13391
3 June 2014

The General Manager
Port Macquarie-Hasting Council
PO Box 84
PORT MACQUARIE NSW 2444

Attention: Patrick Galbraith-Robertson (Development Assessment Planner)

Dear Mr Swift-McNair

CHARLES STURT UNIVERSITY - PORT MACQUARIE (D/2014/120)
MAJOR INNES ROAD, PORT MACQUARIE

We refer to your email of 5 June 2014 in which you request further information in relation to the above development application (DA). This letter has been prepared by JBA on behalf of the applicant, Charles Sturt University (CSU).

In response to the request for additional information relating to the DA, the following are attached to this letter:

- Response to traffic and parking issues, prepared by TEF Consulting (**Attachment A**); and
- Response to the issue in relation to sewer servicing, prepared by Arup (**Attachment B**).

1.0 TRAFFIC AND PARKING

Council requested additional information regarding the traffic impacts of the proposed development and also raised issues in relation to proposed design of the parking area. The former encompassed issues raised by Roads and Maritime Services. The detailed response to each issue prepared by TEF (see **Attachment A**) demonstrates that the development the subject of this DA will have no or negligible impact on the road network, intersection performance and the like. It also establishes the efficacy of the TEF traffic modelling process which utilised Council's own data/model prepared by SMEC.

The response further demonstrates that the design of the proposed car park complies with relevant Australian standards and will be able to operate in a safe and efficient manner.

Scope of DA
As an overall comment, it appears that the assessment undertaken by Council may not have fully appreciated the limited scale and scope of the proposed development. We wish to point out the new CSU campus is intended to accommodate up to 770 effective full time students (and, as you would understand, only a proportion of these would be on the campus or utilising the road network at the same time). The current funding is for a campus for this population, and any future expansion of CSU Port Macquarie would be dependent on many factors, including funding and student take-up. Likewise, any future development proposal would, perforce, need to be assessed in its own right, including in relation to traffic impacts.

Bike path
In relation to Council's draft Bike Plan and increased cyclist and pedestrian activity as a result of the proposed development (Item 8 of Council's email), we wish to confirm that CSU – across all its campuses – encourages alternative transport modes, such as cycling and walking.

To this end, in the context of the recent announcement of $7 million in funding to upgrade the Wrights Road roundabout, CSU is proposing to undertake works, in accordance with Council's April 2014 Draft Bike Plan, to the missing links in the existing bike path within and adjacent to the future CSU campus. It is proposed that these works would be delivered as a material public benefit in the form of the construction of a bicycle path from Ellis Parade to Wrights Road. The value of the works undertaken will be equivalent to the section 94A levy likely to be imposed by Council as a condition of consent

It is proposed that the material public benefit works will be undertaken concurrently with the construction of the new university campus and would completion targeted to occur prior to occupation of the campus.

CSU is currently preparing a detailed proposal for Council which explores this opportunity further.

2.0 SEWER SERVICING

Council has raised concerns regarding the ability of waste water to drain from the site to the sewer system. This issue is addressed by Arup at **Attachment B**. Arup confirms that a private sewer pump out system will be installed and maintained by CSU to address the issue. The attached schematic and drawing indicate the configuration and position of the pump out system relative to the building and the existing sewer connection.

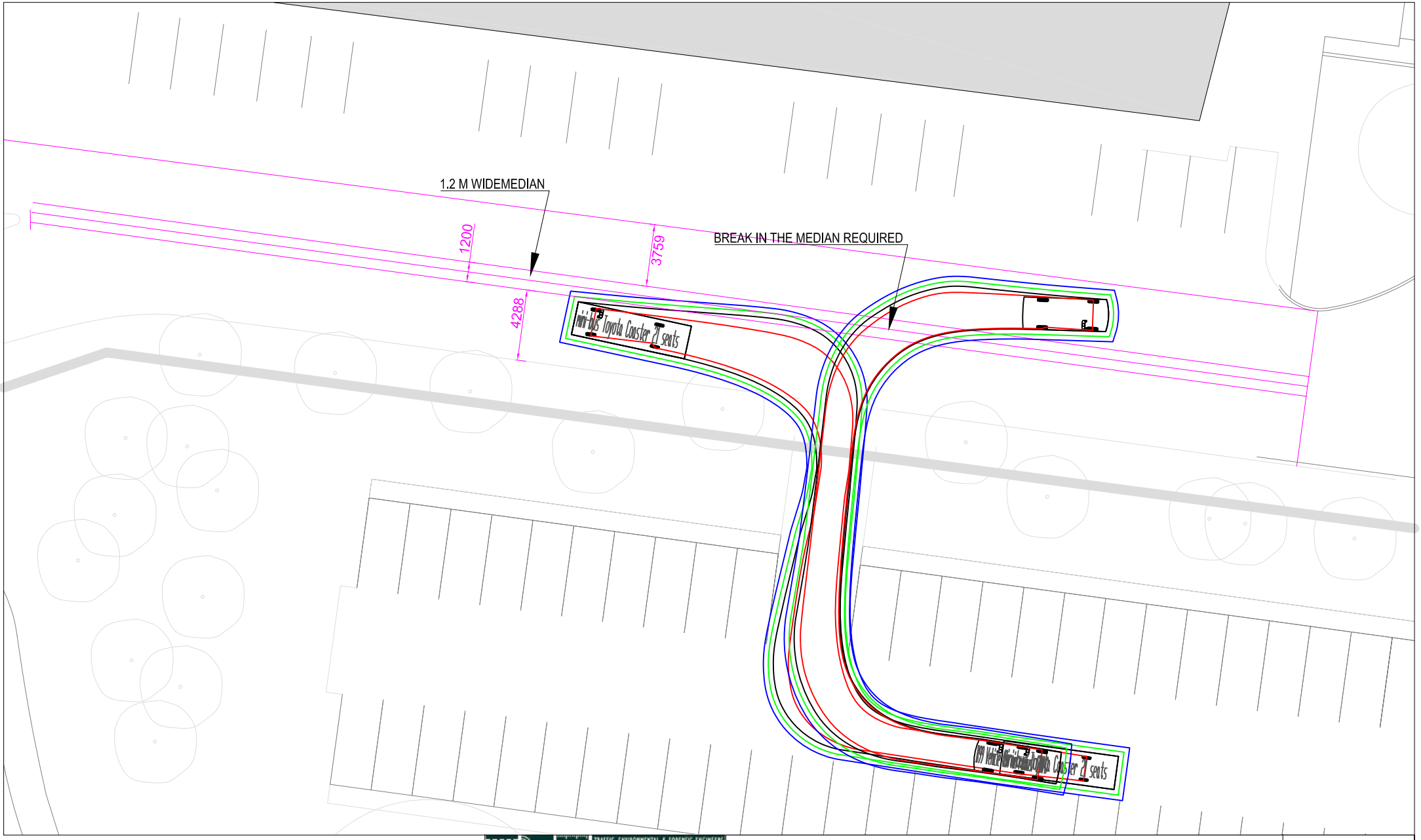
We trust that the above information and the detailed responses to each issue raised will enable Council to complete its assessment and refer CSU's development application to the JRPP for determination.

Should you have any queries about this matter, please do not hesitate to contact Hugh Irving at APP on 0421 328 688 (or Hugh.Irving@app.com.au) or me on 9956 6962 (vgoldschmidt@jbaurban.com.au).

Yours faithfully

Vivienne Goldschmidt
Associate

Attachments
*Response to traffic and parking issues, prepared by TEF Consulting (**Attachment A**)*
*Response to sewer servicing issue, prepared by Arup (**Attachment B**).*



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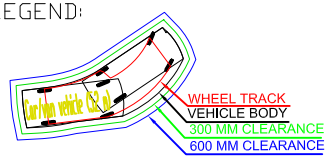

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JOB 13013	Rev. A	10/07/2014

Client:
Charles Sturt University

Charles Sturt University Port Macquarie Campus - Stage 1 development

SCALE 1:300 @ A4

SHEET 01

MEDIAN IN ELLIS PARADE

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MEMORANDUM 02

DEVELOPMENT APPLICATION ISSUES

CHARLES STURT UNIVERSITY, PORT MACQUARIE CAMPUS

Property address	No. 7 Major Innes Road, Port Macquarie NSW 2444
Client	Charles Sturt University
Prepared by	O. Sannikov, MEngSc (Traffic Engineering), MIEAust, PEng, MAITPM
Date	19/06/14
Job No.	13013
Report No.	**13013 Memo 02**

Item	**Report**
Relevant Documents	• This document addresses the concerns identified by Council staff in an e-mail sent by Patrick Galbraith-Robertson on 5 June 2014. ◦ Numbering of the main issues as per the original email was retained with some of the issues broken down into sub-points for the ease of reference and for specific responses.

A) Traffic

1. With reference to the RMS advice, in particular point 3 in their letter, it is considered that the proposed development will have a significant impact on the broader traffic network. It is considered reasonable that the proponent contribute to the upgrade of this broader infrastructure and it is requested that a mechanism be proposed to secure these contributions/upgrades.

- RMS letter advises about a "potential for higher proportion of trips" . This is not the same as "a significant impact" and merely means that the RMS is of the opinion that a higher proportion of trips may originate from a wider area and thus would use the regional road network. This concern is in line with Council's request to review the adopted directional split for CSU traffic of 70% north/30% south towards a greater proportion of movements to/from the north. This issue and associated impacts on the road network are considered further in this document under Item 5 a).
- Also, it is apparent that the RMS advice was based on the considerations made by the RMS with regard to the potential full 3-Stage development of the CSU Campus.
- The present Development Application is for Stage 1 development only.
- The information made available to Council previously about the potential future population of up to 3,000 to 5,000 students as well as about other student numbers for possible future development stages was only indicative. It was used to gauge the effects of various development scenarios for further consideration of CSU options during the internal Master Planning process. The student population adopted for this DA was 700 to 770. Any future expansion of the CSU Campus would need to be assessed in its own right, including in relation to traffic impacts, and will depend on many factors, e.g. the actual demand for student places and financial considerations. It is therefore unreasonable to request an assessment to be carried out for any other development scale than that stated in Section 3.3.2 Population of the SEE, that is the subject of this application.

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2.	
2.a)	The assessment of existing traffic conditions is considered insufficient. Being an isolated intersection model, Sidra is limited in its' ability to evaluate a greater network issue.
	• SIDRA is a highly capable modelling software designed primarily for the analysis of standalone intersections. Modelling results obtained from SIDRA software are universally accepted by road, traffic and transport planning authorities in Australia, as well as internationally.
	• Whilst SIDRA was a single intersection model until recently, the current version of SIDRA allows for the operation of two adjacent intersections (and their effects on each other operations) to be analysed. Such an analysis was performed in the course of preparation of the present document (refer to Appendix A at the end of this document).
	• It is noted that SIDRA model was used to cross-check the results of Aimsun (microsimulation) modelling contained in SMEC (2013). These results were adopted by Council. We used SIDRA results from the SMEC report to calibrate our models for the base case scenario.
	• It is noted that SMEC report states as follows: "Interestingly, the AIMSUN analysis showed the existing intersection layout working satisfactorily under all growth scenarios."
	• The use of specific road network modelling software (Aimsun, Vissim, Paramics or similar models) was considered in the course of preparation of the traffic and parking study for Stage 1 DA and was found to be unjustified for the following reasons.
	◦ The decision about the appropriateness of the model to be used is normally based on a preliminary assessment of the traffic operations as well as on the likely impacts.
	◦ Network modelling software can be very useful in determining the likely trip distribution on the road network when multiple origin and destination nodes and access points are involved. This is not the case with the DA for the CSU which features only one defined access point to the road system. Trip distribution at all key intersections of the network was already assessed in SMEC (2013) and was utilised in our study.
	◦ It is a valid practice to utilise single intersection modelling to assess the likely impacts and interaction between closely spaced intersections before more complex and data hungry network modelling software is employed.
	▪ SIDRA modelling showed no indication that the operation of key intersections was likely to be affected by changes in the operational characteristics at the nearest intersections due to the increased traffic as a result of the proposed CSU development. Modelled queue lengths were not significant enough to reach the nearest intersections so as to affect their operation (refer to the Appendix A).
	▪ In these circumstances the use of single intersection models is justified for the assessment of the network operation. However, we are happy to consider the use of other modelling software if advised by Council.
2.b)	The analysis of back-of-queue results provided does not accurately reflect existing conditions. Field observations show significantly larger queues occur on the John Oxley Drive and Major Innes Road network in peak periods, particularly during evening peak periods associated with the adjacent school peaks (around 3.30pm). Of critical importance to the development is the fact that existing queuing from the John Oxley Drive / Major Innes Road roundabout extends past the Major Innes Road / Ellis Parade intersection during these peak periods, obstructing egress movements from Ellis Parade. Further analysis should be provided to address these concerns and to enable appropriate mitigation measures to be determined.

