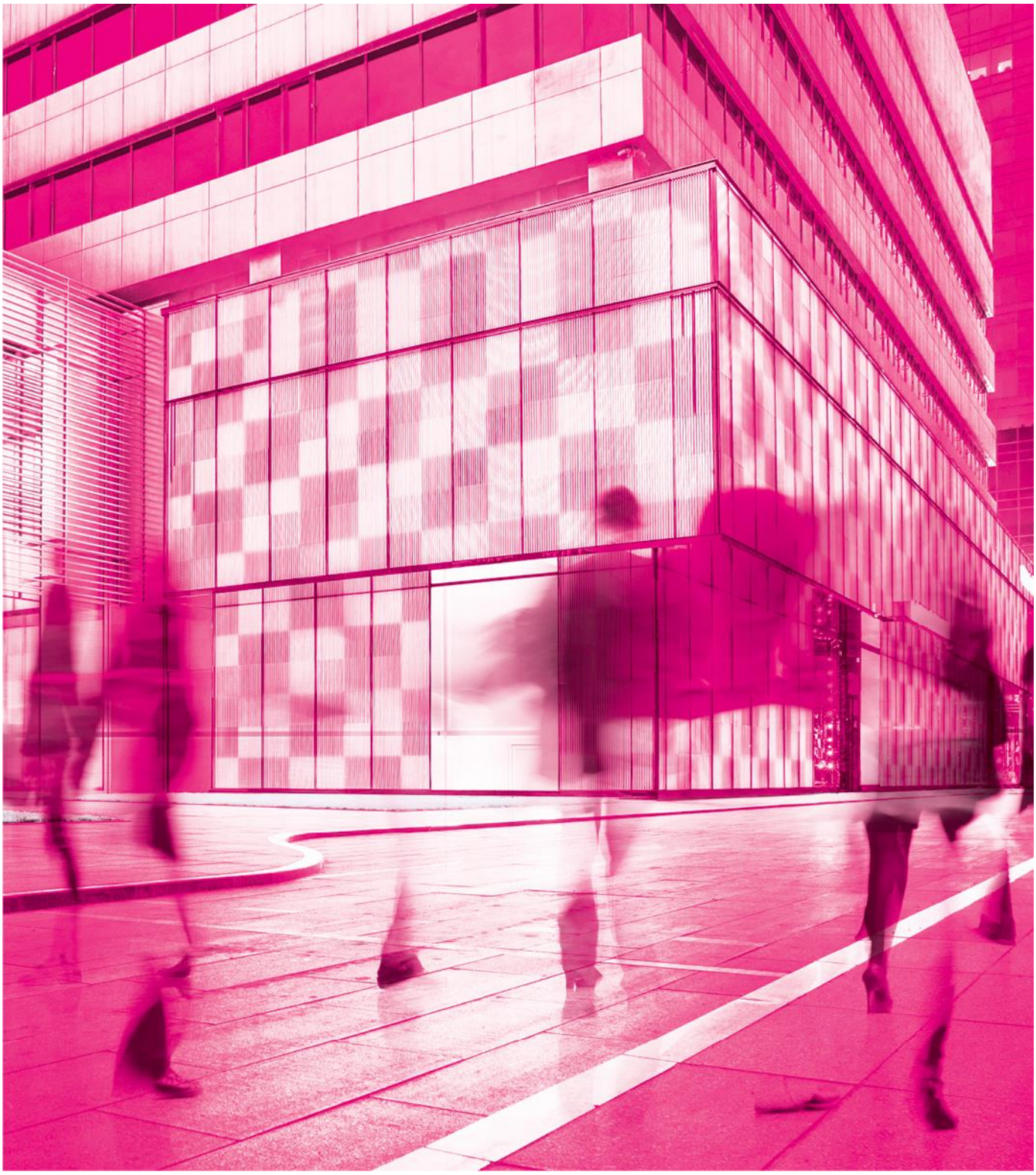


Traffic Impact Assessment;

Budawang School SSDA

For SINSW

13 April 2021

parking;
traffic;
civil design;
wayfinding;

ptc.

Document Control

Budawang School SSDA, Traffic Impact Assessment

Issue	Date	Issue Details	Author	Reviewed	For the attention of
1	07/12/20	WIP Issue	HL/PS	KB/AM	Mark Reynolds (SINSW)
2	18/02/21	Final Issue	HL	KB/SW	Mark Reynolds (SINSW)
3	23/02/21	Revision 1	HL	KB/SW	Mark Reynolds (SINSW)
4	13/04/21	Revision 2	KB	AM	Michael Stern (SINSW)

Contact

Andrew Morse

+61 2 8920 0800

andrew.morse@ptcconsultants.co

Kasia Balsam

+61 2 8920 0800

kasia.balsam@ptcconsultants.co

Henry Li

+61 2 8920 0800

henry.li@ptcconsultants.co

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

Contents

1. Executive Summary

ptc. has been engaged by School Infrastructure New South Wales (SINSW) to prepare a Traffic Impact Assessment to accompany a State Significant Development Application. The proposed development involves the relocation of the existing Budawang School from Ulladulla to a new site to occupy a portion of the former Shoalhaven Anglican School at 17 Croobyar Road, Milton NSW.

The overall proposal is to construct a new school with an enrolment capacity of 80 students and approximately 34 FTE staff. This school will cater for students with moderate to severe levels of intellectual and physical disability.

The School also has the following characteristics:

- Three pick-up/drop-off spaces which are located in a secured area of the car park and highly managed by staff to allow vehicles to park momentarily and parents to escort their child to and from the School
- 30 car parking spaces (inclusive of two accessible bays) for staff use
- Two staff and four visitor bicycle parking spaces
- One shared loading bay accommodating trucks up to 11.3m in length for the purposes of deliveries to the hydrotherapy pool and waste collection. A turning area is provided to allow vehicles to enter and exit the site in a forward direction.

In regard to transport modes, the following has been considered:

- The school will cater for students with moderate to severe levels of intellectual and physical disability, meaning that the main transportation mode will comprise government taxis or parents in either light vehicles or vans.
- Given the above, no bicycle provision has been adopted for students.
- The project is not proposing to provide a bus stop as part of this development. However, the layout has taken in consideration potential future inclusion of a bus bay along Croobyar Road.

In terms of traffic activity, a SIDRA traffic model has been prepared with the following considerations:

- The model includes developments approved to date by Shoalhaven City Council, including shed buildings and seniors' housings. It is noted that none of the developments directly impacting the Croobyar Road / Princess Highway intersection have presented SIDRA modelling or an analysis of the 10-year scenario.
- The proposed Budawang School would be located within land that was previously occupied by the Shoalhaven Anglican School. While it is acknowledged that the 'existing scenario' represents the current traffic situation, it is noted that the former school was previously approved and generated traffic, which could not be captured by the traffic surveys undertaken as part of this project. Given the proposed student population of 80 students, it is assumed that the Budawang School will generate less traffic than the former High School.

- The traffic growth rate for the 10-year scenario was derived from traffic counters and has been determined to be 1.03% per annum.
- While the final corridor location and access points for the Milton-Ulladulla bypass have not been decided yet, this proposed infrastructure will likely result in a reduction of traffic at the Princess Highway /Croobyar Road intersection.
- In general, the SIDRA modelling has identified that the proposed development will not have a significant effect on the surrounding intersections.

Other points considered include:

- A preliminary review of the proposed car park layout indicates that the design is capable of complying with the design requirements of the current relevant standards.
- The proposed development will be located only within a portion of the former school. The use of the remainder has not been decided yet, but it will most likely involve a future educational establishment, which does not form part of this application.
- The originally indicated zebra crossing across Croobyar Road is no longer being proposed.

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

2. Introduction

2.1 Background

ptc. has been engaged by School Infrastructure New South Wales (SINSW) to prepare a Traffic Impact Assessment (TIA) report for the relocation of the existing Budawang School (the School) from Ulladulla to a new site to occupy a portion of the former Shoalhaven Anglican School at 17 Croobyar Road, Milton NSW. This report has been prepared to accompany the State Significant Development Application (SSDA) for the School.

Currently, the School has an enrolment population of 35 students ranging from ages 4 to 20 years as identified on the School's website. The overall proposal is to construct a new school with a maximum capacity of 80 school students. The Budawang School caters for students with moderate to severe intellectual and physical disability.

The subject site lies within the Shoalhaven City Council's local government area and has been assessed under relevant Council and State controls. The location of the relocated School is outlined in Figure 1.

This report sets out the methodology and findings of the study to assess the traffic, parking and the transport implications associated with the proposal.

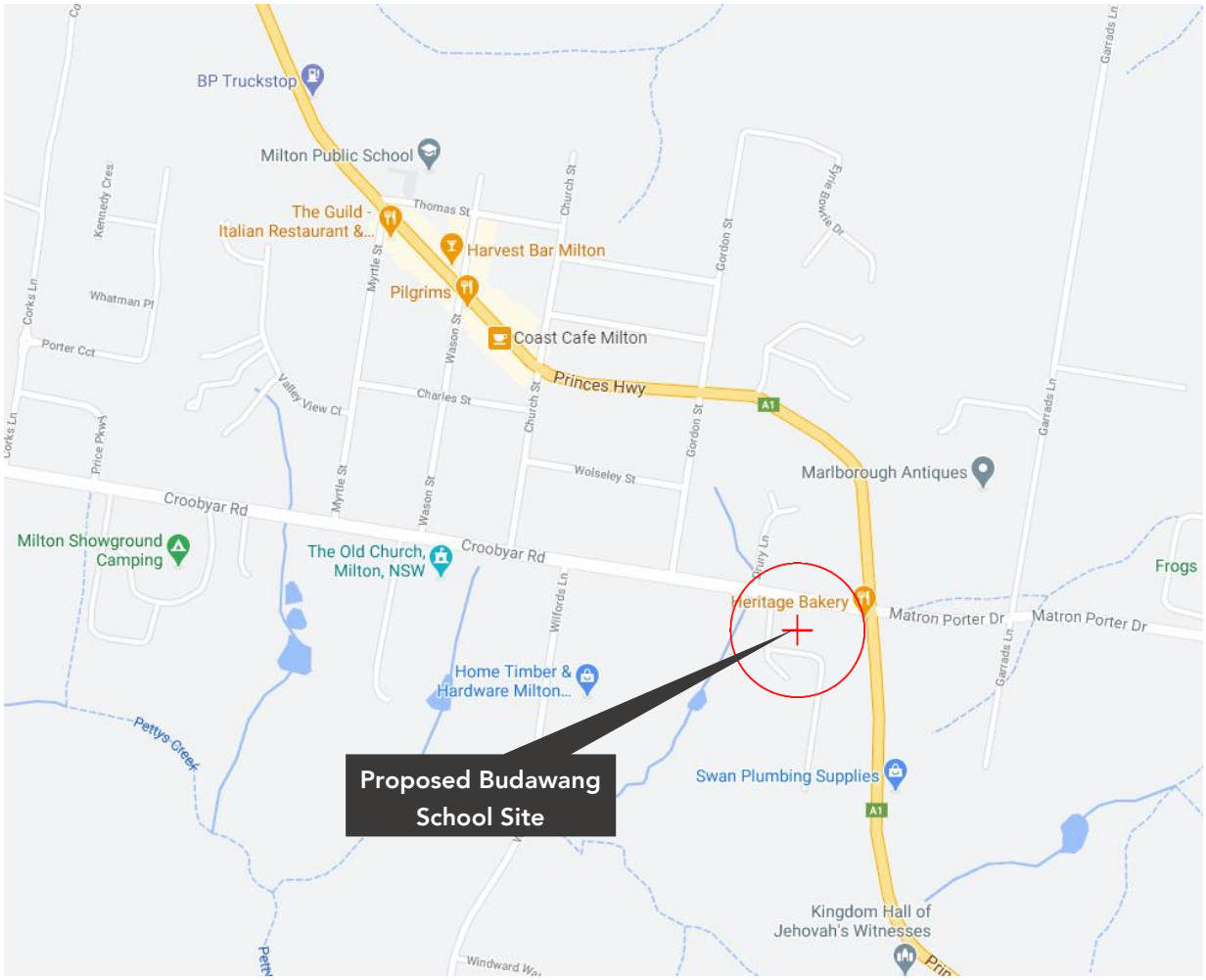


Figure 1 – Site Location (Source: Google Maps)

2.2 Response to SEARs, TfNSW and Council Comments

2.2.1 SEARs Requirements

SEARs Requirement	ptc. Response
Analysis of the existing transport network, including:	
• road hierarchy	Refer to Section 3.1
• pedestrian, cycle and public transport infrastructure	Refer to Section 3.2 and Section 3.3
• details of current daily and peak hour vehicle movements based on traffic surveys and / or existing traffic studies relevant to the locality	Refer to Section 5.1
• existing performance levels of nearby intersections utilising appropriate traffic modelling methods (such as SIDRA network modelling).	Refer to Section 5.2.2, Section 5.2.3
Details of the proposed development, including:	
• a map of the proposed access which identifies public roads, bus routes, footpaths and cycleways	Refer to Section 2.8, Attachment 1 and the Green Travel Plan
• vehicular access arrangements, including for service and emergency vehicles and loading/unloading, including swept path analysis demonstrating the largest design vehicle entering and leaving the site and moving in each direction through intersections along the proposed transport routes	Refer to Section 6, Section 7.2 and Attachment 3
• car parking, bicycle parking and end-of-trip facilities	Refer to Section 4.4 and Section 4.8
• drop-off / pick-zone(s) and bus bay(s)	Refer to Section 4.3 and Section 4.2
• pedestrian or road infrastructure improvements or safety measures.	Refer to Section 6 and the Green Travel Plan
Analysis of the impacts due to the operation of the proposed development, including:	Refer to Section 5 and Section 4
• proposed modal split for all users of the development including vehicle, pedestrian, cyclist, public transport and other sustainable modes	Refer to Section 4.3, Section 4.4, Section 5.2.2, Section 5.2.3 and the Green Travel Plan
• estimated total daily and peak hour vehicular trip generation	Refer to Section 5.2 and Section 5.5

SEARs Requirement	ptc. Response
• a clear expansion and justification of the:	
- assumed growth rate applied	Refer to Section 5.4
- volume and distribution of proposed trips to be generated	Refer to Section 5.2, Section 5.3 and Section 5.4
- type and frequency of design vehicles accessing the site	Refer to Section 4.9 and Section 0
• details of performance of nearby intersections with the additional traffic generated by the development both at the commencement of operation and in a 10-year time period (using SIDRA network modelling)	Refer to Section 5.5
• cumulative traffic impacts from any surrounding approved development(s)	Refer to Section 5.3
• adequacy of pedestrian, bicycle and public transport infrastructure to accommodate the development	Refer to Section 4.2 and Section 4.8 and the Green Travel Plan
• adequacy of car parking and bicycle parking provisions when assessed against the relevant car / bicycle parking codes and standards	Refer to Section 4.4 and Section 4.8
• adequacy of the drop-off / pick-up zone(s) and bus bay(s), including assessment of any related queuing during peak-hour access	Refer to Section 4.3 and Section 4.2
• adequacy of the existing / proposed pedestrian infrastructure to enable convenient and safe access to and from the site of all users.	Refer to Section 3.3.2 and the Green Travel Plan
Measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including:	
• travel demand management measures to encourage sustainable transport (such as a Green Travel Plan and / or specific Workplace Travel Plan)	Refer to the Green Travel Plan
• infrastructure improvements, including details of timing and method of delivery.	Refer to Section 6.2
A preliminary operational traffic and access management plan for the site, the drop-off / pick-up zone(s) and bus bay(s)	Refer to Section 6

SEARs Requirement	ptc. Response
Analysis of the impacts of the traffic generated during construction of the proposed development, including: • construction vehicle routes, types and volumes • construction program (duration and milestones) • on-site car parking and access arrangements for construction, emergency and construction worker vehicles • cumulative impacts associated with other construction activities in the locality (if any) • road safety at identified intersections near the site due to conflicts between construction vehicles and existing traffic in the locality • measures to mitigate impacts, including to ensure the safety of pedestrian and cyclists during construction	Refer to the Preliminary Construction Traffic Management Plan
A preliminary Construction Traffic and Pedestrian Management Plan	Refer to the Preliminary Construction Traffic Management Plan

2.2.2 TfNSW Comments

TfNSW Requirement	ptc. Response
1. Traffic Impact Study (TIS): A detailed TIS is required to consider the implications of the development. As a guide Table 2.1 of the RTA'S *Guide to Traffic Generating Developments* outlines the key issues that should be considered in preparing a TIS. The TIS also needs to include, but not limited to the following:	
a) Details of the maximum number of staff and students, facility usage (e.g., after hours, public usage of rooms/hydrotherapy facility), etc.;	Refer to Section 2.8
b) Details of all traffic types and volumes likely to be generated by the proposed development during both its construction and its ongoing operation;	Refer to Section 5.2 and the Preliminary Construction Traffic Management Plan
c) Details on access arrangements for vehicles during construction as well as for both vehicles and students for its ongoing operation (e.g. existing access points to be retained, existing	Refer to Section 6, Section 7.2, Attachment 4 and the Preliminary Construction Traffic Management Plan

TfNSW Requirement	ptc. Response
access points to be closed, new access points to be created, etc.);	
d) A swept path assessment for the vehicles that will use the site inclusive of service vehicles. This should demonstrate that the vehicles can enter and leave in a forward direction and will not have any adverse impacts on the adjoining road network;	Refer to Attachment 3
e) Details on drop off and pick up zones for cars as well as buses including an assessment of the impacts on the adjoining road network;	Refer to Section 4.3, Section 4.2 and Section 5.2
f) Consideration of the impacts on the state road network and identification of appropriate measures to mitigate the impact (e.g. impacts on the signalised intersection of Croobyar Road/Princes Highway). The assessment of impacts depending on traffic volumes generated by the development may require the use of SIDRA modelling to be provided (including the electronic files);	Refer to Section 5.5
g) Details on active transport to be used by students (walking, cycling) including the adequacy of existing infrastructure;	Refer to Section 3.3
h) Details on the pedestrian crossing that appears to be shown in Figures 3 and 4 of the Mecone report. This including details on how it meets the numerical warrants detailed in the TfNSW Supplement *Austroads Guide to Traffic Management Part 6.* TfNSW has concerns with the proximity of the crossing point to the signalised intersection of Croobyar Road/Princes Highway and the impact it will have on the operation of these signals in terms of safety and efficiency;	The zebra crossing indicated in the Request for SEARs report is no longer being proposed, therefore no assessment has been undertaken.
i) An assessment of the adequacy of on-site car parking to service the development; and	Refer to Section 4.4
j) Details on school zone requirements to be installed	Refer to Section 7.1
2. State Environment Planning Policy (Educational Establishments and Child Care Facilities) 2017 The provision of Clause 57 needs to be addressed (e.g., the requirements of subclause 3 (b) and (c), is it applicable and if it is not why it is not). (3) The consent authority must take into consideration— (b) the accessibility of the site concerned, including—	

TfNSW Requirement	ptc. Response
(i) the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and	Refer to Section 5.2 and Section 6
(ii) the potential to minimise the need for travel by car, and	Refer to the Green Travel Plan
(c) any potential traffic safety, road congestion or parking implications of the development.	Refer to Section 4
3. Staging Details on the staging of any work associated with the proposed development.	Refer to the Preliminary Construction Traffic Management Plan
4. Future use of the remainder of the site Details on the intended future use of the remainder of the site noting that Figure 3 and 4 in the Mecone report show the outline of a new High School Admin building, a 'Potential High School Entry' and reference 'Potential Future Middle Years High School'. Is a masterplan approval being sought, and if not, why? TfNSW is supportive of considering the intended use of the site as a whole as opposed to several separate applications.	The use of the remainder has not been decided yet, but it will most likely involve a future educational establishment. However, this does not form part of this application.
5. Consultation TfNSW encourages further consultation, if required in the preparation of the EIS to discuss traffic and accessibility issues as they relate to impacts on the state classified road and traffic signals at the intersection of the Princes Highway and Croobyar Road. Details on what discussions have occurred with the TfNSW during the EIS preparation and with who should be detailed in the EIS.	Consultation has been initiated with an email response from TfNSW received on 23rd December 2020.
6. Strategic/Concept Design: Should it be identified as part of preparing the EIS or during the assessment of the application that mitigation measures are required, that will impact a state/classified road then, a concept design for the proposed works will need to be prepared and submitted. This is needed in order to clarify the scope of works, demonstrate the works can be constructed within the road reserve and allow the consent authority to consider any environmental impacts of the works as part of their assessment.	No measures are required and proposed
7. Other Information: Milton Ulladulla bypass: TfNSW has announced plans for a proposed bypass of Milton and Ulladulla. Although a corridor has not been identified in Shoalhaven Council's Local Environmental Plan (LEP), a preferred corridor for the proposed Milton Ulladulla bypass has not	Refer to Section 2.5 and Section 5.4

TfNSW Requirement	ptc. Response
been decided. TfNSW is currently undertaking a review of the current road corridor on Council's LEP and carrying out other investigations to determine a preferred option for a Milton Ulladulla bypass.	

2.2.3 Council's Comments

Council's Requirement	ptc. Response
3. Queuing impacts to Croobyar Road intersection left turn with the Princes Highway. Note that Croobyar Road left turning lane is currently limited to 50m in length and may require extending further west to accommodate an increase in traffic movements.	Refer to Section 5.5 and Section 0
4. Recent developments approved in the vicinity include: a. DA20/1358 industrial storage units Lot 1 DP 1082590 Croobyar Road b. DA17/2021 industrial shed lot 1 DP 1071300 Wilfords Lane c. RA10/1005 Seniors Housing Development – lot 2 DP 1097329 & Lot 3 DP 702859 Croobyar Road These projects are available on council's DA tracking web page under: https://www.shoalhaven.nsw.gov.au/Services/Development-Application-Tracking	Refer to Section 5.3 and Section 5.5

2.3 Purpose of this Report

The purpose of this report is to present the considerations relating to the Traffic Impact Assessment (TIA) of the proposed school development. This report will form part of the State Significant Development Application (SSDA) to the NSW Department of Planning, Industry and Environment (DPIE) for the relocation of Budawang School and will address the following:

Section 2 Introduction and brief description of the proposal;

Section 3 Description of the existing transport facilities serving the School;

Section 4 Assessment of the proposed parking provisions;

Section 5 Determination of the traffic activity associated with the School development;

Section 6 An overview of the operational traffic and access management measures;

Section 7 Car park assessment; and

Section 8 Conclusion.

2.4 Site Location

The proposed School site is located within the north-eastern portion of the former Shoalhaven Anglican School site at 17 Croobyar Road, Milton NSW and is identified as Lot 200 in Deposited Plan 1192140. It is located approximately 1km south-east of the Milton Town Centre. More specifically, the site is located to the west of the Princes Highway.

The site area proposed for the School site is approximately 5,000m^2 and has a frontage to Croobyar Road to the north. An aerial view of the subject site is shown in Figure 2.

Figure 2 – Aerial View of the Subject Site (Source: Near Map)

In a wider context, Milton is a small rural town with a population of approximately 1,700 residents. It is located west and north of larger town such as Narrawallee, Mollymook, Ulladulla and Burrill Lake, as shown in Figure 3.

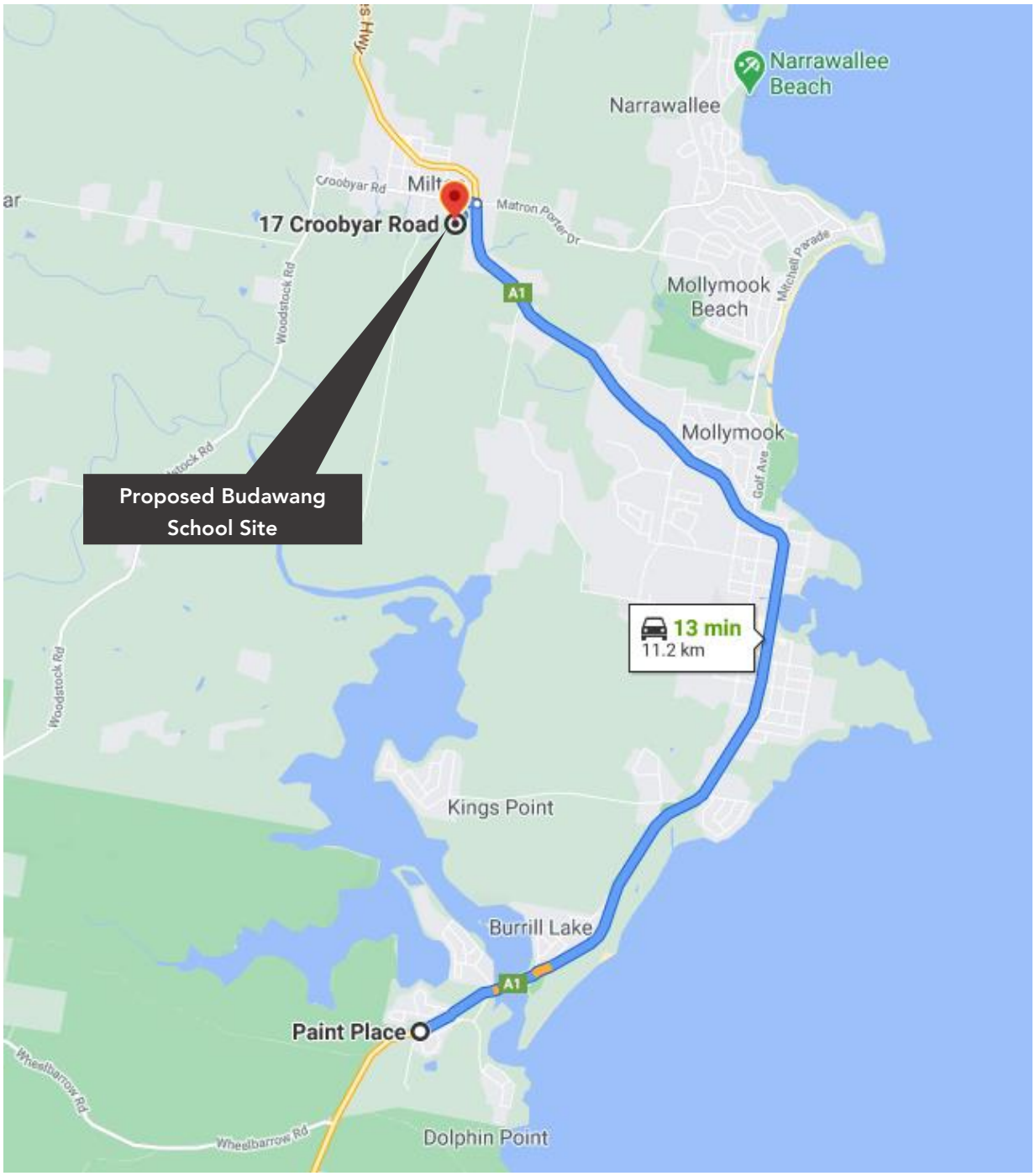


Figure 3 – Location Overview (Source: Google Maps)

2.5 Surrounding Land Use

The proposed School site is currently within an RU2 (Primary Production) zone, where the surrounds comprise of R2 Low Density Residential zones, RU4 (Primary Production Small Lots) and various other RU2 zones. The Milton Town Centre is located to the north-west comprising a combination of B2 (Local Centre), SP2 (Infrastructure) zones as well as a few scattered Public Recreation (RE1) zones within the vicinity of the site.

Refer to Figure 4 for details of the surrounding land use zoning.

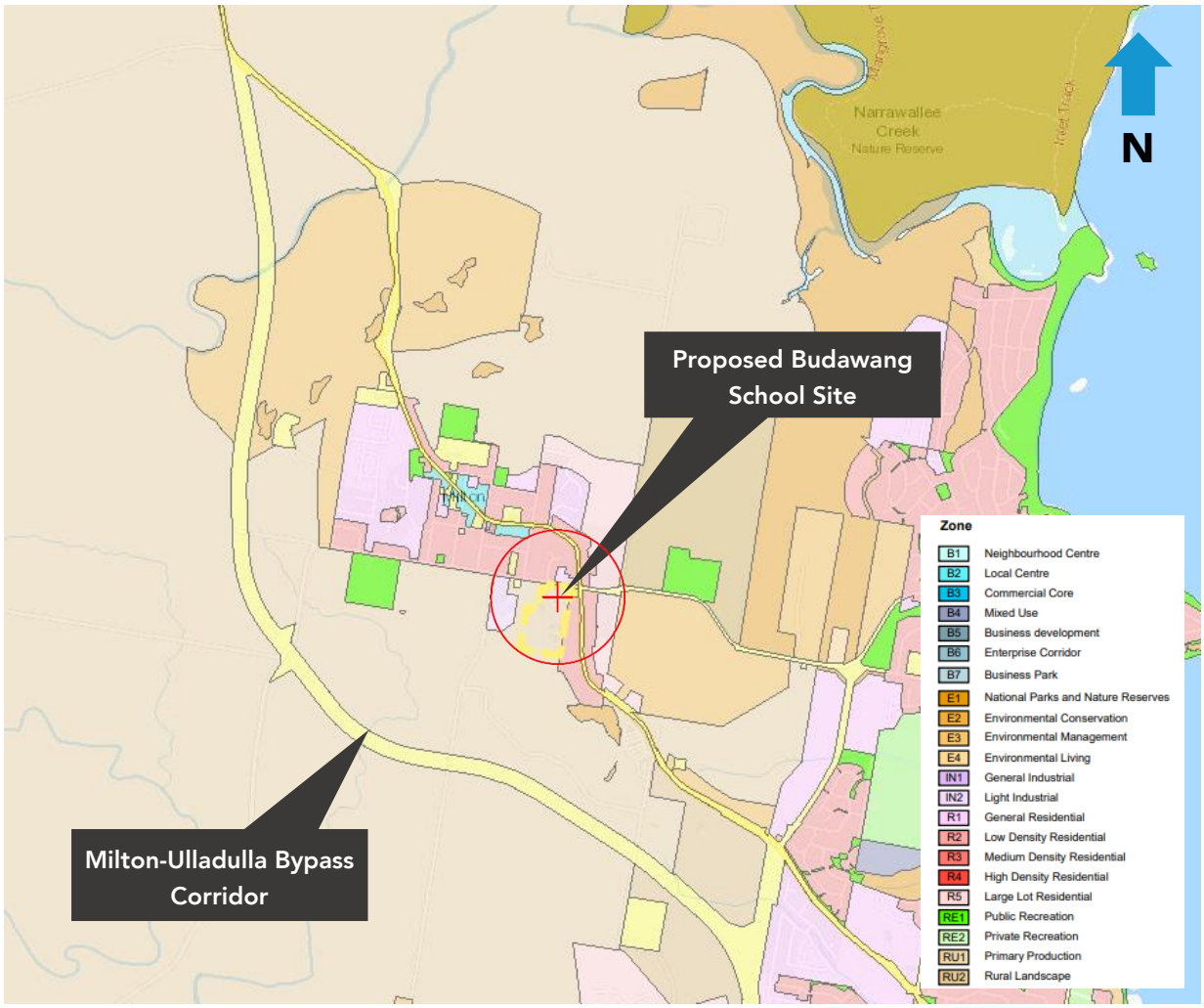


Figure 4 – Local Land Use Map (Source: NSW Planning Viewer)

2.6 Milton-Ulladulla Bypass

As part of the Princes Highway Upgrade project, it is planned to construct the Milton-Ulladulla Bypass which is currently under investigation. The project will serve as an opportunity to improve the safety and amenity of existing intersections for pedestrians, cyclists as well as vehicles. Community consultation has identified the intersection of Princes Highway/Matron Porter Drive/Croobyar Road as a potential location to be investigated as part of the project. The identified corridor as shown in the Shoalhaven Local Environmental Plan (LEP) is illustrated in Figure 4 and Figure 5.

Upon consultation with TfNSW, the following information was obtained in December 2020:

> *A preferred corridor for the proposed Milton Ulladulla bypass has not been decided. TfNSW is currently undertaking a review of the current road corridor on Council's Local Environmental Plan and carrying out other investigations to determine a preferred option for a Milton Ulladulla bypass which will inform connection points. TfNSW is currently looking at options to be further investigated at the concept design stage for the Milton-Ulladulla bypass next year.*

Additional consultation with the Princess Highway project team was undertaken in April 2021 and we were advised that the project is still in the process of assessing submissions received as part of community consultation, hence no decision on the future corridor alignment or access points has been made yet. The team acknowledged the proposed school development and confirmed that this will be taken into consideration.

Considering that the bypass will lead to through traffic being diverted away from Milton, it is expected that traffic along the Princess Highway and its intersection with Croobyar Road will be reduced.

