Jordan Springs Public School

Green Travel Plan

Prepared by: GTA Consultants (NSW) Pty Ltd for Department of Education
on 11/05/2020
Reference: N180320
Issue #: B Dr 2

GTAconsultants

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A-Dr	15-Apr-2020	Draft - client review	Liam Clark	Volker Buhl	Rebecca Want	
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CONTENTS

Figures

Tables

1. Green Travel Plan

01

1.1. Executive Summary

This Green Travel Plan meets the conditions D12 Green Travel Plan, D13 Operational Transport and Access Management Plan of SSD No. 9354 Mod 1 for 14-28 Cullen Avenue, Jordan Springs.

This Green Travel Plan has been prepared in collaboration with the School Principal Ms Kylie Johnson, the Department of Education Sustainable Transport Technical Advisor Ms Rebecca Lehman and with reference to the Department of Education Transport Assessment Background and Reporting Requirements, Section C: School Transport Plan.

This Green Travel Plan has been informed by analytics of the student catchment data. While the targets for active travel are aspirational, the opportunity of shaping the active travel behaviours with the opening of new school must be maximised. With a mindset of actively encouraging and promoting active travel, Jordan Springs Primary School may well become an exemplar school for active transport.

This plan has been developed with focused and specific actions co-designed with the School Principal in order to increase active travel to school for the Jordan Springs Primary School Students.

Actions that are recommended to ensure the success of an increase in active transport to Jordan Springs Schools include adequately supporting the School Principal with an Travel Coordinator who would be charged with implementing, measuring and monitoring the active travel program and recurrent funding to support the education, coordination, participation and communication of the active transport program. To enable these outcomes a recurrent budget of $42,800 comprising of the resource of a Travel Coordinator at $12,800 per annum and an Active Travel Program budget of $30,000 per annum.

1.2. Action Plan

The Jordan Springs Green Travel Plan (GTP) outlines the transport goals, active travel targets, actions recommended to increase active travel to school and a process to monitor and measure the success of the Green Travel Plan.

1.2.1. Transport Objectives

Achievable and aspirational transport objectives and mode share targets have been co-designed together with the School Principal in April 2020. These objectives and mode share targets have been designed with guiding principles:

1. Co-design with the School Principals achievable and aspirational sustainable travel targets for the future of Jordan Springs School.
2. Support the implementation of the sustainable travel program with resources to enable the aspirational sustainable travel targets to be achieved in the future (2025) through increased uptake of public transport and increased active travel modes like walking and cycling to Jordan Springs Public School.

1.2.2. Mode Share

Average Student Mode Share

Data from GTA Consultants' *Trip Generation Surveys, Schools Analysis Report (2014)* was used to show the average modal split of trips to and from Primary Schools in Metropolitan Sydney. It was found that travel to and from Primary Schools were primarily comprised of either car or active transport (mainly walking), with a small percentage of public transportation. A wide variation of mode share percentages was noted in the surveyed schools, indicative of the dependence of mode share on school characteristics.

The average statistics for Primary Schools within the Sydney Metropolitan area are reproduced in Table 1.1 below:

Table 1.1: Average Sydney Primary School Mode Share

Walk	Bus	Car
53%	2%	45%

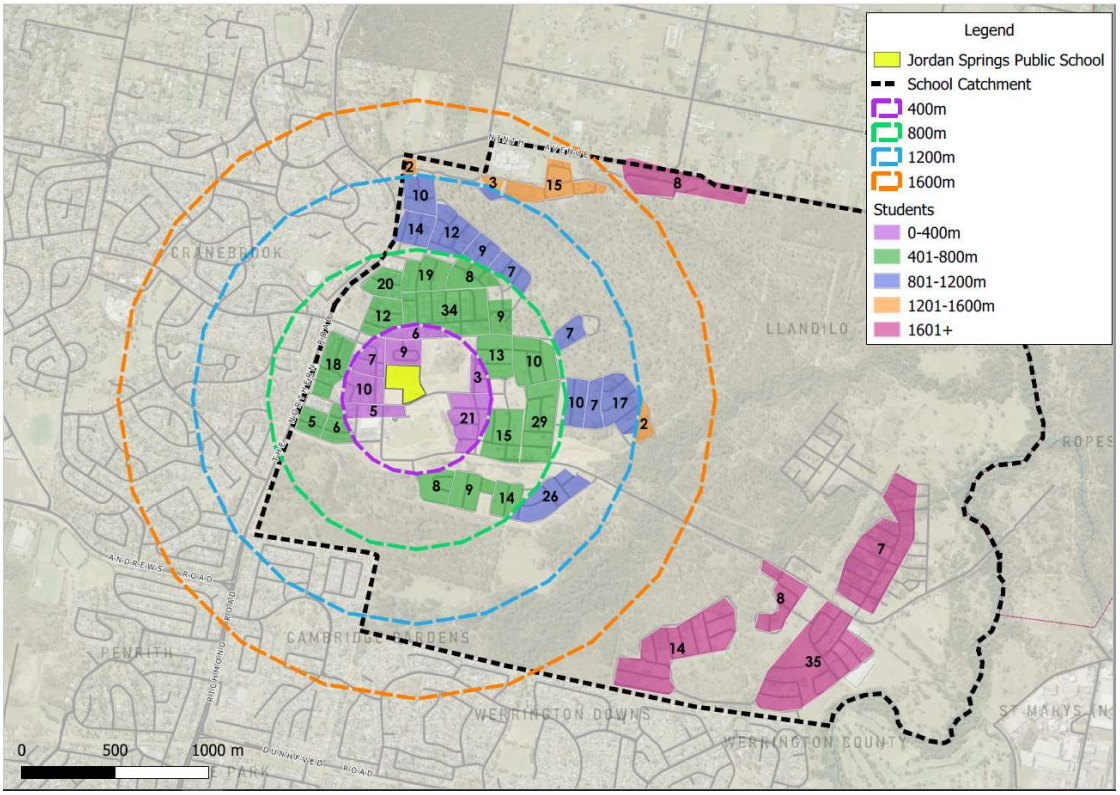
Xavier College, a high school was one of these surveyed schools. It is located close by, to the north of Jordan Springs. However, as it is a high school it features different school characteristics to the proposed Jordan Springs Public School. It is noted that the mode share at Xavier College was approximately 45% car, 43% bus and 12% walking. As a high school, the percentage of students taking the bus will be higher, however the percentage of students travelling by car were consistent with the stated primary school statistics.

The travel behaviours for the Jordan Springs Public School is therefore expected to be reflective of the Average Sydney Primary Mode Share statistics for primary schools in the Sydney Metropolitan area.

Analysis of de-personalised data provided by the Department of Education in April 2020 for enrolments anticipated at Jordan Springs Public School for its commencement in Term 3 2020 tells the story that:

- 13% of students live within 400m radius from the school
- 57% of students live within 800m radius from the school
- 81% of students live within 1200m radius from the school.

Figure 1.1: Students Living in Jordan Springs PS Catchment



The 400/800/1200/1600m notional walking catchment and 5/10/15-minute on-path walking catchments, along with student residence locations, are depicted in Figure 1.2