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	◦ We utilised services of King+Campbell Pty Ltd to undertake independent turning movement counts at the intersection of Major Innes Road and Ellis Parade. Movements entering and exiting the secondary access to the shopping centre north of Ellis Parade were also counted. The results of these counts were used in our intersection operation assessment.
	◦ The independent observer reported smooth intersection operation in both AM and PM peak periods. There were no reported issues with queuing extending from the roundabout of John Oxley Drive and Major Innes Road.
	◦ It is requested that the source and data for observations of queuing occurring on John Oxley Drive and Major Innes Road be provided by Council to enable further analysis.
	◦ SIDRA modelling of the roundabout operation with additional traffic from both CSU and the shopping centre (refer to a response to item 3 a) below) indicates maximum queues in the order of 5 vehicles / 35 metres. The distance between the roundabout and Ellis Parade is approximately 100 m and therefore is of sufficient length to accommodate the estimated queuing.
	• Adopted trip distribution assumed that all additional traffic from the shopping centre and from the CSU will enter and exit via Ellis Parade. This is clearly the worst case scenario considering that a secondary entry and exit to the shopping centre is located north of the John Oxley Dr / Major Innes Rd roundabout.
3.	• The report states that "traffic volumes in Ellis Parade are not expected to grow in the near future". This assumption appears to be incorrect as traffic generation of Innes Lake Shopping Village is likely to grow as housing developments on Innes Peninsula continue. The shopping centre is currently trading below its expected capacity and an approval for a tavern exists on the site. This should be factored into the traffic modelling.
	◦ Traffic growth forecasts in SMEC (2013) included full development of the Lake Innes Village (including the tavern). SMEC trip estimates for 2023 are **lower** than those used by TEF for the base case scenario (based on the turning movement counts at the Ellis Parade intersection) – refer to **Figure 1** overleaf.
	◦ It must be noted that in the TEF model the number of trips using Ellis Parade only is greater than the total number of trips estimated by SMEC (and adopted by Council). This is clearly the worst case scenario considering that a secondary entry and exit to the shopping centre is located north of the John Oxley Dr / Major Innes Rd roundabout.
4.	• The assessment should include a clear table of the likely number of staff and students on-site at each hour throughout a typical weekday. This will allow the traffic generation and parking demand forecasts to be more rigorously assessed.
	◦ Estimated traffic generation for extended AM and PM peaks is provided in **Table 4.7** of the TEF report. These trip generation patterns, based on the observed patterns at other similar CSU Campuses, provide longer that typical trip generation periods for the impact assessment.
	◦ The requested staff and student population data at one hour increments is impossible to forecast accurately because this would be based on many assumptions. The number of students and staff on campus will change from day to day and month to month. Such a detailed analysis is unnecessary when the estimated **peak** parking demand and trip generation figures can be worked out, for the worst case scenario analysis.

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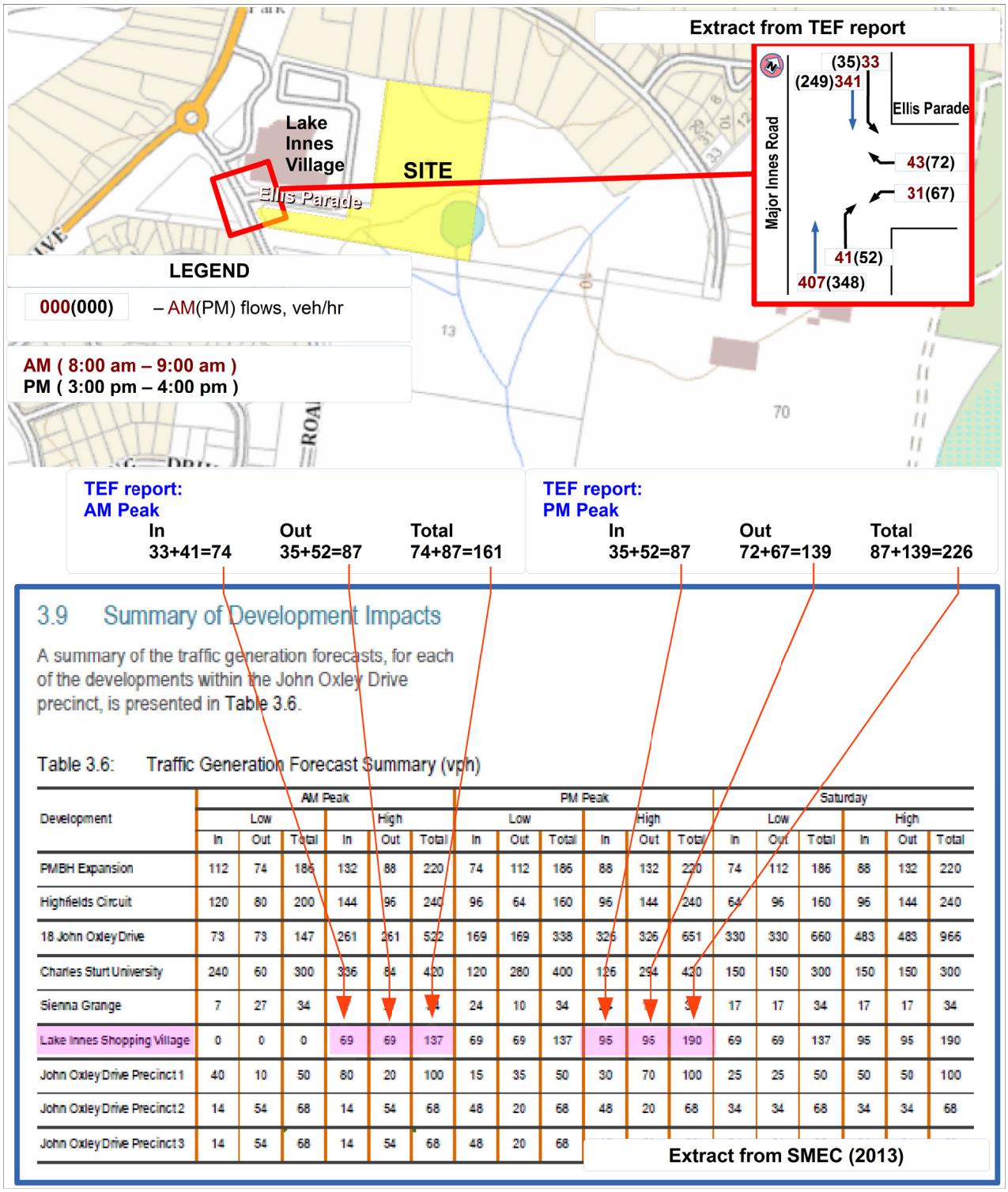

Development	AM Peak						PM Peak						Saturday					
	Low			High			Low			High			Low			High		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
PMBH Expansion	112	74	186	132	88	220	74	112	186	88	132	220	74	112	186	88	132	220
Highfields Circuit	120	80	200	144	96	240	96	64	160	96	144	240	64	96	160	96	144	240
18 John Oxley Drive	73	73	147	261	261	522	169	169	338	325	325	651	330	330	660	483	483	966
Charles Sturt University	240	60	300	336	84	420	120	280	400	126	294	420	150	150	300	150	150	300
Sienna Grange	7	27	34	[illegible]	[illegible]	[illegible]	24	10	34	[illegible]	[illegible]	[illegible]	17	17	34	17	17	34
Lake Innes Shopping Village	0	0	0	69	69	137	69	69	137	95	95	190	69	69	137	95	95	190
John Oxley Drive Precinct 1	40	10	50	80	20	100	15	35	50	30	70	100	25	25	50	50	50	100
John Oxley Drive Precinct 2	14	54	68	14	54	68	48	20	68	48	20	68	34	34	68	34	34	68
John Oxley Drive Precinct 3	14	54	68	14	54	68	48	20	68									

Figure 1.

Comparison of "High Growth" trip estimates for the Lake Innes Village from Table 3.9 of SMEC (2013) and turning movements at Ellis Parade adopted in the TEF assessment.

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5.	
5.a)	With regard to trip distribution, the report states "At the intersection of Major Innes Road and Ellis Parade. Assumed 70% to/from north and 30% to/from south." This assumption is questionable based on observations of current conditions, which put a more realistic estimate around 95% to/from the north and 5% to/from the south.
	◦ Independent traffic surveys conducted by King+Campbell Pty Ltd show the following existing trip distribution. approximately 58% travel to the north and 42% travel to the south during the AM peak and 52% to the north and 48% to the south during the PM peak.
	◦ Existing traffic volumes are shown in **Figure 6** of the TEF report and the detailed survey data is included in **Appendix C** of the report.
	◦ We therefore question the accuracy of the data indicating the distribution of trips at 95% to/from the north and 5% to/from the south.
	◦ The assumed distribution at the John Oxley Drive / Major Innes Road intersection was based on the likely distribution of student and staff places of residence.
	▪ It is considered reasonable that both students and staff would seek to reside close to the Campus; with many residential properties to the south of the Campus 70%/30% distribution was considered reasonable.
	▪ On the other hand, it is considered unreasonable to expect only 5% of staff and students to reside south of the Campus.
	◦ Nevertheless, in response to the above concerns, we undertook a sensitivity analysis using the following base parameters for modelling.
	▪ Base traffic volumes to/from Ellis Parade (already higher than those in SMEC report for the year 2023) were further increased by 50% (note that SMEC report uses 25% for "high growth").
	▪ Trip distribution for CSU traffic was changed to 90% north /10% south .
	▪ A SIDRA network model for the two intersections on Major Innes Road (John Oxley Drive and Ellis Parade) was used for the analysis (utilising the latest version of SIDRA software) in order to assess the mutual effect of the two intersections' operation.
	◦ The results of modelling show virtually no difference with those contained in the TEF report for this DA.
	▪ Average delays decreased slightly compared with the DA report – this is due to the SIDRA model having been upgraded to a new version with enhanced calculations.
	▪ Queuing in Ellis Parade increased compared with the existing situation and with the model for the 70%/30% trip distribution.
	• AM Peak: ◦ Existing – 4.2 m ◦ 70/30 model – 7.2 m ◦ 90/10 model with 50% increase of shopping traffic – 17.8 m
	• PM Peak: ◦ Existing – 6.4 m ◦ 70/30 model – 19.9 m ◦ 90/10 model with 50% increase of shopping traffic – 33.4 m
	▪ The recalculated queues, based on the increased traffic, remain acceptable (shorter than the distance of approximately 60 m to the proposed CSU exit driveway).

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	▪ Average delays also remain acceptable at the Level of Service B (same as in the previous assessment).
	◦ Refer to **Table 1** below.

Table 1. Results of SIDRA modelling with increased traffic volumes – after CSU development.

50% increase shopping traffic; 90%/10% distribution

Intersection	With additional traffic from CSU												
	AM Peak Hour							PM Peak Hour					
	AVD	LOS	DS	Queue, m	Movement			AVD	LOS	DS	Queue, m	Movement	
Major Innes Road - Ellis Parade	17.8	B	0.41	17.8	EP	WB	R	17.0	B	0.63	33.4	EP	WB R
John Oxley Drive - Major Innes Road	13.3	A	0.53	40.3	JOD	SB	L	13.7	A	0.57	34.9	MIR	NB T
Oxley Hwy - John Oxley Dr - Wrights Rd	17.5	B	0.62	39.9	JOD	NB	T	17.7	B	0.59	35.5	JOD	SB T

Legend:

JOD	John Oxley Drive	EB	Eastbound
MIR	Major Innes Road	WB	Westbound
EP	Ellis Parade	NB	Northbound
OH	Oxley Highway	SB	Southbound
WR	Wrights Road		
AVD	Average delay, sec	T	Through movement
LOS	Level of Service	R	Right hand turn
DS	Degree of saturation	L	Left hand turn

5.b)	In addition the assumed distribution at the John Oxley Drive / Major Innes Road intersection should be detailed.
	◦ TEF report provided detailed information about the traffic generation and distribution of additional trips likely to be generated by the CSU Campus on the road network. These results were detailed in **Figure 7** of the TEF report as well as in **Appendix D**.
	◦ Updated trip distribution including the increased number of trips and amended directional split as per 5 a) above is included in Appendix A.
6.	• According to the RMS *Guide to Traffic Generating Developments* (2002) Table 6.1, and AS 2890.1 Table 3.2, the width of Ellis Parade in its' current form appears insufficient to serve the number of car parking spaces proposed. The Access Facility should be a Category 4 use. This requires a minimum 6 to 8m wide entrance (i.e. two lanes) and 6 to 8m exit, separated by a median. Ellis Parade does not appear to have sufficient capacity to address existing (Coles) and future (CSU) demands. Furthermore, existing off-street car parking provided along Ellis Parade is likely to compound safety concerns. In order to address this concern, consideration should be given to an alternate primary access through adjacent CSU lands to the south. A road that crosses the Crown 'paper' road, linking the north with the south, may be necessary for the future stages, and in the interest of addressing operational concerns with Stage 1, it could prove more cost effective to propose this crossing with Stage 1
	◦ Ellis Parade is a public street rather than an access driveway to the development. Along its length, on the northern side of the street, it has an existing access driveway to the shopping centre car park. Ellis Parade ends at this driveway.
	◦ The intersection of Major Innes Road and Ellis Parade is designed and operates as a typical intersection of two public streets. Provisions of RMS (2002) Guide and AS/NZS 2890.1:2004 for access driveways do not apply in this situation. The operating performance of the Major Innes Road and Ellis

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	Parade intersection should be assessed based on the provisions of Section "4.2.2 Intersections" of RMS (2002) Guide. This is the approach used in the original TEF report and in this document.
	▪ Should access driveway design provisions be applicable to Ellis Parade, then the same considerations could be used for the Major Innes Road intersection with John Oxley Drive, requiring Major Innes Road to be at least two lanes in each direction.
	▪ As noted earlier in this document, there are two additional access points to the shopping centre car park, north of Ellis Parade. They have to be taken into account in terms of the number of car parking spaces per access point.
	◦ Two new driveways are proposed on the southern side of Ellis Parade to service the proposed CSU car parks. These two driveways will service the southern car park containing 125 spaces. The eastern driveway is proposed for ingress only, whilst the western driveway is proposed to be only for exit. The design compliance of these driveways needs be assessed separately from other access points along Ellis Parade, having regard to the number of car parking spaces they are servicing (that is providing access to and from Ellis Parade). This assessment is provided under Item B) 1. a) overleaf.
7.	
7.a)	Provision of additional bus services should be investigated with Busways.
	• Consultation has been undertaken, however it is noted that Busways is a private enterprise subject to commercial imperatives and it would be difficult for CSU control the outcome of these consultations.
7.b)	The existing bus stop on the eastern side south of Ellis Parade is too close and should be relocated clear of the intersection (towards the south).
	• There is no existing bus stop on the eastern side of Major Innes Road south of Ellis Parade; CSU is proposing to construct a new bus stop.
	• A number of design options have been considered during the design process.
	• The proposed location appears to be optimal in terms of its distance from the new CSU entry - approximately 230 m. It is approximately 65 m to the south of Major Innes Road / Ellis Parade intersection. Further relocation to the south would reduce the attractiveness of the bus stop for the CSU users.
	• The proposed bus stop was designed to the same standard as the new bus stops in Major Innes Road north of Braeroy Drive. The proposed bus stop is indented, so that a standing bus would not affect passing traffic.
	• In terms of its location, the proposed bus stop mirrors the existing bus stop on the western side of Major Innes Road. The latter is also located directly opposite the intersection, in this case Ellis Parade.
	• The proposed bus stop is located close to the existing pedestrian crossing facility. Relocation of the stop further to the south may prompt some pedestrians to cross the road unsafely.