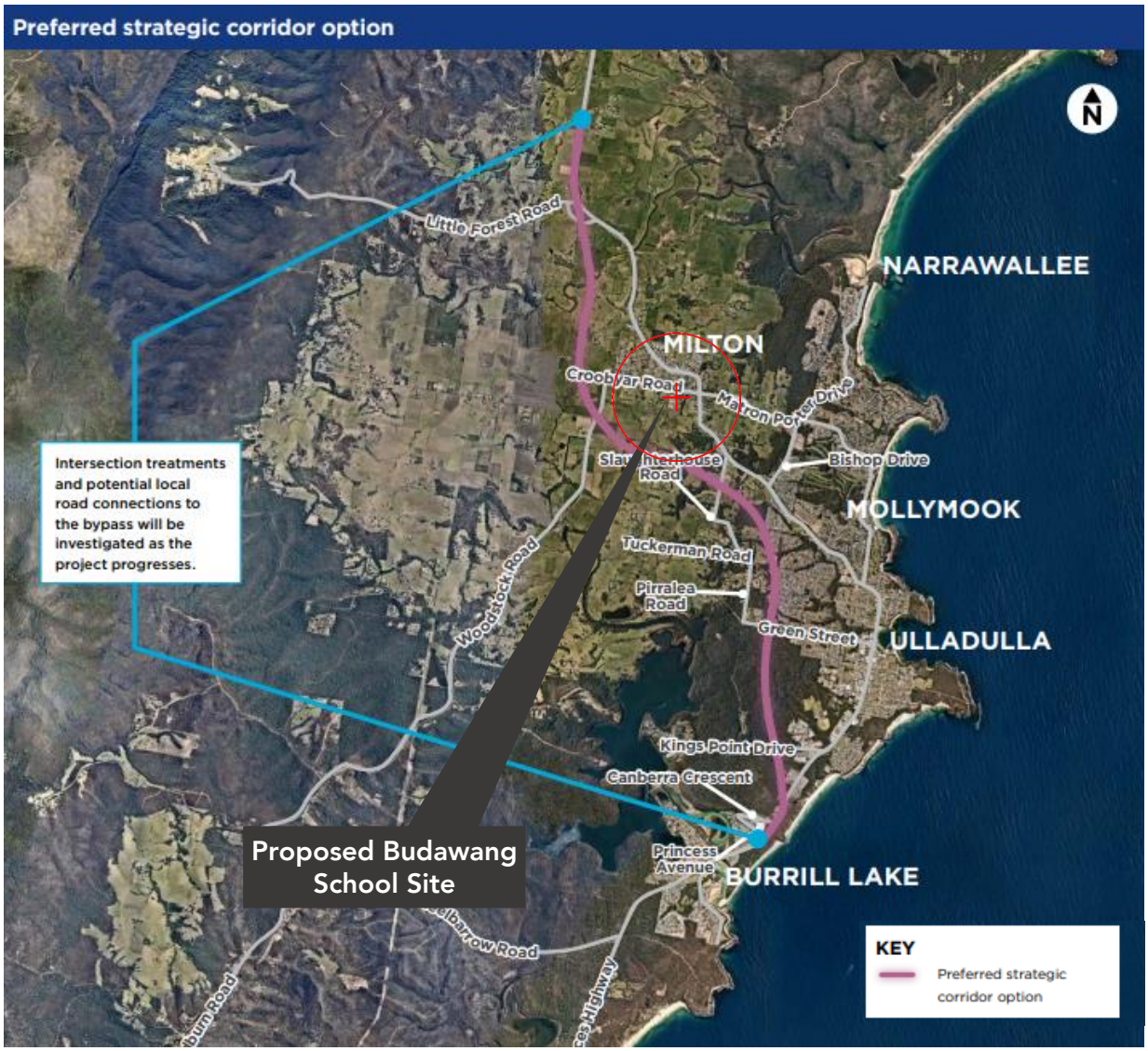


Figure 5 – Preferred Strategic Corridor for Milton-Ulladulla Bypass (Source; TfNSW)

2.7 Budawang School

The Budawang School caters for students with moderate to severe disabilities and is currently located at the corner of Camden and Narrawallee Streets Ulladulla NSW 2539. The School currently accommodates 32 students with varying levels of physical or intellectual disability. According to the My School website[1], the School also has a population of 13.5 Full-Time Equivalent (FTE) staff, inclusive of teaching and non-teaching employees.

The current bell times as outlined on the Budawang School website are as follows:

- School Opening Time: 8:55am
- Class Start Time: 9:25am
- School Finish Time: 3:00pm

A review of the depersonalised student data has been undertaken to determine the approximate areas of where students reside and where they travel from to get to Budawang School. It is noted that the data relates to the existing location of the School in Ulladulla.

The key residential areas where students are travelling from are illustrated in Figure 6.

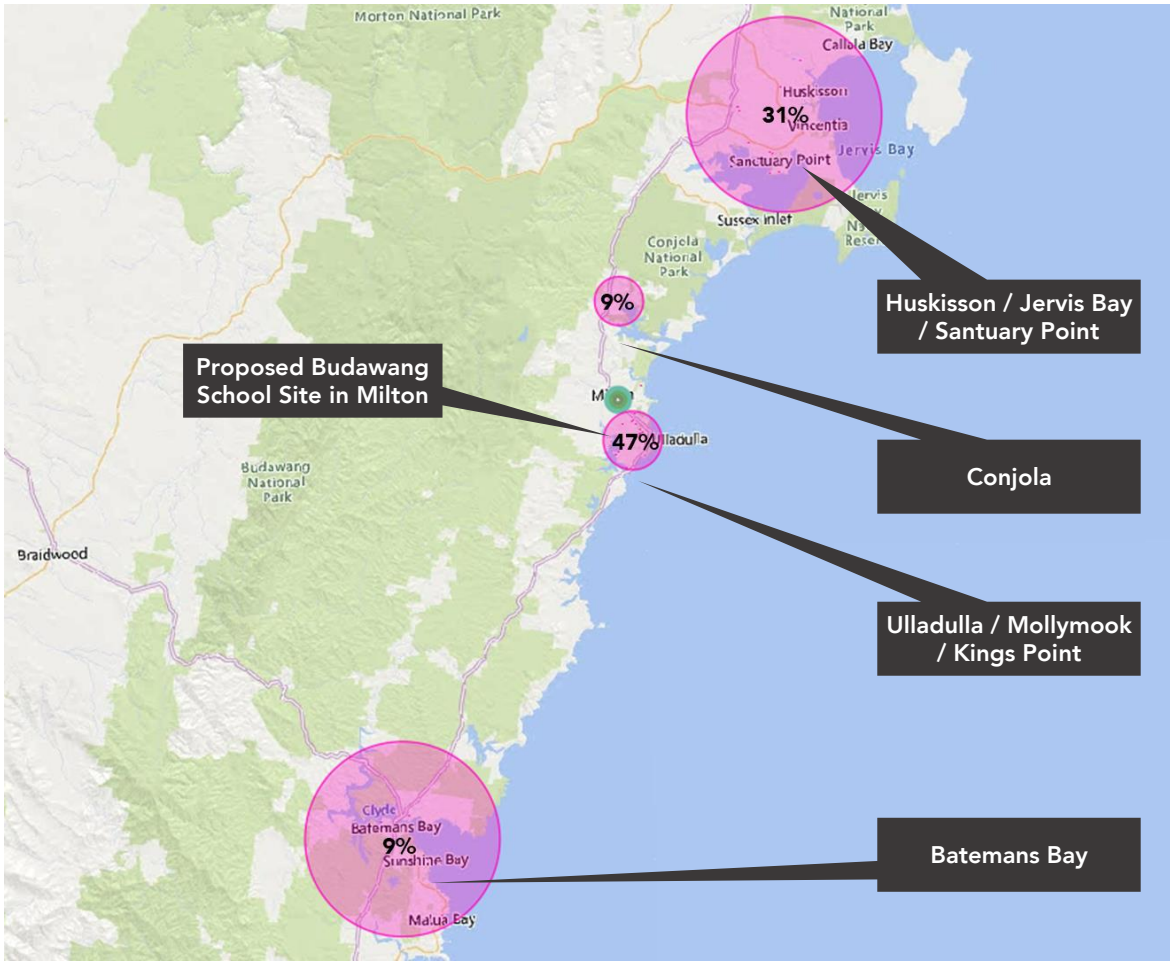


Figure 6 – Key Residential Areas for Existing Student Population at Budawang School

[1] https://www.myschool.edu.au/school/42903

As illustrated in Figure 6, the vast majority of students reside within the Ulladulla/Mollymook/Kings Point area which accounts for approximately half of the existing student population. There are approximately one-third of students who reside within the Huskisson, Sanctuary Point and Jervis Bay area to the north and approximately 9% of students residing in Conjola. Similarly, there are approximately 9% of students residing to the south in Batemans Bay. No students live Milton.

It is noted that one student resides within Penrith (potentially as a secondary residence due to the significant travel distance from the School) and this has not been included in the map shown, thus percentages may not total up to 100%.

It is highlighted that the main conclusion from this analysis is that students do not generally reside within a typical walking catchment of up to 1.2km which makes walking not a feasible mode of travel. Hence, it is anticipated that the majority of students would travel to and from school by other means.

2.8 Development Proposal

The development proposal for the Budawang School involves the relocation of the existing Budawang School from Ulladulla to a part of a new lot within the former Shoalhaven Anglican School site at 17 Croobyar Road, Milton NSW.

In the context of transport and traffic, the proposed School will involve the following:

- A capacity of 80 student placements, accommodating students from ages 4 to 20 with moderate to severe intellectual and physical disability;
- Due to the nature of the school, the enrolment catchment is not clearly defined, and some student travel from as far as Nowra;
- An estimated staff population of approximately 34 FTE staff.
  It is noted that given the type of the school, this educational facility has a higher staff to student ratio compared to general schools;
- Three pick-up/drop-off spaces;
- 30 staff car parking spaces (inclusive of two accessible bays); and
- One shared loading bay accommodating trucks up to 11.3m for the purposes of deliveries to the hydrotherapy pool and waste collection.

The school is also proposing to provide a bike track within the school grounds, but it is noted that this will be used for physical education only. Bicycles used will be 3-wheeler bikes provided by and stored in the school.

It is envisaged that the construction commences in November 2021 and finishes in December 2022. It is planned to open the school to Term 1 in February 2023.

The proposed site layout plan of Budawang School is illustrated in Figure 7 and the detailed architectural plans prepared by GroupGSA are presented in Attachment 1.

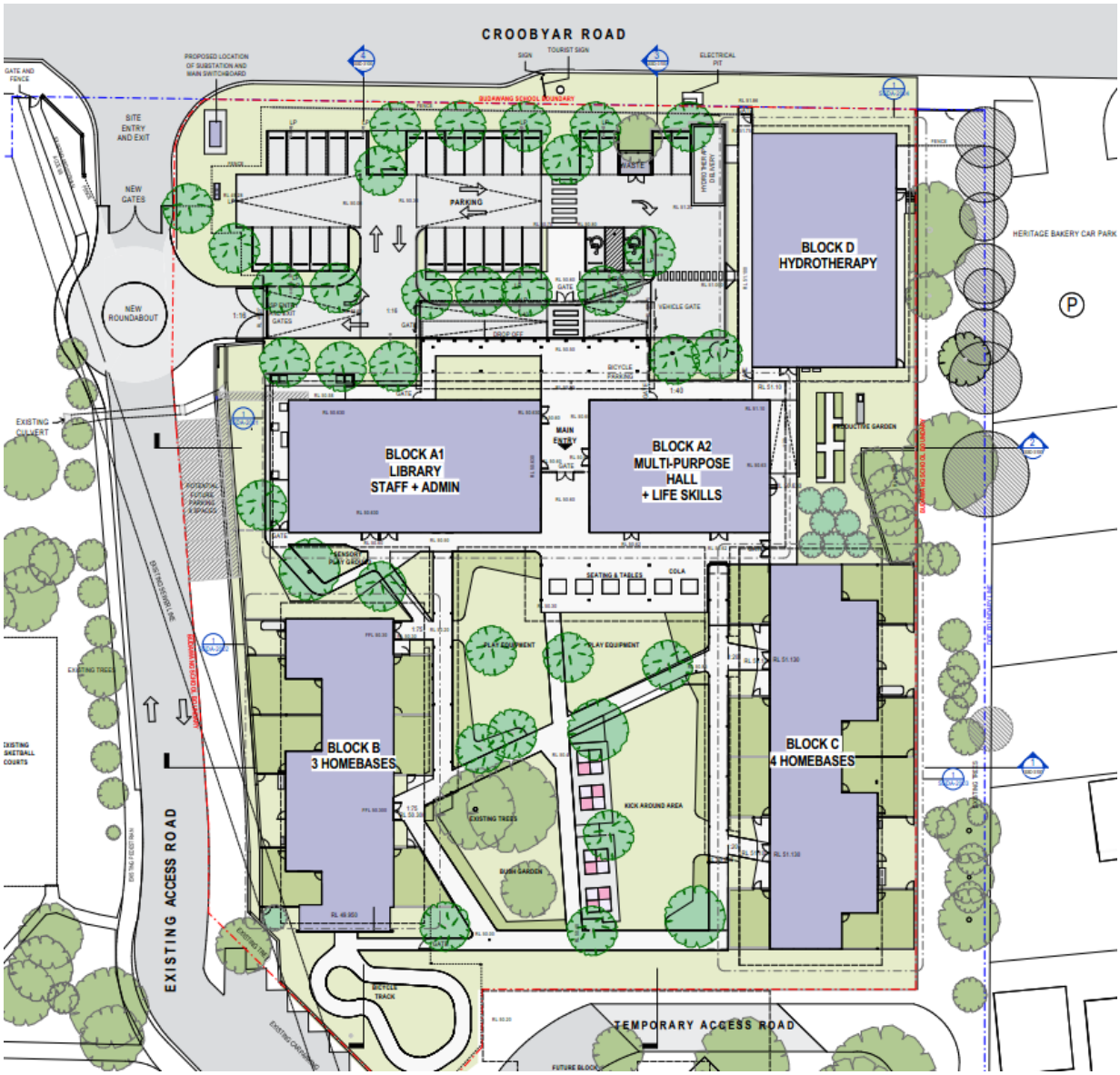


Figure 7 – Proposed Site Layout (Source: GroupGSA)

3. Existing Transport Facilities

3.1 Road Hierarchy

The subject site is located in Milton, NSW and is primarily serviced by the Princes Highway which forms the main north-south arterial connection through the Milton Town Centre and along the south coast of New South Wales. The main east-west connection is Croobyar Road (local road) which forms the northern frontage of the proposed Budawang School site.

A summary of the key State and Council managed local roads serving the site is presented Figure 8.

Figure 8 – Surrounding Road Network (Source: TfNSW Road Hierarchy)

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)

A summary of the roads serving the proposed site are presented in the following tables.

Table 1 – Princes Highway (Northbound)

Princes Highway (A1)	
Road Classification	State Road
Alignment	North - South
Number of Lanes	Typically 1 lane in each direction with parking lanes on either side of the carriageway
Carriageway Type	Undivided
Carriageway Width	12.5m
Speed Limit	50km/h northbound; 60km/h southbound
School Zone	No
Parking Controls	Typically unrestricted parking
Forms Site Frontage	No

Figure 9 – Princes Highway – Northbound (Source: Google Street View)

Table 2 – Croobyar Road (Westbound)

Croobyar Road	
Road Classification	Local Road
Alignment	East - West
Number of Lanes	Typically 1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12.5m
Speed Limit	50km/h
School Zone	Yes
Parking Controls	Typically unsigned
Forms Site Frontage	Yes

Figure 10 – Croobyar Road – Eastbound (Source: Google Street View)

Table 3 – Gordon Street (Northbound)

Gordon Street	
Road Classification	Local Road
Alignment	North - South
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	8.5m
Speed Limit	50km/h
School Zone	No
Parking Controls	Unsigned
Forms Site Frontage	No

Figure 11 – Gordon Street – Northbound (Source: Google Street View)

3.2 Public Transport

The locality of the site has been assessed in the context of available forms of public transport that may be utilised by prospective staff and students. When defining accessibility, the NSW Planning Guidelines for Walking & Cycling (2004) suggests that 400m-800m is a comfortable walking distance to access public transport and local amenities.

The notional ('as the crow flies') walking catchments of 400m and 800m radius from the proposed Budawang School site as well as the actual walking catchments are illustrated in Figure 12. The existing bus routes operating within the vicinity of the School and bus stops are also presented. Details of the available public transport options are outlined in the following sections.

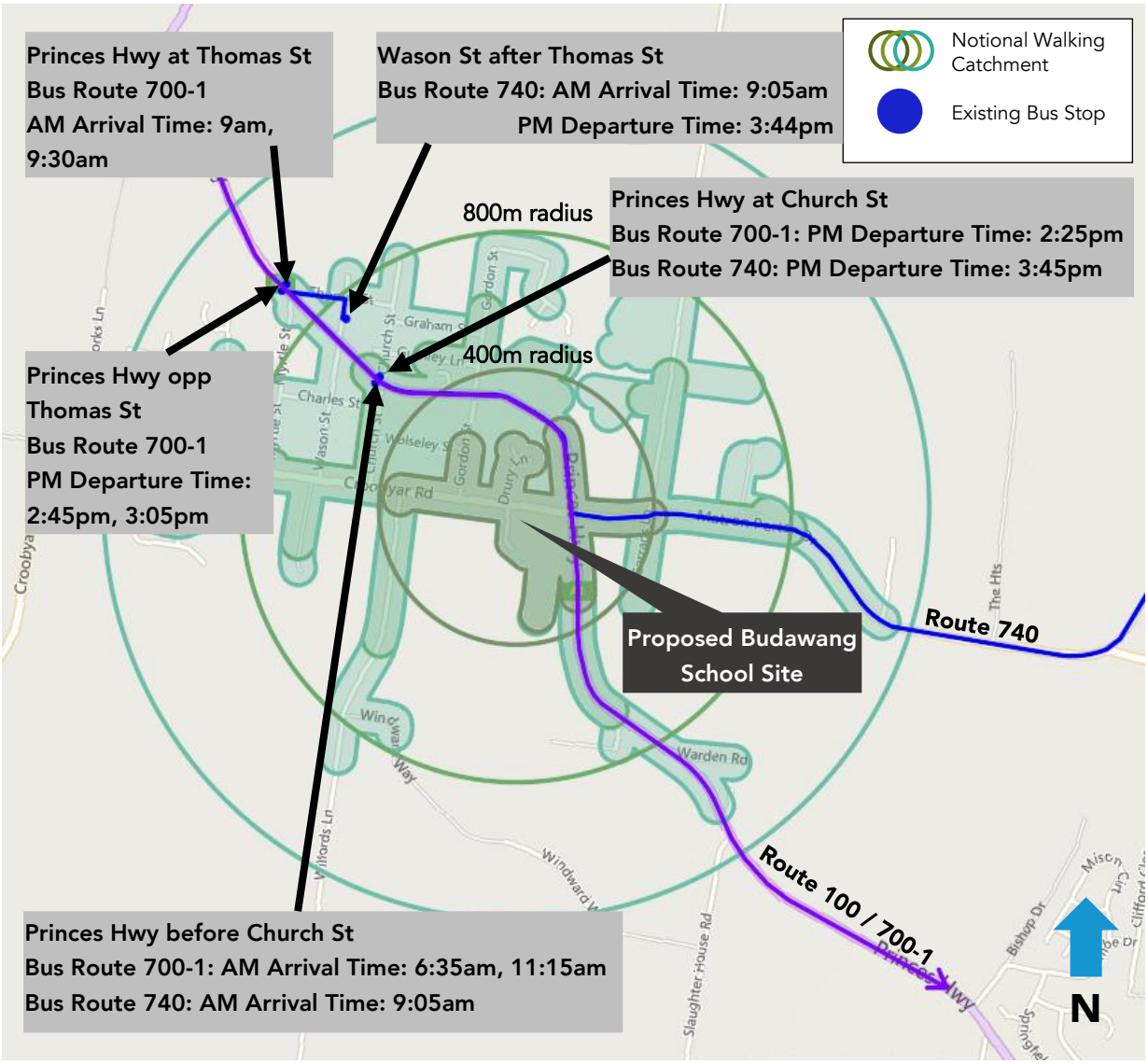


Figure 12 – Existing Bus Routes

3.2.1 Bus Services

As shown in Figure 12 and Table 2, there are only three bus services operating within the 400m, 800m and 1,200m walking catchments. The closest existing bus stop (Stop ID: 253818) is located adjacent to the Princes Highway/Church Street intersection and lies within the 800m actual walking catchment. This bus stop is only serviced by the 700-1 bus.

It is noted that there are also bus stops located further along the Princes Highway, adjacent to the Princes Highway/Thomas Street intersection, and along Wason Street, but these are located approximately 1,200m away from the site. These bus stops are serviced by the 100 and 740 buses, respectively.

The existing bus services including coverage, approximate operation times and frequency, are summarised in Table 2 and the nearby bus stops are illustrated in Figure 12.

Table 2 – Public Bus Service Summary

Bus Route	Operator	Coverage	Approximate Operation Times and Service Frequency
100	Premier Motor Service	Bomaderry to Burrill Lake via Nowra & Ulladulla	Mon & Fri: 2 services per day at 9:30am and 2:45pm Tues & Thurs: 2 services per day at 9:00am and 3:05pm
700-1	Premier Motor Service	Bomaderry to Eden	Mon-Fri: 2 services per day at 2:10pm and 7:30pm Sat: 2 services per day at 2:10pm and 7:30pm Sun & Public Holidays: 2 services per day at 2:10pm and 7:30pm
		Eden to Bomaderry	Mon-Fri: 2 services per day at 6:35am and 11:15am Sat: 2 services per day at 6:35am and 11:15am Sun & Public Holidays: 2 services per day at 6:35am and 11:15am
740	Busline Group	Ulladulla to Milton via Mollymook & Narrawallee	Mon-Fri: 9:05am, 11:15am, 2:15pm, 2:15pm, 3:20pm Sat: 1 service at 9:20am
		Milton to Ulladulla via Narrawallee & Mollymook	Mon-Fri: 9:05am, 10:05am, 11:10am, 2:15pm, 3:45pm Sat: 1 service at 9:45am, 11:35am

The subject site is currently poorly serviced by bus, with limited weekday services, typically only two services per day, which would not suit school staff. Therefore, the current public transport provision is not a viable travel mode option for students, parents or staff.

3.2.2 School Bus Services

Ulladulla Buslines currently operate special school bus services in the locality which stop at the following schools:

- Milton Public School
- Ulladulla Public School
- Ulladulla High School
- St Marys Star of the Sea Milton

Several school buses service the nearby Milton Public School and St Marys Star of the Sea Milton within the Milton suburb. The existing closest school bus services including coverage, approximate operation times and frequency, are summarised in Table 3. It is noted that Milton Public School is currently the closest stop to the new Budawang School site; as such, this has been used as the reference destination for the service frequencies presented in Table 3.

Table 3 – School Bus Service Summary (Source: Ulladulla Buslines)[2]

Bus Route	Coverage	Approximate Operation Times and Service Frequency
1	Ulladulla to Milton Public School (AM only)	Mon-Fri: Departs Ulladulla at 7:15am, arrives Milton Public School at 9:05am.
3	Ulladulla to Milton Public School (AM/PM services)	Mon-Fri: Departs Ulladulla at 7:50am, arrives Milton Public School at 8:57am. Departs Milton Public School at 3:30pm.
4	Ulladulla to Milton Public School (AM/PM services)	Mon-Fri: Departs Ulladulla at 8:00am, arrives Milton Public School at 8:57am. Departs Milton Public School at 3:31pm.
5	Ulladulla to Milton Public School (AM/PM services)	Mon-Fri: Departs Ulladulla at 8:20am, arrives Milton Public School at 9:05am.
6	Milton Public School to Ulladulla Plaza (PM only)	Mon-Fri: Departs Milton Public School at 3:34pm.
7	Ulladulla to Milton Public School (AM only)	Mon-Fri: Departs Ulladulla at 8:15am, arrives Milton Public School at 9:05am.
8	Milton Public School to Ulladulla (PM only)	Mon-Fri: Departs Milton Public School at 3:51pm.
9	Ulladulla to Milton Public School (AM only)	Mon-Fri: Departs Ulladulla at 8:00am, arrives Milton Public School at 8:58am.
10	Milton Public School to Ulladulla (PM only)	Mon-Fri: Departs Milton Public School at 3:40pm.
11	Ulladulla to Milton Public School	Mon-Fri: Departs Ulladulla at 8:00am, arrives Milton Public School at 9:02am. Departs Milton Public School at 3:40pm.
12	Milton Public School to Ulladulla (PM only)	Mon-Fri: Departs Milton Public School at 3:40pm.

As the Budawang School will be relocated to a new site, the school buses do not currently service the proposed School. It is noted that there are currently no bus stops located along the site frontage of the proposed Budawang School site; However, the project is proposing to provide a bus stop along Croobyar

[2] Special School Services as of 29 September 2020

Road in the future. As such, the School may benefit from consultation between SINSW and Ulladulla Buslines to investigate the potential of updating the school bus route to also serve Budawang School.

3.3 Active Transport

The locality has been reviewed for features that would attract active transport trips (walking and cycling), with reference to the NSW Guidelines for Walking and Cycling (2004).

In order to undertake an analysis of potential walking and cycling catchments, the following information has been considered:

- The maximum enrolment capacity at the School is anticipated to be 80 students;
- It is noted that Budawang School caters for students with moderate to severe disabilities and therefore, students are unlikely to be able to travel independently;
- The NSW Planning Viewer Map (refer to Figure 13) has been used to determine the location of various land uses, such as low, medium and high density residential zones and business zones;
- Milton is a small town of approximately 1,700 residents, but is located between 4 and 12km from towns such as Ulladulla or Mollymook with higher residential areas. It is therefore likely that the majority of staff and students live outside of Milton;
- The NSW Guidelines to Walking & Cycling (2004) suggests that 400-800m is a comfortable walking distance when considering the distance to public transport, which is approximately equivalent to a 5-10 minute walk. SINSW defines 1.2km distance (approximately a 15 minute walk) as being an acceptable walking distance. The comfortable cycling distance is defined by the Guide to be between 800m-1.5km, which is approximately a 5-10 minute cycle. SINSW considers distances up to 3.6km as being acceptable for cycling.

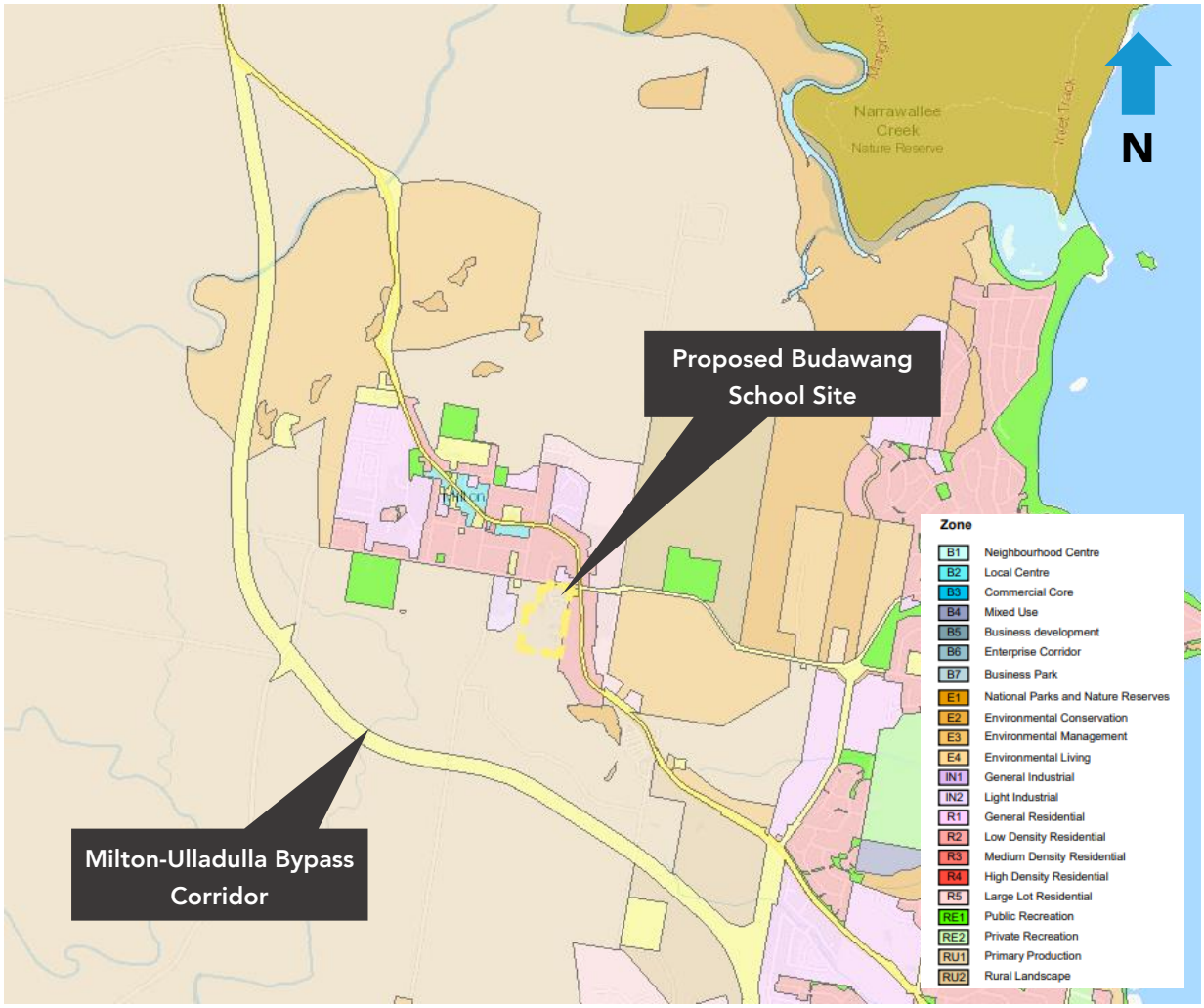


Figure 13 – Local Land Use map (Source: NSW Planning Viewer)

A discussion on the adequacy of this infrastructure is presented in the following subsections.

3.3.1 Cycling

The notional and actual cycling catchments as well as the existing cycling infrastructure are presented in Figure 14 to identify the potential reach to staff residing in the surrounding suburbs.

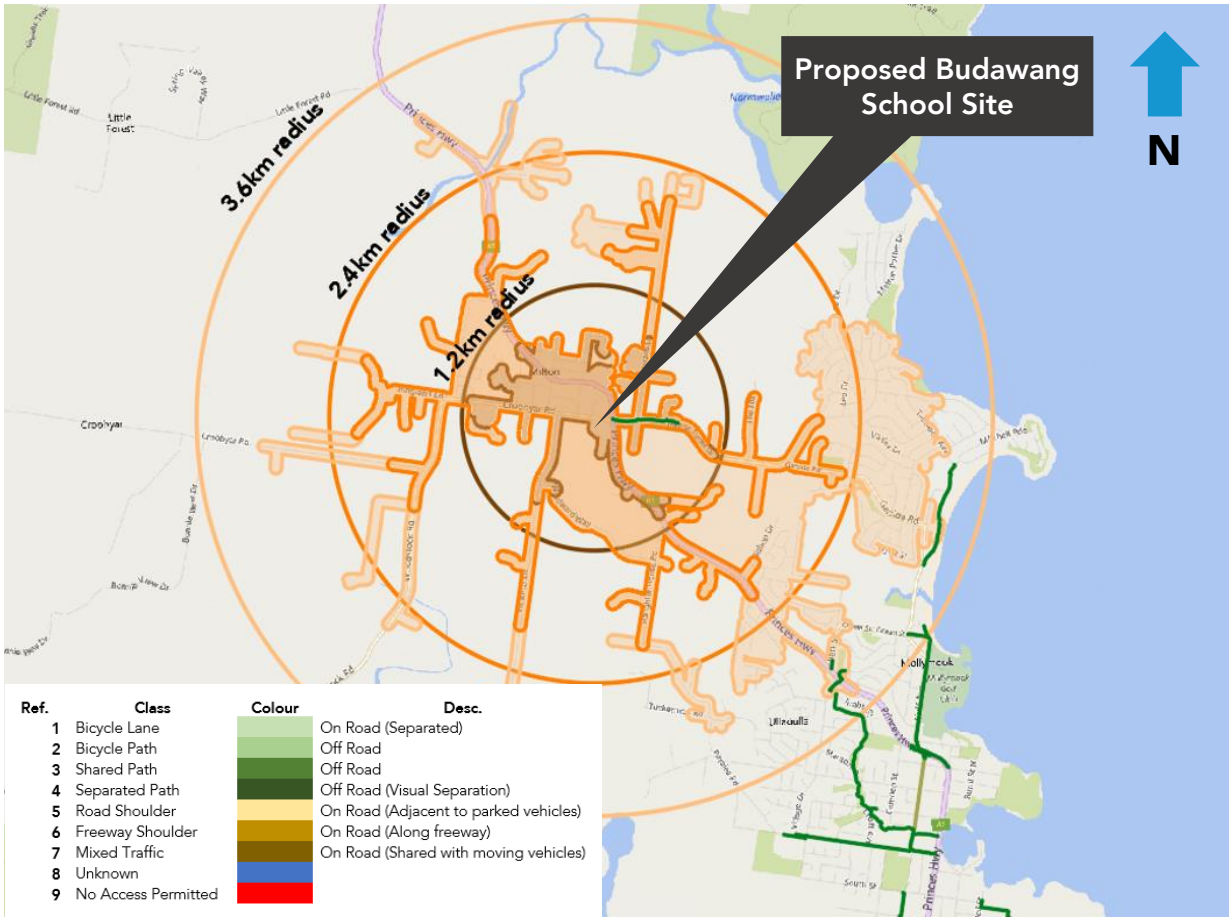


Figure 14 – Existing Cycling Infrastructure

As illustrated in Figure 14, the cycling network is currently underdeveloped with limited cycling facilities within the vicinity of the proposed Budawang School site. It is noted that the majority of the cycling facilities are on-road which may act as a barrier to the uptake of cycling. Furthermore, the limited off-road cycling infrastructure is not well connected with sections of off-road shared paths provided that can only be accessed by travelling on-road.

In considering these factors together with points made at the beginning of Section 3.3, cycling is a travel mode which may not be likely to be utilised. Although the adjacent town centres such as Mollymook and Ulladulla lie outside the actual cycling catchment of 3.6km, cycling journeys of between 4km to 12km can be managed by adults if appropriate cycling infrastructure is provided.

Based on the database of cycleway infrastructure in NSW maintained by TfNSW, there are some new routes planned for Milton and surrounding towns within the Shoalhaven LGA. The network is expected to be expanded to provide greater connectivity between Milton, Narrawallee, Mollymook and Ulladulla. The proposed routes comprise of a combination of on-road treatments (such as road shoulders and mixed traffic) and off-road shared paths. The planned cycling infrastructure is shown in Figure 15.

