Transport and Accessibility Impact Assessment

John Palmer Public School

SSD-23330227

Prepared for School Infrastructure NSW

14 January 2022

Revision 2

211395

Executive Summary

This Transport and Accessibility Impact Assessment (TAIA) assesses the traffic and transport impacts and design elements of the proposed John Palmer Public School redevelopment. The project seeks to cater for a permanent student capacity of 1,012 students, with an estimated 59 staff employed on the site.

The overall transport strategy for the proposed development is as follows:

- **Pedestrians**
  - Provide a new pedestrian entry to Jetty Street
  - Provide a new raised zebra crossing on Jetty Street (subject to separate Council approval)
- **Cyclists**
  - Provide new bicycle and scooter storage for students
  - Provide new bicycle storage and end-of-trip facilties for staff
- **Public transport**
  - No change; existing provisions to be retained
  - Usage of public transport to be encouraged through School Transport Plan and improved through ongoing consultation and governance measures
- **Freight & deliveries**
  - Consolidated in the modified staff car park, separated from pedestrian areas
- **Kiss & ride**
  - No change; existing provisions to be retained
  - Usage of kiss & ride to be discouraged through School Transport Plan and improved through ongoing consultation and governance measures
- **Car parking**
  - Existing car park to be modified to allow for waste collection; capacity reduction of 2 spaces
  - Final parking provision of 35 spaces equates to approximately 0.6 spaces per staff member

This strategy has been proposed to, and discussed with, both Blacktown City Council and Transport for NSW during ongoing liaison through a Transport Working Group for the project. The project team has met with this group three times since July 2021 and the transport strategy for the project has been refined during that period in response to feedback received.

Pedestrian improvements are provided to the south of the School, in the form of a new pedestrian entry and a raised zebra crossing (subject to separate Council approval). These works will improve the pedestrian accessibility of the site and improve pedestrian safety at one of the primary routes for vehicular kiss & ride traffic.

Cyclist improvements include expanding the existing bicycle and scooter storage, which could allow for up to 11% and 8% mode share for students respectively. Additionally, end-of-trip facilities in the form of 1 shower and change area, 1 accessible shower and change area, and 10 lockers are to be provided for staff along with dedicated bike storage facilities.

No change is proposed to public transport infrastructure or accessibility. While public transport usage is generally minimal for primary school students, this may be an attractive option for staff or parents. Future consultation will be required with Transport for NSW during the life of the project, particularly if catchment boundaries change in the future.

No change is proposed to kiss & ride infrastructure or function. The local road network could accommodate the additional traffic volumes anticipated as a result of the project, however this activity should not be encouraged under a sustainable and safe transport strategy. The pedestrian and cyclist improvements being

provided as part of this project, and ongoing management measures under a School Transport Plan, should assist in reducing private vehicle volumes around the site.

Car parking is considered the lowest priority mode in accordance with state government policy such as the Road User Space Allocation Policy (TfNSW, January 2021) and other relevant strategies and guidelines. Considering the combination of active and public transport improvements, a reduced parking demand for staff is expected to be achieved. The parking capacity will be 35 spaces (approximately 0.6 spaces per staff member) including 2 accessible parking spaces, plus provisions for a new loading dock / waste collection area.

Following determination of the SSDA, it is anticipated that a Construction Traffic and Pedestrian Management Plan (CTPMP) and School Transport Plan (STP) would be fully developed, prior to construction and operation of the school, respectively. Preliminary versions of these documents have been provided as part of this TAIA.

These final documents and other detailed design elements can be reasonably expected to be finalised as a condition of development consent.

The proposed alterations and additions to John Palmer Public School are considered suitable on consideration of the traffic and transport elements of the site and its surrounds, and the transport strategy proposed for its management.

Contents

Revision Register

Rev	Date	Prepared by	Reviewed by	Approved by	Remarks
0	20/09/2021	MG	MB	-	Draft for comment
0.1	08/10/2021	MG, MB	MB	-	Revised draft
1	11/10/2021	MG, MB	MB	PY	Issue for SSDA
2	**14/01/2022**	**MG, MB**	**MB**	**PY**	**Response to Submissions**

1.0 Introduction

This Transport and Accessibility Impact Assessment accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in support of a State Significant Development Application (SSD-23330227).

The development is for upgrading works comprising alterations and additions to John Palmer Public School at 85 The Ponds Boulevard, The Ponds. The site is legally described as Lot 1 DP 1131340.

The site is roughly rectangular in shape, with a total area of 29,830m^2 and street frontages to Pebble Crescent to the west, Jetty Street to the south and The Ponds Boulevard to the east. The Ponds Shopping Centre adjoins the northern property boundary of the school.

This report addresses the relevant Secretary's Environmental Assessment Requirements (SEARs), which have been detailed in Section 1.2 of this report.

The revision of the report also incorporates updates and comments in response to submissions made on the exhibited EIS, which have been detailed in Section 1.5 of this report.

1.1 Scope

Taylor Thomson Whitting (TTW) has been engaged by School Infrastructure NSW (SINSW) to provide traffic engineering consultancy services for the proposed redevelopment.

This TAIA has been developed to assess and address the traffic and transport impacts of the proposed development. This report covers the following areas:

- Site access
- Active transport (walking and cycling)
- Public transport
- Service and loading
- Pick-up and drop-off (kiss & ride)
- Car parking
- Road network performance
- Sustainable travel (green travel)
- Operational transport management
- Construction traffic management

A School Transport Plan (STP) and a Construction Traffic and Pedestrian Management Plan (CTPMP) have been prepared and included as part of this document. These plans are considered preliminary in nature for the purposes of the SSDA and would be finalised post-approval as a condition of consent.

1.2 Response to SEARs

The Secretary's Environmental Assessment Requirements (SEARs) issued in respect of SSD-23330227 were issued on 20 July 2021 following the Department of Planning, Industry and Environment's (DPIE) consultation with relevant authorities and stakeholders. The requirements for a Transport and Accessibility Impact Assessment are shown in Table 1.1 and have been addressed in various sections of this report as referenced.

Table 1.1: Response to SEARs

Requirements	Comments and References
5. Transport and Accessibility Provide a transport and accessibility impact assessment, which includes, but is not limited to the following:	
Analysis of the existing transport network to at least the existing or proposed enrolment boundary, including:	Section 2.0
• Road hierarchy	Section 2.4
• Pedestrian, cycle and public transport infrastructure	Section 2.2, Section 2.5, Section 2.6
• Details of current daily and peak hour vehicle movements based on traffic surveys and / or existing traffic studies relevant to the locality	Section 2.11
• Existing transport operation for 1hr before and after (existing or proposed) bell times such as span of service, frequency for public transport and school buses, pedestrian phasing for signals	Section 2.9
• Existing performance levels of nearby intersections utilising appropriate traffic modelling methods (such as SIDRA network modelling)	Section 2.9
Details of the proposed development, including:	Section 3.0
• A map of the proposed access which identifies public roads, bus routes, footpaths and cycleways	Section 3.1
• Pedestrian site access and 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	Section 3.2
• Car and motorcycle parking, bicycle parking and end-of-trip facilities	Section 3.5, Section 3.4
• Drop-off / pick-up zone(s) and arrival/departure bus bay(s)	Section 3.6
• Pedestrian, public transport or road infrastructure improvements or safety measures	Section 3.3, Section 3.6
Analysis of the impacts due to the operation of the proposed development, including:	
• Proposed modal split for all users of the development including vehicle, pedestrian, bicycle riders, public transport, school buses and other sustainable travel modes	Section 2.11, Section 4.7.1

Requirements	Comments and References
• Estimated total daily and peak hour vehicular trip generation	Section 4.7.1
• A clear explanation and justification of the: o Assumed growth rate applied o Volume and distribution of proposed trips to be generated o Type and frequency of design vehicles accessing the site	Section 4.7.1, Section 4.6 and Section 4.7.2
• 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)	Section 4.7.4
• Cumulative traffic impacts from any surrounding approved development(s)	Section 6.2
• Adequacy of pedestrian, bicycle and public transport infrastructure to accommodate the development	Section 4.2, Section 4.2
• Adequacy of car and motorcycle parking and bicycle parking provisions when assessed against the relevant car / bicycle parking codes and standards	Section 4.6
• Adequacy of the drop-off / pick-up zone(s) and bus bay(s), including assessment of any related queuing during peak-hour access	Section 4.5
• Adequacy of the existing / proposed pedestrian infrastructure to enable convenient and safe access to and from the site for all users	Section 3.3
Measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including:	
• A preliminary School Transport Plan: o An operational traffic and access management plan for the site, pedestrian entries, the drop-off / pick-up zone(s) and bus bay(s) o Travel demand management programs to increase sustainable transport	Section 5.0 (included in School Transport Plan)
• Arrangements for the Travel Coordinator roles	
• Governance arrangements or relationships with state and local government transport providers to update roads safety.	
• Infrastructure improvements, including details of timing and method of delivery	Section 3.0
Analysis of the impacts of the traffic generated during construction of the proposed development, including:	

Requirements	Comments and References
• Construction vehicle routes, types and volumes	Section 6.2
• Construction program (duration and milestones)	Section 6.2
• On-site car parking and access arrangements for construction, emergency and construction worker vehicles	Section 6.2
• Cumulative impacts associated with other construction activities in the locality (if any)	Section 4.7.1
• Road safety at identified intersections near the site due to conflicts between construction vehicles and existing traffic in the locality	Section 6.2
• Measures to mitigate impacts, including to ensure the safety of pedestrians and cyclists during construction	Section 6.2
A preliminary Construction Traffic and Pedestrian Management Plan.	Section 6.0

1.3 Authority Consultation

This report has been prepared following consultation between the design team and relevant stakeholders, including the Transport Working Group which was assembled for the project. This group included project team and client representatives, Council, and TfNSW. Consultation events and outcomes occurred as follows:

- **22 July 2021**
    - The meeting included representatives from Council and Transport for NSW.
    - The project was introduced to the Transport Working Group, and the overall strategic concept of moving away from traditional car-based assessment towards more sustainable transport options.
    - Key feedback included observations of parking issues around school sites, discussion of the relevant warrant requirements for pedestrian zebra crossings, and concern with the successful implementation of Green Travel Plans (or the School Transport Plan).
- **19 August 2021**
    - The meeting included representatives from Council and Transport for NSW.
    - The existing travel mode splits were reviewed based on data from the school, including the forecast changes to demand for each travel mode. A proposed concept design was presented for a raised zebra crossing at Jetty Street to accompany a new pedestrian entry to the site. Proposed changes to the on-site car park (to accommodate waste/loading activity) resulting in a capacity reduction of 2 car parking spaces were presented. The proposed construction traffic strategy (access generally from Pebble Crescent) was presented.
    - Key feedback included that the proposed zebra crossing location was not supported and should be moved. It was agreed that SCATS data would be suitable for traffic modelling.
- **16 September 2021**
    - The meeting included representatives from Council and Transport for NSW.
    - A revised concept location for the Jetty Street zebra crossing was presented and discussed,

including impacts to School Zone speed limits. Traffic modelling assumptions and results were presented.

- Key feedback included a direction for a more mid-block zebra crossing. No comments were provided on the preliminary traffic modelling results. Council noted that the proposed reduction of 2 car parking spaces was not necessarily approved and would need to be reviewed in detail as part of the Submissions process, in the broader context of the project e.g. percentage reduction in parking.

Full details and minutes of the relevant agency consultation is attached in **Appendix A** of this document.

1.4 Guidelines and References

This report has been prepared in the context of and with knowledge of a variety of relevant documents, standards, and guidelines:

- Blacktown Development Control Plan 2015 (DCP 2015)
- Blacktown Local Environmental Plan 2015 (LEP 2015)
- NSW Department of Education Educational Facilities Standards & Guidelines (EFSG)
- Future Transport 2056
- *Road User Space Allocation Policy* (TfNSW, January 2021)
- Australian Standards, including but not limited to:
  - AS2890 – Parking facilities
- Austroads Guidelines, including but not limited to:
  - Guide to Road Design
  - Guide to Road Safety
  - Guide to Traffic Management
  - Cycling Aspects of Austroads Guides
- RMS Guides to Traffic Generating Developments, including:
  - Roads and Maritime Service Trip Generating Surveys – Schools – Analysis Report (GTA, 25 August 2014)
- *Planning guidelines for walking and cycling* (Department of Infrastructure, Planning and Natural Resources, 2004)
- *EIS Guideline – Roads and Related Facilities* (Department of Urban Affairs and Planning, 1996)

1.5 Response to Submissions

The Environmental Impact Statement (EIS) was publicly exhibited between 19 October 2021 and 15 November 2021 on the Department of Planning website, for submissions by members of the public and government agencies.

Table 1.2: Response to Submissions

Submission Author	Key items	Comments and references
Transport for NSW	It is understood that the location of the proposed raised zebra crossing on Jetty Road is not yet confirmed. TfNSW provides the following comments for the further design and location of the raised zebra crossing design: • TfNSW is concerned with regards to the sight distance at the approaches to the new raised zebra crossing due to in-lane plant box on Jetty Road. • Safety concerns raised with regards to the location of the new pedestrian entry to the school location opposite to Sail street. This location may encourage pedestrian to cross at the intersection. Pedestrian fencing should be provided to ensure pedestrian crossing at the designated crossing facilities. • The indicative location of the new raised zebra crossing on Jetty Street will conflict with the start of the existing 40km/h school zone. • Once the confirmation of the exact location of the new access to the school is received TfNSW will conduct on site review in line with the School Zone Guidelines. Once the construction new entry is completed on site, the developer should allow 15 weeks between the construction completion date and the opening date for the school to allow TfNSW to review/approve/implement the extension of the 40km/h school zone signs. • The new raised zebra crossing and associated signage will need to be submitted to and approved by the Local Traffic Committee prior to the construction.	The proposed raised zebra crossing on Jetty Street will be subject to local approval through Council's Traffic Committee, and the design may continue to develop through that approval process. Nevertheless, these design comments are acknowledged. It is anticipated that the in-lane plant boxes on Jetty Street would be removed or modified such that no full-height planting is present (i.e. some low-height planting could remain). These details would be confirmed with Council during the detailed design to ensure appropriate sight distances are achieved. Pedestrian fencing could be investigated between Sail Street and the crossing, and outside the new pedestrian entry. However, based on analysis of the school catchment intake area, the majority of movements would be to the east which would not benefit from any shortcutting away from the crossing. The existing 40km/hr School Zone will need to be extended/relocated as a result of the new pedestrian entry, so any conflict with the existing zone / markings would be resolved. Refer to Section 3.3. The project will continue to work with Council to resolve the detailed design for approval by the Local Traffic Committee prior to the construction.
Transport for NSW	TfNSW has reviewed the STP and advises that further improvements can be considered and would provide the following comments: • Mode share – Further steps should be undertaken to increase the mode share for students, as they could walk, cycle or scooter or take the bus/train to the school and back. TfNSW proposes a small	It is noted that the School Transport Plan (STP) included as part of this TAIA is intended to be preliminary in nature only, and would be further developed post-approval as an anticipated condition of consent. Mode share targets in the preliminary STP have been updated to reflect the TfNSW recommendations with the purpose of

Submission Author	Key items	Comments and references
	percentage decrease for staff car use to 80%, split into 40% for car-pooling and 40% for single occupant cars. TfNSW has suggested detailed improvement for mode share. • The STP should be updated to include, but not be limited to: 1. analysis of current travel survey data and school postcode data and discussion of how this data has informed the mode share targets and actions of the STP; 2. identifying the number of staff and students within reasonable walking / cycling distance; 3. staged mode share targets for staff, students and visitors which reflect a commitment to increase non-car mode share for travel to and from the site; 4. implementation strategy that commits to specific actions (including operational procedures to be implemented along with timeframes) to encourage the use of public and active transport and discourage the use of single occupant car travel to access the site for both students and staff; 5. details of bicycle parking and dedicated end of trip facilities including but not limited to lockers, showers and change rooms and e-bike charging station(s) for staff and students to support an increase in the non-car mode share for travel to and from the site; 6. a Transport Access Guide for staff, students and visitors providing information about the range of travel modes, access arrangements and supporting facilities that service the site; 7. a communication strategy for engaging with students, staff and visitors regarding public and active transport use to the site and the promotion of the health and wellbeing benefits of active and non-car travel to the site; 8. include a mechanism to monitor the effectiveness of the measures of the plan; and 9. the appointment of a Travel Plan Coordinator responsible for implementing the plan and its ongoing monitoring and review, including the delivery of actions	achieving higher rate for using public transport, riding bicycle and scooter, and lower rate of using private vehicles. Refer to Section 5.1.2. The STP has also been updated to include: 1 and 2. Comparison of current travel mode data (based on school advice), depersonalised location data, number of students within reasonable walking / cycling distances, and discussion of how these have informed the targets and actions (refer Section 5.1.2). 3. Staged / interim mode share targets have been added, refer Section 5.1.3. 4 and 5. According to the facilities proposed in Section 3.3 and Section 3.4, the strategies recommended to improve active transport usage are addded to STP. Please refer to Section 5.5. 7, 8 and 9. It is recommended to undertake periodic surveys to monitor the efficiency of the plan, and this to be added in the STP, refer to Section 5.5.1 and Section 5.5.2. The STP has not been updated with any of the following items as we consider these are not critical to the general proposal and are a detailed design element. It is recommended that these could be required as a condition of consent if necessary. 6. Transport Access Guide - This would be included in the final School Transport Plan which will be further developed as a condition of development consent.

Submission Author	Key items	Comments and references
	and associated mode share targets.	
Blacktown City Council	**Parking Provision** The car park provision will cover only 60% of staff car parking needs whereas it is reported that 99% staff use private vehicle as their mode of travel. This travel pattern by the staff is not expected to change in the near future and can still be a cause of concern to Council as 40% staff will park on surrounding streets. Parking provision will not comply with Blacktown Development Control Plan 2015. While this is addressed in the Traffic Report these concerns are not addressed satisfactorily. This significant shortfall in onsite parking will impact on the amenity of surrounding residential area.	The transport strategy for the site has been developed to reduce the reliance on single-occupant car travel. The construction of additional on-site parking would encourage reliance on this mode and be counter to the transport strategy for the site, the local area, and the state more broadly. Revised travel mode targets have been adopted based on recommendations from TfNSW during the Submissions phase. The combination of 40% single-occupant vehicles with 40% carpooling vehicles (i.e. total of 80% of staff travelling by vehicle in some form) would result in a demand of 36 spaces which is effectively equivalent to the proposed capacity of 35 spaces. The proposed works would increase the total staffing by an estimated 3 staff (from 56 to 59 staff). In order to achieve a net-zero result of no additional parking demand, only 5% of staff (3 staff) would need to change to a non-single-occupant travel mode (e.g. carpool, public, or active transport). This is a low mode shift and considered achievable for a net-zero result, which is realistic to be achieved in the near future. In the longer term, the STP plans to go significantly further and improve on the existing conditions. In the short to medium-term while some usage of on-street parking is anticipated (in alignment with existing conditions), on-street parking has good availability during school hours and is more heavily used by local residents out of hours. Therefore, potential overflow would not cause undue impact to residents. Refer Section 2.7 and Section 4.6.
Blacktown City Council	**Splay** A pedestrian safety issue has been identified due to not having splay at the north-east boundary of the school with The Ponds Shopping Centre vehicular access along The Ponds Boulevard. It is necessary that a splay be provided by removing a few panels of the fence and landscaping to improve the line of sight for pedestrians at The Ponds Shopping Centre vehicular access. This will need to be reflected on an amended plan.	It is suggested to remove a few panels of the fence to improve sight for vehicles moving northbound and pedestrians approaching The Ponds Shopping Center driveway.

Submission Author	Key items	Comments and references
Blacktown City Council	**On-road parking** On-road parking demand by parents and staff will increase as a result of the upgrade. It is to be noted that with the introduction of a new wombat crossing on Jetty Street there will some loss of on-street parking in the vicinity of the school. A development cannot solely rely on on-street parking as the on-street parking can be changed with time and demand of the surrounding land uses. While this is addressed in the Traffic Report these concerns are not addressed satisfactorily. These upgrades will see a greater dependence on on-street parking which will result in complaints from surrounding residents to Council.	The proposed works would increase the total staffing by an estimated 3 staff (from 56 to 59 staff). In order to achieve a net-zero result of no additional parking demand, only 5% of staff (3 staff) would need to change to a non-single-occupant travel mode (e.g. carpool, public, or active transport). The introduction of a new wombat crossing would locally remove approximately 24m or parking on each side of the road (assuming 2.5m kerb extensions for a 3.6m-wide crossing, plus 10m 'No Stopping' zones either side), the equivalent of up to 8 spaces in total. The existing in-lane plant boxes and driveways mean this loss would realistically be closer to 6 spaces. In the scheme of the overall capacity of on-street parking (187 spaces in the surrounding assessed zones), this loss would be negligible even when accounting for a minor increase (e.g. 3 spaces) in additional staff demands. Regarding historical usage (as per Nearmap aerial imagery), the on-street car parking nearby JPPS is occupied by a maximum of 88 cars during school days, and 140 spaces are available. On-street parking has good availability during school hours and is more heavily used by local residents out of hours. Therefore, any potential overflow would not cause undue impact to residents. Refer to Section 2.7 and Section 4.6.
Higgins Planning Pty Ltd on behalf of ISPT	**Traffic and parking impacts** Inadequate off-street car parking capacity for the upgraded JPPS with 59 staff and 1,012 students, while the mode share of almost all staff is private vehicle. Provision of "end-of-trip" facilities is proposed, however, this alone is insufficient to create a modal shift in the culture of behaviour for staff attending the site from using a private car to using a bicycle. The centre managers for The Ponds shopping centre have observed cars which park on-site all day at The Ponds shopping centre other than tenants / or staff of tenants of the shopping centre. In addition, parking at The Ponds becomes limited for customers of the shopping centre during the school drop-off / pick-up periods.	The transport strategy for the site has been developed to reduce the reliance on single-occupant car travel. The construction of additional on-site parking would encourage reliance on this mode and be counter to the transport strategy for the site, the local area, and the state more broadly. The proposed works would increase the total staffing by an estimated 3 staff (from 56 to 59 staff). In order to achieve a net-zero result of no additional parking demand, only 5% of staff (3 staff) would need to change to a non-single-occupant travel mode (e.g. carpool, public, or active transport). The provision of end-of-trip facilities is not proposed as the only mode shift encouragement measure. Additional measures include intentional limitations on car parking capacity, implementation of a dedicated School Travel Coordinator role, ongoing consultation and coordination with

Submission Author	Key items	Comments and references
		local and state transport authorities to discuss and plan for future services, continual data collection and review measures to refine the School Transport Plan, and more. Refer to Section 5.1, Section 5.2 and Section 5.3.5. Regarding historical usage (as per Nearmap aerial imagery), the on-street car parking nearby JPPS is occupied by a maximum of 88 cars during school days, and 140 spaces are available. On-street parking has good availability during school hours and is more heavily used by local residents out of hours. Therefore, any potential overflow would not cause undue impact to residents. Refer to Section 2.7 and Section 4.6. Although Jetty Street and The Ponds Boulevard are partially occupied, there are a high number of parking spaces available at both sides of Sail Street, Picnic Street, Teague Street and west Pebble Crescent, and northbound of east Pebble Crescent. It has to be noted that northbound of west Pebble Crescent is Plaza Park and a playground, which does not create high demand during school hours. Refer Section 2.7 and Section 4.6. In response to the Centre's observations of all-day parking usage, the School Transport Plan has been updated to include reminders and suggestions for any staff/parents to not park at this facility, refer to Section 5.5. Further oversight of individual drivers' choices is outside the control of the School.

2.0 Existing Conditions

2.1 The Site

John Palmer Public School (JPPS) is located in the suburb of The Ponds in north Western Sydney and falls within Blacktown City local government area, between Quakers Hill and Rouse Hill. The property is legally identified as Lot 1, DP 1131340. Figure 2.1 shows the site location.

JPPS is surrounded by Pebble Crescent to the west, The Ponds Boulevard to the east, Jetty Street to the south and with commercial properties including The Ponds Shopping Centre to the north.

Figure 2.1: Site extents
Source: SIX Maps

Figure 2.2 illustrates the existing layout of the site, including demountable buildings to the south and west.

Figure 2.2: Existing and proposed site plan
Source: Pedavoli Architects / John Palmer Public School / Masterplan Report

2.2 Site Access

There are four existing access gates into John Palmer Public School, including pedestrians, vehicles and service vehicles; three are along The Ponds Boulevard and one from Pebble Crescent, as shown in Figure 2.3.

Figure 2.3: Access gateways into John Palmer Public School

2.2.1 Pedestrian Access

The main pedestrian access of JPPS is located at the eastern side of the site on The Ponds Boulevard, shown on Figure 2.4. There is also a pedestrian access into JPPS through Pebble Crescent at west of the campus presented in Figure 2.5.

Figure 2.4: Main pedestrian access to John Palmer Public School at The Ponds Boulevard

Figure 2.5: Secondary pedestrian access gateway into John Palmer Public School at Pebble Crescent

2.2.2 Vehicle Access

The vehicle accessway into the campus off-street car park, shown in Figure 2.6, located on The Ponds Boulevard.

Figure 2.6: Vehicle access to John Palmer Public School at The Ponds Boulevard

The access of service vehicles including deliveries, waste collection truck and emergency vehicles is through the northern gate at The Ponds Boulevard depicted in Figure 2.7.

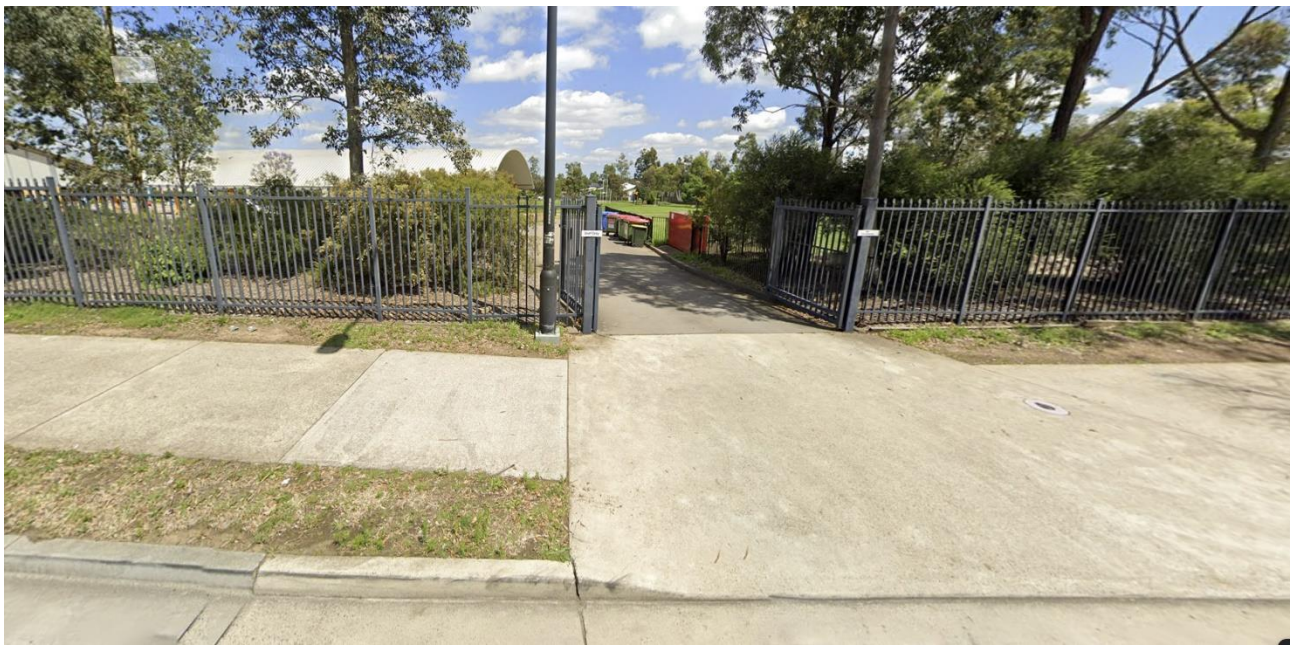


Figure 2.7: Service vehicles access to John Palmer Public School at The Ponds Boulevard

2.3 School Catchment

While it is acknowledged that some existing students live outside the catchment boundary (refer Section 2.10 for further assessment), for the purposes of this transport assessment only the catchment area is considered. Future student intakes can reasonably be expected to live within the catchment (in accordance with state government and School policy).

There is currently no known plan to change this catchment boundary.

Figure 2.8 shows the current school catchment intake boundary.