Figure 1.2: Walking Catchments

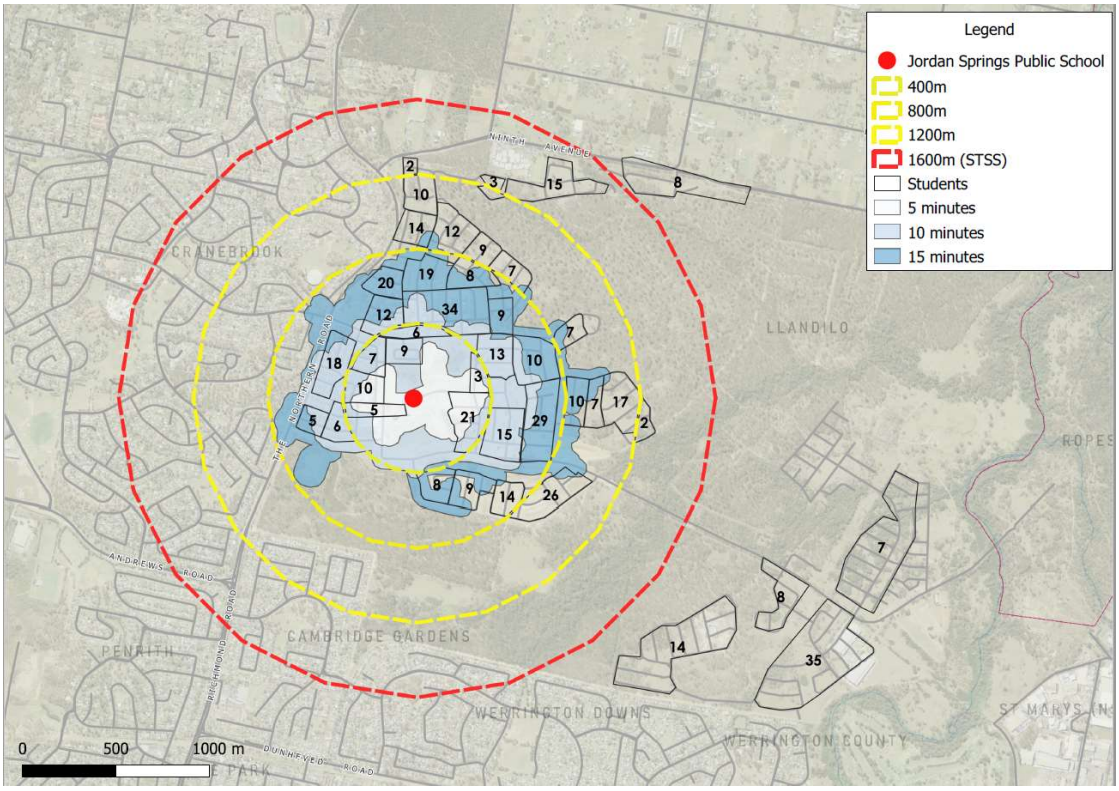
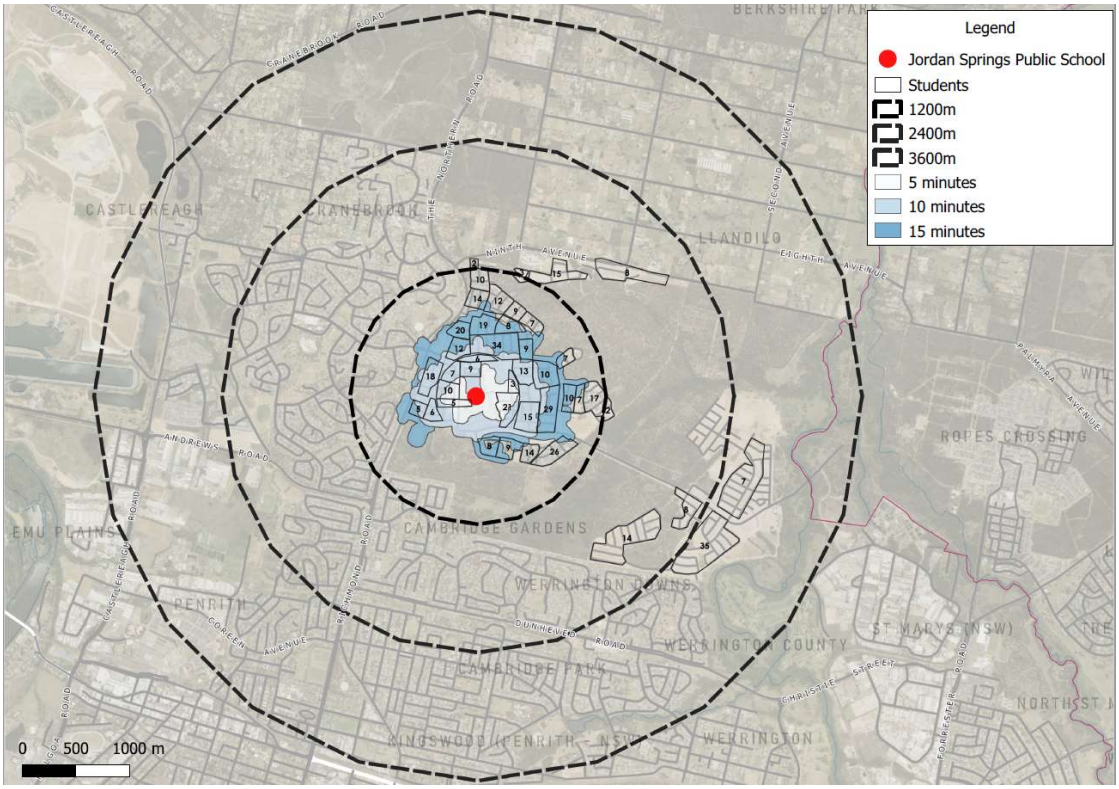


Figure 1.3 shows the 1200/2400/3600m notional cycling catchment and 5/10/15-minute on-path cycling catchments.

Figure 1.3: Cycling Catchments



With regard to the de-personalised student data, the walking and cycling catchments and the Sydney-wide school mode share patterns, the expected mode choice of students based upon their age and distance from school is shown in Table 1.2.

Table 1.2: Expected Use of Mode by Distance from School

Catchment	Walk	Cycle	Bus	Car
Kindergarten to Year 4				
1-400m	High	Low	Low	Moderate
401m-800m	High	Low	Low	Moderate
801m-1200m	Moderate	Low	Low	High
1201m-1600m	Low	Low	Low	High
1601m+	Low	Low	Low	High
Year 5 and Year 6				
1-400m	High	Moderate	Low	Moderate
401m-800m	High	Moderate	Low	Moderate
801m-1200m	High	Moderate	Low	Moderate
1201m-1600m	Low	High	Low	High
1601m+	Low	High	Moderate	High

By understanding what kind of transport choices students and their parents are likely to make based on the student's age and distance from the school, an initial mode share target has been developed. These targets – in Table 1.3 – are generally in accordance with the average mode split of primary schools in the Sydney Metropolitan Area.

Table 1.3: Jordan Springs Mode Share Targets in 2021

Walk	Cycle	Bus	Car
40%	5%	2%	53%
244 students	31 students	12 students	324 students

However, it is also valuable to understand the mode share that could be achieved in the long-term with the implementation of a coordinated and resourced active travel program, like the program described in Section 1.2.4, the expected transport choices could significantly shift, as depicted in Table 1.4.

Table 1.4: Future Use of Mode by Distance from School

Catchment	Walk	Cycle	Bus	Car
Kindergarten to Year 4				
1-400m	High	Low	Low	Low
401m-800m	High	Low	Low	Low
801m-1200m	High	Low	Low	Moderate
1201m-1600m	Low	Low	Low	High
1601m+	Low	Low	Low	High
Year 5 and Year 6				
1-400m	High	Moderate	Low	Low
401m-800m	High	Moderate	Low	Low
801m-1200m	High	Moderate	Low	Low
1201m-1600m	Low	High	Low	High
1601m+	Low	High	Low	High

Using this future mode choice likelihood matrix, it is foreseeable that as many as 65% of students and 10% of students walk and cycle, respectively, to school. These aspirational mode share targets are summarised in Table 1.5.

Table 1.5: 2025 Aspirational Mode Share Targets (assuming student population 1,000 students)

Walk	Cycle	Bus	Car
65%	10%	2%	25%
650 students	100 students	20 students	250 students

With the implementation of the active travel program and communication plan, it is possible that students have been set up with the skills and habits to actively travel to school.

It is important to note that the aspirational bus mode share could be increased with the introduction of bus service, potentially a small bus format, for the students in the south-western section of the school catchment area. At the time of preparing this report, Transport for NSW Sydney Coordination Office is committed to working with Department of Education to look at provision of bus services to increase mode share by public transport to Jordan Springs Public School.

It is also noted that the Subsidised School Transport Scheme does not fund students who live within 2.2km of the school and it is only a minority of Jordan Springs Public School students would be eligible for free public transport to school. However, public bus travel is a sustainable form of travel and students are able to apply for the school bus term pass which is discounted to incentivise student travel.

1.2.3. Travel Coordinator

Enabling Active Travel through Resourcing

A fundamental enabler of a successful program to uplift increased use of public transport and uptake of active travel to school is adequate resourcing. While the implementation of programs such as Independent Travel Training and Walk to School Day have been the responsibility of the School Principal, it is recommended that the School Principal is supported with a resource to assist implement, measure and monitor the active travel programs.

The role of the Travel Coordinator would include implementing the Sustainable Travel Program as outlined in this Green Travel Plan, measuring the participation of the program and collecting data on the way staff and students travel to/from school and then recommending improvements to the program to assist Jordan Springs Public School meet its aspirational mode share targets.

1.2.4. Programs

The following Sustainable Travel Action Plan has been co-designed with the Jordan Springs Public School Principal. It includes a range of initiatives and actions, some to be completed and implemented prior to the opening of the school, that will help to achieve the mode share targets and reduce the overall car travel associated with the school.

The actions need to be reviewed on a regular basis, at least annually, to review the actions and refine as the school community needs may change over time.

Table 1.6: Sustainable Travel Action Plan

Strategy	Action	Target Audience	Timeframe	Responsibility
Educate children to give them the skills to travel actively, independently				
Educate Stage 1 students	Apply the curricula for Year K-2 students to educate Road Awareness using play-based learning	Students	Annual curriculum	School Principal
Educate Stage 2 students	Apply the curricula for Year 3 students to learn Road Safety with a focus on walking independently to school. Action to include: Liaising with Penrith Council's Road Safety Officer Wendy Read	Students	Annual curriculum	School Principal
Educate Stage 2 students	Apply the curricula for Year 4 students to learn Road Safety with a focus on cycling independently to school. This may include an experience like St Marys CARE bicycle riding experience	Students	Annual curriculum	School Principal
Educate Stage 3 students	Apply the curricula for Year 5-6 students to learn to travel independently on the public bus system in preparation for travelling to high school and other destinations	Students	Annual curriculum	School Principal
Bike readiness program for Year 4 students with St Marys Community and Road Education Scheme	Year 4 students attend an excursion to CARES a purpose-built bicycle safety education facility in St Marys Further information https://www.penrithcity.nsw.gov.au/services/health-safety/road-safety/st-marys-community-and-road-education-scheme	Students	Annually	Travel Coordinator
Enabling active travel through resourcing				
Travel Coordinator	Get a price from a service provider to promote, coordinate and monitor the implementation of the green travel initiatives. Estimate budget for Travel Coordinator assuming 10 weeks per term, 4 terms and 4 hours per week at a rate of $80 per hour. Budget $12,800.	N/A	By 15 May 2020	Department of Education led by Project Director
Recurrent funding submission	Project team to submit a budget for recurrent funding to enable mode shift from car to active which would fund Travel Coordinator and associated program costs (communications, participation costs). Budget $30,000 per year recurrent funding	N/A	By 22 May 2020	Department of Education led by Project Director

