Norfolk County Council

GREAT YARMOUTH THIRD RIVER CROSSING

Monitoring and Evaluation Plan

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1 INTRODUCTION

1.1.1. This document is the Monitoring and Evaluation Plan for the Great Yarmouth Third River Crossing project (the Scheme). It forms a part of the Full Business Case (FBC) submitted by Norfolk County Council (NCC) and should be read in conjunction with both the FBC and the Benefits Realisation Plan.

1.2 REQUIREMENTS FOR MONITORING AND EVALUATION

1.2.1. 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. They are defined in HM Treasury's 'Magenta Book' as follows:

- **Monitoring** seeks to check progress against planned targets. It can be defined as the formal reporting and evidencing that spend and outputs are successfully delivered and milestones met
- **Evaluation** is the assessment of the initiative's effectiveness and efficiency during and after implementation. It seeks to measure the causal effect of the Scheme on planned outcomes and impacts and assessing whether the anticipated benefits have been realised, how this was achieved, or if not, why not.

1.2.2. DfT guidance in 'The Transport Business Cases' (January 2013) requires that the FBC should:

- provide details of the project's overall balance of benefits and costs against objectives, and set out plans for monitoring and evaluating these benefits when required.

1.2.3. The DfT 'Monitoring and Evaluation Strategy' (March 2013) set out a framework for enhancing the generation of good quality monitoring and evaluation evidence, to be integrated into Departmental decision making and delivered within a robust and proportionate governance framework. It aims to provide greater accountability and a stronger evidence base for future decision making and communication activities.

1.2.4. Specific guidance is set out in DfT's 'Monitoring and Evaluation Framework for Local Authority Major Schemes' (September 2012). This framework has been followed by NCC in preparing this plan.

1.3 LEVELS OF MONITORING AND EVALUATION

1.3.1. 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 evaluation** (only when specifically requested by DfT)

1.3.2. As the Scheme will cost over £50 million, it will be subject to the **enhanced** level of monitoring. In addition, 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
- Large contribution from DfT
- Wide range of economic benefits including:

- Supporting offshore energy industries
- Creating new jobs
- Supporting the regeneration of Great Yarmouth including the town centre and sea front.

1.3.3. The aim of undertaking fuller evaluation is to generate evidence on:

- Whether the Scheme was delivered effectively and efficiently
- The causal effect of the Scheme on the anticipated outcomes and whether these have contributed to the intended impacts
- Whether it had any unintended adverse or positive effects.

1.3.4. The evaluation will therefore seek to build on the evidence generated through standard and enhanced monitoring to demonstrate the causal pathways between the Scheme and the observed outcomes and impacts, whilst asking the following high-level questions:

- How was the Scheme delivered?
- What difference did the Scheme make?
- Did the benefits justify the costs?

1.4 MONITORING DURING THE CORONAVIRUS PANDEMIC

1.4.1. At the time of preparing this Monitoring and Evaluation Plan, the global coronavirus pandemic of 2020 is affecting every aspect of life in the UK. Traffic levels have fallen dramatically throughout the country and it is not known when, or indeed whether, they will return to the levels they were before the Spring of 2020. Patterns of economic activity, travel to work and mode choice may have been affected for the long term. An economic recession is anticipated, but its severity and duration cannot be predicted.

1.4.2. For these reasons, a conventional “before and after” study will not be possible. Any data collected between now and the start of construction would not represent a settled state, as the situation is atypical and changing rapidly. But if we compare data collected after Scheme opening with historic data collected before the pandemic, it will be very difficult to separate out the impacts of the Scheme from the impacts of the pandemic.

1.4.3. This M&E Plan therefore attempts to achieve a balance between:

- The need to avoid unnecessary expenditure on data collection which is not useful for its intended purpose
- The need to understand what difference the Scheme has made, directly in terms of traffic and indirectly in terms of the local economy, separating out these impacts from those of the pandemic.

1.4.4. The preferred solution is to make use of historic data, collected before the pandemic, together with a limited amount of additional data collection prior to Scheme opening.

2 SCHEME BACKGROUND AND CONTEXT

2.1 LOCATION

2.1.1. Great Yarmouth is located at the mouth of the River Yare, one of the main waterways providing access to the Norfolk Broads. 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.

2.1.2. Figure 2-1 below shows the location of Great Yarmouth.

Figure 2-1 – Location of Great Yarmouth

2.1.3. Through traffic on the A47 presently 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.

2.1.4. The proposed Scheme is illustrated in Figure 2-2 below. It 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 connect the peninsula to the strategic road network via the A47 Harfrey's roundabout.

Figure 2-2 - Location of the Scheme

2.1 DESCRIPTION

2.1.1. The Scheme will create a new, direct link between the western and eastern parts of the town. It will substantially improve connectivity between the A47 (part of the SRN) and destinations on the South Denes peninsula, including the South Denes Business Park, Great Yarmouth Energy Park, the Port and Outer Harbour, including part of the Great Yarmouth and Lowestoft Enterprise Zone.

Figure 2-3 - The Scheme

2.1.2. The Scheme includes:

- A new dual carriageway road across the river Yare, linking the A47 at Harfrey's Roundabout to the A1243 South Denes Road
- A new double-leaf bascule bridge with an opening span to facilitate vessel movement
- A new five-arm roundabout connecting the new dual carriageway road with Suffolk Road, William Adams Way and the western end of Queen Anne's Road
- A single-span bridge over Southtown Road
- A single-span bridge to provide an underpass on the eastern side of the river
- A new signalised junction connecting the new road with A1243 South Denes Road
- The closure of Queen Anne's Road at its junction with Suffolk Road, and formation of a new junction with Southtown Road
- Revised access arrangements for existing businesses
- Dedicated provision for cyclists and pedestrians
- A control tower to facilitate the operation of the new bascule bridge
- The demolition of an existing footbridge on William Adams Way
- Associated changes, modifications and/or improvements to the existing local highway network
- Additional signs, including Variable Message Signs (VMS)

2.2 COST AND FUNDING

2.2.1. The forecast out-turn cost of the Scheme is £121,164,461

2.2.2. The Scheme will be funded as follows:

- Local contribution (NCC) £21,076,461
- Government contribution (Local Majors Fund) £98,088,000
- Third Party Funding (LEP) £2,000,000

2.3 TIME FRAME

BUSINESS CASE

2.3.1. An Outline Business Case (OBC) was submitted by NCC to the Department of Transport (DfT) in March 2017. The scheme achieved Programme Entry within the Large Local Major schemes programme and was allocated provisional funding in the Autumn 2017 budget. An update to the management, financial and commercial aspects of the business case was submitted to the DfT in July 2018 as required in the letter from DfT confirming Programme Entry status. The FBC will be submitted in September 2020. Delivery of the Scheme depends on it achieving Full Approval status following scrutiny of the FBC by the DfT.

DEVELOPMENT CONSENT ORDER

2.3.2. The Scheme is covered by a Development Consent Order (DCO) under the Planning Act 2008. NCC submitted DCO Examination documents to the Planning Inspectorate in April 2019. Examination in Public took place between 24 September 2019 and 29 March 2020. It is expected that the decision whether to grant the DCO will be announced on or before 24 September 2020.

CONSTRUCTION

2.3.3. Construction is programmed to start in January 2021, with completion in February 2023.

2.4 WIDER DELIVERY CONTEXT

SHIPPING AND PORT OPERATIONS

2.4.1. The future growth of the port and Outer Harbour are threatened by the lack of direct access to the SRN, as traffic currently has to travel through congested roads through Great Yarmouth town centre. The third river crossing would significantly improve connectivity between the port and the A47 which would improve journey times and provide easier access to businesses and port facilities.

REGENERATION

2.4.2. The Scheme will provide greater access to employment opportunities through reduced severance, which will only increase as the port grows and more jobs are created.

2.4.3. In addition to improved connectivity to the peninsula, the Scheme will reduce the volume of traffic travelling over Haven Bridge and through the town centre. This will relieve congestion and improve the street environment in key areas for regeneration, such as Great Yarmouth waterfront area.

MOVEMENT WITHIN THE TOWN

2.4.4. The Scheme will provide a new route into the peninsula and harbour area which will reduce congestion through the town centre and on Haven Bridge. An additional crossing over the River

Yare will also provide the network with much needed resilience in the event of a planned or unforeseen closure of Haven Bridge.

2.4.5. The Third River Crossing, used in combination with Breydon Bridge, will allow traffic accessing the peninsula to travel on the A47 for a greater distance instead of transferring to local roads on the east of the river.

2.4.6. Highways England are planning improvement works to the A47 at the main junctions through Great Yarmouth which, in combination with the Third River Crossing, will reduce congestion and provide improved journey times and reliability for users.

3 SCHEME OBJECTIVES AND OUTCOMES

3.1 OBJECTIVES

The objectives of the Scheme 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.

These objectives relate closely to the policies, opportunities and problems which are described in detail in the FBC Strategic Case.

3.2 OUTCOMES

OVERVIEW

3.2.1. The Scheme is expected to achieve its objectives in the following ways:

- It will reduce journey distances, thereby reducing fuel consumption and emissions of greenhouse gases
- It will enable traffic to re-route within the town, thereby reducing traffic on the existing bridges, and in historic areas.
- It will reduce exposure to accident risk and hence reduce the number of accident casualties
- It will reduce transport costs for businesses
- It will create extra network capacity, resulting in less congestion and delay at the existing bridges, shorter journey times and increased journey time reliability.
- It will create a new link into the South Denes peninsula for cars, goods vehicles, buses, cyclists and pedestrians, improving accessibility for businesses, reducing community severance, and encouraging more sustainable modes of transport.
- It will reduce congestion and delay in the town centre, helping the visitor and retail economy.

LOGIC MAP

3.2.2. The logic map below (Figure 3-1), taken from the FBC[1], shows how the Scheme is expected to deliver the desired outcomes and impacts, and achieve NCC's overall aim for the Scheme.

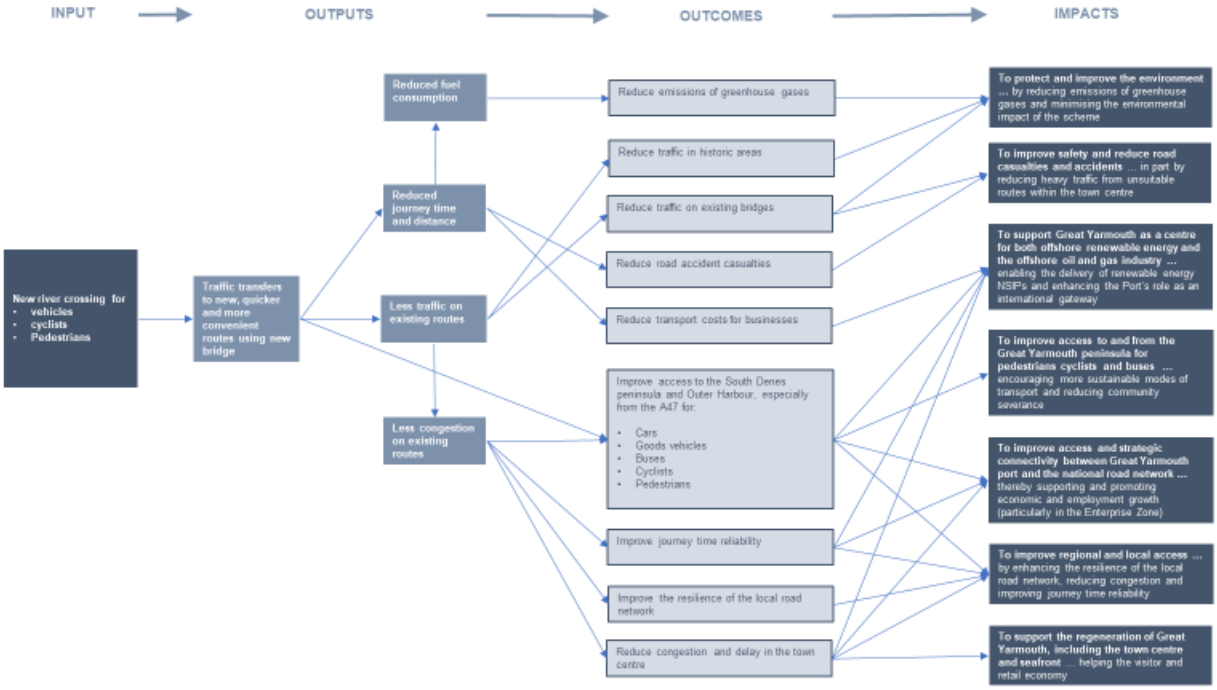


Figure 3-1 – Logic map

3.2.3. Key linkages are demonstrated, but for clarity not all are shown in detail. Therefore, where necessary, more detailed logic maps for some measures are included in Section 5.3 (Monitoring and evaluation of Scheme objectives) later in this report.

[1] For consistency, the FBC defines "impacts" and "outcomes" in the same way as the OBC. The logic map above has been re-labelled in accordance with the definitions in DfT guidance in 'Monitoring and Evaluation Framework for Local Authority Major Schemes' (September 2012).

4 EVALUATION APPROACH

4.1 AIMS

4.1.1. In accordance with the DfT's Framework, the Monitoring and Evaluation Plan seeks to:

- provide accountability for the investment
- provide evidence to inform future spending decisions
- help to show which schemes deliver cost-effective transport solutions
- enhance the operational effectiveness of future schemes
- Identify lessons learnt that can be applied to other schemes

4.2 APPROACH TO FULLER EVALUATION

4.2.1. As the Scheme has been selected for fuller evaluation, the approach will include both *impact evaluation*, *process evaluation* and *economic evaluation*.

IMPACT EVALUATION

4.2.2. NCC fully recognises the need to understand not only the measurable impacts and outcomes of the Scheme but also the reasons why those impacts and outcomes have (or have not) occurred. We will therefore seek to discover the extent to which the Scheme has itself caused any of the changes observed in the outcomes and impacts, as well as any unintended impacts of the scheme.

4.2.3. This is likely to be quite difficult at the present time because the external impacts of the Covid-19 pandemic may mask some of the expected impacts and outcomes of the scheme (for example travel behaviour and economic growth). For this reason, it will be especially important to measure any changes in traffic movements and journey times which occur as a direct result of the Scheme opening (e.g. the proportion of traffic which immediately transfers to the new river crossing, as these will show that the Scheme is producing the expected results, even if background levels of traffic are still reduced, or in a state of flux, due to external factors such as Covid-19.

4.2.4. Not all outcomes can be measured directly or attributed with certainty to the Scheme. For this reason we have set out our assessment of likely causality in the form of a logic map for the Scheme as a whole (Figure 3-1 above) and for selected Scheme objectives (Section 5.3 below). If we are able to show that clear changes have been observed that relate to one or more causal links (e.g. reductions in journey time, changes in traffic patterns) this will provide confidence that the scheme will help deliver the expected impacts. If, however, the changes are weak, absent, or very different from those expected, this would suggest that the Scheme may not, at that stage, be helping to deliver the expected impacts.

4.2.5. It is also important to determine whether the Scheme has had any unintended impacts (which may be positive or negative). For this reason, air quality and noise will be monitored post Scheme opening, even though the impacts would not normally be monitored. Another example would be accidents, where impacts are expected to be small, but where it is clearly desirable to identify any unintended impacts as soon as possible. See paragraph 5.2.90 below.

PROCESS EVALUATION

4.2.6. NCC recognises the importance of seeking to learn lessons from the experience of planning and delivering the Scheme, and from the monitoring of its outcomes. This includes assessing whether

the scheme has been delivered as intended, in order to understand how and why it has produced the outcomes and impacts observed.

