



# OPERATIONAL TRANSPORT MANAGEMENT PLAN

**St Catherine's School – 2021 Traffic Study**  
**26 Albion Street, Waverly NSW**

Reference: 16.226r05v05  
Date: December 2021


**TRAFFIX**  
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt St  
Surry Hills, NSW 2010

t: (02) 8324 8700  
w: [www.traffix.com.au](http://www.traffix.com.au)



## DOCUMENT VERIFICATION

Job Number	16.226			
<b>Project</b>	St Catherine's School – 2021 Traffic Study			
<b>Client</b>	St Catherine's School, Waverley			
Revision	Date	Prepared By	Checked By	Signed
v05	21/12/2021	Shenara Wanigasekera	Ben Liddell	



# CONTENTS

1. Introduction	1
2. Traffic Management Objectives	3
3. Overview of Site Operations	6
3.1 Site and Location	6
3.2 Existing Site Capacity	10
3.3 Existing On-street Unrestricted Parking	10
3.4 Existing On-street Bus Stops	11
3.5 Existing Site Operations Details	13
4. Implemented Travel Strategies	16
4.1 Car Pooling	16
4.2 Bicycle Parking and Active Travel	16
4.3 Bus Services	17
4.4 Travel Pass	19
4.5 Green Travel Plan	19
5. Establishing Baseline Data	21
5.1 Travel Mode Surveys	21
5.2 Travel Mode Survey Results	22
5.3 Future Travel Strategies	25
6. Traffic Survey Analysis	28
6.1 Context	28
6.2 Survey Results	31
6.3 Traffic Distribution 2021	41
7. Future Travel Strategies	65
7.1 Objectives	65
7.2 Bus Services	65
7.3 On-site Staff Parking and Management	68
7.4 On-street Parking Alterations / Pedestrian Crossing Relocation	69
7.5 Walking and Cycling Routes	72
7.6 Bicycle Parking Provision	74
8. Monitoring and Measurement	76
8.1 Roles and Responsibilities	76



8.2 Collecting and Collating Information	77
8.3 Promotional Information	78
<b>9. Goal Setting</b>	<b>79</b>
9.1 Staff Travel Targets	79
9.2 Student Travel Targets	79
<b>10. Management Review</b>	<b>82</b>
10.1 Surveys	82
10.2 Use of Aquatic Centre and Major Events	82
10.3 Road Safety Audit	82
10.4 Post Occupation	83
<b>11. Special Events</b>	<b>84</b>
11.1 Increase in Attendees for Existing Events	84
11.2 New Events	84
11.3 Traffic Assessment	85
11.4 Travel Strategies	86
11.5 Traffic Management Strategies for Aquatic Centre and Major Events	86
<b>12. Conclusion</b>	<b>89</b>
<b>Appendices</b>	
Appendix A: ARUP Traffic & Transport Assessment 2014	
Appendix B: CCC Letter	
Appendix C: Junior School Car Line Procedure Flyer (April 2018)	
Appendix D: St Catherine's Major Events Schedule	
Appendix E: St Catherine's School Travel Access Guide	
Appendix F: Student Travel Mode Surveys	
Appendix G: Staff Travel Mode Surveys	
Appendix H: Bus Stops & Routes Map	





# 1. INTRODUCTION

TRAFFIX has been commissioned by St Catherine's School, Waverley, to update the existing Operational Transport Management Plan (OTMP) for the approved State Significant Development (SSD-6339 determined 06/04/2016) of the school, which is located at 26 Albion Street, Waverley. The previous OTMP was dated 17 July 2019.

The SSD covers Stage 1A of the Masterplan. The OTMP has been prepared to address the proposed increased capacity of St Catherine's School to accommodate a student population of 1,200 and 212 staff by 2030 and the management of traffic for proposed increases and events in the new Aquatic Centre and Auditorium.

ARUP prepared the original traffic and transport assessment for the development in 2014 provided in **Appendix A**. Prior to and during the construction of the RPAC development, St Catherine's commissioned annual traffic surveys in 2016, 2017, 2018 and 2019. In 2020, an annual traffic survey was not conducted due to the impact of COVID-19 related restrictions and the associated impacts upon public transport and private vehicle use. St Catherine's resumed the annual surveys in March 2021 with students attending the campus and in anticipation of the completion of the construction phase of the RPAC project by the end of 2021. The 2021 surveys were conducted in the same manner as previous years noting that working from home and a general reduction in public transport use has had some influence on the 2021 data.

The OTMP is a key workplace document that has legal standing. The process has been to identify potential hazards, assess their associated risks formulate proposed treatments to address these risks, as documented within this OTMP. The OTMP should be referred to for all transport management measures for St Catherine's School, Waverley.

This OTMP and management measures are assessed based on updated survey data for 2021. The results of the 2021 Traffic Survey and this OTMP were presented and discussed with the Community Consultative Committee (CCC) on 17 September 2021. As part of the ongoing consultation with the community via the CCC, this report acknowledged a number of concerns brought to the CCC via letter dated 11 October 2021 provided in **Appendix B**. These concerns were discussed at a special CCC meeting held on 22 October 2021.



The survey participation data can be found at **Table 5** of this report and the Annual Survey Questions for students and staff are attached at **Appendices F** and **G**, respectively, as requested by the CCC.

The school has confirmed that it will continue to work with the CCC to improve annual traffic survey data including an ongoing effort to maximize the staff and student participation rates in annual traffic surveys, where possible. This report also acknowledges what appears to be an anomaly in the drop-off (6) and Pick-Up (11) numbers counted in the Leichhardt Street car line (Drop-Off and Pick-Up Site 4), measured 30 March 2021 as compared with the 2019 survey which demonstrated 49 vehicles between 8-9am and 47 vehicles between 2.30-4pm. The next survey will focus on the accurate measurement of activity in Drop Site 4 and increase the morning survey period by 1 hour (7-9am in total) to reflect the current on-street parking restrictions (7:45 – 9.00am and 2.30 – 4.00pm) and also capture students arriving at this location prior to 8.00am.

This OTMP addresses, for the first time, additional conditions of consent relating to the requirements prior to the occupation and use of the new facilities from the start of the 2022 school year. The additional conditions are contained in Schedule 3, Part D of the consent and are specifically Conditions A 8(b), E2, E3, E4, and E7.

This report is structured as follows:

- Section 2: Traffic Management Objectives
- Section 3: Overview of Site Operations
- Section 4: Implement Travel Strategies
- Section 5: Establishing Baseline Data
- Section 6: Analysis of Traffic Surveys
- Section 7: Future Travel Strategies
- Section 8: Monitoring and Measurement
- Section 9: Future Travel Mode Goals
- Section 10: Management Review
- Section 11: Special Events
- Section 12: Conclusion



## 2. TRAFFIC MANAGEMENT OBJECTIVES

The target audience of this plan are the staff, students, residents and visitors to St Catherine's School, Waverley. The aim of the annual review of the OTMP is to ensure that the additional development on the site does not result in any net increase in private vehicle trips to/from the school. This OTMP continues to address several conditions contained within the Development Consent issued by the Minister of Planning dated 6 April 2016, notably condition A8 of Schedule 2, and conditions A8 a), A8 b), A9 and A10 of Schedule 3 as follows:

### **Schedule 2: Operational Transport Management Plan**

*A8. The applicant shall prepare an Operational Transport Management Plan (OTMP) for St Catherine's School. The plan must identify mode share targets for the proposed travel strategies that target a reduction in private vehicle trips and ensure no net increase in vehicle trips, as detailed in condition A8 of Schedule 3.*

### **Schedule 3: Operational Transport Management Plan**

*A8. The applicant must prepare and implement (within 3 months of its approval) an Operational Transport Management Plan (OTMP) for St Catherine's School in consultation with Council and the local community, which must identify mode share targets for the proposed travel strategies that target a reduction (and ensure "no increase") in private vehicle trips to the site (as compared to the figures provided in the EIS) the OTMP must be approved by the Secretary:*

*a) Prior to the issue of any Construction Certificate and must include details regarding the travel strategies and interim traffic management measures (including details for management of the drop-off / pick-up zones, including training for supervising staff/ traffic controllers) and must be updated to the satisfaction of the Secretary.*

*b) Prior to the issue of any Occupation Certificate for the RPAC and must include details regarding the travel strategies and the final traffic management measures (including details for management of the drop-off /*



*pick up zones, including training for supervising staff / traffic controllers), and taking the monitoring results (required in condition A9) into account, and*

*c) Prior to any increase in student enrolment / staff numbers above 1050 students and 202 staff and taking the monitoring and road safety audit results (required in condition A9 and E2) into account.*

*A9. The OTMP must provide details for each of the travel strategies and must address the following matters for each of the travel strategies:*

- a) Objectives and targets;*
- b) Timing;*
- c) Responsibility;*
- d) Funding;*
- e) Implementation;*
- f) Monitoring regime to evaluate each strategy; and*
- g) Monitoring of whether the overall strategies are meeting the targeted reductions in private car trips*

*A10. The School must make the approved OTMP, any updated OTMP and the results of the monitoring and independent auditing conducted as part of the OTMP, publicly available on the school's website and available to the Community Consultative Committee.*

The OTMP highlights the measures undertaken by the school since the lodgement of the Development Application, since the receipt of the development consent and subsequent approved modifications and the approval of the OTMP by DPIE on 25 May 2018; as well as proposed measures to meet the above conditions in the future.

The primary objectives of the St Catherine's OTMP are as follows:

- Ensure the proposed development has no net increase in private vehicle trips to the school;



- Ensure the safety of staff and students, the public and those who will be impacted by traffic during site operations;
- Manage the safe and efficient 'drop-off' and 'pick-up' activities associated with school operations.
- Ensure that road users are aware of any proposed changed traffic conditions and that associated risks are identified and mitigated; and
- Ensure that the local road network will not be impacted by traffic generated due to the school's operation of the development.



## 3. OVERVIEW OF SITE OPERATIONS

### 3.1 Site and Location

The school is located in Waverley approximately 5.5km south-east of Sydney CBD. The site is irregular in shape and has an area of approximately 22,330m<sup>2</sup>. The school has a north-eastern frontage to Bronte Road of approximately 33 metres and a south-eastern frontage to Leichhardt Street of approximately 55 metres. The school also has a southern frontage to Macpherson Street of approximately 165 metres and a western frontage to Albion Street of approximately 140 metres. The site is also boarded by residential developments in the north and south-eastern sides of the site.

The existing school operations offer education programmes for a variety of age groups, including the Junior School from Kindergarten to Year 6, the Senior School from Year 7 to Year 12, and a range of extra-curricular activities, also known as 'Beyond The Curriculum' (BTC).

The site location, site plan and road hierarchy are presented in **Figures 1, 2 and 3** below.

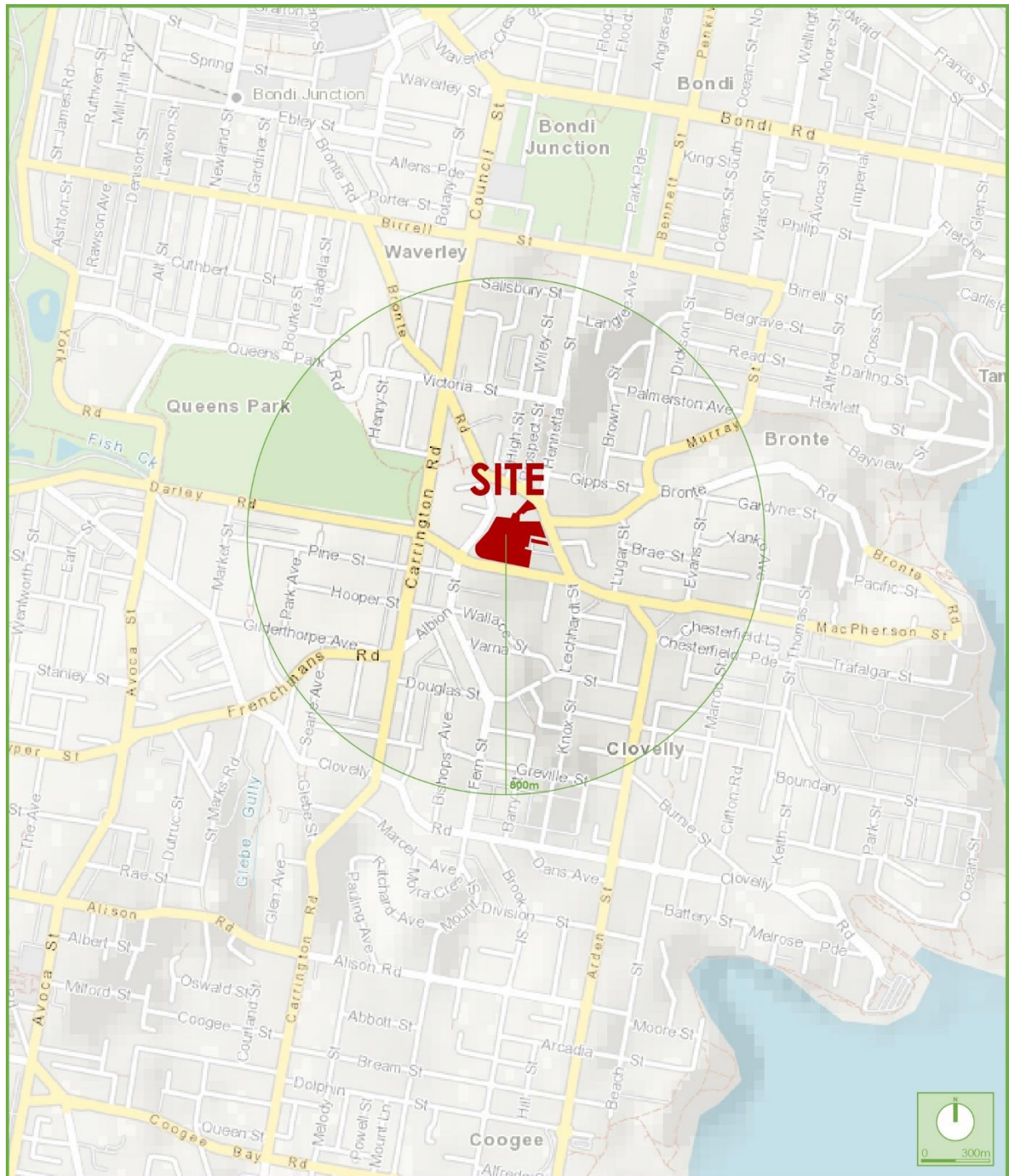


Figure 1: Location Plan





Figure 2: Site Plan







### 3.2 Existing Site Capacity

The school population is capped at 1,050 students from Kindergarten to Year 12. Subject to development consent conditions being met, it is possible for the school to grow its capacity to 1,200 students with student population projections shown in **Table 1** to 2030. Condition A6 of the Development Consent provides a breakdown of the student and staff population numbers under which student numbers may increase subject to conditions contained in the development consent.

**Table 1: Number of Staff and Students**

Year	Students	Staff
2016 – 2020	1,050	202
2021	1,065	212
2022	1,080	212
2023	1,095	212
2024	1,110	212
2025	1,125	212
2026	1,140	212
2027	1,155	212
2028	1,170	212
2029	1,185	212
2030	1,200	212

### 3.3 Existing On-street Unrestricted Parking

There are a number of unrestricted kerbside parking spaces adjoining the frontage of the school. These spaces are not line marked. These spaces are utilised by residents and visitors to the surrounding areas and members of the school community access these spaces at different times of the day and night. Reference should be made to The St Catherine's School, Waverley Traffic and Transport Assessment by ARUP (2014) provided at **Appendix A** for detailed baseline survey results.



### 3.4 Existing On-street Bus Stops

Bus Stops are currently provided for public use on Macpherson Street, Albion Street and Leichhardt Street. These bus stops are serviced by the routes provided in **Table 2** below and shown within **Figure 4**:

**Table 2: Existing Bus Services and Attributes**

Route Number	Stop	Destination	Frequency
313	Carrington Street	Coogee, Bondi Junction	30 minutes
350	Albion Street	Sydney Domestic Airport, Bondi Junction	10 minutes
379		North Bondi, Bronte	10 minutes
390X		La Perouse, Bondi Junction	10 minutes
360	Leichhardt Street	Clovelly, Bondi Junction	30 minutes
362		Coogee, Rose Bay	30 minutes
379	Macpherson Street	North Bondi, Bronte	10 minutes



Figure 4: Public Transport



## 3.5 Existing Site Operations Details

The following traffic strategies and traffic measures exist and are regularly monitored and revised for “interim traffic management measures” in place prior to occupation of the RPAC development.

### 3.5.1 Site Access Arrangements

The site currently has a number of access points for both vehicles and pedestrians. Vehicular access can be gained from Albion Street via a two-way driveway at the sites southernmost point, and two (2) single entry and exit driveways further north. An entry and access driveway is also present on Macpherson Street outside the Dame Joan Sutherland Centre. It is noted that there are currently a total of 56 car parking spaces available for use on the site, of which 31 are accessed from Albion Street and 25 from Macpherson Street. The majority of the parking spaces is available to staff, with an additional 6/7 parking spaces for visitors via Gate 1 on Albion Street.

Pedestrian access can be gained from multiple access points on Albion Street, Macpherson Street and Leichhardt Street.

### 3.5.2 Existing School Drop-off/Pick-up

Currently, the site provides drop-off and pick-up zones on Albion Street, Macpherson Street and Leichhardt Street. The school has assigned specific year groups to each drop-off / pick-up zone, to ensure that the students are dropped off and picked up at the correct school entrance and to spread drop-off and pick-up activity evenly across all available frontages. This managed approach minimises random driver behaviour and improves safety, however some drop-off and pick-up activities do occur outside the designated drop-off and pick-up zones. Future traffic surveys will attempt to identify and quantify the extent of this type of activity. A full-time traffic controller has been employed by the school since April 2017. Currently there is a supervised drop-off and pick-up management system in place for the Leichhardt Street drop-off and pick-up zone. The school operates a car line to cater for the Junior School at this location and a copy of the Junior school car line procedure is provided in **Appendix C** for reference. The Macpherson Street drop-off / pick-up area is supervised in the afternoons only. Upon completion of the relocation of the Macpherson Street pedestrian crossing, the length of the Macpherson Street drop-off and pick-up zone will increase with



operational improvements anticipated from 2022. The Albion Street drop-off and pick-up zones are currently unsupervised. A summary of the existing pick-up and drop-off locations is provided in **Table 3** below. The number of cars utilising each of the three (3) drop-off and pick-up facilities during the approved operational hours is monitored annually (commencing April 2018) and this data is presented in **Tables 14, 15, 16 and 17** of this OTMP.

**Table 3: Existing On-street Drop-off and Pick-up Arrangements**

Street	Side	Restriction	Number of Spaces	Year Group
Albion Street	Eastern	No Parking 8:00am – 9:00am 3:00pm – 4:15pm, School Days	6	7-12
	Western		5	
Macpherson Street	Northern	Kiss & Go: stay with your car 2-minute limit. No Parking 8:00am – 9:15am 2:45pm – 4:15 pm, School Days	18*	5-12
	Southern	No drop-off and pick-up provision		
Leichhardt Street	Eastern	No drop-off and pick-up provision		
	Western	No Parking 7:45 am – 9:00 am, 2:30 pm – 4:00 pm, School Days	8	1-4

\*19 spaces anticipated from 2022. Refer to Section 7.4.1 of the report.

### 3.5.3 Baseline Staff Travel

In 2014, ARUP undertook a School Travel Survey to identify travel modes for staff. Of the 202 staff on site in 2013, 150 drove, 37 used public transport, 11 walked and four (4) car pooled. Based on this survey, with 56 parking spaces currently available on site for staff through an allocation based on tenure or seniority, 94 staff vehicles were parked on neighbouring streets.

### 3.5.4 Existing School Bus Services

St Catherine's School provides four (4) heavily subsidised private bus services available to all students. Due to the ever-changing student demographic and needs of the parents, routes and stops are reviewed periodically with parents encouraged to contact the school if they would like to see stops added or removed.

The bus routes have been implemented at considerable cost to the school to reduce the impact of private car travel generated by the school. To encourage parents away from



private car travel, the school offered the first two terms of 2016 free of charge to parents. The fees for using the service for subsequent terms have been heavily subsidised and align with those charge by local government transport operators. The bus service is discussed in more detail in **Section 4.3** of this report.

### **3.5.5 Major Events Held in the Existing Joan Sutherland Performing Arts Centre**

For existing major events that are held at the school, St Johns Carpark is open for visitor and staff vehicles with any additional vehicles parking on-street. This arrangement arose in response to the CCC response for a previous year.

### **3.5.6 Future Major Events in New Auditorium**

The OTMP addresses making car parking spaces available to the attendees of certain events in accordance with Condition E7 of the development consent. The indicative usage profile for events in the new aquatic centre and the new auditorium is provided with **Appendix D**.





## 4. IMPLEMENTED TRAVEL STRATEGIES

Since the Development Application was lodged in 2014, the school has implemented and monitored several travel strategies with the aim of creating travel mode shifts away from the reliance on private vehicles for travel to and from the school. This section of the report details the initiatives that have been implemented to date prior to construction and occupation of the RPAC development and discusses their success.

### 4.1 Car Pooling

The school implemented a carpooling programme in an effort to reduce the number of private vehicle trips made to and from the school for both staff and students. The school received 12 staff and 2 parent registrations, and the school estimates the number of trips made through Sydney Carpool to be less than 10 trips in total. Despite the School offering two spaces for on-site parking to staff and numerous notifications to parents, the initiative is considered to have been unsuccessful.

### 4.2 Bicycle Parking and Active Travel

In February 2016, the school installed a bicycle rack offering 10 bicycle parking spaces. A note was then circulated with details of the changing facilities offered by the school and available to all staff. During a meeting with the School's Executive, concerns were raised over student safety and promoting cycling as an alternative mode. Due to additional co-curricular items students are required to carry, it was decided that the initiative was not appropriate for students and that other more suitable initiatives be identified. The number of bicycles parked in the rack ranges from 2 – 5 bikes per day.

It is noted that the school will provide 100 bike parking spaces as part of the Stage 1 works in accordance with Condition B.5 of Schedule 3. Appropriate end of trip facilities will be provided for cyclists and the school is undertaking a review of the current rules associated with riding to school prior to occupation in order to encourage more students to this mode of travel and to reduce private vehicle activity.

The junior school has participated in the 'Walk Safely to School' day annually since 2016 (except in 2020 when the event occurred during the first NSW lockdown). Students were able





to attend School on the day in casual clothing with participation levels encouraging from both the junior and senior schools.

