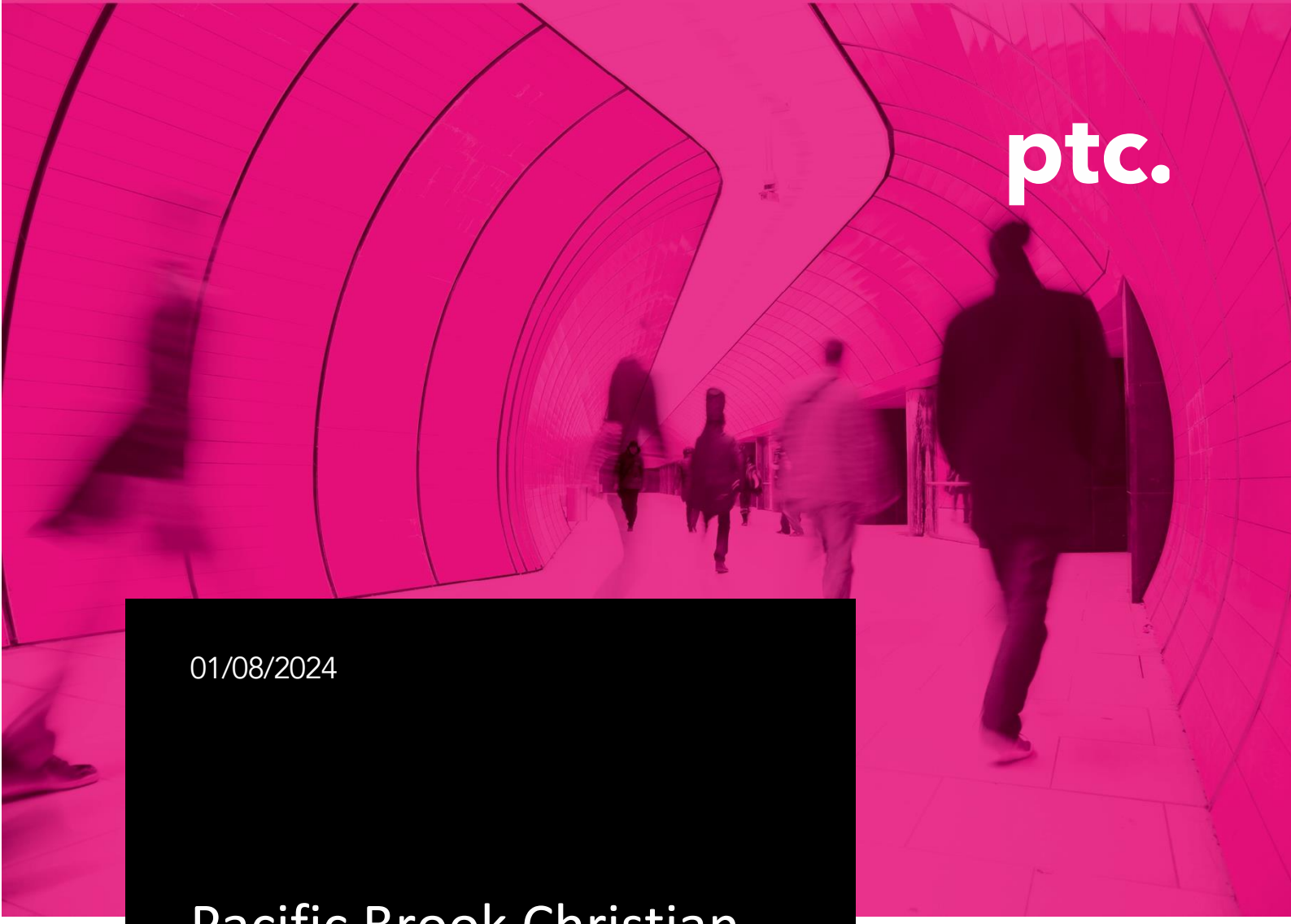

01/08/2024

Pacific Brook Christian School

NBRS

Traffic Impact Assessment;

For: NBRS

Site Address: 72 Maitland Street, Muswellbrook, NSW 2333

Document reference number: 24-0961

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1. Introduction

1.1. Background

ptc. has been engaged by the NBRS to prepare a Traffic Impact Assessment in relation to the proposed Pacific Brook Christian School located at 72-74 Maitland Street, Muswellbrook. The assessment focuses on Stage 1 of the master plan (the School), which proposes to accommodate up to 140 students.

A development application (DA) will be submitted to Muswellbrook Shire Council for these works.

1.2. Purpose of this Report

This report presents the following considerations in relation to the Traffic and Parking Assessment of the proposal:

Section 2 Background information on the proposal;

Section 3: A description of the existing transport characteristics of the locality serving the development property;

Section 4: Assessment of the proposed parking provision in the context of the relevant planning control requirements;

Section 5: Determination of the traffic activity associated with the development proposal, and the adequacy of the surrounding road network;

Section 6: Assessment of the proposed car park design, Pick – up and Drop off area, queuing analysis

Section 7: Conclusion.

2. Site Context

2.1. School Location and Current Use

The proposed School site is located at 72-74 Maitland Street, Muswellbrook and is located approximately 250 kilometres north of Sydney CBD. More specifically, it is located south of Muswellbrook Golf Course and north of Muswellbrook Showground. The site has a frontage to Maitland Street on the southwestern boundary.

The site is a former nursery which consists of clad buildings, metal sheds and a greenhouse shed. An aerial view of the site is provided in Figure 1.

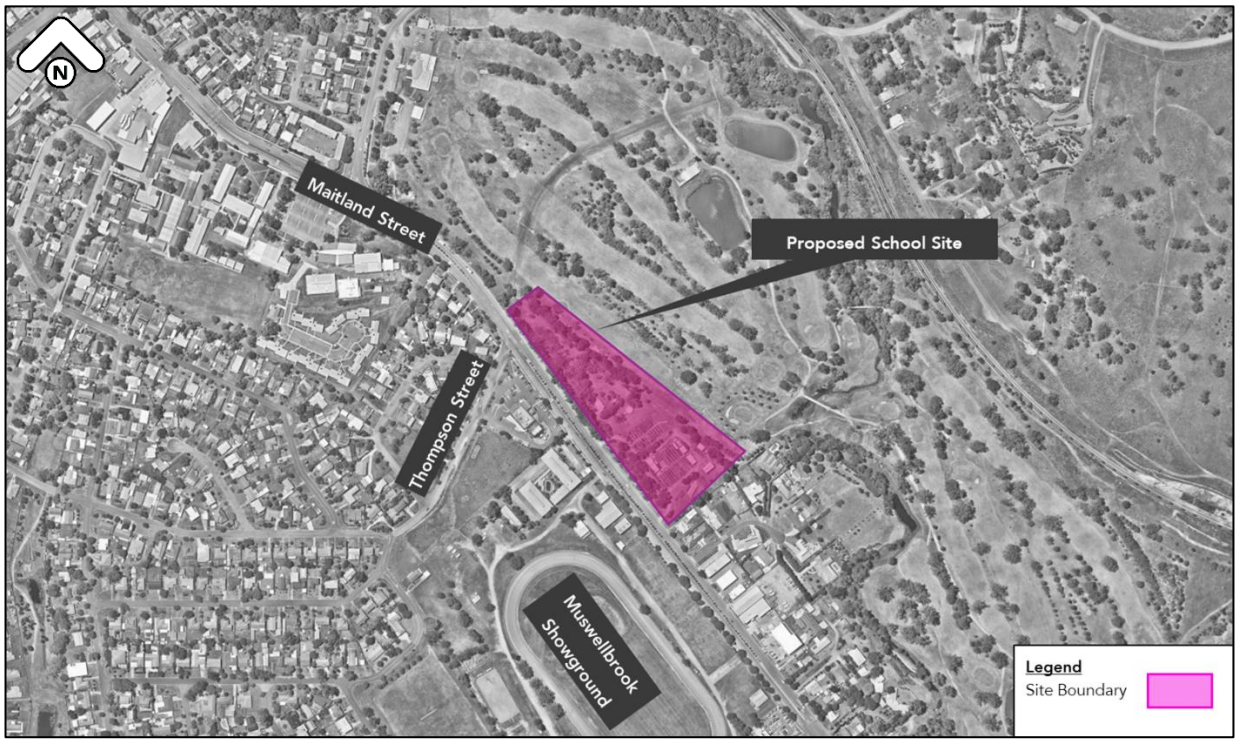


Figure 1 – School Location (Source: Nearmap)

2.2. Surrounding Land Use

The proposed site is currently zoned as a R1 General Residential. The following uses are surrounding the proposed development:

- To the south, the surrounds are predominantly R1 (General Residential)
- Directly opposite the site is the Muswellbrook Showground, zoned as a E3 Environment Management
- Surrounding the northern side of the site is the Muswellbrook Golf Course zoned as RE2 Private Recreation

- There are also some RE1 (Public Recreation), and E3 (Environment Management) zones within the vicinity of the site.
- A railway corridor to the north of the Golf Course leads to the Muswellbrook Railway Station and provides a barrier to the north of Muswellbrook.

The surrounding land uses are presented in Figure 2.

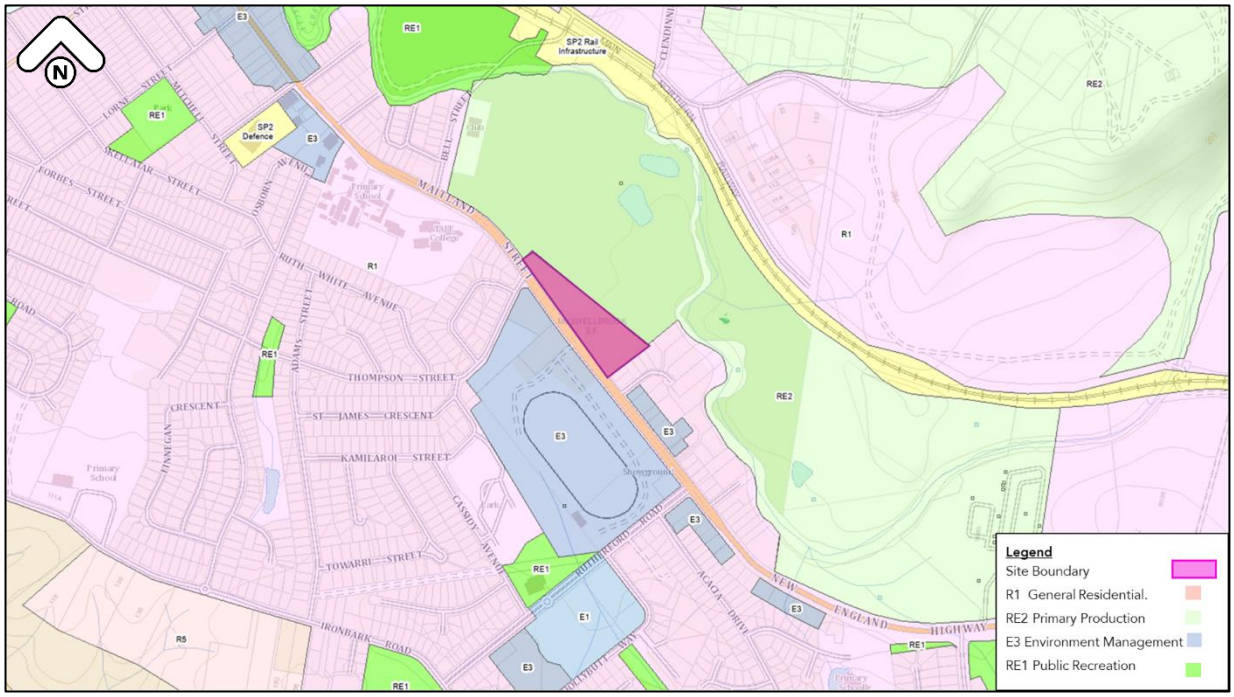


Figure 2 – Local Land Use map (Source: NSW Planning Viewer)

2.3. Proposed Development

2.3.1. General Description

Stage 1 of the masterplan consists of:

- Site remediation;
- Facilities for a maximum of 140 students and 16 staff, including:
    - One (1) administration and staff area;
    - One (1) staff and student amenities block (including one (1) end of trip facility);
    - Five (5) General Learning Areas (GLAs);
    - One (1) Science classroom; and
    - Covered Outdoor Learning Area (COLA)
- Internal pathways.
- On-site Parking (15 spaces, including of 1 accessible);
- Evacuation bus bays

- Kiss and drop off areas;
- Bus stop;
- Signage;
- Infrastructure works; and
- Widening of existing vehicular access from Maitland Street.

The proposed School layout is shown in Figure 3 and in Appendix 1.

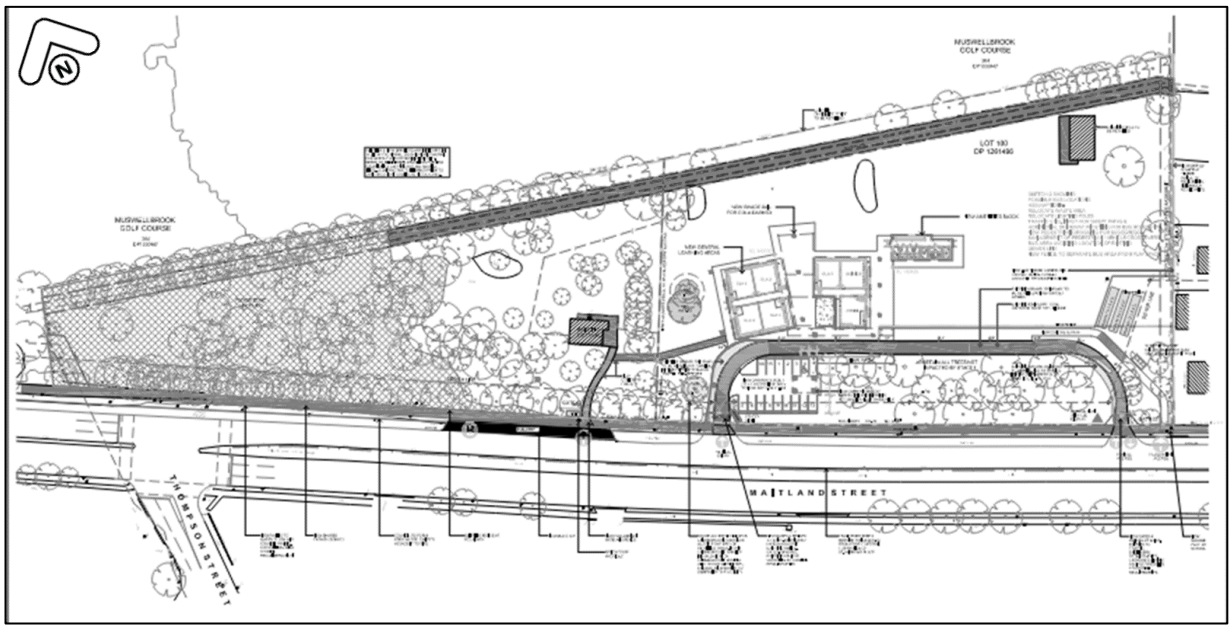


Figure 3 – School Site Plan – Stage 1

2.3.2. School Characteristics

The School characteristics relevant from a traffic and parking perspective is as follows:

- 140 students from Kindergarten to Year 12;
- 16 staff;
- Car parking area consisting of 5 parking spaces, including 1 accessible car space;
- The following bell times are proposed:
    - Start – 8:50am
    - Finish – 3:10pm
- The following timetables are proposed for before and after school activities:
    - Before School Care: 7:30am – 8:50am
    - After School Care: 2:50 – 6:30pm

2.4. Site Access

2.4.1. Vehicular Access

The site has frontage along Maitland Street to the southwest, with two vehicular access points from this street. The northern access (entry) leads to a drive-through lane, connecting to a drop-off/pick-up area and a car park, and subsequently to the exit driveway at the other end. The vehicular access is depicted in Figure 4.