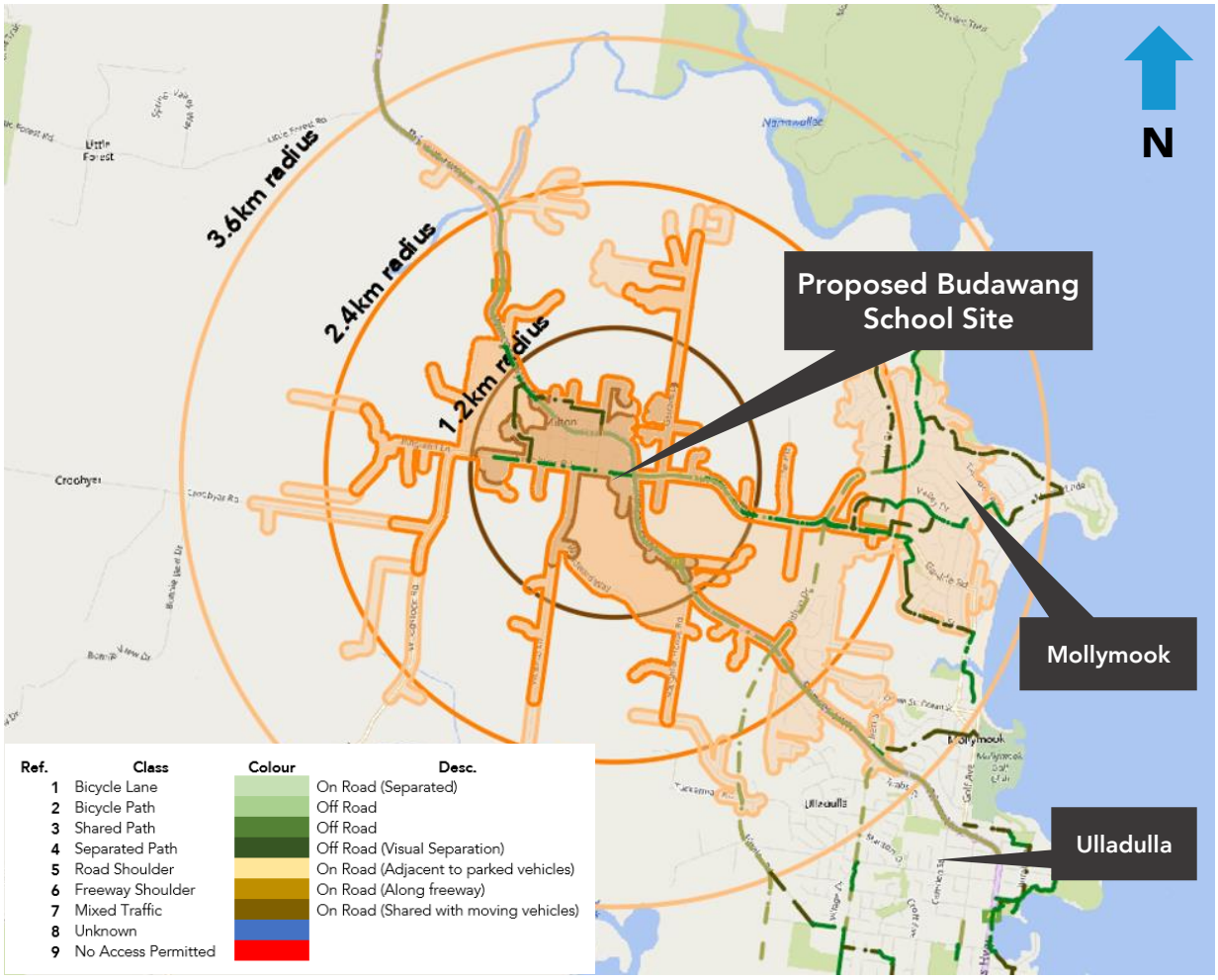


Figure 15 – Planned Cycleway Infrastructure

The proposed routes would provide improved connectivity to the school, and in particular cycle paths along the Princess Highway and Matron Porter Drive would enable cycling from Mollymook and Ulladulla.

It is unclear as to the current status and progress of the planned cycleway infrastructure. Liaison with TfNSW and Shoalhaven City Council is recommended to be sought to identify any routes which may support travel to and from school by cycling and expedite their construction.

3.3.2 Walking

Walking may be viable transport option for staff who reside within one kilometre (approximately 15-20min) from the School. Walking is also the most space efficient mode of transport for short trips and presents the highest benefits. Co-benefits where walking replaces a motorised trip include improved health for the individual, reduced congestion on the road network and reduced noise and emission pollution.

A desktop review reviled that the pedestrian infrastructure within the vicinity of the proposed Budawang School site is generally underdeveloped and there are currently limited footpaths provided near the School. The existing pedestrian infrastructure within 1,200m radius from the School is shown in Figure 16.

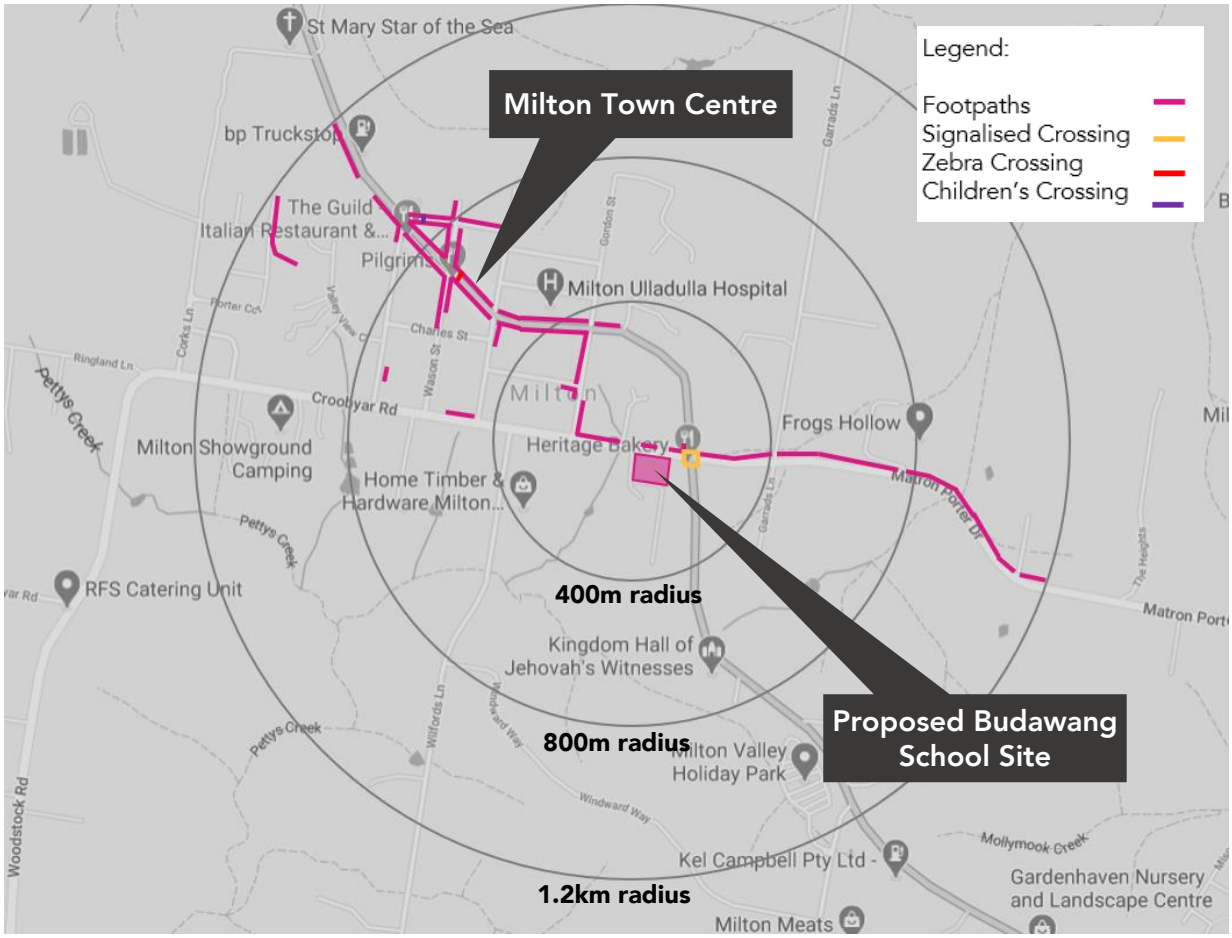


Figure 16 – Existing Pedestrian Infrastructure within 1.2km Radius of Budawang School

A review of the existing pedestrian infrastructure indicates that there are significant gaps in the network, with footpaths only being sparsely provided across the walking catchment. Footpaths are provided along the Princes Highway within the Milton Town Centre but pedestrian connectivity through the surrounding local roads is generally poor, with footpaths either provided only on one side of the carriageway or are missing.

Pedestrians would be required to utilise the nature strips on either side of the carriageway, which is generally typical of regional areas, but not ideal to encourage active transport. Notwithstanding this, there are signalised pedestrian crossings provided along each approach of the Princes Highway / Matron Porter Drive / Croobyar Road intersection which would assist in providing pedestrian connectivity across the Princes Highway.

The notional ('as the crow flies') walking catchments and the actual walking catchments are presented in Figure 17. A comparison between the notional and actual walking catchments indicates that walkability is considerably reduced when taking into consideration the links available for pedestrians. Due to the regional nature of the site location, the nature strips along the road carriageways have been considered a pedestrian connection, despite a formal footpath not being provided.

The gaps illustrated between the notional and actual walking catchments are also attributed to the land use in the vicinity of the site. There are large parcels of RU1 (Primary Production) land which are not accessible to the public; therefore, resulting in noticeable gaps to the north and the south.

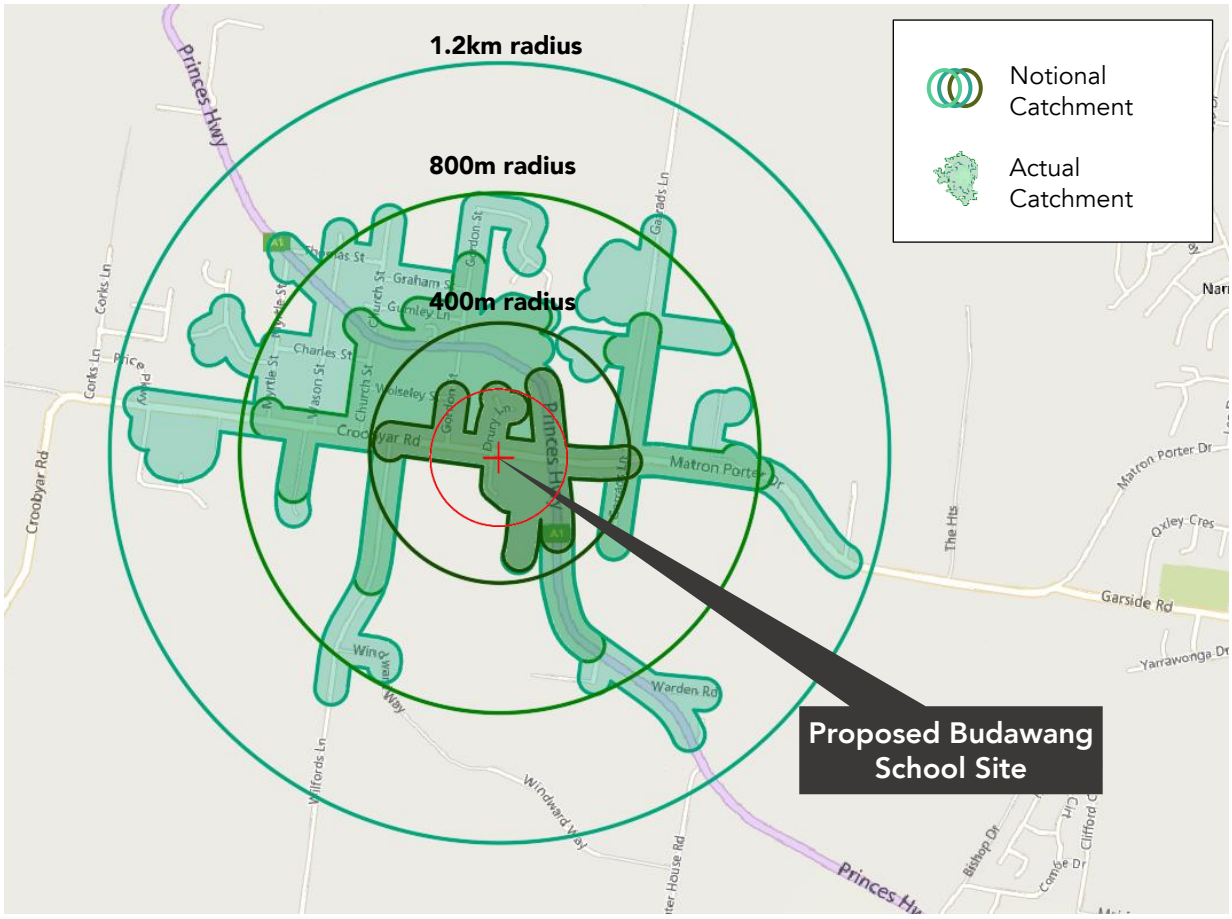


Figure 17 – Notional & Actual Walking Catchments

In considering the above factors together with points made at the beginning of Section 3.3, walking would likely attract only a small proportion of staff, and taking into account the described constraints, this travel mode may not be likely to be chosen.

Students are not expected to walk to school considering the level of disability and the residential characteristic, as described in Section 2.7.

4. Parking Provisions

The following sections outline an assessment of the proposed car parking provisions for the School.

4.1 Planning Policy Requirements

The subject site is identified to be under the Shoalhaven Local Environment Plan (LEP) 2014. In establishing the parking provision requirements, reference is made to the parking provision rates stipulated in the following planning documents:

- Shoalhaven Development Control Plan (DCP) 2014
- Building Code of Australia 2019 (BCA)
- NSW Planning Guidelines for Walking and Cycling (2004)
- Austroads Guide to Traffic Management Part 11

In particular, the following excerpts have been analysed for the purpose of this report:

- *Chapter G21* of the Shoalhaven DCP 2014 stipulates the following minimum car parking rates for combined primary and high schools:
    - Car Parking: 1 space per 5.5 students
    - Pick-up/Drop-off: 1 space per 25 students
    - Bus Zone: 1 space per 150 students
- The Department of Education3 states the following:
    - "A school is not obliged to provide parking on site to anyone at any time."
    - "If a school has space available, they may offer disabled parking spaces and parking for visitors and staff."

The following sections outline the parking requirements and discussions around the proposed provisions for the School development.

3 https://education.nsw.gov.au/teaching-and-learning/curriculum/learning-across-the-curriculum/road-safety-education/safe-travel/parking-on-school-grounds

4.2 Bus Stop

It is proposed to allocate an area suitable to accommodate an indented bus bay within the Croobyar Road frontage to the School along the eastern corner. The bus bay will provide space to accommodate 1 bus at a time. A pedestrian path will provide direct access between the bus stop and the School.

The requirements stipulated by the DCP and the proposed provision are summarised in Table 4.

Table 4 – DCP Requirement and Provision – Bus Provision

Use Type	Minimum DCP Bus Provision Rate	No. of Students	Min. Bus Parking Requirement	Proposed Bus Parking Allocation
Bus Zone	1 bus space per 150 students	80	1 (0.5)	1

It is noted that students are not anticipated to travel to and from school by public transport.

4.3 Pick-up/Drop-off

Considering the type of school, a vast majority of students are and will be transported by either Government Taxis or by parents / carers. The pick-up and drop-off facility will be provided in the form of a gated porte-cochere, separated from the main car park.

SINSW has advised ptc. of the existing travel characteristics of students at Budawang School which have been used to determine the future requirement associated with student pick-up/drop-off activity.

The existing and future provisions are described in the following two sub-sections. A detailed description of the pick-up and drop-off operation is provided in Section 6.4.

4.3.1 Existing Pick-up and Drop-off Provision

The current student population of 33 students travel to and from School using two primary modes, being minibuses and private vehicles. The resulting travel mode share and vehicle occupancy rates are outlined in Table 5.

Table 5 – Summary of Existing Travel Characteristics

Travel Mode	No. of Students utilising Travel Mode	Approx. Travel Mode Share	No. of Vehicles used to Transport Students	Vehicle Occupancy (students/vehicle)
Minibus	14	40%	4	3.5
Private Vehicle	19	60%	19	1
TOTAL	33	100%	23	-

Based on information provided by SINSW, the operation of the pick-up/drop-off at the current Budawang School site in Ulladulla would take approximately 10-15 minutes (pre-COVID19 operation) to service all 23 vehicles transporting the students. This results in an average dwell time of approximately 39 seconds per vehicle.

During COVID19, the pick-up/drop-off period typically occurs over a longer period of 30 minutes. This results in an average dwell time of approximately 78 seconds.

Both the pick-up and drop-off are highly managed, with staff supervising one vehicle at a time.

The arrival times are scheduled in a way that drivers are allocated a specific time slot. This is to reduce waiting times and minimise queuing.

4.3.2 Future Pick-up and Drop-off Provision

With reference to the existing travel characteristics previously determined in Table 5, the estimated future number of vehicles associated with pick-up/drop-off activity has been calculated on a pro-rata basis as follows:

Table 6 – Projected Future Student Trip Characteristic

Travel Mode	Future Student Number	Mode Share	Projected No. of Students using Travel Mode	Vehicle Occupancy (students/vehicle)	Projected No. of Vehicles
Minibus	80	40%	32	3.5	10 (9.1)
Private Vehicle		60%	48	1	48
TOTAL					**58**

As shown in Table 6, it is anticipated that the School will be serviced by 58 vehicles associated with the student pick-up/drop-off activity. Further, it is anticipated that the same parking demand will be applicable during both the morning and afternoon, as it is assumed that students will utilise the same travel mode to and from school.

Although the existing dwell times lie at approximately one minute, from experience with other SSP schools the dwell times are generally longer. Therefore, as a means of conservatism, a dwell time of three minutes is adopted for the purpose of this report.

With 58 vehicles to be processed and a pick-up and drop-off time frame of 60 minutes, the School requires to provide 3 pick-up and drop-off spaces, which will be serviced simultaneously.

Similar to the existing arrangement, arrivals will be managed through appropriate scheduling to mitigate the potential for vehicle queuing. Minibus drivers and parents will be allocated specific time slots to ensure that arrivals are staggered. With this arrangement, it is expected that potential queuing would not exceed 3-5 vehicles at any one time, which equates to 18-30m. The internal car park layout allows to accommodate approximately 13 vehicles along the 80m long internal aisle, which is sufficient for any queuing related to the pick-up and drop-off at the School under the described arrangement.

The requirements stipulated by the DCP and the proposed provision are summarised in Table 7.

Table 7 – DCP Requirement and Provision – Pick-up and Drop-off

Use Type	Minimum DCP Parking Provision Rate	No. of Students	Min. Car Parking Requirement	Proposed Car Parking Provision
Pick-up/Drop-off	1 space per 25 students	80	3 (3.2)[4]	3

[4] Fractional parking provision requirements are rounded to the nearest whole number as per Section 5.1 of the Shoalhaven DCP 2014.

The proposed development satisfies the DCP requirement by providing 3 pick-up and drop-off bays.

4.4 Car Parking

Given the regional location of the site and that staff potentially reside outside the typical walking catchment of 800m, combined with the currently limited public transport accessibility, it is likely that the vast majority of staff will drive to and from work. Considering this, the car parking requirements and provisions for staff are summarised in Table 8.

Table 8 – DCP Requirement and Provision – Car Parking

Use Type	Minimum DCP Parking Provision Rate	No. of Students	Min. Car Parking Requirement	Proposed Car Parking Provision
Staff Car Parking	1 space per 5.5 students (rate combines both staff and students)	80	15 (14.5)	30
		TOTAL	15	30

Given that the School is situated in a regional area, it is likely that most of staff will reside outside of Milton. It is also highlighted that the existing public transport facilities are very limited, with buses typically operating only two times a day resulting in poor accessibility. As such, it is anticipated that the majority of staff will travel by private car, some of which may choose to carpool. Furthermore, as the school will accommodate students with varying levels of disability, it is not anticipated that students will drive to school or use other modes of transport, other than using a shared minibus or being dropped off by a parent or guardian.

In light of these factors, the proposed car parking provision of 30 staff spaces and no parking for students is considered reasonable.

4.5 Accessible Car Parking

In regard to the accessible parking, *Part 5.3* of the DCP refers to the *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 requirements and provisions are summarised in Table 9.

Table 9 – Accessible Car Parking Requirement and Provision

User Group	Total Car Parking Provided	Accessible Car Parking Provision Rate	Accessible Car Parking Requirement	Accessible Car Parking Provided
Class 9b - School	30	1 space for every 100 car parking spaces or part thereof	1 (0.3)	2

The proposed car park accommodates a total of 30 staff car spaces, which results in a minimum requirement of one accessible car parking space. The proposal includes a provision of two accessible car parking spaces, which exceeds the minimum requirements.

Separate to the provision of accessible parking spaces, the project provides three separate pick-up and drop-off spaces, which have been design specifically to cater for students with a disability.

4.6 Car Parking Summary

It is anticipated that the School will accommodate 80 students in the future, which results in a minimum DCP parking requirement of 15 car parking spaces (including one accessible space), three pick-up and drop-off spaces and one bus bay. The proposal is to provide 30 car spaces for staff (including two accessible spaces), three spaces for pick-up/drop-off use plus an allocation for one bus bay (located within the Croobyar Road frontage), which meets and/or exceeds the minimum DCP requirements.

4.7 Motorbike Parking

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

4.8 Bicycle Parking & End of Trip Facilities (EOTF)

The DCP encourages to incorporate bicycle parking areas with adequate shower and change facilities for staff (where appropriate). However, the DCP does not stipulate any bicycle parking rates, but refers to the Austroads Guidelines for recommended bicycle parking rates. Given the user group for the development are students with varying levels of disability, it is not anticipated that cycling is a suitable method of transport for students, but may be an option for staff and visitors.

It is noted that the *Austroads Guide to Traffic Management Part 11* only provides rates for students and not staff or visitors. As such, reference has been made to the *NSW Planning Guidelines for Walking and Cycling (2004),* which outlines the bicycle parking requirement for staff and visitors for secondary schools. The resulting bicycle parking requirements and provisions for staff and visitors are summarised in Table 10.

Table 10 – Bicycle Parking Requirement and Provision

User Group	No. of staff / students	Bicycle Parking Provision Rate	Bicycle Parking Requirement	Bicycle Parking Provided
NSW Planning Guidelines for Walking and Cycling				
Staff	**34**	**1 staff space for 3-5% staff (long-term use)**	**1 – 2 spaces**	**6**
Visitor		**1 visitor space for 5-10% staff (short-term use)**	**2 – 4 spaces**	

Based on the *NSW Planning Guidelines for Walking & Cycling*, the proposed school development requires 1-2 bicycle spaces for staff and 2-4 bicycle spaces for visitors. The proposed development is able to accommodate 2 bicycle spaces for staff and 4 bicycle spaces for visitors. An area adjacent to the School's main entry has been allocated for the provision of bicycle parking.

The bicycle parking facilities shall be designed to comply with *AS2890.3:2015 Bicycle Parking*. It is therefore recommended that bicycle lockers be provided for staff/employees, and bicycle rails be provided for visitors. Bicycle parking should be protected from the weather.

Lockers, showers and change rooms are required for staff. The requirements and provisions according to the rates stated in the *NSW Planning Guidelines for Walking & Cycling 2004* are summarised in Table 11, Table 12 and Table 13, respectively.

Table 11 – Lockers Requirement and Provision

FTE Staff	Racks (Spaces)	Lockers Provision Rate	Lockers Requirement	Lockers Provided
34	2	1 per 3 racks	1	1 locker provided within the staff room

Table 12 – Showers Requirement and Provision

FTE Staff	Shower Provision Rate	Showers Requirement	Showers Provided
34	- 1 for 0-12 staff - 2 (1 male and 1 female) for 13-49 staff - 4 (2 male and 2 female) for 50-149 staff - 6 (3 male and 3 female) for 150-299 staff	2 (1 male and 1 female)	2

Two accessible toilets/shower rooms are provided within Block A2 for staff use. These rooms will incorporate changing facilities such as towel rail and shelves.

Table 13 – Change Cublicle Requirement and Provision

FTE Staff	Change Rooms Provision Rate	Change Rooms Requirement	Change Rooms Provided
34	- 2 (1 male and 1 female) for 13-500 staff	2 (1 male and 1 female)	1 unisex change room plus 2 accessible toilets/shower rooms with changing facilities

In addition to the two accessible toilets/shower rooms, a separate unisex change room is also located within Block A2 for staff.

Overall, the development is not proposing to provide any bicycle parking spaces for students given the character of the school. However, the project proposes to provide 2 bicycle spaces for staff, 4 bicycle spaces for visitors, one locker, two accessible toilets/shower rooms with changing facilities and one dedicated unisex change room, which complies with satisfies the *NSW Planning Guidelines for Walking & Cycling*.

4.9 Service Vehicles

In regard to the service areas, it is noted that *Section 6.4 – Service Areas* of the DCP does not specifically outline any rates for service vehicles. Given that the primary use of the loading bay is to service the hydrotherapy building and waste collection for the School, the development proposes to provide one service bay which is considered adequate for the development's needs.

The proposed loading bay is able to accommodate an 11.3m long vehicle (largest anticipated vehicle entering the site). The loading bay is located adjacent to the hydrotherapy building where a suitable turning area is provided to allow the truck to enter and exit the site in a forward direction.

Appendix C of the *Shoalhaven Waste Minimisation and Management Guidelines* indicates that the largest waste collection vehicle (commercial front lift) is 11m in length. A swept path assessment has been undertaken for an 11.3m Heavy Rigid Vehicle (HRV) and demonstrates that there is appropriate manoeuvring area to allow the 11.3m vehicle to enter and exit the site in forward direction. For details of the swept path assessment, refer to Attachment 3.

5. Traffic Impact Assessment

The following sections present an assessment of the existing traffic activity and future traffic conditions for the proposed School development.

5.1 Existing Traffic Conditions

In order to determine the existing traffic conditions within the surrounding road network serving the school, traffic count surveys were undertaken on Thursday, 29th October 2020 (outside of school holiday period) between 7am – 10am and 2pm – 6pm at the following intersections (illustrated in Figure 18):

- Intersection 1 - Princes Highway / Croobyar Road / Matron Porter Drive (Signalised 4-arm intersection;
- Intersection 2 - Croobyar Road / Gordon Street (Priority controlled 3-arm intersection); and
- Intersection 3 - Princes Highway / Gordon Street (Priority controlled 3-arm intersection).

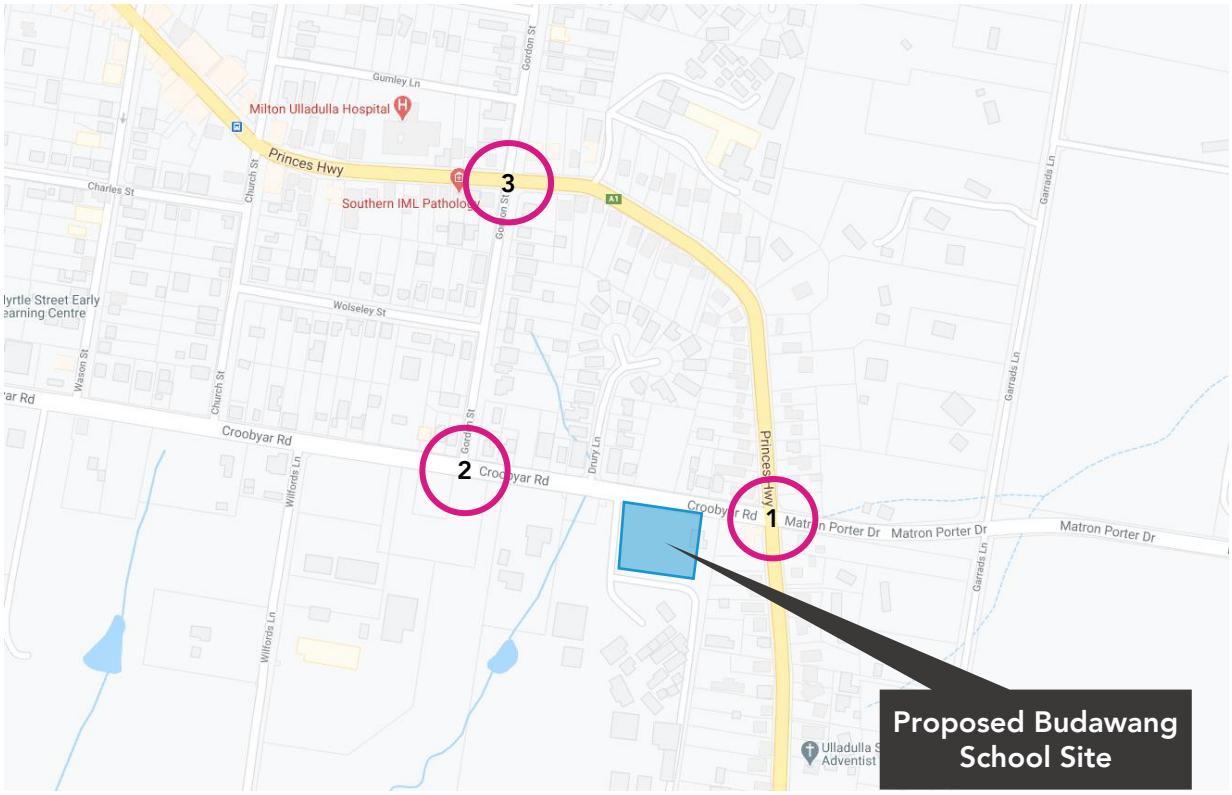


Figure 18 – Surveyed Intersections

The survey data indicates that the peak period for the network is as follows:

- Network AM Peak Hour: 8:30am – 9:30am
- Network PM Peak Hour: 3pm – 4pm

This time coincides with the general school peak time.

Existing traffic volumes during the morning and afternoon peak hours are shown in Figure 19 and Figure 20 respectively.

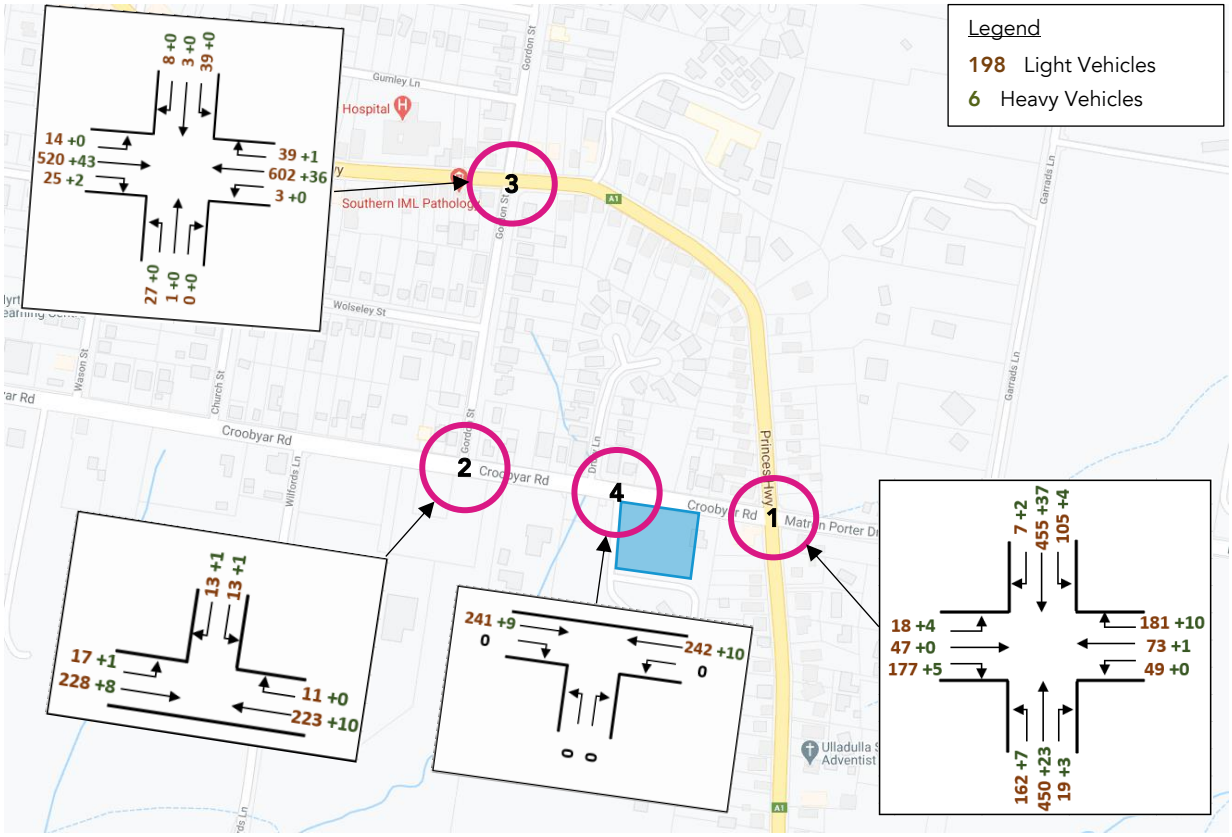


Figure 19 – Existing AM Peak Hour Traffic Volumes

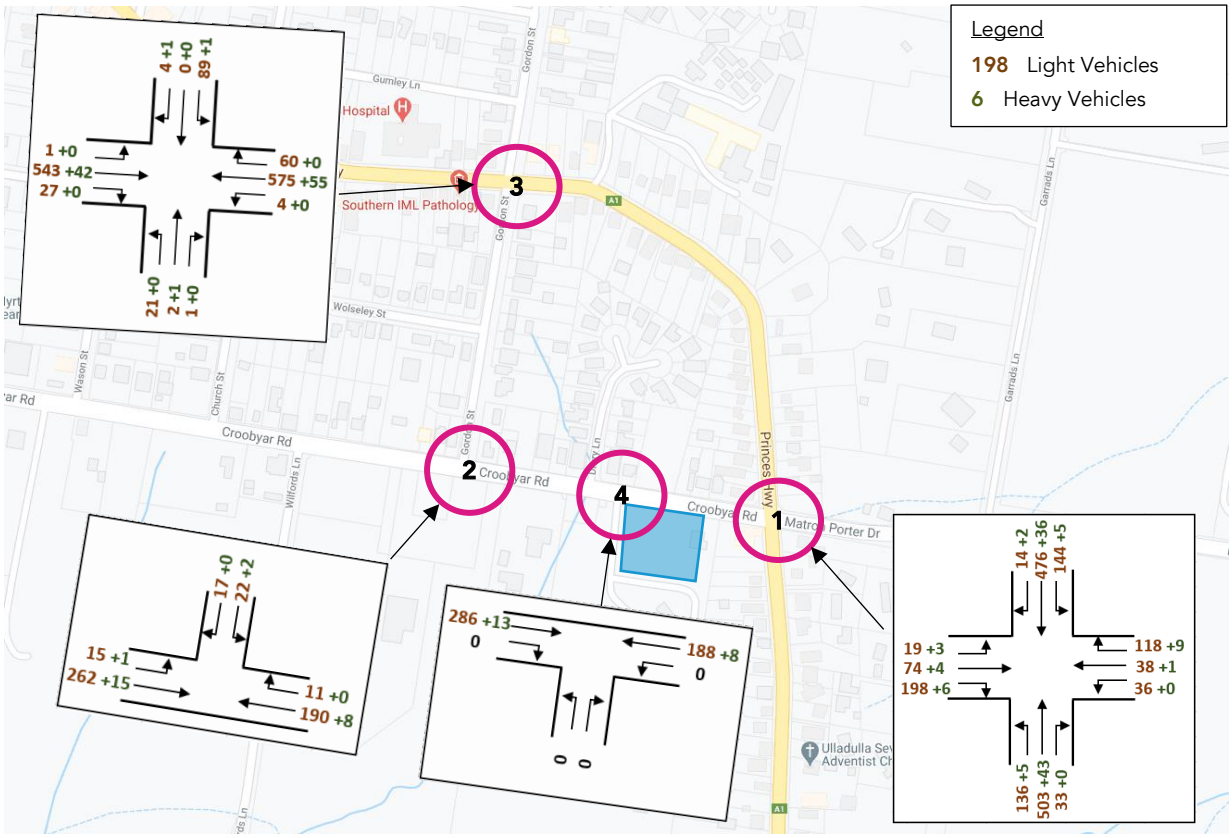


Figure 20 – Existing PM Peak Hour Traffic Volumes

5.2 Traffic Generated by the Proposed Development

5.2.1 Proposed Traffic Distribution

The proposed development traffic distribution is estimated based on the location of nearby residential areas. The following assumptions have been made:

- The majority of residential areas are located towards the east and south from the site. Therefore, it is assumed that 80% of the future school traffic will turn right out of the development site and drive through the Princes Highway / Croobyar Road / Matron Porter Drive intersection to travel to the east and south. The remaining 20% of the future school traffic is expected to turn left out of the development to travel to the west (10%) and north (10%) via Croobyar Road / Gordon Road intersection;
- It is considered unlikely that people travelling to/from the east and south would travel through the Princes Highway / Gordon Street intersection for the following reasons:
    - Travelling through this intersection towards the School would result in a detour;
    - This intersection is unsignalised and no priority is given to vehicles turning right from Gordon Street.
- The trip distribution on Princes Highway / Croobyar Road / Matron Porter Drive intersection has been based on the existing traffic derived from the traffic surveys.

