Traffic Impact Assessment

UNE Tamworth Central Campus

Prepared for Architectus / 06 May 2024

221823

Contents

Revision Register

Rev	Date	Prepared By	Reviewed By	Authorised By	Remarks
1	02/08/2023	AA	GC	PY	Draft for comment
2	01/09/2023	AA	GC	PY	Draft for comment
3	22/11/2023	AA	GC	PY	For issue
4	06/05/2024	AA	GC	PY	Following submissions

1.0 Response to Submission

This report has been prepared to provide further context to the University of New England Tamworth Central Campus project to a Request for Information (RFI) received from the Tamworth Regional Council on 17 April 2024.

The Traffic Impact Assessment (TIA) has been updated to reflect the necessary changes.

1.1 Response to Request for Further Information

This section of the report summarises the responses to each item raised within the Request for Further Information, in particular sections **1. Agency Requested Information** and **2. Parking and Access**.

Agency Requested Information

Proposed traffic generation rates to be based on a survey of similar existing developments.

It is important to note that the proposed development is unique to the city of Tamworth, with no current University campus of similar scale within Tamworth to compare trip generation rates with. To provide a comprehensive understanding of traffic and transport behaviour, census data showing Journey-to-work patterns (Place of work & Place of Residence), along with data from similar regional universities within other city centres has been included in Section 3.6.

Given the unique nature of the project within Tamworth, benchmarking against similar regional university projects was undertaken with available information from the NSW Planning Portal. This benchmarking indicates that the adopted traffic generation rate is in line with what has been applied for other regional university campuses.

It's important to note that the methodology used in developing the Traffic Impact Assessment (TIA) was conservative, as the campus in Tamworth is a new development. The approach was based on Tamworth's Development Control Plan (DCP) rate for parking at an educational establishment, basing trip generation on the imposed car parking rate by Tamworth Regional Council to adapt localised trip generation rates.

While surveys from other University of New England (UNE) sites were considered, they may not accurately represent transport behaviours within Tamworth. Factors such as local commuting habits, public transportation infrastructure, and regional road conditions can vary significantly across different locations. Therefore, using the DCP rate for parking as the baseline provides a more reliable estimate for the Tamworth campus, acknowledging its unique context.

The total impact of existing and proposed development on the road network with consideration for a 10-year horizon.

Traffic modelling has been completed with consideration to a 10-year horizon. Analysis indicates that the level of service (LoS) remains within acceptable ranges, with levels primarily at LoS A and B for both post development and in the 10-year horizon.

This finding suggests that the proposed Tamworth Central Campus development has no significant impact on the performance of the three nearby roundabouts. Refer to Section 5.3.2 for further information regarding the traffic generation.

The distribution of the trips generated by the proposed development, shown diagrammatically.

Updated - Refer to Section 5.3.1.

Background growth rate to be applied to future horizon.

Updated - Refer to Section 5.3.1.

Traffic analysis of the proposed development using SIDRA and including submission of updated electronic files.

Attached to the submission.

Relevant swept path analysis for the largest design vehicle accessing the site (refuse, deliveries, etc).

Updated – Appendix A

Table 4.1 shows the incorrect total figures for staff and students and should be updated.

Updated – Section 5.2.1

Amend the speed zone the comment on page 8, Section 2.2.3 indicating a speed zone of 80km/h, whereas the limit has reduced to 60km/h well in advance of the development location.

Updated – Section 3.2.3

There are multiple mistakes (i.e. Road name labels, access arrow direction), these should be rectified.

A review of all road name labels and access arrow directions within this report has been completed.

There are multiple reductions around parking requirements from unknown program shifts throughout the document.

Only a reduction to the Development Control Plan (DCP) rate has been requested, based on the following key factors (refer to Section 5.2.1):

- The site benefits from 33 on-street parking spaces on Peel Street and Roderick Street, reducing the need for excessive on-site parking.
- Proposed sustainable travel initiatives encourage staff and students to use alternative transportation modes, aligning with TfNSW's Road User Space Allocation Policy and fostering a safer, lower-traffic environment around the campus.
- The central location of the site within Tamworth provides strong connectivity to pedestrian and cyclist networks, including a shared path along Peel River, promoting active transportation.
- Reducing on-site parking also supports environmental sustainability by discouraging car dependency and enhancing the urban streetscape, maintaining a vibrant city center atmosphere.

These factors form the basis for the requested reduction to the DCP rate, supporting a more sustainable and efficient approach to campus development.

We note that the current Tamworth CBD Parking Strategy prepared by Tamworth Regional Council notes an average of at least 1,500 vacant car parking spaces at any one time within the city centre, indicating there is ample parking within the city centre available for overflow demands of the university should that overflow be required.

Additionally, UNE is open to exploring potential leasing car parking opportunities through commercial agreements to address potential overflow parking needs while the transport mode shift occurs.

Consideration of alternative modes of transport should address maximising pedestrian and bicycle facilities around the site.

Bicycle parking has been provided in accordance with the rates for tertiary education establishments, as specified by the NSW Planning Guidelines for Walking and Cycling. This ensures that the Tamworth Central Campus meets the recommended standards for accommodating cyclists. To further support sustainable transportation, end-of-trip facilities have been incorporated into the design, providing amenities for those who

choose to cycle to campus. These facilities include secure bike storage, showers, and changing rooms. For additional information on the specifics of the bicycle parking and end-of-trip facilities, refer to Section 4.5.

Further consideration should be given to the continuation of the shared path along the front of Peel Street to allow for flow of bicycles and pedestrians.

There is no shared path on Peel Street. The shared path is located along the river to the west of the site and is maintained in the proposed development.

The Applicant should examine opportunities for relocating the driveway further than 65 meters from the roundabout and State Road to provide safe access to the site.

The driveway is located in accordance with the requirements outlined in AS2890. The traffic impact assessment confirms that the development will generate a limited number of trips, with no need for access controls such as boom gates. This, along with the site's left-turn-only access when exiting the state road network, will ensure smooth traffic flow into and out of the site. Consequently, there will be no queuing impacts on the roundabout at Peel St/Murray St/Scott Rd, mitigating potential congestion concerns.

Parking and Access

The proposed car parking arrangement and number of spaces is not considered appropriate for the use sought. The Tamworth Regional Development Control Plan 2010 (TRDCP) requires 1 space per 2 staff plus 1 space per 5 students for higher education establishments.

Refer to the above responses and Section 5.2.1.

Based on the presumed staff and student numbers as detailed within the Traffic Impact Assessment (31 staff and 266 students), the development would require 70 car parking spaces to be provided on site. The proposed 53 is not supported, and an updated plan with a minimum 70 spaces is to be provided. Council will not support the consideration of 33 available on street spaces to form an offset from the requirement to provide parking to cater for the use proposed.

UNE is open to exploring potential leasing car parking opportunities through commercial agreements to address potential overflow parking needs while the transport mode shift occurs.

Further, the carparking layout proposed does not meet the objectives outlined in AS2890.1, particularly with reference to the use of long blind aisles. The blind aisles will result in cars reversing in the event that they enter, only to find all bays are occupied, and no facility for turning. The carpark should be re-designed to accommodate the additional required bays, and provide proper circulation.

The carpark design can be brought into compliance with minor adjustments, as indicated in Appendix A. The proposed adjustments involve incorporating a one-way circulation system from the south of the carpark. This will enable recirculation of vehicles. These changes will not require significant adjustment to the current layout and can be accommodated.

The design does not facilitate any separation of passenger vehicles and commercial vehicles. The current vehicular access would be disrupted by waste collection and other service vehicle activity, and should be redesigned to allow for concurrent access and servicing to occur. It is also noted that no marked delivery/set down/drop off areas are shown on plans where all three elements would be expected to occur with an educational establishment.

Waste collection will be managed to occur outside of peak hours, reducing the risk of service vehicle manoeuvres and passenger vehicle conflict. An MRV swept path was provided to confirm entry and exit in a forward direction. Furthermore, when an MRV is parked to collect waste, passenger vehicles can still navigate the site smoothly, with adequate space to manouevre around the service vehicle, refer to Appendix A.

Circulation should be explored further within the revised design and vehicle manoeuvring/swept paths on site and within the parking and waste areas are to be provided. It is noted that the current TIA shows swept paths for passenger vehicles running through dedicated car bays and landscape elements.

Updated - see the item above related to the carparking layout

In terms of traffic impact and interaction with the surrounding road network, it has previously been flagged that Roderick Street and Kable Avenue may be closed to all but emergency vehicles, taxis and buses. While this concept is still preliminary, a sensitivity analysis and commentary should be incorporated into the TIA – specifically to demonstrate that the presence and format of the development will not negatively impact on this objective.

The primary access and loading point is through Peel Street. Given this configuration, the potential closure of Roderick Street and Kable Avenue would not impact the site's accessibility or functionality. Trip generation to and from the site has assumed no use of Roderick Street or Kable Avenue.

2.0 Introduction

TTW has been engaged by Architectus to provide a Transport Impact Assessment (TIA) to assess and address the traffic and transport impacts of the proposed development and define the key traffic-related design elements of the proposal.

This report has been prepared to accompany a development application (DA) made to Tamworth Regional Council for the University of New England Tamworth Central Campus project, located at 545 Peel Street, Tamworth.

2.1 Scope

University of New England (UNE) is collaborating with Tamworth Regional Council to establish a university presence that encourages growth in the city and surrounding area, improves educational performance across the region, and supports Tamworth's aims for the region.

The scope of this project is to provide a tertiary educational campus which includes a four-storey building with associated landscaping, cultural grounds and carparking. This development will cater to a total of 295 students and 30 staff members.

This report covers the following areas:

- Site access
- Active transport (pedestrians and cyclists)
- Public transport
- Service and loading
- Car parking
- Road network performance
- Access and Circulation
- Traffic Impacts

2.2 References and Guidelines

This report has been prepared in the context of and with knowledge of relevant documents as follows:

- Tamworth Regional Council Development Control Plan 2010
- Tamworth Regional Local Environmental Plan 2014
- RMS Guide to Traffic Generating Developments 2002
- Clinical Services Framework 2020-2025
- UNE Tamworth Site Investigation and Campus Development Strategy (2021)
- Tamworth CBD Parking Strategy 2020-2030
- University of New England Tamworth plan (2020)

3.0 Existing Conditions

3.1 The Site

The proposed campus location is at 545 Peel Street, Tamworth at the corner of Roderick and Peel Streets. The site is situated within the local government area of Tamworth Regional Council, in the northeast region of New South Wales.

Within the vicinity of the proposed site, Peel Street is aligned north-west to south-east, connecting with Roderick Street to the north-west and Scott Road to the south-east. Peel River is adjacent to the site from the south-west direction.

The site is surrounded predominantly by a mix of low-density residential properties and industrial premises to the north-east, agricultural land and Calala Creek to the south of the site. The Campus is approximately 20-minutes' walk from Tamworth train station and a 7 minutes' drive to Tamworth Hospital.

The site location and surrounding environs are shown in Figure 3.1.

Figure 3.1: Site Location within Local Context

3.2 Road Network

3.2.1 State and Regional Roads

The state and Local Road network within the vicinity of the Campus site can be seen in Figure 3.2.

Figure 3.2: State and Regional Road Network

Source: NSW Road Network Classifications (TfNSW)

3.2.2 Local Roads

Peel Street

UNE Campus is bordered by Peel Street. It is a two-way road with one lane in each direction and a 50 km/h speed limit. The road contains parallel on-street parking on both sides of the road and a footpath on the eastern side of the road. There are no public transport facilities or services along this road. According to traffic count data[1] collected on Friday the 28th of September 2018, a total of 748 vehicles were counted at the morning peak hour and 924 at the evening peak on Peel Street.

Roderick Street

Roderick Street connects Kabel Avenue with Peel Street and provides direct access to the site. It contains two travel lanes, one in each direction. The road is signposted with a 50 km/h speed limit. A roundabout is located

[1] UNE Tamworth Site Investigation and Campus Development Strategy

at the intersection between Peel Street and Kable Street at the northern corner of the site. Adjacent to the site to the south of the street, 45° angle on-street parking is generally permitted along one side of the road and parallel parking on the other side. However, a footpath is located on north-western side of the road while no bicycle facilities nor public transport facilities are provided along the road. According to the UNE Tamworth Site Investigation and Campus Development Strategy, 438 vehicles were counted on Roderick Street during the morning peak hour and 654 during the evening peak.

3.2.3 State Roads

Scott Road

Scott Road is a state road connecting Tamworth to Newcastle. It aligns north to south and serves as the southern approach to the roundabout intersection with Peel Street. It is a two-way road with one travel lane in each direction, with a shared path located on the western side of the road. The road forms part of the state route A15, with an 60km/hr speed limit and no parking.

3.3 Public Transport

There are 9 public bus routes operating in Tamworth as shown in the network map in Figure 3.3. These buses are operated by Tamworth Buslines Service. At the Marius Street bus stop, which is close to the Campus's main entrance, the bus route 430 stops every 2 hours throughout the week, Saturdays from 9am to 4pm only, and no scheduled trips on Sundays and public holidays. The bus routes and their frequencies are detailed in Table 3.1.

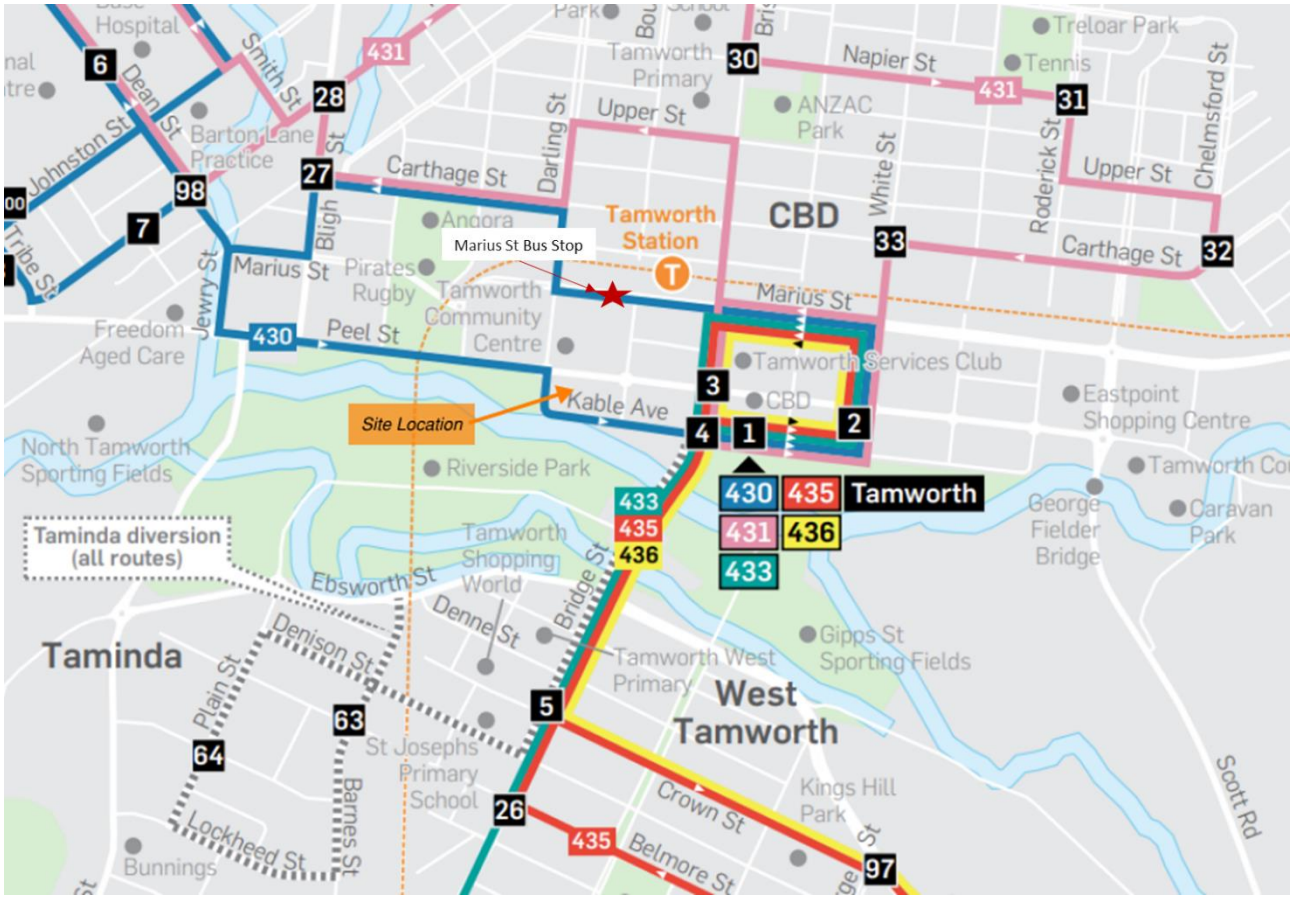


Figure 3.3: Tamworth Bus Service Network Map

Source: Tamworth Bus lines

Table 3.1: Bus Routes Services

Bus Number	Bus Route	Weekday Frequency
430	Tamworth to Oxley Vale via Tamworth Hospital (Loop Service)	1 service per hour
431	Tamworth to North Tamworth via Tamworth Hospital (Loop Service)	1 service per 2 hours
433	Tamworth to South Tamworth (Loop Service)	1 service per hour
435	Tamworth to Tamworth Sports Dome via South Tamworth (Loop Service)	1 service per hour
436	Tamworth to Calala via Goonoo Goonoo Rd & Tamworth Shopping world (Loop Service)	1 service per 1.5 hour

3.4 Active Transport

3.4.1 Pedestrian and Cycling Facilities

Active transportation options near the site are limited to pathways on Roderick and Peel streets, as well as a shared route on Scott Road. Off-road cycling via a shared path is available along Scott Road.

Figure 3.4 identifies cycling routes map in the Tamworth within the vicinity of site.

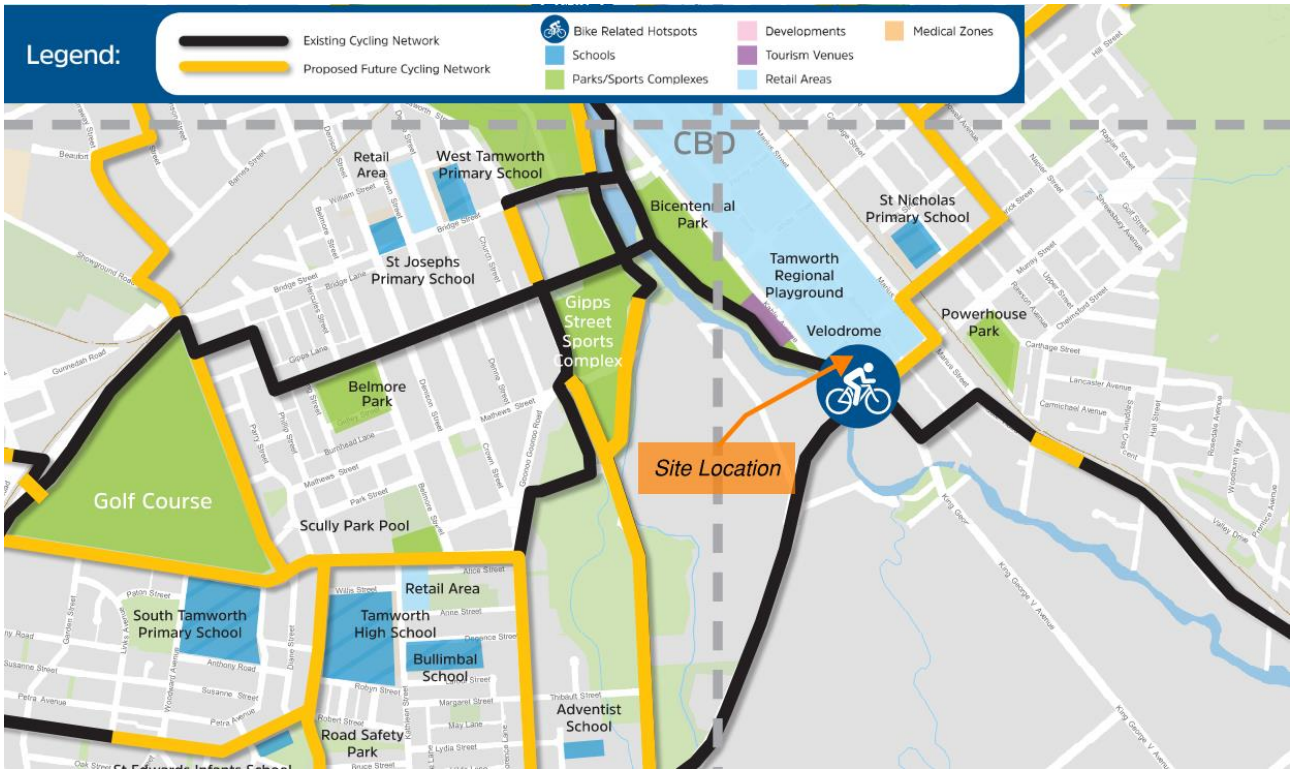


Figure 3.4: Existing and Proposed cycling Infrastructure within Vicinity of the Site

Source: Tamworth Regional Council

3.5 Car Park

3.5.1 On-Street Parking

The surrounding area of the site offers mostly unrestricted on-street parking, particularly in the adjacent streets (Peel Street and Roderick Street).

The Tamworth Parking Strategy provides a detailed map displaying the network, including the locations of carparks, parking meters, time-restricted zones, and free on-street parking zones.

