

Lake Lothing Third Crossing DCO

Submission at Deadline 8 on behalf of
Northumbrian Water Limited

12 April 2019



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1 INTRODUCTION

- 1.1 Northumbrian Water Limited ("**NWL**") made written representations to the Examining Authority in its Submission for Deadline 7 on 15 March 2019 in respect of Suffolk County Council's (the "**Applicant**") DCO application for a Third Crossing at Lake Lothing, Lowestoft.
- 1.2 This submission is made on behalf of NWL. It provides a response to the second round of the Examining Authority's written questions ("**ExQ2**") and specifically question 2.3 put to NWL. It also sets out NWL's further representations in response to the Applicant's submissions at Deadline 7, and in relation to further direct correspondence and discussions between NWL and the Applicant.

2 EXQ2: NWL RESPONSE TO QUESTION 2.3

"Has the noise monitoring methodology now been agreed between Northumbrian Water and the applicant and also shared with NWES?"

NWL can confirm that discussions between their noise consultants (PBA) and the Applicant's consultants (WSP) have continued since Deadline 7. WSP has produced a draft methodology for the carrying out of representative noise monitoring in relation to Trinity House prior to the start of construction of the Scheme, and at a suitable period following completion of the Scheme and it coming into operation. A revised draft methodology was received from WSP on 3 April 2019, and this is currently under review. It is still the intention that the agreed methodology will be secured by direct agreement between NWL and the Applicant which will also secure the provision of appropriate noise mitigation measures in circumstances where adverse noise impacts from the Scheme cause a material detriment to NWL's operations at Trinity House.

NWL can confirm that it has been in contact with NWES and has kept them up-to-date with the discussions on noise monitoring arrangements being agreed with the Applicant.

3 NWL FURTHER WRITTEN SUBMISSIONS IN RELATION TO INFORMATION SUBMITTED BY THE APPLICANT AT DEADLINE 7

3.1 Traffic and Transport

- 3.1.1 NWL's Deadline 7 submission confirmed that of the 14 transport and traffic issues raised in the NWL Relevant Representations on 8 January 2019 (given Issue Numbers HT4 to HT17 by the Applicant in its 'Response to Relevant Representation's Document (SCC/LLTC/EX/2), only the following remained unresolved:

- HT4 - Waveney Drive increase in traffic
- HT6 - New Access Road / Waveney Drive Priority Ghost Island Junction
- HT13 - Pedestrian crossings on Waveney Drive

- 3.1.2 PBA, on behalf of NWL, has continued to seek clarification from the Applicant's transport consultants (WSP) in light of the additional written materials WSP has prepared and submitted, and further to the Issue Specific Hearing on 7 March 2019.

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Consideration of the Applicant submissions from Deadline 7

- 3.1.3 PBA has provided a brief update Technical Note ("PBA Third Report") which seeks to assess the updated materials and information produced by the Applicant at Deadline 7, and the additional information WSP has provided directly to PBA (as set out at 1.1 in the PBA Third Report). The PBA Third Report is provided at Appendix 1 and should be treated as part of NWL's written representations.
- 3.1.4 With reference back to the outstanding concerns set out above, and the queries and concerns presented by NWL at Deadline 7 the PBA Third Report updates the NWL position, and this can be summarised as follows:
- (a) NWL continues to be concerned that the traffic counts being used by the Applicant are an under-estimation of the current levels, and that this has a knock-on effect for the assessment of future capacity. The PBA Third report notes that given the importance of the new junction as the single access route into the Riverside Business Park, the traffic flows being tested need to be robust and representative. A single day of recording doesn't provide such robustness. PBA have noted that taking the 85th percentile flows from the more extensive traffic counts recorded by PBA, this provided flows which are significantly higher than those currently being applied by the Applicant. More extensive trip measurements which were carried out by PBA on December 2018 and which NWL considers are more representative. NWL would strongly urge that the Applicant reconsider the baseline figures being used for their assessment. Should the Applicant continue to rely on its single-day figures, NWL would ask Examining Authority to consider the effect this has on being able to rely on the robustness of those assessments.
 - (b) NWL is grateful for the updated information regarding the two new roundabouts at the eastern end of Waveney Drive, and note that this includes corrections to the original assessment results. PBA has no further technical comments on the assessments, but it should be noted by the Examining Authority that the updates continue to show that the two roundabouts exceed operational capacity though are still within theoretical capacity. While this is acknowledged by the Applicant, no mitigation measures are proposed.
 - (c) NWL remains of the view that the proposed new ghost island junction to service the Riverside Business Park will result in a traffic arrangement which is less effective to that currently in place, and at risk of reaching capacity within the life period to 2037. Moreover, NWL maintains its concerns that the new junction will very likely result in drivers waiting for substantial periods of time before being able to enter or exit across traffic, and this will increase health and safety risks.
- 3.1.5 The proposed ghost island junction will provide the only vehicular access to the Business Park. Even if the adjacent Jen Weld site is developed to the extent of providing an additional road access onto Waveney Drive, the ghost island junction forming part of the Scheme would continue to be the primary access for the Business Park and for Trinity House. NWL therefore considers that it is not unreasonable to expect the Applicant to include within the Scheme a junction that demonstrates sufficient resilience and security of access to maintain operational facilities on the Business Park, as well as providing an attractive proposition to future occupiers.

