Issue	Response
RMS RFI	
1. The TIA Stage 2B relies on previous assessments under Stages 1 and 2A rather than providing a clear methodology and assessment on its own merit. The TIA should provide a clear explanation of baseline data and all underlying parameters adopted to inform the supporting modelling. The relevance of the adopted parameters to the stages of development, and the current and future network conditions should be established without reliance solely on historical reports.	Neither Stage 2A nor 2B TIAs relied on the previous TIA for Stage 1. The TIA for Stage 2A established the baseline for traffic and parking conditions based on the surveys conducted in March 2018, with Stage 1 of the CSU fully operational. The TIA for Stage 2A adopted the methodology for estimation of additional trip generation and parking demand based on the actual survey data collected at CSU after completion of Stage 1. This approach was different from that employed in Stage 1 TIA as the latter, in the absence of the local data at the time, relied on the survey data from other CSU Campuses. The Stage 2B TIA used exactly the same approach as in the Stage 2A TIA because no changes occurred since Stage 2A TIA at the CSU Campus and the only sizable change on the road network was the completion of the signalised access to the Bunnings bulky goods store. Neither Stage 2A nor 2B TIAs thus relied on the historical data. The above methodology was explained in both Stage 2A and Stage 2B TIAs.

2. It is understood that modelled conditions have been based on updates to the John Oxley Drive Precinct Model. It is unclear if the adopted approach has taken into consideration the most recent land use inputs and network conditions informing recent network investigations, including the Port Macquarie Area Wide Traffic Study, Council's Orbital Road proposal and the Oxley Highway Corridor Model. It is recommended the Consent Authority seek clarification of all input parameters used to inform modelling and justification of their continued relevance.	The TIA did not utilise SMEC (2013) The model used existing turning movement counts at the nearest intersections and assumed 2.5% general traffic growth plus additional traffic from the new bulky goods store. This approach was discussed and agreed upon with Council at the time of Stage 2A assessment, due to the absence of detailed approved modelled data from the Area Wide Traffic Study (AWTS) or other studies (Orbital Road Project (ORP) and the Oxley Highway Corridor (OHC)). It is noted that the only relevant intersection included in the OHC is the intersection of Oxley Hwy/John Oxley Dr/Wrights Rd. It is also noted that the latest available document on the TfNSW website (Oxley Highway Draft Corridor Strategy, OHDCS) identifies this intersection as operating at the Level of Service A (refer to the extract from this document overleaf). This does not appear to correspond to Council's views that this intersection requires an upgrade at present, let alone in the near future. ORP relies on AWTS for modelling data and thus it is not a separate source of reference in terms of future traffic conditions for modelling purposes. Also, ORP is still being developed and there are no final plans to rely upon in terms of road network geometry and connections. AWTS provides the results of mesoscopic modelling for 3 time horizons (2021, 2026 and 2036). However, firstly, a number of options of network development are considered in the AWTS and thus no firm base can be established for the purpose of the TIA. Secondly, AWTS model is mesoscopic and does not provide detailed data for specific intersection modelling. Thus neither of the above studies can be used to inform CSU TIA modelling. It is important to note also that the estimated traffic generation from CSU Stages 2A and 2B is of a much lower scale than any existing or future traffic flows on relevant roads and intersections, thus negating the need for a wider network modelling with detailed references to any of the above studies.

Figure 5-18 Level of service at key intersections on the Oxley Highway in Port Macquarie during peak periods

3. The TIA does not clearly identify trips generated by the existing and proposed stages of development. We note that Council's review of the Stage 2A TIA sought clarification of cumulative trip generation for the staged development and that additional information was tabled to inform that assessment. We recommend that the Consent Authority require further detail of trips that will be generated by all existing, proposed and future stages of development to assist in understanding the cumulative impact of trips generated on the network.	The Stage 2B TIA has all additional trips for Stages 2A and 2B and their distribution at the intersections shown in Appendix D of the TIA. It must be noted, with reference to Appendix D, that the new proposed access road south of Ellis Pde is expected to attract a significant proportion of CSU traffic to/from the south, thus reducing traffic flows for the right hand turns into and left hand turns out of Ellis Pde, previously assigned to Ellis Pde in Stage 2A TIA. A summary table is provided below. Contrary to what appears