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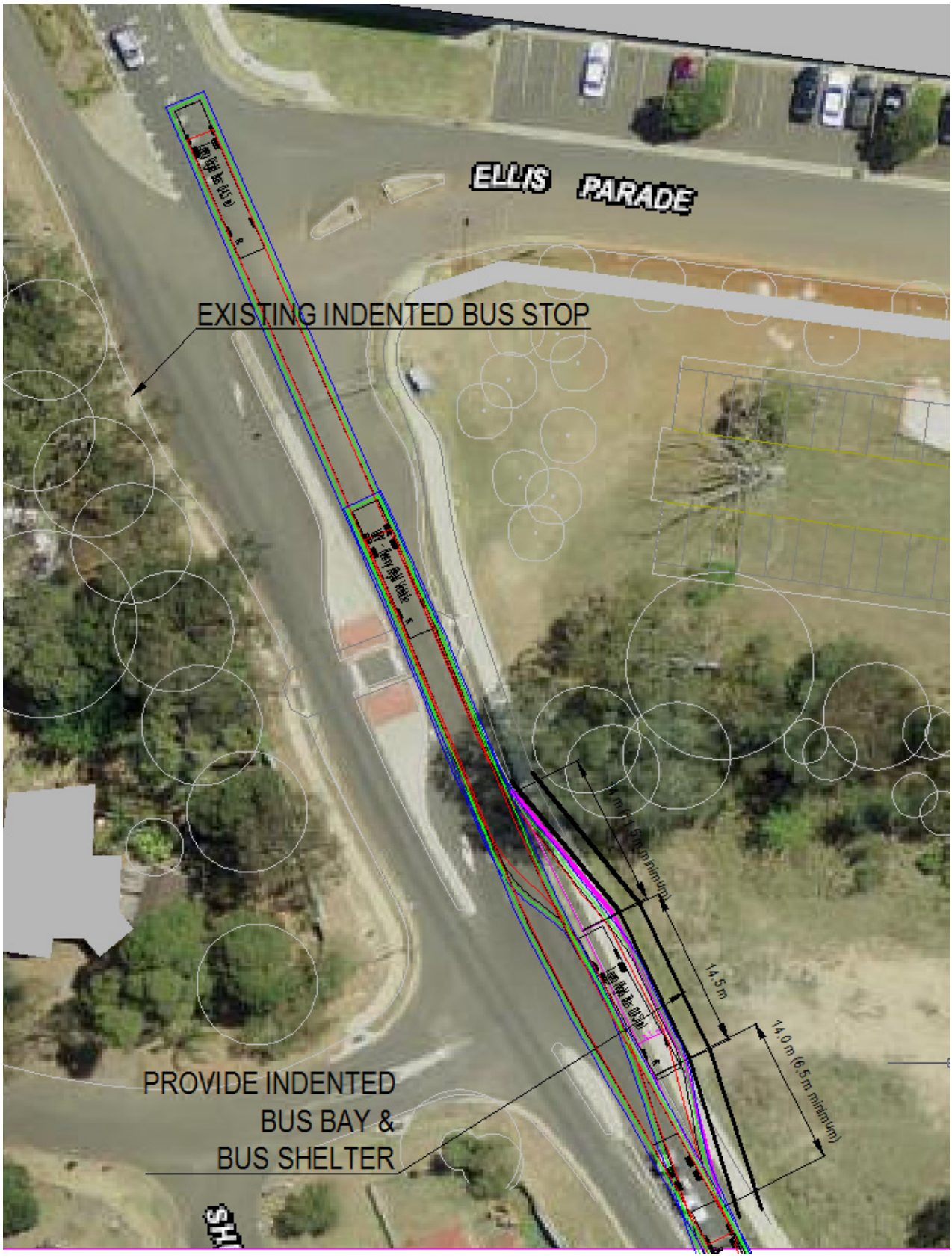
ELLIS PARADE
EXISTING INDENTED BUS STOP
PROVIDE INDENTED
BUS BAY &
BUS SHELTER
14.5m
14.0m (6.5m minimum)

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7.c)	It may be appropriate that a dedicated bus aisle be provided internal within the site.
	• A number of options for provision of a dedicated bus stop within the CSU land were considered during the design process. None of these were found to be feasible, primarily due to the size of the area required for a standard bus to turn around, or indeed necessary.
	• It is also important to note that based on the survey data from the Thurgoona Campus of CSU, only 1-2% of staff and students use buses to travel to and from the university. This low number would be typical for a regional university. Provision of a dedicated bus stop for a small number of people would therefore be unrealistic both in terms of demand and the extension of bus service times due to a deviation off the main route.
8.	A draft Bike Plan has been placed on exhibition by Council subsequent to lodgement of the DA. The bike plan defines measures to provide and improve the existing shared path on the eastern side of Oxley Highway, from north of Wrights Road, to the eastern side of Major Innes Road south of Ellis Parade. The proposed use will significantly increase cycle and pedestrian activity between the school, the hospital precinct and residential areas south and improvements associated with this plan are likely to be required and should be provided as part of this proposal.
	• CSU are currently preparing a works-in-kind proposal for Section 94 contributions to be allocated towards the cycle path described.

Item	Report
B) Parking area design	
1.	
1.a)	The proposed western ingress/egress driveway on the south side of Ellis Parade is not supported, as it does not appear to comply with Australian Standards [...].
	• The southern car park is designed for 125 spaces of User Class 2. AS/NZS 2890.1:2004 requires a Category 3 driveway to service this car park.
	• Table 3.1 from AS/NZS 2890.1:2004 reproduced below provides guidelines for selection of the driveway category.

TABLE 3.1

SELECTION OF ACCESS FACILITY CATEGORY

Class of parking facility (see Table 1.1)	Frontage road type	Access facility category — Number of parking spaces (Note 1)				
		<25	25 to 100	101 to 300	301 to 600	>600
1,1A	Arterial	1	2	3	4	5
	Local	1	1	2	3	4
2	Arterial	2	2	3	4	5
	Local	1	2	3	4	4
3,3A	Arterial	2	3	4	4	5
	Local	1	2	3	4	4

NOTES:

1 When a car park has multiple access points, each access should be designed for the number of parking spaces effectively served by that access.

	• Table 3.2 from AS/NZS 2890.1:2004 reproduced overleaf provides design requirements for access driveways.

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	• Clause 3.2.1, however, specifically notes that both Tables 3.1 and 3.2 should be used to establish the number and widths of driveways where there is no accurate data available about traffic flows. If such data, that is the estimated number and directional split of trips, as well as types of vehicles, is available, both the number and the widths of lanes can be determined using accepted design procedures.
	• During the design process the number of trips and the directional split for each car parking area were estimated for both AM and PM peak conditions. Lane capacities specified in Appendix D of AS/NZS 2890.1:2004 were considered and it was found that one lane entry and one lane exit were sufficient for the size of the car parking areas and the User Class proposed.

TABLE 3.2

ACCESS DRIVEWAY WIDTHS

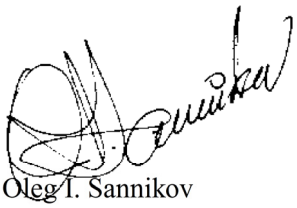
metres

Category	Entry width	Exit width	Separation of driveways
1	3.0 to 5.5	(Combined) (see Note)	N/A
2	6.0 to 9.0	(Combined) (see Note)	N/A
3	6.0	4.0 to 6.0	1 to 3
4	6.0 to 8.0	6.0 to 8.0	1 to 3
5	To be provided as an intersection, not an access driveway, see Clause 3.1.1.		

NOTE: Driveways are normally combined, but if separate, both entry and exit widths should be 3.0 m min.

	• The western driveway is an **egress only** driveway which is 5 m wide. This width complies with the 4m to 6m exit width outlined in Table 3.2 in AS/NZS 2890.1:2004.
1.b)	The proposed western ingress/egress driveway on the south side of Ellis Parade is not supported, as it [...] is likely to create unsafe conditions, especially due to the location of this driveway directly across from off-street 90 degree parking associated with the shopping centre
	• The proposed width of the driveway (5.0 m) ensures that an exiting B99 vehicle turning at 8 m radius (as per AS/NZS 2890.1:2004) does not veer across the existing centre line of Ellis Parade. Therefore there will be no impact on the angle parking on the opposite side of the street.
1.c)	In addition, vehicle movements within Ellis Parade (for eastbound right turning vehicles) are likely to queue to Major Innes Road and impact this intersection.
	• The proposed western driveway is an **egress only** driveway. There will be no entering eastbound right turning movements and therefore no queuing and no impacts on the major Innes Road intersection.
1.d)	Ellis Parade has a limited capacity to service the existing and proposed development. It is recommended that additional access to Major Innes Road be investigated so that in the case of any emergency, accident or otherwise, the facility is not dependant on a single point of access from Ellis Parade. Alternatively, this may be accommodated through further widening of Ellis Parade.
	• Ellis Parade, as has been demonstrated by modelling results, has sufficient capacity to cater for the future traffic demand from both the shopping centre and the CSU.
	• Provision of an additional driveway, not used in normal conditions, purely in case of an accident is regarded as unjustified. Two proposed driveways for the southern car park provide sufficient evacuation opportunities. For the shopping

Item	Report
	centre, Ellis Parade is not the only available access point in case of an emergency.
2.	The blind aisle at the west end of southern car park does not comply with Australian Standards (exceeds maximum length). Vehicles are required to turn around in a forwards-only manner (i.e. to facilitate single movement, as three point turns are not compliant for this class of facility per AS 2890.1 Table 1.1).
	• AS/NZS 2890.1:2004 does not require that vehicles be able to turn around in a forward only manner at the end of blind aisles.
	• One space will be left at the end of each blind area as a turning only area. This provision fully complies with AS/NZS 2890.1:2004.
3.	Relocation/redesign to the easternmost south car park access aisle to form the southern leg off the eastern roundabout should be investigated so as to negate the blind aisle car park.
	• One space will be left at the end of each blind area as a turning only area. This provision fully complies with AS/NZS 2890.1:2004.
4.	Current configuration of kerb ramp (to west) appears partially blocked when a car occupies the disabled parking space.
	• This issue was identified and has been resolved through the design development process. This ramp is proposed to be removed.
5.	Blind aisle at the Northwest corner of the main building does not comply with AS 2890.1, and should be linked to the aisle to the north or a turning circle provided.
	• The design of this area was checked for vehicle manoeuvring during the design process. Please refer to a drawing included in Appendix B.