4.2.7. Process evaluation will therefore go beyond a desk-based review of key documents to encompass a systematic approach to obtaining feedback from key stakeholders, delivery partners and transport users, local communities and businesses using robust research methods.

4.2.8. Our approach will therefore be to triangulate data collected in the standard and enhanced monitoring with feedback from key personnel and stakeholders to determine the extent to which the Scheme is delivering the expected outcomes and impacts, as well as possible reasons for any unintended outcomes.

4.2.9. In addition, NCC will identify an *independent evaluator* to review the findings at each stage of the monitoring and evaluation to provide additional insight into the way these have been affected by both the internal scheme processes and externalities. In discussion with DfT (September 2020) it was agreed that this would make a useful contribution to the process evaluation, but that the cost of an external appointee might not be proportionate. The preferred solution would be to identify someone who has a good working knowledge of the scheme but is still able to provide a professionally independent and objective review.

4.2.10. The brief to the evaluator will include, but will not be limited to, a review of the study findings related to the research questions set out in Paragraph 4.2.13 below.

ECONOMIC EVALUATION

4.2.11. A fuller evaluation will seek to compare the benefits of the scheme with its actual costs, and compare these with the costs and benefits presented in the business case.

4.2.12. To do this by creating and updating an ex-ante appraisal model would not be proportionate in this case, in view of the likely cost, and because the background of Covid-19 and temporary economic downturn makes it very difficult to determine a counter-factual scenario (i.e. what would have happened had the scheme not been provided). We have therefore set out a proportionate approach to post-opening economic evaluation in Section 5.4 below.

RESEARCH QUESTIONS

4.2.13. Key research questions for the evaluation have been determined based on the scope and objectives of the scheme:

- **Delivery:** Has the Scheme been delivered as intended and to the expected timetable? If any internal and external factors affected delivery, what impact did these have? How were they managed? Could they have been foreseen or avoided? What went well and what went less well?

- **Cost:** How accurate were the cost estimates? If out-turn costs were different from expectations, why was this, and what actions were taken? Were the allowances for quantified risk and optimism bias reasonable, or should a different approach be taken in future?

- **Traffic:** Has the Scheme produced the expected changes in the pattern of traffic movement in Great Yarmouth, and were there any unintended changes? Is traffic on the new bridge more or less than forecast? Has traffic reduced on the existing bridges as expected? Have journey times reduced? If not, what are the reasons? If there are differences, are they due to Scheme specific, or external factors affecting traffic demand. Are there implications for similar schemes in future?

- **Connectivity:** Has the Scheme improved the strategic connectivity of Great Yarmouth Port to the national strategic road network, in ways that will support and promote economic and employment growth? Has it changed people's perceptions of the town as an employment location?

- **Economy:** Has the Scheme enhanced the position of Great Yarmouth as a centre for offshore renewable energy and the offshore oil and gas industry, and as an international gateway? Has it changed perceptions of the town by residents, local businesses and new investors as a place of opportunity? Have there been any unintended consequences?

- **Accessibility**: Has the Scheme improved the accessibility of the Great Yarmouth peninsula for local people, and for all modes of transport, in ways expected in the appraisal? Has it encouraged more walking and cycling?

- **Value for money**: Did the traffic model provide a realistic forecast of future growth and the effects of the Scheme? If there are differences, are they enough to raise questions about the VfM category attributed to the Scheme?

- **Environment:** Were the environmental impacts of the Scheme in line with expectations? Is mitigation perceived to have been effective? Have there been any unintended impacts, and, if so, how might they have been foreseen, or avoided with future schemes? How is the new bridge now perceived as part of the townscape?

- **Community:** Has public support for the Scheme increased or reduced since its completion? How effective was engagement with the public and stakeholders during construction? What went well and what went less well? Were there any unforeseen issues and if so, how were they resolved?

4.3 TYPES OF MEASURE

4.3.1. The following types of measure will be monitored, as defined in the DfT framework:

- **Inputs** – what is being invested to deliver the Scheme
- **Outputs** – what has been delivered, and how it is being used
- **Outcomes** – intermediate effects of the Scheme, such as changes in traffic flow
- **Impacts** – longer-term effects on wider social and economic outcomes, such as economic growth

4.4 STAGES OF MONITORING AND EVALUATION

4.4.1. This Monitoring and Evaluation Plan will need to be agreed with the DfT before construction starts, and before any new data collection is programmed to take place.

4.4.2. The monitoring process will be split into three stages:

- **Pre-construction and during construction (monitoring)**
  - Baseline data will be based on historic (pre-2020) surveys, with limited additional surveys undertaken in 2020 before Scheme construction starts
  - Data to monitor Scheme delivery will be collected during construction
- **One-year after (monitoring and evaluation)**

- Data to monitor Scheme performance will be collected at least one year (but less than two years) after Scheme opening.
- An initial "One Year After"' report will be published within two years of Scheme opening, focusing on the Scheme's outcomes

- **Five-years after (monitoring and evaluation)**
  - Further data will be collected up to approximately five years after Scheme opening
  - A final "Five Years After" report will be published within six years of Scheme opening, based on analysis of all the data available, including an assessment of the wider impacts of the Scheme

4.5 MEASURES TO BE MONITORED

4.5.1. The measures which will be monitored for the enhanced evaluation of the Scheme are set out in Table 4-1 below.

Table 4-1 – Measures to be monitored

Item	Requirement	Type of measure	When data will be collected	Fuller evaluation rationale
Scheme build	Standard/Full	Input	During construction	Process and economic evaluation
Scheme costs	Standard	Input	During construction, and one year after opening	
Delivered Scheme	Standard	Output	During construction, and one year after opening	Process evaluation
Scheme objectives	Standard	Outputs, outcomes or impacts	Up to five years after opening	Impact evaluation
Travel demand	Standard	Outcome	Before construction, one and five years after opening	Impact evaluation
Travel times and reliability	Standard	Outcome	Before construction, one and five years after opening	
Impact on the economy	Standard	Impact	Before construction, one and five years after opening	Impact evaluation
Carbon	Standard	Impact	Before construction, one and five years after opening	Impact evaluation
Noise	Enhanced	Impact	During construction, one and five years after opening	
Local air quality	Enhanced	Impact	During construction, one and five years after opening	

Item	Requirement	Type of measure	When data will be collected	Fuller evaluation rationale
Accidents	Enhanced	Impact	Up to five years before construction, and up to five years after opening	

4.5.2. 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. 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.

4.5.3. This document describes how data will be collected and analysed to monitor the Scheme's performance in each of these areas.

4.6 STUDY AREA

4.6.1. The study area is illustrated in Figure 4-1. Within this area, the focus will be on the area where the Scheme is expected to have most impact. Impacts outside the study area are likely to be minimal and will not be monitored.

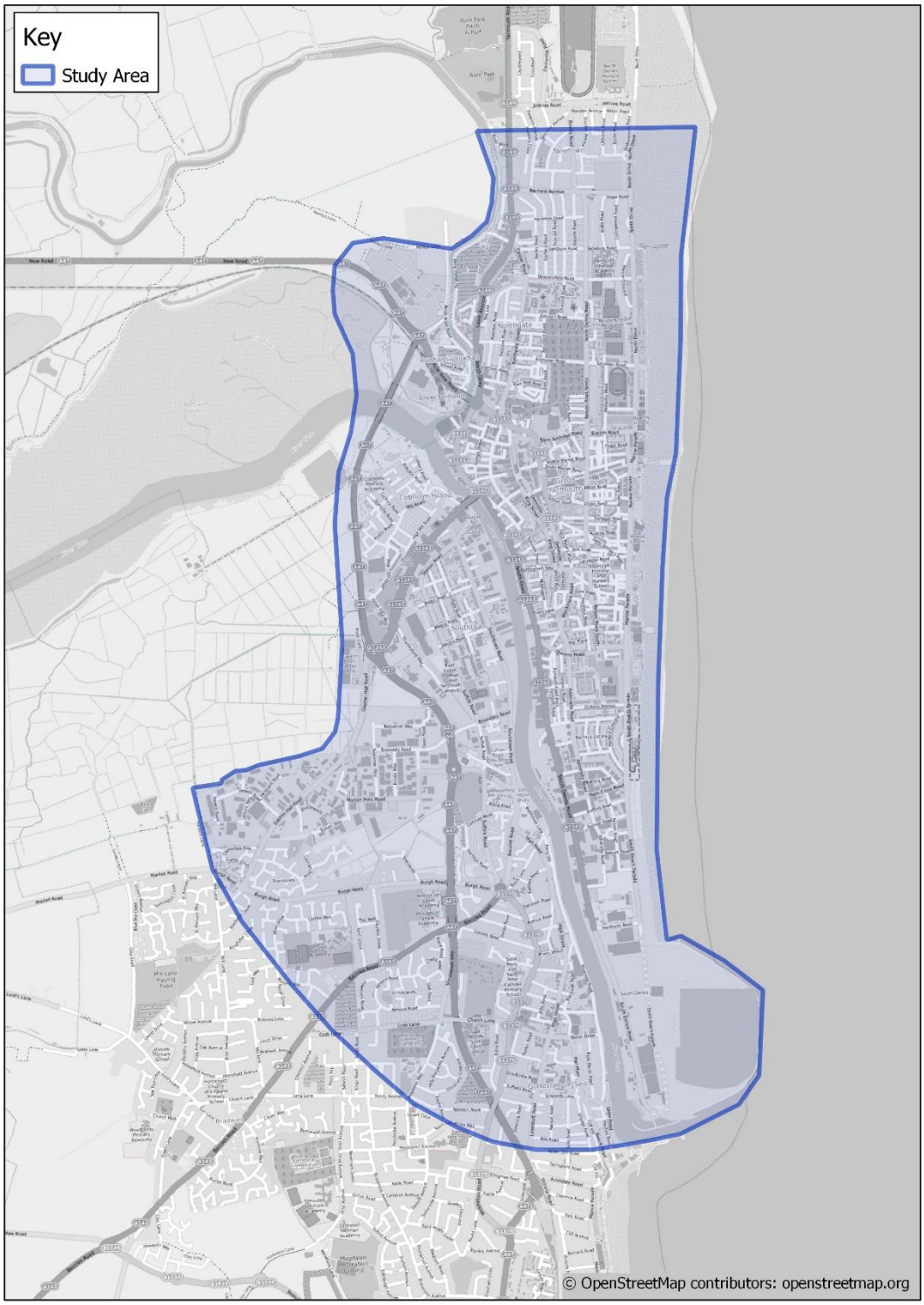


Figure 4-1 - Study Area

5 DATA REQUIREMENTS AND DATA COLLECTION METHODS

5.1 MONITORING AND EVALUATION OF SCHEME BUILD, COSTS AND DELIVERED SCHEME

SCHEME BUILD

5.1.1. Data on the progress of the construction works will be collected continuously throughout the construction period and monitored against the project plan and key milestones on a monthly basis.

5.1.2. Progress will be reported in the “One Year After”’ report within two years of the Scheme opening.

5.1.3. This report will also review the effectiveness of engagement with Stakeholders during construction and upon the opening of the Scheme, to learn lessons that can be applied to other schemes. Details of the principal stakeholders and NCCs communication with them are set out in Section 8 below.

5.1.4. The report will also describe how risks were identified, managed and mitigated during construction.

5.1.5. The main source of data on Scheme build, including risk management and stakeholder management, will be the regular reports to the Project Board, which will meet monthly. The Project Manager is responsible for day to day execution of the project plan, for monitoring the progress of the project, and for maintaining a Risk Register/Log.

Fuller evaluation of scheme build.

5.1.6. The evaluation will go beyond a desk-based review of key documents to encompass a systematic approach to obtaining feedback from:

- key stakeholders
- delivery partners
- transport users
- local communities
- businesses.

5.1.7. This will be undertaken principally through existing channels of communication with stakeholders, as detailed in separate document, the Communications Strategy 2020 (Appendix A) and summarised in Chapter 8 below.

5.1.8. Extensive engagement has already taken place throughout the development of the Scheme and this will continue throughout the construction period and reported in the “One-year after” Monitoring and Evaluation Report.

5.1.9. The process will include:

- **Providing quality information:** Appointment of a Public Liaison Officer to ensure stakeholders are well-informed throughout construction, complemented by the regular updating of the NCC Scheme website, press releases and a monthly newsletter requesting feedback from stakeholders.
  (More detail is given in Table 8-1 below.)
- **Recording and reporting all feedback received:** All communications with stakeholders (face-to-face conversations, emails, telephone calls, social media etc.) will be recorded on an online portal and reviewed at bi-weekly and monthly meetings to ensure continual improvement.

- **Actively seeking feedback from stakeholders:** Online questionnaires and satisfaction surveys will be offered to all on the stakeholder list (see Section 8.2 below)
- **Actively seeking detailed, informed, feedback from key players:** In-depth, targeted interviews will be arranged with key stakeholders (e.g. Peel Ports, the LEP, Portfolio holders etc.) and with key personnel involved with the project (project manager, finance officers, contractor, public liaison officer etc.)

5.1.10. This approach will be modelled on the approach used successfully by NCC on the Norwich Northern Distributor Road project (completed 2018).

5.1.11. Based on the information gathered during and post-construction, the reporting will cover:

- **Scheme context** – a description of the context at the time of planning. Significant changes in context will be documented during construction to help determine whether similar results may be expected in other areas, or whether the results are specific to Great Yarmouth.
- **Scheme inputs** – an assessment of the critical success factors and any key obstacles to resourcing the scheme (e.g. staffing, skills and expertise, securing approvals, accessing materials and services)
- **Risk management** – an assessment of the effectiveness of the risk management strategy and mitigation measures on key risks, including safety during construction, delays and any negative impacts on transport users.

5.1.12. Inevitably, the uncertainties associated with Covid-19 and its economic impacts will be addressed in this reporting, but an in-depth case study of these unprecedented impacts is not proposed, as it is not considered proportionate.

COSTS

5.1.13. Out-turn data on all expenditure associated with the Scheme will be monitored against spending plans on a monthly basis throughout the delivery period using NCC's financial monitoring system.

5.1.14. To enable comparisons to be made, costs will be reported as actual (out-turn) expenditure by financial year in at least the level of detail given the Financial Case of the FBC:

- Construction contracts
- Utilities
- Land
- Fees (Design, surveys, procurement, supervision etc)

5.1.15. Where a variation in cost is attributable to an element of risk identified in the original estimates, this will be highlighted. If there have been cost over-runs, or if savings have been made, the reasons for these will also be identified.

5.1.16. Total expenditure will be disaggregated by funding stream, and compared with that in the FBC:

- Government Funding (DfT Local Majors Fund)
- Local contribution (NCC)
- Third Party Contribution (LEP)

5.1.17. A description of the underlying sources of local contribution (e.g. Business rates, Community Infrastructure Levy, Section 106 contributions etc.) will be given.

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

5.1.19. Expenditure will be reported in the "One Year After"' report within two years of the Scheme opening, and updated as necessary in the final report, which will also include an estimate of operating costs (which are unlikely to be available at the first stage).

DELIVERED SCHEME

5.1.20. Any changes to the Scheme since funding approval will be monitored during delivery and reported in detail in the post-opening report within one year of the Scheme opening, together with a clear map of the delivered Scheme.

5.1.21. Any changes to the way the Scheme is operated (e.g. bridge openings) will be monitored and the reasons for such changes outlined in the "One Year After"' report.