### 4.3 Bus Services

The school provides an internal St Catherine's Transport page. The page provides parents with access to all the initiatives offered by the school. Four (4) separate routes, are advertised to parents via the portal, with details of the suburbs serviced presented below:

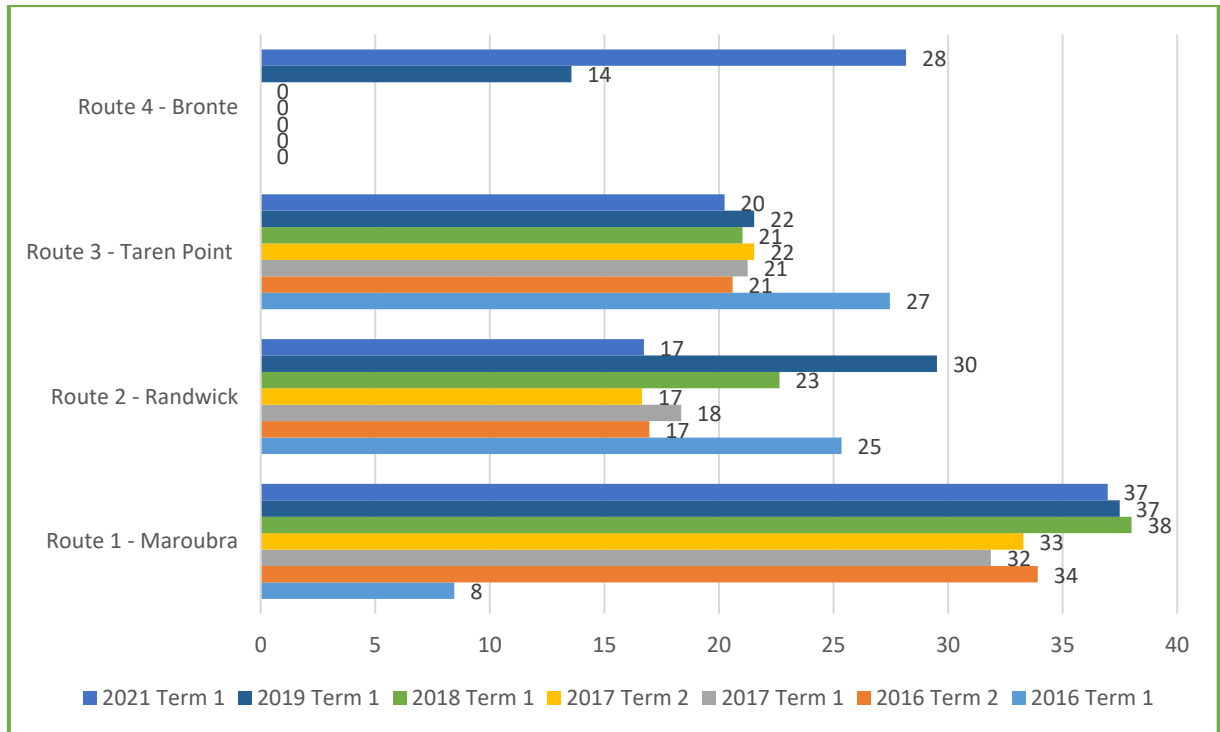
- Taren Point: Taren Point, Little Bay, Malabar and Brighton-Le-Sands
- Randwick: Roseberry, Kingsford, Kensington, Centennial Park, Randwick
- Coogee: Botany, Pagewood, Maroubra, Maroubra Beach, South Coogee and Coogee
- Bronte: Vaucluse, Rose Bay, North Bondi, Bondi, Tamarama and Bronte

Routes and utilisation were carefully monitored with data taken from the online bus booking form, and an electronic booking form developed internally. This data was used to adjust services, accordingly, based on demand.

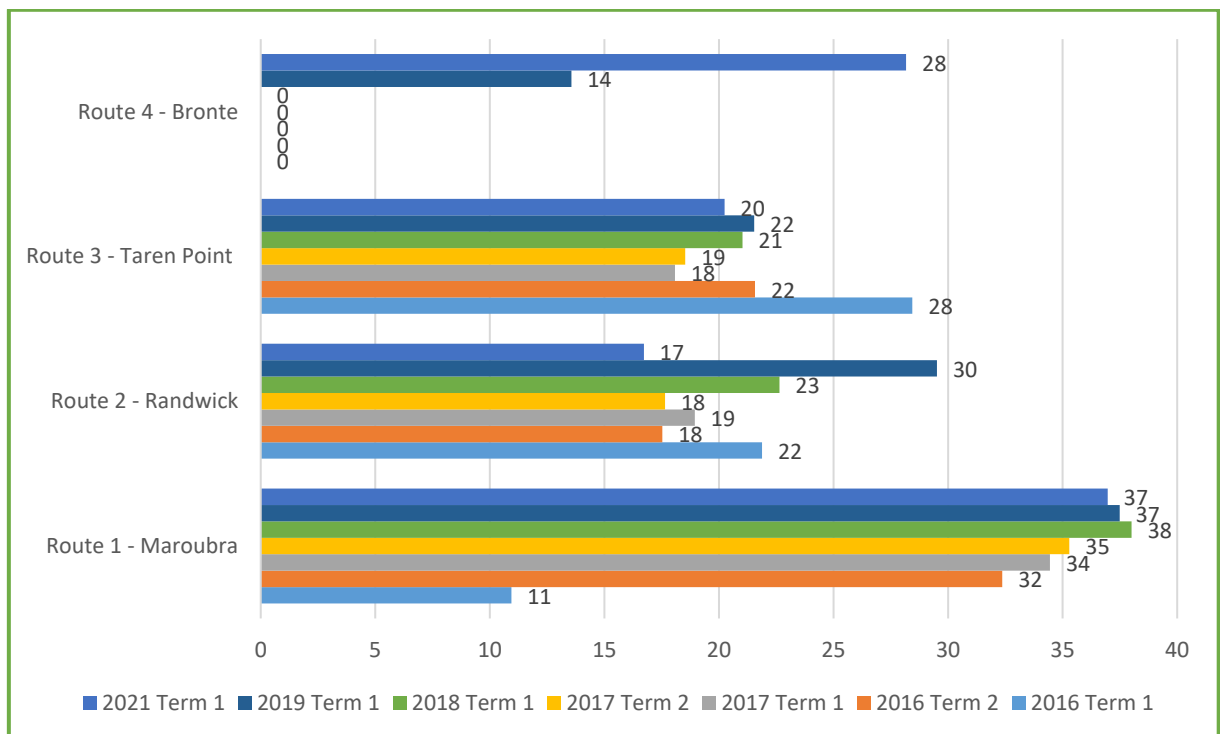
The utilisation of the bus services during the AM arrival and PM departure periods for the four (4) school terms in 2016, 2017, 2018, 2019 and 2021 are demonstrated in **Figure 5** and **6** below based on the results of the Travel Modes Surveys and adjusted for the total school population.

The school has trialled differing payment options for the Bus Service. Currently the school offers a flat charge of \$160 per term.

Participation rates for bus services will be monitored annually in order to adjust routes where possible to maximise the use of this travel mode and increase the student use of buses to and from the school.



**Figure 5: Bus Service Utilisation for AM arrivals in 2016, 2017, 2018, 2019 & 2021**



**Figure 6: Bus Service Utilisation for PM departures in 2016, 2017, 2018, 2019 & 2021**



## 4.4 Travel Pass

Certain students may be eligible for a School Opal Pass. The pass allows for free travel on public transport for students on public transport between home and school on trains, buses and ferries within the Opal network. Students are required to live a minimum distance from the school to be eligible for the School Opal Pass. The minimum distance requirements are provided in **Table 4** below.

**Table 4: School Opal Card Requirements**

Grade	Distance Requirement
Years K-2 infants	No requirement
Years 3-6 Primary	1.6km straight line distance or 2.3km walking or further
Years 7-12 Secondary	2.0km straight line distance or 2.9km walking or further

The school has obtained data from the Transport for NSW regarding how many students were issued with School Opal passes starting from June 2017 and this is summarised below.

- 2017: 103 school opal passes
- 2018: 155 school opal passes
- 2019: 237 school opal passes
- 2020: 301 school opal passes
- 2021: 395 school opal passes

It is clear from above that the number of opal cards issued to students at St Catherine's has steadily increased year on year, with an average increase of 40%.

## 4.5 Green Travel Plan

A comprehensive Green Travel Plan, a combine measures and implementation to promote, encourage and support target audience to achieve a more environmental travel options, is considered to be the most effective travel planning measure to encourage travel by alternative means other than private car for students, staff and visitors to the school. The Green Travel Plan allows for the school to measure existing travel modes and set goals for future travel



mode splits. As part of a Green Travel Plan, a Travel Access Guide (TAG) is usually developed to inform and educate users about alternate modes of transport.

A TAG has been developed by the school to distribute to staff, students, parents, and visitors. A copy of the TAG is provided in **Appendix E** for reference. The TAG provides relevant transport and access information. The TAG has been made available on both the internal and external websites of the school and hard copies have been distributed to staff and students.

From the initiatives that have been discussed in this section of the OTMP, it is evident that some have been more successful than others. The development consent forms a link between future student population increases and no increase in private vehicular trips to the site as a result of the RPAC development. The school will therefore be required to achieve a mode shift to more sustainable transport modes to ensure no net increase. All alternate travel modes will be investigated and promoted in the future, however, it is envisaged that active travel and further utilisation of Public Transport are the most viable alternatives for the specific site, as opposed to car-pooling schemes and the provision of bicycle parking. Mode shift targets are discussed in further detail in **Section 9** of this report. The participation in transport mode shifts away from private vehicle use will be measured annually in order to illustrate that no increase in private vehicle trips occur.



## 5. ESTABLISHING BASELINE DATA

### 5.1 Travel Mode Surveys

In April 2014, ARUP undertook a travel mode survey of both the staff and students on site. The survey results as presented in the ARUP St Catherine's School Travel Strategies Transport Report dated 23 September 2015 established the existing mode share for both students and staff travelling to and from the site. The current student enrolments and staff employment is summarised in **Table 5** below.

TRAFFIX conducted further Travel Mode Surveys in 2017-2021 to obtain up to date survey information. From the surveys conducted by ARUP in 2014 and TRAFFIX between 2017-2021, the existing and updated travel mode splits for staff and students are as provided in **Table 6** and **7** below, respectively. A copy of the 2021 TRAFFIX survey questionnaires are also available within **Appendix F** and **Appendix G**.

This section is to identify current travel mode patterns for both students and staff at St Catherine's School, Waverley. To enable this analysis, questionnaire surveys were distributed via the Survey Monkey website to staff and parents of school children between Monday 29 March 2021 and Monday 3 May 2021. This information is imperative to identifying the existing travel mode patterns and future impacts of the increase in student population and informing the trip distribution assessment.

The 2021 survey data (inclusive of **Table 5**) was reviewed with the Community Consultative Committee (CCC) on 22 October 2021. The CCC raised a concern over the participation rates achieved for the 2021 survey. (28% primary school students, 62% secondary students and 58% full time teachers). It is noted that the 2021 responses totalled 669 (K-Year 12 students) as compared with 579 in the 2014 surveys. In 2021, 98 full time and 18 part time staff responded to the travel surveys as compared to 86 full time and 17 part time staff who responded to the baseline 2014 travel surveys. The school is investigating ways to lift participation rates for future travel mode surveys



**Table 5: Number of Students and Staff**

Class	Count (Enrolment Records)	Count (Surveyed)	% (Surveyed)
Full Time	169	98	57.99%
Part Time	50	18	36.00%
Casual	N/A	1	N/A
<b>STAFF</b>	<b>219</b>	<b>117</b>	<b>53.42%</b>
Kindergarten	14	4	28.57%
Year 1	20	6	30.00%
Year 2	17	5	29.41%
Year 3	38	14	36.84%
Year 4	49	17	34.69%
Year 5	79	21	26.58%
Year 6	95	21	22.11%
Year 7	117	78	66.67%
Year 8	128	113	88.28%
Year 9	113	94	83.19%
Year 10	123	105	85.37%
Year 11	119	103	86.55%
Year 12	109	88	80.73%
<b>TOTAL STUDENTS</b>	<b>1,021</b>	<b>669</b>	<b>65.52%</b>

*(Source: St Catherine's School Records and TRAFFIX Survey 2021)*

219 staff and 1,021 students were accounted for in the survey summarised below and the distribution of students across the grades shows correlation with the true grade distribution, strongly suggesting that the modal surveys capture a sample that reflects the population.

## 5.2 Travel Mode Survey Results

### 5.2.1 Staff Modal Splits

**Table 6** provides a comparison between baseline (2014 ARUP) and subsequent Staff Mode Travel Splits.



**Table 6: 2014-2021 Staff Travel Mode Splits**

Travel Mode	Percentage						
Year	ARUP 2014	TRAFFIX 2017	TRAFFIX 2018	TRAFFIX 2019	2020	TRAFFIX 2021	Variance 2014-2021 (% Points)
Car Driver	71%	70%	67%	67%	No travel mode surveys were conducted in 2020 due to COVID-19	70%	-1%
Car Passenger	3%	3%	3%	2%		5%	+2%
Public Transport	19%	16%	17%	19%		10%	-9%
Walk	5%	9%	8%	9%		11%	+6%
Cycle	2%	2%	5%	2%		2%	0%
Other	0%	0%	0%	1%		2%	+2%

Source: ARUP and TRAFFIX Survey

**Table 6** shows that the percentage of respondents driving or passengers to the site has increased this year as compared with the 2019 survey but remains 1% point (2 staff) lower than the 2014 baseline level. If the sample distribution is identical to the total staff population distribution, this indicates that approximately 153 staff drive to St. Catherine's School.

The number of respondents walking to the site has increased by a total of 6% points (13 staff), which suggests a small proportion of staff (1%) who previously drove to the site or used public transport now walk.

The percentage of staff travelling to/from the site by public transport has decreased by 9% points (20 staff), however, this is attributed to the COVID-19 pandemic, which has impacted public transport usage generally and the proportion of staff using public has been relatively consistent from 2014 to 2019. According to data released by the Australian Bureau of Statistics (ABS), one in seven Australians (14 per cent) reported using public transport in March 2021, compared with nearly one in four (23 per cent) who reported regular use before COVID-19 restrictions began in March 2020. Therefore, the questionnaire survey results with a 9%-point decrease, aligns with the above analysis of the ABS data.



### 5.2.2 Student Modal Splits (AM)

**Table 7** provides a comparison between 2014 to 2021 Student Mode Travel Splits for the AM arrival of students.

**Table 7: 2014-2021 Student Travel Mode Splits AM Arrivals**

Travel Mode	Percentage						
Year	ARUP 2014	TRAFFIX 2017	TRAFFIX 2018	TRAFFIX 2019	2020	TRAFFIX 2021	Variance 2014-2021 (% Points)
Private Vehicle	60%	55%	54%	51%	No travel mode surveys were conducted in 2020 due to COVID-19	51%	-9%
Walk	16%	21%	18%	19%		19%	+3%
Bus Service St. Catherine's Bus	4%	7%	8%	10%		10%	+6%
Public Transport	15%	16%	20%	20%		20%	+5%
Other	5%	0%	0%	0%		0%	-5%

Source: ARUP and TRAFFIX Survey

**Table 7** shows that the proportion of students travelling by private vehicle in 2021 was similar to the 2019 data (51%) and 9% points lower when compared against the 2014 baseline numbers. Also, 51% (521) of students travelled to school by private vehicle during the AM Peak, which is below the 2014 baseline, in accordance with the Condition of Consent (requiring no net increase in private vehicle trips).

The number of students travelling to the site by the St Catherine's private bus service increased by 6% points (an additional 61 students when applied to total student population) and the number of students walking to the site increased by 3% points (an additional 31 students) in 2021 when compared to the 2014 baseline numbers.

### 5.2.3 Student Modal Splits (PM)

**Table 8** provides a comparison between 2014 to 2021 Student Mode Travel Splits for the PM departure of students.





**Table 8: 2014-2021 Student Travel Mode Splits PM Departures**

Travel Mode	Percentages						
Year	ARUP 2014	TRAFFIX 2017	TRAFFIX 2018	TRAFFIX 2019	2020	TRAFFIX 2021	Variance 2014-2021 (% Points)
Private Vehicle	46%	45%	43%	42%	No travel mode surveys were conducted in 2020 due to COVID-19	44%	-2%
Walk	24%	25%	22%	23%		23%	-1%
Bus Service Catherine's Bus	7%	7%	9%	10%		9%	+2%
Public Transport	18%	24%	26%	24%		24%	+6%
Other	5%	0%	0%	0%		0%	-5%

Source: ARUP and TRAFFIX Survey

**Table 8** shows that the number of students travelling home by private vehicle from the site increases by 2% points when compared with 2019 surveys but decreased by 2% points in comparison with 2014 baseline numbers. If the sample surveyed is indicative of the population, it can be estimated that 449 students travel home from St Catherine's School by car. The number of students travelling from the site by public transport increased by 6% points (an additional 61 students). Also, the number of students travelling home by the St Catherine's private bus service increased by 2% points and the number of students walking home from the site decreased by 1% point in 2021 when compared to 2014 baseline numbers.

It is evident from comparison of the ARUP 2014 and the TRAFFIX 2021 student travel mode splits, shown in **Table 7** and **Table 8**, that there is a reduction in private vehicle usage and increases in active and public transport. The reduction is significant and in the order of 9% points and 2% points in the AM and PM peak period, respectively.

### 5.3 Future Travel Strategies

A number of travel strategies have already been put into place to encourage active travel, reduce the reliance on private vehicle travel for staff and students and to minimise the traffic impacts from activities undertaken within the RPAC. The 2014 ARUP report provided travel



mode targets for staff and students to achieve no net increase in private vehicle trips to the school as follows:

**Table 9** identifies the student numbers required to use alternative modes of transport for the years 2014 to 2030 to ensure no net increase in traffic is generated as the student population increases.

**Table 9: Student Population from 2014-2030**

Year	Total Student Population	Private Vehicle	Students by Private Bus	Other	Students by Public Transport	Students by Active Travel
<b>2014</b>	970	582	39	48	146	155
<b>2018</b>	1,020	550	82	0	204	184
<b>2019</b>	1,014	517	101	0	203	193
<b>2020</b>	<b>No surveys conducted due to COVID-19</b>					
<b>2021</b>	1,021	521	102	0	204	194
<b>2022</b>	1,080	582	100	-	199	199
<b>2023</b>	1,095	582	103	-	205	205
<b>2024</b>	1,110	582	106	-	211	211
<b>2025</b>	1,125	582	109	-	217	217
<b>2026</b>	1,140	582	112	-	223	223
<b>2027</b>	1,155	582	115	-	229	229
<b>2028</b>	1,170	582	118	-	235	235
<b>2029</b>	1,185	582	121	-	241	241
<b>2030</b>	1,200	582	124	-	247	247

*Travel mode percentages based on AM Peak Period which has a higher number of vehicle trips. Numbers coloured white are subject to approval.*

It can be seen in **Table 9** that in 2030 when the school has a capacity of 1,200 students and under the circumstance that all non-private vehicle travel modes are utilised by new students equally, 124 students will be required to travel by private bus, 247 students by public transport and 247 students by active travel.



In addition, the student population increases have been divided evenly amongst all other modes of transport between 2022 and 2030. These figures are indicative and expected to be different in reality which has been the case between 2014 and 2021 as demonstrated above. **Table 9** is to be updated each year to reflect the actual travel mode patterns of the student population.



## 6. TRAFFIC SURVEY ANALYSIS

### 6.1 Context

In order to measure the effectiveness of the OTMP and to have an accurate way of monitoring the condition of consent (Schedule 2, Condition A8) stating that “*The plan must identify mode share targets for the proposed travel strategies that target a reduction in private vehicle trips and ensure no net increase in vehicle trips, as detailed in condition A8 of Schedule 3.*”. Traffic surveys in the form of automatic tube counts and peak period turning counts at the critical intersections surrounding the site were undertaken in March 2014 by ARUP and by TRAFFIX in 2016, 2017, 2018 and 2019. The 2020 traffic surveys were not undertaken due to the COVID-19 pandemic restrictions in place as of March 2020 but recommenced in March 2021 as full-time attendance on campus was permitted at this time.

The results of the surveys are summarised in **Table 10** with the locations of the counters shown in **Figure 7** and show the baseline data that will be used to assess the traffic impacts associated with the school's operations. To maintain a consistent approach to the assessment, the same locations have been surveyed for one (1) week during the school term, and also during one (1) week of the school holidays. The 2021 traffic survey takes into account the existing travel strategies that have been implemented to help identify any reductions in traffic volumes (when compared with the 2014 baseline) that has already been achieved. Any reduction in private vehicle usage may therefore act as credit for the site, enabling the additional proposed enrolment of students, with no net increase in traffic generation to the site.

A community consultative committee (CCC) has been established for this project in accordance with the Development Consent. The committee determined that an additional tube count location on Bronte Road, between Henrietta Street and High Street, be conducted from 2018 onwards to determine the traffic entry of the street network at the intersection of Bronte Road and Leichardt Street.

In summary, tube traffic counts were conducted on the following streets from 29 March to 4 April and 5 April to 11 April 2021:

- Albion Street (between Santa Marina Avenue and Macpherson Street),
- Macpherson Street (between Albion Street and Wills Avenue),



- Leichhardt Street (between Lugar Brae Avenue and Macpherson Street), and
- Bronte Road (between Prospect Street and Henrietta Street).

Turning movement counts were conducted during the AM and PM peak periods on the Thursday 1 April, Saturday 3 April, Thursday 8 April and Saturday 10 April 2021 at the following intersections:

- Macpherson Street / Leichhardt Street,
- Bronte Road / Albion Street,
- Bronte Road / Leichhardt Street, and;
- Albion Street and Macpherson Street

Surveys of the pick-up zones were undertaken during an AM and PM school peak periods on Tuesday, 30 March 2021 at:

- Both sides of Albion Street;
- The north side of Macpherson Street, and;
- The west side of Leichhardt Street

The tube counts completed in 2021 are consistent with similar counts conducted as part of the 2014 benchmark with the exception of Bronte Road, which was added in 2018.



Figure 7: Location of Traffic Surveys



## 6.2 Survey Results

The detailed survey results of the annual traffic volume counts are provided in **Tables 10, 11, 12 and 13** as well as **Figures 8, 9, 10 and 11**.

### 6.2.1 School Term Hourly Volumes

The surveys show that there has been a minor decrease (2.1%) in traffic volumes during the AM (8:00am-9:00am) peak and a moderate decrease (8.5%) in traffic volumes during the PM (3:00pm-4:00pm) peak surrounding the school when comparing to 2014 volumes.

When compared to the 2019 surveys there has been a minor decrease (-0.5%) in traffic volumes during the AM (8:00am-9:00am) school peak and a minor decrease (-2.9%) in traffic volumes during the PM (3:00pm-4:00pm) school peak.

The PM commuter peak periods have seen a moderate reduction in overall traffic volumes whilst the AM commuter peak saw a moderate increase when compared to 2014 volumes. The AM commuter peak saw an increase of 6.9% between 9am-10am. The PM reductions equate to a decrease of 2.9% between 5-6pm and 12% between 6-7pm. This overall reduction may be a result of the COVID-19 pandemic which has seen a reduction in trips away from home generally, noting that recent ABS data has shown that two in five people with a job (41 per cent) worked from home at least once a week in February 2021, compared with 24 per cent at least once a week before March 2020.

The weekend PM peak has also seen a significant reduction in overall traffic volumes, equating to a decrease of 14.2% when compared to 2014 volumes.

