2.5.4 Drop-off

The school has a pick-up and set-down zone on the south of Quarry Street. The bays are 70 metres long and accommodates eight drop-off spaces (No Parking) and three 15-minute parking spaces during school peak periods.

School commences at 9:00am with parents found gradually arriving between 8:15am to 9:00am. A large majority of them were found walking to school. Even during the busiest periods, the 11 drop-off spaces were found to have some spare capacity, shown in Photo 7. The vehicular drop-off zone operates efficiently with no double parking observed. Some parents were found to drop-off their children while others preferred to park along Quarry Street and walk their children to school.

Arrivals during the morning period occurred over a period of an hour. The existing drop-off zone was found to be able to accommodate the existing demand, with a maximum occupancy of 70% during the busiest period.

Car occupancy surveys

During the survey period from 8:15am to 9:15am, a total of:

- 50 students arrived by cars
- 35 cars were recorded dropping off students
- An average 1.4 student to car occupancy rate was observed.

The estimated mode share of the existing 335 students getting home from school is shown in Figure 15. It shows an extremely low car user rate with a large majority found walking or taking public transport.

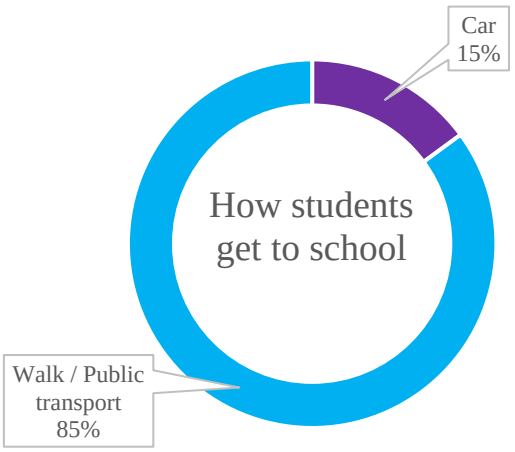

Figure 14: Existing estimated mode share for students 335 travelling to school

Photo 6: Cars parked along Quarry Street, 8:20am

Photo 7: Cars parked along Quarry Street, 8:50am

Photo 8: Quarry Street pick-up area unoccupied at, 9:10am

2.5.5 Pick-up

School ends at 3:00pm with parents found waiting at the foyer to pick up their children in Photo 9. A large majority of them were found to walk home with their children. Cars were parked along Quarry Street with all the pick-up bays found to be fully occupied as shown in Photo 10. This included the eight no parking bays which were parked with stationary vehicles. The vehicular pick-up zone operates efficiently with no double parking observed. This was due to the large walking mode share adopted by parents and children. By 3:15pm, the pick-up bays along Quarry Street were unoccupied as shown in Photo 11. Turnover rate was high with cars departing as soon as the children got into the cars.

A group of approximately 50 students was found forming outside the school at 3:20pm. These students were guided by staff to School bus 740 which was waiting along Jones Street. The bus then took them to an after school care at the community centre.

Car occupancy surveys

During the survey period from 2:40pm to 3:15pm, a total of:

- 30 students left by cars
- 21 cars were recorded picking up students
- An average 1.4 student to car occupancy rate was observed.

The estimated mode share of the existing 335 students getting home from school is shown in Figure 15. It shows a low car user rate with a large majority found walking or taking public transport.

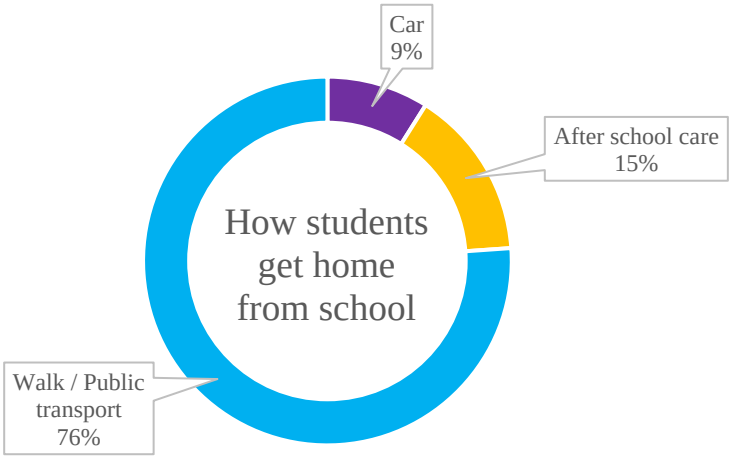

Figure 15: Existing estimated mode share for students 335 leaving school

Photo 9: Parents waiting at foyer for children, 2:45pm. A large majority were seen walking with their children

Photo 10: Quarry Street pick-up area occupied by parents waiting for children, 3:05pm

Photo 11: Quarry Street pick-up area unoccupied at, 3:15pm

Photo 12: Large number of students found walking with parents

Photo 13: Students gathering for afterschool care along Quarry Street, 3:20pm

Photo 14: School bus 740 leaving

2.5.6 Existing arrival profiles along Quarry Street

Surveys were carried out along the southern side of Quarry Street drop-off and pick-up area during both school peak periods.

The arrival profile during the AM peak is shown in Figure 16. Cars were found to arrive more gradually with the busier period at 8:50am.

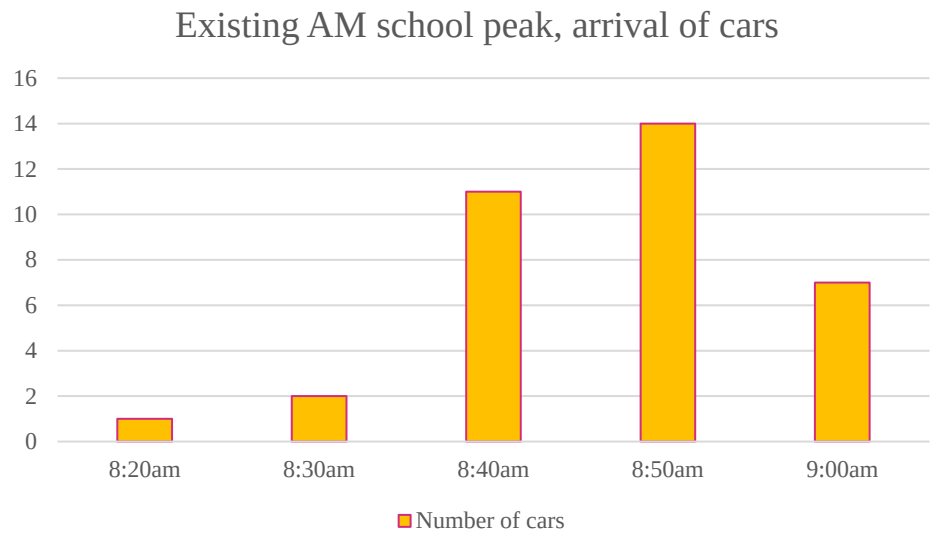

Figure 16: Arrival profile of cars during the AM drop-off period

The arrival profile during the PM peak is shown in Figure 17. The bays were found to be fully occupied at 2:50pm with parents parked and waiting for their children, as discussed in section 2.5.5. These cars departed promptly at 3:00pm with an additional six cars re-entering the pick-up area.

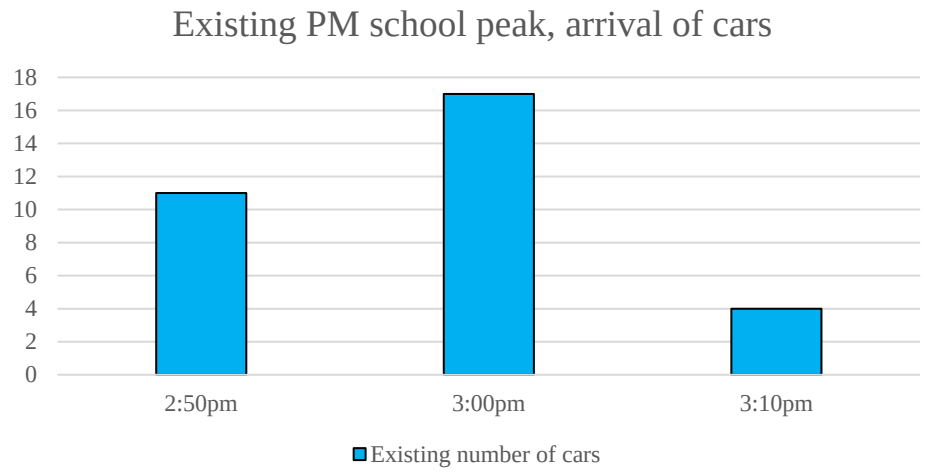

Figure 17: Arrival profile of cars during the PM pick-up period

3 Development overview

The new facility will be built in place of the existing school location which will meet the educational needs and demands for school assets for the future. A temporary school will be located at Wentworth Park during the construction phase of the school. The need is generated by the following:

- Urban development and additional new housing which is driving population growth and projected increases in student enrolments and demand for additional teaching spaces and facilities over the next five years and beyond (to at least 2031) within City of Sydney
- Limited capacity of existing primary school assets to accommodate projected increases in student enrolments and population growth.

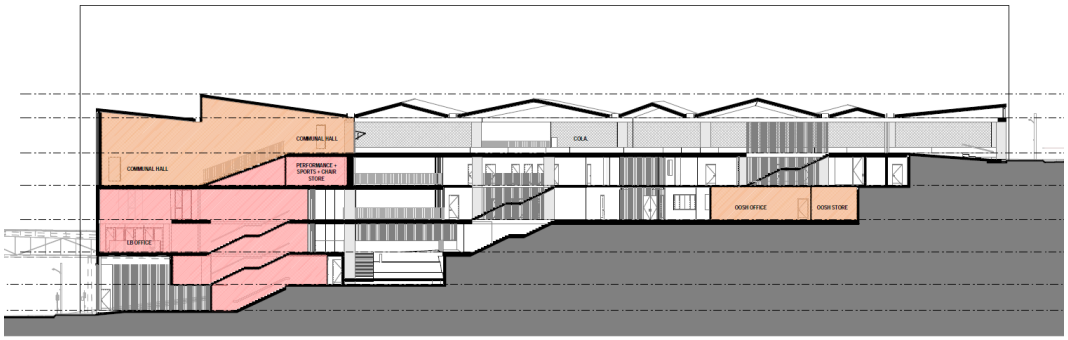

Figure 18: Section schematic design (DesignInc, Lacoste + Stevenson)

Existing Ultimo Public School arrangement

- 335 Kinder to Year 6 students
- 16 teaching staff and 5 non-teaching staff
- 13 permanent classrooms and 1 demountable

Completion of the New Ultimo Pyrmont Public School

- Up to 800 Kinder to Year 6 students (415 to 465 increase)
- 33 teaching staff members (12 increase)
- New classrooms and playgrounds distributed over four levels
- Shell place for child care centre
- Other community facilities

3.1 Pedestrian access

The proposed pedestrian access will remain at the existing location along the southern side of Quarry Street. Existing pedestrian infrastructure is efficient with safe crossing areas and park connectors leading to the school.

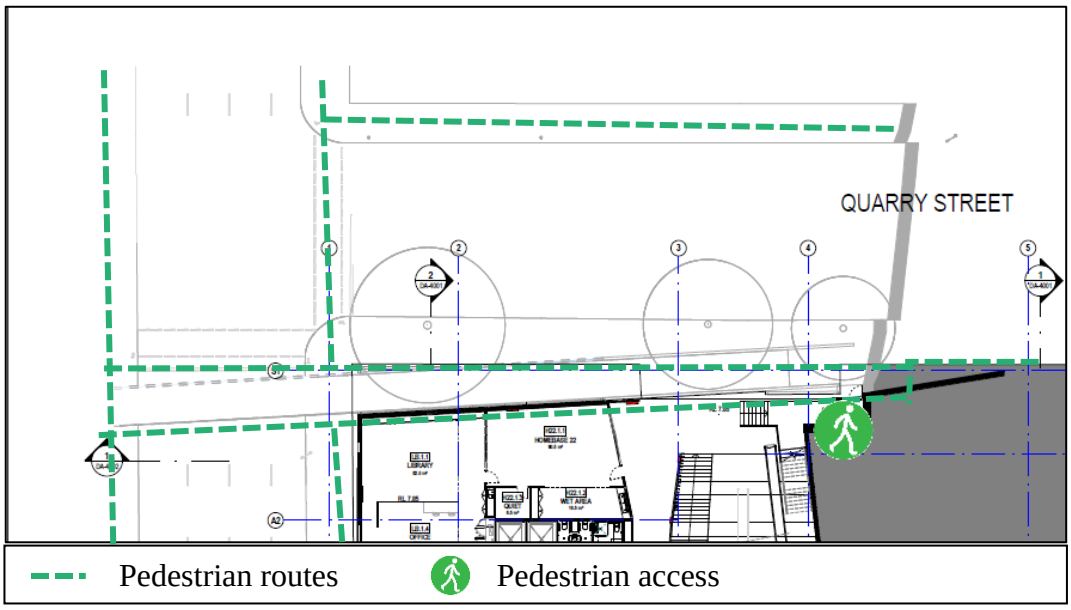

Figure 19: Pedestrian entry on level 1

3.2 Off-street parking and requirements

The existing 16 staff car park spaces will be demolished and built over. Parking spaces are proposed to be located on the northern end of the school, shown in Figure 20. It will consist of three spaces, two of which will be allocated as accessible parking spaces.

