

Appendix K – DfT Check Sheet

Checklist of appraisal and modelling supporting material

Option Assessment

| Item | Section/Page |
|---|---|
| <p>An Option Assessment Report to include steps 1 to 8 set out in WebTAG – the transport appraisal process.</p> | <p>The appraisal of options was undertaken over an extended period and has been very comprehensive.</p> <p>The initial process of generating, refining and appraising options is detailed in the OAR (2016). This was submitted with the application for scheme development costs, and describes assessments undertaken in 2007 (Stage 1) and 2009 (Stage 2). It identified a preferred corridor for the scheme, but did not identify a specific scheme within that corridor.</p> <p>Subsequent more detailed assessment work to identify the best scheme within the preferred corridor is described in a further Final OAR (2017).</p> <p>Both OAR documents were provided in support of the OBC, which can be accessed at: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission (Supporting Documents 1&2).</p> <p><u>OAR (2016)</u></p> <p>Step 1 2.1 Step 2 2.2 Step 3 2.3 Step 4a 2.4 Step 4b 2.5 Step 5 3.1 Step 6 3.2 Step 7 3.3, 3.4 Step 8 OAR</p> <p><u>Final OAR (2017)</u></p> <p>Step 1 Ch 2 Step 2 Ch 3 Step 3 Ch 4 Step 4a Ch 5 Step 4b Ch 6 Step 5 Ch 7 Step 6 Ch 8 Step 7 Chps 9-12 Step 8 OAR</p> |

Modelling

| Item | Section/Page |
|---|--|
| An Existing Data and Traffic Surveys Report to include: | |
| Details of the sources, locations (illustrated on a map), methods of collection, dates, days of week, durations, sample factors, estimation of accuracy, etc. | <p>Existing data sources and details are given in Section 2 of the Traffic Data Collection Report (OBC Supporting Document 3).</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> |
| Details of any specialist surveys (e.g. stated preference). | <p>RSI, ATC and MCC surveys were commissioned specifically for this study, as detailed in Section 3 of the Traffic Data Collection Report (OBC Supporting Document 3).</p> <p>Additional ATC, MCC and queue surveys were commissioned in 2018 in order to update the modelling base year, as detailed in Section 2 of the Traffic Data Collection Report Addendum (DCO document 7.2a Transport Assessment Appendix A).</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |

| Item | Section/Page |
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| <p>Traffic and passenger flows; including daily, hourly and seasonal profiles, including details by vehicle class where appropriate.</p> | <p>Information can be found at the following locations in the Traffic Data Collection Report (OBC Supporting Document 3):</p> <ul style="list-style-type: none"> • Hourly profiles are given in Table 3-5. • Data by time period and vehicle class is given in Table 3-3. • Vehicle class proportions are given in Table 4-1. • Daily flow profiles are given in Figure 4-1. • Observed User class splits are given in Table 4-2. • Peak hour traffic flows are given in Figures 3-5, 3-6 and 3-7. <p>A comparison of ATC flows between the 2016 and 2018 datasets can be found in Section 3 of the Traffic Data Collection Report Addendum (DCO document 7.2a Transport Assessment Appendix A).</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>Journey times by mode, including variability if appropriate.</p> | <p>Journey Time information is discussed in Section 5.2 of the LMVR Addendum (DCO document 7.6 Economic Appraisal Report Appendix A).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |

| Item | Section/Page |
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| <p>Details of the pattern and scale of traffic delays and queues.</p> | <p>Journey Time information is discussed in Section 5.2 of the LMVR Addendum (DCO document 7.6 Economic Appraisal Report Appendix A).</p> <p>Information on queues is included in Section 5.4 of the Paramics LMVR (DCO document 7.2b Transport Assessment Appendix B).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>Desire line diagrams for important parts of the network.</p> | <p>Desire lines based on the RSI surveys have been included in Figure 3-2 of the Traffic Data Collection Report (OBC Supporting Document 3).</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> |
| <p>Diagrams of existing traffic flows, both in the immediate corridor and other relevant corridors.</p> | <p>Traffic flow diagrams are given in Figures 3-6, 3-7 and 3-8 of the Traffic Data Collection Report (OBC Supporting Document 3).</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> |
| <p>An Assignment Model Validation Report to include:</p> | |