Oleg I. Sannikov
Director
MEngSc (Traffic Engineering)
MIEAust, PEng
MAITPM

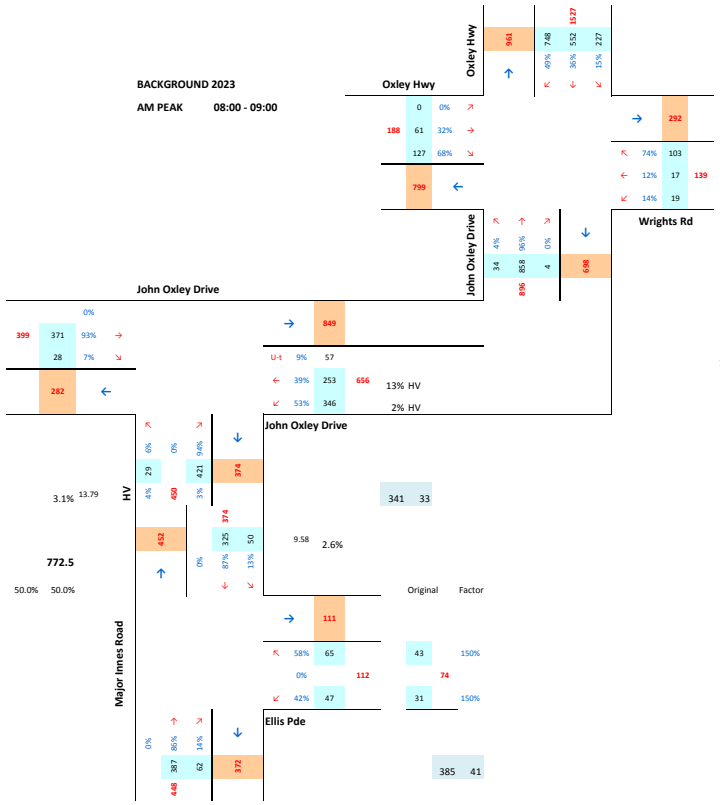
References:

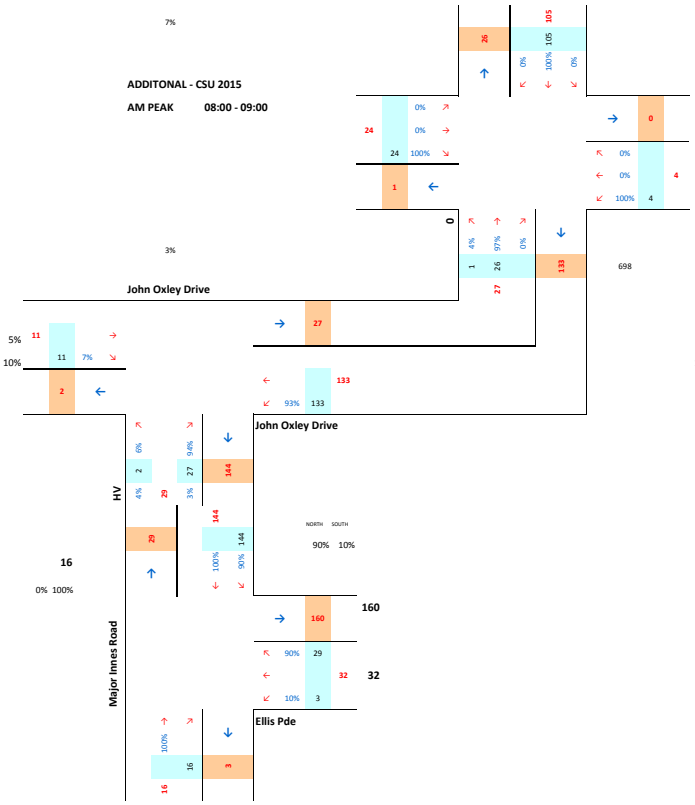
SMEC (2013) John Oxley Drive Precinct Traffic Study
Australian/New Zealand Standard 2890.1:2004 Off-street car parking.

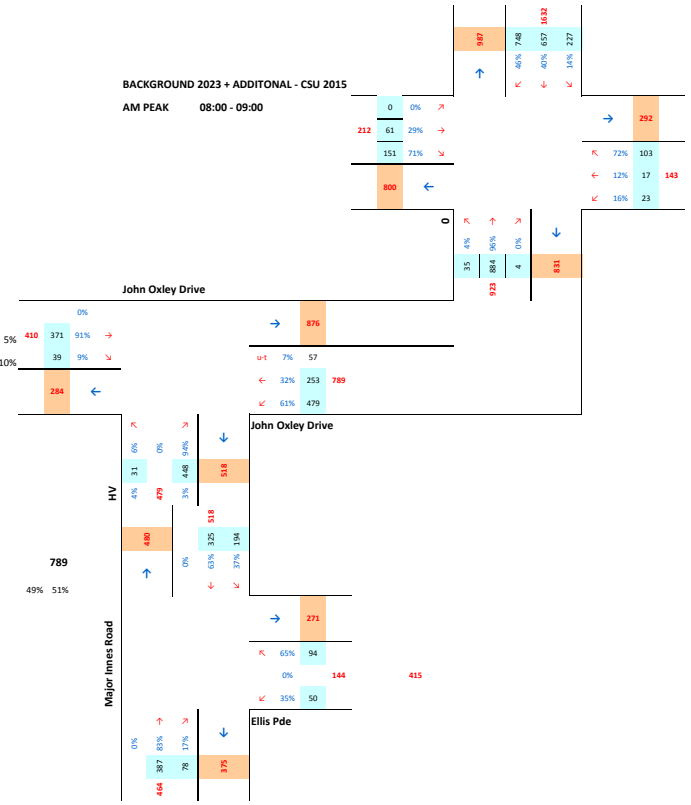
Appendix A: Amended trip distribution and SIDRA modelling results

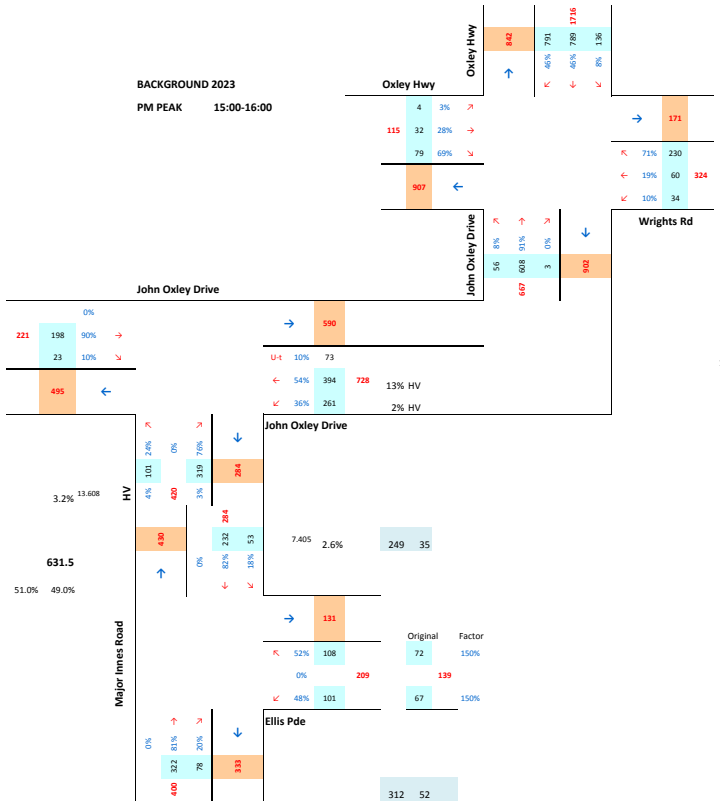
Appendix B: Vehicle manoeuvring diagram for the north-west corner of the main building

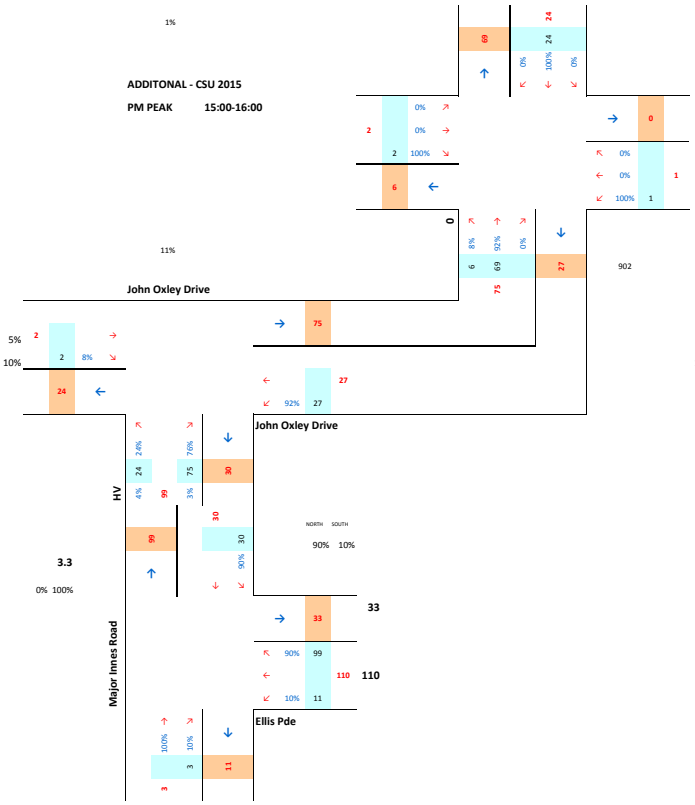
Appendix A
Amended trip distribution and SIDRA modelling results

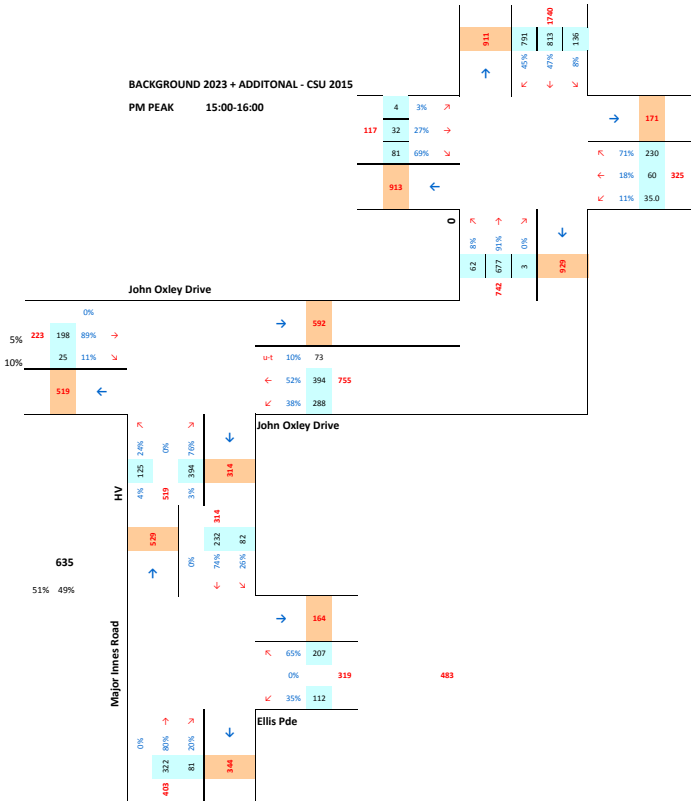

BACKGROUND 2023
AM PEAK 08:00 - 09:00
Oxley Hwy
John Oxley Drive
Wrights Rd
Major Innes Road
Ellis Pde
HV
3.1%
772.5
50.0% 50.0%
13% HV
2% HV
2.6%
Original Factor


ADDITONAL - CSU 2015
AM PEAK 08:00 - 09:00
John Oxley Drive
Major Innes Road
Ellis Pde
HV
16
0% 100%
90% 10%
160
32
698


BACKGROUND 2023 + ADDITONAL - CSU 2015
AM PEAK 08:00 - 09:00
John Oxley Drive
Major Innes Road
Ellis Pde
HV
789
49% 51%
415


BACKGROUND 2023
PM PEAK 15:00-16:00
Oxley Hwy
John Oxley Drive
Wrights Rd
John Oxley Drive
Major Innes Road
Ellis Pde
HV
631.5
51.0% 49.0%
3.2%
13.608
7.405
2.6%
13% HV
2% HV
Original
Factor
150%

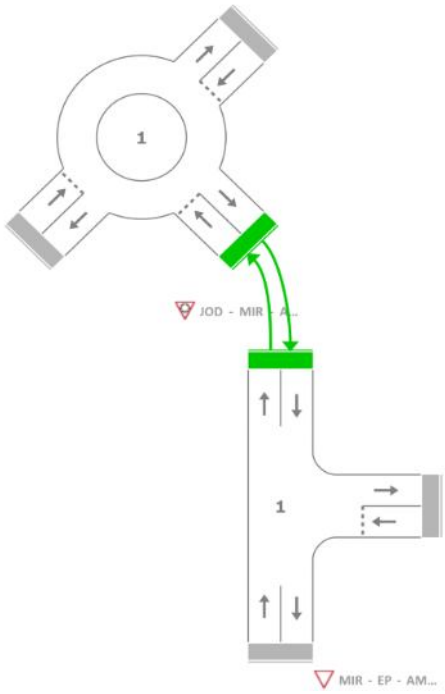

ADDITONAL - CSU 2015
PM PEAK 15:00-16:00
John Oxley Drive
John Oxley Drive
Major Innes Road
Ellis Pde
HV
3.3
0% 100%
90% 10%
33
110


BACKGROUND 2023 + ADDITONAL - CSU 2015
PM PEAK 15:00-16:00
John Oxley Drive
John Oxley Drive
Major Innes Road
Ellis Pde
HV
635
51% 49%
483