The Sydney Local Environmental Plan 2012 (SLEP) provides a maximum rate for the number of allowable parking spaces. The proposed three parking spaces is less than the existing 16 spaces and does not exceed the maximum permissible of 61 spaces (6,100m2 GFA /100 = 61 spaces). Section 4 provides an impact assessment of the reduction of off-street parking spaces.

Table 2: Sydney LEP parking rates

Component	LEP Rate
School	**(3) Information and education facilities:** The maximum number of car parking spaces for a building used for the purposes of information and education facilities is 1 space for every 200 square metres of the gross floor area of the building used for those purposes.
Child care centre	**(2) Child care centres:** The maximum number of car parking spaces for a building used for the purposes of a child care centre is 1 space plus 1 space for every 100 square metres of the gross floor area of the building used for those purposes.

Parking within the site is being provided as per AS2890.1 and AS2890.6.

3.3 Bicycle parking

3.3.1 Department of Education guidelines

The Department of Education website states that:

- Not all schools have the facilities to store students' bikes. The decision to install and maintain bike racks is made by the school. Some schools choose not to have bikes brought into the school. This may be due to safety reasons, or the inability to safely secure bikes. Principals have the authority to stop students from bringing bikes, scooters and skateboards onto school property.
- Bikes need to be stored in the area specified by the school. The school accepts no responsibility for loss, damage or theft. We recommend that students lock their bikes with a secure chain.
- The school may assist with safe storage of helmets if space permits.

Source: https://education.nsw.gov.au/road-safety-education/safe-student-travel/bikes

3.3.2 City of Sydney guidelines

The City of Sydney 2012 Development Control Plan (DCP) provides guidelines on the number of bicycle parking spaces that should be provided by a Tertiary educational institution at 1 per 10 staff and 1 per 10 students. No rates are provided for primary or secondary schools.

3.3.3 Proposed cycle parking

The overall cycling infrastructure surrounding the school is robust with good cycling connections in each direction. The residential streets around the school are bicycle friendly with low traffic volumes observed. Staff (more so than primary school students) should be encouraged to cycle to school, as such, the following cycle parking provisions are proposed:

Table 3: Proposed bike parking provision

	Number of people	Rate	Bike spaces
School Staff	33	1 per 10 staff	4
Kinder to year 6	800	1 per 50 students	16
Total proposed provision			**20**

A total of 20 bike parking spaces are proposed. To complement the parking facilities, the school should provide two shower facilities for staff as an end of trip provision. The proposed bicycle parking facilities will be located within the school, near the school entry. Bike parking facilities will be designed in accordance to Standards Australia AS2890.3 (Bicycle Parking Facilities), and should be provided in a sheltered and secure location. Staff will have access to a Class B facility in the parking/loading area while students will have Class C facilities on Level 4.

3.4 Shell space for child care centre

A shell space child care centre which can accommodate up to 40 children is proposed as part of the school upgrades. The shell space will be located within the school compounds.

The City of Sydney Child Care Centres Development Control Plan 2005[1] provides guidelines to the Planning and Design Criteria of a child care centre. The key transport and accessibility guidelines, along with how the school will fulfil them is shown in Table 4. The guidelines do not provide a minimum fixed number of required drop-off, pick-up or short-term parking arrangements. Section 5 discusses how the drop off and pick up can be accommodated.

Table 4: CoS Child Care Centres DCP 2005 guidelines

Child Care Centres DCP 2005 guidelines	Project arrangements
3.8.1 The number of car spaces and other relevant issues shall be in accordance with the provisions of the relevant LEP and DCP	The Sydney LEP 2012 provides guidelines where the maximum number of car parking spaces for a building used for the purposes of a child care centre is 1 space plus 1 space for every 100 square metres of the gross floor area of the building used for those purposes. The school is not providing limited parking as discussed in section 3.2.
3.8.3 Vehicle and pedestrian access points to the centre and parking areas are to be appropriately marked and signposted.	Vehicle drop-off would be located along Jones Street and is shown in Section 5. Appropriate signage will be erected.
3.8.4 All vehicles must be able to enter and leave the site in a forward direction.	The arrangement discussed in Section 5 fulfils this requirement
3.8.5 Parking and vehicle areas are to be separated from any area used by children by appropriate safety fencing and gates.	The arrangement discussed in Section 5 fulfils this requirement
3.8.6 All applications for Child Care Centres involving above 20 children shall be supported by a Traffic Report, addressing as a minimum the following factors: • (i) the prevailing traffic conditions; • (ii) the likely impact of the proposed development on existing traffic flows • (iii) pedestrian and traffic safety; • (iv) justification of any variation to the parking requirements • (v) how impacts of drop off and pick up will be accommodated.	The assessment is discussed in 6.

1 http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0009/119538/ChildCareCentresDCP2005ADOPTEDFINAL.pdf

3.5 Proposed vehicle access

3.5.1 Access location

The car park and loading dock are located at the lowest level of the development with direct access from Wattle Street as shown in Figure 20. The proposed vehicle access is located 14.5 metres south of the Wattle Street / Quarry Street intersection.

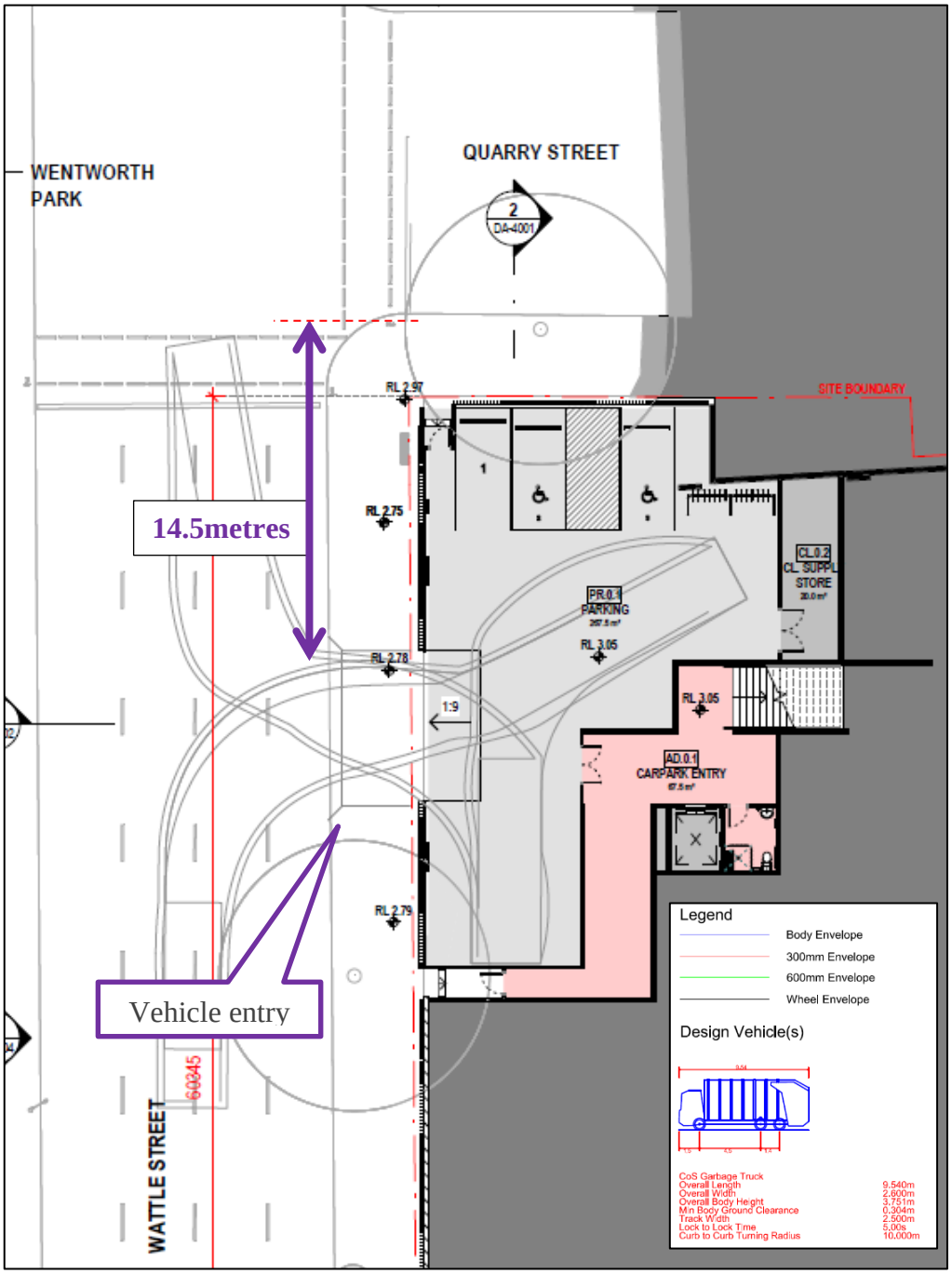

Figure 20: Proposed vehicle access point, with Swept path of 9.5metre City of Sydney Garbage Truck entering / exiting the site

3.5.2 On-street parking on Wattle Street

The proposed vehicle access for the New Ultimo Pyrmont Public School is proposed closer to Quarry Street and will result in an additional 10m of No Stopping (to a total of 30m No Stopping). As such, the existing driveway to the Ultimo Public School will result in the removal of the existing No Parking on-street restrictions, which also measures approximately 10m. Therefore, there will no net change of on-street parking in Wattle Street as shown in Figure 21.

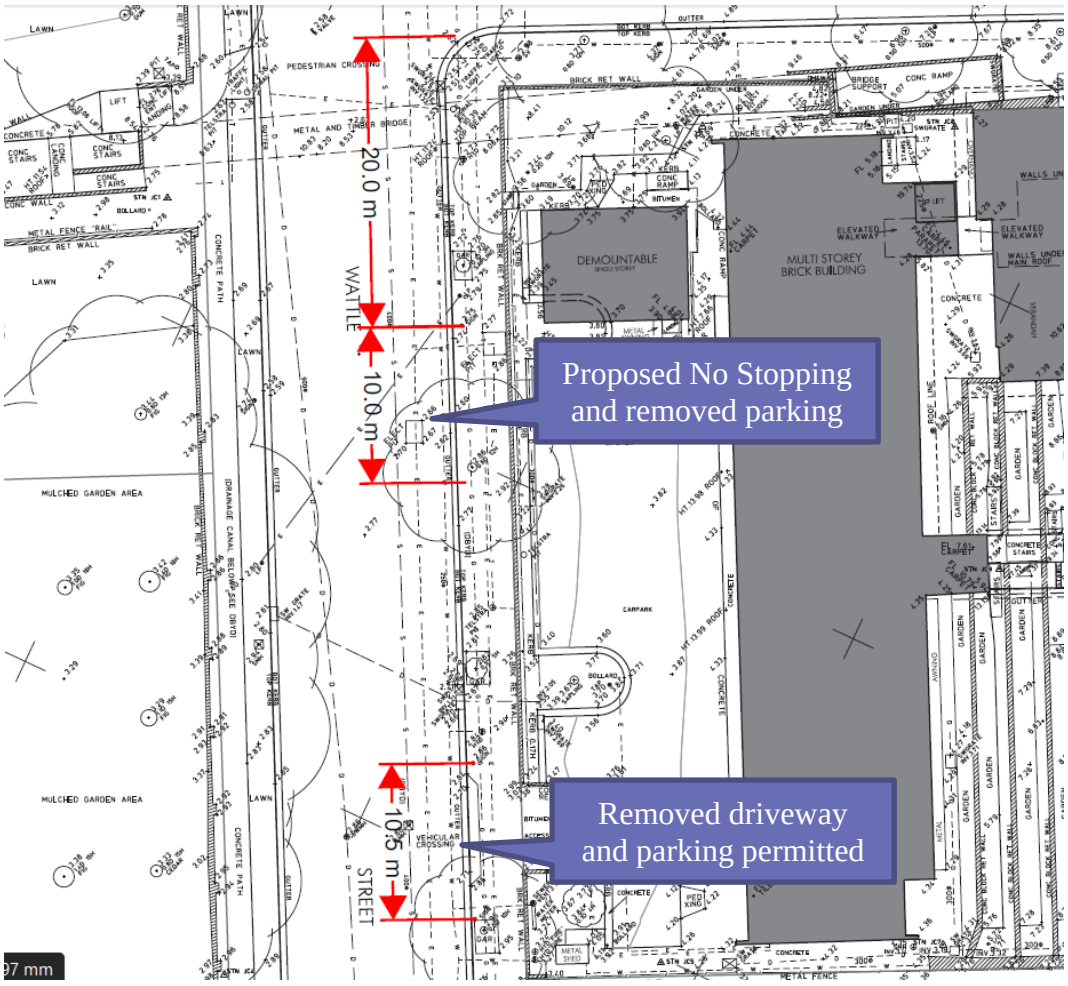

Figure 21: No Parking and No Stopping restrictions

3.5.3 Loading and refuse collection

The school is currently serviced by delivery vans and garbage trucks with the largest vehicle being approximately 9.5 metres in length. The contents of goods and refuse material proposed to be collected in the future would remain the same. Despite a larger quantity of refuse collection and deliveries required for the new school, it is anticipated that these can be accommodated within the same number of delivery / refuse trucks.