5.1.22. Any changes to the associated mitigation measures will be monitored during delivery and the reasons for such changes outlined in the "One Year After"' report.

5.1.23. A simple assessment will be made of whether the Scheme has reached the intended beneficiaries. Initially this will be based on overall levels of use, determined from classified traffic counts on the bridge and reported in the "One Year After"' report.

Fuller evaluation of delivered scheme

5.1.24. If usage of the Scheme is significantly different from expectations, this will be investigated in more detail and the likely reasons set out in the report. It will triangulate evidence from the standard and enhanced monitoring with evidence from post-opening consultation and interviews (as set out in paragraphs 5.1.6ff) to assess:

- **Scheme outputs** – whether the scheme has been delivered to the quality standard expected and meets the requirements of the business case (FBC), including the needs of stakeholders and end users.
- **Assessment of causal pathways** – whether the scheme has been delivered as intended and is on track to achieve the intended outcomes and impacts as envisaged in the logic map (Figure 3-1 above). If the outputs differ from what was expected, why has this happened and what impacts will it have on the delivery of the outcomes and impacts?

5.2 MONITORING AND EVALUATION OF OUTCOMES AND IMPACTS

TRAVEL DEMAND

5.2.1. To assess whether the Scheme has had its anticipated effect on travel patterns, data will be collected on:

- Road traffic flows
- Public transport impacts (bus and coach)
- Pedestrians and cyclists

5.2.2. Monitoring of travel demand will be undertaken before construction and one year and five years after the opening of the Scheme.

Road traffic

Historic traffic data – 2015 and 2016

5.2.3. Existing data sources were collated, and extensive traffic data surveys were undertaken in 2015 and 2016 for the development of the traffic models. They included automatic number plate recognition (ANPR) surveys, roadside interviews (RSI), manual classified counts (MCC) and automatic traffic counts (ATC) as follows:

- Automatic Number Plate Recognition (ANPR) at 36 locations;
- Roadside Interview (RSI) surveys on nine main roads in Great Yarmouth;
- Count data from 62 Automatic Traffic Counts (ATCs) and 69 Manual Classified [junction turning] Counts (MCCs);
- Queue length surveys at 20 locations; and
- Count data from permanent counters from Highways England's WebTRIS database at four locations along the A47.

5.2.4. The roadside interview surveys were conducted between 7 a.m. and 7 p.m. on the 10th and 24th November 2016. MCCs were conducted alongside the roadside interview surveys on the same day. ATCs were undertaken for two weeks around the roadside interview survey date to allow adjustments to be made for day to day variability.

5.2.5. The MCC counts were classified into:

- Car
- Taxi
- LGV
- OGV1
- OGV2
- Bus/coach
- Motorcycle
- Pedal cycle

Historic traffic data – 2018

5.2.6. The 2015/2016 data was supplemented by additional surveys in 2018. These included:

- ATCs at 20 locations undertaken for a two-week period between 6th March and 20th March 2018; and
- MCCs at 15 locations undertaken on 8th March 2018

5.2.7. These MCCs were undertaken between 7 a.m. and 7 p.m. on the dates shown, and classified into:

- Pedal cycle
- Motorcycle
- Car
- LGV
- OGV1
- OGV2
- Bus/coach

Traffic data to be collected for monitoring and evaluation

5.2.8. The historic surveys represent the "before" scenario in considerable detail. They will form the basis for the forecasts of the traffic impacts of the Scheme. For monitoring and evaluation purposes, a much smaller data set will be collected. However, the option remains to investigate traffic impacts at any of the historic sites by means of additional surveys, should the need arise in the future.

Sites for monitoring

5.2.9. Traffic monitoring will be based upon new MCC and ATC counts at a selection of the locations for which equivalent historic data is already available. These will enable us to determine:

- The volume of traffic using the Scheme
- The effect of the Scheme on the volume of traffic using the existing two bridges
- The effect of the Scheme on the volume of traffic using other roads in Great Yarmouth

5.2.10. Traffic data will be collected by means of:

- MCCs between 7 am and 7 pm on a weekday
- ATCs over at least one week, including the dates of the MCCs

5.2.11. Data will be classified into:

- Pedal cycle
- Motorcycle
- Car
- LGV
- OGV1
- OGV2
- Bus/coach

5.2.12. The proposed MCC and ATC survey sites are shown in Figure 5-1 and listed in Table 5-1 and Table 5-2. Except for sites on the Scheme itself, these are all sites for which historic data is available.

"Before" monitoring

5.2.13. As noted in section 1.4 above, the 2020 coronavirus pandemic means that the "before" monitoring will be based largely on the historic ATC and MCC data. This is because counts taken in 2020 are likely to be atypical. However, to understand the developing situation better, a limited set of new ATC counts will still be undertaken in 2020, prior to the start of construction, at:

- Breydon Bridge
- Haven Bridge

5.2.14. ATC data will also be obtained, as far as possible, for existing WebTRIS sites on the A47 (see Figure 5-1 below) covering the period from 2015 to 2020 in order to determine background changes to traffic over that period, and to allow historic surveys to be adjusted to represent 2020 levels.

5.2.15. A very limited set of new MCC counts will also be undertaken in 2020, prior to the start of construction at:

- North Quay / South Quay / Bridge Road, including pedestrian counts
- A1243 Pasteur Rd / Bridge Rd / Southtown Road, including pedestrian counts
- South Denes Road (at site of future new signal-controlled junction)

5.2.16. This approach will help to separate out the effects of the pandemic from those of the Scheme, although this remains a problem, especially if there are any longer-term impacts of the pandemic or a resulting economic recession.

"After" monitoring

5.2.17. A carefully selected sub-set of the historic MCC and ATC sites will then be re-surveyed:

- at least one year (but less than two years) after Scheme opening
- approximately five years after Scheme opening

5.2.18. The new MCCs will be undertaken at 12 locations across Great Yarmouth, as set out in Table 5-1 and illustrated in Figure 5-1 . For these locations, historic MCC data is also available from the surveys in 2015, 2016 or 2018, as set out in Table 5-1. This should help identify any changes in traffic patterns which occur before the Scheme opens and are therefore not a result of the Scheme.

5.2.19. The MCCs include both the existing bridges, the new bridge and approach junctions to the three bridges. They should provide a comprehensive and detailed picture of the local traffic impacts of the Scheme and any developments that occur within five years of its opening.

5.2.20. The MCCs will include counts at the key junctions identified in the Transport Assessment as requiring post-Scheme monitoring:

- A47/William Adams Way (Harfrey's Roundabout)
- Pasteur Road/Bridge Road / Southtown Road
- North Quay/South Quay/Bridge Road
- South Quay/Yarmouth Way
- A47/Acle New Road (Vauxhall Roundabout)
- A47/Pasteur Road (Gapton Roundabout)
- A47/A143 Beccles Road
- William Adams Way / Southtown Road junction

5.2.21. Because the MCCs will be for one day only, ATCs be undertaken to monitor traffic over a longer period of time – at least a week. ATCs will also be undertaken at locations further from the Scheme, to monitor its impacts on key routes within the town.

5.2.22. The 15 proposed ATC locations are set out in Table 5-2 and illustrated in Figure 5-1. The sites indicated as WebTRIS counts are part of Highways England's continuous traffic monitoring network and may be able to provide data without the need for additional surveys. If data is not available for the period required, these surveys will need to be undertaken together with the other ATCs.

5.2.23. The ATC data will show the impact of the Scheme on drivers' route choice journeys that cross the River Yare. The Scheme will enable the creation of a new, high standard, route into the South Denes industrial area, seafront and port and is expected to lead to reductions in traffic on the existing routes across the River Yare, especially the Haven Bridge.

5.2.24. The ATCs will also show the pattern of use of the new river crossing by day of the week, as well as by hour of the day.

5.2.25. The changes in traffic flow identified from the MCC and ATC surveys will be compared with the changes forecast by the traffic modelling for the Scheme, and any significant variances discussed in the Monitoring and Evaluation Reports.

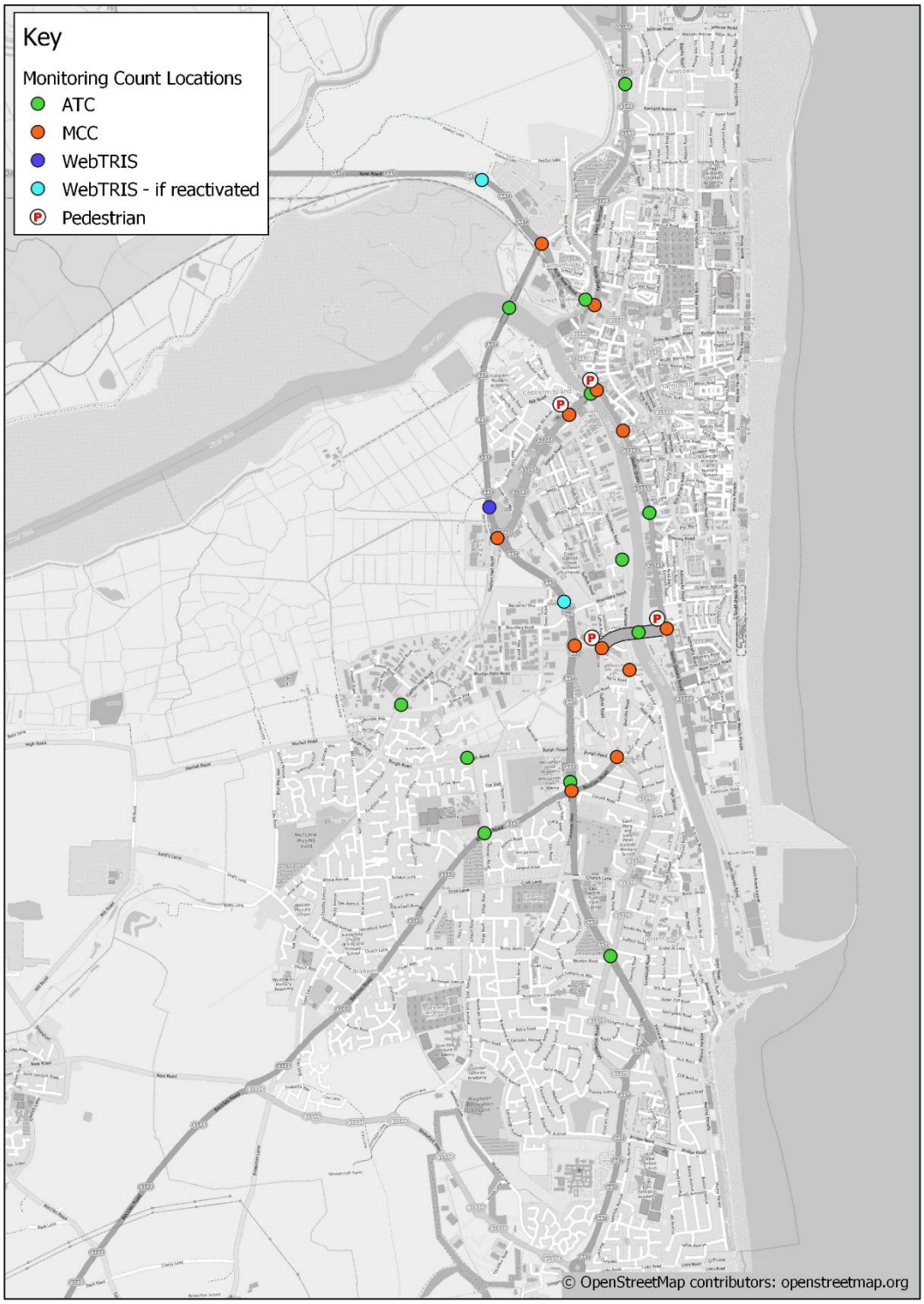


Figure 5-1 – Proposed ATC and MCC Surveys

Table 5-1 – Proposed MCC surveys

No	Site	Historic data available	2020 before opening	1 year after	5 years after
1	A47 Vauxhall Roundabout	MCC – 2018		✓	✓
2	Fullers Hill Roundabout	MCC – 2018		✓	✓
3	North Quay / South Quay / Bridge Road	MCC – 2018	✓ + peds	✓ + peds	✓ + peds
4	A1243 Pasteur Rd / Bridge Rd / Southtown Road	MCC – 2018	✓ + peds	✓ + peds	✓ + peds
5	A47 Gapton Hall Roundabout	MCC – 2018		✓	✓
6	Harfrey's Roundabout	MCC – 2018		✓	✓
7	William Adams Way / Third River Crossing	N/A		✓ + peds	✓ + peds
8	A1243 South Denes Road/Third River Crossing	N/A	✓ S Denes Rd only	✓ + peds	✓ + peds
9	Southtown Road / William Adams Way / Beccles Road	MCC – 2018		✓	✓
10	Burgh Road / A143 Beccles Road	MCC – 2018		✓	✓
11	A47 / A143 Beccles Road	MCC - 2016		✓	✓
12	South Quay / Yarmouth Way	MCC - 2018		✓	✓

Walking and cycling

Walking

5.2.26. Pedestrian counts will be undertaken alongside the MCCs on both sides of Haven Bridge, and both sides of the Scheme once open. This will enable monitoring of the total number of pedestrian trips across the River Yare, the numbers of people walking over the new bridge, and the extent to which these are new pedestrian trips or diversions to the Scheme from the existing bridges.

Cycling

5.2.27. Cycles, including non-carriageway flows, will be counted at all the MCC locations in Figure 5-1. This will enable monitoring of the total number of cycle trips crossing the River Yare, and the extent to which cycle trips transfer to the Scheme from the existing bridges. Cycling trips recorded in the MCCs may be affected by day-to-day variations in weather, but cycle data from the ATC locations shown in Figure 5-1 will provide a clearer view, as well as tracking cycling trends over a larger area.

Table 5-2 – Proposed ATC surveys

No	Site	Historic data available	2020 before opening	1 year after	5 years after
1	A149 Lawn Avenue	ATC – 2018		✓	✓
2	A47 Acle New Road	WebTRIS count – available to 2020		✓	✓
3	A149 Acle New Road – River Bure	ATC – 2018		✓	✓
4	A47 – Breydon Bridge	ATC – 2018	✓	✓	✓
5	Haven Bridge	ATC – 2018	✓	✓	✓
6	A47 – North of Gapton Roundabout	WebTRIS count – active	✓	✓	✓
7	A1243 South Quay	ATC – 2016		✓	✓
8	Southtown Road	ATC – 2018		✓	✓
9	A47 – North of Harfrey's Roundabout	WebTRIS count – available to 2020	✓	✓	✓
10	Third River Crossing	N/A		✓	✓
11	Gapton Hall Road	ATC – 2018		✓	✓
12	Burgh Road	ATC – 2018		✓	✓
13	A47 – North of Beccles Road	ATC – 2018		✓	✓
14	A143 Beccles Road	ATC – 2018		✓	✓
15	B1370 Middleton Road	ATC – 2018		✓	✓

Public transport

5.2.28. Buses and coaches will be counted at all the MCC locations. This will enable monitoring of the total number of buses and coaches crossing the River Yare, and the extent to which buses and coaches transfer to the Scheme from the existing bridges.

5.2.29. In addition, information on timetabled bus routes will be obtained from the local bus operator, First Bus. This will identify whether any bus routes or service timings have been changed to make use of, or because of, the Scheme.

5.2.30. Public transport patronage will not be surveyed directly, but data will be obtained from the operator, First Bus, to gain an overview of:

- Changes in bus use in the study area
- Changes in bus use associated with the scheme.

