

**construction
traffic and
pedestrian
management
sub-plan;**

New Primary School in Mulgoa Rise

For Richard Crookes Constructions
22nd March 2022

**parking;
traffic;
civil design;
wayfinding;
ptc.**

Document Control

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1. Introduction

1.1 Background

ptc. has been engaged by Richard Crookes on behalf of School Infrastructure New South Wales (SINSW) to prepare a Construction Traffic and Pedestrian Management Plan (CTPMP) report for a development of a new primary school in Mulgoa Rise (the School) at 1-23 Forestwood Drive, Glenmore Park.

The project has been submitted as a State Significant Development Application (SSDA) to the Department for Planning, Industry and Environment (DPIE). As the proposed site lies within the Penrith City Council local government area, the project has also considered the local controls.

This report addresses construction works related to the development of the school, and has been prepared to address the requirement for the submission of a Construction Traffic and Pedestrian Management Plan as set out in Item 5 of the SEARs issued for the project dated 2 December 2020.

The location of the site is shown in Figure 1.

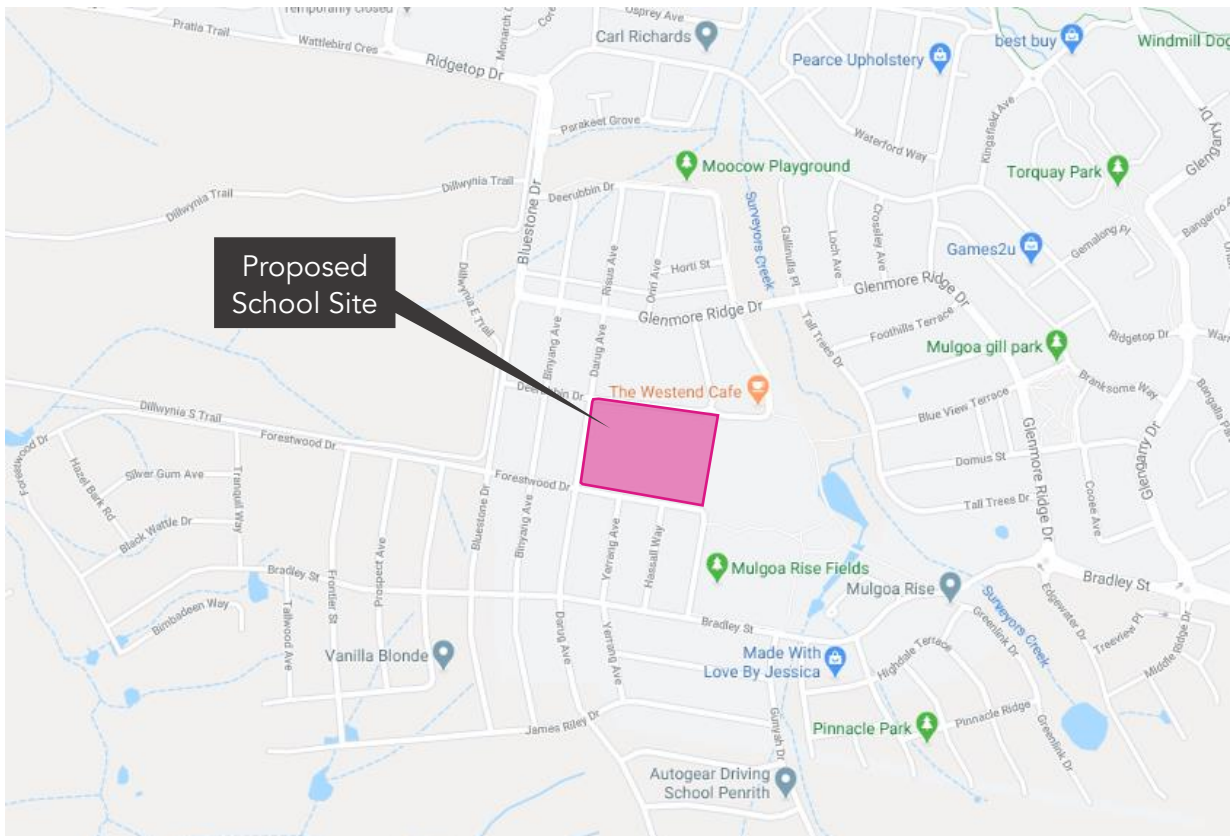


Figure 1 – Site Location (Source: Google Maps)

1.2 Structure of this Report

This report presents the following considerations in relation to the CTPMP:

Section 2	Background;
Section 3	A description of the project;
Section 4	A description of the road network and transport facilities serving the development site;
Section 5	Management of construction vehicles and non-site traffic;
Section 6	Set out of Traffic Guidance Schemes; and
Section 7	Summary

1.3 Purpose of this Report

The CTPMP addresses the potential construction activity associated with the construction of the development, including:

- Location of any proposed Work Zone, Site Boundary, and any site office, crane locations, material and waste storage area and other components as necessary;
- Haulage routes;
- Construction vehicle access arrangements;
- A heavy vehicle swept path assessment, demonstrating feasibility of any site access, in addition to haulage routes if required;
- Estimated construction hours;
- Estimated number of construction vehicle movements;
- Estimated construction program;
- Mitigation of any potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works;
- Development of a concept traffic management plan (TMP), outlining the construction access to the development and a description of likely traffic control measures required.

This report has been prepared to present the traffic and pedestrian management arrangements (including Traffic Control Plans) associated with the construction of the school.

This report has been prepared in response to Conditions of the Development Consent letter dated 18th March 2022 for the SSD 11070211, which reads as follows:

Conditions	ptc. References
<p><i>B15. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must be prepared to achieve the objective of ensuring safety and efficiency of the road network and address, but not be limited to, the following:</i></p> <p><i>a) be prepared by a suitably qualified and experienced person(s);</i></p> <p><i>b) be prepared in consultation with Council and TfNSW;</i></p> <p><i>c) detail:</i></p> <ul style="list-style-type: none"> <i>i. measures to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;</i> <i>ii. measures to ensure the safety of vehicles and pedestrians accessing adjoining properties where shared vehicle and pedestrian access occurs;</i> <i>iii. heavy vehicle routes, access and parking arrangements;</i> <i>iv. the swept path of the longest construction vehicle entering and exiting the site in association with the new work, as well as manoeuvrability through the site, in accordance with the latest version of AS 2890.2;</i> <i>v. construction vehicle volumes during stages of works and measures to reduce parking impacts on local streets;</i> <i>vi. arrangements to ensure that construction vehicles enter and leave the site in a forward direction unless in specific exceptional circumstances under the supervision of accredited traffic controller(s).</i> 	<p>Refer to Attachment 1</p> <p>Refer to Attachment 2 which includes an extract from the transport letter dated 11th November 2021 addressing the comments to submission from the authorities</p> <p>Refer to Section 5.18, 5.25 and 6</p> <p>Refer to Sections 5.17, 5.18, 5.19, 5.20, 5.24 and 5.25</p> <p>Refer to Section 5.7, 5.9, 5.12</p> <p>Refer to Section 5.9</p> <p>Refer to Section 5.7 and 5.8</p> <p>Refer to Section 5.9 and 6</p>
<p><i>B20. Prior to the commencement of construction, the Applicant must submit a Construction Worker Transportation Strategy to the Certifier. The Strategy must detail the provision of sufficient parking facilities or other travel arrangements for construction workers in order to minimise demand for parking in nearby public and residential streets or public parking facilities. A copy of the strategy must be provided to the Planning Secretary for information.</i></p>	<p>Refer to Sections 4 and 5.12</p>

2. Background Information

2.1 Site Location

The proposed school site is located at 1-23 Forestwood Drive, Glenmore Park and is identified as Lot 1663 in Deposited Plan 116686. It is located approximately 33 kilometres west of Paramatta CBD.

The site has a frontage to Deerubbin Drive to the north, Forestwood Drive to the south and Darug Avenue to the west. The east of the site is bound by Council's car park.

A mixed-use development has recently been approved north of Deerubbin Drive, which will act as a local town centre. To the east of the school are Council sports grounds with an adjoining car park.

The aerial view of the subject site is shown in Figure 2.

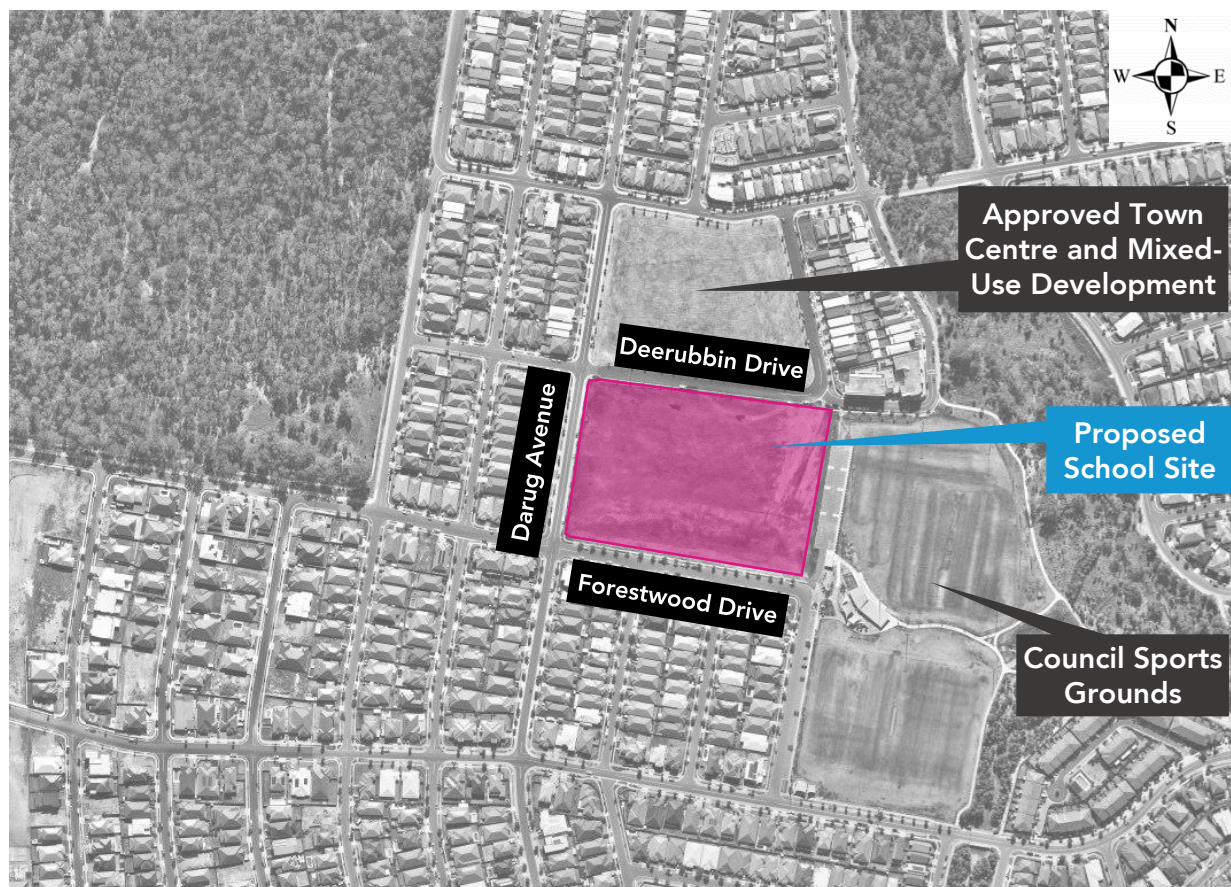


Figure 2 – Aerial View of the Subject Site (Source: Near Map)

2.2 Surrounding Land Use

The proposed school site is currently a R1 (General Residential) zone, with the surrounds being predominantly R1 and R2 (Low Density Residential). There are large E1 (National Parks and Nature Reserves) and E2 (Environmental Conservation) zones to the west, a large RU2 (Rural Landscape) zone to the south, a B2 (Local Centre) zone to the north and RE1 (Public Recreation) zones within the vicinity of the site. This is presented in Figure 3.

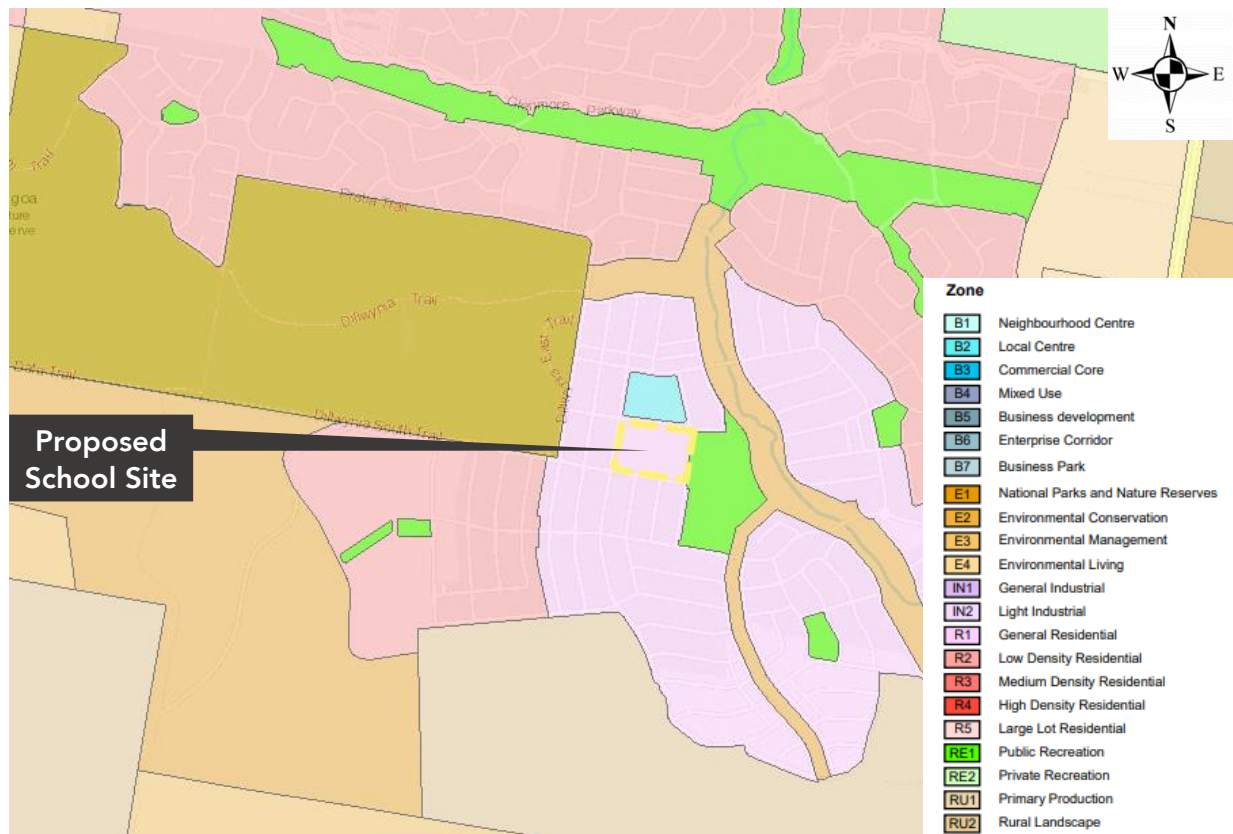


Figure 3 – Local Land Use Map (Source: NSW Planning Viewer)

It is noted that the Rural Landscape zone to the south is currently in the phase of a Planning Proposal for redevelopment of this region to a residential area.