Strategy	Action	Target Audience	Timeframe	Responsibility
Programs to be coordinated by a Travel Coordinator				
Ride-to-School day	School participates in Ride-To-School day. This provides an opportunity for students, parents and teachers to try riding, walking, skating or scooting to school as well as celebrating the regular walkers and riders. Further information: www.bicyclenetwork.com.au	Staff, parents and students	March 2021 and then annually	Travel Coordinator
Walking buddy program	Pair older students (year 5&6) with younger students who live close together to walk to school as a pair or small group.	Parents and students	For school year 2021	Travel Coordinator
Walking School Bus (WSB) scheme	Research a sustainable alternative to walking school buses as this is volunteer dependent and may not have ongoing support. The concept is an organised group who walk to schools guided by two adults.	Parents and students	July 2020	Travel Coordinator
Walk safely to school day	Promote and take part in 'Walk Safely to School Day'. Further information: www.walk.com.au	Staff and students	May 2021 and then annually	Travel Coordinator
Infrastructure and environmental elements to encourage active travel to school				
Pedestrian and cycling infrastructure leading to school	Advocate Provision of safe footpaths and safe crossing facilities Separated cycleways where possible, safe crossing facilities, kerb ramps	Staff and students	30 May 2021	Project team to put a submission to Council for specific, targeted infrastructure upgrades required.
Better pedestrian amenities	Plant trees around the school	Staff and students	30 May 2021	Travel Coordinator to put a submission to DPIE as part of the 5,000,000 trees initiative.
Have asked ESD consultant Kazi to confirm – End of trip facilities	Provide bicycle parking, shower, locker room	Staff	Prior to opening	Department of Education
Well-being and student needs				
Promote use of public transport with OPAL card as a reward	Implement an award when a child has attended school in accordance with the plan set by the School Principal by active mode. For example, if a student walks or rides for 5 consecutive days that the student is rewarded.	Staff, students and parents	2021 School Year	Recommendation by Travel Coordinator to School Principal
Reduce car travel				
Staff Car pooling	Establish a car-pooling scheme that enables staff to share their car trip to the school with more than 1 person in the car, reducing cars travelling to the school.	All staff	2021 School Year then ongoing	Travel Coordinator
Parents Car Pooling initiative	Discuss the idea of a car-pooling scheme for parents to share the transport of students to / from school and encouraging more than 1 student in the car for each drop-off and pick up	All parents	2021 School Year then ongoing	Travel Coordinator

Strategy	Action	Target Audience	Timeframe	Responsibility
Car Parking Management Strategy	Consider the applicability of a parking management strategy which would discourage the use of single occupant car travel to the site and incentivise employees to travel to the site by public or active transport. This could involve, for example, the charging of a fee for use of on-site parking, which could be hypothecated to fund incentives for those that travel by more sustainable modes / other travel plan initiatives	Staff	2021 School Year then ongoing	Travel Coordinator co-designed with the School Principal and Staff
Parking restrictions	Introduction and enforcement of parking restrictions around the school and promotion of this in collaboration with the Road Safety Officer Penrith	Staff and students	Term 4 2021	Travel Coordinator in consult with Penrith Council
Seek assistance from Transport for NSW for bus in the southwest catchment of the School				
Bus service for students living beyond 1200m	Request Transport for NSW, Sydney Coordination Office to look at feasibility and viability of bus service for students >1200m radius from school. Request made to TfNSW SCO by GTA Consultants on 10 April 2020	Students	By 30 June 2020	David Surplice, Sydney Coordination Office TfNSW
Bus service for students living beyond 1200m catchment	Request Transport for NSW, Sydney Coordination Office to explore alternate transport options including a small format bus. Request made to TfNSW SCO by GTA Consultants on 10 April 2020.	Students	By 30 June 2020	David Surplice, Sydney Coordination Office TfNSW
Additional actions				
Inspire the school community towards active transport to school as a vision for the school and its community	Communicate to Staff and Students the key messages including targets and actions outlined in the Green Travel Plan. Positively inspire positive action. Travel Coordinator to prepare messaging for School Principal	Staff, students and parents	Per communication plan	School Principal
Transport Access Guide (TAG)	Publish the transport access guide to Jordan Springs Public School on the school website so that it is easy to understand the options to travel to school using active modes or public transport. Further information: refer to	Staff, students and parents	Per communication plan	Travel Coordinator using the TAG prepared by Project team (GTA Consultants)

1.2.5. Communication Plan

This communication plan has been co-designed with the School Principal. This provides a guide for some of the messages that the School Principal may communicate to promote uptake of walking, cycling and bus to school.

Table 1.7: Jordan Springs Communication Plan

What	When	Which Channel	To Whom	By Whom
Jordan Springs aspiration to have school children travel to school by walking, bike, scooter or bus Share the vision and targets for the number of children targeted to walk and ride to school	Before school opens – in promotional and marketing material Periodically	Welcome pack to new families when enrolling Facebook page Local newspaper at school opening	Staff, parents and students	School Principal Travel Coordinator to draft content
Share the walk, ride, buses transport options to get to Jordan Springs Public School Springs Noting that Public School Websites have standardised transport information on websites, apply this same approach.	Omni-present information easy to obtain online for new and existing students	Induction / welcome pack to staff and students Facebook School website	Staff, parents and students	School Principal Travel Coordinator to draft content based on TAG provided with this report.
Promote that students would be able to access discounted travel by obtaining a School Term Bus Pass to encourage use of public transport as a sustainable travel option	At least annually at the end of the school year with regular periodic updates	E-newsletter	Parents	School Principal Travel Coordinator to draft content
Promote and encourage participation in National Ride2School Day	Annually in March. Register in Term 4 annually	E-newsletter School calendar of events	Staff, parents and students	School Principal Travel Coordinator to draft content
Promote Walk Safely to School Day. Materials available at walk.com.au	Annually in May	E-newsletter School calendar of events	Staff, students and parents	School Principal Travel Coordinator to draft content
Promote the school's participation in the St Marys CARES riding readiness program	Annually	E-Newsletter Recognise 'graduates' at school assembly Post images of the excursion ion Facebook	Students and parents	School Principal Travel Coordinator to draft content
Communicating expected standards of behaviour for Kiss n Drop	Very firm message at upon school opening and commencement of each school year. Regularly, multiple times each term.	Welcome packs to new families E-newsletter	Students and parents	School Principal Travel Coordinator to draft content based on information provided by Road Safety Officer Penrith Council
Link to NSW Department of Education Road Safety Website, which is typically included in all Public School Websites.	Omni-present from website launch	School website	Students and parents	School Principal/School website designer
Educational road safety You Tube video links including: Safety - https://youtu.be/OcNgdmniL8E	Omi-present with some updating and show-casing of content periodically	School website Facebook page	Students and parents	School Principal Travel Coordinator to draft content.

What	When	Which Channel	To Whom	By Whom
School Zone - https://www.youtube.com/watch?v=l7Le_k0R0PY&feature=youtu.be School Crossings - https://youtu.be/ih0rXAqxSZg				THis sample content has been provided by Penrith Council Road Safety Officer
Penrith City Council Road Safety Officer suggested materials to leverage and communicate key messages including: Penrith City Council 'School Zone Offences' Penrith City Council 'Parking Information' Penrith City Council 'Travel to School Safety Tips' Penrith City Council 'No Parking' flyer – this is the common issue of motorists not understanding how to use a 'No Parking' for drop off	Very firm message at upon school opening and commencement of each school year. Regularly, multiple times each term	Induction / welcome pack to staff and students Facebook School website	Staff, students and parents	Note Wendy Read, Penrith City Council Road Safety Officer is able to provide pdf flyers and the like on these topics

1.3. Evaluation Plan

1.3.1. Data Collection Methodology

The Green Travel Plan will be evaluated periodically and as a minimum biennially to increase the success of increasing active travel modes to school. It is recommended that data is collected biennially in Terms 3 to enable refinements to be made to the program in time to influence behaviour changes. The School Principal will delegate the evaluation of the Green Travel Plan to the Travel Coordinator. The data that can be collected to review whether the active travel participation targets are realistic and being achieved are available from:

1. Department of Education Enrolment de-personalised data together with a GIS analysis of the student catchment to assess whether travel modes are aligned with those set out in this document.
2. A Journey to School survey at regular intervals to understand whether students are arriving and departing from school by walking, riding, scooting, bus or private vehicle (including how many children travel to school in that car for drop-off or pick up). Other information that might be gathered includes access points used into the school and times of travel.
3. A record of the number of students participating in the active travel program events such as Walk to School.
4. Targeted interviews with parents, teachers and students participating in the active travel plan actions to understand which elements of the active travel program are assisting them in their daily lives and what might be done to make the program more relevant/helpful to them.

1.3.2. Data Evaluation Methodology

The data should evaluate whether the active travel modes are being met or are on track to being met.

Recommendations on how the Green Travel Plan, with a focus on the Action Plan and Communications Plan might be improved to assist with reaching the targets and aspirational targets should be recommended as a result of the data analysis.

If the targets are on track to be met, consideration might be given to increasing the active mode share target.

The Action Plan and Communications Plan might be re-shaped also based on parent interviews and feedback.

1.3.3. Ongoing Feedback Framework

The School Principal will delegate the ongoing feedback framework to the Travel Coordinator to continuously improve the leadership of active travel outcomes for Jordan Springs Public School. This may include activities such as:

- Reviewing the adequacy of bicycle racks required periodically – are more required?
- Observing road safety activity beyond the school grounds for improvements required.
- Observing how pathways are being used, or whether pathway design is inadequate or in the wrong location (for example if 'goat tracks' are worn through particular areas, should a request to Council be put in to improve the pathway in future works programs.
- Observing the operation of buses and the pick up / drop off facilities for safety and making note to understand whether the bus pick up / drop off facility should have an indented bus bay, if this is not provided at the time that the school is opened. Make recommendations up to School Principal accordingly.
- Liaising with the Penrith Council Road Safety Officer in the management of parking behaviours around the school.
- Any other feedback from Transport for NSW, Police, Residents, Teachers, Parents or Students that might arise from time to time.

