money.

This Economic Case covers:

- Options appraised
- Overview of methodology and assumptions
- Scheme costs
- Transport economic efficiency (TEE)
- Safety impacts
- Active mode impacts
- Reliability benefits
- Wider impacts
- Non-monetised impacts
- Social and distributional impacts
- Sensitivity testing
- Appraisal summary table (AST)
- Value for money statement
- Summary and conclusion

3.2 OPTIONS APPRAISED

- 3.2.1. The proposed Scheme has been identified after consideration of a full range of options. These included:

- Non-road options
- Different types of crossing (bridge or tunnel)
- Different corridors and locations for a crossing
- Different types of bridge or tunnel structure
- Different bridge heights (high or low)
- Different carriageway standards (single, dual or three-lane)
- Different ways of connecting to the existing highway network

- 3.2.2. The assessment of these options, and the refinement of the preferred option, is described in detail in the 2016⁶⁸ and 2017⁶⁹ Option Assessment Reports and is summarised in the Strategic Case. At each stage of the assessment, use has been made of the analytical tools available at that time. The models used to determine Scheme impacts have been progressively improved, giving increasing confidence in the results.
- 3.2.3. The 2016 Option Assessment Report which builds on earlier work in 2007 and 2009, identified, sifted and assessed a very broad range of options. It led to the identification of a preferred type of crossing (a bascule bridge) and a preferred corridor.



Figure 3-1 Preferred Route Corridor

- 3.2.4. The 2017 Final Option Assessment Report considered 40 options for a road crossing within the preferred corridor. These were sifted and assessed against the Scheme objectives to produce a short list of nine options:

Option	Western Tie-In	Bridge Height	Carriageway Standard
4	Existing Harfrey's roundabout	High (7m)	2 lane single carriageway
5	Existing Harfrey's roundabout	High (7m)	Dual carriageway
6	Existing Harfrey's roundabout	High (7m)	Three lane carriageway

⁶⁸ Great Yarmouth Third River Crossing Options Assessment Report (2016) OBC Supporting Document 1

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁶⁹ Great Yarmouth Third River Crossing Final Options Assessment Report (2017) OBC Supporting Document 2

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

Option	Western Tie-In	Bridge Height	Carriageway Standard
31	New roundabout at Suffolk Road	High (7m)	2 lane single carriageway
32	New roundabout at Suffolk Road	High (7m)	Dual carriageway
33	New roundabout at Suffolk Road	High (7m)	Three lane carriageway
37	At-grade junction with Southtown Road	Low (3m)	2 lane single carriageway
38	At-grade junction with Southtown Road	Low (3m)	Dual carriageway
39	At-grade junction with Southtown Road	Low (3m)	Three lane carriageway

Table 3-1 Shortlisted Options (2017)

- 3.2.5. All of the short-listed options involved a signalised T-junction with South Denes Road as the eastern tie-in to the existing road network.
- 3.2.6. The nine options were then assessed in more detail using the DfT’s Early Assessment and Sifting Tool (EAST). This considered the high level economic, environmental and social impacts of the Scheme, in line with the five-case model. The EAST sifting process is intended to inform a decision, not to make one.
- 3.2.7. The final stage of assessment led to the identification of a single preferred option which was then refined and optimised as part of the Scheme design process.

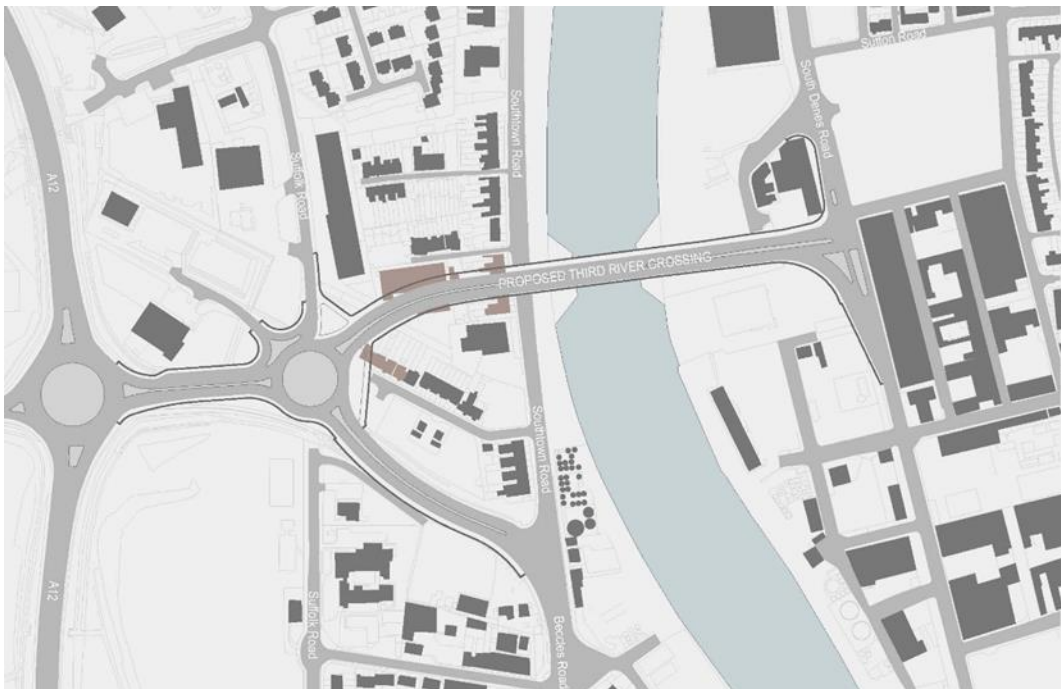


Figure 3-2 Preferred Scheme

- 3.2.8. The Scheme will provide a third crossing over the River Yare, creating a new, more direct link between the western and eastern parts of the Great Yarmouth. Specifically, it will provide a connection between the Strategic Road Network (A17) and the South Denes Business Park,

Enterprise Zone, Great Yarmouth Energy Park and the Outer Harbour, all of which are located on the South Denes peninsula.

- 3.2.9. A new lifting bridge will carry a dual carriageway road across the river, opening when required to allow shipping to pass through. Traffic will be controlled by lifting barriers at either end of the bridge, and queueing space will be provided.
- 3.2.10. On the western side of the river, a new roundabout will be constructed on William Adams Way, at the site of the existing junction with Suffolk Road, to the east of the A47 Harfrey's Roundabout. Suffolk Road (north) will connect directly into the roundabout. William Adams Way will be realigned and widened between Harfrey's Roundabout and the new roundabout, and between the new roundabout and Beccles Road / Southtown Road.
- 3.2.11. From the new roundabout, a new dual carriageway road will run eastwards towards the river, crossing Southtown Road on a flyover, and continuing over the new bridge. On the eastern side of the river, the new dual carriageway will connect to the A1243 South Denes Road at a new signal-controlled junction.
- 3.2.12. The Economic Case sets out the results of assessing this Scheme in more detail, using the most up-to-date information and analytical tools available.

3.3 OVERVIEW OF TRAFFIC MODELLING METHODOLOGY AND ASSUMPTIONS

- 3.3.1. The economic assessment is based on the detailed modelling of traffic in Great Yarmouth, both with and without the proposed Scheme. The modelling methodology was agreed by a peer group of representatives from NCC, DfT and WSP (then Mouchel).
- 3.3.2. The Great Yarmouth Traffic Model (GYTM) is based on a SATURN model originally built by Mott MacDonald in 2008. This was recalibrated to create a new 2016 base model which informed the OBC. This model was updated to a 2018 base year to inform the Transport Assessment (TA), and it is forecasts from the 2018 base year that now inform the economic appraisal for FBC.
- 3.3.3. The development, validation and use of the SATURN model are described in the following reports.

Title	Reference
Data Collection Report	Great Yarmouth Third River Crossing Data Collection Report OBC Supporting Document 3 https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission
Traffic Data Collection Report addendum	Great Yarmouth Third River Traffic Data Collection Report Addendum DCO Document 7.2a Transport Assessment Appendix A https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application
Local Model Validation Report (LMVR) (SATURN)	Great Yarmouth Third River Crossing Local Model Validation Report (SATURN) OBC Supporting Document 5 https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission

LMVR addendum (SATURN)	Great Yarmouth Third River Crossing Local Model Validation Report Addendum (SATURN) DCO Document 7.6 Economic Appraisal Report Appendix A https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application
Variable Demand Model Report	Supporting Document 7
Forecasting Report (SATURN)	Great Yarmouth Third River Crossing Forecasting Report (SATURN) DCO Document 7.6 Economic Appraisal Report Appendix B https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application
Supplementary Modelling Report	Supporting Document 10

Table 3-2 Modelling Reports

3.3.4. A very brief summary of the approach to modelling is set out below.

UPDATING THE 2008 MODEL

3.3.5. The model update included:

- Reviewing the network structure, taking account of changes to the highway infrastructure
- Refining the zone structure and zone connectors, especially close to the proposed Scheme
- Updating traffic signal timings
- Adding development sites introduced between 2008 and 2018
- Updating demand matrices using new RSI survey and traffic count data

FEATURES OF THE MODEL

3.3.6. The SATURN software employs an iterative process of assigning flows and simulating delay. Within the simulated model area, capacity is restrained at junctions.

3.3.7. In line with DfT TAG Unit M2.1 (May 2020), variable demand modelling (VDM) has been used.

MODEL STUDY AREA

3.3.8. The simulation model area covers the whole of the Great Yarmouth conurbation, as shown in Figure 3-3 .

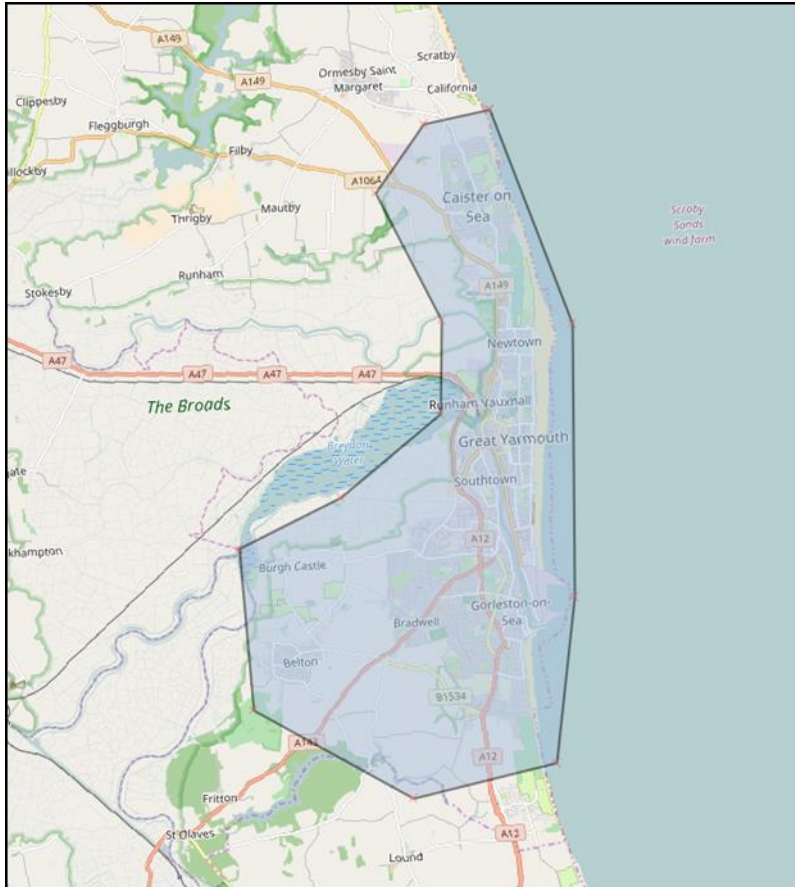


Figure 3-3 SATURN Model – Extent of Detailed Simulation Area

- 3.3.9. The simulation area is considered large enough to capture the biggest impacts expected due to the Scheme and also includes an area where impacts are quite likely but are expected to be relatively small.

ZONING

- 3.3.10. The model comprises 240 zones, with the greatest level of detail being in the town centre and close to the proposed Scheme. The zoning structure is illustrated in Figure 3-4 and is described in more detail in the LMVR⁷⁰.

HIGHWAY NETWORK

- 3.3.11. The simulation area of the model network is also shown in Figure 3-4 and described in more detail in the LMVR. All roads outside the core model area are coded as buffer links.

⁷⁰ Great Yarmouth Third River Crossing Local Model Validation Report (SATURN) OBC Supporting Document 5
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

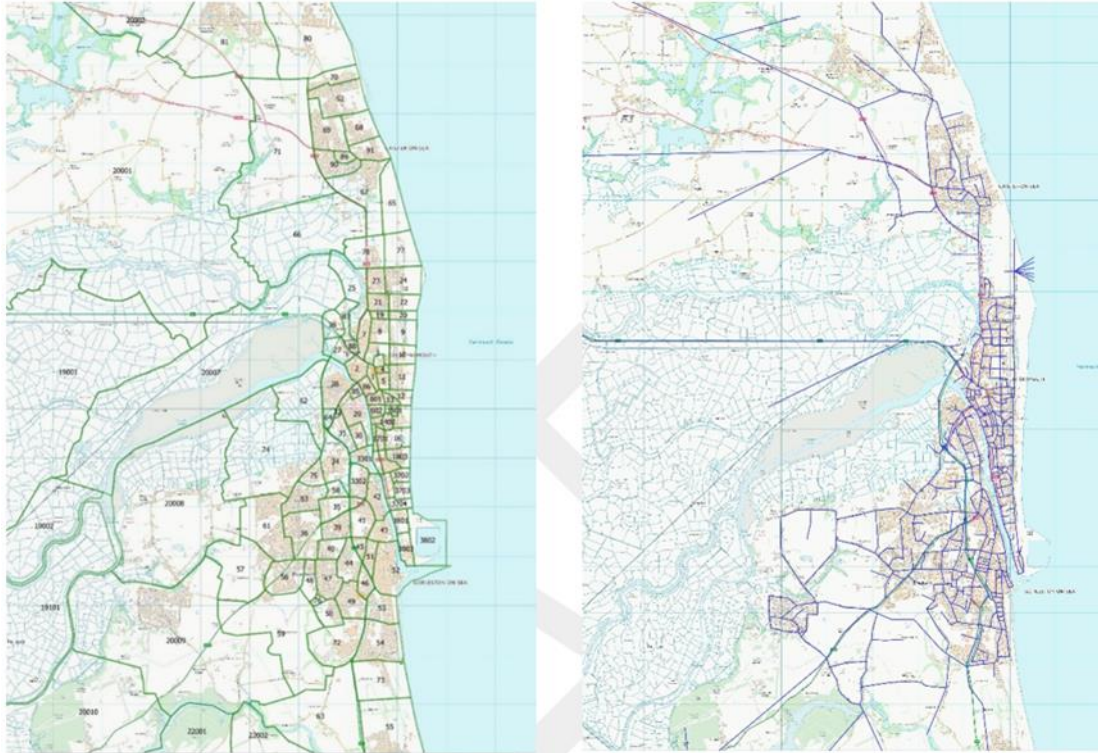


Figure 3-4 SATURN Zoning and Highway Network

TRAFFIC DATA

3.3.12. Traffic data was obtained from:

- Existing data, including: ANPR, MCC, ATC, queue surveys, Trafficmaster
- Roadside interview surveys in 2016
- Manual classified counts at over 40 locations in 2016
- Automatic traffic counts at 30 locations in 2016
- Journey time surveys on 8 routes in 2016
- Automatic traffic counts at 20 locations in 2018

3.3.13. The collection and processing of this data is detailed in the Data Collection Report⁷¹ and Traffic Data Collection Report Addendum⁷².

⁷¹ Great Yarmouth Third River Crossing Data Collection Report OBC Supporting Document 3 <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁷² Great Yarmouth Third River Traffic Data Collection Report Addendum DCO Document 7.2a Transport Assessment Appendix A <https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application>

JUNCTION MODELLING

- 3.3.14. In order to represent the effects of traffic delay and queues at junctions, junction operation has been modelled in detail within the study (simulation) area.

MATRIX DEVELOPMENT

- 3.3.15. Base year trip matrices were developed for 2018. Three time periods were modelled in order to replicate trip patterns over a typical weekday:

- AM Peak hour (08:00 – 09:00)
- PM Peak hour (16:30 – 17:30)
- Average Inter-Peak hour (10:00 – 15:30)

- 3.3.16. Five user classes have been modelled:

- Cars – employer business
- Cars – commute
- Cars – other
- Light Goods Vehicles
- Heavy Goods Vehicles (OGV1, OGV2 and Coaches)

- 3.3.17. The development of the base year (2016) traffic model and its validation against observed traffic flows and journey times is fully documented in the LMVR⁷³.

FORECASTING

- 3.3.18. The modelled assessment years are:

- Base Year (2018)
- Opening Year (2023)
- Design Year (2038)
- Horizon Year (2051)

- 3.3.19. The forecasting process comprised the following stages:

- define future year travel scenarios
- define future year intervention strategies
- undertake fixed matrix DM and DS forecasting
- undertake variable matrix DM and DS forecasting
- report model outputs

⁷³ Great Yarmouth Third River Crossing Local Model Validation Report (SATURN) OBC Supporting Document 5
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

- 3.3.20. The future year travel scenarios include the planned developments described in the Strategic Case, and other individual developments. The Forecasting Report⁷⁴ includes the 'uncertainty log' detailing these developments and describes the development of the future year trip matrices.
- 3.3.21. In accordance with DfT TAG Unit M4 (May 2019), three growth scenarios were considered:
- Core
 - Low demand
 - High demand
- 3.3.22. The following future networks were developed:
- Do Minimum (DM) – validated 2018 network plus committed do-minimum Schemes
 - Do something (DS) – DM network plus the proposed Scheme
- 3.3.23. The variable demand modelling (VDM) allows demand model matrices to change in response to changes in travel cost as predicted by the highway supply model. VDM has only been applied to car trips. The process is described in the Variable Demand Model Report (Supporting document 7).