| Item | Section/Page |
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| <p>Description of the road traffic and public transport passenger assignment model development, including model network and zone plans, details of treatment of congestion on the road system and crowding on the public transport system.</p> | <p>Section 6 of the LMVR (OBC Supporting Document 5) describes the network development and Section 7 describes the demand development. The model updates undertaken in 2018 are discussed in Section 2 of the LMVR Addendum (DCO document 7.6 Economic Appraisal Report Appendix A).</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>Description of the data used in model building and validation with a clear distinction made for any independent validation data.</p> | <p>Section 5 of the LMVR (OBC Supporting Document 5) provides details of the data used in model development. Data used in the 2018 model update is discussed in Section 2 of the LMVR Addendum (DCO document 7.6 Economic Appraisal Report Appendix A).</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |

| Item | Section/Page |
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| <p>Evidence of the validity of the networks employed, including range checks, link length checks, and route choice evidence.</p> | <p>Appendix E of the LMVR (OBC Supporting Document 5) provides several checks on the acceptability of the network. Appendix I of the LMVR (OBC Supporting Document 5) describes route choice in the validated assignments.</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> |
| <p>Details of the segmentation used, including the rationale for that chosen.</p> | <p>Section 4.7 of the LMVR (OBC Supporting Document 5) describes the user classes used in the model.</p> |
| <p>Validation of the trip matrices, including estimation of measurement and sample errors.</p> | <p>Trip matrix validation statistics are given in Section 9 of the LMVR (OBC Supporting Document 5).</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> |
| <p>Details of any 'matrix estimation' techniques used and evidence of the effect of the estimation process on the scale and pattern of the base travel matrices.</p> | <p>Section 9.2 of the LMVR (OBC Supporting Document 5) describes the ME process. Section 9.3 gives matrix statistics which measure the level of change between the prior and post ME matrices. Section 9.3 also gives sector to sector matrices which show the impact on the O-D traffic patterns.</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> |

| Item | Section/Page |
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| <p>Validation of the trip assignment, including comparisons of flows (on links and across screenlines/cordons) and, for road traffic models, turning movements at key junctions.</p> | <p>Trip assignment validation can be found in Section 5 of the LMVR Addendum (DCO document 7.6 Economic Appraisal Report Appendix A).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>Journey time validation, including, for road traffic models, checks on queue pattern and magnitudes of delays/queues.</p> | <p>Journey time validation statistics can be found in Section 5.2 of the LMVR Addendum (DCO document 7.6 Economic Appraisal Report Appendix A).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>Detail of the assignment convergence.</p> | <p>Assignment convergence statistics can be found in Section 5.3 of the LMVR Addendum (DCO document 7.6 Economic Appraisal Report Appendix A).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>Present year validation if the model is more than 5 years old.</p> | <p>Not applicable as the model is validated to 2018 base year.</p> |
| <p>A diagram of modelled traffic flows, both in the immediate corridor and other relevant corridors.</p> | <p>Section 10 of the LMVR (OBC Supporting Document 5) provides diagrams of model flows.</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> |