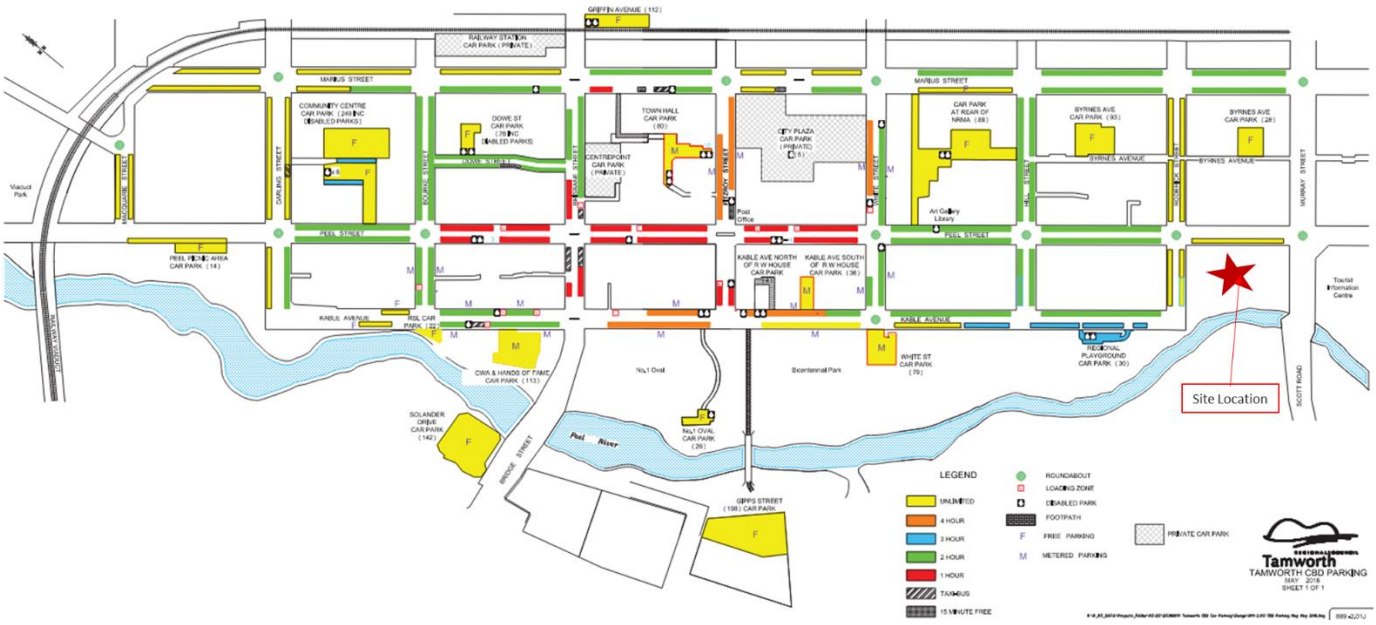


Figure 3.5: Tamworth Parking Strategy

3.6 Travel Characteristics

Journey to Work (JTW) data supplied by the 2016 Australian Census approximates the current mode share split for those who work in Tamworth and can be used to represent the travel modes of the staff working at the Campus. The JTW data is defined by Statistical Area Level 2 zones, and the site is located within the Tamworth - North region.

Table *3.2* demonstrates the breakdown of mode shares for each mode of travel. It is clear that private vehicle use is the favoured travel mode (as driver or passenger). In addition, while all other means of transportation show low usage, less than 1% take the train and bus combined and 3.3% of people walk to work.

Method of Travel (MTW15P) categorisation of travel modes (as listed in the left column of Table 3.2) is used for a clearer and simpler assessment of key travel modes through the allocation of a primary mode when multiple modes have been used in one trip.

Table 3.2: Journey to Work Data for Tamworth (Place of Work)

Source: Australian Bureau of Statistics 2016 Census

Travel Mode	Mode Share (%)
Train	0.13%
Bus	0.58%
Taxi	0.26%
Car, as driver	86.97%
Car, as passenger	6.63%
Truck	0.87%
Motorbike/scooter	0.66%
Bicycle	0.46%
Walked only	3.33%
Other Mode	0.09%
Total	**100.0%**

Table 3.3 shows a summary of the above information into three main travel mode categories. Private vehicle usage is the most popular mode choice, with 95% share, followed by active transport and lastly public transport.

Table 3.3: Summarised Journey to Work Data

Mode Summary	Mode Share (%)
Private vehicle (car, truck, taxi, motorbike)	95.39%
Public transport (train, bus)	0.71%
Active transport (walk, bicycle)	3.79%
Total	**100.0%**

Journey to Work data for the Place of Work can be seen in Table 3.4 below. This data can be used to further examine where people live, their demographic characteristics, and how they connect to employment centres. The data shows a similar pattern to Place of Work data, with the predominant mode of travel being private vehicles (91.56%), followed by active transport (4.75%).

Table 3.4: Journey to Work Data for Tamworth (Place of Residence)

Source: Australian Bureau of Statistics 2016 Census

Travel Mode	Mode Share (%)
Train	0.17%
Bus	0.54%
Taxi	0.35%
Car, as driver	84.64%
Car, as passenger	6.92%
Truck	1.30%
Motorbike/scooter	0.73%
Bicycle	0.35%
Walked only	4.40%
Other Mode	0.61%
Total	**100.0%**

A review of similar existing developments has been included in Table 3.5 below. These developments can serve as a good benchmark for travel characteristics for this unique regional university project type.

Table 3.5: Similar Existing Developments

Source: NSW Planning Portal

Project	Proposed works	Student number	Staff number	Traffic generated (peak hour trips)	Vehicle Trips /Total Occupation
UNE Tamworth Central Campus	**Four-storey school building with carpark.**	**295**	**30**	**75**	**23%**
Educational Establishment (Charles Sturt University) and Associated Infrastructure	Whole university	700	74	336	43%
Nihon University Newcastle Campus (accomodation)	Education establishment with student accommodation. Construction of two 4-storey buildings	100	8	20	18%
New Space Project at the University of Newcastle CBD Campus	10 storey education buildings	2000	100	19	1%
University of Newcastle, Gosford Campus	New tertiary institution in Gosford.	660	50	35	5%

As shown above, the ratio of trip generation to total site occupation varies significantly across regional university projects. The location of the proposed UNE Tamworth campus is such that it is located within the town centre with access to key transport networks such as key cycle routes and public transport routes.

3.7 Road Safety

Transport for NSW provides a history of recorded crash data for a 5-year period between 2017 and 2021. This data is reviewed to better understand the existing levels of safe road operation at and around the site, and the potential implications of any increases to traffic volumes.

Figure 3.6 presents the crash history locations available from TfNSW.

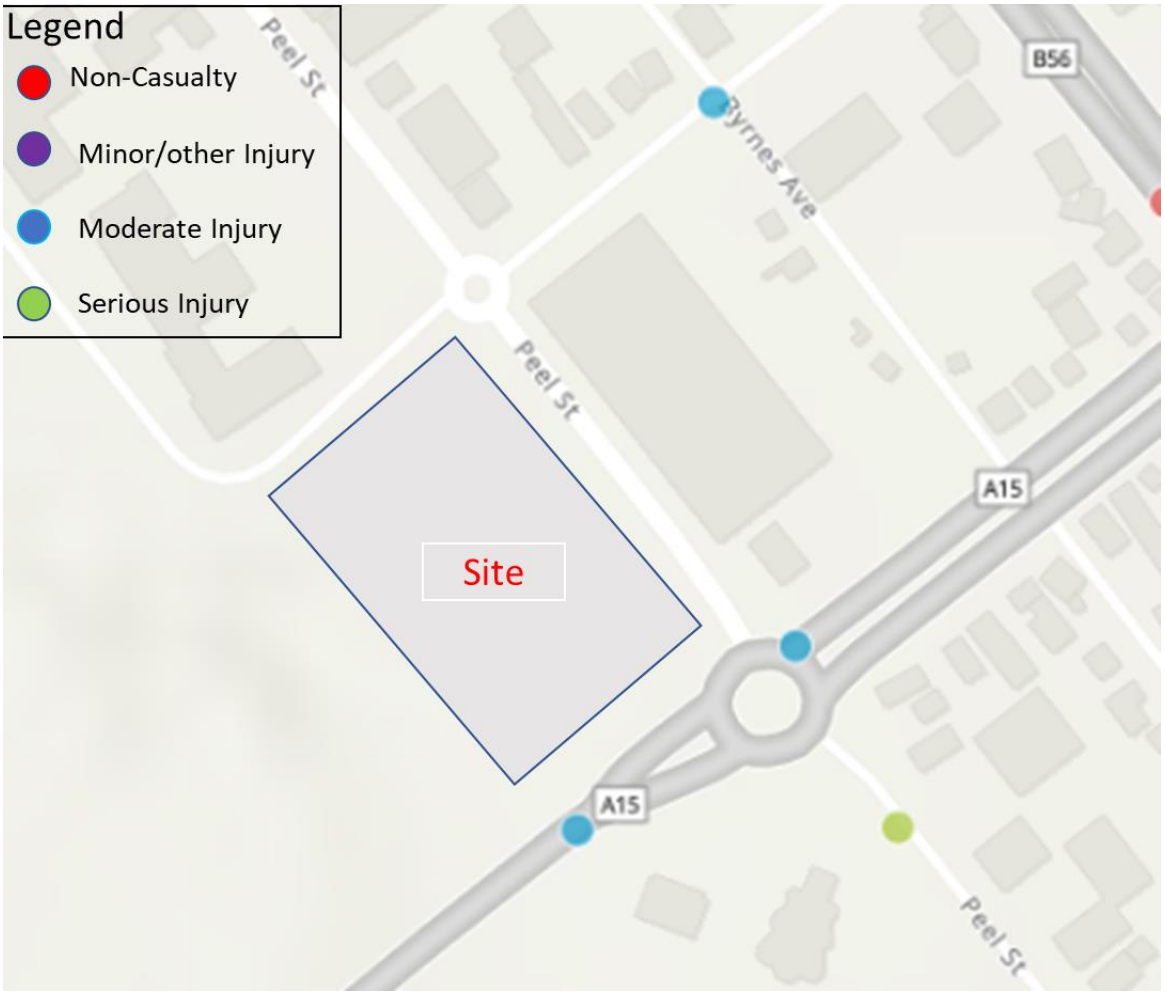


Figure 3.6: Recorded Crash History (2017 - 2021)

Source: Transport for NSW

The data indicates two moderate injuries along Scott Road whereas no incidents are shown along Peel Street nor Kabel Street.

Traffic impacts in this area should be carefully considered and treated for future developments and road user safety should be considered on an ongoing basis during future design stages.

3.8 Traffic Condition

3.8.1 Traffic Data Collection

To develop a baseline for this transport assessment, traffic data collection has been undertaken for several intersection around the site, as illustrated in Figure 3.7. Traffic volume data was collected on Thursday the 27th of August 2023 from 7am to 10am and 3pm to 7 pm at the three-roundabout listed below.

- Peel Street, Murray Street and Scott Road
- Peel Street and Roderick Street
- Marius Street and Murray Street

Figure 3.7: Modelled intersections

These locations have been chosen due to their potential for the most significant impact or relevance in relation to this development assessment. Analysing the traffic data collected, the identified peak hours for the roundabouts are 8:00 am - 9:00 am and 4:45 pm - 5:45pm.

3.8.2 Traffic Modelling

The analysis of the existing traffic conditions has been conducted for these three intersections using SIDRA Intersection 9.0 software. The intersections were modelled in a network configuration, refer to Figure 3.8 for the modelling schematic within SIDRA.

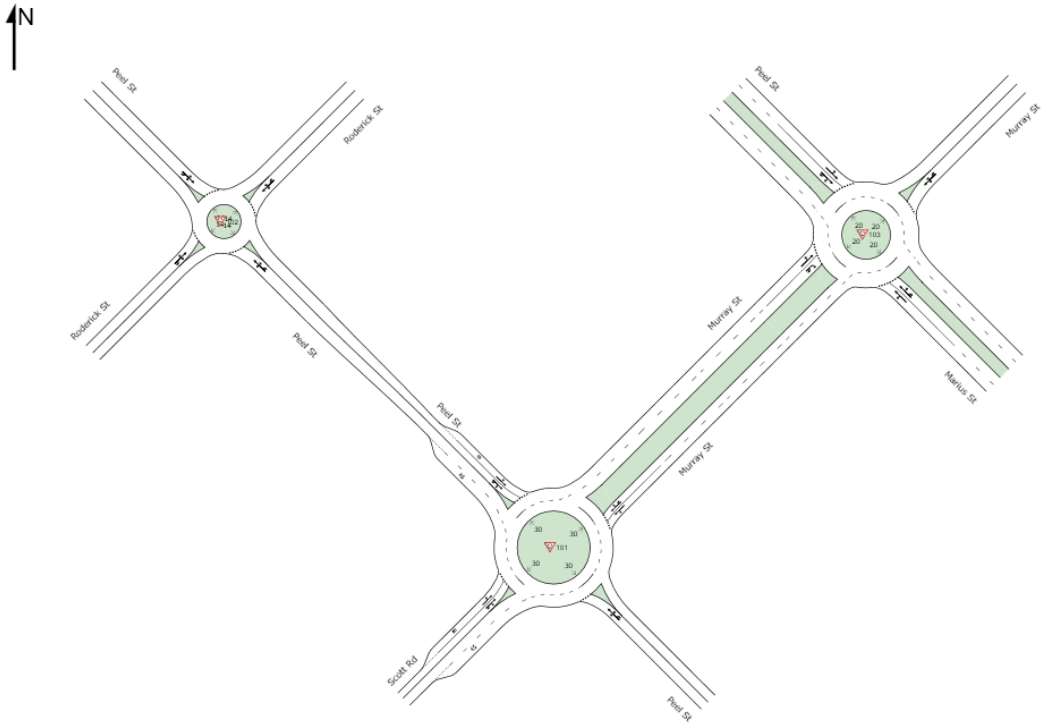


Figure 3.8: SIDRA Intersection Layout

Layout pictures are schematic functional drawings; not to scale.

3.8.3 Network Performance

Table 3.5 presents a summary of the existing operation of the key intersections, with full results presented in Appendix B It should be noted that the level of service for the key roundabouts is based on the approach with the highest delay.

Table 3.5: SIDRA modelling results for existing Conditions

Data for unsignalised intersections is the manoeuvre with worst delay

Intersection	Peak Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
Peel St x Murray St / Scott Rd	AM	0.301	12.4	5.4	LOS A
	PM	0.446	14.1	8.7	LOS A
Peel St x Roderick St	AM	0.140	10.2	1.9	LOS A
	PM	0.334	12.2	5.8	LOS A
Marius St x Murray S	AM	0.346	16.1	5.3	LOS B
	PM	0.266	14.3	3.3	LOS A

As indicated in Table 3.5, all roundabouts demonstrate satisfactory performance, achieving a level of service A and B within during both the AM and PM peak hours which indicates limited queues on any approach at the assessed roundabouts.

Table 3.6 summarise the analysis for the three intersections in a 10-year horizon, looking ahead to 2034, with the full results available in Appendix B. All the assessed roundabouts exhibit a slight decrease in average delay and degree of saturation while maintaining satisfactory performance, achieving Level of Service A and B during both AM and PM peak hours. This indicates minimal queuing on any approach to the roundabouts.

Table 3.6: SIDRA modelling results for 2034 Conditions (Without Development Volumns)

Data for unsignalised intersections is the manoeuvre with worst delay

Intersection	Peak Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
Peel St x Murray St / Scott Rd	AM	0.348	12.6	6.5	LOS A
	PM	0.535	15.4	12.5	LOS B
Peel St x Roderick St	AM	0.161	10.5	2.3	LOS A
	PM	0.409	13.3	7.7	LOS A
Marius St x Murray S	AM	0.429	18.1	7.3	LOS B
	PM	0.333	15.3	4.5	LOS B

According to the level of service criteria provided in Table 3.6 and Table 3.7 all of the three roundabouts have a good operation at Level of Service A and an average delay below 14 seconds per vehicle.

Table 3.7: Level of service criteria for intersections

Level of Service	Average Delay (sec/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	**<14**	Good operation	Good operation
B	**15 to 28**	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	**29 to 42**	Satisfactory	Satisfactory, but accident study required
D	**43 to 56**	Operating near capacity	Near capacity & accident study required
E	**57 to 70**	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, required other control mode

4.0 Proposed Works

4.1 Overall works

The project involves the construction of a contemporary four-storey school building located adjacent to Roderick Street. Additionally, a car park with access from Peel Street, cultural grounds, and complementary landscaping will be established. This site is situated at the corner of Peel Street and Roderick Street as shown in Figure 4.1.

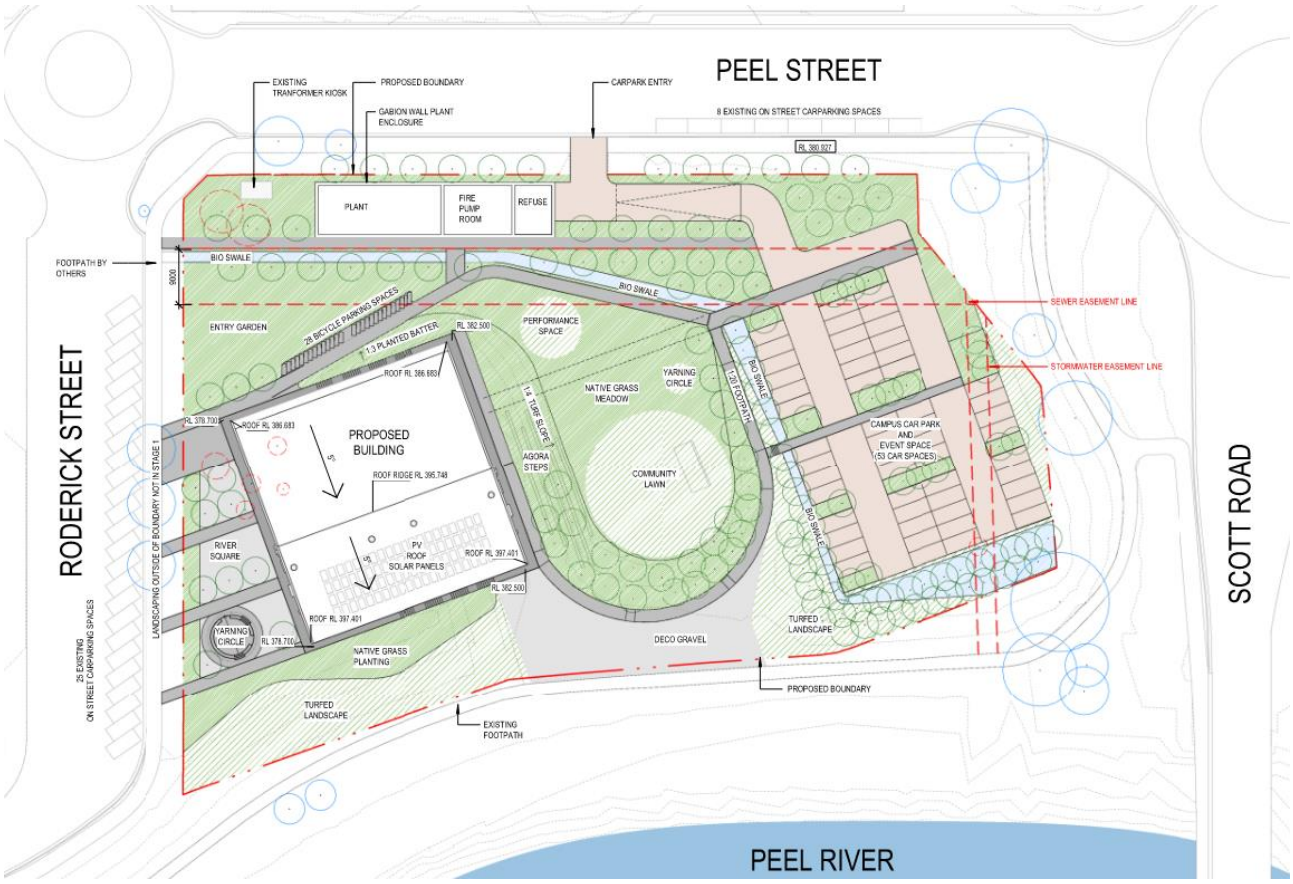


Figure 4.1: Concept Design Option

4.2 Car Parking

4.2.1 Off-Street Parking

The campus contains on grade car parking providing 53 parking spaces on-site. Figure 4.2 outlines the details of this car park.

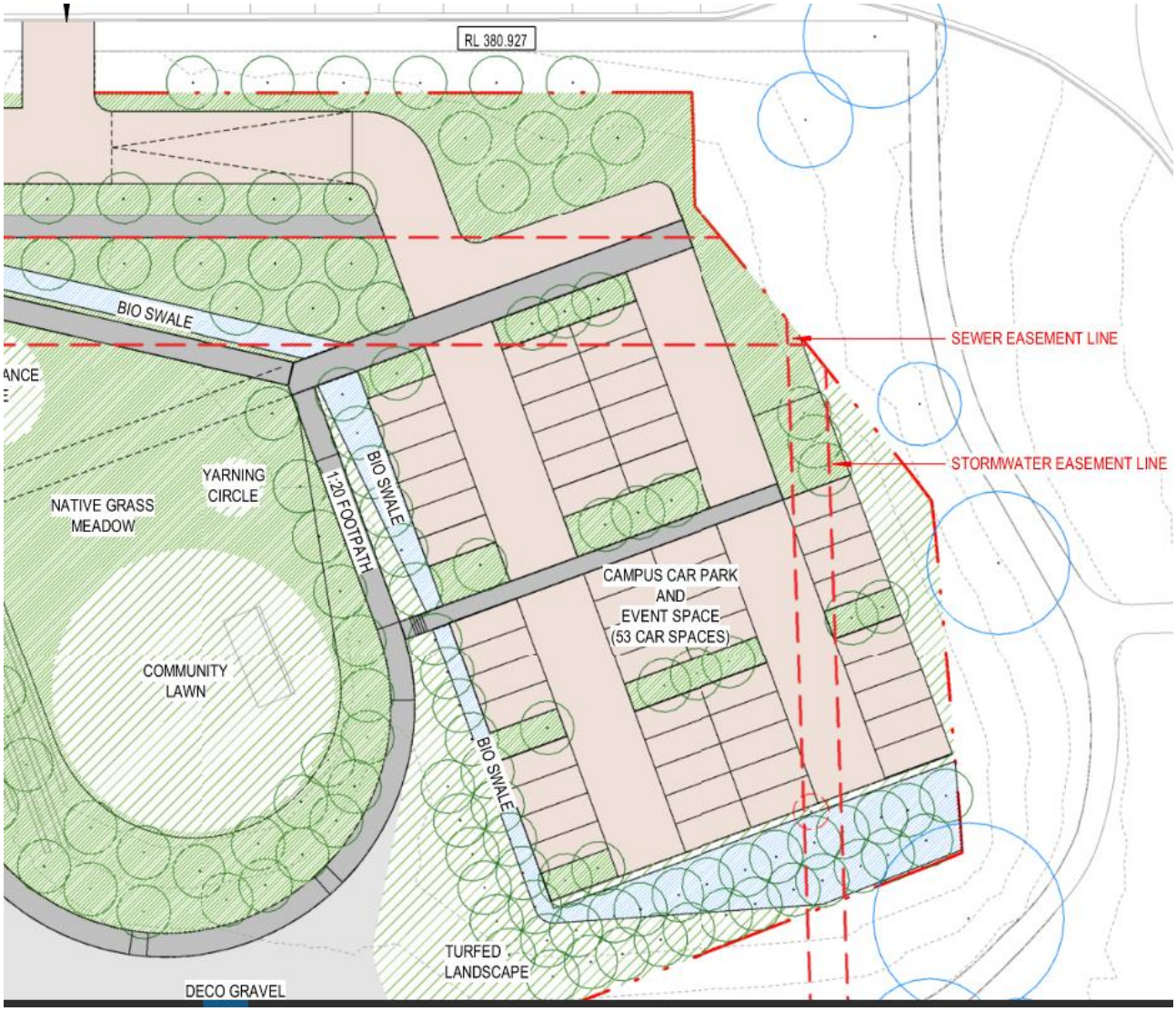


Figure 4.2: Off-Street Car Parking

4.2.2 On-Street Parking

Outside the main campus entry, on-street parking is widely available on Roderick Street, with 45-degree angled parking available on one side of the road for the majority of the road length and parallel parking on the other side of the road. A total of 25 existing angled parking spaces are to be retained on Roderick Street and a further 8 existing parallel parking spaces will be retained on Peel Street.