3.4 OVERVIEW OF ECONOMIC APPRAISAL METHODOLOGY AND ASSUMPTIONS

- 3.4.1. The economic assessment of the Scheme has been undertaken in accordance with current DfT TAG guidance, including:
- TAG Unit A1 cost-benefit analysis
 - TAG Unit A2 economic impacts
 - TAG Unit A4 social and distributional impacts
 - TAG Unit A5.1 active mode appraisal
- 3.4.2. The methodology is illustrated in Figure 3-5.

⁷⁴ Great Yarmouth Third River Crossing Forecasting Report (SATURN) DCO Document 7.6 Economic Appraisal Report Appendix B
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application>

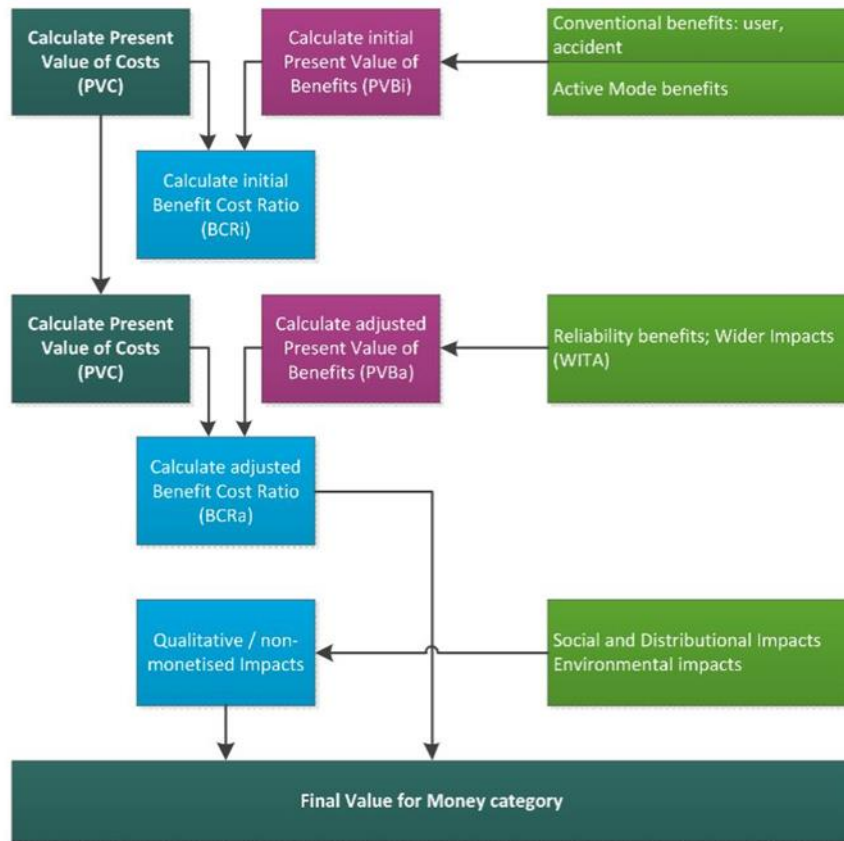


Figure 3-5 Calculation of BCR and VfM Score – Methodology

3.4.3. The basic steps are summarised below:

- The present value of cost (PVC) is calculated using the discounted **whole life costs** of the Scheme.
- TUBA (Transport User Benefit Analysis) is used to calculate the **user benefits** from time and vehicle operating cost savings, and reductions in greenhouse gas emissions.
- COBA-LT (Cost and Benefit to Accidents – Light Touch) is used to assess benefits arising from savings in **accidents**.
- The Active Mode Appraisal Toolkit (AMAT) is used to determine the economic benefits of increases in **active travel**.
- Environmental modelling is undertaken to assess economic benefits due to changes in **noise** and **air quality**.
- An **initial benefit-cost ratio (BCR)** is calculated.
- Other monetised 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**.
- Other impacts which are not capable of being fully monetised – social, distributional and environmental impacts – are then assessed qualitatively. 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.

3.4.4. The use of the SATURN model to support economic appraisal is described in the following reports, which are provided as Supporting documents to the FBC.

Title	Reference
Economic Appraisal Report (EAR)	Supporting Document 1
Active Mode Appraisal Report	Supporting Document 2
Social and Distributional Impact Report	Supporting Document 3
Regeneration and Wider Impacts Report	<p>Great Yarmouth Third River Crossing Regeneration and Wider Impacts Report OBC Supporting Document 11</p> <p>https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p>
Environmental Options Assessment Report and worksheets	<p>Great Yarmouth Third River Crossing Environmental Options Assessment Report OBC Supporting Document 12</p> <p>https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> <p>Worksheets: FBC Appendix C</p>

Table 3-3 Economic Appraisal Reports

3.5 COSTS

- 3.5.1. The costs presented in this section include the cost for construction which has been developed from the Contractors total of the Prices for Stage 2.
- 3.5.2. Costs have been estimated under three broad headings:
- Investment costs (Scheme preparation and construction)
 - Operating costs
 - Maintenance and renewal cost

SCHEME PREPARATION AND CONSTRUCTION COST

- 3.5.3. The risk adjusted Scheme preparation costs have been estimated following the principles set out in DfT TAG Unit A1.2 (July 2017).
- 3.5.4. The forecast out-turn capital cost for the Scheme is £121,164,461. This equates to **£119,473,850** at 2020 Q2 prices, with costs up to and including 2019-20 at actual prices. Further details are set out in Chapter 4 The Financial Case. The costs include an adjustment for quantified risk (QRA).

OPERATING COST

- 3.5.5. The operating cost for 24/7 operation of the bridge has been calculated at a 2016 Q3 price base, amounting to a total cost of **£6,048,857** over a 60-year appraisal period.

MAINTENANCE AND RENEWAL COSTS

3.5.6. The estimated costs of maintenance and renewal of the bridge and the road sections leading to the bridge, expressed as total cost over a 60-year appraisal period, are:

- Bridge: **£5,565,406** at 2016 Q3 prices
- Roads: **£3,933,648** at 2016 Q3 prices

OPTIMISM BIAS

3.5.7. In line with the guidance in DfT TAG Unit A1.2 (July 2017), an adjustment for optimism bias has been applied to all costs in the economic assessment⁷⁵.

3.5.8. The allowance is designed to compensate for the systematic tendency for appraisers to be overly optimistic about key parameters. The Green Book (HMT, 2003) suggests that appraisers should make explicit, empirically-based adjustments to the estimates of costs, and DfT TAG provides recommended adjustment factors based on the project category and stage of development.

Project Category

3.5.9. The relevant project types identified in guidance are:

- Fixed link (bridges and tunnels)
- Roads (motorways, trunk and local roads, cycle and pedestrian facilities etc.)

3.5.10. The Scheme comprises a bascule bridge and the approach roads (with cycle and pedestrian facilities) connecting the bridge to the local highway network.

3.5.11. Examination of the cost estimates shows that the proportion of total Scheme cost attributable to each part of the Scheme is:

- Bascule bridge 66% of total Scheme cost
- Roads 34% of total Scheme cost

3.5.12. These proportions (66:34) were used to calculate the overall allowance for optimism bias.

Stage of Development

3.5.13. As a project develops, the Scheme cost estimate is expected to be refined, based on better-quality data. As project-specific risks become better understood, quantified and valued, the factors that contribute to optimism bias are better captured within the risk management process. Therefore, as risk analysis improves it is expected that the risk-adjusted Scheme cost estimate will become more certain, whilst the applicable level of optimism bias will decrease.

3.5.14. DfT TAG Unit A1.2 (July 2017) states clearly that the allowance for optimism bias should be largest at the initial stage of the life of a transport project (Strategic Outline Business Case), should decrease in a more detailed business case (Outline Business Case), and be smallest in the presence of a fully detailed business case (Full Business Case).

⁷⁵ 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 Case.

3.5.15. The recommended optimism bias uplifts for each stage of a transport project are set out in Table 3-4.

Stage Category	Stage 1 “Programme entry”	Stage 2 “Conditional approval”	Stage 3 “Full approval”
Fixed link (bridge)	66*	23%	6%
Road	44%	15%	3%
Weighted average (66:34)	59%	20%	5%

Table 3-4 Recommended Option Bias Uplifts

3.5.16. The guidance in DfT TAG Unit A1.2 (July 2017) does not give an exact equivalence between the above stages and the three levels of business case approval. However, the DfT guidance “*The Transport Business Cases*” identifies three phases of Scheme development as illustrated below:



Figure 3-6 Stages of Business Case Development (Source DfT)

3.5.17. This document is the Full Business Case and following its submission an investment committee will make a recommendation to ministers.

3.5.18. For the preparation of this full business case:

- The final detailed design for the bridge and highways elements of the Scheme have been completed.
- A detailed estimate of costs has been prepared, as set out in Appendix D (Detailed Cost Breakdown). The construction cost estimate has been produced by the design and build contractor. The costs incurred to date are also included.
- A full quantified risk assessment (QRA) has been undertaken, including a risk identification workshop and statistical calculations of volume and cost risks for individual project components, as summarised in the Financial Case and detailed in Appendix E.

3.5.19. The total quantified risk has been assessed at **£17,545,225,731** at 2020 Q2 prices, which adds **17%** to the base cost of the Scheme. The quantified risk is based on the most likely risk method of risk assessment.

Determining an Appropriate Allowance for Optimism Bias

3.5.20. This robust approach to Scheme design, cost estimation and quantified risk assessment gives a high degree of confidence in the risk-adjusted cost estimates and for this reason the allowances for

optimism have been reduced to the Stage 3 levels: **6%** for the fixed link and **3%** for the road elements. For simplicity, a weighted average has been calculated, based on the proportions of bridge and road costs (66:34) giving an overall optimism bias allowance of **5%**.

- 3.5.21. This approach is supported by advice in DfT guidance “Procedures for dealing with Optimism Bias in Transport Planning” (June 2004) which, whilst urging caution, states that:

“Individual projects may exist where the claims to improved risk mitigation are so strong that a downward adjustment to uplifts is warranted in order to avoid double counting. This may be the case if advanced risk analysis (e.g. risk identification workshop and statistical calculations of volume and cost risks for individual project components) has been applied and their results adequately reflected in the established budget.”

- 3.5.22. For the economic assessment an overall allowance for optimism bias of 5% has therefore been applied to the total risk-adjusted costs.

SUNK COSTS

- 3.5.23. In accordance with DfT TAG Unit A1.2 July 2017, only the cost that will be incurred after the time of economic appraisal and decision to go ahead with the scheme should be considered. Therefore, the costs incurred for 2017/18, 2018/19 and 2019/20 are removed from the economic appraisal process. Sunk costs amount to **£16,954,671**.

PRESENT VALUE OF COSTS

- 3.5.24. Finally, the costs are projected over the whole life of the Scheme (assumed to be 60 years) and discounted to a 2010 base year at an annual rate of 3.5% for the first 30 years after opening and 3% for years 31 to 60. Discounting represents the assumption that costs (and benefits) incurred at a future date are less valuable now than those incurred earlier. All costs and benefits in the Economic Case are expressed at 2010 prices, discounted to 2010.

£ ,000	Risk Adjusted Scheme Preparation and Construction Cost	Maintenance, Renewal and Operation (60 yrs)	Total
Estimated cost at current prices with removal of sunk costs (2020 Q2 for Scheme, 2016 Q3 for maintenance and operation)	104,124	15,548	N/A
Cost at 2010 prices, including inflation, discounted to 2010 with market price adjustment.	71,043	4,172	75,215
Optimism bias (5%)	3,538	0	3,538
Present Value of Costs (PVC)	74,581	4,172	78,753

Table 3-5 Present Value of Costs

- 3.5.25. Further detail on the costs are set out within Supporting Document 6 (Scheme Costs Technical Note).
- 3.5.26. The total discounted Present Value of Costs (PVC) is **£78.753 million** (2010 prices, discounted to 2010).

PUBLIC ACCOUNTS TABLE

- 3.5.27. The full Public Accounts (PA) Table in the format required by DfT is set out in Appendix F. The apportionment of costs between local and central government is discussed in the Financial Case.

3.6 BENEFITS

- 3.6.1. The expected economic impacts of the Scheme have been established through various transport studies, following methods set out in the Department's modelling and appraisal guidance (as set out within TAG).
- 3.6.2. The benefits assessed are:
- Transport Economic Efficiency (user benefits)
 - Safety benefits
 - Physical Activity (Active Modes) benefits
 - Environmental benefits (noise, air quality and greenhouse gases)
 - Wider public finances (indirect taxation revenues)
- 3.6.3. The assessment assumes that the opening year for the Scheme will be 2023 with an appraisal period spanning 60 years from opening. The choice of appraisal period is informed by HM Treasury's Green Book and DfT TAG which stipulates a 60-year appraisal for projects that are deemed to have an "indefinite life", including some major infrastructure Schemes such as tunnels and bridges.
- 3.6.4. Annualisation factors for the three modelled time periods were based on values obtained from local traffic survey data, and are discussed in more detail in the TUBA Methodology Technical Note (Supporting Document 5) and in the Economic Appraisal Report (Supporting Document 1).

TRANSPORT ECONOMIC EFFICIENCY

- 3.6.5. The Transport Economic Efficiency (TEE) benefits are derived from travel time and vehicle operating cost benefits as a result of the Scheme.
- 3.6.6. TEE benefits for the Scheme were assessed using the DfT's Transport Users Benefit Appraisal (TUBA) software. TUBA calculates the benefits associated with journey time savings and vehicle operating cost savings using information taken from the traffic model, in accordance with the procedures and economic parameters in DfT TAG Unit A1. The standard TUBA 1.9.13 economics file was used. The TUBA methodology is described in more detail in Supporting Document 5.
- 3.6.7. The TEE benefits were assessed for a 60-year period (2023 to 2082) with an opening year of 2023, a design year of 2038 and a horizon year of 2051.
- 3.6.8. The full Transport Economic Efficiency (TEE) Table is included in Appendix G in the format required by DfT and summarised in Table 3-6.

Transport Economic Efficiency (TEE) Benefits	Transport Economic Efficiency (TEE) Benefits	£,000s 2010 prices discounted to 2010
Consumer – commuting user benefits	Travel Time	41,191
Consumer – commuting user benefits	Vehicle operating costs	934
Consumer – commuting user benefits	Subtotal	42,125
Consumer – other user benefits	Travel Time	88,640
Consumer – other user benefits	Vehicle operating costs	7,175
Consumer – other user benefits	Subtotal	95,815
Business benefits	Travel Time	64,337
Business benefits	Vehicle operating costs	12,876
Business benefits	Subtotal	77,213
Total TEE benefit		215,153

Table 3-6 Transport User Benefits

3.6.9. The benefits by time period are summarised in Table 3-7.

Time Period	PV Benefits £,000
AM Peak	35,773
PM Peak	66,896
Inter Peak	85,177
Off Peak	-
Weekend	21,561

Table 3-7 TUBA Benefits by Time Period

SAFETY BENEFITS

- 3.6.10. The assessment of safety benefits and costs was undertaken using COBA-LT Cost Benefit Analysis Light Touch), the DfT's cost-benefit analysis software for accident savings, in line with the guidance set out in DfT TAG Unit A4.1.
- 3.6.11. Accident data was obtained for Great Yarmouth for the six-year period between 2010 and 2015. All junctions where at least one Personal Injury Accident (PIA) was recorded in the period were included. Default accident rates were used across the COBA-LT network.
- 3.6.12. The safety benefits were assessed for a 60-year period (2023 to 2082) with an opening year of 2023, a design year of 2038 and a horizon year of 2051.

- 3.6.13. The latest COBA-LT economic parameter file (included in the Economic Appraisal Report, Supporting Document 1) was used to calculate accident impacts in line with DfT TAG guidance. The data tables provide the inputs required to calculate accident and casualty numbers and costs for each year of the appraisal period.
- 3.6.14. COBA-LT uses “Do Minimum” and “Do Something” outputs from the SATURN traffic model to forecast changes in the number of accidents as a result of the Scheme, using details of link and junction characteristics, relevant accident rates and costs and forecast traffic volumes by link.
- 3.6.15. Separate links and junctions were assessed. As COBA-LT does not accept links with a 20mph speed limit, a speed of 30mph was assigned to any links in both the Do Minimum and Do Something networks which were below this threshold.
- 3.6.16. The COBA-LT analysis indicates that 20 accidents will be saved by 2082 as a result of the Scheme, as shown in Table 3-8:

Accidents in 60 Years	Accidents in 60 Years	Accidents in 60 Years
Do Minimum	Do Something	Reduction in Accidents
5,174	5,154	20

Table 3-8 Accident Savings over 60 Years

- 3.6.17. COBA-LT also provides a summary of the number of casualties saved as a result of the Scheme, as shown in Table 3-9:

Casualty Reduction over 60 Years	Do Minimum	Do Something	Reduction in Casualties
Slight	30	30	0
Serious	437	436	1
Fatal	6,770	6,717	53
Total	7,237	7,183	54

Table 3-9 Casualty Reduction in 60 Years

- 3.6.18. The economic value of the accident savings is set out in Table 3-10.

Accident Savings over 60 Years	Do Minimum Cost	Do Something Cost	Accident Savings
Accident costs (£,000)	187,885	186,938	947

Table 3-10 Casualty Reduction in 60 Years

- 3.6.19. Overall, the Great Yarmouth Third River Crossing is expected to generate accident benefits with a present value of **£0.95 million** (2010 prices, discounted to 2010).

