NSW Department of Education and School Infrastructure NSW

Lindfield Learning Village Phase 2 and 3

Green Travel Plan

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1 Introduction

1.1 Overview

This Green Travel Plan has been prepared by Arup on behalf of the NSW Department of Education and School Infrastructure NSW (the Applicant). It accompanies a Response to Submissions Report in support of State Significant Development Application (SSD 16_8114) for Lindfield Learning Village (the site).

On 24 October 2018 the Minister for Planning granted partial development consent to SSD 8114 for Phase 1 construction and operation of a new school for 350 students. The remainder of SSD 8114 (as originally proposed) has not yet been granted consent and has been subject to further investigation, assessment and engagement with the relevant agencies (DPE, RFS, OEH, RMS, TfNSW) and Council.

The Response to Submissions and supporting documents seek approval for the remainder of SSD 8114, being:

Phase 2(a):

- Minor internal works within the approved Phase 1 area to accommodate an additional 35 students.
- The additional 35 students (a total of 385 enrolled students) is needed for Day 1 Term 1 2020, prior to Phase 2(b) being completed.
- Phase 2(a) will occur immediately on approval to allow the additional students for Day 1 Term 1 2020.

Phase 2(b) of construction:

- Works to accommodate 1,050 students (including the approved 350).
- Repurposing of the Phase 1 area.
- A loop road around the southern portion of the site for emergency vehicles, buses and drop off and pick up vehicles.

Phase 3 of construction:

- Works to accommodate an additional 950 students in the western wing of the building.

Vegetation management will be required to achieve the necessary APZ. The SSD does not seek approval for vegetation management outside the site boundary.

This Green Travel Plan (GTP) has been prepared to guide the travel choices for staff and students attending the Lindfield Learning Village and of visitors and the wider community groups who will use the facility.

1.2 Site Location

The school is located about 2km from Lindfield and Roseville Station and approximately 17km north of the Sydney CBD.

The area is located at the end of Eton Road, surrounded by nature reserves in the south. Towards the north, the area mainly consists of low density houses.

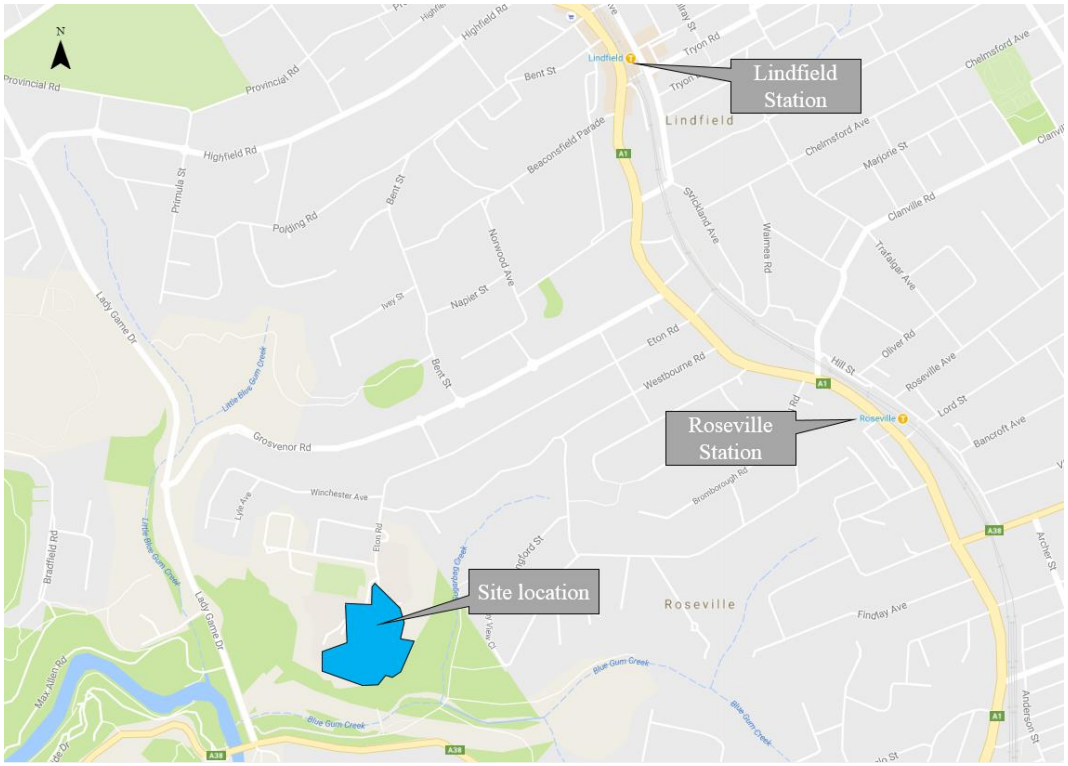


Figure 1: Location of the Lindfield learning village

1.3 School population

This Green Travel Plan assesses the access requirements for Stages 2 and 3 of the school where up to 2,000 students would occupy the final stage of opening.

Phase 2(a) of construction:

- Works to accommodate 1,050 students (including the approved 350).
- Repurposing of the Phase 1 area.
- A loop road around the southern portion of the site for emergency vehicles, buses and drop off and pick up vehicles.

Phase 3 of construction:

- Works to accommodate an additional 950 students in the western wing of the building.

1.4 What is a Green Travel Plan?

A Green Travel Plan is a package of measures put in place to try and encourage more sustainable travel whilst commuting and also during the course of activities, including business and delivery travel or other visitors to the site. For a school environment it applies to both staff travel and to student travel. It is a means for an organisation to demonstrate a commitment and take a pro-active step towards improving the environmental sustainability of its activities.

More generally, the principles of a Green Travel Plan are applied to all people travelling to and from a site. Government authorities are placing increasing emphasis on the need to reduce the number and lengths of motorised journeys and in doing so encourage greater use of alternative means of travel which have less environmental impact than the car with the benefits of reducing localised congestion, improving safety and achieving health outcomes.

1.5 Objectives

The objectives of a Green Travel Plan are:

1. **Travel Demand Management** which reduces the need for energy intensive travel by combining journeys for different purposes, travelling to alternative closer locations, or using other means of communications e.g. audio conferencing and video conferencing.
2. The use of **more sustainable transport modes** i.e. walk, cycle, bus, motorcycle, car sharing, tram, bus and rail in place of the higher energy consumption travel modes such as single occupant car travel, taxi and air travel. This generally requires improving people's travel choices by making more travel modes available (i.e. to improve mobility for non-car-drivers). The alternative measures of reducing mobility for car drivers by increased road usage and parking charges or restricting road and parking capacity are also an option, particularly in congested locations.

2 Green Travel Plan Framework

This Green Travel Plan specific for the school needs to address the following issues:

- What are the **objectives** for the school in terms of travel journeys to and from the school, during school hours and other travel to and from the school?
- How are the set objectives going to be met? What **measures** are going to be implemented and encouraged?
- Who is going to be responsible for the management, implementation and administration of the measures?
- How will students and staff be encouraged to reduce car dependent travel?

These matters are addressed in the following sections.

2.1 Green Travel Plan Objectives

The main objectives of the Green Travel Plan are to reduce the need to travel and promotion of sustainable means of transport.

The more specific objectives include:

	Objective	Action
Obj 1	High modal share for public transport, cycling and walking to school journeys.	Monitoring of travel choice by staff and students through annual travel surveys will enable target mode share to be set and measures implemented to achieve these targets.
Obj 2	To ensure adequate facilities are provided at the site to enable staff, visitors and students to commute by sustainable transport modes.	Initial bicycle rails to be monitored to ensure adequate available for staff, visitors and students. Walking routes to be monitored for safety and connectivity.
Obj 3	To reduce the number of car journeys associated with business travel by staff and visitors.	Encourage digital communication where appropriate.
Obj 4	To raise awareness of sustainable transport amongst staff, students and visitors.	Build this into the school curriculum.

2.2 Green Travel Plan Measures

A range of travel method alternatives have been recommended as well as incentives to change travel behaviour over the short and longer term period. The purpose is to encourage mode shifts away from private vehicle usage and create a positive outlook for active transport.

These initiatives aim to improve the existing and future conditions of the school population increase by:

- Reducing private vehicle usage from staff and therefore parking demand
- Reducing private vehicle usage (pick-ups and drop-offs) from students
- Reducing traffic congestion and improving intersection performance

The modal shift associated with these travel methods aim to reduce car trips to the development so there is reduced impact from School population and proposed development increases on existing traffic conditions.