5.2.31. To obtain a baseline, bus patronage data for 2019 will be obtained for the local bus services which operate within, or pass through, Great Yarmouth[2]. Corresponding data from evaluation years (one year after and five years after) will then be obtained.

5.2.32. Bus patronage data at a route by route level is considered commercially sensitive. It is therefore proposed that the data will be aggregated, and any changes reported in terms of the percentage difference from the base.

5.2.33. It will be difficult to separate out any scheme impacts (which are likely to be relatively small as it is not primarily a public transport scheme) from the potentially larger impacts of Covid-19 in the short, medium and long term. To try to determine this in more detail would not be proportionate.

Census data

5.2.34. The UK census collects data on modes of transport for journeys to work and provides useful background information on travel patterns and trends. The last census was in 2011, and the next will be in 2021 and 2031. These timings mean that information from the census cannot be used to determine the specific impacts of the Scheme on travel behaviour for the "One Year After" and Five Year After" Monitoring and Evaluation Reports, though it will, eventually, provide insight into longer term changes in behaviour.

Fuller evaluation of travel behaviour

5.2.35. Using the objective measures of travel demand set out in the standard measures section, any evidence of **mode shift** will be reported and commented on. Although mode shift is not one of the Scheme objectives, we will look for evidence of change in levels of walking, cycling and bus use into the Great Yarmouth peninsula that can be directly attributed to the Scheme. In the unlikely event that the Scheme appears not to have an impact on walking and cycling, we will seek to understand the reasons why.

5.2.36. This highlights an important point about fuller evaluation. The questions asked in targeted interviews with key players (Paragraph 5.1.9 above) will to some extent be determined by the results of the standard/enhanced evaluation, as will the brief given to the independent evaluator (Paragraph 4.2.9 above).

5.2.37. Additional travel surveys, beyond those detailed in this Plan, are not proposed but, where appropriate, comparisons may be made with other data already available to NCC – e.g. national traffic data and data from other schemes and places.

TRAVEL TIMES

5.2.38. Monitoring the Scheme's impacts on travel times is very important, as they are critical to the success of the Scheme and the generation of economic benefits. The Scheme is expected to reduce travel times in two ways:

- It will enable some drivers to choose shorter, quicker routes via the new bridge

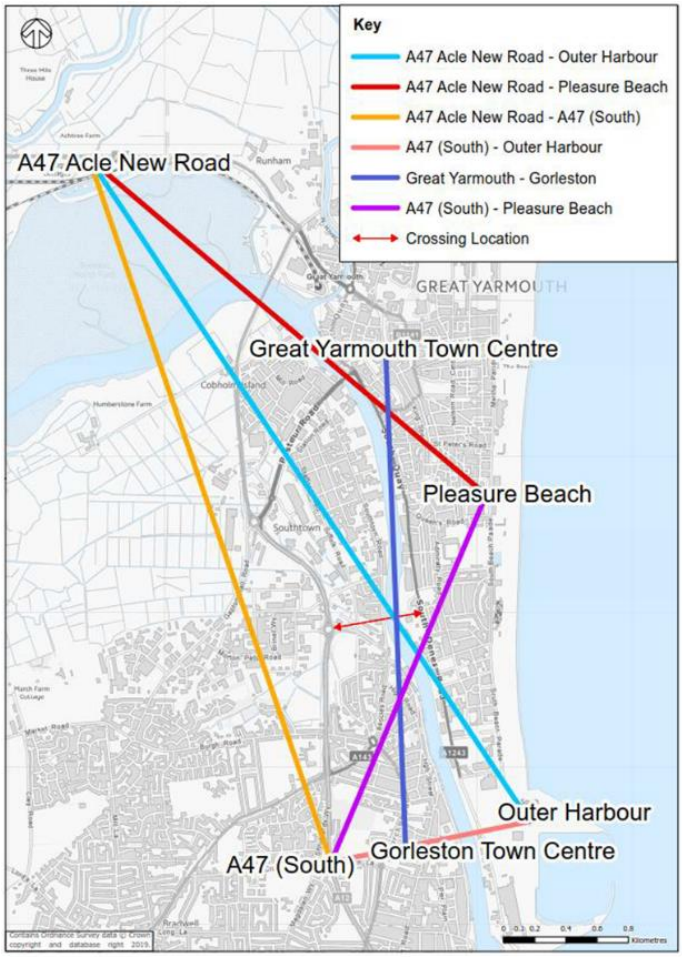
[2] Services 1,1A, 2, 5, 6, 6B and 8.

- It will create extra road capacity and reduce congestion and delay on roads relieved of traffic

5.2.39. A set of six key journeys was defined in the Transport Assessment (TA) to determine the forecast journey time impacts, and these will form the basis for further monitoring and evaluation. The journeys are described below and illustrated in Figure 5-2.

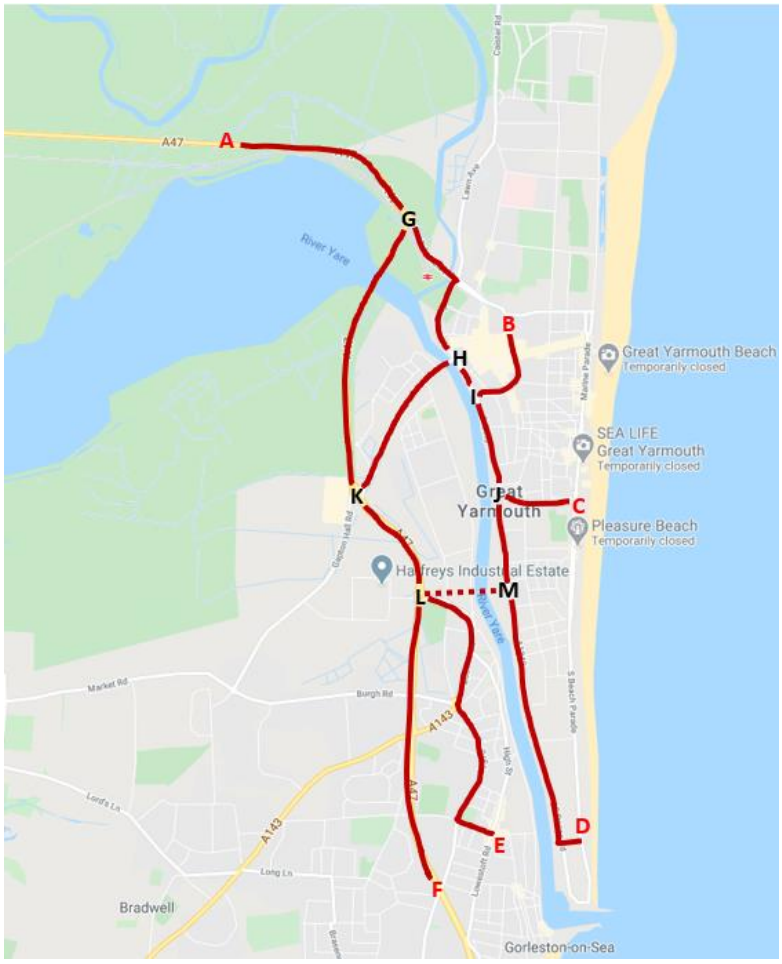
- A – D (Between A47 Acle New Road and the Outer Harbour)
- A – C (Between A47 Acle New Road and the Pleasure Beach (St Nicholas' Car Park))
- A – F (Between A47 Acle New Road and A47 (south))
- F – D (Between A47 (south) and the Outer Harbour)
- F – C (Between A47 (south) and the Pleasure Beach (St Nicholas' Car Park))
- B – E (Between Great Yarmouth Town Centre and Gorleston (Library))

Figure 5-2 – Origins and destinations for journey time monitoring



5.2.40. For each of these representative journeys, the quickest route will be identified. In some cases (e.g. between A47(S) and the Outer Harbour) journeys are expected to re-route via the new bridge. In other cases (e.g. between A47(S) and A47 Acle New Road) the route will be the same, but the journey is likely to be different as a result of changes in traffic flow associated with the new bridge. And in some cases (e.g. Outer Harbour to A47 Acle New Road) the Scheme will create a potentially shorter route (via the new bridge, A47 and Breydon Bridge) but some trips will remain on the old route (via the town centre and avoiding all river crossings).

Figure 5-3 - Routes for journey time monitoring



5.2.41. Travel time data will be obtained for a set of 15 route segments, as illustrated in Figure 5-3. Journey times on these will be obtained from Trafficmaster GPS data for a period of at least one week. Data will be disaggregated by time period. The data will be obtained:

- In Spring 2020 (i.e. prior to the coronavirus pandemic)
- In 2020, prior to start of construction
- One year after opening
- Five years after opening

5.2.42. The total time for each of the journeys indicated in paragraph 5.2.39 will be calculated for each potential route, before and after the Scheme opening, as indicated in Table 5-3.

Table 5-3 – Calculating journey times

Route	Before opening	After opening Existing route	After opening Route via Scheme (L-M)
A-D	A-G-H-I-J-M-D	A-G-H-I-J-M-D	A-G-K-**L-M**-D
A-C	A-G-H-I-J-C	A-G-H-I-J-C	A-G-K-**L-M**-J-C
A-F	A-G-K-L-F	A-G-K-L-F	n/a
F-D	F-L-K-H-I-J-M-D	F-L-K-H-I-J-M-D	F-**L-M**-D
F-C	F-L-K-H-I-J-C	F-L-K-H-I-J-C	F-**L-M**-J-C
B-E	B-I-H-K-L-E	B-I-H-K-L-E	B-I-J-**M-L**-E

5.2.43. As well as looking at these key routes, we will also look in detail at each of the 15 links surveyed. ATC or MCC data will also be available for these links, so it will be possible to determine whether observed journey time changes are a result of changes in traffic flow, or whether they are, for example, due to changes in road layout.

5.2.44. Journey time (and ATC) data will be disaggregated by time period, enabling periods of congestion to be identified and changes in congestion levels to be monitored. As journey times will have been measured for individual vehicles, variations in these times (expressed as standard deviation from the mean) can be used as an indication of journey reliability.

5.2.45. Consideration has been given to whether reliability should be evaluated by mode. It was concluded that, given the nature of the roads in the study area, with very little opportunity for overtaking, reliability impacts are likely to be similar across all modes, and it would be better not to try to disaggregate this data further.

IMPACT ON THE ECONOMY

5.2.46. The Scheme is expected to have a positive impact on the economy by improving access to planned development sites in the areas identified for regeneration, providing additional capacity to accommodate growth, making it easier for people to get to work by a range of modes, and by improving the perceptions of the town (by reducing congestion and demonstrating a commitment to infrastructure investment). These are likely to be long-term impacts, and it is unlikely that significant change will be observed within one year of the Scheme opening.

5.2.47. Over the first five years after the Scheme opening, the following will be monitored:

- Number, location and size of new employment sites delivered in the study area, and the number of jobs associated with these
- New business start-ups and closures in the study area
- Local employment statistics and comparisons with national and regional trends.
- Gross Value Added (GVA) headline data
- Indices of multiple deprivation (IMD)

5.2.48. Data on the economy and employment will be obtained from Norfolk Insight[3], the ONS NOMIS database and planning data held by NCC and Great Yarmouth Borough Council (GYBC). In most cases the information is available annually. Generally, data is available for the whole of Norfolk and the whole of Great Yarmouth. Some employment data and IMD data are available at Local Super Output Area (LSOA) level. Local planning data is, of course, available for individual sites.

Fuller evaluation of impacts on the economy

5.2.49. The next few years are expected to be a time of unprecedented economic upheaval, and it would be unrealistic to expect to be able to determine in any detail the extent to which the Scheme has helped to mitigate this for Great Yarmouth. There is no "dependent development" as strictly defined in WebTAG, but the Scheme has been designed to greatly improve the accessibility of the Port and regeneration areas on the peninsula. For this reason, the stakeholder consultations (e.g. with Peel Ports), and targeted interviews with key players (e.g. Economic Development officers and the LEP) described in Paragraph 5.1.9 above will be the main way of exploring this important issue. Events and measures picked up in the standard and enhanced monitoring (such as progress or otherwise of a key development proposal) will also inform the brief given to the independent evaluator (Paragraph 4.2.9 above).

5.2.50. The assessment of impacts on the economy is examined further in Section 5.3 below which considers the monitoring of scheme objectives related to the promotion of economic and employment growth (particularly in the Enterprise Zone) and support for the offshore energy industry.

CARBON

Operational Phase

5.2.51. The Scheme is forecast to achieve a reduction in emissions of carbon and other greenhouse gases (GHGs), compared with the emissions that would occur in a "do minimum" scenario. It is not possible to measure this impact directly. However, emissions are a direct consequence of vehicles using the road network, and changes in emissions can be estimated from changes in traffic volume and speed.

5.2.52. In the Scheme appraisal, reported in the FBC, changes in emissions were estimated directly from the outputs of the traffic model using Transport User Benefit Appraisal (TUBA) software. It would not be practicable to replicate this process for the "One Year After" and "Five Year After" Monitoring and Evaluation Reports, as this would require re-calibration of the traffic model, and this is not

[3] Norfolk Insight is a locality-focused information system providing data and analysis for neighbourhoods in Norfolk and Waveney. It contains over 5,000 indicators that are all from open data sources – such as Office for National Statistics (ONS), Department for Work and Pensions (DWP), Public Health England and other sources. Through data, reports and analysis, Norfolk Insight provides a comprehensive picture of Norfolk and Waveney. Much of the data is uploaded annually, and may be disaggregated, e.g. to wards, parishes or Lower Super Output Areas (LSOAs) to give a detailed view of economic activity.

considered proportionate. Furthermore, it would not give a definitive answer as, once the Scheme is open, it will no longer be possible to observe the “do minimum” scenario.

5.2.53. Instead, the traffic volume and speed data collected for the one-year after and five years after will be compared with those forecast in the traffic model. If they correlate with the modelled data, it will be reasonable to conclude that the changes in emissions are in line with the forecasts.

5.2.54. If, however the traffic surveys show that the Scheme is not having the expected impacts on traffic, this would cast doubt on the forecast changes in carbon and other GHGs.

Fuller Evaluation of Carbon Impacts

5.2.55. The predicted reduction in carbon and other GHGs emissions was based on data available at the time of writing. Forecast changes in greenhouse gas emissions may result from different traffic behaviour and other measures such as the uptake of electric vehicles and vehicle fuel consumption data. Future predictions of such aspects will contain a degree of uncertainty and should be taken into consideration when evaluating future carbon and other GHGs emissions and comparing them to the model provided in the ES. If traffic data based on traffic counts from future traffic surveys was modelled, it would be possible for the carbon and other GHGs emissions to be re-calculated using the latest guidance available at the time to re-assess the emissions.

NOISE

Baseline

5.2.56. Baseline noise monitoring was completed in March (weekday) and April (weekend) 2018. The baseline noise monitoring was undertaken at a series of locations around the Principal Application Site, as shown on Figure 5-4 – Noise Monitoring Locations below. These locations are considered representative of the nearest Noise Sensitive Receptors (NSRs) to the Scheme. The survey timings were representative of normal conditions, local road works and maintenance activities were avoided.

5.2.57. The aim of the baseline noise monitoring was to determine construction noise thresholds and to establish the general noise climate in the area near to the Scheme.

5.2.58. Both the locations and the durations of the baseline noise monitoring were agreed with Great Yarmouth Borough Council.