2.4.2. Pedestrian Access

The site proposes two pedestrian access points from Maitland Street. Currently, there are no footpaths on the eastern side of the carriageway along the site, and no crossings, making the site inaccessible by foot. However, the School proposed footpath along the school site, which will connect to the footpath and crossing at the intersection of Maitland Street (New England Highway) and Thompson Street, thereby making the school site accessible by foot. The school pedestrian access is shown in Figure 4.

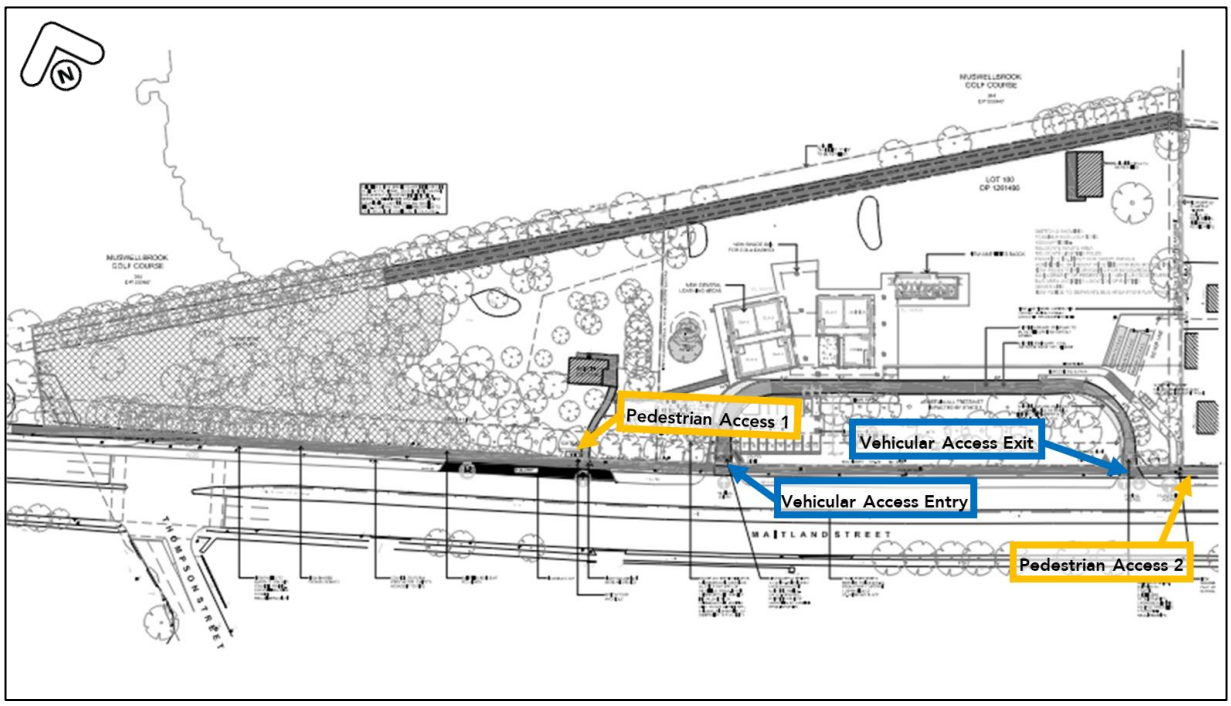


Figure 4 – Access Arrangement

2.5. Evacuation Bus Bays

As previously mentioned, the development proposes to provide bus bays on-site. These buses are an integral part of the school's Flood Emergency Response Plan (FERP). In the event of a flood exceeding the 0.2% Annual Exceedance Probability (AEP) or a 1 in 500-year event, staff and students will be evacuated via these buses to the Muswellbrook Indoor Sports Centre on Rutherford Rd. The evacuation route is illustrated in the map provided in the FERP.

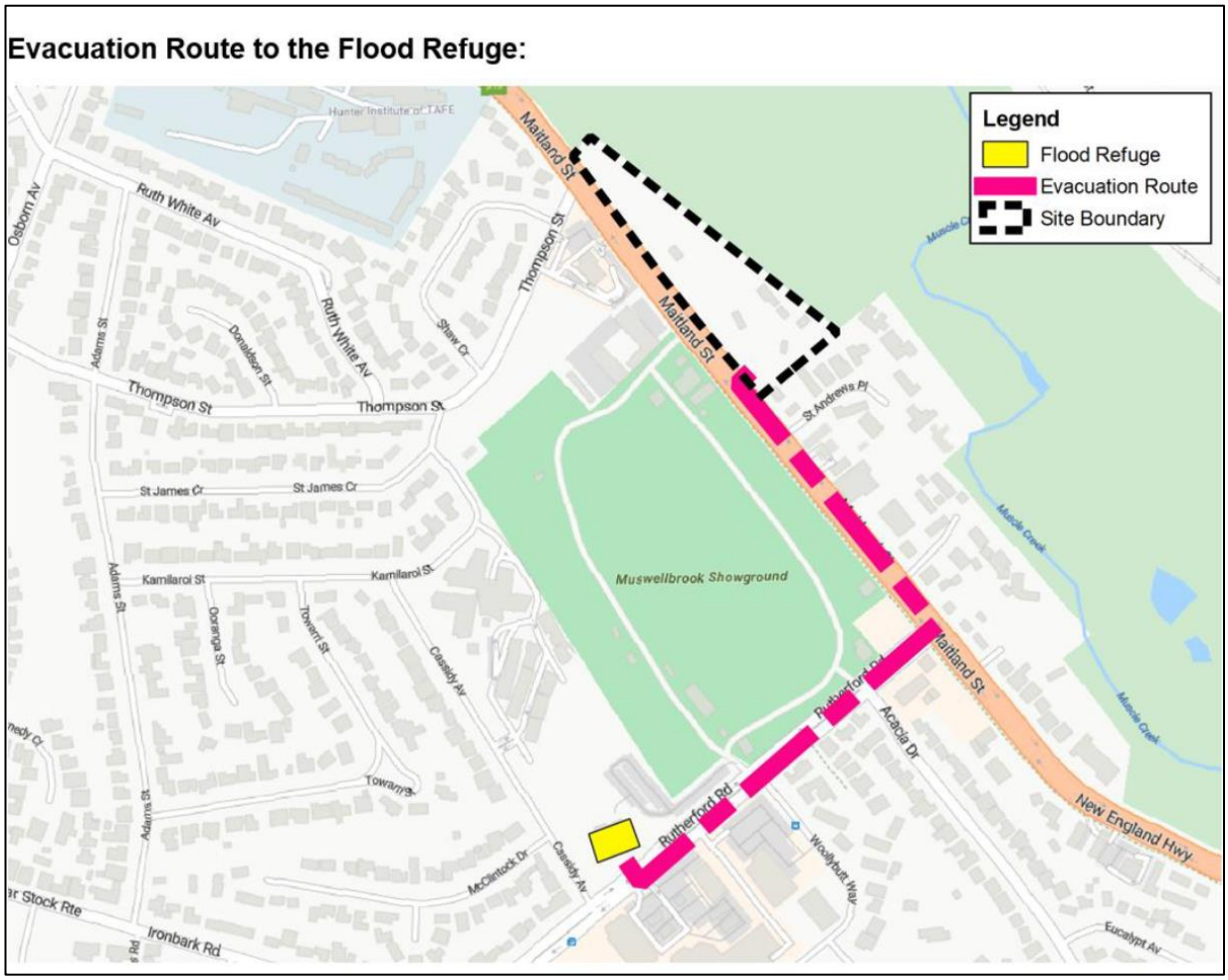


Figure 5 –Evacaution Route to the Flood Regue (Source: Flood Emergency Response Plan (FERP))

The bus bay design complies with AS2809.2, subject to the comments in Appendix 2. The bay dimensions are to be designed at 3.5 x 12.5 metres, and the swept path analysis indicates that buses can manoeuvre in and out of the site in a forward direction. It is important to note that these bus bays are designated solely for emergency use and will not be utilised by other buses at any other time. For more details, please refer to Appendix 2.

3. Existing Transport Facilities

3.1. Road Hierarchy

The subject site is located in the suburb of Muswellbrook and is primary serviced by Maitland Street i.e., a state road. The road hierarchy is illustrated in Figure 6.

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

- **State Roads** - Freeways and Primary Arterials (TfNSW managed)
- **Regional Roads** - Secondary or sub-arterials (Council managed, partly funded by the State)
- **Local Roads** - Collector and local access roads (Council managed)

Figure 6 – Surrounding Road Network (Source: TfNSW State and Regional Roads)

Table 1: Road Network Characteristics - Maitland Street

Maitland Street	
Road Classification	State Road – Council managed
Alignment	Northeast - Southwest
Number of Lanes	2 lanes in each direction
Carriageway Type	Divided
Carriageway Width	23m
Speed Limit	50km/h
School Zone	Yes
Parking Controls	Northbound – 'Loading Zone 7am – 5pm Mon-Fri'
Forms Site Frontage	Southbound – no parking restrictions

Figure 7: Maitland Street (Source: Google Map)

Table 2: Road Network Characteristics - Rutherford Road

Rutherford Road	
Road Classification	Local Road
Alignment	Northeast - Southwest
Number of Lanes	1 lane in each direction
Carriageway Type	Divided
Carriageway Width	21m
Speed Limit	50km/h
School Zone	No
Parking Controls	Unrestricted Parking
Forms Site Frontage	No

Figure 8: Rutherford Road (Source: Google Map)

Table 3: Road Network Characteristics - Thompson Street

Thompson Street	
Road Classification	Local Road
Alignment	North - South
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m
Speed Limit	50km/h
School Zone	No
Parking Controls	"No Stopping" on eastern side, unrestricted on western side
Forms Site Frontage	No

Figure 9: Thompson Street (Source: Google Map)

3.2. Public Transport

The locality has been assessed in the context of available forms of public transport that may be utilised by prospective students and staff. When defining accessibility, the *NSW Planning Guidelines for Walking and Cycling (2004)* suggests that 400m-800m is a comfortable walking distance. The 800 - 400m walking catchment are shown in Figure 10.

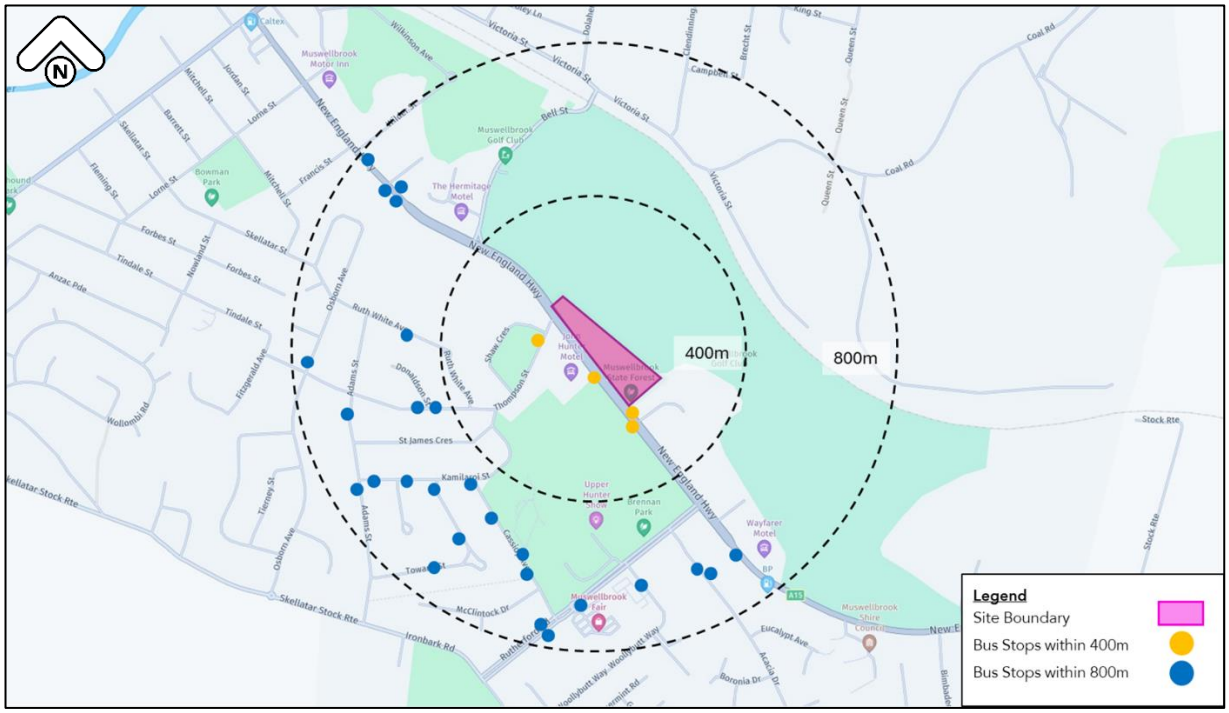


Figure 10 – 400 - 800m Catchment (source: Nearmap)

3.2.1. Public Bus Services

There are about 30 bus stops which are located within the 800m catchment of the subject site, with four of these within 400m of the site. A summary of the bus routes is presented in Table 5.

Table 4: Bus Operation Timetables (Source: Northern Rivers Buslines and TfNSW)

Routes	Direction	School Days Operation timetable
411	Muswellbrook - Muswellbrook Hospital (Loop Service)	Mon-Fri: 38-87 minutes intervals, between 9:07am and 2:12pm
413	Muswellbrook – Highbrook (Loop Service)	Mon-Fri: 36-90 minutes intervals, between 10:05am and 2:54pm
414	Muswellbrook – Scone (Loop Service)	Mon-Fri: 55-150 minutes intervals, between 6:50am and 5:55pm Sat - Sun: No services
415	Muswellbrook – Scone (Loop Service)	Mon-Fri: Approximately 4 hours interval, between 8:03am and 12:58pm Sat - Sun: No services
418	Muswellbrook – Eastlinks (Loop Service)	Mon-Fri: 60-130 minutes intervals, between 9:20am and 2:52pm Sat: 60 minutes intervals, between 9:20am and 12:21pm

The development is poorly serviced by bus, with services every 36 minutes to 4 hours throughout the day on weekdays. In addition, most of the buses commence their services after the morning bell time and conclude their services before the afternoon bell time.

Considering the above, the current public bus services are not a reliable or convenient travel mode option for students, parents and staff.

3.2.2. School Buses

The current school location is serviced by school buses run by Osborn's Transport.

The proposed School site location is not currently serviced; However, preliminary discussions with the local bus operator have already commenced and the routes would be reviewed in due course.

3.2.3. Active Transport

Walking catchments of 400m and 800m (5 and 10 minutes, respectively) show that walking is a viable transport option for short trips. It is the most space-efficient mode of transport and offers significant benefits. Replacing motorized trips with walking improves individual health, reduces road congestion, and lowers noise and emissions. However, the likelihood of walking depends on the amenities available between the trip's origin and destination. South of Maitland Street falls within the walking catchment, while the north has limited coverage due to the golf course and railway line.

Moreover, the subject site features shared bicycle paths, road shoulders, and quiet streets, as defined by the TfNSW Cycleway Finder, enhancing the safety and appeal of cycling. Figure 11 shows various cycleways connecting the school in all directions, making cycling a viable transport option to the site.

Figure 11 - Cycling Paths (Source: TfNSW Cycleway Finder)

4. Parking Assessment

4.1. Planning Policy Requirements

The School is subject to the parking provision rates stipulated in the following planning documents:

- *Muswellbrook Shire Development Control Plan 2009 (DCP)*
- *Building Code of Australia 2019*
- *Planning Guidelines for Walking and Cycling (NSW Government 2004)*

4.2. Car Parking

Section 16.6 of the DCP stipulates minimum car parking rates for educational establishments. The car parking requirements and provisions for the School is summarised in Table 5.