The assumed traffic distribution is presented in Figure 21.

Figure 21 – Proposed Traffic Distribution for the AM and PM Peak Hours

5.2.2 Proposed Future Student Traffic Volumes

With reference to the existing and future travel characteristics described in Section 4.3, the estimated peak hour student traffic generation associated with the pick-up/drop-off activity has been calculated based on the number of vehicles that would transport students.

As shown in Table 6, it is estimated that 58 vehicles will be required to transport 80 students. It is expected that the trip generation will be applicable for both the 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 58 vehicles will arrive and depart during each of the peak hours, resulting in 58 inbound and 58 outbound trips in both 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 22 and Figure 23 respectively

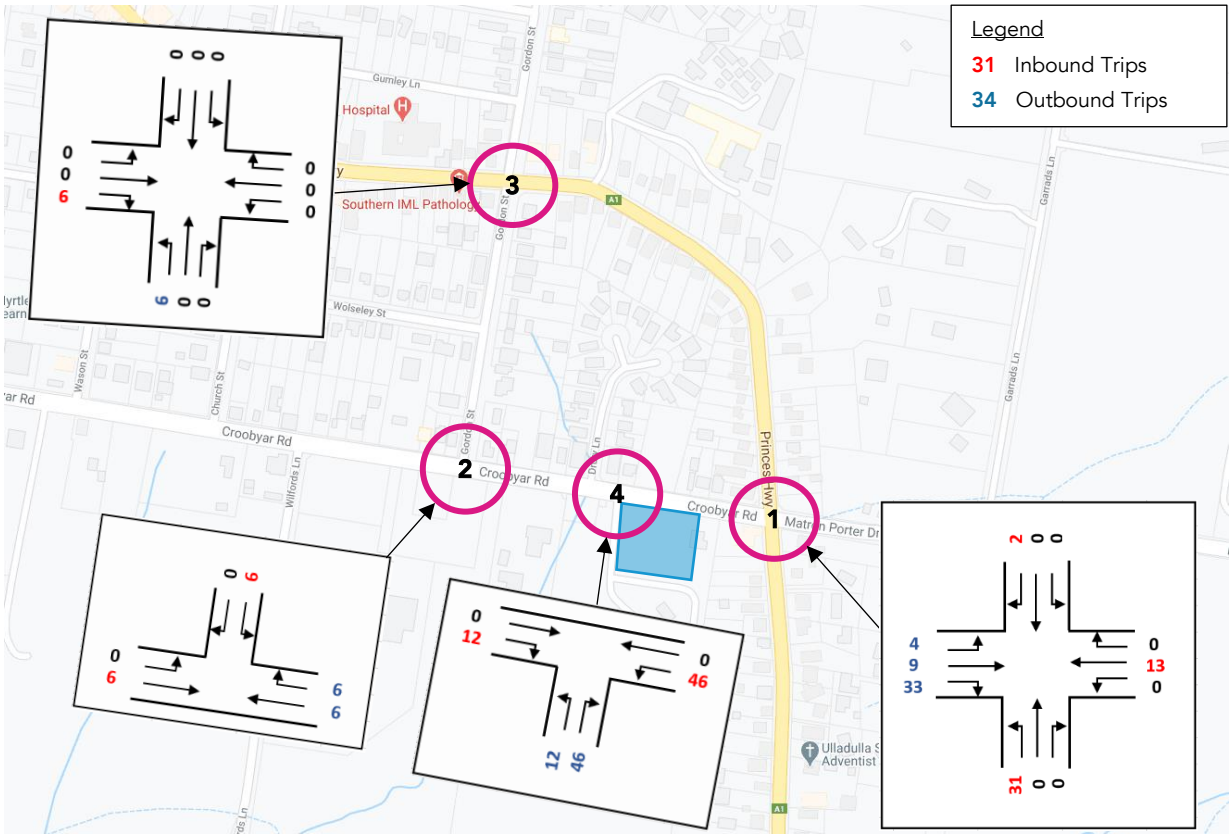


Figure 22 – Proposed Future Student Traffic Volumes during the AM Peak Hour

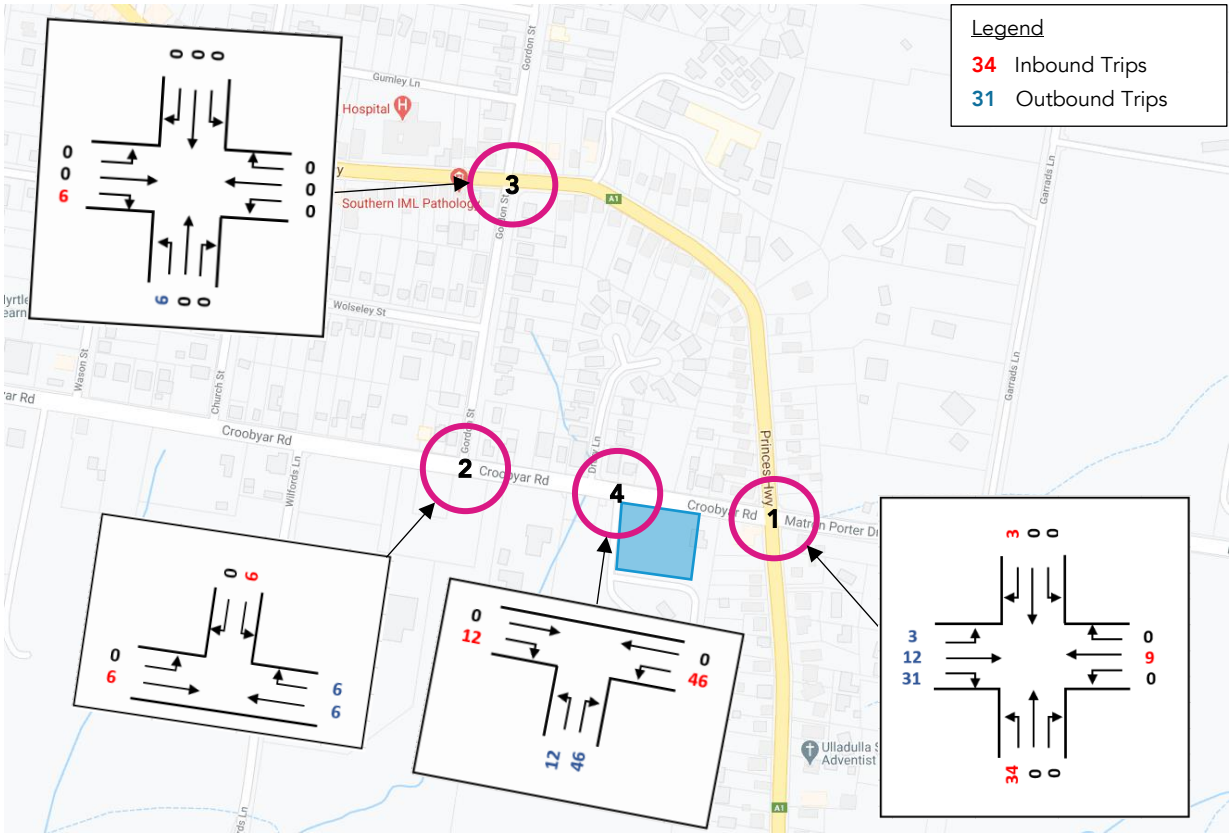


Figure 23 – Proposed Future Student Traffic Volumes during the PM Peak Hour

5.2.3 Proposed Future Staff Traffic Volumes

As outlined in Section 4.4, the development involves the provision of 30 staff car parking spaces. Although it is expected that staff will generally arrive prior to the arrival students in the morning and also 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 34 vehicles will arrive in the morning school peak and all 34 vehicles 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 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 staff traffic volumes for the AM and PM peak hours are presented in Figure 24 and Figure 25 respectively.

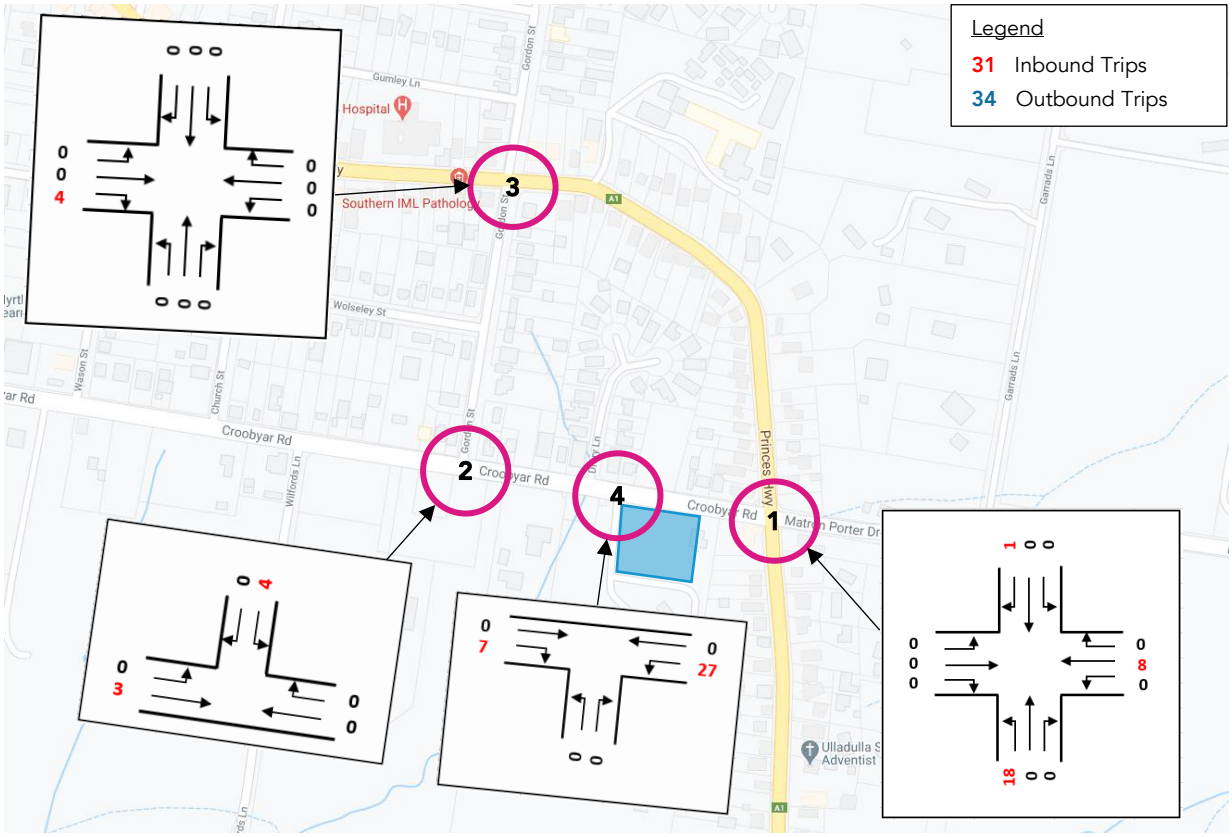


Figure 24 – Proposed Future Staff Traffic Volumes during the AM Peak Hour

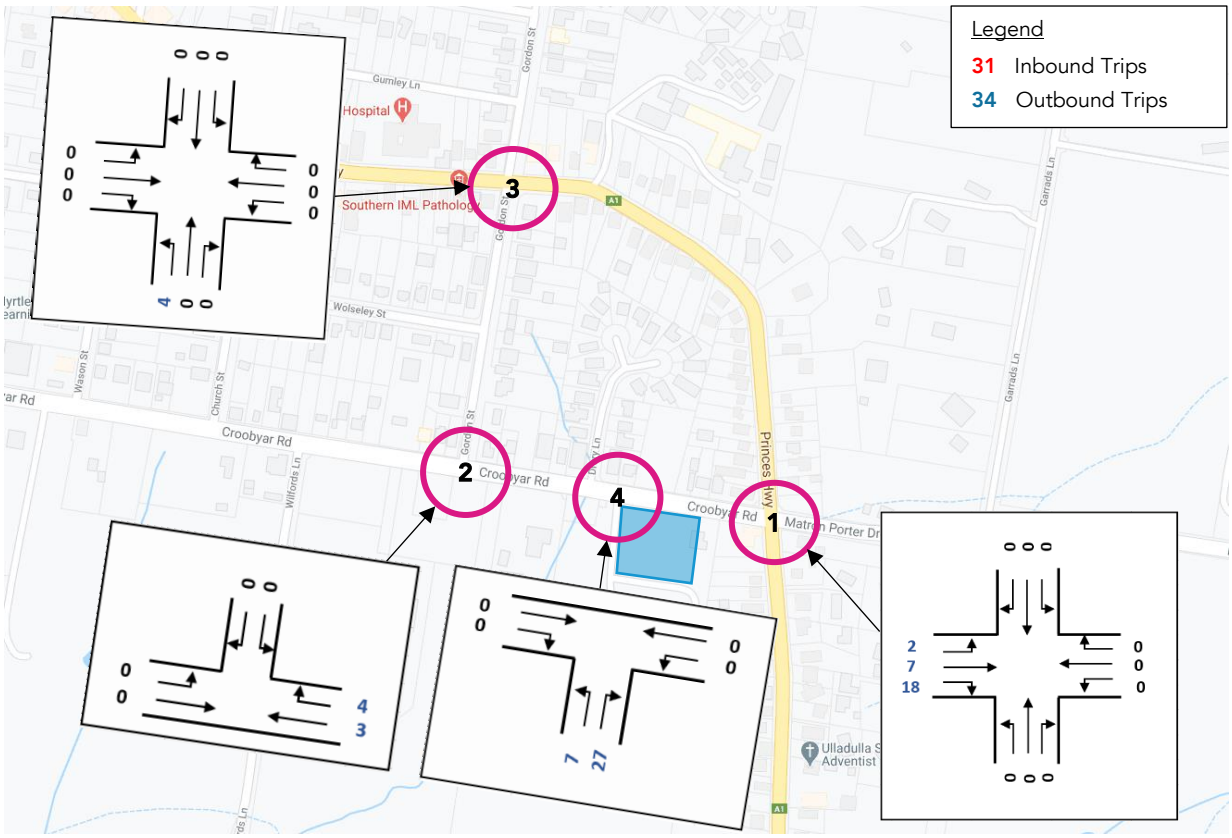


Figure 25 – Proposed Future Staff Traffic Volumes during the PM Peak Hour

5.3 Developments Approved by Shoalhaven Council

Although the timing of construction of the developments already approved by Council is not known, for the purpose of this report it is assumed that these will be ready and operational before the school opening time in early 2023. Based on information provided by Council on 4th September 2020, the following 3 approved developments within the vicinity of the site have been taken into consideration:

- DA20/1358 Industrial Storage Units Lot 1 DP 1082590 Croobyar Road (9 Wilfords Lane, Milton);
- DA17/2021 Industrial Shed Lot 1 DP 1071300 Wilfords Lane (17B Wilfords Lane, Milton);
- RA10/1005 Seniors Housing Development – Lot 2 DP 1097329 & Lot 3 DP 702859 Croobyar Road (Claydon Park Seniors Living Community, Milton).

Upon further comments provided by Council on 4th January 2021, the following approved development has also been incorporated into traffic modelling:

- RA17/1001 – Seniors Housing Development - 267 Princes Hwy, Milton - Lot 1 - DP 737576 on DA tracking.

ptc. undertook an analysis of documents provided on Council's website; a summary of potential traffic generation associated with the approved developments is outlined in the following subsections.

5.3.1 Industrial Developments

With regard to the Industrial Storage Units at 9 Wilfords Lane in Milton, The *Statement of Environmental Effects* document prepared by PDC Planners on 31 March 2020 describes that nine (9) car parking spaces will be provided for the industrial storage units. However, the document does not provide any information regarding the trip generation during the peak periods.

Likewise, for the Industrial Shed at 17B Wilfords Lane in Milton, the architectural plans prepared by Ray Holstegge on 18 January 2018 indicate that the proposed development will contain 23 car parking spaces. However, no documents regarding the trip generation were found on Council's website.

Due to the lack of information on the likely trip generation of these developments, the following considerations and assumptions based on the number of parking spaces have been made:

- The total number of parking spaces of the two industrial developments is 32 (23+9). As a conservative approach, these spaces have been assumed to generate trips at a 100% rate, such that 32 vehicle trips would occur in the morning peak hour and 32 trips would occur in the afternoon peak hour;
- As the warehouses are visited by different user groups, i.e., warehouse staff as well as customer / visitors to the industrial storage units, and the dwell time for visitors may vary significantly, it is assumed that the ratio between inbound and outbound trips is similar. Therefore, a 50:50 inbound-outbound trip rate has been adopted;
- For the purpose of this report, it is assumed that all trips are generated from the east, meaning that no vehicles would turn left into Croobyar Road or right into the site from Croobyar Road;
- As per the traffic distribution described in Section 5.2.1, approximately 20% of trips would travel northbound, but instead of using Gordon Street, vehicles would travel via Church Street due to the proximity. The remaining 80% would travel through to the Princes Highway / Croobyar Road intersection, with a traffic distribution based on the existing condition.

Based on the above, the following number of trips is anticipated at the nearby intersections during the AM and PM peak hours generated by the industrial storage units and sheds:

Table 14 – Assumed Trip Distribution for Industrial Storage Units and Sheds in Milton

Intersection	Direction	Total Trips AM (PM)	Inbound (PM)	Outbound (PM)
Princes Highway / Croobyar Road / Matron Porter Drive	Princes Highway Northbound	1 (2)	0 (1)	1 (1)
	Matron Porter Drive Eastbound	7 (6)	4 (3)	3 (3)
	Princes Highway Southbound	18 (18)	9 (9)	9 (9)
Croobyar Road / Church Street	Church Street Northbound	6 (6)	3 (3)	3 (3)
TOTAL		32 (32)	16 (16)	16 (16)

5.3.2 Seniors Housing Development at Lot 2 DP 1097329 & Lot 3 DP 702859 Croobyar Road in Milton

In regard to Claydon Parks Seniors Living Community at Croobyar Road in Milton, reference is made to the Traffic and Parking Assessment Report prepared by Hughes Trueman in August 2009. The report estimates a total of 95 vehicle trips during both of the peak hours. The report also estimates the following trip distribution for the adjoining roadways:

- 40% of the total traffic is expected to use Princes Highway southbound;
- 20% of the total traffic is expected to use Matron Porter eastbound;
- 20% of the total traffic is expected to use Church Street northbound;
- 15% of the total traffic is expected to use Wason Street northbound; and
- 5% of the total traffic is expected to use Myrtle Street northbound.

Although the traffic report provides an estimation of the overall number of trips, it does not specify the number of inbound and outbound trips. Therefore, an assumption on the inbound and outbound trips is made based on the uses of the Claydon Parks Seniors Living Community.

From the traffic report prepared by Hughes Trueman, it has been identified that the Claydon Parks Seniors Living Community proposes to provide a mix of residential units for seniors (residential care facilities, independent dwellings, residential care facilities and self-contained dwellings), as well as other facilities (entertainment / bar / lounge / dining facility, craft centre, administration / library, farm and commercial operations, playground, tennis court, health / fitness centre and medical centre).

Based on the different uses for residents, staff (for the living community and other facilities), patrons visiting the other facilities and visitors of the residents, it is estimated that the ratio between inbound and outbound trips is similar during both peak hours. Therefore, a 50:50 inbound-outbound trip rate has been adopted.

Based on the above, the following number of trips is anticipated at the nearby intersections during the peak hours generated by the senior housing development:

Table 15 – Assumed Trip Distribution for Seniors Housing Development at Croobyar Road in Milton

Intersection	Direction	Total Trips	Inbound	Outbound
Princes Highway / Croobyar Road / Matron Porter Drive	Matron Porter Drive Eastbound	19	10	9
	Princes Highway Southbound	38	19	19
Croobyar Road / Church Street	Church Street Northbound	19	9	10
Croobyar Road / Wason Street	Wason Street Northbound	14	7	7
Croobyar Road / Myrtle Street	Myrtle Street Northbound	5	3	2
TOTAL		95	48	47

5.3.3 Seniors Housing Development at 267 Princes Highway (Lot 1 DP 737576) in Milton

In regard to Seniors Living Development at 267 Princes Highway in Milton, reference is made to the letter prepared by GTA Consultants dated 29 May 2018 (ref #N122790), which provides further information on traffic generation of the development upon comments received from TfNSW. The letter estimates the following trip generation by the seniors housing: 172 vehicle trips (42 inbound and 110 outbound trips) in the morning peak hour and 158 vehicle trips (116 inbound and 42 outbound trips) during the evening peak hour, as shown in Figure 26.

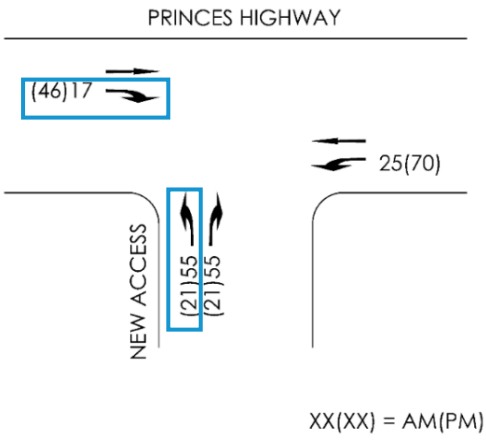


Figure 26 – Traffic Volumes at Senior Housing Development (Source: GTA Consultants)

Only trips passing the Princess Highway / Croobyar Road intersection are relevant for consideration, and these are marked in blue in Figure 26 and summarised in Table 16.

Table 16 – Estimated Trip Distribution for Seniors Housing Development at Princes Highway in Milton

Intersection	Direction	AM Peak Hour Trips	PM Peak Hour Trips
Princes Highway / Croobyar Road / Matron Porter Drive	Princes Highway Northbound	55	21
	Princes Highway Southbound	17	46
Croobyar Road / Gordan Street	Princes Highway Westbound	55	21
	Princes Highway Eastbound	17	46

5.3.4 Traffic Volumes Generated by Developments Approved by Shoalhaven Council

The total estimated traffic volumes for industrial storage units, industrial sheds and the seniors housing developments at the key intersections during the AM and PM peak hours are presented in Figure 27 and Figure 28 respectively.

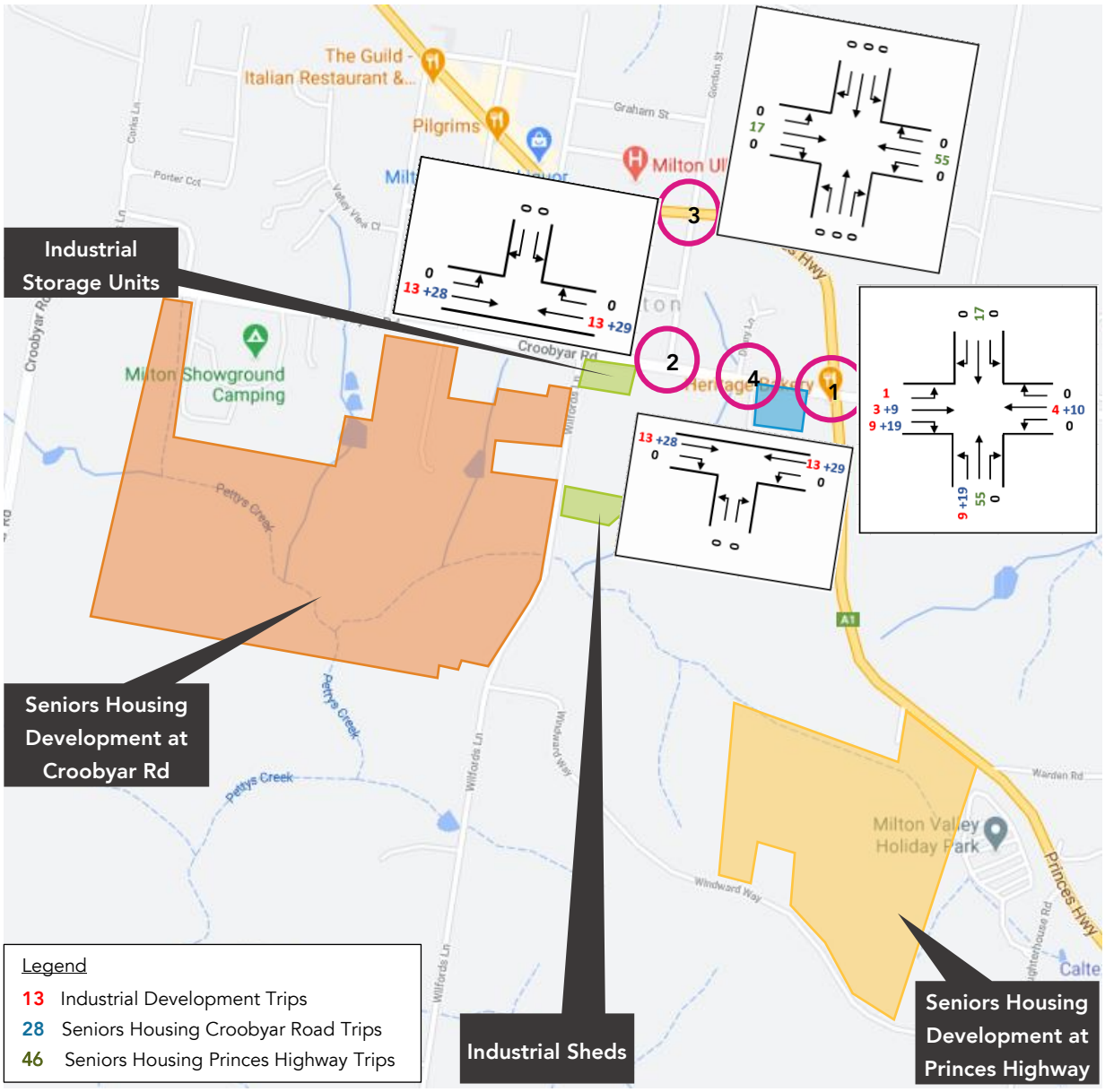


Figure 27 – Assumed Traffic Volumes Generated by Other Developments for the AM Peak Hour

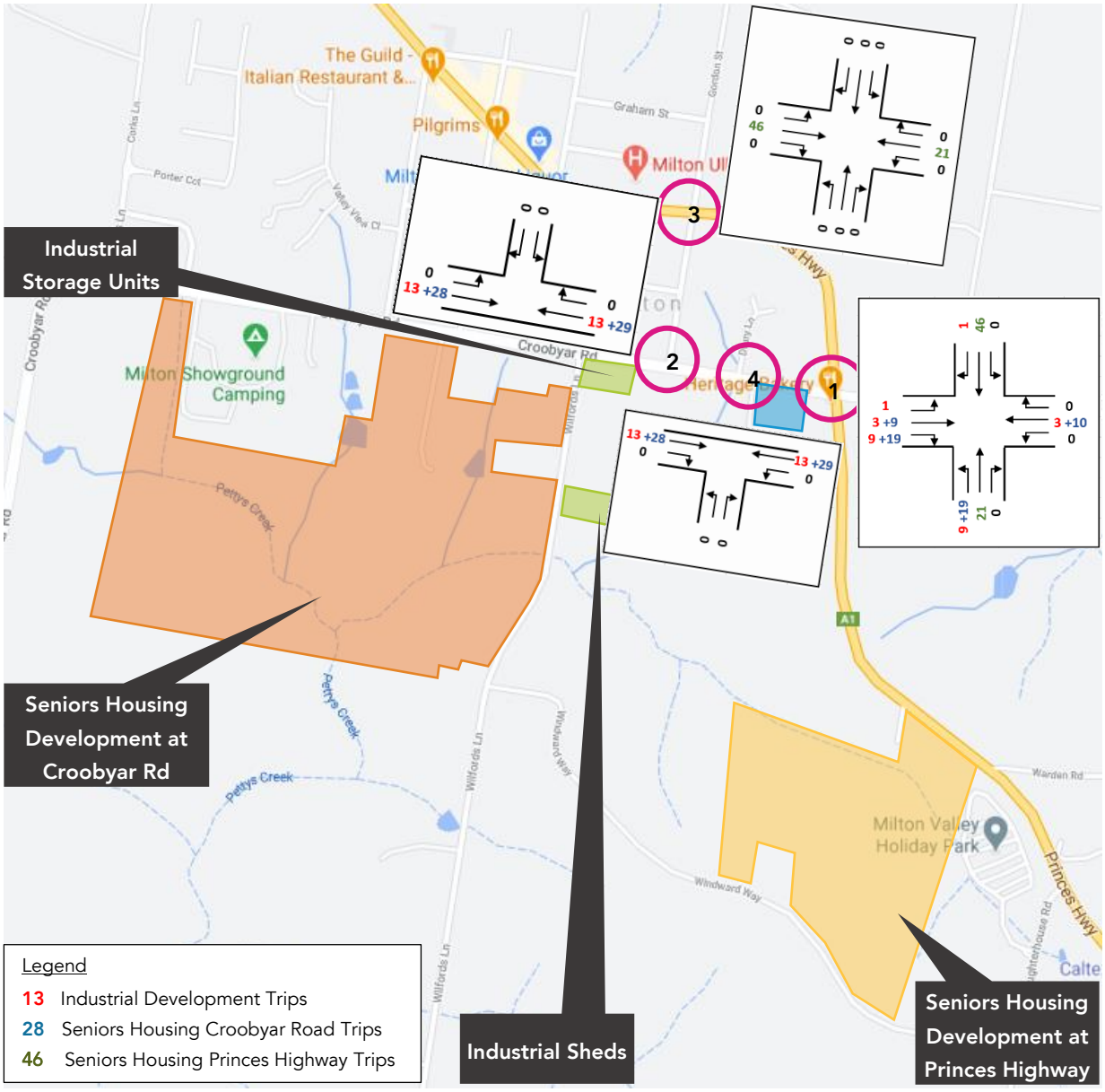


Figure 28 – Assumed Traffic Volumes Generated by Other Developments for the PM Peak Hour

5.4 Long-term Background Traffic Growth

In order to determine the background traffic growth rate for a 10-year period, the "Town of Milton Development Control Plan (August 2013)" and "Draft Shoalhaven Regional Plan 2041 (November 2020)" have been reviewed; However, neither of these documents outline any major changes to the areas of Milton or Ulladulla.

As discussed in Section 2.5, TfNSW is planning to develop a Milton Ulladulla bypass as a strategic corridor option as part of the Princes Highway upgrade[5]. Once this corridor is constructed, it can be expected that traffic volumes along the Princes Highway would decrease. However, at the time of writing the upgrade project is still in the planning stage and timing of completion has not been announced. TfNSW has also advised by email dated 23rd December 2020 that they are "*unable to provide any information on the estimated future traffic volumes along either the Princes Highway or Croobyar Road (e.g. what traffic increase / decrease factor should be used for both the Princess Highway and Croobyar Road for [the] 10-year horizon SIDRA modelling scenario.*" Therefore, for the purpose of providing a robust assessment, the diversion of through traffic to the Milton Ulladulla bypass has not been incorporated.

Further, reference is made to the traffic volume information provided by TfNSW on the website *Traffic Volume Viewer*[6]. Traffic counters closest to the proposed development are located on the Princes Highway, 50m South of Church Street, with traffic data provided for the years 2007 and 2009. While it is acknowledged that the information is dated, no other information has been found or received. Therefore, the growth rate recorded with the *Traffic Volume Viewer* has been used to determine the future, 10-year background traffic.

The traffic volumes show a growth rate of 1.03% per annum and this has been adopted.

Generally, the growth rate is applied only to traffic streams that are most likely to be affected. Despite the planned bypass, for the purpose of this report as a means of conservativeness, the growth rate has been applied to the through traffic along the Princess Highway. In addition, although no planning documents were found on any proposed developments to the east, it has been assumed that Mollymook and Narrawallee areas may be expanded in near future. Therefore, the growth rate has also been applied to traffic movements coming into and out of Matron Porter Drive.

The growth rate has been applied to the surveyed traffic volumes (refer to Section 5.1) for the assessment of 2030 background traffic volumes.

The expected 2030 background traffic for the AM and PM peak hours at the key intersections are presented in Figure 29 and Figure 30.