2.2.1 Existing School Measures

Currently students have to pay for public transport if they live within a certain distance of the School. This varies between the year groups and costs up to $52 per term if they live within the distances as follows:

- a primary student (Years 3-6) who lives more than 1.6km (radial distance) from school, or 2.3km or more by the most direct practical walking route
- a secondary student (Year 7-12) who lives more than 2km (radial distance) from school, or 2.9km or more by the most direct practical walking route

It should be noted that an infant student (K, Year 1 and Year 2) older than 4 years and 6 months who lives any distance between home and school does not need to pay for public transport passes.

Action	**The School will coordinate the process of having bus passes arranged for students. The School will raise awareness of this as an offering to encourage greater use of public transport.**

2.2.2 General Marketing and Promotion

The objectives of the Green Travel Plan will only be achieved with the support of staff and student's parents. Marketing the benefits and promoting the sustainable alternatives available are therefore crucial in encouraging staff and students to adopt the Green Travel Plan measures. It is important that at an early stage, everyone is made aware of the need for the Green Travel Plan, and that it is emphasised that the measures are being introduced to support and encourage people to use cars more wisely.

In addition to raising general awareness, any successes achieved will be fully publicised to staff and students in order to motivate them to use sustainable modes of transport.

Action	**A dedicated webpage for employees will be created to include travel information section containing information on cycle parking and useful links to public transport websites specific to the school location.**
Action	**Support and promote events such as National Bike Week, Bike2Work Days, walk to work day to staff through lunch time presentations or students during assembly, notice board posters, newsletters intranet and email.**

2.2.3 Cycling

As described in Section 3.4, the school has reasonable access to the cycling network and will provide onsite facilities for cyclists (i.e. easily accessible bike room/shelter, changing rooms and showers, lockers etc.). There are no known planned upgrades to cycle facilities in the immediate area however the school will take an interest in future redevelopment of initiatives through Ku-ring-gai Council. In order to activate and promote cycling the following measures should be considered:

- Supply a Green toolkit-this can consist of puncture repair equipment, a bike pump, a spare lock and lights;
- Come to an arrangement with a local cycle retailer for cheap servicing of student and staff bikes. If people buy enough bikes from the retailer, they may agree to service them for free;
- Consider providing interest-free loans for staff to buy a bicycle and accessories, which they then pay back from their wages;
- Provide cycle maps to staff and students;
- Participate in annual events such as 'Ride to Work Day';
- Notice boards should have news of events / generic posters promoting cycling;
- The schools should have a 'Cycling to school' webpage specific for their school containing details of storage areas, shower facilities and links on the intranet containing useful links to journey planning websites in Sydney;
- Make staff and students aware of public transport cycling carriage policies and cycle storage facilities at rail stations;
- Staff and students who cycle should be encouraged to form a Bicycle User Group in order to provide a body of regular cyclists who can discuss issues relating to the provision of on-site cycling facilities and the maintenance of off-site cycle routes; and
- Set up 'Bike Buddies' scheme for less confident people interested in cycling.

Action	**Nominate a cycling champion from the staff and involve keen student cyclists to action these measures.**

2.2.4 Public Transport

To promote the use of public transport for travel to school and school-related journeys during the day.

- Provide an intranet public transport page to contain useful links to journey planning websites in Sydney;
- Provide useful public transport maps and promotional items to potential and current public transport users in the existing induction pack for new employees; and
- Provide notice boards that should have news of events / generic posters promoting public transport.

Action	**The Green Travel Plan coordinator will compile appropriate public transport information.**

2.2.5 Walking

Specific Travel Plan measures designed to encourage more walking trips to and from the schools by those staff and students living within a reasonable distance. Updates to the existing footpath network are occurring to improve connectivity. Safety of pedestrian routes will be monitored by the school and parents and where necessary the School will work with Council to address any identified issues.

Other initiatives that could be explored include:

- Produce a map showing the most direct route connecting the transport interchange and schools, along with the estimated walking time;
- Produce walking related articles for inclusion in the school newsletters focussing on 'walking champions' to highlight best practise in walking;
- Create and maintain an intranet 'useful walking routes' containing useful routes to key areas;
- Make pedometers available to staff and students expressing an interest in walking to school;
- Participate in Walk to Work day and look into holding a 'healthy breakfast' as a reward to all those who participate; and
- Facilitate the walking school bus initiative if appropriate.

Action	**The Green Travel Plan coordinator will compile appropriate walking information and liaise with Ku-ring-gai Council regarding ongoing upgrades to footpaths.**

2.2.6 Car pooling, taxi share and shuttle bus service

In order to reduce the number of car trips and especially trips made to common destinations the following measures should be considered:

- Set up a journey to/from school car share system for all staff who are willing to participate in the scheme. The system would inform participants of other staff who live in the same area or who pass through the area on their way to the schools. The participants either share the costs or alternate in driving to the schools;
- Utilise a range of free apps currently available online to assist with the implementation of this initiative. The schools will need to investigate the most appropriate app that aligns with its Child Protection Policies before promoting this initiative; and
- Introduce a taxi or pool car system for trips during the day for staff.

Action	**The Green Travel Plan coordinator will set up a car pool scheme.**

2.2.7 Staff Induction

To ensure new members of staff are aware of car parking arrangements and the Green Travel Plan, all staff members should be made aware of the Plan as part of their induction process. The Green Travel Plan section of the induction should provide new starters with the following:

- A brief introduction to the Green Travel Plan and its purpose;
- Tour of the schools to include visit cycle parking areas and shower and changing facilities; and
- Provision of a Green Travel Plan information package which would include information on incentives to use sustainable means of transport e.g. pool bikes and car/taxi share system.

Action	**The Green Travel Plan coordinator will coordinate the information available into a staff welcome pack..**

2.3 Scheme Administration

2.3.1 Administration

An essential part of an effective Green Travel Plan is to nominate a Travel Plan Co-ordinator for both the primary and secondary school. The role should be undertaken by enthusiastic and high quality communicators in order to promote measures that will encourage people to think about travel other than as a single occupancy car user. He/she will need to be an enthusiastic and respected member of staff who is keen to champion the cause of the Travel Plan. Other qualities that may be appropriate include the capability of dealing with all types of people within the schools and external organisations, the ability to lead by example, the ability to approach issues with a practical and balanced perspective and the capability for original and innovative thinking to raise awareness of the Travel Plan at a local level.

Senior management support is critical to ensuring the success of any travel plan for a number of reasons such as to:

- Lead by example;
- Allow budget allocations for the implementation of measures; and
- Give support to changes or development of policy documentation.

Administration of the Travel Plan involves the maintenance of necessary systems, data and paperwork, consultation and promotion.

Action	**Nominate Green Travel Plan Coordinator(s) from the staff.**

2.3.2 Consultation

The success of the Green Travel Plan will rely on the support of the employees which will be overseen by the Green Travel Plan co-ordinator. The school should also support staff administrative needs such as providing lockers and storage spaces, reducing the need for staff to carry bulky items home. The Green Travel Plan co-ordinator will be responsible for all liaisons with outside bodies, including local transport operators, planning and highway authorities.

Liaison with officers of the Council (e.g. those responsible for cycling and public transport will be undertaken as required). The co-ordinator will also seek to join and attend meetings with any local travel forums as appropriate in order to exchange ideas with other like-minded organisations.

Action	**The Green Travel Plan Coordinator is to set up appropriate consultation with Ku-ring-gai Council, the bus operator and other relevant parties.**

2.3.3 Promotion

All students and staff will be made aware of the details of the Green Travel Plan, its objectives in enhancing the environment and the role of individuals in achieving its objectives at its launch.

Other promotional material will take a variety of forms and will be issued either to individual staff members and students, displayed in a prominent location in the school or provided in the form of 'one off' marketing initiatives. This would include outlining the benefits for the school in participating in government travel surveys to both improve public transport services and promote the use of public transport.

The promotional material will advise employees wishing to raise specific transport-related matters to discuss them with the appropriate nominated Travel Plan co-ordinator who in turn would liaise with the Green Travel Plan management team, transport operators and the local authority as required.

2.3.4 Updating, reviewing and monitoring

The Green Travel Plan is a strategy that will evolve over time. Although the objectives of the Plan to 'educate' students and staff, and to facilitate travel by sustainable modes will not change, it may be possible over time to define or re-define specific targets. Target setting should reflect an ambition for continued progress year on year and there should be a mechanism to review targets in light of monitoring surveys. The monitoring measures could include collecting data on travel patterns for journeys to school and also during the school hours. The recorded data would inform modes of transport and distance travelled by each mode, from which energy consumption and emissions could be estimated. It is recommended that the school undertake travel surveys of students and parents at 3, 6 and 12 months upon opening of the school.