The anticipated vehicle activity for the Wattle Street driveway comprises delivery movements, waste and recycle collection, special needs student drop-off and pick-up and operational/staff vehicle movements.

Delivery movements:

Deliveries vary from 5 to 10 per week. They are usually small items such as stores and resources for teachers. These would be delivered by vans using the car spaces and small trucks.

Waste and recycle collection:

The school normally has 2 x general waste and 1 x paper/cardboard collections each week.

Special needs student drop-off and pick-up:

There may be special needs students in the school. Each student would be dropped off in the morning and picked up in the afternoon utilising either the accessible spaces in the car park or on-street parking.

Operational/staff vehicle movements:

1 car per day may access the car space in the car park and stay most of the day.

Summary of vehicle movements:

On a typical day there could be 1 waste truck, 1 delivery van/service vehicle, and 4 student cars (twice per day) visiting the site. This is a total of 6 entry and 6 exit movements per day.

- In the morning traffic/school peak 4 vehicles would enter and 4 leave the site.
- In the afternoon school peak 4 vehicles would enter and 4 leave the site.
- Delivery and service vehicles movements would occur through the day between the peaks.

With the number of proposed deliveries remaining within a similar range to existing conditions, the school would not generate a significant amount of additional traffic related to refuse collection and goods deliveries.

Swept paths using a 9.5 metre City of Sydney Garbage Truck have been conducted for the proposed loading dock area, shown in Figure 20. The trucks would enter and exit the loading area off Wattle Street, in a forward manoeuvre.

3.5.4 Vehicle sight distance

Wattle Street is one-way northbound at the site driveway with 3 traffic lanes and a kerbside parking lane on the eastern side. Parking is permitted on the western side between clearway periods. At the proposed driveway location there is no stopping on approach to the Quarry Street traffic signals.

The photographs shown in Figure 22 and Figure 23 have been taken from the driver's seat for a car and a truck exiting the site crossing the footpath but before entering the roadway. It is clear that all four of the traffic lanterns facing south become visible at this point. Exiting drivers will therefore be able to determine when they can proceed to join the traffic stream and be controlled by the traffic lights.

The loading dock and car park provides for a small number of vehicle movements over a typical school day. The driveway is located on Wattle Street close to the Quarry Street traffic signals. On site observations have confirmed that there are clear sight lines to the traffic signal lanterns facing south for drivers exiting the driveway. Given the Wattle Street one-way traffic flow in 2 or 3 lanes, the small number of vehicle movements using the driveway and the clear sight lines, the location of the driveway is considered acceptable.


View from car window towards traffic signals – traffic signals are visible


View from truck window towards traffic signals - – traffic signals are visible

Figure 22: Drivers eye view looking north from driveway

For car and truck drivers looking south on exit, there are clear sightlines to approaching traffic as shown in the photographs below.

	
View to the south from a car	View to the south from a truck

Figure 23: Drivers eye view looking south from driveway

To improve sightlines for vehicles exiting the site, it was requested by the RMS that the No Stopping restriction on Wattle Street be extended 10m to the south as shown in Figure 24 which requires the removal of 2 on-street parking spaces. These have a 4hr parking restriction.

Figure 24: Extended No Stopping controls on Wattle Street

4 Parking Impact Assessment

4.1 Off-street car park reduction

Part of the school upgrades will result in a reduction of 13 off-street parking spaces, with 3 parking spaces to be located on-site. These limited number of spaces will be allocated to less mobile staff, with two of these three spaces being disabled spaces provided on-site. The remaining space will be managed by the school and would either be allocated to staff or visitors. A majority of the staff would therefore be expected to use public transport or park in other off-street public parking stations.

4.2 On-street car parking availability

The existing on-street parking occupancy along Wattle Street, Jones Street and Quarry Street were found to be close to capacity during both school peak periods.

These surrounding local streets are predominantly time restricted with exception to residents (Permit Holders Area 20). The surrounding road network within the vicinity of the school does not provide any form of unrestricted on-street parking which limits the ability for staff to park.

As such upon completion of the school, existing and future staff will need to adopt an alternative form of transport due to the limited off-street parking provision. There would be no impact the existing on-street parking arrangements as a result of staff parking.

4.3 Staff travel behaviour

4.3.1 Existing

The existing staff car park is located off Wattle Street and has a capacity of 16 car spaces including 1 disabled parking space. Site observations on 10 August 2017 at 10:00am found all the spaces to be fully occupied. With the school having some 21 staff, this indicates that approximately 80% drive to work.

4.3.2 Target

It is envisaged that a large majority of the staff (with exception to the less mobile) will use the following alternative modes to travel to school:

- Surrounding public transport, bus, light rail and train
- Walk and cycle

Should staff still wish to drive, they may park at the nearby public car park shown in Figure 25. The nearest car park is located along 320 Harris Street and provides all day secure parking at hourly and monthly rates.

The school may organise an internal car pool scheme where teachers can share the cost of parking at the car park. A detailed green travel strategy for staff is discussed in section 7.1 and 7.3.

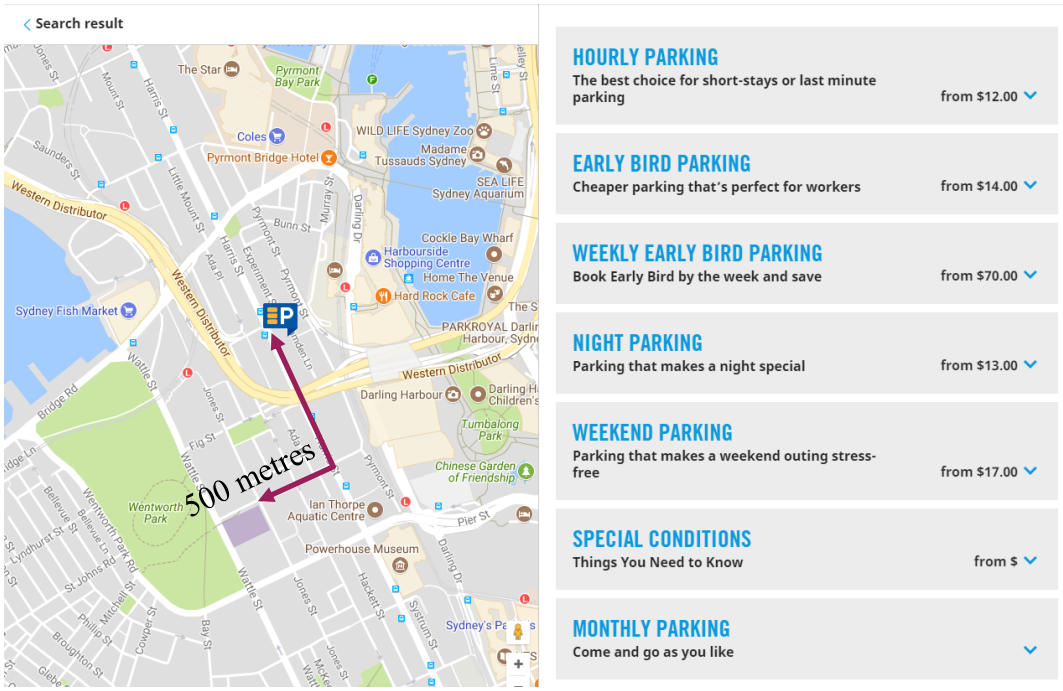

Figure 25: 320 Harris Street Car Park location and rates

Source: https://www.secureparking.com.au

The school will have to adopt a green travel plan to encourage existing and future staff to adopt alternate forms of public transport. These strategies are detailed in Section 7.

With the implementation of the Green Travel Plan and a much reduced on-site parking provision, it is assumed that there will be no additional traffic generation as a result of any staff number changes.

5 Future Drop-off and Pick-up Arrangements

5.1 Future arrival profiles along Quarry Street

5.1.1 School drop-off

The school currently has 335 students and is anticipated to accommodate an additional 465 students (a 139% increase). Assuming the future students adopt a similar arrival profile to existing students, a 139% increase is applied to obtain the future drop-off profile, shown in Figure 26.

Arrivals during the morning period occurred over a period of an hour. The existing drop-off zone was found to be able to accommodate the existing demand, with a maximum occupancy of 70% during the busiest period. Assuming no future mode shifts and a future profile to existing drop-off behaviour, the existing drop-off bays are unlikely to accommodate the 139% increase in drop-offs. Additional drop-off bays are therefore required.

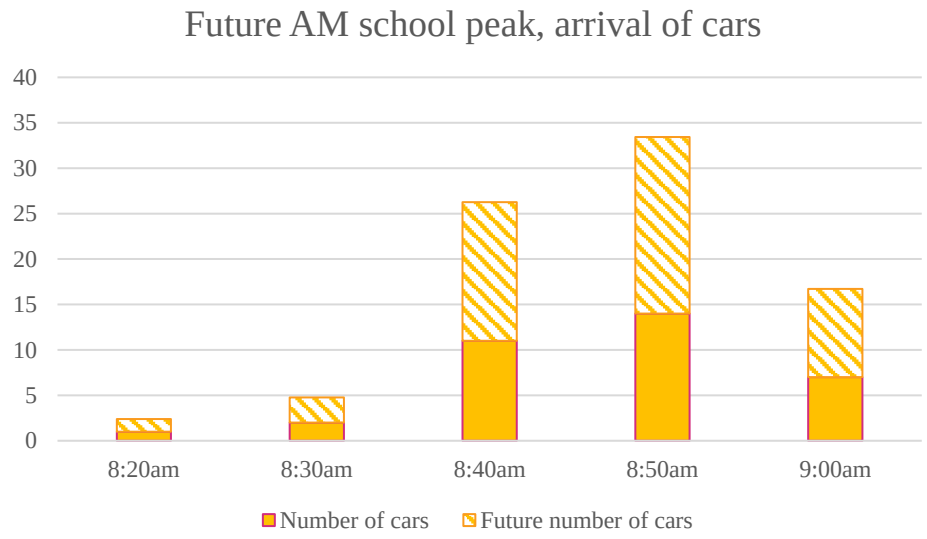

Figure 26: Future arrival profile of AM drop-off period, and the factored increase in number of cars at each time interval.

5.1.2 School pick-up

A future pick-up profile is developed using similar methods to the drop-off periods. As discussed in section 2.5.5, cars were parked along Quarry Street with all the pick-up bays found to be fully occupied shown in Photo 10.

This shows that parents arrive before school finishes to wait for their children. These queues however dissipate quickly within 10 minutes when the bell rings.

The supply of pick-up bays influences the time in which parents arrive. Given surrounding on-street parking is restricted, parents would be inclined to arrive later to pick-up their children, or be forced to circulate the block till an available pick-up space is free. The existing shortage of pick-up bays discourage parents to arrive before school finish times and arrive after 3:00pm where pick-up activity is less busy.

In conclusion, pick-up traffic volumes will reach a supply and demand equilibrium. Additional pick-up / drop-off bays should be designed to accommodate the anticipated drop-off profile.

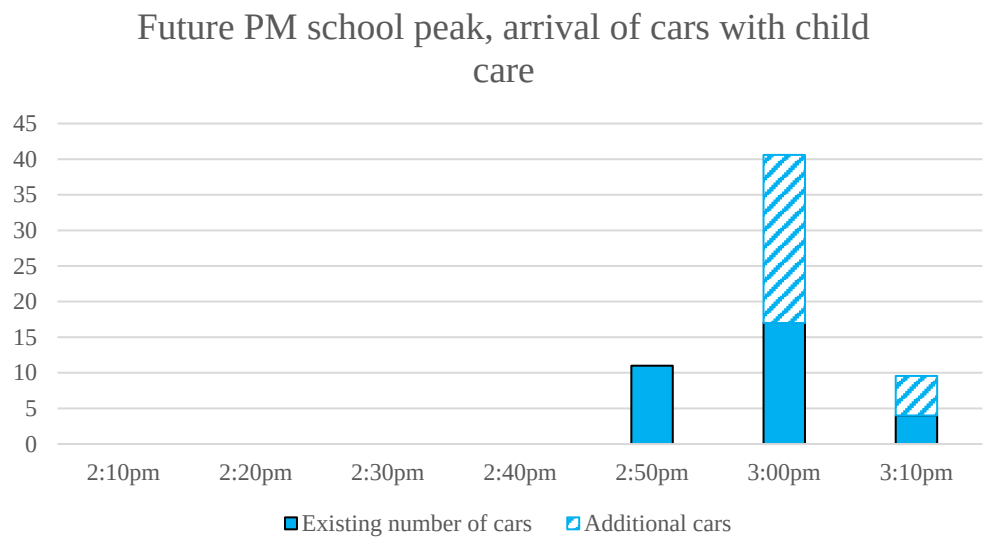

Figure 27: Future arrival profile of PM drop-off period, and the factored increase in number of cars at each time interval.

5.1.3 Cumulative drop-off with child care

The nearby KU Ultimo Children's Centre accommodates 48 children. The child care centre was surveyed during drop-off period from 7:30am to 10:30am, with 35 cars recorded arriving.