3. Development Proposal

The site is currently vacant.

The proposed development will facilitate a Core 21 school with 18 learning spaces (LS) + 2 support classes, with the selected core facilities at Core 35, for the Hall, Library, Staff facilities and Admin. This will Cater for an initial 414 students.

The school has been master planned to facilitate future expansions up to a full 44 learning spaces + 4 support classes should additional demand materialise.

The future development of the primary school will complete the build to a Core 35, facilitating future expansion up to 44 learning spaces and 4 support classes.

The new school will provide the surrounding area community access to the school's core facilities - the communal hall, the library and the outdoor sports court. The school will also provide Outside School Hours Care (OSHC) services to assist dual-working families with parents commuting and working long hours.

The construction of this development is a two-year program. Planning and Statutory approvals undertaken through 2021, with construction works planned to occur within the year 2022. This will see the doors open for students in Term 1, 2023.

A site plan of the proposed development in shown in Figure 4.

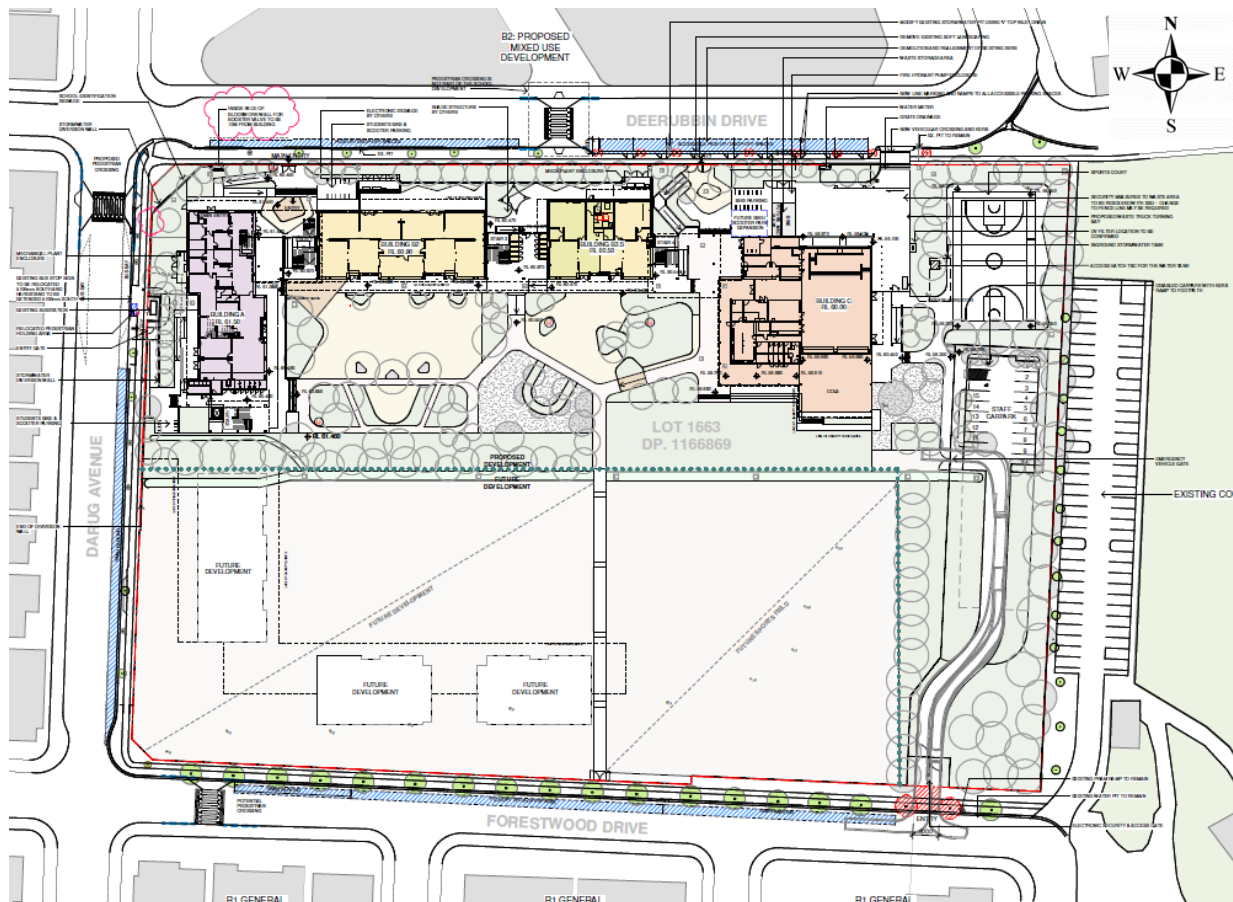


Figure 4 – Development Proposal Site Plan

The School will cater for years K-6, with the following traffic relevant parameters:

- Student capacity: 414
 - 400 students can be accommodated within general home bases
 - 14 students can be accommodated within SST bases
- Staff: approximately 27 full time equivalents (FTE)
- OSHC spaces

4. Existing Transport Facilities

4.1 Road Hierarchy

The subject site is located in the suburb of Glenmore Park and is primarily serviced by local roads including Deerubbin Drive to the north, Forestwood Drive to the south and Darug Avenue to the west.

A summary of the State, Regional and Council managed local roads serving the site is presented in Figure 5 and the following tables.

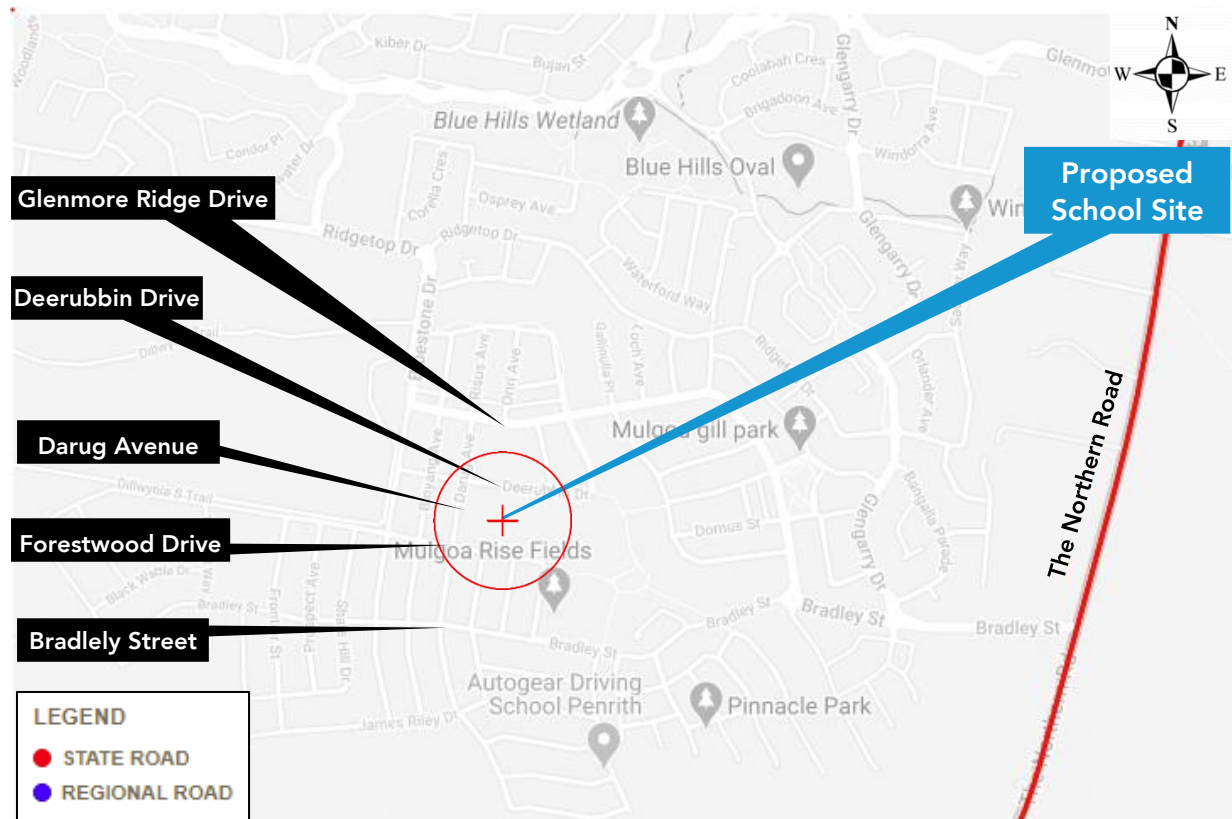


Figure 5 – Surrounding Road Network (Source: RMS Road Hierarchy)

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 (RMS managed)
- Regional Roads** - Secondary or Sub Arterials (Council managed, partly funded by the State)
- Local Roads** - Collector and Local Access Roads (Council managed)

Table 1 – The Northern Road

The Northern Road	
Road Classification	State Road
Alignment	North-South
Number of Lanes	Varies, typically 1 lane in each direction. Road widens to 3 lanes southbound and 2 lanes northbound in the vicinity of the site
Carriageway Type	Undivided
Carriageway Width	Varies, typically 15m in section with 1 lane in each direction. Approximately 21m in widest section near the vicinity of the site
Speed Limit	80km/h
School Zone	No
Parking Controls	No parking
Forms Site Frontage	No

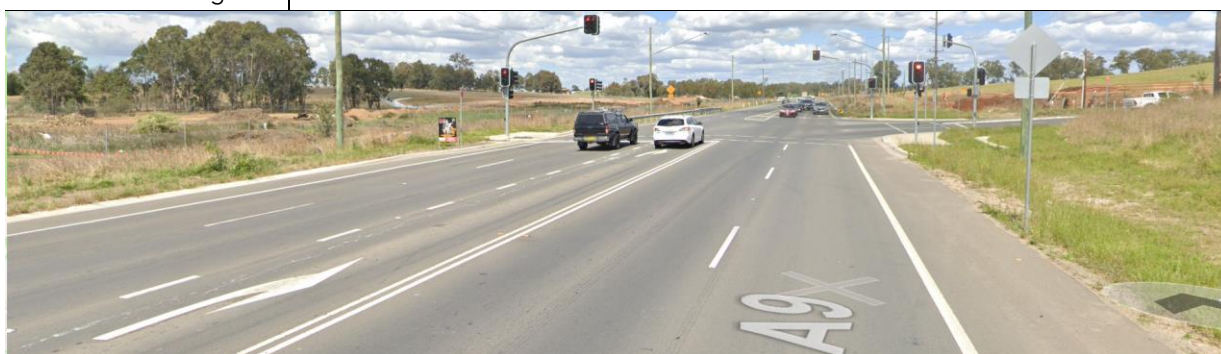


Figure 6 – The Northern Road – Southbound towards Bradley Street

Table 2 – Glenmore Ridge Drive

Glenmore Ridge Drive	
Road Classification	Collector Road
Alignment	East-West in the vicinity of the site
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m
Speed Limit	50km/h
School Zone	No
Parking Controls	Unrestricted Parking
Forms Site Frontage	No



Figure 7 – Glenmore Ridge Drive – Westbound towards Darug Avenue

Table 3 – Bradley Street

Bradley Street	
Road Classification	Collector Road
Alignment	East - West
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m
Speed Limit	50km/h
School Zone	No
Parking Controls	Unrestricted
Forms Site Frontage	No



Figure 8 – Bradley Street – Westbound towards Parkway Avenue

Table 4 – Darug Avenue

Darug Avenue	
Road Classification	Local Road
Alignment	North - South
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m
Speed Limit	50km/h
School Zone	No, but will be in the future
Parking Controls	Unrestricted
Forms Site Frontage	Yes



Figure 9 – Darug Avenue – Southbound towards Forestwood Drive

Table 5 – Deerubbin Drive

Deerubbin Drive	
Road Classification	Local Road
Alignment	East - West
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m
Speed Limit	50km/h
School Zone	No, but will be in the future
Parking Controls	Unrestricted
Forms Site Frontage	Yes



Figure 10 – Deerubbin Drive – Westbound towards Darug Avenue

Table 6 – Forestwood Drive

Forestwood Drive	
Road Classification	Local Road
Alignment	East - West
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	11m
Speed Limit	50km/h
School Zone	No, but will be in the future
Parking Controls	Unrestricted
Forms Site Frontage	Yes



Figure 11 – Forestwood Drive – Eastbound towards Yerrang Avenue

4.2 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.

Figure 12 illustrates 400m and 800m catchments from the proposed School site, together with the public transport options and network, which are available in the vicinity of the site. Details of public transport options available are outlined in the following sections.

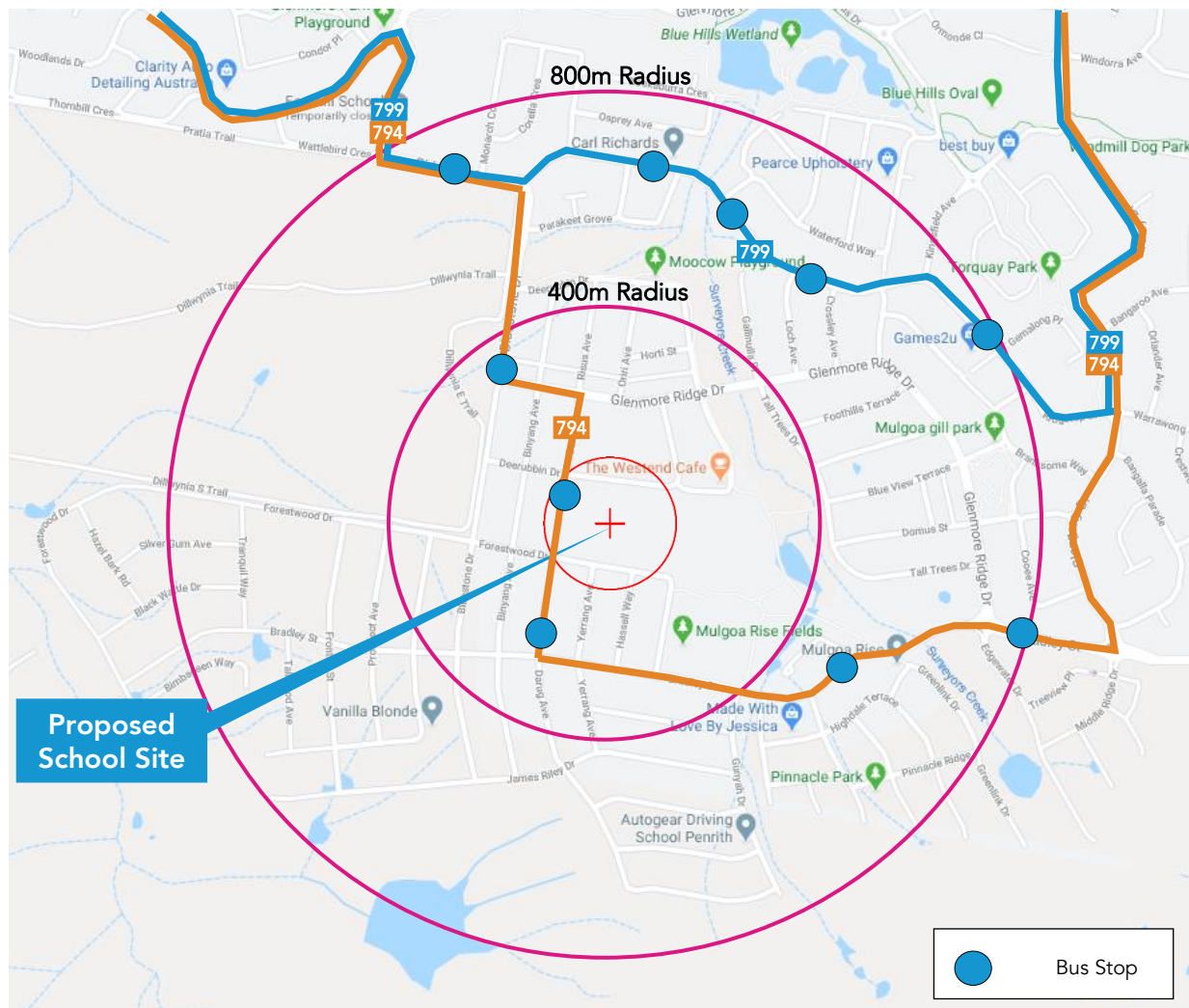


Figure 12 – 400m and 800m radius of the subject site

4.2.1 Bus Stops

As shown in Figure 12, there are a few bus services within the 400m and 800m catchment. The closest existing bus stop is located within 400m catchment along Darug Avenue, and serviced by 794 bus.