1.4. Governance Framework

1.4.1. Stakeholders

The table of contacts below identify the stakeholders who will deliver actions to support the Jordan Springs Green Travel Plan.

Table 1.8: Jordan Springs Sustainable Travel Plan Contacts

Contacts	Role	Phone	Email
Kylie Becker	Principal, Jordan Springs Public School	0410 615 102	Kylie.l.johnson@det.nsw.edu.au
Wendy Read	Road Safety Officer, Penrith Council	47 328242	Wendy.read@penrith.city
David Surplice	Senior Project Manager, Travel Demand, Sydney Coordination Office, Transport for NSW	0481 913 187	David.surplice@transport.nsw.gov.au
Jim Lewis	Project Director, Department of Education		Jim.lewis3@det.nsw.edu.au
Martin Fenn	Project Manager, TSA Management. Delivering the Jordan Springs School project	0436 480 857	Martin.fenn@tsamgt.com
Rebecca Lehman	Sustainable Transport Technical Advisor, Department of Education	0432 427 766	Rebecca.lehman@det.nsw.edu.au
Jackie Hicks	Road Safety Education Officer, Department of Education	9208 7615	Jacqueline.hicks@det.nsw.edu.au

2. TRANSPORT ASSESSMENT

02

2.1. Context

2.1.1. The School

Background

Jordan Springs is a rapidly developing suburb located in the outer west of Sydney, approximately 53 kilometres from the Sydney CBD. It is located within the Penrith Local Government Area (LGA), for which the majority of the land use zoning is dedicated to low-density residential properties.

Located at 14-28 Cullen Avenue is the Jordan Springs Public School – a new primary school currently in construction and open to students in Term 3, 2020. The school comprises a hall, library and a pair of two-storey buildings totalling 42 Home Bases. The school is expected to have a capacity of 1,000 students and 70 staff members. The general operating hours of the school are Monday – Friday, 8:00am to 5:00pm based on the Traffic Impact Assessment (TIA). It contains Out of Hours School Care. The concept site plan, situated in the broader context of the adjacent childcare centre and local neighbourhood, is depicted in Figure 2.1.

Figure 2.1: Site and Surrounding Environment

Base source: Traffic Impact assessment, Bitzios Consulting

Using depersonalised student residential data provided by Department of Education NSW, in April 2020 the Jordan Springs Public School catchment and student locations are shown in Figure 1.2 and analysed in Table 1.2. From the data set provided, GTA Consultants has extracted the Grade and location of the students assuming that this is the best data available for the 2020 enrolment year.

Figure 2.2: Students Living in Jordan Springs PS Catchment

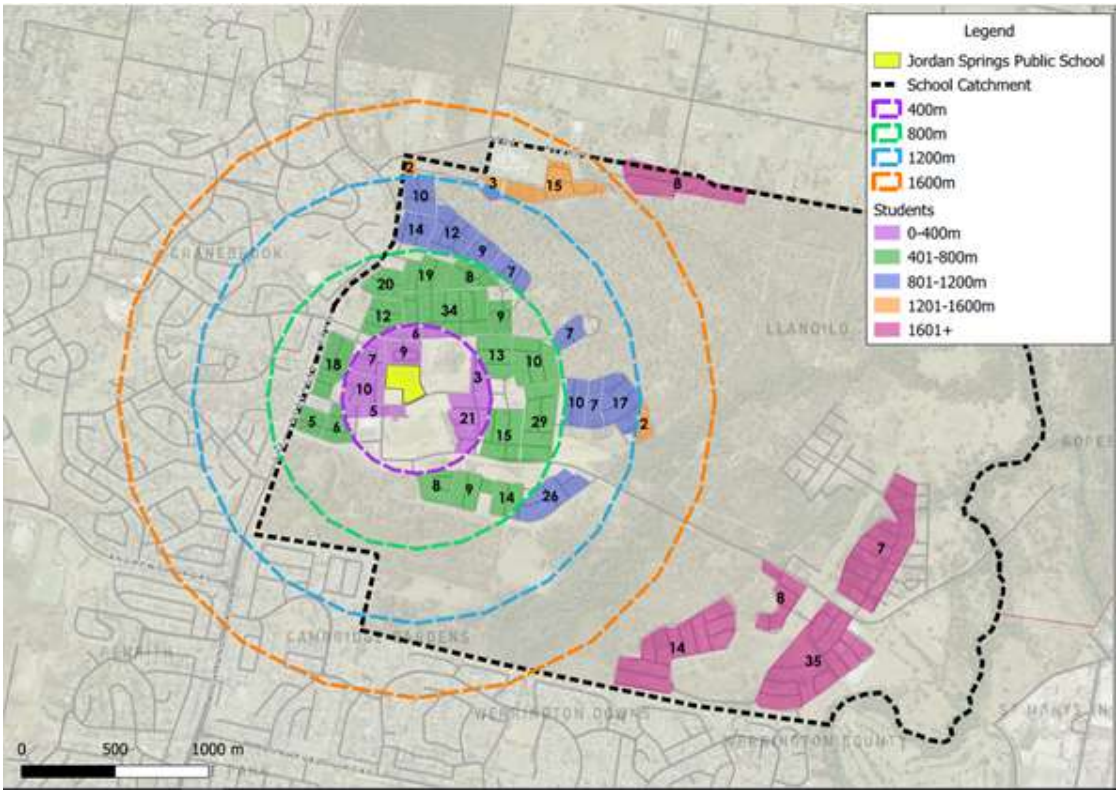


Table 2.1: Summary of Students Living in Jordan Springs PS Catchment

	Boundaries	No. of Students	% Students	Cumulative %
	Within 400m	78	13%	13%
	Within 401m-800m	271	44%	57%
	Within 801m-1200m	148	24%	81%
	Within 1201m-1600m	29	5%	86%
	Outside 1600m	85	14%	100%
	Total	**611**	**100%**	

2.2. Existing Transport Network and Operations

2.2.1. Transport Network

Pedestrian Network

The pedestrian network in the Jordan Springs catchment is well formed. Wide footpaths are provided on both sides of most roads and provide dedicated off-road links across Jordan Springs, including Lakeside Parade, Greenwood Parkway, Alinta Promenade, Cullen Street, Water Gum Drive and Jordan Springs Boulevard. The nearby signalised intersections have pedestrian crossings on all sides, including:

- Lakeside Parade/ Water Gum Drive/ Cullen Avenue
- Lakeside Parade/ Jordan Springs Boulevard
- The Northern Road/ Jordan Springs Boulevard
- The Northern Road/ Greenwood Parkway/ Borrowdale Way.

Bicycle Network

The existing cycling facilities are well formed with shared pathways built into the precinct. The existing cycling facilities available surrounding the Jordan Springs Public School, including[1]:

- a short on-road bicycle lane on the southbound carriageway of The Northern Road at the intersection with Jordan Springs Boulevard, extending 100 metres north of the intersection and 50 metres south
- an off-road shared path adjacent to the northbound carriageway of The Northern Road
- an off-road shared path connecting Greenwood Parkway and Cullen Avenue between Lakeside Parade and Alinta Promenade
- an off-road shared path along the northern footpath of Jordan Springs Boulevard
- an off-road shared path along the western footpath of Alinta Promenade between Greenwood Parkway and Cullen Avenue, continuing approximately 180 metres west along the northern footpath of Cullen Avenue
- an off-road shared path along the western and southern footpaths of Lakeside Parade south of the intersection with Jordan Springs Boulevard.

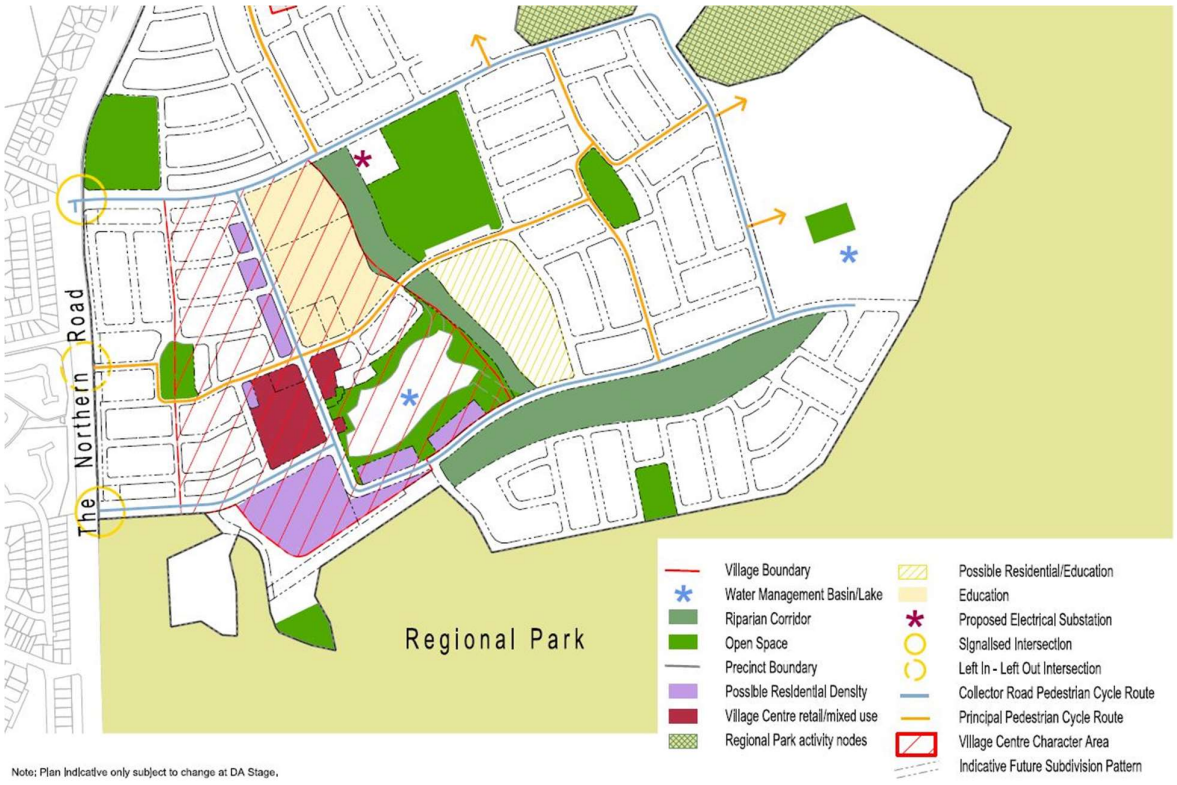
The concept plan also proposes additional walking and cycling paths in Jordan Springs as follows:

- collector road pedestrian cycle route along Greenwood Parkway, connecting to some local streets
- principal pedestrian cycle route along Watkin Street, Water Gum Drive and Cullen Avenue
- principal pedestrian cycle routes along Illoura Way and Tengala Drive.