The on-street parking design option for the concept design phase is shown in Figure 4.1.

Figure 4.3: On-Street Parking

4.3 Service and Loading

Service and loading vehicles will access the site through the vehicle access point connected to Peel Street. To efficiently manage waste disposal, dedicated waste facilities will be positioned to the north-west of the premises. The largest anticipated vehicle will be a medium rigid vehicle, primarily employed for on-site operations and waste collection purposes.

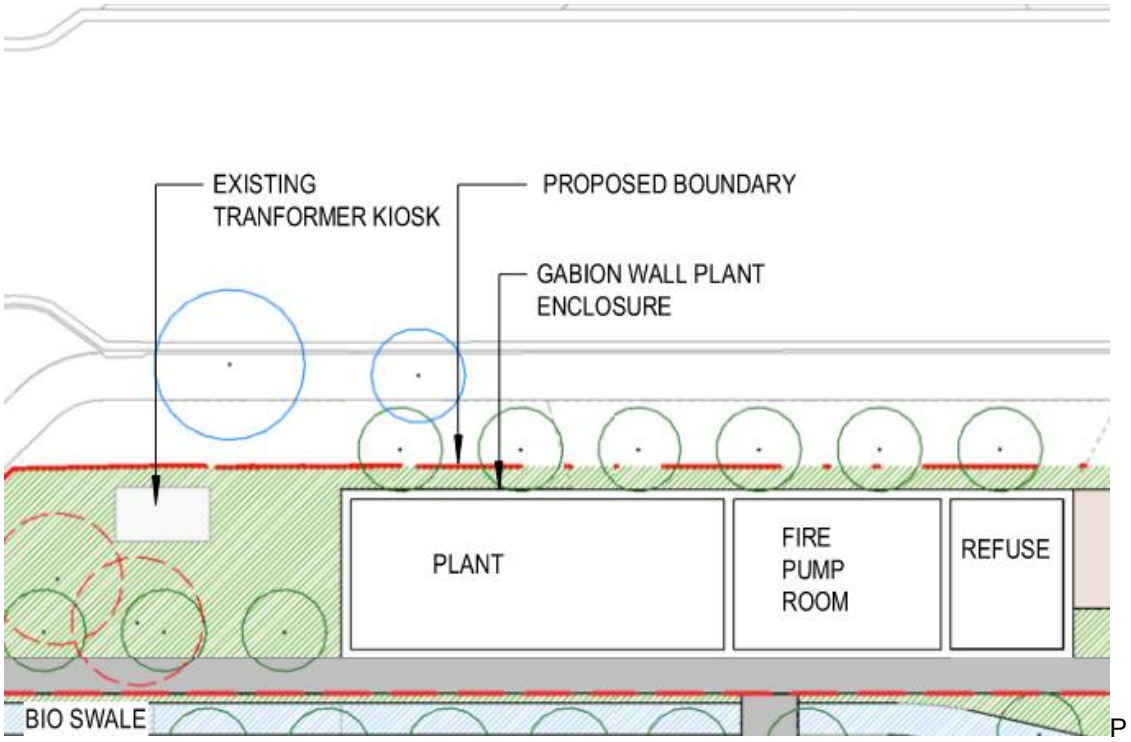


Figure 4.4: Service and Loading

4.4 Site Access

The site has one pedestrian access point from Roderick Street shown in Figure 4.5. The site has an internal walkway spanning the south-western end of the site. The main vehicle access is through Peel Street directly to the car park area. A shared service vehicle area, encompassing waste and delivery services, is located to the west of the site, with an entry/exit access point from Peel Street.

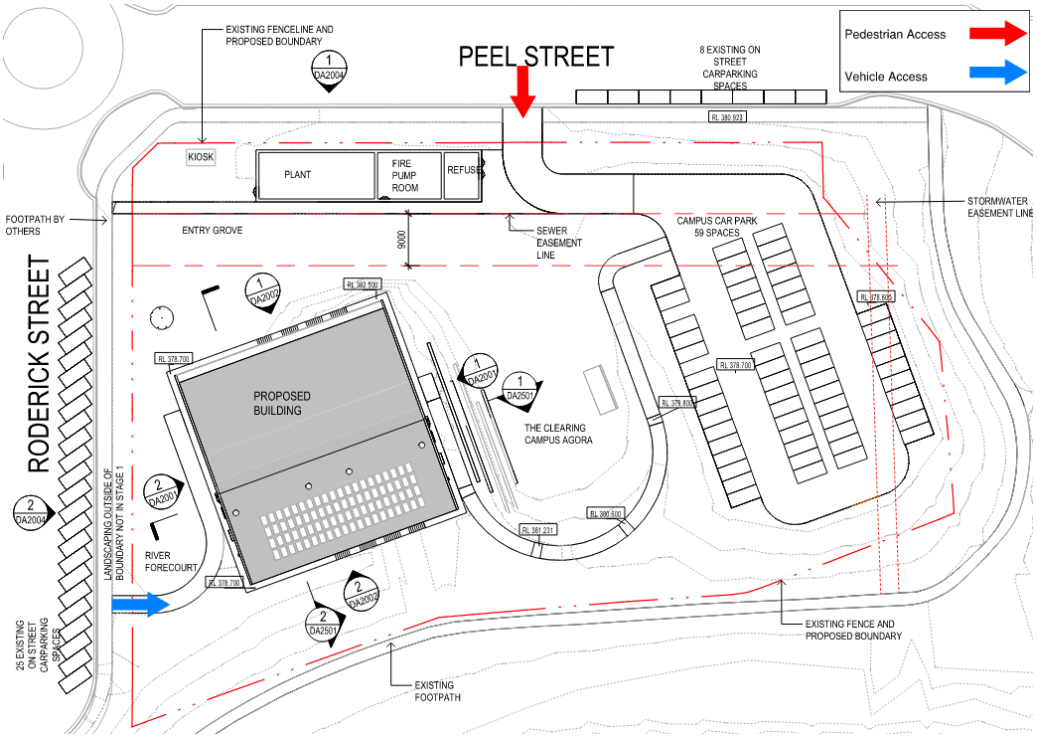


Figure 4.5: Site Access Points

4.5 Bicycle Parking

On-site cyclist facilities are available to ensure secure storage of bicycles and equipment. A total of 28 bicycle parking spaces is proposed along the pathway connecting the entry garden and plant rooms, as shown in Figure 4.6.

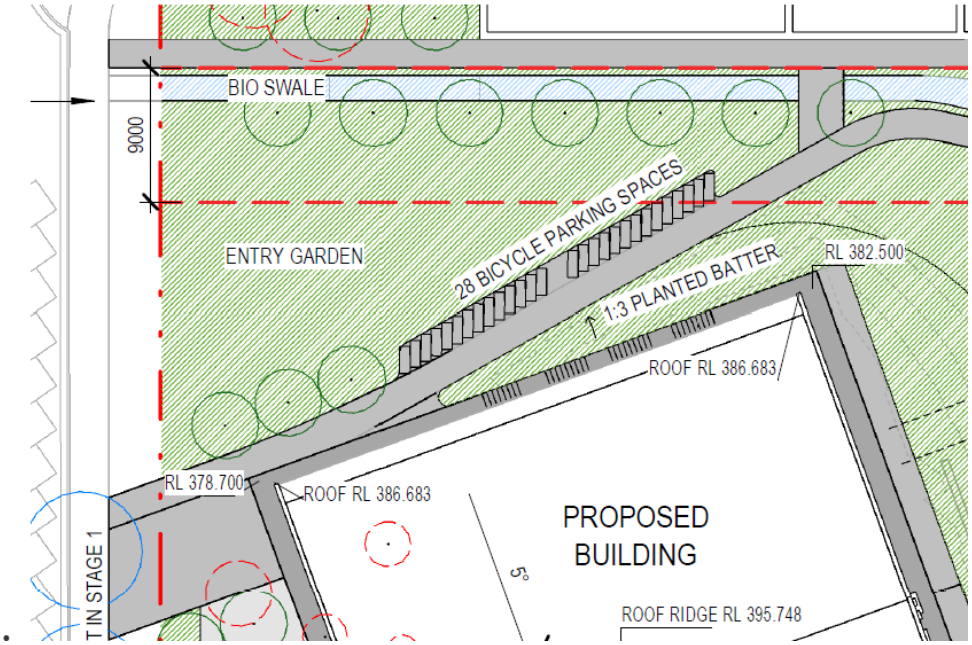


Figure 4.6: Bicycle Parking

5.0 Impact analysis

5.1 Transport Hierarchy

The transport strategy for the project is designed as a sustainable transport strategy, prioritising non-vehicle modes such as active transport (i.e., walking, cycling) and public transport and discouraging private vehicle travel (including car parking). This hierarchy is indicatively illustrated in Figure 5.1.

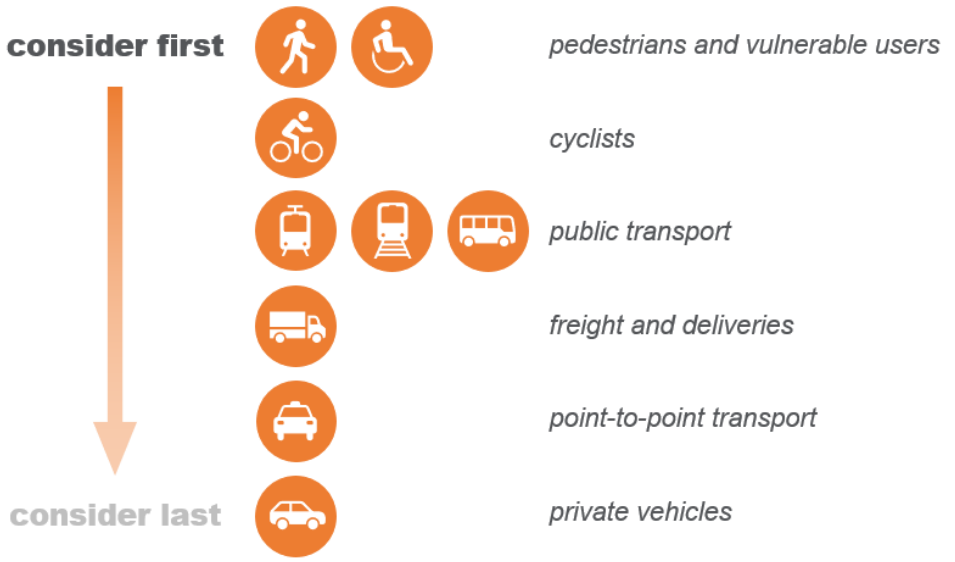


Figure 5.1: Sustainable Transport Hierarchy

This strategy is consistent with NSW state government policy, specifically the Road User Space Allocation Policy.

5.2 Parking Provision

5.2.1 Car parking

The Tamworth Regional Development Control Plan 2010 (DCP) requires a car parking rate for educational establishment to be:

- 1 space per 2 staff, plus
- 1 space per 30 students over 17 years for high school and 1 space per 5 students for higher education establishments.

Table 5.1: DCP parking Requirements

	Total	DCP Parking Requirements
Staff	30	15
Students	295	59
Total	**325**	**74**

The development proposes 53 car parking spaces which is a reduced supply when compared to the DCP rate. However, this is deemed sufficient for the following reasons:

- The consideration of 33 available on street spaces immediately adjacent to the site on the surrounding streets (Peel Street and Roderick Street) contributes to the overall parking availability. It is also noted that there are limited traffic generators on these streets that would generate additional parking demands.
- The proposed sustainable travel initiatives that will be in place to encourage staff to use alternative transportation modes, reducing reliance on vehicles.
- A reduction in on-site car parking will promote staff use of alternative modes, leading to lower vehicular traffic volumes around the site and enhanced safety for students.
- Prioritising pedestrian access and reducing private vehicle infrastructure aligns with the TfNSW Road User Space Allocation Policy.
- The site is located within the town centre of Tamworth and is well connected to the wider pedestrian and cyclist networks including being adjacent to the shared path along Peel River that connects to all major areas of Tamworth, including west across the river, north and east.

The approach aligns with the Tamworth Parking Strategy[2], considering various factors for effective parking management, particularly the below:

- Environmental sustainability is compromised through a dependency on cars. The convenient and abundant availability discourages the opportunities for the development of public transport and active transport infrastructure, and the lack of options feeds our car dependency.
- Excessive or poorly located car parking spaces detract from the quality of the urban streetscape, by fragmenting the street-facing businesses in the commercial area. This disrupts the atmosphere of a bustling and vibrant city centre.

In summary, the proposed lower provision of parking spaces is in line with the project's sustainable transport objectives, promoting alternative transportation options and adhering to relevant state planning policies and strategies.

5.2.2 Motorcycle Parking

There are no requirements for motorcycle parking specified in the Tamworth Regional Council DCP. Motorcycle parking should be provided in car parks where possible, in locations such as corners where it would not be possible to provide car parking spaces.

5.2.3 Bicycle Parking

There are no requirements for bicycle parking specified in the Tamworth Regional Council DCP, however the NSW Planning Guidelines for Walking and Cycling provide the following rates for tertiary education establishments:

- 3-5% of staff
- 5-10% of full time students

Applying these rates to the development bicycle parking provisions are recommended in the range of 14 to 28 spaces. The site proposes 28 bicycle parking spaces, which aligns with the recommendations of the NSW Planning Guidelines for Walking and Cycling.

[2] Tamworth Parking Strategy 2020-2030

5.2.4 Compliance Review

Car parking shall be designed in accordance with AS2890.1 Key design parameters for 90-degree angled parking include:

- Classification: Class 1 (all-day employee parking)
- Parking space width: 2.4m or higher
- Aisle width: 6.2m
- Parking space length: 5.4m
- Gradient: 1:20 (5%) maximum

Accessible parking spaces will be provided in accordance with Table D3.5 of the BCA, at a rate of 1 space for every 100 car parking spaces or part thereof (1%). The development is required to provide a minimum of one accessible parking spaces, which the proposal meets and therefore complies with the BCA.

The proposed car parking has been reviewed for compliance with the above standards and has been found that it can readily comply with minor changes to its arrangement.

5.3 Intersection Analysis

5.3.1 Proposed Trip Generation

As a conservative estimate, the generated trips from the development have been assumed to be equal to the number of parking spaces required under the DCP rate (75 peak hour trips). Based on the distribution of residential areas within Tamworth, the distribution of these trips has assumed to be even from North Tamworth, Central Tamworth and Western Tamworth. It has been assumed that these trips are towards the site during the AM peak and away from the site in the PM peak.

As discussed in Section 3.6, benchmarking has been completed to review this trip generation rate against other similar regional university campus trip generation rates and against the Australian Bureau of Statistics Journey to Work data.

Figure 5.2: Trip Distribution

5.3.2 Intersection Performance

Table 5.2 provides an overview of the anticipated operation of the relevant intersections post-development without the account for the population growth in Tamworth, and Table 5.3 shows the projected results in 10 years ahead with development volumes. A comprehensive breakdown of results is available in Appendix B.

Table 5.2: SIDRA modelling results for proposed conditions

Data for unsignalised intersections is the manoeuvre with worst delay

Intersection	Peak Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
Peel St x Murray St / Scott Rd	AM	0.390	12.5	7.5	LOS A
	PM	0.456	14.4	9.2	LOS A
Peel St x Roderick St	AM	0.142	10.4	2	LOS A
	PM	0.336	12.2	5.8	LOS A
Marius St x Murray St	AM	0.347	16.3	5.3	LOS B
	PM	0.266	14.3	3.3	LOS A

As detailed in Table 5.2, the intersections demonstrate a satisfactory operational performance, operating at a level of service A during both the AM and PM peak hours (the exception being the Marius St/Murray St

roundabout is operating at a LoS of B). These findings highlight the minimal presence of significant delays or queues on any approach at the roundabouts post-development.

Table 5.3 presents the expected performance results for 2034, incorporating a background growth rate of 1.2% taken from the Tamworth Regional Council's average annual population growth estimate, with the addition of the development volumes.

Table 5.3: SIDRA modelling results for 2034 proposed Conditions (With Development Volumes)

Data for unsignalised intersections is the manoeuvre with worst delay

Intersection	Peak Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
Peel St x Murray St / Scott Rd	AM	0.457	12.6	9.5	LOS A
	PM	0.574	15.9	14.8	LOS B
Peel St x Roderick St	AM	0.166	10.7	2.4	LOS A
	PM	0.429	14.0	8.5	LOS A
Marius St x Murray S	AM	0.432	18.1	7.4	LOS B
	PM	0.343	15.5	4.7	LOS B

The results indicate a slight increase in the average delay and degree of saturation, with a similar level of service compared to the 2034 projections without development volumes. This suggests that the proposed development does not have a significant impact on any of the three nearby roundabouts.

6.0 Access and Circulation

One vehicular access point from Peel Street is proposed to provide access to the carpark, while one pedestrian access point is proposed from Roderick Street.

The proposed driveway access will be located at a sufficient distance from the roundabout to ensure adequate queuing space. The distance between the driveway access and the tangent point of the kerb at the roundabout of Peel and Short Street is approximately 65m.

6.1 Service and Loading

Service and loading vehicles will access the site from Peel Street. The waste contractor will determine collection hours based on the university location and logistical access requirements, vehicles are likely to service the site outside of peak school hours from 8:00 am to 9:30 am and from 2.30 pm to 4:00 pm to reduce safety concerns of service vehicle manoeuvres in the presence of students.

7.0 Conclusion

7.1 Summary

The proposed development includes a new tertiary educational campus which includes a four-storey building with associated landscaping, cultural grounds and carparking. The development will cater to a total of 295 students and 30 staff members.

The design has been reviewed with regards to traffic, parking and access. The main vehicular access will be through Peel Street, that will provide access both to car parking and a waste collection area.

The proposed 53 parking spaces are considered sufficient for the development, considering the availability of 33 spaces on adjacent streets (Peel and Roderick Street) and sustainable travel initiatives that will be employed by the project. The encouragement of alternative transportation use will reduce car reliance and promote pedestrian access, in line with sustainable transport goals and state policies.

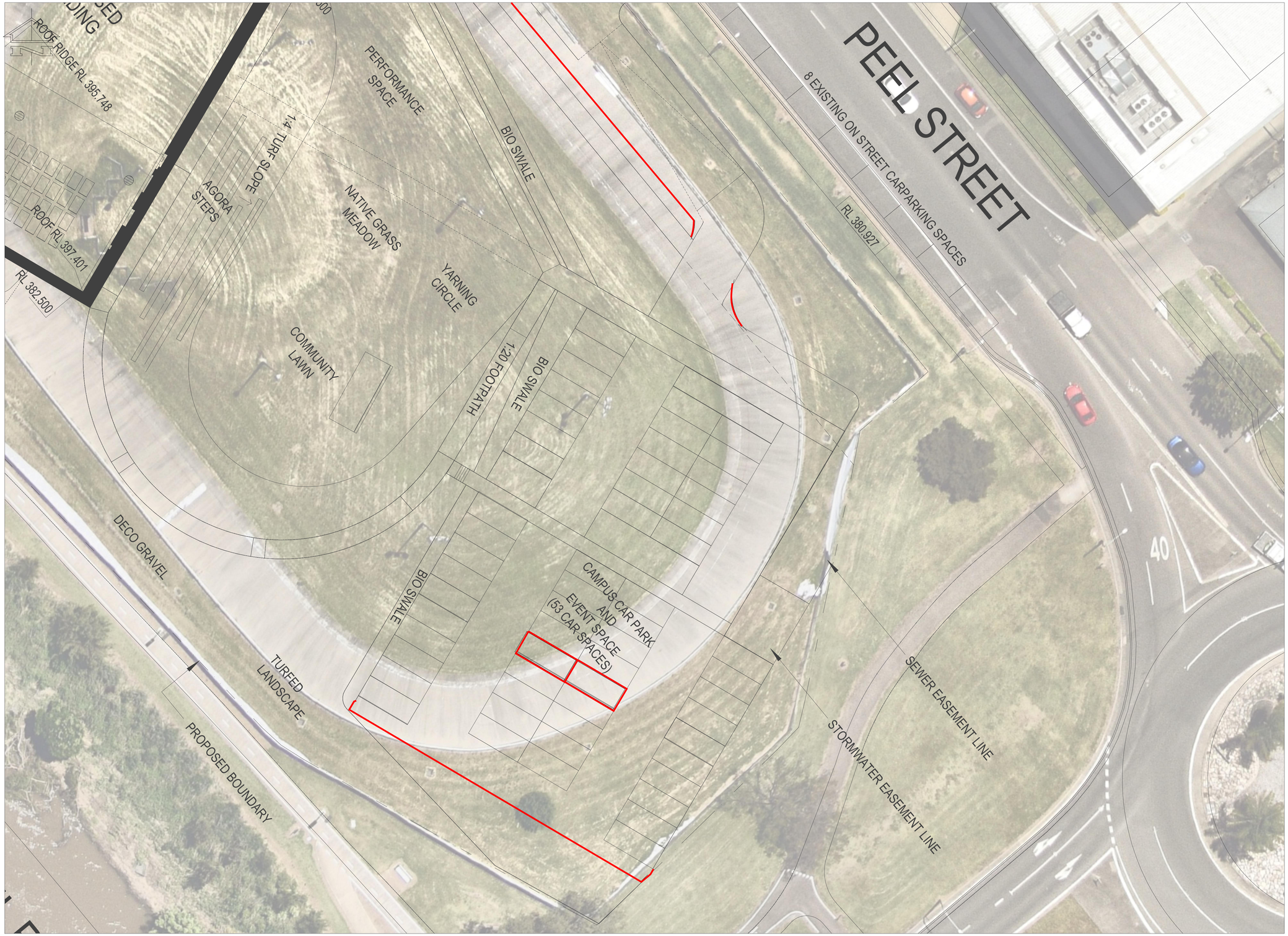
All intersections operate at a satisfactory Level of Service both pre and post development, achieving a level of service A during AM and PM peak hours, except for the Marius Street and Murray Street roundabout, which achieves Level of Service B. This indicates minimal significant delays or queues at relevant intersections near to the site after the proposed development.