- 7:30am to 8:00am, 10 children arrived
- 8:00am to 9:30am, 30 children arrived
- 9:30am to 10:30am, 8 children arrived

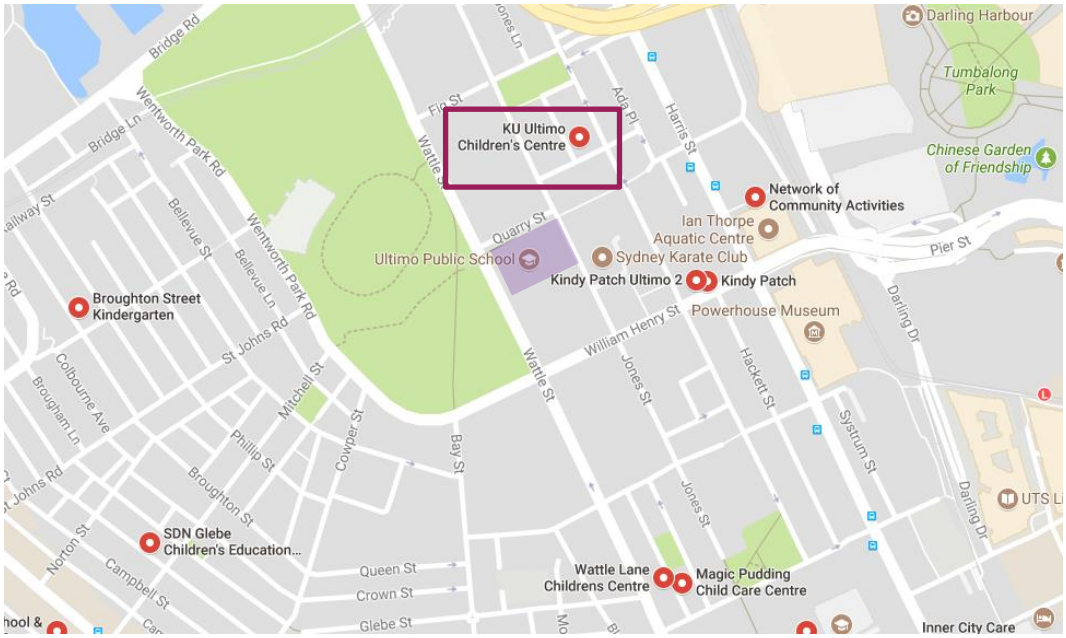

Figure 28: Nearby KU Ultimo Children's Centre

Assuming a similar profile for the proposed 40 child space child care centre in the school, a future cumulative drop-off profile has been developed, shown in Figure 29. This assessment has been performed for the provision of the child care facility, even though a child care shell is proposed with this application.

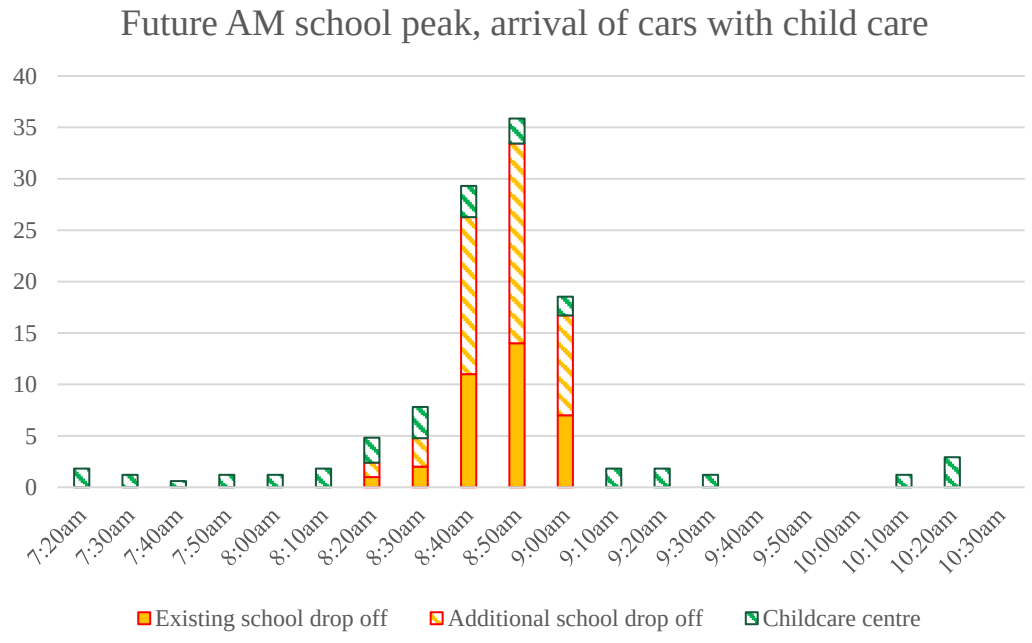

Figure 29: Cumulative arrival profile during the future school drop-off period, with a 40 child space child care centre

A similar profile is developed for the PM school pick-up period, shown in Figure 30. Child care pick-ups tend to occur at different times throughout the day and vary on a daily basis. A majority of the pick-ups occur outside of school peak periods given parents are often travelling home from work to pick up children.

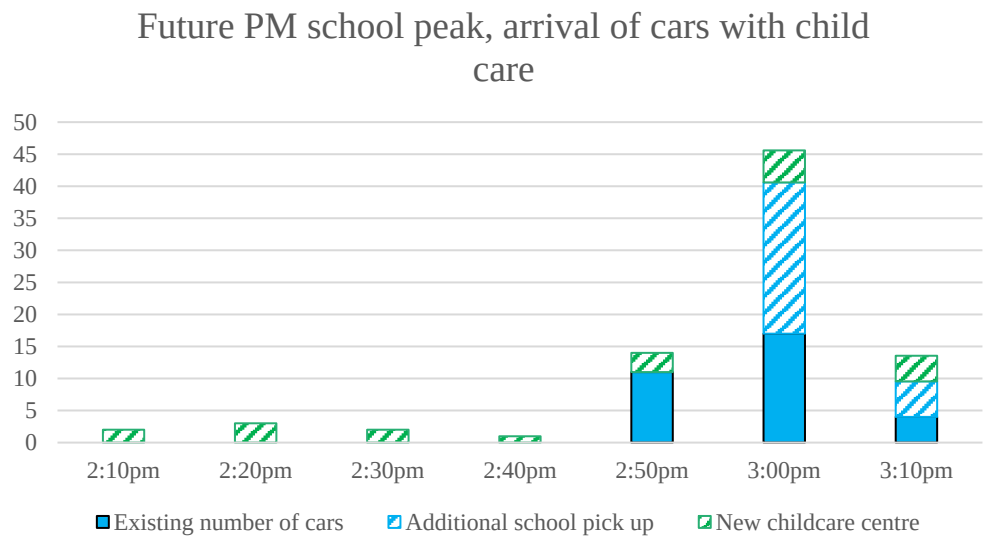

Figure 30: Cumulative arrival profile during the future school pick-up period, with a 40 child space child care centre

5.2 Additional provision of drop-off bays

Provision for additional drop-off bays can be along Jones Street, along the school frontage. This will require converting the existing bus zone which currently serves only school buses, to a "No Parking 8:00am to 9:30am, 2:30 – 3:30pm" restriction as shown in Figure 31.

Accessible set down would be provided within the school off Wattle Street, as discussed in section 5.1. No accessible spaces would be allocated along Jones Street.

The amount of bus services using the area does not match the demand which could be fulfilled by allowing parents to drop-off and pick up in these periods. Observed bus services were arriving after 3:20pm. Altering the restrictions to match these arrivals can assist in maximising the efficiency of this space.