### 6.2.2 School Holidays Hourly Volumes

The surveys show that during the school vacation period, there has been a moderate decrease (10%) in traffic volumes during the AM (8:00am-9:00am) peak and a minor decrease (4.6%) in traffic volumes during the PM (3:00pm-4:00pm) peak surrounding the school when comparing to 2014 volumes.

When compared to the 2019 surveys there has been a significant decrease (18.2%) in traffic volumes during the AM (8:00am-9:00am) peak and a significant decrease (13.8%) in traffic volumes during the PM (3:00pm-4:00pm) peak.



The weekday commuter AM peak period during the school vacation period has seen a significant reduction in overall traffic volumes when compared to 2014 volumes, equating to 7.8% between 9am-10am. The weekday PM commuter peaks have seen a minor increase (1%) between 5-6pm and a moderate increase (7.4%) between 6-7pm.

The weekend PM peak during the school vacation period has seen a minor reduction in overall traffic volumes, equating to a decrease of 2.1% when compared to 2014 volumes.





**Table 10: Average Mid-block Volumes 2014-2021 (School Term)**

Location	Years of surveys compared		Weekday AM Peak (8am-9am)	Weekday AM Commuter Only Peak (9am-10am)	Weekday PM School Only Peak (3pm-4pm)	Weekday PM Commuter Only Peak (5pm-6pm)	Weekday PM Commuter Only Peak (6pm-7pm)	Weekend PM Peak (12pm-1pm)
Leichhardt Street	2014		1,181	910	1,170	1,215	1,102	1,234
	2016		1,094	955	1,057	1,151	1,055	1,196
	2017		1,138	1,193	1,024	1,215	1,280	1,373
	2018		1,322	1,027	1,371	1,392	1,168	1,398
	2019		1,164	1,040	1,161	1,329	1,189	1,401
	2020		No mid-block counts were conducted in 2020 due to COVID-19					
	2021		1,125	1,014	1,194	1,302	1,205	1,202
	2014-2021	No.	-56	104	24	87	103	-32
	2014-2021	%	-4.7%	11.4%	2.1%	7.2%	9.3%	-2.6%
Albion Street	2014		660	568	766	722	746	677
	2016		681	555	625	624	609	677
	2017		604	664	776	611	567	717
	2018		757	591	755	746	653	744
	2019		717	601	714	744	678	445
	2020		No mid-block counts were conducted in 2020 due to COVID-19					
	2021		776	594	658	720	612	491
	2014-2021	No.	116	26	-108	-2	-134	-186
	2014-2021	%	17.6%	4.6%	-14.1%	-0.3%	-18.0%	-27.5%
Macpherson Street	2014		1,181	910	1,170	1,215	1,102	1,234
	2016		1,094	955	1,057	1,151	1,055	1,196
	2017		1,138	1,193	1,024	1,215	1,280	1,373
	2018		1,322	1,027	1,371	1,392	1,168	1,398



Location	Years of surveys compared		Weekday AM Peak (8am-9am)	Weekday AM Commuter Only Peak (9am-10am)	Weekday PM School Only Peak (3pm-4pm)	Weekday PM Commuter Only Peak (5pm-6pm)	Weekday PM Commuter Only Peak (6pm-7pm)	Weekend PM Peak (12pm-1pm)
	2019		1,026	940	1,084	1,121	1,056	1,213
	2020		No mid-block counts were conducted in 2020 due to COVID-19					
	2021		992	980	1,021	961	746	979
	2014-2021	No.	-189	70	-149	-254	-356	-255
	2014-2021	%	-16.0%	7.7%	-12.7%	-20.9%	-32.3%	-20.7%
Bronte Road	2018		502	435	575	626	541	596
	2019		451	461	572	646	571	511
	2020		No mid-block counts were conducted in 2020 due to COVID-19					
	2021		543	464	615	633	585	561
	2018-2021	No.	41	29	40	7	44	-35
	2018-2021	%	8.2%	6.7%	7.0%	1.1%	8.1%	-5.9%
Overall	2014		2,956	2,420	3,140	3,072	2,911	3,113
	2016		2,797	2,392	2,639	2,749	2,559	2,933
	2017		2,863	2,923	2,639	2,866	2,906	3,211
	2018 (excluding Bronte Rd)		3,208	2,594	3,339	3,306	2,805	3,381
	2019 (excluding Bronte Road)		2,907	2,581	2,959	3,194	2,923	3,059
	2020		No mid-block counts were conducted in 2020 due to COVID-19					
	2021 (excluding Bronte Road)		2,893	2,588	2,873	2,983	2,563	2,672



**Table 11: Average Mid-block Volumes 2016-2021 (School Holidays)**

Location	Years of surveys compared	Weekday AM Peak(8am-9am)	Weekday AM Commuter Only Peak (9am-10am)	Weekday PM School Only Peak (3pm-4pm)	Weekday PM Commuter Only Peak (5pm-6pm)	Weekday PM Commuter Only Peak (6pm-7pm)	Weekend PM Peak (12pm-1pm)
Overall	2016	2,326	2,338	2,507	2,516	2,214	2,730
	2017	2,450	2,406	2,587	2,715	2,435	3,174
	2018 (excluding Bronte Rd)	2,567	2,482	2,657	2,780	2,315	3,034
	2019 (excluding Bronte Road)	2,559	2,382	2,773	2,826	2,546	3,164
	2021 (excluding Bronte Road)	2,094	2,155	2,391	2,540	2,377	2,672

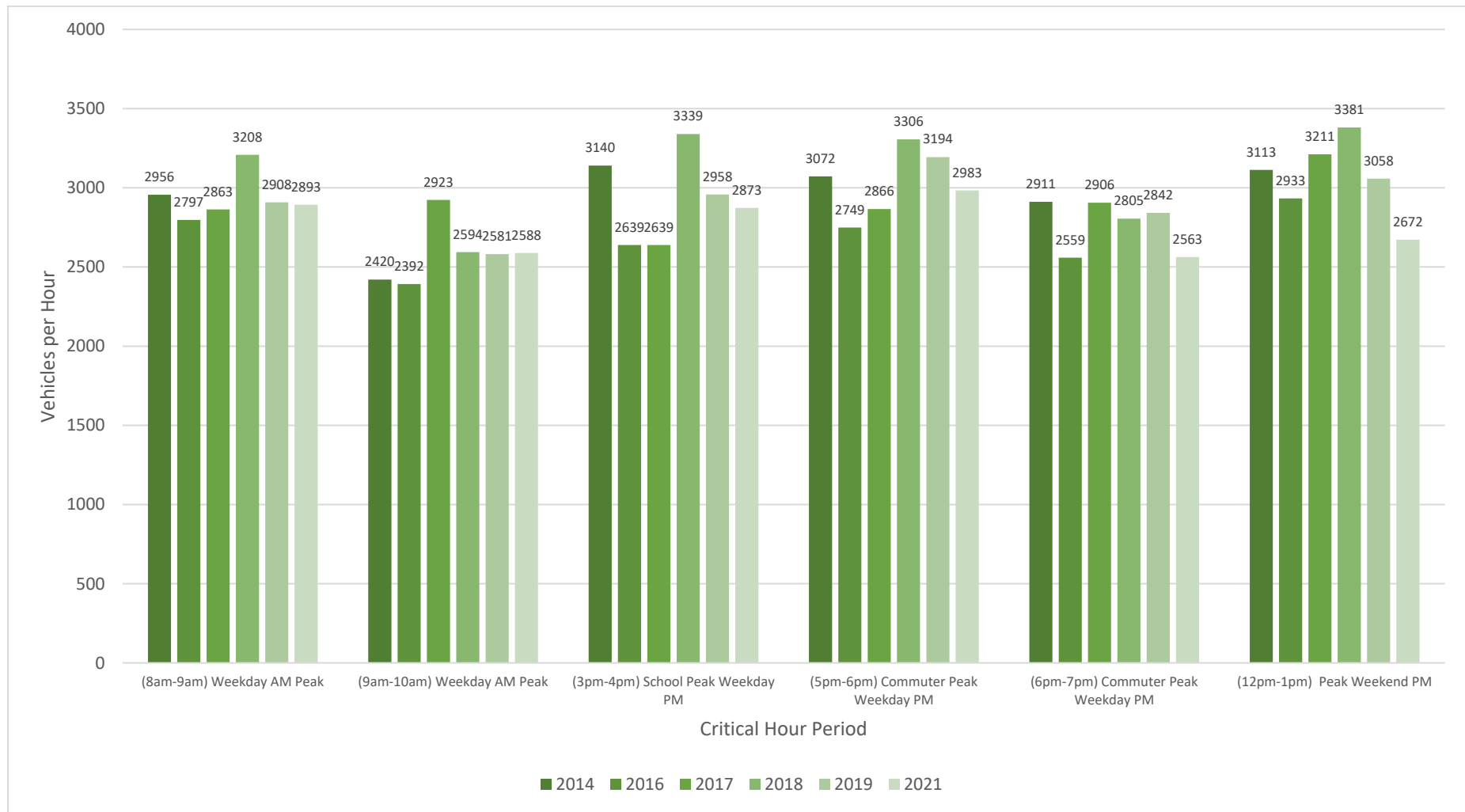
**Table 12: Total Daily Traffic Volumes per Day 2014-2021 (School Term)**

Year of Survey	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Average Weekday	7 Day Average
2014	37,921	38,648	39,661	40,544	39,285	40,605	35,335	39,212	38,857
2016	34,477	35,934	36,138	37,854	38,705	38,169	29,792	36,620	35,865
2017	35,572	39,951	40,322	40,438	40,287	39,571	36,390	39,311	38,932
2018	39,326	40,052	41,850	43,290	44,133	41,342	37,784	41,728	41,110
2019	38,431	38,703	40,668	40,754	40,841	40,534	38,134	39,879	39,879
2020	No mid-block counts were conducted in 2020 due to COVID-19								
2021	35,391	37,497	41,293	42,510	27,432	29,161	24,393	36,825	33,954



**Table 13: Total Daily Traffic Volumes per Day 2016-2021 (School Holidays)**

Year of Survey	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Average Weekday	7 Day Average
2016	32,964	33,410	35,438	34,516	35,784	32,594	32,134	34,421	33,833
2017	37,313	36,349	36,639	37,989	32,273	42,462	34,243	36,110	36,749
2018	35,544	35,094	36,410	37,863	38,123	36,247	33,579	36,606	36,122
2019	35,056	36,528	38,325	39,228	34,729	40,323	34,557	36,773	36,964
2020	No mid-block counts were conducted in 2020 due to COVID-19								
2021	27,106	32,933	34,634	35,860	37,844	35,355	30,854	33,676	33,512



**Figure 8: Hourly Traffic Volumes at Critical Times 2014-2021 (School Term)**

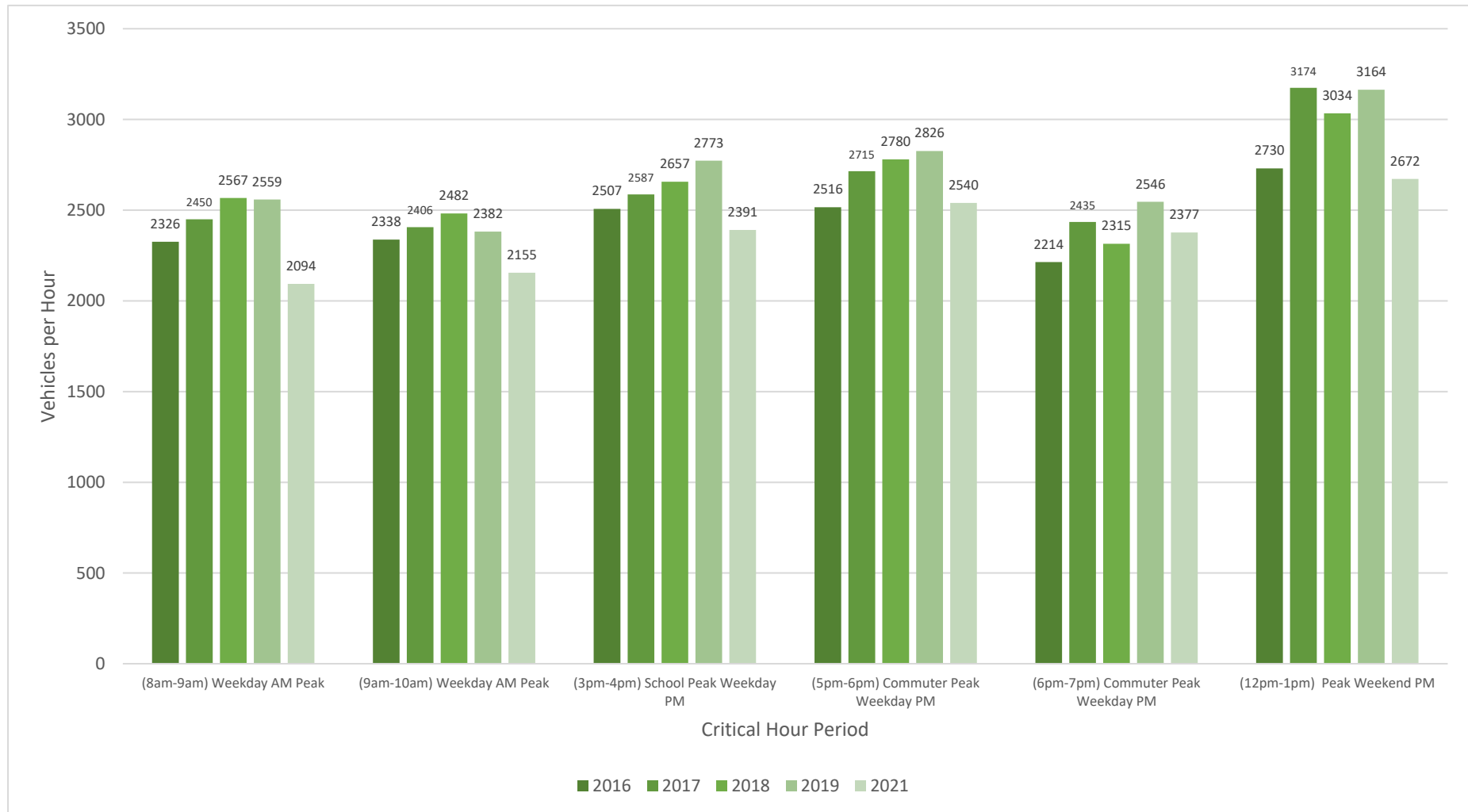


Figure 9: Hourly Traffic Volumes at Critical Times 2016-2021 (School Holidays)

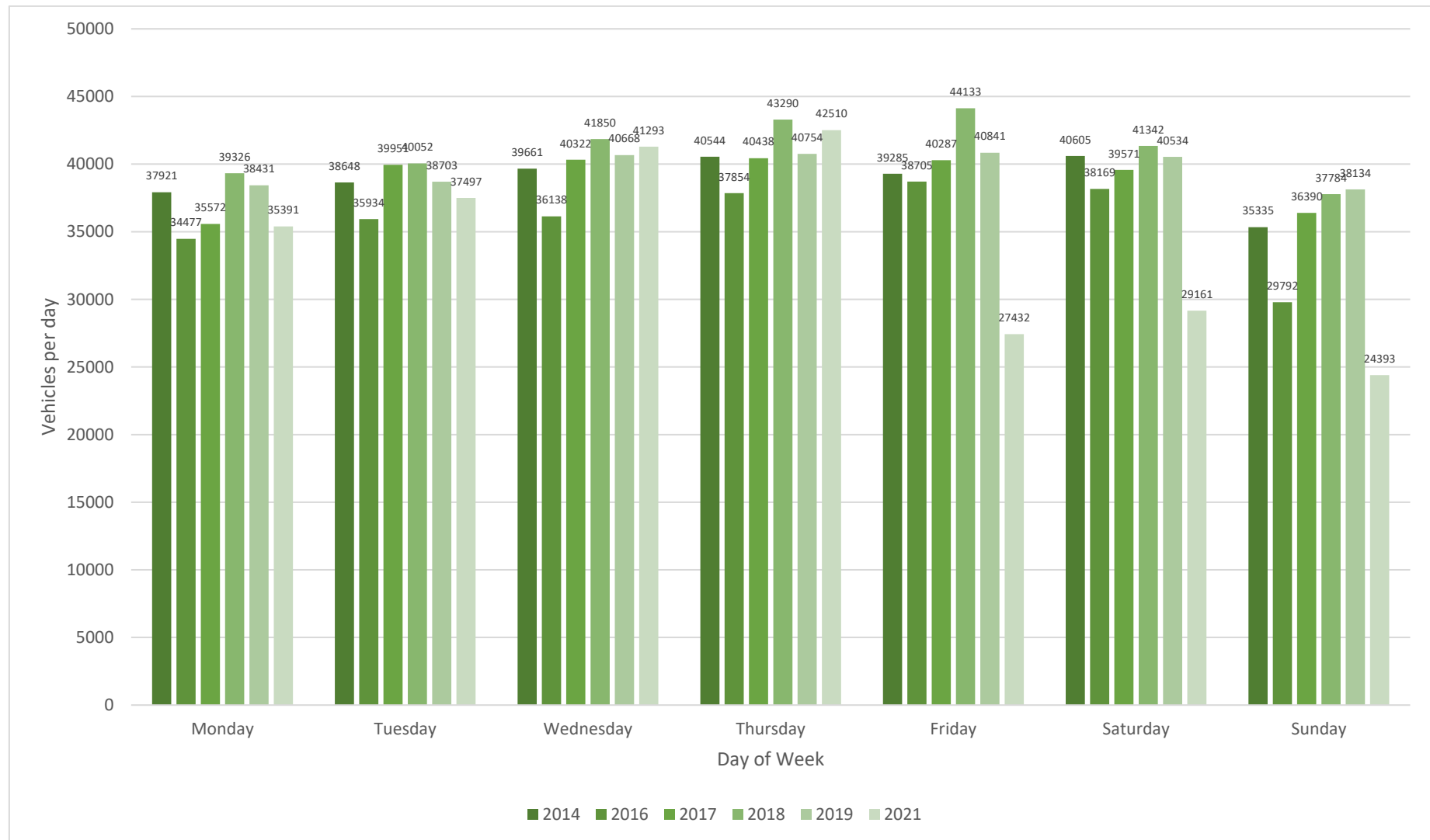
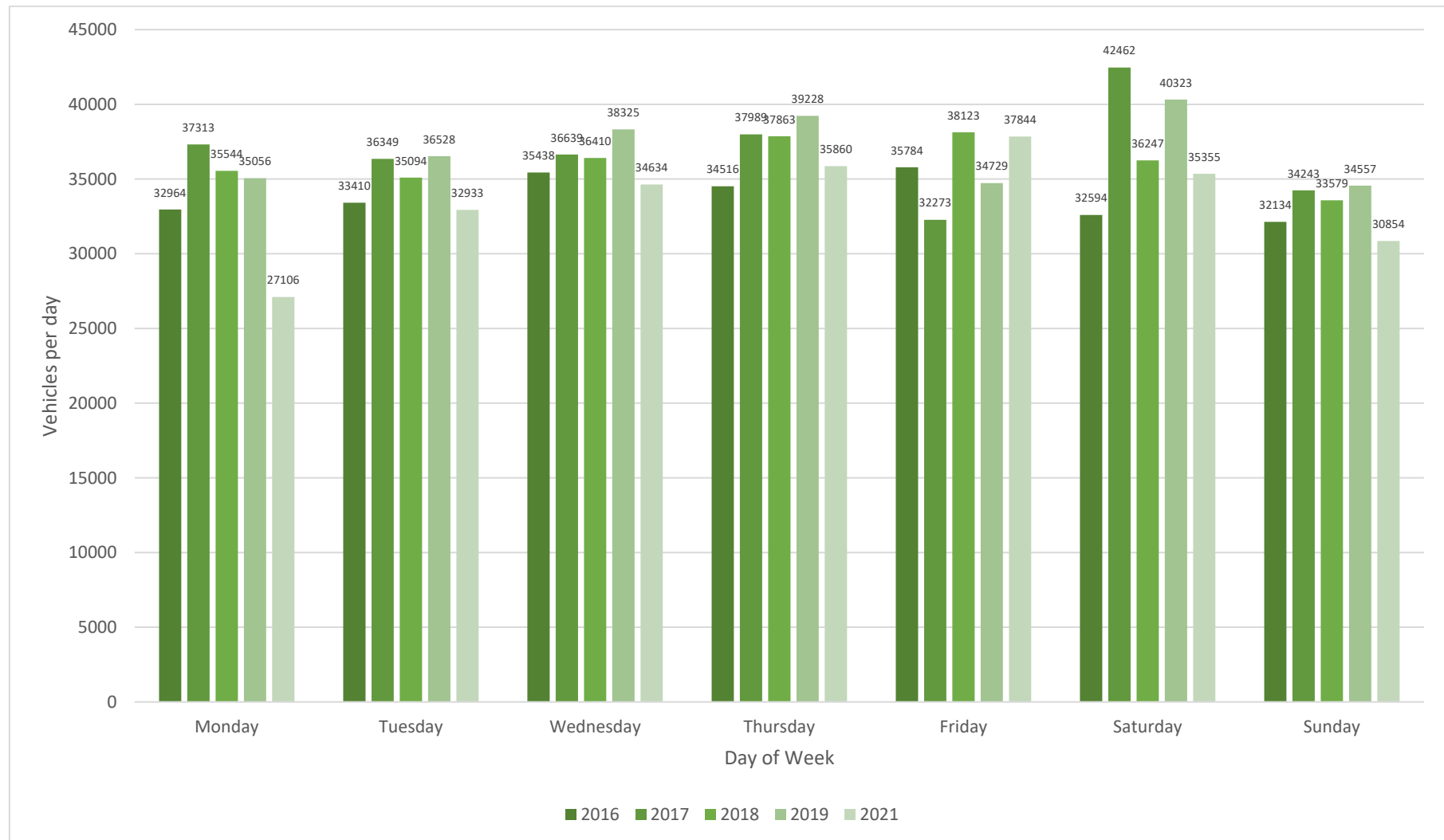


Figure 10: Daily Traffic Volume 2014-2021 (School Term)





**Figure 11: Daily Traffic Volume 2016-2021 (School Holidays)**

## 6.3 Traffic Distribution 2021

### 6.3.1 Intersection Traffic Volumes

Figures 12 to 17 below present the hourly turning counts at each intersection during the respective peak periods.