[5] https://www.rms.nsw.gov.au/projects/01documents/milton-ulladulla-bypass/milton-ulladulla-bypass-community-update-2020-11.pdf

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

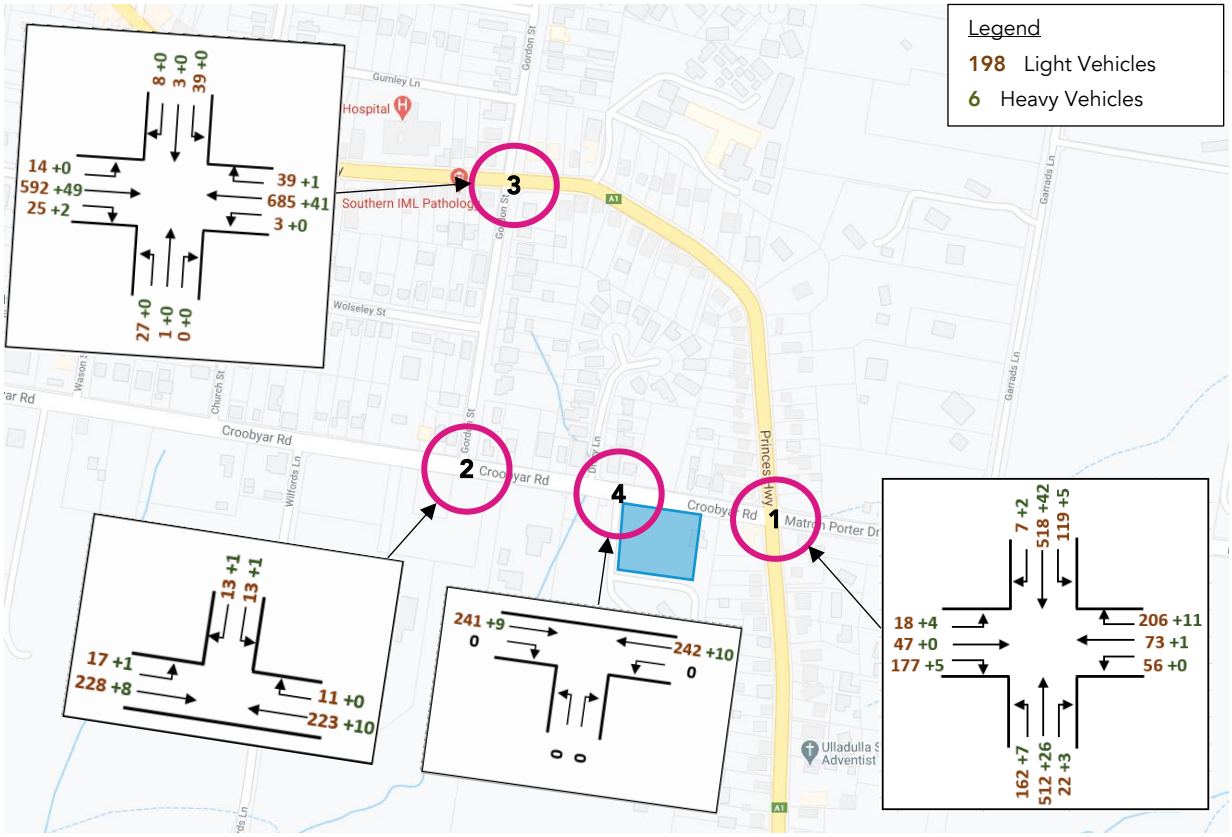


Figure 29 – Proposed 2030 Background Traffic for the AM Peak Hour

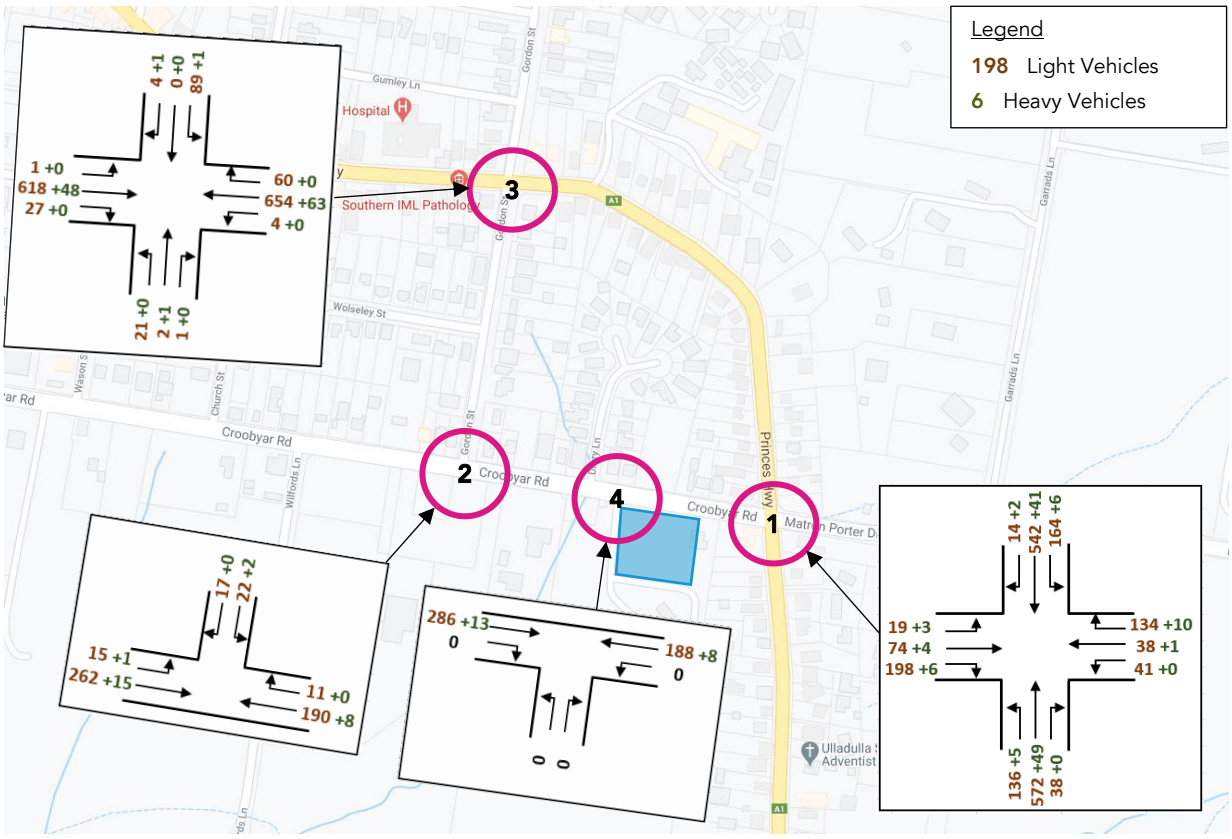


Figure 30 – Proposed 2030 Background Traffic for the PM Peak Hour

5.5 SIDRA Modelling

In order to confirm the current and future 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 categorisation of average delay, intended for simple reference. TfNSW adopts the following bands:

Table 17 – 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

For the SIDRA analysis, all intersections have been coordinated in a network.

5.5.1 Modelling Scenarios

The intersections have been modelled for the following five scenarios:

- Existing Scenario

The existing scenario has been modelled with the existing intersection arrangements and with the existing traffic volumes as described in Section 5.1.

It is noted that although the driveway exists, it is currently not being used. In order to depict the driveway in the model, the left turn movement has been turned on with only one vehicle exiting the driveway (required setting).

- 2023 Future Base Scenario

The 2023 future base scenario represents the likely traffic volumes at the School commencement in early 2023. This scenario comprises the existing scenario based on surveyed traffic volumes, plus the additional traffic volumes of the developments approved by Shoalhaven Council in the vicinity of the site, as described in Section 5.3.

It is noted that although the driveway exists, it is currently not being used. In order to depict the driveway in the model, the left turn movement has been turned on with only one vehicle exiting the driveway (required setting).

- 2023 Future Base + Development Scenario
- The future development scenario is modelled with the 2023 future base scenario plus the additional traffic volumes for parents/students/staff, as described in Section 5.2.
- 2023 Future Base + 2030 Background Growth Scenario

This scenario has been modelled with the 2023 future base scenario plus the estimated additional traffic growth within the next 10 year period, as described in Section 5.4.

It is noted that although the driveway exists, it is currently not being used. In order to depict the driveway in the model, the left turn movement has been turned on with only one vehicle exiting the driveway (required setting).

- 2023 Future Base + 2030 Background Growth + Development Scenario

This scenario has been modelled with the 2023 future base scenario, the estimated additional traffic growth within the next 10 year period and the additional traffic volumes for parents/students/staff.

5.5.2 SIDRA Results

Table 18 summarises the most relevant SIDRA results for all modelling scenarios with a comparison of the network operation. Full SIDRA results can be found in Attachment 2.

Table 18 – SIDRA Modelling Results for pre and post-development

Intersection	Time	Scenario	LoS	Delay (s)[7]	Highest DoS (v/s)	Highest Q95 (m)
Princes Highway / Croobyar Road / Matron Porter Drive	AM Peak	Existing	B	17.8	0.696	93.8
		2023 Future Base (FB)	B	18.6	0.759	111.1
		2023 FB + Development	B	20.2	0.806	117.5
		2023 FB + 2030 Backgr. Growth	B	22.3	0.863	156.2
		2023 FB + 2030 Backgr. Growth + Devel.	B	26.3	0.909	188.0
	PM Peak	Existing	B	19.2	0.801	122.5
		2023 Future Base (FB)	B	22.6	0.873	155.8
		2023 FB + Development	B	27.8	0.930	195.9
		2023 FB + 2030 Backgr. Growth*	B	20.7	0.829	143.9
		2023 FB + 2030 Backgr. Growth + Devel.*	B	28.0	0.923	169.1
Croobyar Road / Gordon Street	AM Peak	Existing	A	10.3	0.141	0.9
		2023 Future Base (FB)	A	11.1	0.163	1.0
		2023 FB + Development	A	11.4	0.169	1.3
		2023 FB + 2030 Backgr. Growth	A	11.1	0.163	1.0
		2023 FB + 2030 Backgr. Growth + Devel.	A	11.4	0.169	1.3
	PM Peak	Existing	A	9.7	0.161	1.1
		2023 Future Base (FB)	A	10.5	0.183	1.2
		2023 FB + Development	A	10.7	0.187	1.6
		2023 FB + 2030 Backgr. Growth	A	10.5	0.183	1.2
		2023 FB + 2030 Backgr. Growth + Devel.	A	10.7	0.187	1.6
Princes Highway / Gordon Street	AM Peak	Existing	B	23.2	0.407	6.4
		2023 Future Base (FB)	B	26.4	0.438	7.1
		2023 FB + Development	B	27.0	0.438	9.3
		2023 FB + 2030 Backgr. Growth	C	35.5	0.494	9.3
		2023 FB + 2030 Backgr. Growth + Devel.	C	36.1	0.494	12.2
	PM Peak	Existing	C	37.2	0.432	9.8
		2023 Future Base (FB)	C	42.5	0.448	10.9
		2023 FB + Development	C	42.4	0.448	10.8
		2023 FB + 2030 Backgr. Growth	D	53.0	0.474	12.3
		2023 FB + 2030 Backgr. Growth + Devel.	D	45.5	0.439	9.7
Croobyar Road / School Driveway	AM Peak	Existing	A	3.5	0.140	0
		2023 Future Base (FB)	A	3.7	0.162	0
		2023 FB + Development	A	5.9	0.204	2.0
		2023 FB + 2030 Backgr. Growth	A	3.7	0.162	0
		2023 FB + 2030 Backgr. Growth + Devel.	A	5.9	0.204	2.0

[7] 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.

Intersection	Time	Scenario	LoS	Delay (s)[7]	Highest DoS (v/s)	Highest Q95 (m)
	PM Peak	Existing	A	3.3	0.166	0
		2023 Future Base (FB)	A	3.5	0.188	0
		2023 FB + Development	A	5.9	0.198	3.1
		2023 FB + 2030 Backgr. Growth	A	3.5	0.188	0
		2023 FB + 2030 Backgr. Growth + Devel.	A	5.9	0.198	3.1

*Amended lane utilisation, refer to Section 5.5.2.1 for clarification

It should be noted that the site, while currently vacant, was approved and operated as a high school for a number of years. Traffic predicted to be generated by the proposed development is likely to represent only a portion of the traffic generated by the former school.

5.5.2.1. Princes Highway / Croobyar Road / Matron Porter Drive

The overall LoS at this intersection is currently B in both the AM and PM peak hours and is expected to remain at this level in the future.

It is noted that for the 10-year scenarios the lane utilisation of the southern Princess Highway approach was adjusted to represent a more realistic driver behaviour, i.e. that drivers wanting to continue their journey northbound along the highway will change from the right into the left late to drive around vehicles wanting to turn right into Matron Porter Drive.

The results show that the development will have only minor impact on the overall delay and saturation of this intersection.

The left turn from Croobyar Road into the Princess Highway is not expected to be heavily used by the development, as those that want to go north are expected to travel via Gordon Street.

5.5.2.2. Croobyar Road / Gordon Street

The LoS of all turn movements of this priority intersection is currently A in the AM and PM peak hours. Future scenarios do not result in significant changes and the LoS for all turn movements remain the same, whilst, the other performance measures increase marginally for both the AM and PM peaks. The intersection will still have a minimum 80% spare capacity in the peak hours. Therefore, the traffic impact at this intersection as a result of the development and future growth will be minor.

5.5.2.3. Princes Highway / Gordon Street

The through and right turn movements from Gordon Street North have a LoS B and C for the AM and PM peak hours respectively, which can be attributed to the fact that this intersection is not signalised. The future development will not change the LoS of any turn movements and no significant changes are noted on the other parameters. Post-development, there will be a minimum of 55% spare capacity in the peak hours. Therefore, the traffic impact at this intersection as a result of the development will be minor.

The 10 years scenario changes the LoS of the through and right turn movements from Gordon Street North to LoS D and C respectively. However, the intersection will still operate with 55% spare capacity in the PM peak hour and 50% spare capacity in the AM peak hour. Therefore, the future growth will not have significant changes to the intersection.

5.5.2.4. Croobyar Road / Site Driveway

The LoS of all turn movements of this priority intersection is currently A in the AM and PM peak hours. The LOS is not anticipated to be affected by the development or the future growth. The other performance measures increase marginally for both the AM and PM peaks, but are considered to be acceptable. Post-development and in future, there will be approximately 80% spare capacity in the peak hours. Therefore, the traffic impact at this intersection as a result of the development will be minor.

5.6 Pedestrian Movements

The existing pedestrian volumes have also been surveyed as part of the intersection counts undertaken on Thursday, 29th October 2020 (outside of school holiday period) between 7am – 10am and 2pm – 6pm at the three intersections of interest. The pedestrian volumes for the AM and PM school peak periods are illustrated in Figure 31 and Figure 32, respectively.

Figure 31 – AM Peak Hour Pedestrian Volumes 8:30am – 9:30am

Figure 32 – PM Peak Hour Pedestrian Volumes 3pm – 4pm

The survey data indicates that the pedestrian volumes are generally very low in both the AM and PM peak periods, which is expected given the remote nature of the surrounding region.

6. Preliminary Operational Traffic and Access Management Plan

The following subsections outline the proposed access arrangements for pedestrians, light vehicles (staff parking and pick-up/drop-off) and heavy vehicles (delivery trucks and waste collection vehicles). Refer to Figure 33 for details of the site access arrangement and parking layout.

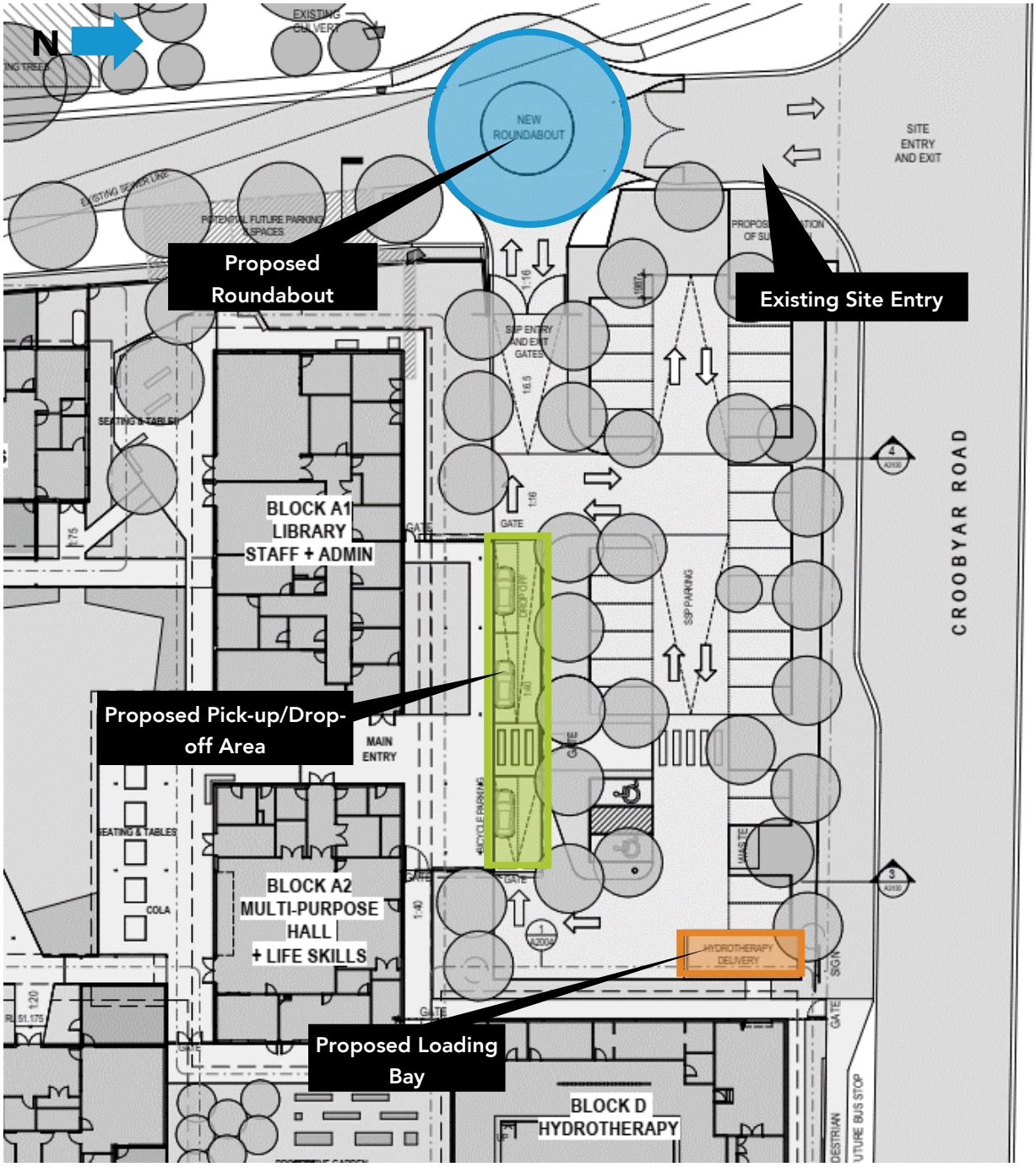


Figure 33 – Proposed Site Access Arrangement (Source: GroupGSA)

6.1 Pedestrian and Cyclists Access

The proposed pedestrian access points are presented in Figure 7. A pedestrian access gate is proposed within the eastern portion of the School. The pedestrian access gate is provided within the Croobyar Road frontage adjacent to the hydrotherapy building which connects by a footpath to the main entry into the School.

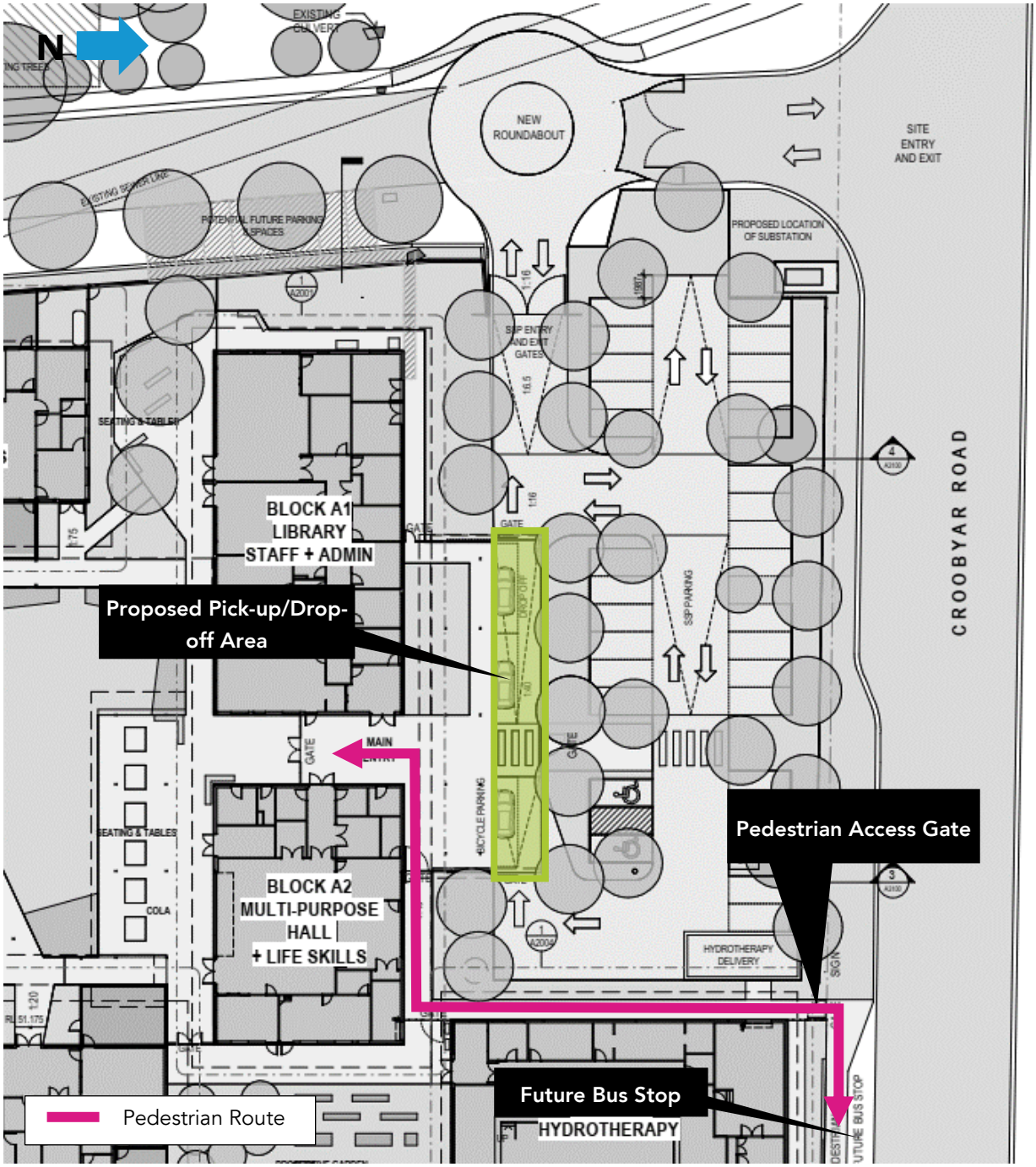


Figure 34 – Proposed Site Layout – Site Plan, Drawing No. A2000, Issue J (Source: GroupGSA)

6.2 School Bus Stop Access

With regard to school bus access, the project is not proposing to provide a bus stop as part of this development. However, the layout has taken in consideration potential future inclusion of a bus bay for potential future educational establishment within the reminder of the site.

The future bus stop would be located on the southern side of Croobyar Road at the school frontage. The bus stop would occupy approximately 30m of the frontage which aligns with the required Bus Zone length for a standard 12.5m rigid bus, as per the *State Transit Bus Infrastructure Guide*.

A direct pedestrian connection would be provided to the future bus stop via the pedestrian access gate (shown in Figure 34), to separate pedestrian and vehicular movements.

6.3 Light Vehicle Access

Vehicles accessing the car park or the pick-up/drop-off area will enter via the existing driveway on Croobyar Road. Vehicles will circulate through the proposed roundabout and enter the site via a gate off the eastern leg of the roundabout. The staff car park will operate using a two-way traffic flow arrangement to allow for entry and exit, even if the pick-up/drop-off zone is closed and not in operation.

The drop-off/pick-up area is approximately 33m in length and is able to accommodate a maximum of three vehicles at any one time. For details of the operation of the pick-up/drop-off area, refer to Section 6.4.

6.4 Pick-up/Drop-off Operation

Student transport to and from the school is generally via either minibuses or private vehicles. For both these modes, pick-up/drop-off facilities are provided to facilitate safe and efficient movement of students from a vehicle to the School grounds and vice versa.

Drop-off and pick-up activities will be conducted in a secured area in front of the proposed library, staff and admin building. The gated pick-up/drop-off area will accommodate up to three vehicles at any one time and is in a single lane arrangement. These three spaces will be closely managed in the morning drop-off and afternoon pick-up periods by the School.

For student safety, the pick-up/drop-off zone is gated and secured such that only three vehicles may enter or exit the facility at any one time. Vehicles will be stopped completely in the pick-up/drop-off zone and be parked in a three-car tandem parking configuration. A staff member is stationed at the main entrance during drop-off and pick-up periods to assist students into the School and monitor the drop-off and pick-up activities. The gates will only be opened once all vehicles have completed the loading / unloading of students.

As there are three pick-up/drop-off bays proposed, arrivals and departures will be managed through appropriate scheduling to mitigate the potential for waiting and vehicle queuing. Minibus drivers and parents will be allocated specific time slots to ensure that arrivals are staggered. Each time slot is expected to be approximately three minutes in duration, which has been calculated in Section 4.3.2 as being generally sufficient to accommodate the expected demand.

It is also highlighted that staff entry and exit from the car park is proposed to take place outside of the peak pick-up/drop-off periods, and hence will not conflict with the movement of vehicles dropping off and picking up students.

6.5 Service Vehicle Access

With regards to servicing and deliveries, there are three types of heavy vehicles which are anticipated to require access to the site being:

- 11.3m Hydrotherapy Delivery Vehicle;
- 11m Council Waste Collection Vehicle; and
- 10m Class 2 Pumper / General Fire Appliance[8] (for emergencies only).

6.5.1 Hydrotherapy Delivery Vehicle

The largest anticipated vehicle requiring access to the site is the 11.3m hydrotherapy delivery vehicle. This vehicle will be used to transport goods to the hydrotherapy building on the eastern portion of the site. The truck will park within a dedicated bay during the delivery.

The transportation of any goods will be managed by a third-party supplier in conjunction with the School and appropriate measures will be implemented to ensure the safe use of the loading bay. The deliveries will be scheduled such that no conflict between the truck and students/parent/staff will be possible.

It is highlighted that deliveries to the hydrotherapy pool by heavy vehicles will be managed through school operations and scheduled to occur within non-peak hours.

Access to the delivery bay will be via the existing school site access off Croobyar Road and the proposed roundabout. The 11.3m delivery vehicle will travel through the staff car park and reverse into the designated loading bay adjacent to the hydrotherapy building. To exit, the vehicle will travel through the pick-up/drop-off area and subsequently turn right at the roundabout onto the site access road to proceed to Croobyar Road.

6.5.2 Waste Collection

With regard to waste collection, it is understood that this will be undertaken by Council. As outlined in Section 4.9, it is anticipated that the largest waste collection vehicle with length of 11m will be used. There are two types of waste which will require collection from the School, being general waste and nappy collection.

The waste collection vehicle movements are expected to occur during early morning off-peak periods and are not anticipated to impact on the peak hour traffic flow.

The waste collection vehicle will enter and exit the site in a similar arrangement to the 11.3m hydrotherapy delivery vehicle. The waste storage area will be situated proximate to the loading bay to provide convenient access for collection.

6.5.3 Emergency Vehicle Access

In the event of an emergency, access will be required for an NSW Fire Brigade Class 2 Pumper Truck. The pumper truck is 10m in length and will enter and exit the site as per the other heavy vehicles. Consideration has been given to the need to provide access to all areas throughout the car park and pick-up/drop-off area so that the vehicle has access to service the various buildings within the School.

[8] As per the Fire and Rescue NSW Fire Safety Guideline – Access for Fire Brigade Vehicles and Firefighters (2019)

7. Access and Car Park Assessment

The following section presents an assessment of the proposed development with reference to the requirements of AS2890.1:2004 (Off-street car parking), AS2890.2:2018 (Off-street commercial vehicle facilities), AS2890.3:2015 (Bicycle parking) and AS2890.6:2018 (Off-street parking for people with disabilities) and industry best practice. The proposed car park is to be predominantly used as a staff car park, and therefore, a preliminary review of the car park has been undertaken with reference to AS2890.1 for typical User Class 1A.

This section is to be read in conjunction with the architectural plans provided by GroupGSA shown in **Attachment 1** and car park assessment undertaken by **ptc.** as shown in **Attachment 3**.

7.1 School Zone

A former School Zone was provided along Croobyar Road between the Princes Highway and Gordon Street which would have served the former Shoalhaven Anglican School. However, it is highlighted that this School Zone appears to have been removed, with some remnants of the former pavement markings. As such, the School Zone will need to be reinstated and new School Zone signage is recommended to be upgraded to include flashing lights to alert drivers of the change in the speed limit along Croobyar Road. In light of this, it is recommended that TfNSW reinstate the School Zone to ensure that it is clear to all drivers travelling along the frontage road.

The School Zone is to be installed according to the requirements of "RTA TD 2003/RS02 Installation of 40km/h School Zones on Multi-lane Roads and High Speed Roads".

7.2 Vehicular Access and Circulation

A number of options have been investigated with regard to the location of the vehicular access to the site. Details of the options which have been explored are outlined in **Attachment 4**. The outcome of this investigation has identified the preferred option to utilise the existing site access off Croobyar Road to the former Shoalhaven Anglican School (SAS).

The access to the proposed 30 space (Class 1A) at-grade staff car park and three space pick-up/drop-off area is via Croobyar Road which is a local road. In accordance with Table 3.1 of AS 2890.1, the car park is classified as a Category 1 facility which requires a minimum driveway width of 5.5m (between kerbs) for two-way flow. The proposed driveway into the car park has a width of 6.2m which meets this requirement.

A swept path assessment demonstrating two-way passing of a B99 and B85 vehicle with appropriate clearance is included in **Attachment 3**.

7.2.1 Internal Roundabout

In order to facilitate vehicular access and egress to and from the School, an internal roundabout is proposed within the existing site access to the former SAS. The roundabout will prioritise traffic movements of vehicles exiting the proposed School car park and helps to streamline vehicular traffic between the Budawang School and any future redevelopment on the former SAS site.

A number of considerations has led to the proposed layout of the roundabout including:

- Existing Road Alignment – the internal roundabout is aligned with the existing SAS site access and positioned to be perpendicular to the driveway into the School car park. This will allow for greater visibility for all vehicles approaching the roundabout.
- Riparian Corridor – there is an existing creek and riparian corridor on the western side of the SAS site access road which presents a physical constraint for any proposed works. The location of the roundabout minimises any potential impact upon the riparian corridor.
- Roundabout Dimensions – the inscribed diameter of the roundabout is approximately 17m and circulating lane width of approximately 4.5m which has been determined using a swept path assessment to allow for access by an 11.3m vehicle (largest anticipated vehicle).
- Vehicle Manoeuvring – the central island of the roundabout will need to be constructed such that it is semi-mountable to allow heavy vehicles to enter and exit the School site as determined by the swept path assessment in Attachment 3.
- Vehicle Storage – the roundabout is located approximately 20m from the Croobyar Road frontage which is sufficient to allow for the storage of the 11.3m HRV without encroaching onto Croobyar Road (upon entry) or obstructing traffic flow through the roundabout (upon exit).

7.2.2 Internal Circulation

The proposed car park provides minimum 6.2-6.6m traffic aisle widths throughout the car park to allow vehicles to manoeuvre into the parking spaces. The proposed aisle width exceeds the requirements stipulated in AS 2890.1 for a typical Class 1A facility. Two-way circulation will be provided within the staff car park and one-way flow is proposed through the pick-up/drop-off area. A swept path assessment has been undertaken which demonstrates that a B99 and a B85 vehicle is able to pass each other with appropriate clearances when entering and exiting the car park. For heavy vehicles, a swept path assessment has also been undertaken to demonstrate entry and egress into the site by an 11.3m vehicle (the largest anticipated vehicle). The swept path analysis is presented in Attachment 3.

The vehicular access, circulation, aisle width and car space dimensions are capable of complying with AS2890.1, AS2890.2 and AS2890.6.

7.2.3 Grades

The at-grade carpark is to be designed in accordance with AS2890.1 and AS2890.2, where:

- Maximum grades do not exceed 1:20 (5%) for the first 6m from the property line;
- Maximum grade transitions of 1:16 (6.25%) running for at least 7m in length wherever access by heavy vehicles is required;
- Maximum grade of 1:6.5 (15.4%) for any areas accessed by vehicles larger than a standard B99 vehicle;
- Maximum grade within car parking spaces do not exceed 1:20 (5%);
- Maximum grade of any accessible or shared spaces do not exceed 1:40 (or 1:33 if the surface is a bituminous seal and parking is outdoors).

7.3 Car Parking Arrangement

7.3.1 Typical Requirements

The proposed car park access and parking arrangements of the at-grade staff car park have been assessed against the requirements of AS2890.1:2004, with reference to Class 1A (employee) facilities. The Class 1A facilities are to provide the following dimensions (90° angle parking):

- Car Spaces: 2.4m x 5.4m
- Aisle Width: 5.8m (minimum)

additional 300mm needs to be provided where one side of the aisle is bounded by high obstruction (i.e. wall or column)

The parking spaces have been assessed and found to be generally compliant with or are capable of complying with the minimum requirements of AS2890.1.

A service vehicle bay has been provided in the eastern portion of the staff car park adjacent to the hydrotherapy building, and swept paths showing an 11.3m long vehicle have been used to demonstrate the usability of this bay.

A blind aisle extension of at least 1m in width has been provided within the car park to allow for manoeuvrability into and out of the end parking spaces.