The concept plan showing all proposed road upgrades and local developments (some of which are now existing) within Jordan Springs precinct is illustrated in Figure 2.3.

[1] Green Travel Plan, Bitzios Consulting, 2019

Figure 2.3: Proposed Cycle Routes



Public Transport Network and School Bus Operations

Route and school bus services in the region are operated by Busways Western Sydney. Bus Route 783 – Penrith to Jordan Springs is the primary bus service currently operating near the site and surrounding areas. Two additional bus routes operate along The Northern Road, approximately 600 metres west of Lakeside Parade, including:

- Route 677 – Richmond to Penrith
- Route 786 – Penrith to Cranebrook.

However, these routes do not directly service the Jordan Springs schools precinct aside from The Northern Road.

Additionally, six school bus services run northbound in the morning, four school bus services run southbound in the morning, and six school bus services run southbound in the afternoon to service The Northern Road. The schools serviced include Xavier College, Cranebrook High School and Samuel Terry Public School. There is also one morning school bus service (5081) that stops at the existing bus stop on Cullen Avenue, located approximately 125 metres east of Charlotte Street, travelling towards Henry Fulton Public School in Cranebrook (north).

A map of bus stops and their associated bus routes is shown in Figure 2.4.

Figure 2.4: Local Bus Network

Source: Traffic Impact assessment, Bitzios Consulting

Bus route destinations and frequency of services are summarised in Table 2.2.

Table 2.2: Bus Services Around the Site

Route Number	Direction of Service	Bus Stop Nearest to School	Walk from Bus Stop to School	No. of Services Arriving in Morning Peak (7:45am-8:45am)	No. of Services Departing in Afternoon Peak (3:15pm-4:15pm)
677	Both directions	The Northern Road opp Jordan Springs Blvd	11 minutes	2	1
783	Both directions	Lakeside Pde after Landsborough St	1 minute	4	3
786	Penrith to Cranebrook via North Penrith (Loop Service)	Borrowdale Way at Seaton Cres	7 minutes	3	2
5081	Jordan Springs to Henry Fulton Public School	Cullen Ave before Alinta Prm	1 minute	1	0

Road Network

Access to Jordan Springs is via The Northern Road, a major arterial road connecting the suburb to the larger western Sydney region. Within the suburb itself, there is a network of local streets adjoining the local collector roads, such as Jordan Springs Boulevard, Lakeside Parade and Greenwood Parkway.

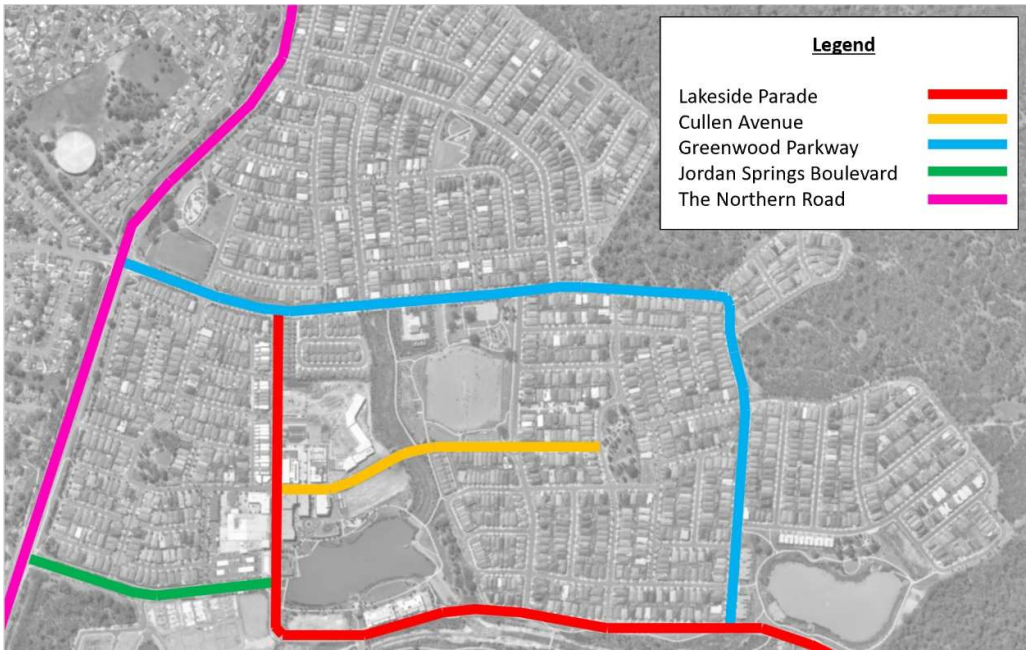
For trips originating within the precinct, the maximum distance to be travelled to reach the proposed Jordan Springs Public School is around two kilometres, with a large portion of residences located within one kilometre of the site.

Unrestricted on-street parking is available on the local roads near the proposed school. Within the Jordan Springs Town Centre, there is time-restricted 1-hour parking on Lakeside Parade between Water Gum Drive/ Cullen Avenue and Jordan Springs Boulevard. The surrounding road network is illustrated in Figure 2.5. Table 2.3 provides further details such as the current speed limit and on street parking restrictions.

Table 2.3: Surrounding Road Network

Road name	Type	Details
Lakeside Parade	Local road	Running north to south between Greenwood Parkway and Jordan Springs Boulevard, and running east to west along the southern fringe of Jordan Springs. It has one lane in each direction, with short right turn bays at its intersections with side roads. On-street parking includes 1-hour parking restriction, mail zone, unrestricted kerbside parking, and bus stops near Jordan Springs Town Centre. Lakeside Parade has a speed limit of 50km/h.
Cullen Avenue	Local road	It is connecting the eastern and western areas of Jordan Springs Between Illoura Way and Lakeside Parade/Water Gum Drive. It has one lane in each direction with unrestricted kerbside parking, a bus stop and a speed limit of 50km/h. Cullen Avenue includes a roundabout at Alinta Promenade.
Greenwood Parkway	Collector road	Runs east to west, connecting Jordan Springs and Cranebrook, and forms a boundary along the southern half of Jordan Springs towards Lakeside Parade in the south. It has one lane with unrestricted kerbside parking, bus stops and a speed limit of 50km/h.
Jordan Springs Boulevard	Collector road	Running east to west between The Northern Road and Lakeside Parade. It generally has two lanes in both directions, which are separated by a central median, as well as bus stops and a speed limit of 50km/h. Jordan Springs Boulevard includes signalised intersections at The Northern Road, providing links to and from the wider road network, and Lakeside Parade.
The Northern Road	Arterial road	Runs north to south, connecting Berkshire Park (near Windsor) and Narellan via Luddenham and Bringelly. The road along the western fringe of Jordan Springs has two lanes in both directions, short southbound bicycle lanes, bus stops and a speed limit of 70km/h. The Northern Road is used as a major thoroughfare for commuters in Jordan Springs and is currently the only carriageway that provides access to and from the wider road network, including the Great Western Highway and M4 Motorway, as well as key suburbs such as Richmond, Penrith and Campbelltown.