Table 5: Car parking provision

User Group	Level	No.	Minimum Car Parking Provision Rate	Minimum Car Parking Requirement	Car Parking Provided
Staff		16	1 space per 2 employees	8	15
Student	Primary School	75	1 space per 12 students	6.3	
	Secondary School	65	1 space per 10 students	6.5	
Total				21 Note 1	

Note 1: According to the DCP, the total number of parking spaces is rounded to the next highest whole number.

It is anticipated that the school will have 16 staff members, which results in a minimum requirement of 8 car parking spaces based on the DCP. The Department of Education's parking policy states that "A school is not obliged to provide parking on site to anyone at any time. "This policy offers flexibility and acknowledges that various logistical and environmental factors influence parking needs. The proposal to provide 15 car spaces, which will be used by both staff, visitors, and secondary school students, meets the minimum requirement, and adequately meets the demand. This approach is reasonable given that the majority of the students will primarily be dropped off and picked up, reducing the need for student parking spaces, especially for primary school students. Additionally, not all staff members will commute by private car, with many likely to use public transport, carpool, or other modes of travel. Therefore, the current provision is deemed to be sufficient.

4.3. Accessible Car Parking

The DCP does not stipulate any car parking rates for people with disabilities; hence reference is made to *Building Code of Australia 2019 (BCA)*. Schools are categorised as a Class 9b facility in accordance with Part A6.9 of the BCA. The accessible parking provision requirement for Class 9b buildings are

stipulated in Table D3.5 of BCA. The accessible parking requirement and provisions are summarised in Table 6.

Table 6: Accessible Car Parking Provision

User Group	Total Car Parking Provided	Accessible Car Parking Provision Rate	Provided
Class 9b - School	16	1 space for every 100 car parking spaces or part thereof	1

4.4. Bicycles Spaces

The DCP does not stipulate any bicycle parking rates for educational establishments, hence, reference is made to *NSW Planning Guidelines for Walking & Cycling 2004 and Austroads Guide to Traffic Management Part 11* which outlines the bicycle parking requirement for staff and visitor, and students respectively for both primary and secondary school. The bicycle parking requirement and provision for Stage 1 is summarised in Table 8.

Table 7: Bicycle Parking Provision

User Group	Number	Bicycle Parking Provision Rate	Bicycle Parking Requirement	Bicycle Parking to be Provided
Planning Guidelines for Walking and Cycling				
Staff	16	3-5% staff (long-term use)	1 space	11
Visitor		5-10% staff (short-term use)	1 – 2 spaces	
Austroads Guide to Traffic Management				
Primary School Students	75 (Approx. 22 Year 5 & Year 6)	1 space for 5 students over Year 4	4 spaces	
Secondary School Students	Approx. 65 students in Year 7 - 12	1 space for 20 students	3 spaces	
TOTAL			11 spaces	

Based on the planning guidelines the project requires 1 bicycle space for staff, 1-2 bicycle spaces for visitors and 9 spaces for students. To meet this requirement, the proposal provides a total of 11 bicycle spaces, accommodated by 6 bike racks, for use by staff, visitors, and students.

4.4.1. End of Trip Facilities

The *NSW Planning Guidelines for Walking & Cycling 2004* also stipulate a requirement for personal lockers, showers and change rooms for staff bicycle parking facilities. The requirements and provisions are summarised in Table 8 and Table 9 respectively.

Table 8 – Lockers for Staff Requirement and Provision

Use	Racks	Lockers Provision Rate	Lockers Requirement	Lockers Provided
The School	1	1 locker for 3 bicycle racks	2	2

Table 9 – Showers Requirement and Provision

Use	No. of Staff	Shower Provision Rate	Requirement	Provided
The School	16	- 1 shower for 0 up to 12 staff - 2 (1 male and 1 female) showers for 13 up to 49 staff - 4 (2 male and 2 female) showers for 50 up to 149 staff	2	1 unisex

Table 10 – Change Rooms Requirement and Provision

Use	No. of Staff	Change Cubicle Provision Rate	Requirement	Provided
The School	16	- 1 change cubicle for 0 up to 12 staff - 2 (1 male and 1 female) change cubicles for 13 up to 500 staff	2 (1 male and 1 female)	1 unisex

4.5. Motorbike Parking

The DCP does not stipulate any motorbike parking requirement and the development does not propose to provide any.

4.6. Service and Delivery

Section 16.4.4 of the DCP specifies that loading and unloading facilities can be accommodated on-site. Although a service or waste collection area is not presently included in the plans, it will be added at a later stage. Waste collection vehicles will enter the site via the entry driveway, collect the waste, and then exit through the designated exit.

4.7. Emergency Vehicles

Emergency vehicles will enter the site through the northern entry and exit through the exit driveway, or use the bus bay to stop, if required.

5. Traffic Impact Assessment

In order to determine the traffic activity in the surrounding road network, following key intersections were analysed:

- Intersection 1 - Maitland Street / Thompson Street; and
- Intersection 2 - Maitland Street / Rutherford Road.

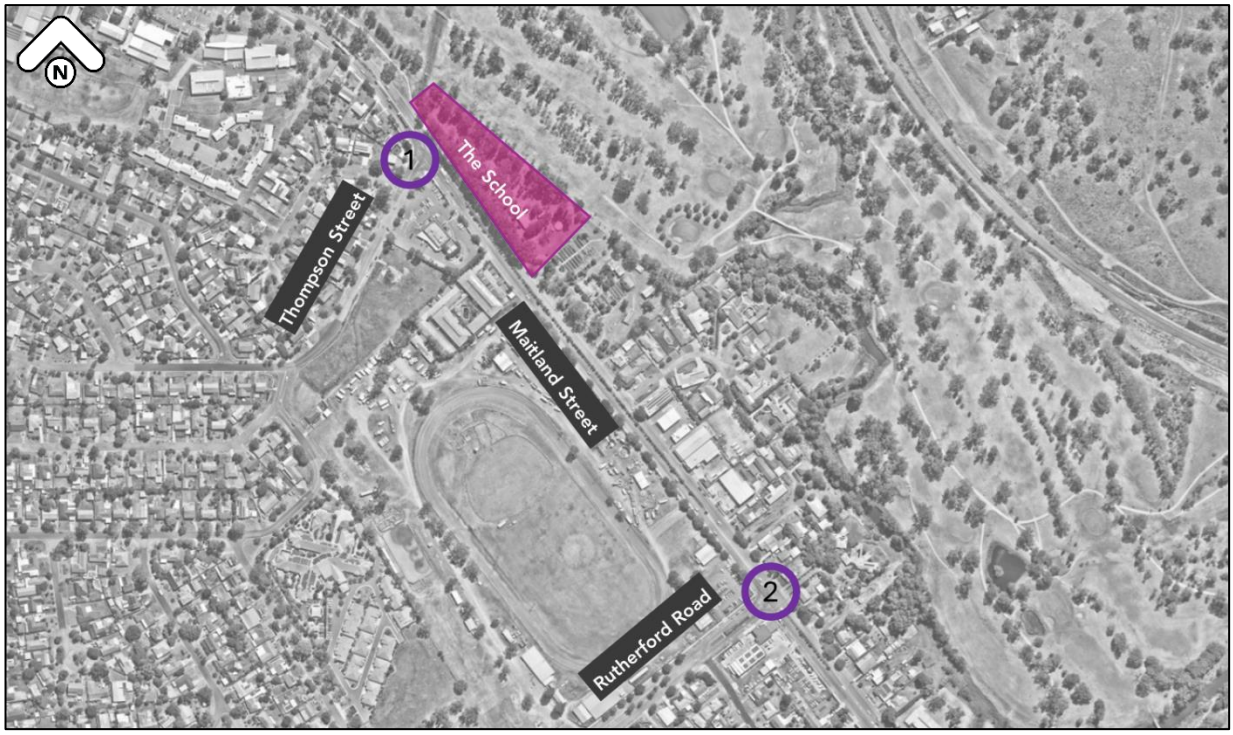


Figure 12 – Key Intersections

5.1. Existing Traffic and Peak Hour Volumes

To assess the current traffic conditions within the road network serving the school, traffic count surveys were conducted at key intersections on Tuesday, 6 August 2019. The surveys took place during peak hours, from 6:30 AM to 9:30 AM and from 3:00 PM to 6:00 PM. To project the traffic data to the current year (2024) and for a robust assessment an annual increase of 1% has been applied to the 2019 survey results.

The peak hours have been determined based on the traffic volumes during the morning and evening weekday commuter peaks. The two intersections were studied as a network and the AM and PM peak hours were identified to be from 8:15am to 9:15am and from 4:30pm to 5:30pm respectively. It should be noted that the network AM peak hour aligns with the school drop off hour, whereas the network PM peak hour does not align with the school pick up peak hour. In order to study the traffic impact of the school traffic, the school peaks are adopted for the PM peak hour in the traffic analysis. It should also be noted that the intersection survey spanned between 3pm and 6pm in the evening and therefore does not cover the 15 minutes interval between 2:45pm to 3pm. Therefore, traffic volumes

from 3pm to 4pm were taken instead for the analysis. The network peak hours adopted for the analysis are summarised in Table 11.

Table 11 – Network Peak Hour

Road Intersection	Weekday AM Network Peak Hour	Weekday PM Network Peak Hour
Maitland Street / Thompson Street	8:15am – 9:15pm	3:00pm – 4:00pm
Maitland Street / Rutherford Road		

The results of the intersection surveys conducted during the network's peak hours, adjusted by an annual increase of 1% to reflect the current year, 2024, are illustrated in the following figures for the AM peak hour and PM peak hour, respectively:

Figure 13 – Traffic Volumes during AM Peak Hour – Existing

Figure 14 – Traffic Volumes during PM Peak Hour – Existing

5.2. Development Traffic

5.2.1. Traffic Distribution

Area of students' residence has been analysed based on actual student location data. For the purposes of the development traffic analysis, the local residential areas surrounding the proposed School site have been divided into areas as shown in Figure 15.

Figure 15 – Student Residential Zones

The likely travel route of where students commute to and from the School is based on the assumption that the trips originate from their place of residence in the morning and vice versa in the afternoon can be deduced based on these residential zones.

Maitland Street has a median in front of the proposed School site and therefore, right turn from Maitland Street into the site and right turn from the site into the Maitland Street is not possible. All vehicles will enter the site turning left from Maitland Street and exit the site by turning left into Maitland Street.

The trip distribution at the key intersections and adjacent roads is presented in Figure 16.

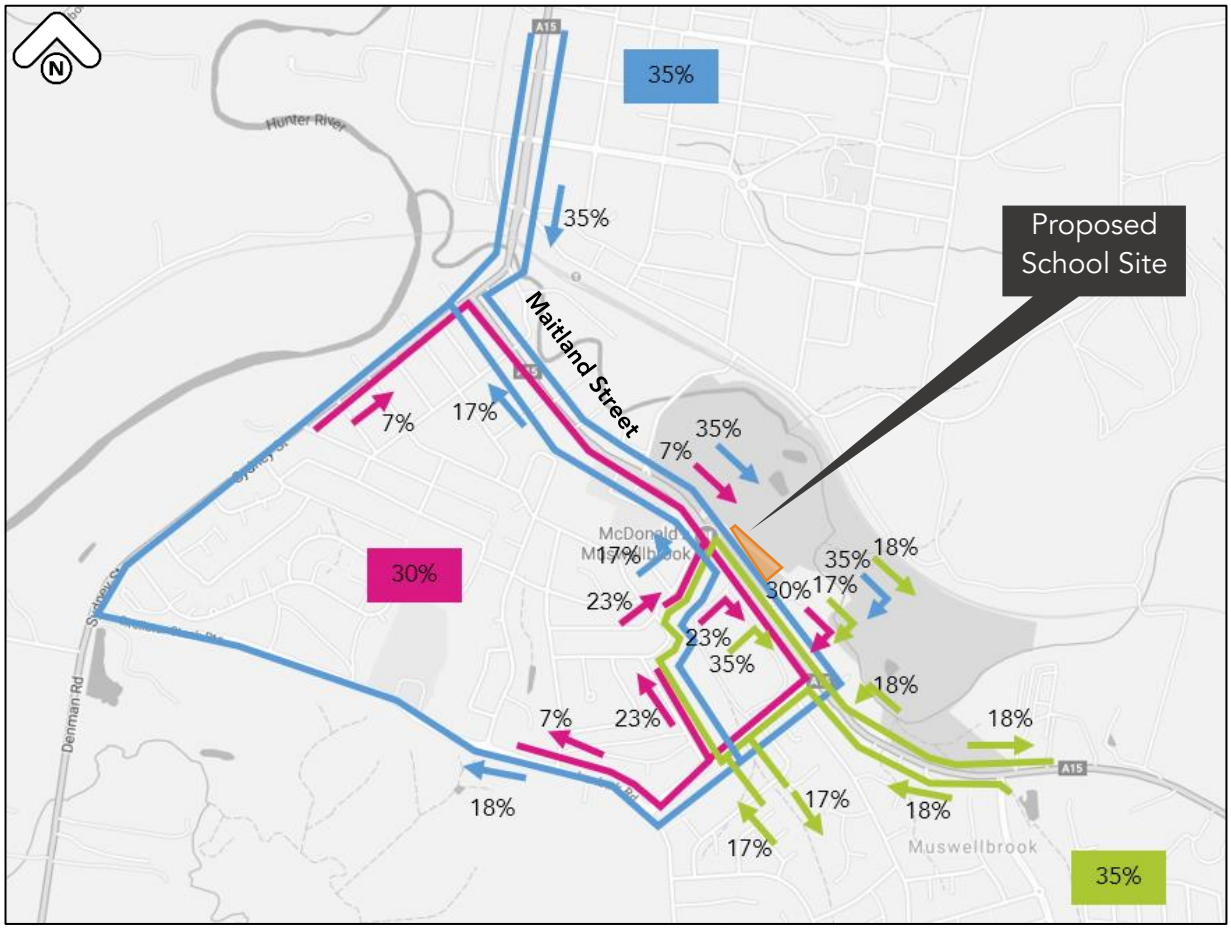


Figure 16 – Proposed Traffic Distribution for the AM and PM Peak Hours

5.2.2. Student Traffic Volumes

Projected student traffic volumes have been determined based on factors including the total number of future students, and car occupancy rates. The following assumptions have been made for this assessment:

- A conservative car occupancy rate of 1.2 passengers per vehicle is considered, drawing from ptc.'s experience with other schools.
- It is assumed, for a comprehensive evaluation, that all students will be dropped off and picked up by private vehicles.
- For conservative estimation purposes, it is assumed that no students will participate in Out of School Hours (OOSH) activities, although this scenario is unlikely. Therefore, all student arrivals and departures are expected to occur during peak school periods.

Considering all these factors, following number of vehicles are estimated during the morning and afternoon peak hour:

Table 12 – Summary of Existing Travel Characteristics

Travel Mode	Future Student Number	Mode Share – Private Vehicles	No. of Students not attending before and after school care	Vehicle Occupancy (students/vehicle)	Projected No. of Vehicles
Private Vehicle	140	100%	100%	1.2	117

As shown in Table 12, it is estimated that 117 vehicles will arrive and depart during the peak hour. It is expected that the trip generation will be applicable for both AM and PM peak hours, as it is anticipated that students will utilise the same travel mode to and from school.

Considering short dwell times, it is assumed that all 117 vehicles will arrive and depart during each of the peak hours, resulting in 117 inbound and outbound trips in the morning and afternoon peaks.

The number of trips at each intersection has been determined based on the above and the proposed traffic distribution described in Section 5.2.1.

The proposed future student traffic volumes for the AM and PM peak hours are presented in Figure 17 and Figure 18 respectively.

5.2.3. Staff Traffic Volumes

As outlined in Section 2.3.2, a total of 16 staff is anticipated for the masterplan. For a conservative assessment it is assumed that all 16 staff will travel by car, with a car occupancy of 1 staff per car. Therefore, it is estimated that the total number of vehicles during the peak hour is 16.