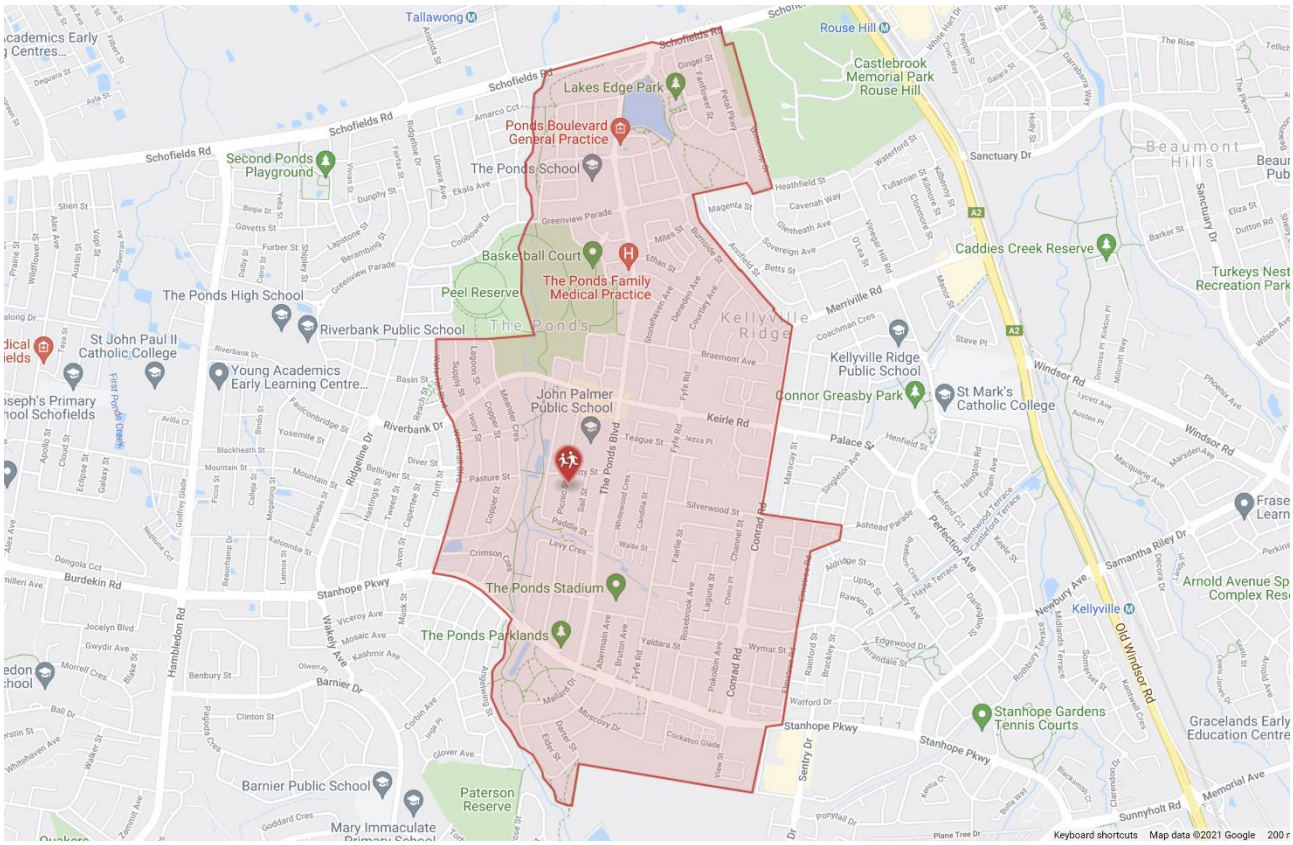


Figure 2.8: School catchment boundary

Source: NSW Public School Finder (https://schoolfinder.education.nsw.gov.au/). Accessed 8 July 2021.

2.4 Road Network

2.4.1 State Roads

Schofields Road is a major arterial road to the north of the site. The road links the suburb of Schofields in west, to Rouse Hill Metro Station. Parking is not allowed along Schofields Road in both directions. There are typically two travel lanes in each direction, with a general speed limit of 70 km/hr with a Bus lane at each direction near intersections.

Windsor Road is a north-south state road located east of the site area that connects the suburb of Mulgrave to the Westmead Hospital. The road has two lanes in each direction, with a general speed limit of 80 km/hr.

The location of the site within the classified road network is shown Figure 2.9.

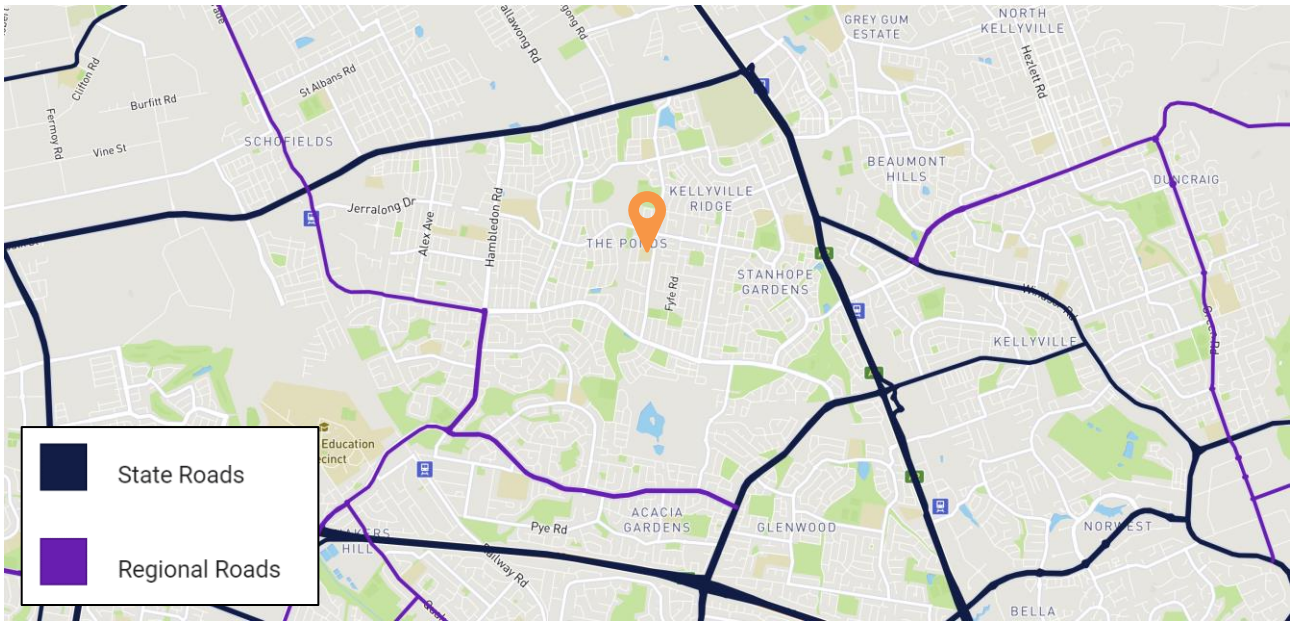


Figure 2.9: Classified road network
Source: NSW Road Network Classifications map (https://roads-waterways.transport.nsw.gov.au/classification/map/). Accessed 11 October 2021.

2.4.2 Local Roads

The Ponds Boulevard is a local street running east of the school, which provides the main access for people walking, cycling, or driving to the School. There is a single travel lane in each direction with various parking restrictions. The general speed limit along The Ponds Road is 50 km/hr, however, is also located within a 40 km/hr School Zone at the relevant times (8:00 – 9:30am, 2:30 – 4:00pm).

Pebble Crescent, Jetty Street, and Teague Street are local streets in adjacent to the school. There is a single travel lane in each direction, with a speed limit of 50 km/hr with signage for 40 km/hr School Zone.

Riverbank Drive, Picnic Street and Sail Street are also local roads, which connect JPPS to the surrounding road network.

The location of the site within the local road network and intersection controls are shown in Figure 2.10.

Figure 2.10: Intersection controls in local road network
Background image source: SIX Maps

Figure 2.11 shows the surrounding site road network with school zone speed limitations highlighted in yellow.

Figure 2.11: School Zone extents
Background image source: SIX Maps

2.5 Public Transport

2.5.1 Public Buses

The nearest bus stops to the School are located on The Ponds Boulevard, which is serviced by the 734 route in both directions.

The relevant services and destinations in the vicinity of the site are listed in Table 2.1, with all local routes shown in Figure 2.12 in the context of the school and the existing catchment boundary.

Table 2.1: Bus routes in the vicinity of the school

Bus Route Number	Bus Route	Morning Times	Afternoon Times
Conrad Road before Silverwood Street			
731	Blacktown to Rouse Hill Station via Stanhope Gardens	8:08am	3:49pm
Conard Road after Gunsynd Street			
731	Rouse Hill Station to Blacktown via Stanhope Gardens	8:16am	2:51pm, 3:14pm
John Palmer School, The Ponds Boulevard			
734	Blacktown to Riverstone via Schofields	8:03am	2:47pm, 3:11pm
The Ponds Boulevard opposite John Palmer Public School			
734	Riverstone to Blacktown via Schofields	8:10am	3:34pm
Greenview Parade after Watercress Street			
752	Rouse Hill Station to Blacktown via Quakers Hill	8:28am	3:09pm
Greenview Parade before The Ponds Boulevard			
752	Blacktown to Rouse Hill Station via Quakers Hill	--	2:55pm

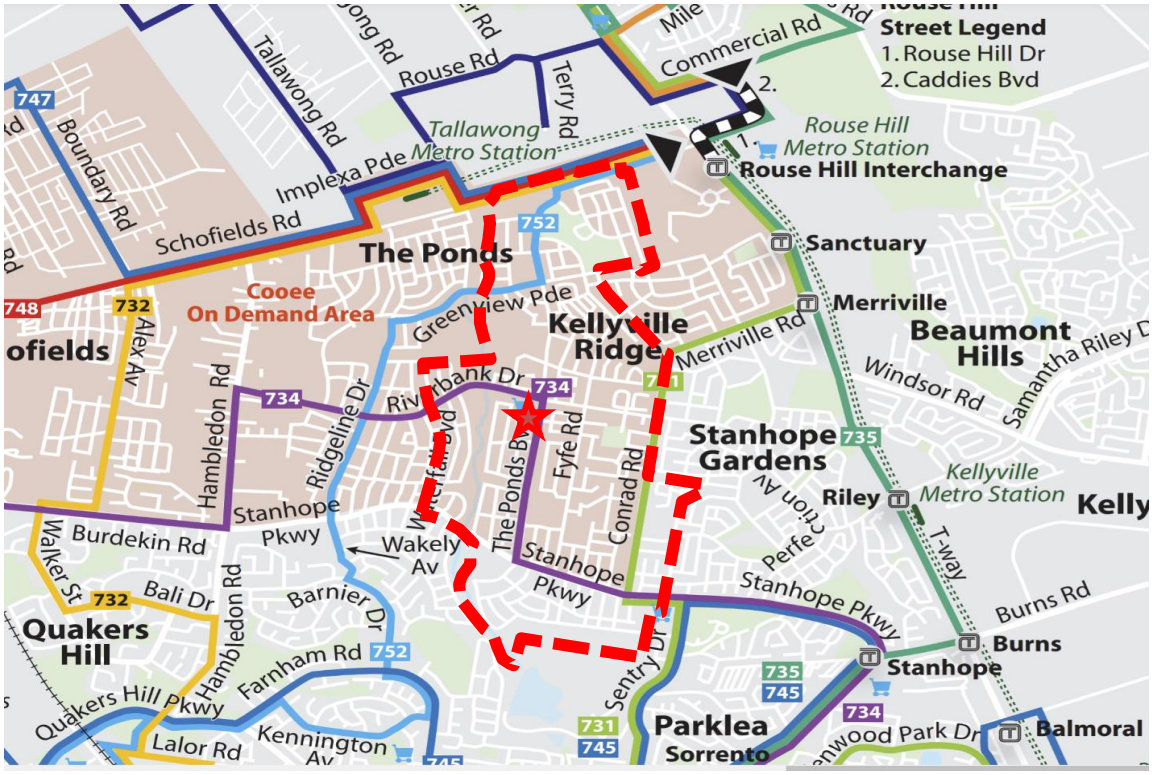


Figure 2.12: Local bus routes

Source: Greater Western Sydney Bus Network Map (Transport for NSW), Effective April 2021

2.5.2 Train

John Palmer Public School is located within 4.5 kilometres from Schofields and Quakers Hill Train Stations, which is an hour walk. Schofield and Quakers Hill Train Stations can also be reached via bus route 734 and 752 respectively.

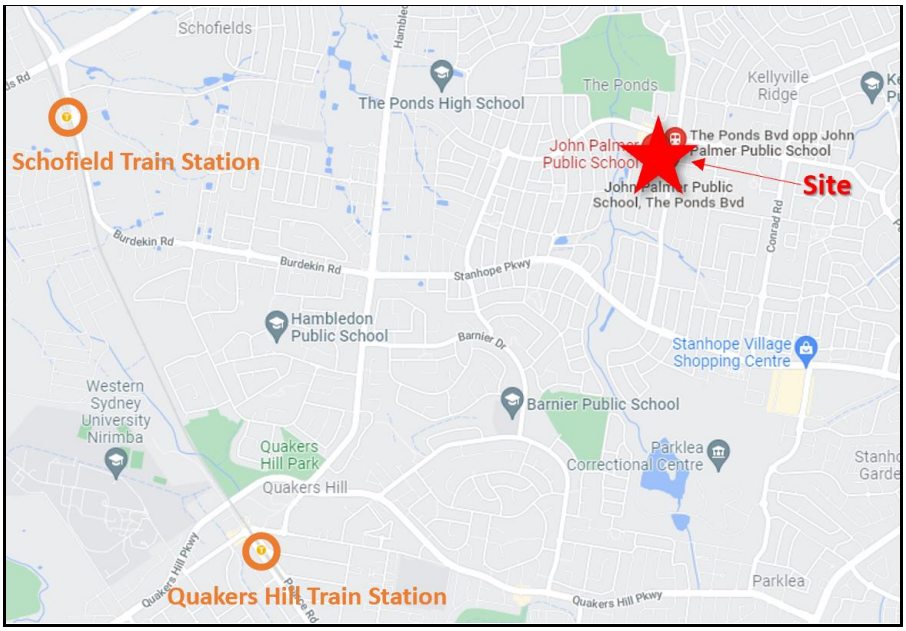


Figure 2.13: Schofield and Quakers Hill Train Stations

2.5.3 Metro

There are three metro stations, shown in Figure 2.14, relatively close to JPPS, including:

- Tallawong Station located north of Schofields Road with 2.4 km distance from JPPS, which is within a 30-minute walk and can be reached by bus route 734 and 732;
- Rouse Hill Station at the eastern side of Windsor Road within 3 km of JPPS, which is within a 40-minute walk and accessed via bus route 752
- Kellyville Stations at the east of Old Windsor Road within 3 km of JPPS, which can be reached by bus route 734 or a 40-minute walk

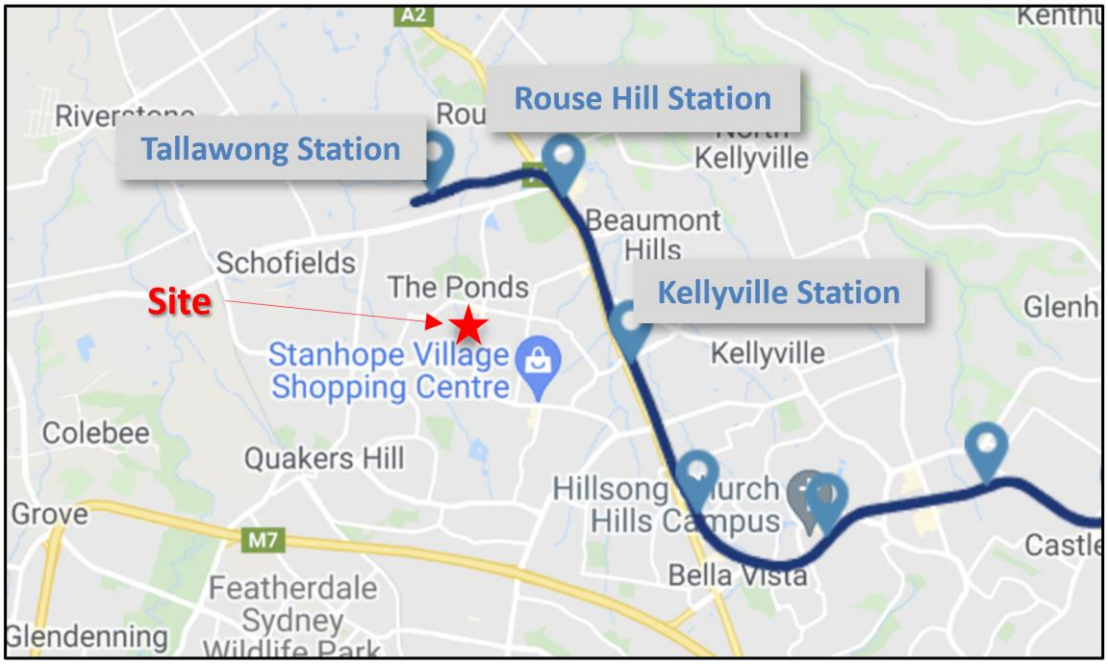


Figure 2.14: Parramatta Light Rail route map
Source: Sydney Metro, Transport for NSW

2.6 Active Transport

2.6.1 Pedestrian Facilities

The local area is well serviced by pedestrian facilities for people walking to the site. Local roads, including The Ponds Boulevard and Pebble Crescent are equipped with pedestrian zebra crossings. There is also a pedestrian refuge island on Jetty Street and one on The Ponds Boulevard (shown in Figure 2.15). In addition, all the local roads nearby JPPS provide concrete footpaths on both sides of the road. Furthermore, there is a pedestrian traffic signal at the intersection of The Ponds Boulevard and Riverbank Drive on the northeast side of the site.

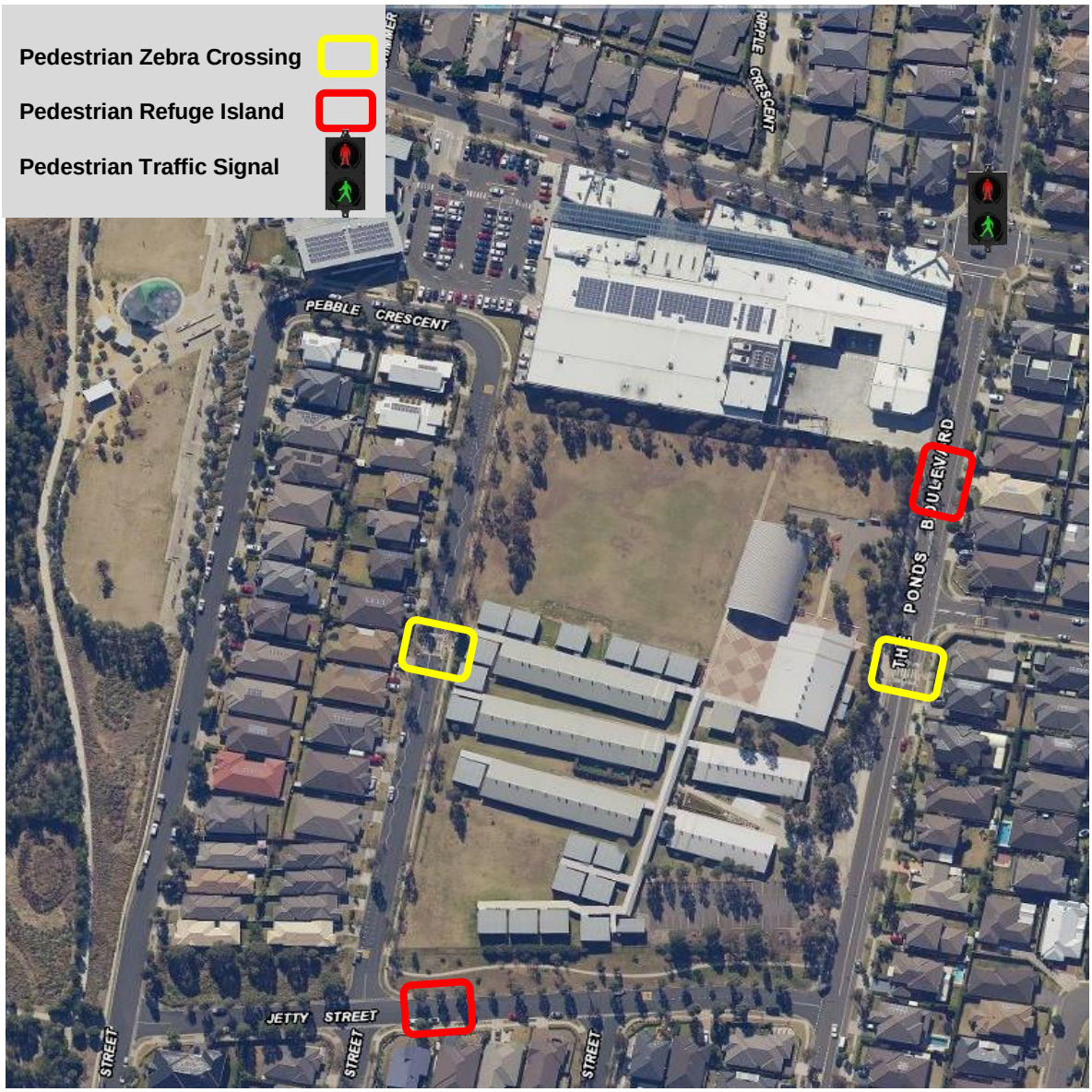


Figure 2.15: Pedestrian facilities in local road network
Image source: SIX Maps

2.6.2 Cycling Facilities

Figure 2.16 shows the existing local cycling routes near the site.

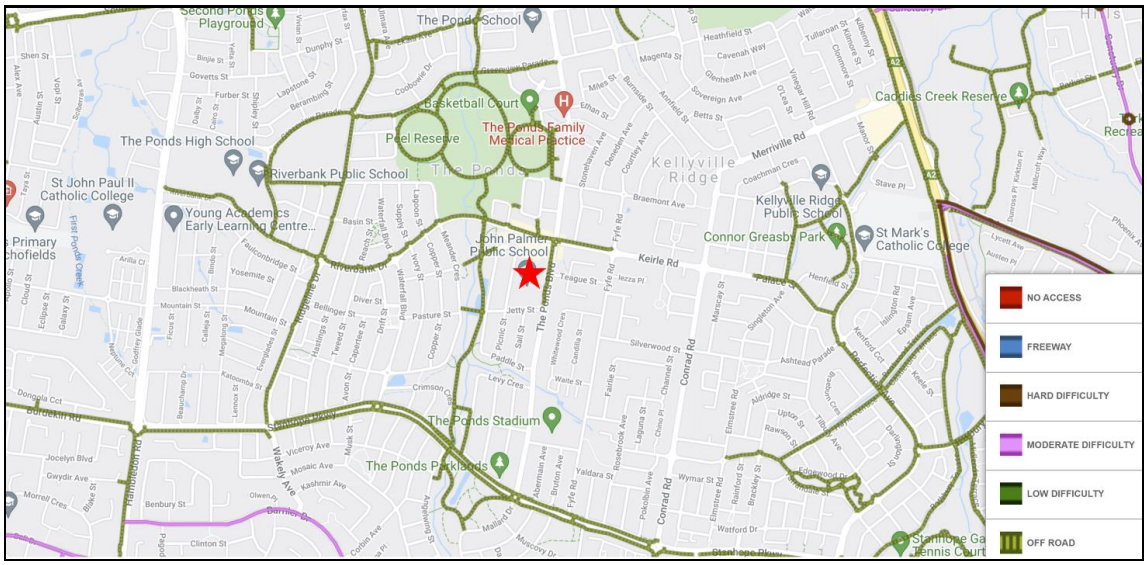


Figure 2.16: Cycling map in local road network
Image source: Cycleway Finder

According to the Blacktown Bike Plan, cycling paths will be improved by some proposed routes in the site precinct, which are mostly along The Ponds Boulevard. The future cycling network is shown in Figure 2.17.

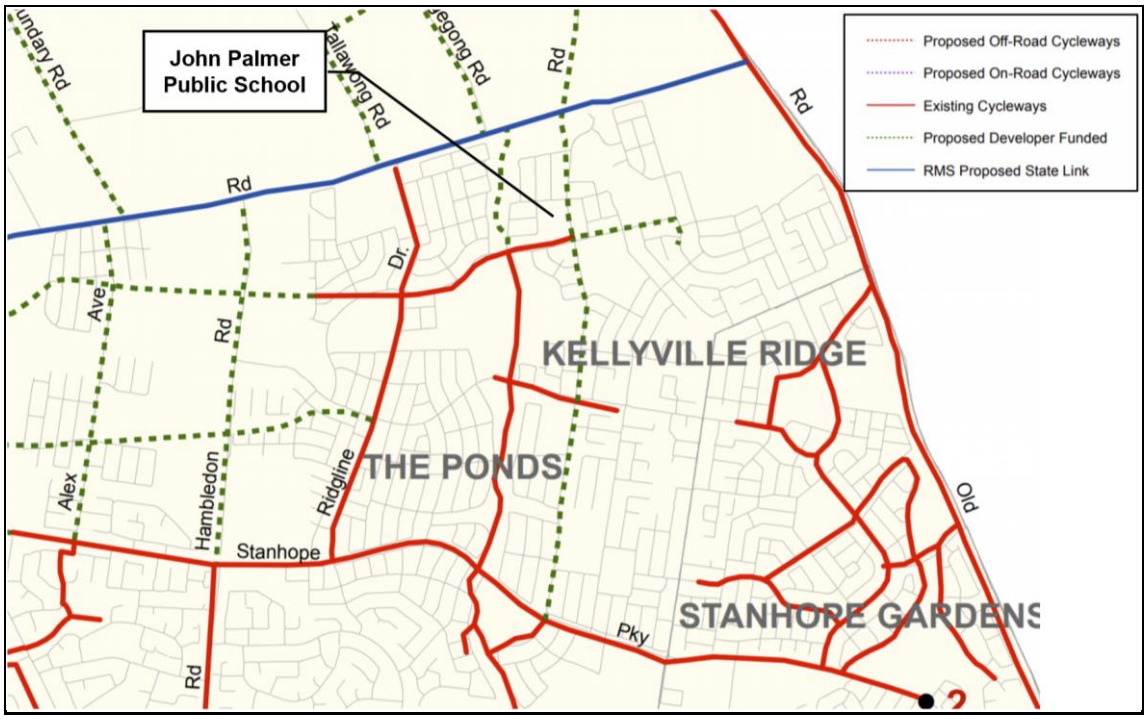


Figure 2.17: Existing and Future proposed cycling network
Source: Blacktown City Council, 2016 Bike Plan

There are 86 bicycle parking spaces and 60 scooter parking spaces inside the school. The location of the bike racks is shown in Figure 2.18.

Figure 2.18: Existing bike park
Source: Nearmap

The existing staff facilities do not currently provide any end-of-trip facilities such as showers, change rooms, or storage lockers.

2.7 Car Parking

2.7.1 Off-Street Parking

The off-street staff car parking has 37 car parking spaces, including one accessible space (which is non-compliant to current design standards), and is located in the southeast of the campus with access from The Ponds Boulevard. Figure 2.19 illustrates the layout of the existing on-site staff car park.

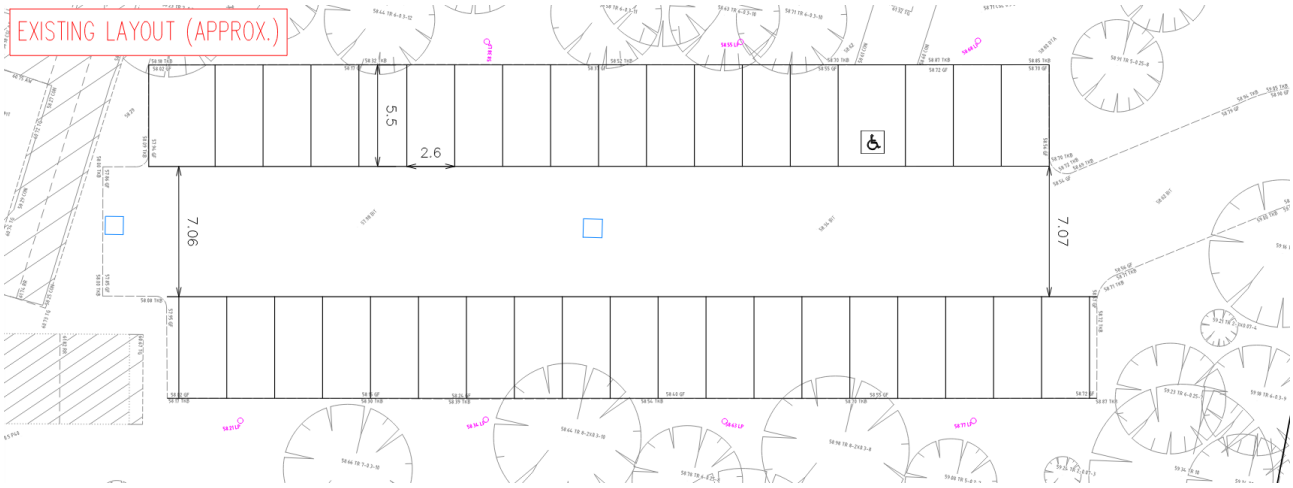


Figure 2.19: Existing car park

Historical aerial imagery available from Nearmap has been assessed to determine the long-term trends in occupancy, including comparing school days and non-school days. For the purposes of this analysis, 'school days' are defined as those data points which clearly show high levels of usage of the on-site car park.