Prepared by	Reviewed By	Authorised By
TAYLOR THOMSON WHITTING (NSW) PTY LTD	**TAYLOR THOMSON WHITTING (NSW) PTY LTD**	**TAYLOR THOMSON WHITTING (NSW) PTY LTD**
		
AMMAR AHMED Traffic Engineer	**GRACE CARPP** Associate	**PAUL YANNOULATOS** Technical Director

Appendix A

Swept Path Analysis

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01



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Rev	Description	Eng	Draft	Date
P1	ISSUE FOR INFORMATION	AA	GC	01.05.24

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Project
UNE - TAMWORTH CENTRAL CAMPUS

Sheet Subject
B99 VEHICLE SWEPT PATH ANALYSIS

Scale : A1	Drawn	Authorised
1:200	AA	GC

Job No	Drawing No	Revision
221823	C004	P1

Plot File Created: May 06, 2024 - 11:29am

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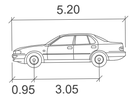

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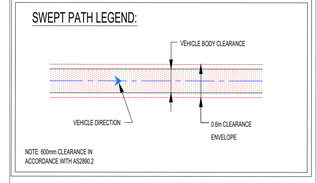

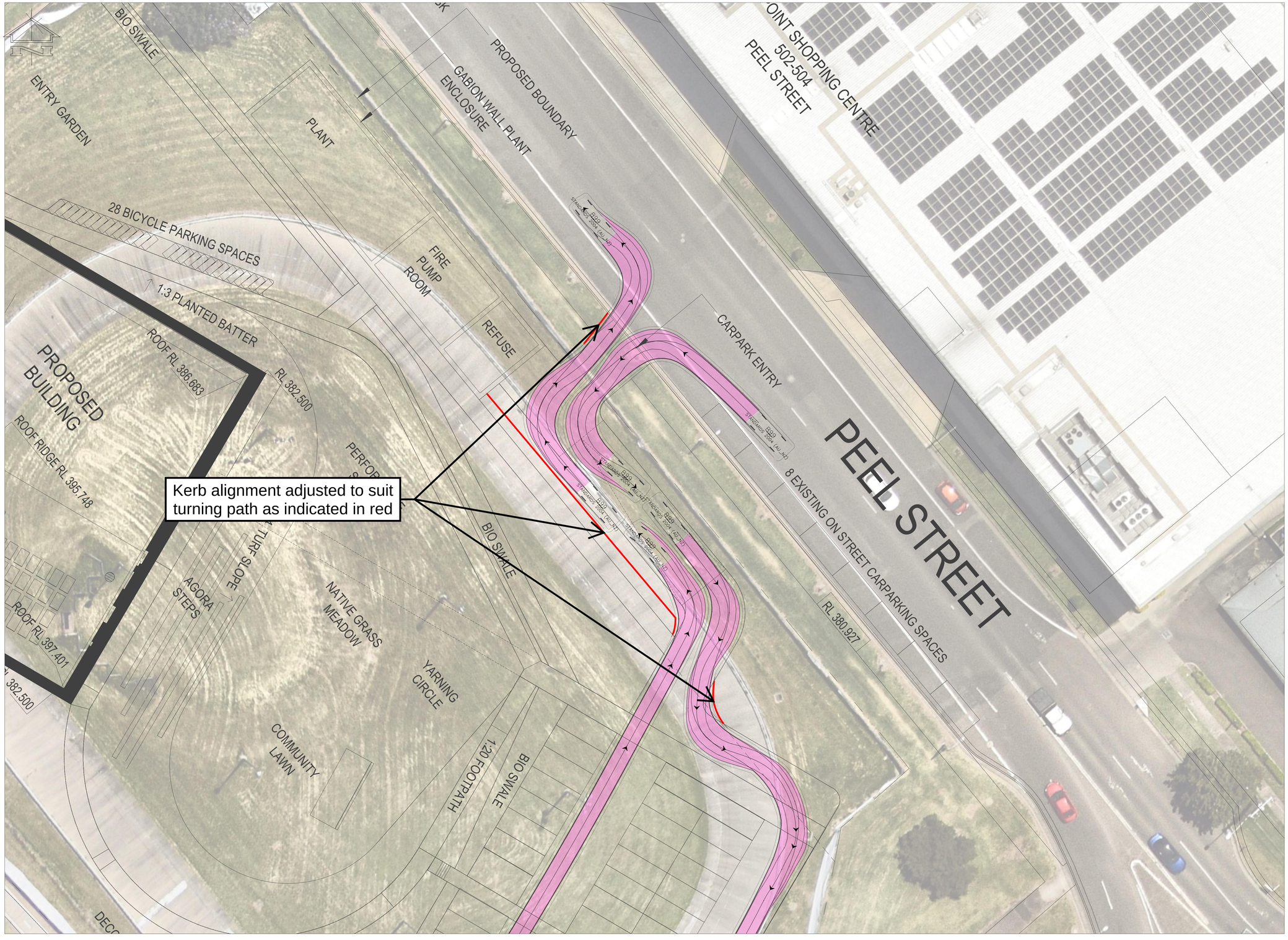

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P1	ISSUE FOR INFORMATION	AA	GC	01.05.24

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Sheet Subject
B99 VEHICLE SWEPT PATH ANALYSIS

Scale : A1	Drawn	Authorised
1:200	AA	GC

Job No	Drawing No	Revision
221823	C004	P1

Plot File Created: May 06, 2024 - 10:49am

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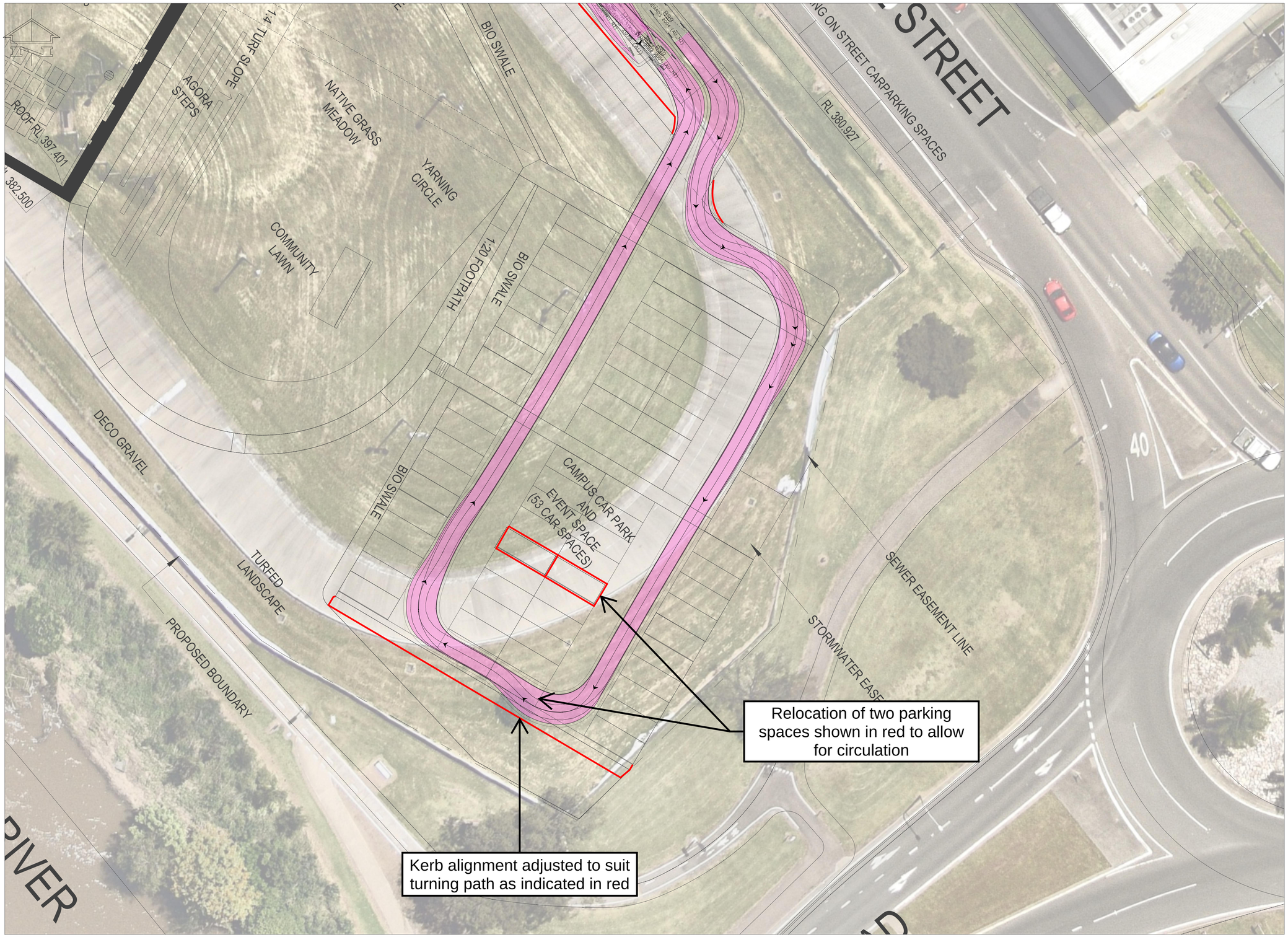

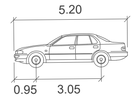

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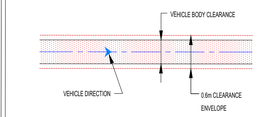

NOTE: 800mm CLEARANCE IN ACCORDANCE WITH AS2890.2

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Sheet Subject
B99 VEHICLE SWEPT PATH ANALYSIS

Scale : A1	Drawn	Authorised
1:200	AA	GC

Job No	Drawing No	Revision
221823	C004	P2

Plot File Created: May 06, 2024 - 10:50am

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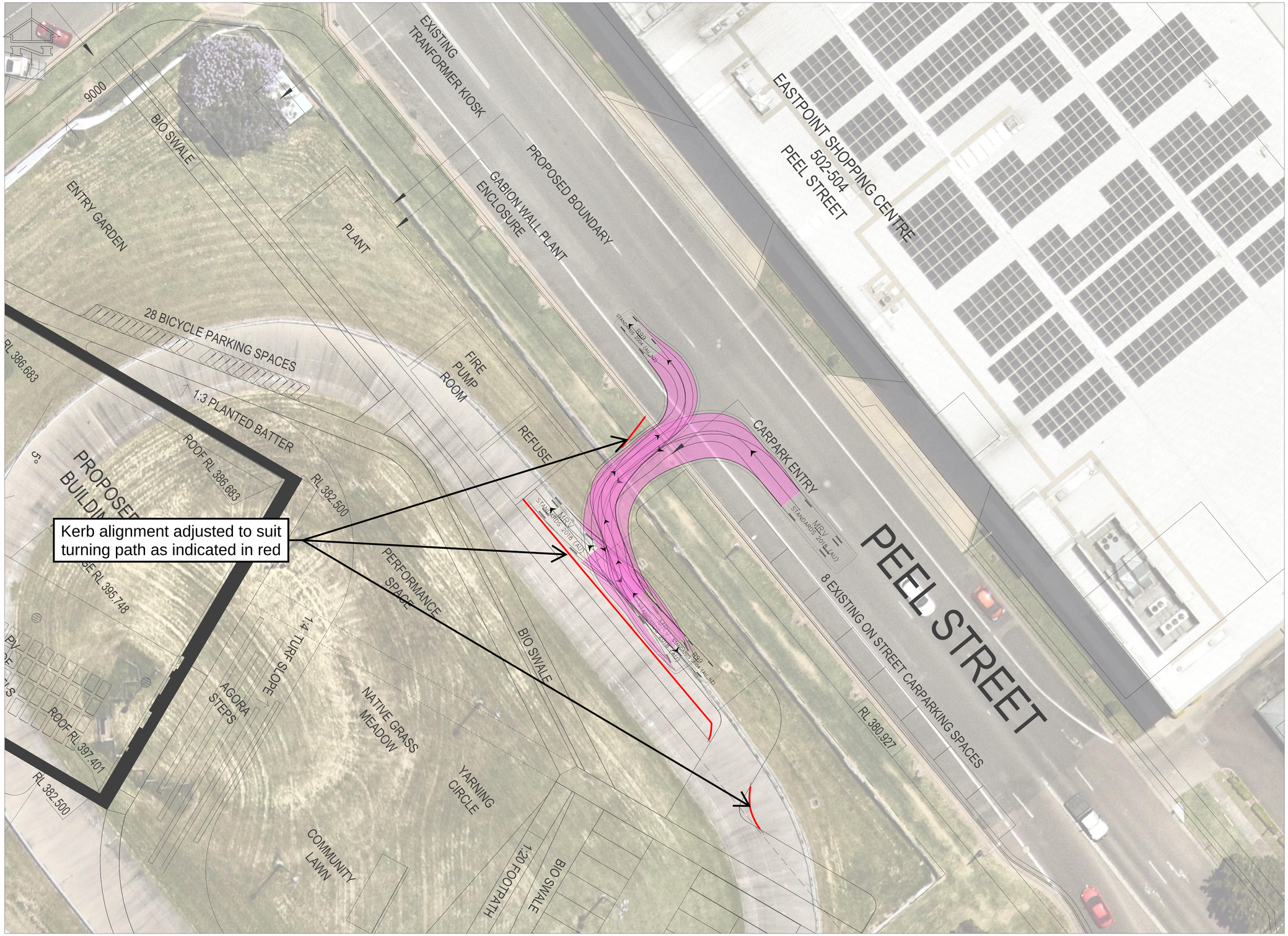

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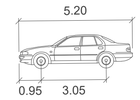

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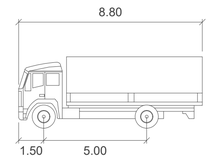

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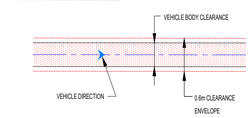

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Rev	Description	Eng	Draft	Date
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UNE - TAMWORTH CENTRAL CAMPUS

Sheet Subject
B99 & MRV VEHICLES SWEPT PATH ANALYSIS

Scale : A1	Drawn	Authorised
1:200	AA	GC

Job No	Drawing No	Revision
221823	C004	P3

Plot File Created: May 06, 2024 - 10:51am

Appendix B

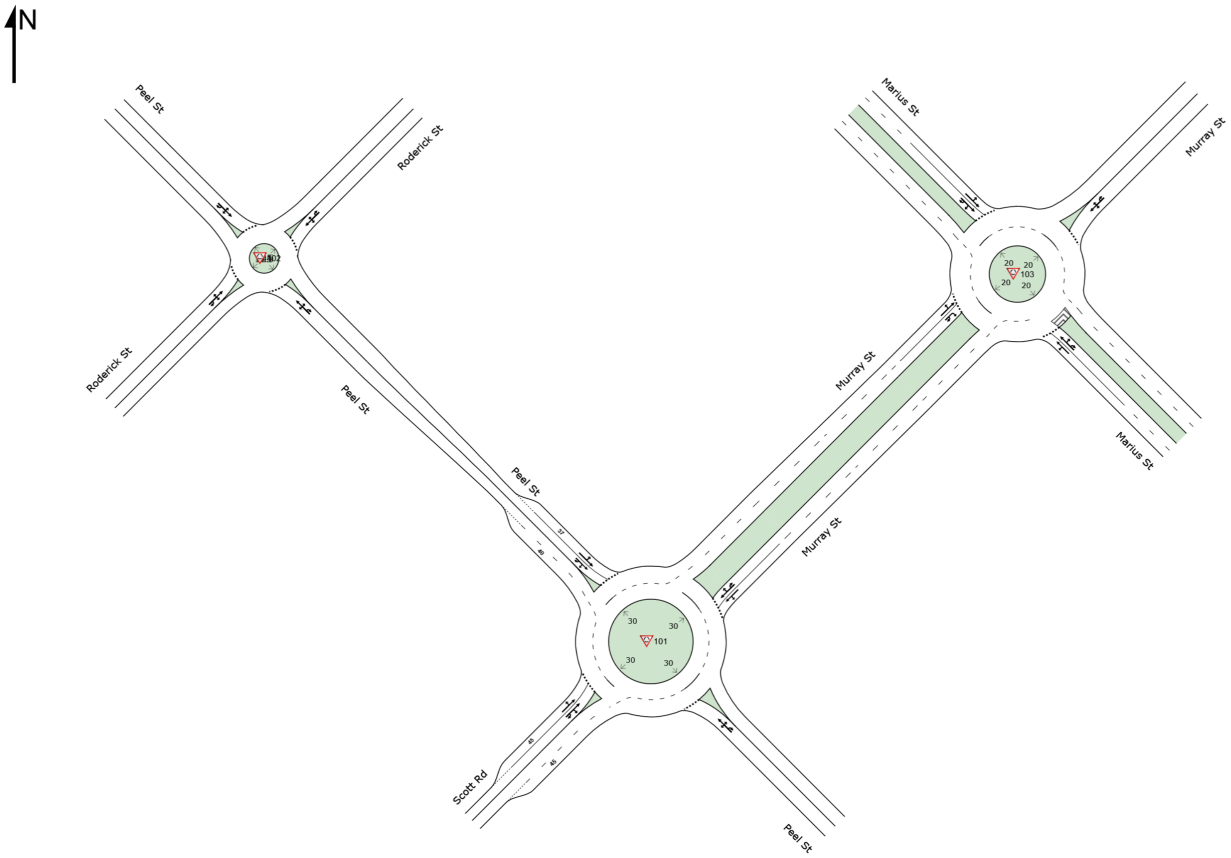
SIDRA Results

NETWORK LAYOUT

Network: N101 [Existing AM 8:00-9:00 (Network Folder: UNE Tamworth - Existing - AM)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Peel St & Murray St & Scott Rd - AM 8:00-9:00
102	NA	Peel St & Roderick St - AM 8:00-9:00
103	NA	Marius St & Murray St - AM 8:00-9:00

MOVEMENT SUMMARY

Site: 102 [Peel St & Roderick St - AM 8:00-9:00 (Site Folder: Existing-AM)]

Network: N101 [Existing AM 8:00-9:00 (Network Folder: UNE Tamworth - Existing - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Peel St														
21	L2	157	2.0	157	2.0	0.371	4.3	LOS A	0.8	5.8	0.33	0.51	0.33	37.9
22	T1	245	0.9	245	0.9	0.371	4.2	LOS A	0.8	5.8	0.33	0.51	0.33	42.4
23	R2	63	0.0	63	0.0	0.371	7.5	LOS A	0.8	5.8	0.33	0.51	0.33	42.0
23u	U	1	0.0	1	0.0	0.371	9.1	LOS A	0.8	5.8	0.33	0.51	0.33	35.1
Approach		466	1.1	466	1.1	0.371	4.7	LOS A	0.8	5.8	0.33	0.51	0.33	41.0
NorthEast: Roderick St														
24	L2	39	0.0	39	0.0	0.140	4.7	LOS A	0.3	1.9	0.38	0.55	0.38	36.7
25	T1	81	2.6	81	2.6	0.140	4.7	LOS A	0.3	1.9	0.38	0.55	0.38	40.6
26	R2	26	4.0	26	4.0	0.140	8.1	LOS A	0.3	1.9	0.38	0.55	0.38	42.3
26u	U	3	33.3	3	33.3	0.140	10.2	LOS A	0.3	1.9	0.38	0.55	0.38	42.3
Approach		149	2.8	149	2.8	0.140	5.4	LOS A	0.3	1.9	0.38	0.55	0.38	40.3
NorthWest: Peel St														
27	L2	28	0.0	28	0.0	0.149	4.6	LOS A	0.3	2.1	0.37	0.53	0.37	41.3
28	T1	112	6.6	112	6.6	0.149	4.6	LOS A	0.3	2.1	0.37	0.53	0.37	37.2
29	R2	15	7.1	15	7.1	0.149	7.9	LOS A	0.3	2.1	0.37	0.53	0.37	40.2
29u	U	6	0.0	6	0.0	0.149	9.4	LOS A	0.3	2.1	0.37	0.53	0.37	43.7
Approach		161	5.2	161	5.2	0.149	5.1	LOS A	0.3	2.1	0.37	0.53	0.37	38.9
SouthWest: Roderick St														
30	L2	14	7.7	14	7.7	0.156	5.5	LOS A	0.3	2.3	0.48	0.66	0.48	36.9
31	T1	41	7.7	41	7.7	0.156	5.4	LOS A	0.3	2.3	0.48	0.66	0.48	38.4
32	R2	88	8.3	88	8.3	0.156	8.8	LOS A	0.3	2.3	0.48	0.66	0.48	27.7
32u	U	5	0.0	5	0.0	0.156	10.1	LOS A	0.3	2.3	0.48	0.66	0.48	27.7
Approach		148	7.8	148	7.8	0.156	7.6	LOS A	0.3	2.3	0.48	0.66	0.48	33.0
All Vehicles		925	3.2	925	3.2	0.371	5.3	LOS A	0.8	5.8	0.37	0.54	0.37	39.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 103 [Marius St & Murray St - AM 8:00-9:00 (Site Folder: Existing-AM)]

Network: N101 [Existing AM 8:00-9:00 (Network Folder: UNE Tamworth - Existing - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marius St														
21	L2	186	5.1	186	5.1	0.415	6.6	LOS A	1.3	9.4	0.68	0.66	0.68	38.9
22	T1	648	6.3	648	6.3	0.415	7.1	LOS A	1.3	9.4	0.69	0.68	0.69	44.7
23	R2	51	4.2	51	4.2	0.415	12.0	LOS A	1.2	9.0	0.70	0.71	0.70	45.8
23u	U	11	10.0	11	10.0	0.415	14.3	LOS A	1.2	9.0	0.70	0.71	0.70	46.6
Approach		896	6.0	896	6.0	0.415	7.3	LOS A	1.3	9.4	0.69	0.68	0.69	43.9
NorthEast: Murray St														
24	L2	33	3.2	33	3.2	0.290	5.6	LOS A	0.4	3.0	0.47	0.66	0.47	45.1
25	T1	156	1.4	156	1.4	0.290	5.8	LOS A	0.4	3.0	0.47	0.66	0.47	39.2
26	R2	82	1.3	82	1.3	0.290	10.4	LOS A	0.4	3.0	0.47	0.66	0.47	45.9
26u	U	1	0.0	1	0.0	0.290	12.5	LOS A	0.4	3.0	0.47	0.66	0.47	49.8
Approach		272	1.6	272	1.6	0.290	7.2	LOS A	0.4	3.0	0.47	0.66	0.47	42.6
NorthWest: Marius St														
27	L2	23	9.1	23	9.1	0.240	4.9	LOS A	0.5	3.9	0.56	0.54	0.56	42.1
28	T1	272	12.8	272	12.8	0.240	4.8	LOS A	0.5	3.9	0.56	0.58	0.56	43.2
29	R2	148	2.1	148	2.1	0.240	9.2	LOS A	0.5	3.6	0.56	0.70	0.56	31.9
29u	U	6	0.0	6	0.0	0.240	11.0	LOS A	0.5	3.6	0.56	0.70	0.56	42.6
Approach		449	8.9	449	8.9	0.240	6.3	LOS A	0.5	3.9	0.56	0.61	0.56	40.3
SouthWest: Murray St														
30	L2	302	2.4	302	2.4	0.608	9.7	LOS A	1.9	13.7	0.83	0.99	1.06	40.2
31	T1	197	0.0	197	0.0	0.608	9.7	LOS A	1.9	13.7	0.83	0.99	1.06	45.2
32	R2	171	9.9	171	9.9	0.346	14.6	LOS B	0.7	5.3	0.74	0.92	0.78	39.4
32u	U	6	0.0	6	0.0	0.346	16.1	LOS B	0.7	5.3	0.74	0.92	0.78	31.1
Approach		676	3.6	676	3.6	0.608	11.0	LOS A	1.9	13.7	0.81	0.97	0.98	41.2
All Vehicles		2293	5.3	2293	5.3	0.608	8.2	LOS A	1.9	13.7	0.67	0.75	0.72	42.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Peel St & Murray St & Scott Rd - AM 8:00-9:00 (Site Folder: Existing-AM)]

