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Your reference:

21 February 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 EIS RESPONSE TO SUBMISSIONS –
TRANSPORT AND TRAFFIC**

Bitzios Consulting Pty Ltd (Bitzios) has been engaged to prepare responses and provide further information to the Transport Planning and Traffic Engineering items of relevant Government agency responses for Stage 2 of the Tweed Valley Hospital EIS. This letter specifically responds to:

- Transport Roads and Maritime Services (RMS) correspondence (RMS reference NTH18/00047/11) dated 28 November 2018
- Tweed Shire Council (Council) correspondence (Council reference DA19/0683& DA18/0681.01 LN84310) dated 8 November 2019
- Transport for New South Wales (TfNSW) correspondence (TfNSW reference SSD9575 MOD 2 and SSD10353) dated 4th November 2019.
- Department of Planning Industry and Environment (DPIE) correspondence dated 15/11/2019.

1.0 RESPONSE TO ROADS AND MARITIME

1.1. Item 1: Traffic Impact Assessment

The Hospital is a major development, with the potential to have a significant impact on traffic and road users in the area. While the EIS has attempted to address the management of traffic to and from the Hospital, as well the impact on general traffic using the same road network; we have identified some concerns with data provided and outcomes suggested. These are summarised below:

- A new Traffic Impact Assessment (TIA) was not provided with Stage 2, although this was requested by Roads and Maritime and reflected in Stage 1 conditions. The document provided with Stage 2 has given some updated SIDRA outputs only, with no detail of the methodology used; for example, why different cycle times were used.

Response:

A new TIA was prepared for the Stage 2 submission (specifically *P3378.006R Tweed Valley Hospital Project Stage 2 Traffic Impact Assessment* issued 23/09/2019). The TIA was prepared specifically for Stage 2 of the Tweed Valley Hospital application and incorporating the most recent and up-to-

date development components, including assessment of traffic generation, parking demands and supply as well as more detailed internal layout designs.

The TIA addressed the relevant conditions from Stage 1 as well as the SEARS for Stage 2. This included preparing a Green Travel Plan, Transport Access Guide and Way Finding Signage Plan.

Given the nature of the approval stages (i.e. Stage 1 – Concept Proposal and Stage 2: Hospital Main Works and Operation), there is an overlap of some assessment areas and similarities between reports. In this regard, it is noted that much of the background information remains consistent with the Stage 1 TIA. This remains relevant given no significant changes have occurred. Where changes have occurred, these were reflected in the TIA accordingly. In addition, the status of the design, summary of the assessment findings and any changes from the previous Stage 1 TIA were discussed with RMS assessing representative and Council at a meeting held on 31 July 2019. This included an on-site walk-thru with RMS for Cudgen Road and Tweed Coast Road / Cudgen Road intersection.

- The tables in the body of the original (TIA) Version 5, dated October 2018 did not fully address the impacts of the development on the intersection of Tweed Coast and Cudgen Roads. The SIDRA modelling used in Stage 1 was different to the modelling used for Stage 2 so comparisons were difficult to make between queue lengths, and the consequential impact on the intersection. The Level of Service (LOS), Degree of Saturation and queue lengths reflected significant differences between the two assessments (Stage 1 and Stage 2) and no detail was given to explain the changes.

Response:

The road infrastructure works proposed as part of Stage 1 were appropriate to address the developments impacts (for the development yield proposed as part of Stage 1). Specifically, traffic modelling at the intersection of Tweed Coast Road / Cudgen Road demonstrates that the intersection operations are improved with the installation of the proposed upgrades and with design traffic volumes (i.e. forecast background traffic and development traffic) when compared to forecast background traffic with no intersection upgrades in place. This is demonstrated by comparison of the SIDRA results presented in Table 3.6 (forecast background volumes in 2023) and Table 5.9 (forecast background volumes plus development traffic 2023). Without upgrades in place, under background conditions overall the intersection is expected to operate at LOS E in the AM peak and LOS D in the PM Peak. Comparatively with the addition of development traffic and the proposed upgrades in place, the intersection is expected to operate at LOS C in both peak periods.

The Stage 1 TIA noted that consultation was ongoing with Council and RMS regarding the extent of upgrades to be provided and ensuring that the design was commensurate with Council's ultimate planning for the corridor and intersection. This consultation was finalised as part of Stage 2 and the proposed upgrades were discussed in principle at a meeting on 31 July 2019 at the Tweed Heads Project Office. Council also confirmed as part of their assessment of the Stage 2 TIA in comments issued on the 8 November 2019 that the proposed upgrades were commensurate with Council's ultimate planning for the Tweed Coast Road corridor.

The upgrades proposed as part of Stage 2 differed slightly to Stage 1 (i.e. extended right turn on the southern side of Tweed Coast Road was also proposed as part of Stage 2). Results will therefore naturally differ between the two Stages of assessment. The Stage 2 assessment had higher traffic generation due to changes to staff and bed numbers. Queues lengths and delays are therefore not expected to be the same between the two assessment stages. Further, SIDRA's Optimum Cycle time setting was used which changes cycle and phase times based on demands to achieve the lowest delays and queuing. Different demands due to traffic generation therefore provide different results (in terms of delays and queuing).

- No indication was given with the current application as to where the data for the cycle times at the above-mentioned intersection was sourced. Such data is typically available from Roads and Maritime, but no evidence was provided as to whether we were consulted to provide existing cycle lengths and phasing.

Response:

Section 3.7.4 of the Stage 2 TIA (version 6, issued 23/09/2019) identified that the phasing was adopted from the RMS Traffic Control Site (TCS) Plan. The TCS plan was obtained from RMS during the Stage 1 assessment process. The plan is the *Tweed Council Area Traffic Signals at Old Bogangar Road, Cudgen Road and Chinderah Road Cudgen* (TCS No. 3384). It was also noted that the SIDRA optimum cycle time setting was used, given this is a future year assessment and is unlikely that the current phase or cycle times would be appropriate for future traffic demands. This is consistent with the adaptive design of SCATS which constantly adjusts phase and cycle time based on demands and any variations over time.