Following the implementation to the Green Travel Plan, the Green Travel Plan management team should meet annually to undertake a review of the Travel Plan measures in place. The objective will be to measure their success and to identify

the potential for refinements. The plan would be updated to consider firmer details of the initiatives of the Future Transport Strategy 2056, as they are forthcoming. The management team will further engage with Government to assist in designing and operating services which best support the needs to the students and staff, and therefore promote high levels of sustainable transport modes.

The Green Travel Plan management team will then compile a review report outlining the results of the review. The report will also incorporate the results of on-going monitoring processes throughout each of the preceding periods.

Action	**The Green Travel Plan coordinator will set up a travel survey for students and staff to set a benchmark during the first year of operation. Future travel targets will be set by the end of 2019 for the 2020 school year.**

3 Transport and Access Service Strategy

3.1 Bus

3.1.1 Existing route bus

The site is directly serviced by a bus route, number 565. There is an opportunity to improve bus frequencies to create a multi modal service of trains and buses to the site.

A bus stop is located just north of the site, providing convenient access to future patrons. Bus route 565, which operates hourly, services Chatswood and Macquarie University. It predominantly travels along the Pacific Highway and services the residential area around the site. Typical bus travel times during the morning 8am peak is shown in Table 1. The bus route currently serves Beumont Road Public School.

Table 1: Weekday bus 565 timetable and travel times

Departing from	Travel time to site	Service period
Macquarie University	29 mins	AM – First service 6:56am
		PM – Last service 5:42pm
Chatswood	19 mins	AM – First service 7:37am
		PM – Last service 6:08pm
Roseville Station Pacific Highway	9 mins	AM – First service 7:48am
		PM – Last service 6:13pm
Lindfield Station Pacific Highway	9 mins	AM – First service 6:32am
		PM – Last service 6:15pm

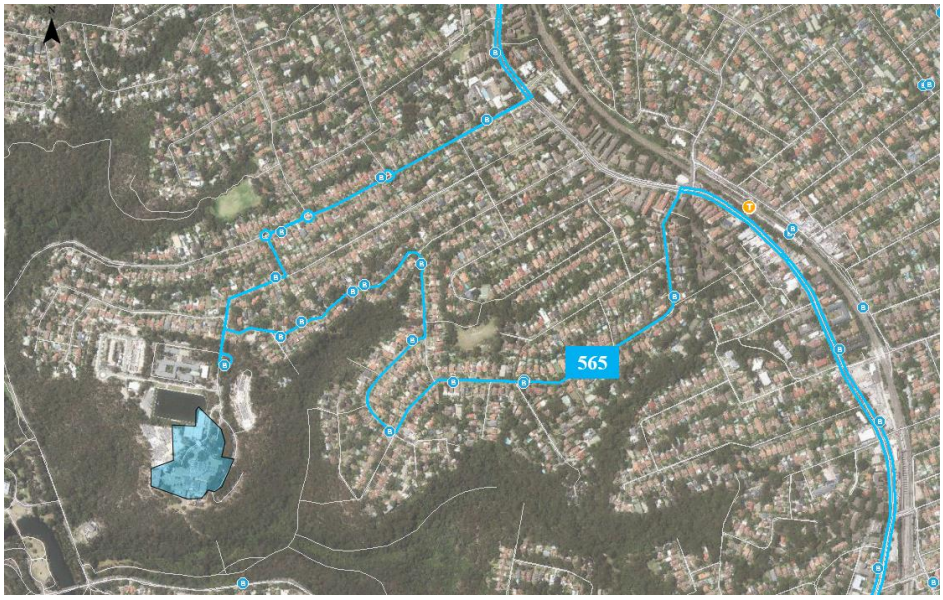


Figure 2: Bus route 565

3.1.2 Proposed bus arrangements for the school

A one-way loop road through the site utilising the alignment of the fire access trail has been developed to provide an appropriate bus facility. There is a high bus mode target for the school with up to 7 school buses likely to be on the site at any one time during the pick-up period in Stage 3.

3.1.3 Description of the bus facility

The proposed bus loop enters the school grounds at the end of Dunstan Grove and traverses the lower portion of the site where the set-down / pick-up zone will be located as shown in Figure 3.

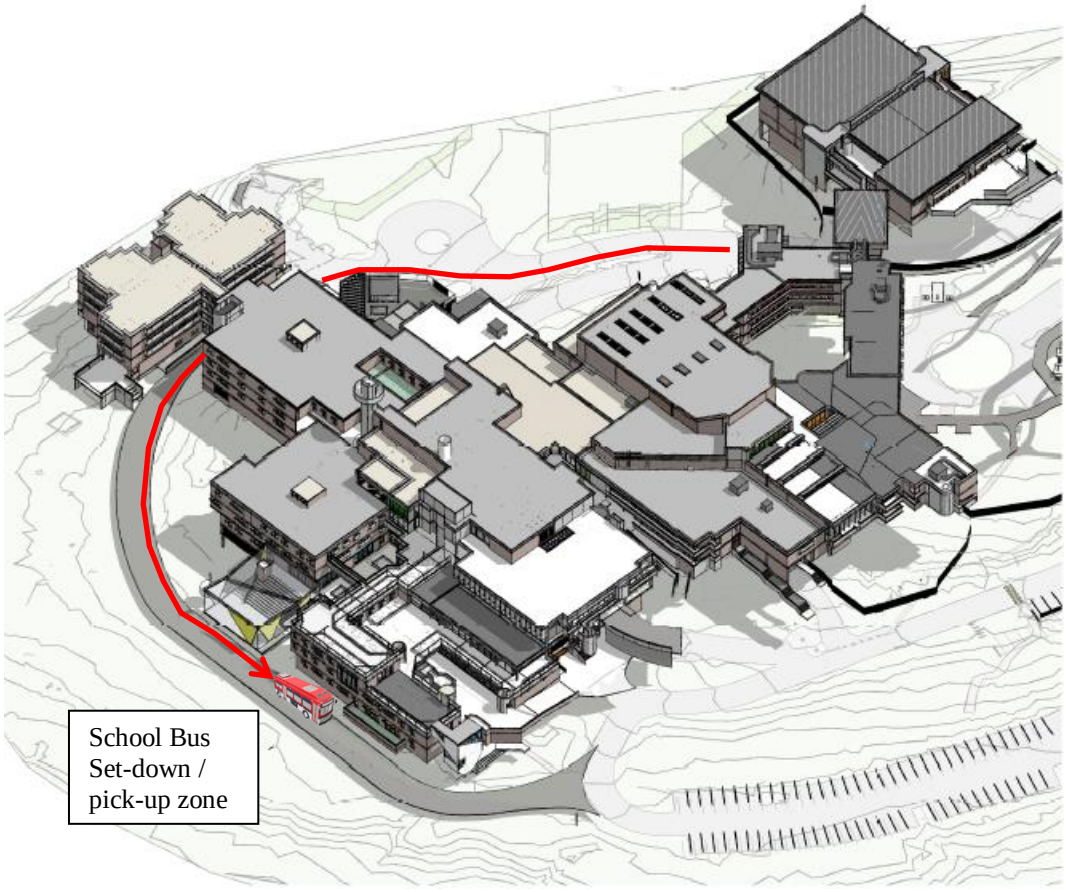


Figure 3: Location of bus loop and drop-off / pick-up zone

The bus loop will only be open for use during school drop-off and pick-up times. The roadway will be closed during the school day to allow students to fully utilise the lower campus grounds. An overall site plan showing the existing Eton Road bus bay for public buses and the proposed bus loop for school buses in shown in Figure 4.