Network: N101 [Existing AM 8:00-9:00 (Network Folder: UNE Tamworth - Existing - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Peel St														
21	L2	32	3.3	32	3.3	0.086	4.7	LOS A	0.1	0.9	0.43	0.52	0.43	50.4
22	T1	37	2.9	37	2.9	0.086	3.6	LOS A	0.1	0.9	0.43	0.52	0.43	38.4
23	R2	14	7.7	14	7.7	0.086	9.0	LOS A	0.1	0.9	0.43	0.52	0.43	38.4
23u	U	1	0.0	1	0.0	0.086	10.9	LOS A	0.1	0.9	0.43	0.52	0.43	51.3
Approach		83	3.8	83	3.8	0.086	5.0	LOS A	0.1	0.9	0.43	0.52	0.43	45.5
NorthEast: Murray St														
24	L2	29	0.0	29	0.0	0.131	4.9	LOS A	0.3	1.9	0.42	0.49	0.42	46.5
25	T1	398	3.7	398	3.7	0.301	4.7	LOS A	0.7	5.4	0.42	0.49	0.42	54.0
26	R2	73	0.0	73	0.0	0.301	10.0	LOS A	0.7	5.4	0.42	0.49	0.42	41.0
26u	U	5	0.0	5	0.0	0.301	12.4	LOS A	0.7	5.4	0.42	0.49	0.42	41.0
Approach		505	2.9	505	2.9	0.301	5.6	LOS A	0.7	5.4	0.42	0.49	0.42	52.6
NorthWest: Peel St														
27	L2	46	9.1	46	9.1	0.082	6.8	LOS A	0.1	1.1	0.62	0.68	0.62	32.8
28	T1	45	4.7	45	4.7	0.181	4.4	LOS A	0.4	2.7	0.60	0.71	0.60	42.1
29	R2	131	3.2	131	3.2	0.181	9.9	LOS A	0.4	2.7	0.60	0.71	0.60	49.4
29u	U	1	0.0	1	0.0	0.181	11.8	LOS A	0.4	2.7	0.60	0.71	0.60	32.4
Approach		223	4.7	223	4.7	0.181	8.1	LOS A	0.4	2.7	0.61	0.70	0.61	46.5
SouthWest: Scott Rd														
30	L2	360	0.6	360	0.6	0.371	4.4	LOS A	1.0	6.9	0.35	0.45	0.35	51.3
31	T1	620	3.2	620	3.2	0.371	4.3	LOS A	1.0	6.9	0.36	0.44	0.36	50.8
32	R2	18	0.0	18	0.0	0.371	9.9	LOS A	1.0	6.9	0.37	0.44	0.37	54.5
32u	U	1	0.0	1	0.0	0.371	12.3	LOS A	1.0	6.9	0.37	0.44	0.37	58.2
Approach		999	2.2	999	2.2	0.371	4.4	LOS A	1.0	6.9	0.36	0.44	0.36	51.1
All Vehicles		1811	2.8	1811	2.8	0.371	5.2	LOS A	1.0	6.9	0.41	0.49	0.41	50.7

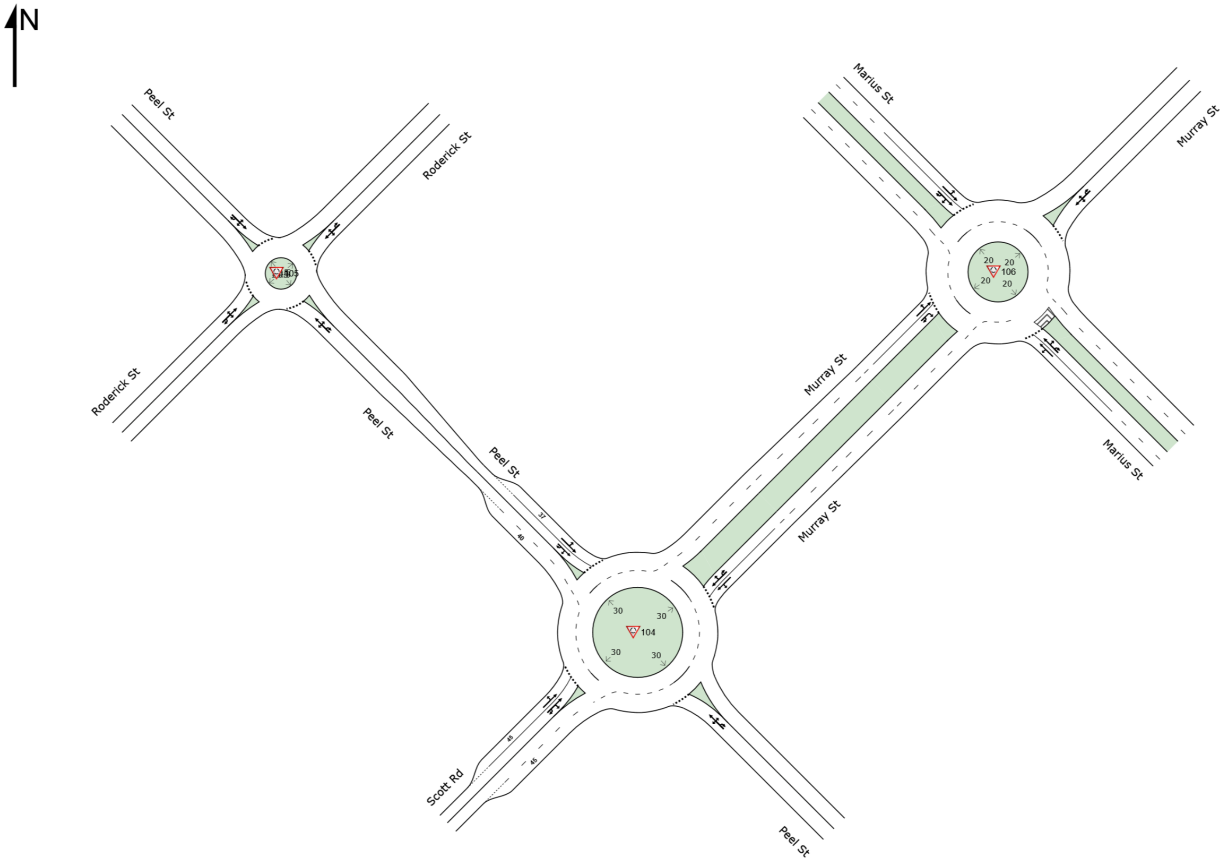
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity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

NETWORK LAYOUT

Network: N101 [Existing PM 4:45-5:45 (Network Folder: UNE Tamworth - Existing - PM)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
104	NA	Peel St & Murray St & Scott Rd - PM 4:45-5:45
105	NA	Peel St & Roderick St - PM 4:45-5:45
106	NA	Marius St & Murray St - PM 4:45-5:45

MOVEMENT SUMMARY

Site: 105 [Peel St & Roderick St - PM 4:45-5:45 (Site Folder: Existing-PM)]

Network: N101 [Existing PM 4:45-5:45 (Network Folder: UNE Tamworth - Existing - PM)]

UNE Tamworth
27 July 2023 - PM Peak Period: 4:45-5:45
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Peel St														
21	L2	93	1.1	93	1.1	0.244	4.3	LOS A	0.5	3.6	0.32	0.50	0.32	38.1
22	T1	166	0.0	166	0.0	0.244	4.1	LOS A	0.5	3.6	0.32	0.50	0.32	42.6
23	R2	33	0.0	33	0.0	0.244	7.5	LOS A	0.5	3.6	0.32	0.50	0.32	42.1
23u	U	3	0.0	3	0.0	0.244	9.0	LOS A	0.5	3.6	0.32	0.50	0.32	35.3
Approach		295	0.4	295	0.4	0.244	4.6	LOS A	0.5	3.6	0.32	0.50	0.32	41.2
NorthEast: Roderick St														
24	L2	149	1.4	149	1.4	0.334	7.4	LOS A	0.8	5.8	0.70	0.79	0.70	33.4
25	T1	76	1.4	76	1.4	0.334	7.4	LOS A	0.8	5.8	0.70	0.79	0.70	37.9
26	R2	39	0.0	39	0.0	0.334	10.7	LOS A	0.8	5.8	0.70	0.79	0.70	40.1
26u	U	2	0.0	2	0.0	0.334	12.2	LOS A	0.8	5.8	0.70	0.79	0.70	41.0
Approach		266	1.2	266	1.2	0.334	7.9	LOS A	0.8	5.8	0.70	0.79	0.70	36.3
NorthWest: Peel St														
27	L2	88	1.2	88	1.2	0.464	6.1	LOS A	1.2	8.6	0.63	0.69	0.63	40.1
28	T1	340	0.0	340	0.0	0.464	6.0	LOS A	1.2	8.6	0.63	0.69	0.63	35.4
29	R2	9	0.0	9	0.0	0.464	9.3	LOS A	1.2	8.6	0.63	0.69	0.63	39.3
29u	U	13	0.0	13	0.0	0.464	10.9	LOS A	1.2	8.6	0.63	0.69	0.63	42.4
Approach		451	0.2	451	0.2	0.464	6.2	LOS A	1.2	8.6	0.63	0.69	0.63	37.1
SouthWest: Roderick St														
30	L2	25	0.0	25	0.0	0.338	5.1	LOS A	0.8	5.5	0.47	0.65	0.47	37.2
31	T1	96	0.0	96	0.0	0.338	5.0	LOS A	0.8	5.5	0.47	0.65	0.47	38.7
32	R2	240	0.9	240	0.9	0.338	8.4	LOS A	0.8	5.5	0.47	0.65	0.47	27.9
32u	U	3	0.0	3	0.0	0.338	9.9	LOS A	0.8	5.5	0.47	0.65	0.47	23.4
Approach		364	0.6	364	0.6	0.338	7.3	LOS A	0.8	5.5	0.47	0.65	0.47	32.8
All Vehicles		1376	0.5	1376	0.5	0.464	6.5	LOS A	1.2	8.6	0.54	0.66	0.54	37.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 104 [Peel St & Murray St & Scott Rd - PM 4:45-5:45 (Site Folder: Existing-PM)]

Network: N101 [Existing PM 4:45-5:45 (Network Folder: UNE Tamworth - Existing - PM)]

UNE Tamworth
27 July 2023 - PM Peak Period: 4:45-5:45
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Peel St														
21	L2	75	0.0	75	0.0	0.216	8.0	LOS A	0.4	2.9	0.65	0.73	0.65	49.1
22	T1	59	0.0	59	0.0	0.216	5.4	LOS A	0.4	2.9	0.65	0.73	0.65	36.0
23	R2	31	0.0	31	0.0	0.216	10.8	LOS A	0.4	2.9	0.65	0.73	0.65	36.0
23u	U	1	0.0	1	0.0	0.216	12.8	LOS A	0.4	2.9	0.65	0.73	0.65	48.9
Approach		165	0.0	165	0.0	0.216	7.6	LOS A	0.4	2.9	0.65	0.73	0.65	44.5
NorthEast: Murray St														
24	L2	35	0.0	35	0.0	0.194	7.1	LOS A	0.4	2.9	0.64	0.71	0.64	44.5
25	T1	471	2.5	471	2.5	0.446	6.8	LOS A	1.2	8.7	0.70	0.66	0.71	52.3
26	R2	53	0.0	53	0.0	0.446	11.7	LOS A	1.2	8.7	0.72	0.64	0.72	38.1
26u	U	11	0.0	11	0.0	0.446	14.1	LOS A	1.2	8.7	0.72	0.64	0.72	38.1
Approach		568	2.0	568	2.0	0.446	7.4	LOS A	1.2	8.7	0.70	0.66	0.71	51.1
NorthWest: Peel St														
27	L2	193	1.1	193	1.1	0.249	5.4	LOS A	0.5	3.5	0.60	0.67	0.60	35.3
28	T1	51	0.0	51	0.0	0.451	4.3	LOS A	1.1	7.9	0.64	0.76	0.65	41.0
29	R2	438	0.5	438	0.5	0.451	9.8	LOS A	1.1	7.9	0.64	0.76	0.65	48.6
29u	U	1	0.0	1	0.0	0.451	11.8	LOS A	1.1	7.9	0.64	0.76	0.65	31.3
Approach		682	0.6	682	0.6	0.451	8.2	LOS A	1.1	7.9	0.63	0.73	0.63	46.4
SouthWest: Scott Rd														
30	L2	202	0.5	202	0.5	0.254	4.3	LOS A	0.6	4.3	0.35	0.45	0.35	51.2
31	T1	413	3.6	413	3.6	0.254	4.3	LOS A	0.6	4.3	0.36	0.46	0.36	50.5
32	R2	40	0.0	40	0.0	0.254	10.0	LOS A	0.6	4.3	0.37	0.46	0.37	54.1
32u	U	1	0.0	1	0.0	0.254	12.3	LOS A	0.6	4.3	0.37	0.46	0.37	57.9
Approach		656	2.4	656	2.4	0.254	4.7	LOS A	0.6	4.3	0.36	0.46	0.36	51.0
All Vehicles		2072	1.5	2072	1.5	0.451	6.8	LOS A	1.2	8.7	0.57	0.62	0.57	49.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 106 [Marius St & Murray St - PM 4:45-5:45 (Site Folder: Existing-PM)]

Network: N101 [Existing PM 4:45-5:45 (Network Folder: UNE Tamworth - Existing - PM)]

UNE Tamworth
27 July 2023 - PM Peak Period: 4:45-5:45
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marius St														
21	L2	141	7.5	141	7.5	0.264	6.7	LOS A	0.7	5.6	0.66	0.66	0.66	39.1
22	T1	351	11.4	351	11.4	0.264	7.3	LOS A	0.7	5.6	0.67	0.68	0.67	44.8
23	R2	22	0.0	22	0.0	0.264	11.9	LOS A	0.7	5.3	0.68	0.70	0.68	46.7
23u	U	6	0.0	6	0.0	0.264	14.0	LOS A	0.7	5.3	0.68	0.70	0.68	48.5
Approach		520	9.7	520	9.7	0.264	7.4	LOS A	0.7	5.6	0.67	0.68	0.67	43.8
NorthEast: Murray St														
24	L2	24	0.0	24	0.0	0.266	6.2	LOS A	0.5	3.3	0.67	0.79	0.67	43.9
25	T1	112	0.9	112	0.9	0.266	7.5	LOS A	0.5	3.3	0.67	0.79	0.67	36.9
26	R2	46	0.0	46	0.0	0.266	12.1	LOS A	0.5	3.3	0.67	0.79	0.67	44.1
26u	U	1	0.0	1	0.0	0.266	14.3	LOS A	0.5	3.3	0.67	0.79	0.67	47.8
Approach		183	0.6	183	0.6	0.266	8.6	LOS A	0.5	3.3	0.67	0.79	0.67	40.3
NorthWest: Marius St														
27	L2	35	0.0	35	0.0	0.431	6.2	LOS A	1.1	7.7	0.72	0.71	0.77	42.2
28	T1	433	3.6	433	3.6	0.431	6.2	LOS A	1.1	7.7	0.72	0.75	0.77	43.2
29	R2	227	0.0	227	0.0	0.431	11.1	LOS A	1.0	7.3	0.73	0.89	0.79	29.9
29u	U	17	0.0	17	0.0	0.431	12.9	LOS A	1.0	7.3	0.73	0.89	0.79	40.6
Approach		712	2.2	712	2.2	0.431	7.9	LOS A	1.1	7.7	0.72	0.79	0.78	39.7
SouthWest: Murray St														
30	L2	215	0.5	215	0.5	0.458	6.8	LOS A	1.1	8.1	0.67	0.73	0.69	42.8
31	T1	205	0.5	205	0.5	0.458	6.9	LOS A	1.1	8.1	0.67	0.73	0.69	48.0
32	R2	391	4.3	391	4.3	0.459	11.3	LOS A	1.2	8.4	0.66	0.81	0.67	42.6
32u	U	63	0.0	63	0.0	0.459	13.2	LOS A	1.2	8.4	0.66	0.81	0.67	34.0
Approach		874	2.2	874	2.2	0.459	9.3	LOS A	1.2	8.4	0.66	0.77	0.68	43.3
All Vehicles		2288	3.8	2288	3.8	0.459	8.4	LOS A	1.2	8.4	0.68	0.76	0.71	42.1

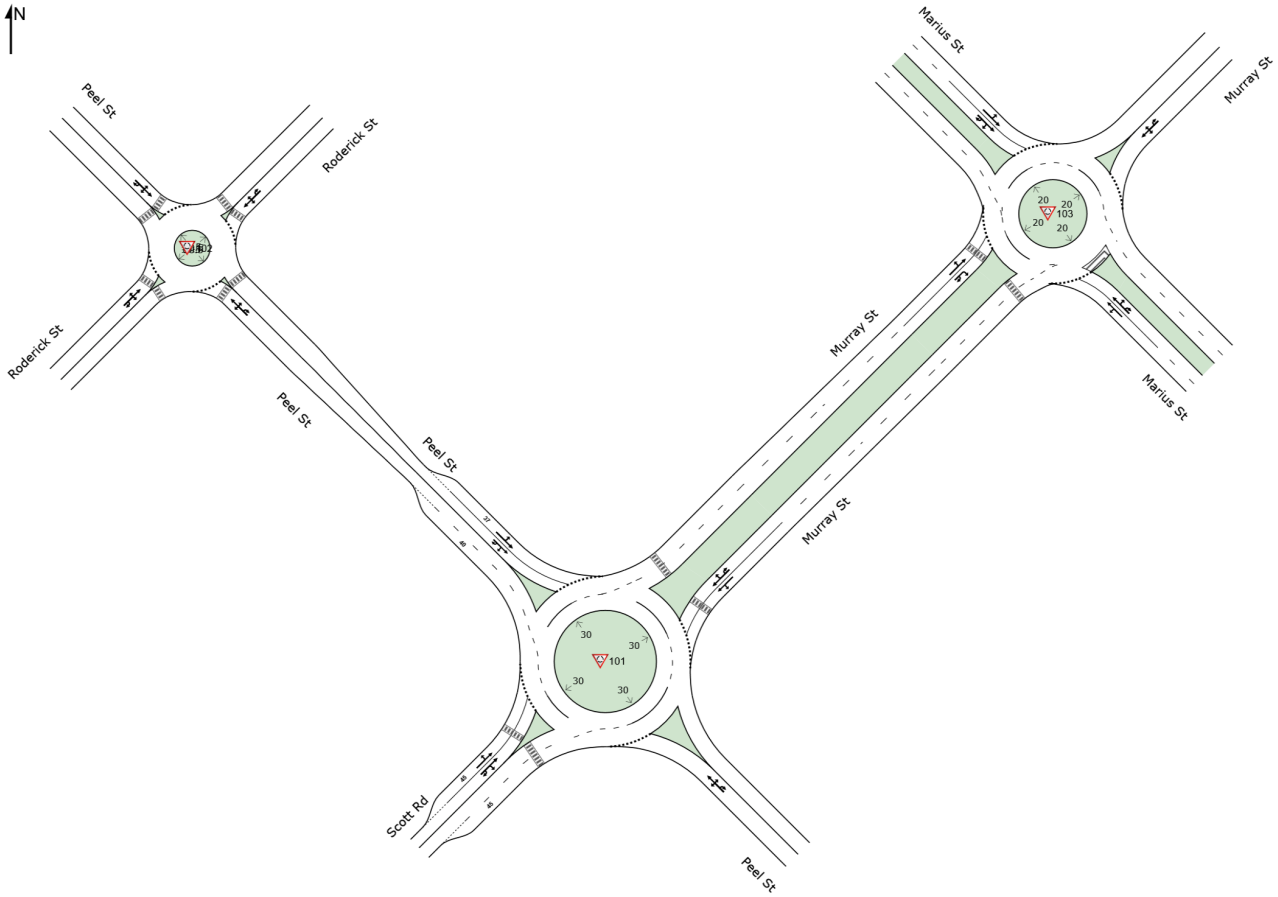
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity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

NETWORK LAYOUT

Network: N101 [AM 8:00-9:00 - 10 years Horizon (Network Folder: UNE Tamworth - Existing - AM)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Peel St & Murray St & Scott Rd - AM 8:00-9:00
102	NA	Peel St & Roderick St - AM 8:00-9:00
103	NA	Marius St & Murray St - AM 8:00-9:00

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Created: Tuesday, 30 April 2024 11:33:41 AM
Project: P:\2022\2218\221823\Reports\TTW\Traffic\Modeling\RtS model\221823_RtS - UNE Tamworth.sip9