- Modelling was based on a future 4 lane upgrade of Tweed Coast Road being delivered but did not take a proposed future East/West Link into consideration (the exact alignment is yet to be determined). The timing of these road infrastructure projects is unclear in relation to the Hospital and no discussion was provided in respect to alternative solutions.

Response:

Modelling was based on the current geometry with upgrades proposed to the current intersection form. It is noted Tweed Coast Road already has a four-lane form for the extent of the intersection. Ultimately the four-lane upgrade to Tweed Coast Road will tie-in on either side of the intersection. This was confirmed in consultation with Council during the meeting held on 31 July 2019 and in line with Council's planning outlined in the Tweed Road Development Strategy (TRDS). This will add further capacity to the intersection, by providing additional storage lengths and removing the diverges and merges associated with the current arrangement which transitions from the two-lane section of Tweed Coast Road either side of the intersection to the four-lane section through the provision of short-lanes.

A conservative approach to traffic modelling was undertaken which assumed that the two planned east-west links from Tweed Coast Road to Kingscliff located north between Cudgen Road and Pacific Highway may not be constructed by the ultimate design year. Cudgen Road via Tweed Coast Road is historically the key route to and from Kingscliff from Cudgen and Tweed Coast Road. Provision of the new east-west links to the north of the intersection has been shown in Council's TRDS to reduce turning movements at Cudgen Road by providing an alternate route between Tweed Coast Road and Kingscliff. Section 3.7.4 of the TIA provides a comparison of the surveyed traffic volumes and 2041 traffic volumes from the Tweed Strategic Transport Model (TSTM) with and without the new east-west links. This shows that volumes on Cudgen Road are expected to significantly reduce (a reduction in the order of 30%) once the east-west links are constructed relative to the future background volumes.

- Stage 1 consent condition B22 (c) requires plans for the upgrade for Tweed Coast Road/Cudgen Road intersection. The plans provided for stage 2 have no dimensions and should be updated to include the additional lengthening of the Tweed Coast Road north-bound right-turn bay, and left-turn deceleration lanes on Cudgen Road. No detailed plans were provided for the proposed traffic signals at the Hospital entrance.

Response:

Updated plans have been prepared by Robert Bird Group (RBG) showing dimensions for all proposed intersection works (short lane lengths, lane widths etc.).

Provision of detailed design drawings is not considered warranted for the purpose of Development Approval. It is recommended that provision of detailed design drawings for the proposed upgrades at the Tweed Coast Road / Cudgen Road intersection and signalised Site access to Cudgen Road be conditioned to be provided as part of the approval.

Further to this it is noted that detailed design drawings will be required for the Section 138 applications to Council in order to undertake works. The response provided by Tweed Shire Council identified this requirement and provides a recommendation that applications be made to Tweed Shire Council under Section 138 of the Roads Act 1993 and that applications shall include engineering plans and specifications. In addition, it is noted that the works involving traffic signal infrastructure will involve a Works Agreement Deed (WAD) with RMS and shall be conditioned accordingly.

1.2. Item 2: Queue Lengths

Observations taken from the EIS in regard to queue lengths, and our comments thereon are:

- The SIDRA modelling estimated that the queue lengths on Cudgen Road were 202m for left-turns and 289m for right-turns. The eastern approach of Cudgen Road (E phase) provided only 35 seconds of green time. This will take at least 2 cycles (or more) too clear. Access to the left-turn lane will likely be blocked and westbound through traffic will be delayed by the additional right-turn traffic sharing the lane. It is suggested that this be given further consideration in line with clause 104(3) if the ISEPP to better understand the extent and duration of expected queuing during peak periods in the interests of identifying any measures required to accommodate forecast traffic demand.

Response:

The SIDRA modelling used the optimum time setting for the intersection, which aim to minimise delays and queues across the entire intersection. Similar to SCATS, SIDRA balances the phase splits to achieve the best results across the intersection. Increasing the E Phase split will result in additional delays and queuing on the other intersection approaches.

It is noted that with the proposed upgrades, on the western approach the existing kerbside through lane will be changed to a right-through configuration. The purpose of this is to increase the capacity of the eastbound right-turn movement from Cudgen Road to Tweed Coast Road. This right turn-movement is the dominant movement on this approach (in the order of 65% of all movements turn right in the 2033 design traffic scenario relative to 10-15% of through movements). Without the development's proposed duplication of the right-turn movement, queues would extend even further due to less right-turning vehicles clearing the intersection each cycle (resulting in the right-turn pocket queuing out and blocking the through lane / left turn). For comparison in Year 2023 under the background scenario (i.e no development, no works) the right-turn queues are in the order of 260m and 230m in AM and PM peak period scenarios. With 2033 design traffic and the proposed upgrades in place, these queues are reduced to 100-170m.

It is re-iterated that the proposed upgrades, more than cater for the development's traffic impacts at the intersection as is demonstrated when comparing the operation performance between the existing geometrical layout (with background traffic volumes) to the proposed upgraded layout (with design traffic volumes). Further, consultation with Council 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, the following has been noted:

"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 has been 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."

- Left-turn lanes at the Tweed Coast Road/Cudgen Road at the access into the Hospital should be designed in accordance with Austroads standards. They should be long enough to cater for deceleration and queued traffic due to pedestrian crossings or internal design. For a 60km/h speed zoned area, this would require a minimum of 55m plus queue length.