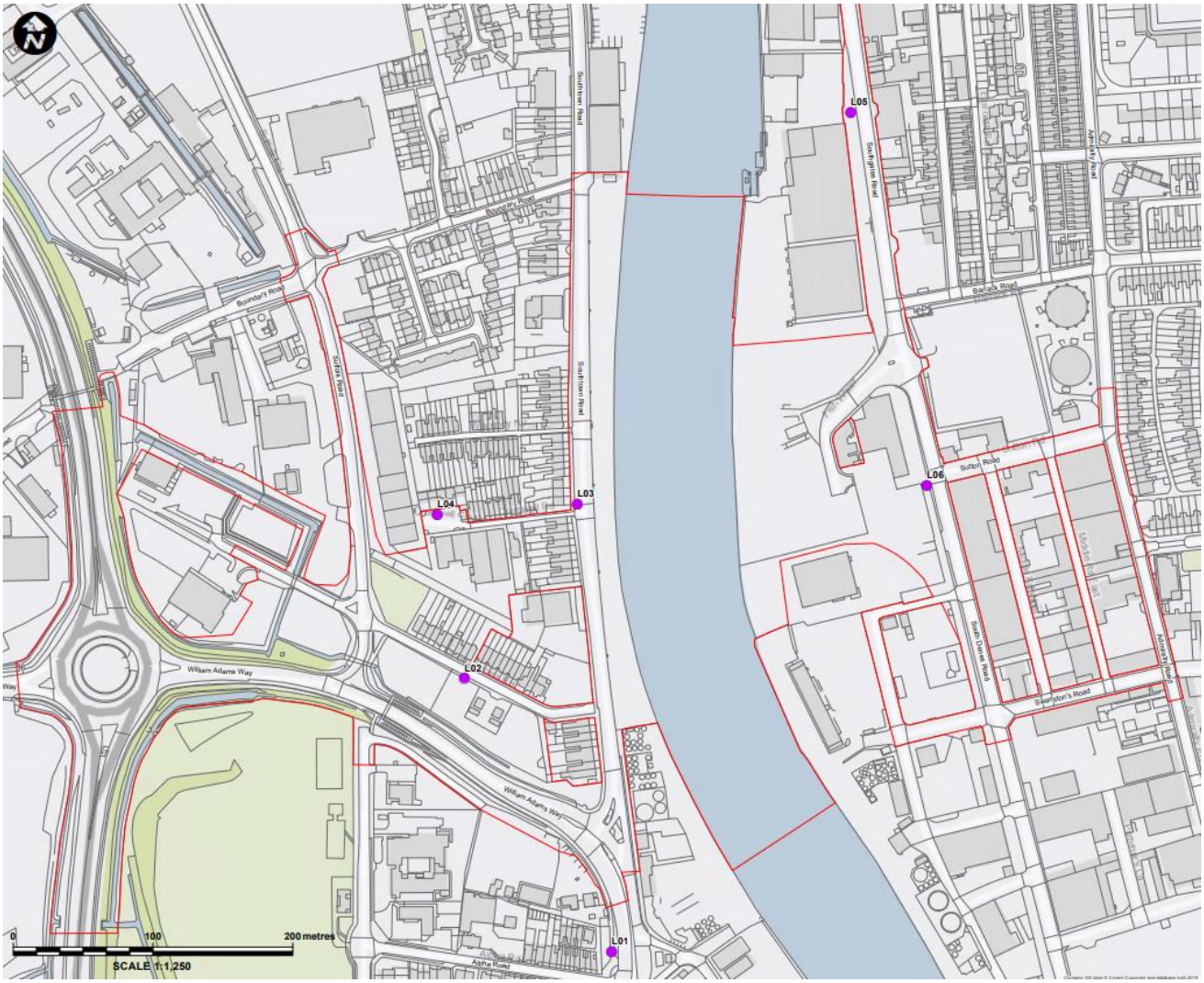


Figure 5-4 – Noise Monitoring Locations

Construction Phase

5.2.59. The Contractor will complete noise monitoring during the construction phase of the Scheme and is required to prepare a full Code of Construction Practice (CoCP)[4] setting out the proposals in detail. The construction noise and vibration monitoring will be completed for the following reasons:

- To measure the performance of noise and vibration control measures;
- To ascertain noise and vibration from items of plant;
- To provide confirmation that noise and vibration thresholds are not exceeded.

4 For reference, the Outline CoCP can be found here: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010043/TR010043-000916-NCC-GY3RC-EX-073_Update%20to%20Outline%20Code%20of%20Construction%20Practice%20Clean.pdf

5.2.60. The proposed programme of monitoring will be set out by the Contractor in the full CoCP.

5.2.61. The monitoring locations will be agreed with the county planning authority in consultation with Great Yarmouth Borough Council. The locations selected will be representative of the NSRs to the Scheme, and therefore those most likely to be adversely affected by noise.

Operational Phase

5.2.62. A series of noise monitoring will be undertaking during the operational phase of the Scheme as requested by the DfT. The scope of the noise monitoring will be as follows:

- Post Scheme Opening – for a period of two weeks; and
- 5 Years Post Scheme Opening – for a period of two weeks.

5.2.63. The noise monitoring will be undertaken simultaneously with traffic flow and weather monitoring. The monitoring will be undertaken will be completed at the same time of year will take place within a neutral month, where there is less seasonal variation.

5.2.64. The monitoring locations will be equivalent to those used for the noise monitoring undertaken during the construction phase. As aforementioned, the locations selected will be representative of the NSRs to the Scheme, and therefore those most likely to be adversely affected by noise.

5.2.65. The monitoring results will be presented within the “One Year After” Report and the “Five Years After” Report.

5.2.66. Detailed consideration was given to significant number of operational mitigation measures are part of the design development of the Scheme, none of which were considered practicable. These included changing location or alignment of the road, changing the height of the road, the use of low-noise thin surface course system, reducing traffic speed, and the use of roadside acoustic barriers, screens or bunds.

5.2.67. As the detailed design of the Scheme progresses and on completion of the construction phase continual reviews will be undertaken to ensure that the as-built Scheme is compliant with that which was assessed.

LOCAL AIR QUALITY

5.2.68. As part of the Environmental Statement (ES)[5] for the Scheme, studies into the effects of the Scheme on air quality have considered both its construction and operational phases. In particular, the assessment considered emissions associated with dust during the construction phase and vehicle emissions when the Scheme is operational.

5.2.69. There are no AQMAs designated within Great Yarmouth, and the nearest AQMA (Central Norwich) is considered too far away to be of relevance to the Scheme.

[5] *For reference, the Environmental Statement can be found here: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010043/TR010043-000465-6.1%20Environmental%20Statement%20(Vol%20I%20Written%20Statement).pdf*

Baseline

5.2.70. GYBC operate a network of 12 NO_2 diffusion tube monitoring sites and one continuous monitor within their jurisdiction for the purposes of Local Air Quality Management (LAQM).

5.2.71. GYBC previously operated an automatic continuous air quality monitor at Gorleston to monitor levels of NO_2 and PM_{10} within Great Yarmouth until it was decommissioned in 2016. A continuous monitor was subsequently installed along the South Denes Peninsula, measuring concentrations of NO_2, PM_{10} and $PM2_{.5}$. The South Denes monitor is situated to the east of the River Yare close to Fenner Road, approximately 570m to the south-east of the Scheme.

5.2.72. The annual mean PM_{10}, $PM_{2.5}$, and NO_2 concentrations at these locations demonstrate that there have not been any exceedances of the respective Air Quality Strategy (AQS) objectives for the period reviewed (2012-2018).

5.2.73. A check of the latest published LAQM Annual Status Report (ASR) for GYBC[6] indicated that there were no exceedances of either the annual, or short-term objectives at the South Denes continuous monitoring location in regard to NO_2, PM_{10} and $PM_{2.5}$ for 2018. Furthermore, annual statistics taken from the Air Quality England website[7] indicate that the respective AQS objectives have not been exceeded. An annual mean NO_2 concentration of 15 µg/m^3, and respective annual mean concentrations for PM_{10} (21 µg/m^3) and $PM_{2.5}$ (12 µg/m^3) were recorded at the South Denes monitoring site for 2019.

5.2.74. Annual mean NO_2 concentrations at the identified diffusion tube locations, obtained from GYBC for the period 2010 – 2017 inclusive, demonstrate that there has not been an exceedance of the AQS objective. The maximum monitored annual mean concentration recorded in the last two reported years (2016/2017) was 36.7 µg/m^3.

5.2.75. In addition, a Scheme-specific NO_2 baseline air quality monitoring survey, comprising of 40 diffusion tubes, was established for a five-month monitoring period from August 2017 to January 2018. All monitored values are well below the respective annual mean NO_2 AQS objective, the highest concentration of 30.8µg/m^3 recorded. Table 6.13 of the ES provides a summary of the Scheme-specific NO_2 baseline air quality monitoring programme.

5.2.76. Figure 6.17 of the ES presents the spatial locations of those monitoring sites incorporated within the model verification exercise completed for the operational phase local air quality assessment.

Construction Phase

5.2.77. The Contractor will implement a series of mitigation measures in regard to the respective air quality impacts of dust generation during the construction phase of the Scheme, as identified in Section 3 of

[6] Great Yarmouth Borough Council (2019) 2019 Air Quality Annual Status Report (ASR) [online] https://www.great-yarmouth.gov.uk/media/5003/2019-Air-Quality-Annual-Status-Report/pdf/Great_Yarmouth_ASR_2019_Final.pdf.

[7] Air Quality England (2020) Great Yarmouth South Denes Air Pollution Report [online] https://www.airqualityengland.co.uk/assets/downloads/airqualityengland-statistics-report-GYBC1-2019link.pdf.

the Outline CoCP. Section 3.3 of the Outline CoCP presents further information on the requirement for monitoring of dust deposition and real-time continuous PM_{10} in relation to construction activities.

5.2.78. The construction dust and PM_{10} monitoring will be completed for the following reasons:

- To ensure that the construction activities do not give rise to any exceedances of the air quality objectives for PM10 and/or PM2.5, or any exceedances of recognised threshold criteria for dust deposition/soiling;
- To ensure that the agreed mitigation measures to control dust emissions are being applied and are effective;
- To provide an 'alert' system with regard to increased emissions of dust, and a trigger for cessation of site works or application of additional abatement controls;
- To provide a body of evidence to support the likely contribution of the site works in the event of complaints; and,
- To help to attribute any high levels of dust to specific activities on site in order that appropriate action may be taken.

5.2.79. Given the proximity of receptors considered sensitive to construction dust and the medium to high risk rating with respect to potential dust impacts as presented within Chapter 6 of the ES, monitoring of dust and PM_{10} will be incorporated into the full CoCP, focusing on particularly sensitive locations adjacent to likely construction activity areas.

5.2.80. Agreement of dust deposition or real-time continuous PM_{10} monitoring locations with the county planning authority, in consultation with GYBC, will be required.

Operational Phase

5.2.81. Operational phase impacts are expected to be associated with changes to vehicle emissions caused by re-routing of traffic. Following the assessment presented within Chapter 6 of the ES, overall the air quality impacts are expected to be of negligible significance. More receptor locations / properties will see a moderate improvement (mostly to the north of the Scheme) in local air quality conditions than a moderate worsening (immediately adjacent to the Scheme, Blackfriars Road and Nelson Road Central). The assessment also presented that no sensitive receptors (residential, educational or health care properties, the King's Centre and ecological receptors within 200m of road links to the Scheme) will see an exceedance of any AQS objectives and respective EU Limit Values as a result of the operation of the Scheme. As a consequence, the local air quality impacts associated with the operation of the Scheme would not constitute a significant environmental effect.

5.2.82. It is, however, important to know what the actual impacts are. Air quality monitoring data will therefore be collated for the operational phase of the Scheme as requested by the DfT. The air quality monitoring data will be taken from the existing Great Yarmouth Borough Council network, used for the purposes of LAQM. The air quality monitoring data will be gathered from the diffusion tube monitoring and continuous monitor sites in close proximity to the Scheme. Data will be collected for PM_{10}, $PM_{2.5}$, and NO_2 concentrations.

5.2.83. The scope of the air quality monitoring will be as follows:

- Post Scheme Opening:
  - Hourly observations extracted from the South Dene monitoring station will be acquired on a monthly basis for NO_2, PM_{10} and $PM_{2.5}$, up to one-year Post Scheme Opening; and

- Correlation of monthly passive diffusion tube monitoring data from the Great Yarmouth Borough Council LAQM Network on a quarterly basis, with annual mean monitoring concentrations to be observed once data has been appropriately annualised and bias adjusted, as per DEFRA LAQM: TG16.

- 5 Years Post Scheme Opening:
  - Hourly observations from the South Dene monitoring station will be acquired on a monthly basis NO_2, PM_{10} and $PM_{2.5}$, for the fifth year of Post Scheme Opening, with annual mean statistics taken for each of the five years encompassing Post Scheme Opening; and
  - Passive diffusion tube data from the Great Yarmouth Borough Council LAQM Network will be correlated for each of the five years encompassing Post Scheme Opening.

5.2.84. The air quality monitoring data will be presented within the "One Year After"' report and the "Five Years After" report.

ACCIDENTS

5.2.85. Accident data is collected continuously and will be collated for all roads in the study area on an annual basis for five years and presented in the 'Five Years After' report. (The base data will be for five years prior to construction) The Scheme is forecast to have only a small impact on the total number of accidents in the study area. Because accidents are, thankfully, rare events statistics are subject to year to year variation and it is unlikely that any reliable conclusions could be drawn in the 'One Year After' report. Also, there are many other factors that can affect safety, and (as with carbon emissions) it is never possible to know how many would have occurred had the Scheme not been built.

5.2.86. Any accidents occurring on, or in the immediate vicinity of the Scheme itself, or on any roads or junctions where traffic monitoring shows that there have been changes in traffic or pedestrian flow, will be investigated to try to understand the possible reasons. If any unforeseen safety problems occur, remedial actions will be identified.

5.3 MONITORING AND EVALUATION OF SCHEME OBJECTIVES

OBJECTIVES SELECTED FOR MONITORING AND EVALUATION

5.3.1. Three of the Scheme objectives have been identified for monitoring and evaluation, as required by DfT guidance:

- **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 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 to and from the Great Yarmouth peninsula for pedestrians, cyclists and buses** … encouraging more sustainable modes of transport and reducing community severance

5.3.2. For the most part, the achievement of these objectives will be evaluated by means of the monitoring of outcomes and impacts described in detail in Section 5.2 above. Therefore, except where specifically stated below, no additional metrics or data collection is required for the monitoring and evaluation of scheme objectives.

Objective 1:

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)

5.3.3. The overall logic map, Figure 3-1, shows the mechanisms by which the Scheme is expected to achieve its objectives. The causal links specific to this objective are highlighted in Figure 5-5.