MOVEMENT SUMMARY

Site: 101 [Peel St & Murray St & Scott Rd - AM 8:00-9:00 (Site Folder: AM - 10 years Horizon- without Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [AM 8:00-9:00 - 10 years Horizon (Network Folder: UNE Tamworth - Existing - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Peel St															
21	L2	All MCs	36	2.9	36	2.9	0.101	5.3	LOS A	0.1	1.1	0.47	0.54	0.47	49.3
22	T1	All MCs	41	2.6	41	2.6	0.101	4.1	LOS A	0.1	1.1	0.47	0.54	0.47	38.3
23	R2	All MCs	16	6.7	16	6.7	0.101	9.5	LOS A	0.1	1.1	0.47	0.54	0.47	38.3
23u	U	All MCs	1	0.0	1	0.0	0.101	11.1	LOS A	0.1	1.1	0.47	0.54	0.47	41.5
Approach			94	3.4	94	3.4	0.101	5.5	LOS A	0.1	1.1	0.47	0.54	0.47	44.9
NorthEast: Murray St															
24	L2	All MCs	34	0.0	34	0.0	0.151	5.1	LOS A	0.3	2.2	0.45	0.49	0.45	44.9
25	T1	All MCs	446	3.3	446	3.3	0.348	4.9	LOS A	0.9	6.5	0.46	0.49	0.46	50.9
26	R2	All MCs	82	0.0	82	0.0	0.348	10.2	LOS A	0.9	6.5	0.47	0.50	0.47	40.5
26u	U	All MCs	6	0.0	6	0.0	0.348	12.6	LOS A	0.9	6.5	0.47	0.50	0.47	40.5
Approach			568	2.6	568	2.6	0.348	5.8	LOS A	0.9	6.5	0.46	0.49	0.46	49.9
NorthWest: Peel St															
27	L2	All MCs	52	8.2	52	8.2	0.098	7.7	LOS A	0.2	1.3	0.65	0.69	0.65	31.8
28	T1	All MCs	51	4.2	51	4.2	0.216	5.2	LOS A	0.5	3.4	0.66	0.70	0.66	38.5
29	R2	All MCs	146	2.9	146	2.9	0.216	10.6	LOS A	0.5	3.4	0.66	0.70	0.66	45.3
29u	U	All MCs	1	0.0	1	0.0	0.216	12.3	LOS A	0.5	3.4	0.66	0.70	0.66	31.9
Approach			249	4.2	249	4.2	0.216	8.9	LOS A	0.5	3.4	0.66	0.70	0.66	42.9
SouthWest: Scott Rd															
30	L2	All MCs	405	0.5	405	0.5	0.423	4.7	LOS A	1.2	8.2	0.41	0.46	0.41	50.9
31	T1	All MCs	696	2.9	696	2.9	0.423	4.3	LOS A	1.2	8.5	0.40	0.43	0.40	50.5
32	R2	All MCs	20	0.0	20	0.0	0.423	9.9	LOS A	1.2	8.5	0.40	0.42	0.40	49.3
32u	U	All MCs	1	0.0	1	0.0	0.423	12.3	LOS A	1.2	8.5	0.40	0.42	0.40	53.0
Approach			1122	2.0	1122	2.0	0.423	4.6	LOS A	1.2	8.5	0.40	0.44	0.40	50.6
All Vehicles			2034	2.5	2034	2.5	0.423	5.5	LOS A	1.2	8.5	0.45	0.49	0.45	49.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Peel St & Roderick St - AM 8:00-9:00 (Site Folder: AM - 10 years Horizon- without Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [AM 8:00-9:00 - 10 years Horizon (Network Folder: UNE Tamworth - Existing - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Peel St															
21	L2	All MCs	176	1.8	176	1.8	0.422	4.6	LOS A	1.0	7.1	0.37	0.51	0.37	37.0
22	T1	All MCs	276	0.8	276	0.8	0.422	4.5	LOS A	1.0	7.1	0.37	0.51	0.37	40.7
23	R2	All MCs	72	0.0	72	0.0	0.422	7.8	LOS A	1.0	7.1	0.37	0.51	0.37	39.6
23u	U	All MCs	1	0.0	1	0.0	0.422	9.2	LOS A	1.0	7.1	0.37	0.51	0.37	35.1
Approach			524	1.0	524	1.0	0.422	5.0	LOS A	1.0	7.1	0.37	0.51	0.37	39.5
NorthEast: Roderick St															
24	L2	All MCs	44	0.0	44	0.0	0.161	5.0	LOS A	0.3	2.3	0.41	0.55	0.41	36.9
25	T1	All MCs	92	2.3	92	2.3	0.161	5.0	LOS A	0.3	2.3	0.41	0.55	0.41	38.8
26	R2	All MCs	29	3.6	29	3.6	0.161	8.4	LOS A	0.3	2.3	0.41	0.55	0.41	40.2
26u	U	All MCs	3	33.3	3	33.3	0.161	10.5	LOS A	0.3	2.3	0.41	0.55	0.41	39.0
Approach			168	2.5	168	2.5	0.161	5.7	LOS A	0.3	2.3	0.41	0.55	0.41	38.7
NorthWest: Peel St															
27	L2	All MCs	32	0.0	32	0.0	0.171	4.8	LOS A	0.3	2.5	0.39	0.52	0.39	40.8
28	T1	All MCs	125	5.9	125	5.9	0.171	4.9	LOS A	0.3	2.5	0.39	0.52	0.39	37.4
29	R2	All MCs	17	6.3	17	6.3	0.171	8.2	LOS A	0.3	2.5	0.39	0.52	0.39	37.7
29u	U	All MCs	7	0.0	7	0.0	0.171	9.7	LOS A	0.3	2.5	0.39	0.52	0.39	40.6
Approach			181	4.7	181	4.7	0.171	5.4	LOS A	0.3	2.5	0.39	0.52	0.39	38.5
SouthWest: Roderick St															
30	L2	All MCs	16	6.7	16	6.7	0.181	5.9	LOS A	0.4	2.8	0.52	0.64	0.52	36.2
31	T1	All MCs	46	6.8	46	6.8	0.181	5.8	LOS A	0.4	2.8	0.52	0.64	0.52	36.6
32	R2	All MCs	99	7.4	99	7.4	0.181	9.2	LOS A	0.4	2.8	0.52	0.64	0.52	27.4
32u	U	All MCs	5	0.0	5	0.0	0.181	10.4	LOS A	0.4	2.8	0.52	0.64	0.52	26.9
Approach			166	7.0	166	7.0	0.181	8.0	LOS A	0.4	2.8	0.52	0.64	0.52	32.1
All Vehicles			1040	2.8	1040	2.8	0.422	5.6	LOS A	1.0	7.1	0.41	0.54	0.41	38.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Marius St & Murray St - AM 8:00-9:00 (Site Folder: AM - 10 years Horizon- without Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [AM 8:00-9:00 - 10 years Horizon (Network Folder: UNE Tamworth - Existing - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Marius St															
21	L2	All MCs	208	4.5	208	4.5	0.487	8.2	LOS A	1.5	11.3	0.77	0.67	0.79	37.5
22	T1	All MCs	725	5.7	725	5.7	0.487	7.6	LOS A	1.6	11.7	0.75	0.65	0.76	41.0
23	R2	All MCs	57	3.7	57	3.7	0.487	11.8	LOS A	1.6	11.7	0.75	0.63	0.75	41.9
23u	U	All MCs	12	9.1	12	9.1	0.487	14.2	LOS A	1.6	11.7	0.75	0.63	0.75	41.2
Approach			1002	5.4	1002	5.4	0.487	8.0	LOS A	1.6	11.7	0.76	0.65	0.77	40.6
NorthEast: Murray St															
24	L2	All MCs	36	2.9	36	2.9	0.335	6.0	LOS A	0.5	3.8	0.54	0.67	0.54	43.6
25	T1	All MCs	169	1.2	169	1.2	0.335	6.1	LOS A	0.5	3.8	0.54	0.67	0.54	38.6
26	R2	All MCs	88	1.2	88	1.2	0.335	10.8	LOS A	0.5	3.8	0.54	0.67	0.54	40.6
26u	U	All MCs	1	0.0	1	0.0	0.335	12.9	LOS A	0.5	3.8	0.54	0.67	0.54	43.3
Approach			295	1.4	295	1.4	0.335	7.5	LOS A	0.5	3.8	0.54	0.67	0.54	40.2
NorthWest: Marius St															
27	L2	All MCs	27	7.7	27	7.7	0.300	5.3	LOS A	0.7	5.0	0.61	0.58	0.61	41.1
28	T1	All MCs	324	10.7	324	10.7	0.300	5.3	LOS A	0.7	5.0	0.61	0.60	0.61	40.8
29	R2	All MCs	177	1.8	177	1.8	0.300	9.8	LOS A	0.6	4.7	0.62	0.69	0.62	31.9
29u	U	All MCs	8	0.0	8	0.0	0.300	11.8	LOS A	0.6	4.7	0.62	0.69	0.62	36.5
Approach			537	7.5	537	7.5	0.300	6.9	LOS A	0.7	5.0	0.61	0.63	0.61	38.5
SouthWest: Murray St															
30	L2	All MCs	339	2.2	339	2.2	0.752	13.9	LOS A	3.1	22.2	0.94	1.04	1.43	34.9
31	T1	All MCs	222	0.0	222	0.0	0.752	13.9	LOS A	3.1	22.2	0.94	1.04	1.43	38.1
32	R2	All MCs	189	8.9	189	8.9	0.429	16.7	LOS B	1.0	7.3	0.80	0.92	0.94	35.0
32u	U	All MCs	7	0.0	7	0.0	0.429	18.1	LOS B	1.0	7.3	0.80	0.92	0.94	29.0
Approach			758	3.2	758	3.2	0.752	14.7	LOS B	3.1	22.2	0.91	1.01	1.30	35.8
All Vehicles			2592	4.7	2592	4.7	0.752	9.7	LOS A	3.1	22.2	0.75	0.75	0.87	38.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 104 [Peel St & Murray St & Scott Rd - PM 4:45-5:45 (Site Folder: PM - 10 years Horizon- without Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [PM 8:00-9:00 - 10 years Horizon (Network Folder: UNE Tamworth - Existing - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Peel St															
21	L2	All MCs	84	0.0	84	0.0	0.272	9.9	LOS A	0.6	3.9	0.72	0.74	0.72	47.6
22	T1	All MCs	66	0.0	66	0.0	0.272	6.6	LOS A	0.6	3.9	0.72	0.74	0.72	35.1
23	R2	All MCs	35	0.0	35	0.0	0.272	12.0	LOS A	0.6	3.9	0.72	0.74	0.72	35.1
23u	U	All MCs	1	0.0	1	0.0	0.272	13.8	LOS A	0.6	3.9	0.72	0.74	0.72	39.4
Approach			186	0.0	186	0.0	0.272	9.1	LOS A	0.6	3.9	0.72	0.74	0.72	43.2
NorthEast: Murray St															
24	L2	All MCs	39	0.0	39	0.0	0.233	7.6	LOS A	0.5	3.5	0.69	0.68	0.69	42.7
25	T1	All MCs	528	2.2	528	2.2	0.535	8.1	LOS A	1.8	12.5	0.78	0.73	0.86	49.1
26	R2	All MCs	59	0.0	59	0.0	0.535	13.0	LOS A	1.8	12.5	0.81	0.74	0.90	37.1
26u	U	All MCs	12	0.0	12	0.0	0.535	15.4	LOS B	1.8	12.5	0.81	0.74	0.90	37.1
Approach			638	1.8	638	1.8	0.535	8.6	LOS A	1.8	12.5	0.78	0.73	0.85	48.1
NorthWest: Peel St															
27	L2	All MCs	217	1.0	217	1.0	0.293	6.0	LOS A	0.6	4.3	0.64	0.64	0.64	34.6
28	T1	All MCs	57	0.0	57	0.0	0.528	5.6	LOS A	1.6	11.0	0.71	0.76	0.80	37.7
29	R2	All MCs	493	0.4	493	0.4	0.528	11.1	LOS A	1.6	11.0	0.71	0.76	0.80	44.6
29u	U	All MCs	1	0.0	1	0.0	0.528	12.8	LOS A	1.6	11.0	0.71	0.76	0.80	30.9
Approach			767	0.5	767	0.5	0.528	9.2	LOS A	1.6	11.0	0.69	0.73	0.75	43.0
SouthWest: Scott Rd															
30	L2	All MCs	227	0.5	227	0.5	0.291	4.6	LOS A	0.7	5.1	0.40	0.46	0.40	50.9
31	T1	All MCs	463	3.2	463	3.2	0.291	4.4	LOS A	0.7	5.2	0.39	0.45	0.39	50.2
32	R2	All MCs	45	0.0	45	0.0	0.291	10.0	LOS A	0.7	5.2	0.39	0.45	0.39	49.1
32u	U	All MCs	1	0.0	1	0.0	0.291	12.3	LOS A	0.7	5.2	0.39	0.45	0.39	52.8
Approach			737	2.1	737	2.1	0.291	4.8	LOS A	0.7	5.2	0.40	0.45	0.40	50.3
All Vehicles			2328	1.4	2328	1.4	0.535	7.7	LOS A	1.8	12.5	0.63	0.64	0.67	46.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [Peel St & Roderick St - PM 4:45-5:45 (Site Folder: PM - 10 years Horizon- without Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [PM 8:00-9:00 - 10 years Horizon (Network Folder: UNE Tamworth - Existing - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Peel St															
21	L2	All MCs	104	1.0	104	1.0	0.279	4.5	LOS A	0.6	4.3	0.35	0.50	0.35	37.2
22	T1	All MCs	187	0.0	187	0.0	0.279	4.4	LOS A	0.6	4.3	0.35	0.50	0.35	40.9
23	R2	All MCs	37	0.0	37	0.0	0.279	7.7	LOS A	0.6	4.3	0.35	0.50	0.35	39.7
23u	U	All MCs	3	0.0	3	0.0	0.279	9.1	LOS A	0.6	4.3	0.35	0.50	0.35	35.3
Approach			332	0.3	332	0.3	0.279	4.8	LOS A	0.6	4.3	0.35	0.50	0.35	39.7
NorthEast: Roderick St															
24	L2	All MCs	168	1.3	168	1.3	0.409	8.6	LOS A	1.1	7.7	0.78	0.75	0.81	32.3
25	T1	All MCs	85	1.2	85	1.2	0.409	8.6	LOS A	1.1	7.7	0.78	0.75	0.81	35.2
26	R2	All MCs	44	0.0	44	0.0	0.409	11.9	LOS A	1.1	7.7	0.78	0.75	0.81	37.3
26u	U	All MCs	2	0.0	2	0.0	0.409	13.3	LOS A	1.1	7.7	0.78	0.75	0.81	37.0
Approach			300	1.1	300	1.1	0.409	9.1	LOS A	1.1	7.7	0.78	0.75	0.81	34.3
NorthWest: Peel St															
27	L2	All MCs	100	1.1	100	1.1	0.547	7.4	LOS A	1.7	12.1	0.72	0.69	0.78	39.2
28	T1	All MCs	383	0.0	383	0.0	0.547	7.3	LOS A	1.7	12.1	0.72	0.69	0.78	34.9
29	R2	All MCs	11	0.0	11	0.0	0.547	10.6	LOS A	1.7	12.1	0.72	0.69	0.78	36.2
29u	U	All MCs	15	0.0	15	0.0	0.547	12.2	LOS A	1.7	12.1	0.72	0.69	0.78	39.0
Approach			508	0.2	508	0.2	0.547	7.5	LOS A	1.7	12.1	0.72	0.69	0.78	36.3
SouthWest: Roderick St															
30	L2	All MCs	28	0.0	28	0.0	0.391	5.5	LOS A	1.0	6.7	0.52	0.63	0.52	36.5
31	T1	All MCs	108	0.0	108	0.0	0.391	5.4	LOS A	1.0	6.7	0.52	0.63	0.52	37.0
32	R2	All MCs	271	0.8	271	0.8	0.391	8.8	LOS A	1.0	6.7	0.52	0.63	0.52	27.6
32u	U	All MCs	3	0.0	3	0.0	0.391	10.2	LOS A	1.0	6.7	0.52	0.63	0.52	23.2
Approach			411	0.5	411	0.5	0.391	7.7	LOS A	1.0	6.7	0.52	0.63	0.52	32.1
All Vehicles			1551	0.5	1551	0.5	0.547	7.3	LOS A	1.7	12.1	0.60	0.64	0.63	35.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 106 [Marius St & Murray St - PM 4:45-5:45 (Site Folder: PM - 10 years Horizon- without Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [PM 8:00-9:00 - 10 years Horizon (Network Folder: UNE Tamworth - Existing - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Marius St															
21	L2	All MCs	158	6.7	158	6.7	0.311	8.0	LOS A	0.8	6.4	0.74	0.66	0.74	37.8
22	T1	All MCs	389	10.3	389	10.3	0.311	7.6	LOS A	0.9	6.9	0.73	0.64	0.73	41.1
23	R2	All MCs	23	0.0	23	0.0	0.311	11.6	LOS A	0.9	6.9	0.72	0.63	0.72	42.6
23u	U	All MCs	7	0.0	7	0.0	0.311	13.8	LOS A	0.9	6.9	0.72	0.63	0.72	42.6
Approach			578	8.7	578	8.7	0.311	8.0	LOS A	0.9	6.9	0.73	0.64	0.73	40.6
NorthEast: Murray St															
24	L2	All MCs	27	0.0	27	0.0	0.333	7.4	LOS A	0.6	4.5	0.73	0.83	0.76	42.2
25	T1	All MCs	125	0.8	125	0.8	0.333	8.5	LOS A	0.6	4.5	0.73	0.83	0.76	36.0
26	R2	All MCs	53	0.0	53	0.0	0.333	13.1	LOS A	0.6	4.5	0.73	0.83	0.76	39.0
26u	U	All MCs	1	0.0	1	0.0	0.333	15.3	LOS B	0.6	4.5	0.73	0.83	0.76	41.5
Approach			206	0.5	206	0.5	0.333	9.6	LOS A	0.6	4.5	0.73	0.83	0.76	38.1
NorthWest: Marius St															
27	L2	All MCs	39	0.0	39	0.0	0.521	7.4	LOS A	1.5	10.5	0.79	0.80	0.92	40.7
28	T1	All MCs	485	3.3	485	3.3	0.521	7.6	LOS A	1.5	10.5	0.79	0.81	0.93	40.1
29	R2	All MCs	256	0.0	256	0.0	0.521	12.6	LOS A	1.4	10.0	0.79	0.87	0.94	28.7
29u	U	All MCs	19	0.0	19	0.0	0.521	14.5	LOS B	1.4	10.0	0.79	0.87	0.94	34.0
Approach			799	2.0	799	2.0	0.521	9.3	LOS A	1.5	10.5	0.79	0.83	0.93	37.1
SouthWest: Murray St															
30	L2	All MCs	242	0.4	242	0.4	0.540	8.0	LOS A	1.6	11.4	0.75	0.74	0.84	40.7
31	T1	All MCs	232	0.5	232	0.5	0.540	8.1	LOS A	1.6	11.4	0.75	0.74	0.84	44.0
32	R2	All MCs	438	3.8	438	3.8	0.537	12.4	LOS A	1.6	11.7	0.74	0.78	0.82	38.9
32u	U	All MCs	72	0.0	72	0.0	0.537	14.3	LOS A	1.6	11.7	0.74	0.78	0.82	33.4
Approach			983	1.9	983	1.9	0.540	10.4	LOS A	1.6	11.7	0.74	0.76	0.83	40.1
All Vehicles			2566	3.4	2566	3.4	0.540	9.5	LOS A	1.6	11.7	0.75	0.76	0.83	39.2

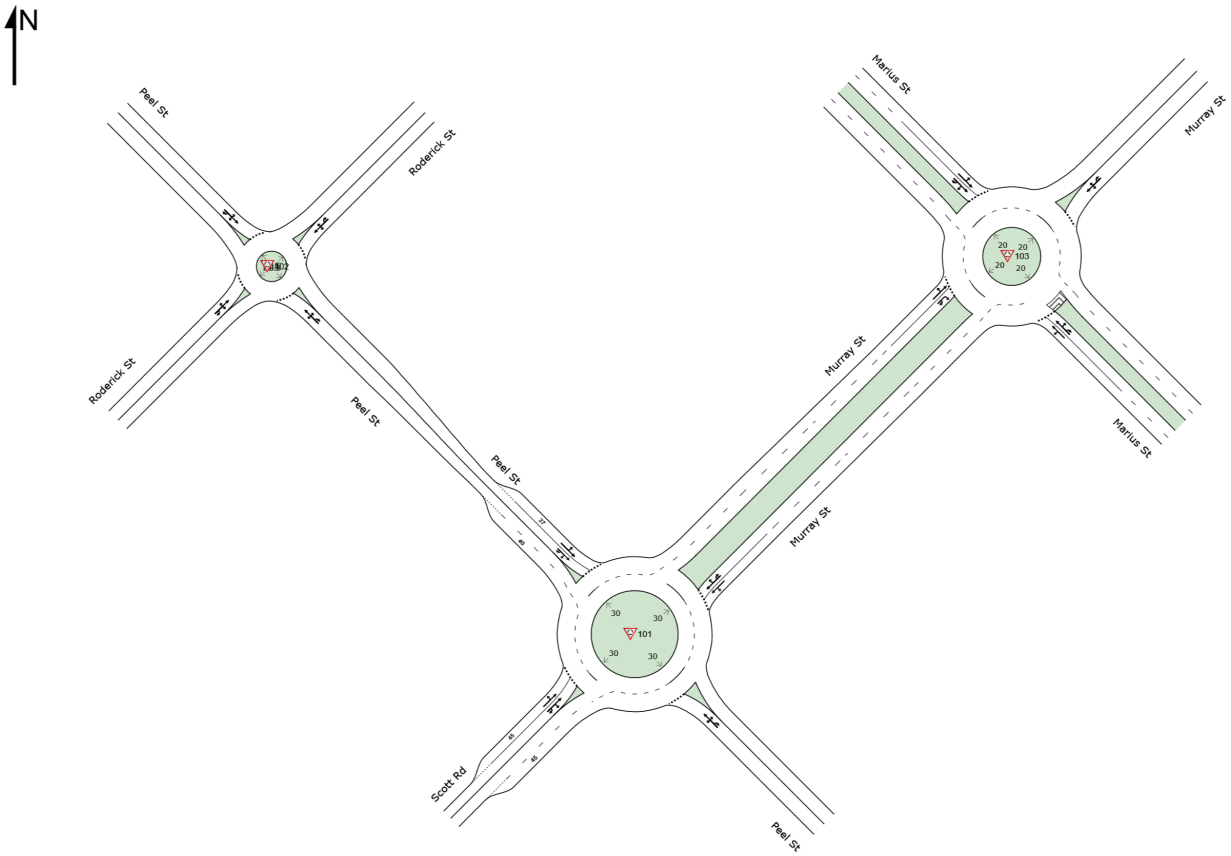
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

NETWORK LAYOUT

Network: N101 [Proposed AM 8:00-9:00 (Network Folder: UNE Tamworth - Proposed - AM)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Peel St & Murray St & Scott Rd - AM 8:00-9:00
102	NA	Peel St & Roderick St - AM 8:00-9:00
103	NA	Marius St & Murray St - AM 8:00-9:00

MOVEMENT SUMMARY

Site: 101 [Peel St & Murray St & Scott Rd - AM 8:00-9:00 (Site Folder: Proposed-AM)]