Response:

The only change to left-turn lanes at the Tweed Coast Road / Cudgen Road is the proposed new left-turn lane on the northern leg of the intersection on Tweed Coast Road. The design provides a total length in the order of 200m including the taper. This caters for left-turn queues at the year of opening (up to 180m). The proposed turn lane adequately mitigates against the impacts of left-turning traffic associated with the proposed development and background traffic. It is understood that further extension of this lane would have impacts to the verge would result in significant additional cost due to the verge profile. Reference is made to Items 10 and 12 of Council's response as detailed above.

The Auxiliary Left Lanes (AUL) proposed for entry at Access A and C have been designed in accordance with Austroads Guide to Road Design (ARGD) Part 4A. The diverge length for an AUL (including taper) as detailed in Table 5.4 of ARGD is 55m for a design speed of 70km/h (60km/h posted speed) for a stop condition. The proposed diverge length is in the order of 70m for the AUL at Access A and Access C exceeding the requirements of ARGD. It is also noted that neither Access A or C includes a stop condition. Both designs include an 'exit curve' into the site rather than a control point requiring vehicles to stop. The proposed pedestrian crossings across each access are also kerb ramps rather than zebra crossings, providing priority to vehicles (i.e. no significant queuing expected).

Access A is constrained by the subject site's western boundary, the adjacent driveway crossover of Lot 741 Cudgen Road and the heritage listed wall within the site. Access D is constrained by Access B, the proposed bus stops and the location of the TAFE access. Neither of these accesses can be extended, nor is it considered to be required.

In addition to the above, the access arrangements are consistent with the approved Concept Proposal and Stage 1 Early and Enabling Works. Further, Council has granted approval for the Section 138 Application of Access A and this is currently under construction. Council's response also noted that access arrangements operate within acceptable limits (refer Section 1.2).

- Modelling provided with the Stage 2 EIS has indicated that only 20m storage was required for the east-bound left-turn deceleration lane. This should be lengthened to provide 55m to cater for deceleration and queuing back from the hold line as only a single entry lane is provided for both left and right-turning entering traffic into the site. This change should also apply to the four other left-turn slip lanes (east-bound left-turn lane at Tweed Coast Road signals; and the three along the frontage of the site).

Response:

SIDRA model results for the signalised Cudgen Road / Site access are presented in Section 5.4.4 of the TIA. The slip lane at the intersection is referred to in the results as Approach: *Southwest Cudgen Road (SW)* and OD Movement: *L2*. The maximum 95th percentile queue length modelled in all scenarios was 2.4m (i.e. less than one vehicle). While only a single entry is provided into the site, the only conflicting movement is the right-turn movement during C Phase. The left turn movement has priority due to the signal phasing at all other times, which is reflected in the low vehicle queues. The provision of a left slip lane (with a storage length of 20m) was incorporated in the design to maximise the efficiency of the intersection operations. The provision of short left-slip lanes is common design practice, including at other intersections in the Tweed Shire, such as:

- Tweed Coast Road / Cudgen Road
- Wharf Street / Florence Street
- Fraser Drive / Leisure Drive
- Tweed Coast Road / Casuarina Way.

The design is also constrained by the requirement to provide a 30m vegetated agricultural buffer between Cudgen Road and the main Hospital building. Any extension to the left-turn lane would reduce this buffer below acceptable levels.

Extending the left slip into the site is onerous given the expected queue length, impacts to the vegetation buffer requirements for the site and is inconsistent with numerous similar signalised intersection designs across the Tweed shire.

- The existing left-turn slip lane for vehicles turning from the western approach to Cudgen Road into Tweed Coast Road has limited storage. SIDRA modelling indicates that this lane needs to provide more capacity. Any queuing will have a significant impact on through and right-turn traffic. It is noted that the northern side is constrained by existing residential. It is suggested that strategic drawings be provided to show queue lengths, and that Council/State Government confirm that those lengths are acceptable and meet Austroads standards.

Response:

This is an existing intersection configuration not the responsibility of Health Infrastructure, particularly given no development traffic is added to this left turn movement as a result of the proposed hospital.

A series of upgrades are proposed at the intersection which directly mitigate against the Hospital's traffic impacts at the intersection and improve operations. Council's response notes that the proposed works cater for the proposed development and while the intersection operates at or above acceptable limits for some movements, that the proposed upgrades will improve current levels of service (refer Section 1.2 for further details).

- Lengthy delays at the Tweed Coast Road/Cudgen Road traffic signals may encourage traffic to seek other routes from the Hospital. This has the potential to increase the existing left-turn demand at the Hospital's traffic signals and at other local intersections to the east.

Response:

Forecast traffic distribution to the surrounding road network was based on distributions from the TSTM with the Hospital located on the subject site as well as a first principle's assessment which considered the surrounding population centres and densities across the Tweed Shire. The majority of traffic will travel to and from the Pacific Motorway via Tweed Coast Road. In order to avoid the Tweed Coast Road / Cudgen Road intersection as suggested, traffic would need to detour via the local streets in Kingscliff, increasing both vehicle kilometres travelled (VKT) and vehicle hours travelled (VHT) which is undesirable for route choice selection. A comparison was undertaken with Google Maps:

- To reach the Pacific Motorway northbound from the subject site via Tweed Coast Road takes approximately 4 minutes and has a travel distance of approximately 4.1km. Comparatively to reach the Pacific Motorway northbound from the subject site via Kingscliff takes approximately 7 minutes and has a travel distance of approximately 5.3km
- To reach the Pacific Motorway southbound from the subject site via Tweed Coast Road takes approximately 4min has a travel distance of approximately 3.6km. Comparatively to reach the Pacific Motorway southbound from the subject site via Kingscliff takes approximately 9 minutes and has a travel distance of approximately 6.7km.