	Total	In, veh/h	Out, veh/h	In, %	Out, %
Stage 1 (2018) actual					
CSU Trips Morning peak - Existing	**153**	144	9	94%	6%
CSU Trips Afternoon peak - Existing	**149**	75	74	50%	50%
Stage 2A					
CSU Trips Morning peak - Additional	**84**	79	5	94%	6%
CSU Trips Afternoon peak - Additional	**81**	41	40	50%	50%
Total Stage 1(2018)+Stage 2A (morning peak)	**237**	**223**	**14**		
Total Stage 1(2018)+Stage 2A (afternoon peak)	**230**	**116**	**114**		
Stage 2B					
CSU Trips Morning peak - Additional	**58**	55	3	95%	5%
CSU Trips Afternoon peak - Additional	**57**	29	28	50%	50%
Total Stage 1(2018)+Stage 2A+Stage 2B (morning peak)	**295**	**278**	**17**		
Total Stage 1(2018)+Stage 2A+Stage 2B (afternoon peak)	**287**	**144**	**143**		

4. The TIA suggests that additional traffic generated by the proposed development will be accommodated by future intersection upgrades being planned by the relevant road authorities. The TIA should clearly demonstrate how additional trips will impact existing intersection conditions prior to future upgrades. The Consent Authority should consider the likelihood of proposed trips exacerbating network conditions prior to delivery of future upgrades and whether the additional trips generated by the development warrant a proportional contribution to future network improvements.	The need for the John Oxley Drive intersection upgrades was identified in all of the above mentioned studies. It is quite clear from those studies that the upgrades are required due to the general traffic growth, regardless of the CSU development. In particular, AWTS identifies projected growth in residential dwellings in the Innes Peninsula Area (where CSU is located) by 84.2% between 2016 and 2036 (page 44 of Volume 1 of AWTS). Retail floor area in Lake Innes shopping centre is proposed to grow from 3,000 to 10,000 m^2 GFA. AWTS identifies high priority levels for the John Oxley Drive corridor upgrade by 2026 (and moderate by 2021), independent of the ORP (page 132 of Volume 1 of AWTS). AWTS concludes **9.2 Corridor Upgrades** Corridor upgrades have been identified for a number of roads in the study area, involving intersection upgrades (particularly in urban areas) or other improvements in rural locations. | ID | Treatment / Option | Comment | | --- | --- | --- | | 5 | John Oxley Drive corridor upgrade – The Ruins Way to Wrights Road | Upgrades required to accommodate traffic accessing from adjacent residential areas, where significant growth is forecast. | Please note reference to residential growth as the reason for upgrades. AWTS, however, employed a mesoscopic model which does not provide detailed intersection turning movement forecasts that could be used for traffic modelling for Stage 2B TIA. We do not possess sufficient information about the future background traffic growth on the affected roads. For Stage 1 analysis we had an opportunity to use traffic projections contained in SMEC (2013) John Oxley Drive Precinct Traffic Study, where future traffic growth was based on the land use analysis and trip assignment modelling. SMEC data was not used for Stage 2A or 2B TIAs as the SMEC projections for 2023 were less than the actual traffic levels observed in 2018. At the beginning of the Stage 2A study we requested traffic forecasts from Council and we were advised that no traffic projections for the 10-year horizon were available. This is understandable given that all available studies are either still in options development or do not provide detailed modelled data. We thus had to resort to the use of the approximate general annual growth.

	The most critical intersection for the TIA is obviously the intersection of Major Innes Dr/Ellis Pde. This was modelled without upgrades in the TIA. In response to the current request, the roundabout of John Oxley Dr / Major Innes Rd was modelled without improvements. Base 2024 and Base 2029 scenarios assume annual growth of general traffic by 2.5%, without CSU Stages 2A and 2B. The results are presented overleaf. They show that 1. The John Oxley Dr / Major Innes Rd roundabout will need to be upgraded by 2024 (based on the assumed traffic growth) regardless of further CSU development. 2. The intersection of Major Innes Rd/Ellis Pde does not require an upgrade (it is noted that the model assumes good driver discipline with regard to the “KEEP CLEAR” restriction). Please note that in the course of preparation of this response we have uncovered an inconsistency in the traffic distribution for Stage 2A traffic for the 2A+2B scenario, for the afternoon peak only. This inconsistency was corrected and the correction resulted in increased additional CSU traffic north of Ellis Pde for the afternoon peak (in the order of 30 veh/hr). The corrected values were utilised in the additional models described above.