The closest bus stops and their relation to pedestrian gates of the proposed school are shown in Figure 13.

Currently, there is no pedestrian crossing connecting the school with the bus stop located on the western side of Darug Avenue.

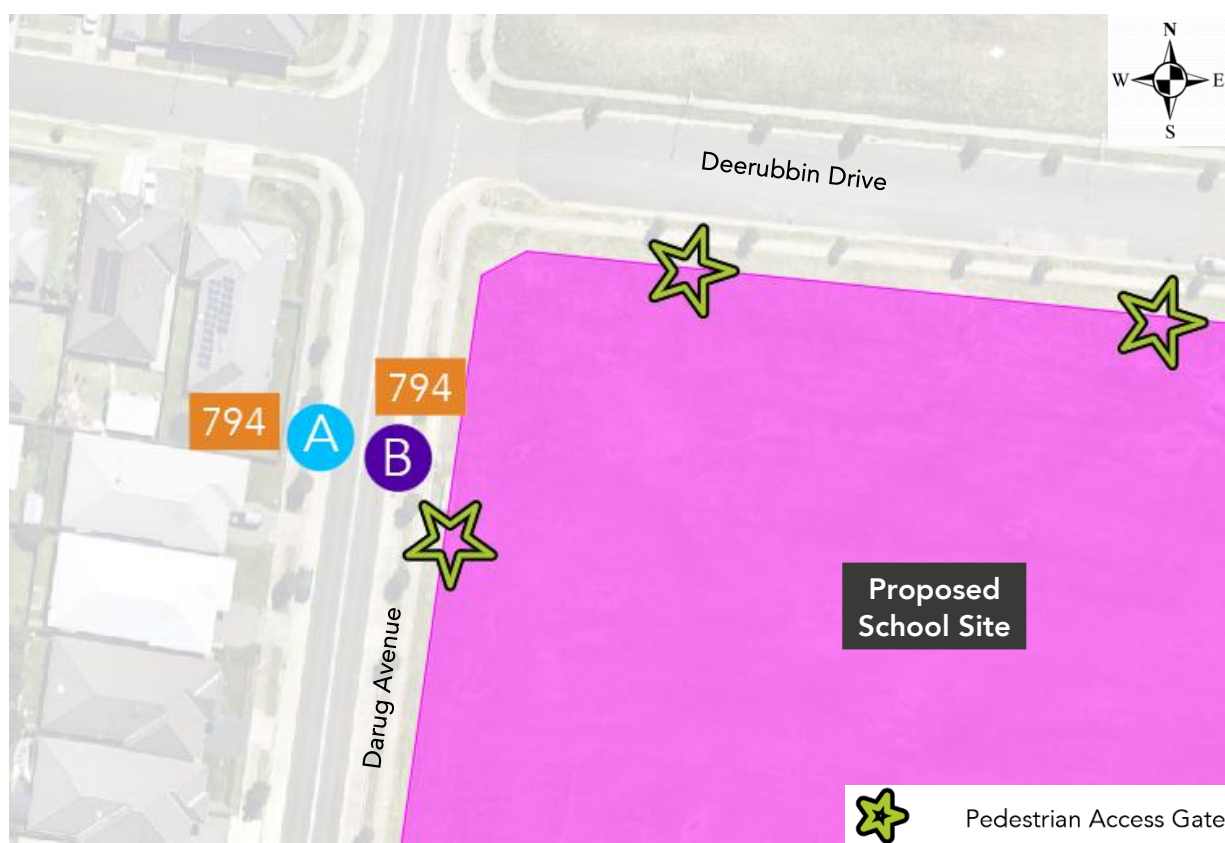


Figure 13 – Nearest Bus Stops

4.2.2 Bus Services

Bus services, including coverage, approximate operation times and frequency during school peak hours are presented in Table 7.

Table 7 – Bus Service Summary (Source: Transport NSW)

Bus Route	Coverage	Bus Stop	Morning Peak	Bus Stop	Afternoon Peak
794	Penrith to Glenmore Park via The Northern Road	A	7:57, 8:35, 9:27	A	14:34, 15:47, 16:17
	Glenmore Park to Penrith via The Northern Road	B	7:51, 8:18, 8:54, 9:42	B	13:46, 15:07, 16:10

Considering potential construction times, the 794 bus timetable does not provide convenient services for workers.

The development is poorly serviced by bus, with services every 18 to 69 minutes throughout the day on weekdays, and therefore is not a reliable mode share option for staff.

4.3 Active Transport

Penrith Council’s DCP Part E7B indicates that footpaths and shared paths are provided within the vicinity of the school, as shown in Figure 14.

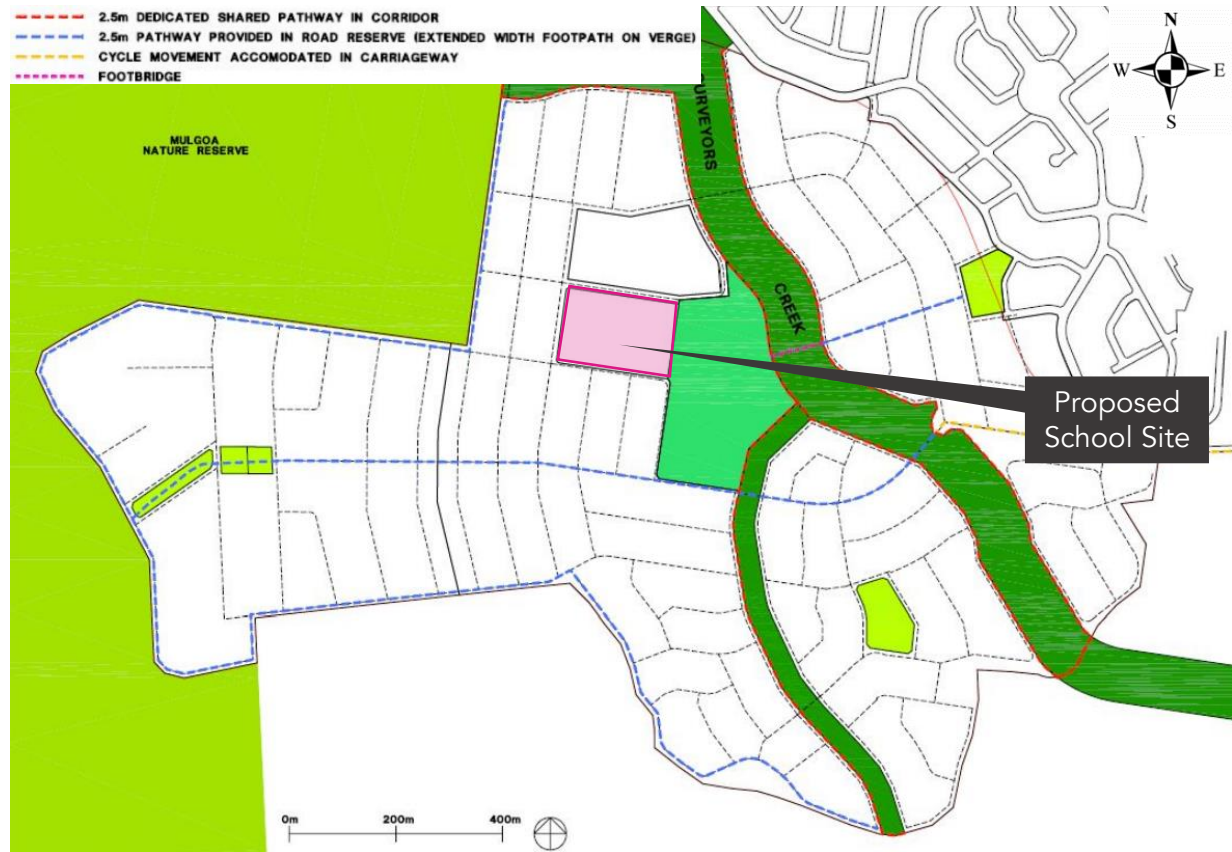


Figure 14 – Pedestrian and Cycle Network (Penrith Council DCP 2014)

Upon review of *nearmap* imagery it is known that footpaths and shared paths have been provided along major roads, biodiversity corridors and parklands, as per Council’s DCP.

4.3.1 Cycling

As shown in Figure 14, the surrounding locality within the vicinity of the proposed site has some dedicated bicycle paths along Derrubin Drive and Tall Trees Drive.

4.3.2 Walking

Walking is viable transport option for distances under one kilometre (approximately 15-20min) and is often quicker for short trips door to door. 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.

The pedestrian network in the locality of the proposed School site has been assessed to provide a reasonably high level of amenities within the vicinity of the school. Almost all roads in the vicinity of the site have footpaths on both sides. Pram ramps are generally provided at each end of the footpaths; however, there is a lack of formalised crossings in the vicinity of the site.

5. Concept Construction Traffic and Pedestrian Management Plan

5.1 Traffic Management Planning Process

Temporary Traffic Management (TTM) for the project has been planned in accordance with Transport for NSW (TfNSW), *Traffic control at work sites – Technical Manual, Issue No.6.0*, 14 September 2020 (TCAWS). The process is shown in Figure 15.

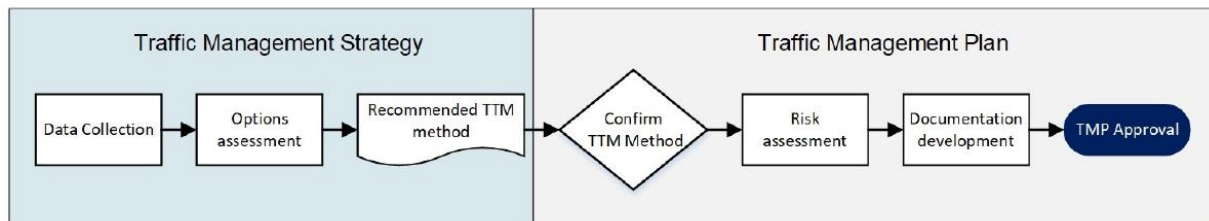


Figure 15 – TTM process

An iterative process is being adopted in collaboration with relevant stakeholders to adopt the most appropriate traffic management approach and develop the associated documents for the work.

5.2 Traffic Management Strategy

A traffic management strategy has been chosen to support the appropriate allocation of time, funds and resources for the project, and allow for consultation in determining the safest and most efficient way for road users to interact with the work site.

The traffic management strategy included consistent engagement with authorities throughout the development and submission of the CTMP. The CTMP process included the initial data collection and options assessment to ensure the lowest net risk for all stakeholders were considered. The following have been considered in determining the TTM method:

Detour options

No detours are necessary or proposed by the client and therefore, disproportionate amount of disruption to the road users will NOT be introduced.

Site location

The site of the works is primarily flat.

Work area

The area needed to safely perform the work does not require any road closure. NO Works Zone is required.

Vulnerable road users

Desire lines of pedestrians (students, staff, carers), cyclists, motorcyclists and users of scooters may impact on works or create undesired interaction between these road users and traffic.

Community facilities and needs

The presence of the bus stops on Darug Avenue in the vicinity of the site does not create conflict with the work.

5.3 Decision of TTM Method

After considering the factors in Section 5.2 and the recommendation of the client, the TTM method chosen is "Around (elimination)" as traffic can and will be completely separated from the work area. This method will provide the lowest overall net risk option

5.4 Objective

The traffic management plan associated with the construction activity aims to ensure the safety of all workers and road users within the vicinity of the construction site and following are the primary objectives:

- To minimise the impact of the construction vehicle traffic on the overall operation of the road network;
- To ensure continuous, safe and efficient movement of traffic for both the general public and construction workers;
- Installation of appropriate advance warning signs to inform users of the changed traffic conditions;
- To provide a description of the construction vehicles and the volume of these construction vehicles accessing the construction site;
- To provide information regarding the changed access arrangement and also a description of the proposed external routes for vehicles including the construction vehicles accessing the site; and
- Establishment of a safe pedestrian environment in the vicinity of the site.

5.5 Hours of Work

All works associated with construction will be restricted to time periods stipulated by the Conditions of Consent, which are as follows:

	Construction, including the delivery of materials to & from the site	Works which do not exceed the existing background noise level plus 5dB(A)	Rock breaking, rock hammering, sheet piling, pile driving and similar
Monday to Fridays	7:00am to 6:00pm	6:00pm to 7:00pm	9:00am to 12:00pm 2:00pm to 5:00pm
Saturdays	8:00am to 1:00pm	1:00pm to 4:00pm	9:00am to 12:00pm
Sunday, Public Holidays	No works to be undertaken without prior approval		

Construction activities may be undertaken outside of the above hours if required:

- by the Police or a public authority for the delivery of vehicles, plant or materials; or
- in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
- where the works are inaudible at the nearest sensitive receivers; or
- where a variation is approved in advance in writing by the Planning Secretary or its nominee if appropriate justification is provided for the works.

5.6 General Requirements

In accordance with Transport for NSW (TfNSW) requirements, all vehicles transporting loose materials will have to be entirely load covered and / or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during the travel to and from the site. All subcontractors must be inducted by the lead contractor to ensure that the procedures are met for all vehicles entering and exiting the construction site. The lead contractors will monitor the roads leading to and from the site and take all necessary steps to rectify any road deposits caused by site vehicles.