As demonstrated, seeking alternate routes is expected to result in significant additional travel time and distance. It is considered unlikely that peak period intersection delays at this particular intersection of Tweed Coast Road / Cudgen Road intersection will result in re-routing.

Council's road network planning for the surrounding area including the future planned east-west linkages have been considered throughout the development's design process.

- There is potential for conflict between exiting and queued merging traffic, on the internal road networks adjacent to the main entrance to the Hospital, especially in the peak hours. It is suggested that the eastern left slip lane into the car park and the through merge should be separated to avoid such conflict. It is also suggested that bus bays be positioned on the departure sides of the traffic signals to avoid conflict.

Response:

The internal road layout has been designed with consideration to managing peak period traffic movements, most notably AM peak ingress movements and PM peak egress movements. Egress queuing capacity has been maximised through a double right turn in order to reduce queuing back into the site, along with a dedicated high angle left turn lane. We acknowledge that there may be an opportunity to extend the length of the high angle left turn lane to reduce to improve access from the facility. This aspect of the road layout is being considered by the design team while also considering surrounding landscaping and pedestrian pathway facilities.

The eastbound bus bay has been located on the departure side of the intersection. The westbound bus stop has been located on the approach side to the intersection due to:

- The available road reserve and site constraints, including the location of a residential driveway crossover and a commercial driveway crossover
- The width of the road reserve and verge on the southern side of Cudgen Road

- Widening works on Cudgen Road associated with the main access and ensuring no impacts to residential property boundaries or structures.

These aspects of the proposed intersection and bus stops were identified on-site during a site meeting with RMS's assessing officer.

While the TfNSW State Transit Bus Infrastructure Guide states it is 'often preferred' to locate bus stops on the departure side of the intersection, the guide acknowledges that the location needs to be considered on the individual characteristics of the site. The location of the westbound bus stop on the approach side of the intersection also provide the opportunity for buses to utilise the site access to turn around (subject to TfNSW's future bus route planning).

Both bus stops are provided as fully indented bus stops to remove the conflicts associated with busses stopping in lane. The proposed westbound bus stop design and location offers a significant improvement over the existing westbound bus stop, which is located in the left turn lane for the TAFE access.

1.3. Item 3: Satisfaction of Consent Authority

The consent authority should be satisfied that adequate road infrastructure is in place with each stage of the development to cope with the capacity of traffic anticipated, and to guarantee the safety of the community and road users.

Response:

Noted. Council's response identifies they are generally satisfied that proposed infrastructure is suitable to service the development.

1.4. Item 4: Main Access Location

The positioning of the main access, bus bays and alternative ingress within close proximity to each other has the potential to compromise the ability to include any improvements in the future. This warrants further consideration at this time.

Response:

The main access design (including location) caters for traffic volumes in the 10-year design horizon. The intersection has also been designed to operate with some spare capacity to allow future increases in volumes and flexibility in the operation of the intersection. A four-lane section will be provided through the intersection, with the alternate accesses and bus stops designed around this. It is considered unlikely that additional capacity at the intersection would be needed in the foreseeable future. This is appropriate considering Council's strategic road planning to introduce two new east-west linkages between Kingscliff and Tweed Coast Road, reducing through traffic which currently utilise Cudgen Road past the subject site.

The access intersection has also specifically been designed to allow potential future proofing, with the location directly opposite the TAFE site, allowing the flexibility to add a fourth leg for a new TAFE access if this is required.

1.5. Item 5: Signage and Traffic Control Plans

All regulatory signs, controls and traffic signal plans for internal and external roads should be referred to Tweed Shire Council's Traffic Committee for a recommendation. The internal roads are Road Related Areas and traffic regulations can be enforced.

Response:

Noted.

1.6. Item 6: TAFE Access

It is noted that the western approach right-turn lane of the Turnock Street roundabout is also shared by the TAFE's access as an east-bound acceleration lane. The merge/diverge movements will have an impact on the efficient and safe operations of this approach lane. This should be noted and further considered

Response:

The TAFE access and western approach to the Turnock Street / Cudgen Road roundabout is an existing arrangement. A range of changes were incorporated at the roundabout in consultation with Council to improve operations and safety, including widening of the roundabout where the new leg is proposed and reducing the number of movements through the intersection, and simplifying the lane designations. These works have been approved as part of Section 138 application construction is currently underway.

1.7. Item 7: Green Travel Plan

The EIS mentioned provision of a Green Travel Plan (GTP), however little detail of content or actions was provided. The GTP should identify initiatives which can be undertaken to reduce the share of private vehicles used in trips to and from Hospital. These initiatives include encouraging use of the buses servicing the Hospital, promoting car-pooling for staff; increasing active transport; and providing end-of-trip facilities.

The GTP should include the following:

- A detailed action plan comprising specific tasks needed to complete the proposed actions, the person/s responsible for completion of the task, completion date and anticipated costs.
- Quantitative data and targets for appropriate sustainable transport mode share targets;
- An implementation checklist to achieve the proposed initiatives;
- Alternative actions to undertake where targets are not achieved; and
- The set-up of a steering group or committee of relevant internal and external stakeholders to inform future targets and the ongoing monitoring and revision of the GTP for five years.

It is requested that the Department consider the above points and include a condition to ensure the GTP is a relevant and useable document.

Response:

A draft GTP was prepared and included as Appendix F of the TIA. The GTP identified existing travel patterns and existing alternate public transport infrastructure and services. Specific targets were identified for public transport, walking and cycling mode shares, consistent with TfNSW's Regional NSW Services Infrastructure Plan.