Summary details for the off-street parking areas are shown in Table 2.2. Statistics for the 'total' row are the on-site totals recorded for each date, not a sum of statistics for individual areas (therefore should not be added).

Table 2.2: Off-street parking occupancy
Source: Nearmap imagery

	School Days			Non-School Days		
	Minimum	**Average**	**Maximum**	**Minimum**	**Average**	**Maximum**
Car Park	32	35.6	38	0	0.4	9
Loading	1	2.9	5	0	0.3	2
Total	34	38.4	42	0	0.7	10

Based on the historical data, the car park occupancy on school days is fairly steady, and some informal parking occurs on a rare basis beyond the marked capacity of 37 spaces. The average occupancy is comfortably accommodated within the marked capacity.

Additionally, the existing loading and service bay to the north of the site is used for the occasional storage of service or maintenance vehicles. During non-school days, maintenance and other parking usage tends to occur at the main car park.

The full set of historical parking analysis is provided at **Appendix B**.

2.7.2 On-Street Parking

On-street parking in the vicinity of the site is generally unrestricted and is used by some staff for parking. Similarly to the off-street parking, on-street parking in the vicinity of the site has been reviewed to assess long-term usage trends.

The extent and description of on-street zones used for the detailed analysis is shown below in Figure 2.20. The assumed occupancy of each zone is based on approximate distances between driveways, and accounting for other parking restrictions, and represents an estimate only. All on-street parking spaces in the vicinity are unmarked, meaning that capacity may vary from day-to-day.

Figure 2.20: On-street and off-street parking areas for analysis

Summary details for the on-street parking areas are shown in Table 2.3. Statistics for the 'Occupied' and 'Available' rows are inverse data (therefore should not be added).

Table 2.3: On-street parking occupancy
Source: Nearmap imagery

	School Days			Non-School Days		
	Minimum	**Average**	**Maximum**	**Minimum**	**Average**	**Maximum**
Occupied	47	64.4	88	38	54.1	81
Available	99	122.6	140	106	132.9	149
Total	187	187	187	187	187	187

The analysis shows that there is generally good availability of parking in the vicinity of the site and within the assessed zones.

Noting the overall capacity in the assessed zones of 187 spaces, there is an average occupancy rate of around 34%, or a maximum rate of 47%, suggesting that on-street parking usage could increase by approximately double within the fixed capacity. However, it is acknowledged that 100% occupancy is highly undesirable and that parking areas are often considered to be at or near their practical capacity at around 85% of their physical capacity. This would suggest that in the period of the highest observed occupancy (88 vehicles), another 70 or so vehicles could potentially be accommodated, bringing the precinct occupancy to 85%.

The majority of available spaces are located on Pebble Crescent West (i.e. near the Second Ponds Creek reserve, north of Paddle Street). This area has no residential frontages or driveways and therefore has significant capacity. Due to recreation activity at the reserve, this shows the highest usage in non-school days.

The zone showing the highest difference between school day usage and non-school day usage is Jetty Street eastbound (i.e. the side closest to the School), which is consistent with anecdotal advice.

The full set of historical parking analysis is provided at **Appendix B**.

2.8 Drop-off and Pick-up (Kiss & Ride)

The school currently operates with two kiss & ride zones along Pebble Crescent near the accessway (shown in Figure 2.21), which allow parents to pick up and drop off their children in front of the school. The overall length of these zones is around 120 metres, and drivers can stay for almost 2 minutes. Both kiss & ride zones on Pebble Crescent are shown in Figure 2.22 and Figure 2.23. These zones are signposted 'No Parking' zone between 8:00-9:00 am and 2:30-3:30 pm to provide smooth traffic flows through the area. There is also a 'No Stopping' sign between the zones.

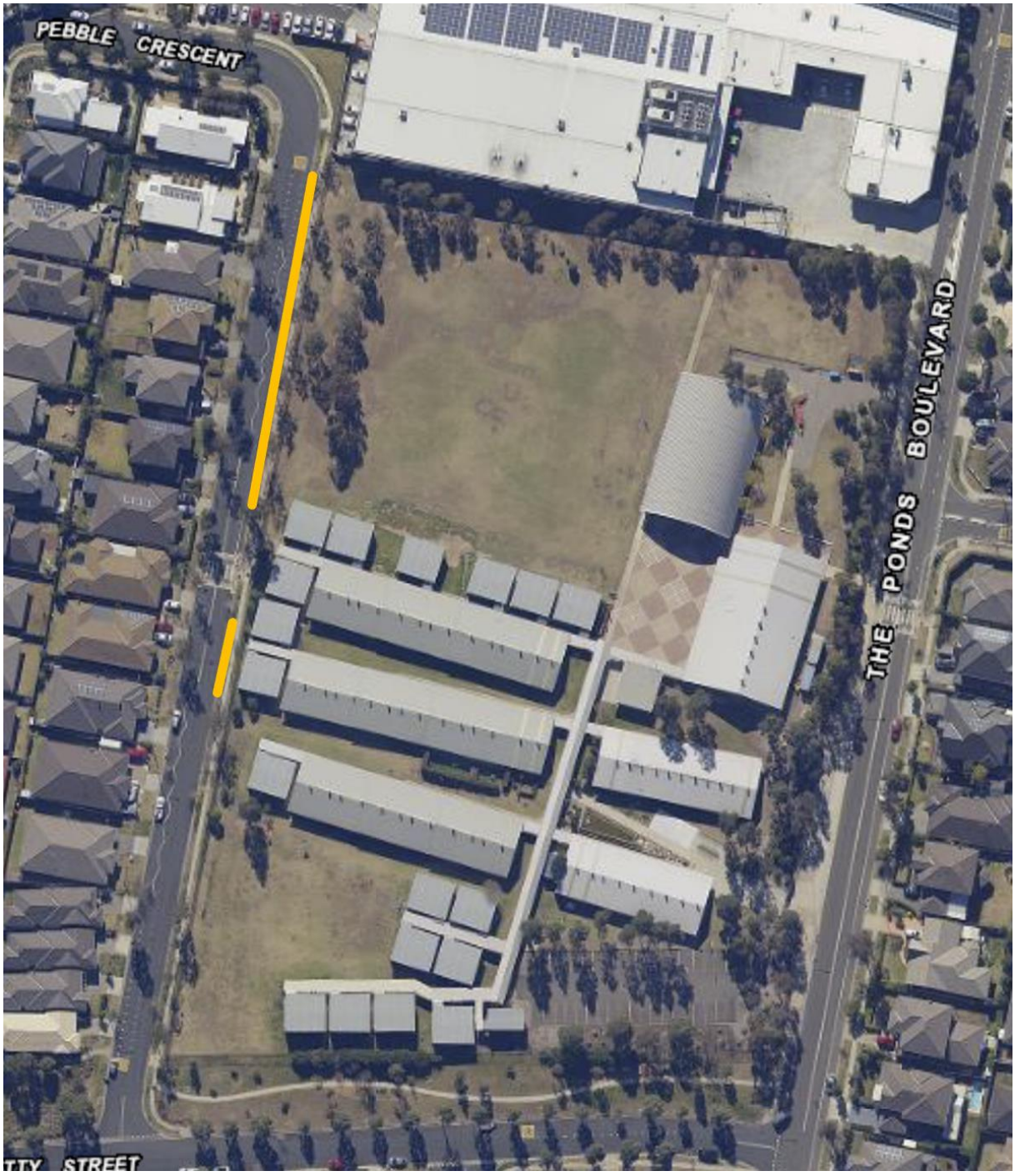


Figure 2.21: Kiss & ride areas near JPPS

Figure 2.22: Pebble Crescent first kiss & ride area

Figure 2.23: Pebble Crescent second kiss & ride area

2.9 Intersection Performance

2.9.1 Traffic Data Collection Scope

To analyse the existing traffic conditions around the site, the intersection of The Ponds Boulevard and Riverbank Drive has been modelled. To this end, the intersection movement counts were extracted from SCATS data, and traffic survey is not possible since COVID 19 lockdown restrictions have affected traffic demands.

Intersection traffic modelling was undertaken during peak morning (8:00-9:00 am) and afternoon (4:50-5:50 pm) periods on Wednesday 16 June 2021.

The location of this intersection is shown in Figure 2.24. The scope of intersection studies was reviewed and agreed with the Transport Working Group.

Figure 2.24: Location of traffic data collection

2.9.2 Intersection Traffic Movements

Figure 2.25 shows hourly traffic volumes extracted from SCATS data for the intersection of The Ponds Boulevard and Riverbank Drive related to Wednesday 16 June 2021. According to the SCATS data for one day, AM and PM peak hours as a whole and related to school hours were determined. As shown in Figure 2.25, AM peak hour is between 8 am and 9 am, which is compatible with the school start time; however, the

PM peak hour of the intersection starts after school hours. Therefore, we consider two PM peak hours for modelling the intersection to investigate JPPS development impact on the intersection traffic operation.

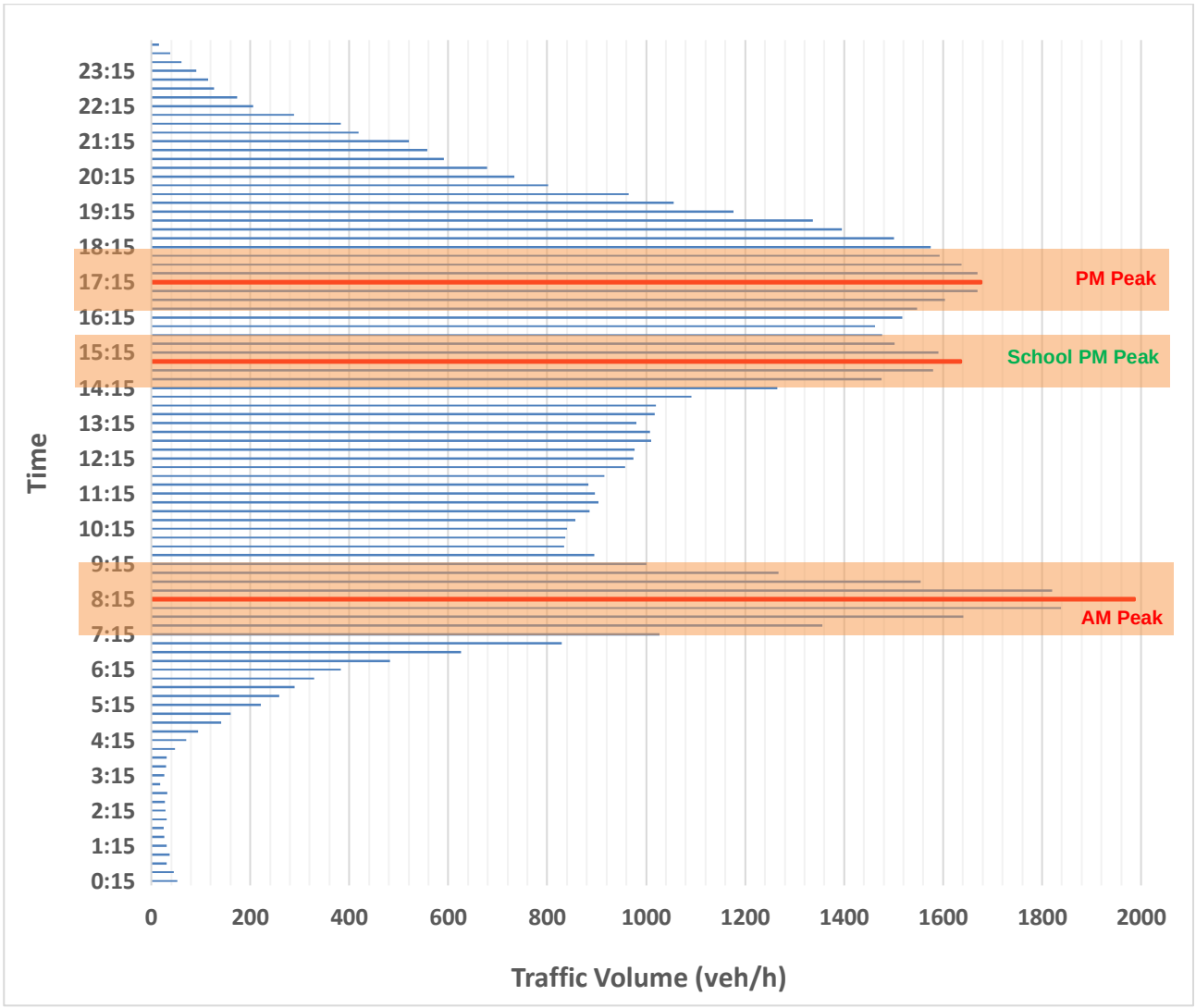


Figure 2.25: SCATS traffic counts during 24 hours - Wednesday 16 June 2021

Total intersection's traffic volumes on the nominated study intersection are summarised in Table 2.4 and presented in Figure 2.26 and Figure 2.27.

Table 2.4: traffic volumes Summary

Movement	Peak Hour		Total Volume
Northbound – Through/Left Turn	AM	08:00-09:00	202
	PM	16:50- 17:50	206
	School PM	14:45 – 15:45	184
Northbound – Right Turn	AM	08:00-09:00	146
	PM	16:50- 17:50	142
	School PM	14:45 – 15:45	168
Southbound – Through/Left Turn	AM	08:00-09:00	280
	PM	16:50- 17:50	171
	School PM	14:45 – 15:45	160
Southbound – Right Turn	AM	08:00-09:00	226
	PM	16:50- 17:50	253
	School PM	14:45 – 15:45	210
Eastbound – Through/Left Turn	AM	08:00-09:00	436
	PM	16:50- 17:50	310
	School PM	14:45 – 15:45	272
Eastbound – Right Turn	AM	08:00-09:00	204
	PM	16:50- 17:50	179
	School PM	14:45 – 15:45	121
Westbound – Through/Left Turn	AM	08:00-09:00	360
	PM	16:50- 17:50	291
	School PM	14:45 – 15:45	338
Westbound – Right Turn	AM	08:00-09:00	133
	PM	16:50- 17:50	133
	School PM	14:45 – 15:45	126

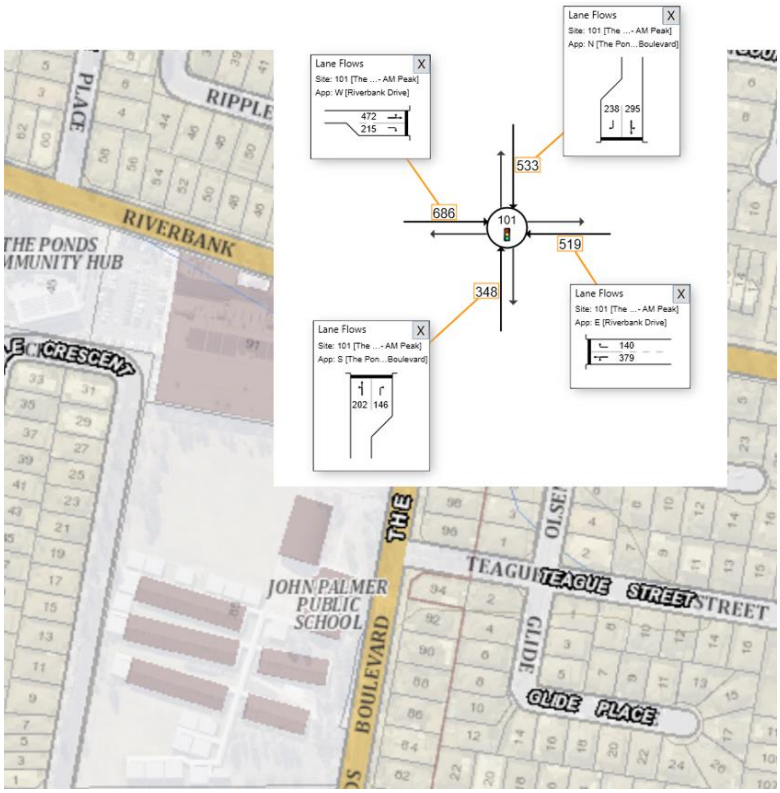


Figure 2.26: Trip Volume Summaries – AM Peak – Wednesday 16 June 2021

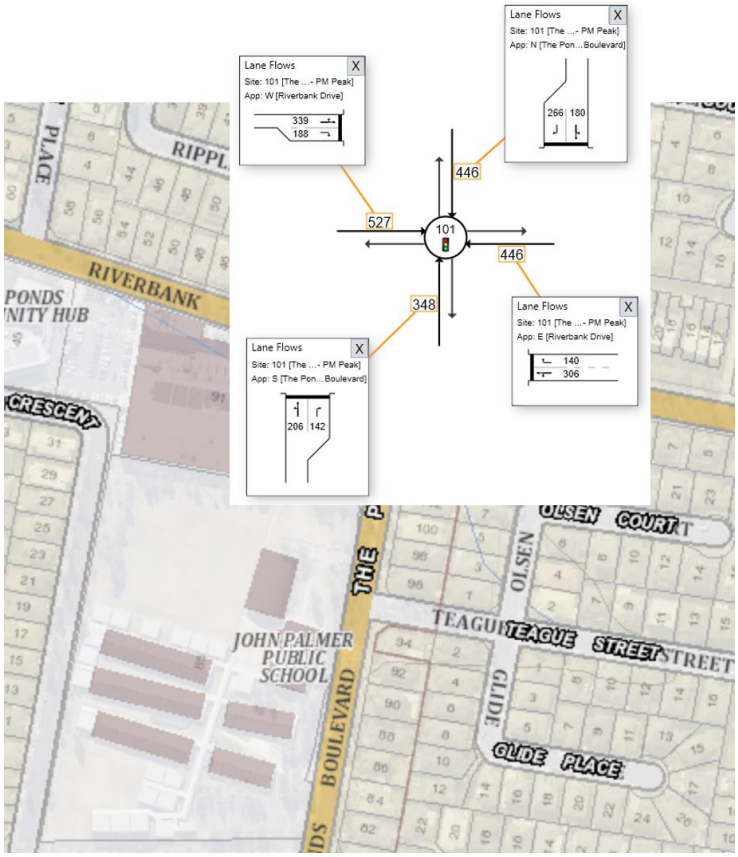


Figure 2.27: Trip Volume Summaries – PM Peak – Wednesday 16 June 2021

2.9.3 Traffic Modelling

Traffic modelling of the existing conditions has been undertaken using SIDRA 9 intersection modelling software to accurately determine and demonstrate the current performance of the road network nearby John Palmer Public School.

Since through and left-turning movements use shared lanes at each approach and SCATS data cannot split them, it is assumed that 10% of the traffic counts passed through these lanes turn left, and 90% of this volume have through movement.

For modelling purposes, pedestrian volumes have been determined based on the number of students living at north JPPS and commuting between their homes and the school by walking, equal to 15% of the students living at north JPPS.

The intersection of The Ponds Boulevard and Riverbank Drive plus the pedestrian crossing has been modelled, as illustrated in Figure 2.28.

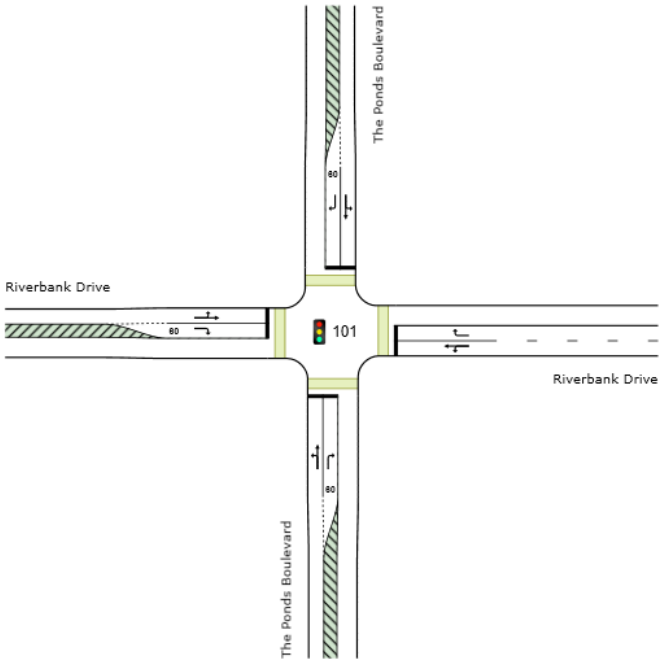


Figure 2.28: SIDRA study intersection layout
Diagram is indicative of connections only; not to scale.

The summary results of the intersection modelling are shown in Table 2.5.

Table 2.5: SIDRA modelling results
Data presented is intersection total/average

Intersection	Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
The Ponds Boulevard & Riverbank Drive	**AM**	0.881	50.2	160.2	**D**
	PM	0.890	45.9	98.7	**D**
	School PM	0.871	41.5	77.9	**C**

Full results of the SIDRA intersection modelling are provided at **Appendix E**.

Some notable results requiring further explanation are as follows:

- The model reflects the current congestion issues of the intersection, which is due to the John Palmer Public School and The Ponds Shopping Centre located in the close distance of the intersection.
- The most congested approach of the study intersection is west Riverbank Drive, and it operates with high delay and degree of saturation during AM and PM peak hours. It needs to be noted that right-turning vehicles reduce the capacity of the nearby lane with through and left-turning vehicles.

It is acknowledged that not all of the congestions issues that occur on the site during a typical day could be observed and modelled since the COVID 19 lockdown has restricted daily trips and site inspection.

2.10 School Catchment Access Analysis

Figure 2.29 shows the school catchment (in black) and the approximate walking distance catchments for the 400m, 800m, 1200m, and 2400m walk (shaded colours). These are roughly equivalent to the 5-minute, 10-minute, 15-minute, and 30-minute walking catchment, respectively. A 1200m walk and 2400m walk are also approximately equal to a 5-minute and 10-minute cycling catchment, respectively.

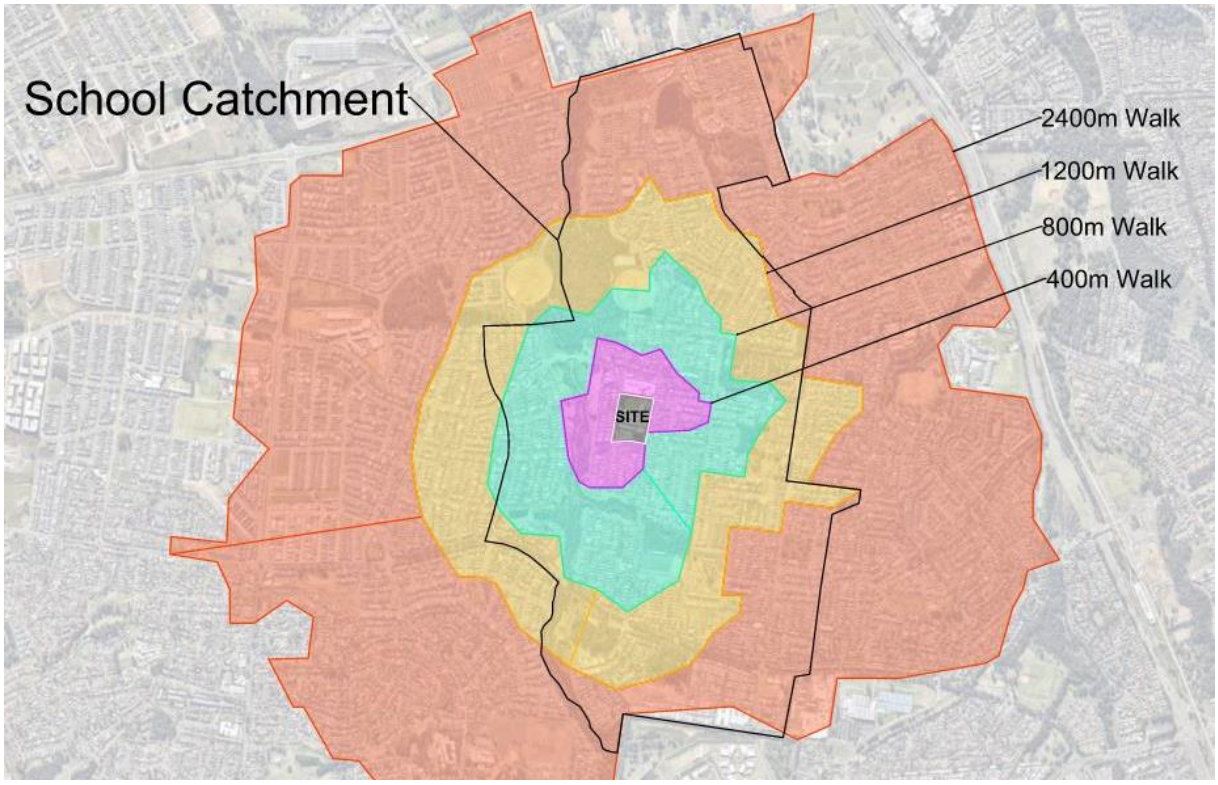


Figure 2.29: School catchment and walking catchments

Based on depersonalised student location data provided by SINSW, an analysis of the catchment coverage within these walking and cycling distances has been undertaken, as provided in Table 2.6.

Table 2.6: School catchment and walking catchment student coverage

Walking Distance (m)	Number of current students	Portion of current students (%)	Cumulative #	Cumulative %
0 – 400m (5-min walk)	131	14%	131	14%
400 – 800m (10-min walk)	229	24%	360	38%
800 – 1200m (15-min walk)	366	39%	726	77%
1200 – 2400m (10-min cycle)	199	21%	925	98%
> 2400	23	2%	948	100%
Total	**948**	**100%**		

2.11 Travel Mode

Due to lockdowns and travel changes associated with COVID-19, a questionnaire was not distributed to staff and students for completion and no detailed on-site travel mode data has been collected. As an alternative, the School has provided information regarding the travel habits of the students and staff of the school. The questionnaire is attached to Appendix A.

2.11.1 Student Travel Information

According to the School's responses, the travel mode of students commuting between home and the school is shown in Figure 2.30. The results demonstrates that most of the students are dropped off and picked up in Pebble Crescent. A small number of them use active transport and less than 10 students ride buses to the campus.

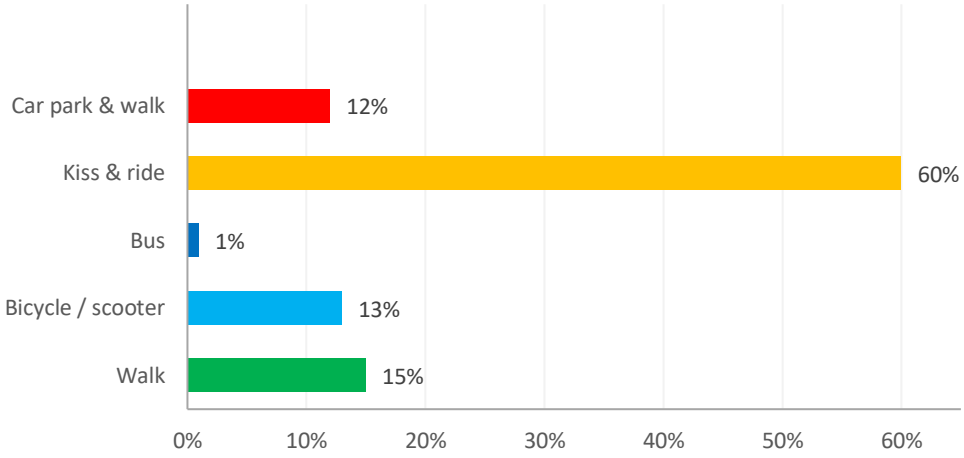


Figure 2.30: Student travel modes

2.11.2 Staff Travel Information

Figure 2.31 illustrates the travel mode of the JPPS's staff, which is almost exclusively private vehicle. The School has indicated that the modes of drop-off, bicycle, or walking are used by a single staff member.