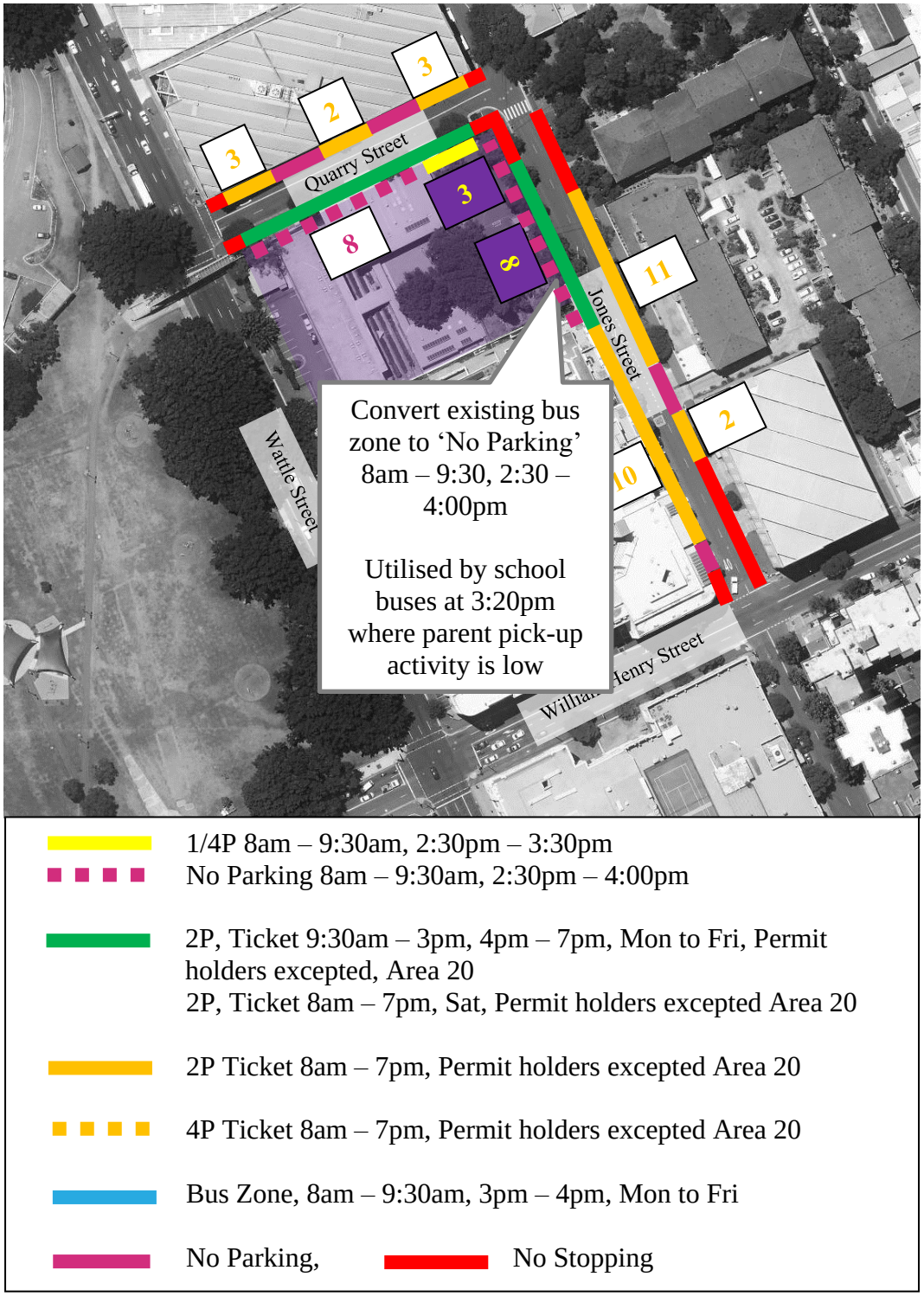

Figure 31: Proposed on-street parking adjustments

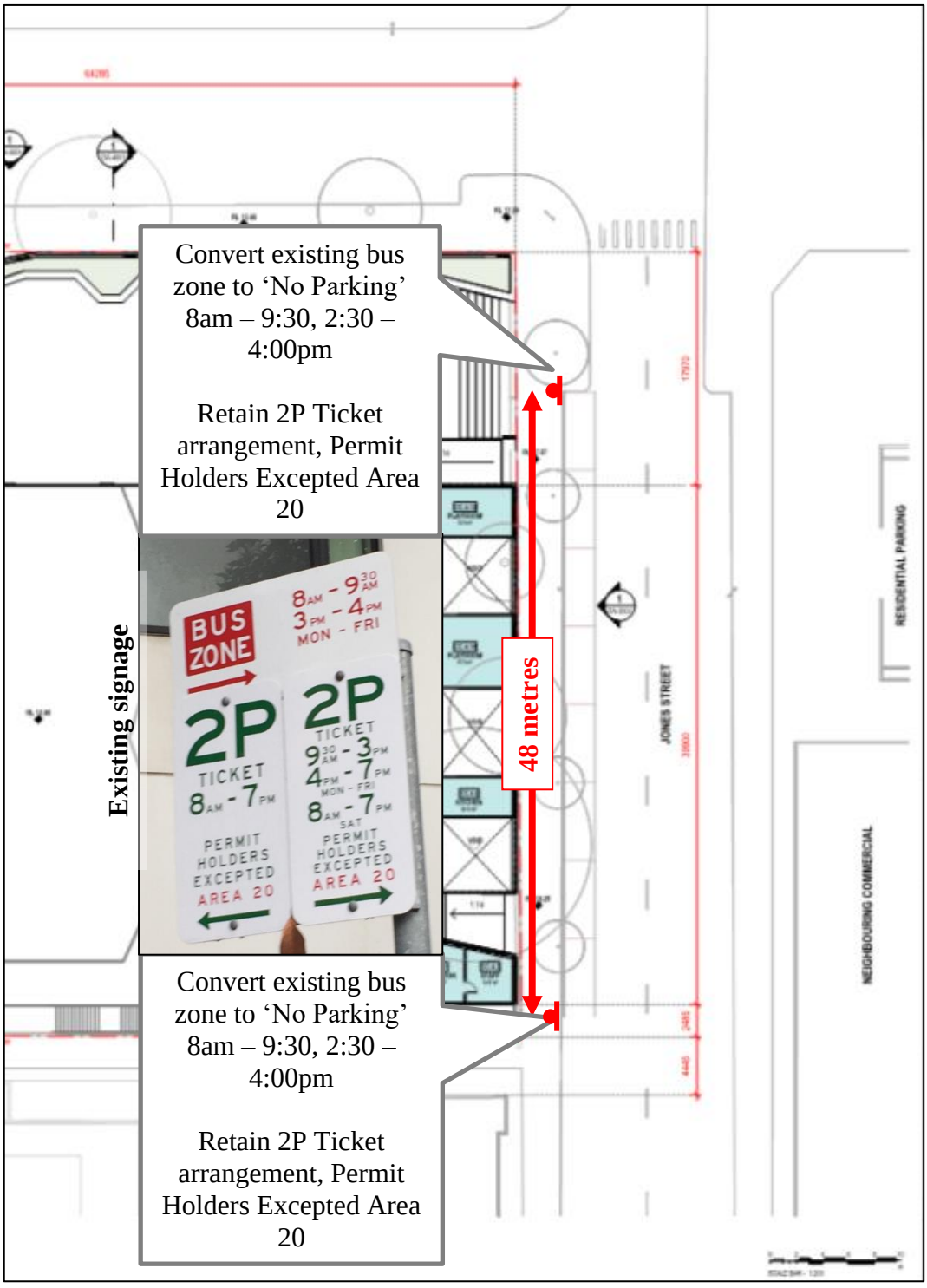

Figure 32: On-street parking adjustments

Source: DesignInc, Level 4, 03 General Arrangement Plan

5.2.1 General drop-off and pick-up

By allocating a No Parking kerbside restriction, a high turn-over rate will be encouraged. This will allow buses to occupy the space along Jones Street pick-up area. Pick-up surveys have indicated a low utilisation from parents from 3:20pm onwards. Any additional demand for pick-up can be supplemented along Quarry Street.

Through this arrangements buses will be able to occupy the No Parking area along the corner of Quarry Street and Jones Street. Kerbside utilisation competition is minimised between parents and buses.

An increase of eight drop-off bays equates to a 72% increase in available drop-off / pick-up bays. Given the existing school drop-off bays have additional capacity, the total of 19 spaces will be able to accommodate:

- An additional 465 students (a 139% increase). Of which 49 additional drop-offs are estimated between 8:20 to 9:00am
- An additional 40 children in the new child care centre. Of which 13 additional drop-offs are expected between 8:20am to 9:00am
- Pick-up provision is controlled by the availability of pick-up spaces discussed in section 5.1.2. Pick-up periods may result in higher peak demands. This should be subject to observation and should double parking be observed, further enforcement through parking rangers should be implemented

The eight additional drop-off and pick-up bays proposed along Jones Street will allow the efficient operation of the school in the future, yet allow the timely arrival of school buses to utilise these spaces when parent pick-up activity is lower.

5.2.2 Child care Centre

The existing three 1/4P 8am – 9:30am, 2:30pm – 3:30pm spaces can be used for the future child care centre. This number is deemed to be sufficient, based on observations from nearby child care centres. However, the availability should be subject to monitoring and constant feedback from parents. Should the number of short term parking bays be insufficient, there is scope to increase this number along Quarry Street by converting the existing No Parking bays to 1/4P 8am – 9:30am, 2:30pm – 3:30pm.

6 Impact assessment

6.1 Traffic generation

Based on the likely future drop-off and pick-up profile of additional students and child care, traffic generation rates for the AM and PM peak are developed. Upon completion of the school, it is anticipated that there would be an additional 61 trips in the AM peak and an additional 50 trips in the PM school peak hour (of which includes 13 and 20 vehicles in the AM and PM peak hours respectively for the child care centre).

It should be noted that this assessment uses a conservative approach to include the full occupancy of the shell child care centre. The delivery of a child care centre is not included in the submission of this project.

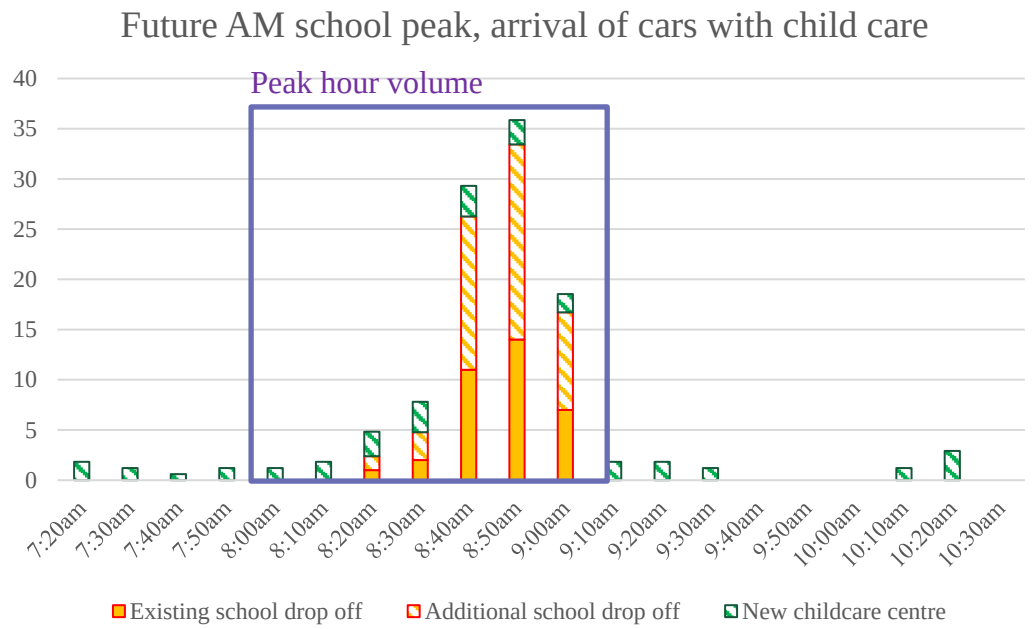

Figure 33: Future AM school peak car arrivals

Using a similar approach, a Future PM school peak profile for the arrival of cars is shown in Figure 34. Child care centre pick-up times generally occur outside of the school peak time.

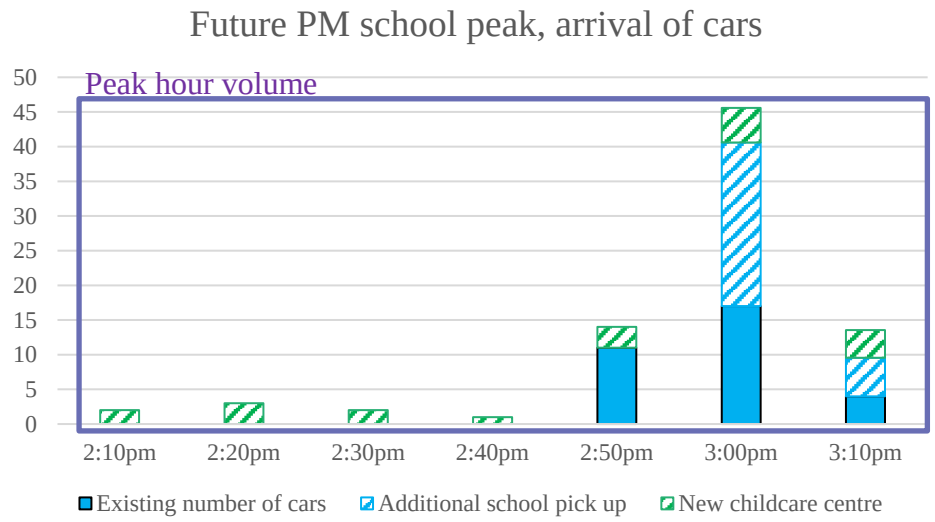

Figure 34: Future PM school peak car arrivals

6.2 Traffic distribution and counts

Based on the catchment boundary discussed in section 2.2, it is anticipated that a majority of the traffic would arrive from the north and south, illustrated in Figure 35. No traffic is expected from the west given the catchment does not extend west of Wentworth Park. Traffic arriving would leave in the same direction, within the same peak hour.

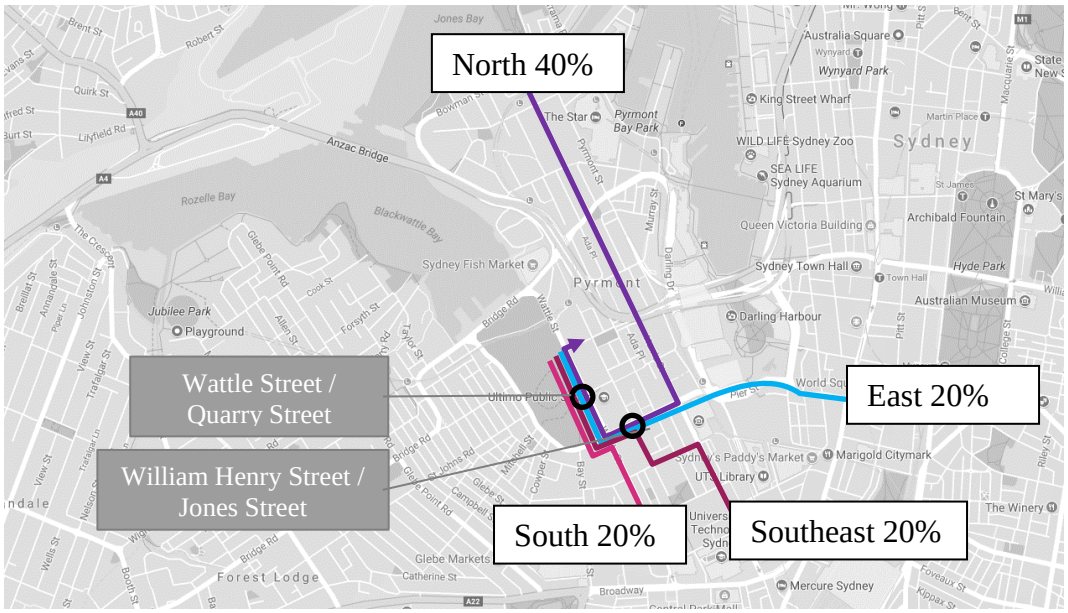

Figure 35: Assumed traffic distribution given catchment boundaries

Arup has commissioned Matrix to carry out traffic counts on Thursday 29 June 2017 at the following key intersections:

- Wattle Street / Quarry Street
- William Henry Street / Jones Street

The counts were carried out during:

- AM school and commuter peak, from 7:00am to 10:00am
- PM school peak, from 2:00pm to 4:00pm

6.3 Traffic modelling

6.3.1 Assessment criteria

The intersections have been assessed using RMS approved software SIDRA software. The existing intersection performance is assessed in this report in terms of the following three factors for each intersection.

- Degree of Saturation
- Average Delay (Seconds per vehicle)
- Level of Service

In urban areas, the traffic capacity of the major road network is generally a function of the performance of key intersections. This performance is quantified in terms of Level of Service (LoS), is based on the average delay per vehicle. LoS ranges from A = very good to F = unsatisfactory (see Table 5).

Table 5: Level of service criteria for intersections

Level of Service	Average delay (seconds)	Description
A	Less than 14	Good operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At Capacity. At signals, incidents will cause excessive delays. Roundabouts require other control mode
F	Greater than 71	Unsatisfactory with excessive queuing

Another common measure of intersection performance is the degree of saturation (DoS), which provides an overall measure of the capability of the intersection to accommodate additional traffic. A DoS of 1.0 indicates that an intersection is operating at capacity. The desirable maximum degree of saturation for an intersection is 0.9.

The existing scenario SIDRA models were calibrated to match existing queue lengths observed during the site visit.

The results of the surrounding intersections are summarised in the following section.

6.3.2 Results

Modelling was performed on key intersections adjacent to the site, shown in Figure 35. This is to determine whether these are performing effectively in the present year, and whether they would perform effectively in a future year with the completion of the school. A summary of the SIDRA results is shown in Table 6 and Table 7.

Existing performance

Both intersections are performing efficiently with an overall average level of service A. The intersection was also observed to perform with minimal queuing and delay with spare capacity available,

Future performance

Traffic generated from the proposal was added to the model based on the traffic generation numbers and traffic distribution discussed in sections 6.1 and 6.2 respectively. Results suggest that that intersections will continue to perform efficiently with no change in level of service.