The Project is still in the planning and preliminary construction phases. Preparing detailed action plans or commitment are not feasible at this preliminary stage as numerous operational elements are still to be resolved in the lead up to opening in 2023. While specific commitments are not yet made, the GTP identifies a range of measures that could be implemented, some which has been included in the design phase. These measures include:

- Management of car parking to encourage alternate modes

- Staff car pooling initiatives to reduce single occupant private trips
- Improvements to accessibility and desirability of public transport. New bus stop and pedestrian crossing infrastructure is proposed as part of the design. A number of bus services have been committed to by TfNSW, including increasing the frequency of services past the site frontage and provision of new services
- Preparation of Transport Access Guide (TAG) to increase awareness of alternate transport modes. A draft TAG was prepared to accompany the GTP and TIA
- Public transport concessions
- Provision of end of trip facilities. Bicycle parking and end-of trip facilities have included as part of the design.

During the detailed design phase and prior to the commissioning of the new hospital, more information, including staffing detail, will become available and the GTP will be updated and finalised in consultation with various stakeholders including Council and TfNSW. It is considered appropriate that a condition of the Stage 2 consent can require the Green Travel Plan to be finalised and submitted prior to occupation of the hospital, to the satisfaction of DPIE and TfNSW.

2.0 RESPONSE TO TWEED SHIRE COUNCIL

2.1. Modification

The most significant changes relating to public infrastructure are the amended traffic and access provisions, and the increased number of beds for the facility.

Traffic access changes facilitate better separation of operational and staff vehicles from patient /visitor vehicles, and spread turning movements across the various entries and exits for the site.

Car parking has been increased from 700 spaces under the approval to about 1200 initially, and over 1500 ultimately via the introduction of a 10 storey multi deck car park. The additional spaces are pleasing to Council, and address concerns that the original estimates for parking were conservative. The application does not provide anything definitive regarding management of on-site parking (e.g. paid parking or time restrictions) but flag an intent to consider these options to limit long term parking on site and promote public and active transport. Similarly, off-site parking impacts are acknowledged but not explored in depth, other than an intent to provide high quality and convenient parking at the facility which will limit desirability of more remote options. While internal parking management is a matter for Health Infrastructure, potential impacts on surrounding streets will ultimately come back to Council to manage. This would include requirements for parking restrictions, enforcement, complaint handling and maintenance in surrounding streets. Council would like the opportunity to continue dialogue with the hospital regarding ongoing management of parking issues in the locality, should they eventuate, with a commitment that the hospital will be engaged in solutions.

Response:

Noted and agreed. It is expected that hospital management will continue liaison with Council throughout the design, construction and operational phases of the project.

The project caters for gross projected visitors and staff parking for the design years with the aim of minimising impacts to local streets and providing sufficient, high quality and convenient parking for visitors and staff.

The new Tweed Valley Hospital will provide immediate and ongoing economic and social impacts for the community which will far outweigh any impact of potential impacts to local roads due to on-street parking.

External parking impacts will be further minimised through the implementation of demand management strategies such as provision of end of trip facilities and a green travel plan.

Health Infrastructure have advised that if paid parking is implemented, concessional parking will be available with parking up to three hours provided free of charge for eligible patients and their carers.

2.2. Item 10 – Parking and Traffic

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.

Response:

Noted. It is also re-iterated that in the long-term turning movements will reduce at this intersection as a result of proposed new east-west links to Kingscliff as outlined in Council's TRDS and Kingscliff Locality Plan.

2.3. Item 11 – Parking and Traffic

The increases in right turn traffic movements at the Cudgen Road/Turnock Street roundabout, due to internal reconfiguration, has been modelled and does not significantly affect its level of service.

Response:

Noted. And agreed.

2.4. Item 12 – Parking and Traffic

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.

Response:

Noted. This is consistent with consultation undertaken with Council and RMS.

2.5. Item 13 – Parking and Traffic

At a meeting held between Council staff and the hospital project team on 21 October 2019, the potential to undertake additional infrastructure works at this intersection in conjunction with the hospital works was discussed. A 500mm sewer rising main is required through the intersection to connect the future Kings Forest development to the south to the Chinderah Waste Water Treatment Plant to the north. A significant upgrade to a transverse stormwater drain north of the intersection is also required, and has been discussed with consultants for Gales Holdings to facilitate residential development in Cudgen/West Kingscliff. Council will continue to negotiate with Health Infrastructure on this matter.

Response:

Noted.

2.6. Item 14 – Parking and Traffic

While parking will be provided at a rate commensurate with Tweed DCP Section A2 - Car Parking and RMS guidelines, the implementation of a paid parking scheme may result in long term parkers, i.e. patients admitted for several days or months, parking on the adjacent street network. This may result in Council demands for timed parking on streets and public car parks in close proximity to the hospital.

Response:

Noted, however it is considered unlikely that long-term patients would leave vehicles in parked in the surrounding streets for significant lengths of time rather than making alternate travel arrangements. It is expected that this will need to be monitored over time.

2.7. Item 15 – Parking and Traffic

Service Vehicle Access is considered appropriate and caters for the design vehicle.

Response:

Noted and agreed.

2.8. Item 16 – Parking and Traffic

Pedestrian access and alternate transport linkages are considered appropriate.

Response:

Noted and agreed.

2.9. Item 17 – Parking and Traffic

The following conditions of consent are specifically recommended for parking traffic:

- a. Any proposed paid parking scheme should be implemented in consultation with Tweed Shire Council to ensure that parking associated with the Tweed Valley Hospital does not adversely impact on adjacent residences or businesses.
- b. All road works are subject to assessment and approval under s138 Roads Act and are to include street lighting plans complying with AS1158 V4 Category.
- c. Applications shall be made to Tweed Shire Council under Section 138 of the Roads Act 1993 for any works pursuant to this consent located within the road reserve. Applications shall include (but not limited to) engineering plans and specifications undertaken in accordance with Council's Development Design and Construction Specifications for the following required works:
 - Cudgen Road is to be upgraded to an urban type road with kerb and gutter, street lighting, drainage, signage, line marking etc. from the existing kerb near the intersection

of Tweed Coast Road/Cudgen Road to the existing kerb and gutter near the Kingscliff Tafe.