Vehicles operating to, from and within the site shall do so in a manner, which does not create unreasonable or unnecessary noise or vibration. No tracked vehicles will be permitted or required on any paved roads. Public roads and access points will not be obstructed by any materials, refuse skips or the like, under any circumstances. No construction vehicles are permitted to double park, or park on the public road. No building materials, work sheds, vehicles, machines or the like shall be allowed to remain in the road reserve area without the written consent of Penrith City Council.

The applicant / contractor is required to follow and abide by the specific standard requirements for construction management as set out by the Department of Planning, Industry and Environment in any consent issued for the project.

5.7 Construction Phasing

The construction is planned to commence in March 2022 and finish in January 2023.

The works will involve the following:

- The buildings have been designed with consideration to hybrid of conventional and factory made prefabricated component method of construction.
- Construction of a car park to accommodate 17 parking spaces including 2 accessible parking spaces.

The construction timeline is shown in Table 8

Table 8 – Construction timeline

Construction Phases	Dates
Site Establishment	28.03.2022 – 08.04.2022
Earthworks & Piling	02.05.2022 – 25.06.2022
Construction	30.05.2022 – 18.01.2023
External Works	27.07.2022 – 14.01.2023

5.8 Construction Vehicles

The construction will involve the use of a number of different vehicle types in relation to the various tasks involved. A 20m long Articulated Vehicle (AV) is the largest vehicle anticipated to be used for all material removal and deliveries.

Types and number of vehicles that will require access to the site during different phases of the construction are shown in Table 9.

Table 9 – Types and number of construction vehicles

Construction Phases	Movements at peak	Range of vehicles during stage	Largest Vehicle
Earthworks & Piling	35-40/day	SRV, MRV, HRV, AV	AV
Site Establishment	5/day	MRV, HRV, AV	AV
Construction	15/day	SRV, MRV, HRV, AV	AV
External Works	5/day	SRV, MRV, HRV, AV	AV

All vehicles are to enter and exit the site in a forward direction.

Any oversized vehicle that is required to access the development site will be dealt with separately, with the submission of required permits to and subsequent approval by Penrith City Council.

5.9 Construction Vehicle Routes and a Swept Path Assessment

The site is located in the suburb of Glenmore Park and the proposed construction vehicle routes have regard for the surrounding traffic arrangements in the vicinity of the site. No queuing or marshalling of trucks is permitted on any public road and all loading and unloading of materials will be undertaken within the site.

All vehicle routes to the site are constrained to existing public roads that have the physical geometry to accommodate the turning movements. Approaching the site, some vehicle movements will entail the assistance of traffic controllers to manage a two-way flow along the surrounding roads. For signage and controls requirements in these cases refer to Section 5.10. The vehicle routes as shown in Figure 16.

All vehicles will enter the site via a temporary construction access on Darug Avenue, approximately 40m to the north of the intersection with Forestwood Drive (refer Section 5.6.2 for further detail). Vehicles travelling from the north, east or west will approach the site southbound via The Northern Road, turn right into Bradley Street, continue straight on Bradley Street, turn right into Darug Avenue and then turn right into the site.

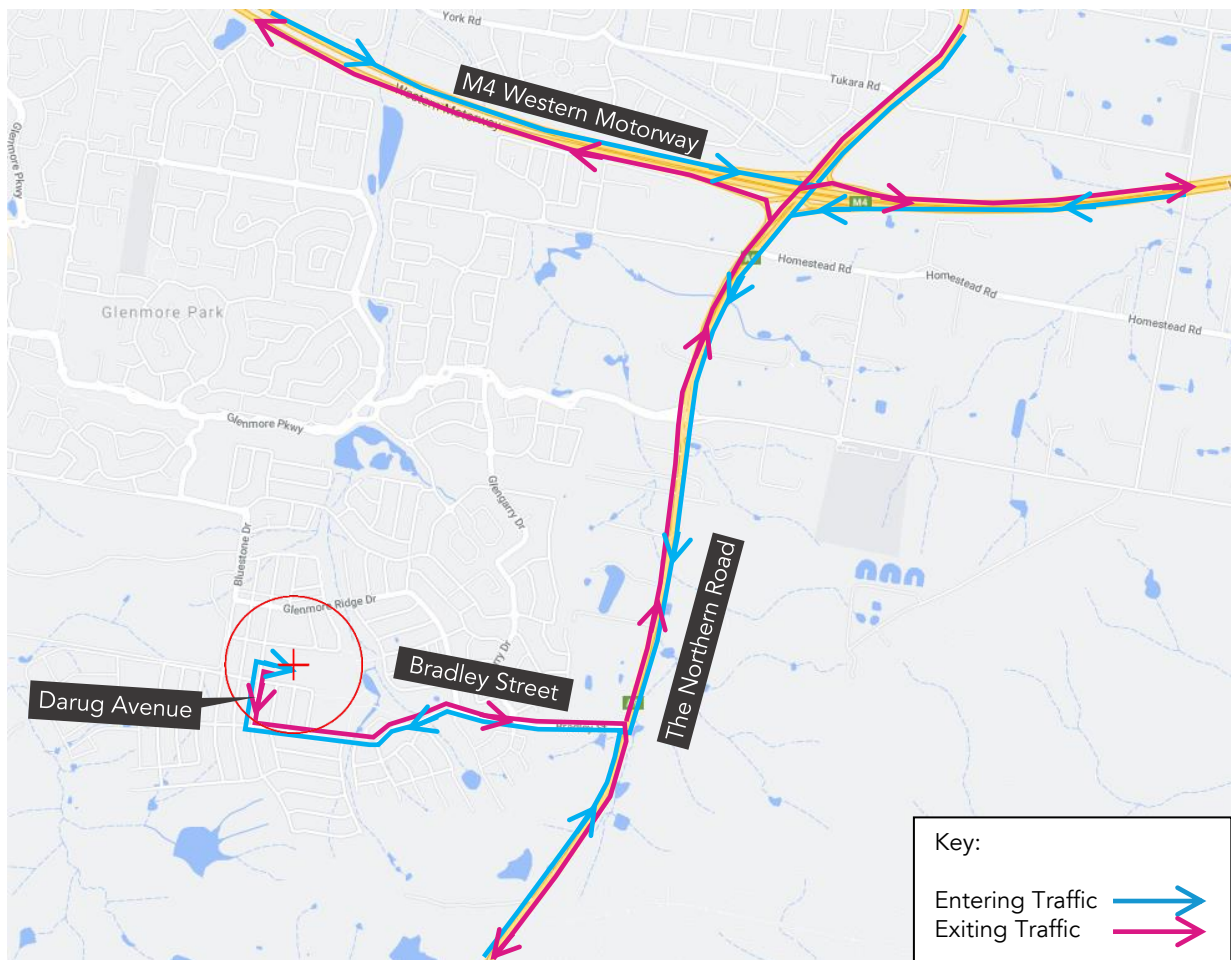


Figure 16 – Constructon Vehicle Routes

Vehicles travelling from the south will approach the site northbound via The Northern Road, turn left into Bradley Street, continue straight on Bradley Street, turn right into Darug Avenue and then turn right into the site.

All vehicles will exit the site via Darug Avenue in the southbound direction, turn left into Bradley Street and then turn left on The Northern Road to travel north, east and west or turn right on The Northern Road to travel south.

5.9.1 Key Intersections

The key intersections for the proposed School site are based on the construction vehicle routes. The key intersections in the vicinity of the site and their characteristics are listed below and shown in Figure 17.

- The Northern Road / Bradley Street: 3-arm signalised intersection
- Bradley Street / Glengarry Drive / Middle Ridge Drive: 4-arm roundabout intersection
- Bradley Street / Glenmore Ridge Drive / Edgewater Drive: 4-arm roundabout intersection
- Bradley Street / Darug Avenue: 4-arm give way intersection

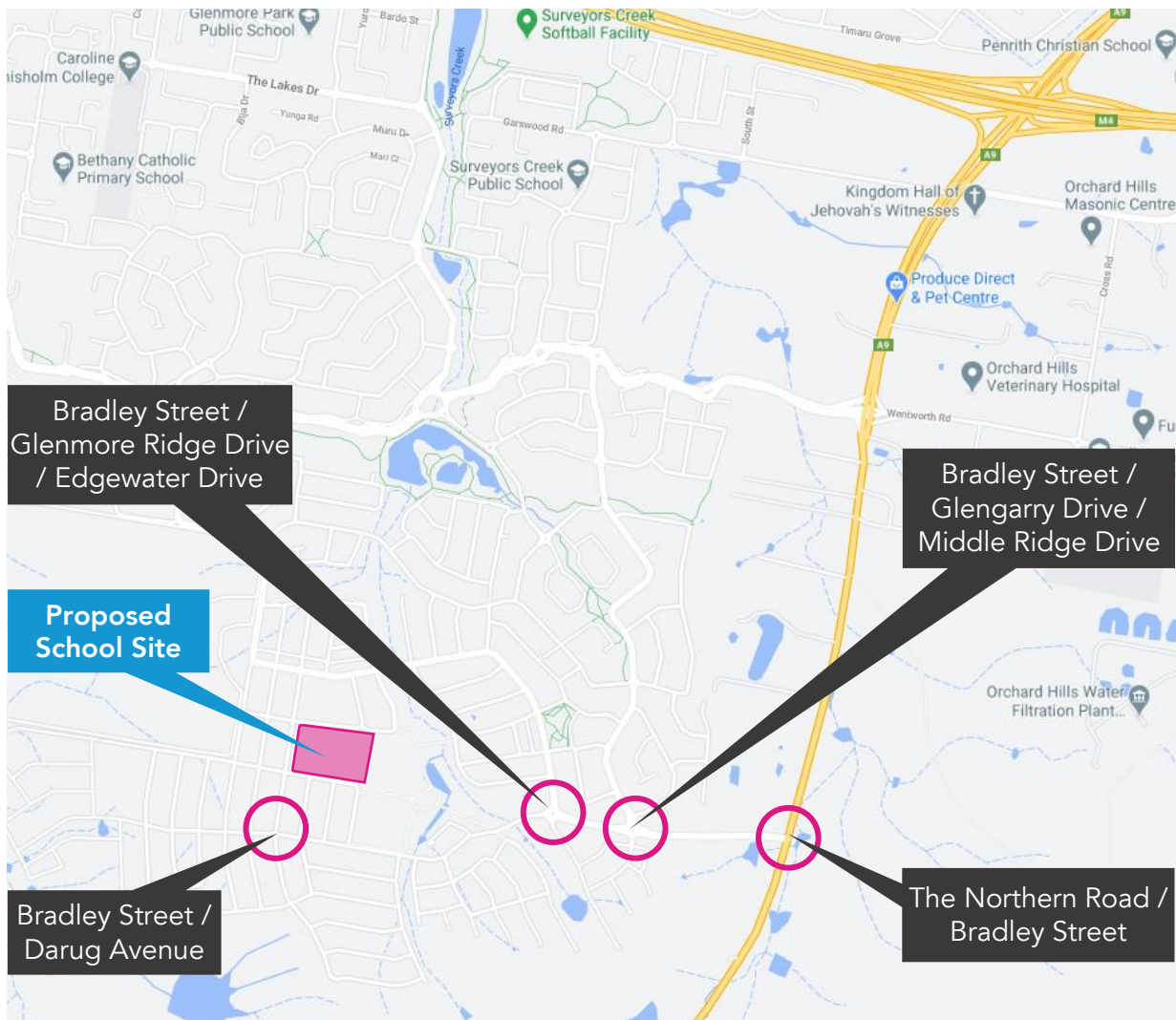


Figure 17 – Key Intersections

5.9.2 Swept Path Assessment

As discussed in Section 5.8, the largest anticipated vehicle approaching the site will be an AV. The construction trucks are to enter and exit the site via Darug Avenue. A temporary driveway and gate need to be constructed on Darug Avenue. A single driveway / gate will be used by entering and exiting trucks. The gate and driveway need to be at least 8 and 9 metres wide respectively to accommodate an AV. A swept path assessment of an AV entering and exiting the site via Darug Avenue is shown in Attachment 3.

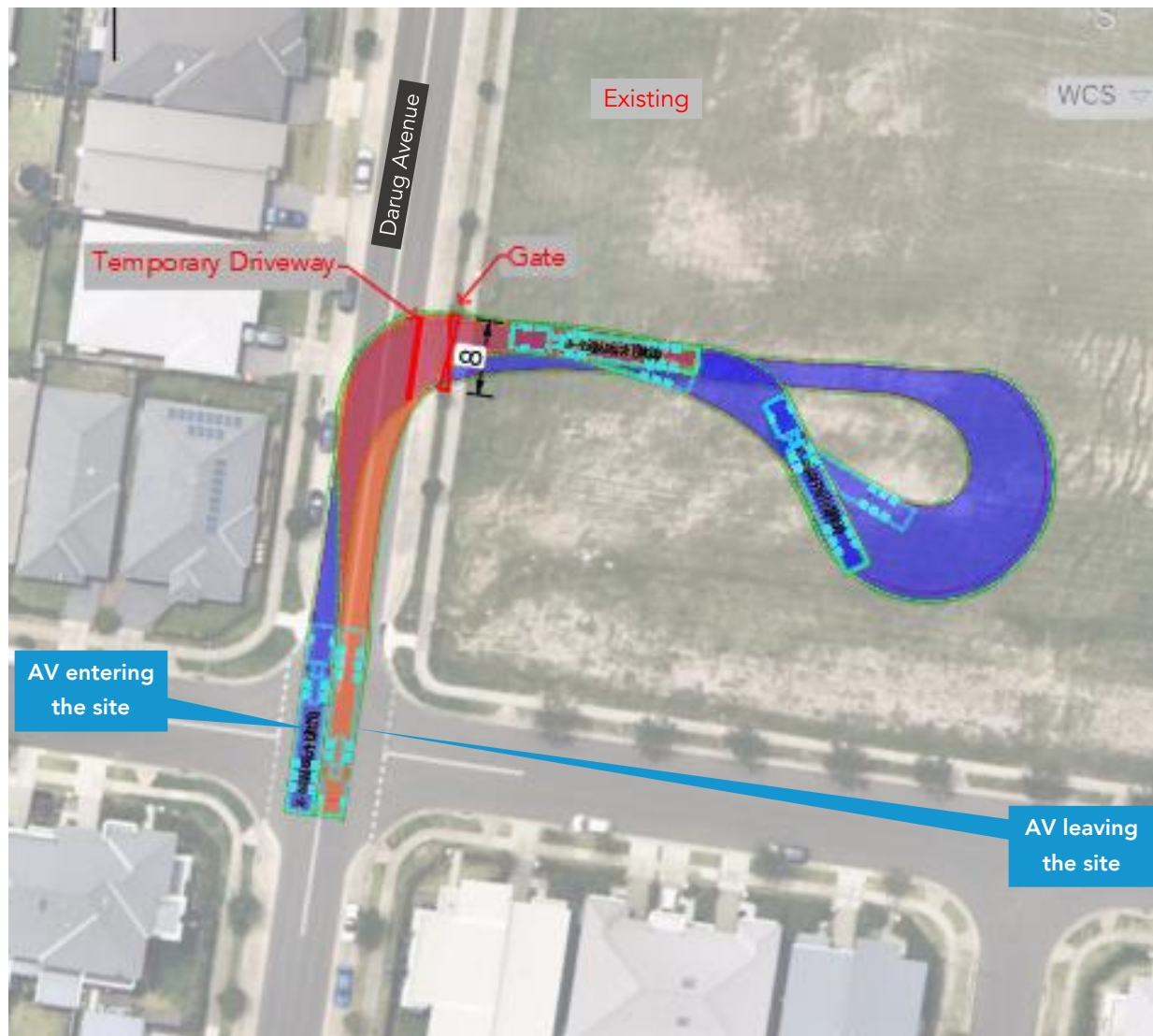


Figure 18 – AV entering and exiting the site via Darug Avenue

When entering and exiting the site the vehicles need to use the surrounding road network and intersections. For this reason, a swept path assessment has been undertaken to confirm that all required vehicle movements are possible. The following figures show AV movements at the key intersections as described in Section 5.9.1.