| Item | Section/Page |
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| A Demand Model Report to include: | |
| Where no Variable Demand Model has been developed evidence should be provided to support this decision (e.g. follow guidance in WebTAG M2 Variable Demand Modelling – section 2.2). | N/A |
| Description of the demand model. | The structure and methodology of the demand model are described in Section 3 and 4 of the Demand Model Report (FBC Supporting Document 7). |
| Description of the data used in the model building and validation. | Data used is described in Section 3.4 of the Demand Model Report (FBC Supporting Document 7). |
| Details of the segmentation used, including the rationale for that chosen. This should include justification for any segments remaining fixed. | Demand segmentation used is described in Section 3.4 of the Demand Model Report (FBC Supporting Document 7). |
| Evidence of model calibration and validation and details of any sensitivity tests. | Calibration of the base model is described in Section 5 of the Demand Model Report (FBC Supporting Document 7). |
| Details of any imported model components and rationale for their use. | N/A |
| Validation of the supply model sensitivity in cases where the detailed assignment models do not iterate directly with the demand model. | N/A |
| Details of the realism testing, including outturn elasticities of demand with respect to fuel cost and public transport fares. | Realism testing is covered in Section 5 of the Demand Model Report (FBC Supporting Document 7). |
| Details of the demand/supply convergence. | Convergence statistics are given in Appendix A and B of the Demand Model Report (FBC Supporting Document 7). |
| A Forecasting Report to include: | |

| Item | Section/Page |
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| <p>Description of the methods used in forecasting future traffic demand.</p> | <p>Section 3 of the Forecasting Report (DCO document 7.6 Economic Appraisal Report Appendix B) details the forecasting methodology.</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>Description of the future year demand assumptions (e.g. land use and economic growth - for the do minimum, core and variant scenarios).</p> | <p>Future year demand assumptions are included in Section 4 of the Forecasting Report (DCO document 7.6 Economic Appraisal Report Appendix B).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>An uncertainty log providing a clear description of the planning status of local developments</p> | <p>Details of the uncertainty log used in the development of the forecast models are included in Section 4.2 of the Forecasting Report (DCO document 7.6 Economic Appraisal Report Appendix B). Key developments are included in Table 2 and Table 3.</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| <p>Description of the future year transport supply assumptions (i.e. networks examined for the do minimum, core scenario and variant scenarios).</p> | <p>Future year network configurations are described in Section 5 of the Forecasting Report (DCO document 7.6 Economic Appraisal Report Appendix B).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |

| Item | Section/Page |
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| Description of the travel cost assumptions (e.g. fuel costs, PT fares, parking). | <p>These are incorporated into the cost parameters that are given in Section 4.8 of the Forecasting Report (DCO document 7.6 Economic Appraisal Report Appendix B).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| Comparison of the local forecast results to national forecasts, at an overall and sectoral level. | <p>Growth forecasts are controlled to national growth via TEMPRO. This is described in Section 6 of the Forecasting Report (DCO document 7.6 Economic Appraisal Report Appendix B).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| Presentation of the forecast travel demand and conditions for the core scenario and variant scenarios including a diagram of forecast flows for the do-minimum and the scheme options for affected corridors. | <p>This information will be provided in the Supplementary Modelling Report (FBC Supporting Document 10).</p> |
| If the model includes very slow speeds or high junction delays evidence of their plausibility. | <p>This information will be provided in the Supplementary Modelling Report (FBC Supporting Document 10).</p> |
| An explanation of any forecasts of flows above capacity, especially for the do-minimum, and an explanation of how these are accounted for in the modelling/appraisal. | <p>This information will be provided in the Supplementary Modelling Report (FBC Supporting Document 10).</p> |

| Item | Section/Page |
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| Presentation of the sensitivity tests carried out (to include high and low demand tests). | <p>The sensitivity tests undertaken are discussed in Section 6.9 of the Forecasting Report (DCO document 7.6 Economic Appraisal Report Appendix B).</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |