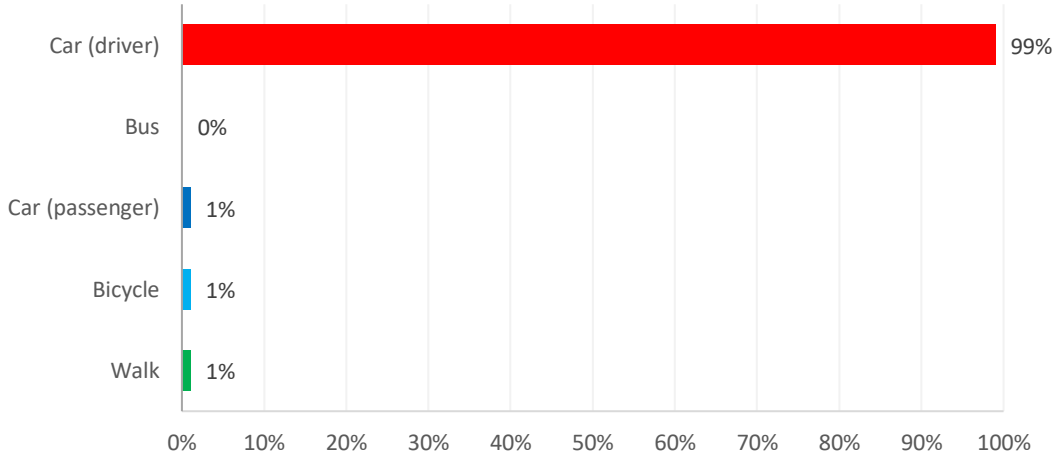


Figure 2.31: Staff travel modes

3.0 Proposed Development

3.1 Overall Works

The proposed development seeks to upgrade John Palmer Public School. The upgrade consists of the following alterations and additions:

- Construction of a new three storey building facing The Ponds Boulevarde which will accommodate 29 Permanent Learning Spaces and 1 new staff room;
- Construction of a one storey new library building;
- Relocation of service access to staff car park off The Ponds Boulevarde, including alterations to the existing car park to accommodate service vehicle;
- One-storey extension to and refurbishment of existing School Hall building. The School Hall extension will accommodate ancillary spaces for Out of Hours School Care;
- Building Block D will be re-purposed from an existing library to special program spaces and administration;
- Refurbishment of Building F to provide 1 new support unit;
- Minor additions and internal refurbishments to Building A;
- Removal of all 20 existing demountable classroom buildings once alterations and additions have been completed; and
- Ancillary works to support the alterations and additions including landscaping and service provision.

A summary table of changes to student and staff capacities is shown in Table 3.1.

Table 3.1: Summarised existing and future capacities

	Existing (permanent)	Existing (enrolment)	Proposed
Students	368[1]	943[2]	1,012
Staff	25[3]	56[3]	59[3]

The proposed site plan is shown in Figure 3.1 below, with the new build located to the north-east of the site.

[1] *16 permanent teaching spaces at 23 students per teaching space*
[2] *As advised by JPPS (11 August 2021)*
[3] *Calculated as per School Infrastructure NSW staffing entitlement methodology*

Figure 3.1: Proposed site plan
Source: PTW Architects

3.2 Site Access

3.2.1 Pedestrian

A new pedestrian access to the campus is proposed to be provided at Jetty Street. This will form a continuation of the existing central pedestrian spine within the site. The new entry will improve the pedestrian accessibility of the site and will interface with the wide roadside verge on Jetty Street. An adjacent zebra crossing is also proposed in the vicinity, discussed further in Section 3.3.

A new pedestrian ramp is proposed to be provided within the northern access point along The Ponds Boulevard, near the new build, opposite the existing canteen. This will improve the accessibility of the site, compared to the existing conditions which have a staircase along the only path at this location.

The existing pedestrian access at Pebble Crescent will be maintained in its existing configuration.

3.2.2 Cyclists

Cyclist access will be available at all existing and proposed access points to the site. New bike storage and staff end-of-trip facilities will be provided near the new entry point at Jetty Street, detailed in Section 3.4.

3.2.3 Car Parking & Service Vehicles

Car park access will be retained at The Ponds Boulevard, and this existing access point will now also provide access to the future service vehicle zone.

Service vehicle access will be moved from the existing dedicated service vehicle driveway to a new service vehicle zone within the staff car park. The existing service vehicle access will be demolished.

3.3 Pedestrian Facilities

To increase the uptake of the walk-only travel mode to the site, and to improve connectivity to surrounding public transport stations and services, several pedestrian improvements are proposed, including:

- New raised zebra crossing at Jetty Street
- New pedestrian access into JPPS at Jetty Street
- New accessible ramp to the existing northern access at The Ponds Boulevard

As a result of the new entry to Jetty Street, the current school zone area along Jetty Street will also need to be extended to its intersection with Pebble Crescent, subject to separate approval processes through Transport for NSW.

The overall extent of pedestrian facility improvements around the site is illustrated in Figure 3.2. It is noted that the location of the raised zebra crossing is conceptual only, and would be located between Sail Street and The Ponds Boulevard subject to detailed design and separate approvals by Council's Local Traffic Committee.

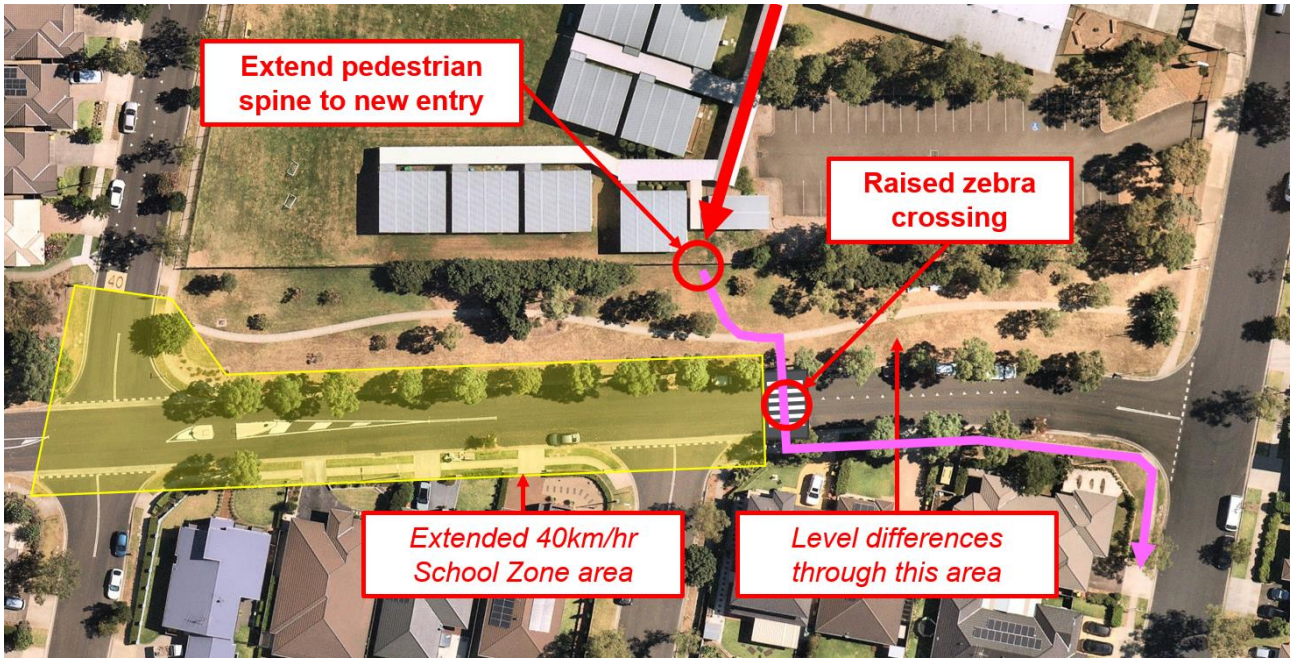


Figure 3.2: Proposed pedestrian works concept
Zebra crossing location is conceptual only and subject to detailed design and separate approvals.

3.4 Cyclist Facilities

Additional parking and staff end-of-trip facilities (EOTF) are proposed as follows:

- 10 bike rails for 20 bikes (86 existing), near the new Jetty Street entry
- Rack for 10-20 scooters (60 existing), near the new Jetty Street entry
- 4 bike rails for 8 bikes for staff, to be located near the staff area
- 1 unisex shower, 1 unisex accessible shower, and 10 lockers for staff

The indicative location of the bicycle storage area and end-of-trip facilities is shown in Figure 3.3 and Figure 3.4 below, however this may be subject to change during the Detailed Design.

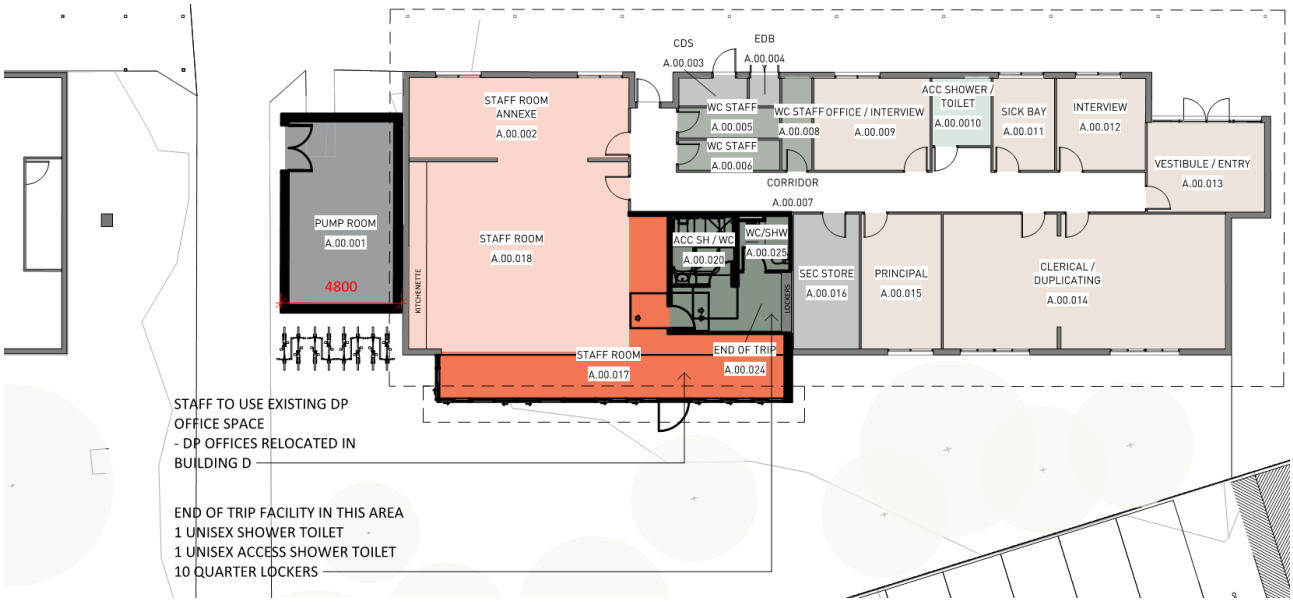


Figure 3.3: Staff bicycle storage and end-of-trip facilities
Source: PTW

Figure 3.4: Student bicycle and scooter storage
Source: PTW

3.5 Car Parking & Service Vehicles

The existing car park is proposed to be modified to accommodate:

- A service vehicle access and waste collection area,
- A compliant accessible parking space to replace the existing non-compliant space, and
- New line marking for the overall layout.

The works will reduce the capacity of the car park from the existing 37 car spaces (including 1 non-compliant accessible space) to 35 car spaces (including 2 compliant accessible spaces). The proposed layout is shown in Figure 3.5 below.

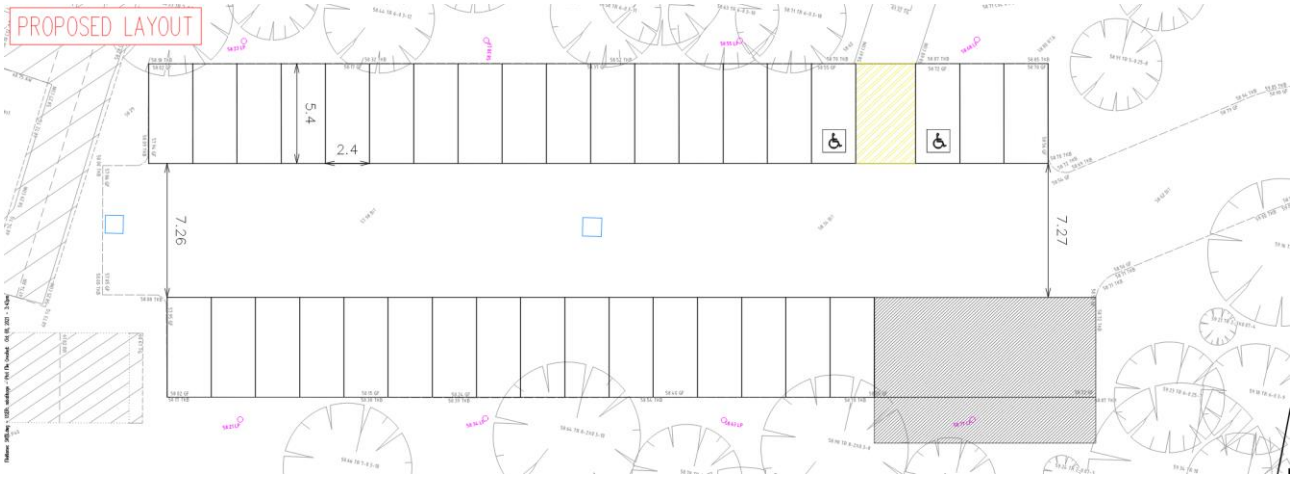


Figure 3.5: Proposed car park layout

The proposed layout is compliant with Australian Standard AS2890.1 as a Class 1 car park (minimum 2.4m space width, minimum 6.2m aisle width required). The aisle width of 7.2m is substantially wider than the 6.2m required, which will assist with circulation and access. Accessible spaces will now be compliant with AS2890.6.

A detailed plan of the proposed changes to the car park is provided at **Appendix C**.

The new service vehicle area could accommodate access for vehicles up to a 12.5m Heavy Rigid Vehicle while the car park is empty, or an 8.8m Medium Rigid Vehicle while the car park is occupied. The proposed access for an MRV is shown in Figure 3.6 below.

Full swept path analysis is provided at **Appendix D**.

The vacant space shown in Figure 3.6 would accommodate the storage of bins, and other uses as required from time to time by the School.

The existing service vehicle area located to the north of the School would be demolished as part of this project.

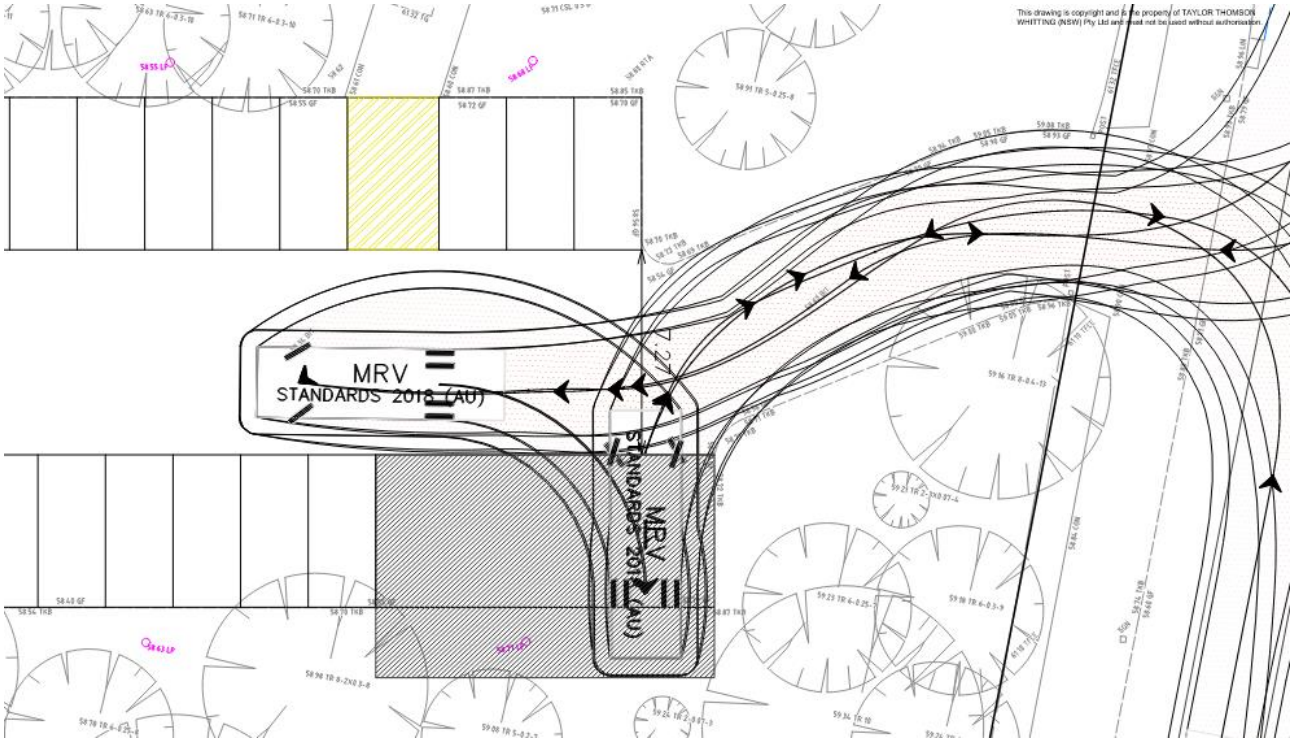


Figure 3.6: Service vehicle access

3.6 Pick-up and Drop-off (Kiss & Ride)

There are no changes proposed to pick-up and drop-off facilities. The existing No Parking zone on Pebble Crecent would be retained its its current configuration.

3.7 Public Transport Access

There are no changes proposed to public transport acces. The existing indented bus bay on The Ponds Boulevard will be retained in its current configuration.

4.0 Operational Impacts

4.1 Overall Travel Demands

As detailed in Section 3.1 the student capacity is proposed to increase to 1,012 students, from the current operation of 943 students (as of August 2021), or an increase of approximately 7.3%. As a result of this growth, the anticipated staffing allowance would increase from approximately 56 staff to 59 staff, or an increase of approximately 5.4%.

Accordingly, the anticipated increases in travel demands can be estimated as shown in Table 4.1. Mode splits are based on the existing travel habits as estimated and advised by the School, see Section 2.11.

Table 4.1: Travel mode splits and volume forecasts
Values may not add to 100% due to rounding.

	Students				Staff			
Travel Mode	**Mode Split**	**Existing Volumes**	**Forecast Volumes**	**Growth**	**Mode Split**	**Existing Volumes**	**Forecast Volumes**	**Growth**
Walk	15%	141	152	10	<1%	1[4]	1	0
Bicycle	8%	75	81	6	<1%	1[4]	1	0
Scooter	5%	47	51	3	0%	0	0	0
Bus	<1%	5[5]	5	0	0%	0	0	0
Drop-off & pick-up	60%	566	607	41	<1%	1[4]	1	0
Park & walk	12%	113	121	8	0%	0	0	0
Car (driver)	-	-	-	-	99%	55	58	3
Total	**100%**	**943**	**1,012**	**69**	**100%**	**56**	**59**	**3**

The growth outlined in Table 4.1 and the analysis in this section of the report assume that mode splits remain consistent post-development. However, the School Transport Plan (see Section 5.0) seeks to change this mode split to reduce car-based travel and achieve a shift towards active and public transport modes.

4.2 Pedestrians

As detailed in Table 4.1, a growth of approximately 11 additional pedestrians (11 students and 0 staff) could be expected as a result of the development.

In general, this growth in pedestrian activity is considered negligible and and would create no significant change to the local pedestrian network. The additional students walking to/from school may generate some volume of additional parents, however this would also be negligible across the network.

The proposed transport infrastructure for the site includes a new raised zebra crossing at Jetty Street, between Sail Street and The Ponds Boulevard, in the vicinity of the new pedestrian entry on the Jetty Street frontage. While pedestrian crossings on local roads are not strictly subject to Transport for NSW approvals, consultation

[4] School has advised of a single staff member who alternates between modes
[5] School has advised of 3-5 students who catch the bus, representing less than half a percent of travel. These are listed in addition to the other mode splits, so may not add to a correct total.

with Council during the Transport Working Group process has indicated that the TfNSW warrants are the preferred assessment process.

The Transport for NSW warrants for pedestrian zebra crossings are as follows[6] (relevant extracts):

> *"Transport practice for numerical warrants for Pedestrian (Zebra) Crossings on arterial roads are:*
>
> ***i) Normal Warrant:***
>
> *A pedestrian (Zebra) Crossing is warranted where:*
>
> *In each of three separate one-hour periods in a typical day*
>
> *(a) The pedestrian flow per hour (P) crossing the road is greater than or equal to 30 AND*
>
> *(b) The vehicular flow per hour (V) through the site is greater than or equal to 500 AND*
>
> *(c) The product PV is greater than or equal to 60,000*
>
> ***ii) Reduced Warrant for sites used predominantly by children and by aged or impaired pedestrians:***
>
> *If the crossing is used predominately by school children, is not suitable site for a Children's Crossing and in two counts of one-hour duration immediately before and after school hours:*
>
> *(a) P ≥ 30 AND*
>
> *(b) V ≥ 200*
>
> *a pedestrian (Zebra) Crossing may be installed.*

The planned treatment for this location is a full-time pedestrian priority facility. Therefore a pedestrian zebra crossing is preferred over a Children's Crossing. A Children's Crossing would provide lower priority to pedestrians (is intended to provide vehicle priority outside specific hours) and would require manned operation. As this would be the third zebra crossing in the vicinity of the site, it may be unreasonable to require additional manned operation at multiple locations.

The 'Reduced Warrant' is considered suitable for assessing a zebra crossing in this location.

While detailed pedestrian and vehicle counts cannot currently be taken in this location to fully assess the Reduced Warrant, detailed estimates can be made as follows:

- Total pedestrian activity around the School is expected to be approximately 405 students, including:
  - 152 'walk only' pedestrians
  - 81 cyclists
  - 51 scooters
  - 121 'park and walk' pedestrians
- Additional pedestrian demand will be generated by parents accompanying their children to School, say an additional 200 parents, resulting in 600 total pedestrians.
- Kiss & ride activity at the Pebble Crescent 'No Parking' zone is expected to be approximately 607 students, which at approximately 1.5 students per vehicle would represent approximately 400 vehicles. Noting that vehicles arrive and depart in a short time period, this represents 800 movements per hour.
- If only 5% of total pedestrian activity around the site and 25% of Pebble Crescent traffic passed through the proposed zebra crossing location, the warrants would be met.

[6] Supplement to Australian Standard AS 1742.10-2009, *Manual of Uniform Traffic Control Devices* – Part 10: *Pedestrian control and protection* Version 3.1

These percentage estimates are considered be substantially conservative. It can be reasonably assumed that approximately one-third to half of the School's pedestrian activity would occur to the south of the site (noting the central location of the School within the catchment), and very high portions or almost all of the kiss & ride traffic would pass through this location as the main intersection to the local road network.

Therefore, in the absence of more detailed pedestrian and vehicle counts, it can be assumed that the Transport for NSW 'Reduced Warrants' for a pedestrian zebra crossing would be met in this location. Additionally, given the safety improvements and amenity which would be achieved, the proposal is considered suitable. It is noted that final design and installation would be subject to approval by Council's Local Traffic Committee.

4.3 Cyclists

As detailed in Table 4.1, a growth of approximately 6 additional cyclists (6 students and 0 staff) could be expected as a result of the development. A further 4 students may ride scooters or skateboards to school.

To encourage additional uptake of bicycles and scooters for the journey to school, storage for 20 bikes, 10-20 scooters, and 8 staff bikes are proposed (substantially higher than required by the current mode share). The final capacity would be 106 bikes, 80 scooters, and 8 staff bikes. These capacities would allow a mode share of up to 10.5% of students cycling, 7.9% of students riding scooters, and 13.6% of staff cycling. It is expected that this would result in spare capacity for staff and a higher level of amenity (e.g. 1 bike per rail, instead of 2).

Additionally, end-of-trip facilities for staff are proposed as detailed in Section 3.4, including 1 unisex shower, 1 unisex accessible shower, and 10 storage lockers.

The NSW Department of Education Educational Facilities Standards & Guidelines (EFSG) nominate the following requirements for bicycle storage:

Table 4.2: EFSG bicycle storage requirements

Source: NSW Department of Education

School core size	1	3	7	14	21	28	35
Number of bikes	3	5	12	24	36	48	60

The proposed provision of 106 bikes shall meet and exceed the EFSG requirements for a Core 35 school (60 spaces).

4.4 Public Transport

As detailed in Table 4.1, no growth in public transport usage is expected as a direct result of the development. However, the School Transport Plan (see Section 5.0) seeks to change the existing mode split to reduce car-based travel and achieve a shift towards active and public transport modes.

Transport for NSW provides the School Student Transport Scheme (SSTS), which gives school students free or subsidised travel between home and school on all public transport modes including buses, trains, ferries and light rail. The minimum distance requirements for a free School Travel Pass are as follows[7]:

- Years K to 2 (Infants): no minimum distance
- Years 3 to 6 (Primary): 1.6 kilometres straight line distance or 2.3 kilometres walking or further

[7] Transport for NSW: https://apps.transport.nsw.gov.au/ssts/#/whoIsEligible

Where students are not eligible for the School Travel Pass, the School Term Bus Pass offers discounted travel on buses between home and school for a whole school term, for a cost of $55 per term.

Based on the size and configuration of the current catchment intake boundary, almost all students are within the 2.3km exclusion zone (for Years 3 to 6). Therefore, the most likely users of public transport would be Year K-2 students (accompanied by a parent), staff, or Year 3-6 students with a School Term Bus Pass. Opportunities for applying for the School Term Bus Pass, and available bus routes, would be made clear in a Travel Access Guide to be provided as part of the final School Transport Plan (see Section 5.0).

Noting the negligible increases in public transport demand that are expected, including with an increased uptake in the future, the proposed development will result in no impacts to public transport operations. Existing physical infrastructure (including the indented bus bay along The Ponds Boulevard) will continue to suitably service the School.

4.5 Pick-up and Drop-off

As detailed in Table 4.1, a growth of approximately 41 additional drop-off and pick-up users (41 students and 0 staff) could be expected as a result of the development.

The growth in the number of students accommodated by the proposed development is approximately 7% relative to existing operations. At an estimated rate of 1.5 students per vehicle, this could represent approximately 30 additional vehicles using the kiss & ride area on Pebble Crescent. The relative growth and the net number of additional vehicles are both considered reasonable growth which could be accommodated within the local road network. Impacts to the road network are considered further in Section 4.7.

Additionally, through the provision of new infrastructure such as the Jetty Street zebra crossing, new pedestrian entry, and additional bicycle and scooter parking, and improved management and communications under the School Transport Plan, it is anticipated that the usage of private vehicle would reduce in the future. For current volumes to remain consistent under the increased student capacity, kiss & ride usage would need to decrease from the existing 60% to approximately 56%, which is considered to be an achievable reduction.

4.6 Car Parking

As detailed in Table 4.1, a growth of approximately 3 additional vehicles (0 students and 3 staff) could be expected as a result of the development.

The proposed reduction in car parking capacity of 2 spaces (5.4%) to accommodate the waste collection and loading zone, combined with the increase in parking demand of 3 vehicles, will result in some additional demand for on-street parking spaces. However, given the significant levels of available capacity in the surrounding street network (see Section 2.7.2), this additional demand could be accommodated and would not create unreasonable impacts to local residents. The usage of on-street parking by residents is currently low (as shown by non-school day occupancy of on-street parking).

The introduction of the new zebra crossing on Jetty Street will also result in some reduction of parking availability on Jetty Street to accommodate the crossing and the associated regulatory ‘No Stopping’ zones. It is anticipated that this would be on the order of 6-8 spaces, which is minimal in the context of the wider availability of on-street parking.

Table 6.1 of the Blacktown DCP 2015 notes the following recommended rates for provision of parking at primary and secondary schools:

- 1 space per staff member, plus
- 1 space per 100 students, plus
- 1 space for delivery vehicles, drop-off area and buses as appropriate

Based on the capacity of 1,012 students and an estimated 59 staff, the total on-site parking requirement based on the DCP rates would be 59 spaces for staff and 10 spaces for visitors.

On completion of the proposed works, the development would accommodate 35 on-site staff car parking spaces plus a waste collection and loading zone within the car park. This would be equivalent to a rate of 0.6 spaces per staff member, with no provision for visitor parking on-site, which is lower than the DCP rate.

However, as noted in Part A, Section 6.2 of the Blacktown DCP 2015, car parking provision should be determined with consideration of:

- The size and type of the development and its traffic generation
- The availability and accessibility of other public parking
- Traffic volumes on the street network, including expected future traffic volumes relating to the City's road hierarchy
- Hours of operation and any other specific characteristics of the development proposal.

The increase in size of the development relative to today's existing conditions is minimal (+7% of students, +5% of staff) and will result in low levels of additional traffic generation and car parking demand. As the type of development is for a school, it is critical to increase the amount of available on-site open play space and reduced levels of on-site car parking assist in achieving this.

Regarding aerial maps (collected from Nearmap), the total number on-street car parking spaces nearby JPPS is around 187, which is occupied by maximum of 88 cars during school days, and 140 spaces are available, more details are presented in **Appendix B**. As mentioned above, the numebr of required parking spaces due to the JPPS development will be 69 that consists of staff and students' parents or other visitors. The on-site car park would provide 35 spaces. The other 34 vehicles can use the 140 spaces available on-street. On-street parking has good availability during school hours and is more heavily used by local residents out of school hours. Therefore, potential overflow would not cause undue impact to residents. Further analysis has been done on Nearmap images, and the map presented in Figure 4.1 has been captured out of lockdown period in August 2020 in a normal day and the on-site car parking is almost full. As shown in Figure 4.1, there are remarkably high number of parking spaces available at both sides of Sail Street, Picnic Street, Teague Street and west Pebble Crescent, and northbound of east Pebble Crescent. It has to be noted that the land-uses around northbound of west Pebble Crescent is Plaza Park and a playground, which does not create high demand during school hours.