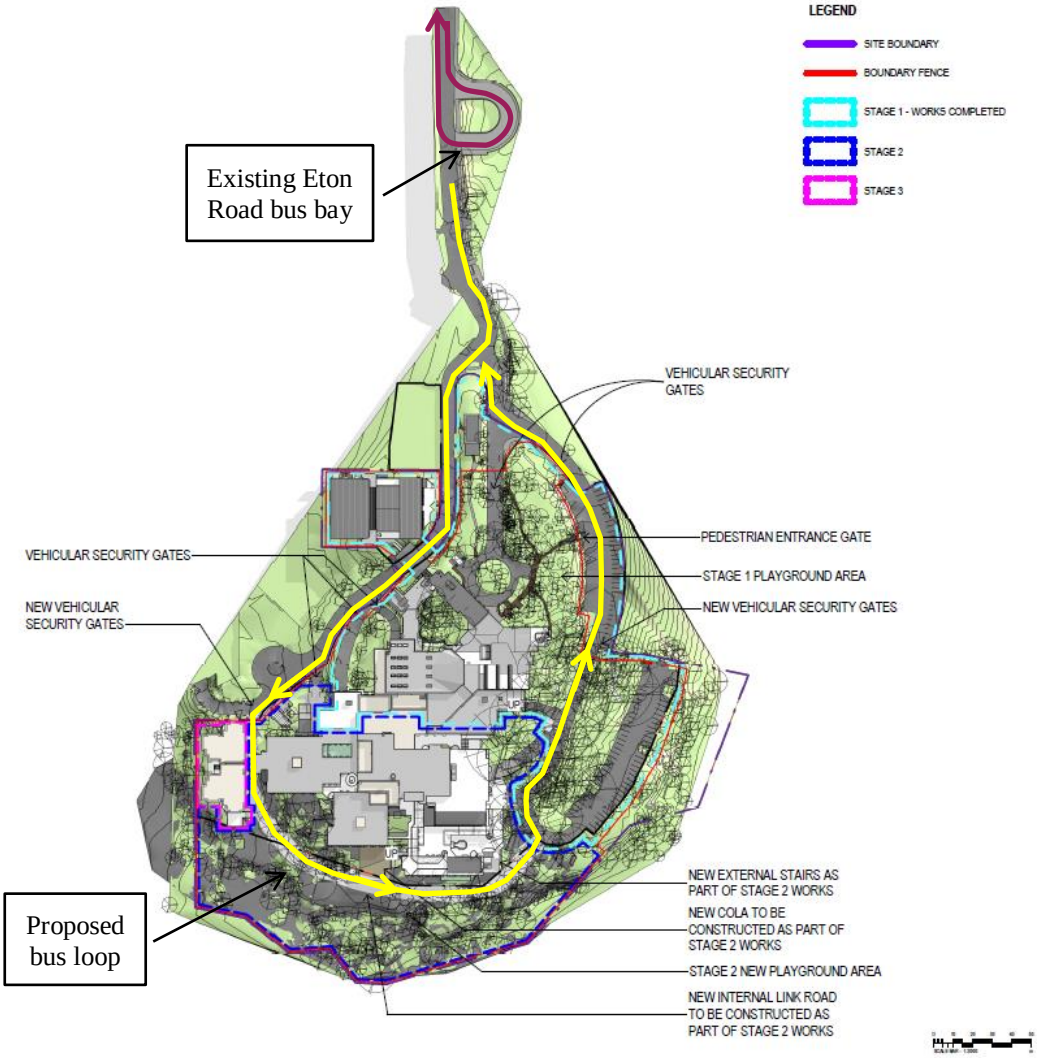


Figure 4: Overall site plan showing bus facilities

The configuration of the bus zone along the loop road is shown in Figure 5. It is envisaged that up to 5 buses could drop-off or pick-up at one time with room for a further 3 buses to queue to wait. A 12.5m standard bus has been used for setting out the bus zone with no allowance for independent movement given that buses are expected to load in batches.

A pedestrian fence will be located along the northern side of the road to control where students wait. A waiting area utilising the COLA provides covered protection for students that are waiting. A series of gates will enable students to access the bus loading area.

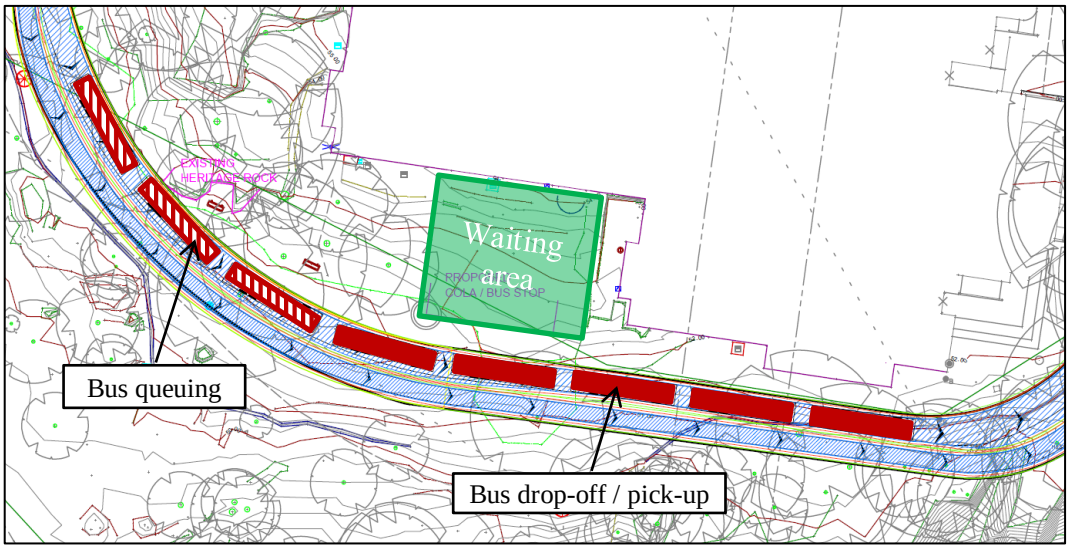


Figure 5: Bus zone (12.5m buses)

3.2 Train

The site is located about a 2km (approximately 20 minute walk) from both Lindfield and Roseville Station. Trains to Lindfield Station run frequently during peak hours along the T1 North Shore Line.

Patrons to the site would likely catch the train followed by the bus. However given that bus 565 only operates on an hourly basis, scheduling would be difficult. There is an opportunity to improve existing bus frequencies to better service the site. The general facilities at each train station is shown in Table 2.

Table 2: General facilities at train stations

Facilities	Lindfield Station	Roseville Station
Kiss and Ride	✓	✓
Ramp (1:20 gradient)	✓	✗
Lift	✓	✗
Portable boarding ramp	✓	✓

3.3 Walking

3.3.1 School Zones

A School Zone has been installed on all roads in the vicinity of the school in consultation with the Roads and Maritime Services.

3.3.2 Footpath upgrades at the school

Pedestrian infrastructure upgrades have been carried out for Phase 1 within the vicinity of the school boundary as shown in Figure 6.

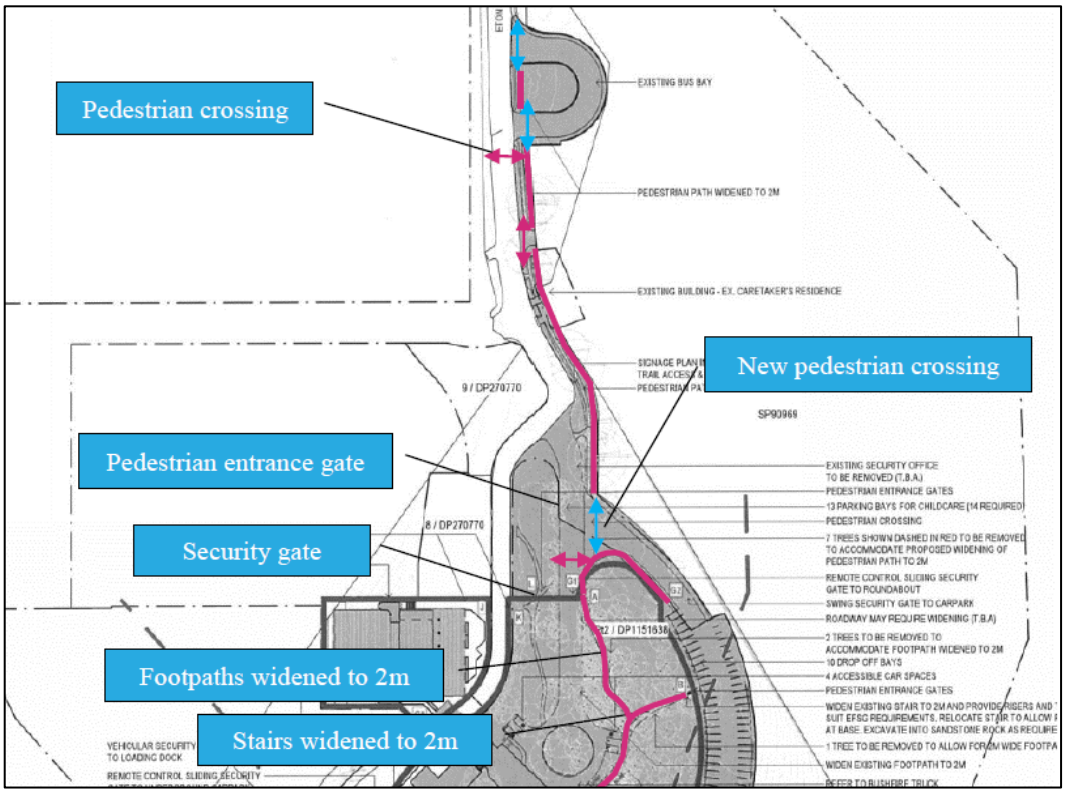


Figure 6: Pedestrian upgrades for Phase 1

3.3.3 Footpath upgrades on the local road network

Further upgrades to the wider local road network have also been undertaken by Ku-ring-gai Council to improve walkability to the school. A continuous footpath route from Lindfield Learning Village to Lindfield Public School and the Pacific Highway has been installed as a good spine route.