Network: N101 [Proposed AM 8:00-9:00 (Network Folder: UNE Tamworth - Proposed - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Proposed Design 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Peel St														
21	L2	32	3.3	32	3.3	0.087	4.8	LOS A	0.1	0.9	0.44	0.53	0.44	50.3
22	T1	37	2.9	37	2.9	0.087	3.8	LOS A	0.1	0.9	0.44	0.53	0.44	38.3
23	R2	14	7.7	14	7.7	0.087	9.1	LOS A	0.1	0.9	0.44	0.53	0.44	38.3
23u	U	1	0.0	1	0.0	0.087	11.0	LOS A	0.1	0.9	0.44	0.53	0.44	51.2
Approach		83	3.8	83	3.8	0.087	5.1	LOS A	0.1	0.9	0.44	0.53	0.44	45.4
NorthEast: Murray St														
24	L2	29	0.0	29	0.0	0.138	4.9	LOS A	0.3	2.0	0.42	0.49	0.42	46.5
25	T1	398	3.7	398	3.7	0.316	4.8	LOS A	0.8	5.7	0.43	0.50	0.43	53.8
26	R2	99	0.0	99	0.0	0.316	10.0	LOS A	0.8	5.7	0.43	0.51	0.43	40.6
26u	U	5	0.0	5	0.0	0.316	12.4	LOS A	0.8	5.7	0.43	0.51	0.43	40.6
Approach		532	2.8	532	2.8	0.316	5.8	LOS A	0.8	5.7	0.43	0.50	0.43	52.1
NorthWest: Peel St														
27	L2	46	9.1	46	9.1	0.082	6.8	LOS A	0.1	1.1	0.62	0.69	0.62	32.7
28	T1	45	4.7	45	4.7	0.183	4.5	LOS A	0.4	2.8	0.61	0.71	0.61	42.0
29	R2	131	3.2	131	3.2	0.183	9.9	LOS A	0.4	2.8	0.61	0.71	0.61	49.4
29u	U	1	0.0	1	0.0	0.183	11.8	LOS A	0.4	2.8	0.61	0.71	0.61	32.3
Approach		223	4.7	223	4.7	0.183	8.2	LOS A	0.4	2.8	0.61	0.70	0.61	46.4
SouthWest: Scott Rd														
30	L2	385	0.5	385	0.5	0.390	4.6	LOS A	1.1	7.4	0.39	0.47	0.39	51.0
31	T1	620	3.2	620	3.2	0.390	4.5	LOS A	1.1	7.4	0.41	0.46	0.41	50.4
32	R2	18	0.0	18	0.0	0.390	10.1	LOS A	1.0	7.5	0.41	0.45	0.41	54.2
32u	U	1	0.0	1	0.0	0.390	12.5	LOS A	1.0	7.5	0.41	0.45	0.41	58.0
Approach		1024	2.2	1024	2.2	0.390	4.6	LOS A	1.1	7.5	0.40	0.46	0.40	50.7
All Vehicles		1862	2.7	1862	2.7	0.390	5.4	LOS A	1.1	7.5	0.44	0.51	0.44	50.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Peel St & Roderick St - AM 8:00-9:00 (Site Folder: Proposed-AM)]

Network: N101 [Proposed AM 8:00-9:00 (Network Folder: UNE Tamworth - Proposed - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Proposed Design 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Peel St														
21	L2	157	2.0	157	2.0	0.371	4.3	LOS A	0.8	5.9	0.33	0.51	0.33	37.9
22	T1	245	0.9	245	0.9	0.371	4.2	LOS A	0.8	5.9	0.33	0.51	0.33	42.4
23	R2	63	0.0	63	0.0	0.371	7.5	LOS A	0.8	5.9	0.33	0.51	0.33	42.0
23u	U	1	0.0	1	0.0	0.371	9.1	LOS A	0.8	5.9	0.33	0.51	0.33	35.1
Approach		466	1.1	466	1.1	0.371	4.7	LOS A	0.8	5.9	0.33	0.51	0.33	41.0
NorthEast: Roderick St														
24	L2	39	0.0	39	0.0	0.142	4.8	LOS A	0.3	2.0	0.41	0.56	0.41	36.5
25	T1	81	2.6	81	2.6	0.142	4.8	LOS A	0.3	2.0	0.41	0.56	0.41	40.5
26	R2	26	4.0	26	4.0	0.142	8.2	LOS A	0.3	2.0	0.41	0.56	0.41	42.1
26u	U	3	33.3	3	33.3	0.142	10.4	LOS A	0.3	2.0	0.41	0.56	0.41	42.2
Approach		149	2.8	149	2.8	0.142	5.5	LOS A	0.3	2.0	0.41	0.56	0.41	40.1
NorthWest: Peel St														
27	L2	28	0.0	28	0.0	0.173	4.6	LOS A	0.3	2.5	0.37	0.52	0.37	41.3
28	T1	138	5.3	138	5.3	0.173	4.6	LOS A	0.3	2.5	0.37	0.52	0.37	37.2
29	R2	15	7.1	15	7.1	0.173	8.0	LOS A	0.3	2.5	0.37	0.52	0.37	40.2
29u	U	6	0.0	6	0.0	0.173	9.4	LOS A	0.3	2.5	0.37	0.52	0.37	43.7
Approach		187	4.5	187	4.5	0.173	5.0	LOS A	0.3	2.5	0.37	0.52	0.37	38.7
SouthWest: Roderick St														
30	L2	14	7.7	14	7.7	0.156	5.5	LOS A	0.3	2.3	0.48	0.66	0.48	36.9
31	T1	41	7.7	41	7.7	0.156	5.4	LOS A	0.3	2.3	0.48	0.66	0.48	38.4
32	R2	88	8.3	88	8.3	0.156	8.8	LOS A	0.3	2.3	0.48	0.66	0.48	27.7
32u	U	5	0.0	5	0.0	0.156	10.1	LOS A	0.3	2.3	0.48	0.66	0.48	27.7
Approach		148	7.8	148	7.8	0.156	7.6	LOS A	0.3	2.3	0.48	0.66	0.48	33.0
All Vehicles		952	3.1	952	3.1	0.371	5.3	LOS A	0.8	5.9	0.37	0.55	0.37	39.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 103 [Marius St & Murray St - AM 8:00-9:00 (Site Folder: Proposed-AM)]

Network: N101 [Proposed AM 8:00-9:00 (Network Folder: UNE Tamworth - Proposed - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Proposed Design 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marius St														
21	L2	186	5.1	186	5.1	0.424	6.8	LOS A	1.3	9.7	0.69	0.68	0.69	38.7
22	T1	648	6.3	648	6.3	0.424	7.3	LOS A	1.3	9.7	0.71	0.70	0.71	44.6
23	R2	51	4.2	51	4.2	0.424	12.2	LOS A	1.2	9.2	0.72	0.73	0.72	45.7
23u	U	11	10.0	11	10.0	0.424	14.6	LOS B	1.2	9.2	0.72	0.73	0.72	46.4
Approach		896	6.0	896	6.0	0.424	7.5	LOS A	1.3	9.7	0.71	0.70	0.71	43.8
NorthEast: Murray St														
24	L2	33	3.2	33	3.2	0.294	5.7	LOS A	0.4	3.1	0.49	0.67	0.49	45.0
25	T1	156	1.4	156	1.4	0.294	5.8	LOS A	0.4	3.1	0.49	0.67	0.49	39.1
26	R2	82	1.3	82	1.3	0.294	10.5	LOS A	0.4	3.1	0.49	0.67	0.49	45.7
26u	U	1	0.0	1	0.0	0.294	12.6	LOS A	0.4	3.1	0.49	0.67	0.49	49.7
Approach		272	1.6	272	1.6	0.294	7.3	LOS A	0.4	3.1	0.49	0.67	0.49	42.5
NorthWest: Marius St														
27	L2	23	9.1	23	9.1	0.253	4.9	LOS A	0.5	4.1	0.57	0.54	0.57	42.0
28	T1	272	12.8	272	12.8	0.253	4.8	LOS A	0.5	4.1	0.57	0.57	0.57	43.3
29	R2	175	1.8	175	1.8	0.253	9.2	LOS A	0.5	3.8	0.57	0.71	0.57	31.6
29u	U	6	0.0	6	0.0	0.253	11.1	LOS A	0.5	3.8	0.57	0.71	0.57	42.2
Approach		476	8.4	476	8.4	0.253	6.5	LOS A	0.5	4.1	0.57	0.62	0.57	39.8
SouthWest: Murray St														
30	L2	302	2.4	302	2.4	0.610	9.7	LOS A	1.9	13.8	0.84	0.99	1.06	40.1
31	T1	197	0.0	197	0.0	0.610	9.7	LOS A	1.9	13.8	0.84	0.99	1.06	45.2
32	R2	171	9.9	171	9.9	0.347	14.6	LOS B	0.7	5.3	0.74	0.93	0.78	39.3
32u	U	6	0.0	6	0.0	0.347	16.2	LOS B	0.7	5.3	0.74	0.93	0.78	31.0
Approach		676	3.6	676	3.6	0.610	11.0	LOS A	1.9	13.8	0.81	0.98	0.99	41.2
All Vehicles		2319	5.3	2319	5.3	0.610	8.3	LOS A	1.9	13.8	0.68	0.76	0.73	42.0

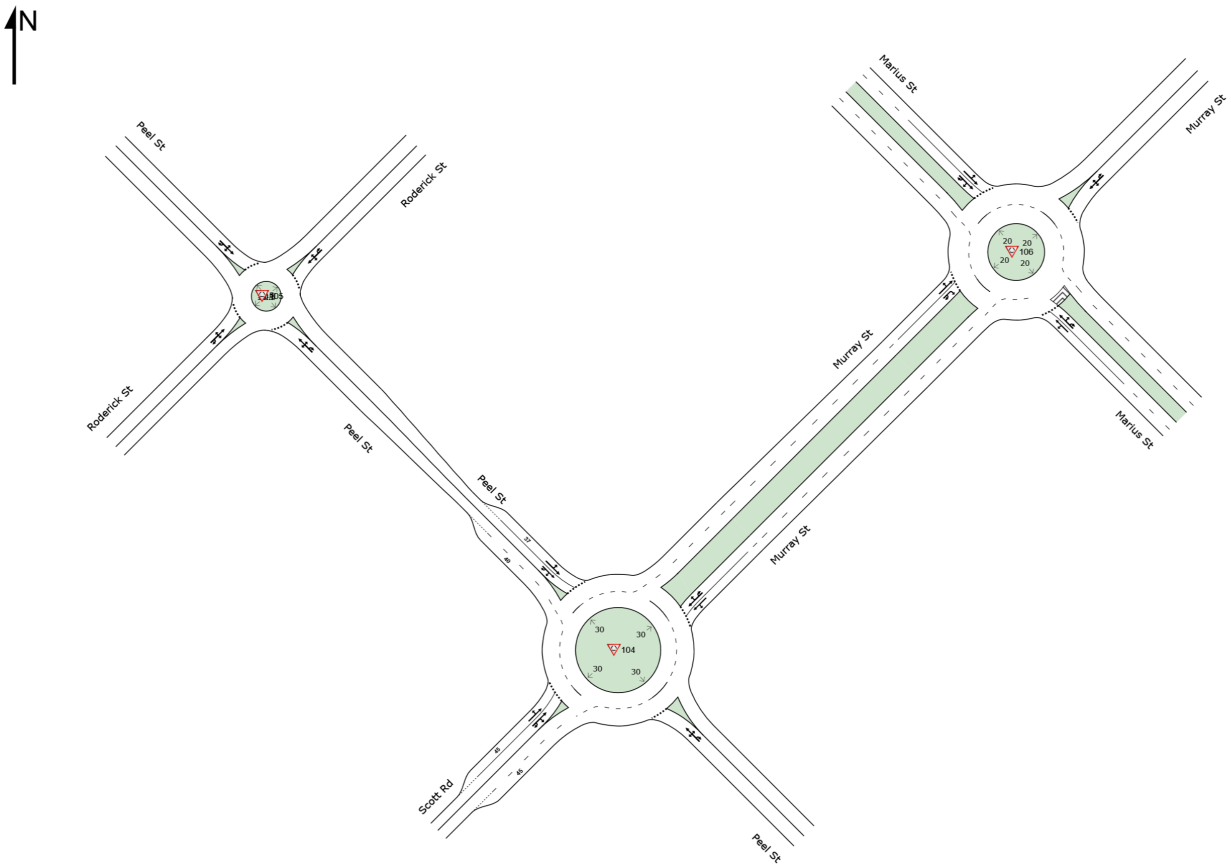
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity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

NETWORK LAYOUT

Network: N101 [Proposed PM 4:45-5:45 (Network Folder: UNE Tamworth - Proposed - PM)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
104	NA	Peel St & Murray St & Scott Rd - PM 4:45-5:45
105	NA	Peel St & Roderick St - PM 4:45-5:45
106	NA	Marius St & Murray St - PM 4:45-5:45

MOVEMENT SUMMARY

Site: 104 [Peel St & Murray St & Scott Rd - PM 4:45-5:45 (Site Folder: Proposed-PM)]

Network: N101 [Proposed PM 4:45-5:45 (Network Folder: UNE Tamworth - Proposed - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Proposed Design 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Peel St														
21	L2	75	0.0	75	0.0	0.221	8.3	LOS A	0.4	3.0	0.66	0.74	0.66	48.9
22	T1	59	0.0	59	0.0	0.221	5.6	LOS A	0.4	3.0	0.66	0.74	0.66	35.7
23	R2	31	0.0	31	0.0	0.221	11.0	LOS A	0.4	3.0	0.66	0.74	0.66	35.7
23u	U	1	0.0	1	0.0	0.221	13.0	LOS A	0.4	3.0	0.66	0.74	0.66	48.7
Approach		165	0.0	165	0.0	0.221	7.9	LOS A	0.4	3.0	0.66	0.74	0.66	44.3
NorthEast: Murray St														
24	L2	35	0.0	35	0.0	0.199	7.3	LOS A	0.4	3.0	0.66	0.73	0.66	44.4
25	T1	471	2.5	471	2.5	0.456	7.1	LOS A	1.3	9.2	0.72	0.68	0.74	52.1
26	R2	53	0.0	53	0.0	0.456	12.0	LOS A	1.3	9.2	0.74	0.67	0.76	37.9
26u	U	11	0.0	11	0.0	0.456	14.4	LOS A	1.3	9.2	0.74	0.67	0.76	37.9
Approach		568	2.0	568	2.0	0.456	7.7	LOS A	1.3	9.2	0.72	0.68	0.74	51.0
NorthWest: Peel St														
27	L2	219	1.0	219	1.0	0.275	5.4	LOS A	0.6	3.9	0.60	0.68	0.60	35.3
28	T1	51	0.0	51	0.0	0.474	4.5	LOS A	1.2	8.7	0.66	0.78	0.68	40.9
29	R2	463	0.5	463	0.5	0.474	10.0	LOS A	1.2	8.7	0.66	0.78	0.68	48.5
29u	U	1	0.0	1	0.0	0.474	12.0	LOS A	1.2	8.7	0.66	0.78	0.68	31.2
Approach		734	0.6	734	0.6	0.474	8.2	LOS A	1.2	8.7	0.64	0.75	0.66	46.3
SouthWest: Scott Rd														
30	L2	202	0.5	202	0.5	0.255	4.3	LOS A	0.6	4.3	0.35	0.45	0.35	51.2
31	T1	413	3.6	413	3.6	0.255	4.3	LOS A	0.6	4.3	0.36	0.46	0.36	50.5
32	R2	40	0.0	40	0.0	0.255	10.0	LOS A	0.6	4.3	0.37	0.46	0.37	54.1
32u	U	1	0.0	1	0.0	0.255	12.3	LOS A	0.6	4.3	0.37	0.46	0.37	57.9
Approach		656	2.4	656	2.4	0.255	4.7	LOS A	0.6	4.3	0.36	0.46	0.36	51.0
All Vehicles		2123	1.5	2123	1.5	0.474	6.9	LOS A	1.3	9.2	0.58	0.64	0.59	48.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 105 [Peel St & Roderick St - PM 4:45-5:45 (Site Folder: Proposed-PM)]

Network: N101 [Proposed PM 4:45-5:45 (Network Folder: UNE Tamworth - Proposed - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Proposed Design 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Peel St														
21	L2	93	1.1	93	1.1	0.264	4.3	LOS A	0.6	4.0	0.32	0.50	0.32	38.1
22	T1	193	0.0	193	0.0	0.264	4.1	LOS A	0.6	4.0	0.32	0.50	0.32	42.6
23	R2	33	0.0	33	0.0	0.264	7.5	LOS A	0.6	4.0	0.32	0.50	0.32	42.1
23u	U	3	0.0	3	0.0	0.264	9.0	LOS A	0.6	4.0	0.32	0.50	0.32	35.3
Approach		321	0.3	321	0.3	0.264	4.6	LOS A	0.6	4.0	0.32	0.50	0.32	41.4
NorthEast: Roderick St														
24	L2	149	1.4	149	1.4	0.336	7.4	LOS A	0.8	5.8	0.70	0.79	0.70	33.4
25	T1	76	1.4	76	1.4	0.336	7.4	LOS A	0.8	5.8	0.70	0.79	0.70	37.9
26	R2	39	0.0	39	0.0	0.336	10.7	LOS A	0.8	5.8	0.70	0.79	0.70	40.1
26u	U	2	0.0	2	0.0	0.336	12.2	LOS A	0.8	5.8	0.70	0.79	0.70	41.0
Approach		266	1.2	266	1.2	0.336	7.9	LOS A	0.8	5.8	0.70	0.79	0.70	36.3
NorthWest: Peel St														
27	L2	88	1.2	88	1.2	0.466	6.1	LOS A	1.2	8.6	0.64	0.69	0.64	40.1
28	T1	340	0.0	340	0.0	0.466	6.0	LOS A	1.2	8.6	0.64	0.69	0.64	35.4
29	R2	9	0.0	9	0.0	0.466	9.3	LOS A	1.2	8.6	0.64	0.69	0.64	39.3
29u	U	13	0.0	13	0.0	0.466	10.9	LOS A	1.2	8.6	0.64	0.69	0.64	42.4
Approach		451	0.2	451	0.2	0.466	6.2	LOS A	1.2	8.6	0.64	0.69	0.64	37.1
SouthWest: Roderick St														
30	L2	25	0.0	25	0.0	0.347	5.2	LOS A	0.8	5.7	0.50	0.67	0.50	37.1
31	T1	96	0.0	96	0.0	0.347	5.2	LOS A	0.8	5.7	0.50	0.67	0.50	38.6
32	R2	240	0.9	240	0.9	0.347	8.5	LOS A	0.8	5.7	0.50	0.67	0.50	27.7
32u	U	3	0.0	3	0.0	0.347	10.1	LOS A	0.8	5.7	0.50	0.67	0.50	23.4
Approach		364	0.6	364	0.6	0.347	7.4	LOS A	0.8	5.7	0.50	0.67	0.50	32.7
All Vehicles		1402	0.5	1402	0.5	0.466	6.5	LOS A	1.2	8.6	0.54	0.66	0.54	37.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 106 [Marius St & Murray St - PM 4:45-5:45 (Site Folder: Proposed-PM)]

Network: N101 [Proposed PM 4:45-5:45 (Network Folder: UNE Tamworth - Proposed - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Proposed Design 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Marius St														
21	L2	141	7.5	141	7.5	0.264	6.7	LOS A	0.7	5.6	0.66	0.66	0.66	39.1
22	T1	351	11.4	351	11.4	0.264	7.3	LOS A	0.7	5.6	0.67	0.68	0.67	44.8
23	R2	22	0.0	22	0.0	0.264	11.9	LOS A	0.7	5.3	0.68	0.70	0.68	46.7
23u	U	6	0.0	6	0.0	0.264	14.0	LOS A	0.7	5.3	0.68	0.70	0.68	48.5
Approach		520	9.7	520	9.7	0.264	7.4	LOS A	0.7	5.6	0.67	0.68	0.67	43.8
NorthEast: Murray St														
24	L2	24	0.0	24	0.0	0.266	6.2	LOS A	0.5	3.3	0.67	0.79	0.67	43.9
25	T1	112	0.9	112	0.9	0.266	7.5	LOS A	0.5	3.3	0.67	0.79	0.67	36.9
26	R2	46	0.0	46	0.0	0.266	12.1	LOS A	0.5	3.3	0.67	0.79	0.67	44.1
26u	U	1	0.0	1	0.0	0.266	14.3	LOS A	0.5	3.3	0.67	0.79	0.67	47.8
Approach		183	0.6	183	0.6	0.266	8.6	LOS A	0.5	3.3	0.67	0.79	0.67	40.3
NorthWest: Marius St														
27	L2	35	0.0	35	0.0	0.431	6.2	LOS A	1.1	7.7	0.72	0.71	0.77	42.2
28	T1	433	3.6	433	3.6	0.431	6.2	LOS A	1.1	7.7	0.72	0.75	0.77	43.2
29	R2	227	0.0	227	0.0	0.431	11.1	LOS A	1.0	7.4	0.73	0.89	0.79	29.9
29u	U	17	0.0	17	0.0	0.431	13.0	LOS A	1.0	7.4	0.73	0.89	0.79	40.6
Approach		712	2.2	712	2.2	0.431	7.9	LOS A	1.1	7.7	0.72	0.79	0.78	39.7
SouthWest: Murray St														
30	L2	241	0.4	241	0.4	0.481	6.9	LOS A	1.3	8.9	0.68	0.74	0.71	42.8
31	T1	205	0.5	205	0.5	0.481	7.0	LOS A	1.3	8.9	0.68	0.74	0.71	48.0
32	R2	391	4.3	391	4.3	0.459	11.3	LOS A	1.2	8.4	0.66	0.81	0.67	42.6
32u	U	63	0.0	63	0.0	0.459	13.2	LOS A	1.2	8.4	0.66	0.81	0.67	34.0
Approach		900	2.1	900	2.1	0.481	9.3	LOS A	1.3	8.9	0.67	0.78	0.69	43.3
All Vehicles		2315	3.7	2315	3.7	0.481	8.4	LOS A	1.3	8.9	0.69	0.76	0.71	42.1