The availability of on-street car parking is shown to be good, based on the analysis presented in Section 2.7.2.

With respect to road hierarchy, almost all surrounding streets are local roads (the lowest on the Blacktown road hierarchy) with the exception of The Ponds Boulevard and Riverbank Drive which are minor collector roads (the second lowest), indicating low traffic volumes generally.

It is acknowledged that during peak school periods, traffic volumes are high, however these periods of congestion are typically short (15-20 minutes). The school also only operates during school hours, with staff generally arriving from around 8am and departing by around 4pm, meaning that all on-street parking remains available for residents and their visitors outside these hours and during weekends and school holidays.

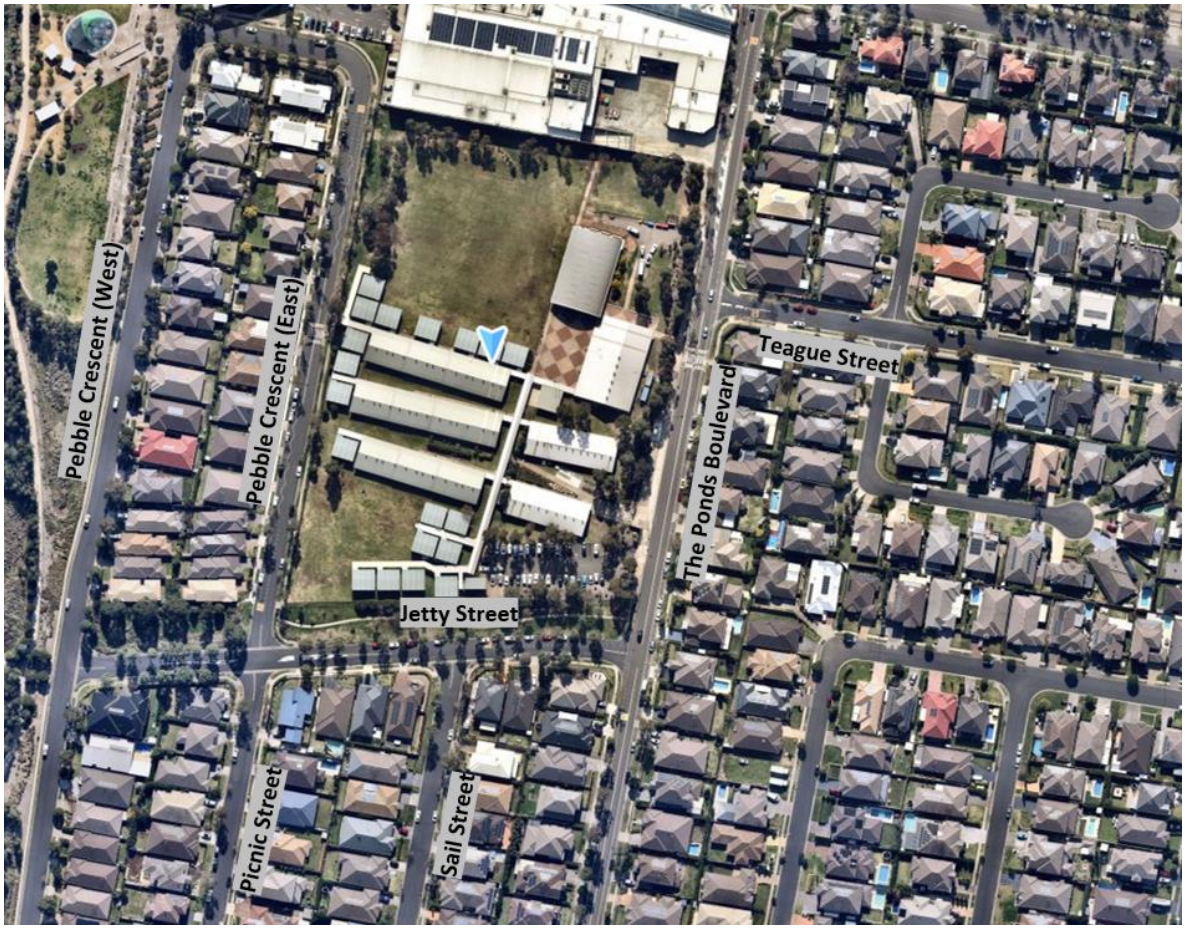


Figure 4.1: On-street car parking availabilty near JPPS

Source: Nearmap (captured on 3 August 2020)

On balance, the proposed parking capacity is considered acceptable for the proposed development.

In accordance with Section D3.5 of the Building Code of Australia (BCA), accessible parking for schools (Class 9b) is required at a rate of 1 accessible space per 100 parking spaces or part thereof, which is a requirement of 1 accessible space for this development. The BCA requirements are therefore satisfied in this proposal, which includes 2 accessible spaces.

4.7 Traffic Conditions

4.7.1 Traffic Generation

As detailed in Table 4.1, a growth of approximately 3 additional vehicles (0 students and 3 staff) could be expected to generate parking demand. Additionally, approximately 41 additional drop-off and pick-up users (41 students and 0 staff) could be expected, or approximately 30 vehicles at a rate of 1.5 students per vehicle. Total vehicular trip generation for the site is therefore around 33 (say 40) vehicles.

While there is a small level of traffic generation for the car park, most traffic for the kiss & ride would generate two trips, say 40 arrivals and 40 departures.

As described in Section 4.1, the analysis in this section of the report assumes that mode splits remain consistent post-development. However, the School Transport Plan (see Section 5.0) seeks to change this mode split to reduce car-based travel and achieve a shift towards active and public transport modes.

4.7.2 Trip Distribution

It is estimated that traffic would be split roughly evenly between north and south approaches to the School. Therefore, for the purposes of intersection modelling at the intersection of The Ponds Boulevard and Riverbank Drive, approximately 50% of new traffic, or 20 arrivals and 20 departures, would be estimated to use this intersection.

Due to the configuration of the school catchment, there is no demand expected from the west of the site. Additional trips are assumed to be distributed proportionally to only the northern (The Ponds Boulevard) and eastern (Riverbank Drive) legs of the subject intersection, resulting in the following additional trip distribution for AM peak hour that is compatible with school start time:

- North approach, through: 17 vehicles
- East approach; left-turn: 3 vehicles
- South approach; through: 11 vehicles
- South approach; right-turn: 9 vehicles

As the School PM peak hour has different traffic prportaion, the additional trip distribution is different from AM and PM peak hours. Traffic demand added due to the new development per approach for each movement is as follows:

- North approach, through: 16 vehicles
- East approach; left-turn: 4 vehicles
- South approach; through: 10 vehicles
- South approach; right-turn: 10 vehicles

4.7.3 Background Growth

For the purposes of traffic modelling of future conditions (with planning horizons of 5 and 10 years, through to 2026 and 2031 respectively), a background growth rate of 1.5% per annum is applied to external traffic.

4.7.4 Future Traffic Condition

The intersection of The Ponds Boulevard and Riverbank Drive has been modelled with traffic growth in 2026 and 2031 considering the addition of the development traffic as described in Section 4.7.2. The results of the traffic modelling at this intersection with and without the new development of JPPS are as follows.

Table 4.3: SIDRA modelling results for 2026 without development

Data presented is intersection total/average

Intersection	Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
The Ponds Boulevard & Riverbank Drive	**AM**	0.920	62.8	229.4	**E**
	PM	0.907	52.9	117.7	**D**
	School PM	0.861	45.1	95.4	**D**

Table 4.4: SIDRA modelling results for 2026 with development

Data presented is intersection total/average

Intersection	Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
The Ponds Boulevard & Riverbank Drive	**AM**	0.950	65.8	238.8	**E**
	PM	0.907	52.9	117.7	**D**
	School PM	0.915	46.5	94.8	**D**

Table 4.5: SIDRA modelling results for 2031 without development

Data presented is intersection total/average

Intersection	Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
The Ponds Boulevard & Riverbank Drive	**AM**	0.990	77.7	274.3	**F**
	PM	0.967	65.5	155.9	**E**
	School PM	0.911	52.4	121.3	**D**

Table 4.6: SIDRA modelling results for 2031 with development

Data presented is intersection total/average

Intersection	Period	Degree of Saturation	Average Delay (sec)	95% Back of Queue (m)	Level of Service
The Ponds Boulevard & Riverbank Drive	**AM**	0.987	81.3	287.0	**F**
	PM	0.967	65.5	155.9	**E**
	School PM	0.905	55.5	127.2	**D**

As expected, the proposed development has some effect on the traffic operation of the modelled intersection in AM and School PM peak hours due to additional demands (if no mode shift is to occur). However, there will be no increase in traffic demand during the PM peak hour.

The modelling of background traffic growth through to 2026 and 2031 demonstrates that there is an expected deterioration of traffic conditions over time, and that the worsening of traffic as a result of the development is negligible compared to the results of background growth.

Therefore, the traffic impacts as a direct result of the proposed development are considered negligible and acceptable in the context of the local network. Any impacts during school peak periods will dissipate within a short period of time of typically 15-20 minutes.

4.8 Service and Loading

The requirements for service and loading will be no higher than the existing conditions, but will be relocated to the new service area in the staff car park.

The service vehicle area can accommodate vehicles up to and including Medium Rigid Vehicles (MRVs), which can enter and exit the site in a forward direction.

4.9 Emergency Vehicles

A new fire booster is to be provided near the staff car park at The Ponds Boulevard. Fire vehicle access would be accommodated from the street in the event of an emergency.

Ambulance access can be accommodated to various areas through the site, including the northern and southern play spaces, with new access gate proposed to the northwest from Pebble Crescent.

4.10 Social Impacts

As part of the EIS for the proposed works, a Social Impact Assessment (SIA) has been prepared by Elton Consulting. The SIA identifies and analyses the potential positive and negative social impacts associated with a development proposal. It involves a detailed and independent study to outline social impacts, identify mitigation measures, and provide recommendations in accordance with professional standards and statutory obligations.

In relation to traffic and parking, the SIA consultation revealed the following feedback for the existing situation:

- There are some constraints on staff parking
- There are issues with pick up/drop off areas creating bottleneck traffic in peak times in the kiss and drop zone.

The SIA consultation revealed the following feedback for the proposed project:

- Noise, trucks and safety concerns during construction
- Parking and traffic pressure during construction including workers parking in the area and alterations to the staff carpark to accommodate service vehicles
- Concerns regarding parking and traffic due to increased number of users at the kiss and drop area and in local streets, particularly Pebble Crescent, and The Ponds Boulevard.

The SIA consultation revealed the following suggestions for the design:

- Improve kiss and drop, staff car parking and safety or entry and exits to the school, and ensure streets are safe for students walking/riding, as well as a scooter rack

4.10.1 Response to Social Impact Assessment

In response to the findings of the SIA and the recommendations put forward, the following comments are noted:

- The existing local transport network, and the physical space available for it, are constrained in the local residential area. This includes provision for all modes of transport including private vehicles, public transport, and active transport (walking and cycling).
- The existing traffic and parking issues around the school, including management of the drop-off and pick-up area, have been noted by the community and the School as issues to be considered in this project.

- Therefore, on consideration of these two items, the transport strategy put forward for this development is to reduce private vehicle usage as far as practical, by providing feasible alternatives for both staff and students.
- The improvements being provided as part of this project for alternative travel modes include a new pedestrian zebra crossing at Jetty Street, new bicycle and scooter storage for students, new bicycle storage and end-of-trip facilties for staff, and a new pedestrian entry to the site. These works will make walking and cycling to site a safer and more attractive option, thereby allowing for an increased active transport mode share.
- Additionally, external projects by Council (including the provision of a raised zebra crossing on Riverbank Drive) will provide more extensive safety and priority improvements for pedestrians across the local area.
- The operation of the School will include a strong communications platform in the School Transport Plan, of which a preliminary version has been included in this TAIA. Messages to staff and parents will include identifying safe routes to school, identifying available facilities (such as bicycle storage), discussing relevant events or road safety courses, and important messages relating to usage of transport facilities (such as the kiss & ride zone). School Infrastructure NSW has also recently standardised a Travel Access Guide document for all schools to improve the distribution of this information (see Section 5.5.3).
- A reduction in private vehicle usage (and uptake in active travel modes in particular), and therefore reductions in traffic congestion and improvements to road safety, are considered realistic and achievable because:
    - While approximately 15% of students currently walk to site, analysis of the school catchment shows that approximately 77% of the student catchment population lives within a 1200-metre walking distance, roughly equivalent to a 15-minute walk, allowing for vast improvements for this overall mode split.
    - The preliminary School Transport Plan and the Transport Working Group for the project have identified communication and consultation strategies for any future issues or concerns to be put forward to the relevant authorities for consideration.
    - Due to the relatively low increase in student population which can be accommodated by the proposed works, only a low shift in travel mode would be required to achieve a net zero change in existing vehicular traffic conditions.

5.0 School Transport Plan

A School Transport Plan (STP) is a way to sustainably manage the transport needs of staff, students, volunteers and visitors to a development. The aim of the Plan is to reduce the environmental impact of travel to and from the site and to provide a clear plan of management for vehicle and pedestrian movements within and around the site.

This Plan contains travel plan objectives for the development, the proposed design features that contribute to meeting these objectives, and management strategies intended to fulfil the outlined objectives.

This preliminary School Transport Plan has been prepared to support the development and future operation of the school, and to satisfy conditions of the SEARs issued by the Department of Planning, requiring the provision of a School Transport Plan and strategies to improve infrastructure.

This document is preliminary in nature and is intended to be dynamic and respond to the future operation of the site. It is anticipated that this preliminary STP will be developed into a more comprehensive and final STP prior to commencement of operations of the new development. This document may also form a reference point for further development of new operational plans in the future.

5.1 Transport Goals

5.1.1 Vision and Objectives

The vision and objectives of the preliminary School Transport Plan for John Palmer Public School are:

- To proactively identify and meet school travel demand safely, efficiently and sustainably
- To deliver transport infrastructure to meet school travel demand
- To decongest the road networks around the school
- To empower children and young people to be safe road and transport users now and into the future

5.1.2 Transport Context

To inform realistic mode share targets and practical actions, the existing transport context for the site has been considered. Existing student travel habits (as per Section 2.11) show an overall travel rate of approximately 72% by car. However, analysis of depersonalised location data (as per Section 2.10) shows that only 23% of the student catchment is outside a reasonable 1200-metre walking distance of the site. If considering a lower reasonable walking distance of 800 metres, only 62% of the catchment is outside this distance.

Substantial reductions in travel by car are considered realistic and achievable based on this comparison of current travel habits to actual location/distance data. Additionally, an ambitious travel mode target has been supported by Transport for NSW during the assessment of this application, and their suggested rates are adopted here for both staff and students.

5.1.3 Mode Share Targets

The recommended mode share targets for the site are outlined in Table 5.1. This includes both interim targets (for the short to medium term, or approximately between 5 to 10 years) and final targets (for the medium to long term, or approximately between 10 to 15 years).

The volume change listed is the difference between the full operational capacity based on existing travel habits (i.e. as outlined in Table 4.1), and the full operational capacity with the final mode shift achieved.

Table 5.1: Travel mode split targets and volumes

Values may not add to 100% due to rounding.

Travel Mode	Students				Staff			
	Existing Mode Split	Interim Target	Final Target	Volume Change	Existing Mode Split	Interim Target	Final Target	Volume Change
Walk	15%	20%	25%	101	<1%	2%	3%	2
Bicycle	8%	12%	15%	71	<1%	4%	9%	5
Scooter	5%	7%	10%	51	0%	0%	0%	0
Bus	<1%	2%	5%	50	0%	4%	8%	5
Drop-off & pick-up	60%	50%	40%	-202	<1%	0%	0%	0
Park & walk	12%	9%	5%	-71	0%	0%	0%	0
Car (single-use)	-	-	-	-	99%	70%	40%	-35
Car (carpool)	-	-	-	-	-	20%	40%	24
Total	**100%**	**100%**	**100%**	**-**	**100%**	**100%**	**100%**	**-**

These mode share targets are considered reasonable and achievable as:

- A walking rate of 25% of students would be equivalent to all students in the 0 to 400-metre walking distance bracket (estimated 5-minute walk) plus approximately half of the students in the 400 to 800-metre walking distance bracket (estimated 10-minute walk). Even for primary school children, these are considered realistic walking distances that could be achieved.
- Bicycle usage by 15% of students would represent 152 bicycles, which is an increase of 46 bicycles above the currently proposed storage for 106 bicycles. This is a moderate increase which could be accommodated on the site as uptake of the bicycle mode share increases over time.
- Scooter usage by 10% of students would represent 101 scooters, which is an increase of 21 scooters above the currently proposed storage for 80 scooters. This is a small increase which could be easily accommodated on the site as uptake of the scooter mode share increases over time.
- Bus usage by 5% of students would represent 51 students, which is approximately 1 full bus-load of students or potentially 2 full bus-loads of passengers if parents choose to travel with their child(ren). The route 734 service which runs immediately adjacent to the School operates two services in the morning (arriving 8:03am and 8:10am) and three services in the afternoon (departing 2:47pm, 3:11pm, 3:34pm). Transport for NSW has also indicated the bus service provision in the local area is likely to increase once the Sydney Metro City & Southwest line opens in 2024 (increasing demand for local bus connections). This will align with the anticipated completion of the School expansion which is forecast to be complete by around Q3 2023. Demonstrated uptake of existing bus services will support Transport for NSW in providing additional future services.
- While it is acknowledged that this is not a practical solution for all users, it is likely to be viable for a number of staff at any given time and will be encouraged. The activity of 40% single-occupancy drivers (24 staff in 24 cars) plus 40% car pooling (24 staff in 12 cars) would represent a total of 36 cars, approximately equal to the car park capacity of 35 spaces with negligible usage of street parking. In the interim case, usage of on-street parking would be no worse than (and would show improvements relative to) the existing conditions.
- These rates (specifically, the final targets) have been recommended and supported by Transport for NSW

5.2 Policies and Procedures

The transport policies and procedures to be implemented for John Palmer Public School are:

- Prioritise multi-model transport access
- Access policies for car parking in the staff car park
- Information campaigns to staff, students, and visitors
- Reduce impact to local residents

5.3 School Transport Operations

5.3.1 Emergency Vehicles

Emergency vehicles are the highest priority vehicle types requiring access to the school. The Ponds Boulevard and Pebble Crescent are both available for ambulance access. Fire brigade vehicles would not access the site due to turning and reversing restrictions, and would operate from the street at The Ponds Boulevard.

5.3.2 Active Transport

Active transport modes include walking and cycling and other non-motorised means of transport. For the purposes of this Plan, active transport also considers pedestrian movements to and from vehicles parked on-street, vehicles at the pick-up and drop-off area, and The Ponds Boulevard bus stops. These movements result in some level of conflict and crossover and therefore require safe management. For this reason, active transport is a higher priority mode than all other non-emergency movements.

The main location requiring pedestrian management would be the driveway to the staff car park, which may conflict with pedestrians travelling to/from the southern catchment. People walking to and from School should be encouraged to use the new Jetty Street pedestrian entry as an alternative (where practical), to reduce this level of crossover.

5.3.3 Public Transport

The travel demands for students and staff travelling to the site via bus are expected to be minimal, as primary schools generally see low usage by students. Buses may be an attractive option for staff. The bus stops along The Ponds Boulevard will continue to operate as the primary bus stops servicing the school.

The low frequency of the public bus services may discourage staff and students from using public transport, and more regular services or dedicated school services may be required in order to have a significant influence. Increased demand for public transport may influence the service provider to create additional services. Travellers are more likely to utilise the bus system if services are frequent and reliable with short waiting times. This is a long-term action that the organisation should explore with the relevant service operator if deemed appropriate. This scheme has been discussed with Transport for NSW during preparation of the EIS.

5.3.4 Pick-up and Drop-off

The pick-up and drop-off facility at the School (on Pebble Crescent) currently attract very high volumes of private vehicles, despite the good walkability of the catchment (77% of students within a 1200-metre walk). These demands occur for short periods of time in the morning and afternoon, creating high levels of congestion in the road network.

Activities relating to pick-up and drop-off can produce significant safety concerns and impacts on the local traffic condition. Accordingly, PUDO zones require deliberate management to ensure user safety and maintain an acceptable traffic flow.

5.3.5 Car Parking

Travel by car for the purposes of car parking is considered a low-priority transport mode. While the demand volumes for car parking are high for this site location, the safety and sustainability of private vehicle travel result in this being a low priority mode. Nevertheless, to ensure operation of the site it is critical to manage the car parking in an efficient way, for example to allow staff to access the facility in a timely manner.

The provided off-street staff car park is only accessible via The Ponds Boulevard. On-site car parking is deliberately restricted and will be allocated and managed, encouraging staff to use alternative means of transport.

This car park is for the exclusive use of staff members, and also accommodates the loading dock area (including waste storage). The car park is locked outside of hours but is generally expected to be open for access during School hours. Access is provided out-of-hours for maintenance and servicing, such as waste collection.

5.3.6 Service and Loading

Service and loading functions are a key component of the operation of the school. However, given the importance of other travel mode types, particularly the risk of other movements becoming unsafe or congested, service vehicles are considered the lowest priority transport type for the school site. Heavy rigid vehicles are the largest expected vehicle used for waste collection purposes, while medium rigid vehicles are expected for more regular services or deliveries.

Delivery and service vehicles will enter the site in a forward direction via The Ponds Boulevard and manoeuvre within the car park aisle. On completion of unloading or servicing activities, the truck will exit the site from the same access in a forward motion. Trucks staying on-site for any period of time are to park in the nominated service bay, to avoid impacts to car park circulation. Medium trucks (approx. 9 metres long or less) could remain in the service bay without impacting traffic in and out of the car park. Large trucks may require the car park to be empty in order to manoeuvre. The final arrangements for internal movement of delivery and service vehicles will be finalised in the detailed design stage, and this would also need to be coordinated through the operating life of the School with individual contractors, as the service needs may change over time.

All delivery and service trucks are to be fitted with reversing alarms, and should be fitted with cameras, to assist truck drivers in performing reverse manoeuvres and avoiding any conflict with other vehicles such as parked cars. Given that deliveries are generally occurring outside of school hours, there is a minimal chance for any such conflict to occur. However, some deliveries may be required to occur during school hours. In any case, as a minimum safety requirement delivery and service vehicles should be fitted with the above recommended safety features.

Wherever practical, all deliveries should be scheduled at least 15 minutes apart to avoid any conflicts and allow a buffer for unexpected delays. Additionally, deliveries are recommended to be scheduled outside of school hours either before 8:00am or after 4:00pm. Where the car park is used by staff associated with Out Of School Hours Care (OOSHC) services, which operates between 6am and 6pm, these users are to be advised to park at the western end of the car park to if large delivery vehicles (12+ metres) are expected at any time.

All vehicle movements are to occur between 7:00am and 10:00pm to comply with residential noise impact restrictions (i.e. there are to be no movements between 10:00pm and 7:00am, which is defined as night time according to the Noise and Vibration Impact Assessment by AECOM).

Other considerations for the scheduling of deliveries include:

- Personnel to be available to marshal vehicles through the site for access to the main loading areas (to manage conflict and movements across the external pedestrian footpath)
- Nominated external personnel (if available) to be recorded and provided with induction information if necessary

- Relevant staff in departments or classrooms near loading areas to be advised of any scheduled activities which may be noisy or disruptive to classes.
- Once deliveries are completed, a record of deliveries is to be kept, to assist with future planning or any incidents which may occur.
- Vehicle size to be determined, and necessary traffic control measures to be considered if necessary and planned for within the scheduling system.
- Vehicle requirements (e.g. reversing alarms) are to be made clear to construction or delivery contractors.

5.4 Transport Programs

5.4.1 Ride 2 School Day and Other Health Events

Various organisations and groups develop programs and events to encourage active transport. For example, Bicycle Network coordinates a Ride2Work and Ride2School Day each year. These events provide a good opportunity for organisations to encourage staff and students to participate in cycling. Additionally, these initiatives create awareness and are useful for influencing the school community's travel behaviours. The school should investigate avenues to promote this event and encourage staff participation. An additional suggestion is to introduce incentives such as competitions or rewards.

Bicycle training workshops can also be a component of these programs to enable users to become familiar with bicycle maintenance, recommended cycling routes and general bicycle and road safety. Rideability is an example of a cycling education service that delivers workshops in schools with an emphasis on road safety and cycling skills.

Other health events encouraging active transport include Bike Week, Walk Safely to School Day and Health and Wellness Fairs. These initiatives expose staff and students to the many benefits of choosing active transport.

Annually hosting these events provides the community with a continual reminder and is therefore more likely to influence their behaviour.

5.4.2 Carpooling

A strategy to encourage staff to carpool involves a pairing system that notifies staff members of other staff who live in nearby areas or along their travel route. Initiating this system might involve a meeting to provide an opportunity for staff members to discuss carpooling options, including coordination of staff by local area. Off-the-shelf alternatives such as the Liftango app may also be an option for staff to utilise.

5.4.3 Priority Parking

It is expected that the total demand for parking may exceed the on-site provision. Parking is provided for 60% of staff.

Therefore, all on-site spaces should be allocated to individual staff members. This will ensure orderly operation of the car park and to remove the need for any redundant circulation or traffic flows around the area (such as staff failing to find an on-site parking space and needing to re-circulate).

5.5 Communications Plan

5.5.1 Channels

New Starter Kits

To ensure new travellers have information regarding all their travel options, a Travel Access Guide should be provided. This brochure can easily be included as part of an induction or orientation package. This is especially important for travellers new to the area and who may be completely unfamiliar with the transport options.

Periodic Reminders

One method to enable periodic information sharing is to include a sustainable travel section within a school newsletter. The content may include details about new travel initiatives, mode share progress updates, upcoming events or changes, as well as reminding travellers about the importance of sustainable travel. It should also allow for feedback or questions regarding any travel-related concerns. In addition, it can provide behavioural reminders such as engouraging staff and parents to not park at the The Ponds Shopping Centre.

School Website

The school website is to be utilised to provide up-to-date transport information, and to provide a central source of information for students and parents. External visitors would also have access to the website.

5.5.2 Messages

Key points of information and typical messages to the school community could include:

- Advising preferred on-street parking areas (e.g. Pebble Crescent West) to reduce impact to residents
- Encouraging all-day parking users not to use The Ponds Shopping Centre car parking
- Transport goals, safety requirements, and parent expectations
- On-site bicycle storage areas and end-of-trip facilities
- Informing staff regarding the end-of-trip facilities of bikes, e.g. shower, locker, etc.
- School Student Transport Scheme (SSTS) and School Term Bus Pass availability
- Changes to local public transport routes (as they occur)
- Changes to local pedestrian and cyclist facilities (as they occur)
- Out of School Hours (OOSH) service start and end times
- Opal card reminders (to ensure students tap on and off even if public transport is free)
- Any available memberships or discounts
- How to contact the Travel Coordinator or governance committee

5.5.3 Travel Access Guide

The aim of a Travel Access Guide is to present staff and students/parents with information about the available transport options in the local area. Staff and students are more likely to change their travel behaviour after being made aware of the public and active transport options and how to safely and easily utilise these alternatives.

Recommendations for the brochure content includes bus and train routes and how to access these from the site. It should also include information about end-of-trip facilities and safe routes to surrounding neighbourhoods for staff and students able to participate in active transport.

The guide can be distributed to staff, students and parents and can be developed in-house or by an external consultant. The brochure should also be accessible online through the website for visitors and ease of access.

A Travel Access Guide template is provided in Figure 5.1 and Figure 5.2. This guide gives the type of content and advice to include in a Travel Access Guide for an educational development.