3.4 Cycling

The recommended RMS cycle routes are shown in Figure 7. While the Pacific Highway does not provide a dedicated cycle route, the site can be accessed from a network of smaller, more accessible local streets.

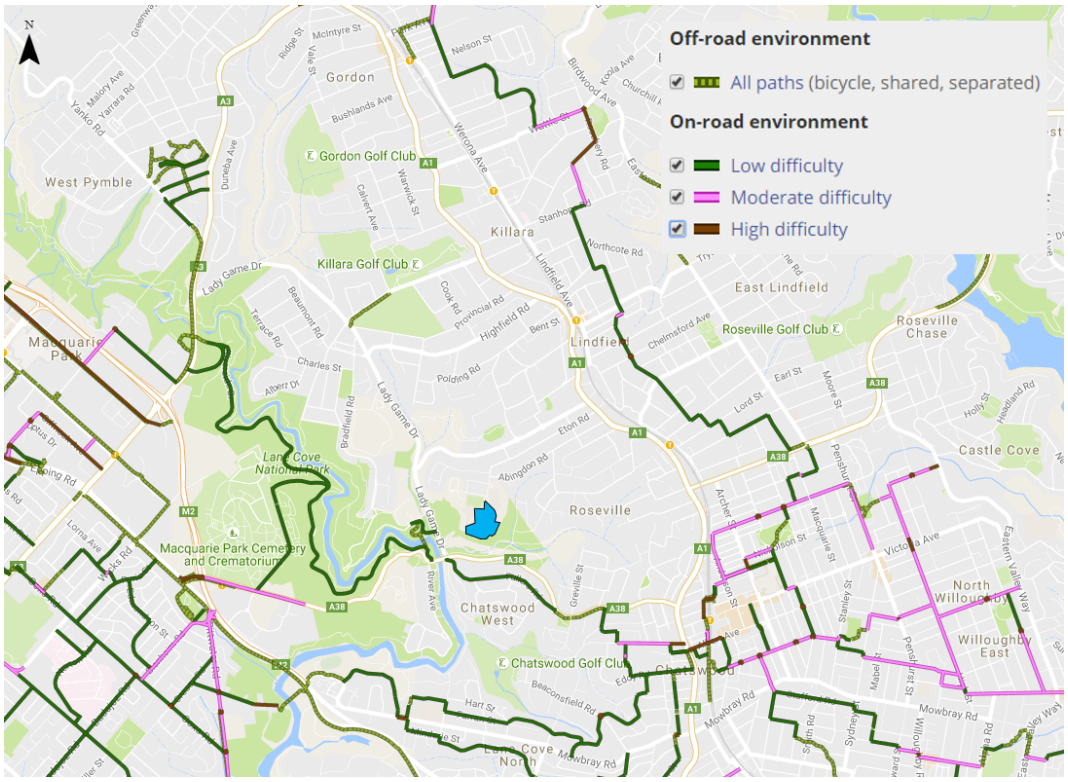


Figure 7: RMS recommended cycle routes

3.5 School catchment

The school catchment is not determined at this stage and will develop as the school matures. Enrolments will be focused on developing a local catchment which will reduced travel distance and permit active transport strategies to be adopted.

4 Travel mode targets

4.1 Phase 1 School

Phase 1 of the school commenced in the 2019 school year and accommodates 350 students and 48 staff. There is a 45 place Out of School Hours Care (OOSH) available on site. The start and finish times are shown in Table 3.

Table 3: School start and finish times

	Start time	Finish time
OOSH	7.00am	-
Year K - 6	8.50am	2.50pm
Year 7 - 10	8.50am	3.10pm
Year 11 - 12	9.10am	3.30pm
OOSH	-	6.00pm

4.1.1 Student travel

A travel survey was undertaken between 27 February and 5 March 2019 by the school with 201 respondents representing 298 students. There was a good spread of respondents across all age groups as shown in Table 4.

Table 4: Comparison of survey respondents to enrolled students

Year	Enrolled students		Survey respondents	
	Number	%	Number	%
K-2	86	25%	81	27%
3-6	120	34%	98	33%
7-10	144	41%	119	40%
Total	**350**	**100%**	**298**	**100%**

The key reason for undertaking the travel survey was to determine the bus service requirements given that no new bus services were available at the start of the 2019 school year. As such, very detailed information on the use of existing bus services and the potential for increased use of bus services when new services are provided was collected.

The route 565 bus provides the only current service to the school. The current and potential bus users are shown in Table 5.

Table 5: Existing and potential bus travel

Bus drop-off									
	Existing bus users						**Potential bus users**		
Year	From Lindfield			From Chatswood	Total bus users	% of year	New	total	% of year
	8:00	8:23	8:40	8:00					
K-2	3	3	2	4	12	15%	13	25	31%
3-6	4	24	2	9	39	40%	21	60	61%
7-10	15	45	14	27	101	85%	19	120	100%
Total	**22**	**72**	**18**	**40**	**152**			**205**	
Bus pick-up									
	To Lindfield		To Chatswood		Total bus users	% of year	New	total	% of year
	15:01	15:31	15:13	15:53					
K-2	4	2	6	2	14	17%	13	27	33%
3-6	17	7	18	0	42	43%	21	63	64%
7-10	0	35	63	2	100	84%	19	119	100%
Total	**21**	**44**	**87**	**4**	**156**			**209**	

Based on the findings of the travel survey, a high bus mode can be adopted. For the future stages of the school development, bus services should be planned to achieve the bus mode targets as shown in Table 6.

Table 6: Future bus mode target

Year	Bus mode
K-2	30%
3-6	60%
7-9	80%
10-12	90%

4.1.2 Staff Travel

There are 48 staff for the Phase 1 school of which 90% are assumed to attend on any one day. There is currently a high car mode with car parking available on site. Approximately 40 cars are expected to arrive at the site over the morning peak period and depart after the afternoon school peak.

4.2 Phase 1 school travel

Based on the travel survey and observations during operation of the Phase 1 school, the current travel patterns have been determined.

Table 7: Current travel modes

	Year	Classes	Class size	Enrolled Students		Bus		Walk/cycle		Car Passenger	
						%	No	%	No	%	No
Primary	K	2	20	39	206	15%	6	5%	2	80%	31
	1	1	22	22		15%	3	5%	1	80%	18
	2	1	24	25		15%	4	5%	1	80%	20
	3	1	30	30		40%	12	5%	2	55%	17
	4	1	30	30		40%	12	5%	2	55%	17
	5	1	30	30		40%	12	5%	2	55%	17
	6	1	30	30		40%	12	5%	2	55%	17
Secondary	7	2	30	63	144	80%	50	5%	3	15%	9
	8	1	30	22		80%	18	5%	1	15%	3
	9	1	30	30		90%	27	5%	2	5%	2
	10	1	30	29		90%	26	5%	1	5%	1
	11	0	24	0		90%	0	5%	0	5%	0
	12	0	24	0		90%	0	5%	0	5%	0
Total					**350**		**182**		**18**		**151**

With an average car occupancy of 1.6 students/car, there are approximately 94 car movements generated for the car drop-off and pick-up. All 182 bus travellers use the Route 565 bus from the Eton Road bus bay. The walk cycle mode is currently low due to the wide spread of enrolments.

The timing of the drop-off and pick-up activity is shown in Table 8.