Given the concerns over the potential lack of capacity and the associated health and safety risks, NWL draws the Examining Authority's attention to the recommendations of PBA at para 7.5 of the PBA Third report to "monitor and manage" the proposed new Business Park site access (and two southern roundabouts). This active monitoring needs to be carried out on a regular basis with a view to considering the need for any improvements having regard to the future junction performance. These measures should be secured within the DCO through being added to the specified works listed in Requirement 12 of the draft DCO (Traffic mitigation), including ensuring

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participation by the local highways authority as the body with direct responsibility for these junctions.

Bryan Cave Leighton Paisner LLP

12 April 2019

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APPENDIX 1 PBA REPORT (APRIL 2019) – ADDITIONAL TRANSPORT/HIGHWAYS RESPONSES ON BEHALF OF NWL

Job Name: Lake Lothing Third Crossing – Development Consent Order
Job No: 42498
Note No: 2
Date: 12th April 2019
Prepared By: N Fern
Subject: **Deadline 8 – Transport/Highways Responses on behalf of Northumbrian Water**

1. Introduction

1.1. This Technical Note has been prepared by Peter Brett Associates LLP (PBA) – now part of Stantec on behalf of Northumbrian Water Limited (NWL), to provide additional commentary in response to the following:

- the Applicant's *Document SCC/LLTC/EX/93: Response to Northumbrian Water Limited and NWES' Oral Submissions at 7-8 March 2019 Hearings* submitted as part of Deadline 7 on March 15th 2019.
- additional model extracts supplied to PBA on April 1st 2019 by WSP for PBA to fully understand the error WSP identified in the previous junction capacity assessment of the new southern Scheme roundabout.
- draft materials provided to PBA on April 8th 2019 by WSP which PBA understand is being submitted as part of Deadline 8 by the Applicant (titled *Appendix B: Junction Capacity Assessment based upon Sensitivity Tests*)¹. This was provided to PBA in advance.

1.2. The Technical Note concentrates on the following:

- the differences in the level of observed traffic flows to and from the Riverside Business Park (Issue HT4);
- the chosen junction form for the New Access Road / Waveney Drive junction (Issue HT6), with reference to:
 - the DMRB guidance
 - the modelled New Access Road / Waveney Drive junction visibility splays
 - the two strategic SATURN model sensitivity tests undertaken
- the sensitivity test implications on the two southern roundabouts on Waveney Drive.

1.3. With reference to the second round of the Examining Authority's written questions, it was noted that there were no questions relating to traffic and transport.

¹ Our review considers this material on the basis that there will be no changes to it as part of the Applicant's Deadline 8 submissions.

2. Existing Observed Riverside Business Park Traffic Flows

Applicant's Response

2.1. In summary, the Applicant stated the following:

- The acknowledgement that the Riverside Business Park was surveyed on a single day in July 2016 (a non-neutral month).
- The oral submissions at the Hearing were misleading in terms of comparing the recorded highest traffic flows collected by PBA over a two-week period in December 2018 against the Applicant's single day flow.
- It is standard practice to use the average traffic flow of multiple survey days.
- PBA's surveyed average flows were only 7% or 21 vehicles (AM peak hour) and 14% or 28 vehicles (PM peak hour) more than the Applicant's single day survey, therefore not considered significant.
- In order to seek to resolve this issue and assist the Examining Authority, the Applicant has now included the difference in the base traffic counts between the single July 2016 count and the average flow derived from PBA's December 2018 survey to the assessment. This is an extra 21 vehicles in the AM peak hour, and 28 vehicles in the PM peak hour (there is no reference to the highest one-day flows).
- The Applicant has also now included significant growth in the first sensitivity test with 611 vehicles in the AM peak hour, and 429 vehicles in the PM peak hour through the access from the Business Park and Jeld Wen redevelopment.