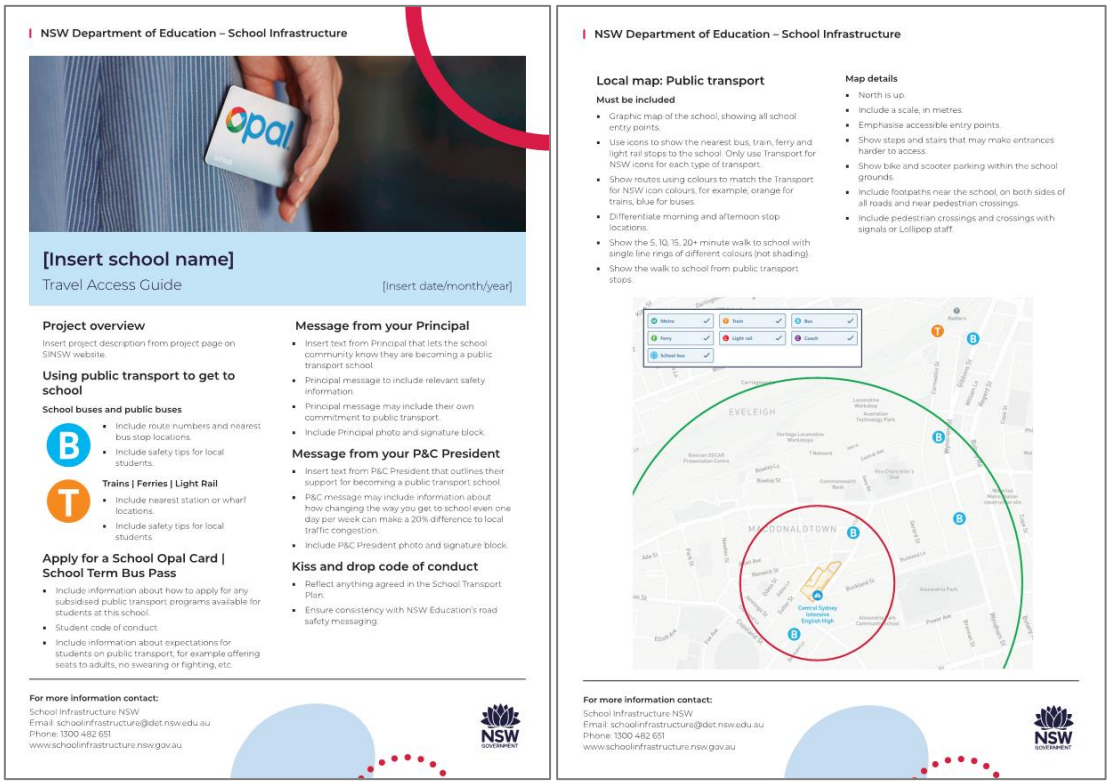


Figure 5.1: Travel Access Guide public transport template
Source: School Infrastructure NSW

Figure 5.2: Travel Access Guide active transport template
Source: School Infrastructure NSW

5.6 Data Collection and Monitoring

5.6.1 Data Collection

Transport Data Collection

Data collection is required for the ongoing management and reviewing of this Plan. These investigations are intended to evaluate whether a particular operation, facility, or management system is still successfully functioning and meeting demands. Table 5.2 contains suggestions for the data collection context and the types of data to be collected.

Table 5.2: Data Collection Summary

Context	Data to be collected
Pedestrian Facilities	• Number of pedestrians entering through gates • Arrival and departure times through school gates • Number of pedestrians using pedestrian crossings • Number of pedestrians jaywalking as well as the time and location
Cyclist Facilities	• Number of daily vacant and occupied bicycle parking spaces • Number of cyclists entering through each site access point • Number of end-of-trip facility users
Buses	• Number of public bus users (morning, afternoon and overall) • Number of school bus users (morning, afternoon and overall) • Number of school vs non-school users at nearby bus stops • Observational assessments (e.g. queuing, safety concerns)
PUDO Zone	• Number of users (morning, afternoon and overall) • Set down times • Arrival and departure times • Number of students exiting/entering vehicles • Number of any non-formal pick-up and drop-off occurrences as well as the time and location • Observational assessments (e.g. queuing, illegal stopping, safety concerns)
Car Parking	• Number of daily vacant and occupied spaces • Number of passengers per vehicle • Arrival and departure times

Incident Recording System

It is recommended that the school should keep and maintain an on-site traffic incident record. This record would contain a description of the incident, including contact details and what actions were taken by the school in response to the incident. It is advised that records of incidents be kept for an extended period of time following the incident occurrence.

The school should be able to provide the traffic incident register to relevant authorities on request.

Complaints Management

It is recommended that the school should keep and maintain a record of all complaints made in relation to any transport or access issues in a complaint register. Suggestions for what the record may include are:

- The date and time of the complaint
- The method by which the complaint was made (e.g. phone or email)
- Any personal details provided by the complainant
- The nature of the complaint
- Any action taken by the school in relation to the complaint including any follow-up communication

It is advised that records of the complaint be kept for an extended period of time after the complaint was made. The school should be able to provide a copy of the complaints register to relevant authorities on request.

5.6.2 Program Evaluation

Once the School Transport Plan is finalised, it is to be maintained by the school and shall be distributed to all the concerned logistic personnel and managers. The school is also responsible for distributing appropriate information to staff and contractors as necessary.

This STP should be reviewed regularly and updated as required. It is recommended that an initial review should take place following six months of operation. This review should include detailed observations of the transport operations of the site and adjustments to procedures where necessary.

Following this initial review, a review every two years would likely be an appropriate schedule. To ensure that the ongoing review of this STP is carried out as expected, responsibility for this task should be allocated to the Travel Coordinator or a specific alternative staff member.

5.6.3 Reporting Findings

The School Travel Plan and other associated documentation including the Travel Access Guide should be regularly reviewed and updated as required. It is recommended that an annual review would be an appropriate schedule. The review should include an updated travel mode survey, consultation with staff, students and visitors, and adjustments to initiatives and targets.

Sample evaluations and outputs to stakeholders may include:

School data	School Infrastructure NSW	Students / parents	State / local government
▪ Annual update to dashboard ▪ Compare results ▪ Document progress or deficiencies during delivery ▪ Results to communicate ▪ Analyse policies, infrastructure, or programs to revisit	▪ Annual update to dashboard ▪ Compare results ▪ Document progress or deficiencies during delivery ▪ Results to communicate ▪ Analyse policies, infrastructure, or programs to revisit	▪ Issue report	▪ Issue verification ▪ Issue resolution ▪ Review school and public transport network and services

5.7 Governance Framework

5.7.1 Travel Coordinator Responsibilities

Transport programs must be implemented to achieve travel behaviour change. The school principal and teachers are not travel coordinators, so a dedicated role is required to implement and manage these programs.

The dedicated Travel Coordinator shall:

- Liaise with the School Principal as the nominated transport representative for the school
- Liaise with other internal stakeholders (see below)
- Coordinate communications and publications to staff and students as required
- Directly oversee implementation of transport programs where relevant
- Consult and engage external parties to implement transport programs where relevant
- Liaise with the Contractor prior to the construction phase to review and approve proposed construction traffic and access methodologies
- Liaise with the Contractor during the construction phase to maintain safe operations at and around the site

A dedicated Travel Coordinator is generally required for the duration of construction and the first year post-occupancy. This role is funded by the project during delivery.

After this period, subsequent arrangements for this role are under discussions between School Infrastructure, the Department of Education, and Transport for NSW.

5.7.2 Internal School Stakeholders

The list of internal stakeholders to be consulted by the Travel Coordinator includes:

- School Principal
- Other school Executive Staff as relevant
- Road Safety Education Officer
- Asset Management
- Grounds Management, including the Public Private Partnership (PPP) consortium
- WHS Representative
- P&C

5.7.3 State and Local Government Stakeholders

The list of external stakeholders to be consulted by the Travel Coordinator includes:

- Blacktown City Council
- Transport for NSW
- Busways

In the event of external consultation being required, various state and local stakeholders have provided a nominated contact person, either for addressing concerns and comments or for providing alternative best contacts for a specific issue.

The nominated point of contact at **Blacktown City Council** is as follows:

- Name:
  - *To be advised by Council for inclusion in post-approval documentation.*
- Role:
  - *TBC*
- Phone:

  - *TBC*
- Email:
  - *TBC*

The nominated point of contact at **Transport for NSW** is as follows:

- Name:
  - *To be advised by TfNSW for inclusion in post-approval documentation.*
- Role:
  - *TBC*
- Phone:
  - *TBC*
- Email:
  - *TBC*

The nominated point of contact at **Busways** is as follows:

- Name:
  - To be advised by Busways for inclusion in post-approval documentation.
- Role:
  - *TBC*
- Phone:
  - *TBC*
- Email:
  - *TBC*

6.0 Construction Traffic and Pedestrian Management Plan

This preliminary Construction Traffic and Pedestrian Management Plan (CTPMP) addresses the proposed construction of the John Palmer Public School development. It discusses the management of construction vehicles and activities, and an investigation of the local traffic and safety conditions throughout the construction process. A draft CTPMP is required in accordance with the SEARs for this development.

A detailed CTPMP will be prepared by the builder with consideration of all final design selections. This preliminary CTPMP is intended to provide a framework within which a future CTPMP can be developed and implemented, and to demonstrate the potential operation of the construction site. The future CTPMP would be subject to consultation and approval with Blacktown City Council.

6.1 Construction Operations

6.1.1 Access Arrangements

During the constructability review for JPPS several site access options were considered, and it was determined that Pebble Crescent was the best access overall and construction staging is based on this access. The Covered Outdoor Learning Area (COLA) is to remain in place for the construction duration.

The draft access plan (developed by Jacobs) is shown in Figure 6.1 for Stage 1, however this expected to be consistent in regards to traffic and access throughout the construction period:

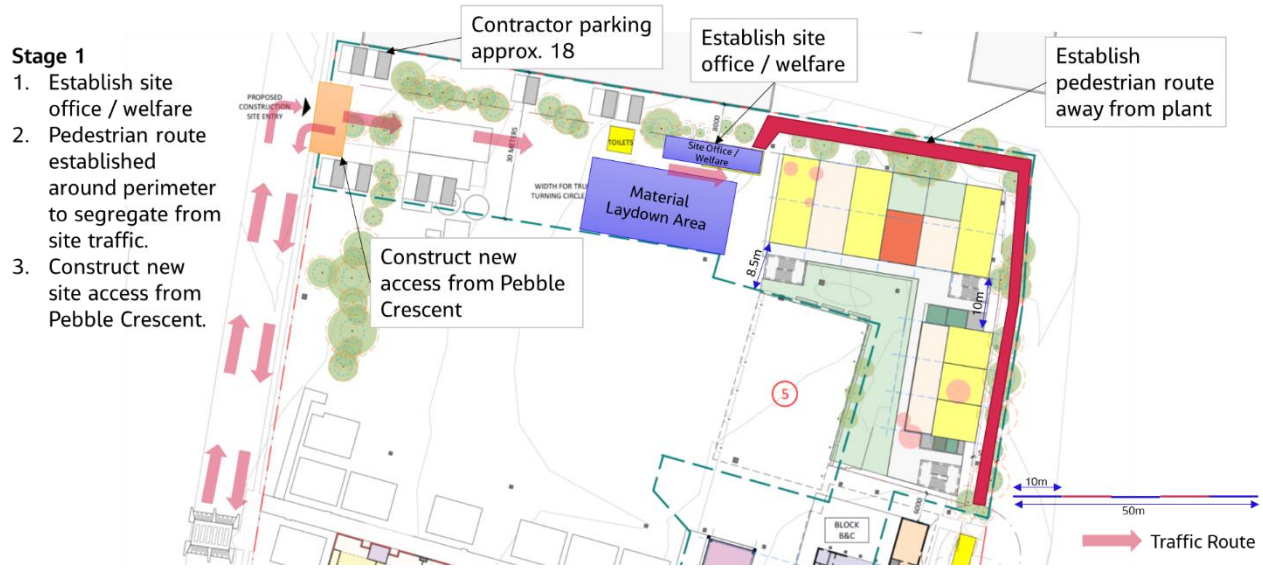


Figure 6.1: Construction site access (preliminary)
Source: Jacobs

6.1.2 Worker Parking

Due to the spatial constraints within the site, it is expected that some on-site parking may be available for construction workers however this may not accommodate individual spaces for all workers. The following mitigation measures are recommended to ensure impacts to local residential streets are limited:

- Workers to be provided with information on available public transport options and transport planning
- Workers recommended and reminded to carpool where possible
- Preferred parking locations which would not occupy residential frontages (such as frontages to Second Ponds Creek and Plaza Park) should be advised to workers, to reduce impacts to residents for those workers that do choose to drive

- No workers to park within 100 metres of the School boundary (to ensure parking availability and to reduce impact to drop-off and pick-up periods)
- Workers recommended to park away from the Pebble Crescent kiss & ride area, to avoid additional congestion

Workers must follow all on-street regulatory signage including drop-off and pick-up zones around the schools.

6.1.3 Construction Program

The estimated construction program is provided in Table 6.1.

Table 6.1: Estimated construction program
Source: Jacobs

Key Milestones	Date
Construction Commencement	Q2 2022
New Building Construction Complete	Q3 2023
Refurbishments Complete	Q3 2023

6.2 Construction Traffic Management

6.2.1 Vehicle Management

Vehicle volumes for a development of this scale are likely to be on the order of no more than 10-20 vehicles per day (equivalent to 2-4 vehicles per hour), subject to confirmation by an appointed contractor. At these volumes, the local road network could easily accommodate the proposed standard construction vehicle movements subject to appropriate management.

Construction vehicle management will be subject to local traffic control by qualified traffic controllers. A detailed Construction Traffic and Pedestrian Management Plan will be developed prior to commencement of construction and will require further consultation with Council and Transport for NSW.

6.2.2 Construction Vehicle Routes

As detailed in Section 6.1, access will be to/from Pebble Crescent on the western boundary of the site.

The nearest state roads are Schofields Road to the north and Sunnyholt Road to the south.

To access the site from Schofields Road, the following vehicle routes would likely be utilised:

- Schofields Road > The Ponds Boulevard > Jetty Street > Pebble Crescent

To access the site from Sunnyholt Road, the following vehicle routes would likely be utilised:

- Sunnyholt Road > Stanhope Parkway > The Ponds Boulevard > Jetty Street > Pebble Crescent

Departing vehicles would use identical routes to and from the site.

6.2.3 Public Transport Impacts

The anticipated construction works would have no impact to public transport in the vicinity of the site.

6.2.4 Cumulative Impacts

Subject to the construction program being finalised, Council and Transport for NSW would be contacted for information relating to other developments in the area which may be impacted by the construction traffic.

6.3 Road Safety

6.3.1 Construction Vehicle Access Points

The construction vehicle access points to the site would be secured by manned traffic control to ensure no unauthorised or unsafe access is permitted for vehicles or pedestrians.

6.3.2 Construction Vehicle Routes and Intersections

The state road network is constructed to a high standard and would comfortably accommodate all construction vehicles. Similarly, Stanhope Parkway is a sub-arterial road which will also accommodate these vehicles.

On the local road network along The Ponds Boulevard, two roundabouts at Greenview Parade and Spearmint Street appear to be sized for local traffic only and should not be used for U-turns by construction vehicles, particularly large rigid vehicles or semi-trailers. The anticipated construction vehicle routes would use these roundabouts for through traffic only, which would not be an area of concern given the available geometry.

When accessing and using Jetty Street, construction vehicles will need to be aware of local traffic (which may include students walking). Additionally, the pedestrian refuge island near the intersection of Pebble Crescent may restrict movements of large vehicles. As part of the detailed Construction Traffic Management Plan (to be prepared by the appointed contractor), swept path analysis for this area should be undertaken and modifications or treatments may be required. Detailed measures would be refined in consultation with Council prior to any implementation.

6.3.3 Pedestrians and Cyclists

The safe movement of pedestrians around the site, particularly during drop-off and pick-up periods, would be accommodated by the proposed construction methodology.

7.0 Conclusion

7.1 Transport Strategy

The overall transport strategy for the proposed development is as follows:

- **Pedestrians**
  - Provide a new pedestrian entry to Jetty Street
  - Provide a new raised zebra crossing on Jetty Street (subject to separate approval)
- **Cyclists**
  - Provide new bicycle and scooter storage for students
  - Provide new bicycle storage and end-of-trip facilties for staff
- **Public transport**
  - No change; existing provisions to be retained
  - Usage of public transport to be encouraged through School Transport Plan and improved through ongoing consultation and governance measures
- **Freight & deliveries**
  - Accommodated in the staff car park, separated from pedestrian areas
- **Kiss & ride**
  - No change; existing provisions to be retained
  - Usage of kiss & ride to be discouraged through School Transport Plan and improved through ongoing consultation and governance measures
- **Car parking**
  - Car park to be modified to allow for waste collection; final parking provision of approximately 0.6 spaces per staff member

This strategy has been proposed to, and discussed with, both Council and Transport for NSW during ongoing liaison through a Transport Working Group for the project. The project team has met with this group three times since July 2021 and the transport strategy for the project has been refined during that period in response to feedback received.

A preliminary School Transport Plan has been prepared which addresses the sustainable management of operational transport demands, and discusses different management options to ensure the success of the future operation of the School. A preliminary Construction Traffic and Pedestrian Management Plan has also been developed to assess any traffic impacts expected to occur during construction works.

7.2 Findings

This TAIA has analysed the proposed development and its transport strategy and found the following:

- The proposed permanent capacity of the school is only marginally higher (approx 7%) than the existing level of enrolment, and therefore traffic and transport demands and conditions are not expected to worsen significantly beyond today's levels.
- The additional traffic generated by the kiss & ride area and staff car parking could be accommodated at the signalised intersection of The Ponds Boulevard and Riverbank Drive.
- The proposed improvements for pedestrians and cyclists will assist in reducing the total volume of vehicles accessing the kiss & ride zones, therefore offsetting the growth that would otherwise occur and retaining existing performance at the signalised intersection.

- Some usage of on-street parking by staff is anticipated, however analysis of historical usage of this parking shows good spare capacity, and staff will also be strongly encouraged to use alternative travel modes (including provision of new dedicated cyclist facilities).

The proposed development is deemed suitable on consideration of the traffic and transport elements of the site and its surrounds, and the transport strategy proposed for its management. Only minor items are required to be resolved during further design (see below).

7.3 Next Steps

Following the approval of this SSDA, the expected future works and actions would include:

- Detailed design and Local Traffic Committee approval of the proposed raised zebra crossing at Jetty Street
- Further development of the School Transport Plan and Construction Traffic and Pedestrian Management Plan (subject to any relevant conditions of consent)

Prepared by	Reviewed by	Approved by
		
MINA GHANBARIKAREKANI	**MICHAEL BABBAGE**	**PAUL YANNOULATOS**
Senior Traffic Engineer	Associate	Technical Director

TAYLOR THOMSON WHITTING (NSW) PTY LTD

Appendix A

School Travel Questionnaire

Question	*Response*	*Notes*
School activity		
How many students are currently enrolled?	943	*983 Students currently enrolled. This includes 15 students enrolled in our Early Intervention Support Class. One class has 8 Students Mon-Wed, the other class has 7 students Thur-Fri until 12pm)* *Numbers can fluctuate up and down each week due to students starting and leaving.*
How many staff are on-site on a typical day? • *Total of full-time, part-time, casual, volunteer etc. – provide breakdown if necessary*	64 - 69	*This is a head count. The majority of staff are full time which means onsite between 8.30am and 3.30pm. Very few staff members work less than these hours and it depends on special programs etc to what days these staff are onsite.*
What is the school start bell time?	8:55am	*9am*
What is the school finish bell time?	3:00pm	*3Pm*
How many OOSH places?	160	
When does OOSH start?	6am	
When does OOSH finish?	6pm	
Is the school accessed during the evenings?	No	*We have a couple of groups who hire facilities after school but these can change each term on a needs basis.eg soccer, music, technology activities*
Is the school accessed on weekends?	No	*Only if an election or a special event*
School transport behaviour		
As an estimate, how many / what portion of **staff** travel by:		
Car (park, as driver)	98-99%	*We only have 2-3 staff members who live within walking distance, and they will occasionally walk to school for fitness, not because it is their only option*
Car (passenger/carpool)	nil	
Car (drop-off)	1% Same person	*There is one staff member who does not drive. She sometimes walks, sometimes gets dropped off or rides her bike.*
Walk only		
Scooter / skateboard	nil	
Bicycle	1% Same person	
Motorbike	nil	
Bus	nil	
Train	nil	
As an estimate, how many / what portion of **students** travel by:		
Car (drop-off)	Approx. 60%	*How many students carpool in friend/family groups?* *These are the parents/carers that use the kiss and drop in pebble crescent.*
Car Park & walk	Approx 12%	*These parents park at either the shops or nearby streets and walk their children to the gates*
Walk only	Approx. 15%	*These walk from front door to school gate*
Scooter / skateboard	Approx. 5%	*Parking for 60 scooters*
Bicycle	Approx. 8%	*Parking for 86 bikes*
Motorbike	Nil	
Bus	Less than .5%	Approx. 3-5 students catch a bus to and from school
Train	Nil	
School transport facilities		

Question	*Response*	*Notes*
How many pedestrian entries to the school?	3 – 2 on The Ponds Boulevard, 1 on Pebble Crescent	*Due to covid and social distancing of parents, when we have fine weather we also open the gate into the kindergarten playground on pebble cres near the corner of Jetty street for students to be picked up in the afternoon. This has no formal entry, just straight onto the grass in the playground.*
How much parking is available on the school grounds for:		
Cars (general use)	36	
Cars (accessible/disabled)	1	
Cars (service/maintenance)	Nil	
Cars (carpooling)	Nil	
Cars (visitors)	Nil	
Loading / delivery zones	Access driveway near COLA/ Canteen	*This will not be available due to location of new building*
Bicycles	nil	
Scooters / skateboards	nil	
Motorbikes	nil	
Shuttle bus (on-site)	nil	
Do the on-site parking facilities (all types above) have sufficient capacity for current demands? • *Consider any informal parking of bicycles, scooters, cars, maintenance vehicles etc.*	No	*There is not enough parking for the staff, let alone any visitors. Visitors riding a bike or scooter could park with the students ones if there were spots free. The lack of parking makes it very difficult for staff carrying resources, especially in the rain.*
What end-of-trip facilities are available for staff or students? • *Showers, lockers, change rooms*	Nil	
School transport management		
Does the school have any transport policies? • *e.g. when are students permitted to travel independently to school, are students discouraged from riding scooters etc.*	Bike policy	*Needs updating*
How do you manage the pedestrian entries?	Exec staff	*An exec member of staff is positioned at each enry and exit point from 8.30-9am in the morning, and from 3pm in the afternoon until the last student is picked up. Any students who are not collected withing an approx. 15 min time frame are taken to the office and their parents are called.*
How is car parking allocated? • *e.g. longest service, hierarchy, furthest distance travelled, key roles*	Exec and some admin/school counselling staff have spaces	These staff members may need to attend meetings off site throughout the day. Other car spaces are filled on a first into work in the morning basis. The earlier you get to work, the more likely you are to get a space. The carpark is usually full by 8.10am.
Are there any nearby pedestrian operations or School Crossing Supervisors (lollipop)?	1 supervisor	*On the crossing on The Ponds Boulevard.* *No supervisor at the pedestrian crossing on Pebble Cres where the kiss and drop is located.*
Does the school have a traffic/parking management plan for day-to-day operations or functions/events/carnivals?	No	
Does the school or any third party operate shuttles, buses, or vans for the daily journey to/from school?	Yes	*These vehicles do not come onto the school site. There are approx. 3-4 external OOSH providers to cater for students at JPPS. They usually collect from the bus bay on The Ponds Boulevard.*
Do you offer staff any transport benefits? • *e.g. vehicle salary packaging, Opal cards, fleet vehicles, GoGet membership, travel reimbursement, carpool programs*	No	
Do you offer students or parents any transport programs? • *e.g. Travel Access Guide or brochure, carpool programs, school crossing staff or volunteers at crossings, walking training, walking school bus, road safety education*	Road Safety part of Curriculum	

Question	*Response*	*Notes*
	Reminders and information sent on the ENews app	
Does the school manage 'kiss and ride' activity on a street(s) adjacent to the school grounds?	Yes	*An executive member is always availableat this exit/entry point.*
Do you place any restrictions on students riding a bicycle/scooter to school?	No	*Any younger students riding bikes or scooters are usually with an older sibling or a parent.*
Which communication channels do you use with staff, students, parents and friends? • *e.g. social media, E-newsletter, print newsletter/flyers, printed posters, school website, school intranet*	Facebook Website ENews App	*We also have parking rules and fines on the school fences that were supplied by the P&C*
Are you aware of any other transport initiatives in your local area or at other local schools?	No	*JPPS use to have a walking school bus when the school was much smaller but it was stopped due to lack of volunteers.*
Additional information		
Please provide information on waste management – time of day, number of times per week, collections for waste/recycling/greenwaste etc.	General waste x2 weekly Recycling x 1 weekly	*This operation has been changes to before 7am for collection. This is a new time as it was previously throughout the school day.*
Please provide information on service and maintenance – trades vehicles, out of hours work etc.	Various	*This is on a needs basis and the majority of this work is managed through spotless.*

Any other feedback or comments:

Survey completed by: Lisa Crawford

Date: 11.08.2021

Appendix B

Historical Parking Occupancy (via Nearmap)

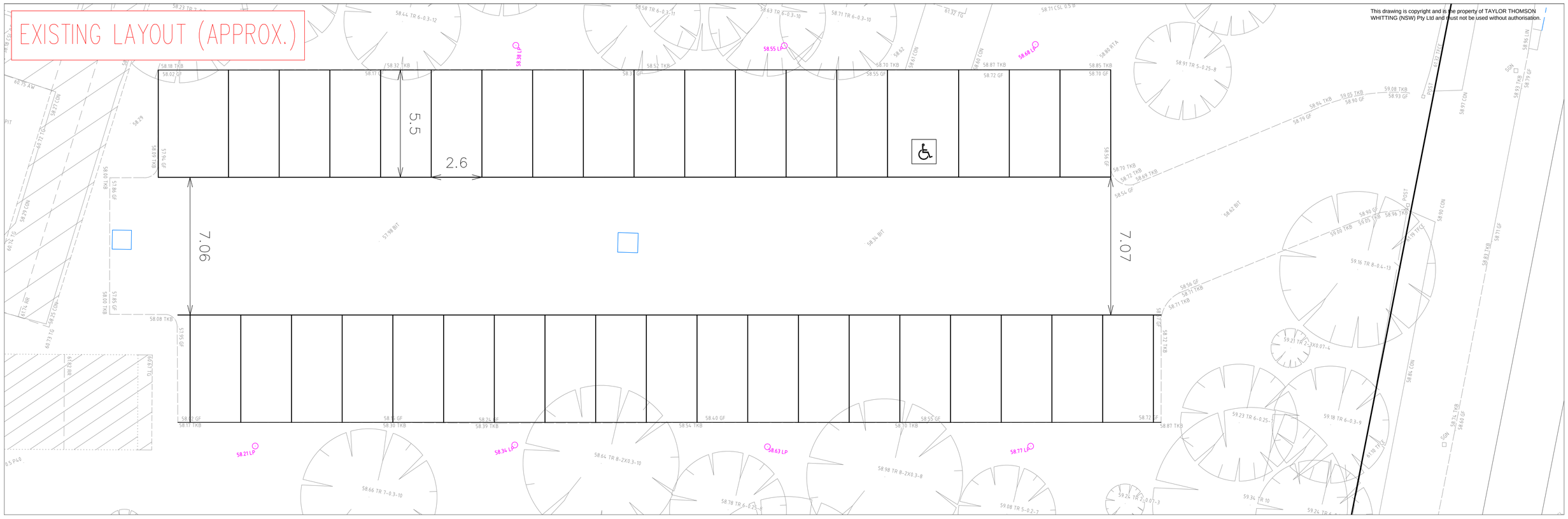
			OCCUPIED																				
			OFF-STREET		ON-STREET																		
					PONDS BLVD		TEAGUE ST		JETTY STREET		SAIL ST		PICNIC ST		PEBBLE CRESCENT (WEST)				PEBBLE CRESCENT (EAST)				
Day	**Date**	**SD**	**Car Park**	**Load**	**NB**	**SB**	**EB**	**WB**	**EB**	**WB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**EB**	**WB**	**NB**	**SB**	**EB**	**WB**	**Total**
Saturday	7/08/2021	N	0	0	0	11	4	3	3	2	4	3	0	2	17	5	1	0	6	0	1	0	62
Saturday	5/06/2021	N	0	0	0	11	3	3	3	2	3	3	2	1	14	5	1	0	3	1	0	1	56
Saturday	10/04/2021	N	0	0	0	10	1	2	2	5	1	1	2	2	3	3	0	0	3	2	1	0	38
Tuesday	26/01/2021	N	0	0	0	9	3	0	4	3	3	1	2	2	8	4	0	0	6	3	1	0	49
Sunday	6/12/2020	N	0	0	0	9	2	1	2	3	1	1	2	1	14	4	1	0	6	0	0	1	48
Friday	2/10/2020	N	0	1	0	10	3	4	3	3	1	2	2	1	7	5	0	0	5	0	1	1	48
Monday	3/08/2020	Y	37	5	0	19	3	1	11	5	2	2	1	0	6	5	1	0	14	4	1	0	75
Tuesday	23/06/2020	Y	37	4	2	14	1	1	8	3	2	1	1	4	4	3	0	0	8	5	0	0	57
Tuesday	14/04/2020	N	1	1	0	15	3	0	4	1	3	2	1	2	9	7	0	0	3	0	0	1	51
Saturday	1/02/2020	N	0	0	0	15	3	0	3	1	2	1	0	2	7	4	0	0	4	0	1	1	44
Tuesday	29/10/2019	Y	38	3	0	20	1	1	9	4	0	2	2	1	7	1	0	0	10	2	2	2	64
Thursday	12/09/2019	Y	37	3	2	17	1	0	12	5	1	3	3	1	8	3	1	0	7	2	0	0	66
Friday	16/08/2019	Y	37	3	0	21	2	2	12	4	0	2	1	2	7	3	1	0	4	3	0	1	65
Friday	19/07/2019	N	0	1	0	11	4	0	3	4	1	2	0	2	12	5	1	0	5	2	3	0	55
Sunday	7/04/2019	N	0	0	0	7	3	0	14	8	6	7	1	3	17	8	1	0	3	0	0	2	80
Saturday	29/12/2018	N	0	0	0	11	3	2	3	3	0	1	2	2	12	6	0	0	5	0	0	0	50
Tuesday	13/11/2018	Y	33	2	2	15	4	2	8	5	1	2	2	2	5	3	0	0	5	8	2	0	66
Sunday	16/09/2018	N	0	0	1	9	1	2	3	7	0	0	2	0	18	7	2	2	6	0	4	0	64
Monday	30/07/2018	Y	35	5	0	10	3	2	12	7	2	2	0	1	7	1	1	0	6	3	0	0	57
Tuesday	29/05/2018	Y	33	1	1	12	0	2	5	3	0	3	1	2	8	1	0	0	7	3	0	0	48
Thursday	18/01/2018	N	0	1	0	12	2	1	3	3	0	1	1	0	12	3	0	0	3	0	0	0	41
Thursday	7/09/2017	N	0	0	0	11	4	3	2	9	1	1	1	1	12	9	0	0	4	5	2	1	66
Saturday	22/07/2017	N	0	0	0	15	5	0	1	2	0	1	1	3	31	9	3	1	4	3	1	1	81
Tuesday	16/05/2017	Y	32	3	2	14	1	1	7	3	0	1	1	2	5	3	0	0	11	4	0	0	55
Sunday	12/03/2017	N	0	0	0	13	3	0	3	7	0	1	2	1	17	5	3	0	7	0	0	0	62
Friday	2/12/2016	Y	32	3	3	12	2	3	7	4	0	3	0	1	8	5	2	0	6	5	1	0	62
Sunday	2/10/2016	N	0	0	4	17	3	0	1	7	1	1	1	0	19	9	4	1	4	0	0	2	74
Monday	18/07/2016	Y	36	2	1	13	4	2	6	2	0	1	0	2	17	10	0	0	8	2	0	0	68
Friday	15/07/2016	N	0	2	0	5	5	4	1	4	1	1	1	0	11	8	1	0	4	1	0	0	47