- Two new bus bays to be provided on Cudgen Road to include all weather shelters and seating. A pedestrian refuge crossing to be provided near the bus stops including applicable footpath connections for pedestrians.
- All intersection upgrade works including road works, stormwater, road furnishings, sediment and erosion control etc.
- Relocation of existing services (i.e. relocation of electrical poles).
- All Permanent site access provisions into the Hospital Site.
- An ultimate urban road design shall be provide to cater for traffic volumes taking into consideration any future additions/extensions to the hospital.

The above mentioned engineering plan submission must include copies of compliance certificates relied upon and details relevant to but not limited to the following:

- Road works/furnishings
- Stormwater drainage
- Sediment and erosion control plans
- Traffic Control Plan (as applicable)
- A combined services plan indicating location of all new / existing service conduits (water, sewer, electricity supply, landscaping, gas and telecommunication infrastructure, as applicable).
- Including submission of electrical reticulation plans clearly identifying the location of streetlights), underground cables and all other electrical infrastructure including transformers and substations.

Application for the Section 138 of the Roads Act 1993 shall be made to Tweed Shire Councils Development Engineering Unit where an invoice will be provided for assessment based on the rates contained in Council's current Fees and Charges at an hourly rate.

Response:

Noted, however:

- With respect to “A pedestrian refuge crossing to be provided near the bus stops including applicable footpath connections for pedestrians”, the proposed signalised intersection will incorporate a signalised pedestrian crossing and no additional refuge crossings are recommended for Cudgen Road.
- The request that “Cudgen Road is to be upgraded to an urban type road with kerb and gutter, street lighting, drainage, signage, line marking etc. from the existing kerb near the intersection of Tweed Coast Road/Cudgen Road to the existing kerb and gutter near the Kingscliff Tafe” is onerous. Cudgen Road is an existing road, generally rural with some urbanised sections. Provision of kerb and channel for the full length would require significant civil works, including but not limited to provision of kerb and channel, pavement works, construction of new residential and commercial crossovers and provision of stormwater infrastructure. It is agreed that the Hospital will urbanise the environment to some degree and as such where intersection / access works are proposed on Cudgen Road, kerb and channel is proposed to be provided. Specifically, kerb and channel is proposed:
 - on the northern side of Cudgen Road for the full site frontage
 - on the southern side of Cudgen Road generally for the extent of Access B connecting east to the existing kerb and channel at the TAFE access

Outside these extents the kerbing shall tie-back to the existing form. To the south west, the area remains rural and includes a number of rural/commercial accesses (e.g. “Mate and Matt’s Farm” at Lot 752 Cudgen Road). Provision of kerb and channel may restrict agricultural / heavy vehicle access. Further the rural nature of the road to the south-west allows agricultural vehicles to leave the carriageway if required. The extent of kerb and channel proposed was detailed in the Cudgen Road access plans prepared by Robert Bird Group and included as Appendix E of the TIA. It is requested that conditions for the urbanising of Cudgen Road consider the above and the proposed works. The proposal is consistent with the existing mix of urbanised and rural sections of Cudgen Road (e.g. at the TAFE access, at the Cudgen Road / Turnock Street intersection and at the Tweed Coast Road / Cudgen Road intersection). The ultimate configuration is subject to detailed design and consultation with Council. It is understood lighting will be provided at each of the site accesses.

It considered appropriate for relevant conditions regarding the above to be applied.

2.10. Item 49 – Pedestrian and Cycle Pathways

Pedestrian and cycle pathway recommendations:

- c. In addition to internal pedestrian and cycle routes, a pedestrian and cycle pathway should extend across the length of the sites Cudgen Road and in part Turnock Street frontage. This would then connect the hospital's passive movement network into Council's broader pathway network thereby linking the hospital site with the existing town centre. This is a key strategy within the draft Kingscliff Locality Plan and Development Control Plan

Response:

The proposal includes retention of the existing shared pathway facility on the site’s Cudgen Road frontage. The path is proposed to be reconstructed around each of the four site accesses, and a Reconfiguration of Lot (ROL) will be required at various locations. Specific details around the footpath design at Access A and D were included in the associated Section 138 application. A new pathway has not been proposed for the full length of the Turnock Street frontage as this would not provide connection to the external network, instead a section of pathway has been proposed in conjunction with a new refuge crossing on the northern side of the Cudgen Road / Turnock Street, providing connection to the existing pathway on the eastern side of Turnock Street.

3.0 RESPONSE TO TRANSPORT FOR NSW

3.1. Proposed New Bus Stops on Cudgen Road

Details of the proposed new bus stops should be included in the drawings in support of the EIS documents to demonstrate the adequacy of the design and reference be made to the bus capable infrastructure guidelines and DDA compliance.

It is recommended that the proponent be conditioned to undertake an independent Detailed Design Road Safety Audit (RSA, refer to NSW Centre for Road Safety Guidelines for Road Safety Audit Practices) of the proposed pedestrian facility improvements and bus stop arrangement on Cudgen Road, prior to issue of construction certificate. The proposed design shall address any deficiencies identified within the RSA.

Response:

Noted and agreed. This can be conditioned and addressed during detailed design, prior to issue of a construction certificate as indicated by TfNSW.

3.2. Construction Traffic Impact

It is requested that the proponent must inform the local bus operator regarding proposed changes to traffic conditions during the course of the construction, particularly the upgrading works to the bus stops.

Response:

Noted and agreed.

3.3. Preliminary Green Travel Plan

It is appreciated that not all of the above information may be immediately available, but that the proponent should ensure that the above items are considered/addressed and be included in the Green Travel Plan prior to occupation.