ACTIVE MODES BENEFITS

- 3.6.20. As a result of the Scheme pedestrians and cyclists will have better access to the Great Yarmouth peninsula and a more pleasant environment. Dedicated facilities on the new bridge will improve journey quality and make encourage more people to walk or cycle. These impacts are expected to produce economic benefits due to:
- Increased physical activity leading to lower healthcare costs
 - Less absenteeism and fewer working days lost
 - The value placed on improved journey quality and ambience
 - Time savings for cyclists and pedestrians
- 3.6.21. To quantify these benefits, an active mode appraisal has been conducted over a 30-year appraisal period, in line with DfT TAG guidance. 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 2020, a discount rate of 3.50% per year has been applied until 2050, with a rate of 3.00% thereafter. Again, in line with TAG, the values have included real growth in line with forecast GDP/capita.
- 3.6.22. A full report on the calculation of active modes benefits is contained in the Active Mode Appraisal Report (Supporting Document 2).
- 3.6.23. The present value of benefits for each active mode impact are summarised in Table 3-11 .

Impact	Pedestrian £,000	Cycle User £,000	Total £,000
Physical Activity (Health)	2,698	2,662	5,361
Absenteeism	849	609	1,459
Journey Quality/Ambience	984	788	1,772
Journey Time	3,489	226	3,715
Total	8,021	4,286	12,307

Table 3-11 Present Value of Active Mode Impacts over 30-Year Appraisal Period (2010 Prices and Value)

- 3.6.24. It is calculated that the present value of the active modes benefits for the Great Yarmouth Third River Crossing over a 30-year assessment period is **£12.307 million** (2010 prices discounted to 2010).

ENVIRONMENTAL BENEFITS

Noise

- 3.6.25. The noise impact of the Scheme has been calculated in accordance with DfT TAG Unit A3 May 2019. The impact was assessed for annoyance, sleep disturbance and health impacts.
- 3.6.26. The net present value in change in noise is **-£1.408 million** (2010 prices discounted to 2010).

3.6.27. Further details are given in Economic Appraisal Report (Supporting Document 1) and the TAG Noise Workbook is included in Appendix C Appraisal Summary Table.

Air Quality

3.6.28. The air quality impact of the Scheme has been calculated in accordance with DfT TAG Unit A3 May 2019. The impact was assessed for Nitrogen Dioxide (NO₂) and Particulate Matter (PM_{2.5}).

3.6.29. The net present value in change in air quality is **-£0.386 million** (2010 prices discounted to 2010).

Greenhouse Gases

3.6.30. Emissions of greenhouse gases are dependent on traffic composition, speed and flow, which is determined by the traffic model. An economic value can be assigned to reductions in greenhouse gases. The reduction in greenhouse gases as a result of the Scheme, and the resulting economic benefit is calculated directly by TUBA.

3.6.31. The present value of benefits associated with greenhouse gas reductions for the Great Yarmouth Third River Crossing over a 60-year assessment period is **£2.951 million** (2010 prices discounted to 2010).

3.7 INITIAL BENEFIT-COST RATIO (BCR)

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

3.7.2. According to DfT Value for Money Framework (2015), 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
- Very High VfM if the BCR is greater than 4.0

3.7.3. Based on the AMCB (Appendix H), the total monetised benefits exceed the costs by **£145 million** (2010 prices discounted to 2010). The initial BCR of the Scheme is **2.8**. This means that the initial value for money category is **high**.

3.7.4. The initial value of BCR includes monetised benefits of accident savings, greenhouse gas reductions) 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 £,000
Noise	-1,408
Local Air Quality	-386
Greenhouse Gases	2,951
Physical Activity (Active Mode Appraisal)	12,307

Analysis of Monetised Costs and Benefits (Initial BCR)	2010 Prices Discounted to 2010 £,000
Accidents	947
Economic Efficiency: Consumer Users (Commuting)	42,125
Economic Efficiency: Consumer Users (Other)	95,815
Economic Efficiency: Business Users and Providers	77,213
Wider Public Finances (Indirect Taxation Revenues)	-5,747
Present Value of Benefits (PVB)	223,817
Cost to Broad Transport Budget	
Investment cost	74,581
Operating costs	4,172
Present Value of Costs (PVC)	78,753
Net Present Value (NPV)	145,064
Initial BCR	2.8

Table 3-12 Analysis of Monetised Costs and Benefits (AMCB)

3.8 ADDITIONAL BENEFITS

- 3.8.1. Given an initial BCR of more than 2.0, it is not necessary to demonstrate further economic benefits from a formal assessment of reliability or wider economic impacts. However, as improved reliability and benefits to the local economy are important objectives of the Scheme, these impacts have been considered and used to produce an adjusted BCR.

RELIABILITY BENEFITS

- 3.8.2. Reliability has been assessed in line with DfT TAG Unit A1.3, Section 6 (May 2019) using relationships based on calculation of the standard deviation of journey times from journey time and distance for each O-D (origin-destination) pair.
- 3.8.3. A full report on the calculation of reliability benefits is included in the Economic Appraisal Report (Supporting document 1).
- 3.8.4. It is calculated that the present value of the reliability benefits for the Great Yarmouth Third River Crossing over the 60-year assessment period is **£11.292 million** (2010 prices discounted to 2010).

WIDER ECONOMIC IMPACTS

- 3.8.5. Wider impacts, as defined in DfT guidance, are the economic impacts of transport that are additional to transport user benefits. In perfectly competitive markets, these impacts would be fully captured by a properly specified appraisal. But in practice, most markets are not perfectly competitive and as a

result, wider impacts may result as direct user impacts are amplified through the economy. It has been demonstrated that these impacts can be large and can therefore be an important part of the overall appraisal of a transport Scheme.

3.8.6. The types of wider impacts that need to be considered are:

- WI1 – Agglomeration
- WI2 – Output change in perfectly competitive markets
- WI3 – Tax revenues arising from labour market impacts
(from labour supply impacts and from moves to more or less productive jobs)

3.8.7. The Wider Impacts for the Scheme have been calculated using WSP’s Wider Impacts in Transport Appraisal (WITA) emulation tool. The emulation tool, a macro-embedded spreadsheet that applies the methodology set out in DfT TAG Unit A2.1 (May 2018) has previously been accepted for use by HE, Transport for the North and the DfT for appraisal of wider impact benefits for the Trans-Pennine Tunnel and the M60 North West Quadrant. The WITA tool assesses all three types of Wider Impacts discussed above.

3.8.8. On this basis, it is calculated that the present value of these wider benefits for the Great Yarmouth Third River Crossing over the 60-year assessment period is **£68.338 million** (2010 prices discounted to 2010). A full report on the calculation of wider benefits is included in the Economic Appraisal Report (Supporting document 1).

3.8.9. In order to validate these assumptions, the likely impact of regeneration in Great Yarmouth has been reported by consultant Regeneris in the Regeneration and Wider Impacts Report⁷⁶. Their 2017 assessment of benefits and impacts is largely qualitative, but quantification is also outlined with the focus of the assessment being on the impacts on employment land and existing sites and premises, as well as on town centre regeneration and the visitor economy. There is also a commentary on demographic change and the how increased investment and development activity in Great Yarmouth will lead to requirements for, and supply of, a skilled labour market.

3.8.10. The non-monetised impacts on regeneration are discussed further in section 3.10 below.

3.9 ADJUSTED BENEFIT COST RATIO (BCR)

3.9.1. The adjusted BCR has been calculated as set out below:

Adjusted BCR	(2010 prices discounted to 2010) £,000
Initial Present Value of Benefits (PVB)	223,817
Wider Impacts – Reliability	11,292
Wider Impacts - Economic	68,338

⁷⁶ Great Yarmouth Third River Crossing Regeneration and Wider Impacts Report OBC Supporting Document 11

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

Adjusted BCR	(2010 prices discounted to 2010) £,000
Adjusted Present Value of Benefits (PVB)	303,448
Cost to Broad Transport Budget	
Investment Cost	74,581
Operating Costs	4,172
Present Value of Costs (PVC)	78,753
Net Present Value (NPV)	224,695
Adjusted BCR	3.9

Table 3-13 Adjusted BCR Calculation

3.9.2. Following this adjustment, the BCR increases to **3.9** and is within the **high** value for money category.

3.10 NON-MONETISED IMPACTS

3.10.1. Where impacts cannot be monetised, they are assessed in qualitative terms and, where appropriate, quantified.

ENVIRONMENTAL IMPACTS

3.10.2. This section summarises the expected impacts of the proposed Scheme on the environment. The assessed environmental impacts are:

- Noise
- Air quality
- Greenhouse gases
- Townscape
- Historic environment
- Biodiversity
- Water environment

3.10.3. Noise, Air Quality and Greenhouse gas emissions benefits have been monetised and included in the BCR calculation. The impact of the remaining impacts is summarised below.

Townscape – Slight Adverse

3.10.4. The Scheme would be visible as a localised feature in the townscape of the port area particularly along the waterfront of the River Yare, but with neutral effects on the historic core of Great Yarmouth to the north. There would be a localised change to the gridiron pattern of streets and the scale of the Scheme would be slightly larger than features currently present in the locality, but not out of proportion.

Historic Environment – Moderate Adverse

- 3.10.5. There are 124 designated heritage assets within 1km of the Scheme, and 135 non-designated assets within 500m of the Scheme. 15 non-designated heritage assets located within the Scheme will be impacted (neutral to slight adverse). There is also a potential for currently unknown below ground heritage assets and paleoenvironmental remains to be impacted (neutral to moderate adverse). The setting of designated and non-designated heritage located outside of the Scheme will also be impacted (slight adverse to moderate adverse).

Biodiversity – Neutral

- 3.10.6. The Scheme has the potential to impact bats, birds, water vole and benthic species prior to mitigation measures. With the agreed mitigation measures in place the overall impact is assessed as neutral.

Water Environment – Slight Adverse (Surface Water), Slight Adverse/Neutral (Groundwater)

- 3.10.7. Surface Water: The Scheme may have some localised impacts on water quality through contaminated discharges, accidental spillage or disturbance of contaminated sediments, but is assessed to have only negligible impact on specific features. The loss of standing water within the MIND Centre and Grounds is assessed to have a large impact on the recreation value, and to some extent the biodiversity value, at the site. However, in the context of the wider catchment the ponds are not significant. The Scheme has variable impacts on flooding from the River Yare, with some receptors seeing benefit and others adverse impacts. The design of culverts for local drains will be based on a risk assessment, therefore significant changes in flood risk from local drains is unlikely.
- 3.10.8. Groundwater: The Principal Application Site directly overlays, and will therefore directly interact with, superficial deposits hosting Secondary A aquifers. These deposits are directly underlain by the Crag Group Principal Aquifer which offers strategic water supplies to local abstractors and is considered to be in hydraulic continuity with the overlying superficial deposits. Groundwater modelling undertaken to quantify the impacts to the principal aquifer and local water users identified a slight magnitude of impact. Groundwater water quality identified no change due to existing saline groundwater already present. With mitigation measures in place the overall impact to groundwater receptors will be slight / neutral.
- 3.10.9. Further details are provided in the individual category TAG worksheets which are included in Appendix C.

REGENERATION IMPACTS

- 3.10.10. Regeneration benefits (as defined by DfT) are not included in the calculation of the adjusted BCR and are reported here as qualitative benefits as part of the Strategic Case. This is because there is no “dependent development” associated with the Scheme, and therefore no calculable land value uplift (planning gain) that is directly attributable. It is likely that the regeneration benefits form a component of potential Level 3 “dynamic clustering” impacts, although the levels of assurance around such benefits are necessarily lower than those lodged under Level 1 (transport economic) and Level 3 (wider impact) benefits. Hence the exclusion of monetised regeneration impacts is considered a conservative approach to the calculation of Scheme benefits.

- 3.10.11. The likely “dynamic” impact of regeneration and wider impacts in Great Yarmouth has been reported by consultant Regeneris in “Assessment of Wider Economic and Regeneration Benefits”⁷⁷, 2017. Their appraisal of benefits and impacts is largely qualitative, but quantification is also outlined with the focus of the appraisal being on the impacts on employment land and existing sites and premises, as well as on town centre regeneration and the visitor economy. There is also a commentary on demographic change and how increased investment and development activity in Great Yarmouth will lead to requirements for, and supply of, a skilled labour market.
- 3.10.12. The analysis represents additional gain to the Great Yarmouth economy based on changes to land use, primarily earlier realisation of development sites related to the availability of the Third River Crossing. This is discussed further in the Strategic Case. The quantified outputs are not included in this report.

3.11 SOCIAL AND DISTRIBUTIONAL IMPACT ANALYSIS

Social and Distributional Impact analysis has been undertaken, as set out in DfT TAG Units A4.1 (May 2020) and A4.2 (May 2020). The indicators and their respective assessments are included in the Social and Distributional Impact Report (Supporting Document 3) and are summarised as follows:

User Benefits – Large Beneficial

- 3.11.1. Around 88% of the benefits of the Scheme are experienced by the population within the impact area. Further to this, approximately 61% of the benefits within the impact area are accrued by people within the lowest 20% of the IMD income domain. No overall disbenefits were observed for any quintile.

Noise – Large Beneficial

- 3.11.2. The noise impact analysis showed an increase in noise on roads immediately surrounding the Scheme, with a decrease in noise in the mostly residential areas east and west the Haven Bridge. The majority of LSOAs assessed (18 out of 22) are in the most deprived quintile (0-20%). The net benefits for this quintile are greater than the share of households, therefore the assessment score is Large Beneficial.

Air Quality – Moderate Adverse

- 3.11.3. The air quality analysis shows that no exceedances of the Air Quality Strategy objectives for Nitrogen Dioxide (NO₂) or Particulate Matter 2.5 (PM_{2.5}) are predicted at any considered receptors for each of the modelled scenarios. Adverse impacts are predicted for the lowest three quintiles and benefits for the highest quintile. The majority of LSOAs, 15, are in the most deprived quintile (0-20%), and this accounts for 86% of the population. The impact in this quintile is Moderate Adverse for NO₂ and PM_{2.5}.

⁷⁷ Great Yarmouth Third River Crossing Regeneration and Wider Impacts Report OBC Supporting Document 11

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

Accidents – Slight Adverse

- 3.11.4. Analysis of the accidents data demonstrates that there are slightly more links and junctions within the impact area that are forecast to experience an increase in accidents than are forecast to decrease. These links also have higher a number of casualties from vulnerable users and groups.

Severance – Slight Beneficial

- 3.11.5. The provision of a new crossing between two previously poorly connected parts of Great Yarmouth will have a significant positive impact on community severance by offering an alternative central crossing, providing access to the town centre and other key amenities and facilities.

Personal Affordability – Large Beneficial

- 3.11.6. The two lowest income groups (<20% and 20%-40% IMD Income Domain) experience the largest share of the benefits, 62% and 13% respectively. No disbenefits were observed across any income groups.
- 3.11.7. Security and Accessibility indicators were considered to be out of scope during the screening process.

3.12 SENSITIVITY TESTING

- 3.12.1. In order to understand how sensitive, the benefits described above are to a range of alternative parameters, a number of tests have been performed.

- Alternative growth scenarios as prescribed by DfT TAG Unit M4 (May 2019)
- Alternative economic growth projections
- Alternative carbon valuation

- 3.12.2. The results of these tests are summarised below and set out in more detail in the Economic Appraisal Report (Supporting Document 1).

ALTERNATIVE GROWTH SCENARIOS SENSITIVITY TEST

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

Benefits	Benefits	Low Growth	Core	High Growth
Environmental modelling	Noise	-1,408	-1,408	-1,408
Environmental modelling	Air Quality	-386	-386	-386
TUBA	Consumer – commuting user benefits	29,597	42,125	55,666
TUBA	Consumer – other user benefits	67,557	95,815	132,940
TUBA	Business benefits	56,452	77,213	104,043
TUBA	Indirect Tax Revenue	-4,785	-5,747	-6,798
TUBA	Greenhouse Gases	2,400	2,951	3,533

Benefits	Benefits	Low Growth	Core	High Growth
COBA-LT	Accident benefits	3,006	947	-2,150
Active Mode Appraisal	Active Mode Appraisal	8,688	12,307	15,919
Total TEE benefit	Total TEE benefit	161,121	223,817	301,359
Initial BCR	Initial BCR	2.0	2.8	3.8
Additional Benefits	Reliability Benefits	6,228	11,292	18,317
Additional Benefits	Wider Impacts	57,250	68,338	78,918
Total Benefits	Total Benefits	224,600	303,448	398,595
Adjusted BCR	Adjusted BCR	2.9	3.9	5.1
VfM	VfM	High	High	Very High

Table 3-14 High, Core and Low Growth Scenario TUBA Benefits Sensitivity Tests (£0,000s, 2010 prices, discounted to 2010)

- 3.12.4. Note that monetisation of Noise and Air Quality has not been carried out for low or high growth scenario. The proportion of total benefits due to these impacts is low (-0.8% of TEE benefits for core scenario) and as such monetisation for low and high growth scenarios was not deemed to be proportionate. As such the Noise and Air Quality benefits for the core growth are applied to the low and high growth scenario.
- 3.12.5. Although the alternative growth scenarios (low and high) have a significant impact on the total benefits forecast, these remain well above the costs even for the low growth forecast, indicating that the value for money is very robust.

ALTERNATIVE ECONOMIC GROWTH PROJECTIONS

- 3.12.6. At the time of preparing this Business Case, the global coronavirus (COVID-19) pandemic is affecting every aspect of life in the UK. Traffic levels fell in the Spring of 2020, and it is not known when, or indeed whether, they will return to the levels they were before the pandemic. Patterns of economic activity, travel to work and mode choice have changed, and may have been affected for the long term. An economic recession is anticipated, but its severity and duration cannot be predicted.
- 3.12.7. As part of the Spring Budget of 2020, the Office for Budgetary Responsibility (OBR) published a revised economic and fiscal outlook and associated forecasts of the UK economy in the long-term. On 14th July, OBR published the 2020 Fiscal Sustainability Report, updating medium-term growth forecasts to 2024 to take into account COVID-19 impacts.
- 3.12.8. As such, a sensitivity test has been undertaken to establish the impact that changes to long-term economic projections due to COVID-19 would have on the benefits of the Scheme. This has been undertaken using a sensitivity test versions of TUBA, COBA-LT and WITA dataset that account for the updated growth projections.