Any control measures are described in Section 5.10.

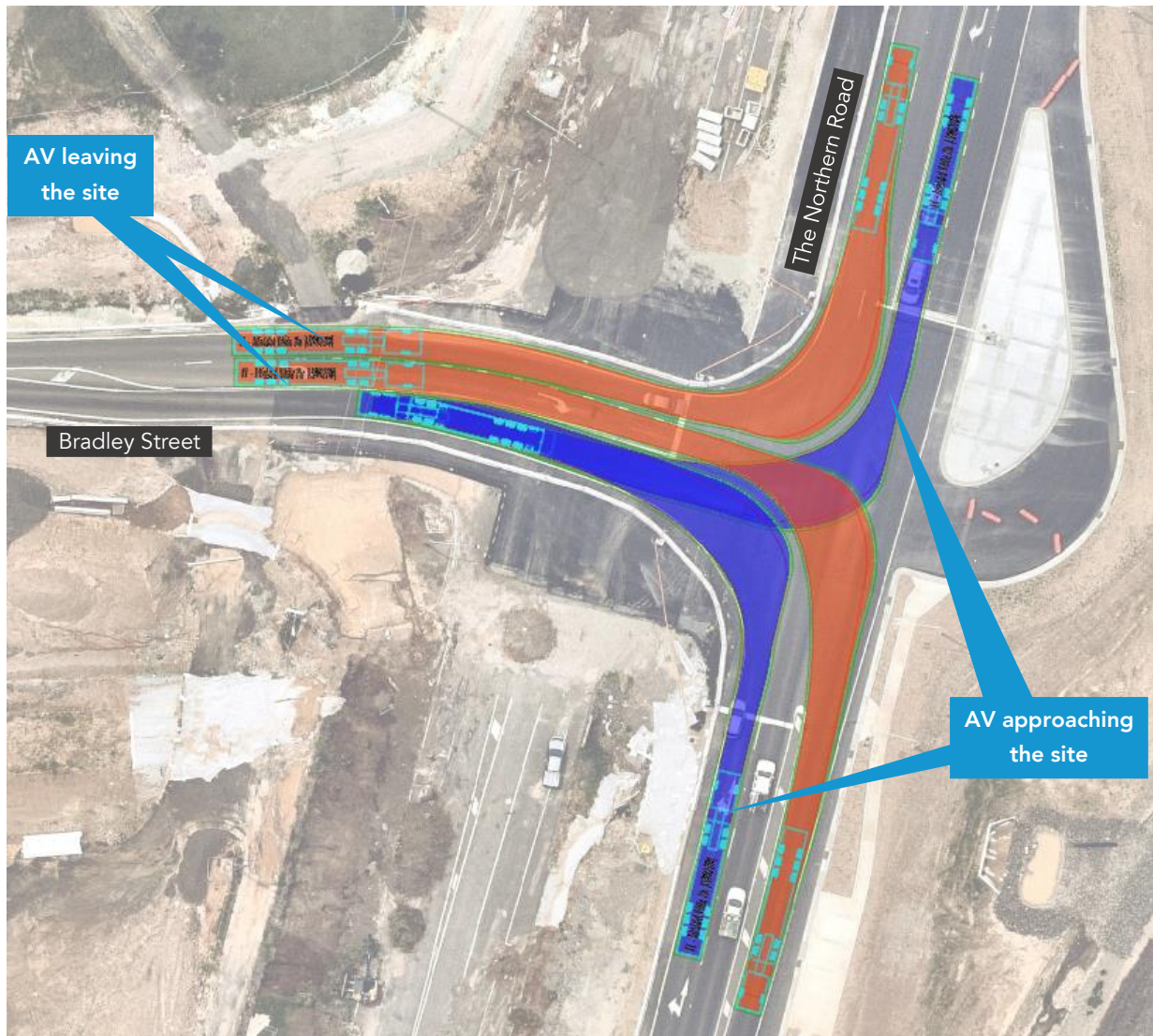


Figure 19 – AV at The Northern Road / Bradley Street intersection

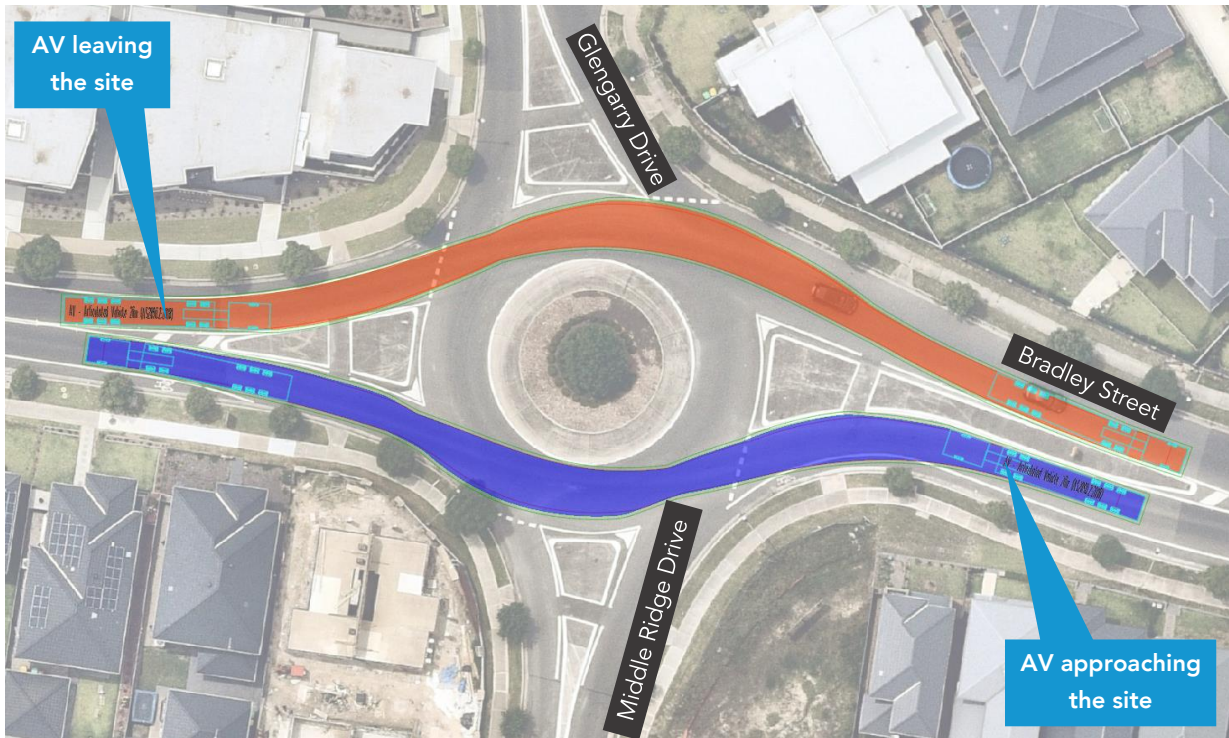


Figure 20 – AV at the Bradley Street / Glengary Drive / Middle Ridge Drive intersection

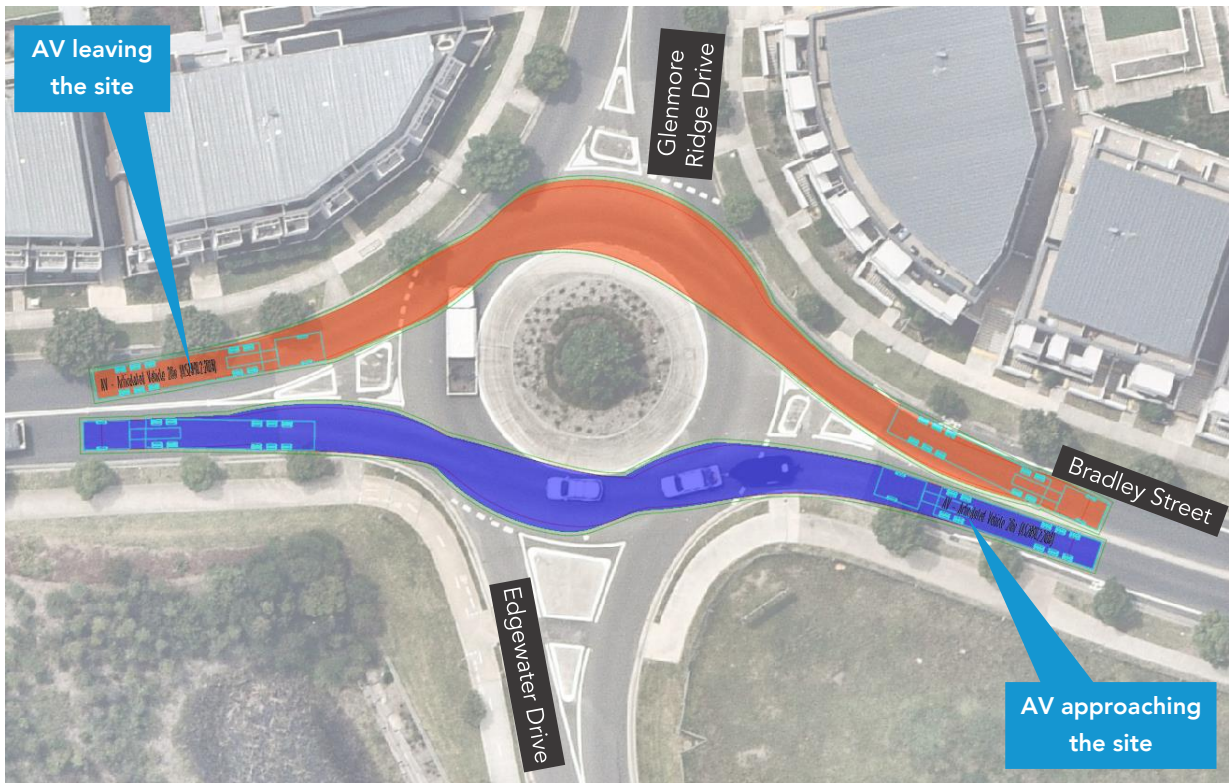


Figure 21 – AV at the Bradley Street / Glenmore Ridge Drive / Edgewater Drive intersection

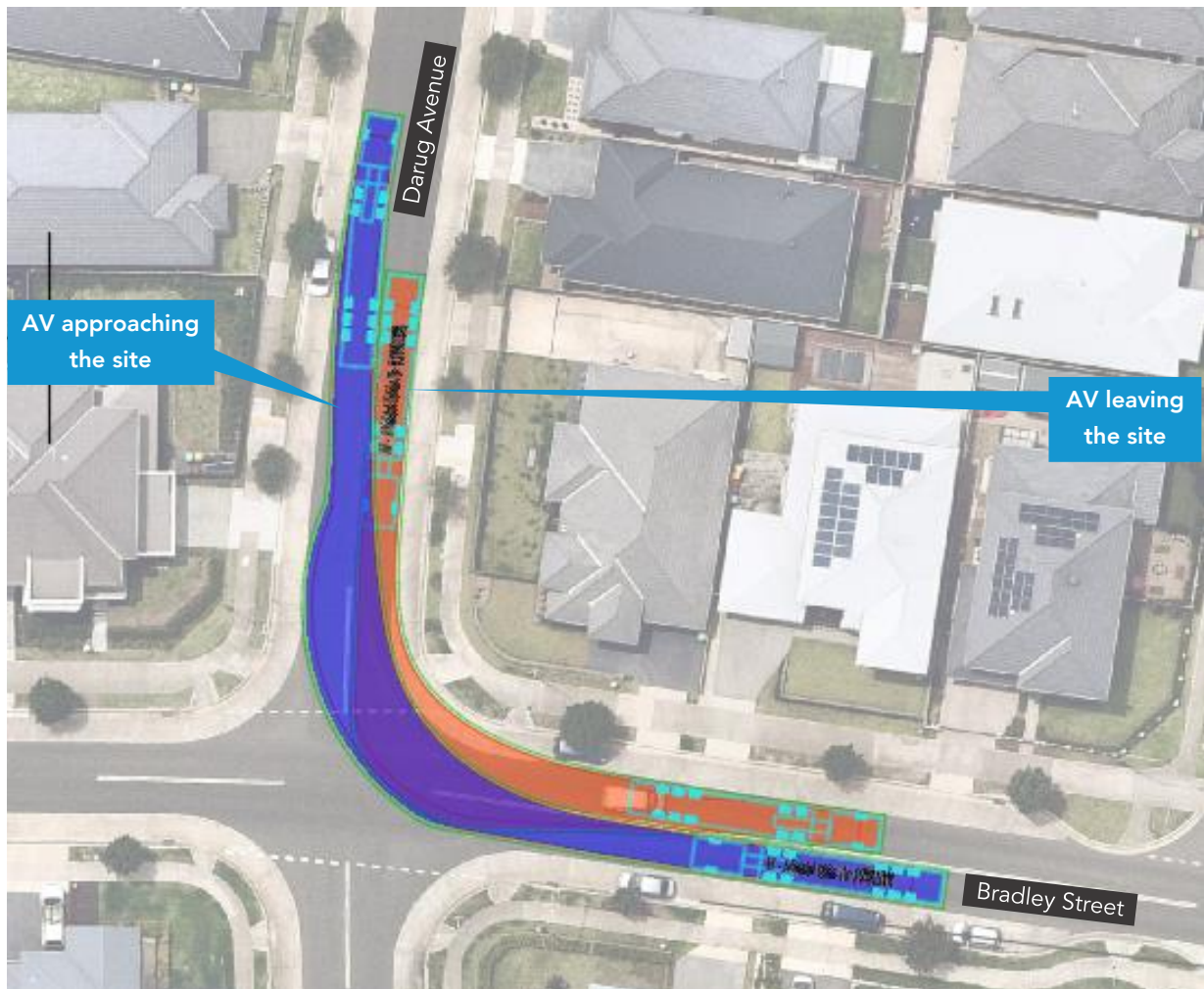


Figure 22 – AV at the Bradley Street / Darug Avenue intersection

5.10 Work Zone

No work zones are proposed during the construction of the school, as all construction activities will be undertaken within the site.

5.11 Special Deliveries

Whilst not anticipated, any oversized vehicle that is required to travel to the site will be dealt with separately, with the submission of required permits to and subsequent approval by Penrith City Council prior to any delivery.