Although it can be expected that staff will generally arrive prior to the arrival of students in the morning and depart after students in the afternoon, a worst-case assessment of the potential staff trip generation has been undertaken.

As a worst-case assessment, it has been assumed that a 1 staff per vehicle ratio may be adopted, therefore 16 vehicles will arrive in the morning school peak and all 16vehicles will depart in the afternoon school peak. These volumes have been incorporated into the SIDRA traffic model for the post-development scenarios to assess the development traffic activity.

The trip distribution for staff is considered to be the same as for students as described in Section 5.2.1. The only difference is that all staff trips are considered to be inbound only in the morning and outbound only in the afternoon.

The proposed future staff and students traffic volumes for the AM and PM peak hours are presented in Figure 17 and Figure 18 respectively.

Figure 17 – Proposed Future Student and Staff Traffic Volumes during the AM Peak Hour

Figure 18 – Proposed Future Student and Staff Traffic Volumes during the PM Peak Hour

5.3. 10-Year Traffic Growth

In order to determine the 10-years traffic growth, the major development projects in the vicinity of the School in Muswellbrook area have been analysed. Reference has been made to Gateway Application for West Muswellbrook Project which is a coal mining project. From the government website (refer https://www.planningportal.nsw.gov.au/major-projects/project/3026) it is understood that a conditional gateway certificate has been issued to the West Muswellbrook Project in 2015, and no other documents regarding the approval of the development has been found.

Furthermore, no other information has been found regarding the major developments in the vicinity of the School and therefore reference has been made to the traffic volume information provided by

TfNSW on the website *Traffic Volume Viewer*[1]. Traffic counters recording the recent traffic counts for the years 2015 – 2022 are located on New England Highway 1.6km south of Muscle Creek Road and New England Highway 60m north of Burtons Lane which is shown in Figure 19.

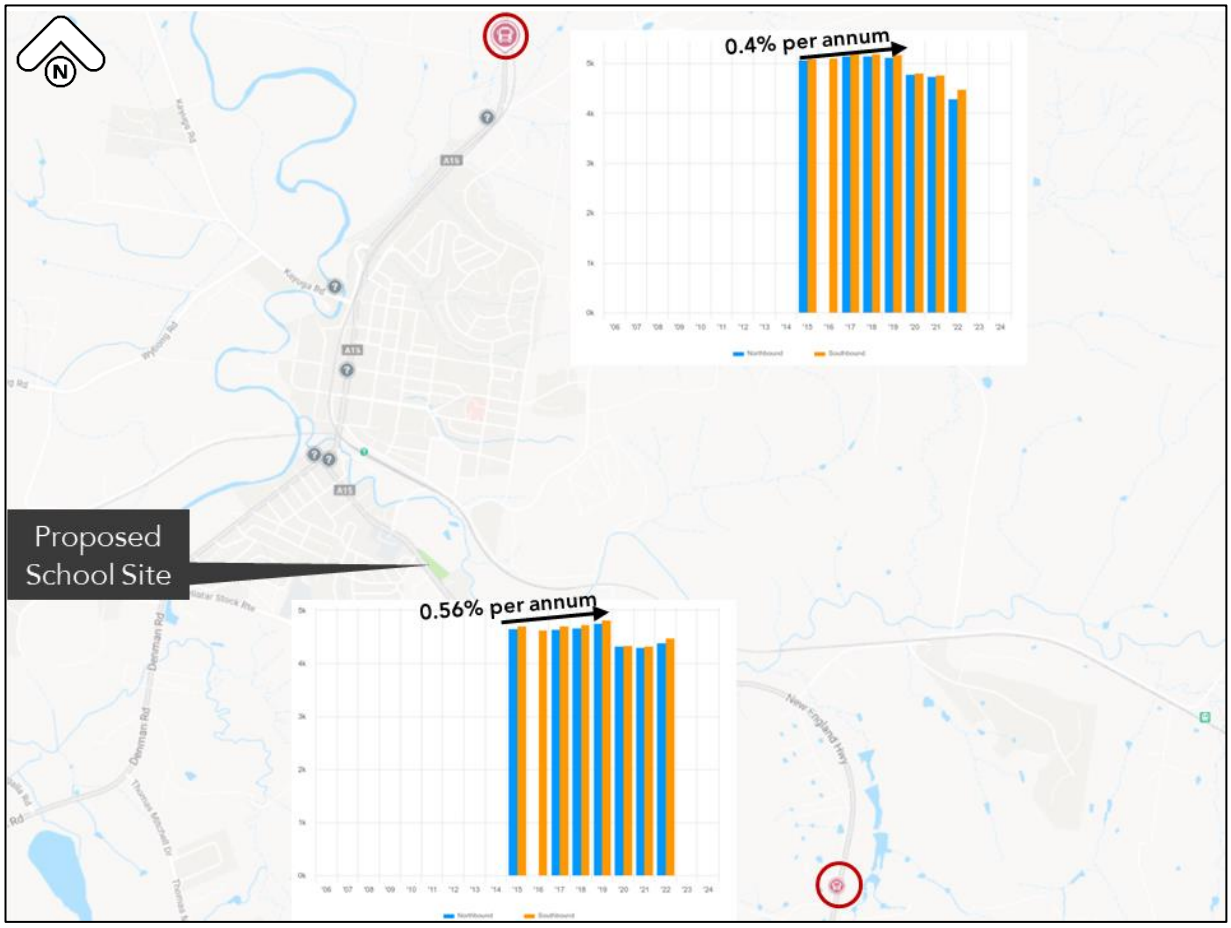


Figure 19 – Traffic Growth

2020 – 2022 information are post COVID-19 and may not be the actual representations of the traffic growth in the area. Therefore, the data for 2015 – 2012 has been considered.

Traffic counts on New England Highway 1.6km south of Muscle Creek Road shows a traffic growth of 0.56% per annum and traffic counts on New England Highway 60m north of Burtons Lane shows a traffic growth of 0.4% per annum. For a conservative assessment counts on New England Highway 1.6km south of Muscle Creek Road has been considered, and therefore a growth rate of 0.56% per annum is adapted to determine the future 10-year background traffic.

The growth rate has been applied to the surveyed traffic volumes (refer to Section 5.1).

The expected 2034 background traffic for the AM and PM peak hours at the key intersections are presented in Figure 20 and Figure 21 respectively.

[1] https://www.rms.nsw.gov.au/about/corporate-publications/statistics/traffic-volumes/aadt-map/index.htm

Figure 20 – Proposed 10 Years Growth Traffic Volumes during the AM Peak Hour

Figure 21 – Proposed 10 Years Growth Traffic Volumes during the PM Peak Hour

5.4. Intersection Modelling

In order to confirm the current operation of the intersection, an assessment has been undertaken using the SIDRA modelling software, which presents a range of performance indicators (Level of Service, Average Delay, etc.).

Typically, there are four performance indicators used to summarise the performance of an intersection, being:

- Average Delay – The average delay encountered by all vehicles passing through the intersection. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay.

- Degree of Saturation (DoS) – The total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation (e.g. 0.8=80% saturation).
- 95% Queue lengths (Q95) – is defined to be the queue length in metres that has only a 5-percent probability of being exceeded during the analysis time period. It transforms the average delay into measurable distance units.
- Level of Service (LoS) – This is a categorization of average delay, intended for simple reference. The RMS adopts the following bands:

Table 13 – Level of Service Criteria

Level Of Service	Average Delay (Secs/Veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	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 would cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Extra capacity required	Extreme delay, major treatment required

5.4.1. Modelling Scenarios

The intersections have been modelled with different scenarios as follows:

- **Existing Scenario**

The existing scenario is modelled with the existing intersection with the existing traffic.

- Future Development Scenario

The future development scenario is modelled with the existing traffic volume with the additional traffic volumes for parents/students and staff as described in Section 5.2.1.

- 10 Years Growth Scenario

This scenario has been modelled with the estimated traffic growth within the next 10-year period as described in Section 5.3.

- 10 Years Growth + Future Development Scenario

This scenario has been modelled with the estimated additional traffic growth within the next 10-year period and the additional traffic volumes for students and staff.

5.4.2. SIDRA Results

Table 14 summarises the most relevant SIDRA results for the existing condition, and future development condition with the summary and a comparison of the network operation. Full SIDRA results can be found in Appendix 3.

Table 14 – SIDRA Modelling Results for Pre and Post-Development

Intersection	Time	Scenario	LoS [2]	Delay (s) [3]	Highest DoS (v/s)	Highest Q95 (m)
Maitland Street / Thompson Street	AM Peak	Existing	LOS B	15.7	0.679	47
		Existing with Future Development	LOS B	15.7	0.679	47
		10-Yrs Growth	LOS B	16.2	0.718	51.4
		10-Yrs Growth + Future Dev	LOS B	16.4	0.718	51.4
	PM Peak	Existing	LOS A	9.1	0.593	30.4
		Existing with Future Development	LOS A	8.6	0.537	26
		10-Yrs Growth	LOS A	9.7	0.626	33.5
		10-Yrs Growth + Future Dev	LOS A	10.9	0.522	35.1
Maitland Street / Rutherford Road	AM Peak	Existing	LOS B	17.7	0.678	38.4
		Existing with Future Development	LOS B	17.2	0.681	38.7
		10-Yrs Growth	LOS B	18.5	0.725	42.6
		10-Yrs Growth + Future Dev	LOS B	24.8	0.937	66.6
	PM Peak	Existing	LOS B	16.9	0.633	35.6
		Existing with Future Development	LOS B	19.2	0.765	46.6
		10-Yrs Growth	LOS B	18.4	0.696	40.5
		10-Yrs Growth + Future Dev	LOS B	28.2	0.903	111.2

It is noted that the development traffic used for the purpose of this SIDRA analysis is assumed to represent the worst-case scenario for the following reasons:

- For conservative reasons, the car occupancy of 1.2 students per car is lower than the car occupancy determined through the online surveys. With a higher car occupancy, the number of vehicles will be reduced.

[2] For signalised intersections, the average performance indicators have been reported. It is noted that for priority-controlled intersections, the minor road usually experiences the highest delay whereas the major road experiences zero delay. In light of this, the average performance indicators may not be a suitable method of assessing the performance of an intersection. Therefore, the performance indicators for the worst movement have been reported for priority-controlled intersections.

[3] For signalised intersections, the average performance indicators have been reported. It is noted that for priority-controlled intersections, the minor road usually experiences the highest delay whereas the major road experiences zero delay. In light of this, the average performance indicators may not be a suitable method of assessing the performance of an intersection. Therefore, the performance indicators for the worst movement have been reported for priority-controlled intersections.

- A 100% car usage has been assumed despite the provision of pubic and active transport facilities. From the online surveys it is known that the school community is likely to use these alternative transport options, therefore, it is likely that the car usage will be lower than 100%; and
- For the purpose of this traffic model, it has been assumed that no students would attend before and after school activities. The school has advised that there is potential to implementing OOSH;
- For a robust assessment, it was assumed that the total number of the student and staff in 10 years are 656 and 65 respectively compared to the proposed stage 1 numbers of 140 students and 16 staff.

The SIDRA analysis for the intersections at Maitland Street/Thompson Street and Maitland Street/Rutherford Road indicates that the overall performance remains stable with Level of Service (LOS) generally staying within acceptable limits (LOS A or B) under various scenarios. The delays and queue lengths see modest increases with future growth and development, but no significant deterioration in intersection performance is observed. Therefore, it can be concluded that the proposed development and future traffic volumes can be accommodated within the existing road network capacity without major impacts on traffic flow.

6. Design Assessment

6.1. Relevant Design Standards

The site access, car park, waste areas, bicycle spaces would be designed to comply with the following relevant.

Australian Standards:

- AS2890.1 for car parking areas;
- AS2890.2 for commercial vehicle loading areas;
- AS2890.6 for accessible (disabled) parking.
- AS2890.3:2015 for bicycle spaces

6.2. Design Requirements

The following characteristics are noteworthy with regard to the design of the site access driveway, car parking, and bicycle spaces are discussed in Appendix 2

- A single entry/exit driveway for student & staff and commercial vehicles that is to be designed in accordance with AS2890.1 and AS2890.2 design standards.
- All staff parking spaces are designed in accordance with a User Class 1A and are to be provided with a minimum space length of 5.4m, a minimum width of 2.4m, and a minimum 5.8m aisle width
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1.
- All disabled and adaptable parking spaces are to be provided in accordance with AS2890.6, which requires a space with a clear width of 2.4m and located adjacent to a minimum shared area of 2.4m. It is expected all future DA architectural plans would be designed to comply with AS 2890.1 and AS 2890.2. 8.2
- All bicycle parking spaces are to be provided in accordance with AS2890.3:2015 with the following dimension :
    - Horizontal Parking: 1800mm x 500mm
    - Vertical Parking: 1200mm x 500mm
    - Access Aisle: 500mm for bicycle racks and 2000mm for bicycle storage lockers

6.3. Sight Distance

The sight distance requirements are outlined in Section 3.2 of AS2890.1 and are prescribed on the basis of the posted speed limit or 85th percentile vehicle speeds along the frontage road.

Maitland Street near the site has a speed limit of 50km/h which requires a desirable visibility distance of 69 metres and a minimum stopping sight distance of 45 metres. No changes are proposed to the location of existing driveways and the driveways comply with the minimum sight distance requirement.

AS2890.1 requires the driveway to comply with triangular pedestrian sight splays (2.0m x 2.5m). The existing driveway is able to meet the minimum sight lines for pedestrian safety.

6.4. Pick-up and Drop-off

6.4.1. Arrangement

Section 16.6 of the DCP stipulates the requirement for a drop off / pick up area for education facility. The pick / drop-off is proposed to be provided within the site boundary on the internal roadway. A figurative location is shown in Figure 22.

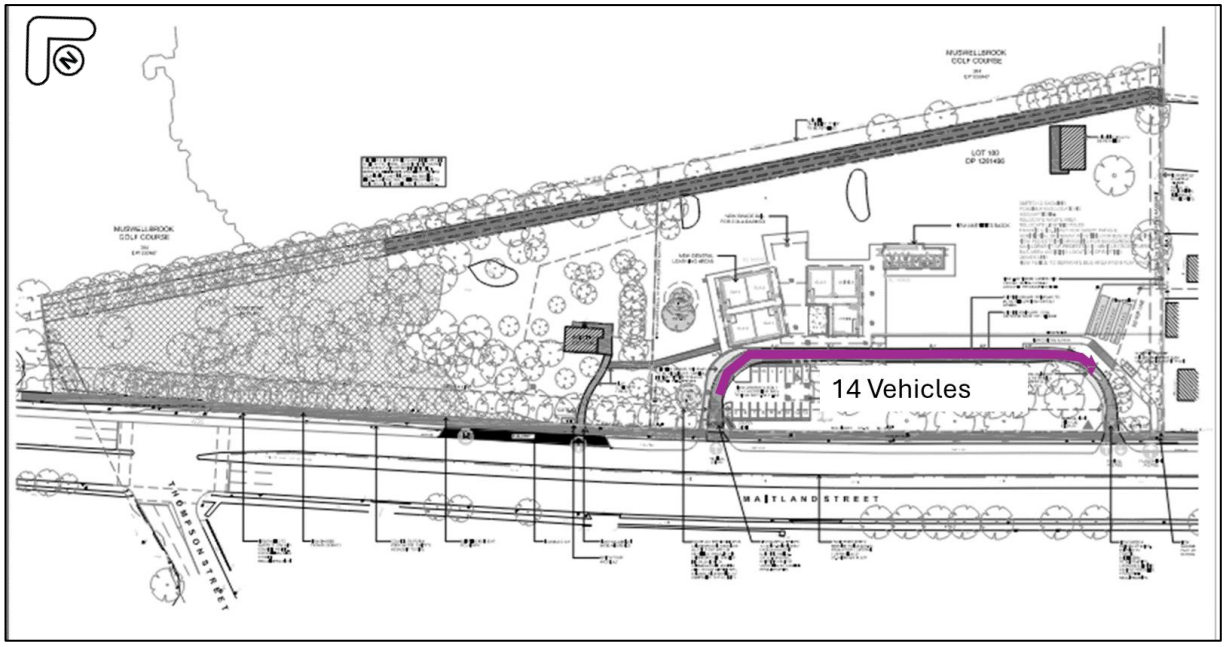


Figure 22 – Pick-up and Drop-off Arrangement

6.4.2. Queuing Options

A queuing analysis has been undertaken to demonstrate the ability of the site to contain all traffic generated by the proposal, and to determine required mitigation measures and trigger points.