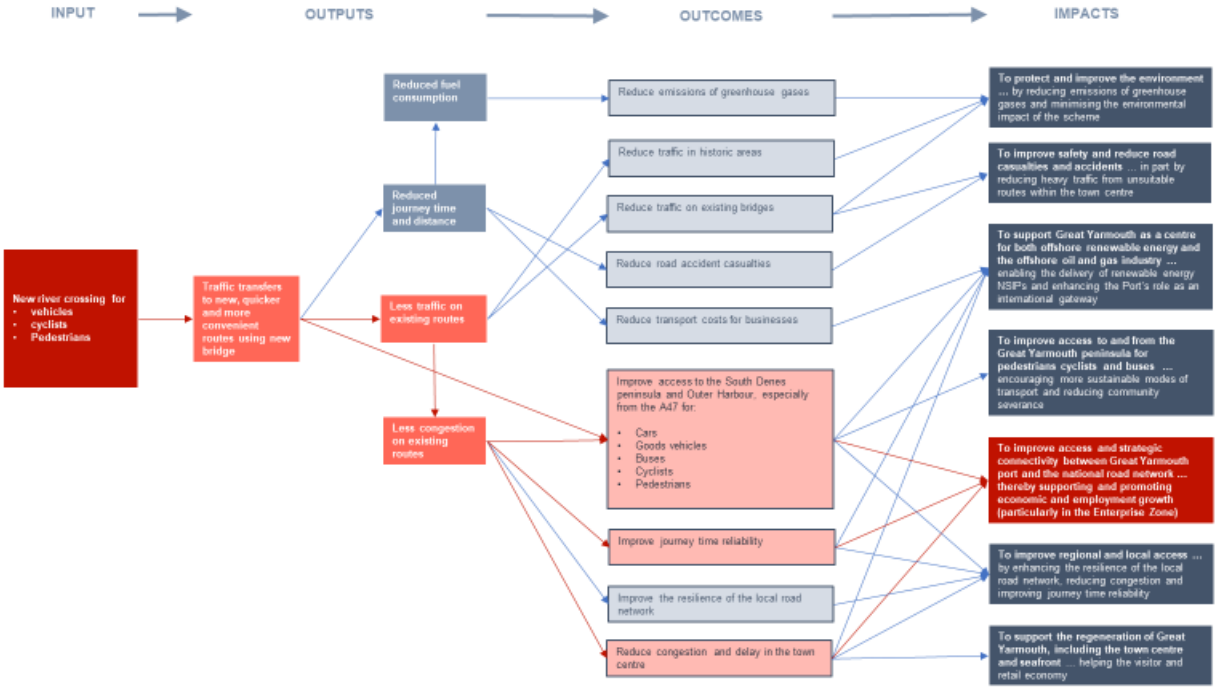


Figure 5-5 – Logic map for objective 1: To improve access and strategic connectivity between Great Yarmouth port and the national road network

5.3.4. There are two parts to this objective:

- Improved access and connectivity between Great Yarmouth port and the national road network
- Supporting and promoting economic and employment growth (particularly in the Enterprise Zone)

5.3.5. **Accessibility** to the national road network will be improved because the new bridge will connect directly into the A47 trunk road at Harfreys Roundabout. As Figure 5-6 shows, traffic to and from the Port will no longer need to travel the full length of the South Denes peninsula to access the A47 via either Gapton or Vauxhall roundabouts.

5.3.6. **Connectivity** is determined by the ease with which journeys (northbound and southbound) can be made between the Port and the A47 trunk road. As indicated in the logic map, this is expected to improve for two reasons: the new bridge will provide a new, shorter route (especially for traffic to and from the A47 south), whilst the reduction in traffic on other roads will mean less congestion on other routes to the Port.

5.3.7. An appropriate metric is therefore the journey times for these trips, both with and without the new bridge, as defined in paragraphs 5.2.38 to 5.2.44 above and illustrated in Figure 5-2 and Figure 5-3.

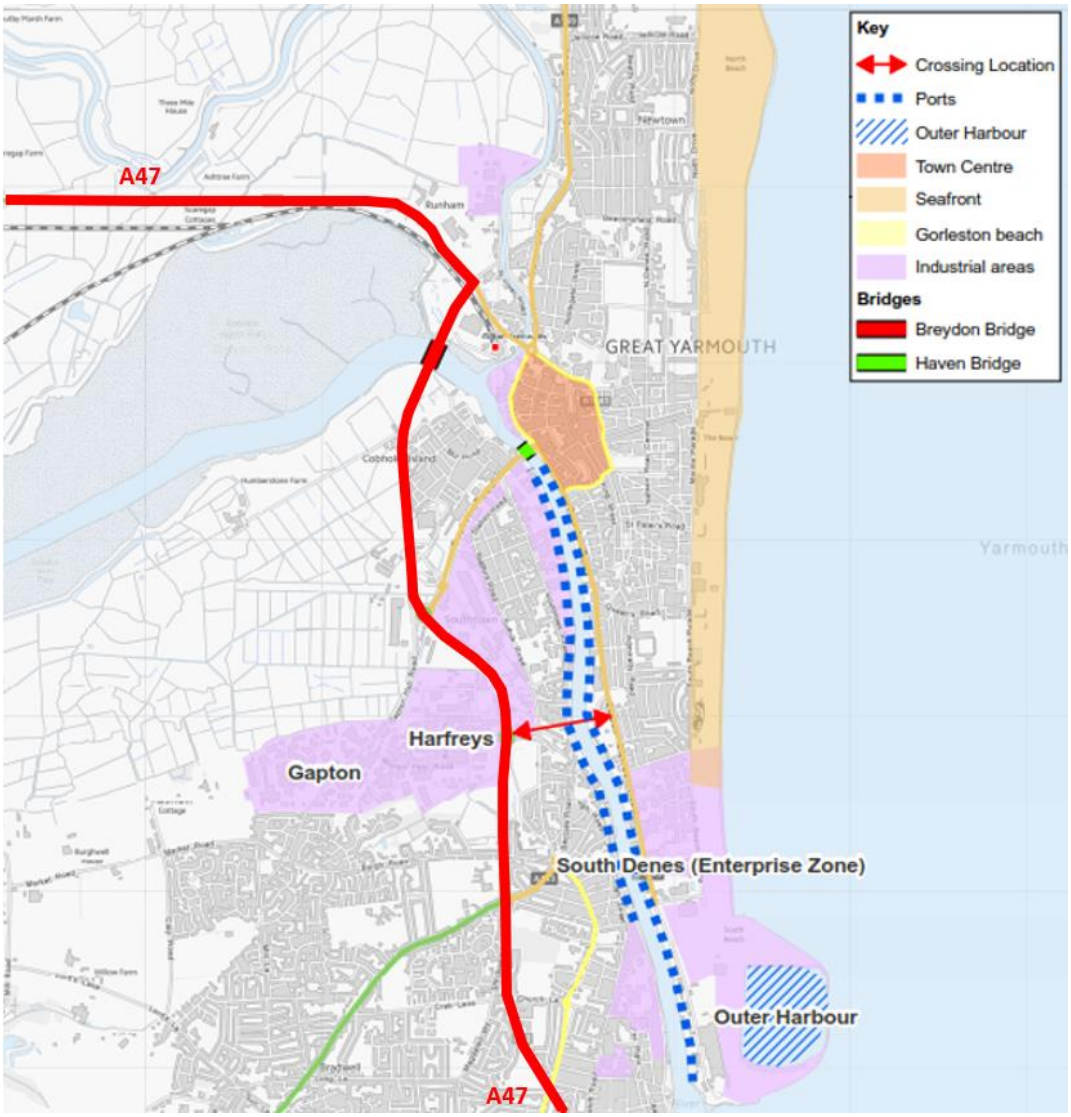


Figure 5-6 - Improved access to the Port from the national road network (A47)

5.3.8. **Economic and employment growth** in the Enterprise Zone at South Denes (Figure 5-6) are expected to be stimulated by improved accessibility and connectivity, together with improved journey reliability and reduced transport costs.

5.3.9. The general relationship between transport and economic growth is well established. Reduced transport costs mean that businesses can:

- Connect with potential suppliers, enabling them to access higher-quality and/or lower-cost inputs.
- Connect with potential customers, enabling them to supply markets further afield.
- Connect with a wider pool of talent in the labour market, allowing skills to be better matched to employment opportunities.

5.3.10. Reduced transport costs mean that individuals can:

- Participate in the labour market.
- Access a wider range of jobs, increasing the chances that they can find a position that provides a better match for their skills.

- Connect with leisure and retail opportunities, allowing them to access a wider range of products or reach similar products at cheaper prices and helping to increase the competitiveness of local businesses.

5.3.11. Through these mechanisms, improvements in connectivity can drive increases in productivity and employment, resulting in increased economic output.

5.3.12. Where transport investments are 'transformational', they can also influence the location of economic activity, for instance allowing businesses to relocate to more productive locations with better access to skills, other resources and customers. Investing in transport connectivity can not only influence the amount of economic activity in a region, it can also influence where it is located.

5.3.13. Whilst it is not possible to separate out the impacts of the Scheme from other things that can affect economic growth, the proposed monitoring of economic impacts detailed in paragraphs 5.2.46 to will provide good indicators of the extent to which this objective is being achieved.

Objective 2:

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

5.3.14. The overall logic map, Figure 3-1, shows the mechanisms by which the Scheme is expected to achieve its objectives. The causal links specific to this objective are highlighted in Figure 5-7

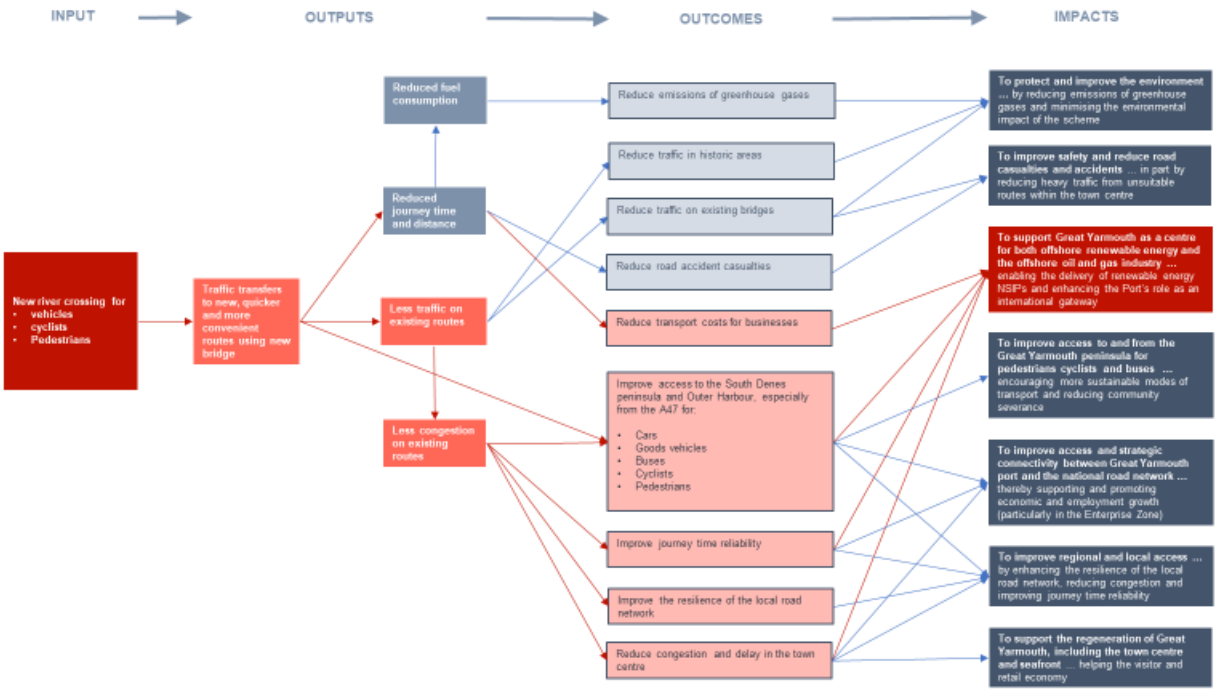


Figure 5-7 – Logic map for objective 2: To support Great Yarmouth as a centre for both offshore renewable energy and the offshore oil and gas industry

5.3.15. Delivery of this objective is closely related to that of Objective 1 – the achievement of improved access and strategic connectivity between the Port and the SRN. These improvements are expected to stimulate economic and employment growth, especially in the Enterprise Zone.

5.3.16. Objective 2 focuses specifically on the offshore energy industry, which is of national significance as well as being critical to the future prosperity of Great Yarmouth. In 2018, the Secretary of State determined[8] that the Third River Crossing Scheme is "in itself" of national significance because:

- 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

5.3.17. Great Yarmouth is part of the East of England Energy Zone (EEEZ), a partnership of local authorities and industry bodies established to smooth the way for future investment and development of the energy sector in Norfolk and Suffolk. The EEEZ 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. 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.

- **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.

- **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.

[8] Decision letter from DfT to NCC, 26 February 2018

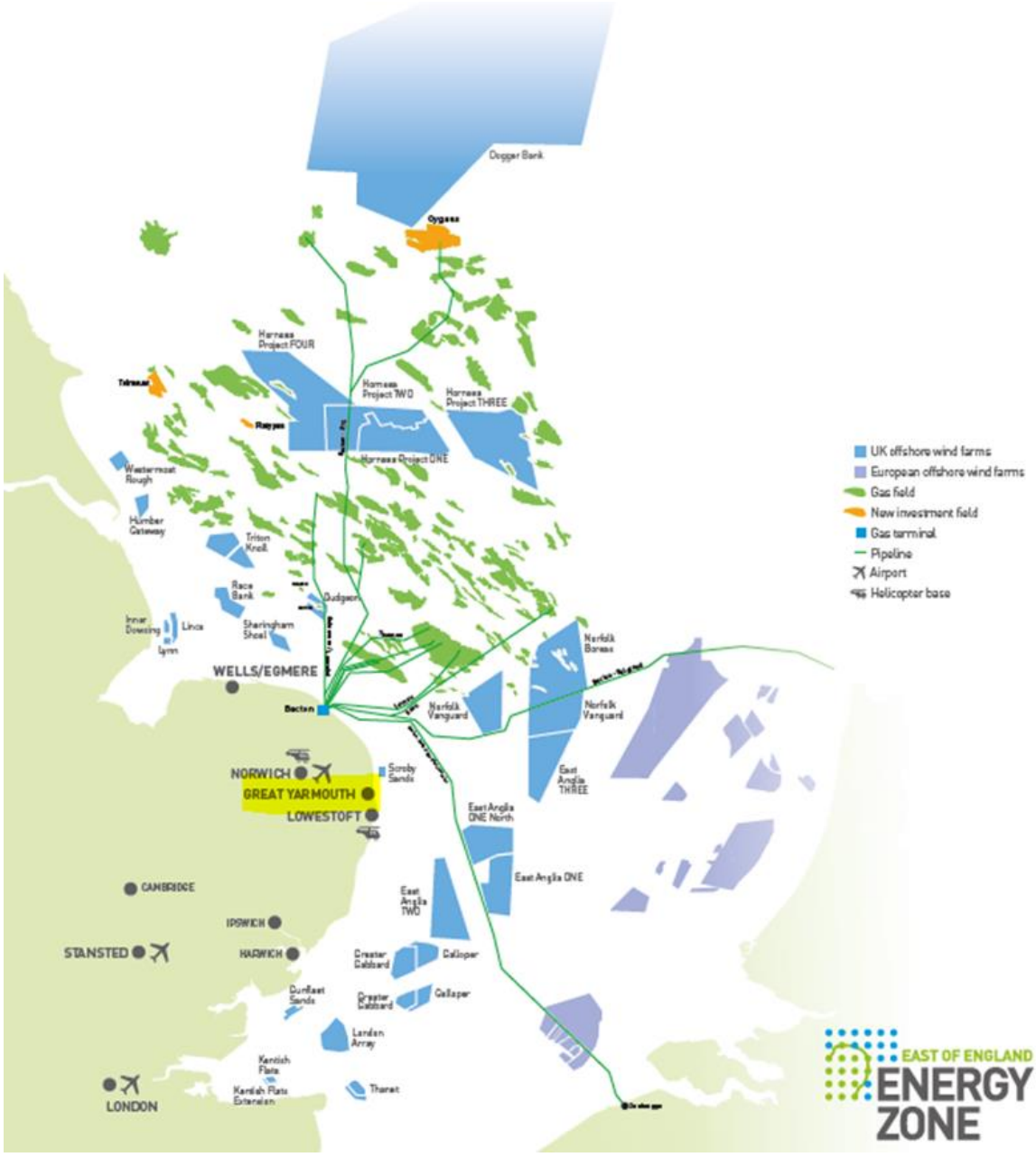


Figure 5-8 - East of England Energy Zone (EEEZ)

5.3.18. The Port of Great Yarmouth is ideally located in relation to these offshore opportunities, as illustrated in Figure 5-8. However, if the people of Great Yarmouth are to benefit, the further challenge is to "bring the benefits onshore". This means overcoming the disadvantages of the Port's location on the remote South Denes peninsula. The Scheme will do this by connecting the Port to the rest of the town and the strategic road network.