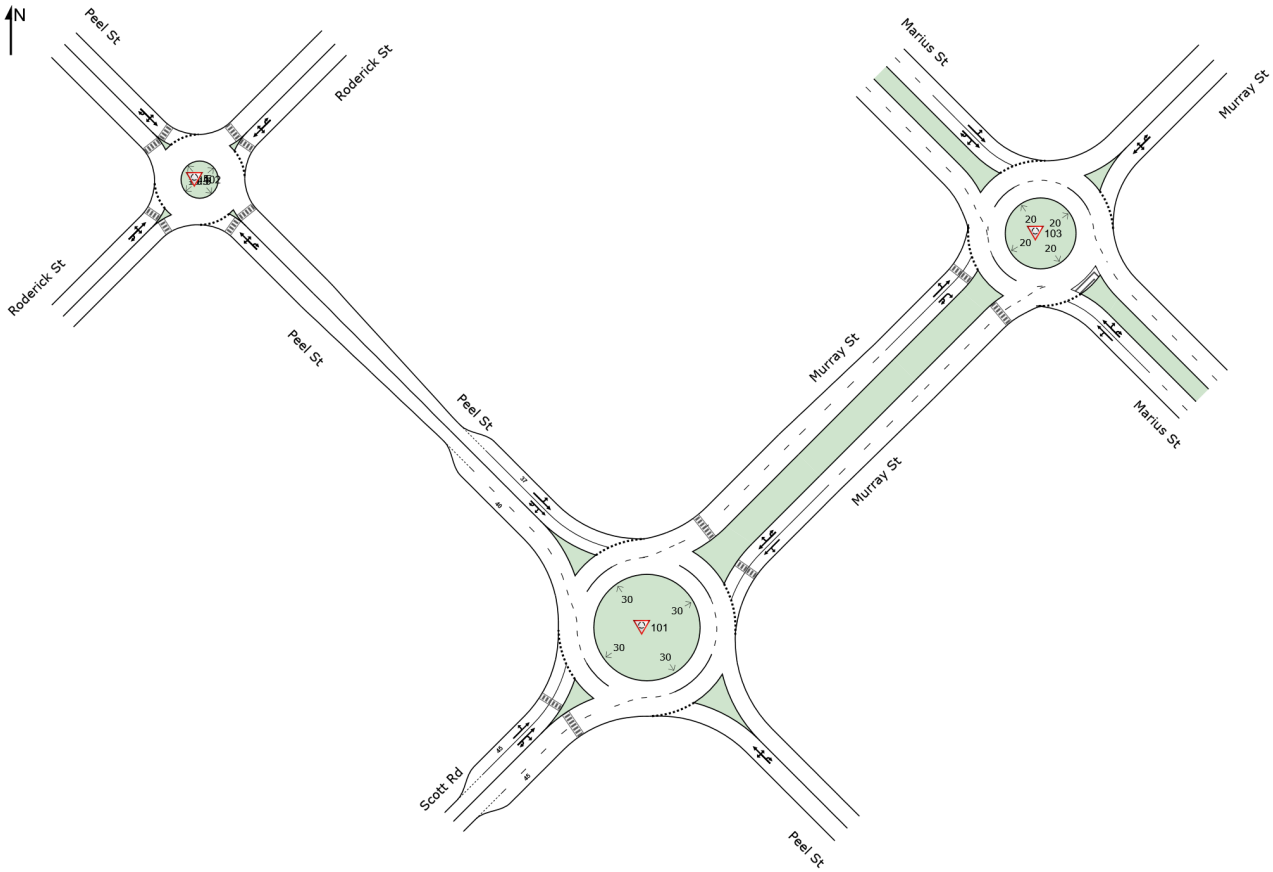
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity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

NETWORK LAYOUT

Network: N101 [Proposed 2034 AM 8:00-9:00 (Network Folder: UNE Tamworth - Proposed - AM)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Peel St & Murray St & Scott Rd - AM 8:00-9:00
102	NA	Peel St & Roderick St - AM 8:00-9:00
103	NA	Marius St & Murray St - AM 8:00-9:00

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Created: Tuesday, 30 April 2024 11:51:00 AM
Project: P:\2022\2218\221823\Reports\TTW\Traffic\Modeling\RtS model\221823_RtS - UNE Tamworth.sip9

MOVEMENT SUMMARY

Site: 101 [Peel St & Murray St & Scott Rd - AM 8:00-9:00 (Site Folder: AM - 10 years Horizon- with Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [Proposed 2034 AM 8:00-9:00 (Network Folder: UNE Tamworth - Proposed - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Peel St															
21	L2	All MCs	36	2.9	36	2.9	0.104	5.4	LOS A	0.2	1.1	0.48	0.56	0.48	49.2
22	T1	All MCs	41	2.6	41	2.6	0.104	4.3	LOS A	0.2	1.1	0.48	0.56	0.48	38.2
23	R2	All MCs	16	6.7	16	6.7	0.104	9.6	LOS A	0.2	1.1	0.48	0.56	0.48	38.2
23u	U	All MCs	1	0.0	1	0.0	0.104	11.2	LOS A	0.2	1.1	0.48	0.56	0.48	41.4
Approach			94	3.4	94	3.4	0.104	5.7	LOS A	0.2	1.1	0.48	0.56	0.48	44.7
NorthEast: Murray St															
24	L2	All MCs	34	0.0	34	0.0	0.162	5.1	LOS A	0.3	2.4	0.45	0.48	0.45	44.8
25	T1	All MCs	446	3.3	446	3.3	0.372	5.0	LOS A	1.0	7.4	0.48	0.50	0.48	50.9
26	R2	All MCs	108	24.3	108	24.3	0.372	10.8	LOS A	1.0	7.4	0.49	0.51	0.49	40.3
26u	U	All MCs	6	0.0	6	0.0	0.372	12.6	LOS A	1.0	7.4	0.49	0.51	0.49	40.3
Approach			595	6.9	595	6.9	0.372	6.1	LOS A	1.0	7.4	0.48	0.50	0.48	49.6
NorthWest: Peel St															
27	L2	All MCs	52	8.2	52	8.2	0.099	7.8	LOS A	0.2	1.4	0.67	0.70	0.67	31.6
28	T1	All MCs	51	4.2	51	4.2	0.220	5.3	LOS A	0.5	3.6	0.68	0.70	0.68	38.4
29	R2	All MCs	146	2.9	146	2.9	0.220	10.7	LOS A	0.5	3.6	0.68	0.70	0.68	45.2
29u	U	All MCs	1	0.0	1	0.0	0.220	12.4	LOS A	0.5	3.6	0.68	0.70	0.68	31.8
Approach			249	4.2	249	4.2	0.220	9.0	LOS A	0.5	3.6	0.67	0.70	0.67	42.8
SouthWest: Scott Rd															
30	L2	All MCs	432	6.6	432	6.6	0.457	5.2	LOS A	1.3	9.6	0.49	0.49	0.49	50.4
31	T1	All MCs	696	2.9	696	2.9	0.457	4.6	LOS A	1.3	9.6	0.47	0.46	0.47	49.9
32	R2	All MCs	20	0.0	20	0.0	0.457	10.2	LOS A	1.3	9.5	0.47	0.45	0.47	48.9
32u	U	All MCs	1	0.0	1	0.0	0.457	12.6	LOS A	1.3	9.5	0.47	0.45	0.47	52.7
Approach			1148	4.2	1148	4.2	0.457	5.0	LOS A	1.3	9.6	0.48	0.47	0.48	50.0
All Vehicles			2086	4.9	2086	4.9	0.457	5.8	LOS A	1.3	9.6	0.50	0.51	0.50	48.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Peel St & Roderick St - AM 8:00-9:00 (Site Folder: AM - 10 years Horizon- with Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [Proposed 2034 AM 8:00-9:00 (Network Folder: UNE Tamworth - Proposed - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Peel St															
21	L2	All MCs	176	1.8	176	1.8	0.422	4.6	LOS A	1.0	7.2	0.37	0.51	0.37	37.0
22	T1	All MCs	276	0.8	276	0.8	0.422	4.5	LOS A	1.0	7.2	0.37	0.51	0.37	40.7
23	R2	All MCs	72	0.0	72	0.0	0.422	7.8	LOS A	1.0	7.2	0.37	0.51	0.37	39.6
23u	U	All MCs	1	0.0	1	0.0	0.422	9.2	LOS A	1.0	7.2	0.37	0.51	0.37	35.0
Approach			524	1.0	524	1.0	0.422	5.0	LOS A	1.0	7.2	0.37	0.51	0.37	39.5
NorthEast: Roderick St															
24	L2	All MCs	44	0.0	44	0.0	0.166	5.2	LOS A	0.3	2.4	0.45	0.56	0.45	36.6
25	T1	All MCs	92	2.3	92	2.3	0.166	5.2	LOS A	0.3	2.4	0.45	0.56	0.45	38.5
26	R2	All MCs	29	3.6	29	3.6	0.166	8.6	LOS A	0.3	2.4	0.45	0.56	0.45	40.0
26u	U	All MCs	3	33.3	3	33.3	0.166	10.7	LOS A	0.3	2.4	0.45	0.56	0.45	38.9
Approach			168	2.5	168	2.5	0.166	5.9	LOS A	0.3	2.4	0.45	0.56	0.45	38.5
NorthWest: Peel St															
27	L2	All MCs	32	0.0	32	0.0	0.211	4.8	LOS A	0.4	3.4	0.42	0.53	0.42	40.9
28	T1	All MCs	152	22.2	152	22.2	0.211	5.4	LOS A	0.4	3.4	0.42	0.53	0.42	37.5
29	R2	All MCs	17	6.3	17	6.3	0.211	8.3	LOS A	0.4	3.4	0.42	0.53	0.42	37.8
29u	U	All MCs	7	0.0	7	0.0	0.211	9.7	LOS A	0.4	3.4	0.42	0.53	0.42	40.7
Approach			207	16.8	207	16.8	0.211	5.7	LOS A	0.4	3.4	0.42	0.53	0.42	38.5
SouthWest: Roderick St															
30	L2	All MCs	16	6.7	16	6.7	0.181	5.9	LOS A	0.4	2.8	0.52	0.64	0.52	36.2
31	T1	All MCs	46	6.8	46	6.8	0.181	5.8	LOS A	0.4	2.8	0.52	0.64	0.52	36.6
32	R2	All MCs	99	7.4	99	7.4	0.181	9.2	LOS A	0.4	2.8	0.52	0.64	0.52	27.4
32u	U	All MCs	5	0.0	5	0.0	0.181	10.4	LOS A	0.4	2.8	0.52	0.64	0.52	26.9
Approach			166	7.0	166	7.0	0.181	8.0	LOS A	0.4	2.8	0.52	0.64	0.52	32.1
All Vehicles			1066	5.2	1066	5.2	0.422	5.7	LOS A	1.0	7.2	0.42	0.54	0.42	38.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Marius St & Murray St - AM 8:00-9:00 (Site Folder: AM - 10 years Horizon- with Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [Proposed 2034 AM 8:00-9:00 (Network Folder: UNE Tamworth - Proposed - AM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Marius St															
21	L2	All MCs	208	4.5	208	4.5	0.503	8.9	LOS A	1.7	12.2	0.79	0.70	0.86	36.8
22	T1	All MCs	725	5.7	725	5.7	0.503	8.1	LOS A	1.7	12.4	0.78	0.67	0.81	40.7
23	R2	All MCs	57	3.7	57	3.7	0.503	12.3	LOS A	1.7	12.4	0.78	0.66	0.79	41.7
23u	U	All MCs	12	9.1	12	9.1	0.503	14.6	LOS B	1.7	12.4	0.78	0.66	0.79	41.0
Approach			1002	5.4	1002	5.4	0.503	8.6	LOS A	1.7	12.4	0.78	0.68	0.82	40.2
NorthEast: Murray St															
24	L2	All MCs	36	2.9	36	2.9	0.343	6.1	LOS A	0.6	3.9	0.55	0.68	0.56	43.5
25	T1	All MCs	169	1.2	169	1.2	0.343	6.2	LOS A	0.6	3.9	0.55	0.68	0.56	38.4
26	R2	All MCs	88	1.2	88	1.2	0.343	10.9	LOS A	0.6	3.9	0.55	0.68	0.56	40.4
26u	U	All MCs	1	0.0	1	0.0	0.343	13.0	LOS A	0.6	3.9	0.55	0.68	0.56	43.2
Approach			295	1.4	295	1.4	0.343	7.6	LOS A	0.6	3.9	0.55	0.68	0.56	40.0
NorthWest: Marius St															
27	L2	All MCs	27	7.7	27	7.7	0.327	5.4	LOS A	0.7	5.5	0.62	0.58	0.62	41.0
28	T1	All MCs	324	10.7	324	10.7	0.327	5.4	LOS A	0.7	5.5	0.63	0.60	0.63	40.8
29	R2	All MCs	203	14.5	203	14.5	0.327	10.6	LOS A	0.7	5.5	0.64	0.71	0.64	31.4
29u	U	All MCs	8	0.0	8	0.0	0.327	11.9	LOS A	0.7	5.5	0.64	0.71	0.64	36.2
Approach			563	11.8	563	11.8	0.327	7.3	LOS A	0.7	5.5	0.63	0.64	0.63	38.2
SouthWest: Murray St															
30	L2	All MCs	339	2.2	339	2.2	0.758	14.2	LOS A	3.2	22.6	0.95	1.05	1.44	34.8
31	T1	All MCs	222	0.0	222	0.0	0.758	14.1	LOS A	3.2	22.6	0.95	1.05	1.44	37.9
32	R2	All MCs	189	8.9	189	8.9	0.432	16.8	LOS B	1.0	7.4	0.81	0.92	0.94	35.0
32u	U	All MCs	7	0.0	7	0.0	0.432	18.1	LOS B	1.0	7.4	0.81	0.92	0.94	29.0
Approach			758	3.2	758	3.2	0.758	14.8	LOS B	3.2	22.6	0.91	1.01	1.31	35.7
All Vehicles			2618	5.7	2618	5.7	0.758	10.0	LOS A	3.2	22.6	0.76	0.77	0.89	38.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 104 [Peel St & Murray St & Scott Rd - PM 4:45-5:45 (Site Folder: PM - 10 years Horizon- with Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [Proposed 2034 PM 4:45-5:45 (Network Folder: UNE Tamworth - Proposed - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Peel St															
21	L2	All MCs	84	0.0	84	0.0	0.284	10.1	LOS A	0.6	4.1	0.74	0.75	0.74	47.4
22	T1	All MCs	66	0.0	66	0.0	0.284	6.9	LOS A	0.6	4.1	0.74	0.75	0.74	34.8
23	R2	All MCs	35	0.0	35	0.0	0.284	12.2	LOS A	0.6	4.1	0.74	0.75	0.74	34.8
23u	U	All MCs	1	0.0	1	0.0	0.284	14.0	LOS A	0.6	4.1	0.74	0.75	0.74	39.2
Approach			186	0.0	186	0.0	0.284	9.4	LOS A	0.6	4.1	0.74	0.75	0.74	43.0
NorthEast: Murray St															
24	L2	All MCs	39	0.0	39	0.0	0.250	7.6	LOS A	0.5	3.8	0.70	0.68	0.70	42.7
25	T1	All MCs	528	2.2	528	2.2	0.574	8.5	LOS A	2.0	14.8	0.80	0.76	0.91	48.9
26	R2	All MCs	85	30.9	85	30.9	0.574	14.9	LOS B	2.0	14.8	0.83	0.78	0.97	36.7
26u	U	All MCs	12	0.0	12	0.0	0.574	15.9	LOS B	2.0	14.8	0.83	0.78	0.97	36.7
Approach			664	5.7	664	5.7	0.574	9.4	LOS A	2.0	14.8	0.80	0.76	0.91	47.7
NorthWest: Peel St															
27	L2	All MCs	217	1.0	217	1.0	0.295	6.1	LOS A	0.6	4.4	0.65	0.65	0.65	34.5
28	T1	All MCs	57	0.0	57	0.0	0.534	5.7	LOS A	1.6	11.4	0.73	0.77	0.81	37.6
29	R2	All MCs	493	0.4	493	0.4	0.534	11.2	LOS A	1.6	11.4	0.73	0.77	0.81	44.6
29u	U	All MCs	1	0.0	1	0.0	0.534	13.0	LOS A	1.6	11.4	0.73	0.77	0.81	30.8
Approach			767	0.5	767	0.5	0.534	9.3	LOS A	1.6	11.4	0.71	0.73	0.77	42.9
SouthWest: Scott Rd															
30	L2	All MCs	254	10.8	254	10.8	0.320	5.2	LOS A	0.8	6.0	0.46	0.49	0.46	50.5
31	T1	All MCs	463	3.2	463	3.2	0.320	4.6	LOS A	0.8	6.0	0.45	0.47	0.45	49.8
32	R2	All MCs	45	0.0	45	0.0	0.320	10.2	LOS A	0.8	5.9	0.44	0.47	0.44	48.8
32u	U	All MCs	1	0.0	1	0.0	0.320	12.6	LOS A	0.8	5.9	0.44	0.47	0.44	52.6
Approach			763	5.5	763	5.5	0.320	5.1	LOS A	0.8	6.0	0.45	0.48	0.45	49.9
All Vehicles			2381	3.5	2381	3.5	0.574	8.0	LOS A	2.0	14.8	0.65	0.66	0.70	46.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [Peel St & Roderick St - PM 4:45-5:45 (Site Folder: PM - 10 years Horizon- with Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [Proposed 2034 PM 4:45-5:45 (Network Folder: UNE Tamworth - Proposed - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Peel St															
21	L2	All MCs	104	1.0	104	1.0	0.279	4.5	LOS A	0.6	4.3	0.36	0.50	0.36	37.2
22	T1	All MCs	187	0.0	187	0.0	0.279	4.4	LOS A	0.6	4.3	0.36	0.50	0.36	40.9
23	R2	All MCs	37	0.0	37	0.0	0.279	7.7	LOS A	0.6	4.3	0.36	0.50	0.36	39.7
23u	U	All MCs	3	0.0	3	0.0	0.279	9.1	LOS A	0.6	4.3	0.36	0.50	0.36	35.2
Approach			332	0.3	332	0.3	0.279	4.8	LOS A	0.6	4.3	0.36	0.50	0.36	39.7
NorthEast: Roderick St															
24	L2	All MCs	168	1.3	168	1.3	0.429	9.4	LOS A	1.2	8.5	0.81	0.78	0.87	31.4
25	T1	All MCs	85	1.2	85	1.2	0.429	9.3	LOS A	1.2	8.5	0.81	0.78	0.87	34.5
26	R2	All MCs	44	0.0	44	0.0	0.429	12.6	LOS A	1.2	8.5	0.81	0.78	0.87	36.7
26u	U	All MCs	2	0.0	2	0.0	0.429	14.0	LOS A	1.2	8.5	0.81	0.78	0.87	36.4
Approach			300	1.1	300	1.1	0.429	9.9	LOS A	1.2	8.5	0.81	0.78	0.87	33.5
NorthWest: Peel St															
27	L2	All MCs	100	1.1	100	1.1	0.594	8.0	LOS A	2.0	14.9	0.75	0.73	0.86	38.6
28	T1	All MCs	409	6.4	409	6.4	0.594	8.2	LOS A	2.0	14.9	0.75	0.73	0.86	34.0
29	R2	All MCs	11	0.0	11	0.0	0.594	11.2	LOS A	2.0	14.9	0.75	0.73	0.86	35.6
29u	U	All MCs	15	0.0	15	0.0	0.594	12.9	LOS A	2.0	14.9	0.75	0.73	0.86	38.4
Approach			535	5.1	535	5.1	0.594	8.4	LOS A	2.0	14.9	0.75	0.73	0.86	35.4
SouthWest: Roderick St															
30	L2	All MCs	28	0.0	28	0.0	0.391	5.5	LOS A	1.0	6.7	0.52	0.63	0.52	36.5
31	T1	All MCs	108	0.0	108	0.0	0.391	5.4	LOS A	1.0	6.7	0.52	0.63	0.52	36.9
32	R2	All MCs	271	0.8	271	0.8	0.391	8.8	LOS A	1.0	6.7	0.52	0.63	0.52	27.6
32u	U	All MCs	3	0.0	3	0.0	0.391	10.2	LOS A	1.0	6.7	0.52	0.63	0.52	23.2
Approach			411	0.5	411	0.5	0.391	7.7	LOS A	1.0	6.7	0.52	0.63	0.52	32.1
All Vehicles			1577	2.1	1577	2.1	0.594	7.7	LOS A	2.0	14.9	0.62	0.66	0.67	35.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 106 [Marius St & Murray St - PM 4:45-5:45 (Site Folder: PM - 10 years Horizon- with Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [Proposed 2034 PM 4:45-5:45 (Network Folder: UNE Tamworth - Proposed - PM)]

UNE Tamworth
27 July 2023 - AM Peak Period: 8:00-9:00
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Marius St															
21	L2	All MCs	158	6.7	158	6.7	0.325	8.4	LOS A	0.9	6.7	0.77	0.68	0.77	37.2
22	T1	All MCs	389	10.3	389	10.3	0.325	7.9	LOS A	1.0	7.4	0.76	0.65	0.76	40.8
23	R2	All MCs	23	0.0	23	0.0	0.325	11.9	LOS A	1.0	7.4	0.76	0.64	0.76	42.4
23u	U	All MCs	7	0.0	7	0.0	0.325	14.1	LOS A	1.0	7.4	0.76	0.64	0.76	42.4
Approach			578	8.7	578	8.7	0.325	8.3	LOS A	1.0	7.4	0.76	0.66	0.76	40.2
NorthEast: Murray St															
24	L2	All MCs	27	0.0	27	0.0	0.343	7.6	LOS A	0.7	4.7	0.74	0.84	0.79	42.0
25	T1	All MCs	125	0.8	125	0.8	0.343	8.7	LOS A	0.7	4.7	0.74	0.84	0.79	35.8
26	R2	All MCs	53	0.0	53	0.0	0.343	13.3	LOS A	0.7	4.7	0.74	0.84	0.79	38.8
26u	U	All MCs	1	0.0	1	0.0	0.343	15.5	LOS B	0.7	4.7	0.74	0.84	0.79	41.3
Approach			206	0.5	206	0.5	0.343	9.8	LOS A	0.7	4.7	0.74	0.84	0.79	37.9
NorthWest: Marius St															
27	L2	All MCs	39	0.0	39	0.0	0.559	7.8	LOS A	1.7	11.9	0.81	0.82	0.97	40.5
28	T1	All MCs	485	3.3	485	3.3	0.559	7.9	LOS A	1.7	11.9	0.81	0.83	0.98	40.0
29	R2	All MCs	282	9.3	282	9.3	0.559	13.9	LOS A	1.6	11.6	0.81	0.91	1.01	27.6
29u	U	All MCs	19	0.0	19	0.0	0.559	15.1	LOS B	1.6	11.6	0.81	0.91	1.01	33.0
Approach			825	5.1	825	5.1	0.559	10.2	LOS A	1.7	11.9	0.81	0.86	0.99	36.4
SouthWest: Murray St															
30	L2	All MCs	242	0.4	242	0.4	0.543	8.0	LOS A	1.6	11.5	0.75	0.74	0.85	40.7
31	T1	All MCs	232	0.5	232	0.5	0.543	8.1	LOS A	1.6	11.5	0.75	0.74	0.85	44.0
32	R2	All MCs	438	3.8	438	3.8	0.540	12.4	LOS A	1.6	11.8	0.74	0.78	0.83	38.9
32u	U	All MCs	72	0.0	72	0.0	0.540	14.3	LOS A	1.6	11.8	0.74	0.78	0.83	33.3
Approach			983	1.9	983	1.9	0.543	10.4	LOS A	1.6	11.8	0.75	0.76	0.84	40.1
All Vehicles			2593	4.3	2593	4.3	0.559	9.8	LOS A	1.7	11.9	0.77	0.78	0.86	38.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.