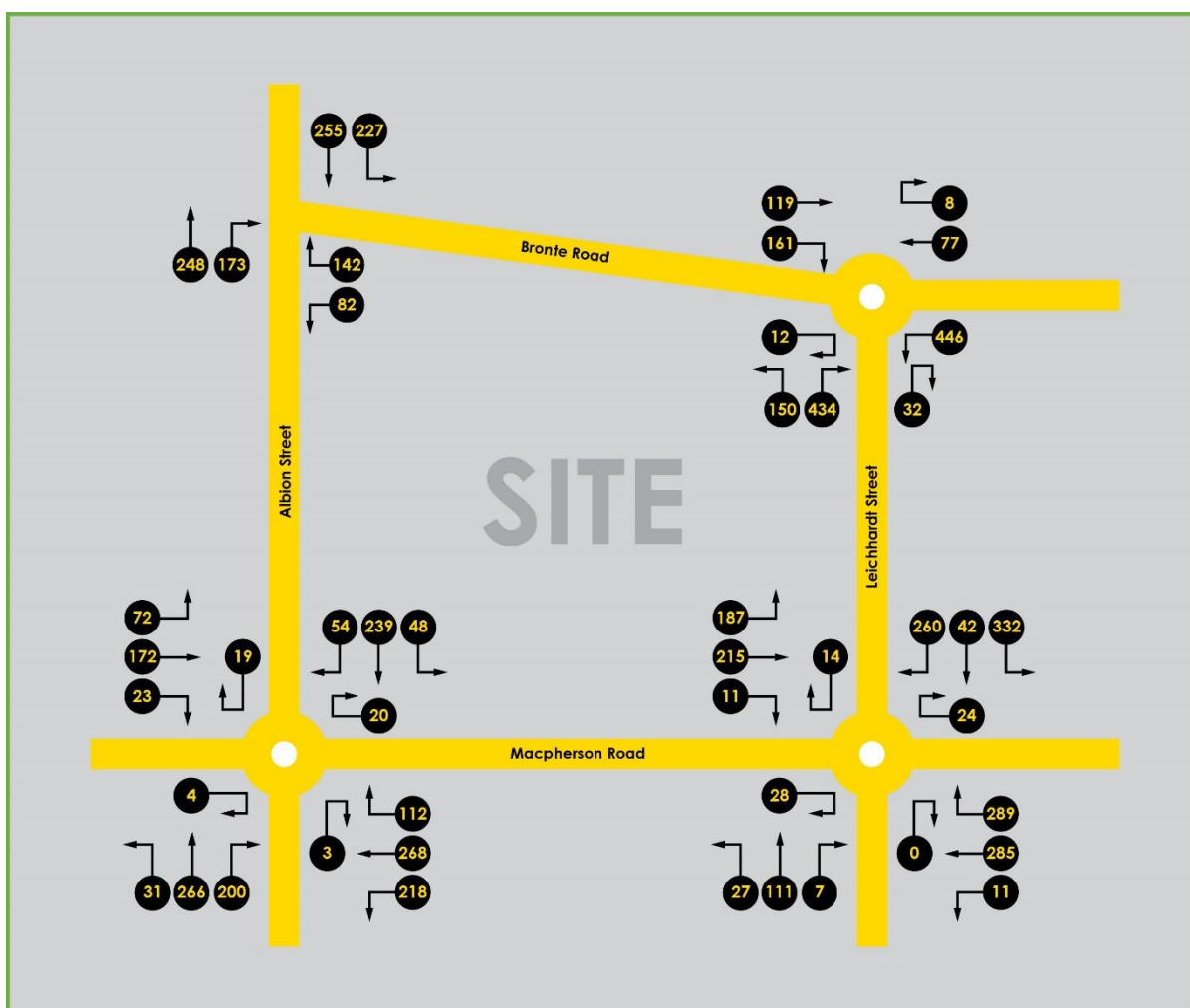


Figure 12: AM Peak (8-9am) Turning Counts during School Term

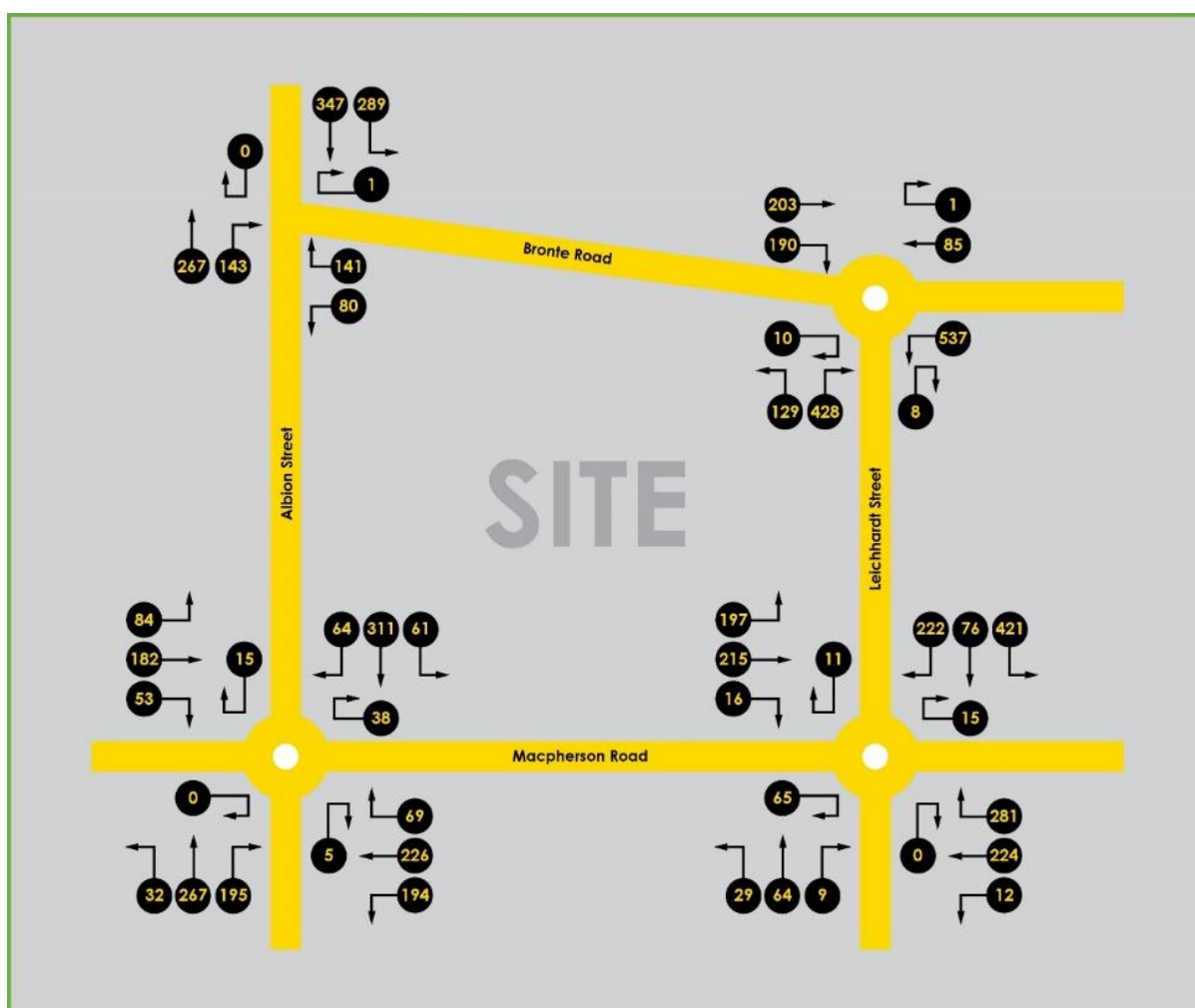


Figure 13: PM School Peak (3–4pm) Turning Counts during School Term

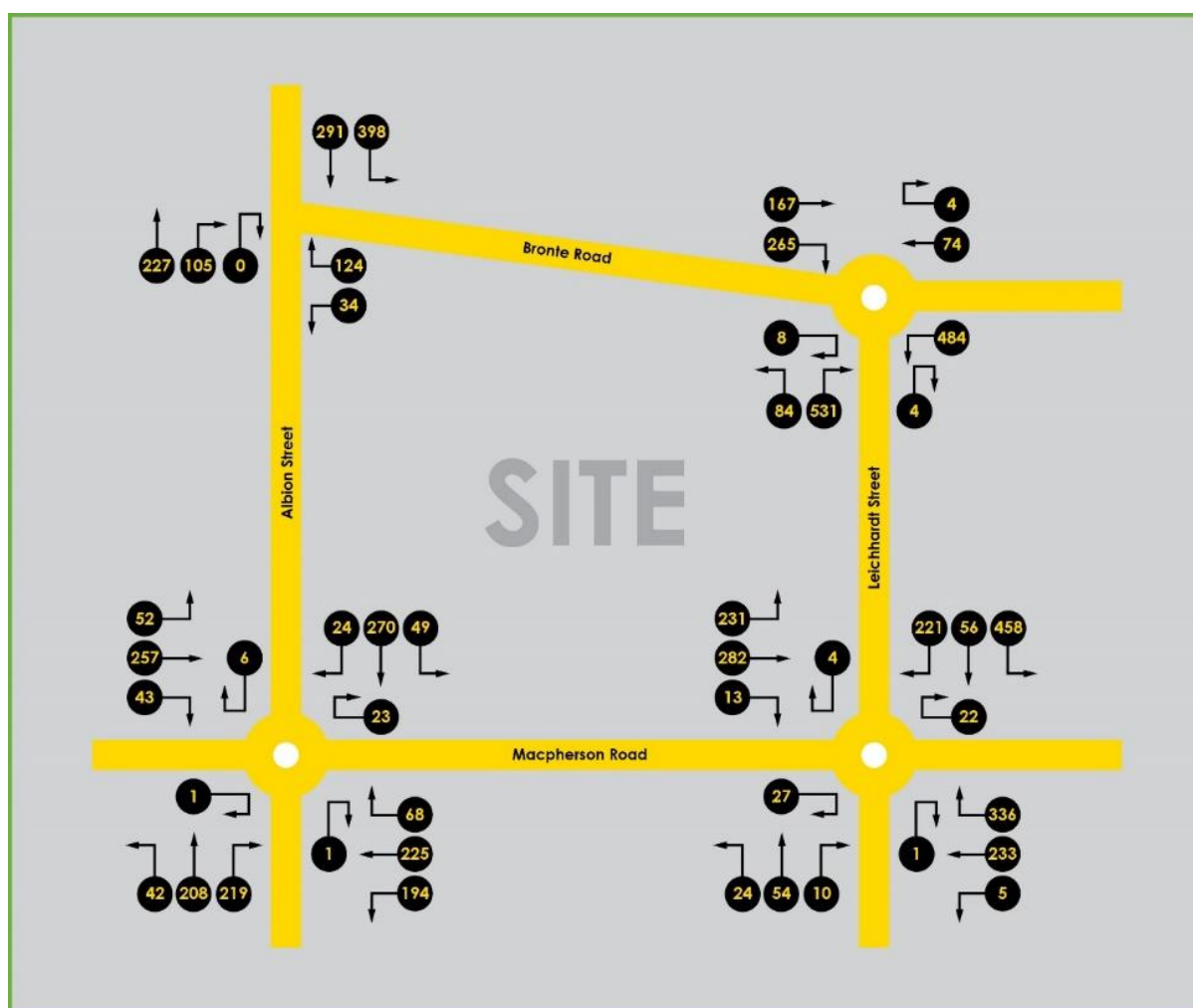


Figure 14: PM Peak (5–6pm) Turning Counts during School Term

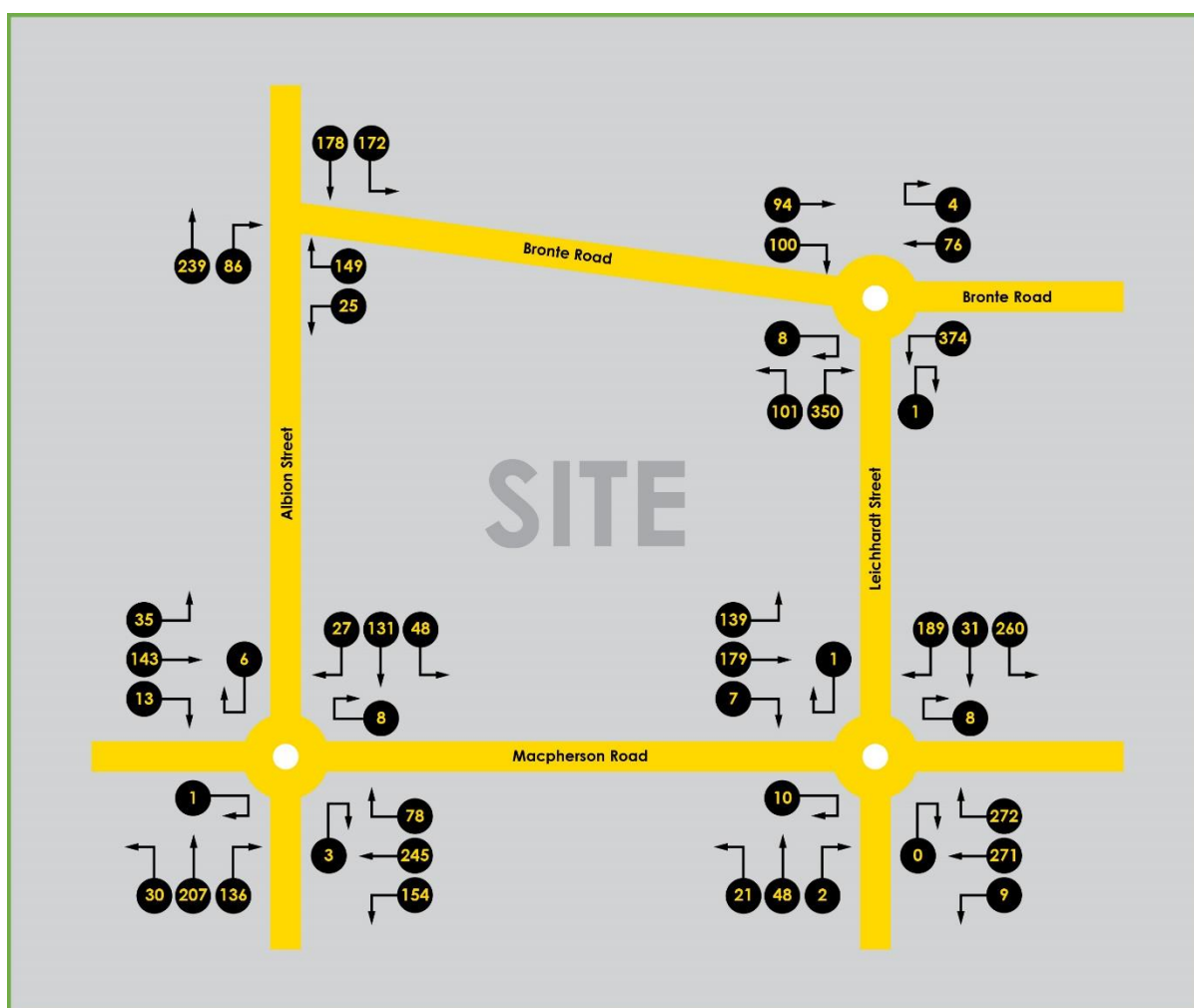


Figure 15: AM Peak (8-9am) Turning Counts during School Holidays

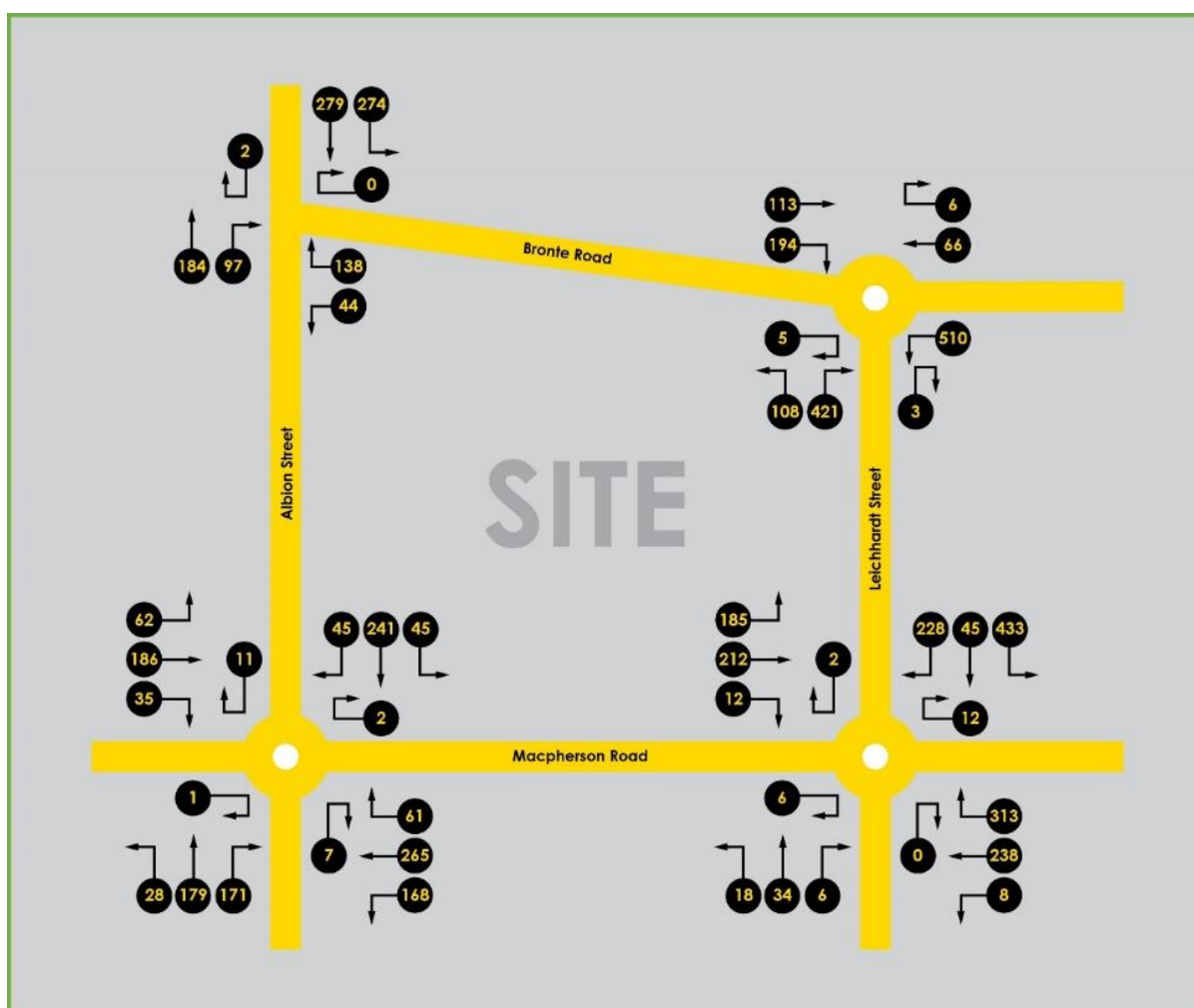


Figure 16: PM School Peak (3–4pm) Turning Counts during School Holidays

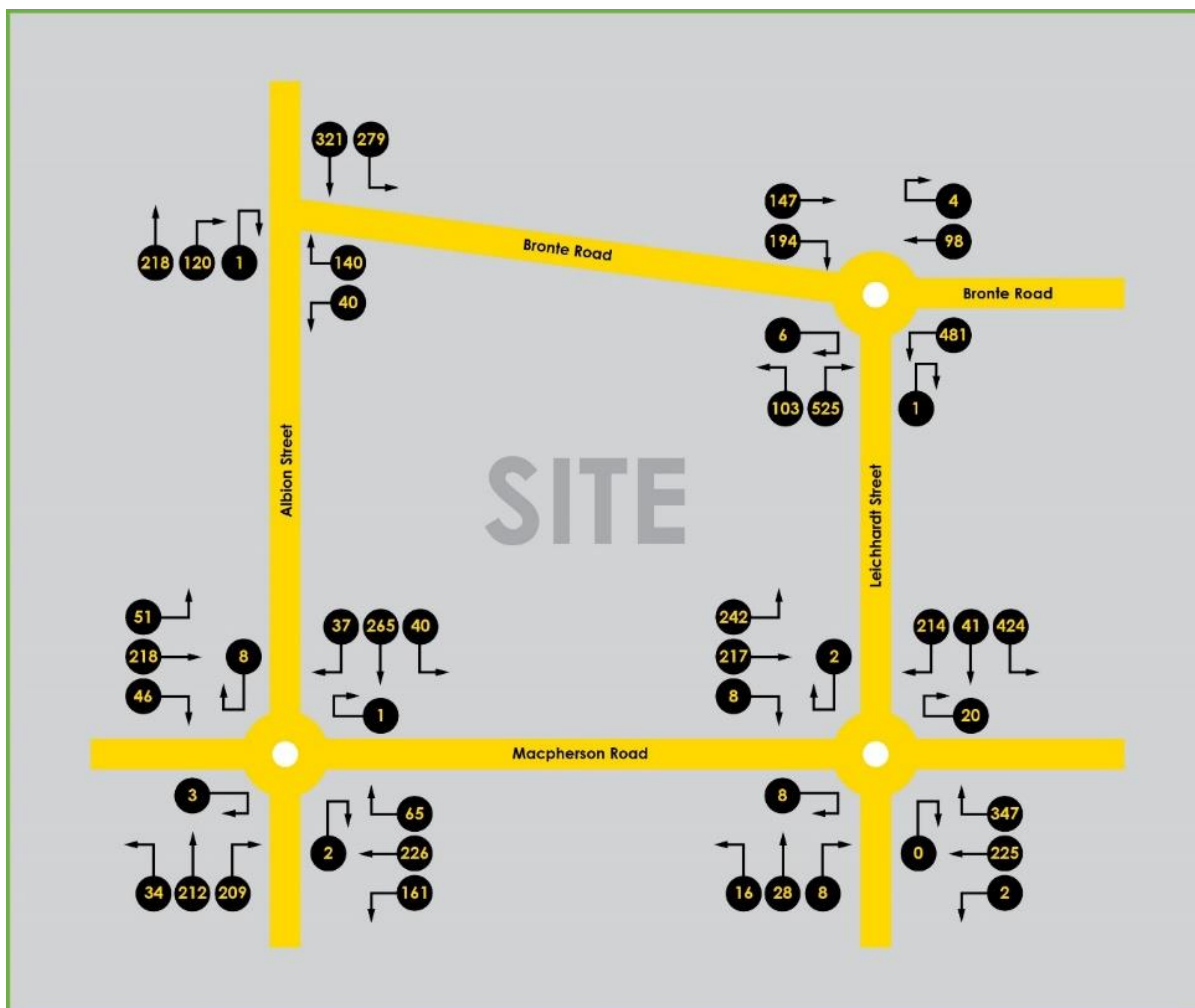


Figure 17: PM Peak (5–6pm) Turning Counts during School Holidays

### 6.3.2 Difference in Term vs Holiday Intersection Volumes

Figures 18 to 20 below show the difference in a typical school term day and a typical school holiday during the AM peak (8:00am – 9:00am), the school PM peak (3:00pm – 4:00pm) and the commuter PM peak (5:00pm – 6:00pm). The numbers presented in the figures below are the school term volumes minus the school holiday volumes. The scale of impact of change is shown by darker shades of grey.