Figure 2.5: Surrounding Road Network Map



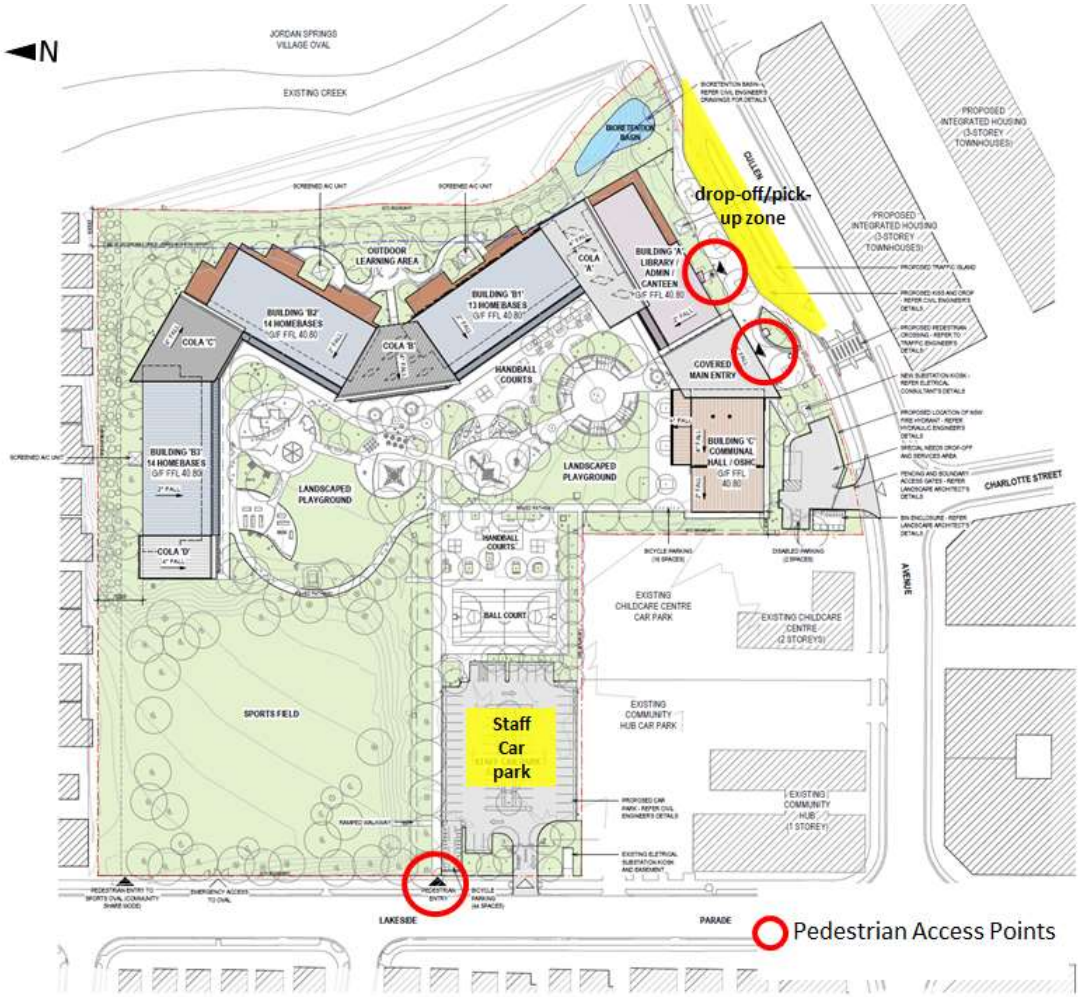
2.3. School Site Access and Parking

2.3.1. Site Access

Pedestrian Access

Three separate pedestrian access points to the school are proposed which are shown in Figure 2.6, including one immediately north of the staff carpark on Lakeside Parade and on both sides of the drop-off/ pick-up zone on Cullen Avenue. The main entrance to the school is located on the west side of the proposed drop-off/ pick-up zone, with an open area facing onto Cullen Avenue.

Figure 2.6: Pedestrian Access to Site



Source: Traffic Impact Assessment, Bitzios Consulting

According to the density and distribution of existing residential developments, it is understood that most pedestrians will access the site from either the north or east side of the school, including Cullen Avenue and Lakeside Parade. The paths provide convenient pedestrian infrastructure. However, no safe pedestrian crossing is provided at the Greenwood Parkway and Lakeside Parade intersection.

The only facilitated crossing is a pedestrian refuge across Greenwood Parkway on the eastern side of Lakeside Parade which is considered as insufficient. Therefore, a safe pedestrian crossing is recommended to be established at this intersection to improve the safety of the students' travels.

The safest access to the school from the west and south west is via the existing Cullen Avenue and Lakeside Parade signalised intersection. However, those blocks located directly to the west of the school along Lakeside Parade/ Pitt Street are close to the western access to the school. Students are likely to cross Lakeside Parade in front of the access instead of using the Cullen Avenue/ Lakeside Parade signalised intersection. To decrease the risk of conflict between pedestrians and vehicles, it is recommended that a wombat pedestrian crossing is installed near the school entry/exit point in Lakeside Parade to provide. This will serve the function of improving pedestrian safety as well as a calming speed treatment for the proposed school zone along Lakeside Parade.

Figure 2.7: Pedestrian analysis based on walking trips and catchments

Base Base map: Google Maps

During non-school peak times, both traffic volumes and pedestrian activity on Cullen Avenue are not expected to be substantial. For the peaks before and after school, a children's crossing is proposed to be implemented on Cullen Avenue to improve pedestrian safety and amenity accounting for the presence of the nearby drop-off/ pick-up zone. It is also recommended that a fence is installed along Cullen Avenue school access to avoid students spilling onto the road and to control access to the drop-off/ pick-up zone. Figure 2.7 provide details illustration of safe pedestrian access links for students and staff to the school.

Cycling Access

As students are allowed to cycle on all footpaths, they can access the school from all sides using the footpath and shared path network explained in Section 2.2.1. The proposed school will provide a total of 60 bicycle racks distributed between the two pedestrian access points. Figure 2.8 shows the safe bicycle access to the School.

For cycling in particular, students should be kept informed of the rules and guidelines, such as not riding across the road and dismounting when using crossings.

Figure 2.8: Pedestrian and Cycling Access to Site

Base map: Traffic Impact assessment, Bitzios Consulting

Bus Access

For pedestrians and staff travelling to the school the closest bus stops to the school are on the west side of Lakeside Parade. There are signalised pedestrian crossings on all approaches of the Lakeside Parade/ Cullen Avenue intersection, enabling safe pedestrian crossing and access.

Jordan Springs Public Primary School has good walking accessibility to the most surrounding neighbourhoods. Providing school bus services for the school may not be necessary, however as of 11 April 2020 Transport for NSW Sydney Coordination Office are assessing the feasibility of increasing bus services to the school. It is noted that a bus zone/ layby is proposed at Lakeside Parade about 30 metres from the school pedestrian access.

Excursion buses will use of either the bus school layby or the drop-off/ pick-up zone as they can be arranged to arrive/ leave outside the school start and finish times. Staff will supervise the arrival and departure of buses.

Figure 2.9: Bus Access for Staff and Students to School

Base map: Traffic Impact assessment, Bitzios Consulting

If Transport for NSW, Sydney Coordination Office finds that increased bus services are viable and feasible, the proposed bus zone can be utilised. Considerations for increased uptake of public transport for both students and staff are outlined in the Green Travel Plan.

Vehicle Access

The school proposes a dedicated staff car park and a separate dedicated drop-off/ pick-up zone for parents/ students. Access to the school for students and staff via car are shown in Figure 2.10. At the time of preparing this report, it is understood that Richard Crookes Construction has submitted parking signage to the Council for implementation in July 2020 prior to the schools opening. This design was not sighted. It is anticipated that parking restrictions are signed around the school to promote safe pedestrian access as well as encouraging driver behaviour to minimise traffic disruptions during the pick-up and drop-off times.

Figure 2.10: Access to School by Car

Source: Traffic Impact Assessment, Bitzios Consulting

Kiss and Drop/ Short Stay Pick-Up

An indented drop-off/ pick-up zone is proposed on the northern side of Cullen Avenue. it is approximately 50 metres long and can cater for eight cars at one time.

According to the assessment that has been undertaken in the TIA by Bitzios Consulting, it is understood that:

- the arrivals during the drop-off period occur between 7:45am and 9:30am, peaking between 8:30am and 8:45am
- the departures in the pick-up period occur between 3:30pm and 4:30pm, with the majority departing at 3:30pm.

During the AM peak, the maximum/ peak number of vehicles arrive at the site between 8:30am and 8:45am, estimated to be about 225 vehicles. This equates to an approximate arrival rate of 15 vehicles per minute. If we apply a drop-off time range per vehicle of 30 seconds-60 seconds and given there are eight drop off bays are provided, there is a total service rate of 8 to 16 vehicles per minute. If drop off is efficient at 30 seconds per vehicle then there will be a utilisation ratio of 0.94 (which is under 1.00), therefore the arrival rate can be accommodated by the provided bay. If the drop-off is less efficient and takes 60 seconds, then there is a total of 8 drop offs per minute and has a utilisation ratio of 1.90 (which is above 1.00) therefore the arrival rate cannot be accommodated by the provided bays. It is essential that the school promotes sustainable travel to assist with traffic congestion resulting from private vehicle usage.

Although the drop-off bays capacity may not be fully utilised (assuming a drop-off of 30 seconds), some queuing is still anticipated. The reason is varying turnover times (i.e. if several students arrive in the same car) and possible platooning of arrivals due to the signals at the Cullen Avenue/ Lakeside Parade intersection. This is not expected to happen outside peak as the arrival rates drop steeply both before and after the peak period.

In the afternoon peak, it is expected that the maximum number of vehicles would arrive at or shortly after 3:30pm following the release of students from the school. According to the TIA, it is assumed that pick-ups will begin at 3:30pm and parents will not be able to pick-up the students any time sooner.

Considering 315 vehicles arrive between 3:30pm and 3:45pm, an approximate arrival rate of 21 vehicles per minute would be expected. With the provided eight drop off bays (a total service rate of 16 vehicles/ minute) a utilisation ratio of around 1.31 will be predicted (which is above 1.00). In this scenario, the arrival rate exceeds the available service rate of the provided bay.

Queueing is therefore expected to occur during the first 15-minute period. As the arrival rate quickly drops off to around 8.5 vehicles/ minute at 3:45pm, the high saturation level primarily occurs within the initial period due to the simultaneous release of all children forcing a concentration of arrivals.

It is therefore most important that the Green Travel Plan, which provides a list of actions to uplift active transport modes including walking and cycling to school are implemented, monitored and measured to reduce dependence on private vehicles.