Benefits	Benefits	Core	Alternative Economic Growth
Environmental Modelling	Noise	-1,408	1,408
Environmental Modelling	Air Quality	-386	-386
TUBA	Consumer – commuting user benefits	42,125	35,382
TUBA	Consumer – other user benefits	95,815	80,892
TUBA	Business benefits	77,213	66,380
TUBA	Indirect Tax Revenue	-5,747	-5,531
TUBA	Greenhouse Gases	2,951	2,785
COBA-LT	Accident benefits	947	969
Active Mode Appraisal	Active Mode Appraisal	12,307	12,307
Total TEE benefit	Total TEE benefit	223,817	191,390
Initial BCR	Initial BCR	2.8	2.4
Additional benefits	Reliability Benefits	11,292	11,292
Additional benefits	Wider Impacts	68,338	58,497
Total benefits	Total benefits	303,448	261,179
BCR	BCR	3.9	3.3
VfM	VfM	High	High

Table 3-15 Core and Alternative Economic Growth TUBA Benefits Sensitivity Tests (£0,000s, 2010 prices, discounted to 2010)

3.12.9. The use of alternative economic projections results in a reduction of the initial BCR from 2.8 to 2.4, and in the adjusted BCR from 3.9 to 3.3. The benefits calculated by TUBA and WITA both reduce by around 15%. Accident benefits calculated by COBA-LT are slightly higher under the alternative economic projections.

3.12.10. The value for money category of the Scheme remains High.

ALTERNATIVE CARBON VALUATION

3.12.11. Where the carbon impacts of a proposed Scheme are monetised using published carbon values, a high carbon values sensitivity test is now required. This requirement reflects recent changes in the UK's domestic and international targets for reducing GHG emissions as well as an ongoing cross-government review of carbon valuation.

3.12.12. The sensitivity test is conducted by extracting the high value carbon from the TUBA output and noting how that affects the overall Scheme Value for Money. The core and other sensitivity tests use the central valuation of carbon.

Benefits	Benefits	Core	Core with High Carbon
Environmental Modelling	Noise	-1,408	1,408
Environmental Modelling	Air Quality	-386	-386
TUBA	Consumer – commuting user benefits	42,125	42,125
TUBA	Consumer – other user benefits	95,815	95,815
TUBA	Business benefits	77,213	77,213
TUBA	Indirect Tax Revenue	-5,747	-5,747
TUBA	Greenhouse Gases	2,951	4,554
COBA-LT	Accident benefits	947	947
Active Mode Appraisal	Active Mode Appraisal	12,307	12,307
Total TEE benefit	Total TEE benefit	223,817	225,420
Initial BCR	Initial BCR	2.8	2.9
Additional benefits	Reliability Benefits	11,292	11,292
Additional benefits	Wider Impacts	68,338	68,338
Total benefits	Total benefits	303,448	305,051
BCR	BCR	3.9	3.9
VfM	VfM	High	High

Table 3-16 Core and Core with High Carbon Value TUBA Benefits Sensitivity Tests (£0,000s, 2010 prices, discounted to 2010)

3.12.13. The use of high value carbon in the assessment produces a slight increase in benefits as the Scheme reduces the amount of carbon emitted. This does not change the value for money of the Scheme.

3.13 APPRAISAL SUMMARY TABLE (AST)

3.13.1. The AST presents in a single table of 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 for the Scheme, in line with DfT TAG requirements, is included in Appendix C.

3.14 VALUE FOR MONEY STATEMENT

VALUE FOR MONEY CATEGORY

- 3.14.1. An analysis of the monetised benefits of the proposed Scheme demonstrates that it offers **high** value for money

PRESENT VALUE OF COSTS AND BENEFITS ASSESSED

- 3.14.2. The monetised costs and benefits assessed are set out in Table 3-17.

BENEFIT COST RATIO

- 3.14.3. The value for money category is based on the Benefit Cost Ratio (BCR). The initial BCR is **2.8**. Inclusion of reliability benefits and wider economic impacts gives an adjusted BCR of **3.9**.
- 3.14.4. 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 Great Yarmouth's economy.
- 3.14.5. The Scheme is expected to lead to a reduction in greenhouse gas emissions; these have been monetised and included in the BCR.

NON-MONETISED IMPACTS ASSESSED

- 3.14.6. The non-monetised impacts assessed were townscape, historic environment, biodiversity and water environment. The impact in biodiversity is neutral, on townscape and water environment it is slight adverse, and on historic environment it is moderate adverse.

Analysis of Monetised Costs and Benefits	£,000 (2010 Prices Discounted to 2010)
Noise	-1,408
Local Air Quality	-386
Greenhouse Gases	2,951
Physical Activity (Active Mode Appraisal)	12,711
Accidents	947
Economic Efficiency: Consumer Users (Commuting)	42,125
Economic Efficiency: Consumer Users (Other)	95,815
Economic Efficiency: Business Users and Providers	77,213
Wider Public Finances (Indirect Taxation Revenues)	-5,747
Present Value of Benefits (PVB)	223,817
Cost to Broad Transport Budget	

Analysis of Monetised Costs and Benefits	£,000 (2010 Prices Discounted to 2010)
Investment cost	74,581
Operating costs	4,172
Present Value of Costs (PVC)	78,753
Net Present Value of Costs (NPV)	145,064
Initial BCR	2.8
Reliability – business	1,497
Reliability – non-business	9,796
Wider impacts - Economic	68,338
Adjusted Present Value of Benefits (PVB)	303,448
Adjusted Net Present Value (NPV)	224,695
Adjusted BCR	3.9

Table 3-17 Present Value of Costs and Benefits Assessed

IDENTIFICATION OF RISKS, SENSITIVITIES AND UNCERTAINTIES

- 3.14.7. The risk register is set out in Appendix E. The financial impact of a range of risks has been considered in a Quantified Risk Assessment (QRA) and the costs included in the calculation of PVC have been adjusted for risk.
- 3.14.8. Sensitivity testing with a range of growth scenarios shows that the Scheme would still offer **high** value for money in a low growth scenario.
- 3.14.9. Sensitivity testing with alternative economic growth projections did not change the value for money category of the Scheme. The Scheme remained categorised as high value for money.
- 3.14.10. A final sensitivity test with high valuation of Carbon did not change the value for money category of the Scheme. The Scheme remained categorised as high value for money.

SOCIAL AND DISTRIBUTIONAL IMPACTS

- 3.14.11. Analysis of social and distributional impacts shows that areas of Great Yarmouth with lower average incomes will benefit most from the Scheme. There are benefits for user impacts, noise, severance and personal affordability. Community severance is greatly enhanced by offering an alternative crossing between two poorly connected parts of Great Yarmouth.
- 3.14.12. There are a slight predicted increase in accidents and a deterioration in air quality.

3.15 SUMMARY OF THE ECONOMIC CASE

- 3.15.1. The Scheme has been subjected to an economic appraisal in line with DfT TAG guidance. The economic case for the Scheme is strong. The value for money category is High based upon initial benefits only. The Scheme also has a positive environmental impact by reducing the amount of greenhouse gas emissions and is shown to provide large benefits to low income groups across Great Yarmouth.
- 3.15.2. Sensitivity testing with alternative economic growth projections **to account for the impact of COVID-19** did not change the value for money category of the Scheme. The Scheme remained categorised as high value for money.

4 THE FINANCIAL CASE

4.1 INTRODUCTION

4.1.1. The cost estimate for delivering the Great Yarmouth Third River Crossing is £121.164 million. The cost estimate includes, preparation costs since 2017/18, construction cost, supervision costs, land acquisition costs and an allowance for risk and inflation. This chapter updates the financial case for the Scheme and shows that the Scheme is affordable. It explains:

- How much the Scheme will cost, and how this has been calculated
- The risks that may affect the cost, and how they are being managed
- The anticipated profile of expenditure (whole life costs)
- How the Scheme will be paid for, and by whom
- The accounting implications for the Scheme funders

4.1.2. The Financial Case deals with cost and accounting issues.

4.2 COSTS – BASE COSTS

4.2.1. The estimated base cost of the Scheme at 2020 Q2 prices for 2020-2024 costs and actual prices for 2017-2020 excluding future inflation and non-recoverable VAT is £101.929 million. The base costs are detailed in Appendix D and are summarised in Table 4-1 below.

Scheme Element	TOTAL £,000	Costs (up to and including 2019-20) Actual prices	Estimated costs (from 2020-21 onwards) 2020 Q2 prices
Construction	69,215	6,042	63,174
Utilities	1,505	21	1,483
Land	16,253	1,279	14,973
Fees	14,956	9,613	5,343
Base cost	101,929	16,955	84,974

Table 4-1 Costs of Scheme Development and Construction (£000)

- 4.2.2. The above costs are for the whole Scheme, including alterations to the existing road network to accommodate the new bridge and its approaches.
- 4.2.3. The allowance for fees includes all costs incurred for preliminary design, up to and including submission to DCO, all costs associated with the DCO process, and all detailed design costs.
- 4.2.4. The construction cost estimate has been developed from the Contractors total of the Prices for Stage 2 using a schedule of quantities and rates updated to reflect design development since the Contractor's appointment in January 2019. Utility cost estimates are based on quotes provided by affected utility companies. Fee estimates have been developed from first principles based on

programmed tasks or activities or provided by the Contractor. The land cost estimate was produced by NPS Property Consultants based on local knowledge of land costs.

4.3 ESTIMATING UNCERTAINTY

4.3.1. The construction cost estimate has been developed from the Contractors pricing of the detailed design elements of the Scheme with an allowance for estimating uncertainty where the design is not yet fully developed. The treatment of risk, and the calculation of Quantified Risk Assessment (QRA) is described below.

4.4 MANAGING RISK

4.4.1. The Treasury Green Book states 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”.

4.4.2. A four-stage risk management process has been followed as illustrated in Figure 4-1 below.



Figure 4-1 Risk Management Process

4.5 IDENTIFYING RISKS

4.5.1. Risks were initially identified during a Risk Management Workshop held on 30 January 2017 by specialists from all relevant disciplines as set out in the OBC. These Scheme risks have been actively managed since then and updated with new emerging risks added and risks closed when the risk has passed.

4.5.2. For the Client risks, risk is assigned a Risk Owner and a Lead Officer. The Risk Owner is the organisation who is liable for the effects of the risks, cost of implanting mitigation measures and the residual risk. The Lead Officer is the person most suitable and capable of influencing the likelihood and impact of a specific risk and who has the capability to identifying the appropriate mitigation measures and the right people to support the identification and implementation of suitable mitigation measures.

4.5.3. Lead Officers and all members of the project delivery team are encouraged to notify the Risk Register Owner as soon as they become aware of a matter which could adversely affect the project, for example matters which could:

- increase the project costs
- delay completion of the works or meeting a key date
- impair the performance of the works when in use
- change the Contractor's design after it has been accepted
- result in increasing the resourcing level required to complete the works
- result in a delay in obtaining any consents required or to be obtained under a Third-Party Agreement or Consent
- result in the project not complying with a Consent or Third-Party Agreement or incurring any additional liability to pay any fees, costs, compensations or expenses to a Third Party under the Consent or Third-Party Agreement
- interfere with the timing of the operational services as set out in the Scope, Consent or Third-Party Agreement
- result in an operational requirement described in the Scope, Consent or Third-Party Agreement not being met or
- impair the effectiveness of the operational services during Stage Three

4.5.4. Throughout the delivery of the project, as soon as a risk changes, the Lead Officer(s) will be responsible for providing the Risk Register Owner with a full status up-date, specifically detailing changes to the:

- Impact of Risk
- Risk Proximity
- Risk Mitigation Measures
- Mitigation Progress
- Likelihood and Impact ratings
- Target Resolution Date
- Status

4.5.5. As an absolute minimum and to ensure the mitigation of risk is a priority, the Risk Register is reviewed and updated by Lead Officer(s) on a monthly basis.

4.5.6. The Scheme risks are presented to the Project Board on a monthly basis for review and comment, with any comments received being fed directly back to the Lead Officer(s) by the Project Manager or the Risk Register Owner.

4.5.7. Periodically, the Risk Register Owner will call a risk workshop which will be chaired by the Risk Register Owner and attended by the Project Manager and all Lead Officers instructed to attend. The purpose of this risk workshop is to flush out any emerging risks or risks which have gone un-recorded.

4.5.8. The actual cost of the mitigation measure implemented and/or the actual cost of the risk occurring will be recorded in the qualitative risk register by the Risk Register Owner wherever possible and within the limitations of the existing financial systems and coding structure.

4.5.9. The standard risk allocations set out in the NEC4 ECC contract have been tailored to place risks with the party best placed to manage or mitigate that risk or manage the consequences should the risk transpire. The quantitative risk register details the assessment of risk retained by NCC. Similarly, the Contractor has a quantitative risk register which sets out the Contractor assessment of their liabilities, with this liability being included in the total of the Prices for the Stage Two Work. NCC and the Contractor are both incentivised to mitigate their own liabilities, but NCC is also incentivised to mitigate the Contractor's liabilities as a failure to mitigate would increase the amount NCC pays for the project due to the payment mechanism which applies to the Stage Two Works (NEC4 ECC Option C).

- 4.5.10. The contractor's primary risks, over the standard NEC4 ECC allocations, are:
- Design responsibility for the whole of the works, with a limitation of liability
 - Ground and site conditions, unless the conditions are materially different to the conditions set out in site information which NCC provided
 - Weather conditions below the conditions that occur less frequently than one in ten years
 - Flooding of the works where the flood level below a pre-defined level
 - Cost inflation on subcontract works
 - Changes to the law of the land
 - Currency risk
 - Performance of all statutory undertakers where the management of the statutory undertakers is under the control of the Contractor
 - Loss at sea of the main bridge members (fabricated structural steelwork)
 - Performance of the bridge in line with defined performance criteria
 - Any unforeseen events occurring in Stage Two (Construction) which the Contractor should have identified during Stage One (Design)
 - Vessels striking the works
- 4.5.11. The probability of a pandemic occurring during the currency of the project was so low that it was not considered in the drafting of the contract which exposes the Contractor to risk that could not have been foreseen.
- 4.5.12. As the coronavirus (COVID-19) pandemic has the potential to adversely affect Stage Two the existing contract will be tailored to suite acceptable levels of liability for NCC and the Contractor.

4.6 QUANTIFIED RISK

- 4.6.1. All project-related risks that may impact on the Scheme cost are identified and quantified in a QRA which is reviewed and updated on a monthly basis to produce a risk adjusted cost estimate.
- 4.6.2. The latest Quantified Risk Assessment is calculated to be £17.545 million at 2020 Q2 prices. The assessment and quantification of risk is described in more detail in Appendix E.
- 4.6.3. Each risk, when first identified, is given an opening risk score which is derived from the likelihood of occurrence and the probable impact.
- 4.6.4. Mitigation measures are identified through collaborative discussion with project members or experts in the area effected by the risk. Each risk is given a target risk score, i.e. mitigated risk score, which is derived from the mitigated likelihood of occurrence and probable impact.
- 4.6.5. Consistent criteria are used in the scoring of risks.
- 4.6.6. The risk impact on programme, the works, land costs, fees, etc. are quantified and assessed using consistent data which is derived from the project forecast running cost and or works costs, which provides a more accurate quantification of the effects on the projects budget.
- 4.6.7. The final quantified risk assessment is derived from the quantified risk assessment multiplied by the probability factor which is consistent with the likelihood of occurrence.
- 4.6.8. The probability of a pandemic occurring during the currency of the project was so low that it did not feature on the initial QRA.
- 4.6.9. The coronavirus (COVID-19) pandemic has and continues to effect delivery of Stage One and has the potential to adversely affect Stage Two with initial assessments based on specific scenario, i.e.

effect of coronavirus (COVID-19) subsiding by the end of August 2021, introducing a cost pressure of circa [£3,580,000.00].

4.7 SPEND PROFILE

4.7.1. Subject to funding, construction of the Scheme will start in January 2021 and the new bridge will open to traffic in February 2023. On this basis the expected profile of expenditure is set out in Table 4-2 below.

Scheme Element	Total %	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024
Construction	100%	0%	0%	9%	8%	53%	29%	1%
Utilities	100%	0%	0%	1%	75%	24%	0%	0%
Land	100%	0%	2%	6%	70%	24%	5%	-7%
Fees	100%	11%	34%	19%	18%	8%	8%	1%

Table 4-2 Spending Profile %

4.7.2. The risk-adjusted forecast spend in each year, is set out in Table 4-3 below:

Scheme Element	Total £,000	Costs	Costs	Costs	Estimate	Estimate	Estimate	Estimate
		(up to and including 2019-20)	(up to and including 2019-20)	(up to and including 2019-20)	d costs (from 2020-21 onwards)	d costs (from 2020-21 onwards)	d costs (from 2020-21 onwards)	d costs (from 2020-21 onwards)
		Actual prices 2017-2018 £,000	Actual prices 2018-2019 £,000	Actual prices 2019-2020 £,000	2020 Q2 prices 2020-2021 £,000	2020 Q2 prices 2021-2022 £,000	2020 Q2 prices 2022-2023 £,000	2020 Q2 prices 2023-2024 £,000
Construction	69,215	136	-10	5,916	5,360	36,994	20,379	440
Utilities	1,505	0	0	21	1,130	354	0	0
Land	16,253	39	236	1,004	11,444	3,889	736	-1,095
Fees	14,956	1,714	5,031	2,867	2,754	1,242	1,139	209
Base cost	101,929	1,888	5,257	9,809	20,687	42,480	22,253	-447
QRA	17,545	0	0	0	5,528	8,828	2,557	632
Risk-adjusted base cost	119,474	1,888	5,257	9,809	26,215	51,309	24,810	186

Table 4-3 Risk Adjusted Forecast Expenditure (£000)

4.7.3. QRA has been apportioned across the future Scheme years only. Each risk is given an impact period, i.e. when the risk is expected to materialise, which is based on the projects programme, this drives the risk profiling across future years.