NETWORK LAYOUT

Network: CSU St 1 AM

C050614
AM Peak



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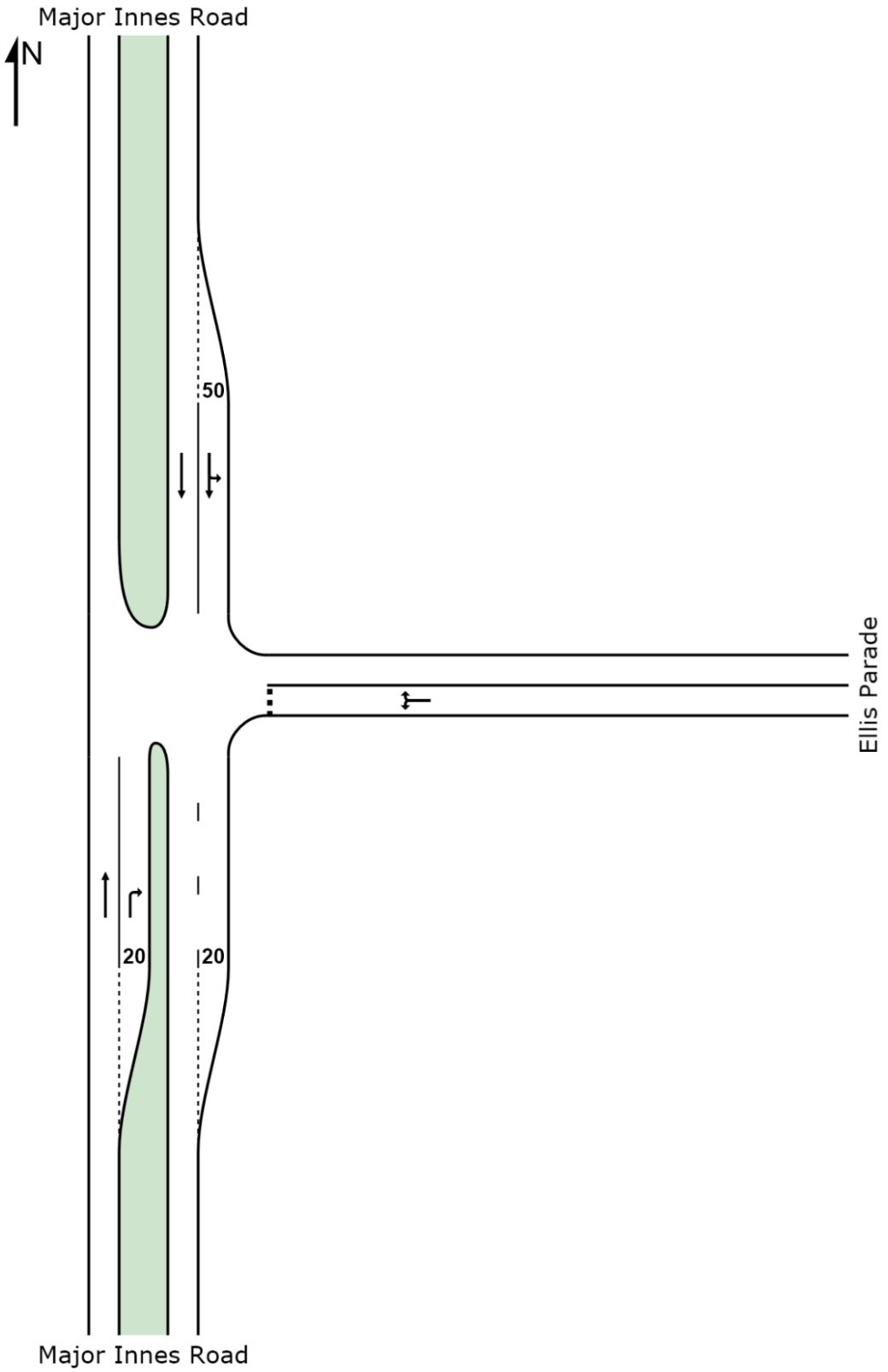
SIDRA INTERSECTION 6.0.22.4722
Project: Z:\consult\13013 - CSU Pt Macquarie - CSU\13013_modelling\13013 sidra\13013 Sidra St 1 Council 050614 response (2).sip6
8000507, TEF Consulting, 1PC

SIDRA INTERSECTION 6


Major Innes Road
N
50
Ellis Parade
20
20
Major Innes Road

MOVEMENT SUMMARY

Site: JOD - MIR - AM 2023 CSU ST 1 - C050614

Network: CSU St 1 AM

John Oxley Dr / Major Innes Rd
background growth 2023 - SMEC
with additional traffic from CSU St 1
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Major Innes Rd													
4	L2	31	3.8	31	3.8	0.466	6.3	LOS A	3.3	23.6	0.63	0.74	50.3
6	R2	448	2.9	448	2.9	0.466	11.1	LOS A	3.3	23.6	0.63	0.74	51.3
Approach		479	3.0	479	3.0	0.466	10.8	LOS A	3.3	23.6	0.63	0.74	51.2
NorthEast: John Oxley Dr													
7	L2	479	2.2	479	2.2	0.531	4.2	LOS A	5.5	40.3	0.29	0.46	50.8
8	T1	253	13.3	253	13.3	0.531	4.4	LOS A	5.5	40.3	0.29	0.46	55.0
9u	U	57	0.0	57	0.0	0.531	11.0	LOS A	5.5	40.3	0.29	0.46	56.3
Approach		789	5.6	789	5.6	0.531	4.7	LOS A	5.5	40.3	0.29	0.46	53.2
SouthWest: John Oxley Dr													
2	T1	371	5.2	371	5.2	0.496	8.5	LOS A	3.9	28.7	0.79	0.83	52.7
3	R2	39	9.5	39	9.5	0.496	13.3	LOS A	3.9	28.7	0.79	0.83	46.9
Approach		410	5.6	410	5.6	0.496	9.0	LOS A	3.9	28.7	0.79	0.83	52.4
All Vehicles		1678	4.8	1678	4.8	0.531	7.5	LOS A	5.5	40.3	0.51	0.63	52.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: MIR - EP - AM CSU St 1 - C050614

Network: CSU St 1 AM

Major Innes Road / Ellis Parade
background growth 2023 - SMEC
with addition traffic for CSU st 1
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Major Innes Road													
11	T1	407	0.0	407	0.0	0.209	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	116	0.0	116	0.0	0.143	8.4	LOS A	0.6	4.0	0.53	0.75	51.2
Approach		523	0.0	523	0.0	0.209	1.9	NA	0.6	4.0	0.12	0.17	56.5
East: Ellis Parade													
1	L2	53	0.0	53	0.0	0.410	17.8	LOS B	1.8	12.7	0.00	0.58	45.5
3	R2	99	0.0	99	0.0	0.410	17.8	LOS B	1.8	12.7	0.00	0.58	38.1
Approach		152	0.0	152	0.0	0.410	17.8	LOS B	1.8	12.7	0.00	0.58	41.5
North: Major Innes Road													
4	L2	204	0.0	204	0.0	0.110	5.6	LOS A	0.0	0.0	0.00	0.58	53.6
5	T1	342	0.0	342	0.0	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		546	0.0	546	0.0	0.175	2.1	NA	0.0	0.0	0.00	0.22	57.4
All Vehicles		1221	0.0	1221	0.0	0.410	3.9	NA	1.8	12.7	0.05	0.24	54.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: JOD - MIR - AM 2023 CSU ST 1 - C050614

John Oxley Dr / Major Innes Rd
background growth 2023 - SMEC
with additional traffic from CSU St 1
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Major Innes Rd											
4	L2	31	3.8	0.466	6.3	LOS A	3.3	23.6	0.63	0.74	50.3
6	R2	448	2.9	0.466	11.1	LOS A	3.3	23.6	0.63	0.74	51.3
Approach		479	3.0	0.466	10.8	LOS A	3.3	23.6	0.63	0.74	51.2
NorthEast: John Oxley Dr											
7	L2	479	2.2	0.531	4.2	LOS A	5.5	40.3	0.29	0.46	54.0
8	T1	253	13.3	0.531	4.4	LOS A	5.5	40.3	0.29	0.46	55.0
9u	U	57	0.0	0.531	11.0	LOS A	5.5	40.3	0.29	0.46	56.3
Approach		789	5.6	0.531	4.7	LOS A	5.5	40.3	0.29	0.46	54.5
SouthWest: John Oxley Dr											
2	T1	371	5.2	0.496	8.5	LOS A	3.9	28.7	0.79	0.83	52.7
3	R2	39	9.5	0.496	13.3	LOS A	3.9	28.7	0.79	0.83	52.4
Approach		410	5.6	0.496	9.0	LOS A	3.9	28.7	0.79	0.83	52.7
All Vehicles		1678	4.8	0.531	7.5	LOS A	5.5	40.3	0.51	0.63	53.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: MIR - EP - AM CSU St 1 - C050614

Major Innes Road / Ellis Parade
background growth 2023 - SMEC
with addition traffic for CSU st 1
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Major Innes Road											
11	T1	407	0.0	0.209	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	116	0.0	0.143	8.4	LOS A	0.6	4.0	0.53	0.75	51.2
Approach		523	0.0	0.209	1.9	NA	0.6	4.0	0.12	0.17	57.8
East: Ellis Parade											
1	L2	53	0.0	0.410	17.8	LOS B	1.8	12.7	0.00	0.58	45.5
3	R2	99	0.0	0.410	17.8	LOS B	1.8	12.7	0.00	0.58	45.3
Approach		152	0.0	0.410	17.8	LOS B	1.8	12.7	0.00	0.58	45.3
North: Major Innes Road											
4	L2	204	0.0	0.110	5.6	LOS A	0.0	0.0	0.00	0.58	53.6
5	T1	342	0.0	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		546	0.0	0.175	2.1	NA	0.0	0.0	0.00	0.22	57.4
All Vehicles		1221	0.0	0.410	3.9	NA	1.8	12.7	0.05	0.24	55.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: OH-JOD-WR AM 2023 CSU ST 1 - C050614

Oxley Hwy/ John Oxley Dr/ Wrights Rd
background growth 2023 - SMEC
with additoinal traffic for CSU St 1
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxley Drive											
4	L2	35	8.8	0.574	9.4	LOS A	5.5	39.9	0.91	0.98	57.2
2	T1	884	3.3	0.574	9.7	LOS A	5.5	39.9	0.91	1.00	54.5
6	R2	4	0.0	0.574	17.5	LOS B	4.9	35.2	0.90	1.02	55.0
Approach		923	3.5	0.574	9.7	LOS A	5.5	39.9	0.91	1.00	54.6
East: Wrights Road											
7	L2	23	10.5	0.069	7.5	LOS A	0.3	2.5	0.75	0.76	53.8
8	T1	17	5.9	0.069	7.1	LOS A	0.3	2.5	0.75	0.76	61.4
6	R2	103	10.0	0.128	13.1	LOS A	0.7	5.3	0.78	0.87	52.6
Approach		143	9.6	0.128	11.5	LOS A	0.7	5.3	0.77	0.84	53.6
North: Oxley Highway											
7	L2	227	2.2	0.598	3.9	LOS A	4.7	34.3	0.53	0.39	55.1
8	T1	657	4.8	0.598	3.6	LOS A	4.7	34.3	0.53	0.39	57.4
9	R2	748	9.4	0.621	11.0	LOS A	4.9	37.2	0.59	0.68	56.1
Approach		1632	6.5	0.621	7.0	LOS A	4.9	37.2	0.56	0.52	56.5
West: Oxley Highway											
10	L2	1	0.0	0.087	8.3	LOS A	0.4	2.9	0.66	0.64	60.6
2	T1	61	5.4	0.087	8.9	LOS A	0.4	2.9	0.66	0.64	63.3
3	R2	151	6.9	0.154	15.7	LOS B	0.8	6.0	0.68	0.80	59.2
Approach		213	6.4	0.154	13.7	LOS A	0.8	6.0	0.68	0.76	60.3
All Vehicles		2911	5.7	0.621	8.6	LOS A	5.5	39.9	0.69	0.71	56.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: JOD - MIR - PM 2023 CSU ST 1 - C050614

Network: CSU St 1 PM

John Oxley Dr / Major Innes Rd
background growth 2023 - SMEC
with additional traffic for CSU St 1
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Major Innes Rd													
4	L2	125	1.9	125	1.9	0.567	9.0	LOS A	4.9	34.9	0.77	0.89	49.2
6	R2	394	1.6	394	1.6	0.567	13.7	LOS A	4.9	34.9	0.77	0.89	50.2
Approach		519	1.7	519	1.7	0.567	12.6	LOS A	4.9	34.9	0.77	0.89	50.0
NorthEast: John Oxley Dr													
7	L2	288	2.1	288	2.1	0.486	4.0	LOS A	4.6	33.7	0.20	0.45	51.1
8	T1	394	7.5	394	7.5	0.486	4.2	LOS A	4.6	33.7	0.20	0.45	55.3
9u	U	73	0.0	73	0.0	0.486	10.8	LOS A	4.6	33.7	0.20	0.45	56.4
Approach		755	4.7	755	4.7	0.486	4.8	LOS A	4.6	33.7	0.20	0.45	54.4
SouthWest: John Oxley Dr													
2	T1	198	5.4	198	5.4	0.262	6.9	LOS A	1.7	12.1	0.67	0.70	53.3
3	R2	25	0.0	25	0.0	0.262	11.5	LOS A	1.7	12.1	0.67	0.70	47.7
Approach		223	4.8	223	4.8	0.262	7.4	LOS A	1.7	12.1	0.67	0.70	52.9
All Vehicles		1497	3.7	1497	3.7	0.567	7.9	LOS A	4.9	34.9	0.47	0.64	52.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: MIR - EP - PM CSU St 1 - C050614