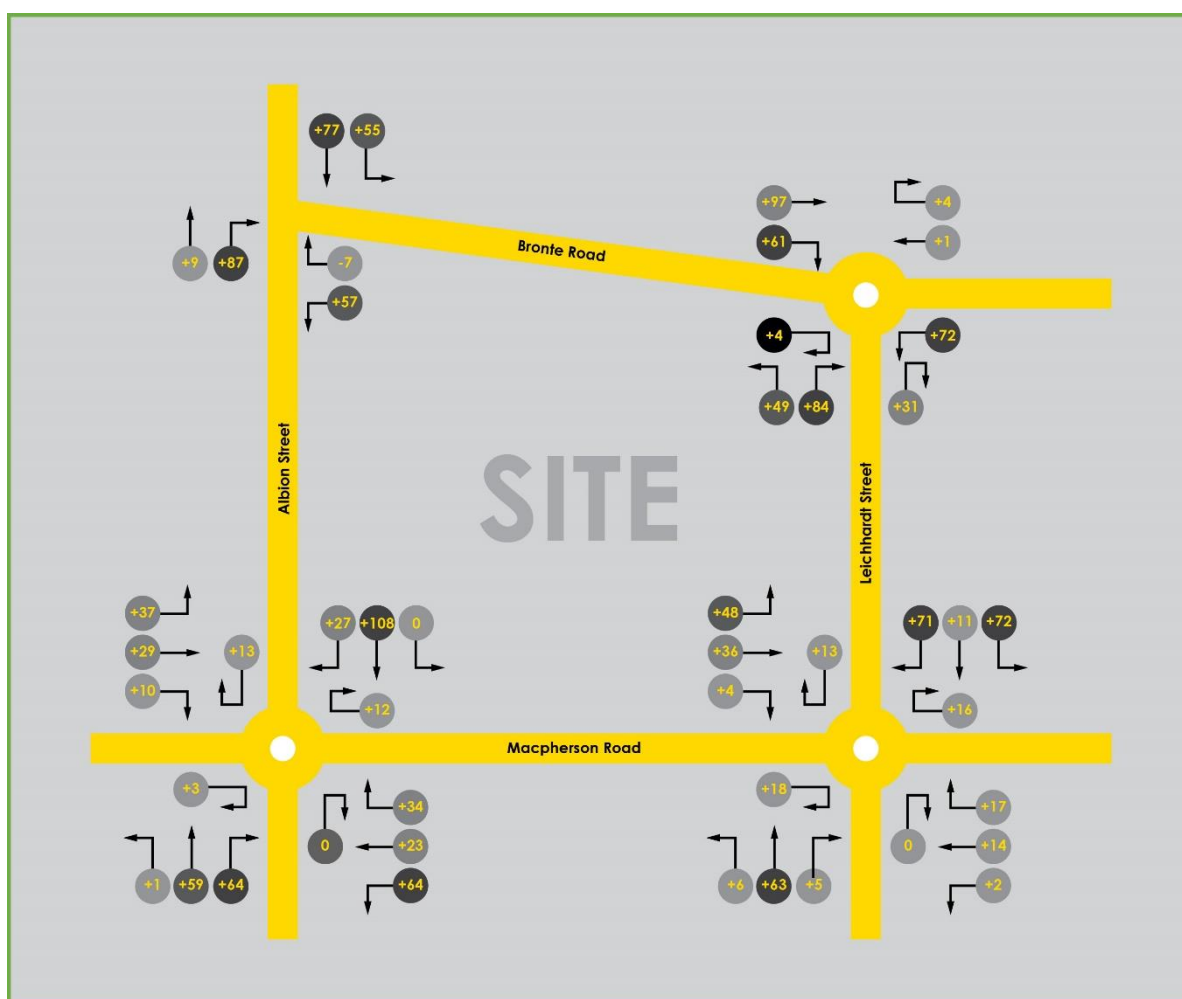


Figure 18: AM Peak (8-9am) Turning Count Differences



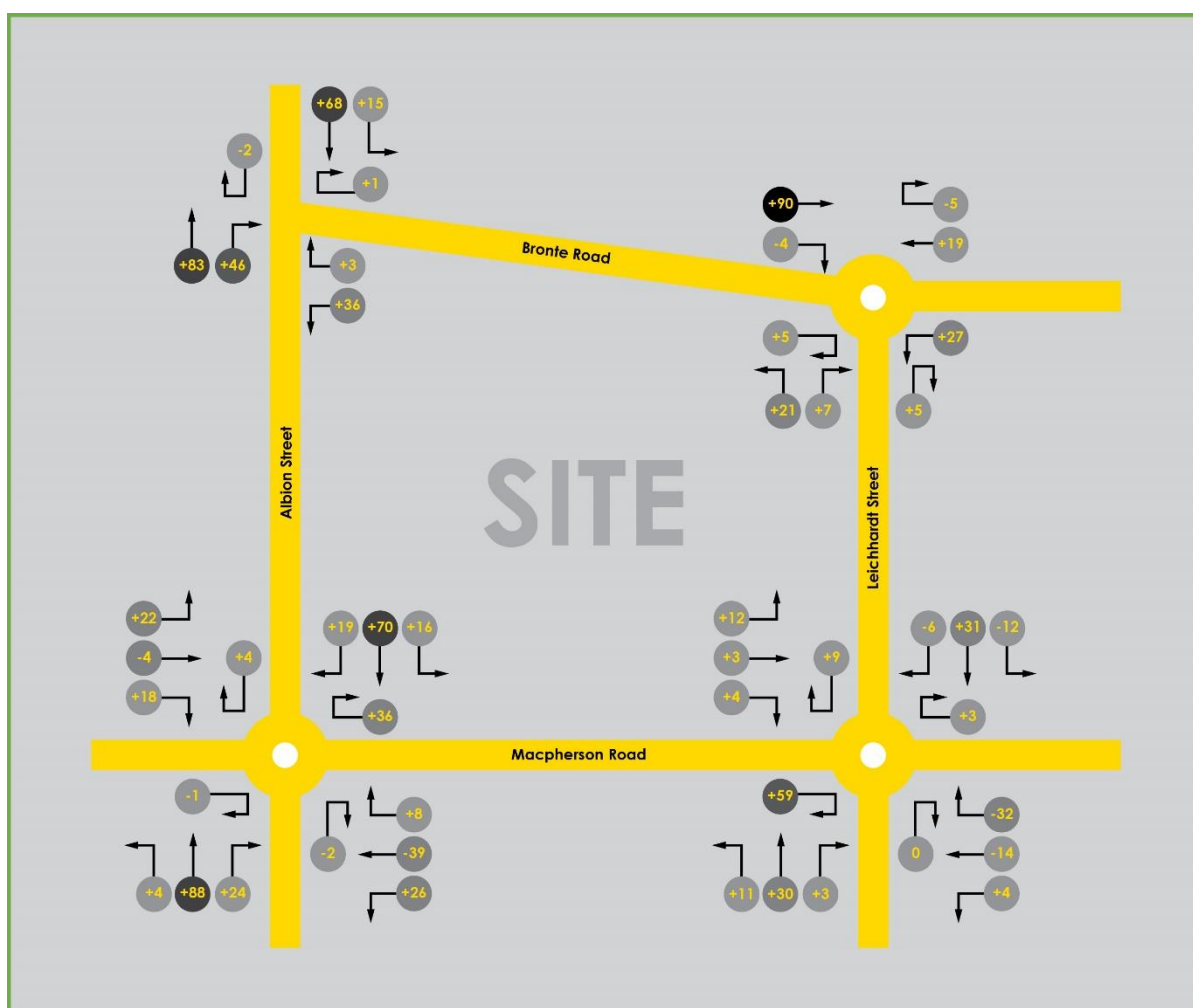
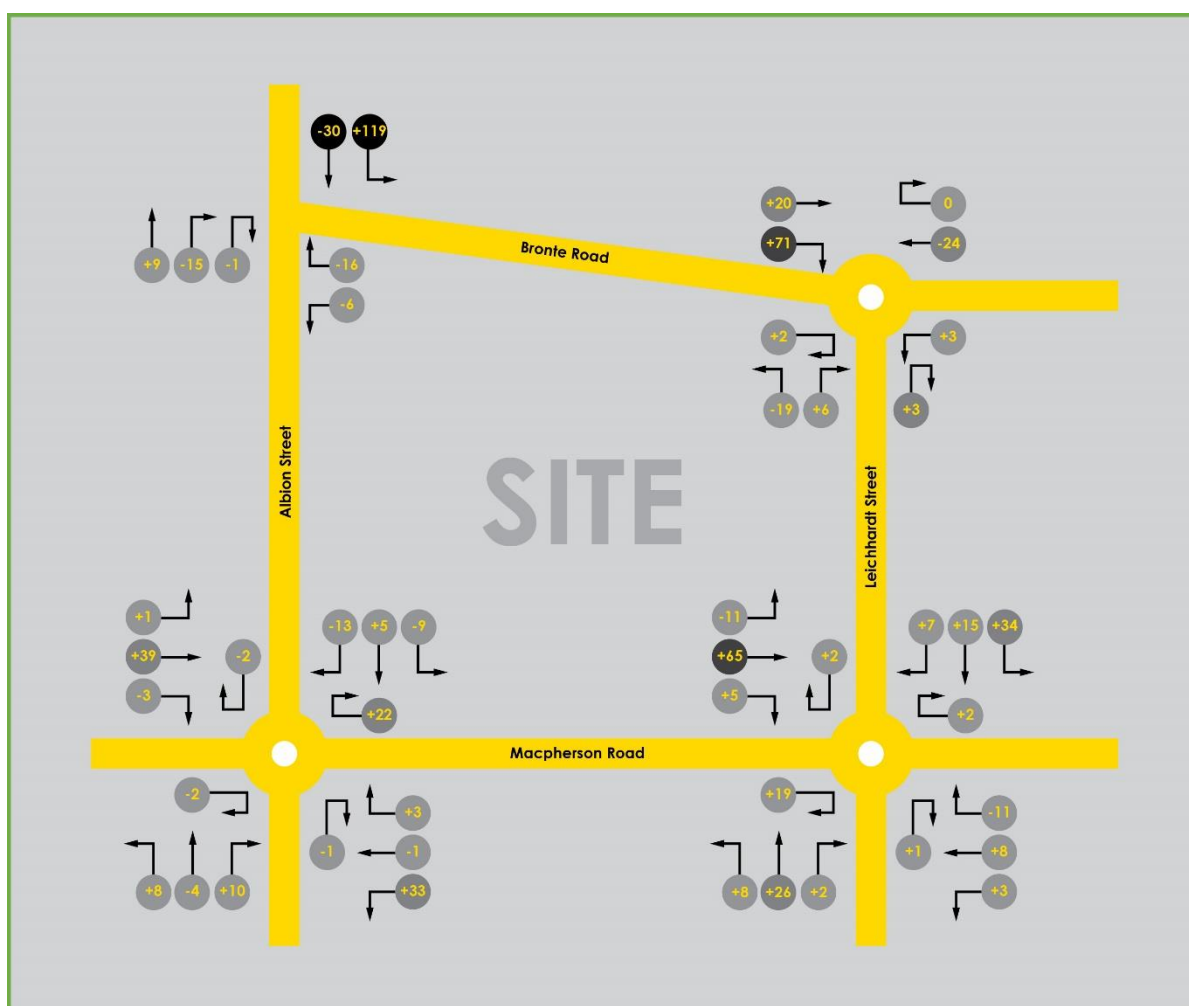


Figure 19: PM School Peak (3-4pm) Turning Count Differences



**Figure 20: PM Peak (5-6pm) Turning Count Differences**

Each intersection experiences a moderate change in the volume of traffic between the school term and school holidays. The AM peak (8:00am – 9:00am) saw a reduction of 24.2%, the school PM peak (3:00pm – 4:00pm) saw a reduction of 12.4% and the commuter PM peak (5:00pm – 6:00pm) saw a reduction of 6.2%. As with all school developments, this reduction during the school holiday period is expected due to vehicle movements associated with drop-off and pick-up.



### 6.3.3 Intersection of Macpherson Road and Leichhardt Street

During 2021, the CCC requested additional analysis in relation to traffic volumes at the intersection of Macpherson Street and Leichhardt Street. To provide an assessment, the peak hour total throughput volumes were compared between 2019 and 2021. These values are outlined below:

#### 2019 Total Volumes

- 8:00am to 9:00am 1,940 vehicles per hour
- 3:00pm to 4:00pm 1,957 vehicles per hour
- 5:00pm to 6:00pm 1,998 vehicles per hour

#### 2021 Total Volumes

- 8:00am to 9:00am 1,843 vehicles per hour (-5% reduction)
- 3:00pm to 4:00pm 1,857 vehicles per hour (-5.1% reduction)
- 5:00pm to 6:00pm 1,977 vehicles per hour (-1.1% reduction)

As can be seen from the above, there has been a minor decrease in traffic volumes through the intersection of Macpherson Road and Leichhardt Street during the critical peak hour periods. This reduction is consistent with the general downward trend in traffic volumes as a result of the COVID-19 pandemic.

### 6.3.4 Midblock Traffic Volumes

Figures 21 to 26 present the hourly midblock counts on each road during the respective peak periods.