5.3.19. The benefits of the Scheme in this regard are most clearly seen (and most easily monitored) in relation to ongoing and potential developments related specifically to offshore energy:

- The Great Yarmouth Energy Park
- Potential Multi-User Energy Sector Facility

Energy Park

5.3.20. Located on the South Denes peninsula, at the heart of the Port industrial area, the Great Yarmouth Energy Park is a project run by the Great Yarmouth Development Company, a joint venture between GYBC and NCC, which aims to pool skills and resources to unlock and accelerate economic development opportunities.

5.3.21. It will 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 5-9.

Figure 5-9 - Great Yarmouth Energy Park

5.3.22. The ongoing development of the Energy Zone is monitored by the Great Yarmouth Development Company and performance (e.g. new sites developed and new businesses attracted) will be reported in the "Five Years After" Monitoring and Evaluation Report for the Third River Crossing Scheme.

Potential Multi-User Energy Sector Facility

5.3.23. NCC, together with GYBC and the Great Yarmouth Port Authority are seeking funding to develop for a new Operations and Maintenance development 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.

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.

5.3.24. A masterplan has been developed which envisages three phases of development. The potential full development is illustrated in Figure 5-10. 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 5-10 - Potential multi-user energy sector facility

5.3.25. The objectives are to:

- Deliver social and economic benefits for Great Yarmouth from the transition to clean growth, by accommodating the expansion of higher value clean energy supply chains
- Support the economic competitiveness of Great Yarmouth by attracting higher value energy-based industries and their supply chain
- Ensure value for money for public sector resources through levering in private sector investment

5.3.26. Measures of success will be developed as part of a benefits monitoring and realisation strategy. These will provide quantified metrics (e.g. employment, rental income and private sector investment) against which to assess the successful outcome of the initiative. Progress on the initiative and its outcomes will be reported in the "Five Years After" Monitoring and Evaluation Report for the Third River Crossing Scheme.

Objective 3:

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

5.3.27. The overall logic map, Figure 3-1, shows the mechanisms by which the Scheme is expected to achieve its objectives. The causal links specific to this objective are highlighted in Figure 5-11.

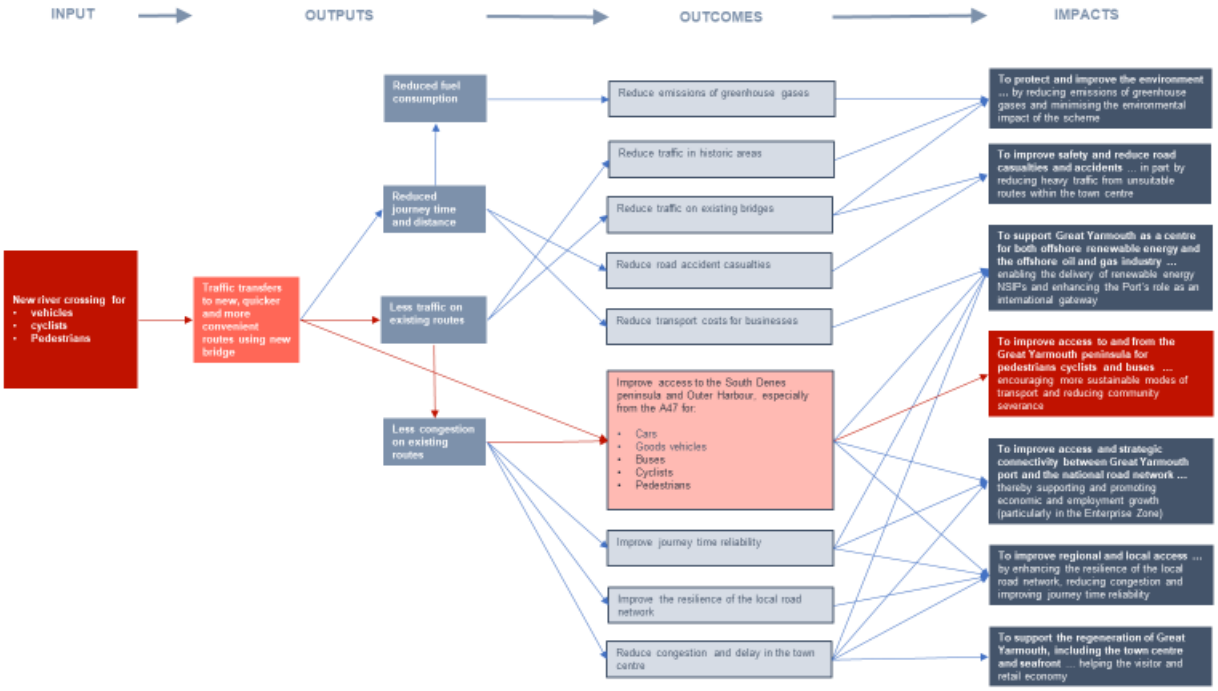


Figure 5-11 – Logic map for objective 3: To improve access to and from the Great Yarmouth peninsula for pedestrians, cyclists and buses

5.3.1. Achievement of this objective will be monitored using the following measures:

- Number of people walking and cycling over the new bridge, and changes in number of people walking and cycling over Haven Bridge (Paragraphs 5.2.27and 5.2.26 above)
- Overall levels of cycling within Great Yarmouth, based on surveys at the MCC monitoring sites (Paragraph 5.2.27 above)
- Number of buses using the new bridge (Paragraph 5.2.28 above)
- Whether or not new bus services are introduced over the new bridge (Paragraph 5.2.29 above)

5.4 MONITORING AND EVALUATION OF VALUE FOR MONEY

5.4.1. The Economic Case which forms part of the FBC includes the calculation of an anticipated BCR for the Scheme of 3.9. This is based on estimates of the costs and forecast monetised benefits of the

Scheme over a 60-year appraisal period. The VfM category for the Scheme is assessed as “high” in line with DfT guidance.

5.4.2. The benefits were calculated from forecast changes in traffic patterns and the resulting changes in journey times, operating costs, accidents and environmental impacts due to the Scheme.

5.4.3. An assessment will be made of the extent to which the Scheme delivers the VfM that was anticipated in the FBC. This will be done by re-calculating the benefit-cost ratio (BCR) and comparing it to the BCR calculated in the FBC to determine whether it would have resulted in a different VfM category for the Scheme.

INITIAL REVIEW OF VFM

5.4.4. For the “One Year After”’ report, this will be done simply by re-calculating the present value of costs, PVC, based on the actual out-turn costs which by then will be available. The present value of benefits (PVB) will not be adjusted, as it will be too soon to determine the longer-term traffic impacts on which this depends.

5.4.5. An updated BCR will be calculated as:

$BCR_{(Updated)} = PVB / PVC_{(actual)}$

An updated VfM category will be determined according to the DfT criteria:

- Very Poor — less than or equal to 0
- Poor VfM — if $BCR_{(Updated)}$ is between 0 and 1.0
- Low VfM — if $BCR_{(Updated)}$ is between 1.0 and 1.5
- Medium VfM — if $BCR_{(Updated)}$ is between 1.5 and 2
- High VfM — if $BCR_{(Updated)}$ is between 2.0 and 4.0
- Very High VfM — if $BCR_{(Updated)}$ is greater than 4.0

5.4.6. In the event of a change in the VfM category from what was anticipated, this will be reported in the “One Year After”’ report, together with a qualitative discussion of the possible reasons, based on the other measures that have been monitored (especially traffic changes) and any known external factors (such as development and economic growth).

FINAL REVIEW OF VFM

5.4.7. For the “Five Years After” report, the approach to recalculating BCR will depend on whether other monitoring shows that the traffic impacts of the Scheme appear to be significantly different from those which were forecast. The key metrics to determine this will be:

- The volume of traffic using the new bridge (peak and inter-peak)
- The volume of traffic still using each of the existing two bridges (peak and inter-peak)
- The volume of traffic using the main ‘A’ roads into and through Great Yarmouth
- Travel times between key origins and destinations

5.4.8. This data set will give a good overall picture of the main traffic movements in and around the town, and on the Scheme. It will be compared with the modelled opening year traffic flows, adjusted using the growth factors assumed in the original economic assessment, and with the forecast journey times.

If no significant change in traffic impacts

5.4.9. If it is clear that the observed traffic patterns five years after opening are a good fit with those forecast in the Scheme appraisal, the original value of PVB will be assumed to be reliable and will not be changed. The $PVC_{(actual)}$ will be re-calculated (as in the "One Year After" report, with any further adjustments to costs) and the $BCR_{(Final\ updated)}$ will be calculated.

5.4.10. In the event of a change in the VfM category from what was anticipated, this will be reported in the 'Five Years After' Monitoring and Evaluation Report.

If there is a significant change in the traffic impacts

5.4.11. If the observed traffic patterns five years after opening are not a good fit with those forecast in the Scheme appraisal, it will be necessary to re-calculate the PVB. It would not be cost-effective, or even feasible, to repeat the full economic appraisal with the benefit of hindsight, and to attempt to do so would not be proportionate. The objective, in this situation, would be to understand the reasons why things had not worked out as expected, and to learn how future appraisals can be made more reliable. The approach taken will therefore be to examine the underlying traffic patterns to determine:

- whether the differences observed are likely to be associated with an increase or a decrease in Scheme benefits. For example, if the time savings for users of the Scheme are greater than forecast, or experienced by a larger number of users, it is reasonable to assume that the benefits would be greater. The converse is also true.
- whether the observed data shows a different overall rate of traffic growth than forecast, and whether this is in line with national trends, or is a result of unexpected levels of local growth and development.
- whether the observed data suggests that the Scheme is not performing in the way that was forecast. For example, if users are continuing to use to use the existing bridges, rather than diverting to the Scheme, or if the expected journey time savings are not occurring.

5.4.12. Depending on what can be learnt from the basic traffic data, a proportionate approach will be taken to the re-calculation of the PVB to determine a new BCR. This could involve adjusting the rate of assumed traffic growth for the first five years after opening and taking a view on the rate to be applied thereafter. Or, it could involve factoring PVB to reflect a more, or less, optimistic view of the monetised benefits resulting from the Scheme.

5.4.13. In effect, the approach taken would be analogous to the use of sensitivity tests in the original appraisal, but with the benefit of a degree of hindsight afforded by the data collected over the first five years of operation.

5.4.14. A final updated BCR will be calculated as:

$$BCR_{(Final\ updated)} = PVB_{(Adjusted\ as\ described\ above)} / PVC_{(actual)}$$

An updated VfM category will be determined according to the DfT criteria noted above

5.4.15. In the event of a change in the VfM category from what was anticipated, this will reported in the "Five Years After" report, together with a detailed discussion of the possible reasons, based on the other measures that have been monitored (especially traffic changes) and any known external

factors (such as development and economic growth). Any limitations or uncertainties in the conclusions that can be drawn will be highlighted, together with any recommendations for:

- improvements to the way schemes are assessed in future
- work to identify possible remedial measures which might address deficiencies in the Scheme.

5.5 SUMMARY OF DATA REQUIREMENTS

5.5.1. The data required to meet both the standard and enhanced requirements for the Monitoring and Evaluation Plan are summarised in Table 5-4 below.

Table 5-4 – Summary of data requirements

Metric	Measure Paragraph ref:	Frequency	Data	Rationale for inclusion	Data collection methods
Input	**Scheme build** Paragraphs 5.1.1 to 5.1.12	During construction (monthly reporting)	Progress on construction works against project plan and key milestones	Knowledge Accountability	Project Manager's monthly reports to Project Board Project Risk Register / Log Feedback from Stakeholders Interviews with key personnel
Input	**Scheme costs** Paragraphs 5.1.13 to 5.1.19	During construction (monthly reporting) One year after opening	Out-turn expenditure against spending plans, disaggregated by: ▪ Funding stream ▪ Type of expenditure	Accountability	Financial monitoring system Project Manager's monthly reports to Project Board Interviews with key personnel
Output	**Delivered Scheme** Paragraphs 5.1.20 to 5.1.24	During construction (Monthly reporting) One year after opening	Description of the Scheme as delivered, including any changes since funding approval Simple assessment of whether Scheme has reached intended beneficiaries	Accountability	As-built drawings and reports to Project Board Assessment of overall usage determined from traffic counts (see "travel demand" below). If usage differs from forecasts after 1 year, investigate further in 5-year report Stakeholder questionnaires & interviews
Outcome	**Travel demand** Paragraphs 5.2.1 to 5.2.37	Before construction (Due to the pandemic, historic "before" data will be used and supplemented by	Road traffic flows, classified by vehicle type: ▪ Pedal cycle ▪ Motorcycle ▪ Car ▪ LGV	Knowledge Accountability	12-hour classified MCCs at selected sites Pedestrian surveys on bridges

Metric	Measure Paragraph ref:	Frequency	Data	Rationale for inclusion	Data collection methods
		limited new "before" surveys in 2020) One year after opening Five years after opening	▪ OGV1 ▪ OGV2 ▪ Bus/coach Pedestrian and cycle flows Public transport impacts		1-week (minimum) ATC surveys at selected sites Information from bus operators and published timetables
Outcome	**Travel times and reliability** Paragraphs 5.2.38 to 5.2.45	Before construction One year after opening Five years after opening	Journey times on defined routes within Lowestoft	Knowledge Accountability	TrafficMaster data obtained by NCC
Impact	**Impact on the economy** Paragraphs 5.2.46 to 5.2.50	Before construction One year after opening Five years after opening	▪ New employment sites, and associated new jobs ▪ New business start-ups and closures ▪ Local employment levels ▪ GVA headline data ▪ Indices of multiple deprivation	Knowledge Accountability	Economic data collected by Norfolk Insight and NCC Planning Dept Interviews with selected key stakeholders
Impact	**Carbon** Paragraphs 5.2.51 to 5.2.55	Before construction One year after opening Five years after opening	Traffic volumes and speeds (Carbon impacts cannot be measured directly)	Knowledge Accountability	As for traffic demand above.
Impact	**Noise** Paragraphs 0 to 5.2.67	During construction One year after opening Five years after opening	Noise monitoring surveys	Knowledge Accountability	Noise monitoring surveys undertaken by contractor
Impact	**Local air quality** Paragraph 5.2.68 to 5.2.86	During construction One year after opening Five years after opening	Air quality monitoring	Knowledge Accountability	Construction phase: Dust deposition and real-time continuous PM10 (monitored by contractor)

Metric	Measure Paragraph ref:	Frequency	Data	Rationale for inclusion	Data collection methods
					Operational phase: Existing diffusion tubes at sites monitored by GYBC
Impact	**Accidents** Paragraph 5.2.89 to 5.2.90	Before construction One year after opening Five years after opening	Accidents on the Scheme. Personal injury accidents on roads in the study area.	Knowledge Accountability	Existing STATS 19 monitoring: 5 years before construction 5 years after Scheme opening
	Scheme objectives Section 5.3	Five years after opening	As set out in Section 5.3	Knowledge, accountability	As set out in Section 5.3
	Value for money Section 5.4	Before construction One year after opening Five years after opening	Calculated BCR and VfM category. Review BCR and vfm based on out-turn costs. Final review based on traffic volumes and speeds	Knowledge Accountability	Proportionate review as set out in Section 5.4

6 RESOURCING AND GOVERNANCE

OWNERSHIP OF THE MONITORING AND EVALUATION PLAN

6.1.1. The Monitoring and Evaluation Plan is owned by NCC. The owners for each monitoring task will be defined following approval of the FBC. The costs will be funded by NCC.