5.12 Staff Parking

The contractor will put their usual processes in place to reduce car usage among construction staff. These measures include delivering all tools and equipment required to the site in the morning and removing it in the afternoon so that construction workers are not reliant on a car. The site personnel will be advised to carpool and use the public transport options available in the vicinity of the site (refer to Section 4.2).

All vehicles associated with the construction activities shall be parked wholly within the site. All site staff related with the works will be encouraged to use public transport. Those that drive will be able to park within the site and within the vicinity of the site.

5.13 Work Site Security

Where necessary, construction fencing around the site will be erected to provide security to the work site and protection to the general public. Prior to commencement of works the contractor will facilitate a Safety Workshop where any stakeholders shall be invited to identify site specific safety and security initiatives.

All access points are to be securely locked when construction activities are not in progress. The site perimeter fence is existing.

5.14 Plant/Equipment Management

At the commencement of construction, plant and equipment, including construction hoarding/scaffolding material, site sheds, mobile cranes and machinery will be required to be delivered to the site. The delivery and removal of plant and equipment to and from the site will be undertaken from the on-site materials handling/loading area, via the use of machine floats.

The delivery and removal of plant and equipment that requires a wide or long load vehicle will be subject to a separate application/permit and separate prior approval from Council and other relevant authorities. In order to minimise traffic disruption during the delivery of the plant and equipment, it is proposed to undertake this work during periods of reduced traffic. All plant and equipment deliveries will be carried out in accordance with Council's requirements and the NSW Police regulations.

5.15 Spoil Management

Contaminated material will be classified in accordance with the provisions of the Protection of the 'Environment Operations Act 1997 and the NSW DECC Waste Classification Guidelines, Part 1: Classifying Waste (April 2008)'.

All construction work involving the removal and disposal of asbestos cement will be undertaken by appropriately qualified contractors duly licensed with SafeWork NSW, holding either a Friable (Class A) or a Non-Friable (Class B) Asbestos Removal License whichever applies.

All vehicles leaving the site will be cleaned. The construction contractor will be responsible for locating a truck wash facility or other appropriate cleaning mechanism adjacent to the construction access driveways. Any run-off from the washing down of vehicles will be directed to the sediment control system to be located within the site.

The loading of spoil onto trucks will be carried out on-site in an approved and controlled manner. The management of the on-site materials handling/loading area and the movement of trucks on and off the site will be the responsibility of the contractor.

5.16 Staff Induction

All staff and subcontractors engaged on site will be required to undergo a site induction. The induction will include permitted access routes to and from the construction site for all vehicles, as well as standard environmental, OH&S, driver protocols and emergency procedures. Additionally, the lead contractor will

discuss CTMP requirements regularly as a part of toolbox talks and advise workers of public transport and car-pooling opportunities.

5.17 Emergency Vehicle Access

The proposed traffic control arrangements do not propose closure of any local roads. Any emergency vehicles requiring access to the project site will do so via Darug Avenue, Deerubbin Drive or Forestwood Drive.

A detailed Emergency Management Plan will be further developed by the contractor prior to site establishment works.

5.18 Pedestrian Management

Pedestrian access to and around the site is to be maintained at all times.

The entire site (and any remote work areas when applicable) will be physically separated via A-Class fencing. The access points to the site will be securely locked even when the construction activities are not occurring.

A site perimeter fence has been established and it will be fitted with appropriate public directional signage. The access points to the site will be securely locked even when construction activities are not occurring.

5.19 Access to Adjoining Properties

Access to all adjoining properties will be maintained throughout the works. The adjacent land owners will be notified of works via letter box distribution and road signage to advised of anticipated truck movements in operation with access to adjoining properties being maintained at all times.

5.20 Cumulative Effect of Adjacent Developments

During the construction phase, liaison with adjacent developments, i.e. the mixed-use development on the northern side of Deerubbin Drive, will be undertaken to mitigate the cumulative effect of the concurrent works. This will include the coordination of truck movements to prevent the combined impact of construction activities.

5.21 Occupational Health and Safety

Any workers required to undertake works or traffic control within the public domain shall be suitably trained and will be covered by adequate and appropriate insurances. All traffic control personnel will be required to hold TfNSW accreditation in accordance with Section 8 of Traffic Control at Worksites.

The comprehensive Work Health & Safety Management Plan will be provided by the Builders and shall be constantly reviewed as the design and construction methodology progress.

5.22 Maintenance of Roads and Footpaths

The roads and footpaths along the route of travel will be kept in a serviceable state at all times. Any damage arising as a result of the proposed truck movements will be treated / repaired by the principal contractor at no cost to Council.

5.23 Method of Communicating Traffic Changes

TGSs in accordance with Australian Standards (AS 1742.3 – Traffic Control Devices for Works on Roads) and TCAWS manual will advise motorist of upcoming changes in the road network.

The contractor shall each morning, prior to work commencing, ensure all signage is erected in accordance with the TGS and clearly visible. Each evening, upon completion of work, the contractor is to ensure signage is either covered or removed as required. Sign size is to be size “A”.

No deviation from the approved TGS shall be permitted, unless otherwise approved by Council and certified by an TfNSW accredited personnel.

The associated TGS road signage will inform drivers of works activities in the area including truck movements in operation.

Prior to commencement of works on site the contractor is to inform neighbouring properties of proposed works and provide site contact information by means of a letter box distribution.

5.24 Departures from TCAWS

The Technical Manual – Traffic control at work sites acknowledges that during the planning or implementation of TTM, there might be instances where the mandatory, minimum requirements contained in this Technical Manual are not achievable, or are not achieving the required level of risk management. In these instances, a variation to a requirement or a departure developed and approved in accordance with this Section, may provide a better outcome. The rationale for all such decisions must be documented, as is in Table 10.

Table 10 – Departures from TCAWS

Departure Category	Departure
<p>General departures—refers to a variation to a mandatory requirement in this Technical Manual that does not fall into a ‘sign’ or ‘device’ category</p>	<p>Distance - D has been reduced of the TGS at the Darug Avenue and Forestwood Drive intersection due to Forestwood Drive being a minor road with a give way line resulting in vehicles slowing down on approach of the intersection. Further, the sign T1-25 needs to be located on Forestwood Drive, as the truck movements occur on the adjacent road - Darug Avenue. The Distance D at the Bradley Street and Yerrand Avenue intersection has been reduced to reduce confusion.</p>

5.25 Hazard and Risk Identification

All construction projects entail a set of risks—from a transport perspective—that may need to be mitigated. Some of these hazards and risks are related to:

- moving traffic
- queued traffic
- site vehicle access and egress points
- topographical constraints

This is appropriate for the construction of the New Primary School in Mulgoa Rise because of the following:

- Some pedestrian activity is expected as the site is located adjacent to the yet to be constructed mixed-use development north of Deerubbin Drive. The Construction vehicles will cross a pedestrian path when entering the site via the construction gate, thus may have potential conflicts with pedestrians.

Risk Matrix Reference: R1

- The distance D has been reduced of the TGS at the Darug Avenue and Forestwood Drive intersection. This is to reduce confusion potentially arising from a misleading location of the T1-25, though the warning distance along Forestwood Drive is reduced.

Risk Matrix Reference: R2

- Whilst TGSs have been designed and attached as part of this report, this is in combination with other constraints associated with the site location e.g. street sign clutter, parked vehicles and moderate pedestrians volumes may reduce visibility.

Risk Matrix Reference: R3

As there is no guarantee that the contractor responsible for implementing the TGSs are fully aligned with the intention of this traffic report, this remains a risk to be assessed. As such, a risk matrix has been prepared as shown in Table 11 using the following definitions:

Risk Rating

- Very High (VH)
- High (H)
- Medium (M)
- Low (L)

Consequence

- Insignificant: Illness, first aid or injury not requiring medical treatment. No lost time.
- Minor: Minor injury or illness requiring medical treatment. No lost time post medical treatment.
- Moderate: Minor injuries or illnesses resulting in lost time.
- Major: 1 to 10 serious injuries or illnesses resulting in lost time or potential permanent impairment\
- Severe: single fatality and/or 11 to 20 serious injuries or illnesses* resulting in lost time or potential permanent impairment.
- Catastrophic: multiple fatalities and/or more than 20 serious injuries or illnesses* resulting in lost time or potential permanent impairment.

Likelihood

- Almost certain: expected to occur multiple times (10 or more times) during any given year
- Very likely: expected to occur occasionally (1 to 10 times) during any given year.
- Likely: expected to occur once during any given year.
- Unlikely: expected to occur once every 1 to 10 years.
- Very unlikely: expected to occur once every 10 to 100 years.
- Almost unprecedented: not expected to occur in the next 100 years.

Table 11 – Risk Matrix

		Consequence					
		Insignificant C6	Minor C5	Moderate C4	Major C3	Severe C2	Catastrophic C1
Likelihood	Almost certain L1	R1, R2					
	Very likely L2			R3			
	Likely L3						
	Unlikely L4						
	Very unlikely L5						
	Almost unprecedented L6						

Some recommended risk mitigation measures include:

- Council to monitor the implementation of the Traffic Guidance Schemes (TGSs). As necessary, the appropriate officer visiting the site shall have the authority to enforce compliance with illegal parking. This will also allow documentation of any form of illegal parking or parking contrary to this CTMP.
- The use of traffic controllers around the site entry gate to ensure pedestrian and traffic movements are not affected by the vehicles entering and exiting the site. Traffic Controllers are NOT to stop traffic on the public street(s) to allow trucks to enter or leave the site. They MUST wait until a suitable gap in traffic allows them to assist trucks to enter or exit the site. The Roads Act does not give any special treatment to trucks leaving a construction site - the vehicles already on the road have right-of-way.

5.26 Driver Code of Conduct

All heavy vehicle drivers are required to follow the ingress and egress routes in a “forward in, forward out” manner as specified in Section 5.8, whilst adhering to all road rules and regulations. This is essential to minimise the impacts of earthworks and construction on the local and regional road network. Should there be a Traffic Guidance Scheme (TGS) required to manage construction activity, all construction vehicles entering or exiting from the site shall operate under the direction of an TfNSW accredited traffic controller at all times; this will also minimise conflicts with other road users.

Furthermore, construction traffic activity shall only occur within the permitted hours of work (see Section 5.5) to minimise road traffic noise. All demolition and construction vehicles (excluding worker vehicles) are to be contained wholly within the site and must enter the site completely before stopping.

A Driver Code of Conduct leaflet will be prepared for distribution to truck drivers. This code of conduct will be advised to all drivers engaged on site at the staff induction or will be included within subcontract documents, as some of the drivers (concrete trucks, delivery drivers, etc) will not be inducted on-site.

5.27 Contact Details for On-Site Enquiries and Site Access

Thomas Archibald

Site Supervisor

0437 324 155er

6. Traffic Guidance Schemes

The Traffic Guidance Scheme (TGS) shown in Attachment 4 outlines the proposed traffic management to inform road users of the changed traffic conditions in the vicinity of the works site. The TGS must be set out in accordance with Issue 6.0 of the Traffic control at work sites Technical Manual, November 2020 (TCAWS).

It has been demonstrated that drivers become complacent to roadwork signage when it is misused, left out or not appropriate for the works. This includes irrelevant roadwork signage left out during aftercare or the use of PREPARE TO STOP (T1-18) or traffic controller symbolic (T1-34) sign while the traffic control is not present. Not only does this affect the credibility of the work site, but it can also lessen the efficacy of the signs when next encountered by the drivers.

It is noted that any changes to the existing parking restrictions will require a minimum fourteen (14) days notification to adjoining property owners prior to the implementation of any temporary traffic control measures.

Any revisions or additional TGSs must be prepared by a PWZTMP qualified person upon engagement of the traffic management contractor and prior to commence of works on site.

6.1 TGS Verification

The TGS has been approved as being appropriate for use at the work site. Site confirmation must be undertaken via the completion of the TGS verification.

A TGS verification must be undertaken to confirm the selected or designed TGS is fit for purpose. A TGS verification must be completed in accordance with Section 8.1.2 TGS verification by an ITCP or PWZTMP qualified person. TGS verification must include an inspection of the work site where the TGS will be implemented.

6.2 TGS Approval

The PWZTMP qualified person who has designed or modified the relevant TGS has approved the TGS for use. Approval of the TGS includes:

- Review of the relevant TMP, risk assessment and associated TTM specific documentation;
- Design, redesign or modification of the TGS must be in accordance with the requirements of TCAWS;
- Confirmation that the TGS provides the relevant information for the ITCP person to safely implement on-site.

The one up manager of the PWZTMP qualified person has approved the TGS, including:

- Any non-standard or unaccepted signs or devices;
- Any departures from the requirements of TCAWS;
- If a manual traffic controller is proposed for use.

7. Summary

This CTPMP has been prepared to outline the construction traffic measures to improve site safety to the public and workers during the construction process.

With the measures described in the CTPMP in place, the construction activity is anticipated to have minimal disruption to the daily activities within the vicinity of the site.

It is envisaged that this document will be reviewed during the construction phase and amended if required, due to changes in design, TfNSW, Councils or any other authority requirements.

Attachment 1 CV of a SafeWork NSW Qualified and Experienced Person

Dan Budai – Senior Team Leader – ptc.

Academic Qualifications

- Master of Engineering Management (2020)
- Bachelor of Engineering (Civil) (1996)
- Associate Diploma in Engineering (Civil) (1992)

Professional Qualifications

- Member of the Australian Institute of Traffic Planning and Management
- Member of Institute of Public Works Engineering Australia
- SafeWork NSW Card No. TCT0016805 (PWZ)



Fields of Special Competence

- Network and operational performance modelling
- Traffic and transport impact assessment
- Traffic engineering
- Traffic management
- Road design
- Vehicle manoeuvring modelling
- Road Safety

Experience

Dan is an efficient and resourceful traffic engineer with 28 years’ experience in private and public sector transport planning. He has expertise in the coordination and delivery of major transport infrastructure projects. With proven success in delivering high quality results and meeting deadlines, Dan is experienced in influencing successful outcomes through networking, relationship development, and negotiation.

Dan began his Traffic Engineering career in local government at Gosford City Council in 1992 where he was responsible for traffic investigations and the design and installation of new and existing traffic facilities in an efficient, safe and integrated traffic environment for vehicles, pedestrians and other road users.

From 1999-2014 Dan added a depth and breadth of experience working at RTA/RMS, managing the development, implementation and operation of the Transport Management Centre’s Incident Response Plans as well as managing the planning of Special Events on the NSW road network; delivering reliable operational assessments for major road projects in NSW that were capable of being used for major NSW Government investment decisions; and designing and implementing the journey information quality framework to support business decisions that achieved RMS business objectives.

Dan relocated to Newcastle in 2014 and contributed to the development and implementation of City of Newcastle’s Delivery Program, Operational Plan and the City Roads & Infrastructure Business Plan as a key member of the Infrastructure Planning Services Unit for three years until returning to Sydney in 2017.