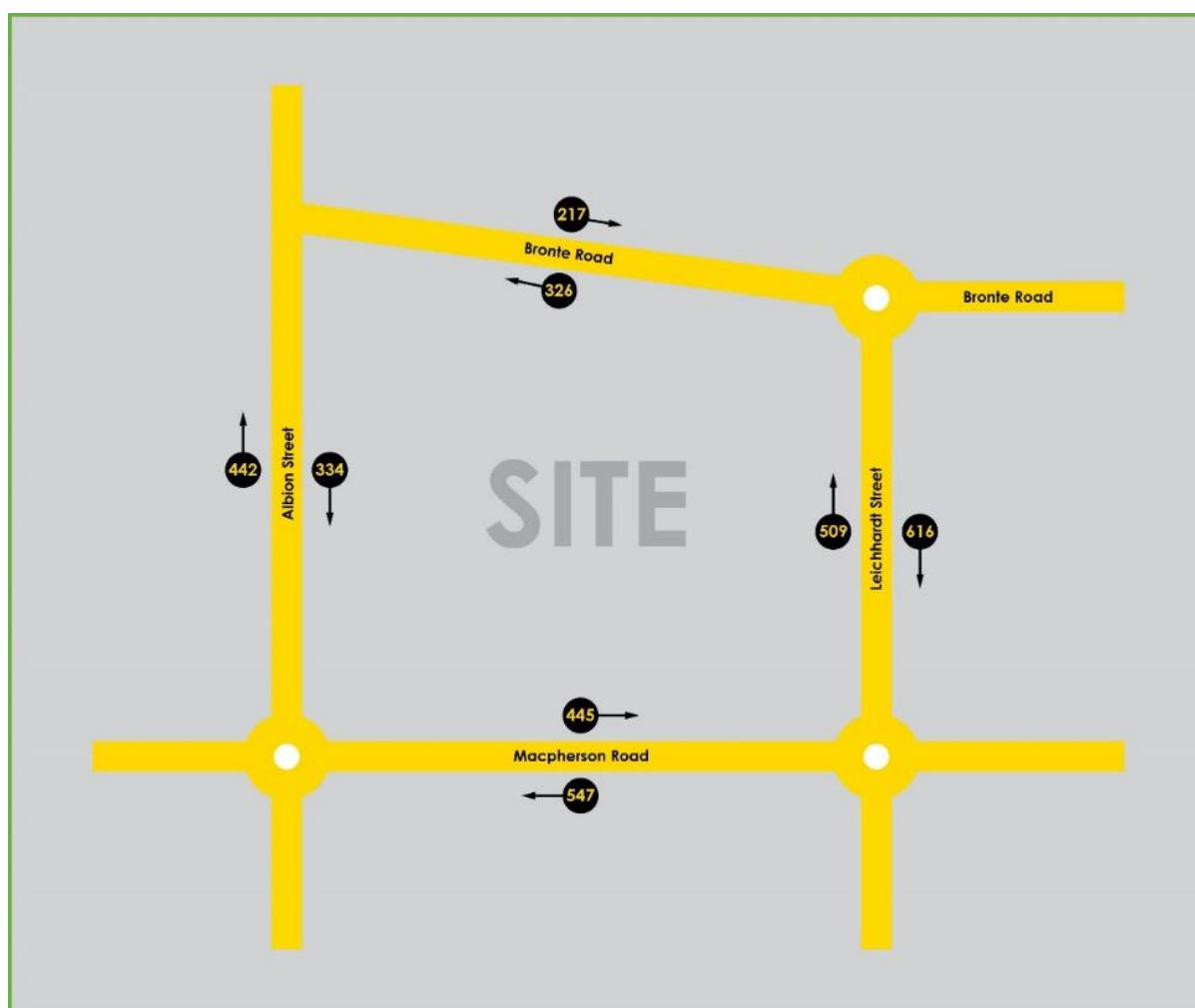


Figure 21: AM Peak (8-9am) Mid-Block Counts during School Term

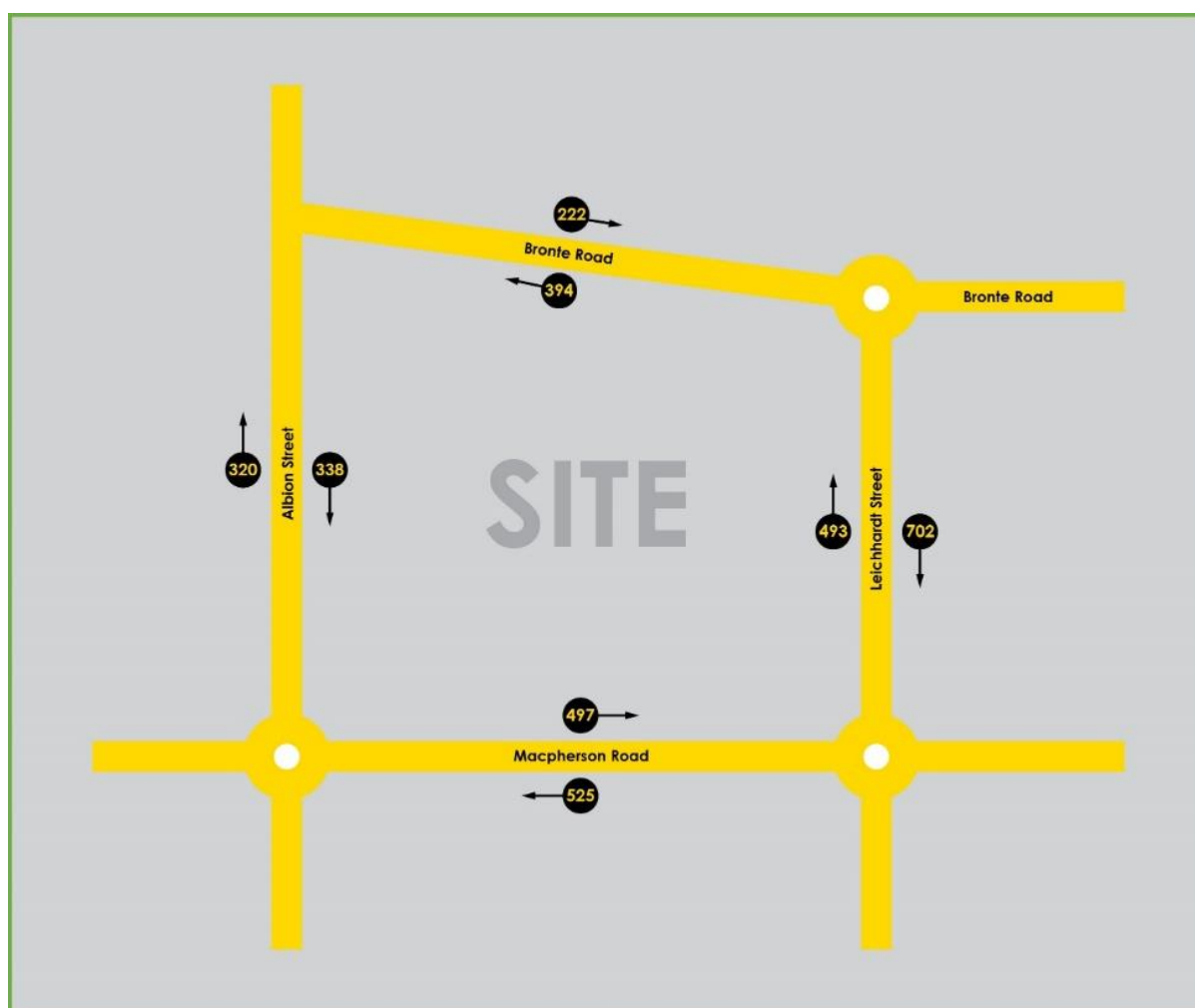


Figure 22: PM School Peak (3–4pm) Mid-Block Counts during School Term

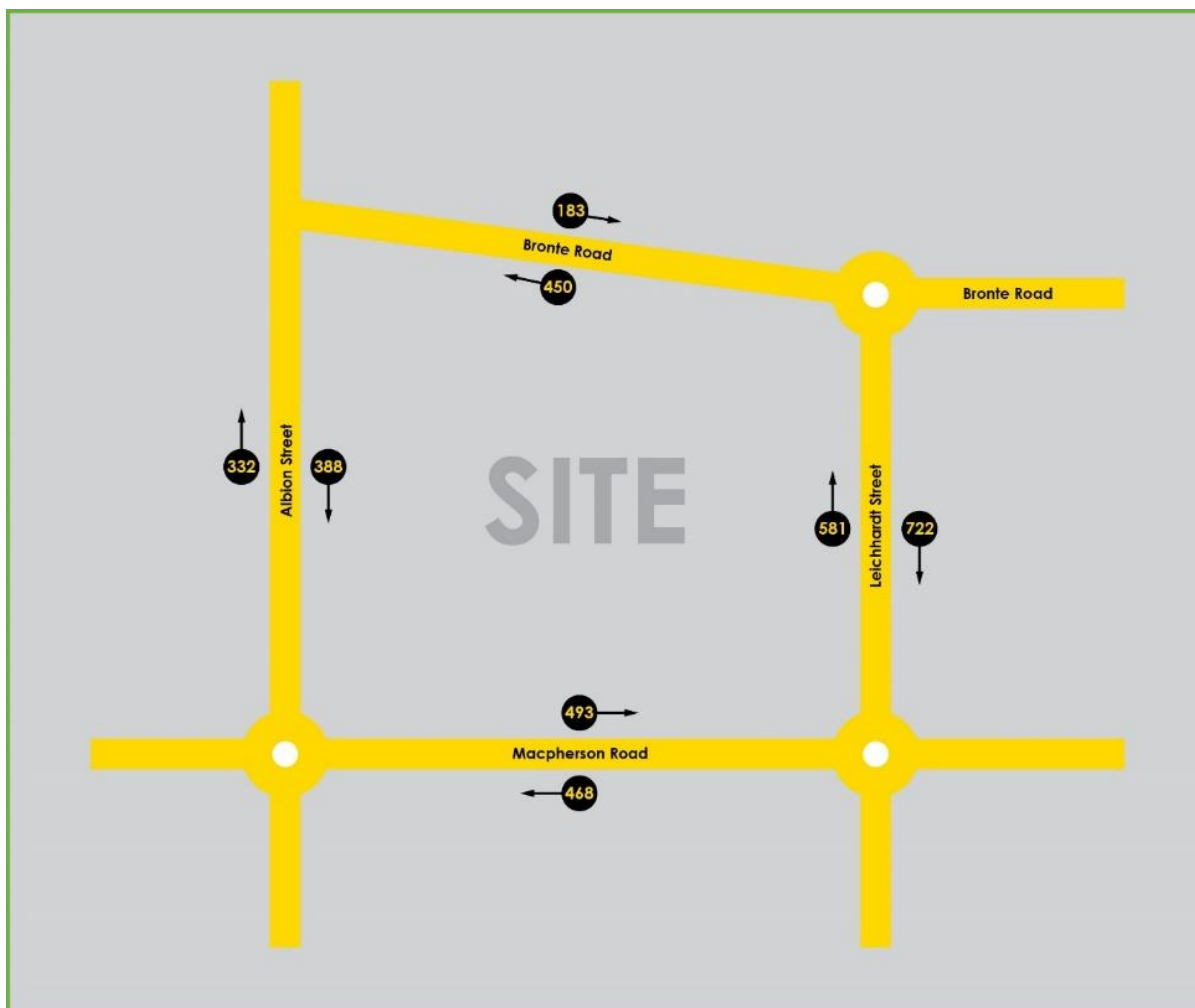


Figure 23: PM Commuter Peak (5-6pm) Mid-Block Counts during School Term

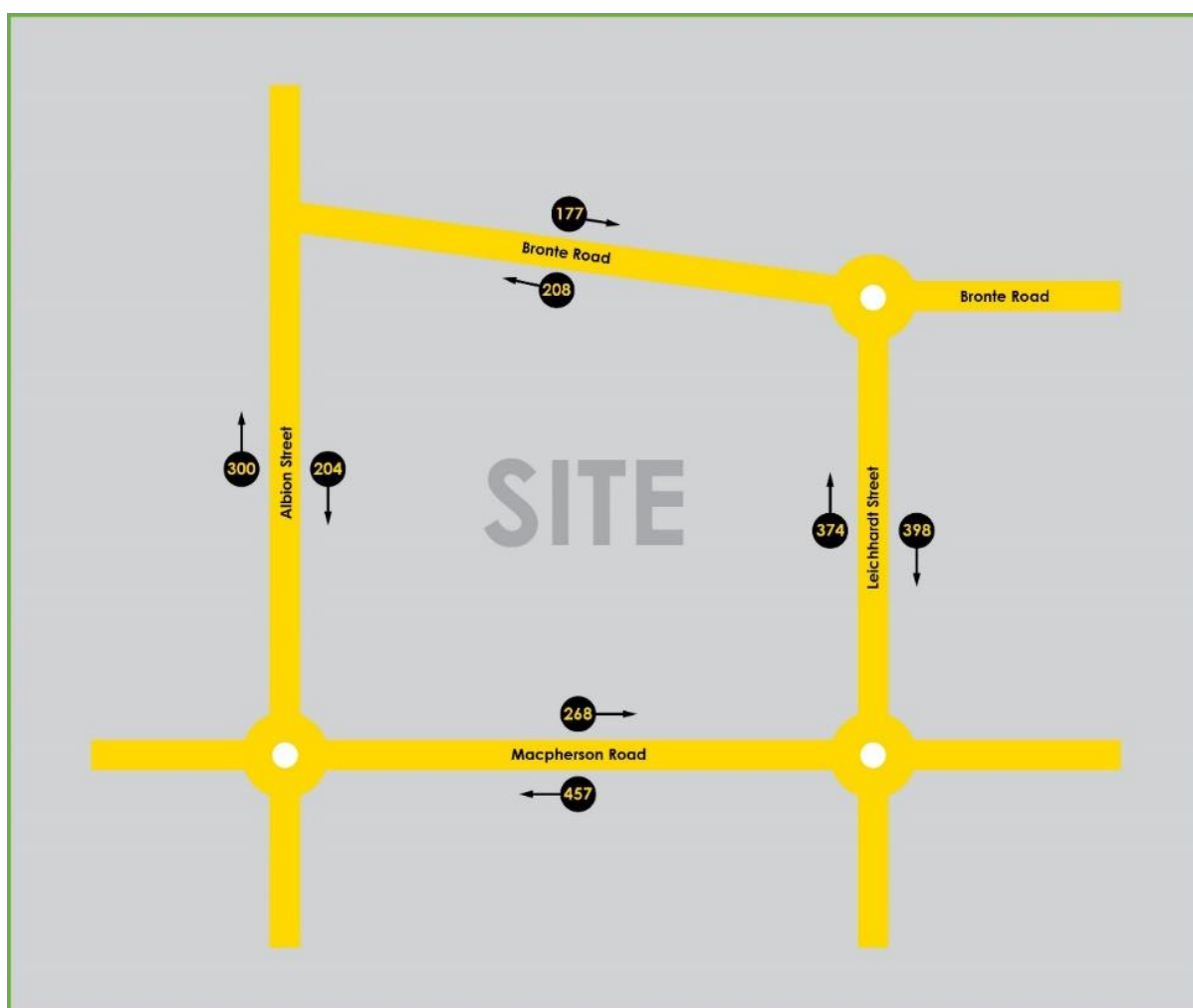


Figure 24: AM Peak (8-9am) Mid-Block Counts during School Holidays

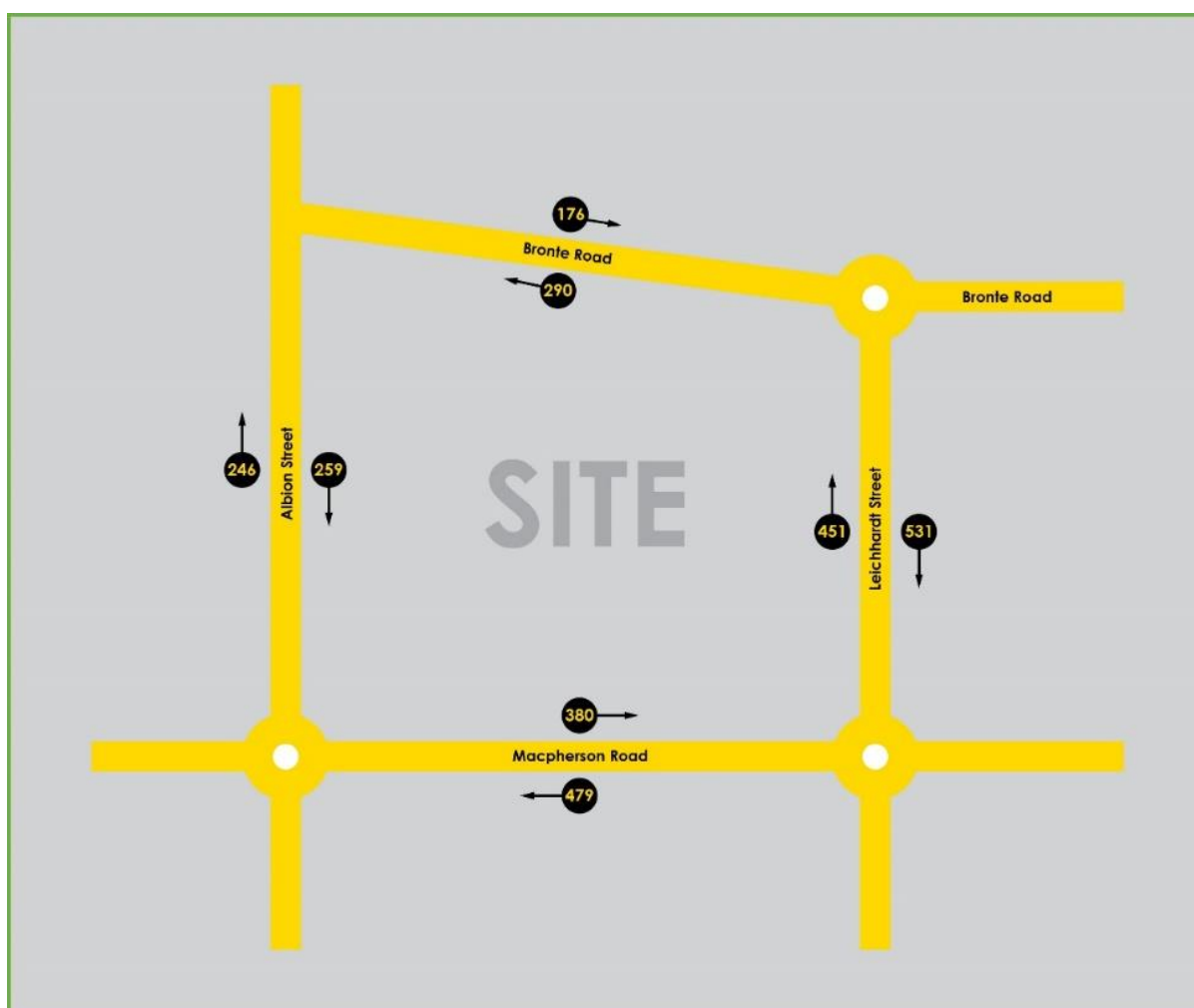
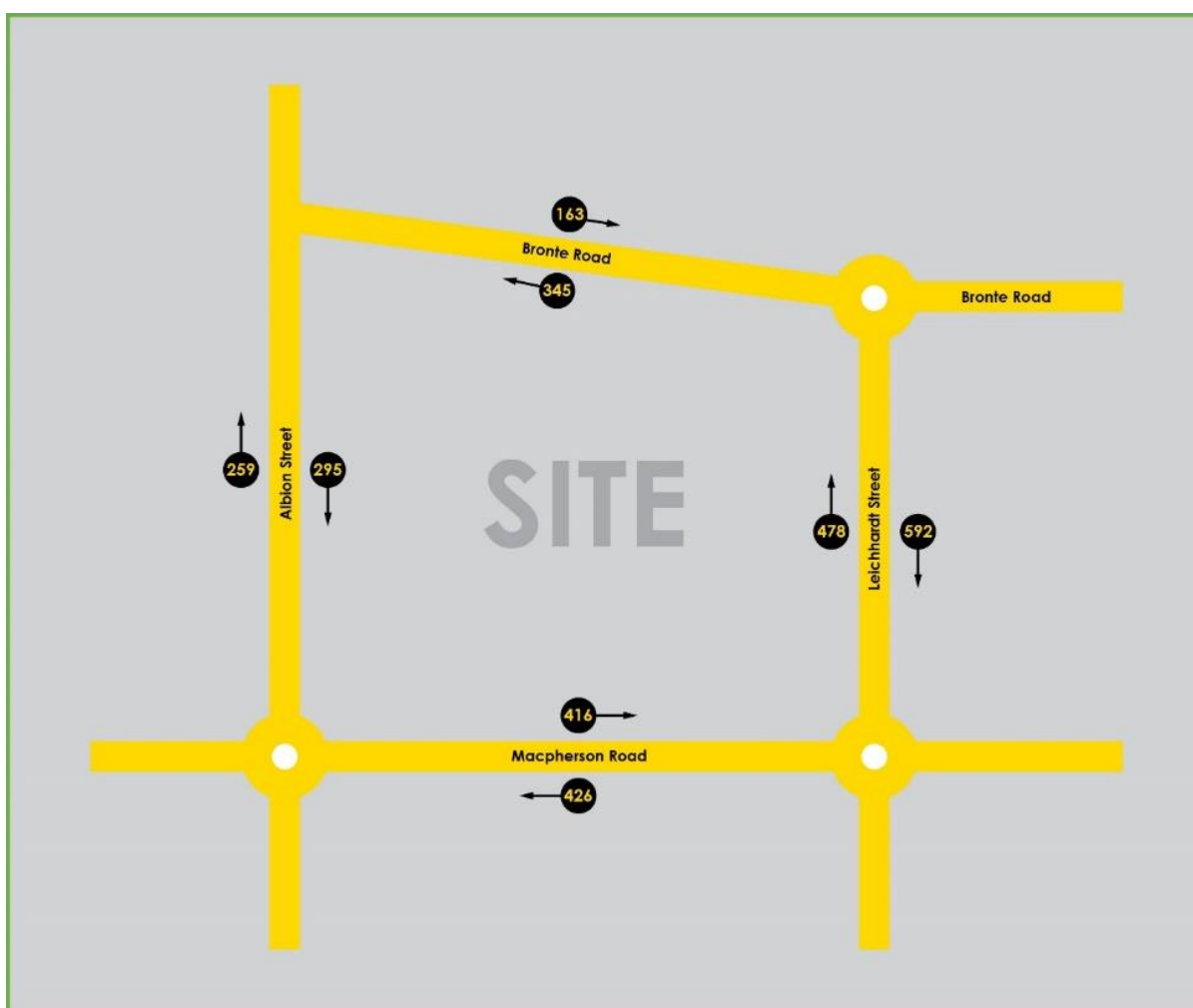


Figure 25: PM Peak (3-4pm) Mid-Block Counts during School Holidays





**Figure 26: PM Commuter Peak (5–6pm) Mid-Block Counts during School Holidays**

### 6.3.5 Difference in Term vs Holiday Midblock Volumes

**Figures 27 to 29** below show the difference between midblock flows in a typical school term day and a typical school holiday during the AM peak (8:00am – 9:00am), the school PM peak (3:00pm – 4:00pm) and the commuter PM peak (5:00pm – 6:00pm). Again, the numbers presented in the figures below are the school term volumes minus the school holiday volumes. A darker shade of grey indicates a greater difference between the school term and holiday counts.

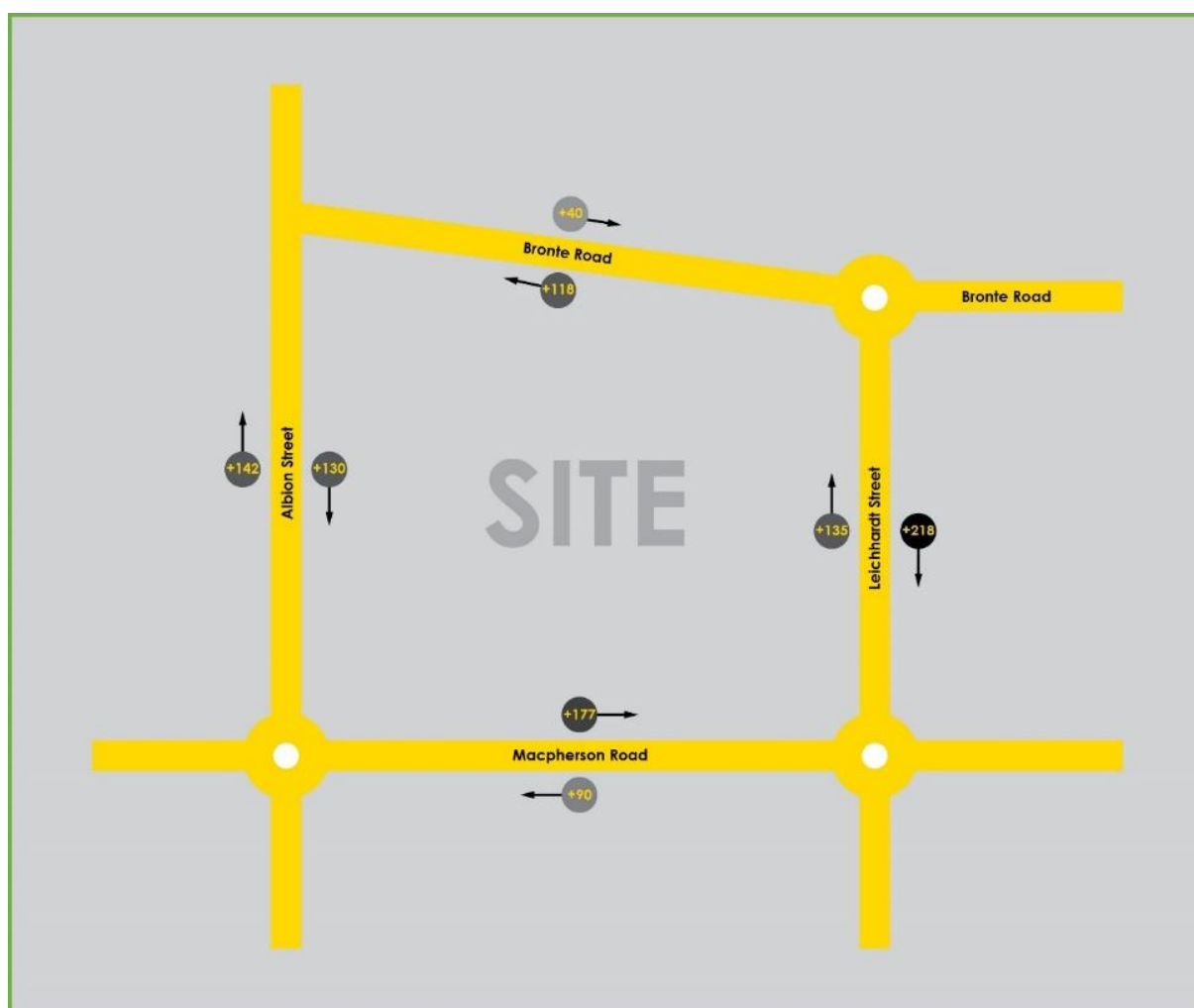


Figure 27: AM Peak (8-9am) Midblock Count Differences (School Term vs. School Holidays)

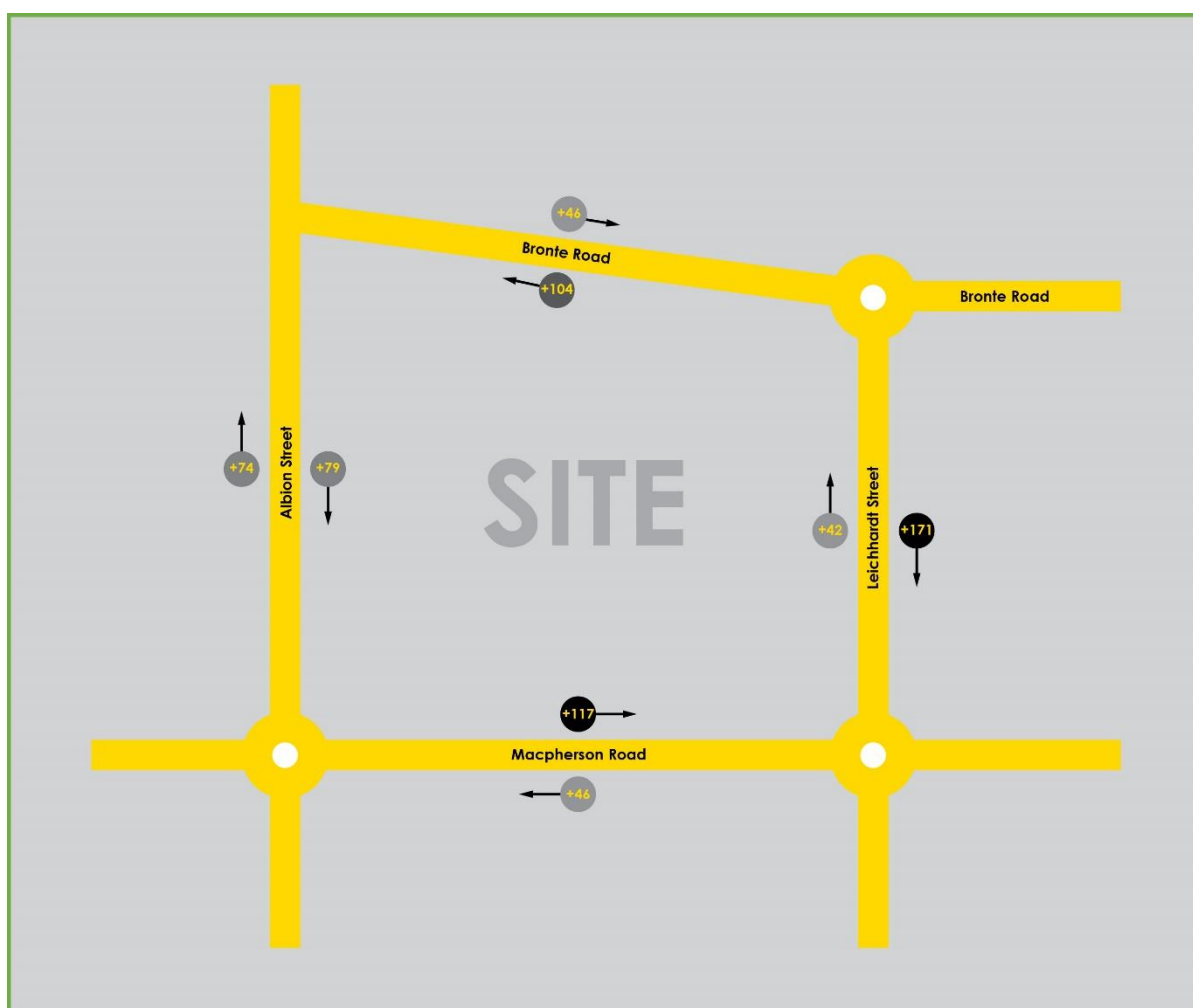
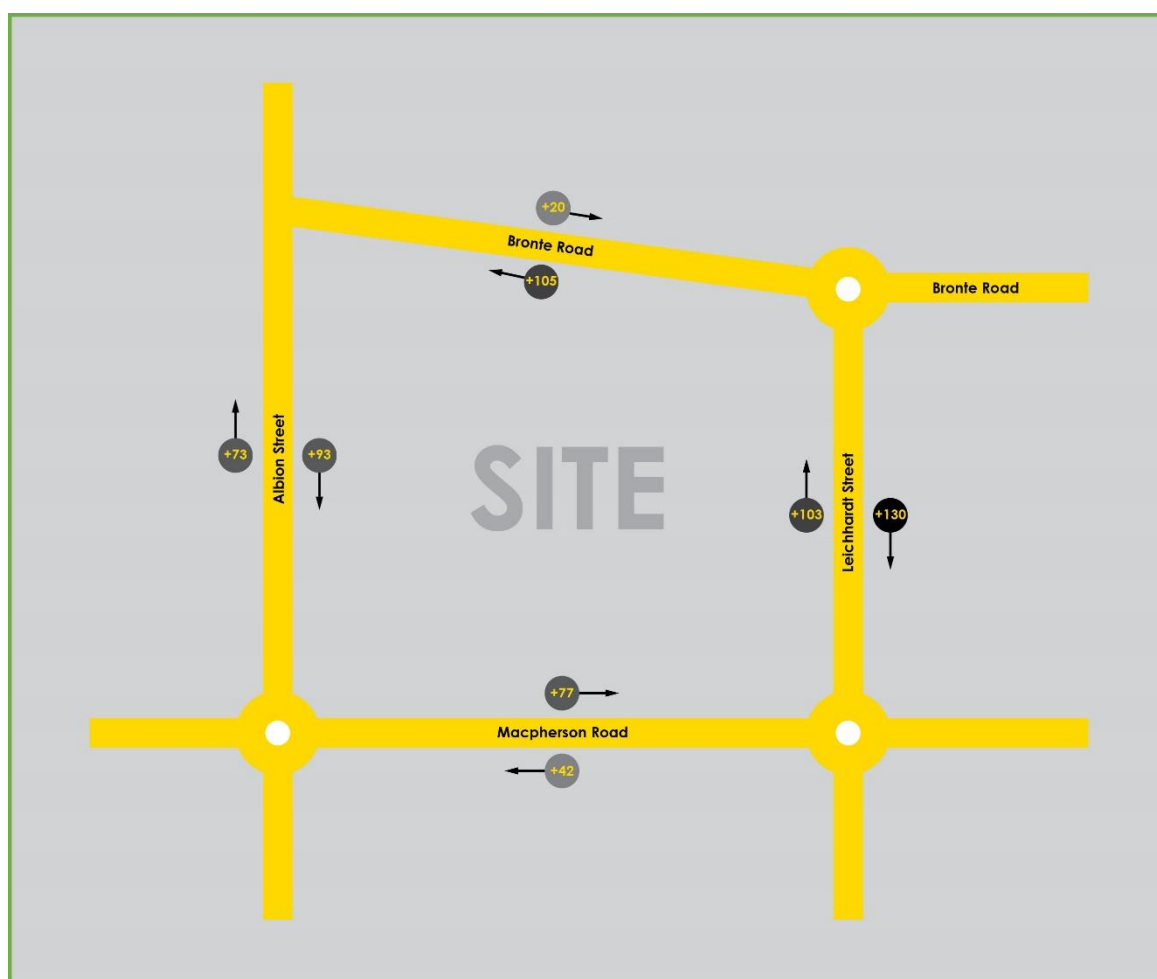


Figure 28: PM Peak (3-4pm) Midblock Count Differences (School Term vs. School Holidays)



**Figure 29: PM Peak (5-6pm) Midblock Count Differences (School Term vs. School Holidays)**

It can be observed from **Figures 27, 28 and 29** above that the traffic volumes along Leichhardt Street, Macpherson Road, Bronte Road, and Albion Street see a moderate change in the volume of traffic between the school term and school holidays. The AM peak (8:00am – 9:00am) saw a reduction of 30.6%, the school PM peak (3:00pm – 4:00pm) saw a reduction of 19.5% and the commuter PM peak (5:00pm – 6:00pm) saw a reduction of 17.8% during the holiday period as compared to the school term period.