All vehicles will enter the site via Maitland Street and both the inbound and outbound movements into/from the site will be left in and left out only.

- All vehicles will enter the School via the northern entry driveway, drop-off / pick-up the students within the internal laneway and exit via the southern exit only driveway. This layout results in a capacity of approximately 20 vehicles (refer to Figure 23).

It is worth noticing that the pick-up and drop-off lane will be restricted to a one-way circulation.

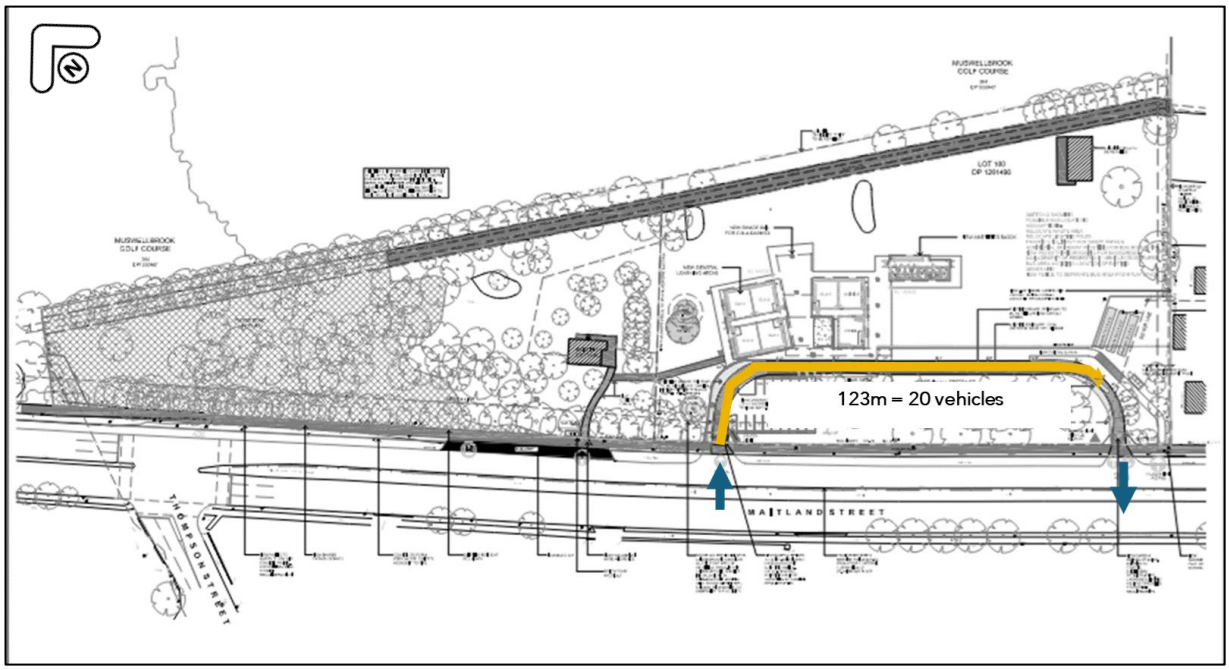


Figure 23 –Separate Entry / Exit

6.4.3. Demand / Queuing Analysis

The Poisson distribution has been used to assess the required number of pick-up and drop-off spaces and the potential of queuing. The following factors have been considered based on previous experience:

- Pick-up and drop-off activity occurs within a 30 minute time period per bell time;
- Generally, more students are driven to school in the morning than from school in the afternoon;
- The morning drop-off activity generates less congestion and the drop-off itself occurs faster;
- The afternoon pick-up often generates queuing due to the following reasons:
    - Parents arrive early and block pick-up spaces;
    - It takes time for students to find the correct car;
- Dwell times in the morning have been found to vary between 15-30 seconds per car and in the afternoon 45-210 seconds per car. The large discrepancy in the afternoon is related to the grade of pick-up management.

The Poisson distribution has been used to determine the likelihood of queuing depending on the number of cars, time period, dwell times and number of spaces available.

With a potintial14 pick-up and drop-off spaces and the factors described above, the following number of vehicles could theoretically be serviced without generating a queue:

- 1,000 (15 sec dwell time) – 500 (30 seconds dwell time) vehicles in the morning drop-off;
- 350 (45 seconds dwell time) – 75 (210 seconds dwell time) vehicles in the afternoon pick-up.

Usually, car occupancy ranges between 1.2 and 1.8 students per car. Applying these rates to the number of potential vehicles, the following number of students could theoretically be dropped-off in the morning and picked-up in the afternoon:

- 1,200 up to 1,800 (15 sec dwell time) – 600 up to 900 (30 seconds dwell time) students in the morning;
- 420 up to 630 (45 seconds dwell time) – 90 up to 135 (210 seconds dwell time) students in the afternoon.

The above numbers take into account a single bell time and no before and after school activities. Considering that a pick-up and drop-off activity occurs within a 30 minute time period, bell times staggered at 15 to 30 minutes intervals can reduce the traffic activity by half (2 bell times) or two-thirds (3 bell times).

A calculation of the pick-up and drop-off demand for different scenarios are presented in Table 15. The scenarios comprise the following variables:

- 140 students
- One bell time;
- Reduced car usage in favour of public and active transport;
- Student attendance of before and after school activities;
- A 210s long dwell time;

The queue analysis based on the above consideration are presented in the table below

Table 15 – Queuing assessment for potential future travel characteristics

Pacific Brook Christian School	
Total number of students (up to)	140
Scenario 1a: • 1 bell time • 100% of students use private transport. • No before and after school activities	
Number of cars (assumed car occupancy of 1.2 students per car)	117
Modelled queue length using Poisson distribution	**30 spaces** **180 metres**
Scenario 1b: • 1 bell time • 70% of students use private transport, 30% walk, cycle, or use public transport. • 10% of students attend before and after school activities	
Number of students driven	88
Number of cars (assumed car occupancy of 1.2 students per car)	74
Modelled queue length using Poisson distribution	**20 spaces** **120 metres**

The school is targeting Scenario 1b with the following characteristics:

- Retention of the existing entry / exit arrangements
- 1 bell time
- 30% of students would use alternative transport modes

It is acknowledged that queuing generated by the pick-up and drop-off activity onto Maitland Street is unacceptable and that preventative measures need to be implemented. Therefore, the school is proposing to implement measures if and when required to reduce car usage and manage school related traffic within the school boundaries. The following strategies are being considered:

- Strict pick-up and drop-off management to reduce the dwell times and therefore the possibility of queuing. Such an arrangement is already in place and works well at other Pacific Group schools;
- Introduction of staggered bell times at later stages, which already is common practice at other Pacific Group schools. It is envisaged that the staggering would occur based on the year groups, see the examples below:
    - One bell time: K-12
    - Two bell times: K-6 7-12
    - Three bell times: K-6 7-9 10-12

The school will provide care for students who either arrive early in the morning or need to wait for their siblings in the afternoon due to the staggered bell time arrangement.

- Implementation of before and after school activities / care for students who wish to enrol in additional activities or need to be cared for before or after the school;
- The school is proposing to provide a bus stop along Maitland Street outside the school boundary to provide an opportunity for students to use public transport;
- The school is looking to discuss with TfNSW:
    - The possibility to amend the existing school bus network to service the new school location in discussion with the current bus operators;
    - The option for TfNSW to provide an additional public bus stop in the vicinity of the school and to potentially amend the public bus routes;
- Pedestrian access points have been set out such that students do not need to cross the driveway upon entry / exit from the school. The school is providing a footpath connection from school buildings to the Maitland Street / Thompson Street intersection
- Provision of cycle facilities on site;
- Implementation of a Green Travel Plan (in form of a School Transport Plan), which will include programs to promote active and public transport;
- Staff will arrive prior to the main drop-off time and depart following the main pick-up time to minimise conflicts and to spread the vehicular movement over a longer period of time.

7. Conclusion and Summary

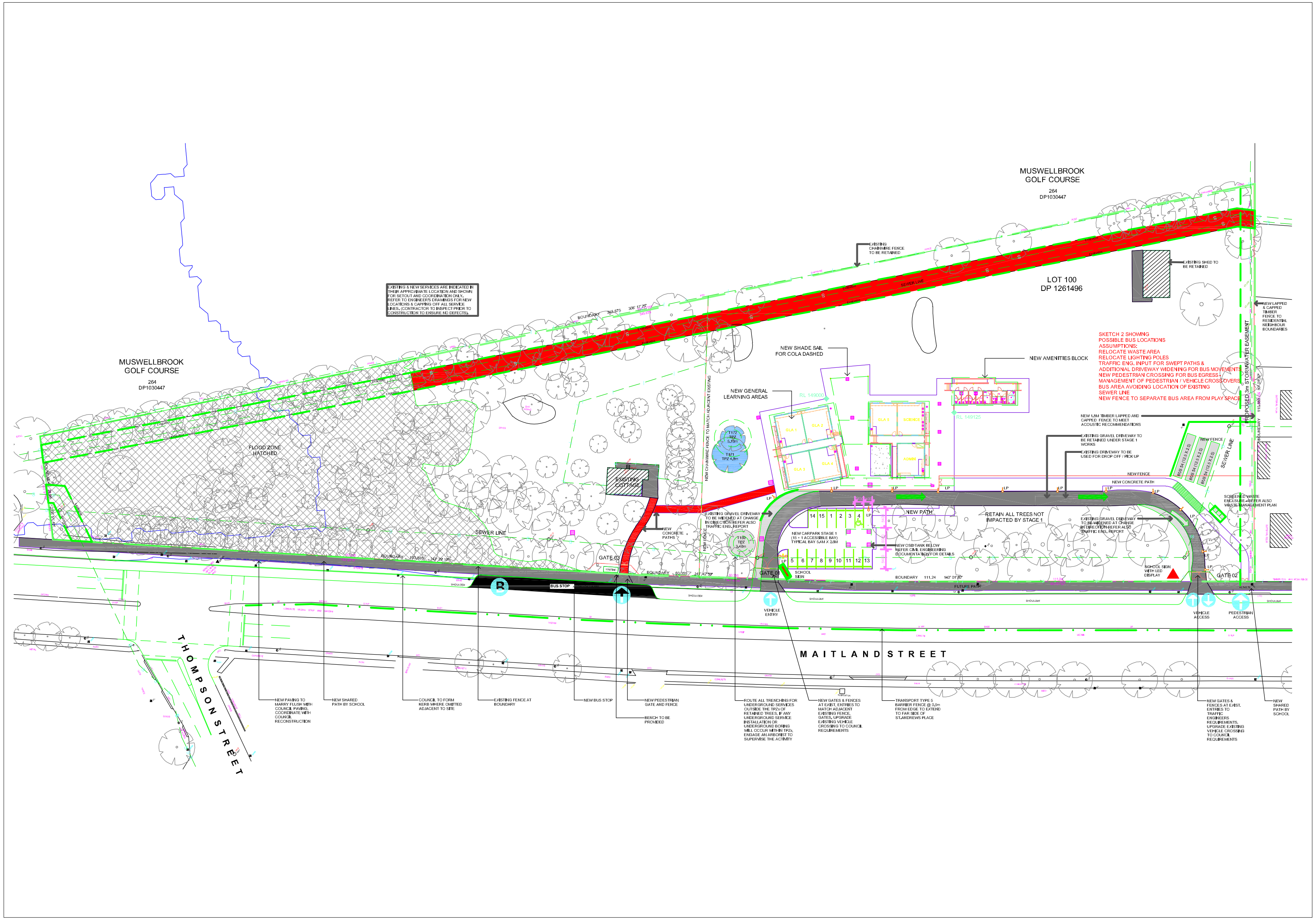
The following section outlines the key findings throughout the course of study:

- The proposal involves the relocation of the existing Pacific Brook Public School from 96-104 Hill Street, Muswellbrook to 72-74 Maitland Street, Muswellbrook. The school facilities are to accommodate 140 students and 16 staff at this stage.
- A review of the available public transport services operating within the vicinity of the proposed School site indicates that public transport is currently not a viable option for students and staff. Discussions between TfNSW, Council and the School should be undertaken to deliver more convenient public transport connections to the School. As part of the project, it is planned that a bus stop will be provided on Maitland Street along the School frontage close to the main school entry.
- A review of the existing walking and cycling infrastructure indicates that the southern part of Maitland Street falls within the walking catchment, while the northern part faces limited coverage due to barriers like the golf course and railway line. Currently, there are no footpaths on the eastern side of the carriageway along the site, and no crossings, making the site inaccessible by foot. However, the school has proposed a footpath along the school site, which will connect to the footpath and crossing at the intersection of Maitland Street (New England Highway) and Thompson Street, thereby making the school site accessible by foot. The site features shared bicycle paths, road shoulders, and quiet streets, as highlighted by the TfNSW Cycleway Finder, enhancing cycling safety and connectivity in all directions.
- A car park has been designed to accommodate up to 15 car spaces. A pick-up and drop-off area has been proposed within the internal roadway of the car park. A loading/waste collection location is proposed within the property boundary.
- A queuing assessment has been undertaken to estimate the pick-up and drop-off space requirement for the school. For 140 students in Stage 1, 1 bell time and 30% of students using public and active transport to travel to and from school, a 20-vehicle long queue is required within the site boundary. This can be accommodated along the existing drive-through. With a growing student population, the school has a number of tools to accommodate the queue within the site, i.e. through implementing a second bell time, offer additional before and after school care activities etc.
- Based on the planning guidelines, the project requires 1 bicycle space for staff, 1-2 spaces for visitors, and 9 spaces for students. To meet this requirement, the proposal provides a total of 11 bicycle spaces, accommodated by 6 bike racks, for use by staff, visitors, and students. The bicycle usage will be monitored, and more spaces will be added should the demand increase.
- The existing and post-development scenarios for the surrounding road network have been modelled using the SIDRA 9.1 intersection software. Overall, the traffic modelling indicates that the proposed development will not have any significant impact on the performance of the surrounding road network.
- A preliminary review of the proposed car park layout indicates that the design is capable of complying with the design requirements of the AS2890.1:2004, AS2890.3:2015, AS2890.2:2018

and AS2890.6: 2022. The concept car park design submitted as part of this DA will be finalised in the detailed design stage to ensure full compliance with the Australian Standards.

In light of the above, the proposed development is endorsed in the context of parking and traffic.