Cost Benefit Analysis

| Item | Section/Page |
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| A clear explanation of the underlying assumptions used in the Cost Benefit Analysis. | Assumptions are outlined in the Economic Case of the Full Business Case and in the Economic Appraisal Report (FBC Supporting Document 1). |
| Information on local factors used. For example the derivation of growth factors and annualisation factors in TUBA (to include full details of any calculations). | The TUBA Methodology Technical Note (FBC Supporting Document 5) provides details of annualisation factors used. |
| A diagram of the network (if COBALT used). | A diagram of the network used for COBALT is provided in Appendix B of the Economic Appraisal Report (FBC Supporting Document 1). |
| Information on the number of junctions modelled (if COBALT used), for both the do-minimum and the do-something. | Junctions included in the COBALT assessment are described in Section 4.3 of the Economic Appraisal Report (FBC Supporting Document 1) and shown in Appendix B of the Economic Appraisal Report . |
| Details of assumptions about operating costs and commercial viability (e.g. public transport, park and ride, etc.). | Operating costs are detailed in the Economic Case of the Full Business Case and in Section 3.3 of the Economic Appraisal Report (FBC Supporting Document 1). Commercial viability is covered in the Commercial Case of the Full Business Case. |
| Full appraisal inputs/outputs (when used, COBALT and/or TUBA input and output files (.tbn and .out) in text format should be supplied). | Provided through emails. |
| Evidence that TUBA/COBALT warning messages have been checked and found to be acceptable. | Analysis of TUBA warnings is included in the TUBA Methodology Technical Note (FBC Supporting Document 5). |
| Spatial (sectoral) analysis of TEE benefits. | The spatial distribution of TUBA benefits is presented in TUBA Methodology Technical Note (FBC Supporting Document 5). |

| Item | Section/Page |
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| Details of the maintenance delay costs/savings. | Delays during construction and maintenance are discussed in Section 3.4 of the Economic Appraisal Report (FBC Supporting Document 1). |
| Details of the delays during construction. | Delays during construction and maintenance are discussed in Section 3.4 of the Economic Appraisal Report (FBC Supporting Document 1). |
| Appraisal tables (AMCB, PA, TEE) in excel format. | The AMCB table is provided in FBC Appendix H , the PA table is provided in FBC Appendix F and the TEE table is provided in FBC Appendix G . |

Economic Case Assessment

| Item | Section/Page |
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| A comprehensive Appraisal Summary Table in excel format. | The AST is provided in FBC Appendix C . |
| Assessment of Economic impacts. | The assessment of economic impacts is detailed in the Economic Case of the Full Business Case and the Economic Appraisal Report (Supporting Document 1). |
| Economic impacts worksheets. | N/A |
| Assessment of Environmental impacts, to include an environmental constraints map. | <p>Environmental impacts have been considered in detail in the Environmental Options Assessment Report (OBC Supporting Document 12) and the Environmental Statement (DCO document 6.1 Environmental Statement).</p> <p>The Environmental Constraints Plan is provided in DCO document 6.4A Natural Environmental Constraints Plan.</p> <p>GYTRC OBC documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/outline-business-case-submission</p> <p>GYTRC DCO documents are available from: https://www.norfolk.gov.uk/roads-and-transport/major-projects-and-improvement-plans/great-yarmouth/third-river-crossing/further-information-and-documents/development-consent-application</p> |
| Environmental impacts worksheets. | TAG environmental impacts worksheets are provided in FBC Appendix C . |
| Assessment of Safety impacts and the assumed accident rates presented (when used, COBALT output should be provided). | The assessment of safety impacts is included in the Economic Appraisal Report (Supporting Document 1). |

| Item | Section/Page |
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| Assessment of Social impacts. | Social and Distributional Impacts are assessed in the Social and Distributional Impact Report (Supporting Document 3). |
| Assessment of Distributional impacts. | Social and Distributional Impacts are assessed in the Social and Distributional Impact Report (Supporting Document 3). |
| Social and distributional impacts worksheets (including DI screening pro forma). | The social and distributional impact worksheets are included in the appendices of the Social and Distributional Impact Report (Supporting Document 3). |
| Cost pro forma | Cost pro forma and calculation details included in the Scheme Costs Technical Note (Supporting Document 6). |