4.8 OUT-TURN PRICE ADJUSTMENT (INFLATION)

4.8.1. The 2020 prices have been inflated through the delivery and construction period based on historic trend analysis of the inflationary indices applicable and a nominal allowance for the effects of coronavirus (COVID-19), as set out in Table 4-4 below:

Factors Applied to 2020 Q1 to Give Out-Turn Prices	2020-2021	2021-2022	2022-2023	2023-2024
Stage One (Design) included on 2020 base cost, no further inflation to be applied as Stage One completion before the next annual adjustment of the Prices.	n/a	n/a	n/a	n/a
Stage Two (Fees).	n/a	2.50%	2.50%	2.50%
Stage Two (Construction).	2.50%	3.50%	3.50%	n/a

Table 4-4 Inflation (based on Bank of England CPI Forecasts of General Inflation)

4.8.2. It is recognised that the coronavirus (COVID-19) outbreak combined with Brexit (trade deals and a reducing migrant workforce) and a desire to ‘kick start’ the economy through the delivery of major infrastructure projects could introduce a shortage of resource which introduces uncertainty when considering the inflationary factors used. This continues to be monitored.

4.9 SCHEME COST

4.9.1. The £121.164 million “Scheme cost” as defined by DfT, is the out-turn capital cost of the Scheme excluding costs incurred prior to completion of the OBC. The inflation factors have been applied to the forecast costs shown in Table 4-5 to produce the total Scheme out-turn spend profile.

Scheme Element	Total £,000	2017-2018 £,000	2018-2019 £,000	2019-2020 £,000	2020-2021 £,000	2021-2022 £,000	2022-2023 £,000	2023-2024 £,000
Construction	70,330	136	-10	5,916	5,404	37,517	20,927	440
Utilities	1,505	0	0	21	1,130	354	0	0
Land	16,253	39	236	1,004	11,444	3,889	736	-1,095
Fees	15,017	1,714	5,031	2,867	2,754	1,263	1,174	214
Base cost	103,105	1,888	5,257	9,809	20,731	43,023	22,837	-441
QRA	18,060	0	0	0	5,733	9,013	2,682	632

Scheme Element	Total £,000	2017-2018 £,000	2018-2019 £,000	2019-2020 £,000	2020-2021 £,000	2021-2022 £,000	2022-2023 £,000	2023-2024 £,000
Risk-adjusted base cost	121,164	1,888	5,257	9,809	26,464	52,036	25,519	191

Table 4-5 Outturn Spending Profile

4.9.2. The total forecast Scheme cost remains at £121.164 million. This is the amount of money actually needed to deliver the Scheme and is the basis for this Full Business Case and local contributions.

SUMMARY OF WHOLE LIFE COSTS

4.9.3. There has been no change to the forecast for operating and maintenance costs from that presented within the March 2017 OBC.

4.10 BUDGETS / FUNDING COVER

FUNDING STRATEGY

4.10.1. Great Yarmouth Third River Crossing will be funded entirely from public finances.

FUNDING REQUEST AND PROFILING

4.10.2. Table 4-6 sets out the funding required from 2017/18 onwards to deliver the Great Yarmouth Third River Crossing.

£,000	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023-2024	Total
DfT funding requested	0	3,941	6,668	26,070	45,129	16,280	0	98,088
LA (NCC) contribution	206	998	3,141	394	6,907	9,239	191	21,076
LEP contribution	1,682	318	0	0	0	0	0	2,000
Total	1,888	5,257	9,809	26,464	52,036	25,519	191	121,164

Table 4-6 Funding Request and Profiling (£)

4.10.3. A contribution of £98.088 million of government funding has been confirmed subject to Full Approval of the Scheme being granted from the DfT following the completion of statutory procedures.

4.10.4. The New Anglia LEP have contributed £2 million.

LOCAL AUTHORITY CONTRIBUTION

4.10.5. Norfolk County Council will manage a local contribution from 2017/18 onwards of £21.076 million.

SECTION 151 DECLARATION

- Norfolk County Council Section 151 Officer (Executive Director of Finance and Commercial Services) declaration can be found at Appendix I of this document.
- The Executive Director of Finance and Commercial Services is responsible for the proper administration of the County Council's financial affairs and for setting and monitoring compliance with agreed standards of financial administration and management, including advice on the County Council's corporate financial position.
- Full Council at its meeting on 15 October 2018 confirmed its support for the scheme and the Council's agreement to underwrite any funding shortfall by Prudential Borrowing.

FUNDING COVER FOR WHOLE LIFE COSTS

- 4.10.6. Norfolk County Council will be responsible for future operating costs of the bridge, maintenance costs of the bridge and the highway, and the longer-term costs of infrastructure renewal for the Scheme. These costs are not included within the tables above.

4.11 SUMMARY OF THE FINANCIAL CASE

- 4.11.1. The cost of delivering the Great Yarmouth Third River Crossing, including allowances for risk and inflation will be £121.164 million.
- 4.11.2. A robust risk management strategy is in place to identify, quantify, manage and review risks, including financial risks.
- 4.11.3. Norfolk County Council is seeking a contribution of £98.088 million from the Government's DfT towards the capital costs of the Scheme, and the New Anglia LEP has already made a contribution of £2m. The Council will support this managing a local contribution of £21.076 million.

5 THE COMMERCIAL CASE

5.1 INTRODUCTION

- 5.1.1. The Commercial Case provides evidence of the commercial viability of the proposed scheme. It provides evidence on the approach to risk allocation and transfer, contract and implementation timescales, and the approach to managing of the contract.
- 5.1.2. Within the Outline Business Case, a number of Output-based objectives were identified against which the procurement route options would be assessed and evaluated. After consideration of a range of options, it was concluded that a Two Stage Design and Build form of contract was most likely to be the most appropriate for this project. This would involve the Contractor at an early stage to develop the design, helping to ensure that the scheme is buildable, affordable and delivered on time.
- 5.1.3. Since submission of the Outline Business Case (OBC) dated March 2017 and the OBC Addendum dated May 2018 Norfolk County Council (NCC) has completed the procurement process and a three-stage contract has been awarded and the Contractor appointed. This is in line with the approach identified and agreed as part of the OBC. The contract contains a break provision with specific tests that must be passed to permit a notice to proceed to be issued for the Stage Two and Stage Three. These tests include the need for the scheme to have secured all necessary planning approvals and funding agreements, and for the total of the Prices to be within budget.
- 5.1.4. The three stages of the contract are:
- Stage One: the development of the detailed design by the Contractor, including support to NCC during the statutory consents process, completing such surveys and investigations as are required, and the setting of the total of the Prices for Stage Two
 - Stage Two: the construction of the Great Yarmouth Third River Crossing
 - Stage Three: the initial operation and planned maintenance of the bridge.

5.2 OUTPUT BASED SPECIFICATION

- 5.2.1. The Commercial case is based on strategic outcomes and outputs, against which alternative contractual options were assessed.
- 5.2.2. The outcomes which the contract will deliver are to:
- Achieve cost certainty, or certainty that the Scheme can be delivered within the available funding constraints
 - Obtain contractor experience and input to the construction programme to ensure the implementation programme is robust and achievable
 - Obtain contractor input to risk management and appraisals, including mitigation measures, to capitalise at an early stage on opportunities to reduce construction risk and improve out-turn certainty thereby reducing risks to a level that is 'As Low as Reasonably Practicable'

5.3 PROCUREMENT STRATEGY

- 5.3.1. The procurement strategy is set out in the OBC Addendum. The procurement strategy was developed and led by the Council's Head of Procurement and used competitive dialogue. Dialogue was based on the lean sourcing principles developed by the Cabinet Office (<http://bit.ly/VU10pH>) and successfully implemented by the Council on a number of procurements of similar scale and complexity, as well as a series of smaller contracts. More detail was provided in the OBC

Addendum. The procurement process is now completed, and the contract was awarded in December 2018.

5.4 TYPE OF CONTRACT

- 5.4.1. The proposed Scheme is a relatively straightforward highway Scheme with a high proportion of the cost and risk associated with the provision of the bascule bridge. An appropriate type of contract is one which manages these risks and reduce cost uncertainty.
- 5.4.2. A number of options were considered:
- Private-public partnership
 - Traditional contract
 - Partnering contract
 - Design and build contract
- 5.4.3. The advantages and disadvantages of each, and the likely contract form, are summarised below:
- 5.4.4. **Private-public partnership:** Design, build, finance and operate (DBFO) or Public Finance Initiative (PFI).
- 5.4.5. It is envisaged that funding will be secured from the DfT Local Majors fund with a local funding contribution. There would be no particular benefit for this project in the DBFO or PFI types of contract, and they have not been considered further.

TRADITIONAL CONTRACT ADVANTAGES

- Principles developed over many years and widely understood
- Client develops the specification
- Risk managed by NCC
- Client retains control and flexibility to change specification
- Award of contract on lowest price basis demonstrates Value for Money

TRADITION CONTRACT DISADVANTAGES

- Client retains risk of delivery on time and to budget
- No incentive for contractor to innovate
- No link between design and construction
- Nature of all risks are not fully realised at the point of award resulting in the potential for an increase in outturn cost and delays with completion

PARTNERING CONTRACT WITH EARLY CONTRACTOR INVOLVEMENT (ECI) ADVANTAGES

- Collaboration between parties
- Risks are better defined than more traditional
- Opportunities to link design and construction

PARTNERING CONTRACT WITH EARLY CONTRACTOR INVOLVEMENT (ECI) DISADVANTAGES

- Many of the disadvantages of traditional procurement can remain
- Difficult to get the right people involved at an early stage in the development of the project

DESIGN AND BUILD CONTRACT ADVANTAGES

- Integration of design and construction leads to efficiencies in cost and time
- Single point of responsibility for NCC

- Risks clearly identified and allocated during the procurement phase
- Stimulates innovation, reducing cost
- Allows the contractor to review the buildability of the design

DESIGN AND BUILD CONTRACT DISADVANTAGES

- Reduced competition with fewer companies interested
- Contractor takes on greater risk and prices accordingly
- Lack of flexibility to change the specification
- Quality may be overridden by cost efficiency

5.5 PREFERRED CONTRACT TYPE

- 5.5.1. Although the highways elements of the project are relatively straightforward, the lifting bridge Mechanical and Electrical (M&E) elements are complex. A traditional contract would not provide an active link between design and construction. Risks would not be fully known at the point of award, resulting in the potential for increased out-turn costs and delays.
- 5.5.2. A partnering contract with early contractor involvement (ECI) would provide a link between design and construction, though it may not result in full integration of design and construction disciplines. It would however provide a better definition of risks than a conventional contract. It would add value by enabling some input into construction methodology or impacts at the anticipated Examination process. However, the procurement process would take longer than with a design and build contract if substantial contractor involvement, such as detailed design work, was required prior to Development Consent Order (DCO) submission, and this would lengthen the overall timescale for delivery.
- 5.5.3. With a Design and Build contract the Contractor takes responsibility and risk related to the detailed design and construction of complex elements. This reduces risk to NCC, whilst the integration of detailed design with construction could bring about efficiencies. Ensuring affordability and reducing the risk of cost increases are key considerations, because the funding from DfT is likely to be capped at a level which cannot be increased.
- 5.5.4. For these reasons, it was concluded that a Three Stage Design and Build form of contract would be the most appropriate for this project.
- 5.5.5. The recently introduced NEC X22 option is used to enable Contractor design and ECI, to avoid the complexity of integrating a separate PSC contract.
- 5.5.6. The inevitable risks arising from losing leverage during stage one, which is non-competitive, are mitigated by:
- Clear NEC Pricing Information, setting the ground rules for arriving at the total of the Prices for Stage Two and Stage Three from the tendered Budget for Stage Two;
 - A budget incentive mechanism encourages the Contractor to reduce the total of the Prices for Stage Two and Stage Three to below the tendered Budget for Stage Two;
 - The backstop position that NCC can go out to tender using the completed design at the end of Stage One if the total of the Prices for Stage Two exceeds the Budget for Stage Two as amended in accordance with the Contract.

5.6 FORM OF CONTRACT

FORM OF NEC CONTRACT

- 5.6.1. NCC have used the NEC form of contract which is the standard form of contract for infrastructure works in the UK.
- 5.6.2. Following the publication of the NEC4 series in June 2017, the decision was taken to use NEC4, rather than NEC3. This will to some extent reduce the need to use 'Z' clauses to deal with inefficiencies in NEC3.
- 5.6.3. The engineering and construction contract (ECC) was considered the most appropriate form of NEC for a contract of this complexity.

DISPUTE RESOLUTION

- 5.6.4. As the Construction Act applies, dispute resolution option W2 was selected.
- 5.6.5. An additional tiered dispute resolution process has been included to encourage resolution of disputes without resort to adjudication or the courts.

ADDITIONAL CLAUSES

- 5.6.6. Clause Z apply and cover, amongst other things:
 - Transparency, as required by the Freedom of Information Act and the Environmental Impact Regulations
 - The passing of prompt payment obligations down through the supply chain, as required by the Public Contracts Regulations 2015
 - Bribery and corruption
 - Social value obligations
- 5.6.7. 'Z' clauses have also been used to join together the three stages of the contract – design, construction, and operations and maintenance – and to allow for the use of different main option clauses at each stage.

INSURANCE AND LIMITS OF LIABILITY

- 5.6.8. Insurances and limits of liability are based on market norms, as advised by our professional advisers and were subject to testing in dialogue.

SOCIAL VALUE

- 5.6.9. This is a works contract and as such is not subject to the Public Contracts (Social Value) Act 2012. Nevertheless, it is appropriate to consider how social value (the economic, social and environmental well-being of the area) might best be promoted via the scheme.
- 5.6.10. Great Yarmouth contains areas of significant economic and educational deprivation. Apprenticeships and employment are at the centre of the social value requirements under the contract, along with provisions for environmental protection and to manage the impact of construction work on local residents and businesses.

LOCAL EMPLOYMENT AND APPRENTICESHIPS

- 5.6.11. The contract includes appropriate provisions specifying the level of apprenticeships to be employed in the delivery of the scheme.

5.6.12. The promotion of local employment and local sub-contracting forms part of the contract.

ENVIRONMENTAL CONSIDERATIONS

5.6.13. The Scheme will bring environmental benefits through encouraging walking and cycling between the residential areas west of the river and the employment and retail areas to the east; through reducing congestion and associated pollution; and through supporting low-carbon electricity generation through the offshore wind industry.

5.6.14. Construction work has the potential for significant environmental impacts. Construction methodology was considered as part of the tender evaluations and the Contractors methodology incorporated into the Environmental Statement that supported the DCO application.

5.7 OTHER COMMERCIAL CONSIDERATIONS

Issue	Approach	Rationale
Specification	<p>Based on the DfT Specification for Highway Works.</p> <p>Because this is a design and build contract, the contractor's designer will be responsible for completion of aspects of the works specification in accordance with its design. It will do so in conformance to the performance specification developed by NCC and its advisers.</p>	<p>The DfT specification is the industry standard and is an integrated system including the standards for the works and the approach to testing.</p>
Operation and maintenance and defects period	<p>Contractor to operate and maintain the structure for the first year and to be responsible for its maintenance for a further two years.</p> <p>Completion of the works and the passing of tests will constitute sectional completion. At that stage, NCC will take over the bridge and the one-year operation and maintenance phase will begin.</p> <p>At the end of that year, the further two years of maintenance will commence. This period will coincide with the defects period.</p>	<p>Experience suggests (and our advisers confirm) that most faults and snags will become apparent in the first year. Having the contractor responsible for operation and maintenance for that year removes any opportunity for 'finger-pointing' and means that the contractor has an on-site team in place to deal with any snags and to train-up the long-term operators of the bridge.</p> <p>It is logical for the further maintenance period to correspond with the period during which the contractor must correct any defects.</p> <p>The approach proposed provides for an overall defects correction period of 3 years, which is considered sufficient to ensure the overall reliability of the bridge in its early years of operation.</p>
Ultimate holding company guarantee	We require an ultimate holding company guarantee	An ultimate holding company guarantee protects us against a contractor avoiding its

Issue	Approach	Rationale
		liabilities by winding up the company that would otherwise be liable.
Delay damages	We will apply delay damages to cover the cost of keeping our project team mobilised for any delay period.	A delay in completing the project does not have a direct monetary impact on the authority, other than the cost of its project team.
Performance bond	We will not require a performance bond.	The premium for a performance bond is significant and would be passed on to the authority. In practice performance bonds are heavily caveated and hard to claim against. The cost is therefore judged to exceed the benefit.
Retention	We will not retain any part of the price.	Retentions have a significant impact on cash flow and as such are usually limited such that they are of limited effect. This means that the administrative burden outweighs their effectiveness.

Table 5-1 Other Commercial Considerations

5.8 SOURCING OPTIONS

- 5.8.1. The Scheme was sourced through advertisement in the Official Journal of the European Union (OJEU) due to its value. This allowed companies from across the EU to bid for the work.

5.9 PAYMENT MECHANISMS

- 5.9.1. The contractual provisions place an obligation on NCC to make monthly assessments with payments to the Contractor via a project bank account, with payment being made within 28 days after the assessment date.
- 5.9.2. The main NEC options of the contract are:

Contract Stage	Payment mechanism
Stage One (defined Scope activities)	Option A: Priced contract with activity schedule
Stage One (undefined Scope activities)	Option E: Cost reimbursable contract
Stage Two	Option C: Target contract with activity schedule
Stage Three	Option A: Priced contract with activity schedule

Table 5-2 NEC Contract options

- 5.9.3. The pros and cons of these main options are set out below.