Appendix 1. Site Plan



MUSWELLBROOK GOLF COURSE
264
DP1030447
MUSWELLBROOK GOLF COURSE
264
DP1030447
LOT 100
DP 1261496
EXISTING & NEW SERVICES ARE INDICATED IN THEIR APPROXIMATE LOCATION AND SHOWN FOR SETOUT AND COORDINATION ONLY. REFER TO ENGINEER'S DRAWINGS FOR NEW LOCATIONS & CAPPING OFF ALL SERVICE LINES. (CONTRACTOR TO INSPECT PRIOR TO CONSTRUCTION TO ENSURE NO DEFECTS).
SKETCH 2 SHOWING
POSSIBLE BUS LOCATIONS
ASSUMPTIONS:
RELOCATE WASTE AREA
RELOCATE LIGHTING POLES
TRAFFIC ENG. INPUT FOR SWEPT PATHS &
ADDITIONAL DRIVEWAY WIDENING FOR BUS MOVEMENTS
NEW PEDESTRIAN CROSSING FOR BUS EGRESS -
MANAGEMENT OF PEDESTRIAN / VEHICLE CROSS OVERS
BUS AREA AVOIDING LOCATION OF EXISTING
SEWER LINE
NEW FENCE TO SEPARATE BUS AREA FROM PLAY SPACE
NEW LAPPED & CAPPED TIMBER FENCE TO RESIDENTIAL NEIGHBOUR BOUNDARIES
NEW 1.8M TIMBER LAPPED AND CAPPED FENCE TO MEET ACOUSTIC RECOMMENDATIONS
EXISTING GRAVEL DRIVEWAY TO BE RETAINED UNDER STAGE 1 WORKS
EXISTING DRIVEWAY TO BE USED FOR DROP OFF / PICK UP
PROPOSED 3m STORMWATER EASEMENT
NEW FENCE
SEWER LINE
NEW AMENITIES BLOCK
NEW SHADE SAIL FOR COLA DASHED
NEW GENERAL LEARNING AREAS
FLOOD ZONE HATCHED
EXISTING COTTAGE
NEW CONCRETE PATHS
NEW PATH
RETAIN ALL TREES NOT IMPACTED BY STAGE 1
NEW CARPARK STAGE 1
GATE 01
GATE 02
GATE 03
BUS STOP
SCHOOL SIGN
VEHICLE ENTRY
VEHICLE ACCESS
PEDESTRIAN ACCESS
MAITLAND STREET
THOMPSON STREET
NEW PAVING TO MARRY FLUSH WITH COUNCIL PAVING. COORDINATE WITH COUNCIL RECONSTRUCTION
NEW SHARED PATH BY SCHOOL
COUNCIL TO FORM KERB WHERE OMITTED ADJACENT TO SITE
EXISTING FENCE AT BOUNDARY
NEW BUS STOP
NEW PEDESTRIAN GATE AND FENCE
BENCH TO BE PROVIDED
ROUTE ALL TRENCHING FOR UNDERGROUND SERVICES OUTSIDE THE TPZs OF RETAINED TREES. IF ANY UNDERGROUND SERVICE INSTALLATION OR UNDERGROUND BORING WILL OCCUR WITHIN TPZs, ENGAGE AN ARBORIST TO SUPERVISE THE ACTIVITY
NEW GATES & FENCES AT EXIST. ENTRIES TO MATCH ADJACENT EXISTING FENCE. GATES, UPGRADE EXISTING VEHICLE CROSSING TO COUNCIL REQUIREMENTS
TRANSPORT TYPE 5 BARRIER FENCE @ 0.5m FROM EDGE TO EXTEND TO FAR SIDE OF ST.ANDREWS PLACE
NEW GATES & FENCES AT EXIST. ENTRIES TO TRAFFIC ENGINEERS REQUIREMENTS. UPGRADE EXISTING VEHICLE CROSSING TO COUNCIL REQUIREMENTS
NEW SHARED PATH BY SCHOOL

Appendix 2. Design Assessment

PROPOSED CAR PARK

GLA 3

GLA 4

ADMIN

LP

LP

LP

LP

LP

L DRIVEWAY
AT CHANGE
FER ALSO
PORT

NEW PATH

RETAIN AL
IMPACTED

14 15 1 2 3 4

5400

2600

1100

5400

6000

NEW CARPARK STAGE 1
(15 + 1 ACCESSIBLE BAY)
TYPICAL BAY 5.4 X 2.6M

NEW OSD TANK BELOW
REFER CIVIL ENGINEERING
DOCUMENTATION FOR DETAILS

T169
TPZ
.46m

148.6
SMH

148.86
SMH

PP

S

S

S

S

LP

5 6 7 8 9 10 11 12 13

5400

5400

600

GATE 01

SCHOOL
SIGN

WHEEL STOP NEED TO BE LOCATED 900MM AWAY FROM THE KERB TO COMPLY WITH THE AS2890.1-2004. THIS ISSUE CAN BE ADDRESSED IN CC STAGE. NO ACTION REQUIRED

BOUNDARY 111.24 140° 01' 50"

FUTURE PATH

9821

SIGN

LP

KERB

SHOULDER

VEHICLE
ENTRY

MEDIAN

STRIP

BASE

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

REV	DATE	DESCRIPTION	DRAWN	REVIEWED
P4	01/08/2024	DESIGN ASSESSMENT	MA	SW
P3	12/06/2024	DESIGN ASSESSMENT	MA	SW
P2	27/05/2024	DESIGN ASSESSMENT	MA	SW
P1	24/05/2024	DESIGN ASSESSMENT	MA	JJ

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

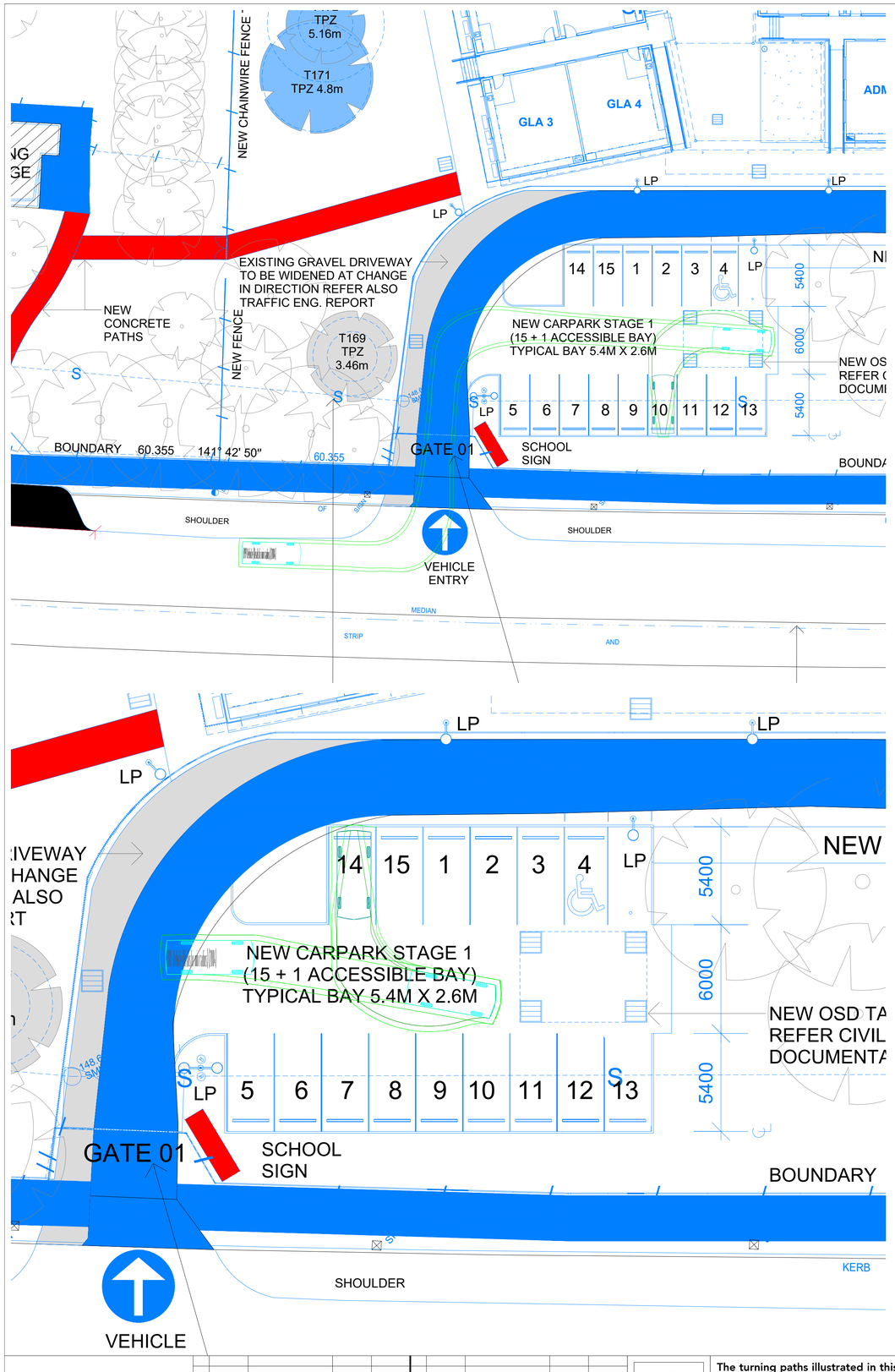
PROJECT
Pacific Brook Christian School

DRAWING TITLE
CAR PARKING ASSESSMENT

CLIENT	NBRS
DRAWING #	ptc-(1)
PROJECT #	24-0961
SCALE	NTS

PRELIMINARY

REV P4



Notes:

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ptc.
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ptcconsultants.co

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P4	01/08/2024	DESIGN ASSESSMENT	MA	SW
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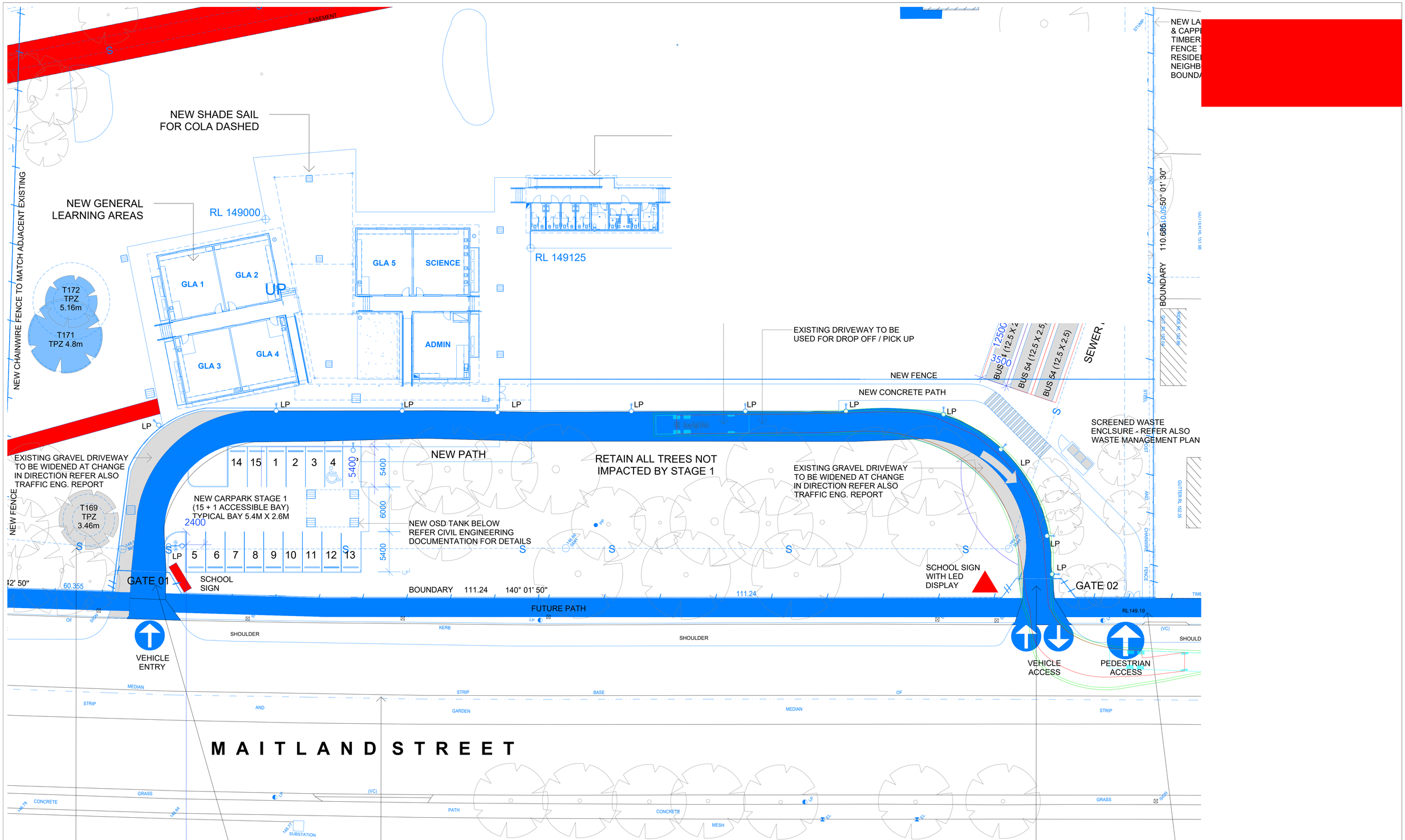
P2	27/05/2024	DESIGN ASSESSMENT	MA	SW
P1	24/05/2024	DESIGN ASSESSMENT	MA	JJ

PROJECT
Pacific Brook Christian School

DRAWING TITLE
SWEPT PATHS ASSESSMENT -
PROPOSED CAR PARK

CLIENT NBRS
DRAWING # ptc-(1)
PROJECT # 24-0961
SCALE NTS

PRELIMINARY
REV P4



ptc.
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REV	DATE	DESCRIPTION	DRAWN	REVIEWED
P4	01/08/2024	DESIGN ASSESSMENT	MA	SW
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P2	27/05/2024	DESIGN ASSESSMENT	MA	SW
P1	24/05/2024	DESIGN ASSESSMENT	MA	JJ

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PROJECT
Pacific Brook Christian School

DRAWING TITLE
SWEPT PATHS ASSESSMENT - WASTE COLLECTOR & SERVICE VEHICLES

CLIENT	NBRS
DRAWING #	ptc-(1)
PROJECT #	24-0961
SCALE	NTS

PRELIMINARY

REV P4

149125

MANAGEMENT OF PEDESTRIAN / VEHICLE CROSS OVERS
BUS AREA AVOIDING LOCATION OF EXISTING
SEWER LINE
NEW FENCE TO SEPARATE BUS AREA FROM PLAY SPACE

ISSUE: THE CURRENT DIMENSIONS OF THE BUS BAY, WITH A WIDTH OF 2.5 METRES, DO NOT COMPLY WITH THE AS STANDARD FOR HEAVY VEHICLES.
RESPONSE: INCREASE THE WIDTH OF THE BAY TO 3.5 METRES.

USED FOR DROP OFF / PICK UP

NEW FENCE

NEW CONCRETE PATH

LP

A TURNING AREA SHOULD BE PROVIDED TO ALLOW BUSES TO REVERSE INTO THE BUS BAY. REFER TO THE NEXT PAGE FOR DETAILED INFORMATION.