Intersection	Existing										
	AM					PM					
	AVD	LOS	DS	Queue, m	Movement	AVD	LOS	DS	Queue, m	Movement	
John Oxley Dr - Major Innes Rd	24.6	B	0.73	26.9	JODr T NB	15.3	B	0.62	22.8	JODr L SB	
Major Innes Rd - Ellis Pde	10.5	A	0.30	3.2	MIRd R NB	8.6	A	0.29	4.1	EPde L WB	

Intersection	Existing+2A+2B										
	AM					PM					
	AVD	LOS	DS	Queue, m	Movement	AVD	LOS	DS	Queue, m	Movement	
John Oxley Dr - Major Innes Rd	38.5	C	0.86	45.5	JODr T NB	18.7	B	0.72	30.1	JODr L SB	
Major Innes Rd - Ellis Pde	13.8	A	0.36	4.0	MIRd R NB	10.9	A	0.34	5.2	EPde L WB	

Intersection	Base 2024										
	AM					PM					
	AVD	LOS	DS	Queue, m	Movement	AVD	LOS	DS	Queue, m	Movement	
John Oxley Dr - Major Innes Rd	251.5	F	1.23	254.9	JODr T NB	29.2	C	0.86	48.0	MIRd L WB	
Major Innes Rd - Ellis Pde	15.1	B	0.45	3.6	EPde L WB	12.7	A	0.38	5.9	EPde L WB	

Intersection	Base 2024+2A+2B										
	AM					PM					
	AVD	LOS	DS	Queue, m	Movement	AVD	LOS	DS	Queue, m	Movement	
John Oxley Dr - Major Innes Rd	267.6	F	1.25	269.3	JODr T NB	46.4	D	0.96	81.1	MIRd L WB	
Major Innes Rd - Ellis Pde	17.6	B	0.46	4.1	EPde L WB	15.0	B	0.51	8.4	EPde L WB	
Major Innes Rd - New access road	20.7	B	0.43	0.8	MIRd R NB	19.6	B	0.32	1.4	MIRd R NB	

Intersection	Base 2029										
	AM					PM					
	AVD	LOS	DS	Queue, m	Movement	AVD	LOS	DS	Queue, m	Movement	
John Oxley Dr - Major Innes Rd	611.5	F	1.64	518.1	JODr T NB	134.5	F	1.10	83.0	MIRd L WB	
Major Innes Rd - Ellis Pde	18.2	B	0.87	4.2	EPde L WB	15.3	B	0.59	6.9	EPde L WB	

Intersection	Base 2029+2A+2B										
	AM					PM					
	AVD	LOS	DS	Queue, m	Movement	AVD	LOS	DS	Queue, m	Movement	
John Oxley Dr - Major Innes Rd	623.9	F	1.66	528.0	JODr T NB	210.0	F	1.20	83.0	MIRd L WB	
Major Innes Rd - Ellis Pde	21.5	B	0.87	4.9	EPde L WB	18.5	B	0.61	9.9	EPde L WB	
Major Innes Rd - New access road	21.7	B	0.48	0.9	MIRd R NB	24.3	B	0.36	1.6	MIRd R NB	

In our opinion, modelling of intersections further to the north of the John Oxley Dr / Major Innes Rd roundabout is not required for the TIA. The estimated additional traffic generation from Stages 2A and 2B constitutes only a minor proportion of the total traffic at these intersections, well within the limits of typical daily traffic fluctuations, as shown in the table below. Furthermore, the uncertainty about the general traffic growth on John Oxley Drive and Major Innes Road (with multiple scenarios in OHTCS, AWTS and ORP), makes such an exercise unnecessary. It is sufficient to consider that the CSU traffic is much lower than what would be required to effect any change in operation of these intersections.