Network: CSU St 1 PM

Major Innes Road / Ellis Parade
background growth 2023 - SMEC
with additional traffic for CSU st 1
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Major Innes Road													
11	T1	339	0.0	339	0.0	0.174	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	93	0.0	93	0.0	0.090	7.0	LOS A	0.4	2.5	0.41	0.64	52.2
Approach		432	0.0	432	0.0	0.174	1.5	NA	0.4	2.5	0.09	0.14	57.0
East: Ellis Parade													
1	L2	118	0.0	118	0.0	0.626	17.0	LOS B	4.8	33.4	0.00	0.58	45.9
3	R2	218	0.0	218	0.0	0.626	17.0	LOS B	4.8	33.4	0.00	0.58	38.7
Approach		336	0.0	336	0.0	0.626	17.0	LOS B	4.8	33.4	0.00	0.58	42.1
North: Major Innes Road													
4	L2	86	0.0	86	0.0	0.046	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
5	T1	244	0.0	244	0.0	0.125	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		331	0.0	331	0.0	0.125	1.5	NA	0.0	0.0	0.00	0.15	58.2
All Vehicles		1098	0.0	1098	0.0	0.626	6.2	NA	4.8	33.4	0.03	0.28	52.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: JOD - MIR - PM 2023 CSU ST 1 - C050614

John Oxley Dr / Major Innes Rd
background growth 2023 - SMEC
with additional traffic for CSU St 1
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Major Innes Rd											
4	L2	125	1.9	0.567	9.0	LOS A	4.9	34.9	0.77	0.89	49.2
6	R2	394	1.6	0.567	13.7	LOS A	4.9	34.9	0.77	0.89	50.2
Approach		519	1.7	0.567	12.6	LOS A	4.9	34.9	0.77	0.89	50.0
NorthEast: John Oxley Dr											
7	L2	288	2.1	0.486	4.0	LOS A	4.6	33.7	0.20	0.45	54.2
8	T1	394	7.5	0.486	4.2	LOS A	4.6	33.7	0.20	0.45	55.3
9u	U	73	0.0	0.486	10.8	LOS A	4.6	33.7	0.20	0.45	56.4
Approach		755	4.7	0.486	4.8	LOS A	4.6	33.7	0.20	0.45	55.0
SouthWest: John Oxley Dr											
2	T1	198	5.4	0.262	6.9	LOS A	1.7	12.1	0.67	0.70	53.3
3	R2	25	0.0	0.262	11.5	LOS A	1.7	12.1	0.67	0.70	53.3
Approach		223	4.8	0.262	7.4	LOS A	1.7	12.1	0.67	0.70	53.3
All Vehicles		1497	3.7	0.567	7.9	LOS A	4.9	34.9	0.47	0.64	52.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: MIR - EP - PM CSU St 1 - C050614

Major Innes Road / Ellis Parade
background growth 2023 - SMEC
with additional traffic for CSU st 1
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Major Innes Road											
11	T1	339	0.0	0.174	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	93	0.0	0.090	7.0	LOS A	0.4	2.5	0.41	0.64	52.2
Approach		432	0.0	0.174	1.5	NA	0.4	2.5	0.09	0.14	58.1
East: Ellis Parade											
1	L2	118	0.0	0.626	17.0	LOS B	4.8	33.4	0.00	0.58	45.9
3	R2	218	0.0	0.626	17.0	LOS B	4.8	33.4	0.00	0.58	45.7
Approach		336	0.0	0.626	17.0	LOS B	4.8	33.4	0.00	0.58	45.8
North: Major Innes Road											
4	L2	86	0.0	0.046	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
5	T1	244	0.0	0.125	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		331	0.0	0.125	1.5	NA	0.0	0.0	0.00	0.15	58.2
All Vehicles		1098	0.0	0.626	6.2	NA	4.8	33.4	0.03	0.28	53.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: OH-JOD-WR PM 2023 CSU ST 1 - C050614

Oxley Hwy/ John Oxley Dr/ Wrights Rd
background growth 2023 - SMEC
with additional traffic from CSU St 1
Roundabout

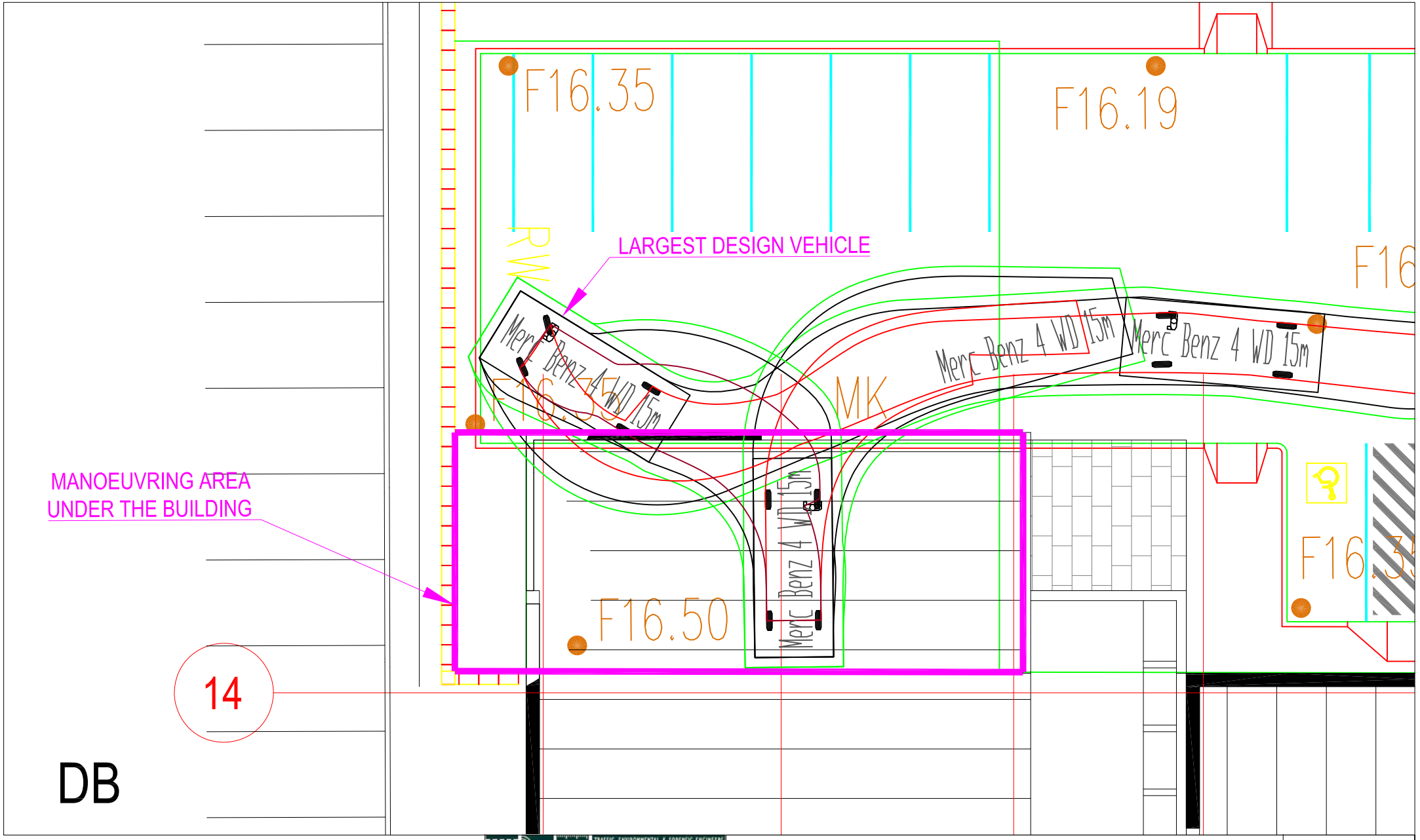
Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxley Drive											
4	L2	62	1.8	0.475	9.0	LOS A	3.8	27.4	0.87	0.93	58.8
2	T1	677	2.1	0.475	9.5	LOS A	3.8	27.4	0.87	0.94	54.7
6	R2	3	33.3	0.475	17.7	LOS B	3.4	24.3	0.85	0.96	54.1
Approach		742	2.2	0.475	9.5	LOS A	3.8	27.4	0.87	0.94	55.0
East: Wrights Road											
7	L2	35	5.9	0.147	7.4	LOS A	0.7	4.9	0.74	0.75	53.9
8	T1	60	1.7	0.147	7.0	LOS A	0.7	4.9	0.74	0.75	62.2
6	R2	230	1.2	0.251	13.0	LOS A	1.4	9.8	0.78	0.86	52.8
Approach		325	1.8	0.251	11.2	LOS A	1.4	9.8	0.77	0.83	54.4
North: Oxley Highway											
7	L2	136	2.2	0.588	3.5	LOS A	4.9	35.5	0.40	0.33	55.8
8	T1	813	3.9	0.588	3.2	LOS A	4.9	35.5	0.41	0.34	58.1
9	R2	791	2.9	0.588	10.3	LOS A	4.8	34.7	0.44	0.61	58.1
Approach		1740	3.3	0.588	6.4	LOS A	4.9	35.5	0.42	0.46	57.9
West: Oxley Highway											
10	L2	4	0.0	0.045	7.9	LOS A	0.2	1.4	0.62	0.63	60.6
2	T1	32	0.0	0.045	8.4	LOS A	0.2	1.4	0.62	0.63	63.4
3	R2	81	13.3	0.081	15.8	LOS B	0.4	3.1	0.62	0.78	59.3
Approach		117	9.2	0.081	13.5	LOS A	0.4	3.1	0.62	0.74	60.4
All Vehicles		2924	3.1	0.588	8.0	LOS A	4.9	35.5	0.58	0.63	56.8

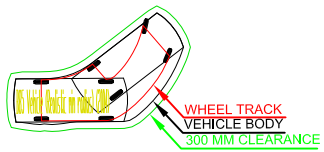
Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix B

Vehicle manoeuvring diagram for the north-west corner of the main building



LEGEND:



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JOB 13013	Rev. D	28/07/2014

Client:
Charles Sturt University

Charles Sturt University Port Macquarie Campus - Stage 1 development

SCALE 1:150 @ A4
SHEET 01

Vehicle manoeuvring area at the north-west corner of the main building

Duncan Gay MLC
Minister for Roads and Freight
Leader of the Government
Legislative Council

MEDIA RELEASE

Thursday 5 June 2014

MINISTER DETERMINED TO DELIVER UPGRADES TO WRIGHTS ROAD ROUNDABOUT

Minister for Roads and Freight Duncan Gay today inspected the Oxley Highway and John Oxley Drive and Wrights Road roundabout precincts with local member Leslie Williams.

“The local member has convinced me improvements are vital for this intersection to improve accessibility for the community and businesses of the Port Macquarie region,” Minister Gay said.

“In the next six months approximately $7 million will be sourced from project savings to deliver a fully signalised intersection.

“A traffic light controlled intersection will help accommodate the increase of traffic growth from planned developments identified before construction of the hospital project and the John Oxley Drive Structure plan.

“Because the Oxley Highway is a state-owned and managed road we will be able to deliver for the communities and businesses of Port Macquarie – unlike the council-owned projects which are constantly stalled.

Member for Port Macquarie welcomed the news: “I am delighted the Minister was able to see firsthand how important upgrading Oxley Highway and John Oxley Drive and Wrights Road roundabout precinct is,” Mrs Williams said.

“This project is planning for the future and is infrastructure the community and businesses expect and deserve.”

MEDIA: Siobhan McCarthy 0407 791 802 (Minister Gay)
Terry Sara 6584 0977 (Mrs Williams)

13391
28 July 2014

The General Manager
Port Macquarie-Hasting Council
PO Box 84
PORT MACQUARIE NSW 2444

Attention: Patrick Galbraith-Robertson (Development Assessment Planner)

Dear Mr Swift-McNair

CHARLES STURT UNIVERSITY - PORT MACQUARIE (D/2014/120)
MAJOR INNES ROAD, PORT MACQUARIE

We refer to Council's email of 21 July 2014 (from Pat Galbraith-Robertson) to APP requesting further information in relation to traffic and parking issues associated with the above development application (DA). This was in response to additional comments provided to Council by APP on 11 July 2014 by email. This letter has been prepared by JBA on behalf of the applicant, Charles Sturt University (CSU).

1.0 TRAFFIC IMPACTS ADJACENT TO THE SITE

Council Comments
Council has provided photographs of its observations of traffic conditions at John Oxley Drive and Major Innes Road through the Ellis Parade intersection and requested that further information be provided to review and assess appropriate measures to address operational issues. Council is concerned that with the CSU development queueing will extend to Ellis Parade. Council has suggested that consideration be given to further intersection improvements at the John Oxley Drive and Major Innes Road intersection and the Major Innes Road and Ellis Parade intersection.

Response
The photographs provided by PMHC confirm that the above queuing is an existing issue unrelated to any forecast traffic from CSU and is unrelated to the Ellis Parade intersection. As the issue appears to be a direct result of school afternoon pick-up from one or more existing schools, CSU should not be required to rectify problems from these other developments. We also note that the short term queuing is not unlike the situation in other towns and cities when schools close in the afternoon.