As mentioned above, this decrease is expected due to reduction of vehicle movements associated with student drop-off and pick-up movements. It is however noteworthy that this downward trend is also reflected in the commuter PM peak between 5:00pm and 6:00pm, suggesting that this is an overall network trend between the school term and school holidays



traffic movements. As such, the school does not appear to be having a significant impact on traffic flows on the roads adjacent to the school.

### 6.3.6 Drop-off and Pick-up Zone Turning Counts

The drop-off and pick-up parking zones surveyed are shown in **Figure 30**.



**Figure 30: Drop-off and Pick-up Zones**

The results of the conducted surveys are summarized in **Table 14** to **Table 17** below.



**Table 14: Drop-off and Pick-up Counts (Site 1 - Albion Street West)**

AM Time	AM Drop-Off (vehicles)	PM Time	PM Pick-Up (vehicles)
8:00 – 8:15	17	2:30 – 2:45	0
8:15 – 8:30	5	2:45 – 3:00	0
8:30 – 8:45	0	3:00 – 3:15	0
8:45 – 9:00	0	3:15 – 3:30	11
N/A	-	3:30 – 3:45	0
N/A	-	3:45 – 4:00	0
N/A	-	4:00 – 4:15	0
<b>Total</b>	<b>22</b>	<b>Total</b>	<b>11</b>

**Table 15: Drop-off and Pick-up Counts (Site 2 - Albion Street East)**

AM Time	AM Drop-Off (vehicles)	PM Time	PM Pick-Up (vehicles)
8:00 – 8:15	22	2:30 – 2:45	0
8:15 – 8:30	12	2:45 – 3:00	0
8:30 – 8:45	4	3:00 – 3:15	0
8:45 – 9:00	0	3:15 – 3:30	2
N/A	-	3:30 – 3:45	1
N/A	-	3:45 – 4:00	1
N/A	-	4:00 – 4:15	1
<b>Total</b>	<b>38</b>	<b>Total</b>	<b>5</b>





**Table 16: Drop-off and Pick-up Counts (Site 3 - Macpherson Street)**

AM Time	AM Drop-Off (vehicles)	PM Time	PM Pick-Up (vehicles)
8:00 – 8:15	25	2:30 – 2:45	0
8:15 – 8:30	14	2:45 – 3:00	0
8:30 – 8:45	0	3:00 – 3:15	43
8:45 – 9:00	0	3:15 – 3:30	27
N/A	-	3:30 – 3:45	12
N/A	-	3:45 – 4:00	1
N/A	-	4:00 – 4:15	0
<b>Total</b>	<b>39</b>	<b>Total</b>	<b>83</b>

**Table 17: Drop-off and Pick-up Counts (Site 4 - Leichhardt Street)**

AM Time	AM Drop-Off	PM Time	PM Pick-Up
8:00 – 8:15	5	2:30 – 2:45	0
8:15 – 8:30	1	2:45 – 3:00	0
8:30 – 8:45	0	3:00 – 3:15	11
8:45 – 9:00	0	3:15 – 3:30	0
N/A	-	3:30 – 3:45	0
N/A	-	3:45 – 4:00	0
N/A	-	4:00 – 4:15	0
<b>Total</b>	<b>6*</b>	<b>Total</b>	<b>11*</b>

\*The site 4 drop-off and pick-up data would appear to be an error and the 2022 survey will particular attention to this location and increase the duration by 1 hour to commence at 7:00am.

It must be noted that there was a clear anomaly in the Site 4 drop-off and pick-up data collected in 2021. This may be due to the following reasons:





- A significant proportion of primary school and secondary school students are dropped-off before 8am;
- A moderate proportion of primary school and secondary school students are picked-up after 4:30pm;
- Students are dropped-off or picked-up on either Albion Street, Macpherson Street or Leichhardt Street outside of the designated parking zones; and
- Students may be dropped-off or picked-up on surrounding streets which are more convenient for parents/caregivers.

To ensure future surveys are more accurate, the 2022 survey will increase the survey duration at all drop-off and pick-up survey locations by one (1) hour in the morning (commence at 7am) and 45 minutes in the afternoon (finish at 5pm).

In summary, the drop-off and pick-up data for all zones demonstrate negligible traffic movements past 8:30am during the AM Peak. This further confirms the low traffic generation resulting from the school as indicated by volume surveys and intersection counts when the school term and school holiday counts are compared.

It should, however, be noted that sites 2 and 3 experience a higher magnitude of traffic than sites 1 and 4, suggesting that parents prefer utilising these areas more for dropping off or picking up. Should it be deemed that traffic volume relating to 'drop-off and 'pick-up' activities is unevenly distributed. Investigation into whether the OTMP can be altered to provide more evenly distributed drop-off and pick-up usage should be considered.



## 7. FUTURE TRAVEL STRATEGIES

### 7.1 Objectives

As discussed in Section 5.1, the 2014 ARUP report provided travel mode targets for staff and students to achieve no net increase in vehicular trips to the school as follows:

#### Staff:

- A 5% reduction in car drivers
- Additional 4% to utilise bus service
- Additional 1% to carpool

#### Students:

- An 11% reduction in drop-off and pick-up
- Additional 8% utilising the school bus
- Additional 7% utilising public transport

A number of travel strategies have been put into place to encourage active travel, reduce the reliance on private vehicle travel for staff and students and to minimise the traffic impacts from the school expansion and construction of the RPAC.

The following section of the OTMP detail how these targets will be met by the completion of the expansion of the school in 2030.

### 7.2 Bus Services

#### 7.2.1 Objectives and Targets

St Catherine's School currently offers a private subsidised bus service as discussed previously. The timetable and detailed breakdown of the stops has been presented in **Appendix F** with the Bus Routes map provided in **Figure 31**. The school have set a target to increase patronage of this bus service across the school and consider that this is the most effective way to create



a positive modal shift away from private car travel. If successful, additional routes and buses will be considered.

### **7.2.2 Timing**

A total of four (4) of the bus services are available for students to use as of 2021. Parents of prospective students are informed of the new service before the school term starts to ensure they have sufficient time to enrol their children.

### **7.2.3 Responsibility**

The School's Head of Finance and Operations is the central authority for the bus service. The school's administration staff are responsible for ensuring the operations of the services, including registration of students on the services and responding to general queries.

### **7.2.4 Funding**

The school continues to adjust and review its funding of the buses. In term 1, 2017 a flat fee of \$150 was applied to bus users. In term 2, 2017 a per ride ticket option was added as an option for payment in order to increase participation. As of 2021, the school bus service costs \$160 per term. Pricing for 2022 is yet to be finalised.

### **7.2.5 Implementation**

The bus service will continue to operate on the routes established over the years, as previously discussed. Due to the success of the initiative, the school will maintain the existing service and attempt to build on it to maximise available seats provided by the service. The focus of the initiative will be to fill each bus and potentially add additional services to the existing routes, depending on demand.

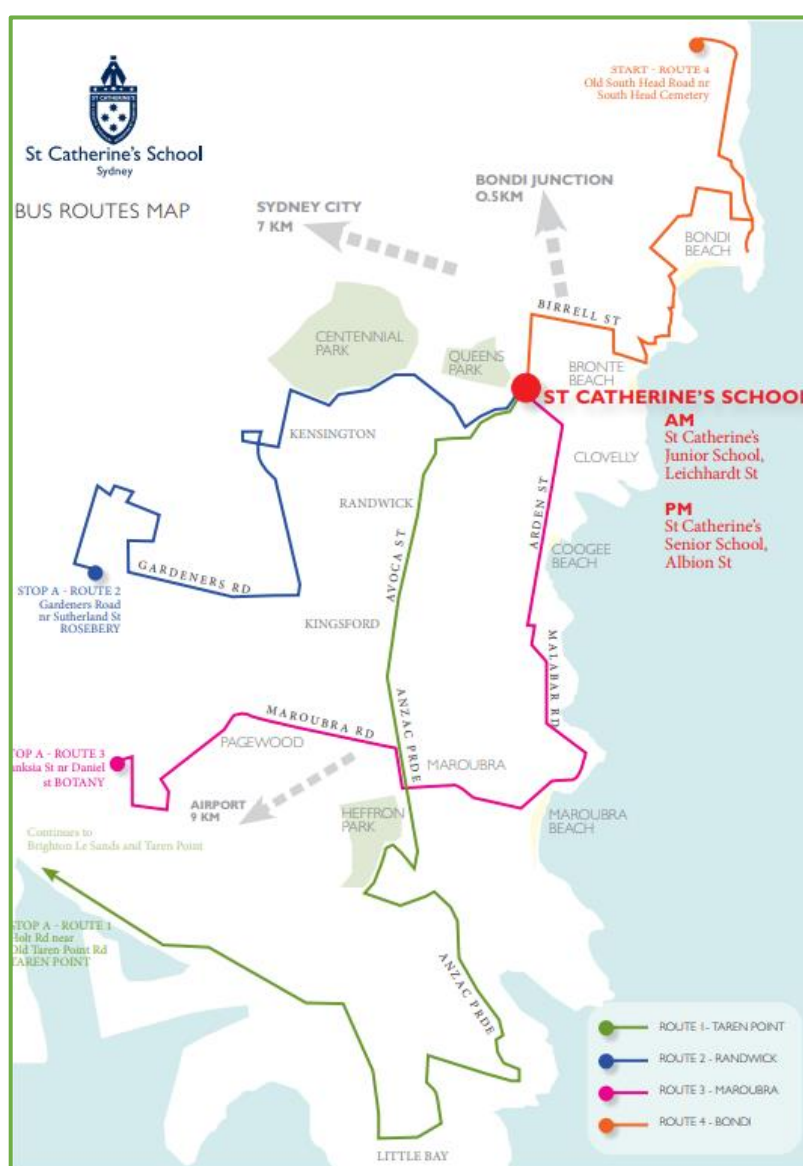
### **7.2.6 Strategy Monitoring**

As the bus operations are being managed in house, the monitoring of the uptake of this service can be easily achieved. Postcode and street data for students is available to the school via annual travel surveys for future route planning purposes, which will cover annual student intakes

and departures. The bus routes will be reviewed annually to ensure effective coverage of the entire school catchment areas and to optimise patronage.

## 7.2.7 Monitoring Targets

The school will publish the results of the monitoring and independent auditing publicly available on the school's website and available to the Community Consultative Committee.



(Source: St Catherine's Bus Travel Pamphlet)

**Figure 31: St Catherine's Bus Service Routes**



## 7.3 On-site Staff Parking and Management

### 7.3.1 Objectives and Targets

St Catherine's School currently has 56 off-street parking spaces. The development application proposed an additional 19 off-street parking spaces to accommodate a total of 75 off-street car parking spaces. From ARUP's 2014 survey results (discussed in more detail in Section 5.1), it was established that 150 staff members were travelling to the site via private vehicle. This equates to 74% of staff. It is considered that the future development will have up to 212 staff and if travel modes are maintained this will see up to 157 private vehicles requiring parking with up to 82 vehicles utilising on-street facilities.

St Catherine's School is proposing to promote active travel and public transport amongst staff to see a shift in the mode splits as previous efforts to promote car-pooling and offering guaranteed on-site parking for car poolers has been poorly received.

### 7.3.2 Timing

Car parking spaces on site will continue to be dedicated to staff based on seniority, however active travel and public transport have been promoted by the school from the beginning of 2017. Two (2) on-site spaces are available for carpooling users. Utilisation will be reviewed on a term-by-term basis.

### 7.3.3 Responsibility

The development consent required the school to employ a Traffic Control Officer. The Traffic Control Officer started at the start of Term 2, 2017 and has re-introduced an internal car pooling initiative. An increased staff participation in car pooling has been recorded and future car pooling participation will be monitored.

### 7.3.4 Funding

The school funds the Traffic Control Officer role.



### **7.3.5 Implementation**

Onsite parking management is ongoing.

### **7.3.6 Monitoring**

Monitoring of the car-pooling scheme will be the responsibility of the Traffic Control Officer.

### **7.3.7 Monitoring Targets**

The school will publish the results of the car-pooling rates on the school's website and provide the rates to the Community Consultative Committee.

## **7.4 On-street Parking Alterations / Pedestrian Crossing Relocation**

### **7.4.1 Objectives and Targets**

The objectives of the relocation of the Macpherson Street pedestrian crossing in accordance with the development consent is to maximise the kerbside space, adjacent to the school, for the utilisation of drop-off and pick-up parking. This initiative will ensure that additional drop-off capacity can be accommodated with minimal impact to the surrounding neighbourhood. Additionally, the relocation will consider the existing bus zones and relate to the new school pedestrian access via the RPAC building, resulting in increased queueing capacity. Kerb extensions will be provided on each side of the pedestrian crossing so that the crossing is better defined and complies with TfNSW guidelines for approach and departure "No Stopping" lengths of parking restrictions. These modifications will improve operational safety. The bus zone will be relocated so that it is on the departure side of the zebra crossing which results in increased queuing capacity and improved operational safety. With the relocation a continuous 'no parking' drop-off / pick-up zone for up to nineteen (19) vehicles will be created and will permit an efficient flow of vehicles. This equates to an increase of approximately three (3) vehicles. The modifications are consistent with the approved development consent.

The school currently provides marshalling areas for different year groups along Albion, Macpherson and Leichhardt Streets which are shown in **Figure 32** below. There are no proposed changes to the existing marshalling areas. Leichhardt Street will continue to be



constantly supervised. Macpherson Street will continue to have the afternoon collection monitored, and the other areas will be marshalled on a needs basis to ensure efficient operation by the school's permanent part time Traffic Control Officer, who will also be responsible for managing all transport operation moving forward.

Following the relocation of the Macpherson Street pedestrian crossing, an Independent Road Safety Audit for the reconfigured drop-off and pick-up zone shall be undertaken, and all matters identified in this audit resolved. (Refer to condition E2 b).

#### **7.4.2 Timing**

The Macpherson Street Crossing relocation will be completed in accordance with the Development Consent and approved staging plan.

#### **7.4.3 Responsibility**

The school recognises that communication and reinforcement of the appropriate traffic and parking behaviours require ongoing efforts.

#### **7.4.4 Funding**

According to the resolution of the Waverley Traffic Committee the costs of the relocation of the crossing will be paid for by St Catherine's. The continued provision of a School Crossing Supervisor on the Leichhardt Street crossing will be jointly funded by Waverley Council and Transport for NSW.

#### **7.4.5 Implementation**

The construction of the proposed relocated pedestrian crossing on Macpherson Street is currently scheduled for the end of the construction program due to its final location being directly adjacent the construction site entry and exit.

#### **7.4.6 Monitoring**

The proposed relocation of the existing zebra crossing on Macpherson Street is intended to improve existing conditions. Monitoring of the drop-off and pick-up efficiencies will be included



in regular reports from the School's Traffic Control Officer to the Community Consultative Committee. Additionally, annual surveys will continue at the four (4) drop-off and pick-up zones.



Figure 32: Allocated Marshalling Year for Drop-off and Pick-up





## 7.5 Walking and Cycling Routes

### 7.5.1 Objectives and Targets

Walking and cycling provide an alternative choice for staff and students to be more active and reduce reliance on private vehicles and congestion around school sites. The objective of providing walking and cycling routes to staff and students is to promote active travel and to encourage a mode shift in journey to work travel methods.

### 7.5.2 Timing

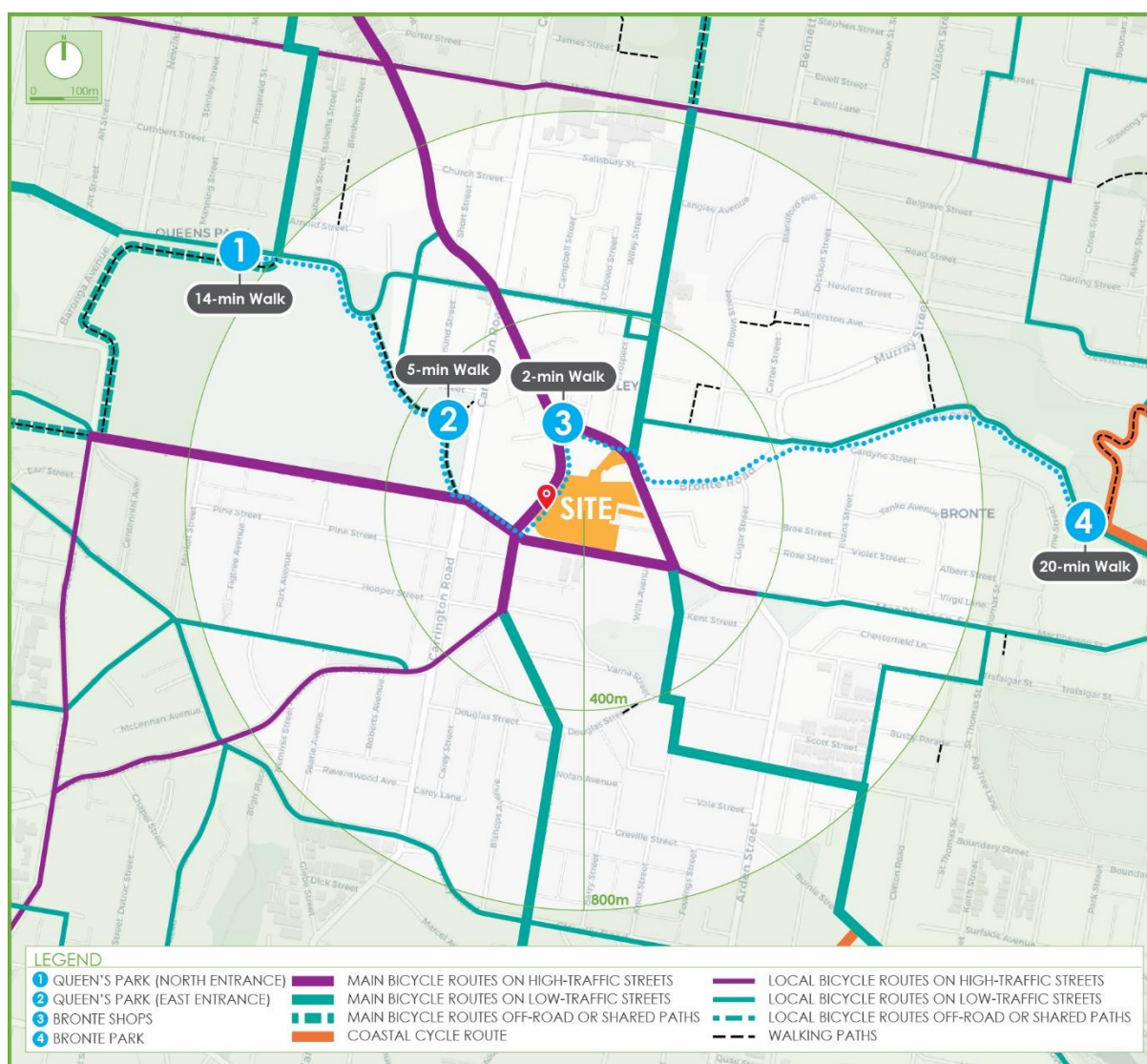
Walking and cycling routes have been provided in **Figure 33** of this OTMP. The routes should be reviewed annually to ensure any changes or additions to routes in the local area are reflected. Once the new facilities are built the school will review the policy of cycling for students. The school shall provide active travel education to all students annually and promote active travel through annual events such as 'Walk to School' and 'Walk to Work' days.

### 7.5.3 Responsibility

It is the responsibility of the School's Traffic Control Officer to maintain route updates, organise active travel promotional documentation and ensure facilities are provided to enable staff and students to utilise walking and cycling routes. Additionally, the school's Environmental Prefect will be responsible to organising and promoting active travel.

### 7.5.4 Funding

Funding for walking and cycling routes within the campus will be provided by the St Catherine's School and managed by the School's Traffic Control Officer.



**Figure 33: Local Walking and Cycling Routes**

## 7.5.5 Implementation

Walking and cycling routes are presented in this OTMP. A comprehensive Travel Access Guide (TAG) is considered to be the most effective travel planning measure to encourage travel by alternative means other than private car. The TAG provides relevant transport and access information that would be relayed to school employees. In addition, the school proposes bicycle parking on the site in order to encourage additional cycle trips with employees safe in the knowledge that secure bike parking is available. This TAG information that is provided to staff includes:



- Local public transport facilities and network maps;
- Local walking and cycling route maps; and
- Car pool information.

A TAG has been and will continue to be distributed to staff members on staff days prior to the commencement of a semester and to new staff when starting employment with the school. The TAG is presented in **Appendix E**.

### **7.5.6 Monitoring**

St Catherine's school has pedestrian entrances on Albion, Macpherson and Leichhardt Street all which provide footpaths on either side of the street, which will ensure safe and efficient access to Sydney Bus Services for pedestrians.

A signalised crossing is provided on Albion Street, to allow safe crossing for students between the drop-off and pick-up zone on the western side of Albion Street and the school. Two (2) pedestrian crossings are also provided, one (1) on Macpherson Street and one (1) on Leichhardt Street. It is noted that the Leichhardt Street crossing is manned by a School Crossing Supervisor, provided conjointly by Waverley Council and Transport for NSW.