In addition to the Green Travel Plan, the primary measure of mitigating vehicle traffic at school pick up time, the following suggestions are proposed in the TIA to mitigate the impact of the queuing:

- Before and After School activities can shift the incoming trips to a wider time interval, as students travel to school earlier in the mornings and leave later in the afternoons.
    - This reduces the concentration of arrivals to specific saturated time periods.
    - Some examples include band practice, sports, club activities and other social events.
- Due to convenience of travel direction and time constraints, it is possible that some parents will not utilise the drop-off zone when delivering their child to school.
    - On-street kerbside stops can be made on the local streets in vicinity of the school to allow children to disembark.
- Working in collaboration with Penrith Council Road Safety Officers to leverage traffic enforcement, management and marshalling of drop-off bay operations together with staff members to enhance the smoothness of traffic flow at the area by ensuring that parents do not wait too long.
- Staggering release times in the afternoon.
    - By staging the release times of students in the afternoon, a more even distribution of arrivals in the after-school period can be achieved, reducing the intensity of the school release spike. At the time of preparing this report we were unclear whether the School Principal would be able to operate the school with staggered finishing times.

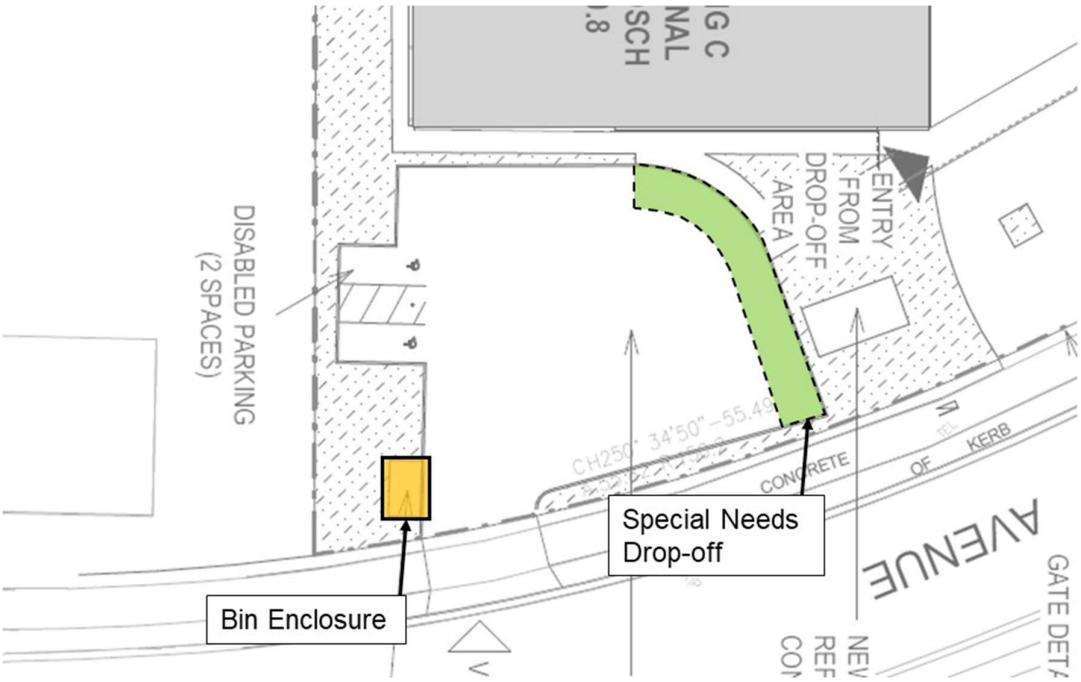
Persons with Disabilities

An off-street area for services and special needs students is proposed on Cullen Avenue opposite Charlotte Street, accessed via a driveway approximately 7 metres wide at the narrowest point.

Two (2) persons with disabilities (PWD) parking spaces are located on the western side of the area, accompanied by a shared area with bollard (per AS2890.6 standards). The eastern side of the space is provided as a kerbside drop-off zone for Special Needs students. It is directly adjacent and connected to the covered main entrance of the school via a footpath, allowing for unimpeded access for any PWD/special needs students.

The area is shown in Figure 2.11, with the bin enclosure and kerbside area for drop-off marked out.

Figure 2.11: Special Needs Drop-Off



For the purpose of maintaining safety of the students with special needs, the area is planned to be gate access controlled, with the gates closed while students embark/ disembark. This prevents any students from accessing the public road (Cullen Avenue).

Given the exclusive nature of the zone combined with the relatively low number of students expected to need to use the zone, the special needs drop-off/ pick-up zone should not be required to adhere to the same time limits as the standard drop-off/ pick-up zone. This will facilitate the potential extra amount of time required for students to embark/disembark vehicles.

A bin enclosure is also provided in this area near the access driveway on the western side, allowing for refuse vehicles to access, collect the waste, turnaround and leave in a forward direction.

Deliveries and Waste Management Functions

A service area is proposed from Cullen Avenue opposite Charlotte Street via an access driveway, approximately seven metres wide at the narrowest point. It will have an automatic sliding gate with access control, a wide turning area on the eastern side, and storage for the bins on the north-eastern side.

Emergency Vehicle Access

Two access gates are proposed for emergency vehicles usage. One is located on Lakeside Parade on the north-west corner of the site, opposite Crimson Street, leading directly onto the school playing fields.

The other gate is located on Cullen Avenue on the south-east corner of the site, leading onto a garden space behind the school buildings. This access route maintains a 10-metre-wide easement for emergency vehicle movements on site.[2]

[2] Source: Traffic Impact assessment, Bitzios Consulting

2.3.2. Parking Operations

Car Parking

The school provides 65 off-street parking spaces, including four PWD spaces, predominantly accessed via Lakeside Parade.

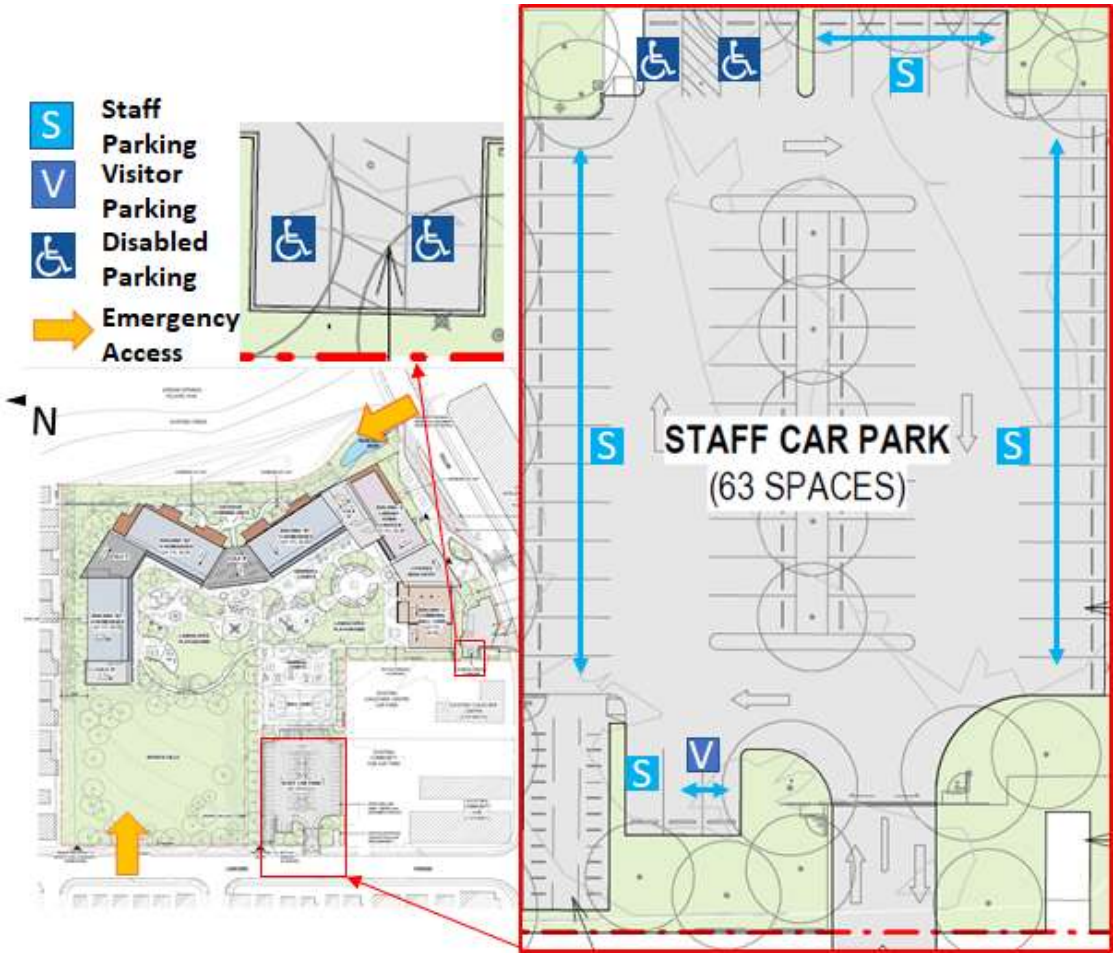
According to assessments of the TIA, 60 parking spaces is capable to respond the parking demand for 70 staff with consideration of 85 per cent of car mode share. That means there is the potential for allocating some parking spaces to the visitors.

In addition, drop-off/ pick-up zone with the capacity of an eight-vehicle parallel parking bay can be utilised as visitor parking bays outside of 8:00am to 9:30am and 2:30pm to 4:00pm pick-up/ drop-off periods.

Figure 2.12 shows the proposed car parking space allocations for the school as follows:

- 63 parking spaces including four disabled parking spaces
- two visitor parking spaces.