Intersection	AM Peak			PM Peak		
	Total 2028, veh/h	Additional Stage 2A, veh/h	%	Total 2028, veh/h	Additional Stage 2A, veh/h	%
Oxley Hwy - John Oxley Dr - Wrights Rd	6399	43	0.67%	6098	47	0.77%
John Oxley Dr - Bulky goods	2807	43	1.53%	2562	47	1.83%
John Oxley Dr - Kingfisher Rd	2594	45	1.73%	2329	49	2.10%
John Oxley Dr - Major Innes Rd	2550	50	1.96%	2218	57	2.57%
Major Innes Rd - Ellis Pde	1815	80	4.41%	1452	81	5.58%

Intersection	AM Peak			PM Peak		
	Total 2029, veh/h	Additional Stage 2A+2B, veh/h	%	Total 2029, veh/h	Additional Stage 2A+2B, veh/h	%
Oxley Hwy - John Oxley Dr - Wrights Rd	6526	77	1.18%	6214	76	1.22%
John Oxley Dr - Bulky goods	2865	77	2.69%	2607	76	2.92%
John Oxley Dr - Kingfisher Rd	2652	81	3.05%	2379	79	3.32%
John Oxley Dr - Major Innes Rd	2604	86	3.30%	2265	92	4.06%
Major Innes Rd - Ellis Pde	1851	86	4.65%	1481	80	5.40%
Major Innes Rd - New Exit	1489	77	5.17%	1098	98	8.93%

Council's RFI	
It is noted that the TIA has been based on future network upgrades being completed. Council is currently developing concept plans for these upgrades however, these proposed upgrades do not have funding at this time and the completion of construction could easily be 10-15 years away.	This situation is noted. Please refer to our response to RMS RFI.
The base line data of the study is unclear. The TIA report would appear to be modelled the future, i.e. 2023, and with significant upgrades completed to Council network. The report is not representative of the traffic situation now and into the future with the existing network in place. Council needs to understand what the existing conditions are, the impact of additional traffic from the development assuming no upgrades to Councils road network. Council & RMS need to understand the levels of service at these intersections now and with the increased traffic from this development. Council needs to understand how the proposed trips will exacerbate the network conditions prior to the delivery of future upgrades and if CSU should be making a contribution to these upgrades.	Please refer to our response to RMS RFI. We trust that Council's request "to understand how the proposed trips **will exacerbate** the network conditions" does not contain a preconceived opinion. We reiterate that the estimated additional traffic from Stages 2A and 2B of CSU development is not high and would constitute only a minor proportion of traffic flows on the access roads.

Can the applicant provide a clear explanation of all underlying input parameters used to support the model, including inclusion of recent network investigations, such as Port Macquarie Area Wide Traffic Study, Council's Orbital Road proposal and the Oxley Highway Corridor Model. Council is currently conducting a TIA of the John Oxley Drive, Major Innes and Kingfisher intersections in order to develop concept plans for future upgrade work. This TIA should be completed in the next month or two.	Please refer to our response to RMS RFI. Should Council be in a position to share with us the future traffic estimates developed for the John Oxley Drive TIA, we will be happy to use this data and to remodel the network. Alternatively, Council's consultants can use additional traffic estimated for CSU Stages 2A and 2B as their model inputs.

The report makes reference to the previous TIA for Stage 2A. Comparison of the previous SIDRA modelling shows the John Oxley/Wrights Roundabout shows the following Existing LOS B in the AM and B in the PM 2023 +completion of Stage 2A LOS E in the AM and LOS F in the PM 2028 (not include stage 2B) LOS F in the AM and LOS F in the PM	Comparison of the existing operation with 2023+2A does not provide a good indication of the changes resulting from Stage 2A. It is better to compare 2023 conditions without and with Stage 2A. SIDRA modelling indicates that the operation of this roundabout is likely to deteriorate to LoS D(AM)/F(PM) by 2023 without Stage 2A. It is noted that the average delay in the morning was calculated as 55.2 seconds, only marginally less than the threshold of 56 seconds where it would be regarded as LoS E. Therefore the upgrade of this intersection will be required regardless of the CSU development. With Stage 2A, the operation og this intersection will be at LoS E(AM)/F(PM) with only minor changes of delays and queuing. By 2028, the LoS at this roundabout is likely to deteriorate well into LoS F during both commuter peak periods. Calculated average delays are in the order of 7 to 10 minutes, totally unacceptable and requiring other control mode. Again, this situation is expected to occur regardless of the CSU development (noting that modelling is based on the assumed 2.5% annual traffic growth in the absence of better data). It is important to reiterate that, as shown previously in this report, additional CSU traffic (Stages 2A + 2B) will constitute only a very minor proportion of total traffic passing through the roundabout of John Oxley Dr /Oxley Hwy / Wrights Rd, within the hourly fluctuations of the total traffic volumes.