7.3.2 Accessible Parking

All accessible parking spaces shall be designed in accordance with the requirements of AS2890.6. 90-degree accessible parking spaces are to be designed based on the following minimum dimensions:

- Accessible Space: 2.4m x 5.4m
- Adjacent Shared Bay: 2.4m x 5.4m (with bollard)

Parallel accessible parking spaces are to be designed based on the following minimum dimensions:

- Accessible space: 3.2m x 7.8m

All shared bays and accessible spaces shall be installed in accordance with AS2890.6, including the installation of bollards and relevant pavement markings. A minimum height clearance of 2.5m is to be maintained above all accessible and shared bays.

7.3.3 Headroom Clearance

Headroom clearances must be provided in accordance with the minimum requirements of AS2890.1 and AS2890.2. These requirements are stipulated below:

- Minimum 2.2m above all general car parking spaces and circulation roadways;
- Minimum 2.5m above all accessible spaces and adjacent shared bays;
- Minimum 2.2m above all bicycle spaces and access paths to the bicycle spaces; and
- Minimum 4.5m above any service vehicle bays and wherever heavy vehicle access is required.

Where circulation areas or parking spaces are below any overhead structures such as trees, the minimum headroom clearances are to be measured to the lowest overhead obstruction (e.g. the underside of the tree canopy, shade sails etc.).

7.3.4 Bicycle Parking

Approved bicycle parking devices (BPD's) shall be installed as per the following minimum requirements of AS2890.3:2015:

- Horizontal parking: 1800mm x 500mm
- Vertical parking: 1200mm x 500mm
- Access aisle: 1500mm for bicycle racks and 2000mm for bicycle lockers

7.3.5 Staff and Pick-up & Drop-off Time Management

It is assumed that teachers will access the staff car park outside the pick-up and drop-off hours and the school will manage staff access accordingly so as to avoid conflicts with student drop-off/pick-up. Access to the staff car park and pick-up/drop-off area can be managed internally by the School.

7.3.6 Hydrotherapy Delivery Vehicle

Hydrotherapy deliveries are proposed to occur from within the shared delivery and waste collection area on the eastern end of the staff car park.

As some deliveries may contain chemical goods, a raised bund is required to prevent contamination of the surrounding road surfaces should any spill occur. The bund will be constructed in a form similar to a mountable median island.

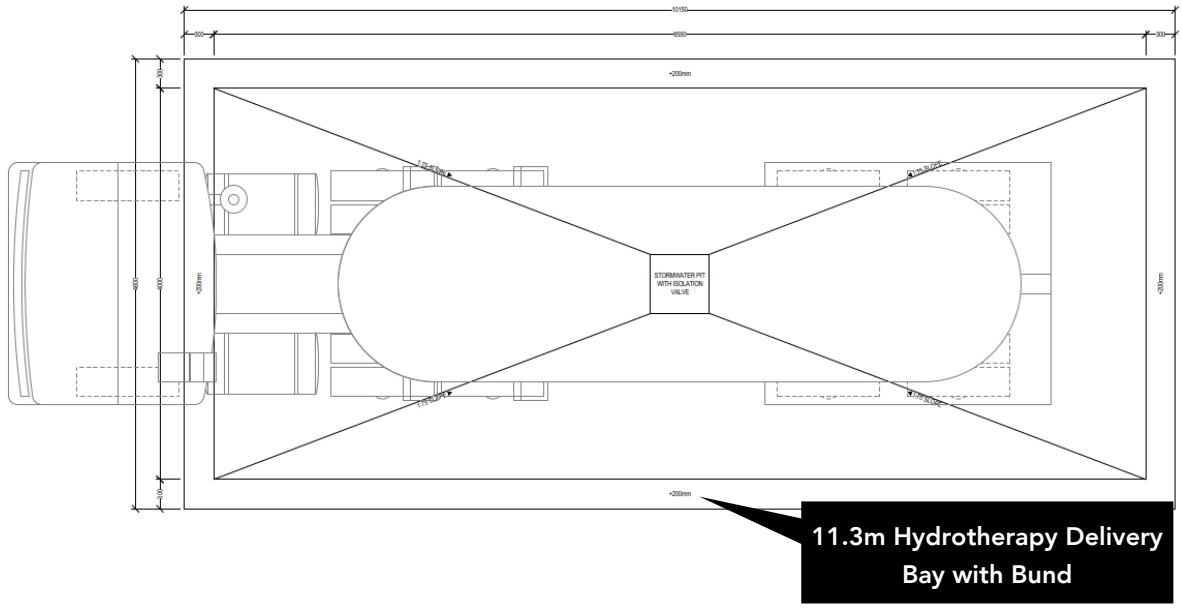


Figure 35 – Loading Bay Arrangement with Bund (Source: CPC Commercial Pool Consulting)

The outer dimensions of the bund are approximately 10.2m x 4.6m, which is adequate for containing the liquid tanker. It is noted that the cabin of the truck will be parked outside of the bunded area; as such, additional length of approximately 1.5m would be required to accommodate the full length of the 11.3m

truck. The required dimension and a sketch of a parked truck within the loading bay are shown in Figure 35. The proposed loading bay shall be designed to ensure the minimum dimensions outlined within this specification are satisfied.

A swept path assessment has been undertaken and it has been demonstrated that a 11.3m long vehicle will be able to enter and exit the site in a forward direction, as shown in the design review included in Attachment 3.

7.3.7 Waste Collection Vehicles

Waste collection is proposed to occur from within the shared delivery and waste collection area on the eastern end of the staff car park. A swept path assessment has been undertaken and it has been demonstrated that a 11.3m long vehicle will be able to enter and exit the site in a forward direction, as shown in the design review included in Attachment 3.

7.4 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. The maximum posted speed limit of 50km/h (excluding 40km/h School Zone limits) have been used to provide a worst-case assessment.

AS2890.1 Clause 3.2.4 stipulates that a roadway with a speed limit of 50 km/h must accommodate a desirable sight distance of 69m or a minimum stopping sight distance of 45m.

It is highlighted that the driveway along Croobyar Road is an existing driveway and located on a straight section of road where sufficient sight distance is provided.

The proposed driveways shall provide the minimum sight lines for pedestrian safety in the form of a 2.0m x 2.5m triangular sight splay, as stipulated in AS2890.1.

8. Conclusion

ptc. has been engaged by School Infrastructure New South Wales (SINSW) to prepare a Traffic Impact Assessment (TIA) to accompany a State Significant Development Application (SSDA). The proposed development involves the relocation of the existing Budawang School (the School) from Ulladulla to a new site to occupy a portion of the former Shoalhaven Anglican School at 17 Croobyar Road, Milton NSW.

The overall proposal is to construct a new school with an enrolment capacity of 80 students and approximately 34 FTE staff. This school will cater for students with moderate to severe levels of intellectual and physical disability. The School also has the following characteristics:

- Three pick-up/drop-off spaces which are located in a secured area of the car park and highly managed by staff to allow vehicles to park momentarily and parents to escort their child to and from the School
- 30 car parking spaces (inclusive of two accessible bays) for staff use
- Two staff and four visitor bicycle parking spaces
- One shared loading bay accommodating trucks up to 11.3m in length for the purposes of deliveries to the hydrotherapy pool and waste collection. A turning area is provided to allow vehicles to enter and exit the site in a forward direction.

A review of the existing walking, cycling and public transport facilities has found that the pedestrian and cycling networks are currently underdeveloped, with limited footpath connectivity or cycling routes. Whilst it is acknowledged that students will travel to and from school by minibus or private vehicle, staff may be able to utilise alternative transport modes if the infrastructure was improved. Public transport is currently not a viable option for the school, but discussions between with TfNSW, Council and SINSW should be undertaken to deliver the more convenient public transport connections to the school for those that cannot walk or cycle.

Although not proposed as part of this application, the layout has taken into consideration a potential future bus stop on the southern side of Croobyar Road along the School frontage. This location is considered to be optimal, as it lies along a collector road and close to the main school entry.

In terms of traffic activity, a SIDRA traffic model has been prepared for the peak periods to identify the potential traffic impact on the surrounding road network upon completion of the development. Various scenarios have been analysed, which include a cumulative assessment of nearby developments approved by Shoalhaven City Council and a traffic growth for a 10-year period. It is noted that a bypass is being planned by TfNSW, which is likely to result in a reduction of traffic at the relevant intersection with the Princess Highway, TfNSW was not able to provide the project with an estimated growth / reduction rate, therefore, a growth rate from the traffic viewer was used.

In general, the SIDRA modelling has identified that the proposed development will not have a significant effect on the surrounding intersections.

A preliminary review of the proposed car park layout indicates that the design is capable of complying with the design requirements of AS2890.1:2004, AS2890.2:2018 and AS2890.6:2009. The concept car park design submitted as part of this SSDA 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.

Attachment 1 - Architectural Drawings

1 SITE PLAN
1 : 250

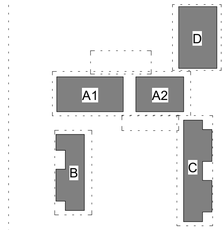
0m 2m 4m 8m 12m

SITE PLAN LEGEND

- NEW LANDSCAPE
- NEW PATHWAYS
- NEW BUILDINGS
- ROADS
- PARKING SPACES
- BUDAWANG SCHOOL BOUNDARY
- EXISTING SEWERLINE
- EXISTING TREES
- PROPOSED TREES
- BOUNDARY TREES
- DOE OWNERSHIP
- LP LIGHT POLE

Amendments

Issue	Description	Date
A	ISSUE FOR INFORMATION	12/03/2021
B	ISSUE FOR INFORMATION	23/03/2021
C	ISSUE FOR INFORMATION	25/03/2021
D	ISSUE FOR SSDA	08/04/2021



SSDA SUBMISSION

Project Management
SJA
Level 1, 109 Pitt Street, NSW, 2000
02 9236 5000

Structural and Civil
HENRY & HYMAS (Consulting Engineers)
Suite 2.01, 828 Pacific Highway, Gordon, NSW, 2072
02 9417 8400

Building Services
INTELLE BUILDING SERVICES
Level 2, 350 Kent Street, Sydney, NSW, 2000
02 9772 3600

BCA Consultant
STEVE WATSON & PARTNERS
Level 17, 456 Kent Street, Sydney, NSW, 2000
02 9283 6555

Client
SCHOOL INFRASTRUCTURE NSW
Level 8, 259 George Street, Sydney, NSW, 2000
1300 482 651

GROUP GSA
Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 80 William St East Sydney NSW
Australia 2011
www.groupgsa.com

T +612 9361 4144 F +612 9332 3458

architecture interior design urban design landscape
nom architect M. Sheldon 3990

Project Title
BUDAWANG SCHOOL

Drawing Title
SITE PLAN

Scale	1 : 250
Drawing Created (date)	02/24/21
Drawing Created (by)	TKD
Plotted and checked by	RF
Verified	RF
Approved	RK

Project No	Drawing No	Issue
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Attachment 2 - SIDRA Outputs

MOVEMENT SUMMARY

Site: 101a [1a. Princes Highway / Croobyar Road - 2020 Existing AM Peak (Site Folder: SCENARIO 1A - 2020 Existing AM PEAK)]

Network: N101 [2020 EXISTING AM (Network Folder: SCENARIO 1 - 2020 EXISTING SCENARIO)]

2020 Existing AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2020 Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	178	4.1	178	4.1	0.198	15.1	LOS B	3.4	24.4	0.59	0.70	0.59	35.6
2	T1	498	4.9	498	4.9	* 0.696	13.7	LOS A	12.8	93.8	0.76	0.68	0.77	36.4
3	R2	23	13.6	23	13.6	0.696	18.4	LOS B	12.8	93.8	0.76	0.68	0.77	38.9
Approach		699	5.0	699	5.0	0.696	14.2	LOS A	12.8	93.8	0.71	0.69	0.72	36.3
East: Matron Porter Drive (E)														
4	L2	52	0.0	52	0.0	0.135	27.5	LOS B	1.8	12.7	0.78	0.71	0.78	34.9
5	T1	78	1.4	78	1.4	0.676	25.2	LOS B	8.3	59.9	0.89	0.82	0.94	19.3
6	R2	201	5.2	201	5.2	* 0.676	30.9	LOS C	8.3	59.9	0.92	0.85	0.99	18.7
Approach		331	3.5	331	3.5	0.676	29.0	LOS C	8.3	59.9	0.89	0.82	0.94	22.8
North: Princes Highway (N)														
7	L2	115	3.7	115	3.7	0.132	14.1	LOS A	2.1	15.3	0.55	0.67	0.55	39.7
8	T1	518	7.5	518	7.5	0.614	11.9	LOS A	12.0	89.7	0.72	0.64	0.72	42.9
9	R2	9	22.2	9	22.2	0.614	16.7	LOS B	12.0	89.7	0.72	0.64	0.72	37.8
Approach		642	7.0	642	7.0	0.614	12.4	LOS A	12.0	89.7	0.69	0.64	0.69	42.4
West: Croobyar Road (W)														
10	L2	23	18.2	23	18.2	0.132	25.8	LOS B	1.8	13.0	0.76	0.63	0.76	16.8
11	T1	49	0.0	49	0.0	0.496	19.7	LOS B	5.7	41.0	0.77	0.64	0.77	29.5
12	R2	192	2.7	192	2.7	0.496	27.8	LOS B	5.7	41.0	0.88	0.80	0.88	30.8
Approach		264	3.6	264	3.6	0.496	26.1	LOS B	5.7	41.0	0.85	0.75	0.85	30.0
All Vehicles		1936	5.2	1936	5.2	0.696	17.8	LOS B	12.8	93.8	0.75	0.71	0.77	36.3

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											
P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
East: Matron Porter Drive (E)											
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10

North: Princes Highway (N)										
P3 Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)										
P4 Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians	211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102a [2a. Croobyar Road / Gordon Street - 2020 Existing AM Peak (Site Folder: SCENARIO 1A - 2020 Existing AM PEAK)]

Network: N101 [2020 EXISTING AM (Network Folder: SCENARIO 1 - 2020 EXISTING SCENARIO)]

2020 Existing AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2020 Existing Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	245	4.3	245	4.3	0.138	0.1	LOS A	0.1	0.7	0.04	0.03	0.04	49.1
6	R2	12	0.0	12	0.0	0.138	5.6	LOS A	0.1	0.7	0.04	0.03	0.04	48.2
Approach		257	4.1	257	4.1	0.138	0.3	NA	0.1	0.7	0.04	0.03	0.04	49.1
North: Gordon Street (N)														
7	L2	15	7.1	15	7.1	0.037	8.8	LOS A	0.1	0.9	0.39	0.90	0.39	36.0
9	R2	15	7.1	15	7.1	0.037	10.3	LOS A	0.1	0.9	0.39	0.90	0.39	38.4
Approach		29	7.1	29	7.1	0.037	9.5	LOS A	0.1	0.9	0.39	0.90	0.39	37.4
West: Croobyar Road (W)														
10	L2	19	5.6	19	5.6	0.141	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	48.7
11	T1	248	3.4	248	3.4	0.141	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	48.7
Approach		267	3.5	267	3.5	0.141	0.3	NA	0.0	0.0	0.00	0.04	0.00	48.7
All Vehicles		554	4.0	554	4.0	0.141	0.8	NA	0.1	0.9	0.04	0.08	0.04	47.8

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

MOVEMENT SUMMARY

Site: 103a [3a. Princes Highway / Gordon Street - 2020 Existing AM Peak (Site Folder: SCENARIO 1A - 2020 Existing AM PEAK)]

Network: N101 [2020 EXISTING AM (Network Folder: SCENARIO 1 - 2020 EXISTING SCENARIO)]

2020 Existing AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2020 Existing Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	28	0.0	28	0.0	0.045	7.6	LOS A	0.2	1.2	0.58	0.71	0.58	40.7
2	T1	1	0.0	1	0.0	0.045	17.1	LOS B	0.2	1.2	0.58	0.71	0.58	39.5
3	R2	1	0.0	1	0.0	0.045	22.9	LOS B	0.2	1.2	0.58	0.71	0.58	36.1
Approach		31	0.0	31	0.0	0.045	8.5	LOS A	0.2	1.2	0.58	0.71	0.58	40.5
East: Princes Highway (E)														
4	L2	3	0.0	3	0.0	0.407	9.4	LOS A	0.9	6.4	0.14	0.04	0.17	48.4
5	T1	672	5.6	672	5.6	0.407	0.6	LOS A	0.9	6.4	0.14	0.04	0.17	48.9
6	R2	42	2.5	42	2.5	0.407	9.5	LOS A	0.9	6.4	0.14	0.04	0.17	47.4
Approach		717	5.4	717	5.4	0.407	1.2	NA	0.9	6.4	0.14	0.04	0.17	48.8
North: Gordon Street (N)														
7	L2	41	0.0	41	0.0	0.106	7.2	LOS A	0.4	2.5	0.63	0.78	0.63	28.0
8	T1	3	0.0	3	0.0	0.106	17.4	LOS B	0.4	2.5	0.63	0.78	0.63	28.0
9	R2	8	0.0	8	0.0	0.106	23.2	LOS B	0.4	2.5	0.63	0.78	0.63	36.3
Approach		53	0.0	53	0.0	0.106	10.4	LOS A	0.4	2.5	0.63	0.78	0.63	30.2
West: Princes Highway (W)														
10	L2	15	0.0	15	0.0	0.362	9.2	LOS A	0.8	6.2	0.12	0.04	0.16	47.0
11	T1	593	7.6	593	7.6	0.362	0.6	LOS A	0.8	6.2	0.12	0.04	0.16	46.9
12	R2	28	7.4	28	7.4	0.362	10.2	LOS A	0.8	6.2	0.12	0.04	0.16	46.9
Approach		636	7.5	636	7.5	0.362	1.2	NA	0.8	6.2	0.12	0.04	0.16	46.9
All Vehicles		1436	6.0	1436	6.0	0.407	1.7	NA	0.9	6.4	0.16	0.08	0.19	47.7

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

MOVEMENT SUMMARY

Site: 104a [4a. Budawang School Site Access - 2020 Existing AM Peak (Site Folder: SCENARIO 1A - 2020 Existing AM PEAK)]

Network: N101 [2020 EXISTING AM (Network Folder: SCENARIO 1 - 2020 EXISTING SCENARIO)]

2020 Existing AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2020 Existing Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	1	0.0	1	0.0	0.001	3.5	LOS A	0.0	0.0	0.33	0.42	0.33	20.7
Approach		1	0.0	1	0.0	0.001	3.5	LOS A	0.0	0.0	0.33	0.42	0.33	20.7
East: Croobyar Road (E)														
5	T1	265	4.0	265	4.0	0.140	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		265	4.0	265	4.0	0.140	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
West: Croobyar Road (W)														
11	T1	263	3.6	263	3.6	0.138	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		263	3.6	263	3.6	0.138	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
All Vehicles		529	3.8	529	3.8	0.140	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9

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

MOVEMENT SUMMARY

Site: 101b [1b. Princes Highway / Croobyar Road - 2020 Existing PM Peak (Site Folder: SCENARIO 1B - 2020 EXISTING PM PEAK)]

Network: N101 [2020 EXISTING PM (Network Folder: SCENARIO 1 - 2020 EXISTING SCENARIO)]

2020 Existing PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2020 Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	148	3.5	148	3.5	0.228	14.7	LOS B	3.9	28.8	0.58	0.65	0.58	36.8
2	T1	575	7.9	575	7.9	* 0.801	18.8	LOS B	16.5	122.5	0.78	0.81	0.91	32.9
3	R2	35	0.0	35	0.0	0.801	24.2	LOS B	16.5	122.5	0.81	0.83	0.94	36.5
Approach		758	6.7	758	6.7	0.801	18.3	LOS B	16.5	122.5	0.74	0.78	0.84	33.8
East: Matron Porter Drive (E)														
4	L2	38	0.0	38	0.0	0.084	27.3	LOS B	1.1	7.6	0.76	0.70	0.76	34.7
5	T1	41	2.6	41	2.6	0.422	23.5	LOS B	4.9	35.9	0.85	0.77	0.85	20.1
6	R2	134	7.1	134	7.1	0.422	28.3	LOS B	4.9	35.9	0.86	0.78	0.86	19.9
Approach		213	5.0	213	5.0	0.422	27.2	LOS B	4.9	35.9	0.84	0.76	0.84	24.2
North: Princes Highway (N)														
7	L2	157	3.4	157	3.4	0.174	15.0	LOS B	2.9	21.1	0.58	0.70	0.58	39.2
8	T1	539	7.0	539	7.0	0.710	14.2	LOS A	14.1	104.9	0.78	0.71	0.79	41.8
9	R2	17	12.5	17	12.5	0.710	18.9	LOS B	14.1	104.9	0.78	0.71	0.79	36.1
Approach		713	6.4	713	6.4	0.710	14.5	LOS B	14.1	104.9	0.73	0.70	0.75	41.2
West: Croobyar Road (W)														
10	L2	23	13.6	23	13.6	0.154	25.9	LOS B	2.1	15.5	0.77	0.64	0.77	16.8
11	T1	82	5.1	82	5.1	* 0.581	20.9	LOS B	7.2	52.0	0.81	0.69	0.81	28.3
12	R2	215	2.9	215	2.9	0.581	28.5	LOS C	7.2	52.0	0.91	0.81	0.91	30.6
Approach		320	4.3	320	4.3	0.581	26.4	LOS B	7.2	52.0	0.87	0.77	0.87	29.7
All Vehicles		2003	6.0	2003	6.0	0.801	19.2	LOS B	16.5	122.5	0.77	0.75	0.81	35.7

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											
P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
East: Matron Porter Drive (E)											
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10

North: Princes Highway (N)										
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)										
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102b [2b. Croobyar Road / Gordon Street - 2020 Existing PM Peak (Site Folder: SCENARIO 1B - 2020 EXISTING PM PEAK)]

Network: N101 [2020 EXISTING PM (Network Folder: SCENARIO 1 - 2020 EXISTING SCENARIO)]

2020 Existing PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2020 Existing Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	186	4.5	186	4.5	0.109	0.1	LOS A	0.1	0.9	0.07	0.04	0.07	48.6
6	R2	15	0.0	15	0.0	0.109	5.7	LOS A	0.1	0.9	0.07	0.04	0.07	47.1
Approach		201	4.2	201	4.2	0.109	0.5	NA	0.1	0.9	0.07	0.04	0.07	48.5
North: Gordon Street (N)														
7	L2	25	8.3	25	8.3	0.044	9.1	LOS A	0.2	1.1	0.40	0.89	0.40	36.3
9	R2	13	0.0	13	0.0	0.044	9.7	LOS A	0.2	1.1	0.40	0.89	0.40	38.8
Approach		38	5.6	38	5.6	0.044	9.3	LOS A	0.2	1.1	0.40	0.89	0.40	37.3
West: Croobyar Road (W)														
10	L2	16	6.7	16	6.7	0.161	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.0
11	T1	289	4.0	289	4.0	0.161	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.0
Approach		305	4.1	305	4.1	0.161	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.0
All Vehicles		544	4.3	544	4.3	0.161	1.0	NA	0.2	1.1	0.06	0.09	0.06	47.2

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

MOVEMENT SUMMARY

Site: 103b [3b. Princes Highway / Gordon Street - 2020 Existing PM Peak (Site Folder: SCENARIO 1B - 2020 EXISTING PM PEAK)]

Network: N101 [2020 EXISTING PM (Network Folder: SCENARIO 1 - 2020 EXISTING SCENARIO)]

2020 Existing PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2020 Existing Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	22	0.0	22	0.0	0.056	7.6	LOS A	0.2	1.4	0.64	0.74	0.64	38.8
2	T1	3	33.3	3	33.3	0.056	27.7	LOS B	0.2	1.4	0.64	0.74	0.64	37.0
3	R2	1	0.0	1	0.0	0.056	26.2	LOS B	0.2	1.4	0.64	0.74	0.64	33.5
Approach		26	4.0	26	4.0	0.056	10.8	LOS A	0.2	1.4	0.64	0.74	0.64	38.5
East: Princes Highway (E)														
4	L2	4	0.0	4	0.0	0.432	9.5	LOS A	1.3	9.8	0.20	0.06	0.26	47.7
5	T1	663	8.7	663	8.7	0.432	0.9	LOS A	1.3	9.8	0.20	0.06	0.26	48.4
6	R2	63	0.0	63	0.0	0.432	9.6	LOS A	1.3	9.8	0.20	0.06	0.26	46.9
Approach		731	7.9	731	7.9	0.432	1.7	NA	1.3	9.8	0.20	0.06	0.26	48.3
North: Gordon Street (N)														
7	L2	95	1.1	95	1.1	0.175	7.6	LOS A	0.6	4.4	0.62	0.81	0.62	29.2
8	T1	2	50.0	2	50.0	0.175	37.2	LOS C	0.6	4.4	0.62	0.81	0.62	29.2
9	R2	5	20.0	5	20.0	0.175	33.4	LOS C	0.6	4.4	0.62	0.81	0.62	36.5
Approach		102	3.1	102	3.1	0.175	9.6	LOS A	0.6	4.4	0.62	0.81	0.62	29.8
West: Princes Highway (W)														
10	L2	1	0.0	1	0.0	0.363	9.7	LOS A	0.7	5.1	0.10	0.03	0.13	47.4
11	T1	616	7.2	616	7.2	0.363	0.5	LOS A	0.7	5.1	0.10	0.03	0.13	47.6
12	R2	28	0.0	28	0.0	0.363	9.7	LOS A	0.7	5.1	0.10	0.03	0.13	47.6
Approach		645	6.9	645	6.9	0.363	0.9	NA	0.7	5.1	0.10	0.03	0.13	47.6
All Vehicles		1504	7.1	1504	7.1	0.432	2.1	NA	1.3	9.8	0.19	0.11	0.24	47.1

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

MOVEMENT SUMMARY

Site: 104b [4b. Budawang School Site Access - 2020 Existing PM Peak (Site Folder: SCENARIO 1B - 2020 EXISTING PM PEAK)]

Network: N101 [2020 EXISTING PM (Network Folder: SCENARIO 1 - 2020 EXISTING SCENARIO)]

2020 Existing PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2020 Existing Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	1	0.0	1	0.0	0.001	3.3	LOS A	0.0	0.0	0.29	0.41	0.29	21.1
Approach		1	0.0	1	0.0	0.001	3.3	LOS A	0.0	0.0	0.29	0.41	0.29	21.1
East: Croobyar Road (E)														
5	T1	206	4.1	206	4.1	0.109	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		206	4.1	206	4.1	0.109	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
West: Croobyar Road (W)														
11	T1	315	4.3	315	4.3	0.166	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		315	4.3	315	4.3	0.166	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
All Vehicles		522	4.2	522	4.2	0.166	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9

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

MOVEMENT SUMMARY

Site: 101c [1c. Princes Highway / Croobyar Road - 2023 Future Base AM Peak (Site Folder: SCENARIO 2A - 2023 FUTURE BASE AM PEAK)]

Network: N101 [2023 FUTURE BASE AM (Network Folder: SCENARIO 2 - 2023 FUTURE BASE SCENARIO)]

2023 Future Base AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	207	3.6	207	3.6	0.224	14.6	LOS B	3.9	28.0	0.58	0.71	0.58	35.9
2	T1	556	4.4	556	4.4	* 0.759	15.0	LOS B	15.3	111.1	0.76	0.73	0.82	35.5
3	R2	23	13.6	23	13.6	0.759	19.7	LOS B	15.3	111.1	0.76	0.73	0.82	38.2
Approach		786	4.4	786	4.4	0.759	15.0	LOS B	15.3	111.1	0.71	0.72	0.76	35.7
East: Matron Porter Drive (E)														
4	L2	52	0.0	52	0.0	0.149	28.6	LOS C	2.0	13.7	0.79	0.71	0.79	34.5
5	T1	93	1.1	93	1.1	0.747	27.9	LOS B	9.3	67.2	0.91	0.86	1.03	18.2
6	R2	201	5.2	201	5.2	* 0.747	34.1	LOS C	9.3	67.2	0.95	0.91	1.11	17.5
Approach		345	3.4	345	3.4	0.747	31.6	LOS C	9.3	67.2	0.92	0.87	1.04	21.5
North: Princes Highway (N)														
7	L2	115	3.7	115	3.7	0.133	13.6	LOS A	2.1	15.4	0.53	0.66	0.53	40.1
8	T1	536	7.3	536	7.3	0.618	11.4	LOS A	12.1	90.2	0.70	0.63	0.70	43.2
9	R2	9	22.2	9	22.2	0.618	16.1	LOS B	12.1	90.2	0.71	0.63	0.71	38.2
Approach		660	6.9	660	6.9	0.618	11.8	LOS A	12.1	90.2	0.67	0.64	0.67	42.7
West: Croobyar Road (W)														
10	L2	24	17.4	24	17.4	0.160	27.0	LOS B	2.1	15.5	0.78	0.65	0.78	16.4
11	T1	62	0.0	62	0.0	0.602	20.8	LOS B	7.0	50.1	0.79	0.66	0.79	28.8
12	R2	221	2.4	221	2.4	0.602	29.6	LOS C	7.0	50.1	0.92	0.82	0.93	30.1
Approach		307	3.1	307	3.1	0.602	27.6	LOS B	7.0	50.1	0.89	0.77	0.89	29.4
All Vehicles		2099	4.8	2099	4.8	0.759	18.6	LOS B	15.3	111.1	0.76	0.73	0.80	35.7

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											
P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
East: Matron Porter Drive (E)											
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10

North: Princes Highway (N)										
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)										
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102c [2c. Croobyar Road / Gordon Street - 2023 Future Base AM Peak (Site Folder: SCENARIO 2A - 2023 FUTURE BASE AM PEAK)]

Network: N101 [2023 FUTURE BASE AM (Network Folder: SCENARIO 2 - 2023 FUTURE BASE SCENARIO)]

2023 Future Base AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	289	3.6	289	3.6	0.161	0.1	LOS A	0.1	0.7	0.04	0.02	0.04	49.2
6	R2	12	0.0	12	0.0	0.161	5.8	LOS A	0.1	0.7	0.04	0.02	0.04	48.4
Approach		301	3.5	301	3.5	0.161	0.3	NA	0.1	0.7	0.04	0.02	0.04	49.2
North: Gordon Street (N)														
7	L2	15	7.1	15	7.1	0.041	9.0	LOS A	0.1	1.0	0.43	0.91	0.43	35.5
9	R2	15	7.1	15	7.1	0.041	11.1	LOS A	0.1	1.0	0.43	0.91	0.43	38.0
Approach		29	7.1	29	7.1	0.041	10.1	LOS A	0.1	1.0	0.43	0.91	0.43	37.0
West: Croobyar Road (W)														
10	L2	19	5.6	19	5.6	0.163	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.9
11	T1	292	2.9	292	2.9	0.163	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	48.9
Approach		311	3.1	311	3.1	0.163	0.3	NA	0.0	0.0	0.00	0.03	0.00	48.9
All Vehicles		641	3.4	641	3.4	0.163	0.7	NA	0.1	1.0	0.04	0.07	0.04	48.0

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

MOVEMENT SUMMARY

Site: 103c [3c. Princes Highway / Gordon Street - 2023 Future Base AM Peak (Site Folder: SCENARIO 2A - 2023 FUTURE BASE AM PEAK)]

Network: N101 [2023 FUTURE BASE AM (Network Folder: SCENARIO 2 - 2023 FUTURE BASE SCENARIO)]

2023 Future Base AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	28	0.0	28	0.0	0.049	8.1	LOS A	0.2	1.2	0.60	0.74	0.60	40.2
2	T1	1	0.0	1	0.0	0.049	19.5	LOS B	0.2	1.2	0.60	0.74	0.60	39.0
3	R2	1	0.0	1	0.0	0.049	26.0	LOS B	0.2	1.2	0.60	0.74	0.60	35.4
Approach		31	0.0	31	0.0	0.049	9.1	LOS A	0.2	1.2	0.60	0.74	0.60	40.0
East: Princes Highway (E)														
4	L2	3	0.0	3	0.0	0.438	9.9	LOS A	1.0	7.1	0.14	0.04	0.18	48.4
5	T1	729	5.2	729	5.2	0.438	0.7	LOS A	1.0	7.1	0.14	0.04	0.18	48.9
6	R2	42	2.5	42	2.5	0.438	10.1	LOS A	1.0	7.1	0.14	0.04	0.18	47.4
Approach		775	5.0	775	5.0	0.438	1.2	NA	1.0	7.1	0.14	0.04	0.18	48.8
North: Gordon Street (N)														
7	L2	41	0.0	41	0.0	0.117	7.4	LOS A	0.4	2.7	0.65	0.80	0.65	27.2
8	T1	3	0.0	3	0.0	0.117	19.8	LOS B	0.4	2.7	0.65	0.80	0.65	27.2
9	R2	8	0.0	8	0.0	0.117	26.4	LOS B	0.4	2.7	0.65	0.80	0.65	35.6
Approach		53	0.0	53	0.0	0.117	11.2	LOS A	0.4	2.7	0.65	0.80	0.65	29.3
West: Princes Highway (W)														
10	L2	15	0.0	15	0.0	0.374	10.1	LOS A	0.9	7.1	0.13	0.04	0.18	46.8
11	T1	611	7.4	611	7.4	0.374	0.7	LOS A	0.9	7.1	0.13	0.04	0.18	46.6
12	R2	28	7.4	28	7.4	0.374	11.1	LOS A	0.9	7.1	0.13	0.04	0.18	46.6
Approach		654	7.2	654	7.2	0.374	1.4	NA	0.9	7.1	0.13	0.04	0.18	46.6
All Vehicles		1512	5.7	1512	5.7	0.438	1.8	NA	1.0	7.1	0.16	0.08	0.20	47.6

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

MOVEMENT SUMMARY

Site: 104c [4c. Budawang School Site Access - 2023 Future Base AM Peak (Site Folder: SCENARIO 2A - 2023 FUTURE BASE AM PEAK)]

Network: N101 [2023 FUTURE BASE AM (Network Folder: SCENARIO 2 - 2023 FUTURE BASE SCENARIO)]

2023 Future Base AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	1	0.0	1	0.0	0.001	3.7	LOS A	0.0	0.0	0.36	0.42	0.36	20.4
Approach		1	0.0	1	0.0	0.001	3.7	LOS A	0.0	0.0	0.36	0.42	0.36	20.4
East: Croobyar Road (E)														
5	T1	309	3.4	309	3.4	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		309	3.4	309	3.4	0.162	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
West: Croobyar Road (W)														
11	T1	306	3.1	306	3.1	0.160	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		306	3.1	306	3.1	0.160	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
All Vehicles		617	3.2	617	3.2	0.162	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9