Table 8: Timing of drop-off and pick-up

Drop-off					**Pick-up**				
Start	OOSH (70%)	bus pass	car passenger	cars	Finish	OOSH (100%)	bus pass	car passenger	cars
7.00am	20	0	20	13					
8.50am	0	61	115	72	2.50pm	0	61	95	59
8.50am	0	121	16	10	3.10pm	0	121	16	10
9.10am	0	0	0	0	3.30pm	0	0	0	0
					6.00pm	40	0	40	25
Total	**20**	**182**	**151**	**94**		**0**	**182**	**151**	**94**

4.3 Stages 2 and 3 school travel modes

4.3.1 Stage 2 school travel

Based on the travel survey and observations during operation of the Phase 1 school, the Stage 2 travel patterns expected for 1,050 students has been determined.

Table 9: Stage 2 travel modes – 1,050 students

	Year	Classes	Class size	Enrolled Students		Bus		Walk/cycle		Car	
						%	No	%	No	%	No
Primary	K	3	20	60	558	30%	18	10%	6	60%	36
	1	3	22	66		30%	20	10%	7	60%	40
	2	3	24	72		30%	22	10%	7	60%	43
	3	3	30	90		60%	54	10%	9	30%	27
	4	3	30	90		60%	54	10%	9	30%	27
	5	3	30	90		60%	54	10%	9	30%	27
	6	3	30	90		60%	54	10%	9	30%	27
Secondary	7	3	30	90	504	80%	72	10%	9	10%	9
	8	3	30	90		80%	72	10%	9	10%	9
	9	3	30	90		80%	72	10%	9	10%	9
	10	3	30	90		90%	81	10%	9	0%	0
	11	3	24	72		90%	65	10%	7	0%	0
	12	3	24	72		90%	65	10%	7	0%	0
Total					**1062**		**702**		**106**		**254**

With an average car occupancy of 1.6 students/car, there are approximately 159 car movements generated for the car drop-off and pick-up.

Based on one additional Route 565 bus being scheduled during the peak periods (increase from 4 to 5 services) some 200 students are expected to use the public bus service. The remainder of bus travellers being 500 have been assigned to new school buses. Seven (7) new school buses are needed based on 75 students per school bus.

The timing of the drop-off and pick-up activity is shown in Table 10. With increased bus mode of travel there is predicted to be only a minor increase in car activity with 106 drop-off cars in the morning peak and 84 pick-up cars in the afternoon peak. This compares to 82 and 69 cars respectively for the Phase 1 school.

Based on the car parking allocation for staff described in Section 4.8, there could be approximately 95 staff cars arriving in the morning peak and 60 departing in the afternoon peak.

Table 10: Timing of drop-off and pick-up

Drop-off					**Pick-up**				
Start	OOSH (70%)	bus pass	car passenger	cars	Finish	OOSH (100%)	bus pass	car passenger	cars
7.00am	84	0	84	53					
8.50am	0	275	143	89	2.50pm	0	275	107	67
8.50am	0	297	247	17	3.10pm	0	297	27	17
9.10am	0	130	0	0	3.30pm	0	130	0	0
					6.00pm	120		120	75
Total	**84**	**702**	**181**	**159**		**0**	**702**	**254**	**159**

The resultant peak traffic generation is:

- Morning peak entry – 106 student drop-off + 95 staff + 7 buses
- Morning peak exit – 106 student drop-off cars departing + 7 buses
- Afternoon peak entry – 84 student pick-up cars entering + 7 buses
- Afternoon peak exit – 84 student cars + 60 staff + 7 buses
- Evening peak entry – Nil
- Evening peak exit – 60 staff cars departing

4.3.2 Stage 3 school travel

The Stage 3 travel patterns expected for 2,000 students have been extrapolated from the Stage 2 travel patterns adopting the same travel modes.

Table 11: Stage 3 travel modes – 2,000 students

	Year	Classes	Class size	Enrolled Students		Bus		Walk/cycle		Car	
						%	No	%	No	%	No
Primary	K	6	20	120	1,115	30%	36	10%	12	60%	72
	1	6	22	132		30%	40	10%	13	60%	79
	2	6	24	144		30%	43	10%	14	60%	86
	3	6	30	180		60%	108	10%	18	30%	54
	4	6	30	180		60%	108	10%	18	30%	54
	5	6	30	180		60%	108	10%	18	30%	54
	6	6	30	180		60%	108	10%	18	30%	54
Secondary	7	6	30	180	885	80%	144	10%	18	10%	18
	8	5.5	30	165		80%	132	10%	17	10%	17
	9	5	30	150		80%	120	10%	15	10%	15
	10	5	30	150		90%	135	10%	15	0%	0
	11	5	24	120		90%	108	10%	12	0%	0
	12	5	24	120		90%	108	10%	12	0%	0
Total					**2,000**		**1,298**		**200**		**503**

With an average car occupancy of 1.6 students/car, there are approximately 314 car movements generated for the car drop-off and pick-up.

Based on one additional Route 565 bus being scheduled during the peak periods (increase from 4 to 5 services), some 200 students are expected to use the public bus service. The remainder of bus travellers being 1100 have been assigned to new school buses. Fourteen (14) new school buses are needed based on 75 students per school bus.

The timing of the drop-off and pick-up activity is shown in Table 12. There is a doubling of car activity with 227 drop-off cars in the morning peak compared with106 cars for Stage 2 and 165 pick-up cars in the afternoon peak compared with 84 cars for Stage 2.

Based on the car parking allocation for staff described in Section 4.8, there could be approximately 100 staff cars arriving in the morning peak and departing after the afternoon peak.

Table 12: Timing of drop-off and pick-up

Drop-off					**Pick-up**				
Start	OOSH (70%)	bus pass	car passenger	cars	Finish	OOSH (100%)	bus pass	car passenger	cars
7.00am	140	0	140	88					
8.50am	0	551	314	196	2.50pm	0	551	214	134
8.50am	0	531	50	31	3.10pm	0	531	50	31
9.10am	0	216	0	0	3.30pm	0	216	0	0
					6.00pm	240		240	150
Total	**140**	**1,298**	**503**	**314**		**0**	**1,298**	**503**	**314**

The resultant peak traffic generation is:

- Morning peak entry – 227 student drop-off + 95 staff + 14 buses
- Morning peak exit – 227 student drop-off cars departing + 14 buses
- Afternoon peak entry – 165 student pick-up cars entering + 14 buses
- Afternoon peak exit – 165 student cars + 60 staff + 14 buses
- Evening peak entry – Nil
- Evening peak exit – 60 staff cars departing

4.4 School buses

An appropriate school bus system will be developed in consultation with TfNSW, bus companies, and surrounding schools during 2019.

Each school bus can accommodate approximately 70 students. The number of school buses serving the school may be subject to sharing the school buses with other schools.

4.4.1 School bus routes

School bus routes can be tailored to suit the needs of the learning village. This can be done by altering existing bus routes or introducing a new bus route. Schools near the learning village, which include

- Chatswood High School (Forest Coaches, Transdev)
- Chatswood Public School (Forest Coaches, Transdev)
- Roseville Public School (Transdev)
- Beaumont Road Public School (Shorelink Bus 565)

4.4.2 Public bus

A bus stop and bus loop is located just north of the site, providing convenient access to future patrons from Bus Route 565. The bus route services key train stations which high train frequencies such as Macquarie University, Chatswood, Lindfield and Roseville. Improving the public bus system would not only provide convenient access to the school, but also to existing and future residents living in the vicinity.

Improving bus frequencies

The bus route currently serves Beumont Road Public School. This improved bus frequency would also provide amenity to the Beumont Road Public School and residential dwelling located around the site.

According to Sydney Buses, rigid buses (standard) carry a maximum of 58 people (43 seated and 15 standing) or some 70 students.

It is recommended that bus frequencies are increased in each direction to increase bus reliability and encourage usage early on.

4.5 Private vehicle drop-of and pick-up

Car Park 2 has been configured for private vehicle drop-off and pick-up of students during school times. The existing drop-off / pick-up facility will continue to be used for the Stage 2 and 3 school. The pick-up occurs over two periods with the primary school finishing at 2.50pm and the secondary school finishing at 3.10pm. The design peak occurs at Stage 3 when it is anticipated that there will be 134 cars picking up primary school students at 2.50pm. Based on 6 cars picking up students at one time in a 1 minute period, 20 minutes will be required. This will clear the majority of the pick-up zone ready for the secondary school pick-up.