PBA's Further Review

2.2. PBA acknowledge that the Applicant has now increased the base traffic flows in these further sensitivity tests. PBA has reviewed and elaborated on this aspect below for the benefit of the Examining Authority and Suffolk County Council (as local highway authority with responsibility for approving the details of the Scheme if granted).

2.3. PBA would comment as follows:

- PBA agree that it is standard practice to use the average traffic flow of multiple survey days, and to test and design to average traffic flows, and not maximum traffic flows.
- From the July 2016 survey, the Applicant does not know what the recorded average traffic flows were over multiple days, since this was not undertaken at the Riverside Business Park. Therefore, it is also misleading to compare PBA's average recorded traffic flows with the single survey in July 2016. For this reason, PBA also compared the 85th percentile traffic flows over two weeks, and the highest recorded one-day traffic flow. If the Applicant had undertaken multiple survey days in July 2016 of the Business Park, then it is likely that the average would be lower than PBA's December 2018 survey, so the absolute difference between the two average data sets would be greater.
- It does not seem unreasonable to PBA, for such a crucial access to a Business Park (i.e., the single point of access), that we fully understand for robustness/resilience/security of access (and highway safety) how the proposed access form to Waveney Drive performs during higher traffic flow days.

- For example, the recorded 85th percentile traffic flows over two weeks and the maximum one-day traffic flows to/from the Riverside Business Park in December 2018 were significantly higher than the recorded average and therefore the Applicant's single day survey:
 - the 85th percentile flows were 26% higher (PM peak hour) than the Applicants single day flow; and
 - the highest one-day flow was 41% higher (PM peak hour) than the Applicants single day flow.

With reference to the standard deviation during the recorded PM peak hours (i.e. how much the days differ from the average) from the two-week December 2018 survey, the standard deviation is 40 vehicles. This highlights a large variation in traffic flow numbers to/from the business Park each day. Survey data for a Friday has lower traffic flows than most other weekdays and thus reduces the average. However, even excluding a Friday from the average, some days experienced +40 vehicles difference in an hour.

3. Chosen Junction Form

- 3.1. The Applicant states that Highways England's DMRB guidance (TD 42/95 – *Geometric Design of Major/Minor Priority Junctions*) is 20 years old and therefore not current, and the junction capacity assessment is more reliable.
- 3.2. PBA would disagree with this statement. DMRB is not a superseded document, and no guidance has replaced it. PBA would expect to see this document to be the first place to go in the design options / appraisal process for new junctions.
- 3.3. The Applicant keeps referencing the junction capacity assessment as the main parameter and deciding factor on chosen junction form. The design of the most appropriate type of junction form should be based on a wide range of factors, not just capacity. For example, there is no reference to Non-Motorised Users (NMU) provision (pedestrians and cyclists) across Waveney Drive at the new Business Park junction, or highway safety for both NMU's and drivers (particularly in light of the Stage 1 Road Safety Audit comment – Problem 1). As PBA stated in Deadline 7 submission, major/minor priority junction will usually have a higher collision rate than other junction types – drivers becoming frustrated and taking risk when exiting. The conversion of priority junctions to traffic signal or roundabout control has been shown to reduce collisions by 30% or more. Traffic signals are also safer for crossing pedestrians and cyclists.

4. New Access Road / Waveney Drive junction visibility splays

- 4.1. The Applicant agrees that the access design should be in accordance with DMRB TD 42/95, requiring a visibility splay of 90m left and right to exiting drivers. The Applicant states this will be considered further at the detailed design stage.
- 4.2. The Applicant does not consider the nominal mismatch in visibility splays will alter the assessment of functionality of the junction.
- 4.3. PBA has no further comment on this aspect at this stage.

5. Strategic Model Sensitivity Tests

- 5.1. PBA acknowledge that the Applicant has undertaken two strategic SATURN modelling sensitivity tests in light of comments made by PBA.

5.2. However, PBA do not agree that “*the decision to carry out sensitivity tests was undertaken by the Applicant in the spirit of a positive engagement with NWL...*”, and “*for the purposes of stress testing the Waveney Drive junctions*”. PBA are not of the view that these were sensitivity tests, but should have been part of the core scenario given the purpose of the Scheme.

5.3. PBA would like to make the following comments regarding the two sensitivity tests that were undertaken:

- **Sensitivity Test 1 (ST1)**

- added additional employment land-uses at the existing Riverside Business Park (from expanding existing tenants and vacant plots).