			OCCUPIED																				
			OFF-STREET		ON-STREET																		
					PONDS BLVD		TEAGUE ST		JETTY STREET		SAIL ST		PICNIC ST		PEBBLE CRESCENT (WEST)				PEBBLE CRESCENT (EAST)				
Friday	6/05/2016	Y	33	2	1	13	2	1	11	4	2	0	0	2	17	7	1	0	9	1	1	0	72
Wednesday	24/02/2016	N	9	1	0	7	4	2	2	4	0	1	0	1	7	4	1	1	2	3	0	0	39
Sunday	6/12/2015	N	0	0	0	10	0	0	2	4	1	1	2	1	11	4	0	0	3	3	0	0	42
Thursday	15/10/2015	Y	37	2	4	23	6	4	11	5	0	2	1	3	4	5	0	0	11	8	0	0	87
Sunday	5/07/2015	N	0	0	1	5	3	0	0	5	0	3	3	1	15	8	1	1	7	0	1	1	55
Tuesday	5/05/2015	Y	37	2	2	17	6	5	4	1	0	1	1	1	13	4	5	4	9	2	7	6	88
Sunday	30/11/2014	N	0	0	0	8	3	0	1	4	0	1	2	1	11	8	1	0	4	1	0	0	45
Sunday	27/07/2014	N	0	0	0	8	2	0	2	4	2	3	3	1	11	9	0	0	3	0	0	0	48
Thursday	26/06/2014	Y	37	4	0	5	3	0	5	3	1	0	1	2	15	3	2	1	5	0	4	3	53
Tuesday	17/06/2014	Y	38	2	0	8	4	3	7	2	0	0	2	1	7	5	0	1	3	0	3	1	47
SCHOOL DAYS		**'Y'**																					
Minimum			32	1	0	5	0	0	4	1	0	0	0	0	4	1	0	0	3	0	0	0	47
Average			35.6	2.9	1.3	14.6	2.7	1.9	8.4	3.8	0.7	1.6	1.1	1.7	8.6	3.9	0.9	0.4	7.7	3.3	1.3	0.8	64.4
Maximum			38	5	4	23	6	5	12	7	2	3	3	4	17	10	5	4	14	8	7	6	88
NON-SCHOOL DAYS		**'N'**																					
Minimum			0	0	0	5	0	0	0	1	0	0	0	0	3	3	0	0	2	0	0	0	38
Average			0.4	0.3	0.3	10.4	2.9	1.2	2.8	4.1	1.3	1.7	1.4	1.3	12.8	6.0	0.9	0.3	4.3	1.0	0.7	0.5	54.1
Maximum			9	2	4	17	5	4	14	9	6	7	3	3	31	9	4	2	7	5	4	2	81
TOTAL																							
Minimum			0	0	0	5	0	0	0	1	0	0	0	0	3	1	0	0	2	0	0	0	38
Average			14.8	1.4	0.7	12.1	2.8	1.5	5.1	4.0	1.1	1.6	1.3	1.5	11.1	5.2	0.9	0.3	5.7	1.9	0.9	0.6	58.3
Maximum			38	5	4	23	6	5	14	9	6	7	3	4	31	10	5	4	14	8	7	6	88
SCHOOL vs NON-SCHOOL																							
Average			35.1	2.6	1.0	4.2	-0.2	0.7	5.6	-0.4	-0.7	-0.1	-0.4	0.4	-4.2	-2.2	0.0	0.1	3.3	2.2	0.6	0.3	10.2

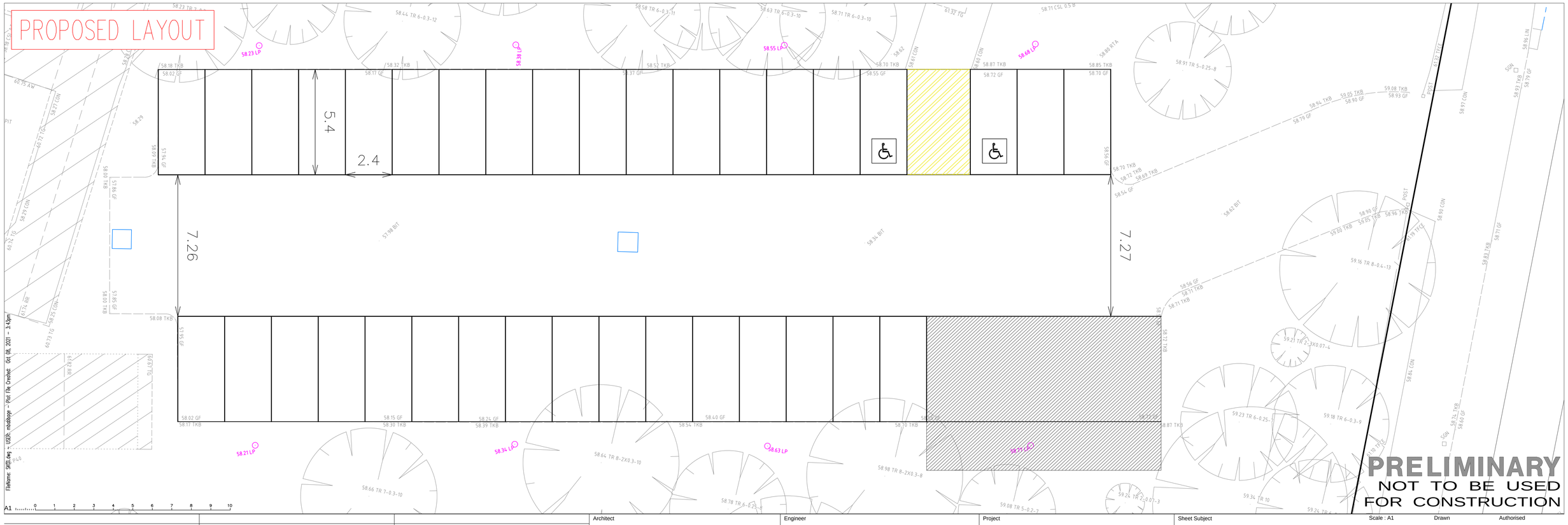
Appendix C

Detailed Car Park Layouts

EXISTING LAYOUT (APPROX.)



PROPOSED LAYOUT



PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Rev	Description	Eng	Draft	Date
P2	PRELIMINARY	MB	MB	08.10.21
P1	PRELIMINARY	MB	MB	23.09.21

Architect
PTW
LEVEL 11, 88 PHILIP STREET
SYDNEY NSW 2000

Engineer
TTW Structural Civil Traffic Façade
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
JOHN PALMER PUBLIC SCHOOL

Sheet Subject
CAR PARK LAYOUT OPTION 1

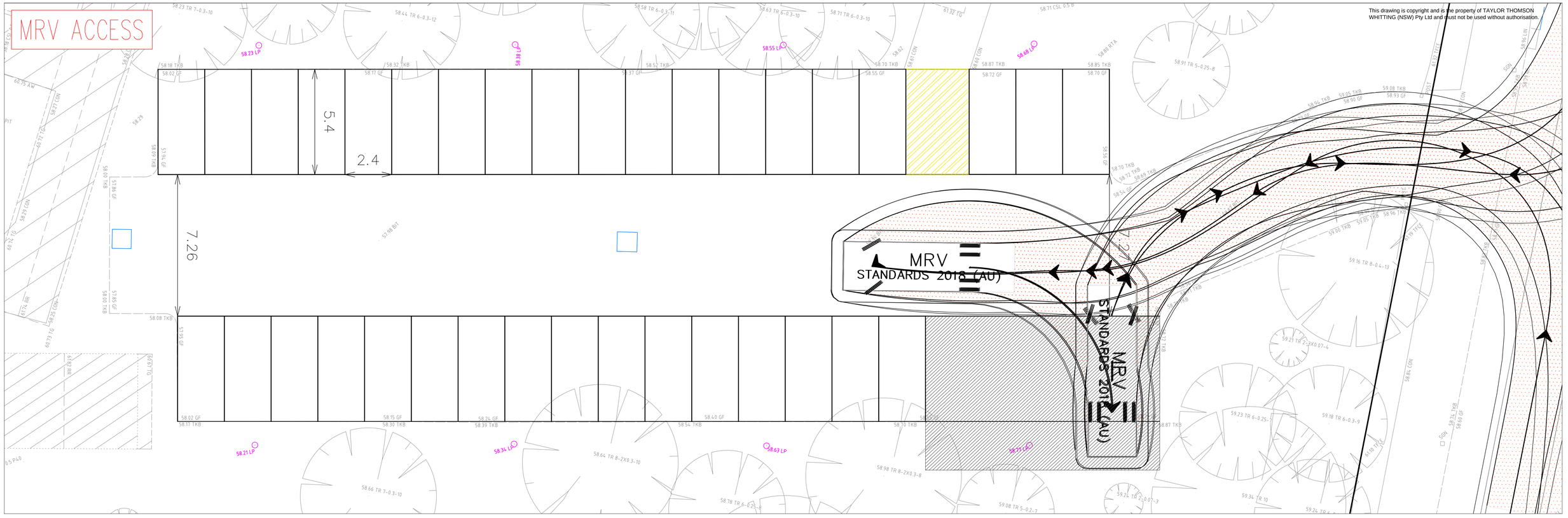
Scale : A1 1:100
Drawn MB
Authorised -
Job No 211395
Drawing No SK01
Revision P2
Plot File Created: Oct 08, 2021 - 3:43pm

FileName: SK01.dwg - USER: mbuildings - Plot File Created: Oct 08, 2021 - 3:43pm

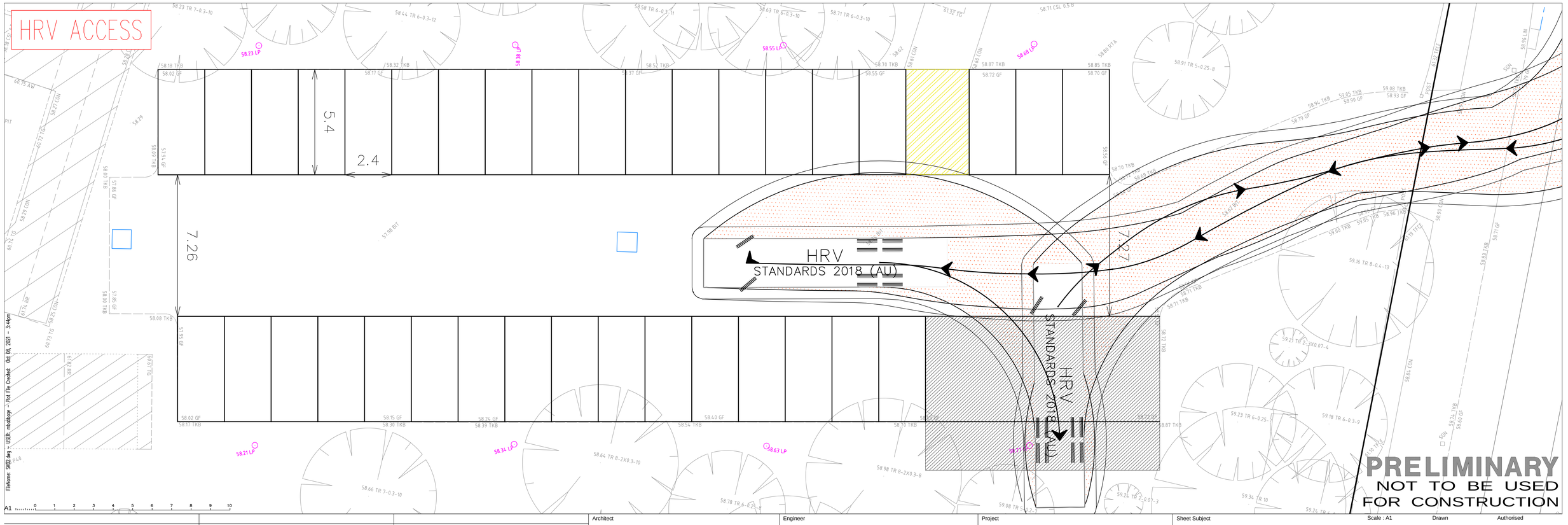
Appendix D

Service Vehicle Swept Paths

MRV ACCESS



HRV ACCESS



PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FileName: SK02.dwg - USER: mbabbage - Plot File Created: Oct 08, 2021 - 3:44pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P2	PRELIMINARY	MB	MB	08.10.21
P1	PRELIMINARY	MB	MB	23.09.21

Architect
PTW
LEVEL 11, 88 PHILIP STREET
SYDNEY NSW 2000

Engineer
TTW Structural Civil Traffic Façade
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
JOHN PALMER PUBLIC SCHOOL

Sheet Subject
WASTE VEHICLE SWEPT PATHS - LAYOUT OPTION 1

Scale : A1	Drawn	Authorised
1:100	MB	-

Job No	Drawing No	Revision
211395	SK02	P2

Plot File Created: Oct 08, 2021 - 3:44pm

Appendix E

SIDRA Modelling Results

MOVEMENT SUMMARY

Site: 101 [The Ponds Blvd/Riverbank Dr - AM Peak (Site Folder: 2021)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	20	0	20	0.0	*0.659	34.8	LOS C	8.3	50.0	0.99	0.81	1.00	31.8
2	T1	182	0	182	0.0	0.659	31.4	LOS C	8.3	50.0	0.99	0.81	1.00	32.2
3	R2	146	0	146	0.0	*0.871	72.0	LOS F	9.6	57.7	1.00	1.00	1.37	23.5
Approach		348	0	348	0.0	0.871	48.6	LOS D	9.6	57.7	0.99	0.89	1.16	27.9
East: Riverbank Drive														
4	L2	36	0	38	0.0	0.814	35.8	LOS C	16.2	96.9	1.00	0.92	1.11	32.2
5	T1	324	0	341	0.0	*0.814	31.3	LOS C	16.2	96.9	1.00	0.92	1.11	34.9
6	R2	133	0	140	0.0	*0.835	70.4	LOS E	9.0	53.9	1.00	0.93	1.30	25.3
Approach		493	0	519	0.0	0.835	42.2	LOS C	16.2	96.9	1.00	0.92	1.16	31.5
North: The Ponds Boulevard														
7	L2	28	0	29	0.0	0.567	44.9	LOS D	14.9	89.2	0.91	0.80	0.91	31.6
8	T1	252	0	265	0.0	0.567	41.6	LOS C	14.9	89.2	0.91	0.80	0.91	29.5
9	R2	226	0	238	0.0	*0.868	68.3	LOS E	15.5	92.7	1.00	0.96	1.28	25.7
Approach		506	0	533	0.0	0.868	53.7	LOS D	15.5	92.7	0.95	0.87	1.08	27.7
West: Riverbank Drive														
10	L2	44	0	46	0.0	0.860	50.8	LOS D	26.7	160.2	0.93	0.94	1.09	30.3
11	T1	392	0	413	0.0	0.860	46.3	LOS D	26.7	160.2	0.93	0.94	1.09	30.5
12	R2	204	0	215	0.0	*0.881	71.1	LOS F	14.2	85.2	1.00	0.98	1.33	23.9
Approach		640	0	674	0.0	0.881	54.5	LOS D	26.7	160.2	0.95	0.95	1.17	28.0
All Vehicles		1987	0	2073	0.0	0.881	50.2	LOS D	26.7	160.2	0.97	0.92	1.14	28.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	28.0	LOS C	0.1	0.1	0.90	0.90	191.1	212.0	1.11
East: Riverbank Drive												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	212.0	0.98
North: The Ponds Boulevard												

P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	212.0	0.98
West: Riverbank Drive												
P4	Full	50	53	27.4	LOS C	0.1	0.1	0.90	0.90	190.4	212.0	1.11
All Pedestrians		200	211	41.0	LOS E	0.2	0.2	0.93	0.93	204.1	212.0	1.04

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

MOVEMENT SUMMARY

Site: 101 [The Ponds Blvd/Riverbank Dr - PM Peak (Site Folder: 2021)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	21	0	21	0.0	* 0.688	32.3	LOS C	7.7	46.4	0.99	0.83	1.04	32.5
2	T1	185	0	185	0.0	0.688	28.9	LOS C	7.7	46.4	0.99	0.83	1.04	32.9
3	R2	142	0	142	0.0	* 0.854	65.7	LOS E	8.5	51.2	1.00	1.00	1.36	24.5
Approach		348	0	348	0.0	0.854	44.1	LOS D	8.5	51.2	1.00	0.90	1.17	28.9
East: Riverbank Drive														
4	L2	29	0	31	0.0	0.727	31.6	LOS C	11.5	68.9	0.98	0.85	1.03	33.4
5	T1	262	0	276	0.0	* 0.727	27.0	LOS B	11.5	68.9	0.98	0.85	1.03	36.3
6	R2	133	0	140	0.0	* 0.842	66.0	LOS E	8.3	50.0	1.00	0.95	1.33	26.1
Approach		424	0	446	0.0	0.842	39.5	LOS C	11.5	68.9	0.99	0.88	1.12	32.2
North: The Ponds Boulevard														
7	L2	17	0	18	0.0	0.328	37.5	LOS C	7.6	45.5	0.83	0.73	0.83	33.7
8	T1	154	0	162	0.0	0.328	34.1	LOS C	7.6	45.5	0.83	0.73	0.83	31.3
9	R2	253	0	266	0.0	* 0.890	65.6	LOS E	16.4	98.7	1.00	1.00	1.34	26.2
Approach		424	0	446	0.0	0.890	53.1	LOS D	16.4	98.7	0.93	0.89	1.14	28.1
West: Riverbank Drive														
10	L2	31	0	33	0.0	0.559	38.8	LOS C	14.7	88.0	0.89	0.77	0.89	33.7
11	T1	279	0	294	0.0	0.559	34.3	LOS C	14.7	88.0	0.89	0.77	0.89	33.9
12	R2	179	0	188	0.0	* 0.872	66.4	LOS E	11.4	68.6	1.00	0.98	1.36	24.6
Approach		489	0	515	0.0	0.872	46.3	LOS D	14.7	88.0	0.93	0.85	1.06	29.8
All Vehicles		1685	0	1755	0.0	0.890	45.9	LOS D	16.4	98.7	0.96	0.88	1.12	29.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	25.5	LOS C	0.1	0.1	0.89	0.89	188.6	212.0	1.12
East: Riverbank Drive												
P2	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	212.3	212.0	1.00
North: The Ponds Boulevard												

P3	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	212.3	212.0	1.00
West: Riverbank Drive												
P4	Full	50	53	23.9	LOS C	0.1	0.1	0.89	0.89	187.0	212.0	1.13
All Pedestrians		200	211	37.0	LOS D	0.2	0.2	0.92	0.92	200.1	212.0	1.06

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

MOVEMENT SUMMARY

Site: 101 [The Ponds Blvd/Riverbank Dr - School PM Peak (Site Folder: 2021)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	18	0	18	0.0	* 0.592	30.6	LOS C	6.2	37.3	0.97	0.80	0.97	33.0
2	T1	166	0	166	0.0	0.592	27.1	LOS B	6.2	37.3	0.97	0.80	0.97	33.5
3	R2	168	0	168	0.0	* 0.835	58.1	LOS E	9.1	54.4	1.00	0.98	1.31	25.8
Approach		352	0	352	0.0	0.835	42.1	LOS C	9.1	54.4	0.98	0.89	1.13	29.3
East: Riverbank Drive														
4	L2	34	0	36	0.0	0.768	30.7	LOS C	13.0	77.9	0.98	0.88	1.07	33.7
5	T1	304	0	320	0.0	* 0.768	26.2	LOS B	13.0	77.9	0.98	0.88	1.07	36.6
6	R2	126	0	133	0.0	* 0.806	59.3	LOS E	7.1	42.5	1.00	0.92	1.29	27.4
Approach		464	0	488	0.0	0.806	35.5	LOS C	13.0	77.9	0.99	0.90	1.13	33.4
North: The Ponds Boulevard														
7	L2	16	0	17	0.0	0.344	37.2	LOS C	6.7	40.4	0.86	0.74	0.86	33.8
8	T1	144	0	152	0.0	0.344	33.8	LOS C	6.7	40.4	0.86	0.74	0.86	31.4
9	R2	210	0	221	0.0	* 0.864	59.4	LOS E	12.2	73.0	1.00	0.98	1.33	27.4
Approach		370	0	389	0.0	0.864	48.5	LOS D	12.2	73.0	0.94	0.87	1.13	29.1
West: Riverbank Drive														
10	L2	27	0	28	0.0	0.506	35.9	LOS C	11.6	69.6	0.88	0.75	0.88	34.6
11	T1	245	0	258	0.0	0.506	31.3	LOS C	11.6	69.6	0.88	0.75	0.88	34.8
12	R2	121	0	127	0.0	* 0.871	63.7	LOS E	7.1	42.7	1.00	0.99	1.46	25.1
Approach		393	0	414	0.0	0.871	41.6	LOS C	11.6	69.6	0.92	0.83	1.06	31.1
All Vehicles		1579	0	1644	0.0	0.871	41.5	LOS C	13.0	77.9	0.96	0.87	1.11	30.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	23.8	LOS C	0.1	0.1	0.88	0.88	186.9	212.0	1.13
East: Riverbank Drive												
P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	207.4	212.0	1.02
North: The Ponds Boulevard												

P3	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	207.4	212.0	1.02
West: Riverbank Drive												
P4	Full	50	53	21.1	LOS C	0.1	0.1	0.88	0.88	184.2	212.0	1.15
All Pedestrians		200	211	33.4	LOS D	0.1	0.1	0.91	0.91	196.4	212.0	1.08

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: 101 [The Ponds Blvd/Riverbank Dr - AM Peak (Site Folder: 2026 - Dev - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	22	0	22	0.0	0.636	39.3	LOS C	11.1	66.8	0.97	0.80	0.97	30.6
2	T1	207	0	207	0.0	* 0.636	35.9	LOS C	11.1	66.8	0.97	0.80	0.97	31.0
3	R2	166	0	166	0.0	* 0.908	90.9	LOS F	13.9	83.1	1.00	1.02	1.38	21.0
Approach		395	0	395	0.0	0.908	59.2	LOS E	13.9	83.1	0.98	0.89	1.14	25.8
East: Riverbank Drive														
4	L2	42	0	44	0.0	0.846	44.4	LOS D	22.5	134.8	1.00	0.94	1.11	29.9
5	T1	349	0	367	0.0	0.846	39.9	LOS C	22.5	134.8	1.00	0.94	1.11	32.2
6	R2	143	0	151	0.0	* 0.950	102.2	LOS F	13.3	79.8	1.00	1.04	1.51	20.7
Approach		534	0	562	0.0	0.950	56.9	LOS E	22.5	134.8	1.00	0.96	1.21	27.9
North: The Ponds Boulevard														
7	L2	30	0	32	0.0	0.725	52.3	LOS D	20.7	124.2	0.91	0.81	0.91	29.7
8	T1	288	0	303	0.0	0.725	49.0	LOS D	20.7	124.2	0.91	0.81	0.91	27.8
9	R2	243	0	256	0.0	* 0.914	87.6	LOS F	21.3	127.9	1.00	0.99	1.32	22.6
Approach		561	0	591	0.0	0.914	65.9	LOS E	21.3	127.9	0.95	0.88	1.09	25.4
West: Riverbank Drive														
10	L2	47	0	49	0.0	0.933	74.8	LOS F	39.8	238.8	0.94	1.03	1.20	25.3
11	T1	422	0	444	0.0	* 0.933	70.2	LOS E	39.8	238.8	0.94	1.03	1.20	25.4
12	R2	220	0	232	0.0	0.905	88.2	LOS F	19.2	115.3	1.00	0.98	1.31	21.5
Approach		689	0	725	0.0	0.933	76.3	LOS F	39.8	238.8	0.96	1.02	1.24	24.0
All Vehicles		2179	0	2273	0.0	0.950	65.8	LOS E	39.8	238.8	0.97	0.95	1.18	25.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	37.4	LOS D	0.1	0.1	0.92	0.92	200.5	212.0	1.06
East: Riverbank Drive												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
North: The Ponds Boulevard												

P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
West: Riverbank Drive												
P4	Full	50	53	35.3	LOS D	0.1	0.1	0.92	0.92	198.4	212.0	1.07
All Pedestrians		200	211	52.8	LOS E	0.2	0.2	0.94	0.94	215.9	212.0	0.98

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: 101 [The Ponds Blvd/Riverbank Dr - PM Peak (Site Folder: 2026 - Dev - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	23	0	23	0.0	* 0.650	34.0	LOS C	9.0	54.3	0.98	0.80	0.98	32.0
2	T1	199	0	199	0.0	0.650	30.6	LOS C	9.0	54.3	0.98	0.80	0.98	32.4
3	R2	153	0	153	0.0	* 0.907	81.2	LOS F	11.2	67.3	1.00	1.04	1.43	22.2
Approach		375	0	375	0.0	0.907	51.4	LOS D	11.2	67.3	0.99	0.90	1.16	27.3
East: Riverbank Drive														
4	L2	31	0	33	0.0	0.766	37.6	LOS C	15.1	90.4	0.99	0.87	1.05	31.7
5	T1	282	0	297	0.0	* 0.766	33.0	LOS C	15.1	90.4	0.99	0.87	1.05	34.3
6	R2	143	0	151	0.0	* 0.892	80.3	LOS F	10.9	65.2	1.00	0.98	1.40	23.7
Approach		456	0	480	0.0	0.892	48.2	LOS D	15.1	90.4	0.99	0.91	1.16	29.9
North: The Ponds Boulevard														
7	L2	18	0	19	0.0	0.317	40.0	LOS C	9.2	55.1	0.80	0.72	0.80	33.0
8	T1	166	0	175	0.0	0.317	36.6	LOS C	9.2	55.1	0.80	0.72	0.80	30.7
9	R2	273	0	287	0.0	* 0.855	68.4	LOS E	19.6	117.7	1.00	0.94	1.21	25.6
Approach		457	0	481	0.0	0.855	55.8	LOS D	19.6	117.7	0.92	0.85	1.04	27.5
West: Riverbank Drive														
10	L2	33	0	35	0.0	0.687	45.6	LOS D	18.9	113.5	0.91	0.79	0.91	31.7
11	T1	301	0	317	0.0	0.687	41.1	LOS C	18.9	113.5	0.91	0.79	0.91	31.9
12	R2	193	0	203	0.0	* 0.903	79.6	LOS F	14.8	88.9	1.00	0.99	1.37	22.6
Approach		527	0	555	0.0	0.903	55.5	LOS D	18.9	113.5	0.94	0.86	1.08	27.7
All Vehicles		1815	0	1891	0.0	0.907	52.9	LOS D	19.6	117.7	0.96	0.88	1.11	28.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	31.7	LOS D	0.1	0.1	0.91	0.91	194.7	212.0	1.09
East: Riverbank Drive												
P2	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	222.3	212.0	0.95
North: The Ponds Boulevard												