Option	Advantages	Disadvantages
A	<ul style="list-style-type: none"> ▪ Somewhat greater price predictability at start of Stage Two ▪ Simpler to administer ▪ Quantity and price risks borne by Contractor 	<ul style="list-style-type: none"> ▪ Contractor incentivised to cut corners at the expense of quality ▪ Contractor's price likely to include high contingency ▪ Adversarial relationship more likely to develop ▪ Less commercial transparency around compensation events
C	<ul style="list-style-type: none"> ▪ More incentive on Contractor to innovate to achieve a better outturn cost ▪ Contractor commercially rewarded for performance ▪ Contractor encouraged to identify supply chain efficiency to benefit of both contractor and client ▪ Collaborative behaviour incentivised ▪ Commercial transparency 	<ul style="list-style-type: none"> ▪ Particularly tight project controls needed ▪ Reduced cost predictability ▪ Reliant on audit accuracy; administratively burdensome

Table 5-3 Option A and Option C Comparison

5.10 PRICING FRAMEWORK

- 5.10.1. The Contractor tendered a pricing model, based on the illustrative design material provided by NCC.
- 5.10.2. The purpose of the pricing model was to provide:
- A basis for comparison of tenders
 - A basis for building up the total of the Prices for Stage Two, tied to the Contractor's tendered rates and prices
- 5.10.3. The model included all the major quantities, allowing NCC to compare tenderers against each other. Greater detail would be requested on those elements of work where it is envisaged that significant design changes may occur.
- 5.10.4. Because of the early stage of the design it was not be possible to make the commercial schedules fully inclusive. Many elements were excluded on the basis that inclusion would require tenderers to make assumptions which might lead to disparity between each tenderers' submissions.
- 5.10.5. Most of the design is being carried out by the Contractor and it was recognised that Contractor's solutions may differ from the concept designs in many instances.
- 5.10.6. The contract documents inform the contractor that the pricing model will form the basis for the build-up of the total of the Prices for Stage Two.
- 5.10.7. The contractor then works with the design delivery team to develop the total of the Prices for Stage Two as the design is finalised through Stage One.
- 5.10.8. The contractor and the design delivery team hold regular risk and opportunities workshops (on a monthly basis) to develop and manage the avoidance of risk, develop mitigation strategies and review the risk allowances.

5.10.9. Once NCC is satisfied with the total of the Prices for Stage Two, and once the scheme has been granted all necessary consents to be built and NCC have secured all funding agreements, the Contractor will be issued a notice to proceed to Stage Two to start the construction. If NCC is not satisfied with the total of the Prices for Stage Two (Specific reasons stated in the contract) NCC has the option of de-Scoping the contract and going back to the market to procure the construction based on the final design developed in Stage One.

5.11 RISK ALLOCATION AND TRANSFER

5.11.1. The general principle is that risks have been passed to the party best able to manage them, subject to who is best placed to deal with the risk.

This section provides an overview of how the risks have been apportioned between NCC and the Contractor.

Risk Category	Potential Allocation - NCC	Potential Allocation - Contractor
Design risk		The Contractor will have single-point design responsibility
Construction & development risk	The standard risk allocations set out in the NEC4 ECC contract have been tailored to reflect the specifics of the scheme. See further discussion below and in the Management Case.	The standard risk allocations set out in the NEC4 ECC contract have been tailored to reflect the specifics of the scheme. See further discussion below and in the Management Case.
Transition and implementation risk	Risks associated with marine and vehicle traffic flow will (subject to the bridge performing in accordance with the contract, which is a Contractor risk) be borne by NCC	Successful commissioning will be a contractor risk
Availability and performance risk	The contract contains a performance specification; failure to meet this would be a defect.	The contract contains a performance specification; failure to meet this would be a defect.
Operating risk	NCC owns the operating risk	
Variability of revenue risks	Not applicable	Not applicable
Termination risks	<p>The contract enables NCC to terminate in Stage One in the event that funding is not made available or if the total Scheme costs exceed the available budget.</p> <p>Otherwise, the standard ECC termination position applies, with additional grounds for termination if the Contractor:</p> <ul style="list-style-type: none"> ▪ is convicted or has been convicted of a criminal offence relating to the 	<p>The contract enables NCC to terminate in Stage One in the event that funding is not made available or if the total Scheme costs exceed the available budget.</p> <p>Otherwise, the standard ECC termination position applies, with additional grounds for termination if the Contractor:</p> <ul style="list-style-type: none"> ▪ is convicted or has been convicted of a criminal offence relating to the

Risk Category	Potential Allocation - NCC	Potential Allocation - Contractor
	<p>conduct of its business or profession; or</p> <ul style="list-style-type: none"> ▪ commits or is found to have committed an act of grave misconduct in the course of its business or profession; or ▪ fails or has failed to comply with any obligations relating to the payment of any taxes or social security contributions; or ▪ has made any serious misrepresentations in the tendering process for any project or matter in which the public sector has or had a significant participation; or ▪ fails to obtain any necessary licences or to obtain or maintain membership of any relevant body; or demerges into two or more firms, merges with another firm, incorporates or otherwise changes its legal form or there is a change of control as defined by section 416 of the Income and Corporation Taxes Act and, in any such change of control, there are reasonable grounds relating to the financial standing of the new entity that is proposed to Provide the Works for NCC to withhold its consent. 	<p>conduct of its business or profession; or</p> <ul style="list-style-type: none"> ▪ commits or is found to have committed an act of grave misconduct in the course of its business or profession; or ▪ fails or has failed to comply with any obligations relating to the payment of any taxes or social security contributions; or ▪ has made any serious misrepresentations in the tendering process for any project or matter in which the public sector has or had a significant participation; or ▪ fails to obtain any necessary licences or to obtain or maintain membership of any relevant body; or demerges into two or more firms, merges with another firm, incorporates or otherwise changes its legal form or there is a change of control as defined by section 416 of the Income and Corporation Taxes Act and, in any such change of control, there are reasonable grounds relating to the financial standing of the new entity that is proposed to Provide the Works for NCC to withhold its consent.
Technology & obsolescence risks	NCC takes the obsolescence risk during the bridge's operational life.	The Contractor takes the initial performance risk associated with choice of technology.
Residual value risks	Residual value risk is retained by NCC	
Financing risks	Financing risk is retained by NCC	
Legislative risks	A post-contract change in customs tariffs as a result of Brexit will be a compensation event.	NEC option X2 has not been used

Table 5-4 Potential Risk Allocation

5.12 CONSTRUCTION RISK

5.12.1. The standard NEC position has been tailored as follows.

Risk	Position
Weather	Wind speed has been added to the list of weather events that trigger a compensation event, where the number of hours where the maximum 3 second wind gust exceeds 32 knots.
Physical conditions – flood	Flooding of the site that occurs when the tidal level at Great Yarmouth exceeds or is equal to 2.74m AOD will trigger a compensation event.
Utilities	The Contractor co-ordinates all statutory undertakes, but if the statutory undertakers do not perform in accordance with the Accepted Programme, this triggers a relief event which protect the Contractor from delay damages being levied.

Table 5-5 Construction Risk Assumptions

- 5.12.2. The probability of a pandemic occurring during the currency of the project was so low that is it was not considered in the drafting of the contract. As the coronavirus (COVID-19) pandemic has the potential to adversely affect Stage Two the existing contract will be tailored to suite acceptable levels of liability for NCC and the Contractor.
- 5.12.3. Extensive ground investigation and marine GI was undertaken to enable the standard NEC position on physical conditions (Clause 60.1 (12)) to be tightened. NCC retains liability for the GI provided, with the Contractor being liable for all other ground conditions.
- 5.12.4. The Scheme risks will be managed in line with the risk management strategy set out in Section 6.9 of the Management Case.

5.13 CONTRACT LENGTH

- 5.13.1. From the contract starting date, the support to the DCO process, development of the detailed design, finalisation of the total of the Prices for Stage Two, appointment of any sub-contractors not forming part of the original consortium, enabling works and mobilisation will together take 24 months.
- 5.13.2. Construction is expected to commence in January 2021 and commissioning is expected to be complete by February 2023.
- 5.13.3. The Contractor is contracted to operate the bridge for an initial one-year period and to deliver maintenance for three years, to coincide with the defects period, from Completion of Stage Two.

5.14 HUMAN RESOURCE ISSUES

- 5.14.1. No significant human resources issues have been identified that could affect the deliverability of the scheme. No TUPE issues are expected. NCC will provide personnel to perform the role of Project Manager and create a small site supervision team.
- 5.14.2. More information on the governance and management of the project, including details of the people involved, is set out in the Management Case.

5.15 CONTRACT MANAGEMENT

- 5.15.1. The form of contract selected provides NCC with a suitable contract at construction to minimise risk, but with increased ability to bring forward the detailed design process in the programme.
- 5.15.2. The proposed implementation timescales are set out in paragraph 5.13 above.
- 5.15.3. NCC anticipate providing a site team to manage Stage 2 comprising a Project Manager, a Structures Supervisor, a Roads Supervisor and MICA Inspector. This site team will be supported by a Commercial Manager, a Programme Engineer and a small team of Quantity Surveyors. Following the initial one year of operation and three years of maintenance undertaken by the Contractor as set out in Table 5-1, NCC as Highway Authority will take over the longer-term operation and maintenance of the bridge and approach roads.

5.16 COMMERCIAL VIABILITY

- 5.16.1. The information above provides evidence that the Scheme is commercially viable, with a robust contracting strategy. NCC has confidence that the contractual and commercial arrangements are appropriate and workable.

5.17 SUMMARY OF THE COMMERCIAL CASE

- 5.17.1. The Commercial Case provides evidence of the commercial viability of the proposed scheme. It provides evidence on the approach to risk allocation and transfer, contract and implementation timescales, and the approach to managing of the contract.
- 5.17.2. Norfolk County Council (NCC) has completed the procurement process and a three-stage contract has been awarded and the Contractor appointed. This is in line with the approach identified and agreed as part of the OBC. The contract contains a break provision with specific tests that must be passed to permit a notice to proceed to be issued for the Stage Two and Stage Three. These tests include the need for the scheme to have secured all necessary planning approvals and funding agreements, and for the total of the Prices to be within budget.
- 5.17.3. **The Design and Build** form of contract involves the Contractor at an early stage to develop the design and help ensure that a buildable and affordable Scheme is available.
- 5.17.4. The contract also includes an initial operate and maintenance period of 1 year and 3 years respectively.
- 5.17.5. The three stages of the contract are:
 - Stage One: the development of the detailed design by the Contractor, including support to NCC during the statutory consents process, completing such surveys and investigations as are required, and the setting of the total of the Prices for Stage Two
 - Stage Two: the construction of the Great Yarmouth Third River Crossing
 - Stage Three: the initial operation and planned maintenance of the bridge.
- 5.17.6. The form of contract is the **NEC4 Engineering and Construction Contract (ECC)**, using the following payment mechanisms:

Contract Stage	Payment Mechanism
Stage One (defined Scope activities)	Option A: Priced contract with activity schedule
Stage One (undefined Scope activities)	Option E: Cost reimbursable contract
Stage Two	Option C: Target contract with activity schedule
Stage Three	Option A: Priced contract with activity schedule

Table 5-6 Payment Mechanisms

- 5.17.7. The Commercial Case sets out the apportionment of risk between NCC and the Contractor.
- 5.17.8. The Commercial Case demonstrates that the Scheme is commercially viable, with a robust contracting strategy.

6 THE MANAGEMENT CASE

6.1 INTRODUCTION

- 6.1.1. The Management Case demonstrates that the Great Yarmouth Third River Crossing Scheme is capable of being delivered successfully in line with recognised best practice. It describes the processes that are being put in place to ensure that the project is effectively delivered, and properly evaluated.
- 6.1.2. Specifically, this chapter sets out:
- examples of other large-scale projects that have been successfully delivered by Norfolk County Council (NCC)
 - the programme for delivery
 - the governance arrangements in place to oversee delivery
 - a summary of the contract management strategy
 - how stakeholders have been involved in the development of the Scheme and how they will be involved in the delivery of the Scheme
 - the strategy for identifying and managing project risks
 - how the intended benefits of the Scheme will be realised
 - a summary of contingency management plans
 - how the performance of the Scheme will be monitored.

6.2 EVIDENCE OF SIMILAR PROJECTS

- 6.2.1. Norfolk County Council has successfully procured and delivered a large number of projects since 1999 using the NEC Engineering and Construction Contract. Projects vary in size and complexity and include:
- Broome Ellingham Bypass
 - Stow Bridge Reconstruction
 - Guist Bridge
 - Marine Parade Great Yarmouth Phases 1, 2 & 3
 - King's Lynn Household Waste Recycling Centre
 - Nar Ouse Regeneration Scheme
 - Sprowston, Harford and Thickthorn park and ride sites
 - Cringleford Cluster (including new development link road)
 - A140 refurbishment at Scole
 - King's Lynn South Lynn Transport Major
 - King's Lynn Major Developments (including new development link road)
 - King's Lynn Transport Interchange
 - A12/A143 Link Road
 - Broadland Northway (formally known as Norwich Northern Distributor Road)
 - Greater Norwich Surface Water Drainage Scheme 2015-18
 - Postwick Hub Junction Improvement
 - Hempnall Roundabout
- 6.2.2. Table 6-1 sets out the scope of the works, timescales and procurement strategy for the 3 most recent Schemes.

- 6.2.3. All of the Schemes have been developed and tendered by NCC or procured using the Council's Strategic Partnership Contract or Highways Term Service Contract using an Option C Target Cost Contract. NCC has fulfilled the role of Project Manager. The proposed form of contract for the Great Yarmouth Third River Crossing (GY3RC) Scheme is a three-staged design and build using the NEC4 Engineering and Construction Contract.
- 6.2.4. A Delivery Team and Contract Administration team has been used successfully on major infrastructure schemes and will again be followed for the Great Yarmouth Third River Crossing.

Scheme Name	Description	Contract	Form of Contract	Approximate Total Project Value	Construction Date
Broadland Northway (formerly Norwich Northern Distributor Road)	Construction of a 20km dual carriageway including eight bridges (one over a railway), a grade separated junction and associated link roads and roundabout junctions.	NEC3 Engineering and Construction Contract	Option C, with a Target Price developed from first principals and an incentivised approach which aims to deliver the construction works below the target figure.	£175.3m	Construction commenced in November 2015 and fully opened to traffic in April 2018.
DfT Maintenance Challenge Fund Tranche 1 Greater Norwich Surface Water Drainage Scheme 2015-18	Installation of new surface water drainage systems within the existing Highway Network in Greater Norwich Area to alleviate flooding and reducing flood risk	Eastern Highway Alliance Framework using NEC3 Engineering and Construction Contract.	Option D – Target Cost with Bill of Quantities derived from first principals. Competitive tender approach assessed through Price and Quality information.	£10.3m	Construction commenced in January 2016 and was completed in February 2018. This led to 9.5 miles of new carrier drainage systems being installed
Postwick Hub Junction Improvement	Construction of a new bridge over the A47 and the construction of associated link roads, slip roads, roundabout junction and new access arrangements to the exiting Park and Ride site.	NEC 3 Engineering and Construction Contract	Option C, with a Target Price developed from first principals and an incentivised approach which aims to deliver the construction works below the target figure.	£29.7m	Construction commenced in May 2014 and opened to traffic in December 2015.

Table 6-1 Examples of Similar Projects Delivered by NCC

6.2.5. The lessons learnt from the above have been applied to the Great Yarmouth Third River Crossing. In particular, the following key lessons learnt are as follows:

- **Resourcing** – Early project investment, and therefore resource, is essential. In recognition of this lesson learnt the Great Yarmouth Third River Crossing delivery team is resourced to ensure that it is better positioned to meet the needs and demands of the project.
- **Contract Strategy** – The Great Yarmouth Third River Crossing contract is a ‘design and build’ performance arrangement, reflecting the need for specialist bridge engineering input. This form of contract also gives the contractor ownership and responsibility for the design and delivery of the works, and reduces NCC’s exposure to the risks inherent in a project of this nature.
- **Commercial** – There is benefit in investing in the preparation of carefully considered contract documents. For the Great Yarmouth Third River Crossing, NCC has engaged industry specialists to support the contract development and procurement processes. In addition, the NCC project team includes a dedicated specialist commercial manager to ensure adherence to the contract.
- **Risk** – Early third-party issues on certain projects, particularly with utility companies and transport network operators can immediately put the project risk provision under pressure, increasing as further problems emerged. The experience from previous projects has helped inform the risk provision for the Great Yarmouth Third River Crossing.
- **Design and Specification** – Design change can result in design, supervision and/or administration costs in addition to those related to construction or delay. For the Great Yarmouth Third River Crossing a ‘design and build’ approach has been adopted that requires the contractor to provide an output solution. This reduces NCC’s exposure to design liability and buildability risks.
- **Third Parties** – Utility companies and transport network operator related works can be the sources of considerable cost increase and delay. The lessons learnt from previous projects have resulted in the Great Yarmouth Third River Crossing project team and contractor placing particular focus on early engagement with key stakeholders.
- **Early Contractor Involvement** - Having a collaborative, open and honest relationship with the contractor can help move a project forward as it enables both parties to work together to achieve the target completion date and to identify efficiencies in the programme through value engineering. In particular, Early Contractor Involvement is an important element that can help steer the project so that the contractor understands the project at an early stage and can provide advice through their construction knowledge; which in turn helps to reduce costs. For the Great Yarmouth Third River Crossing a ‘design and build’ approach has been adopted, with the contractor being part of the project team since January 2019.

6.2.6. Design and Build Contractor experience. The appointment of BAM Nuttall Farrans Construction Joint Venture in January 2019 following a competitive tendering process has brought together two contractors, which combined have significant experience delivering large-scale bridge and highway projects and local knowledge of the area. The joint venture team includes the major road and bridge design experience of Roughan & O’Donovan Consulting Engineers and the moveable bridge design expertise of North American Transportation infrastructure engineering firm Hardesty & Hannover. The selection and procurement of the contractor is summarised in the Commercial Case, and the management of the contractor is considered in the project governance section below.