SCHEME GOVERNANCE

6.1.2. The management structure for the Scheme is summarised below:

6.1.3. 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

6.1.4. The organisational and governance structure is illustrated in Figure 6-1 below 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.

6.1.5. The Project Sponsor is Norfolk County Council, represented by Tom McCabe, Head of Paid Service and Executive Director of Community and Environmental Services.

6.1.6. The SRO, David Allfrey is the Infrastructure Delivery Manager, Communities and Environmental Services at NCC.

6.1.7. 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.

6.1.8. 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

6.1.9. NCC has an established Project Board for the Scheme. The project board meets 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.

6.1.10. The Project Board consists of the people and roles set out in Table 6-1 below:

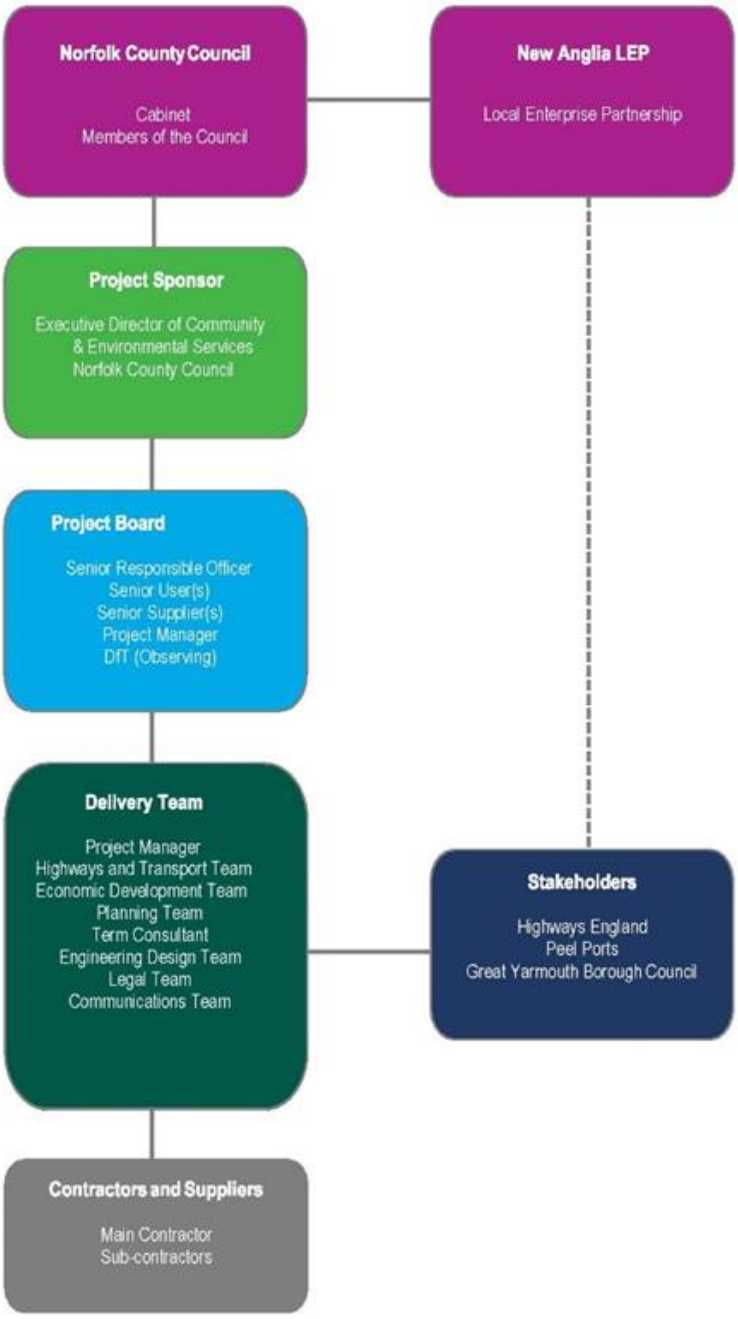


Figure 6-1 Organisational and Governance Structure Detailing the Essential Lines of Accountability and Responsibility

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 6-1 List of Project Board Members

6.1.11. 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.

6.1.12. 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.

6.1.13. The delivery team will continue to meet on a monthly basis throughout the construction phase of the project. Its main responsibilities 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

6.1.14. 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 Strategy 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 6-2 List of Delivery Team Members

7 DELIVERY PLAN FOR MONITORING AND EVALUATION

7.1.1. This section sets out the timeframe for data collection, progress reporting back to the Department and reporting of monitoring and evaluation findings.

7.1.2. The monitoring process will be split into three stages:

- **Pre-construction and during construction (monitoring)**
  - Baseline data will be collected before Scheme construction starts
  - Data to monitor Scheme delivery will be collected during construction
- **One year after (monitoring and evaluation)**
  - Data to monitor Scheme performance will be collected at least one year (but less than two years) after Scheme opening.
  - An initial “One Year After”’ report will be published in 2025. within two years of Scheme opening, focusing on the Scheme’s outcomes
- **Five years after (monitoring and evaluation)**
  - Further data will be collected up to approximately five years after Scheme opening
  - A final “Five Years After” report will be published in 2029, 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

7.1.3. Data collected one year and five years post opening (2024 and 2028), will be compared against the baseline data to quantify the extent of benefits realised. The “One Year After” and “Five Years After” Monitoring and Evaluation reports will set out the results of the analysis, highlighting any interesting and emerging trends.

8 DISSEMINATION PLAN AND STAKEHOLDER ENGAGEMENT

8.1 DISSEMINATION PLAN

8.1.1. This Monitoring and Evaluation Plan will be agreed with the DfT prior to the submission of the FBC. It 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.

8.1.2. Monitoring will be undertaken before and during construction, and after the opening of the Scheme. 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.

8.1.3. The evaluation reports will also be published on NCC's website[9]. The DfT may provide links to it from their own website and may publish meta-analysis of evaluation reports from time to time.

8.2 STAKEHOLDER ENGAGEMENT

8.2.1. NCC has engaged with key stakeholders throughout the development of the Scheme, and this will continue during the delivery phase.

8.2.2. Planning the communications approach began in early 2020 and a Communications Strategy[10] has been jointly developed by NCC and the contractor for the Scheme, Bam Farrans Joint Venture. It is included in a separate document, Appendix A. It identifies the following key stakeholders who will be engaged through targeted communication channels such as letters and newsletters, as well as through general communications channels:

- Local residents (not directly affected as landowners)
- Landowners/occupiers
- Local community and residents' groups
- Peel Ports, operator of river port and outer harbour
- Local businesses
- Port and river users
- New Anglia Local Enterprise Partnership
- Norfolk Chamber of Commerce
- Great Yarmouth Borough Council
- Brandon Lewis, MP for Great Yarmouth
- Relevant county and district councillors
- Utility companies
- Emergency services
- Bus companies
- Other interested parties (from DCO Examination process)

[9] NCC has set up a website to provide current and up-to-date information on the scheme for local residents and businesses during its development. It will continue to be updated during and after construction. The website can be found at: https://www.norfolk.gov.uk/3rc

[10] Great Yarmouth Third River Crossing Communications Strategy May 2020, NCC.

- Greater Yarmouth Tourism
- Department for Transport
- Relevant NCC departments
- Highways England
- Marine Management Organisation
- Environment Agency
- Natural England

8.2.3. The engagement methods used are detailed in Table 8-1 below.

Table 8-1 – Communication methods

Communication Method	Approach
Previous consultation stages	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: ▪ 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.
Future engagement	▪ Ongoing engagement throughout the construction period as detailed below ▪ Ongoing engagement during the post-construction monitoring period as detailed below
Website	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 throughout the construction phase and maintained during the post-construction monitoring period as a means of communication with stakeholders and the public.
Publications and newsletters	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. 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.
Dedicated email address	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 construction phase and during the post-construction monitoring period.
Press releases and information to the media	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

Communication Method	Approach
	information and multimedia content will continue to be provided at regular intervals throughout the construction phase.
Meetings and events	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, if feasible under prevailing Covid-19 restrictions.
Formal reports	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 during construction and the post-construction monitoring phase.
Informal reports	Monthly reports to the Scheme's Delivery Team and Project Board have been drafted and will continue throughout the construction phase.
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 and during post-construction monitoring and evaluation.
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.
Questionnaires	Questionnaires will be prepared and made available to the public and stakeholders via the website during the post-construction and operational phases, in order to determine people's perceptions of the delivery, outcomes and impacts of the scheme, and to discover how individual transport users, residents and businesses are being affected by it.
Targeted interviews with key stakeholders	Targeted interviews will be arranged with a smaller number of key stakeholders (e.g. Peel Ports, the LEP etc to examine in more detail the impacts of the scheme post-opening and towards the end of the 5-year monitoring period.

COMMUNICATIONS AND ENGAGEMENT DURING THE CONSTRUCTION PHASE

8.2.5. The key elements of the strategy that relate to stakeholder engagement and obtaining feedback during construction are as follows:

- A Public Liaison Officer will plan communication activities to ensure stakeholders are well-informed throughout the construction.
- The Third River Crossing webpages on the NCC's website will remain in place as a core information resource.

- A scheme-specific free phone number and email address will be publicised on the NCC's website channels together with letter notifications, newsletters and signage at the works area. The comments made by stakeholders via "one-to-one" conversations, emails, telephone calls, social media will be recorded on an online portal and will be available to NCC to review at bi-weekly and monthly meetings to ensure continual improvement.

  Stakeholders will have the opportunity to sign-up to receive a monthly e-letter newsletter, and a quarterly paper copy newsletter will be delivered to local properties and businesses in the area of the Scheme. At key stages of the Scheme these newsletters will have specific features on obtaining feedback from stakeholders. The methods for feedback will be the scheme specific free phone number, email address and online satisfaction surveys.

COMMUNICATIONS AND ENGAGEMENT IN THE OPERATIONAL PHASE

8.2.6. Once the Scheme is open and in operation:

- NCC's Third River Crossing webpages will be maintained and updated as required for the period of this Monitoring and Evaluation Plan.

- There will be the opportunity to provide feedback on the Scheme via NCC's Customer Call Centre and the Scheme specific email address

- Questionnaire surveys will be undertaken via the scheme website.

- Targeted interviews will be arranged with selected key stakeholders to examine the impacts of the Scheme in greater depth.

EVALUATING THE EFFECTIVENESS OF STAKEHOLDER ENGAGEMENT

8.2.7. Having invested heavily in stakeholder engagement, following similar practices to those used in previous major schemes, it is important to measure how effective this has been. Therefore, in the proposed interviews with the selected key stakeholders we will seek feedback on the effectiveness of our communication and engagement, asking the question: "Did we deliver what people expected to see, following our previous engagement with them?"

9 CONCLUSION - HOW LESSONS WILL BE LEARNED

9.1.1. The Scheme will represent a significant investment of public money in the future of Great Yarmouth by both NCC and the government. Monitoring and evaluation is therefore essential, not only to demonstrate that the investment has delivered the desired impacts, but also to inform and enlighten future decision makers, both locally and nationally. In this way, future investment can be targeted, to provide the best value for money.

9.1.2. For this to happen, the monitoring and evaluation will be:

- **Carefully planned**, so it captures all the information needed.
  (This plan provides a clear rationale for the monitoring to be undertaken)

- **Timely**, so the lessons can be learnt as soon as possible
  (Reports will be made one year, and five years after opening)

- **Shared** with those, including DfT, other local authorities and stakeholders, who can benefit from the knowledge gained
  (See Section 8: Dissemination Plan and Stakeholder engagement)

9.1.3. In the final “Five Years After” report we will seek to meet the requirements of “fuller evaluation” which needs to consider:

- Whether the scheme was delivered effectively and efficiently
- The causal effect of the scheme on the anticipated outcomes and whether these have contributed to the intended impacts
- Whether it had any unintended adverse or positive effects.

9.1.4. We will build on the evidence generated through standard and enhanced monitoring to determine whether the causal links between the scheme and the observed outcomes and impacts are being achieved as expected (Figures 3.3, 5.6 and 5.10), whilst asking the following high-level questions:

- How was the scheme delivered?
- What difference did the scheme make?
- Did the benefits justify the costs?

9.1.5. Lessons will be learnt by seeking answers to the research questions set out in Paragraph 4.2.13:

- **Delivery:** Has the Scheme been delivered as intended and to the expected timetable? If any internal and external factors affected delivery, what impact did these have? How were they managed? Could they have been foreseen or avoided? What went well and what went less well?

- **Cost:** How accurate were the cost estimates? If out-turn costs were different from expectations, why was this, and what actions were taken? Were the allowances for quantified risk and optimism bias reasonable, or should a different approach be taken in future?

- **Traffic:** Has the Scheme produced the expected changes in the pattern of traffic movement in Great Yarmouth, and were there any unintended changes? Is traffic on the new bridge more or less than forecast? Has traffic reduced on the existing bridges as expected? Have journey times reduced? If not, what are the reasons? If there are differences, are they due to Scheme specific,

or external factors affecting traffic demand. Are there implications for similar schemes in future?

- **Connectivity:** Has the Scheme improved the strategic connectivity of Great Yarmouth Port to the national strategic road network, in ways that will support and promote economic and employment growth? Has it changed people's perceptions of the town as an employment location?

- **Economy:** Has the Scheme enhanced the position of Great Yarmouth as a centre for offshore renewable energy and the offshore oil and gas industry, and as an international gateway? Has it changed perceptions of the town by residents, local businesses and new investors as a place of opportunity? Have there been any unintended consequences?

- **Accessibility**: Has the Scheme improved the accessibility of the Great Yarmouth peninsula for local people, and for all modes of transport, in ways expected in the appraisal? Has it encouraged more walking and cycling?

- **Value for money**: Did the traffic model provide a realistic forecast of future growth and the effects of the Scheme? If there are differences, are they enough to raise questions about the VfM category attributed to the Scheme?

- **Environment:** Were the environmental impacts of the Scheme in line with expectations? Is mitigation perceived to have been effective? Have there been any unintended impacts, and, if so, how might they have been foreseen, or avoided with future schemes? How is the new bridge now perceived as part of the townscape?

- **Community:** Has public support for the Scheme increased or reduced since its completion? How effective was engagement with the public and stakeholders during construction? What went well and what went less well? Were there any unforeseen issues and if so, how were they resolved?

9.1.6. By the time of the "Five Years After" report, there may have been changes in policy on transport, the environment and the economy, as well as changes in external circumstances affecting future decision-making both locally and nationally. Many of the impacts of the Scheme should by that time be clearly discernible. The lessons learnt from the monitoring and fuller evaluation of the Great Yarmouth Third River Crossing scheme will help future policy makers to determine whether investment in major local infrastructure schemes of this type can deliver long-term benefits and provide resilient solutions for local communities.

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