Between 2017 and 2020, Dan was employed in the private sector as a Senior Consultant and during this time provided a broad range of transport solutions based on quantitative data and transport related technologies to obtain superior outcomes for clients and key stakeholders. His responsibilities covered all types of development including industrial hubs, inner-city mixed-use developments, new residential subdivisions, school Master Plans and major commercial developments. He worked collaboratively with clients, authorities and key stakeholders to ensure effective, economic and sustainable outcomes.

Dan joined the ptc. team during 2020 to lead the Traffic Engineering team and broaden its traffic modelling services.

Attachment 2 Evidence of Consultation with Council and TfNSW

11 November 2021



Matthew Metlege
School Infrastructure NSW
Level 8
259 George Street
Sydney
NSW, 2000

Dear Matthew

1. New Primary School in Mulgoa Rise – 1-23 Forestwood Drive – Glenmore Park

ptc. has been engaged by Richard Crookes Construction on behalf of School Infrastructure NSW (SINSW) to address comments received following the submission of the State Significant Development Application (SSDA) for the proposed development of a new primary school located at 1-23 Forestwood Drive in Glenmore Park. The Transport and Traffic Assessment dated 20 August 2021 and submitted as part of the SSDA was prepared by **ptc.**

This letter has been prepared in response to the following documents:

- Letter dated 1 October 2021 from Penrith City Council (Council),
- Letter dated 5 October 2021 from Transport for NSW (TfNSW),
- Letter dated 12 October 2021 from the Department for Planning, Industry & Environment.

The individual items are addressed below.

2. Council Comments

2.1 Dedicated School Bus Service

Council Comment

The proposed use of the existing bus stops each side of Darug Street and the existing public bus route services is undesirable. A dedicated school bus service with dedicated bus service drop off and pick up area fronting the school is recommended with no student crossing of Darug Avenue or other roads to access buses. This should be reflected via an amended proposal.

Response

The existing bus stops on Darug Avenue is currently being serviced by only one bus (794 bus service). The frequency of the bus service is 27-73 minutes during the school peak hours. As the existing bus frequency is very low, the bus stops are able to accommodate additional bus services if the timetables are managed by departure / arrival times. Therefore, a dedicated bus drop-off area only for the school is not seen as required.

It is noted that this was not requested at any previous Transport Working Group meetings.

3.26 Buses for School Events

TfNSW Comment

4.3 – How many large buses are anticipated for school events? It is unclear if the buses can be accommodated for in the proposed bus zones without impacting the safe operation of the crossing.

Response

There is a bus atop on the eastern site of Darug Avenue, and an approximately 80m long 15-minute parking zone is proposed on the school frontage along Darug Avenue adjacent to the bus stop. Either the existing bus stop or the 15-minute parking zone can easily accommodate buses required for school events.

3.27 Update STP

TfNSW Comment

Prior to occupancy, the Proponent shall update the School Travel Plan to address the following items, in consultation with TfNSW:

- j. Provide a copy of the Program Evaluation Report to TfNSW;
- k. Provide a final version of the Travel Access Guide to TfNSW.

Response

Noted; The School Transport Plan will be updated and submitted in due course.

3.28 Preliminary Construction Traffic and Pedestrian Management Plan

TfNSW Comment

5.6.2 / Figure 23 – traffic controllers would be required to stop traffic in both directions on Darug Avenue, the plan should be updated to reflect this;

Response

A truck turning right into the site and a truck exiting the site will need to give way to the southbound traffic, which does not create any conflicts. Nevertheless, a traffic controller can be provided on the northern side as requested.

The CTMP can be updated at the Construction Certificate stage.

3.29 Truck Turning

TfNSW Comment

5.6.2 / Figure 24 – Truck turning right requires to occupy the left side of the road, however it is still required to give way to vehicles travelling eastbound. This will cause issues as the truck would either be obstructing the entire westbound carriageway as it waits for an appropriate gap, or the left side of the road, which causes further issues for other traffic navigating this intersection. Traffic would be required to be controlled on all legs, as truck coming out of Darug Avenue is required to still give way to vehicles travelling east along Bradley Street. This arrangement is not supported and TfNSW requests that smaller construction vehicles are used to improve safe outcomes for road users.

Response

The Bradley Street / Darug Avenue intersection discussed in the preliminary CTMP has been shown to accommodate 2 trucks travelling simultaneously. Based on the TfNSW comment, it is proposed that these two turn movements do not overlap, which can be controlled by traffic controllers.

The truck exiting Bradley Street and turning right into Darug Avenue will need to give-way to the eastbound vehicles, which is a standard approach and as such, no conflict is seen between the vehicles travelling eastbound and the truck turning right. The right turn movement into Darug Avenue has been amended and a traffic controller has been provided to prepare the southbound traffic to stop.

For the truck exiting Darug Avenue and turning left into Bradley Street, the truck will need to give-way to the eastbound vehicles, which is a standard approach. It is noted that the truck's left turn movement creates conflict with the westbound vehicles on Bradley Street; however, this will be managed by a traffic controller and is not unusual. The construction truck driver will be informed about the required traffic manoeuvres along the local roads, and therefore, this is not considered an issue.

This was agreed during the TWG meeting held on the 3rd November 2021.

The CTMP will be updated accordingly at the Construction Certificate stage.

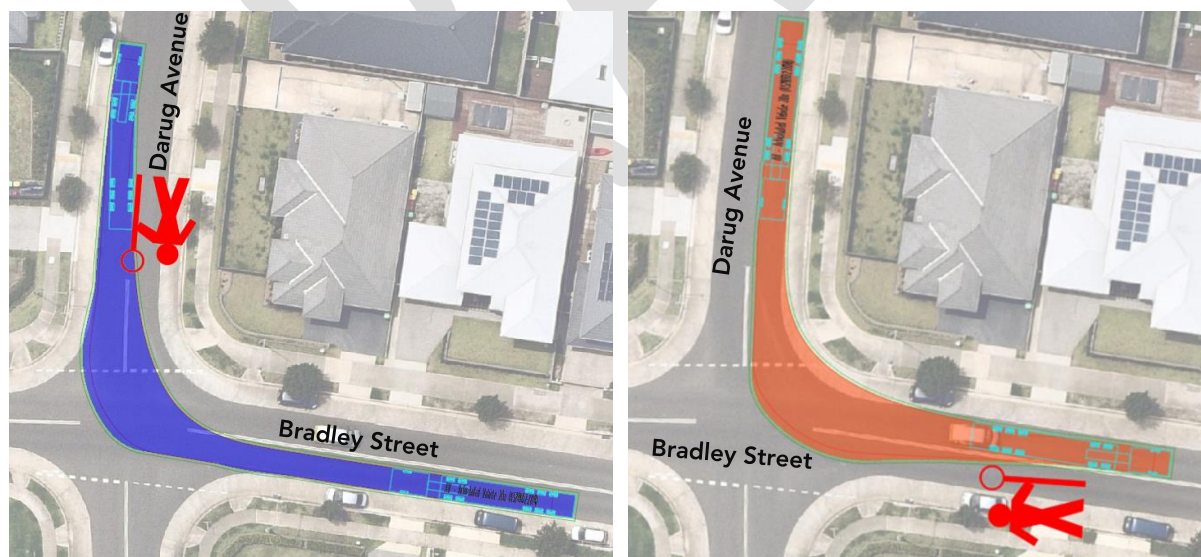


Figure 25 – AV Swept Path at Bradley Street / Darug Avenue intersection

4. DPIE Comments

4.1 Staff Parking

DPIE Comments

Further consideration should be given to the provision of additional staff parking on site given the limited availability of public transport opportunities providing connections from outside of the school catchment. It is noted that the area identified as 'future carpark expansion' could potentially be used.

Response

SINSW has recently put processes in place to ensure that all school developments investigate measures that can be implemented to increase active and public transport and decrease car usage for both staff and students.

A School Transport Plan has been prepared outlining measures to promote active and public transport and carpooling. SINSW is committed to implementing these plans across all new developments; A travel plan coordinator will be employed to coordinate the implementation of these measures and monitor the mode shift.

It is proposed to provide 17 car parking spaces on-site, which accounts for 63% of staff. This provision is to promote active transport and a means to shift towards alternative transport modes.

The proposed school development is a greenfield site with no pre-existing travel behaviours. Therefore, by implementing the School Transport Plan low private car usage can be promoted from commencement of operations.

4.2 Travel Mode Comparison to Other School

DPIE Comments

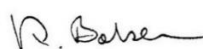
All comments provided by TfNSW and Council are to be addressed in the RtS as previously advised. However, the Department reinforces the importance of undertaking a comparison of other schools

Response

Noted. For responses to travel mode and comparison to other schools refer to Section 2.24.

We trust that this letter assists in the assessment of the application. For any further enquiries, please contact our office on (02) 8920 0800.

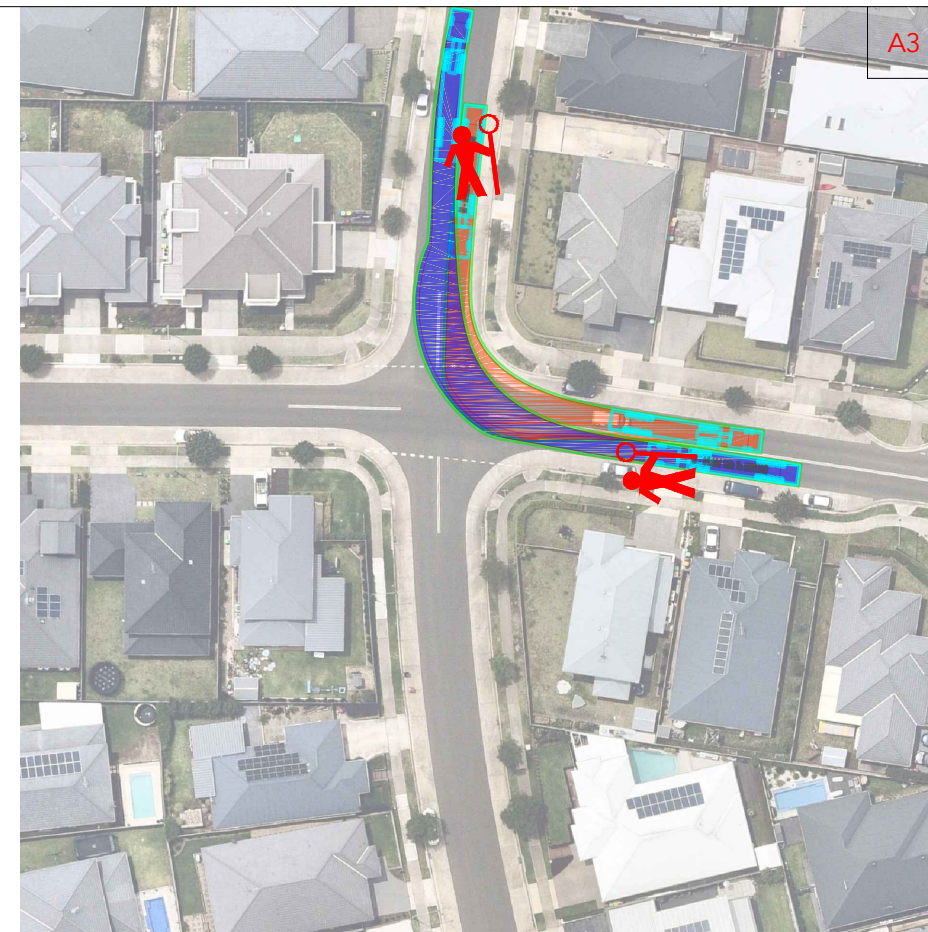
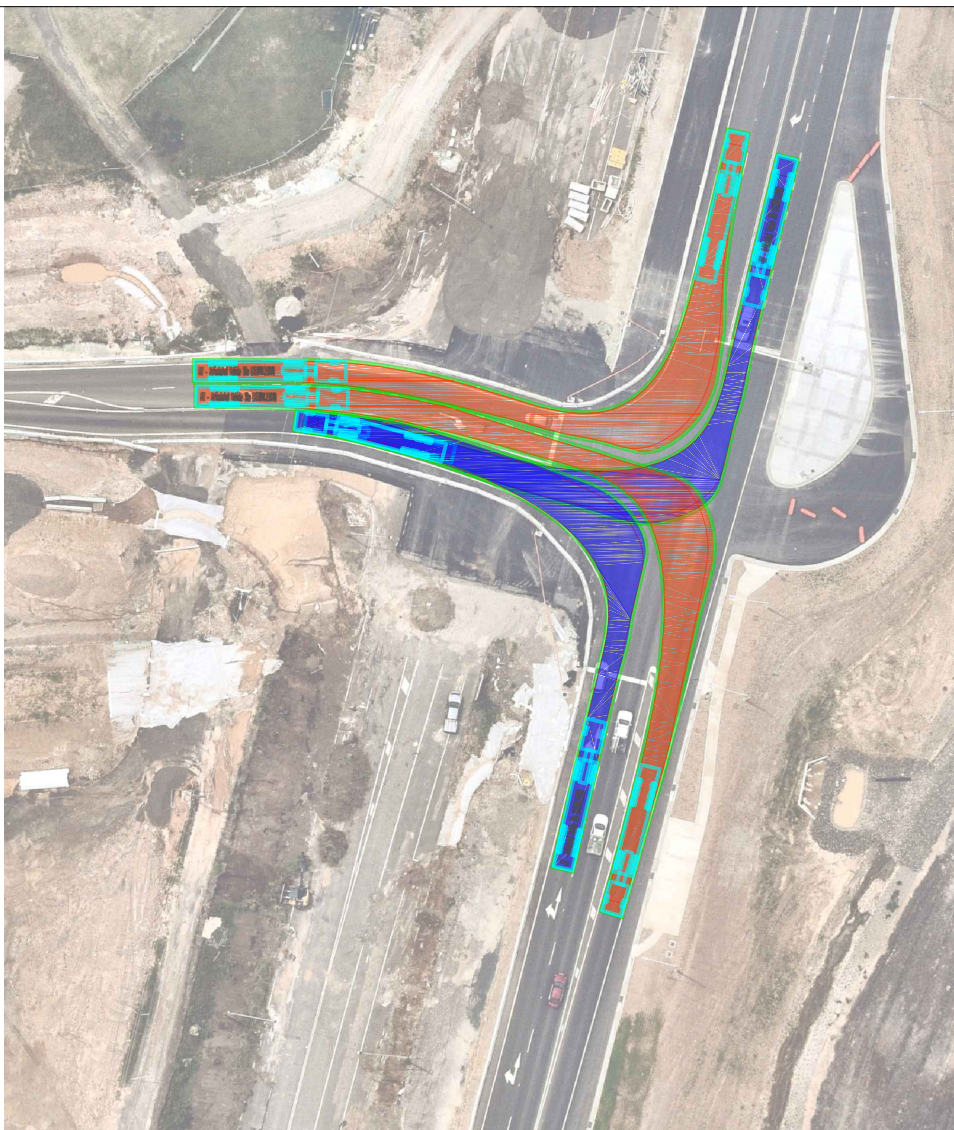
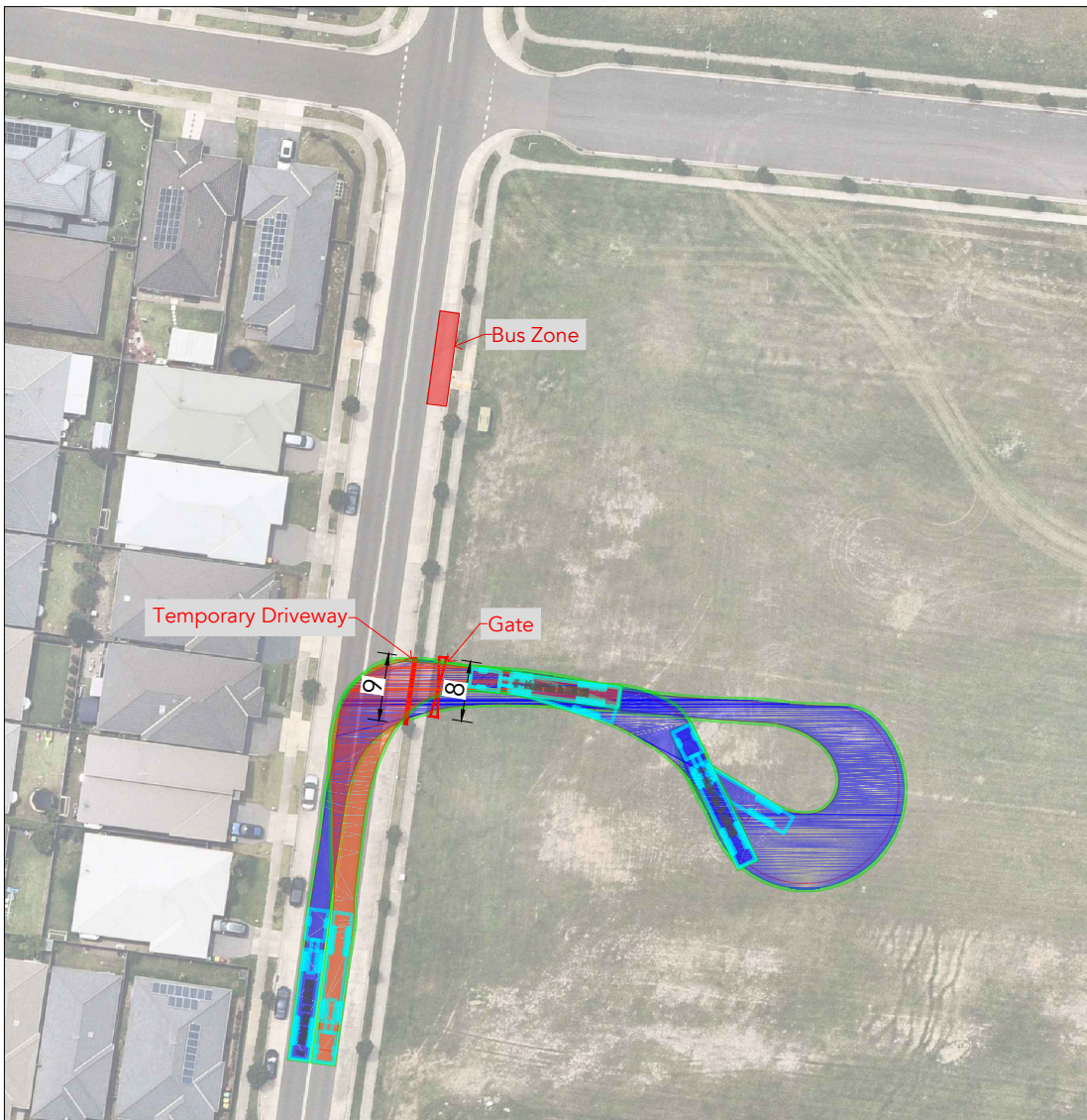
Kind regards,