6.3 PROGRAMME AND PROJECT DEPENDENCIES

- 6.3.1. The GY3RC Scheme is a 'stand-alone' scheme, which can be delivered independently of any other Scheme or development. Similarly, no other future schemes or developments are dependent upon it.
- 6.3.2. Highways England has proposals to improve junctions on the A47 Trunk Road in Great Yarmouth (formerly the A12 south of Vauxhall roundabout) as part of the Government's Road Investment Strategy for 2015-2020 (RIS 1). In August 2017, based on work which did not consider the Scheme to be a committed improvement, Highways England made a preferred route announcement for an improvement scheme. This comprised two locations in Great Yarmouth as described below:
- 6.3.3. A47 Vauxhall Roundabout and Station Approach
- Enlarged roundabout
 - Widening and realignment of approaches
 - Possible improvements for non-motorised users
 - Minor improvements to existing layout and signals, and reinstated right turn at Station Approach (now complete)
- 6.3.4. A47 Gapton Roundabout
- Signalisation of roundabout
 - Possible improvements for non-motorised users
- 6.3.5. Highways England has advised that, with the Scheme in place, the improvement Scheme as detailed in their preferred route announcement may not be the best option. In view of this they commissioned NCC and WSP to evaluate proposals comprising different combinations of junction improvements including economic appraisal. This work has included the consideration of alterations at Harfrey's Roundabout.
- 6.3.6. Highways England have advised that they are considering doing further work to design junction improvements which would work better with the Scheme, to deliver positive economic benefits in Great Yarmouth.

6.4 PROJECT GOVERNANCE, ORGANISATION STRUCTURE AND ROLES

- 6.4.1. To ensure successful delivery of the Scheme throughout construction, NCC has established and will continue to resource the following bodies:
- Project Board
 - Project Delivery Team
- 6.4.2. The organisational and governance structure is illustrated in **Figure 6-2** which shows the essential lines of accountability and responsibility. At the heart of project governance is the Project Board, which is accountable through Project Sponsor to NCC, and responsible for reviewing the Scheme and taking key decisions. The Senior Responsible Officer is accountable to the Project Board and is responsible for the work of the Delivery Team. The diagram also shows how the Local Enterprise Partnership and Stakeholders relate to project governance.
- 6.4.3. The Project Sponsor is Norfolk County Council, represented by Tom McCabe, Head of Paid Service and Executive Director of Community and Environmental Services.
- 6.4.4. The Senior Responsible Officer is David Allfrey, Infrastructure Delivery Manager, Communities and Environmental Services at NCC.

- 6.4.5. David Allfrey is a Chartered Civil Engineer and a Member of the Institution of Civil Engineers (ICE). David has over 30 years' experience working in the Construction Industry.
- 6.4.6. For the last 28 years he has worked for Norfolk County Council specialising in highways design and maintenance, and supervising and delivering a wide range of highway maintenance and major improvement schemes, including:
- The Nar Ouse Regeneration Route in King's Lynn
 - A47/A1042 Postwick Hub Junction
 - Norwich Northern Distributor Road

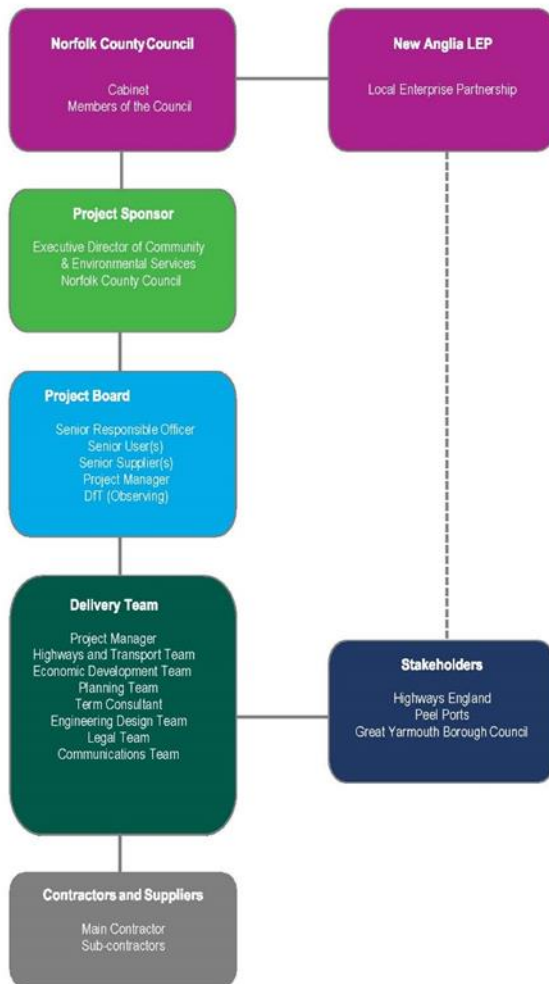


Figure 6-1 Organisational and Governance Structure Detailing the Essential Lines of Accountability and Responsibility

6.4.7. NCC has an established **Project Board** for the Scheme. The project board meet monthly and will continue to meet monthly until the Scheme is completed, after which it will make arrangements for ongoing oversight and reporting of monitoring and evaluation.

6.4.8. The Project Board consists of the people in the following roles:

Name	Role	Responsibilities
Tom McCabe	Project Sponsor	Overall responsibility for the delivery of the project
Grahame Bygrave	Project Director	Oversee development and coordination
David Allfrey	Project Owner	Ensure project delivery is achieved
Mark Kemp	Project Manager	Chair delivery team meetings and report to the Board
Andrew Skiggs	Finance Business Partner	Working alongside Project and Commercial Managers to ensure project remains on budget
Brett Rivett	Commercial Manager	Task order, risk management and review
Charles Ferrar	WSP representative	Project Director WSP
Richard Watts and Neil Barnes	BFJV representative	JV Board Directors
David Glason	Gt Yarmouth Borough Council representative	Development Director
Ellen Goodwin	LEP representative	Infrastructure Manager

Table 6-2 List of Project Board Members

6.4.9. NCC has an established **Delivery Team** for the Scheme. The delivery team is led by the Project Owner and includes the various disciplines and work streams involved in delivering the project to completion.

6.4.10. The delivery team meets monthly, or as required, and the Project Manager will be responsible for determining which disciplines or work streams need to be represented at any particular meeting. The Delivery Team approach runs from ‘cradle to grave’, right through the design and construction stages. Highlight reports are produced by each work stream to update on programme and progress. This ensures co-ordination of all activities and is a forum for discussing and resolution of issues/problems as they arise.

6.4.11. The delivery team will continue to meet on a monthly basis throughout the construction phase of the project.

6.4.12. The main responsibilities of the delivery team are to:

- Comment on delivery and ensure sufficient resource is allocated to the project
- Monitor overall delivery against programme to ensure key activities are completed
- Consider project costs and risks and review and advise on any impacts to project delivery
- Provide governance for the project and initiate corrective action where necessary
- Provide updates, including written progress reports

6.4.13. The delivery team consists of the people in the following roles:

Name	Role	Responsibilities
David Allfrey	Project Owner	Ensure project delivery is achieved
Mark Kemp	Project Manager	Chair delivery team and report to the Board
Victoria Dale	Project Delivery Coordinator	Ensure project deliverables are met against programme and budget for the project.
Duncan Cole	Design Lead	Overall lead for application design
Gavin Broad	Stakeholder Lead	Manage and coordinate stakeholder meetings, prepare SOCGs
Susie Lockwood	Communication Lead	Develop communications plan and stakeholder liaison
Brett Rivett	Commercial Lead	Risk management and review, main contact with BFJV in relation to contract
Tim Ellis	NCC construction advisor	Offer specialist construction advice
Jenny Warhurst	Environmental Lead	Offer specialist environmental advice
Stephen Horne	Maritime Lead	Manage and coordinate all maritime aspects of the project
Grant Brewer	Land Lead	Land lead through DCO and examination process
Heidi Slater	Legal Lead	Offering specialist legal advice
Tony Dempsey	BFJV Design Lead	Contractor design lead
Ewan Barr	BFJV Representative	Contractor Representative

Table 6-3 List of Delivery Team Members

6.4.14. An organisational diagram of the project team is shown in Figure 6-2.

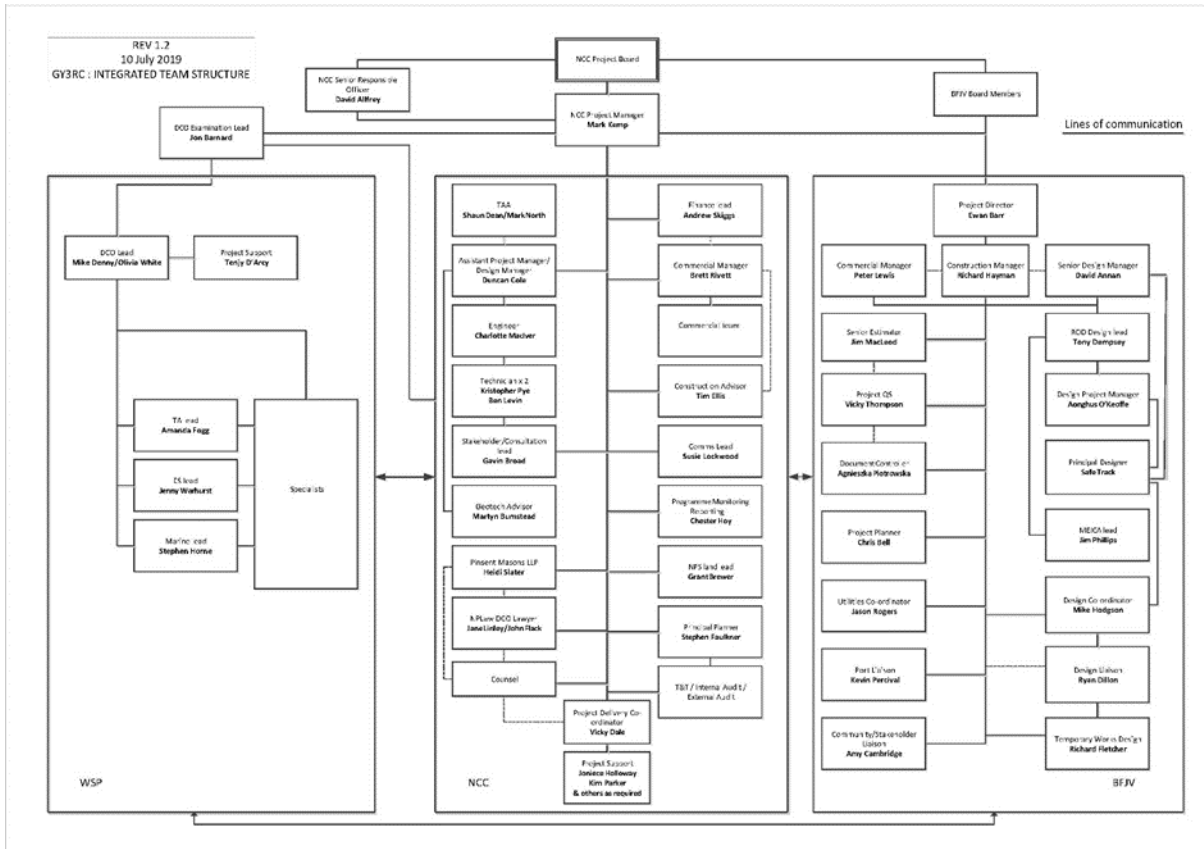


Figure 6-2 Team Structure – (currently being updated for construction phase)

6.4.15. Costs are monitored on a monthly basis. The Commercial Manager maintains the system and takes account of any known committed costs in updating forecast outturn.

6.4.16. The Project Manager, Commercial Manager and Finance Business Partner reviews the actual and forecast expenditure against profile and budget and reports by exception to the Project Board.

6.5 PROGRAMME AND PROJECT PLAN

6.5.1. The project programme is included as Appendix B.

6.6 ASSURANCE AND APPROVALS PLAN

6.6.1. Responsibility for the assurance and approval of the Full Business Case rests with the DfT, who will assess the technical content of the business case 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 Full Business Case.

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

- Programme Entry. The Government's acceptance of an application for Scheme development costs from the DfT's Local Majors Fund, enabling the Council to prepare an Outline Business Case acted as the programme entry agreement
- **Conditional Approval** occurred following the DfT's acceptance / approval of the Outline Business Case (including its assessment of value for money). This was the gateway to proceed

to the development of the Full Business Case but did not guarantee full funding or commitment to the Scheme. It did provide the mandate for NCC to begin the process of obtaining the requisite statutory powers to construct the Scheme (including NSIP / DCO / Planning consents / compulsory acquisition etc)

- **Full Approval** occurs after the selection of a preferred contractor following the procurement process, which will achieve a fixed Scheme cost certainty. This is the Full Business Case, and if approved NCC will be able to start drawing down funding and begin construction

- 6.6.3. The Local funding contribution is discussed within the Financial Case. However, to confirm, NCC's Section 151 Officer has underwritten the local contribution and will approve the release of local funding, when satisfied and appropriate to do so.
- 6.6.4. The 15 October 2018 meeting of the full County Council approved the recommendations for the addition of the full cost of the Scheme into its capital programme. This included the programme entry and a government contribution of £98.088m that was confirmed by the DfT on 28 November 2017, with the remainder being underwritten by the Council with a £2.000m contribution from the LEP.
- 6.6.5. Assurance – **Gateway Reviews**. It is essential that large, complex and long-running projects are monitored effectively. All major transport schemes have to demonstrate that a system for monitoring progress is part of the management structure and plan. Norfolk County Council has commissioned Local Partnerships to undertake the Gateway Review process for the Scheme. The Gateway Review process is a formal assessment of the progress of a project at key stages in its development and is owned and administered by the Office of Government and Commerce (OGC). Gateway Reviews will be undertaken in line with the principles set out in the Project Control Handbook.
- 6.6.6. A Gateway Review is a 'peer review' in which independent project managers from outside the project use their experience and expertise to examine the progress and likelihood of successful delivery project.
- 6.6.7. A Gateway Review provides assurance and support to the Senior Responsible Owner that:
- Suitable skills and experience are deployed on the project
 - All stakeholders understand the project status and issues
 - There is assurance that the project can progress to the next phase
 - Time and cost targets have a realistic basis
 - Lessons are learned
 - The project team are gaining input from appropriate stakeholders
- 6.6.8. Gateway Reviews are a mandated assurance process for all publicly funded major projects, although not all reviews will apply to all projects.
- 6.6.9. The following are the normal stages for Gateway Reviews, as part of the process of managing stage boundaries:

No	Gateway	Major Project phase/stage
1	Business Justification	Entry to the options phase (undertaken on behalf of DfT) (option identification stage)
2	Delivery strategy	Entry to the development phase (preliminary design stage)
3	Investment decision	End of the construction preparation stage
4	Readiness for service	Prior to open for traffic or consent to operate
5a	Operational review and benefits realisation	Following handover into operations and before the end of the defects period
5b	Operation review and benefits realisation	A further operational benefits review may need to be undertaken. The timing is at the discretion of the SRO

Table 6-4 Gateway Review Stages

6.6.10. Three Gateway reviews have been undertaken on the project to date:

- A Gateway 0 Strategic Assessment was carried out in 2008
- A Gateway 2/3 was carried out in June 2017 following submission of the Outline Business Case and prior to the start of the procurement process to appoint a contractor
- A Gateway 3 was carried out in July 2020 following completion of the statutory process public examination and prior to the submission of the FBC to DfT for approval

6.7 COMMUNICATIONS AND STAKEHOLDER MANAGEMENT

6.7.1. The key stakeholder groups with very specific interests in the Scheme are identified in Table 6-5, together with the approach to be taken with each group.

Key Group	Approach to Stakeholder Communication and Engagement
Political and partner organisations	<ul style="list-style-type: none"> ■ Continued engagement to update on Scheme delivery and its expected benefits. ■ Encourage independent advocacy by providing targeted information. ■ Anticipate potential concerns and provide reassurance about potential impacts on the borough and associated mitigation measures during the construction phase. ■ Continued regular meetings of the Scheme's political member group and project board ■ Briefings offered at key stages.
Businesses	<ul style="list-style-type: none"> ■ Raise awareness of the Third River Crossing, its construction timetable and its expected benefits. ■ Instil widespread confidence in the project by providing up-to-date information, regular updates and opportunities to ask questions and comment ■ Provide local opportunities to find out more about the Scheme and discuss details with the project team through holding and attending events.

Key Group	Approach to Stakeholder Communication and Engagement
	<ul style="list-style-type: none"> ■ Provision of timely and targeted information about work on site which may impact their operations, including contact details for the contractor to raise queries or concerns.
Residents	<ul style="list-style-type: none"> ■ Raise awareness of the Third River Crossing, its construction timetable and its expected benefits. ■ Provision of timely and targeted information about work on site which may impact their daily routine, including contact details for the contractor to raise queries or concerns. ■ Provide local opportunities to find out more about the Scheme and discuss details with the project team through holding and attending events. ■ Encourage independent advocacy by providing targeted information. ■ Engagement with land owners indirectly affected by the Scheme.
Peel Ports and port users	<ul style="list-style-type: none"> ■ Ongoing one to one meeting with Peel Ports and port users on the Scheme and its delivery. ■ Provision of timely and targeted information about work on site which may impact their operations, including contact details for the contractor to raise queries or concerns. ■ Establishment of a marine working group in the approach to and during construction to provide a forum to share updates and discuss and resolve issues.
Affected landowners	<ul style="list-style-type: none"> ■ Liaison over planned work on site which may impact their property ■ Engagement with landowners directly affected by the Scheme in the form of one-to-one meetings. ■ Engagement with landowners indirectly affected by the bridge.
Highways England	<ul style="list-style-type: none"> ■ Ongoing one-to-one meetings with Highways England and the wider infrastructure impacts, in particular Harfrey's Roundabout.

Table 6-5 Key Stakeholder Groups

6.7.2. Table 2-8 in the Strategic Case outlines the main stakeholder groups, together with a summary of their specific interests. NCC recognises the important role of stakeholders and has undertaken effective engagement from an early stage.

6.7.3. NCC has engaged extensively with a very wide range of stakeholders throughout the development of the scheme. A variety of communications methods have been employed which are outlined in Table 6-6 below.