Table 6: SIDRA Results Quarry Street / Wattle Street

Peak Period	Existing				Future			
	Deg Satn	Average delay	Level of Service	95%ile q (m)	Deg Satn	Average delay	Level of Service	95%ile q (m)
AM	0.326	5.4	A	56	0.34	6.7	A	7.7
PM	0.378	4.6	A	68	0.38	5.3	A	9.5

Table 7: SIDRA Results William Henry Street / Jones Street

Peak Period	Existing				Future			
	Deg Satn	Average delay	Level of Service	95%ile q (m)	Deg Satn	Average delay	Level of Service	95%ile q (m)
AM	0.343	10.9	A	63	0.34	12.2	A	8.8
PM	0.238	11.4	A	30	0.28	12.5	A	4.2

Completion of the school is not envisaged to affect the surrounding key intersections adversely. This is due to the existing efficient performance and the low quantity of traffic added by the school.

7 Strategies / Transport Management Plan

This section discusses the various transport strategies which the school may implement for staff. These initiatives aim to:

- Reduce parking demand from staff
- Reduce private vehicle usage of staff
- Reduce traffic congestion and improve existing intersection performance

7.1 Staff Green Travel Plan

To minimise the impact, the effects of on-street parking by staff, the school can implement green travel strategies for staff (and the wider school community). These solutions are easy and cost effective:

- Staff carpool, the school could help organise a system which will reduce single private vehicle car trips to the school (explained further below)
- Encourage staff to take public transport / active transport by making it inclusive and entertaining:
  - Host active travel events – such as 'Ride to Work Days'
  - Safe riding days / demonstrations
  - Communication of benefits and measurements of improvements
- Improve walking and bicycle facilities and infrastructure in and around the school.

This plan could be implemented during the temporary relocation stage to ensure a gradual transition of mode shift and adoption of the proposed measures.

7.1.1 Active Transport/ Bike/ Scooter

As described in Section 2.3.5, the schools have good 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.). 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;
- Consider 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 on 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.

7.1.2 Carpooling

Possible ways to further encourage carpooling may include staff registering their interest in carpooling by indicating where they live and matching their shift times with colleagues. The nearby public car park along Harris Street (discussed in section 4.3.2) can be utilised as a parking locations.

Under this scheme, the school would 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, staff should be aware of the benefits and convenience.

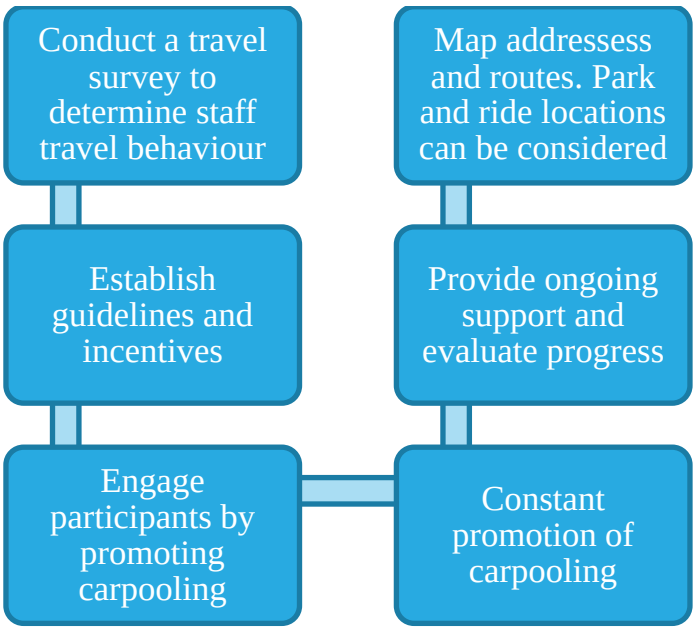

Figure 36: Setting up carpooling for staff[2]

[2] http://www.transport.wa.gov.au/mediaFiles/active-transport/AT_TS_P_Car_Pooling_Toolkit.pdf

UberPOOL

While UberPOOL has not been introduced in Sydney yet, it would create an efficient and cost efficient mode of transport for staff. According to Uber:

- UberPOOL allows you to share your ride and split the cost of your trip with another Uber rider headed in the same direction.
- The average time added to an uberPOOL trip is less than 5 minutes. Each uberPOOL rider can bring one additional passenger along.

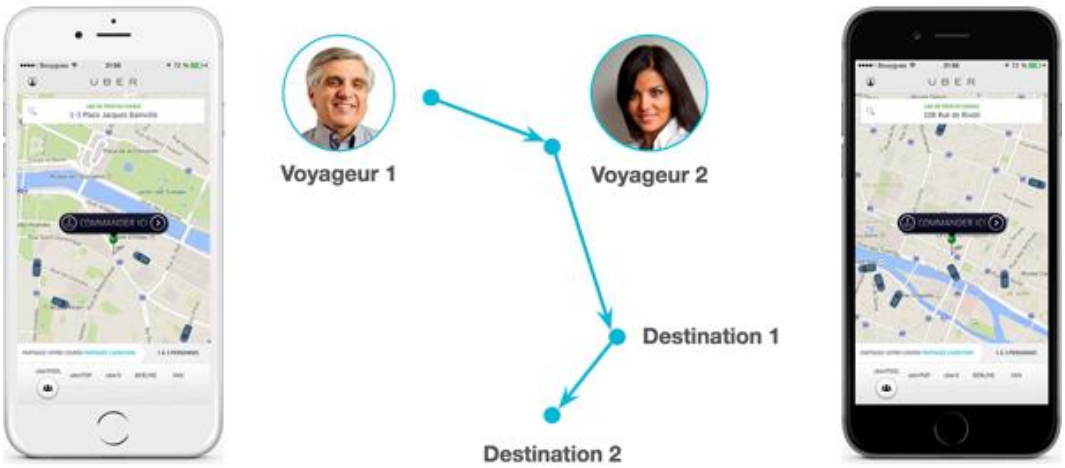

Figure 37: UberPOOL (newsroom.uber.com)

7.1.3 Pool cars, 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 and dedicate at least one car space for this use. 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 are 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 share system for trips during the day for staff.

7.2 Student Green Travel Plan

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 campus population increase by:

- 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 no net impact from School population and proposed development increases on existing traffic conditions.

7.2.1 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

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.

The School currently coordinates the process of having bus passes arranged for students. The School will continue to do this and raise awareness of this as an offering, to encourage greater use of public transport.

7.2.2 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.

- 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.

7.2.3 Public Transport

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

- Manage the student drop-off and pick-up areas surrounding the schools;
- 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.

7.2.4 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.

- 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; and
- Participate in Walk to Work day and look into holding a ‘healthy breakfast’ as a reward to all those who participate.

7.3 Scheme Administration

7.3.1 Administration

An essential part of an effective Green Travel Plan is to nominate a Travel Plan Co-ordinator for students. 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.

7.3.2 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.

7.3.3 Staff Induction

To ensure new members of staff are aware of the Green Travel Plan, all new 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.

7.3.4 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 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.

7.3.5 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.

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 NSW Long Term Transport Masterplan, 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.

8 Outline Construction Traffic Management Plan

The construction of the development will require access for heavy vehicles travelling to and from the site. Prior to the commencement of construction, a Construction Pedestrian and Traffic Management Plan (CPTMP) will be prepared to ensure the safest possible management of construction access and appropriate mitigation measures. The CPTMP would be prepared by the Construction Contractor and address:

- The likely construction vehicle numbers and frequency;
- Approach and departure routes;
- Parking access arrangements during construction; and
- Provision of acceptable pedestrian management measures

A preliminary CTMP (refer to Appendix B) has been prepared alongside the Construction Management Plan and follows the following framework:

- Description of proposed works
- Impact of proposed measures
- Effects on existing and future developments
- Detailed of provisions made for emergency vehicles, heavy vehicles and cyclists
- Measures to ameliorate impacts
- Public transport services affected
- Public consultation

9 Conclusion

The existing Ultimo Public School has 335 students accommodated in 13 permanent classrooms and 1 demountable. The New Ultimo Pyrmont Public School will be built in its place and be designed to accommodate up to 800 students. The number of staff will increase to 33 teaching staff members. A shell space child care centre which can accommodate up to 40 children is proposed as part of the school upgrades.

- The existing staff car park spaces will be demolished and built over. Parking spaces proposed to be located on the northern end of the school. New parking will consist of three spaces, two of which will be allocated as accessible parking spaces.
- The Sydney Local Environmental Plan 2012 (SLEP) provides a maximum rate for the number of allowable parking spaces. The proposed three parking spaces are less than the 16 existing car spaces including 1 disabled parking space and the allowable provision by the LEP.
- A total of 20 bike parking spaces are proposed. To complement the parking facilities, the school should provide two shower facilities for staff as an end of trip provision.
- To cater to match existing staff parking demand, travel strategies have been proposed, which would encourage a more sustainable means of transport to school. The school plays an important role in encouraging, organising and implementing these strategies. The strategies would reduce private vehicle usage, parking demands and congestion.
- Upon completion of the School, it is anticipated that there would be an additional 61 trips in the AM peak and an additional 50 trips in the PM school peak hour (of which includes 13 and 20 vehicles in the AM and PM peak hours respectively for the child care centre).
- Observed intersections adjacent to the school are performing efficiently with modelling indicating an overall average level of service A.
- Completion of the school will not affect the surrounding on-street parking which is predominantly time restricted.
- There is a suggested provision for additional drop-off bays can be along Jones Street, along the school frontage. This will require converting the existing bus zone which currently serves only school buses, to a “No Parking 8:00am to 9:30am, 2:30 – 3:30pm” restriction. The eight additional drop-off and pick-up bays proposed along Jones Street will allow the efficient operation of the school in the future, yet allow the timely arrival of school buses to utilise these spaces when parent pick-up activity is lower.
- The school’s existing mode share has a healthy mix of people walking and taking public transport. It is well placed to further take advantage of the efficient walking and public transport catchment. The school could also adopt several strategies from the recommended Green Travel Plan. The transport and traffic strategies recommended in this report ensure the efficient operation of the school without affecting the surrounding road network adversely.

Appendix A

Consultation with authorities

ARUP

Subject Ultimo Public School - RMS/TfNSW on-site meeting to discuss access

Date 3 October 2017 Job No/Ref 255340

Meeting Date: 29 September 2017

Attendees:	**Organisation:**
Kerry Ryan	RMS
Rachel Nicholson	RMS
David Ballm	RMS
George Mobayed	TfNSW
Charlotte Berry	Department of Education
Katie Fairbrother	HKA
Iulia Brooks	HKA
Sandeep Amin	DesignInc
Jacqueline Urford	DesignInc
Belinda Dawes	Lacoste Stevenson
Tristan Balogh	Lacoste Stevenson
Oliver Klein	Roberts Day
Andrew Hulse	Arup

Issues raised in RMS response dated 14 September 2017 discussed on site.	**Discussion and response**
Clause 101 of ISEPP requires lower order road to be used.	The topography of the site does not allow the loading dock to be located off Jones Street at the top of the site. Both Jones Street and Quarry Street provide frontages for drop-off and pick-up by private car and bus. Wattle Street most appropriate as it is at the bottom of the site and is where the current access is provided.
Any proposed vehicular access shall allow all vehicles to be accommodated on site before being required to stop. Any security gate will need to be recessed such that the largest vehicle can be contained wholly on site before being required to stop in order to prevent queuing onto the footpath of Wattle Street.	The security gate located on the boundary will be open during school hours enabling vehicles to enter the site without stopping. Security will be controlled at the internal pedestrian door location.
The swept path of the longest vehicle (including garbage trucks, maintenance and delivery vehicles) entering and exiting the subject site, as well as manoeuvrability through the site to loading areas, is to be in accordance with Austroads requirements.	The design vehicle swept paths are designed in accordance with AS2890.1 and AS2890.2 with the vehicle crossover being dimensioned to allow vehicles to enter and leave within the driveway.
It is noted that service vehicles will undertake reverse movements in the general car parking area. Pedestrian facilities should be provided within car parking areas to provide safe passage for pedestrians to the school from car parking spaces to eliminate potential pedestrian conflicts within heavy vehicles as far as practical (particularly for pedestrians with a mobility impairment).	Pedestrian safety within the car park will be achieved by: - Clearly marked pedestrian routes - Signage - Timing of deliveries during the day between school start and finish times.

Close proximity of driveway to Quarry Street traffic signals is not supported.	The key issue to address is the driver's ability to see the traffic lights at the Quarry Street intersection and the oncoming traffic along Wattle Street on departure. - The driveway will be moved a further 3 metres south to increase the separation. - The first 10m of car parking will be changed to No Stopping to improve sight lines. - The light pole to be investigated for removal and replacement on the western kerb of Wattle St. - The gate opening should be wide enough to provide clear sight lines south. - The wall along the Wattle St frontage will be open grille to provide clear sight to pedestrians walking on the footpath. - Current design has only 1 standard and 2 accessible parking spaces to cater for special needs children and deliveries. - Garbage collection and loading is expected to be very low at 1 -2 vehicles per day. On the basis of these amendments to the plans, RMS supported the design based on low usage patterns. Arup will document these outcomes in the traffic report for the SSDA.

Appendix B

Outline Construction Pedestrian and Traffic Management Plan

B1 Introduction

This report details the Construction Pedestrian and Traffic Management Plan (CPTMP) for the proposed works at Ultimo Public School. The plan has been created by Arup on behalf of the School Infrastructure NSW for the Environment Impact Assessment.

The purpose of the CPTMP is to assess the proposed construction and site preparation works and operation of construction traffic associated with the proposed development with respect to safety and capacity. The CPTMP is to be submitted for comment by the relevant authorities.