12500
3500
BUS 54 (12.5 X 2.5)
BUS 54 (12.5 X 2.5)
BUS 54 (12.5 X 2.5)

NEW FENCE

SEWER LINE

PROPOSED 3m ST

BOUNDARY 110.685 100°55'01"

110.685

FENCE

GUTTER RL 151.98

148.14 SMH

MANHOLE NOT FOUND

RIDGE RL 152.86

GUTT RL 152.04

STEEL POST

SCREENED WASTE ENCLSURE - REFER ALSO WASTE MANAGEMENT PLAN

GUTTER RL 152.35

RIDGE RL154.32

AND CHAINWIRE FENCE

PP

148.86 SMH

148.08 SMH

SCHOOL SIGN WITH LED DISPLAY

111.24

GATE 02

TIMBER POST AND MESH FENCE

RE PATH

RL149.19

8110

(VC)

SHOULDER

SHOULDER

VEHICLE ACCESS

PEDESTRIAN ACCESS

BASE OF MEDIAN STRIP

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

REV	DATE	DESCRIPTION	DRAWN	REVIEWED
P4	01/08/2024	DESIGN ASSESSMENT	MA	SW
P3	12/06/2024	DESIGN ASSESSMENT	MA	SW
P2	27/05/2024	DESIGN ASSESSMENT	MA	SW
P1	24/05/2024	DESIGN ASSESSMENT	MA	JJ

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PROJECT: Pacific Brook Christian School

DRAWING TITLE: BUS BAYS ASSESSMENT

CLIENT	NBRS
DRAWING #	ptc-(1)
PROJECT #	24-0961
SCALE	NTS

PRELIMINARY

REV P4

RELOCATE WASTE AREA

PT PATHS &
NG FOR BUS MOVEMENTS
OR BUS EGRESS -
MANAGEMENT OF PEDESTRIAN / VEHICLE CROSS OVERS
BUS AREA AVOIDING LOCATION OF EXISTING
SEWER LINE
NEW FENCE TO SEPARATE BUS AREA FROM PLAY SPACE

NEW 1.8M TIMBER LAPPED AND CAPPED FENCE TO MEET ACOUSTIC RECOMMENDATIONS

EXISTING GRAVEL DRIVEWAY TO BE RETAINED UNDER STAGE 1 WORKS

EXISTING DRIVEWAY TO BE USED FOR DROP OFF / PICK UP

NEW FENCE

NEW CONCRETE PATH

SCREENED WASTE ENCLSURE - REFER ALSO WASTE MANAGEMENT PLAN

EXISTING GRAVEL DRIVEWAY TO BE WIDENED AT CHANGE IN DIRECTION REFER ALSO TRAFFIC ENG. REPORT

SCHOOL SIGN WITH LED DISPLAY

GATE 02

NEW FENCE TO SEPARATE BUS AREA FROM PLAY SPACE

PROPOSED 3m STORMWATER EASEMENT

BOUNDARY

SEWER LINE

BUS 54 (12.5 X 2.5)

BUS 54 (12.5 X 2.5)

BUS 54 (12.5 X 2.5)

111.24

RL149.19

8110

VEHICLE ACCESS

PEDESTRIAN ACCESS

SHOULDER

TIMBER POST AND MESH FENCE

GUTTER RL 151.98

GUTTER RL 152.35

RIDGE RL 154.32

RETAINED UNDER STAGE 1
RKS

STING DRIVEWAY TO BE
D FOR DROP OFF / PICK UP

STING GRAVEL DRIVEWAY
BE WIDENED AT CHANGE
IRECTION REFER ALSO
FFIC ENG. REPORT

SCREENED
ENCLSURE
WASTE MA

ISSUE: THE LIGHT LOCATION IS OBSTRUCTING BUS MOVEMENT.

RESPONSE:RELOCATE THE LIGHT POLE OUTSIDE OF THE VEHICLE PATHWAY TO ENSURE UNOBSTRUCTED BUS MOVEMENT.

BUS AREA AVOIDING LOCATION OF EXISTING
SEWER LINE
NEW FENCE TO SEPARATE BUS AREA FROM PLAY SPACE

L DRIVEWAY TO
DER STAGE 1

.WAY TO BE
P OFF / PICK UP

EL DRIVEWAY
) AT CHANGE
EFER ALSO
EPORT

SCREENED WASTE
ENCLSURE - REFER AL
WASTE MANAGEMENT

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ptcconsultants.co

REV	DATE	DESCRIPTION	DRAWN	REVIEWED
P4	01/08/2024	DESIGN ASSESSMENT	MA	SW
P3	12/06/2024	DESIGN ASSESSMENT	MA	SW
P2	27/05/2024	DESIGN ASSESSMENT	MA	SW
P1	24/05/2024	DESIGN ASSESSMENT	MA	IJ

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

PROJECT
Pacific Brook Christian School

DRAWING TITLE
BUS BAYS ASSESSMENT

CLIENT	NBRS
DRAWING #	ptc-(1)
PROJECT #	24-0961
SCALE	NTS

PRELIMINARY

REV P4

Appendix 3. SIDRA Results

MOVEMENT SUMMARY

Site: 101v [1- Maitland St/Thompson St - Existing AM Peak (Site Folder: Existing - AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing AM Peak (Network Folder: Existing Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	18	5.9	18	5.9	0.014	7.5	LOS A	0.1	0.7	0.31	0.59	0.31	44.7
22	T1	All MCs	757	7.6	757	7.6	* 0.679	21.2	LOS B	6.3	47.0	0.94	0.83	0.98	39.4
Approach			775	7.6	775	7.6	0.679	20.9	LOS B	6.3	47.0	0.92	0.82	0.96	39.5
NorthWest: Maitland St (NW)															
28	T1	All MCs	499	12.9	499	12.9	0.277	6.0	LOS A	1.8	14.3	0.43	0.37	0.43	43.0
29	R2	All MCs	121	2.6	121	2.6	* 0.342	22.4	LOS B	1.8	12.6	0.88	0.76	0.88	37.5
Approach			620	10.9	620	10.9	0.342	9.2	LOS A	1.8	14.3	0.52	0.44	0.52	41.0
SouthWest: Thompson Street (SW)															
30	L2	All MCs	238	2.7	238	2.7	0.175	14.2	LOS A	1.6	11.2	0.63	0.71	0.63	40.4
32	R2	All MCs	31	3.4	31	3.4	* 0.175	28.6	LOS C	1.4	9.9	0.73	0.72	0.73	32.9
Approach			268	2.7	268	2.7	0.175	15.9	LOS B	1.6	11.2	0.64	0.71	0.64	39.9
All Vehicles			1663	8.0	1663	8.0	0.679	15.7	LOS B	6.3	47.0	0.73	0.66	0.75	40.0

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
NorthWest: Maitland St (NW)											
P7	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
SouthWest: Thompson Street (SW)											
P8	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		158	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [2- Maitland St / Rutherford Rd - Existing AM Peak (Site Folder: Existing - AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing AM Peak (Network Folder: Existing Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	92	11.5	92	11.5	0.084	10.5	LOS A	0.6	4.9	0.41	0.64	0.41	43.3
22	T1	All MCs	575	8.4	575	8.4	* 0.678	25.0	LOS B	5.1	38.4	0.96	0.85	1.04	30.2
Approach			666	8.8	666	8.8	0.678	23.0	LOS B	5.1	38.4	0.89	0.82	0.95	32.2
NorthWest: Maitland St (NW)															
28	T1	All MCs	345	13.4	345	13.4	0.192	9.0	LOS A	1.7	13.4	0.59	0.48	0.59	44.9
29	R2	All MCs	189	5.6	189	5.6	* 0.419	21.5	LOS B	2.7	20.1	0.88	0.77	0.88	38.6
Approach			535	10.6	535	10.6	0.419	13.4	LOS A	2.7	20.1	0.69	0.59	0.69	42.5
SouthWest: Rutherford Road (SW)															
30	L2	All MCs	284	4.4	284	4.4	0.279	11.8	LOS A	2.6	19.1	0.55	0.71	0.55	37.9
32	R2	All MCs	72	4.4	72	4.4	* 0.149	23.1	LOS B	1.0	7.3	0.80	0.72	0.80	37.4
Approach			356	4.4	356	4.4	0.279	14.1	LOS A	2.6	19.1	0.60	0.71	0.60	37.8
All Vehicles			1557	8.5	1557	8.5	0.678	17.7	LOS B	5.1	38.4	0.75	0.71	0.78	37.7

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
NorthWest: Maitland St (NW)											
P7	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
SouthWest: Rutherford Road (SW)											
P8	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		158	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [1- Maitland St/Thompson St - Existing PM Peak (Site Folder: Existing - PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Exisitng PM Peak (Network Folder: Existing Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	24	0.0	24	0.0	0.019	7.1	LOS A	0.1	0.8	0.23	0.58	0.23	44.9
22	T1	All MCs	725	7.3	725	7.3	* 0.593	9.2	LOS A	4.1	30.4	0.56	0.48	0.56	44.8
Approach			749	7.0	749	7.0	0.593	9.2	LOS A	4.1	30.4	0.55	0.48	0.55	44.8
NorthWest: Maitland St (NW)															
28	T1	All MCs	857	8.4	857	8.4	0.416	5.1	LOS A	3.3	25.1	0.40	0.35	0.40	43.9
29	R2	All MCs	153	1.4	153	1.4	* 0.315	19.1	LOS B	2.2	15.7	0.78	0.76	0.78	38.8
Approach			1009	7.3	1009	7.3	0.416	7.2	LOS A	3.3	25.1	0.46	0.41	0.46	42.5
SouthWest: Thompson Street (SW)															
30	L2	All MCs	153	2.8	153	2.8	0.137	15.1	LOS B	1.4	10.0	0.61	0.69	0.61	39.9
32	R2	All MCs	37	5.7	37	5.7	* 0.137	32.6	LOS C	1.0	7.6	0.79	0.72	0.79	29.6
Approach			189	3.3	189	3.3	0.137	18.5	LOS B	1.4	10.0	0.64	0.70	0.64	38.4
All Vehicles			1948	6.8	1948	6.8	0.593	9.1	LOS A	4.1	30.4	0.51	0.47	0.51	43.1

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
NorthWest: Maitland St (NW)											
P7	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
SouthWest: Thompson Street (SW)											
P8	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
All Pedestrians		158	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [2- Maitland St / Rutherford Rd - Existing PM Peak (Site Folder: Existing - PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Exisitng PM Peak (Network Folder: Existing Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	119	1.8	119	1.8	0.116	12.9	LOS A	1.2	8.3	0.50	0.67	0.50	41.8
22	T1	All MCs	457	10.6	457	10.6	* 0.633	29.4	LOS C	4.7	35.6	0.97	0.82	1.00	28.1
Approach			576	8.8	576	8.8	0.633	26.0	LOS B	4.7	35.6	0.87	0.79	0.90	31.5
NorthWest: Maitland St (NW)															
28	T1	All MCs	521	11.9	521	11.9	0.258	7.2	LOS A	2.5	19.4	0.48	0.40	0.48	45.9
29	R2	All MCs	364	1.7	364	1.7	* 0.568	17.3	LOS B	4.4	31.6	0.70	0.85	0.70	40.3
Approach			885	7.7	885	7.7	0.568	11.3	LOS A	4.4	31.6	0.57	0.59	0.57	43.4
SouthWest: Rutherford Road (SW)															
30	L2	All MCs	308	2.0	308	2.0	0.268	10.8	LOS A	2.9	20.4	0.48	0.69	0.48	38.7
32	R2	All MCs	133	3.2	133	3.2	* 0.301	28.5	LOS B	2.3	16.7	0.86	0.76	0.86	35.5
Approach			441	2.4	441	2.4	0.301	16.1	LOS B	2.9	20.4	0.59	0.71	0.59	37.2
All Vehicles			1902	6.8	1902	6.8	0.633	16.9	LOS B	4.7	35.6	0.66	0.68	0.67	39.0

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
NorthWest: Maitland St (NW)											
P7	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
SouthWest: Rutherford Road (SW)											
P8	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
All Pedestrians		158	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [1- Maitland St/Thompson St - Existing with Dev AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM Peak (Network Folder: Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	18	5.9	18	5.9	0.014	7.5	LOS A	0.1	0.7	0.31	0.59	0.31	44.7
22	T1	All MCs	757	7.6	757	7.6	* 0.679	21.2	LOS B	6.3	47.0	0.94	0.83	0.98	39.4
Approach			775	7.6	775	7.6	0.679	20.9	LOS B	6.3	47.0	0.92	0.82	0.96	39.5
NorthWest: Maitland St (NW)															
28	T1	All MCs	559	11.5	559	11.5	0.308	6.1	LOS A	2.1	16.3	0.45	0.38	0.45	42.9
29	R2	All MCs	121	2.6	121	2.6	* 0.342	22.4	LOS B	1.8	12.6	0.88	0.76	0.88	37.5
Approach			680	9.9	680	9.9	0.342	9.0	LOS A	2.1	16.3	0.52	0.45	0.52	41.1
SouthWest: Thompson Street (SW)															
30	L2	All MCs	259	2.4	259	2.4	0.261	13.9	LOS A	2.5	17.7	0.63	0.72	0.63	40.8
32	R2	All MCs	111	1.0	111	1.0	* 0.261	24.7	LOS B	1.9	13.2	0.81	0.75	0.81	30.9
Approach			369	2.0	369	2.0	0.261	17.1	LOS B	2.5	17.7	0.68	0.73	0.68	38.6
All Vehicles			1824	7.3	1824	7.3	0.679	15.7	LOS B	6.3	47.0	0.72	0.66	0.74	39.7

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
NorthWest: Maitland St (NW)											
P7	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
SouthWest: Thompson Street (SW)											
P8	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		158	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [2- Maitland St / Rutherford Rd - Existing with Dev AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM Peak (Network Folder: Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	116	9.1	116	9.1	0.105	10.4	LOS A	0.8	6.1	0.41	0.64	0.41	43.3
22	T1	All MCs	575	8.4	575	8.4	* 0.681	25.0	LOS B	5.2	38.7	0.96	0.85	1.04	30.2
Approach			691	8.5	691	8.5	0.681	22.6	LOS B	5.2	38.7	0.87	0.82	0.93	32.7
NorthWest: Maitland St (NW)															
28	T1	All MCs	446	10.4	446	10.4	0.244	9.3	LOS A	2.3	17.5	0.60	0.51	0.60	44.8
29	R2	All MCs	211	5.0	211	5.0	* 0.465	21.8	LOS B	3.1	22.6	0.89	0.78	0.89	38.5
Approach			657	8.7	657	8.7	0.465	13.3	LOS A	3.1	22.6	0.70	0.59	0.70	42.6
SouthWest: Rutherford Road (SW)															
30	L2	All MCs	284	4.4	284	4.4	0.279	11.8	LOS A	2.6	19.1	0.55	0.71	0.55	37.9
32	R2	All MCs	72	4.4	72	4.4	* 0.149	23.1	LOS B	1.0	7.3	0.80	0.72	0.80	37.4
Approach			356	4.4	356	4.4	0.279	14.1	LOS A	2.6	19.1	0.60	0.71	0.60	37.8
All Vehicles			1703	7.7	1703	7.7	0.681	17.2	LOS B	5.2	38.7	0.75	0.71	0.77	38.3

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
NorthWest: Maitland St (NW)											
P7	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
SouthWest: Rutherford Road (SW)											
P8	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		158	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [1- Maitland St/Thompson St - Existing with Dev PM Peak (Site Folder: PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM Peak (Network Folder: Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 80 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	24	0.0	24	0.0	0.019	6.4	LOS A	0.1	0.6	0.15	0.56	0.15	45.3
22	T1	All MCs	725	7.3	725	7.3	* 0.537	7.0	LOS A	3.5	26.0	0.41	0.36	0.41	45.9
Approach			749	7.0	749	7.0	0.537	7.0	LOS A	3.5	26.0	0.40	0.36	0.40	45.9
NorthWest: Maitland St (NW)															
28	T1	All MCs	909	7.9	909	7.9	0.409	4.1	LOS A	3.2	24.0	0.32	0.28	0.32	45.1
29	R2	All MCs	153	1.4	153	1.4	* 0.280	17.4	LOS B	2.2	15.9	0.70	0.74	0.70	39.6
Approach			1062	6.9	1062	6.9	0.409	6.0	LOS A	3.2	24.0	0.37	0.35	0.37	43.5
SouthWest: Thompson Street (SW)															
30	L2	All MCs	177	2.4	177	2.4	0.199	17.0	LOS B	2.4	17.1	0.60	0.71	0.60	39.7
32	R2	All MCs	107	2.0	107	2.0	* 0.261	32.6	LOS C	2.2	15.4	0.86	0.76	0.86	26.7
Approach			284	2.2	284	2.2	0.261	22.9	LOS B	2.4	17.1	0.70	0.73	0.70	35.6
All Vehicles			2096	6.3	2096	6.3	0.537	8.6	LOS A	3.5	26.0	0.43	0.40	0.43	43.3

