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Your reference:

9 April 2020

Health Infrastructure
C/- TSA Management
Suite 1, Level 17
215 Adelaide Street
Brisbane QLD 4000

Attention: **TSA Management**

Sent via email

Dear TSA Management

RE: TWEED VALLEY HOSPITAL STAGE 2 RESPONSE TO REQUEST FOR FURTHER INFORMATION – TRAFFIC ASSESSMENT ITEMS

Bitzios Consulting Pty Ltd (Bitzios) has been engaged to prepare responses and provide further information for the Traffic Assessment items in the Department of Planning Industry and Environment (DPIE) Request for Further Information. The request for further information is dated 2 April 2020. This letter responds to the Traffic Assessment items.

1.0 RESPONSE TO TRAFFIC ASSESSMENT ITEMS

1.1. Item 1: Background Traffic Volumes and Modelling

The Department has reviewed the Traffic Impact Assessment Report (TIA) for the Stage 2 application and compared it with the TIA of the Concept Proposal. The Department notes the following discrepancies:

- The background traffic volumes for the Stage 1 and Stage 2 TIA do not match. This is highly unlikely as there should be no difference in the background traffic modelling for year 2023 and 2033 in both Stages. The TIA must address this discrepancy in the results

Response:

The background traffic volumes remain unchanged between the Stage 1 and Stage 2 assessments. Background traffic volumes were included as *Appendix C: Network Diagrams* for the Stage 1 TIA and *Appendix B: Network Diagrams* for the Stage 2 TIA. Sheets titled *Year 2023 Background Traffic* and *Year 2033 Background Traffic* shows that the background traffic volumes remain consistent across the two assessments. The intersection geometry adopted for the background assessment also remained consistent between the two stages.

It is noted that the results of background modelling vary slightly between Stage 1 and Stage 2. As identified in the Stage 2 TIA and further discussed in Bitzios Consulting's Response to Submissions (dated 21 February 2020), upgrades at the Tweed Coast / Road Cudgen Road intersection were revisited and refined as part of the Stage 2 TIA. This included revising traffic modelling for the design traffic scenarios. The revised models adopted the Practical Cycle time setting in SIDRA. Previously the Optimum Cycle time setting was adopted. The Practical Cycle time setting was adopted as these provided a reduced degree of saturation (DOS) for the 2023 Year of Opening design scenario with

the proposed upgrades (DOS under 0.90, which is a typical performance threshold). These cycle time settings were carried over to the base models to ensure an “apples with apples” comparison was undertaken between the background and design scenarios.

When changing the cycle time settings, SIDRA will adopt different cycle times to achieve the relevant performance targets, which in turn can change the modelled intersection performance, particularly on lane to lane comparison basis. This is the reason for the differing background model results between Stage 1 and Stage 2.

The use of various cycle times is consistent with the adaptive design of SCATS which constantly adjusts phase and cycle time based on demands and any variations over time. Further, given this is a future year assessment it is also unlikely that the current phase or cycle times would be appropriate for future traffic demands.

1.2. Item 2: SIDRA Modelling Results – Design Traffic 2023

- The SIDRA modelling results for design traffic at the Tweed Coast Road / Cudgen Road intersection, as provided in the Concept Proposal and the Stage 2 application vary slightly. While this is evident as the Stage 2 application includes more hospital capacity and additional intersection upgrade works, the following discrepancies are noted:
 - Some of the lanes in Tweed Coast Road would have a lower Level of Service (LoS) in 2023 for the Stage 2 application, than that anticipated in the Concept Proposal. The TIA must address why this occurs noting that the proposed number of beds in the Stage 2 application in 2023 is 391 (plus the additional upgrade works) whereas the Concept Proposal was based on 430 beds in 2023.

Response:

As discussed above, different time settings were used between the stages which results in differing modelled performance results. Traffic modelling provides a snapshot of intersection performance based on the intersection geometry, volumes and time settings. In practice for signalised intersections, particularly those using SCATS, these time settings can change cycle to cycle.