This plan will detail the management needed to control construction traffic, while minimising effects on the surrounding developments and allowing for appropriate access at all times. The Construction Contractor will prepare a CPTMP with detailed Traffic Control Plans detailing specific methods of safely managing construction vehicle traffic within the surrounding area when appointed.

B2 Description of Proposed Works

B2.1 Location

The school is located on the corner of Wattle Street and Quarry Street in Ultimo, just outside of the Sydney CBD. The school is bounded by Wattle Street which is a State Road, Quarry Street and Jones Street which are local roads.

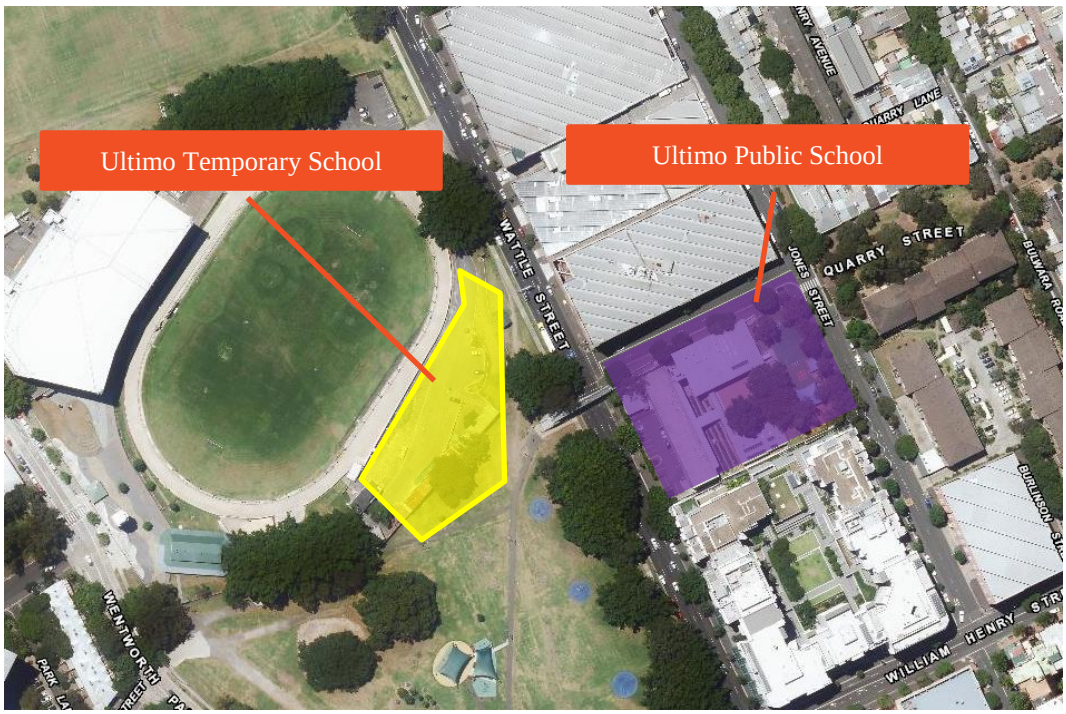

Figure A1 Site Location

B2.2 Overview of proposed development

The DA seeks approval to facilitate the redevelopment of the site. This includes construction, site establishment and access arrangements. Specifically the works include:

- Site establishment and protection of adjoining development;
- Protection, diversion and/or temporary establishment of services and infrastructure as required;
- Erection of perimeter fencing, hoarding, gantry, scaffolding and site accommodation;
- Minor bulk excavation works

A more detailed and comprehensive description of the proposal is contained in the Preliminary Construction Management Plan prepared by HKA. It is proposed that the existing primary school be substantially demolished and replaced with a multi-story building.

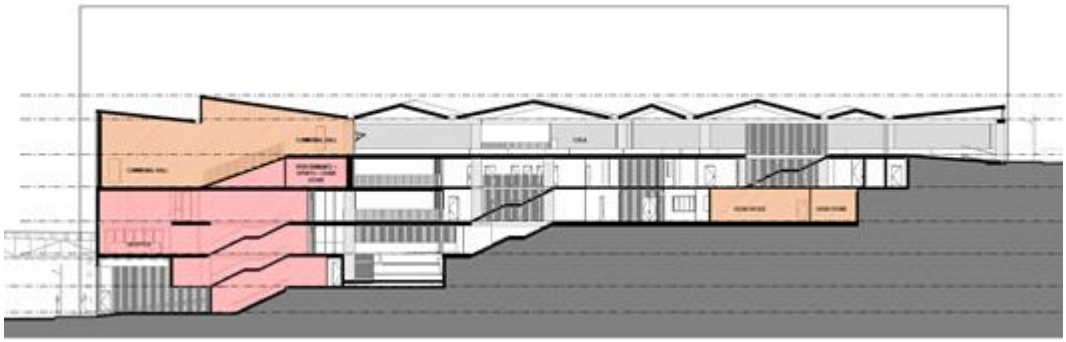

Figure A2: Elevation schematic design (DesignInc, Lacoste + Stevenson)

B3 Construction Management Plan

B3.1 Truck routes and controls

Construction vehicles would be restricted to the state road network for access to the site and vehicles will likely originate from this network. It is envisaged the main site entrance will be off Wattle Street. These routes are shown in Figure A3.

Some movements may also be required along local streets which will only permitted immediately adjacent to the site on Jones Street and Quarry Street for occasional site access.

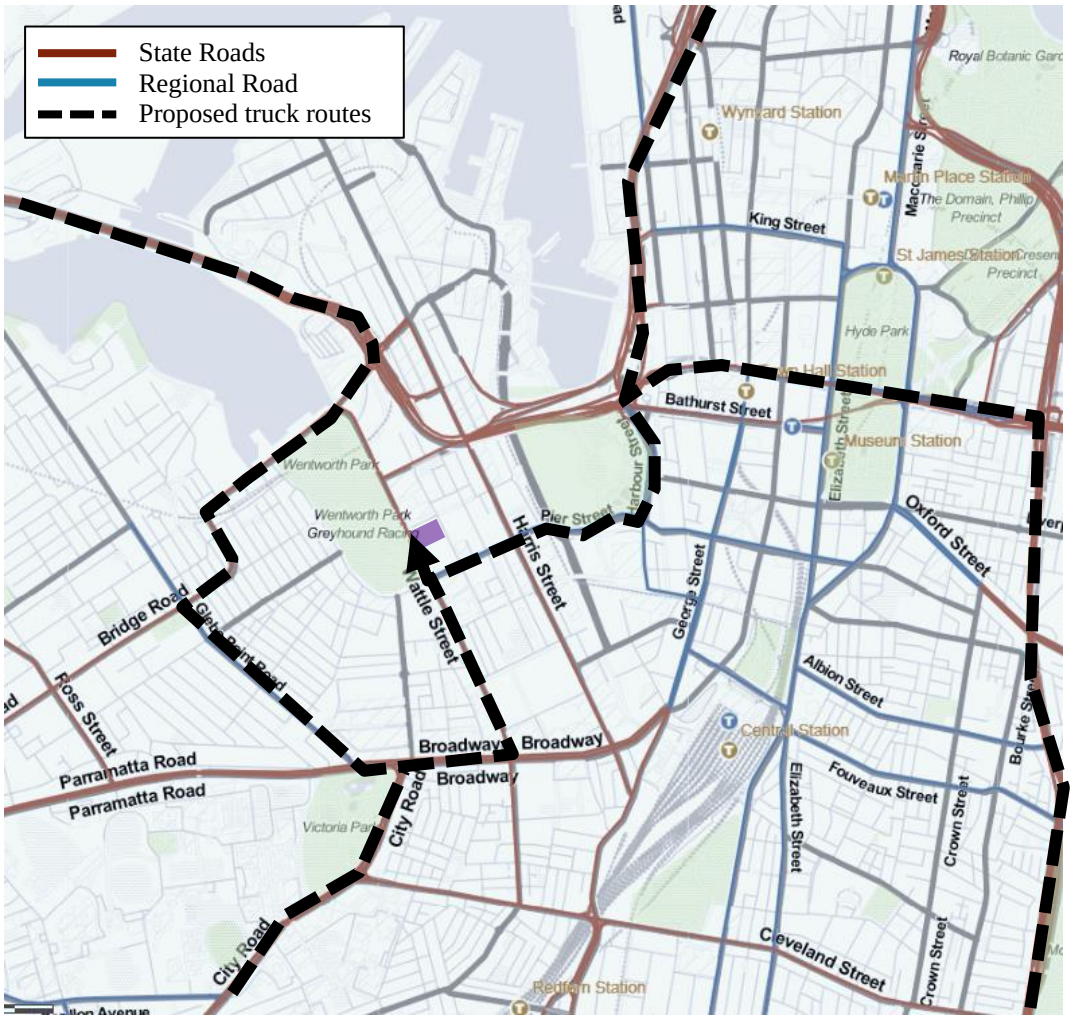

Figure A3: Construction Vehicle Routes

B3.2 Vehicle types

Vehicles that will access the site during construction will comprise:

- Articulated Vehicles (AV) for delivery of site equipment.
- Heavy Rigid Vehicles (HRV) for construction materials removal.
- Truck and Dogs for construction materials removal.

All heavy goods such as machinery plants will need to be delivered outside of peak traffic hours and school peak hours.

B3.3 Pedestrians

Pedestrians will be diverted and controlled by traffic controllers as necessary when larger vehicles wish to access the site. They will control pedestrians as well as vehicles. Pedestrians will be directed through appropriate fencing / hoarding along the street frontages, shown in Figure A4.

The existing footbridge across Wattle Street, connecting the school and Wentworth Park will remain operational and shall not be affected by construction works.

As the site entrance will be at Wattle Street, the interaction with pedestrians is expected to be limited.

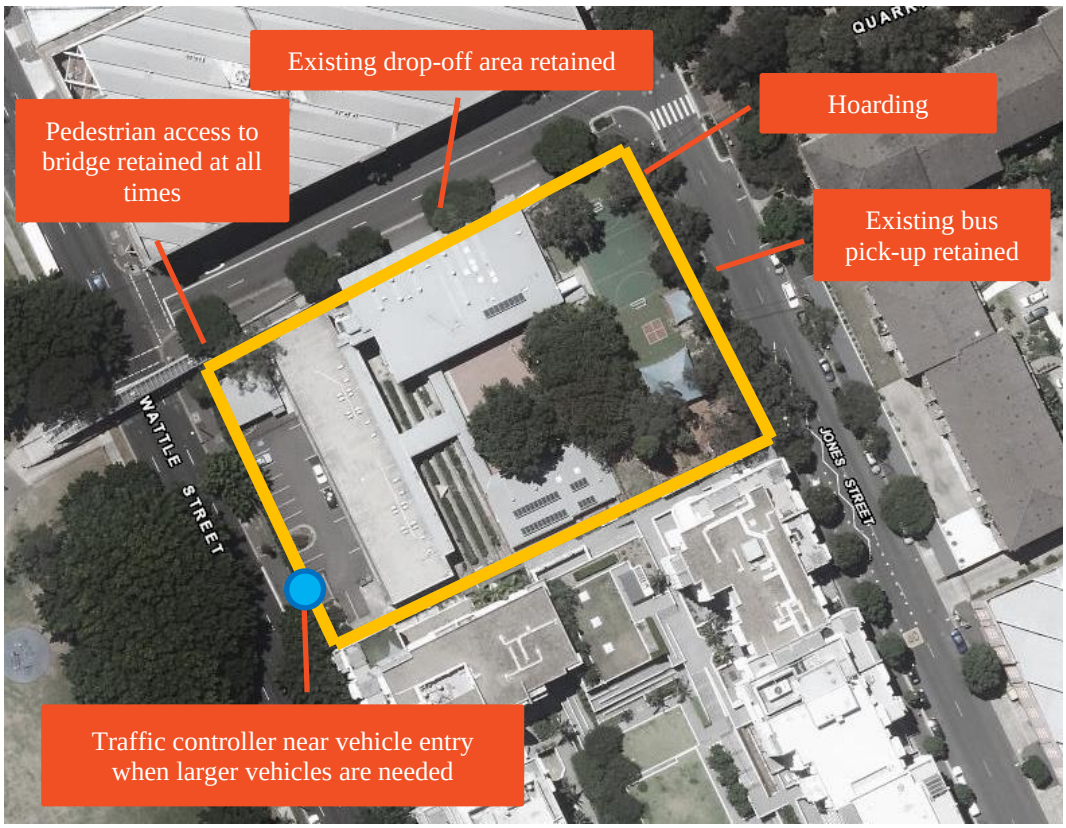

Figure A4: Proposed pedestrian controls

B3.4 Vehicle access

The existing general vehicle access (school drop-off and pick-up) will be retained and shall not be affected during school peak times between:

- 8am – 9:30am
- 2:30pm – 3:30pm

The existing drop-off area along the southern side of Quarry Street will be retained, as will the bus pick-up area along Jones Street. These areas will continue to serve the temporary school (see Figure A4).

Vehicle access for an 18.3 metre articulated Truck and Dog is shown in Figure A5. The vehicle is shown using the third lane along Wattle Street. The fourth lane is being used for parking which is to be retained. The existing car park at Wattle Street level will be used for truck staging during the construction process.