PBA appreciate that there is a level of uncertainty over this, however we must be mindful that this is the only single point of access to the Business Park, with a lesser form of access arrangement (in capacity and pedestrian/cycle accessibility terms) being proposed to replace the existing signal controlled access – as such, resilience and security of access is required.

- added growth associated with the Kirkley Waterfront redevelopment

PBA are of the view that this redevelopment should have been included in the core modelling scenario since the principle of the Scheme is to relieve traffic congestion, but also assist the development and regeneration of Lowestoft in this area – this is a fundamental part of the Scheme and should therefore have been included.

- **Sensitivity Test 2 (ST2)**

- amendments to the routing assignment of Business Park traffic via Kirkley Run / Colville Road.

PBA believe this is not a sensitivity test since the Business Park traffic routing in the strategic SATURN model was not considered realistic (i.e., utilising a residential road and not the main A12) or in line with current routing patterns to/from the Business Park, and provided favourable turning movements at the proposed New Access Road / Waveney Drive junction (a left in, left out arrangement).

6. Revised Junction Capacity Assessments

Introduction

6.1. The Applicant has reassessed the capacity of a number of key junctions locally (including the proposed New Access Road / Waveney Drive priority junction) as a result of traffic flows increasing through these junctions due to the latest strategic model sensitivity tests (ST1 and ST2), as well as the increase in base flows to/from Riverside Business Park. The junctions of particular interest are:

- A12 Tom Crisp Way / A12 Horn Hill / B1531 Waveney Drive Roundabout (eastern roundabout)
- New Southern Roundabout with Riverside Road / Waveney Drive (western roundabout)
- New Access Road / Waveney Drive ghost island right turn lane priority junction

6.2. The sensitivity tests take account of the proposed left in/left out access arrangement for Lings on Waveney Drive and associated u-turning traffic at the two roundabouts either side. It is noted that there is no proposal to facilitate the use of this access for vehicles from Nexen at this current stage.

A12 Tom Crisp Way / A12 Horn Hill / B1531 Waveney Drive Roundabout (eastern roundabout)

- 6.3. In terms of the revised junction capacity assessments, the 2022 opening year scenario is shown to operate within operational capacity (operational capacity defined as <0.85 Ratio of Flow to Capacity – RFC).
- 6.4. The 2037 future year scenario now exceeds operational capacity in both the AM and PM peak hours as a result of the sensitivity tests, with a maximum RFC of 0.96 on Waveney Drive in the AM peak hour, and a Level of Service classification (based on the average delay per arriving vehicle) of ‘Unstable Flow’ with a maximum average delay per vehicle of 40 seconds. The roundabout is still within theoretical capacity i.e., below an RFC of 1.00.

New Southern Roundabout with Riverside Road / Waveney Drive (western roundabout)

- 6.5. PBA understand that upon review of the junction capacity assessment for the new southern roundabout in anticipation for the sensitivity test, the Applicant discovered another error in the modelling – this relates to the results in the Transport Assessment Revision 1 (January 2019) when the model results first changed. It is understood that the error related to the manual transposition of traffic flows from the strategic SATURN model to the localised Junctions 8 model.
- 6.6. As a result, the reported 0.99 RFC in the future year of 2037 was incorrect, but should have actually been an RFC of 0.84.
- 6.7. PBA has reviewed the model outputs supplied from the Applicant and agree with this correction.
- 6.8. In terms of the revised junction capacity assessment results from the sensitivity tests, the 2022 opening year scenario is shown to operate within operational capacity.
- 6.9. The 2037 future year scenario now marginally exceeds operational capacity in both peak hours (maximum RFC of 0.89) in AM peak hour.

PBA’s Further Review

- 6.10. With reference to the two southern roundabouts detailed above, PBA would comment as follows:
 - It is unclear why the Applicant is utilising TRL Junctions 8 modelling software which is 4 ½ years old and not the latest Junctions 9 software.
 - The modelling of the two roundabouts in Junctions 8 does not appear to apply HGV percentages to the turning movements. This would marginally reduce capacity and increase the RFCs further.
 - It is acknowledged that the two roundabouts are shown to exceed operational capacity, but still within theoretical capacity. The Applicant’s response to these assessment results states *“it should also be reinforced that this scenario is the culmination of a number of onerous assumptions with respect to projections of traffic growth as set out earlier in this report. As such having regard to the likelihood of the situation arising and duration of the associated delays in the overall context of the benefits that the Scheme would still deliver, the Applicant considers that no mitigation measures need be specified at this time (having regard to the general duty of the highway authority to monitor the performance of its network).”*

As set out in Section 5 of this Technical Note, PBA do not consider these to be onerous assumptions in terms of traffic growth. PBA are of the view that to a private developer, this would not ordinarily be an acceptable position in terms of the model results.