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

MOVEMENT SUMMARY

Site: 101d [1d. Princes Highway / Croobyar Road - 2023 Future Base PM Peak (Site Folder: SCENARIO 2B - 2023 FUTURE BASE PM PEAK)]

Network: N101 [2023 FUTURE BASE PM (Network Folder: SCENARIO 2 - 2023 FUTURE BASE SCENARIO)]

2023 Future Base PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	178	3.0	178	3.0	0.248	14.8	LOS B	4.4	31.5	0.59	0.67	0.59	36.5
2	T1	597	7.6	597	7.6	* 0.873	26.5	LOS B	21.0	155.8	0.82	0.95	1.08	29.0
3	R2	35	0.0	35	0.0	0.873	32.4	LOS C	21.0	155.8	0.84	0.97	1.13	32.8
Approach		809	6.2	809	6.2	0.873	24.2	LOS B	21.0	155.8	0.77	0.89	0.98	30.6
East: Matron Porter Drive (E)														
4	L2	38	0.0	38	0.0	0.091	27.7	LOS B	1.2	8.3	0.76	0.70	0.76	34.9
5	T1	55	1.9	55	1.9	0.454	23.6	LOS B	5.2	38.3	0.85	0.77	0.85	20.1
6	R2	134	7.1	134	7.1	0.454	28.5	LOS B	5.2	38.3	0.87	0.78	0.87	19.9
Approach		226	4.7	226	4.7	0.454	27.2	LOS B	5.2	38.3	0.85	0.77	0.85	24.0
North: Princes Highway (N)														
7	L2	157	3.4	157	3.4	0.174	15.0	LOS B	2.9	21.1	0.58	0.70	0.58	39.2
8	T1	587	6.5	587	6.5	0.780	17.5	LOS B	17.4	128.9	0.81	0.80	0.90	40.3
9	R2	18	11.8	18	11.8	0.780	22.2	LOS B	17.4	128.9	0.81	0.80	0.90	33.9
Approach		762	5.9	762	5.9	0.780	17.1	LOS B	17.4	128.9	0.77	0.78	0.83	40.0
West: Croobyar Road (W)														
10	L2	24	13.0	24	13.0	0.176	26.1	LOS B	2.4	17.9	0.78	0.64	0.78	16.8
11	T1	95	4.4	95	4.4	0.663	21.3	LOS B	8.6	61.7	0.82	0.70	0.83	28.1
12	R2	244	2.6	244	2.6	* 0.663	30.0	LOS C	8.6	61.7	0.94	0.85	0.99	30.0
Approach		363	3.8	363	3.8	0.663	27.5	LOS B	8.6	61.7	0.89	0.80	0.93	29.3
All Vehicles		2161	5.6	2161	5.6	0.873	22.6	LOS B	21.0	155.8	0.80	0.82	0.90	34.0

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											
P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
East: Matron Porter Drive (E)											
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10

North: Princes Highway (N)										
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)										
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102d [2d. Croobyar Road / Gordon Street - 2023 Future Base PM Peak (Site Folder: SCENARIO 2B - 2023 FUTURE BASE PM PEAK)]

Network: N101 [2023 FUTURE BASE PM (Network Folder: SCENARIO 2 - 2023 FUTURE BASE SCENARIO)]

2023 Future Base PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	231	3.7	231	3.7	0.133	0.1	LOS A	0.1	1.0	0.07	0.03	0.07	48.8
6	R2	15	0.0	15	0.0	0.133	6.0	LOS A	0.1	1.0	0.07	0.03	0.07	47.5
Approach		245	3.4	245	3.4	0.133	0.5	NA	0.1	1.0	0.07	0.03	0.07	48.7
North: Gordon Street (N)														
7	L2	25	8.3	25	8.3	0.047	9.4	LOS A	0.2	1.2	0.44	0.90	0.44	35.8
9	R2	13	0.0	13	0.0	0.047	10.5	LOS A	0.2	1.2	0.44	0.90	0.44	38.5
Approach		38	5.6	38	5.6	0.047	9.7	LOS A	0.2	1.2	0.44	0.90	0.44	37.0
West: Croobyar Road (W)														
10	L2	16	6.7	16	6.7	0.183	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.1
11	T1	333	3.5	333	3.5	0.183	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.1
Approach		348	3.6	348	3.6	0.183	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.1
All Vehicles		632	3.7	632	3.7	0.183	0.9	NA	0.2	1.2	0.05	0.08	0.05	47.5

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

MOVEMENT SUMMARY

Site: 103d [3d. Princes Highway / Gordon Street - 2023 Future Base PM Peak (Site Folder: SCENARIO 2B - 2023 FUTURE BASE PM PEAK)]

Network: N101 [2023 FUTURE BASE PM (Network Folder: SCENARIO 2 - 2023 FUTURE BASE SCENARIO)]

2023 Future Base PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	22	0.0	22	0.0	0.061	7.8	LOS A	0.2	1.5	0.65	0.75	0.65	38.3
2	T1	3	33.3	3	33.3	0.061	31.3	LOS C	0.2	1.5	0.65	0.75	0.65	36.5
3	R2	1	0.0	1	0.0	0.061	29.0	LOS C	0.2	1.5	0.65	0.75	0.65	32.8
Approach		26	4.0	26	4.0	0.061	11.5	LOS A	0.2	1.5	0.65	0.75	0.65	38.0
East: Princes Highway (E)														
4	L2	4	0.0	4	0.0	0.448	10.3	LOS A	1.5	10.9	0.21	0.06	0.29	47.5
5	T1	685	8.4	685	8.4	0.448	1.1	LOS A	1.5	10.9	0.21	0.06	0.29	48.3
6	R2	63	0.0	63	0.0	0.448	10.5	LOS A	1.5	10.9	0.21	0.06	0.29	46.7
Approach		753	7.7	753	7.7	0.448	1.9	NA	1.5	10.9	0.21	0.06	0.29	48.1
North: Gordon Street (N)														
7	L2	95	1.1	95	1.1	0.191	8.0	LOS A	0.7	4.7	0.65	0.83	0.65	28.3
8	T1	2	50.0	2	50.0	0.191	42.5	LOS C	0.7	4.7	0.65	0.83	0.65	28.3
9	R2	5	20.0	5	20.0	0.191	37.5	LOS C	0.7	4.7	0.65	0.83	0.65	36.0
Approach		102	3.1	102	3.1	0.191	10.3	LOS A	0.7	4.7	0.65	0.83	0.65	29.0
West: Princes Highway (W)														
10	L2	1	0.0	1	0.0	0.389	10.2	LOS A	0.8	5.6	0.10	0.03	0.14	47.4
11	T1	664	6.7	664	6.7	0.389	0.5	LOS A	0.8	5.6	0.10	0.03	0.14	47.5
12	R2	28	0.0	28	0.0	0.389	10.2	LOS A	0.8	5.6	0.10	0.03	0.14	47.5
Approach		694	6.4	694	6.4	0.389	1.0	NA	0.8	5.6	0.10	0.03	0.14	47.5
All Vehicles		1575	6.8	1575	6.8	0.448	2.2	NA	1.5	10.9	0.20	0.11	0.25	47.0

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

MOVEMENT SUMMARY

Site: 104d [4d. Budawang School Site Access - 2023 Future Base PM Peak (Site Folder: SCENARIO 2B - 2023 FUTURE BASE PM PEAK)]

Network: N101 [2023 FUTURE BASE PM (Network Folder: SCENARIO 2 - 2023 FUTURE BASE SCENARIO)]

2023 Future Base PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	1	0.0	1	0.0	0.001	3.5	LOS A	0.0	0.0	0.32	0.42	0.32	20.8
Approach		1	0.0	1	0.0	0.001	3.5	LOS A	0.0	0.0	0.32	0.42	0.32	20.8
East: Croobyar Road (E)														
5	T1	251	3.4	251	3.4	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		251	3.4	251	3.4	0.131	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
West: Croobyar Road (W)														
11	T1	358	3.8	358	3.8	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
Approach		358	3.8	358	3.8	0.188	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
All Vehicles		609	3.6	609	3.6	0.188	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9

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

MOVEMENT SUMMARY

Site: 101e [1e. Princes Highway / Croobyar Road - 2023 Future Base + Development AM Peak (Site Folder: SCENARIO 3A - 2023 FUTURE BASE + DEVELOPMENT AM PEAK)]

Network: N101 [2023 FUTURE BASE + DEVELOPMENT AM (Network Folder: SCENARIO 3 - 2023 FUTURE BASE + DEVELOPMENT SCENARIO)]

2023 Future Base + Development AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + Development Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	259	2.8	259	2.8	0.278	15.0	LOS B	5.0	36.0	0.60	0.72	0.60	35.7
2	T1	556	4.4	556	4.4	* 0.792	16.9	LOS B	16.1	117.5	0.76	0.77	0.87	34.2
3	R2	23	13.6	23	13.6	0.792	21.6	LOS B	16.1	117.5	0.76	0.77	0.87	37.1
Approach		838	4.1	838	4.1	0.792	16.5	LOS B	16.1	117.5	0.71	0.75	0.79	34.8
East: Matron Porter Drive (E)														
4	L2	52	0.0	52	0.0	0.161	28.8	LOS C	2.1	15.0	0.80	0.71	0.80	34.6
5	T1	115	0.9	115	0.9	0.806	30.2	LOS C	10.5	75.8	0.92	0.91	1.12	17.4
6	R2	201	5.2	201	5.2	* 0.806	37.3	LOS C	10.5	75.8	0.97	0.97	1.23	16.4
Approach		367	3.2	367	3.2	0.806	33.9	LOS C	10.5	75.8	0.93	0.92	1.13	20.4
North: Princes Highway (N)														
7	L2	115	3.7	115	3.7	0.136	13.6	LOS A	2.2	15.9	0.54	0.66	0.54	40.2
8	T1	536	7.3	536	7.3	0.632	12.0	LOS A	12.4	92.7	0.72	0.65	0.72	42.9
9	R2	13	16.7	13	16.7	0.632	16.8	LOS B	12.4	92.7	0.72	0.65	0.72	37.7
Approach		663	6.8	663	6.8	0.632	12.4	LOS A	12.4	92.7	0.69	0.65	0.69	42.4
West: Croobyar Road (W)														
10	L2	28	14.8	28	14.8	0.188	27.2	LOS B	2.5	18.4	0.79	0.66	0.79	16.2
11	T1	72	0.0	72	0.0	0.707	21.0	LOS B	8.7	62.3	0.80	0.67	0.80	28.7
12	R2	256	2.1	256	2.1	0.707	32.2	LOS C	8.7	62.3	0.96	0.88	1.06	29.1
Approach		356	2.7	356	2.7	0.707	29.6	LOS C	8.7	62.3	0.91	0.82	0.99	28.5
All Vehicles		2224	4.5	2224	4.5	0.806	20.2	LOS B	16.1	117.5	0.77	0.76	0.85	34.7

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											
P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10

East: Matron Porter Drive (E)										
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
North: Princes Highway (N)										
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)										
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102e [2e. Croobyar Road / Gordon Street - 2023 Future Base + Development AM Peak (Site Folder: SCENARIO 3A - 2023 FUTURE BASE + DEVELOPMENT AM PEAK)]

Network: N101 [2023 FUTURE BASE + DEVELOPMENT AM (Network Folder: SCENARIO 3 - 2023 FUTURE BASE + DEVELOPMENT SCENARIO)]

2023 Future Base + Development AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + Development Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	296	3.6	296	3.6	0.169	0.1	LOS A	0.2	1.2	0.06	0.03	0.06	48.9
6	R2	18	0.0	18	0.0	0.169	5.9	LOS A	0.2	1.2	0.06	0.03	0.06	47.7
Approach		314	3.4	314	3.4	0.169	0.4	NA	0.2	1.2	0.06	0.03	0.06	48.8
North: Gordon Street (N)														
7	L2	25	4.2	25	4.2	0.051	8.9	LOS A	0.2	1.3	0.43	0.90	0.43	35.7
9	R2	15	7.1	15	7.1	0.051	11.4	LOS A	0.2	1.3	0.43	0.90	0.43	38.2
Approach		40	5.3	40	5.3	0.051	9.8	LOS A	0.2	1.3	0.43	0.90	0.43	36.8
West: Croobyar Road (W)														
10	L2	19	5.6	19	5.6	0.168	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.9
11	T1	301	2.8	301	2.8	0.168	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	48.9
Approach		320	3.0	320	3.0	0.168	0.3	NA	0.0	0.0	0.00	0.03	0.00	48.9
All Vehicles		674	3.3	674	3.3	0.169	0.9	NA	0.2	1.3	0.05	0.08	0.05	47.5

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

MOVEMENT SUMMARY

Site: 103e [3e. Princes Highway / Gordon Street - 2023 Future Base + Development AM Peak (Site Folder: SCENARIO 3A - 2023 FUTURE BASE + DEVELOPMENT AM PEAK)]

Network: N101 [2023 FUTURE BASE + DEVELOPMENT AM (Network Folder: SCENARIO 3 - 2023 FUTURE BASE + DEVELOPMENT SCENARIO)]

2023 Future Base + Development AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + Development Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	35	0.0	35	0.0	0.058	8.1	LOS A	0.2	1.5	0.60	0.74	0.60	40.3
2	T1	1	0.0	1	0.0	0.058	19.9	LOS B	0.2	1.5	0.60	0.74	0.60	39.1
3	R2	1	0.0	1	0.0	0.058	26.5	LOS B	0.2	1.5	0.60	0.74	0.60	35.5
Approach		37	0.0	37	0.0	0.058	9.0	LOS A	0.2	1.5	0.60	0.74	0.60	40.1
East: Princes Highway (E)														
4	L2	3	0.0	3	0.0	0.438	9.9	LOS A	1.0	7.1	0.14	0.04	0.18	48.4
5	T1	729	5.2	729	5.2	0.438	0.7	LOS A	1.0	7.1	0.14	0.04	0.18	48.9
6	R2	42	2.5	42	2.5	0.438	10.1	LOS A	1.0	7.1	0.14	0.04	0.18	47.4
Approach		775	5.0	775	5.0	0.438	1.2	NA	1.0	7.1	0.14	0.04	0.18	48.8
North: Gordon Street (N)														
7	L2	41	0.0	41	0.0	0.118	7.4	LOS A	0.4	2.7	0.66	0.80	0.66	27.0
8	T1	3	0.0	3	0.0	0.118	20.1	LOS B	0.4	2.7	0.66	0.80	0.66	27.0
9	R2	8	0.0	8	0.0	0.118	27.0	LOS B	0.4	2.7	0.66	0.80	0.66	35.5
Approach		53	0.0	53	0.0	0.118	11.3	LOS A	0.4	2.7	0.66	0.80	0.66	29.2
West: Princes Highway (W)														
10	L2	15	0.0	15	0.0	0.387	10.3	LOS A	1.2	9.3	0.17	0.05	0.23	46.3
11	T1	611	7.4	611	7.4	0.387	0.9	LOS A	1.2	9.3	0.17	0.05	0.23	45.7
12	R2	39	5.4	39	5.4	0.387	11.0	LOS A	1.2	9.3	0.17	0.05	0.23	45.7
Approach		664	7.1	664	7.1	0.387	1.7	NA	1.2	9.3	0.17	0.05	0.23	45.7
All Vehicles		1528	5.6	1528	5.6	0.438	2.0	NA	1.2	9.3	0.18	0.09	0.23	47.4

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

MOVEMENT SUMMARY

Site: 104e [4e. Budawang School Site Access - 2023 Future Base + Development AM Peak (Site Folder: SCENARIO 3A - 2023 FUTURE BASE + DEVELOPMENT AM PEAK)]

Network: N101 [2023 FUTURE BASE + DEVELOPMENT AM (Network Folder: SCENARIO 3 - 2023 FUTURE BASE + DEVELOPMENT SCENARIO)]

2023 Future Base + Development AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + Development Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	14	0.0	14	0.0	0.082	3.8	LOS A	0.3	2.0	0.45	0.64	0.45	16.3
3	R2	49	0.0	49	0.0	0.082	5.9	LOS A	0.3	2.0	0.45	0.64	0.45	16.3
Approach		63	0.0	63	0.0	0.082	5.4	LOS A	0.3	2.0	0.45	0.64	0.45	16.3
East: Croobyar Road (E)														
4	L2	78	0.0	78	0.0	0.204	3.4	LOS A	0.0	0.0	0.00	0.09	0.00	35.9
5	T1	309	3.4	309	3.4	0.204	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	37.8
Approach		387	2.7	387	2.7	0.204	0.7	NA	0.0	0.0	0.00	0.09	0.00	37.4
West: Croobyar Road (W)														
11	T1	306	3.1	306	3.1	0.177	0.2	LOS A	0.2	1.7	0.08	0.03	0.08	38.4
12	R2	21	0.0	21	0.0	0.177	5.2	LOS A	0.2	1.7	0.08	0.03	0.08	35.8
Approach		327	2.9	327	2.9	0.177	0.5	NA	0.2	1.7	0.08	0.03	0.08	38.2
All Vehicles		778	2.6	778	2.6	0.204	1.0	NA	0.3	2.0	0.07	0.11	0.07	36.6

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

MOVEMENT SUMMARY

Site: 101f [1f. Princes Highway / Croobyar Road - 2023 Future Base + Development PM Peak (Site Folder: SCENARIO 3B - 2023 FUTURE BASE + DEVELOPMENT PM PEAK)]

Network: N101 [2023 FUTURE BASE + DEVELOPMENT PM (Network Folder: SCENARIO 3 - 2023 FUTURE BASE + DEVELOPMENT SCENARIO)]

2023 Future Base + Development PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + Development Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	214	2.5	214	2.5	0.264	14.9	LOS B	4.7	33.4	0.60	0.69	0.60	36.1
2	T1	597	7.6	597	7.6	* 0.930	39.2	LOS C	26.4	195.9	0.85	1.13	1.32	24.2
3	R2	35	0.0	35	0.0	0.930	45.2	LOS D	26.4	195.9	0.86	1.16	1.36	28.3
Approach		845	6.0	845	6.0	0.930	33.3	LOS C	26.4	195.9	0.79	1.02	1.14	26.6
East: Matron Porter Drive (E)														
4	L2	38	0.0	38	0.0	0.098	28.0	LOS B	1.3	9.1	0.77	0.70	0.77	35.0
5	T1	64	1.6	64	1.6	0.489	24.3	LOS B	5.5	40.3	0.86	0.77	0.86	19.8
6	R2	134	7.1	134	7.1	0.489	29.5	LOS C	5.5	40.3	0.89	0.79	0.89	19.5
Approach		236	4.5	236	4.5	0.489	27.8	LOS B	5.5	40.3	0.86	0.77	0.86	23.5
North: Princes Highway (N)														
7	L2	157	3.4	157	3.4	0.174	15.0	LOS B	2.9	21.1	0.58	0.70	0.58	39.2
8	T1	587	6.5	587	6.5	0.807	20.0	LOS B	18.8	138.8	0.84	0.85	0.97	39.2
9	R2	21	10.0	21	10.0	0.807	24.7	LOS B	18.8	138.8	0.84	0.85	0.97	32.4
Approach		765	5.9	765	5.9	0.807	19.1	LOS B	18.8	138.8	0.78	0.82	0.89	39.1
West: Croobyar Road (W)														
10	L2	29	10.7	29	10.7	0.214	26.4	LOS B	3.0	22.0	0.79	0.66	0.79	16.6
11	T1	115	3.7	115	3.7	0.807	23.0	LOS B	12.1	86.0	0.84	0.73	0.89	27.2
12	R2	296	2.1	296	2.1	* 0.807	36.1	LOS C	12.1	86.0	0.99	0.97	1.23	27.9
Approach		440	3.1	440	3.1	0.807	32.0	LOS C	12.1	86.0	0.93	0.89	1.11	27.4
All Vehicles		2286	5.2	2286	5.2	0.930	27.8	LOS B	26.4	195.9	0.82	0.90	1.02	31.5

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											
P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10

East: Matron Porter Drive (E)										
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
North: Princes Highway (N)										
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)										
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102f [2f. Croobyar Road / Gordon Street - 2023 Future Base + Development PM Peak (Site Folder: SCENARIO 3B - 2023 FUTURE BASE + DEVELOPMENT PM PEAK)]

Network: N101 [2023 FUTURE BASE + DEVELOPMENT PM (Network Folder: SCENARIO 3 - 2023 FUTURE BASE + DEVELOPMENT SCENARIO)]

2023 Future Base + Development PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + Development Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	240	3.5	240	3.5	0.146	0.2	LOS A	0.2	1.6	0.11	0.06	0.11	48.1
6	R2	25	0.0	25	0.0	0.146	6.0	LOS A	0.2	1.6	0.11	0.06	0.11	46.2
Approach		265	3.2	265	3.2	0.146	0.8	NA	0.2	1.6	0.11	0.06	0.11	48.0
North: Gordon Street (N)														
7	L2	32	6.7	32	6.7	0.054	9.3	LOS A	0.2	1.4	0.44	0.90	0.44	35.8
9	R2	13	0.0	13	0.0	0.054	10.7	LOS A	0.2	1.4	0.44	0.90	0.44	38.5
Approach		44	4.8	44	4.8	0.054	9.7	LOS A	0.2	1.4	0.44	0.90	0.44	36.8
West: Croobyar Road (W)														
10	L2	16	6.7	16	6.7	0.187	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
11	T1	339	3.4	339	3.4	0.187	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
Approach		355	3.6	355	3.6	0.187	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.2
All Vehicles		664	3.5	664	3.5	0.187	1.1	NA	0.2	1.6	0.07	0.10	0.07	47.0

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

MOVEMENT SUMMARY

Site: 103f [3f. Princes Highway / Gordon Street - 2023 Future Base + Development PM Peak (Site Folder: SCENARIO 3B - 2023 FUTURE BASE + DEVELOPMENT PM PEAK)]

Network: N101 [2023 FUTURE BASE + DEVELOPMENT PM (Network Folder: SCENARIO 3 - 2023 FUTURE BASE + DEVELOPMENT SCENARIO)]

2023 Future Base + Development PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + Development Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	33	0.0	33	0.0	0.073	7.8	LOS A	0.3	1.8	0.64	0.75	0.64	39.0
2	T1	3	33.3	3	33.3	0.073	31.7	LOS C	0.3	1.8	0.64	0.75	0.64	37.2
3	R2	1	0.0	1	0.0	0.073	29.3	LOS C	0.3	1.8	0.64	0.75	0.64	33.8
Approach		37	2.9	37	2.9	0.073	10.5	LOS A	0.3	1.8	0.64	0.75	0.64	38.8
East: Princes Highway (E)														
4	L2	4	0.0	4	0.0	0.448	10.3	LOS A	1.5	10.8	0.21	0.06	0.29	47.5
5	T1	685	8.4	685	8.4	0.448	1.1	LOS A	1.5	10.8	0.21	0.06	0.29	48.3
6	R2	63	0.0	63	0.0	0.448	10.4	LOS A	1.5	10.8	0.21	0.06	0.29	46.7
Approach		753	7.7	753	7.7	0.448	1.9	NA	1.5	10.8	0.21	0.06	0.29	48.2
North: Gordon Street (N)														
7	L2	95	1.1	95	1.1	0.192	8.0	LOS A	0.7	4.7	0.65	0.83	0.65	28.3
8	T1	2	50.0	2	50.0	0.192	42.4	LOS C	0.7	4.7	0.65	0.83	0.65	28.3
9	R2	5	20.0	5	20.0	0.192	37.9	LOS C	0.7	4.7	0.65	0.83	0.65	35.9
Approach		102	3.1	102	3.1	0.192	10.3	LOS A	0.7	4.7	0.65	0.83	0.65	29.0
West: Princes Highway (W)														
10	L2	1	0.0	1	0.0	0.396	10.2	LOS A	0.9	7.0	0.12	0.03	0.17	47.1
11	T1	664	6.7	664	6.7	0.396	0.7	LOS A	0.9	7.0	0.12	0.03	0.17	47.0
12	R2	35	0.0	35	0.0	0.396	10.3	LOS A	0.9	7.0	0.12	0.03	0.17	47.0
Approach		700	6.3	700	6.3	0.396	1.2	NA	0.9	7.0	0.12	0.03	0.17	47.0
All Vehicles		1592	6.7	1592	6.7	0.448	2.3	NA	1.5	10.8	0.21	0.11	0.27	46.8

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

MOVEMENT SUMMARY

Site: 104f [4f. Budawang School Site Access - 2023 Future Base + Development PM Peak (Site Folder: SCENARIO 3B - 2023 FUTURE BASE + DEVELOPMENT PM PEAK)]

Network: N101 [2023 FUTURE BASE + DEVELOPMENT PM (Network Folder: SCENARIO 3 - 2023 FUTURE BASE + DEVELOPMENT SCENARIO)]

2023 Future Base + Development PM Peak
Roundabout Option
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + Development Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	21	0.0	21	0.0	0.127	3.6	LOS A	0.4	3.1	0.44	0.65	0.44	16.3
3	R2	78	0.0	78	0.0	0.127	5.9	LOS A	0.4	3.1	0.44	0.65	0.44	16.3
Approach		99	0.0	99	0.0	0.127	5.4	LOS A	0.4	3.1	0.44	0.65	0.44	16.3
East: Croobyar Road (E)														
4	L2	49	0.0	49	0.0	0.158	3.4	LOS A	0.0	0.0	0.00	0.08	0.00	36.1
5	T1	251	3.4	251	3.4	0.158	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	38.2
Approach		300	2.8	300	2.8	0.158	0.6	NA	0.0	0.0	0.00	0.08	0.00	37.8
West: Croobyar Road (W)														
11	T1	358	3.8	358	3.8	0.198	0.1	LOS A	0.1	1.1	0.04	0.02	0.04	39.1
12	R2	14	0.0	14	0.0	0.198	4.8	LOS A	0.1	1.1	0.04	0.02	0.04	36.3
Approach		372	3.7	372	3.7	0.198	0.3	NA	0.1	1.1	0.04	0.02	0.04	39.0
All Vehicles		771	2.9	771	2.9	0.198	1.0	NA	0.4	3.1	0.08	0.12	0.08	36.5

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

MOVEMENT SUMMARY

Site: 101g [1g. Princes Highway / Croobyar Road - 2023 Future Base + 2030 Background Growth AM Peak (Site Folder: SCENARIO 4A - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH AM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH AM (Network Folder: SCENARIO 4 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH SCENARIO)]

2023 Future Base + 2030 Background Growth AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + 2030 Background Growth Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	207	3.6	207	3.6	0.245	14.2	LOS A	4.2	30.7	0.58	0.69	0.58	36.5
2	T1	624	4.4	624	4.4	* 0.863	24.3	LOS B	21.4	156.2	0.80	0.91	1.04	30.1
3	R2	26	12.0	26	12.0	0.863	29.4	LOS C	21.4	156.2	0.81	0.92	1.06	33.5
Approach		858	4.4	858	4.4	0.863	22.0	LOS B	21.4	156.2	0.75	0.86	0.93	31.6
East: Matron Porter Drive (E)														
4	L2	59	0.0	59	0.0	0.168	29.1	LOS C	2.2	15.5	0.80	0.72	0.80	34.5
5	T1	93	1.1	93	1.1	0.838	31.9	LOS C	11.4	82.4	0.93	0.93	1.17	16.6
6	R2	228	5.1	228	5.1	* 0.838	39.7	LOS C	11.4	82.4	0.97	1.01	1.31	15.6
Approach		380	3.3	380	3.3	0.838	36.2	LOS C	11.4	82.4	0.94	0.95	1.20	19.8
North: Princes Highway (N)														
7	L2	131	4.0	131	4.0	0.154	13.7	LOS A	2.5	18.2	0.54	0.67	0.54	40.1
8	T1	607	7.3	607	7.3	0.718	13.1	LOS A	15.0	111.7	0.76	0.69	0.77	42.4
9	R2	9	22.2	9	22.2	0.718	17.9	LOS B	15.0	111.7	0.76	0.69	0.78	36.9
Approach		747	6.9	747	6.9	0.718	13.3	LOS A	15.0	111.7	0.72	0.69	0.73	42.0
West: Croobyar Road (W)														
10	L2	24	17.4	24	17.4	0.162	27.4	LOS B	2.2	15.7	0.78	0.65	0.78	16.4
11	T1	62	0.0	62	0.0	0.610	20.8	LOS B	7.0	50.2	0.79	0.66	0.79	28.8
12	R2	221	2.4	221	2.4	0.610	29.8	LOS C	7.0	50.2	0.92	0.82	0.94	30.0
Approach		307	3.1	307	3.1	0.610	27.8	LOS B	7.0	50.2	0.89	0.78	0.90	29.3
All Vehicles		2293	4.9	2293	4.9	0.863	22.3	LOS B	21.4	156.2	0.79	0.81	0.90	33.8

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											

P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
East: Matron Porter Drive (E)											
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
North: Princes Highway (N)											
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)											
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102g [2g. Croobyar Road / Gordon Street - 2023 Future Base + 2030 Background Growth AM Peak (Site Folder: SCENARIO 4A - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH AM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH AM (Network Folder: SCENARIO 4 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH SCENARIO)]

2023 Future Base + 2030 Background Growth AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + 2030 Background Growth Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	289	3.6	289	3.6	0.161	0.1	LOS A	0.1	0.7	0.04	0.02	0.04	49.2
6	R2	12	0.0	12	0.0	0.161	5.8	LOS A	0.1	0.7	0.04	0.02	0.04	48.4
Approach		301	3.5	301	3.5	0.161	0.3	NA	0.1	0.7	0.04	0.02	0.04	49.2
North: Gordon Street (N)														
7	L2	15	7.1	15	7.1	0.041	9.0	LOS A	0.1	1.0	0.43	0.91	0.43	35.5
9	R2	15	7.1	15	7.1	0.041	11.1	LOS A	0.1	1.0	0.43	0.91	0.43	38.0
Approach		29	7.1	29	7.1	0.041	10.1	LOS A	0.1	1.0	0.43	0.91	0.43	37.0
West: Croobyar Road (W)														
10	L2	19	5.6	19	5.6	0.163	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.9
11	T1	292	2.9	292	2.9	0.163	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	48.9
Approach		311	3.1	311	3.1	0.163	0.3	NA	0.0	0.0	0.00	0.03	0.00	48.9
All Vehicles		641	3.4	641	3.4	0.163	0.7	NA	0.1	1.0	0.04	0.07	0.04	48.0

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

MOVEMENT SUMMARY

Site: 103g [3g. Princes Highway / Gordon Street - 2023 Future Base + 2030 Background Growth AM Peak (Site Folder: SCENARIO 4A - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH AM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH AM (Network Folder: SCENARIO 4 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH SCENARIO)]

2023 Future Base + 2030 Background Growth AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + 2030 Background Growth Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	28	0.0	28	0.0	0.059	8.9	LOS A	0.2	1.5	0.65	0.79	0.65	39.1
2	T1	1	0.0	1	0.0	0.059	26.5	LOS B	0.2	1.5	0.65	0.79	0.65	37.8
3	R2	1	0.0	1	0.0	0.059	34.9	LOS C	0.2	1.5	0.65	0.79	0.65	33.9
Approach		31	0.0	31	0.0	0.059	10.4	LOS A	0.2	1.5	0.65	0.79	0.65	38.9
East: Princes Highway (E)														
4	L2	3	0.0	3	0.0	0.494	11.9	LOS A	1.3	9.2	0.16	0.03	0.22	48.1
5	T1	822	5.2	822	5.2	0.494	0.9	LOS A	1.3	9.2	0.16	0.03	0.22	48.7
6	R2	42	2.5	42	2.5	0.494	12.1	LOS A	1.3	9.2	0.16	0.03	0.22	47.1
Approach		867	5.1	867	5.1	0.494	1.5	NA	1.3	9.2	0.16	0.03	0.22	48.6
North: Gordon Street (N)														
7	L2	41	0.0	41	0.0	0.150	8.1	LOS A	0.5	3.3	0.73	0.87	0.73	24.7
8	T1	3	0.0	3	0.0	0.150	27.1	LOS B	0.5	3.3	0.73	0.87	0.73	24.7
9	R2	8	0.0	8	0.0	0.150	35.5	LOS C	0.5	3.3	0.73	0.87	0.73	33.8
Approach		53	0.0	53	0.0	0.150	13.6	LOS A	0.5	3.3	0.73	0.87	0.73	26.9
West: Princes Highway (W)														
10	L2	15	0.0	15	0.0	0.424	12.2	LOS A	1.3	9.3	0.15	0.03	0.21	46.4
11	T1	693	7.4	693	7.4	0.424	0.9	LOS A	1.3	9.3	0.15	0.03	0.21	45.9
12	R2	28	7.4	28	7.4	0.424	13.4	LOS A	1.3	9.3	0.15	0.03	0.21	45.9
Approach		736	7.3	736	7.3	0.424	1.7	NA	1.3	9.3	0.15	0.03	0.21	46.0
All Vehicles		1686	5.8	1686	5.8	0.494	2.1	NA	1.3	9.3	0.18	0.07	0.24	47.3

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

MOVEMENT SUMMARY

Site: 104g [4g. Budawang School Site Access - 2023 Future Base + 2030 Background Growth AM Peak (Site Folder: SCENARIO 4A - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH AM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH AM (Network Folder: SCENARIO 4 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH SCENARIO)]

2023 Future Base + 2030 Background Growth AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + 2030 Background Growth Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	1	0.0	1	0.0	0.001	3.7	LOS A	0.0	0.0	0.36	0.42	0.36	20.4
Approach		1	0.0	1	0.0	0.001	3.7	LOS A	0.0	0.0	0.36	0.42	0.36	20.4
East: Croobyar Road (E)														
5	T1	309	3.4	309	3.4	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		309	3.4	309	3.4	0.162	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
West: Croobyar Road (W)														
11	T1	306	3.1	306	3.1	0.160	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		306	3.1	306	3.1	0.160	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
All Vehicles		617	3.2	617	3.2	0.162	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9

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

MOVEMENT SUMMARY

Site: 101h [1h. Princes Highway / Croobyar Road - 2023 Future Base + 2030 Background Growth PM Peak (Site Folder: SCENARIO 4B - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH PM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH PM (Network Folder: SCENARIO 4 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH SCENARIO)]