Traffic generation for hospitals is based on both hospital bed numbers and staff numbers, based on the traffic generation rate specified in the Roads and Maritime Services (RMS) Guide to Traffic Generating Developments. While the bed numbers adopted for the Stage 2 assessment at the year of opening were lower relative to the Stage 1 assessment (391 beds compared to 430 beds), the above comments do not acknowledge the change in staff. The Stage 2 assessment included 1,120 staff on-site during the day shift (ASDS), relative to the 1,050 ASDS adopted for Stage 1. This was refined for Stage 2 based on further workforce planning undertaken by Health Infrastructure. As a result, the peak hour traffic generation was similar between the Stage 1 and Stage 2 scenarios, including the Evening Commuter Peak Hour (EVT) scenario which had slightly higher traffic volumes in Stage 2, relative to Stage 1, even though bed numbers were lower.

In terms of comparison between the Stage 1 and Stage 2 design scenarios for the 2023 year of opening, it is noted that there are some minor changes in lane performance, such as the right turn movement for the Tweed Coast Road south approach. In the AM scenario this movement decreased from LOS D to LOS E for Stage 1 and Stage 2, respectively. This LOS change was due to a minor increase in delays of around six seconds. Other lanes showed improvements in this same scenario. For example, the left-turn movement at the Cudgen Road north-west improved from LOS B to A. These minor variations are due to changes in the intersection geometry, traffic volumes and time settings, as detailed previously. From an overall perspective the change in intersection performance is minor, with an overall LOS C achieved in both the AM and PM design traffic scenarios.

Irrespective of minor changes in modelled results between the different assessment stages, it is reiterated that the proposed upgrades more than cater for the development's traffic impacts at the intersection. This is clearly demonstrated when comparing the operational performance between the existing geometrical layout (with background traffic volumes) to the proposed upgraded layout (with design traffic volumes) and specifically considering that this is an “apples with apples” assessment. Further, consultation identified that Council has no intentions to provide significant increases to turning capacity at the intersection (beyond that proposed) due to the proposed four lane upgrade of Tweed Coast Road and future east-west links which will reduce background turning volumes at the Tweed Coast Road / Cudgen Road intersection.

In Item 10 of Council's response to submissions dated 8 November 2019, the following was stated:

“The proposed road upgrades including existing and new intersection works, cater for the proposed development and all accesses and intersections operate within acceptable limits, with the exception of the Tweed Coast Road/Cudgen Road intersection. However, the proposed upgrades to this intersection are expected to improve current levels of service.”

In Item 12 of Council's response, the following was noted:

“The proposed upgrades to the Tweed Coast Road and Cudgen Road intersection are generally acceptable, given they were initially proposed as part of Council's Tweed Road Development Strategy.”

1.3. Item 3: SIDRA Modelling Results – Design Traffic 2033

- Similar variation in results are noted in the intersection performance for 2033, when the Concept Proposal and Stage 2 applications are compared. The Stage 2 TIA needs to address whether the additional delays and lower LoS noted in some lanes for Tweed Coast Road / Cudgen Road for Stage 2 in 2033 are due to the additional hospital capacity proposed. If this is the case, the TIA must also address whether any additional management, mitigation measures are needed at this intersection to improve the delays / queuing for the individual lanes.

Response:

Refer responses to Item 1 and Item 2 for details around variations in traffic modelling and the suitability of infrastructure upgrades to mitigate against the Hospital's traffic impacts.

It is not the responsibility NSW Health Infrastructure to entirely resolve all capacity issues at the subject intersection. Any limitations in capacity or performance of the intersection are due to a combination of factors, including existing traffic volumes, intersection configuration and continued background traffic growth, and are not solely due to development (hospital) traffic. The proposed upgrades more than cater for the development's traffic impacts at the intersection and also improve existing operations. This is clearly demonstrated when comparing intersection modelling results for background traffic (without upgrades) and design traffic (with upgrades). This is also acknowledged in Council's response to submissions. Consultation with Council identified that further upgrades to improve turning capacity at this intersection are not proposed, given the long-term road network planning in the area which includes a four-lane upgrade of Tweed Coast Road and new east-west connections to Kingscliff.

Further mitigation measures (in addition to those already proposed) are not required at this intersection as a result of hospital traffic.

2.0 CONCLUDING STATEMENT

I trust that the above information is sufficient to respond to DPIE's Request for Further Information in relation to the traffic assessment items and will allow reasonable and relevant conditions of approval to be prepared.



Julius Walden-Goodlet

Senior Traffic Engineer and Transport Planner

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