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
NorthWest: Maitland St (NW)											
P7	Full	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
SouthWest: Thompson Street (SW)											
P8	Full	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		158	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [2- Maitland St / Rutherford Rd - Existing with Dev PM Peak (Site Folder: PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM Peak (Network Folder: Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 80 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	140	1.5	140	1.5	0.152	19.5	LOS B	1.8	12.8	0.57	0.69	0.57	40.1
22	T1	All MCs	457	10.6	457	10.6	* 0.765	39.6	LOS C	6.1	46.6	1.00	0.93	1.17	24.8
Approach			597	8.5	597	8.5	0.765	34.9	LOS C	6.1	46.6	0.90	0.88	1.03	28.2
NorthWest: Maitland St (NW)															
28	T1	All MCs	548	11.3	548	11.3	0.252	4.0	LOS A	2.2	16.6	0.28	0.24	0.28	47.6
29	R2	All MCs	476	1.3	476	1.3	* 0.634	19.2	LOS B	6.3	44.4	0.72	0.90	0.72	39.6
Approach			1024	6.7	1024	6.7	0.634	11.0	LOS A	6.3	44.4	0.48	0.55	0.48	43.5
SouthWest: Rutherford Road (SW)															
30	L2	All MCs	308	2.0	308	2.0	0.250	10.0	LOS A	2.9	20.3	0.42	0.67	0.42	39.4
32	R2	All MCs	133	3.2	133	3.2	* 0.325	33.1	LOS C	2.7	19.5	0.88	0.77	0.88	34.0
Approach			441	2.4	441	2.4	0.325	16.9	LOS B	2.9	20.3	0.56	0.70	0.56	36.7
All Vehicles			2062	6.3	2062	6.3	0.765	19.2	LOS B	6.3	46.6	0.62	0.68	0.66	38.0

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
NorthWest: Maitland St (NW)											
P7	Full	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
SouthWest: Rutherford Road (SW)											
P8	Full	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		158	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [1- Maitland St/Thompson St - 10 years - AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM Peak (Network Folder: Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	20	5.3	20	5.3	0.016	7.5	LOS A	0.1	0.8	0.32	0.59	0.32	44.7
22	T1	All MCs	800	7.6	800	7.6	* 0.718	22.2	LOS B	6.9	51.4	0.95	0.87	1.03	39.1
Approach			820	7.6	820	7.6	0.718	21.8	LOS B	6.9	51.4	0.93	0.86	1.01	39.2
NorthWest: Maitland St (NW)															
28	T1	All MCs	528	12.9	528	12.9	0.294	6.1	LOS A	2.0	15.4	0.44	0.37	0.44	42.9
29	R2	All MCs	127	2.5	127	2.5	* 0.370	23.3	LOS B	1.9	13.6	0.90	0.77	0.90	37.2
Approach			656	10.9	656	10.9	0.370	9.4	LOS A	2.0	15.4	0.53	0.45	0.53	40.9
SouthWest: Thompson Street (SW)															
30	L2	All MCs	252	2.5	252	2.5	0.185	14.3	LOS A	1.7	12.0	0.63	0.71	0.63	40.4
32	R2	All MCs	33	3.2	33	3.2	* 0.185	28.6	LOS C	1.5	10.5	0.73	0.73	0.73	32.9
Approach			284	2.6	284	2.6	0.185	15.9	LOS B	1.7	12.0	0.64	0.71	0.64	39.8
All Vehicles			1760	8.0	1760	8.0	0.718	16.2	LOS B	6.9	51.4	0.74	0.68	0.77	39.7

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
NorthWest: Maitland St (NW)											
P7	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
SouthWest: Thompson Street (SW)											
P8	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		158	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [2- Maitland St / Rutherford Rd - 10 years - AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM Peak (Network Folder: Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	97	12.0	97	12.0	0.089	11.5	LOS A	0.7	5.2	0.41	0.64	0.41	43.3
22	T1	All MCs	607	8.5	607	8.5	* 0.725	26.6	LOS B	5.7	42.6	0.98	0.90	1.10	29.7
Approach			704	9.0	704	9.0	0.725	24.6	LOS B	5.7	42.6	0.90	0.86	1.01	31.5
NorthWest: Maitland St (NW)															
28	T1	All MCs	364	13.3	364	13.3	0.203	9.0	LOS A	1.8	14.3	0.59	0.49	0.59	44.9
29	R2	All MCs	201	5.8	201	5.8	* 0.453	22.3	LOS B	3.0	21.8	0.89	0.78	0.89	38.3
Approach			565	10.6	565	10.6	0.453	13.8	LOS A	3.0	21.8	0.70	0.59	0.70	42.3
SouthWest: Rutherford Road (SW)															
30	L2	All MCs	301	4.5	301	4.5	0.295	11.9	LOS A	2.8	20.5	0.55	0.71	0.55	37.9
32	R2	All MCs	76	4.2	76	4.2	* 0.158	23.1	LOS B	1.1	7.7	0.80	0.72	0.80	37.4
Approach			377	4.5	377	4.5	0.295	14.2	LOS A	2.8	20.5	0.60	0.71	0.60	37.7
All Vehicles			1646	8.5	1646	8.5	0.725	18.5	LOS B	5.7	42.6	0.76	0.73	0.81	37.3

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
NorthWest: Maitland St (NW)											
P7	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
SouthWest: Rutherford Road (SW)											
P8	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		158	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [1- Maitland St/Thompson St - 10 years - PM Peak (Site Folder: Existing - PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM Peak (Network Folder: Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	26	0.0	26	0.0	0.021	7.1	LOS A	0.1	0.8	0.23	0.58	0.23	44.9
22	T1	All MCs	766	7.3	766	7.3	* 0.626	9.2	LOS A	4.5	33.5	0.58	0.50	0.58	44.8
Approach			793	7.0	793	7.0	0.626	9.2	LOS A	4.5	33.5	0.57	0.50	0.57	44.8
NorthWest: Maitland St (NW)															
28	T1	All MCs	589	12.9	589	12.9	0.294	4.8	LOS A	2.0	15.8	0.35	0.30	0.35	44.2
29	R2	All MCs	161	1.3	161	1.3	* 0.340	19.5	LOS B	2.4	17.0	0.79	0.77	0.79	38.7
Approach			751	10.4	751	10.4	0.340	8.0	LOS A	2.4	17.0	0.45	0.40	0.45	42.1
SouthWest: Thompson Street (SW)															
30	L2	All MCs	161	2.6	161	2.6	0.144	15.1	LOS B	1.5	10.6	0.61	0.70	0.61	39.8
32	R2	All MCs	39	5.4	39	5.4	* 0.144	32.6	LOS C	1.1	8.0	0.79	0.72	0.79	29.6
Approach			200	3.2	200	3.2	0.144	18.5	LOS B	1.5	10.6	0.65	0.70	0.65	38.4
All Vehicles			1743	8.0	1743	8.0	0.626	9.7	LOS A	4.5	33.5	0.52	0.48	0.52	43.1

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
NorthWest: Maitland St (NW)											
P7	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
SouthWest: Thompson Street (SW)											
P8	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
All Pedestrians		158	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [2- Maitland St / Rutherford Rd - 10 yeasr - PM Peak (Site Folder: Existing - PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM Peak (Network Folder: Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	125	1.7	125	1.7	0.123	14.2	LOS A	1.2	8.8	0.50	0.67	0.50	41.8
22	T1	All MCs	491	10.5	491	10.5	* 0.696	31.2	LOS C	5.3	40.5	0.98	0.87	1.07	27.6
Approach			616	8.7	616	8.7	0.696	27.8	LOS B	5.3	40.5	0.88	0.83	0.96	30.7
NorthWest: Maitland St (NW)															
28	T1	All MCs	549	11.9	549	11.9	0.272	7.8	LOS A	2.8	21.8	0.51	0.44	0.51	45.5
29	R2	All MCs	384	1.6	384	1.6	* 0.609	21.2	LOS B	5.3	37.7	0.80	0.90	0.80	38.8
Approach			934	7.7	934	7.7	0.609	13.3	LOS A	5.3	37.7	0.63	0.63	0.63	42.5
SouthWest: Rutherford Road (SW)															
30	L2	All MCs	325	1.9	325	1.9	0.282	10.9	LOS A	3.1	21.8	0.48	0.69	0.48	38.7
32	R2	All MCs	140	3.0	140	3.0	* 0.317	28.6	LOS C	2.5	17.7	0.86	0.76	0.86	35.5
Approach			465	2.3	465	2.3	0.317	16.2	LOS B	3.1	21.8	0.60	0.71	0.60	37.1
All Vehicles			2015	6.7	2015	6.7	0.696	18.4	LOS B	5.3	40.5	0.70	0.71	0.72	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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
NorthWest: Maitland St (NW)											
P7	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
SouthWest: Rutherford Road (SW)											
P8	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
All Pedestrians		158	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [1- Maitland St/Thompson St - 10 years with Dev - AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM Peak (Network Folder: Existing Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	20	5.3	20	5.3	0.016	7.5	LOS A	0.1	0.8	0.32	0.59	0.32	44.7
22	T1	All MCs	800	7.6	800	7.6	* 0.718	22.2	LOS B	6.9	51.4	0.95	0.87	1.03	39.1
Approach			820	7.6	820	7.6	0.718	21.8	LOS B	6.9	51.4	0.93	0.86	1.01	39.2
NorthWest: Maitland St (NW)															
28	T1	All MCs	682	10.0	682	10.0	0.373	6.3	LOS A	2.7	20.8	0.47	0.41	0.47	42.7
29	R2	All MCs	127	2.5	127	2.5	* 0.370	23.3	LOS B	1.9	13.6	0.90	0.77	0.90	37.2
Approach			809	8.8	809	8.8	0.373	9.0	LOS A	2.7	20.8	0.54	0.46	0.54	41.0
SouthWest: Thompson Street (SW)															
30	L2	All MCs	301	2.1	301	2.1	0.329	14.3	LOS A	3.3	23.2	0.64	0.73	0.64	40.9
32	R2	All MCs	240	0.4	240	0.4	* 0.486	25.2	LOS B	3.8	26.4	0.89	0.80	0.89	29.9
Approach			541	1.4	541	1.4	0.486	19.1	LOS B	3.8	26.4	0.75	0.76	0.75	37.0
All Vehicles			2171	6.5	2171	6.5	0.718	16.4	LOS B	6.9	51.4	0.74	0.69	0.77	39.1

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
NorthWest: Maitland St (NW)											
P7	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
SouthWest: Thompson Street (SW)											
P8	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		158	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [2- Maitland St / Rutherford Rd - 10 years with Dev - AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [AM Peak (Network Folder: Existing Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	160	7.2	160	7.2	0.147	12.0	LOS A	1.2	9.0	0.45	0.66	0.45	43.1
22	T1	All MCs	607	8.5	607	8.5	* 0.801	30.1	LOS C	6.3	47.1	1.00	0.99	1.25	28.1
Approach			767	8.2	767	8.2	0.801	26.3	LOS B	6.3	47.1	0.88	0.92	1.08	31.3
NorthWest: Maitland St (NW)															
28	T1	All MCs	414	11.7	414	11.7	0.228	9.2	LOS A	2.1	16.2	0.60	0.50	0.60	44.8
29	R2	All MCs	437	2.7	437	2.7	* 0.937	46.5	LOS D	9.3	66.6	1.00	1.29	1.62	31.1
Approach			851	7.1	851	7.1	0.937	28.4	LOS B	9.3	66.6	0.80	0.90	1.12	36.5
SouthWest: Rutherford Road (SW)															
30	L2	All MCs	301	4.5	301	4.5	0.287	11.4	LOS A	2.7	19.7	0.53	0.70	0.53	38.3
32	R2	All MCs	76	4.2	76	4.2	* 0.158	23.1	LOS B	1.1	7.7	0.80	0.72	0.80	37.4
Approach			377	4.5	377	4.5	0.287	13.7	LOS A	2.7	19.7	0.59	0.71	0.59	38.0
All Vehicles			1995	7.0	1995	7.0	0.937	24.8	LOS B	9.3	66.6	0.79	0.87	1.00	35.0

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
NorthWest: Maitland St (NW)											
P7	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
SouthWest: Rutherford Road (SW)											
P8	Full	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		158	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [1- Maitland St/Thompson St - 10 years with Dev PM Peak (Site Folder: Existing - PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM Peak (Network Folder: Existing Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	26	0.0	26	0.0	0.020	6.5	LOS A	0.1	0.7	0.14	0.56	0.14	45.3
22	T1	All MCs	766	7.3	766	7.3	* 0.514	6.9	LOS A	3.9	28.8	0.38	0.33	0.38	46.0
Approach			793	7.0	793	7.0	0.514	6.9	LOS A	3.9	28.8	0.37	0.34	0.37	45.9
NorthWest: Maitland St (NW)															
28	T1	All MCs	711	10.7	711	10.7	0.308	3.0	LOS A	2.0	15.2	0.23	0.20	0.23	46.2
29	R2	All MCs	161	1.3	161	1.3	* 0.289	17.0	LOS B	2.5	17.9	0.66	0.74	0.66	39.7
Approach			872	8.9	872	8.9	0.308	5.6	LOS A	2.5	17.9	0.31	0.30	0.31	44.0
SouthWest: Thompson Street (SW)															
30	L2	All MCs	224	1.9	224	1.9	0.262	20.2	LOS B	3.6	25.9	0.65	0.73	0.65	38.4
32	R2	All MCs	203	1.0	203	1.0	* 0.522	39.3	LOS C	5.0	35.1	0.94	0.81	0.94	24.4
Approach			427	1.5	427	1.5	0.522	29.3	LOS C	5.0	35.1	0.78	0.77	0.78	32.5
All Vehicles			2092	6.7	2092	6.7	0.522	10.9	LOS A	5.0	35.1	0.43	0.41	0.43	42.0

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
NorthWest: Maitland St (NW)											
P7	Full	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
SouthWest: Thompson Street (SW)											
P8	Full	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
All Pedestrians		158	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [2- Maitland St / Rutherford Rd - 10 years with Dev PM Peak (Site Folder: Existing - PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [PM Peak (Network Folder: Existing Network)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Network Practical Cycle Time)

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: Maitland St (SE)															
21	L2	All MCs	175	1.2	175	1.2	0.208	28.7	LOS C	2.8	19.9	0.64	0.72	0.64	38.4
22	T1	All MCs	491	10.5	491	10.5	* 0.903	57.4	LOS E	8.8	67.5	1.00	1.13	1.43	20.5
Approach			665	8.1	665	8.1	0.903	49.9	LOS D	8.8	67.5	0.90	1.02	1.22	24.1
NorthWest: Maitland St (NW)															
28	T1	All MCs	613	10.7	613	10.7	0.261	4.5	LOS A	3.0	22.9	0.30	0.26	0.30	47.3
29	R2	All MCs	682	0.9	682	0.9	* 0.829	34.8	LOS C	15.8	111.2	0.95	1.06	1.04	34.2
Approach			1295	5.5	1295	5.5	0.829	20.4	LOS B	15.8	111.2	0.65	0.68	0.69	39.4
SouthWest: Rutherford Road (SW)															
30	L2	All MCs	325	1.9	325	1.9	0.254	9.8	LOS A	3.1	22.4	0.39	0.66	0.39	39.6
32	R2	All MCs	140	3.0	140	3.0	* 0.385	38.9	LOS C	3.3	24.0	0.91	0.78	0.91	32.2
Approach			465	2.3	465	2.3	0.385	18.6	LOS B	3.3	24.0	0.55	0.70	0.55	35.8
All Vehicles			2425	5.6	2425	5.6	0.903	28.2	LOS B	15.8	111.2	0.70	0.78	0.81	34.5

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Maitland St (SE)											
P5	Full	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
NorthWest: Maitland St (NW)											
P7	Full	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
SouthWest: Rutherford Road (SW)											
P8	Full	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
All Pedestrians		158	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.