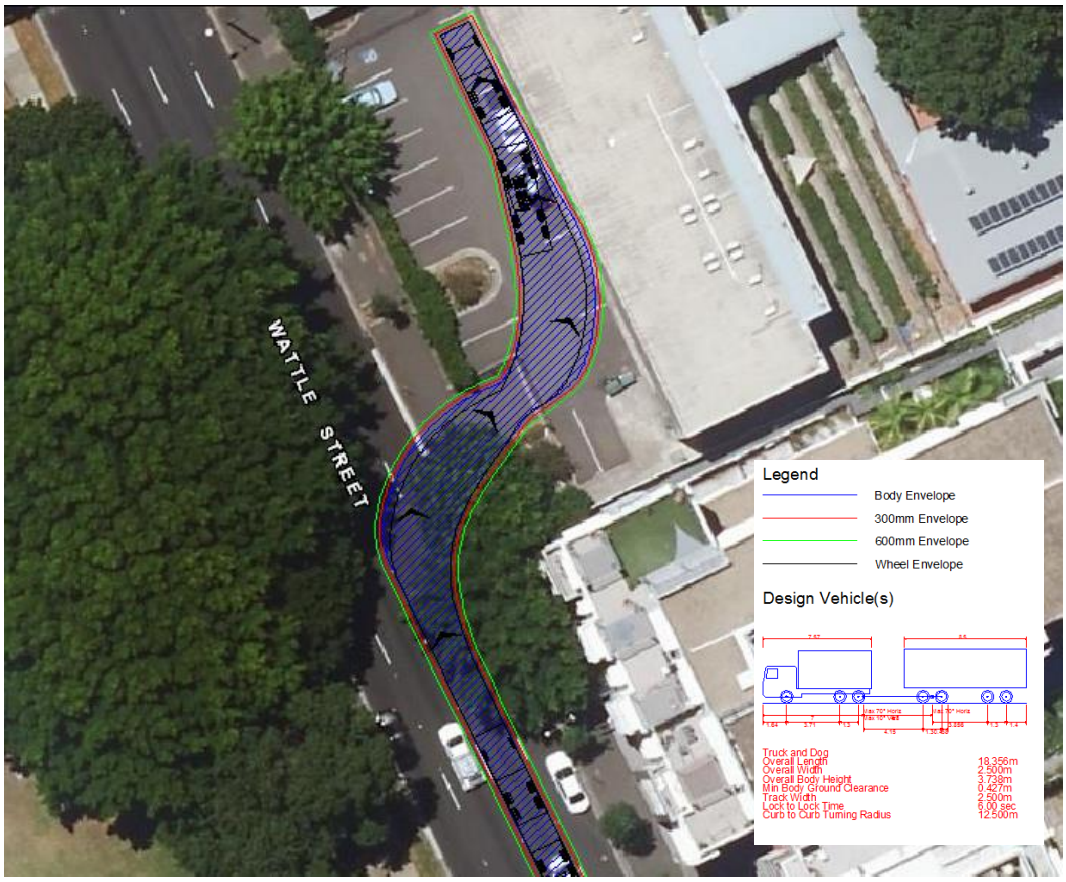

Figure A5: Swept path of 18.3 metre truck and dog entering the site from Wattle Street

B3.5 Hours of work

Hours of works through the course of the project will be as per those detailed in the consent. Typical working hours will be as detailed below:

- Monday to Friday 07:00am to 17:00pm
- Saturday, 07:00am to 15:00pm
- Sundays and public holidays – No works.

Applications for 'out of hours' works will be considered on a case by case basis. All out of hour's application will need to be approved by the relevant authority. Reasons for out of hours work may include the following;

- If it is an emergency
- The works create hazardous environment
- Plant break down have delayed works
- Extended hours should not impact the surrounding community.

B3.6 Construction traffic

Workers will generate additional traffic to the site. Road network impacts will be mitigated by the fact that construction workers generally start earlier and finish earlier than the commuter peak periods, and would likely not coincide with the school or CBD peak periods. Construction workers driving to sites in constrained parking environments typically carpool – further reducing the impact on the road network.

The impact of construction traffic will be discussed once specific construction details are provided however heavy vehicle volumes are expected to be low, in the order of 60 vehicles per day with approximately 6 vehicles in a typical peak hour. The traffic generation of this magnitude is minimal in the context of the Wattle Street state road traffic flow of approximately 25,000 vpd with 2,500 in a typical peak hour.

B3.7 Works Zones

Works Zones may be provided on Wattle Street and Jones Street with Quarry Street retained for school drop-off and pick up. Up to 5 x 4P parking spaces on Wattle Street and up to 7 x 2P parking spaces on Jones Street could be affected as shown on Figure A6. The Jones Street works zone would need to be designated for school bus use during school pick-up times.

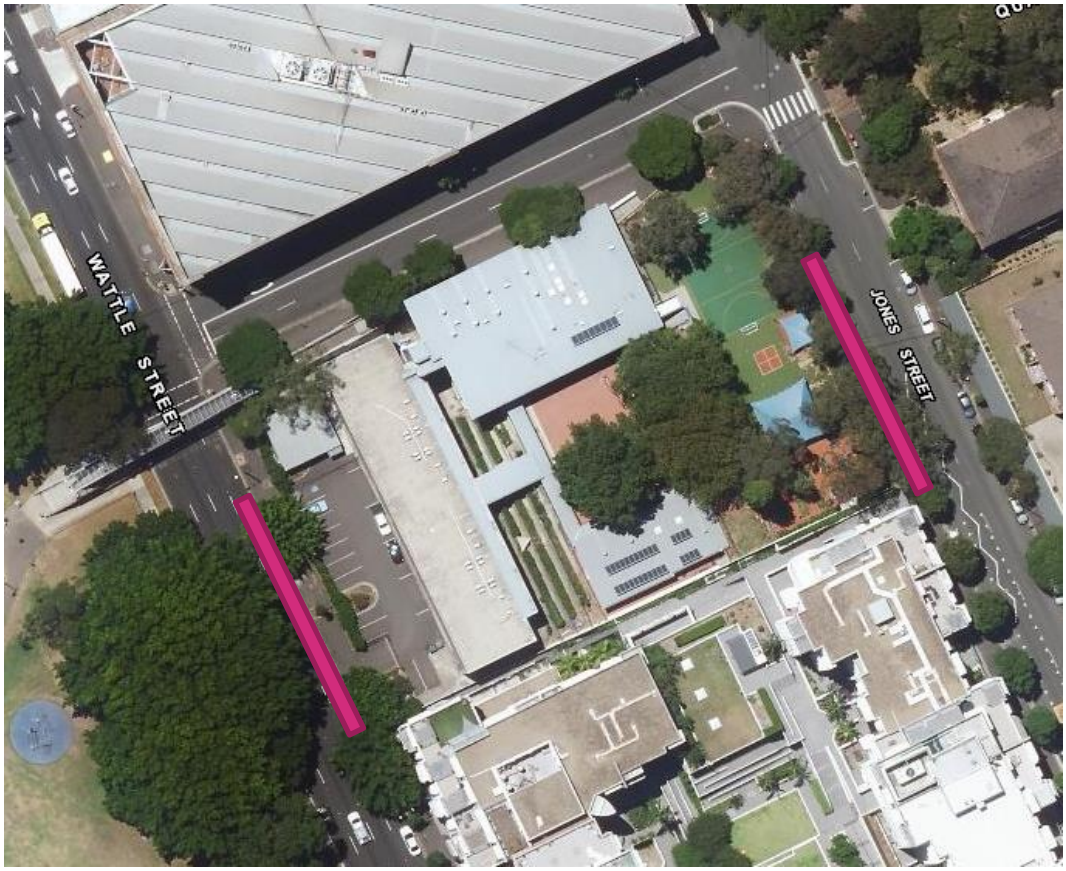

Figure A6: Potential Works Zones

B3.8 Site worker access

On-site parking will not be provided for private construction vehicles, with construction vehicles utilising works zones. Construction workers will be encouraged to take public transport to the site or car pool, utilising the nearby Harris Street public car park and store their larger tools on site. Public Transport access to the site is shown on Figure A7.

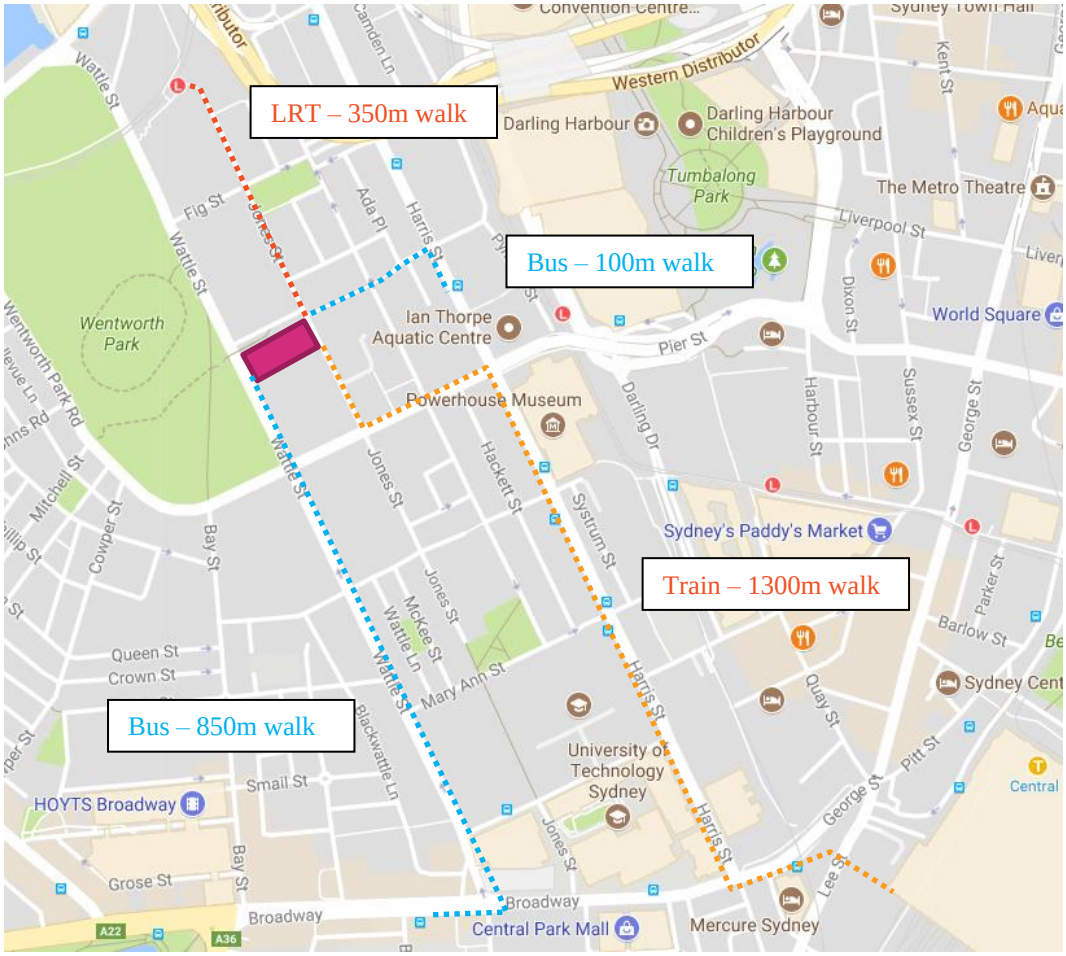

Figure A7: Site worker public transport access

B3.9 Measures to ameliorate impacts

Mitigation measures would be adopted during the construction phase to ensure traffic movements have minimal impact on surrounding land uses and the community in general, and would include the following:

- Truck loads would be covered during transportation off-site
- Neighbouring properties would be notified of construction works and timing. Any comments would be recorded and taken into consideration when planning construction activities.
- All activities, including the delivery of materials would not impede traffic flow along local roads
- Materials would be delivered and spoil removed during standard construction hours
- Avoid idling trucks alongside sensitive receivers
- Deliveries would be planned to ensure a consistent and minimal number of trucks arriving at site at any one time

B3.10 Driver code of conduct

To manage driver conduct the following measures are to be implemented:

- All truck movements will be scheduled
- Vehicles are to enter and exit the site in a forwards direction along the travel path shown on delivery maps
- Drivers are to give way to pedestrians and plant at all times.

Traffic Controllers will be used to stop traffic on the public street(s) to allow trucks to enter or leave the site. Where possible, vehicles must enter and exit the site in a forward direction. They must wait until a suitable gap in traffic allows them to assist trucks to enter or exit the site. The Roads Act does not give any special treatment to trucks leaving a construction site - the vehicles already on the road have right-of-way. Vehicles entering, exiting and driving around the site will be required to give way to pedestrians at all times.

B3.11 Public transport services affected

It is not expected that public transport services would be affected by the works. There are no bus route services operating on Wattle Street. No bus services would be impacted by construction traffic as the work is confined to off street works. School buses along Jones Street will not be affected during school peak periods.

B3.12 Construction traffic provisions made for emergency vehicles, heavy vehicles, cyclists and pedestrians

Construction works and vehicle storage would be mainly confined to the site. As such, no additional specific provisions for emergency vehicles, heavy vehicles, cyclists or pedestrians have been identified on the surrounding road network.