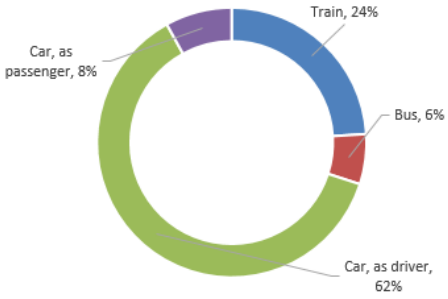
Cars will utilise the one-way loop road travelling parallel with the buses, entering from Dunstan Grove and exiting to Eton Road.

4.6 Future student travel target

For student travel a 10% reduction target should be set for private vehicle drop-off as the school access strategy develops. This may be further reduced if carpooling strategies are adopted.

4.7 Staff travel

Based on the journey to work travel data, some 70% of employees in this area are a car driver or passenger to work. Given that there is only limited car parking available for staff on site, it will be necessary to target a reduction in staff travel by private car, particular for the Stage 3 school.



4.8 Car parking for school activity

No new car parking will be provided on the site due to the topography. There are currently 166 marked car parking bays on the site as shown in Figure 8.

In the upper car park there are 27 parking bays on the western side which are converted to the drop-off and pick-up facility during school hours. This means that there are 139 car parking bays available for school staff use and parent pick-up and drop-off parking. Two (2) of the car bays are for accessible parking adjacent to the front door.

For Stage 2 with an allocation of 10 spaces for parent pick-up and drop-off parking there will be 127 staff parking spaces available. For 164 staff and assuming 90% in attendance on a typical day, this equates to a car mode of 85%. This is easily achieved with some staff travelling by public transport and others either car-pooling or being dropped off.

For Stage 3 with an allocation of 20 spaces for parent pick-up and drop-off parking there will be 117 staff parking spaces available. For 312 staff and assuming 90% in attendance on a typical day, this equates to a car mode of 42%.

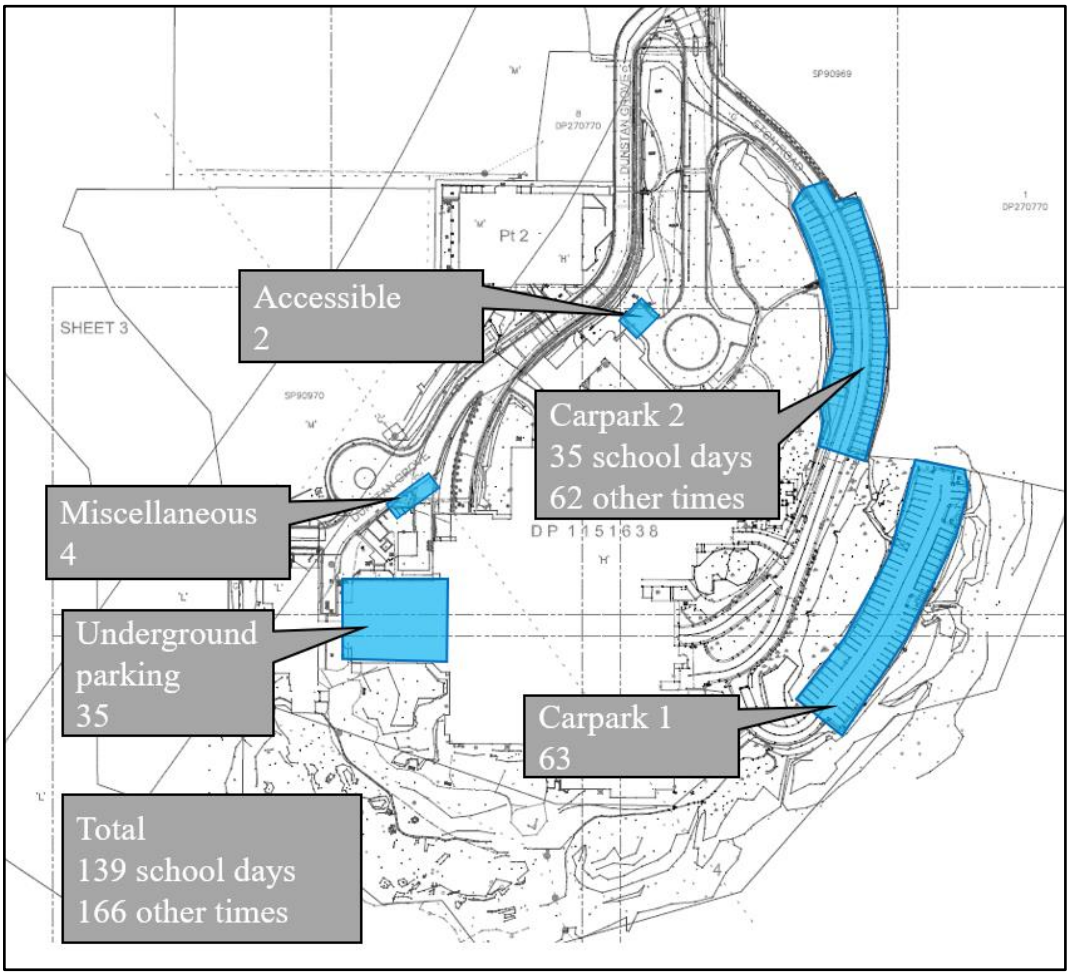


Figure 8: Current on-site car parking

5 Transport Strategies

This section discusses the various transport strategies which the Learning Village may implement by the school.

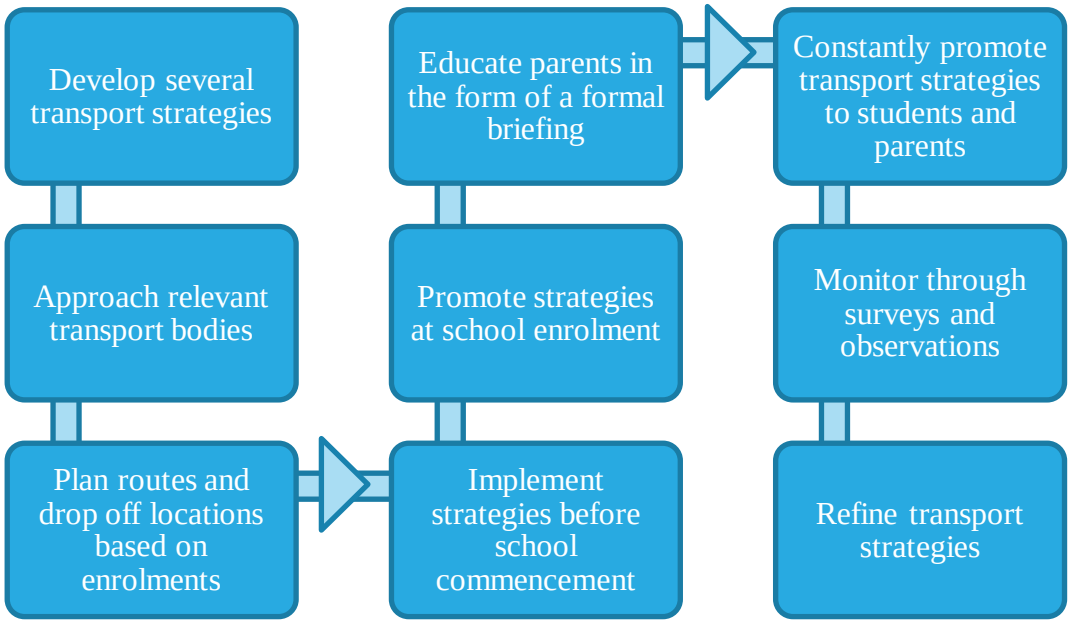
5.1 Early implementation

Convenient and legible means of public transport and active transport, to and from the school should be provided before opening of each stage of the school.

Establishing sustainable transport habits to and from the school, at early inception stages, will be crucial to the success of the school both in early and later stages. A high take up of bus travel has occurred providing a good indication for later stages of development. Providing highly efficient public transport for students from opening day, would attract cultivate sustainable public transport based commuting habits.

Evidence from new residential developments studied in Sydney, suggests that enabling such habits from an early stage will be more successful to implement than trying to change private vehicle reliant travel habits in the future. This poses several advantages to the school, as well as the wider network:

- **Healthier students** – Students who use active and public transport will be encouraged to walk or cycle more than children who take private vehicles
- **Easing congestion** – The school can reduce forecast congestion of the surrounding road network due to development trips, through the provision of a multi-modal and efficient public transport system.
- **Feasibility testing** – Early implementation of sustainable transport means allows the measure of the effectiveness in moving students away from private vehicles



5.2 Subsidised public transport travel

The School Student Transport Scheme (SSTS)[1]. The SSTS provides eligible school students with free or subsidised travel on public transport between home and school, on trains, buses, ferries and long distance coach services.