It is also noted that there are proposed additional health, education, training and research facilities to be introduced to the site at a later date. It is therefore recommended that the Travel Plan identifies a process for including new precinct partners in the Travel Plan's initiatives, and access to its resources.

Response:

A preliminary Green Travel Plan was prepared based on currently available information (as acknowledged by TfNSW) for the purpose of supporting the Stage 2 SSDA. During the detailed design phase and prior to the commissioning of the new hospital, more information, including staffing detail, will become available and the Green Travel Plan will be updated and finalised. It is considered appropriate that a condition of the Stage 2 consent can require the Green Travel Plan to be finalised and submitted prior to occupation of the hospital, to the satisfaction of DPIE and TfNSW.

4.0 RESPONSE TO DEPARTMENT OF PLANNING INDUSTRY AND ENVIRONMENT

4.1. Response to Submissions - Traffic Impacts

The submitted Traffic Impact Assessment Report (TIA) should be amended to further improve the intersection design, phasing and resulting levels of service at the Cudgen Road / Tweed Coast Road intersection, having regard to the comments from Transport for NSW (Roads and Maritime Services) (RMS). In this regard, the Department recommends that consultation be undertaken with RMS and Tweed Shire Council (Council) to resolve the design of the key intersections near the site to the satisfaction of the public authorities.

Response:

The TIA report is considered appropriate and identifies sufficient infrastructure upgrades to mitigate against the Hospital's traffic impacts. This has been specifically noted in Council's submission. A detailed response to each of the RMS items has been provided. For further details refer Section 1.0.

The TIA should include background traffic volumes for the Cudgen Road / Tweed Coast Road intersection (without the hospital development) for 2033 so that a comparison of the background data and the traffic modelling with the hospital, can be undertaken

Response:

The 2033 background volumes are presented in the Network Diagrams (included as Appendix B of the TIA). These volumes are consistent with Council most recent Tweed Road Development Strategy forecast, in which RMS was a stakeholder in the development of the model and report.

SIDRA modelling of the existing intersection form with 2033 background traffic modelling was not undertaken as part of the Stage 2 TIA. This is due to Health Infrastructure's commitment to upgrade the intersection prior to commencement of operations in 2023 and consultation between the project team, Council and RMS in which it was confirmed that the proposed upgrades mitigate against the hospital's traffic impacts at the intersection and that the proposed upgrades are commensurate with Council's ultimate planning for Tweed Coast Road. Comparison of operations can be made between the 2023 background modelling and 2023 design modelling.

A confirmation from Council on timing for delivery of the Tweed Coast Road four lane upgrade should be provided to the Department. If Council cannot confirm delivery of the Tweed Coast Road four lane upgrade by 2033, additional modelling without this upgrade should be provided and alternative solutions considered to improve the level of service at the key intersections and this road.

Response:

The four-lane upgrade of Tweed Coast Road is nominated in Council's Tweed Road Development Strategy (TRDS) and the Tweed Road Contributions Plan (TRCP). Council has undertaken a series of design investigations of the upgrade, with funding subject to Council's S94 Contribution priorities and other funding sources available to Council.

It is re-iterated that the proposed upgrades are in addition to that planned by Council as part of the four-lane upgrade for the corridor, more than cater for the development's traffic impacts at the intersection as is demonstrated when comparing the operational performance between the existing geometrical layout (with background traffic volumes) to the proposed upgraded layout (with design traffic volumes).

While the proposed upgrades are commensurate with the hospitals traffic impacts, it is in the interest of the Hospital that major access road such as Tweed Coast Road are of adequate capacity for future years. As such, HI will continue to work with Council and RMS representatives in expediting planned road upgrades through available funding sources.

Further consideration should be given to left turn / deceleration lane lengths and designs to address the concerns raised by RMS.

Response:

The only change to left-turn lanes at the Tweed Coast Road / Cudgen Road is the proposed new left-turn lane on the northern leg of the intersection on Tweed Coast Road. The design provides a total length in the order of 200m including the taper. This caters for left-turn queues at the year of opening (up to 180m). The proposed turn lane adequately mitigates against the impacts of left-turning traffic associated with the proposed development and background traffic. It is understood that further extension of this lane would have impacts to the verge would result in significant additional cost due to the verge profile. Reference is made to Items 10 and 12 of Council's response as detail above.

The Auxiliary Left Lanes (AUL) proposed for entry at Access A and C have been designed in accordance with Austroads Guide to Road Design (ARGD) Part 4A. The diverge length for an AUL

(including taper) as detailed in Table 5.4 of ARGD is 55m for a design speed of 70km/h (60km/h posted speed) for a stop condition. The proposed diverge length is in the order of 70m for the AUL at Access A and Access C exceeding the requirements of AGRD. It is also noted that neither Access A or C includes a stop condition. Both designs include an 'exit curve' into the site rather than a control point requiring vehicles to stop. The proposed pedestrian crossings across each access are also kerb ramps rather than zebra crossings, providing priority to vehicles (i.e. no significant queuing expected).

Access A is constrained by the subject site's western boundary, the adjacent driveway crossover of Lot 741 Cudgen Road and the heritage listed wall within the site. Access D is constrained by Access B, the proposed bus stops and the location of the TAFE access. Neither of these accesses can be extended, nor is it considered to be required.

In addition to the above, the access arrangements are consistent with the approved Concept Proposal and Stage 1 Early and Enabling Works. Further, Council has granted approval for the Section 138 Application of Access A and this is currently under construction. Council's response also noted that access arrangements operate within acceptable limits.

As required by the Concept Proposal conditions, the following details should be provided:

- additional details of the proposed bus stops (design, location and associated pedestrian access).
- assessment of impacts of agricultural vehicle movements on the hospital traffic including the frequency of the movements (in consultation with the surrounding community) and the mitigation measures to minimise the identified impacts.