Communication Method	Approach to Date and Moving Forward
Consultation Events	<p>Since 2016 a 3-stage consultation strategy was adopted in advance of making an application for development consent in order to provide a better understanding of the purpose of each consultation. The 3 stages were as follows:</p> <ul style="list-style-type: none"> ■ Stage 1 Initial Engagement Consultation (November 2016 - January 2017): Non-statutory consultation to understand views on congestion, share emerging proposals and understand level of support for the Scheme; ■ Stage 2 Scheme Development Consultation (September 2017 – October 2017): Non-statutory consultation to provide an update on progress of the Scheme and understand views on the development work so far; ■ Stage 3 Statutory Pre-application Consultation (August 2018 –October 2018): Statutory consultation to present details of the proposed Scheme and obtain views on it before making an application for a Development Consent Order. <p>Further consultation events will be provided as necessary, including a pre-application consultation event.</p>
Website	<p>A project website was set up (www.norfolk.gov.uk/3rc) and is regularly updated with the latest news. This website will continue to be regularly reviewed and updated.</p>
Publications and newsletters	<p>The use of publications such as the council’s resident’s magazine, Your Norfolk, has been made to provide information to stakeholders and will continued to be utilised at key stages during the Scheme development.</p> <p>Online and hard copy newsletters will be set up and delivered regularly in the approach to and during the construction phase, with the aim of keeping key stakeholders informed of progress, providing reassurance and raising awareness of the Scheme’s expected benefits.</p>
Dedicated email address	<p>A Scheme specific email address was set up and widely disseminated to stakeholders. This is monitored by a member of the project team and will continue to be used throughout the Scheme.</p>
Press releases and information to the media	<p>Press releases have been issued and will continued to be issued at key stages during the Scheme development. Local media will be an important source of news for residents and businesses throughout the construction phase, and timely information and multimedia content will be provided at regular intervals.</p>
Meetings and events	<p>Attendance of meetings with key stakeholders will continue, with the intention of providing updates and answering questions. We will also attend and organise events to support key activity in the lead-in to and throughout the construction phase.</p>
Formal reports	<p>Formal reports to NCC’s Cabinet and other relevant committees have been provided at key stages of Scheme development and will continue to be produced as required (see Section 5.8 of this document).</p>
Informal reports	<p>Monthly reports to the Scheme’s Delivery Team and Project Board have been drafted and will continue.</p>

Communication Method	Approach to Date and Moving Forward
Social media	NCC's established social media channels have been used at key stages, including promotion targeted to the Great Yarmouth area. This will continue to be used in the lead-in to and throughout the construction phase.
Correspondence	General correspondence via letter, email and telephone has been undertaken and will be maintained as required, including letter drops to properties close to the site to inform them of upcoming works that may impact them.
Leaflets and signage	Leaflets and signage containing useful information, such as construction dates, web addresses and contact details and maps and artist's impressions, will be created in the lead-in to and throughout the construction phase.

Table 6-6 Communication Methods

- 6.7.4. Details of stakeholder consultation and engagement over a ten-year period from 2009 to 2019 are comprehensively set out in the Pre-application Consultation Report⁷⁸ which supported NCC's DCO application.
- 6.7.5. NCC has engaged with local stakeholders prior to making and application for a DCO and during the Examination in Public.
- 6.7.6. As part of the Examination in Public for the Great Yarmouth Third River Crossing Norfolk County Council engaged with key stakeholders, in order to develop Statements of Common Ground (SoCG) that could be submitted to the Examining Authority. Engagement was undertaken with the following stakeholders:
- Natural England;
 - Historic England;
 - Environment Agency;
 - Norfolk County Council (County Planning Authority);
 - Great Yarmouth Borough Council;
 - Great Yarmouth Port Company/Peel Ports;
 - Highways England;
 - Marine Management Organisation;
 - Royal Yachting Association;
 - Broads Authority Board;
 - Waveney, Lower Yare & Lothingland Internal Drainage Board;
 - Anglian Water;
 - Local land interests impacted by the scheme;
 - Local marine businesses.

⁷⁸ Great Yarmouth Third River Crossing Pre-application Consultation Report DCO Document 5.1 Consultation Report
<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application>

- 6.7.7. Full details of the SoCGs with the above parties can be viewed on the Planning Inspectorate's website: <https://infrastructure.planninginspectorate.gov.uk/projects/eastern/great-yarmouth-third-river-crossing/>
- 6.7.8. **Communication and Engagement Strategy.** NCC, in liaison with Bam Farrans Joint Venture as the contractor, have developed a robust Communication and Engagement Strategy for the Scheme. This can be found at Appendix J.
- 6.7.9. This strategy sets out how communications will be planned, managed and delivered, including a communications activity schedule and key stakeholders and how the project team will engage with them. The document will be reviewed and updated throughout the lifetime of the project to take account of new information.
- 6.7.10. **New Anglia Local Enterprise Partnership (LEP) and Local Transport Body (LTB).** The LEP is responsible for the Strategic Economic Plan of which the Great Yarmouth Third River Crossing is an important component. The LTB is responsible for delivery of transport infrastructure projects funded in the Growth Deal. The Body is chaired by the LEP and includes a Councillor from each of Suffolk County Council and Norfolk County Council. Regular reports on the Scheme are made to the LEP through formal and informal meetings and to the LTB through regular quarterly meetings. The views of the LEP and LTB are communicated to the Project Board in the same way.
- 6.7.11. The LTB brings together transport stakeholders across the region including the Department for Transport, Highways England, Abellio Greater Anglia, Port of Felixstowe, Norwich International and Stansted Airports, First group, innovative transport providers such as Liftshare, CBI, Federation of Small Businesses as well as the counties' Local Authorities and Chambers of Commerce. The LTB provides a forum for discussing strategic issues and is currently developing an integrated transport strategy which will set out the key transport requirements for Norfolk and Suffolk.
- 6.7.12. The Managing Director for the New Anglia LEP Chris Starkie has confirmed the LEP's full support for the scheme, saying that it will boost productivity, attract inward investment and retain local talent. A Third River Crossing in Great Yarmouth will help create thousands of jobs, improved links across the town and the region.

6.8 PROJECT REPORT

- 6.8.1. Progress will be reported to the County Council's Cabinet. Intervening reports are prepared where decisions by the Administration are needed. The Senior Responsible Officer will provide regular updates to the Cabinet Member for Highways, Infrastructure and Transport. This ensures appropriate involvement of the elected members in this important project.
- 6.8.2. Historically progress was reported to the County Council's Environment, Development and Transport (EDT) Committee. Recent reports considered by the County Council include:
- EDT Committee 08 March 2019
 - EDT Committee 18 January 2019
 - Full Council 15 October 2018
 - EDT Committee 19 January 2018
 - EDT Committee 10 November 2017
 - EDT Committee 15 September 2017
 - EDT Committee 17 March 2017
 - EDT Committee 20 May 2016
 - Cabinet 07 December 2009

6.8.3. In specific circumstances the Infrastructure and Development Select Committee have given delegated powers to either the Project Board or the Executive Director of Community and Environmental Services to make specific decisions on projects.

6.9 RISK MANAGEMENT STRATEGY

6.9.1. The Treasury Green Book states 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*”.

6.9.2. A four stage Risk Management process has been followed, see **Figure 6-3**.

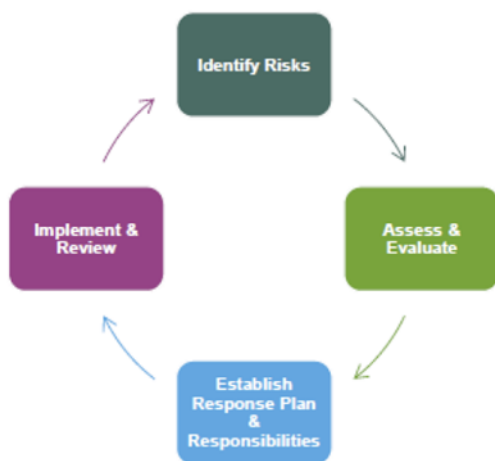


Figure 6-3 Risk Management Process

6.9.3. Risks have been identified by specialists in highways and structural engineering, geotechnics, transport planning, quantity surveying and the environmental disciplines.

6.9.4. Risks are identified in the Risk Register, which is included at Appendix E.

6.9.5. TAG Unit A1.2 requires that all project related risks that may impact on the Scheme costs should be identified and quantified in a Quantified Risk Assessment (QRA), in order to produce a risk-adjusted cost estimate.

6.9.6. Scheme Risks have been identified, responsibilities allocated to the most appropriate party and response plans developed. One of four possible strategies have been adopted for each risk:

- **Accept or tolerate consequences** in the event that the risk occurs. This strategy is adopted where 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;
- **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.

6.10 TRANSFER OF RISK TO THE CONTRACTOR

6.10.1. The standard risk allocations set out in the NEC4 ECC contract have been tailored to place risks with the party best placed to manage or mitigate that risk or manage the consequences should the risk transpire.

6.10.2. The contractor's primary risks, over the standard NEC4 ECC allocations, are:

- Design responsibility for the whole of the works, with a limitation of liability
- Ground and site conditions, unless the conditions are materially different to the conditions set out in site information which NCC provided
- Weather conditions below the conditions that occur less frequently than one in ten years
- Flooding of the works where the flood level below a pre-defined level
- Cost inflation on subcontract works
- Changes to the law of the land
- Currency risk
- Performance of all statutory undertakers where the management of the statutory undertakers is under the control of the Contractor
- Loss at sea of the main bridge members (fabricated structural steelwork)
- Performance of the bridge in line with defined performance criteria
- Any unforeseen events occurring in Stage Two (Construction) which the Contractor should have identified during Stage One (Design)
- Vessels striking the works
- The probability of a pandemic occurring during the currency of the project was so low that it was not considered in the drafting of the contract which exposes the Contractor to risk that could not have been foreseen.
- As the coronavirus (COVID-19) pandemic has the potential to adversely affect Stage Two the existing contract will be tailored to suite acceptable levels of liability for NCC and the Contractor.

6.10.3. The Commercial Case describes the contractor ownership of risks.

6.10.4. Transfer of risk to the contractor is explained in the Commercial Case.

6.10.5. Implementation of response plans and review of the risk is also explained in the Commercial Case.

6.11 BENEFITS REALISATION PLAN

6.11.1. The most important element of a successful project is that it delivers its intended outcomes. To ensure this, a Benefits Realisation (BR) Plan has been prepared for the Scheme (Supporting Document 9). The BR Plan enables benefits to be planned for, managed, tracked and realised. It should be read in conjunction with both the FBC and the Monitoring and Evaluation (M&E) Plan (Supporting Document 8).

6.11.2. The benefits management process spans all stages of project development, and involves asking the following questions:

- What benefits do we intend the Scheme to achieve?
- What is the value of these benefits?
- **How can these benefits be realised by the scheme?**
- Are these benefits being realised by the scheme?
- What, if anything, should we change?

6.11.3. These questions arise at the various stages of Scheme development but at FBC stage the most important question (highlighted) is "how can these benefits be realised". The benefits cycle is illustrated in **Figure 6-4** below.

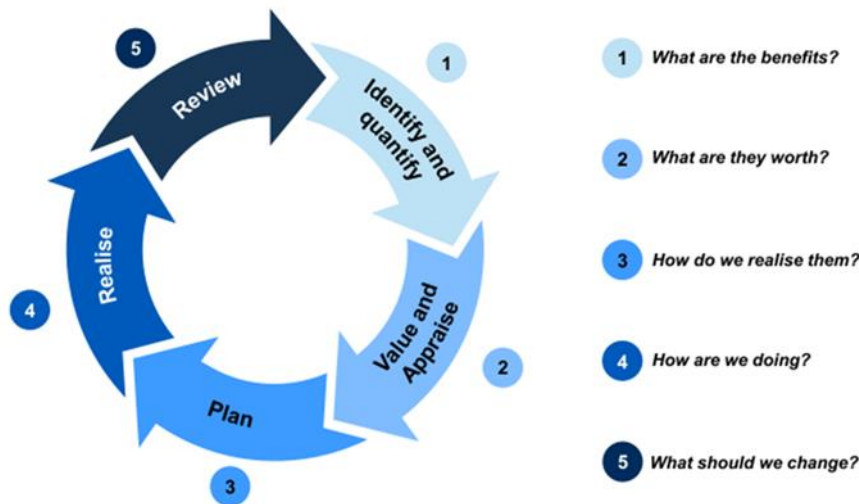


Figure 6-4 The Benefits Cycle

6.11.4. The principles are very simple. We need to be clear what the Scheme is for, by defining the intended benefits. We need to design and deliver the Scheme in a way that will deliver these benefits. We need to know whether the benefits are really being achieved, and we need to be prepared to make changes if it appears that benefits are not being achieved in full. The BR Plan sets out in detail how this is being done, and who is responsible for delivering each benefit.

6.11.5. Figure 5-2 of the BR Plan provides a logic map which shows how the Scheme is expected to deliver the benefits set out in the Strategic Case. Table 5-1 of the BR Plan provides a summary of the Benefits Realisation Strategy.

6.12 MONITORING AND EVALUATION PLAN

6.12.1. Monitoring and evaluation are important elements of any major project. They help to determine the extent to which it is meeting its objectives and delivering the expected benefits, helping to improve future decision making. A Monitoring and Evaluation (M&E) Plan has therefore been prepared for the Scheme (Supporting Document 8) in line with the guidance in ‘Monitoring and Evaluation Framework for Local Authority Major Schemes’ (DfT September 2012). It should be read in conjunction with both the FBC and the BR Plan (Supporting Document 9).

6.12.2. The framework aims to make the process consistent and proportional, by defining three levels of monitoring and evaluation:

- Standard (for all schemes)
- Enhanced (for schemes costing over £50 million)
- Fuller (only when requested by DfT)

6.12.3. DfT have advised that they consider it necessary for the Scheme to be subject to fuller evaluation for the following reasons:

- The high overall Scheme cost
- The large contribution from DfT
- The wide range of economic benefits including supporting offshore energy industries, creating new jobs and supporting the regeneration of Great Yarmouth including the town centre and sea front

- 6.12.4. The monitoring process will be undertaken in three stages:
- Pre-construction and during construction (monitoring)
 - One year after (monitoring and evaluation)
 - Five years after (monitoring and evaluation)
- 6.12.5. Due to the likely impact of the Coronavirus pandemic, the pre-construction monitoring will be based on historic (pre 2020) traffic surveys with limited additional surveys in 2020 before construction starts.
- 6.12.6. The 'One Year After' report will be published within two years of Scheme opening, focusing on the scheme's outcomes. The final 'Five Years After' report will be published within six years of Scheme opening, based on analysis of both the Stage 2 and Stage 3 data, including an assessment of the wider impacts of the scheme.
- 6.12.7. The following measures will be monitored to meet DfT requirements for enhanced evaluation are:
- Scheme build
 - Scheme costs
 - Delivered scheme
 - Scheme objectives
 - Travel demand
 - Travel times and reliability
 - Impact on the economy
 - Carbon
 - Noise
 - Local air quality
 - Accidents
- 6.12.8. In addition, an assessment will be undertaken to determine the extent to which the Scheme has delivered the Value for Money (VfM) that was anticipated in the appraisal set out in the FBC Economic Case. This will be done by re-calculating the benefit-cost ratio (BCR) in both the 'One Year After' and 'Five Years After' reports and comparing it to the BCR calculated in the FBC.
- 6.12.9. The M&E Plan describes in detail how data will be collected to monitor the scheme's performance in each of these areas. Table 5-4 of the M&E Plan summarises the data requirements and methods of collection for each measure.

6.13 OPTIONS

- 6.13.1. The proposed Scheme has been identified only after consideration of a wide range of options. An initial long list of potential solutions was drawn up, and these have been, sifted, refined and evaluated to ensure that the proposed Scheme is the best possible option.

- 6.13.2. The process of generating, refining and appraising options is detailed in the 2016 Options Assessment Report (OAR)⁷⁹. The OAR was submitted with the application for Scheme development costs, and describes assessments undertaken in 2007 (Stage 1) and 2009 (Stage 2). The OAR identified a preferred corridor for the scheme. Subsequent work to identify the best Scheme within this corridor is described in a further Final OAR⁸⁰.
- 6.13.3. A summary of the option assessment process is given in the Section 2.13 of the Strategic Case.
- 6.13.4. The Economic Case describes the most recent assessment of the proposed Scheme using models and analytical tools developed subsequent to the OAR.

6.14 SUMMARY OF THE MANAGEMENT CASE

- 6.14.1. The Management Case demonstrates that the Great Yarmouth Third River Crossing scheme is capable of being delivered successfully in line with recognised best practice. It describes the processes that are being put in place to ensure that the project is effectively delivered, and properly evaluated.
- 6.14.2. Norfolk County Council has extensive recent experience in delivery major infrastructure projects.
- 6.14.3. The Great Yarmouth Third River Crossing is a “stand-alone” scheme, which can be delivered independently of any other scheme or development. Similarly, no other future schemes or developments are dependent upon it.
- 6.14.4. Norfolk County Council will continue to liaise very closely with Highways England as the Third River Crossing scheme is taken forward and will actively co-operate with any further appraisal or design work that HE may decide to undertake in relation to improvements to the A47 trunk road.
- 6.14.5. Norfolk County Council has established and will continue to resource the following bodies:
- Project Board
 - Project Delivery Team
 - Stakeholder Groups
- 6.14.6. The Management Case describes the membership, responsibilities and accountability of these groups including the relationship between them.
- 6.14.7. The Scheme continues to be programmed to open to traffic in 2023. The detailed project programme is included in Appendix B.
- 6.14.8. The Management Case details how stakeholders have been involved in the development of the Scheme and how they will continue to be involved as the Scheme moves into the construction phase.

⁷⁹ Great Yarmouth Third River Crossing Options Assessment Report (2016) OBC Supporting Document 1

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>

⁸⁰ Great Yarmouth Third River Crossing Final Options Assessment Report (2017) OBC Supporting Document 2

<https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission>



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