2023 Future Base + 2030 Background Growth PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + 2030 Background Growth Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	178	3.0	178	3.0	0.655	13.8	LOS A	8.8	64.5	0.61	0.62	0.61	38.5
2	T1	676	7.6	676	7.6	* 0.829	17.7	LOS B	13.7	101.9	0.69	0.75	0.83	33.6
3	R2	40	0.0	40	0.0	0.829	27.0	LOS B	13.7	101.9	0.74	0.84	0.98	35.1
Approach		894	6.4	894	6.4	0.829	17.4	LOS B	13.7	101.9	0.68	0.73	0.80	34.5
East: Matron Porter Drive (E)														
4	L2	43	0.0	43	0.0	0.121	30.9	LOS C	1.4	10.1	0.81	0.71	0.81	33.6
5	T1	55	1.9	55	1.9	0.607	27.1	LOS B	6.3	46.0	0.91	0.80	0.93	18.4
6	R2	152	6.9	152	6.9	0.607	32.3	LOS C	6.3	46.0	0.93	0.82	0.96	18.2
Approach		249	4.6	249	4.6	0.607	30.9	LOS C	6.3	46.0	0.91	0.80	0.93	22.4
North: Princes Highway (N)														
7	L2	179	3.5	179	3.5	0.183	13.4	LOS A	3.1	22.3	0.54	0.69	0.54	40.1
8	T1	662	6.5	662	6.5	0.805	16.6	LOS B	19.5	143.9	0.78	0.79	0.89	40.7
9	R2	18	11.8	18	11.8	0.805	21.3	LOS B	19.5	143.9	0.78	0.79	0.89	34.5
Approach		859	6.0	859	6.0	0.805	16.0	LOS B	19.5	143.9	0.73	0.77	0.81	40.5
West: Croobyar Road (W)														
10	L2	24	13.0	24	13.0	0.207	28.6	LOS C	2.6	19.3	0.82	0.67	0.82	15.4
11	T1	95	4.4	95	4.4	0.781	24.9	LOS B	9.8	70.3	0.87	0.74	0.92	26.1
12	R2	244	2.6	244	2.6	* 0.781	36.6	LOS C	9.8	70.3	0.99	0.95	1.21	27.7
Approach		363	3.8	363	3.8	0.781	33.0	LOS C	9.8	70.3	0.95	0.88	1.11	27.0
All Vehicles		2365	5.7	2365	5.7	0.829	20.7	LOS B	19.5	143.9	0.76	0.77	0.86	35.1

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											

P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
East: Matron Porter Drive (E)											
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
North: Princes Highway (N)											
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)											
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102h [2h. Croobyar Road / Gordon Street - 2023 Future Base + 2030 Background Growth PM Peak (Site Folder: SCENARIO 4B - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH PM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH PM (Network Folder: SCENARIO 4 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH SCENARIO)]

Future Base + 2030 Background Growth PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + 2030 Background Growth Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	231	3.7	231	3.7	0.133	0.1	LOS A	0.1	1.0	0.07	0.03	0.07	48.8
6	R2	15	0.0	15	0.0	0.133	6.0	LOS A	0.1	1.0	0.07	0.03	0.07	47.5
Approach		245	3.4	245	3.4	0.133	0.5	NA	0.1	1.0	0.07	0.03	0.07	48.7
North: Gordon Street (N)														
7	L2	25	8.3	25	8.4	0.047	9.4	LOS A	0.2	1.2	0.44	0.90	0.44	35.8
9	R2	13	0.0	13	0.0	0.047	10.5	LOS A	0.2	1.2	0.44	0.90	0.44	38.5
Approach		38	5.6	38	5.6	0.047	9.7	LOS A	0.2	1.2	0.44	0.90	0.44	37.0
West: Croobyar Road (W)														
10	L2	16	6.7	16	6.7	0.183	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.1
11	T1	333	3.5	333	3.5	0.183	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.1
Approach		348	3.6	348	3.6	0.183	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.1
All Vehicles		632	3.7	631 N1	3.7	0.183	0.9	NA	0.2	1.2	0.05	0.08	0.05	47.5

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 103h [3h. Princes Highway / Gordon Street - 2023 Future Base + 2030 Background Growth PM Peak (Site Folder: SCENARIO 4B - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH PM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH PM (Network Folder: SCENARIO 4 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH SCENARIO)]

2023 Future Base + 2030 Background Growth PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + 2030 Background Growth Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	22	0.0	22	0.0	0.069	8.1	LOS A	0.2	1.7	0.68	0.78	0.68	37.4
2	T1	3	33.3	3	33.3	0.069	38.3	LOS C	0.2	1.7	0.68	0.78	0.68	35.5
3	R2	1	0.0	1	0.0	0.069	34.3	LOS C	0.2	1.7	0.68	0.78	0.68	31.6
Approach		26	4.0	26	4.0	0.069	12.8	LOS A	0.2	1.7	0.68	0.78	0.68	37.0
East: Princes Highway (E)														
4	L2	4	0.0	4	0.0	0.474	12.0	LOS A	1.7	12.3	0.23	0.06	0.32	47.1
5	T1	777	8.5	723	8.5	0.474	1.3	LOS A	1.7	12.3	0.23	0.06	0.32	48.0
6	R2	63	0.0	59	0.0	0.474	12.2	LOS A	1.7	12.3	0.23	0.06	0.32	46.5
Approach		844	7.9	786 N1	7.9	0.474	2.2	NA	1.7	12.3	0.23	0.06	0.32	47.9
North: Gordon Street (N)														
7	L2	95	1.1	95	1.1	0.226	9.2	LOS A	0.8	5.7	0.71	0.88	0.75	26.4
8	T1	2	50.0	2	50.0	0.226	53.0	LOS D	0.8	5.7	0.71	0.88	0.75	26.4
9	R2	5	20.0	5	20.0	0.226	45.3	LOS D	0.8	5.7	0.71	0.88	0.75	34.6
Approach		102	3.1	102	3.1	0.226	11.9	LOS A	0.8	5.7	0.71	0.88	0.75	27.1
West: Princes Highway (W)														
10	L2	1	0.0	1	0.0	0.436	11.2	LOS A	0.9	6.8	0.10	0.02	0.15	47.3
11	T1	749	6.7	749	6.7	0.436	0.6	LOS A	0.9	6.8	0.10	0.02	0.15	47.4
12	R2	28	0.0	28	0.0	0.436	11.3	LOS A	0.9	6.8	0.10	0.02	0.15	47.4
Approach		779	6.5	779	6.5	0.436	1.0	NA	0.9	6.8	0.10	0.02	0.15	47.4
All Vehicles		1752	6.9	1694 N1	7.1	0.474	2.4	NA	1.7	12.3	0.21	0.10	0.27	46.7

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 104h [4h. Budawang School Site Access - 2030 Future Base 2030 Background Growth PM Peak (Site Folder: SCENARIO 4B - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH PM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH PM (Network Folder: SCENARIO 4 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH SCENARIO)]

2023 Future Base + 2030 Background Growth PM Peak
Roundabout Option
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + 2030 Background Growth Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	1	0.0	1	0.0	0.001	3.5	LOS A	0.0	0.0	0.32	0.42	0.32	20.8
Approach		1	0.0	1	0.0	0.001	3.5	LOS A	0.0	0.0	0.32	0.42	0.32	20.8
East: Croobyar Road (E)														
5	T1	251	3.4	251	3.4	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
Approach		251	3.4	251	3.4	0.131	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.0
West: Croobyar Road (W)														
11	T1	358	3.8	358	3.8	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
Approach		358	3.8	358	3.8	0.188	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
All Vehicles		609	3.6	609	3.6	0.188	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9

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

MOVEMENT SUMMARY

Site: 101j [1i. Princes Highway / Croobyar Road - 2023 Future Base + 2030 Background Growth+ Development AM Peak (Site Folder: SCENARIO 5A - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT AM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT AM (Network Folder: SCENARIO 5 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT SCENARIO)]

2023 Future Base + 2030 Background Growth + Development AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + 2030 Background Growth + Development Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	259	2.8	259	2.8	0.278	15.0	LOS B	5.0	36.0	0.60	0.72	0.60	35.7
2	T1	624	4.4	624	4.4	* 0.909	33.4	LOS C	25.8	188.0	0.83	1.04	1.21	26.3
3	R2	26	12.0	26	12.0	0.909	38.0	LOS C	25.8	188.0	0.83	1.04	1.21	30.2
Approach		909	4.2	909	4.2	0.909	28.3	LOS B	25.8	188.0	0.76	0.95	1.04	28.5
East: Matron Porter Drive (E)														
4	L2	59	0.0	59	0.0	0.180	29.3	LOS C	2.4	16.8	0.80	0.72	0.80	34.5
5	T1	115	0.9	115	0.9	* 0.900	37.8	LOS C	13.5	97.8	0.94	1.02	1.33	14.9
6	R2	228	5.1	228	5.1	0.900	47.9	LOS D	13.5	97.8	0.99	1.12	1.52	13.5
Approach		402	3.1	402	3.1	0.900	42.3	LOS C	13.5	97.8	0.95	1.03	1.36	17.7
North: Princes Highway (N)														
7	L2	131	4.0	131	4.0	0.157	13.8	LOS A	2.6	18.6	0.54	0.66	0.54	40.1
8	T1	607	7.3	607	7.3	0.730	13.6	LOS A	15.4	114.4	0.76	0.71	0.79	42.1
9	R2	13	16.7	13	16.7	0.730	18.4	LOS B	15.4	114.4	0.77	0.71	0.80	36.5
Approach		751	6.9	751	6.9	0.730	13.7	LOS A	15.4	114.4	0.72	0.70	0.75	41.8
West: Croobyar Road (W)														
10	L2	28	14.8	28	14.8	0.190	27.7	LOS B	2.6	18.7	0.79	0.66	0.79	16.2
11	T1	72	0.0	72	0.0	0.716	20.9	LOS B	8.8	62.6	0.80	0.67	0.80	28.8
12	R2	256	2.1	256	2.1	0.716	32.6	LOS C	8.8	62.6	0.96	0.89	1.08	28.9
Approach		356	2.7	356	2.7	0.716	29.9	LOS C	8.8	62.6	0.91	0.83	1.00	28.4
All Vehicles		2418	4.6	2418	4.6	0.909	26.3	LOS B	25.8	188.0	0.80	0.87	1.00	31.8

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											

P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
East: Matron Porter Drive (E)											
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
North: Princes Highway (N)											
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)											
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102i [2i. Croobyar Road / Gordon Street - 2023 Future Base + 2030 Background Growth + Development AM Peak (Site Folder: SCENARIO 5A - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT AM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT AM (Network Folder: SCENARIO 5 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT SCENARIO)]

2023 Future Base + 2030 Background Growth + Development AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + 2030 Background Growth + Development Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	296	3.6	296	3.6	0.169	0.1	LOS A	0.2	1.2	0.06	0.03	0.06	48.9
6	R2	18	0.0	18	0.0	0.169	5.9	LOS A	0.2	1.2	0.06	0.03	0.06	47.7
Approach		314	3.4	314	3.4	0.169	0.4	NA	0.2	1.2	0.06	0.03	0.06	48.8
North: Gordon Street (N)														
7	L2	25	4.2	25	4.2	0.051	8.9	LOS A	0.2	1.3	0.43	0.90	0.43	35.7
9	R2	15	7.1	15	7.1	0.051	11.4	LOS A	0.2	1.3	0.43	0.90	0.43	38.2
Approach		40	5.3	40	5.3	0.051	9.8	LOS A	0.2	1.3	0.43	0.90	0.43	36.8
West: Croobyar Road (W)														
10	L2	19	5.6	19	5.6	0.168	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.9
11	T1	301	2.8	301	2.8	0.168	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	48.9
Approach		320	3.0	320	3.0	0.168	0.3	NA	0.0	0.0	0.00	0.03	0.00	48.9
All Vehicles		674	3.3	674	3.3	0.169	0.9	NA	0.2	1.3	0.05	0.08	0.05	47.5

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

MOVEMENT SUMMARY

Site: 103i [3i. Princes Highway / Gordon Street - 2023 Future Base + 2030 Background Growth+ Development AM Peak (Site Folder: SCENARIO 5A - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT AM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT AM (Network Folder: SCENARIO 5 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT SCENARIO)]

2023 Future Base + 2030 Background Growth + Development AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + 2030 Background Growth + Development Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	35	0.0	35	0.0	0.068	9.0	LOS A	0.2	1.7	0.65	0.79	0.65	39.2
2	T1	1	0.0	1	0.0	0.068	27.0	LOS B	0.2	1.7	0.65	0.79	0.65	38.0
3	R2	1	0.0	1	0.0	0.068	35.5	LOS C	0.2	1.7	0.65	0.79	0.65	34.1
Approach		37	0.0	37	0.0	0.068	10.2	LOS A	0.2	1.7	0.65	0.79	0.65	39.1
East: Princes Highway (E)														
4	L2	3	0.0	3	0.0	0.494	11.9	LOS A	1.3	9.2	0.16	0.03	0.22	48.1
5	T1	822	5.2	822	5.2	0.494	0.9	LOS A	1.3	9.2	0.16	0.03	0.22	48.7
6	R2	42	2.5	42	2.5	0.494	12.1	LOS A	1.3	9.2	0.16	0.03	0.22	47.1
Approach		867	5.1	867	5.1	0.494	1.5	NA	1.3	9.2	0.16	0.03	0.22	48.6
North: Gordon Street (N)														
7	L2	41	0.0	41	0.0	0.152	8.1	LOS A	0.5	3.3	0.73	0.87	0.73	24.6
8	T1	3	0.0	3	0.0	0.152	27.3	LOS B	0.5	3.3	0.73	0.87	0.73	24.6
9	R2	8	0.0	8	0.0	0.152	36.1	LOS C	0.5	3.3	0.73	0.87	0.73	33.7
Approach		53	0.0	53	0.0	0.152	13.7	LOS A	0.5	3.3	0.73	0.87	0.73	26.8
West: Princes Highway (W)														
10	L2	15	0.0	15	0.0	0.438	12.4	LOS A	1.6	12.2	0.19	0.04	0.28	45.8
11	T1	693	7.4	693	7.4	0.438	1.3	LOS A	1.6	12.2	0.19	0.04	0.28	44.9
12	R2	39	5.4	39	5.4	0.438	13.3	LOS A	1.6	12.2	0.19	0.04	0.28	44.9
Approach		746	7.2	746	7.2	0.438	2.1	NA	1.6	12.2	0.19	0.04	0.28	45.0
All Vehicles		1703	5.7	1703	5.7	0.494	2.3	NA	1.6	12.2	0.20	0.08	0.27	47.0

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

MOVEMENT SUMMARY

Site: 104i [4i. Budawang School Site Access - 2023 Future Base + 2030 Background Growth + Development AM Peak (Site Folder: SCENARIO 5A - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT AM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT AM (Network Folder: SCENARIO 5 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT SCENARIO)]

2023 Future Base + 2030 Background Growth + Development AM Peak
Survey Date: 27/10/2020
Network Peak Hour: 8:30am - 9:30am
Site Category: 2023 Future Base + 2030 Background Growth + Development Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	14	0.0	14	0.0	0.082	3.8	LOS A	0.3	2.0	0.45	0.64	0.45	16.3
3	R2	49	0.0	49	0.0	0.082	5.9	LOS A	0.3	2.0	0.45	0.64	0.45	16.3
Approach		63	0.0	63	0.0	0.082	5.4	LOS A	0.3	2.0	0.45	0.64	0.45	16.3
East: Croobyar Road (E)														
4	L2	78	0.0	78	0.0	0.204	3.4	LOS A	0.0	0.0	0.00	0.09	0.00	35.9
5	T1	309	3.4	309	3.4	0.204	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	37.8
Approach		387	2.7	387	2.7	0.204	0.7	NA	0.0	0.0	0.00	0.09	0.00	37.4
West: Croobyar Road (W)														
11	T1	306	3.1	306	3.1	0.177	0.2	LOS A	0.2	1.7	0.08	0.03	0.08	38.4
12	R2	21	0.0	21	0.0	0.177	5.2	LOS A	0.2	1.7	0.08	0.03	0.08	35.8
Approach		327	2.9	327	2.9	0.177	0.5	NA	0.2	1.7	0.08	0.03	0.08	38.2
All Vehicles		778	2.6	778	2.6	0.204	1.0	NA	0.3	2.0	0.07	0.11	0.07	36.6

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

MOVEMENT SUMMARY

Site: 101j [1j. Princes Highway / Croobyar Road - 2023 Future Base +2030 Background Growth + Development PM Peak (Site Folder: SCENARIO 5B - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT PM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT PM (Network Folder: SCENARIO 5 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT SCENARIO)]

2023 Future Base + 2030 Background Growth + Development PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + 2030 Background Growth + Development Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Princes Highway (S)														
1	L2	214	2.5	214	2.5	0.729	16.6	LOS B	10.5	77.1	0.64	0.69	0.70	36.2
2	T1	676	7.6	676	7.6	* 0.923	30.5	LOS C	19.2	142.5	0.73	0.93	1.10	27.3
3	R2	40	0.0	40	0.0	0.923	45.4	LOS D	19.2	142.5	0.78	1.08	1.33	28.2
Approach		929	6.1	929	6.1	0.923	27.9	LOS B	19.2	142.5	0.71	0.88	1.02	28.9
East: Matron Porter Drive (E)														
4	L2	43	0.0	43	0.0	0.123	30.3	LOS C	1.5	10.7	0.80	0.71	0.80	34.1
5	T1	64	1.6	64	1.6	0.616	26.8	LOS B	6.4	47.2	0.90	0.80	0.93	18.6
6	R2	152	6.9	152	6.9	0.616	32.3	LOS C	6.4	47.2	0.93	0.82	0.96	18.2
Approach		259	4.5	259	4.5	0.616	30.6	LOS C	6.4	47.2	0.90	0.80	0.93	22.4
North: Princes Highway (N)														
7	L2	179	3.5	179	3.5	0.188	14.0	LOS A	3.2	23.0	0.55	0.70	0.55	39.8
8	T1	662	6.5	662	6.5	0.853	22.7	LOS B	22.9	169.1	0.83	0.90	1.03	38.1
9	R2	21	10.0	21	10.0	0.853	27.4	LOS B	22.9	169.1	0.83	0.90	1.03	31.0
Approach		862	6.0	862	6.0	0.853	21.0	LOS B	22.9	169.1	0.77	0.86	0.93	38.2
West: Croobyar Road (W)														
10	L2	29	10.7	29	10.7	0.237	28.0	LOS B	3.1	23.0	0.82	0.68	0.82	15.7
11	T1	115	3.7	115	3.7	0.893	26.9	LOS B	14.1	100.4	0.86	0.78	0.98	25.1
12	R2	296	2.1	296	2.1	* 0.893	46.4	LOS D	14.1	100.4	1.00	1.09	1.49	24.8
Approach		440	3.1	440	3.1	0.893	40.1	LOS C	14.1	100.4	0.95	0.98	1.31	24.6
All Vehicles		2491	5.4	2491	5.4	0.923	28.0	LOS B	22.9	169.1	0.79	0.88	1.03	31.5

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

* 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	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Princes Highway (S)											

P1	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
East: Matron Porter Drive (E)											
P2	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
North: Princes Highway (N)											
P3	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	194.6	214.8	1.10
West: Croobyar Road (W)											
P4	Full	53	29.3	LOS C	0.1	0.1	0.92	0.92	192.1	211.6	1.10
All Pedestrians		211	29.3	LOS C	0.1	0.1	0.92	0.92	193.9	214.0	1.10

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: 102j [2j. Croobyar Road / Gordon Street - 2023 Future Base + 2030 Background Growth + Development PM Peak (Site Folder: SCENARIO 5B - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT PM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT PM (Network Folder: SCENARIO 5 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT SCENARIO)]

Future Base + 2030 Background Growth + Development PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + 2030 Background Growth + Development Scenario
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Croobyar Road (E)														
5	T1	240	3.5	239	3.5	0.146	0.2	LOS A	0.2	1.6	0.11	0.06	0.11	48.1
6	R2	25	0.0	25	0.0	0.146	6.0	LOS A	0.2	1.6	0.11	0.06	0.11	46.2
Approach		265	3.2	265	3.1	0.146	0.8	NA	0.2	1.6	0.11	0.06	0.11	48.0
North: Gordon Street (N)														
7	L2	32	6.7	31	6.8	0.053	9.3	LOS A	0.2	1.4	0.44	0.90	0.44	35.8
9	R2	13	0.0	12	0.0	0.053	10.7	LOS A	0.2	1.4	0.44	0.90	0.44	38.5
Approach		44	4.8	43[N1]	4.8	0.053	9.7	LOS A	0.2	1.4	0.44	0.90	0.44	36.8
West: Croobyar Road (W)														
10	L2	16	6.7	16	6.7	0.187	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
11	T1	339	3.4	339	3.4	0.187	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
Approach		355	3.6	355	3.6	0.187	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.2
All Vehicles		664	3.5	663[N1]	3.5	0.187	1.1	NA	0.2	1.6	0.07	0.09	0.07	47.1

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 103j [3j. Princes Highway / Gordon Street - 2023 Future Base + 2030 Background Growth+ Development PM Peak (Site Folder: SCENARIO 5B - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT PM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT PM (Network Folder: SCENARIO 5 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT SCENARIO)]

2023 Future Base + 2030 Background Growth + Development PM Peak
Survey Date: 27/10/2020
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + 2030 Background Growth + Development Scenario
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gordon Street (S)														
1	L2	33	0.0	33	0.0	0.073	7.4	LOS A	0.3	1.8	0.63	0.73	0.63	39.1
2	T1	3	33.3	3	33.4	0.073	33.8	LOS C	0.3	1.8	0.63	0.73	0.63	37.3
3	R2	1	0.0	1	0.0	0.073	30.9	LOS C	0.3	1.8	0.63	0.73	0.63	33.9
Approach		37	2.9	37	2.9	0.073	10.4	LOS A	0.3	1.8	0.63	0.73	0.63	38.9
East: Princes Highway (E)														
4	L2	4	0.0	3	0.0	0.419	11.4	LOS A	1.3	9.7	0.21	0.06	0.28	47.3
5	T1	777	8.5	638	8.6	0.419	1.2	LOS A	1.3	9.7	0.21	0.06	0.28	48.2
6	R2	63	0.0	52	0.0	0.419	11.5	LOS A	1.3	9.7	0.21	0.06	0.28	46.7
Approach		844	7.9	693 N1	7.9	0.419	2.0	NA	1.3	9.7	0.21	0.06	0.28	48.1
North: Gordon Street (N)														
7	L2	95	1.1	95	1.1	0.215	9.1	LOS A	0.7	5.4	0.70	0.87	0.73	27.0
8	T1	2	50.0	2	50.0	0.215	45.5	LOS D	0.7	5.4	0.70	0.87	0.73	27.0
9	R2	5	20.0	5	20.0	0.215	40.4	LOS C	0.7	5.4	0.70	0.87	0.73	35.0
Approach		102	3.1	102	3.1	0.215	11.4	LOS A	0.7	5.4	0.70	0.87	0.73	27.7
West: Princes Highway (W)														
10	L2	1	0.0	1	0.0	0.439	10.0	LOS A	1.0	7.3	0.11	0.03	0.16	47.3
11	T1	749	6.7	749	6.7	0.439	0.6	LOS A	1.0	7.3	0.11	0.03	0.16	47.4
12	R2	35	0.0	35	0.0	0.439	10.0	LOS A	1.0	7.3	0.11	0.03	0.16	47.4
Approach		785	6.4	785	6.4	0.439	1.0	NA	1.0	7.3	0.11	0.03	0.16	47.4
All Vehicles		1768	6.8	1618 N1	7.5	0.439	2.3	NA	1.3	9.7	0.20	0.11	0.26	46.7

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 104j [4j. Budawang School Site Access - 2030 Future Base + 2030 Background Growth + Development PM Peak (Site Folder: SCENARIO 5B - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT PM PEAK)]

Network: N101 [2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT PM (Network Folder: SCENARIO 5 - 2023 FUTURE BASE + 2030 BACKGROUND GROWTH + DEVELOPMENT SCENARIO)]

2023 Future Base + 2030 Background Growth + Development PM Peak
Roundabout Option
Network Peak Hour: 3:00pm - 4:00pm
Site Category: 2023 Future Base + 2030 Background Growth + Development Scenario
Give-Way (Two-Way)

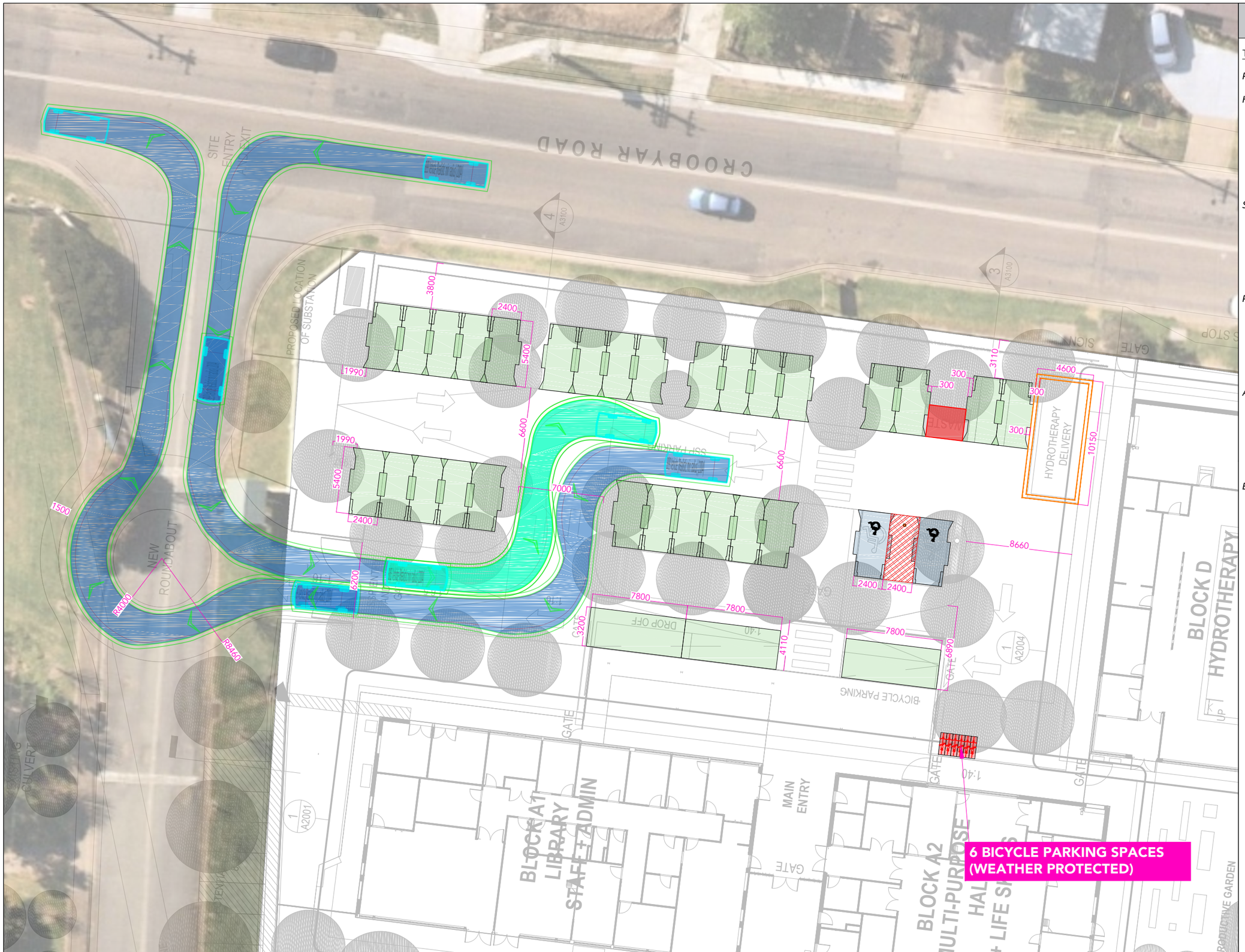
Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: School Site Access														
1	L2	21	0.0	21	0.0	0.126	3.6	LOS A	0.4	3.1	0.44	0.65	0.44	16.3
3	R2	78	0.0	78	0.0	0.126	5.9	LOS A	0.4	3.1	0.44	0.65	0.44	16.3
Approach		99	0.0	99	0.0	0.126	5.4	LOS A	0.4	3.1	0.44	0.65	0.44	16.3
East: Croobyar Road (E)														
4	L2	49	0.0	49	0.0	0.157	3.4	LOS A	0.0	0.0	0.00	0.08	0.00	36.1
5	T1	251	3.4	250	3.3	0.157	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	38.2
Approach		300	2.8	299 N1	2.8	0.157	0.6	NA	0.0	0.0	0.00	0.08	0.00	37.8
West: Croobyar Road (W)														
11	T1	358	3.8	357	3.8	0.198	0.1	LOS A	0.1	1.1	0.04	0.02	0.04	39.1
12	R2	14	0.0	14	0.0	0.198	4.8	LOS A	0.1	1.1	0.04	0.02	0.04	36.3
Approach		372	3.7	371 N1	3.7	0.198	0.3	NA	0.1	1.1	0.04	0.02	0.04	39.0
All Vehicles		771	2.9	769 N1	2.9	0.198	1.0	NA	0.4	3.1	0.08	0.12	0.08	36.5

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Attachment 3 - Design Review



comments

A3

TYPICAL

Please note the following compliance requirements:

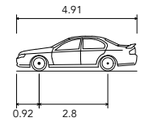
Height Clearance:
2.2m (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays
4.5m wherever access is required for a refuse vehicle (and safety clearance envelope)

Sight Splays:
Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

Parking Spaces:
The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

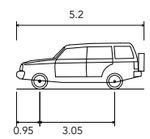
Accessible Spaces:
To be designed in accordance with AS2890.6. i.e, standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).

Bicycle Parking:
Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.



B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

Suite 502, 1 James Place
North Sydney NSW 2060

t +61 2 8920 0800

ptcconsultants.co

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
P2	01/02/21	FOR INFORMATION	HL	KB
P1	18/01/21	FOR INFORMATION	HL	KB

PROJECT
Budawang School

DRAWING TITLE
Swept Path Assessment

B99 & B85

CLIENT	SINSW
DRAWING #	PTC-001
PROJECT #	KB-2890
SCALE	1 : 200

PRELIMINARY

REV P3

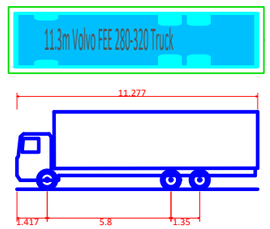
comments

A3

TYPICAL

Please note the following compliance requirements:

Height Clearance:	**2.2m** (min) throughout all areas of the car park accessible to vehicles and bicycles. **2.5m** above accessible and shared bays **4.5m** wherever access is required for a refuse vehicle (and safety clearance envelope)
Sight Splays:	Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)
Parking Spaces:	The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).
Accessible Spaces:	To be designed in accordance with AS2890.6. i.e, standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).
Bicycle Parking:	Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.



11.3m Volvo FEE 280-320 Truck	
Overall Length	11.277m
Overall Width	2.500m
Overall Body Height	3.624m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

6 BICYCLE PARKING SPACES (WEATHER PROTECTED)

Suite 502, 1 James Place
North Sydney NSW 2060

t +61 2 8920 0800

ptcconsultants.co

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
P1	18/01/21	FOR INFORMATION	HL	KB

PROJECT
Budawang School

DRAWING TITLE
Swept Path Assessment

11.3m HRV Access & Egress

CLIENT	SINSW
DRAWING #	PTC-002
PROJECT #	KB-2890
SCALE	1 : 200

PRELIMINARY

REV P3

Attachment 4 - Site Access Review

Three concept options have been investigated for determining the optimal location for a two-way access driveway into the site. Option 1 involves the construction of an access driveway off Croobyar Road at the north-eastern corner of the School, Option 2 uses the existing access to the former Shoalhaven Anglican School (SAS) and Option 3 combines the former options and involves the provision of both driveways. The driveway locations are illustrated in Figure 36.

Figure 36 – Concept Driveway Location Options

Option 1 – Eastern Driveway

Option 1 has been explored to allow for a separate driveway to allow vehicular access to the proposed School, independent to the access roadway to the former SAS. Due to the proximity to the upstream intersection of Princes Highway/Croobyar Road and the limited queue storage capacity of providing an access driveway close to the eastern boundary of the site. Furthermore, the positioning of the driveway at the north-eastern corner of the School also reduced the available internal queuing capacity for the pick-up/drop-off area. The challenges presented resulted in this option deemed unfeasible.

Option 2 – Existing Site Access to the former Shoalhaven Anglican School

Option 2 utilises the existing site access to the Shoalhaven Anglican School (SAS) off Croobyar Road. This option would eliminate the need to construction a new access driveway and effectively increase the distance to the signalised intersection of Princes Highway/Croobyar Road for higher queue storage capacity for eastbound vehicles towards the Princes Highway.

Internal queuing capacity is also increased as vehicles will circulate through the car park to access the pick-up/drop-off area. It is highlighted that the propensity for queuing is greatly minimised and mitigated through the close management of the operations of the pick-up/drop-off zone within the School car park. Details of the operation and management measures are outlined in Section 6.4.

In order to facilitate efficient access and egress, a semi-mountable roundabout is proposed within the site access to the former SAS. The roundabout will prioritise traffic movements of vehicles exiting the proposed School car park and helps to streamline vehicular traffic between the Budawang School and any future redevelopment on the former SAS site.

Option 3 – Eastern Driveway and SAS Site Access

A hybrid option which involves the construction of the eastern driveway and utilisation of the existing SAS site access. This would provide separated access points for light vehicle traffic (using the existing SAS site access) and service vehicle traffic via the eastern driveway.

However, it is understood that there are significant level differences between the eastern side of the site and the western side which would result in a physical constraint which inhibits the construction of an at-grade car park which satisfies the maximum grade limits of accessible parking and access.

Preferred Option Summary

The increased internal queuing capacity through to the pick-up/drop-off area and increased external queue storage capacity along Croobyar Road to the Princes Highway in Option 2 provides key benefits over the other options, thus making it the preferred design option. Option 2 also overcomes the physical constraints of the site (level differences) associated with Option 3.