More specifically:

- The issue arises from the limited capacity of the Major Innes Road (MIR)/John Oxley Drive (JOD) intersection to cope with a sharp short term increase in traffic volumes on one of the approaches.
- Council's photographs were taken between 15:31 and 15:41 on Monday 14 July 2014, which was the first day of term for the St Columba Anglican School, and at around 10 to 20 minutes after the school bell (which is 3.20pm for both the primary and high school). Surveys undertaken by CSU's traffic consultant, TEF, at other schools indicate that the period of peak outbound traffic generation from schools in the afternoon lasts approximately 15 minutes. In TEF's experience it is highly unlikely that the reported situation would last for more than 30 minutes.

- There is no substantial queueing shown on Ellis Parade (one of the four photographs shows one vehicle waiting to turn, a second shows what appears to be one, and the remaining two photographs do not show any queueing vehicles on Ellis Parade).
- It is noted that the forecast peak for CSU traffic would be from 4.30pm to around 5.30pm – which does not coincide with the above after school peak.
- It is further noted that there are 190 school days in a year. The reported issue occurs for around 0.5 hour out of 12 hours of work day traffic (7am to 5 pm) and for 190 out of 365 days, that is for 2.2% of the total annual daytime operational time of the intersection. In CSU's opinion, the issue is of such a low magnitude that it does not warrant introduction of the substantial traffic management measures suggested by Council, such as construction of a roundabout.

In any event, it is TEF's considered opinion that a roundabout at Ellis Parade will not solve the issue with queuing traffic from JOD. It is likely that traffic will continue to queue for the whole length of the lane between the two roundabouts and traffic from Ellis Parade will have little opportunity to enter the roundabout (because the exit lane is blocked).

Notwithstanding that the problem is of a short duration and not caused by CSU traffic, CSU proposes that the following two traffic management options be tested first, as set out below and shown on the attached drawings:

- Option 1: Install advisory sign G9-237 ('DO NOT QUEUE ACROSS INTERSECTION') on the southern approach to the Ellis Parade intersection.
- Option 2: As above, plus provide regulatory (mandatory) 'KEEP CLEAR' markings.

CSU is willing to undertake the above works – starting with Option 1.

In the event that a real problem eventuates once CSU commences operations, and Options 1 and 2 above are not adequate, a third option could be considered as follows:

- Option 3: Provision of a partial seagull treatment - that is, a merging lane on the exit for the right hand turn from Ellis Parade, by utilising part of the existing wide median (see attached drawing).

The proportion of costs that CSU would be prepared to consider for Option 3 would need to be related to the proportion of traffic generated by CSU – estimated at between 14% and 19% of the cost of delivery.

2.0 MEDIAN ALONG ELLIS PARADE AND PAVEMENT STRENGTH

Council Comments

The sketch of the proposed median on Ellis Parade (that Council did not receive) is attached.

Council is of the view that the construction of Ellis Parade may not be of adequate design to accommodate additional vehicle loading and that pavement strengthening is likely to be required.

Response

To date there is no evidence that the pavement strength of Ellis Parade is inadequate for the type and volume of future CSU vehicle movements. CSU would consider upgrading the road pavement if Council is able to demonstrate that the design strength of Ellis Parade would not meet the pavement specification for CSU's forecast operational traffic.

3.0 PARKING DESIGN & CIRCULATION

Council Comment

Council has raised concerns regarding the adequacy of circulation within the car parking areas and has requested a further review of the car park design to ensure that the majority of vehicles circulate in a forward manner and that the proposed arrangements will not result in queuing which could impact the public road network.

Response

CSU wishes to clarify that it does not intend to install or utilise boom gates at the entries to northern and southern the car park. The design makes provision for the possible installation of a boom gate(s) at a future date should this measure ever be required. This would be the subject of a separate application to Council. Council's concerns about delays, congestion and spill over onto Ellis Parade should thus be allayed.

CSU intends to manage parking on the campus by means of signage, permits and infringement notices. In CSU's opinion there are no issues with the southern car park.

In relation to the northern car park specifically, the proposed signage is as follows.

- At the intersection between the southern module access and the northbound circulation aisle:
  - sign: 'Parking for authorised vehicles only' facing east;
  - sign: 'Public car park' with an arrow towards the two northern modules; and
  - sign: 'PARKING (Disability User Limitation)' with an arrow plate towards the west.
- Signposting of parking spaces in the southern module:
  - 'PARKING (Disability User Limitation) (L, R, L&R Arrows)' where appropriate;
  - 'Parking for FSWRC vehicle only';
  - 'CSU permit only' (with special permits issued for some staff);
  - 'Fleet vehicles only'; and
  - other signs for designated users.

The above arrangements are comprehensive and will reduce to the minimum the number of movements in and out of the southern module and negate the need for others to circulate through this module. Importantly, it should be noted that the proposed design the subject of the DA minimises the traffic movement in the southern module, especially towards the western end where the major pedestrian access to the building is located - an obvious advantage for pedestrian safety.

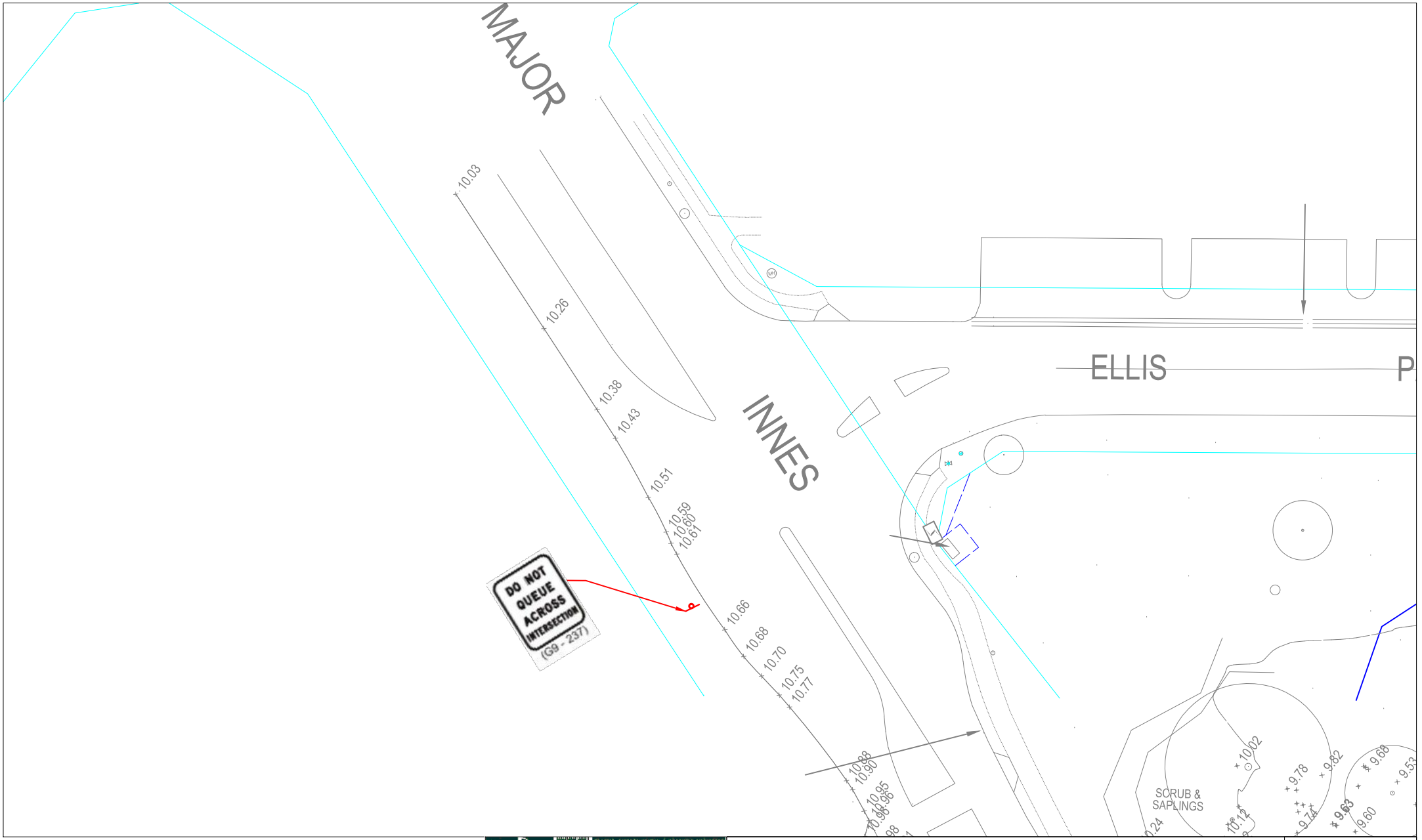
We trust that the above information and the detailed responses to each issue raised will enable Council to complete its assessment and refer CSU's development application to the JRPP for determination. Should you have any queries about this matter, please do not hesitate to contact Greg Carmichael at APP on 0403048648 (or greg.carmichael@app.com.au) or Stephen Gouge at JBA.

Yours faithfully

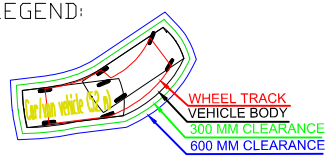
Vivienne Goldschmidt
Associate

Attachments

Options for treatment of Ellis Parade/ Major Innes Road intersection
Ellis Parade median design



LEGEND:



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JOB 13013	Rev. A	23/07/2014

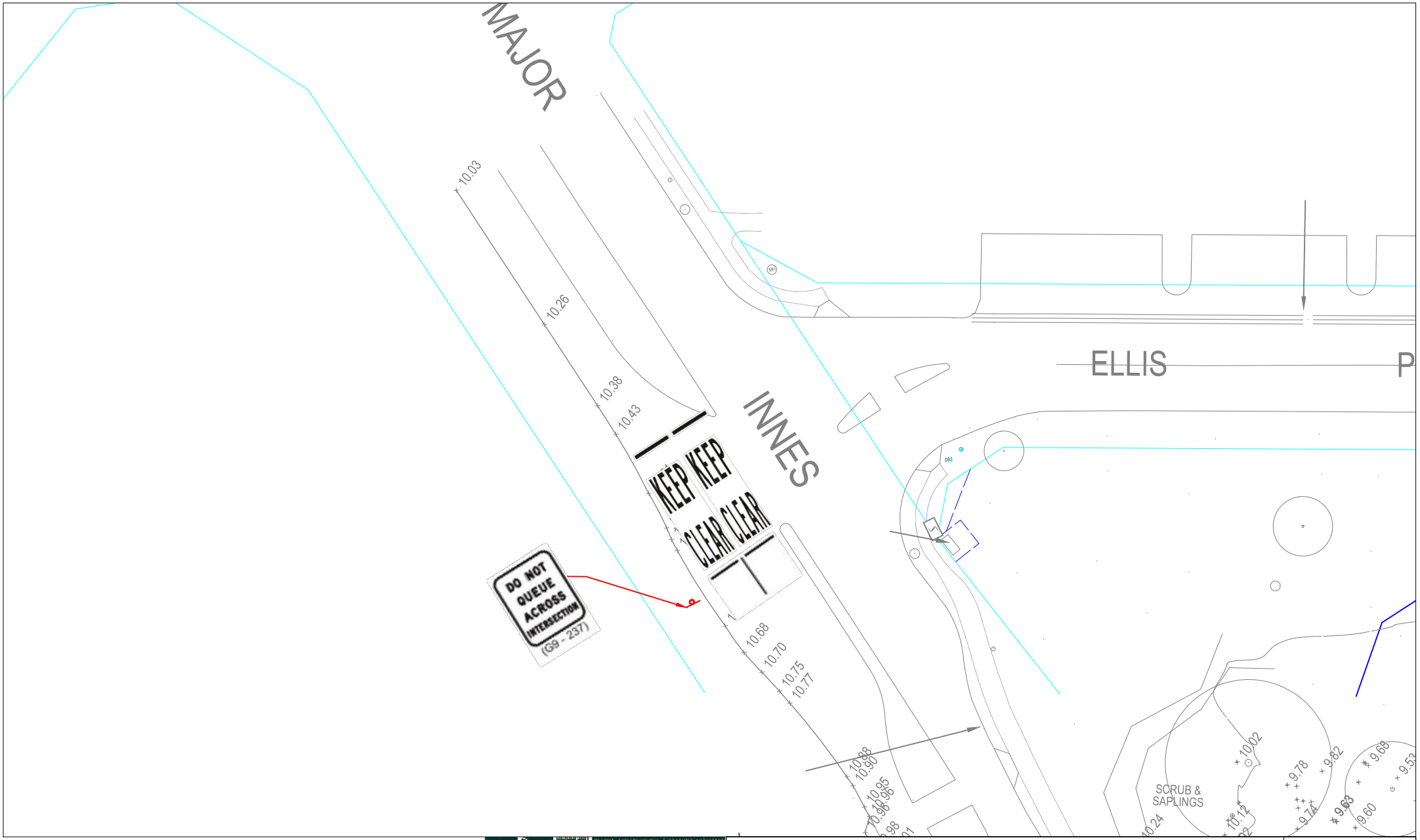
Client:
Charles Sturt University

Charles Sturt University Port Macquarie Campus - Stage 1 development

SCALE 1:500 @ A4

SHEET 01

INTERSECTION OF MAJOR INNES ROAD AND ELLIS PARADE
PROPOSED TREATMENT
OPTION 1



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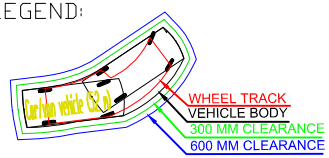