- 6.11. PBA has no further technical comments to make at this stage.

7. Revised Junction Capacity Assessments of the New Access Road / Waveney Drive Ghost Island Right Turn Lane Priority Junction

- 7.1. It is noted that the revised junction capacity assessment now includes the uplift in base flow using PBA's average observed traffic flows.
- 7.2. In terms of the revised junction capacity assessments, the 2022 opening year scenario is shown to operate within operational capacity.
- 7.3. The 2037 future year scenario is also shown to operate within operational capacity with a maximum RFC of 0.77.
- 7.4. PBA would make the following observations:
- In the 2037 future year, the new access is shown to be within operational capacity, but with a margin of capacity of 0.08 RFC (absolute numbers, from 0.77 to 0.85).
 - Even based on these model results, there is predicted to be over ½ minute delay entering and exiting the new access:
 - right turn in during the AM peak hour (the predominant movement) has a maximum delay per vehicle of 30 seconds, resulting in a Level of Service classification of '*Approaching Unstable Flow*'
 - right turn out during both AM and PM peak hours (the least movement) has a maximum delay per vehicle of 35 seconds, resulting in a Level of Service classification of '*Unstable Flow*'
 - It is acknowledged that a signal controlled junction may have similar levels of delay entering and exiting when compared to a priority junction, but principally because signal controlled junctions inherently generate delay due to their nature. However, one reason that delay at signalised junctions is more 'acceptable' is because drivers expect to be delayed at traffic signals. The key difference however would be driver risk and safety. With traffic signals, drivers know they will be able to get out by waiting for the signals to change, so minimal risk. With priority junctions, drivers would need to take a greater level of risk waiting to enter/exit. This was also acknowledged in Problem 1 of the Stage 1 Road Safety Audit.
 - The above additional sensitivity test results are now based on using PBA's base average observed traffic flows to/from the Riverside Business Park. Therefore, on average days, the new Business Park junction is likely to operate within capacity at peak times, as shown in the Applicant's assessment work, albeit with >½ minute delays entering/exiting (and a Level of Service either Approaching or at Unstable Flow).
 - However, as set out in Section 2 (Observed Traffic Flows) of this Technical Note, it is not clear how the new access (and southern roundabouts) may operate during higher traffic flow days at the Business Park. PBA has already demonstrated that regardless of the observed average flows, the recorded 85th percentile traffic flows over two weeks and the maximum one-day traffic flows to/from the Riverside Business Park were significantly higher than the recorded average. It could be that on higher traffic flow days, the new access is unlikely to operate within operational capacity, especially considering the Level of Service as detailed above during average days, and the margin of capacity is relatively tight (higher traffic flow days may tip the margin of capacity remaining at 0.08). Should this situation occur on higher traffic flow days, would this be acceptable to the local highway authority and Business Park tenants, and the potential knock-on effect to driver safety and Non-Motorised Users.

- The greatest risk to the Business Park is that, in reality, should the proposed ghost island priority junction not operate within capacity as per the strategic modelling projections, particularly on high traffic flow days, the design could restrict an occupier/developer the ability to enhance the junction to signals in the future. Although this comment could be said about any new junction/access design, in this case this is the only point of access to the Business Park, at least until a second access is provided to the Kirkley Waterfront redevelopment (although any additional new junction would be designed to accommodate its own development traffic).

7.5. PBA would suggest the best way forward to respond to this level of uncertainty and likely traffic flow fluctuations to/from the Business Park is to 'monitor and manage' the proposed new Business Park site access (and two southern roundabouts). PBA note that where off-site highway mitigation works are proposed as part of the Scheme (e.g., B1531 Victoria Road / B1531 Waveney Drive / Kirkley Run mini-roundabout, and A12 Tom Crisp Way / Blackheath Road signalised junction), the local highway authority will monitor the performance of the junctions on a regular basis and consider the need for improvements, having regard to future junction performance. This is proposed to be secured through the DCO (Requirement 12 of the draft DCO). PBA would strongly recommend that such monitoring apply to the proposed New Access Road / Waveney Drive ghost island right turn lane priority junction, and that this be secured through the DCO.

Getting in touch

Please don't hesitate to get in touch if you would like to discuss anything covered or raised within this document.

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