Figure 2.12: Off- street Parking Allocation



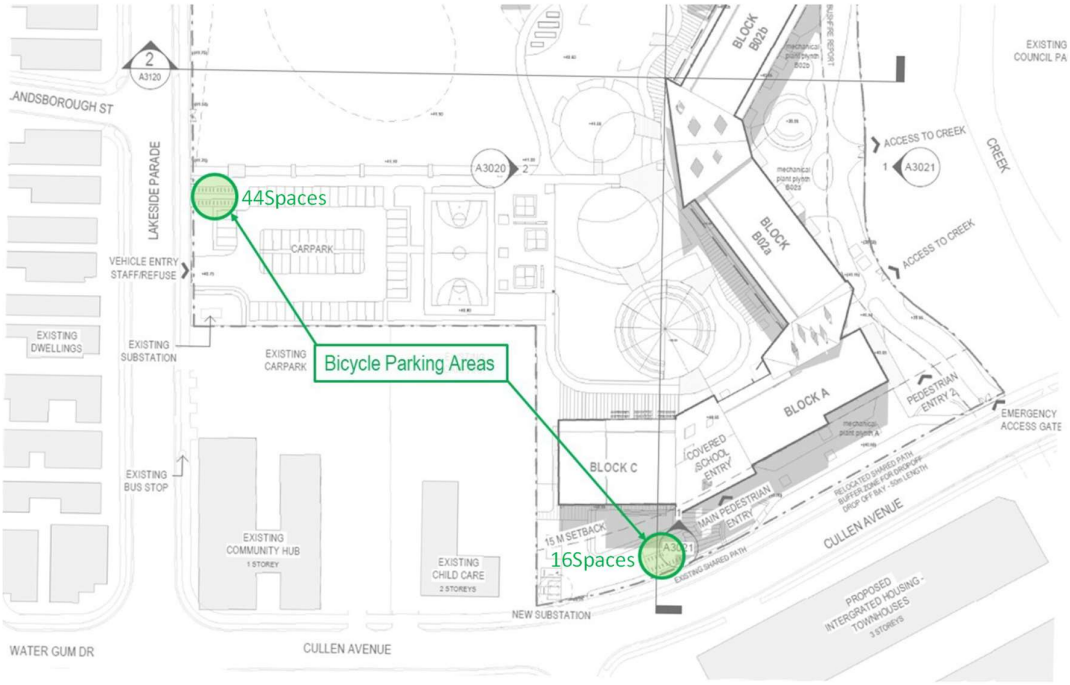
Base map: Traffic Impact assessment, Bitzios Consulting

Bicycle Parking

Two areas for bicycle parking are provided on-site, shown in Figure 2.13. These areas are:

- on Lakeside Parade at Pedestrian Entry 1, adjacent to the staff car park
- on Cullen Avenue next to Pedestrian Entry 2, the main school entrance.

Figure 2.13: Bicycle Parking Location and Numbers within Site



Source: Traffic Impact assessment, Bitzios Consulting

A total of 30 double-sided horizontal bicycle racks are provided between the two parking areas, for 16 bicycles at the bicycle parking area near pedestrian entry 1 (Lakeside Parade) and 44 bicycles at the bicycle parking area near pedestrian entry 2 (Cullen Avenue). In total, 60 bicycle spaces are provided onsite.

2.3.3. Out-of-Hours and Visitor Access

At the time of writing this report, we are seeking confirmation on the Out of Hours School Care (OOSH) program in including the number of places available for students and the hours of operations. The OOSH program and facility was out to tender at the time of writing.

We have assumed that the hours of operation of OOSH will be:

- before School: 6:30am – 9:00am
- after School: 3:00pm – 6:00pm.

Furthermore, there are also hours allowed for community use, subject to a booking process with the school. These hours are restricted to:

- weeknights: no later than 10:00PM
- weekends and public holidays: between 8:00AM and 6:00PM only

In terms of traffic impact, school related OOSH activity will actively assist with spreading out the act to the distribution of school traffic generation over a greater period. A scenario of the spread using some assumptions is outlined below in Table 2.4.

Table 2.4: Suggested Spreading of Traffic Generation Resulting from OOSH

Peak Spreading of Student	2020 Estimated percentage of students arriving	Cumulative number of students (based on 611 students)	Rationale
6.30am – 7.00am	10%	61	Early drop off to OOSH care
7.00am – 7.30am	15%	152	Early drop off to OOSH care
7.30am – 8.00am	10%	214	Regular drop off to OOSH care
8.00am – 8.15am	10%	275	Children arriving to school
8.15am – 8,30am	20%	397	Bulk of non-OOSH care students arrive to school
8.30am – 8.45am	15%	489	Students arrive to school in timely manner
8.45am – 9.00am	20%	611	Students make it to school just-in time for the bell

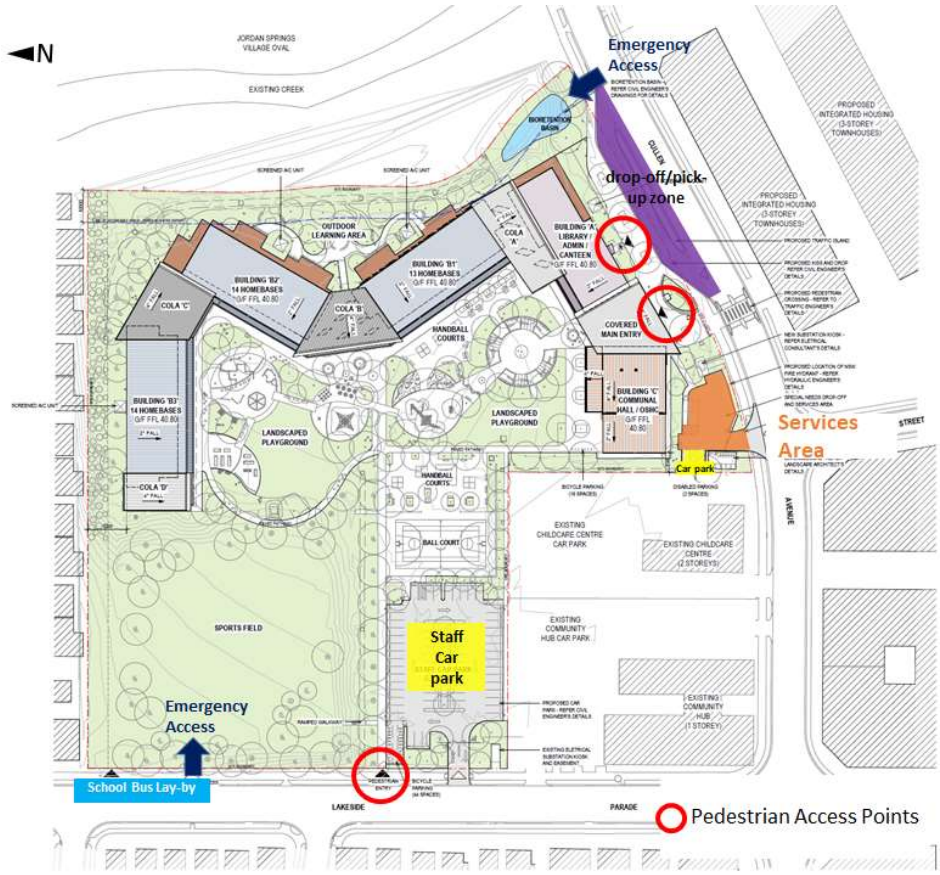
The effect of OOSH care is an improvement in overall traffic conditions, as the high-intensity traffic peak behaviour can instead be distributed over a number of hours. This will result in an alleviation of some of the traffic pressure on the key intersections during the school peak hours. Given that the Future with Development SIDRA analysis shows that no intersection experiences a significant traffic impact due to school-related traffic, OOSH activities are not expected to cause any worsening of traffic conditions such as to result in a lowered Level of Service (LOS).

Additionally, activities for community use of facilities are not likely to generate traffic volumes in excess of the school peak hours. The later hours (outside of typical peak periods, both school and network commuter peaks) entail that the background traffic is lighter, therefore any traffic impact is not expected to be significant.

Notwithstanding the above, prior to any larger scale OOSH activities (concerts, carnivals, etc), a Traffic Management Plan specific to the activity should be prepared to address traffic and parking management matters.

2.3.4. Site Access Recommendations

Figure 2.14: Vehicle Access Overview



Base source: Traffic Impact assessment, Bitzios Consulting

With regard to Figure 2.14 and the various site access arrangements discussed, the following considerations will assist in having smoother access to the school by vehicles.

- Waste service vehicles to access the school outside of AM and PM peak periods and/or school hours to prevent potential conflicts with school vehicular and pedestrian traffic.
- That vehicles travelling westbound on Cullen Avenue wanting to access the drop-off/ pick-up zone may opt to use the Charlotte Street cul-de-sac and turn right at the Cullen Avenue give-way intersection.
- School staff would supervise school entry/exit points at gates as students arrive and depart the school
- Restriction times may need to be imposed on the use of the drop-off/ pick-up zone, only between 8.00am to 9.30am and 3:00am to 4.30am, as well as 'School Drop-off Pick-up Zone' signage. At the time of writing this report, we understand that Richard Crookes Construction has agreed on the street sign design with Penrith Council and that this signage will be installed before school opening in Term 3 2020.
- "No Stopping" restriction on the north side of Cullen Avenue west side of the main school access between 8.00am to 9.30am and 3:00pm to 4.30pm may be required to reduce congestion, potential vehicular/ pedestrian.
- Staff only access to the car park should be reinforced by the school to prevent it being used by parents. Signage at the entrance, such as 'Staff Parking Only' and directional signage to the drop-off/ pick-up zone, is recommended on the NSW Department of Education's Parking on school grounds webpage.
- Concerning the interaction between vehicles and pedestrians, a pedestrian crossing is proposed on Cullen Avenue to facilitate a safer crossing location

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