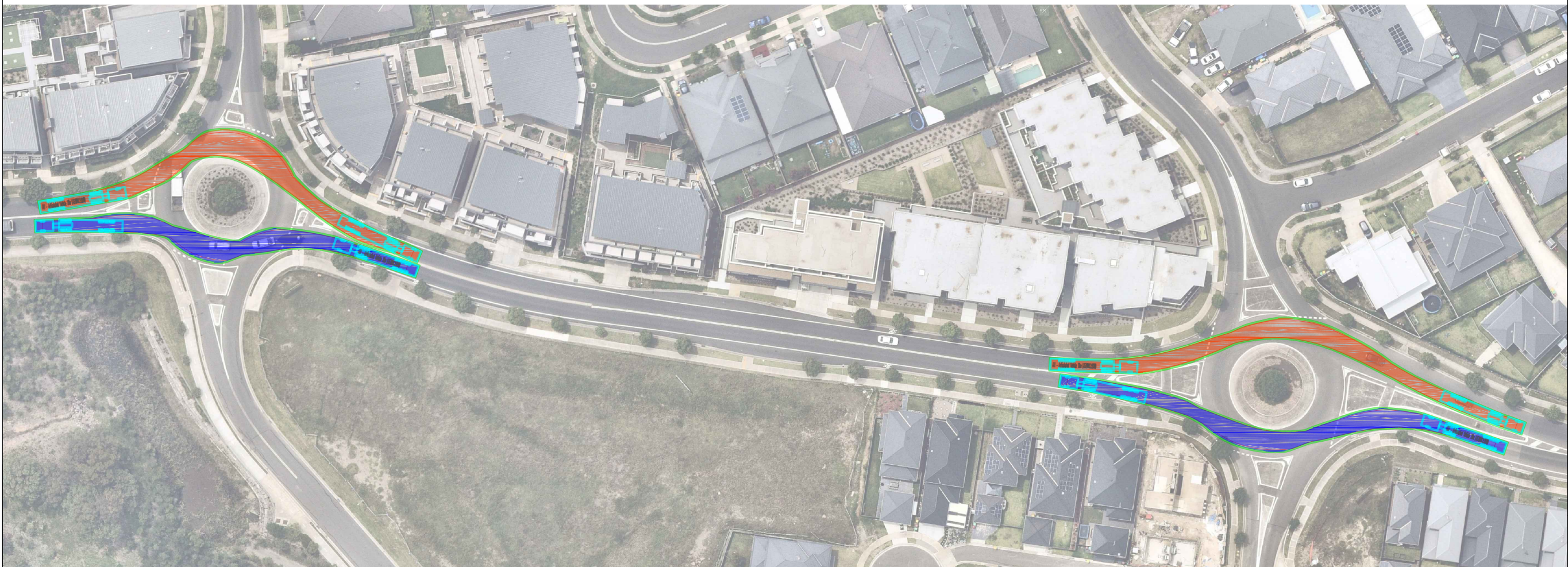
Kasia Balsam
Team Leader

Document Control: Prepared by PS on 9 November 2021. Reviewed by KB on 11 November 2021.

Attachment 3 Vehicle Swept Paths



A3



P1	13/01/2022	FOR INFORMATION	PD	KB
REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED

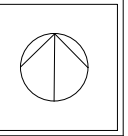
PROJECT
MULGAO RISE PUBLIC SCHOOL

DRAWING TITLE
SWEEP PATH ANALYSIS

DRAWING KEY

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

CLIENT SINSW
DRAWING # PTC-001
PROJECT # KB-2840
SCALE 1 : 100 @ A3



FINAL
REV P1

Attachment 4 Traffic Guidance Scheme



The distance D has been adjusted within excepted tolerances based on site constraints and given the short distances between the local intersections.

The distance D along Forestwood Drive, Bradley Street and Yerrang Avenue have been reduced based on site constrains and to minimise confusion.

Comments A3

- SITE NOTES:**
- S1. Maintain pedestrian access along formed pathway around the site.
 - S2. Work site to be fenced to prevent unauthorised access.
 - S3. Darug Avenue, D=40
Forestwood Dr, D=18
Bradley St, D=30
- GENERAL NOTES:**
- G1. All signs to be clearly visible throughout the works and monitored. Signs can be mounted if required on posts to be visible above parked cars. Signs to be coordinated on site to ensure they are clearly visible.
 - G2. All signs to be size A.
 - G3. All signs to be visible when workers are in the area and covered when workers are not present.
 - G4. Signs to be in accordance with TfNSW Traffic Control at Worksites (TCAWS) Manual and AS1742.3 Traffic Control for Works on roads.
 - G5. TfNSW/Council approvals to be obtained prior to implementation.
 - G6. This TGS is based on TCAWS Manual and is to be set up by qualified traffic controllers (Yellow card). Any alterations on site to this TGS is to be documented and rerecorded by qualified personnel with a Red/Orange card.

Road Name:	DARUG AVENUE
Location of Work:	DARUG AVENUE
Suburb:	GLENMORE PARK
Map Reference:	Neamap
Duration:	Approximately 10 months
Road Configuration:	1 LANE
Speed Limit:	50km/h
ROL Approved:	NA
SZA Approved:	NA

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
P3	10/3/22	FOR REVIEW	HL	DB
P2	11/2/22	FOR REVIEW	AP	DB
P1	12/1/22	FOR REVIEW	AP	DB



PROJECT
MULGOA RISE PUBLIC SCHOOL

DRAWING TITLE
Traffic Guidance Schemes (TGSs)

Designed by: HL - SafeWork NSW Card No TCT1020401(PWZ)
Requested by: DB - SafeWork NSW Card No TCT0016805(PWZ)
Approved by: DB - SafeWork NSW Card No TCT0016805(PWZ)
Delegation: Work Manager

CLIENT SINSW
DRAWING # TGS-002
PROJECT # KB-2840
SCALE 1:500

FINAL

REV P3



- SITE NOTES:**
 S1. Maintain pedestrian access along formed pathway around the site.
 S2. Work site to be fenced to prevent unauthorised access.
 S3. Darug Avenue, D=40
 Forestwood Dr, D=18
 Bradley St, D=30
- GENERAL NOTES:**
 G1. All signs to be clearly visible throughout the works and monitored. Signs can be mounted if required on posts to be visible above parked cars. Signs to be coordinated on site to ensure they are clearly visible.
 G2. All signs to be size A.
 G3. All signs to be visible when workers are in the area and covered when workers are not present.
 G4. Signs to be in accordance with TfNSW Traffic Control at Worksites (TCAWS) Manual and AS1742.3 Traffic Control for Works on roads.
 G5. TfNSW/Council approvals to be obtained prior to implementation.
 G6. This TGS is based on TCAWS Manual and is to be set up by qualified traffic controllers (Yellow card). Any alterations on site to this TGS is to be documented and rerecorded by qualified personnel with a Red/Orange card.

The distance D has been adjusted within excepted tolerances based on site constraints and given the short distances between the local intersections.

The distance D along Forestwood Drive, Bradley Street and Yerrang Avenue have been reduced based on site constrains and to minimise confusion.

Road Name:	DARUG AVE/BRADLEY ST
Location of Work:	DARUG AVE/BRADLEY ST
Suburb:	GLENMORE PARK
Map Reference:	Nearmap
Duration:	Approximately 10 months
Road Configuration:	2 LANE
Speed Limit:	50km/h
ROL Approved:	NA
SZA Approved:	NA

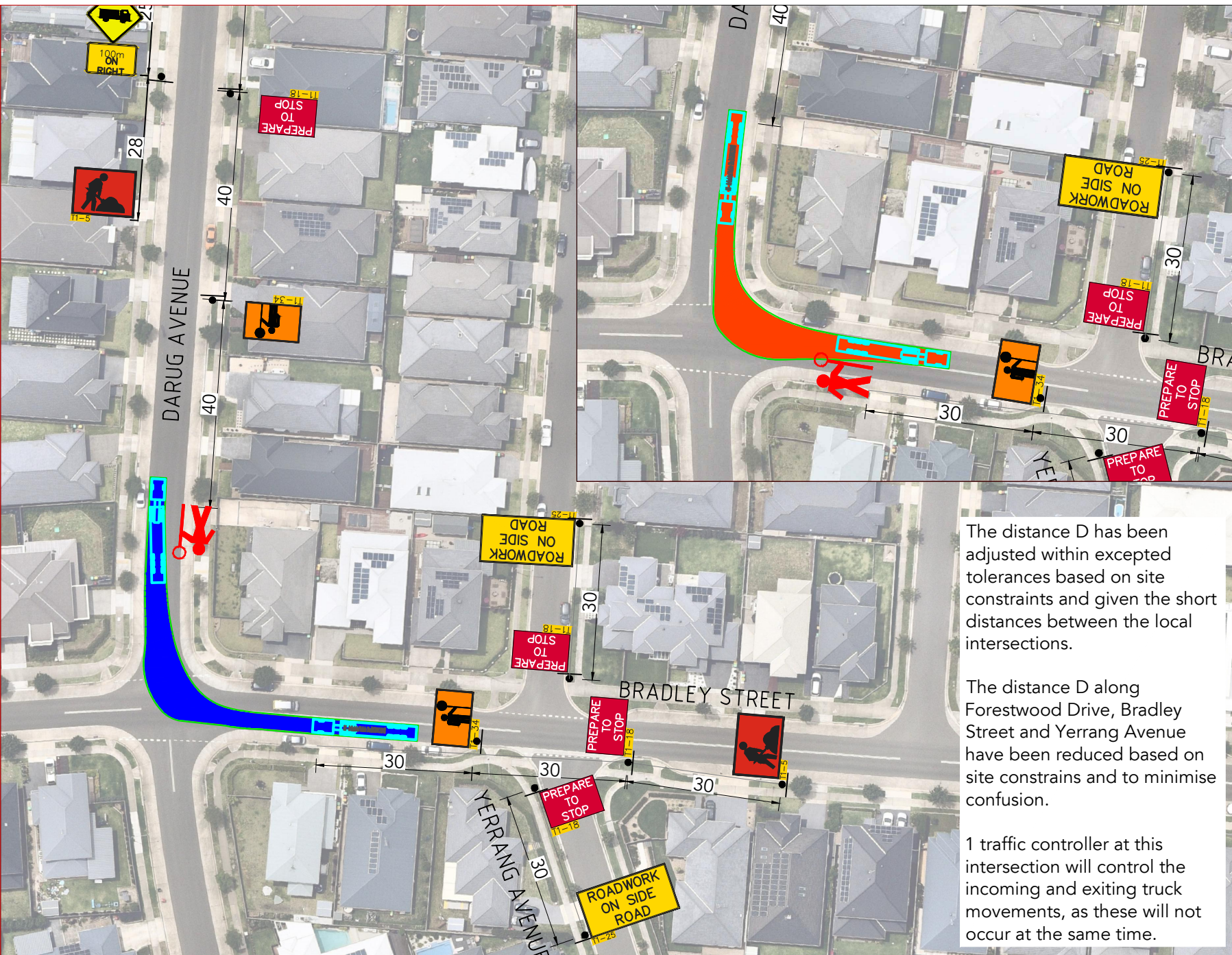
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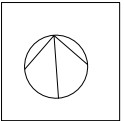
1 traffic controller at this intersection will control the incoming and exiting truck movements, as these will not occur at the same time.

Comments		A3
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Speed Limit:	50km/h
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SZA Approved:	NA

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North Sydney NSW 2060
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ptcconsultants.co

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