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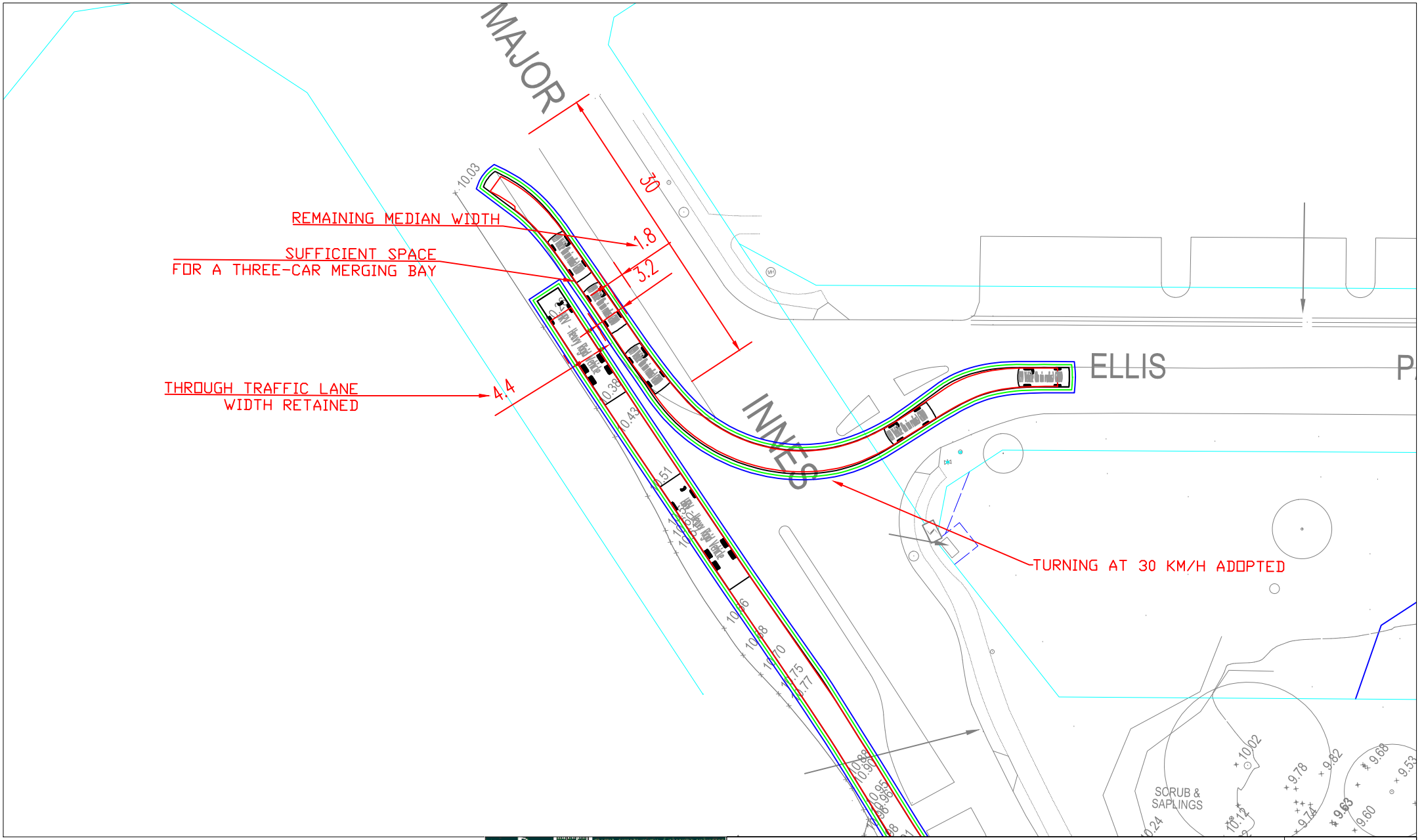
Charles Sturt University Port Macquarie Campus - Stage 1 development

SCALE 1:500 @ A4

SHEET 01

INTERSECTION OF MAJOR INNES ROAD AND ELLIS PARADE
PROPOSED TREATMENT
OPTION 2



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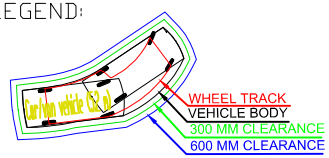

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JOB 13013	Rev. A	23/07/2014

Client:
Charles Sturt University

Charles Sturt University Port Macquarie Campus - Stage 1 development

SCALE 1:500 @ A4

SHEET 03

INTERSECTION OF MAJOR INNES ROAD AND ELLIS PARADE
PROPOSED TREATMENT
OPTION 3

Development Contributions Calculation Sheet - Final Consent Issue

Development Details

DA No.	**2014**	**0120**
Address:	**Ellis Parade & Major Innes Road, PORT**	
Dev Description:	**blishment (Charles Sturt University) & Ass**	
Lot Number(s):	**3, 2 & 8**	
DP Number(s):	**1178043, 1094444**	
Stage No:	**Total**	
Applicant:	**Charles Sturt University**	

Contribution Area:

(Planner must Select Contribution Area: Click Once with Mouse)

- ○ Camden Haven
- ◉ Innes Peninsula
- ○ Kings Creek
- ○ Lake Cathie/Bonny Hills
- ○ Port Macquarie
- ○ Rural
- ○ Sancrox/Thrumster
- ○ Wauchope

DA Lodged Date:	**21/02/2014**
Prepared By:	**Jesse D**
DA Consent Date:	
Issue No.	**1**
Calc Sheet Date:	**6-Aug-2014**
FINAL CONSENT CALCULATION	☑ Tick for FINAL Consent Calculation

Contributions Plans Applicable

General S94 Plans	**Applies**	**ET Chargeable**	**RatePer ET**	**Contribution Amount**
Major Roads	No			
Open Space	No			
Community Cultural & Emergency Services	No			
Admin Building	No			
Bushfire - Specific	No			
Kings Creek	No			
Admin Levy	No			
Specific Contribution Plans *and DSPs* *(Planner Must Select if Plans are Applicable)*				
S94A Levy Development Cost **$29,734,000**	Yes	$30,026,441	1.00%	$300,264
	☐ Applies			
	☐ Applies			
	☐ Applies			
Bushfire Additional	☐ Applies			
Select Rate	☐ Applies			
Water 1.6% levy: $2,745.20	☑ Applies	17.12	$10,022.00	$171,576.60
Sewer	☑ Applies	16.92	$4,171.00	$70,573.30
Car Parking CP	**Contribution Total:**			**$545,159.10**
No. of Spaces Short:	**Notice of Payment Re-Issue Fee:**	☐ Applies		

ET Calculaton for New Development (Proposed)

Commercial & Industrial New Development	**Rate**	**Units**	**Water Rate**	**Sewer Rate**	**ET Water**	**ET Sewer**	**Traffic Facilities m²**
SCHOOLS, EDUCATIONAL ESTABLISHMENTS, CHILD CARE (No PUPILS)	**No. Pupils**	770	0.0425	0.0425	32.725	32.725	
N/A	**m2**	0	0	0	0	0	
N/A	**m2**	0	0	0	0	0	
N/A	**m2**	0	0	0	0	0	
			Total Commercial ETs:		32.725	32.725	0

New Residential Development	**Units**	**Sec 94 ET**	**Water ET**	**Sewer ET**
Number of new residential lots greater than 450m² (excluding Dual Occ & Int Housing)	0	0	0	0
Number of new residential lots greater than 2000m² (excluding Dual Occ & Int Housing)	0	0	0	0
1 Bedroom Units (Low Density - Flats, town houses, villas, dual occs, Int housing & Permanent Self Contained Caravan Park Sites)	0	0	0	0
2 Bedroom Units (Low Density - Flats, town houses, villas, dual occs, Int housing & Permanent Self Contained Caravan Park Sites)	0	0	0	0
3 Bedroom Units (Low Density - Flats, town houses, villas, dual occs, Int housing & Permanent Self Contained Caravan Park Sites)	0	0	0	0
4 Bedroom Units (Low Density - Flats, town houses, villas, dual occs, Int housing & Permanent Self Contained Caravan Park Sites)	0	0	0	0
1 Bedroom Units (High Density - 3 or more storeys)	0	0	0	0
2 Bedroom Units (High Density - 3 or more storeys)	0	0	0	0
3 Bedroom Units (High Density - 3 or more storeys)	0	0	0	0
4 Bedroom Units (High Density - 3 or more storeys)	0	0	0	0
Motel Unit - Partially Self Contained (Own ensuite but shared facilities for cooking & laundry)	0	0	0	0
Motel Unit - Self Contained (Own ensuite and kitchen)	0	0	0	0
Caravan Park - Not Self Contained Site (permanent or transient)	0	0	0	0
Caravan Park - Partially Self Contained Site (permanent or transient)	0	0	0	0
Nursing Homes High Dependency/Residential Care Facility (per bed)	0	N/A	0	0
Nursing Homes Low Dependency/Hostel (per bed)	0	0	0	0
Aged Unit - Self Contained 1 bedroom with ensuite & kitchen (SEPP - Seniors Living)	0	0	0	0
Aged Unit - Self Contained 2 bedroom with ensuite & kitchen (SEPP - Seniors Living)	0	0	0	0
Aged Unit - Self Contained 3 bedroom with ensuite & kitchen (SEPP - Seniors Living)	0	0	0	0
Boarding House per 1 Occupancy Bedroom Not Self Contained (shared facilities for cooking, laundry & bathrooms)	0	0	0	0
Boarding House per 1 Occupancy Bedroom Partially Self Contained (Own ensuite - shared cooking & laundry facilities)	0	0	0	0
Boarding House - Not Self Contained Per Bed (for dormitories/bunkrooms, shared cooking, laundry and bathroom)	0	0	0	0
Boarding House - Self Contained Per Bed (for dormitories/bunkrooms, Own ensuite per bedroom/dorm/bunkroom with shared cooking and laundry)	0	0	0	0
New Residential Unit Total:	0	0	0	0

ET Calculation for Existing Development (Credits)

Commercial & Industrial Existing Development	Rate	Units	Water Rate	Sewer Rate	ET Water	ET Sewer	Traffic Facilities m^2
N/A	m2	0	0	0	0	0	
N/A	m2	0	0	0	0	0	
N/A	m2	0	0	0	0	0	
N/A	m2	0	0	0	0	0	
			Total Commercial ETs:		0	0	0

Existing Residential Development	Units	Sec 94 ET	Water ET	Sewer ET
Number of existing residential lots greater than 450m^2 (excluding Dual Occ & Int Housing)	0	0	0	0
Number of existing residential lots greater than 2000m^2 (excluding Dual Occ & Int Housing)	0	0	0	0
1 Bedroom Units (Low Density - Flats, town houses, villas, dual occs, Int housing & Permanent Self Contained Caravan Park Sites)	0	0	0	0
2 Bedroom Units (Low Density - Flats, town houses, villas, dual occs, Int housing & Permanent Self Contained Caravan Park Sites)	0	0	0	0
3 Bedroom Units (Low Density - Flats, town houses, villas, dual occs, Int housing & Permanent Self Contained Caravan Park Sites)	0	0	0	0
4 Bedroom Units (Low Density - Flats, town houses, villas, dual occs, Int housing & Permanent Self Contained Caravan Park Sites)	0	0	0	0
1 Bedroom Units (High Density - 3 or more storeys)	0	0	0	0
2 Bedroom Units (High Density - 3 or more storeys)	0	0	0	0
3 Bedroom Units (High Density - 3 or more storeys)	0	0	0	0
4 Bedroom Units (High Density - 3 or more storeys)	0	0	0	0
Motel Unit - Partially Self Contained (Own ensuite but shared facilities for cooking & laundry)	0	0	0	0
Motel Unit - Self Contained (Own ensuite and kitchen)	0	0	0	0
Caravan Park - Not Self Contained Site (permanent or transient)	0	0	0	0
Caravan Park - Partially Self Contained Site (permanent or transient)	0	0	0	0
Nursing Homes High Dependency/Residential Care Facility (per bed)	0	N/A	0	0
Nursing Homes Low Dependency/Hostel (per bed)	0	0	0	0
Aged Unit - Self Contained 1 bedroom with ensuite & kitchen (SEPP - Seniors Living)	0	0	0	0
Aged Unit - Self Contained 2 bedroom with ensuite & kitchen (SEPP - Seniors Living)	0	0	0	0
Aged Unit - Self Contained 3 bedroom with ensuite & kitchen (SEPP - Seniors Living)	0	0	0	0
Boarding House per 1 Occupancy Bedroom Not Self Contained (shared facilities for cooking, laundry & bathrooms)	0	0	0	0
Boarding House per 1 Occupancy Bedroom Partially Self Contained (Own ensuite - shared cooking & laundry facilities)	0	0	0	0
Boarding House - Not Self Contained Per Bed (for dormitories/bunkrooms, shared cooking, laundry and bathroom)	0	0	0	0
Boarding House - Self Contained Per Bed (for dormitories/bunkrooms, Own ensuite per bedroom/dorm/bunkroom with shared cooking and laundry)	0	0	0	0
Existing Residential Unit Total:	0	0	15.605	15.805

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