The TIA provided with this application has not included John Oxley/Wrights Roundabout in its model, even though the previous TIA for Stage 2A indicated a deteriorating level of service (which did not consider the impacts of Stage 2B). This TIA report determines that this intersection operates at a good level of service and has spare capacity, which is not the existing situation. ◦ Oxley Highway / John Oxley Drive / Wrights Road Two-lane roundabout, with a separate roadway for north-westbound traffic, constructed in 2012 Currently operates at a good Level of Service	The John Oxley/wrights roundabout was not included in modelling for the reasons explained above and also in the TIA (Section 4.3.2). Based on our observations and surveys conducted during the preparation of Stage 2A TIA and more recent observations in the course of preparation of Stage 2B TIA, this roundabout did operate at a good LoS at the time of our assessment. In our previous response to Council during the Stage 2A assessment process we provided videos of the operation of this intersection with the following notes: "Our observations from the video records and by our staff in the field indicate that queuing indeed occurs during peak periods but clears quickly. No prolonged traffic jams were observed during the surveys and site inspections. This includes the site inspection conducted by the author of this report immediately after the last meeting at Council during the afternoon peak period, when all intersections performed smoothly despite the Bunnings roadworks and closed southeast slip lane of the roundabout." It is acknowledged that the situation on John Oxley Drive is not static and that additional and growing traffic from Bunnings might have affected the roundabout operation after our assessment. However, as stated above, this does not affect our conclusions that this roundabout would need to be upgraded regardless of the CSU development, more so if Council regards its current operation as unsatisfactory, even prior to the construction of Stages 2A and 2B.
This TIA Sidra analysis indicates the LOS in the AM for John Oxley Drive -Major Innes improving from a LOS B in 2023(St2A) to a LOS A in 2023(St2A+St2B). Can you please explain how this intersection has improved given there should be an increase in traffic and a potential loss of service.	In both models SIDRA was set to optimise the traffic signal cycle automatically. After further investigation it appears that for some reason the cycle length became shorter in the 2A+2B models, which resulted in better results. This is possibly due to a variation in traffic distribution between the intersection approaches. We can investigate this matter further if required, however this would better done if Council could provide us with better substantiated background growth data than that assumed in the model. The models in question were based on traffic signals at John Oxley Dr/Major Innes Rd. As per Council's request, this intersection was remodelled with the roundabout control mode. The results were presented earlier in this report and are more consistent.

The analysis notes that the LOS at Ellis Parade will require an upgrade in the future to a roundabout as shown on Council plans. I attach Council concept plans and note that concept plans will impact the existing structure under construction, Stage 2A, i.e. Council requirements for a 4m road reserve cannot be achieved along the frontage of the Stage 2A building and the northern part of Stage 2B building. Council requests that CSU set their building back from the proposed edge of the road reserve in accordance with Council set backs, and tidy up footpath details and kerb returns to marry into Council concept plans.	This matter is for CSU and the architect to consider.
Council will be investigating the traffic to determine the location of the final roundabout, i.e. at Ellis Parade or at your new road. Regardless of the final location, the kerb returns of the new road would have to marry into Council's concept plans, and conditions will be imposed to reflect this. This will have impact to electrical sub-stations, entry signage, kerb returns etc. I have attached some overlays of Councils concept plans with CSU plans and nearmap aerial images	This matter is for CSU and the architect to consider.

It is assumed that the internal road intersecting with Major Innes Road is a private road. Can you please confirm. Please also provide plans detailing the width of the internal roads and the parking spaces to confirm compliance with the relevant standards.	Detailed plans and design checks for compliance with AS/NZS 2890 series and Asutroads were provided.