This initiative can be implemented before the opening of the school. An information package can be sent to parents to inform them of this scheme. The Learning Village can also assist parents in applying for this scheme for the students.

Figure 9: Student Opal Card

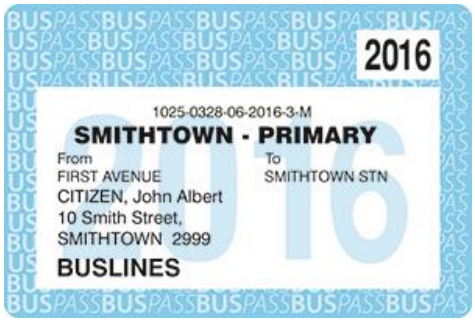


Figure 10: Travel pass for students in rural/regional areas

To be eligible for this scheme, students need to be a resident of NSW, or an overseas student eligible for free government education. Other criteria are stated below.

Students from Kindergarten-Year 2 are eligible if:

- Aged 4 years 6 months, or older.
- No minimum distance criteria applies to these students.

Primary school students from years 3-6 are eligible if:

- The straight line distance from their home address to school is 1.6 km or further.
- The walking distance from home to school is 2.3 km or further.

Secondary school students from years 7-12 are eligible if:

- The straight line distance from their home address to school is 2 kilometres, or further, or
- The walking distance from home to school is 2.9 kilometres or further.

School students who live too close to the school to be eligible for free travel may qualify for a School Term Bus Pass which provides bus travel at a discounted price for the whole school term.

[1] (http://www.131500.com.au/planyourtrip/ upload/links/schoolstudenttransportscheme)

5.3 Carpooling

5.3.1 Overview

The Learning Village may set up a system where real-time carpool information from participants can be displayed or changed. Schedules can be managed through a cloud, google maps or various smartphone applications. Carpooling should be a long term initiative. With consistent promotion of this travel mode and incentives, students and parents will become aware of the benefits and convenience.

An implementation strategy would need to be considered so that student privacy is protected. It is assumed that such an initiative would likely operate through parents on a carpooling forum. This initiative would operate under management of the Learning Village by encouraging parents to be proactive in offering carpooling services.

5.3.2 Awareness

The easiest way of setting up a carpool programme would be to organise booths and provide handouts during school enrolments and registrations. This would educate the parents that the initiative exists. A formal briefing can also be organised, educating parents of the chosen carpool platform. This would also allow parents to meet face to face.

This can be further promoted in Learning Village newsletters, parent teacher meetings and by educating students on the benefits of this initiative. As an incentive for parents, car pool stickers can be given out, giving these shared cars prioritised and designated drop off locations.

Carpooling initiatives provide an opportunity to significantly reduce cars on the road network.

5.3.3 Car pool Apps

A range of free apps are currently available online to assist with the implementation of this initiative. The School will investigate the most appropriate app that aligns with its Child Protection Policies before promoting this initiative.

5.4 Promoting transport strategies

Before and after the implementation of the preferred travel alternatives, the Learning Village should develop ways to promote and support the travel methods continuously. This section details several initiatives which can be carried out.

5.4.1 Promoting green travel

Marketing and encouraging the different travel strategies will be an important aspect in promoting and implementing the plan. Getting students and staff involved will create a more relaxed and fun environment to encourage students and staff to walk or cycle to Learning Village.

5.4.2 Technology

In previous studies carried out by Arup, the issue of students carrying heavy bags was identified as a reason why students are less likely to walk to school.

A culture shift to electronic based teaching and learning is required to aid the initiatives identified. Text books could be provided electronically to limit the need to carry heavy books to and from Learning Village. Therefore, students will then have to carry less material to school.

5.4.3 Student involvement

Student involvement is a fun way of educating them about active travel. For example, Cottesloe Primary holds a drawing contest for the healthy travel to School plan logo. Student leaders are also appointed who will encourage and teach peers on the benefits of active transport. These leaders should be properly trained in road safety rules which will help educate peers. This will boost the Learning Village spirit and foster leadership skills to achieve change. Some possible incentives include:

- Food or snack vouchers can be given to students who walk or cycle to the Learning Village. This can be given out to by teachers at entrances.
- Pedometers for walking competitions
- Awards such as different pins for cyclists or children who walk to Learning Village
- Most number of steps walked for each year competition

5.4.4 Active travel

A mode shift from motorised transportation (principally being driven by car) to active transport improves children's health by[2]:

- Increasing levels of physical activity (and associated physical, psychological and social health benefits)
- Helping children maintain healthy weight
- Reducing injury due to motor vehicle crashes
- Reducing the environmental health damage caused by excessive car use (eg air and noise pollution, global warming)
- Reducing inequalities in children's health associated with physical activity, obesity, and motor vehicle crash injuries.

The Learning Village would support students walking to precinct either for the entire journey or for the last part of a journey from a drop-off point remote from the Learning Village.

There are a number of approaches the Learning Village could take to provide input to improving pedestrian facilities around the Learning Village.

- Local Councils are required to maintain footpaths and crossing points to meet public requirements.
- Safe Routes to school is a road safety program that aims to reduce children's involvement in road accidents. These require the agencies to work together where there is an identified need.
- Local Councils usually undertake PAMP studies across defined areas. This then enables funding to be allocated between local and state government to implement the recommendations of the study.

[2] Active transport: Children and young people, Dr Jan Garrard, 2009

5.5 Measuring effectiveness of transport strategies

5.5.1 Questionnaire

As discussed above, early planning and implementation of transport strategies before the opening of the school is crucial to the success of enabling long term sustainable transport modes. The school shall provide travel surveys to students and parents at 3, 6 and 12 months upon opening of the school.

The questionnaire surveys should be aimed at understanding how students are travelling to school. It should also assess the reason for not taking public transport. Based on the findings, the transport strategies should be improved and customised to suit the needs of these students.

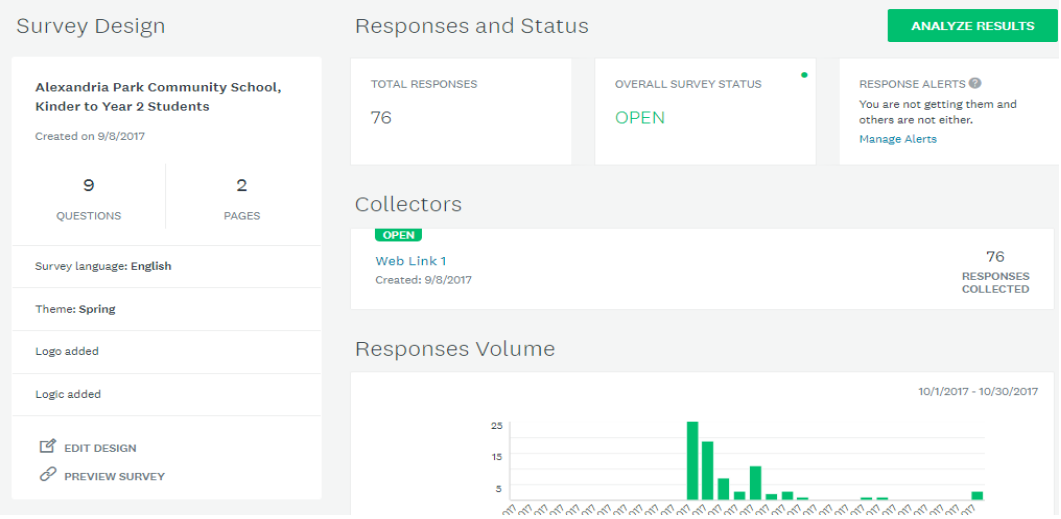


Figure 11: Survey monkey travel survey recently conducted for a school by Arup

6 Conclusion

Implementation of a Green Travel Plan and travel demand measures are essential for providing access to students, staff and visitors of Lindfield Learning Village in a sustainable way and meeting lower car mode share targets. The Green Travel Plan will contribute to a healthier and better quality of life for students and staff, and a reduction in air and noise pollution. The schools will benefit from more productive staff and students, cost savings and reduced demand for car parking.

Staff should be informed, inducted and educated of the travel mode targets. They should also be given ample notice and support in transitioning from driving to work, to taking public transport. The school should also support staff administrative needs such as providing lockers and storage spaces, reducing the need for staff to carry bulky items home.