Response:

Amended plans have been prepared by RBG showing additional details for the bus stop stops and pathway connections to bus stops. It is noted that detailed design drawings will be required for the Section 138 applications to Council in order to undertake works. The response provided by Tweed Shire Council identified this requirement and provides a recommendation that applications be made to Tweed Shire Council under Section 138 of the Roads Act 1993 and that applications shall include engineering plans and specifications

Agricultural vehicle movements on Cudgen Road are infrequent as confirmed during a number of site visits and drive-throughs on the surrounding road network. The demand for agricultural vehicles is driven by agricultural activity. The Project site has been rezoned from RU1 Primary Production to SP2 Infrastructure and will no longer be used as farmland. This results in a reduction of agricultural activity on Cudgen Road to the east of Tweed Coast Road. Areas to the north, east and south are predominantly residential or special use land zonings (i.e. no agricultural activity).

Slow moving vehicles (e.g. tractors) may slow general traffic when travelling on Cudgen Road, however the frequency of agricultural vehicles is low, and there is limited primary production zoned land to the north-east of the Hospital to attract or generate these vehicles. There are also opportunities for agricultural vehicles to move off the carriageway onto the verge due to the rural nature of the road (e.g. westbound to the west of the Project site), or for vehicles to pass (e.g. where additional stand-up lanes are provided at the Tweed Coast Road / Cudgen Road intersection, or new signalised site access).

Agricultural vehicles are subject to the permits and requirements of the National Heavy Vehicle Regulator. The National Heavy Vehicle Regulator dictates mitigation measures that must be implemented by agricultural vehicles including signage and warning lights that must be displayed.

Implementation of further mitigation measures are not warranted.

4.2. Response to Modification Submissions – Traffic Impacts

The Department recommends that consultation be undertaken with RMS and Tweed Shire Council (Council) to resolve the design of the key intersections near the site to the satisfaction of the public authorities and the details to be provided as part of the Modification application (SSD-9575-MOD-2).

Response:

Consultation was undertaken with Council and RMS as part of Stage 2, in which the proposed intersection upgrades and design was discussed. Specifically, the status of the design, summary of the assessment findings and any changes from the previous Stage 1 TIA were discussed with the RMS assessing representative and Council at a meeting held on 31 July 2019. This included an on-site walk-thru with RMS for Cudgen Road and Tweed Coast Road / Cudgen Road intersection. Council noted that the works were appropriate and commensurate with Council's ultimate planning.

This was reflected in Council's response dated 8 November 2019. In Item 10 of Council's response, the following has been noted:

"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 has been 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."

A confirmation from Council on timing for delivery of the Tweed Coast Road four lane upgrade should be provided to the Department. If Council cannot confirm delivery of the Tweed Coast Road four lane upgrade by 2033, additional modelling without this upgrade should be provided and alternative solutions considered to improve the level of service at the key intersections and this road.

Response:

Refer Section 4.1.

5.0 CONSTRUCTION TRAFFIC – HEAVY VEHICLE MOVEMENTS ASSOCIATED WITH STAGE 1 WORKS

The Development Consent and Conditions (Application SSD 9575), specifically Schedule 3, Part B Condition B27(i), for the Concept Proposal and Stage 1 Early and Enabling Works specifies a limit of 70 heavy vehicle movements per day. This was based on initial construction vehicle estimates and was prior to the inclusion of a multi-deck car park and associated modifications, which have resulted in car parking and landform (cut/fill) reconfigurations. It was also prior to a contractor being engaged to undertake construction works. This also considered initial cut/fill estimates, which estimated a balance between cut and fill (i.e. no fill required, and no spoil removal required).

It is understood that the construction site currently operates with 60-65 heavy vehicle movements per day. Further, the cut/fill assessment has been undertaken in greater detail and it is currently estimated that in the order of 18,600m³ of spoil is required to be removed from the site. This is

predominantly due to the inclusion of the multi-deck car park which was added as part of a Modification Application.

Considering the existing heavy vehicle movements and the limitation of 70 heavy vehicle movements per day, the capacity to remove spoil from the site is limited. Under the current restriction of truck movements, there is limited float to allow for up to 10 trucks per day to be used for removal of spoil. The estimated time required for removing excess spoil off site is approximately 18 weeks with this restriction in place. This timeframe is not favourable as the lag time to remove the excess soil would likely affect other works and activities occurring on site. It has been estimated that the excess spoil could be effectively removed within approximately six weeks if an additional 50 heavy vehicle movements per day are permitted. Therefore as the preferred option, the project seeks a temporary variation to Schedule 3, Part B, Condition B27(i), to allow for a temporary increase in the number of heavy vehicle movements from 70 to 120 per day over six weeks to efficiently remove the excess spoil from site.

The additional 50 heavy movements will be distributed across a typical day. The approved weekday construction hours are between 7am and 6pm. This equates to an additional 100 trips across an 11-hour period or approximately nine additional trips per hour. This is not expected to have any significant capacity impacts on the surrounding road network, nor will it require mitigation measures to increase capacity.

Further, all construction traffic will be managed under a Construction Traffic Management Plan (CTMP) which is required to be prepared in accordance with the RMS Traffic Control at Work Sites manual. The CTMP specifies management requirements for site accesses as well as signage for the surrounding road network to inform road users of construction activity and heavy vehicle movements.

On this basis, there are no significant traffic or transport impacts associated with the proposed increase in heavy vehicle movements. No further assessment or update to the Traffic Impact Assessment associated with Stage 1 Works is required.

6.0 CONCLUDING STATEMENT

I trust that the above information is sufficient to respond to RMS, Council and TfNSW in relation to the traffic engineering and transport planning items and will allow reasonable and relevant conditions of approval to be prepared.



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