P3	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	222.3	212.0	0.95
West: Riverbank Drive												
P4	Full	50	53	29.1	LOS C	0.1	0.1	0.91	0.91	192.1	212.0	1.10
All Pedestrians		200	211	44.8	LOS E	0.2	0.2	0.93	0.93	207.9	212.0	1.02

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: 101 [The Ponds Blvd/Riverbank Dr - School PM Peak (Site Folder: 2026 - Dev - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	18	0	18	0.0	*0.581	32.0	LOS C	7.1	42.8	0.96	0.80	0.96	32.6
2	T1	177	0	177	0.0	0.581	28.6	LOS C	7.1	42.8	0.96	0.80	0.96	33.1
3	R2	191	0	191	0.0	*0.884	66.5	LOS E	11.7	70.4	1.00	1.03	1.39	24.4
Approach		386	0	386	0.0	0.884	47.5	LOS D	11.7	70.4	0.98	0.91	1.17	28.1
East: Riverbank Drive														
4	L2	41	0	43	0.0	0.792	33.6	LOS C	15.8	94.8	0.99	0.90	1.08	32.8
5	T1	327	0	344	0.0	*0.792	29.0	LOS C	15.8	94.8	0.99	0.90	1.08	35.6
6	R2	136	0	143	0.0	*0.861	67.3	LOS E	8.6	51.8	1.00	0.97	1.38	25.8
Approach		504	0	531	0.0	0.861	39.7	LOS C	15.8	94.8	0.99	0.92	1.16	32.1
North: The Ponds Boulevard														
7	L2	17	0	18	0.0	0.397	40.6	LOS C	8.8	52.7	0.87	0.76	0.87	32.8
8	T1	171	0	180	0.0	0.397	37.3	LOS C	8.8	52.7	0.87	0.76	0.87	30.5
9	R2	226	0	238	0.0	*0.895	67.3	LOS E	14.8	88.8	1.00	1.00	1.38	25.8
Approach		414	0	436	0.0	0.895	53.8	LOS D	14.8	88.8	0.94	0.89	1.15	27.8
West: Riverbank Drive														
10	L2	29	0	31	0.0	0.528	38.4	LOS C	13.7	82.2	0.88	0.76	0.88	33.8
11	T1	264	0	278	0.0	0.528	33.9	LOS C	13.7	82.2	0.88	0.76	0.88	34.0
12	R2	130	0	137	0.0	*0.915	73.7	LOS F	8.7	52.3	1.00	1.04	1.54	23.5
Approach		423	0	445	0.0	0.915	46.4	LOS D	13.7	82.2	0.92	0.85	1.08	29.9
All Vehicles		1727	0	1798	0.0	0.915	46.5	LOS D	15.8	94.8	0.96	0.89	1.14	29.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	27.1	LOS C	0.1	0.1	0.89	0.89	190.2	212.0	1.11
East: Riverbank Drive												
P2	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	212.3	212.0	1.00
North: The Ponds Boulevard												

P3	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	212.3	212.0	1.00
West: Riverbank Drive												
P4	Full	50	53	23.7	LOS C	0.1	0.1	0.89	0.89	186.7	212.0	1.14
All Pedestrians		200	211	37.3	LOS D	0.2	0.2	0.92	0.92	200.4	212.0	1.06

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

MOVEMENT SUMMARY

Site: 101 [The Ponds Blvd/Riverbank Dr - AM Peak (Site Folder: 2026 - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	22	0	22	0.0	0.652	40.6	LOS C	10.8	65.0	0.98	0.81	0.98	30.3
2	T1	196	0	196	0.0	* 0.652	37.2	LOS C	10.8	65.0	0.98	0.81	0.98	30.6
3	R2	157	0	157	0.0	* 0.920	93.6	LOS F	13.3	79.8	1.00	1.04	1.42	20.7
Approach		375	0	375	0.0	0.920	61.0	LOS E	13.3	79.8	0.99	0.90	1.16	25.5
East: Riverbank Drive														
4	L2	39	0	41	0.0	0.817	40.7	LOS C	21.0	125.7	1.00	0.91	1.07	30.9
5	T1	349	0	367	0.0	0.817	36.2	LOS C	21.0	125.7	1.00	0.91	1.07	33.3
6	R2	143	0	151	0.0	* 0.882	89.0	LOS F	12.2	73.5	1.00	0.96	1.33	22.4
Approach		531	0	559	0.0	0.882	50.7	LOS D	21.0	125.7	1.00	0.92	1.14	29.3
North: The Ponds Boulevard														
7	L2	30	0	32	0.0	0.666	52.7	LOS D	19.6	117.3	0.91	0.80	0.91	29.6
8	T1	271	0	285	0.0	0.666	49.3	LOS D	19.6	117.3	0.91	0.80	0.91	27.7
9	R2	243	0	256	0.0	* 0.906	85.9	LOS F	21.1	126.4	1.00	0.98	1.30	22.8
Approach		544	0	573	0.0	0.906	65.8	LOS E	21.1	126.4	0.95	0.88	1.08	25.4
West: Riverbank Drive														
10	L2	47	0	49	0.0	0.918	69.4	LOS E	38.2	229.4	0.93	1.00	1.15	26.2
11	T1	422	0	444	0.0	* 0.918	64.8	LOS E	38.2	229.4	0.93	1.00	1.15	26.4
12	R2	220	0	232	0.0	0.864	81.6	LOS F	18.3	109.9	1.00	0.94	1.22	22.3
Approach		689	0	725	0.0	0.918	70.5	LOS F	38.2	229.4	0.95	0.98	1.18	24.9
All Vehicles		2139	0	2232	0.0	0.920	62.8	LOS E	38.2	229.4	0.97	0.93	1.14	26.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	36.7	LOS D	0.1	0.1	0.92	0.92	199.8	212.0	1.06
East: Riverbank Drive												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
North: The Ponds Boulevard												

P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
West: Riverbank Drive												
P4	Full	50	53	35.7	LOS D	0.1	0.1	0.92	0.92	198.7	212.0	1.07
All Pedestrians		200	211	52.7	LOS E	0.2	0.2	0.94	0.94	215.8	212.0	0.98

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: 101 [The Ponds Blvd/Riverbank Dr - PM Peak (Site Folder: 2026 - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	23	0	23	0.0	* 0.650	34.0	LOS C	9.0	54.3	0.98	0.80	0.98	32.0
2	T1	199	0	199	0.0	0.650	30.6	LOS C	9.0	54.3	0.98	0.80	0.98	32.4
3	R2	153	0	153	0.0	* 0.907	81.2	LOS F	11.2	67.3	1.00	1.04	1.43	22.2
Approach		375	0	375	0.0	0.907	51.4	LOS D	11.2	67.3	0.99	0.90	1.16	27.3
East: Riverbank Drive														
4	L2	31	0	33	0.0	0.766	37.6	LOS C	15.1	90.4	0.99	0.87	1.05	31.7
5	T1	282	0	297	0.0	* 0.766	33.0	LOS C	15.1	90.4	0.99	0.87	1.05	34.3
6	R2	143	0	151	0.0	* 0.892	80.3	LOS F	10.9	65.2	1.00	0.98	1.40	23.7
Approach		456	0	480	0.0	0.892	48.2	LOS D	15.1	90.4	0.99	0.91	1.16	29.9
North: The Ponds Boulevard														
7	L2	18	0	19	0.0	0.317	40.0	LOS C	9.2	55.1	0.80	0.72	0.80	33.0
8	T1	166	0	175	0.0	0.317	36.6	LOS C	9.2	55.1	0.80	0.72	0.80	30.7
9	R2	273	0	287	0.0	* 0.855	68.4	LOS E	19.6	117.7	1.00	0.94	1.21	25.6
Approach		457	0	481	0.0	0.855	55.8	LOS D	19.6	117.7	0.92	0.85	1.04	27.5
West: Riverbank Drive														
10	L2	33	0	35	0.0	0.687	45.6	LOS D	18.9	113.5	0.91	0.79	0.91	31.7
11	T1	301	0	317	0.0	0.687	41.1	LOS C	18.9	113.5	0.91	0.79	0.91	31.9
12	R2	193	0	203	0.0	* 0.903	79.6	LOS F	14.8	88.9	1.00	0.99	1.37	22.6
Approach		527	0	555	0.0	0.903	55.5	LOS D	18.9	113.5	0.94	0.86	1.08	27.7
All Vehicles		1815	0	1891	0.0	0.907	52.9	LOS D	19.6	117.7	0.96	0.88	1.11	28.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	31.7	LOS D	0.1	0.1	0.91	0.91	194.7	212.0	1.09
East: Riverbank Drive												
P2	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	222.3	212.0	0.95
North: The Ponds Boulevard												

P3	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	222.3	212.0	0.95
West: Riverbank Drive												
P4	Full	50	53	29.1	LOS C	0.1	0.1	0.91	0.91	192.1	212.0	1.10
All Pedestrians		200	211	44.8	LOS E	0.2	0.2	0.93	0.93	207.9	212.0	1.02

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: 101 [The Ponds Blvd/Riverbank Dr - School PM Peak (Site Folder: 2026 - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	18	0	18	0.0	* 0.583	34.4	LOS C	6.8	40.5	0.97	0.83	0.97	31.9
2	T1	167	0	167	0.0	0.583	31.0	LOS C	6.8	40.5	0.97	0.83	0.97	32.3
3	R2	181	0	181	0.0	* 0.838	62.4	LOS E	10.6	63.9	1.00	0.97	1.28	25.1
Approach		366	0	366	0.0	0.838	46.7	LOS D	10.6	63.9	0.98	0.90	1.12	28.3
East: Riverbank Drive														
4	L2	37	0	39	0.0	0.810	34.8	LOS C	15.9	95.4	1.00	0.92	1.11	32.5
5	T1	327	0	344	0.0	* 0.810	30.3	LOS C	15.9	95.4	1.00	0.92	1.11	35.2
6	R2	136	0	143	0.0	* 0.861	67.3	LOS E	8.6	51.8	1.00	0.97	1.38	25.8
Approach		500	0	526	0.0	0.861	40.7	LOS C	15.9	95.4	1.00	0.94	1.19	31.9
North: The Ponds Boulevard														
7	L2	17	0	18	0.0	0.364	40.2	LOS C	8.0	47.7	0.86	0.75	0.86	32.9
8	T1	155	0	163	0.0	0.364	36.9	LOS C	8.0	47.7	0.86	0.75	0.86	30.6
9	R2	226	0	238	0.0	* 0.842	61.1	LOS E	13.9	83.4	1.00	0.94	1.25	27.0
Approach		398	0	419	0.0	0.842	50.8	LOS D	13.9	83.4	0.94	0.86	1.08	28.6
West: Riverbank Drive														
10	L2	29	0	31	0.0	0.528	38.4	LOS C	13.7	82.2	0.88	0.76	0.88	33.8
11	T1	264	0	278	0.0	0.528	33.9	LOS C	13.7	82.2	0.88	0.76	0.88	34.0
12	R2	130	0	137	0.0	* 0.823	64.9	LOS E	8.1	48.3	1.00	0.93	1.30	24.9
Approach		423	0	445	0.0	0.823	43.7	LOS D	13.7	82.2	0.92	0.81	1.01	30.5
All Vehicles		1687	0	1757	0.0	0.861	45.1	LOS D	15.9	95.4	0.96	0.88	1.10	29.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	26.7	LOS C	0.1	0.1	0.89	0.89	189.8	212.0	1.12
East: Riverbank Drive												
P2	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	212.3	212.0	1.00
North: The Ponds Boulevard												

P3	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	212.3	212.0	1.00
West: Riverbank Drive												
P4	Full	50	53	23.4	LOS C	0.1	0.1	0.89	0.89	186.5	212.0	1.14
All Pedestrians		200	211	37.2	LOS D	0.2	0.2	0.92	0.92	200.2	212.0	1.06

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

MOVEMENT SUMMARY

Site: 101 [The Ponds Blvd/Riverbank Dr - AM Peak - Copy - Copy (2) (Site Folder: 2031 - Dev - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	23	0	23	0.0	0.825	58.3	LOS E	13.3	79.9	1.00	1.03	1.15	26.4
2	T1	222	0	222	0.0	* 0.825	54.9	LOS D	13.3	79.9	1.00	1.03	1.15	26.7
3	R2	178	0	178	0.0	* 0.974	108.6	LOS F	16.5	98.9	1.00	1.12	1.55	19.0
Approach		423	0	423	0.0	0.974	77.7	LOS F	16.5	98.9	1.00	1.07	1.32	22.8
East: Riverbank Drive														
4	L2	45	0	47	0.0	0.911	53.5	LOS D	26.7	159.9	1.00	1.02	1.22	27.8
5	T1	376	0	396	0.0	0.911	49.0	LOS D	26.7	159.9	1.00	1.02	1.22	29.8
6	R2	154	0	162	0.0	* 0.950	101.8	LOS F	14.3	86.0	1.00	1.04	1.50	20.8
Approach		575	0	605	0.0	0.950	63.5	LOS E	26.7	159.9	1.00	1.02	1.29	26.6
North: The Ponds Boulevard														
7	L2	33	0	35	0.0	0.878	68.7	LOS E	26.8	160.6	0.95	0.98	1.14	26.2
8	T1	309	0	325	0.0	0.878	65.4	LOS E	26.8	160.6	0.95	0.98	1.14	24.7
9	R2	262	0	276	0.0	* 0.987	112.6	LOS F	26.5	158.7	1.00	1.09	1.53	19.6
Approach		604	0	636	0.0	0.987	86.0	LOS F	26.8	160.6	0.97	1.03	1.31	22.2
West: Riverbank Drive														
10	L2	51	0	54	0.0	0.974	91.4	LOS F	47.8	287.0	0.95	1.13	1.32	22.7
11	T1	455	0	479	0.0	* 0.974	86.8	LOS F	47.8	287.0	0.95	1.13	1.32	22.8
12	R2	237	0	249	0.0	0.970	105.7	LOS F	23.0	138.2	1.00	1.06	1.49	19.5
Approach		743	0	782	0.0	0.974	93.2	LOS F	47.8	287.0	0.96	1.11	1.38	21.6
All Vehicles		2345	0	2446	0.0	0.987	81.3	LOS F	47.8	287.0	0.98	1.06	1.33	23.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	36.0	LOS D	0.1	0.1	0.92	0.92	199.1	212.0	1.06
East: Riverbank Drive												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
North: The Ponds Boulevard												

P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
West: Riverbank Drive												
P4	Full	50	53	34.8	LOS D	0.1	0.1	0.92	0.92	197.8	212.0	1.07
All Pedestrians		200	211	52.3	LOS E	0.2	0.2	0.94	0.94	215.4	212.0	0.98

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: 101 [The Ponds Blvd/Riverbank Dr - PM Peak - Copy - Copy (2) (Site Folder: 2031 - Dev - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	24	0	24	0.0	0.715	39.3	LOS C	11.2	67.3	0.99	0.84	1.02	30.6
2	T1	215	0	215	0.0	* 0.715	35.9	LOS C	11.2	67.3	0.99	0.84	1.02	31.0
3	R2	165	0	165	0.0	* 0.967	106.3	LOS F	15.0	90.3	1.00	1.11	1.54	19.3
Approach		404	0	404	0.0	0.967	64.9	LOS E	15.0	90.3	1.00	0.95	1.23	24.8
East: Riverbank Drive														
4	L2	34	0	36	0.0	0.793	42.8	LOS D	19.0	114.0	1.00	0.89	1.06	30.3
5	T1	304	0	320	0.0	* 0.793	38.3	LOS C	19.0	114.0	1.00	0.89	1.06	32.7
6	R2	154	0	162	0.0	* 0.950	101.8	LOS F	14.3	86.0	1.00	1.04	1.50	20.8
Approach		492	0	518	0.0	0.950	58.5	LOS E	19.0	114.0	1.00	0.94	1.19	27.6
North: The Ponds Boulevard														
7	L2	20	0	21	0.0	0.325	43.6	LOS D	11.2	67.3	0.79	0.72	0.79	31.9
8	T1	179	0	188	0.0	0.325	40.2	LOS C	11.2	67.3	0.79	0.72	0.79	29.8
9	R2	294	0	309	0.0	* 0.925	86.4	LOS F	26.0	155.9	1.00	1.00	1.32	22.8
Approach		493	0	519	0.0	0.925	67.9	LOS E	26.0	155.9	0.91	0.89	1.11	25.2
West: Riverbank Drive														
10	L2	36	0	38	0.0	0.822	57.2	LOS E	25.4	152.2	0.92	0.87	1.01	28.8
11	T1	324	0	341	0.0	0.822	52.7	LOS D	25.4	152.2	0.92	0.87	1.01	28.9
12	R2	208	0	219	0.0	* 0.945	98.7	LOS F	19.3	116.0	1.00	1.03	1.43	20.2
Approach		568	0	598	0.0	0.945	69.8	LOS E	25.4	152.2	0.95	0.93	1.16	25.0
All Vehicles		1957	0	2039	0.0	0.967	65.5	LOS E	26.0	155.9	0.96	0.92	1.17	25.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	37.8	LOS D	0.1	0.1	0.92	0.92	200.9	212.0	1.06
East: Riverbank Drive												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
North: The Ponds Boulevard												

P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
West: Riverbank Drive												
P4	Full	50	53	33.7	LOS D	0.1	0.1	0.92	0.92	196.8	212.0	1.08
All Pedestrians		200	211	52.5	LOS E	0.2	0.2	0.94	0.94	215.6	212.0	0.98

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: 101 [The Ponds Blvd/Riverbank Dr - School PM Peak - Copy - Copy (2) (Site Folder: 2031 - Dev - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	20	0	20	0.0	* 0.525	34.8	LOS C	9.2	55.3	0.93	0.77	0.93	31.8
2	T1	190	0	190	0.0	0.525	31.4	LOS C	9.2	55.3	0.93	0.77	0.93	32.2
3	R2	205	0	205	0.0	* 0.872	78.7	LOS F	15.4	92.6	1.00	0.98	1.28	22.6
Approach		415	0	415	0.0	0.872	54.9	LOS D	15.4	92.6	0.97	0.87	1.10	26.6
East: Riverbank Drive														
4	L2	43	0	45	0.0	0.800	39.6	LOS C	21.2	127.2	0.99	0.89	1.05	31.1
5	T1	353	0	372	0.0	* 0.800	35.0	LOS C	21.2	127.2	0.99	0.89	1.05	33.6
6	R2	146	0	154	0.0	* 0.905	87.1	LOS F	12.0	72.1	1.00	0.99	1.40	22.7
Approach		542	0	571	0.0	0.905	49.4	LOS D	21.2	127.2	0.99	0.92	1.14	29.6
North: The Ponds Boulevard														
7	L2	19	0	20	0.0	0.393	47.6	LOS D	11.6	69.7	0.85	0.75	0.85	30.8
8	T1	183	0	193	0.0	0.393	44.3	LOS D	11.6	69.7	0.85	0.75	0.85	28.8
9	R2	244	0	257	0.0	* 0.894	80.3	LOS F	19.7	118.4	1.00	0.97	1.29	23.7
Approach		446	0	469	0.0	0.894	64.1	LOS E	19.7	118.4	0.93	0.87	1.09	25.8
West: Riverbank Drive														
10	L2	31	0	33	0.0	0.621	46.3	LOS D	18.5	111.0	0.88	0.76	0.88	31.5
11	T1	284	0	299	0.0	0.621	41.8	LOS C	18.5	111.0	0.88	0.76	0.88	31.7
12	R2	140	0	147	0.0	* 0.868	82.6	LOS F	11.1	66.8	1.00	0.95	1.32	22.2
Approach		455	0	479	0.0	0.868	54.7	LOS D	18.5	111.0	0.92	0.82	1.01	28.0
All Vehicles		1858	0	1934	0.0	0.905	55.5	LOS D	21.2	127.2	0.95	0.87	1.09	27.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	36.7	LOS D	0.1	0.1	0.92	0.92	199.7	212.0	1.06
East: Riverbank Drive												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.3	212.0	0.93
North: The Ponds Boulevard												

P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.3	212.0	0.93
West: Riverbank Drive												
P4	Full	50	53	31.6	LOS D	0.1	0.1	0.92	0.92	194.7	212.0	1.09
All Pedestrians		200	211	49.2	LOS E	0.2	0.2	0.94	0.94	212.3	212.0	1.00

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: 101 [The Ponds Blvd/Riverbank Dr - AM Peak - Copy - Copy - Copy (Site Folder: 2031 - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	23	0	23	0.0	0.825	58.1	LOS E	12.8	76.9	1.00	1.02	1.15	26.5
2	T1	211	0	211	0.0	* 0.825	54.7	LOS D	12.8	76.9	1.00	1.02	1.15	26.7
3	R2	169	0	169	0.0	* 0.990	116.3	LOS F	16.2	97.1	1.00	1.15	1.62	18.3
Approach		403	0	403	0.0	0.990	80.7	LOS F	16.2	97.1	1.00	1.07	1.35	22.4
East: Riverbank Drive														
4	L2	42	0	44	0.0	0.880	47.1	LOS D	24.5	147.2	1.00	0.97	1.16	29.3
5	T1	376	0	396	0.0	0.880	42.5	LOS D	24.5	147.2	1.00	0.97	1.16	31.5
6	R2	154	0	162	0.0	* 0.950	101.8	LOS F	14.3	86.0	1.00	1.04	1.50	20.8
Approach		572	0	602	0.0	0.950	58.8	LOS E	24.5	147.2	1.00	0.99	1.25	27.5
North: The Ponds Boulevard														
7	L2	33	0	35	0.0	0.815	60.6	LOS E	23.4	140.4	0.94	0.89	1.03	27.8
8	T1	292	0	307	0.0	0.815	57.2	LOS E	23.4	140.4	0.94	0.89	1.03	26.1
9	R2	262	0	276	0.0	* 0.983	110.6	LOS F	26.2	157.3	1.00	1.08	1.52	19.8
Approach		587	0	618	0.0	0.983	81.3	LOS F	26.2	157.3	0.97	0.98	1.25	22.9
West: Riverbank Drive														
10	L2	51	0	54	0.0	0.959	83.6	LOS F	45.7	274.3	0.94	1.09	1.26	23.8
11	T1	455	0	479	0.0	* 0.959	79.0	LOS F	45.7	274.3	0.94	1.09	1.26	23.9
12	R2	237	0	249	0.0	0.970	105.7	LOS F	23.0	138.2	1.00	1.06	1.49	19.5
Approach		743	0	782	0.0	0.970	87.8	LOS F	45.7	274.3	0.96	1.08	1.34	22.3
All Vehicles		2305	0	2405	0.0	0.990	77.7	LOS F	45.7	274.3	0.98	1.03	1.29	23.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	36.0	LOS D	0.1	0.1	0.92	0.92	199.1	212.0	1.06
East: Riverbank Drive												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
North: The Ponds Boulevard												

P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
West: Riverbank Drive												
P4	Full	50	53	35.0	LOS D	0.1	0.1	0.92	0.92	198.1	212.0	1.07
All Pedestrians		200	211	52.4	LOS E	0.2	0.2	0.94	0.94	215.5	212.0	0.98

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: 101 [The Ponds Blvd/Riverbank Dr - PM Peak - Copy - Copy - Copy (Site Folder: 2031 - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	24	0	24	0.0	0.715	39.3	LOS C	11.2	67.3	0.99	0.84	1.02	30.6
2	T1	215	0	215	0.0	* 0.715	35.9	LOS C	11.2	67.3	0.99	0.84	1.02	31.0
3	R2	165	0	165	0.0	* 0.967	106.3	LOS F	15.0	90.3	1.00	1.11	1.54	19.3
Approach		404	0	404	0.0	0.967	64.9	LOS E	15.0	90.3	1.00	0.95	1.23	24.8
East: Riverbank Drive														
4	L2	34	0	36	0.0	0.793	42.8	LOS D	19.0	114.0	1.00	0.89	1.06	30.3
5	T1	304	0	320	0.0	* 0.793	38.3	LOS C	19.0	114.0	1.00	0.89	1.06	32.7
6	R2	154	0	162	0.0	* 0.950	101.8	LOS F	14.3	86.0	1.00	1.04	1.50	20.8
Approach		492	0	518	0.0	0.950	58.5	LOS E	19.0	114.0	1.00	0.94	1.19	27.6
North: The Ponds Boulevard														
7	L2	20	0	21	0.0	0.325	43.6	LOS D	11.2	67.3	0.79	0.72	0.79	31.9
8	T1	179	0	188	0.0	0.325	40.2	LOS C	11.2	67.3	0.79	0.72	0.79	29.8
9	R2	294	0	309	0.0	* 0.925	86.4	LOS F	26.0	155.9	1.00	1.00	1.32	22.8
Approach		493	0	519	0.0	0.925	67.9	LOS E	26.0	155.9	0.91	0.89	1.11	25.2
West: Riverbank Drive														
10	L2	36	0	38	0.0	0.822	57.2	LOS E	25.4	152.2	0.92	0.87	1.01	28.8
11	T1	324	0	341	0.0	0.822	52.7	LOS D	25.4	152.2	0.92	0.87	1.01	28.9
12	R2	208	0	219	0.0	* 0.945	98.7	LOS F	19.3	116.0	1.00	1.03	1.43	20.2
Approach		568	0	598	0.0	0.945	69.8	LOS E	25.4	152.2	0.95	0.93	1.16	25.0
All Vehicles		1957	0	2039	0.0	0.967	65.5	LOS E	26.0	155.9	0.96	0.92	1.17	25.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	37.8	LOS D	0.1	0.1	0.92	0.92	200.9	212.0	1.06
East: Riverbank Drive												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
North: The Ponds Boulevard												

P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	232.3	212.0	0.91
West: Riverbank Drive												
P4	Full	50	53	33.7	LOS D	0.1	0.1	0.92	0.92	196.8	212.0	1.08
All Pedestrians		200	211	52.5	LOS E	0.2	0.2	0.94	0.94	215.6	212.0	0.98

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: 101 [The Ponds Blvd/Riverbank Dr - School PM Peak - Copy - Copy - Copy (Site Folder: 2031 - Growth)]

The Ponds Boulevard and Riverbank Drive
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: The Ponds Boulevard														
1	L2	20	0	20	0.0	*0.539	33.5	LOS C	8.2	49.5	0.95	0.77	0.95	32.2
2	T1	180	0	180	0.0	0.539	30.0	LOS C	8.2	49.5	0.95	0.77	0.95	32.6
3	R2	195	0	195	0.0	*0.867	73.9	LOS F	13.7	82.0	1.00	0.98	1.29	23.2
Approach		395	0	395	0.0	0.867	51.9	LOS D	13.7	82.0	0.97	0.88	1.12	27.2
East: Riverbank Drive														
4	L2	39	0	41	0.0	0.820	39.5	LOS C	20.2	121.3	1.00	0.92	1.09	31.2
5	T1	353	0	372	0.0	*0.820	34.9	LOS C	20.2	121.3	1.00	0.92	1.09	33.7
6	R2	146	0	154	0.0	*0.911	82.9	LOS F	11.3	67.9	1.00	1.01	1.44	23.3
Approach		538	0	566	0.0	0.911	48.3	LOS D	20.2	121.3	1.00	0.95	1.19	29.9
North: The Ponds Boulevard														
7	L2	19	0	20	0.0	0.364	44.4	LOS D	9.9	59.2	0.85	0.74	0.85	31.7
8	T1	167	0	176	0.0	0.364	41.0	LOS C	9.9	59.2	0.85	0.74	0.85	29.6
9	R2	244	0	257	0.0	*0.870	72.1	LOS F	17.9	107.6	1.00	0.95	1.25	25.0
Approach		430	0	453	0.0	0.870	58.8	LOS E	17.9	107.6	0.93	0.86	1.08	26.9
West: Riverbank Drive														
10	L2	31	0	33	0.0	0.555	44.2	LOS D	17.4	104.4	0.89	0.77	0.89	32.1
11	T1	284	0	299	0.0	0.555	39.6	LOS C	17.4	104.4	0.89	0.77	0.89	32.3
12	R2	140	0	147	0.0	*0.873	78.2	LOS F	10.5	62.7	1.00	0.96	1.35	22.8
Approach		455	0	479	0.0	0.873	51.8	LOS D	17.4	104.4	0.92	0.83	1.03	28.6
All Vehicles		1818	0	1893	0.0	0.911	52.4	LOS D	20.2	121.3	0.96	0.88	1.11	28.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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	Input Vol. ped/h	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: The Ponds Boulevard												
P1	Full	50	53	33.3	LOS D	0.1	0.1	0.91	0.91	196.4	212.0	1.08
East: Riverbank Drive												
P2	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	222.3	212.0	0.95
North: The Ponds Boulevard												

P3	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	222.3	212.0	0.95
West: Riverbank Drive												
P4	Full	50	53	28.8	LOS C	0.1	0.1	0.91	0.91	191.9	212.0	1.10
All Pedestrians		200	211	45.2	LOS E	0.2	0.2	0.93	0.93	208.2	212.0	1.02

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.