## **7.6 Bicycle Parking Provision**

### **7.6.1 Objectives and Targets**

The objective of providing bicycle parking is to see a mode shift from reliance on private vehicle usage to other modes of transport. The school will however be looking to provide an appropriate level of bicycle parking based on expected demand, whilst building in spare capacity to help ensure that facilities are available for the increased demand.

### **7.6.2 Timing**

Condition B8 of the Development Consent requires the school to provide a minimum of 100 bicycle parking spaces as part of the Stage 1 works which shall predominantly be located in a weather protected enclosure within the basement carpark with lift and stair access from the bicycle parking area to the remainder of the campus.



### **7.6.3 Responsibility**

It is the responsibility of the school to provide the bicycle parking. A minimum of 100 bicycle parking spaces are provided as part of the RPAC development. These spaces are located in the basement level of the RPAC development and directly accessible from Macpherson Street.

The scope of building work includes for the installation of the bicycle parking and TRAFFIX will ensure the design and installation of the facility comply with AS2890.3 (1993) *Parking Facilities Part 3: Bicycle Parking Facilities*.

### **7.6.4 Funding**

The cost of supply and installation of bicycle racks will be provided by the school.

### **7.6.5 Implementation**

The required bicycle parking will be installed prior to the completion of the proposed Stage 1 development in 2022. Almost all spaces will be ready at the completion of the RPAC project, which is stage 1 of the masterplan. This is expected in 2022. A minimum of 100 bicycle parking spaces and associated facilities will be provided as part of the RPAC development.

### **7.6.6 Monitoring**

The school will publish the results of the travel mode / bicycle parking surveys on the school's website and provide the rates to the Community Consultative Committee. The traffic control officer will regularly count the usage of bicycle rack provided as part of the RPAC development.



## 8. MONITORING AND MEASUREMENT

A monitoring and review process for the OTMP will be set out by the Head of Finance and Operations of St Catherine's School to ensure that the OTMP reflects any changes to the public transport network and end-of-trip facilities related to the subject site. The Traffic Control Officer is designated with the responsibility of maintaining the OTMP. The Traffic Control Officer will also assess the modal-split for staff and students accessing the site, once operational and revisit the proposed targets if necessary.

Regular review of the success measures outlined in this plan should be undertaken to determine whether alternative or supplementary measures are necessary. A survey will be conducted by students and staff every 12 months to monitor the progress of targets as documented above, which will be undertaken by the Traffic Control Officer. The survey will include (and will not be limited to) transport modal splits for both staff and students. This evaluation will provide a reliable overview of the areas in which the OTMP is operating effectively, and which areas require more attention. However, it is noted that the above targets are primarily indicative, and the travel plan and targets will require on-going evaluation and fine-tuning. Revisions of this OTMP will consider any community feedback received by the school which relates to the objectives of the OTMP.

Since 2014 St Catherine's School has considered other transport initiatives which were unsuccessful. These initiatives included: a walking school bus, scooters and parent / student carpooling (discussed earlier). A walking school bus and scooters were considered to be too risky for the school to implement. When considering student safety, the school elected to pursue other initiatives first. Consequently, this OTMP has omitted details of these travel modes.

### 8.1 Roles and Responsibilities

**Table 18** below identifies the roles and responsibilities in the delivery of this OTMP:



**Table 18: Contact details for responsible personnel**

Role	Person Responsible	Contact Details	Responsibilities
Traffic Control Officer	Traffic Control Officer	transport@stcaths.nsw.edu.au	Manage all OTMP initiatives including, but not limited to: car-pooling initiatives; walking and cycling route initiatives; organise active travel promotional documentation; ensure facilities are provided to enable staff and students to utilise walking and cycling routes. Maintaining the St Catherine's OTMP Collecting and collating of travel mode information for annual reporting to the Community Consultative Committee.
School Bus Operations	Director of Administrative Services	admin@stcaths.nsw.edu.au	Operations of daily bus services including registration of students and queries. Review of bus routes and student uptake.
Transport Initiatives	Head of Finance and Operations	headoffinance@stcaths.nsw.edu.au	Central authority for bus service and new transport initiatives Monitoring and review of the St Catherine's OTMP.
School Crossing Supervisor	St Catherine's		Assist children in safely crossing roads on their way to and from school
Waverley Council Traffic Engineer	Waverley Council to provide		Request and receive annual traffic reports from St Catherine's.

## 8.2 Collecting and Collating Information

Annual surveys will be conducted with both staff and students to monitor travel modes of staff and students. These surveys will also include analysis of bicycle parking facilities, car occupancy rates and utilisation of drop-off and pick-up zones. This information should be reported annually with existing active travel incentives reviewed. An evaluation of the school's bus service will be conducted at this time which includes a financial evaluation to establish the benefits of additional services. Survey data can also be reviewed to establish alternate bus routes.



Survey distribution and collating survey results is the responsibility of St Catherine's School however it is envisaged that the annual reports will be provided to Waverley Council upon request.

### 8.3 Promotional Information

Promotional information is provided to staff, parents and neighbouring properties in the lead up to any major events being held in existing facilities. Delivery methods have been discussed with the CCC. The following information will be distributed to anyone registered to receive notices via the RPAC email address a minimum of two (2) weeks in advance of any major event:

- Date and time of the event
- Description of the event
- Outline of measures taken to mitigate the impact of additional traffic
- Contact details of event organiser or link to website for further information
- School contact information

All correspondence will include a school logo. The development consent imposes conditions on the school to publish an annual event calendar, as part of opening the RPAC. The school has worked with the CCC to distribute its calendar of events from 2017.

At the conclusion of the development, the construction company will provide the email to the school to be used for the alerts two (2) weeks before major events. Those currently on this email list will have the option to opt-out of school communications.



## 9. GOAL SETTING

### 9.1 Staff Travel Targets

The travel mode splits for staff in 2021 and the future targets for staff are provided in **Table 19**. The targets include a 2% improvement on private vehicle reliance for staff.

**Table 19: 2021 Staff Travel Mode Splits and Future Targets**

Travel Mode	2021 TRAFFIX Survey	2022 Future Targets	Target No. of Staff*
Car Driver	70% (148 staff)	68%	144
Car Passenger	5% (11 staff)	3%	6
Public Transport	10% (21 staff)	14%	30
Active Travel + Other	15% (32 staff)	15%	32

\*Based on a future number of 212 staff.

Source: ARUP, 2014 and TRAFFIX Surveys, April 2021)

In addition to the above Section 3.5.3 of the ARUP Travel Strategies Transport Report set targets to staff trips to be reduced by -33 trips to achieve 115 cars during both the AM and PM peak hours and resulting in improvements of the overall network performance and congestion on streets around the school. This equates to 54% of staff in 2029 travelling to the school via private vehicle only. It is considered that a 2% reduction in staff car travel from 2021-2022 is an achievable target for staff.

### 9.2 Student Travel Targets

The current travel modes based on the student travel survey conducted by ARUP in 2014. The OTMP seeks to increase the use of alternate (non-private vehicle) transport for the site. The 2014 reliance upon car related transport to the school relates to approximately 60% of students (in the AM peak).

From the 2021 data it is evident that this reliance has been reduced to 51%, a 9% improvement. With this in mind, it is envisaged that the subject OTMP will continue to encourage increased use of sustainable modes of transport, such as train, bus, bicycle and walking and utilisation of the school bus service.





**Table 20** shows the mode splits in 2021 as per the survey results undertaken by TRAFFIX which demonstrates that the target for no private vehicle net increase from 2014 has been met and non-private vehicle mode shares have been utilised by students at the school. This will enable future potential expansion of the school to 2030 as planned. The breakdown of the baseline travel mode split, and proposed targets are shown in **Table 21**.

**Table 20: Student Travel Existing Mode Splits**

Travel Mode	Existing AM Peak Period		Existing PM Peak Period	
	No.	%	No.	%
Drop-off / Pick-up	521	51%	449	44%
*Walk / Active Travel	194	19%	235	23%
School Bus	102	10%	92	9%
*Public Transport	204	20%	245	24%
Other	0	0%	0	0%
<b>Total</b>	<b>1,021</b>	<b>100%</b>	<b>1,021</b>	<b>100%</b>

(Source: TRAFFIX 2021)



**Table 21: Student Travel Mode Splits and Future Targets**

Travel Mode	2014 Baseline AM Peak Period		Future 2030 AM Peak Period	
	No.	%	No.	%
Drop-off / Pick-up	582	60%	582	48.5%
*Walk / Active Travel	155	16%	247	20.6%
School Bus	39	4%	124	10.3%
*Public Transport	146	15%	247	20.6%
Other	48	5%	-	0%
<b>Total</b>	<b>970</b>	<b>100%</b>	<b>1,200</b>	<b>100%</b>

*Travel mode percentages based on AM Peak Period which has a higher number of vehicle trips.*



## 10. MANAGEMENT REVIEW

### 10.1 Surveys

An annual survey will be distributed to all students and staff. A copy of the surveys distributed for the 2021 TRAFFIX survey have been included in **Appendix F** and **G** for students and staff, respectively. It is considered that the survey should only be updated if new trends develop, however the original questions should be maintained to effectively assess the impacts of the OTMP. The surveys will be distributed, and results analysed by the Traffic Control Officer. The results of the surveys will continue to be reported annually to the Community Consultative Committee with a copy of the report being published on the school's website and a copy provided to Council, if requested. The school will continue to encourage participation rates for the annual traffic surveys.

### 10.2 Use of Aquatic Centre and Major Events

In accordance with the conditions for the development consent (E.7), prior to the commencement of use, this OTMP shall include a major events OTMP to ensure that the requirements of the development consent are satisfied. Reference should be made to Section 11 of this report.

### 10.3 Road Safety Audit

Condition E3 requires supplementary measures to be explored if the road safety identifies any issues with the relocated crossing or monitoring of the revised Macpherson Street drop-off and pick-up does not identify any improvements to the traffic flow. The supplementary measures identified in Condition E3 are as follows:

- a) *Closing the westernmost gate on Macpherson Street to encourage use of the full length of the Macpherson Street drop-off/pick-up zone;*
- b) *Installation of physical measures to provide deterrents to prevent illegal drop-off/pick-up such as fencing or landscaping within the 'No Stopping' zones or video surveillance;*
- c) *Provision of additional supervising staff/traffic controllers, including for use of the aquatic centre before and after school, at designated drop-off areas or delayed pick-*



*up times for parents who are identified as routinely performing unsafe or illegal drop-off/pick-ups; and*

*d) Use of the basement car park for early aquatic drop-off.*

These options must be explored and detailed in an updated OTMP to the satisfaction of the Secretary. As such, this condition can only be addressed once a road safety audit of the completed crossing relocation is complete and/or monitoring of the revised drop-off or pick-up area has been conducted.

## 10.4 Post Occupation

In accordance with the conditions of the development consent (F2-F5), a review of traffic and parking activities should be completed after 6 months of operations of the RPAC. The review will investigate traffic and parking impacts, independent traffic survey data and the implementation and effectiveness of the OTMP following occupation for the RPAC. The results of the post operation review will be presented to the CCC.



## 11. SPECIAL EVENTS

### 11.1 Increase in Attendees for Existing Events

The new Performing Arts Auditorium will allow for additional capacity. The approved timetable of existing events which are expected to have increased attendances are provide in **Table 22** below.

**Table 22: Existing events for the St Catherine's School**

Event	Time	Days per year	Existing Attendance	Additional Attendees	Additional Car Parking
Music Showcase	7:00pm – 9:00pm	1	220	280	90
St Cath's Got Talent	6:30pm – 9:00 pm	1	250	250	80
Trinity Evening	6:30pm – 10:00pm	1	250	250	80
BTC Showcase Event	6:30pm – 9:00pm	2	250	250	80
Infants Christmas Musical	9:00 am – 12:00 pm	1	250	50	16
Junior Musical	6:30 pm – 9:30 pm	2	250	150	48
Stage 2 Music Evening	6:30 pm – 9:30 pm	1	250	50	16
Stage 3 Music Evening	6:30 pm – 9:30 pm	1	250	100	32
Evening of Eminence Junior School (Multi – Purpose Hall)	6:30 pm – 8:30 pm	1	160	90	29

### 11.2 New Events

Two (2) additional events which are currently accommodated off-site at NIDA, are proposed to be accommodated in the new Auditorium. One new event for parents will be held in the Research Centre and will not coincide with events held in the Auditorium. The new events are presented in **Table 23** below.

**Table 23: Proposed Events for the St Catherine's School**

Event	Time	Days per year	Proposed Attendees	Additional Car Parking
Rehearsal Senior School Musical	9am – 2pm	5	60	19
Senior School Musical Event (biennially)	6:30 pm – 9:30 pm	2*	500	160
Parent Event (MPH)	During School Hours	4	50	16

A full list of all proposed events can be found at **Appendix D**.

## 11.3 Traffic Assessment

A Traffic and Transport Assessment was completed by ARUP date 18 August 2014. The findings of that report which are associated with this OTMP are summarised below. All events may be in accordance with the indicative usage profile approved for the development which is provided in **Appendix D**.

### 11.3.1 Event management

- Annual events held on-site will be relocated to the Performing Arts Auditorium which will increase the capacity of events from 250 to 500. There are a number of new events also planned with a capacity of 500 that will be held in the Auditorium.
- Venues will be limited for external hire. External use of venues must be in accordance with the approved indicative usage scheme (**Appendix D**).

### 11.3.2 Parking assessment

- A total site parking provision of 75 car spaces (19 space) increase.



## 11.4 Travel Strategies

The DA conditions of consent (E7) requires the OTMP to implement measures to ensure that the travel strategies outlined below are met for the aquatic centre or for major events held in the auditorium or hall.

- All car spaces with the Dame Joan Sutherland Centre and RPAC basements (minimum 47) will be made available for aquatic centre users after 6pm on weekdays and all day during the weekend;
- All car spaces on site (minimum 75) will be made available to attendees of all major events held in the auditorium or hall where non-students are in attendance; and
- The aquatic centre is not available to external attendees when there is any evening or weekend event occurring on site.

## 11.5 Traffic Management Strategies for Aquatic Centre and Major Events

The school will implement the following strategies in order to comply with Condition E7:

1. The school's building manager will ensure that the entrance to the basement car park under the Dame Joan Sutherland Centre and RPAC is open from 6pm on weekdays and all day during the weekend. In addition, a signalised car park manage system will be installed to manage internal traffic movements and advise visitors if there is spare capacity within the car park (47 spaces). This digital signage will be visible to drivers approaching the car park entrance and will provide sufficient information to advise visitors of the available parking. Condition E1 of the consent also states that *“vehicle access to and from the RPAC must be undertaken by a left-in/left-out movement only. The applicant shall identify and adopt the necessary measures to implement this restriction and to prevent right turn movements.”*. In response to Condition E1, “No Right Turn” signage will be installed within the bounds of the car park and on the westbound approach on Macpherson Street to advise drivers not to turn right into or from the development.



2. The school will ensure that a minimum of 75 car parking spaces will be made available to attendees of all major events held in the auditorium or hall where non-students are in attendance. The 75 on-site parking spaces comprises of 47 spaces under the Dame Joan Sutherland Centre, nine (9) spaces within the northern Albion Street car park and 19 spaces within the southern Albion Street car park. The location of the 75 parking spaces is presented in **Figure 34** below.

The basement car park under the Dame Joan Sutherland Centre and RPAC will be managed by the signalised car park management system detailed above, whilst the at-grade car parks on Albion Street will be managed by an on-site traffic warden supplied by the school. The traffic warden will provide clear signage near the entrance to the Albion Street car parks advising visitors that car parking is available. The traffic warden will direct visitors to available on-site parking as they arrive at the site. Should a particular car park reach capacity, the warden will then place "Car Park Full" signage at the entrance/exit to each car park. After the event, the traffic warden will remove the signage to allow visitors to exit the site. Attendees can be made aware of this provision through appropriate communication channels (newsletters, information packs etc.).

3. The school will schedule events to ensure that the aquatic centre is not available to external attendees when there is any major evening or weekend event occurring on-site.





**Figure 34: On-site Parking for Major Events**



## 12. CONCLUSION

The following is noteworthy:

- This OTMP has been commissioned by St Catherine's School Waverley for the State Significant Development (SSD-6339 determined April 2016) of the school located at 26 Albion Street, Waverley. The OTMP addresses the proposed increased capacity of St Catherine's School to accommodate a student population of 1,200 and 212 staff by 2030 and the management of traffic for proposed increases and new events in the new Aquatic Centre and Auditorium.
- Since the Development Application for the school was lodged in 2014, the school has implemented and monitored several strategies including carpooling, bicycle facilities and encouragement of active travel, bus services, travel passes and a green travel plan. Whilst all alternative travel modes will be promoted in the future, active travel and public transport are considered the most viable alternatives to travel by private vehicle. The travel mode data to date is presented in **Section 5** with future goals and objectives discussed within **Section 7** and **Section 9**.
- Travel mode surveys demonstrate a reduced reliance on private vehicles for students and a slight increase for staff when compared to the 2014 base line data. The percentage of staff travelling to/from the site by public transport has decreased by 9% (20 staff), however, this could be attributed to the COVID-19 pandemic which has impacted public transport usage generally and this consistent with recent ABS data.
- In addition, the travel mode surveys show that the current operations of the school do not result in any net increase to vehicle drivers, meeting the DA conditions which specify that the OTMP must identify mode share targets for the proposed travel strategies that target a reduction "*and ensure no net increase*" in private vehicle trips to the site.
- The 2021 surveys generally showed a decrease in background volumes during the critical peak hour periods for both the school term and the school holiday period when compared to 2014. For example, a decrease of 2.9% and 12% during the school term commuter peak periods (5-6pm and 6-7pm respectively) was observed, when compared to 2014 data. This minor to moderate decrease in commuter traffic is likely the result of changing travel/work



patterns due to the COVID-19 pandemic, and this is clearly reflected in the difference between the 2019 and 2021 traffic data.

- Surrounding intersections and midblock locations experienced a moderate change in traffic volumes between the school term and school holiday periods. The reduced traffic during school holidays is expected due to vehicle movements associated with student drop-off and pick-up movements. However, the mid-block surveys also demonstrated a traffic volume decrease across the 8-9am, 3-4pm and 5-6pm peak periods between the school term and school holidays, suggesting a general network downward trend over the school holiday period. As such, the school does not appear to be having a significant impact on traffic flows at intersections/mid-block locations around the site.
- Section 7 of the report outlines the future travel strategies regarding each travel mode utilised by staff and students to ensure future travel mode targets are met.
- It is envisaged that this OTMP will be reviewed as per the suggested OTMP review and management measures outlined in Section 10.
- Conditions A8 b); E2 a). b) and c); E4 and E7 have been addressed in this OTMP in accordance with the Condition of Consent.

## APPENDIX A

---

ARUP Traffic & Transport Assessment 2014

# St Catherine's School, Waverley

## Traffic and Transport Assessment

001

Rev A | 18 August 2014

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 236045-00

Arup  
Arup Pty Ltd ABN 18 000 966 165






**Arup**  
Level 10 201 Kent Street  
PO Box 76 Millers Point  
Sydney 2000  
Australia  
[www.arup.com](http://www.arup.com)

# ARUP

# Document Verification




# ARUP

<b>Job title</b>		St Catherine's School, Waverley		<b>Job number</b>		236045-00	
<b>Document title</b>		Traffic and Transport Assessment		<b>File reference</b>			
<b>Document ref</b>		001					
<b>Revision</b>	<b>Date</b>	<b>Filename</b>	Draft Report.docx				
Draft 1	23 Apr 2014	<b>Description</b>	First draft				
			Prepared by	Checked by	Approved by		
		Name	James Turner	Andrew Hulse	Andrew Hulse		
		Signature					
Draft 2	27 May 2014	<b>Filename</b>	Draft 2 Report.docx				
		<b>Description</b>	Second draft				
			Prepared by	Checked by	Approved by		
		Name	James Turner	Andrew Hulse	Andrew Hulse		
		Signature					
Draft 3	15 Jul 2014	<b>Filename</b>	Draft 3 Report.docx				
		<b>Description</b>	Draft issue consolidating client comments				
			Prepared by	Checked by	Approved by		
		Name	James Turner	Andrew Hulse	Andrew Hulse		
		Signature					
Issue	15 Aug 2014	<b>Filename</b>	Final Report.docx				
		<b>Description</b>	Updated with client comment				
			Prepared by	Checked by	Approved by		
		Name	James Turner	Andrew Hulse	Andrew Hulse		
		Signature					
Issue Document Verification with Document							<input checked="" type="checkbox"/>



# Document Verification

Page 2 of 2

<b>Job title</b>		St Catherine's School, Waverley		<b>Job number</b>		236045-00	
<b>Document title</b>		Traffic and Transport Assessment		<b>File reference</b>			
<b>Document ref</b>		001					
<b>Revision</b>	<b>Date</b>	<b>Filename</b>	RevA Report.docx				
Rev A	18 Aug 2014	<b>Description</b>	Updated traffic assessment				
			Prepared by	Checked by	Approved by		
		Name	James Turner	Andrew Hulse	Andrew Hulse		
		Signature					
		<b>Filename</b>					
		<b>Description</b>					
			Prepared by	Checked by	Approved by		
		Name					
		Signature					
		<b>Filename</b>					
		<b>Description</b>					
			Prepared by	Checked by	Approved by		
		Name					
		Signature					
		<b>Filename</b>					
		<b>Description</b>					
			Prepared by	Checked by	Approved by		
		Name					
		Signature					
Issue Document Verification with Document							<input checked="" type="checkbox"/>

# Contents

---

	Page
<b>1 Introduction</b>	<b>1</b>
1.1 Director General's Assessment Requirements	1
1.2 Project background	2
1.3 Scope of report	2
<b>2 Planning to address state policies and guidelines</b>	<b>3</b>
2.1 NSW 2021	3
2.2 Draft Metropolitan Strategy for Sydney 2031	3
2.3 Sydney's Cycling Future (2013)	4
2.4 Planning Guidelines for Walking and Cycling	4
2.5 Sydney's Bus Future (2013)	5
<b>3 Existing conditions</b>	<b>6</b>
3.1 Site location	6
3.2 Description of the site	6
3.3 Site access	7
3.4 Existing traffic conditions	7
3.5 Traffic safety	9
3.6 Parking supply and demand	13
3.7 Modal split	18
3.8 Public transport	23
3.9 Pedestrian / bicycle networks	25
3.10 Other proposed developments	25
<b>4 St Catherine's School Campus Master Plan</b>	<b>26</b>
4.1 Objectives	26
4.2 The plan	26
4.3 Student /staff increase	28
4.4 Description of site access / parking / loading / bicycle facilities	28
<b>5 Stage 1 development</b>	<b>29</b>
5.1 Description	29
5.2 Proposed profile of use	29
5.3 Car parking provision	32
5.4 Proposed site accesses	33
5.5 Bicycle facilities	33
5.6 School bus parking	34
5.7 Service vehicle access and waste collection	36



<b>6</b>	<b>Transport impact assessment</b>	<b>37</b>
6.1	School drop-off / pick-up zones	37
6.2	Car parking assessment	40
6.3	Traffic Assessment	44
6.4	Impact of generated traffic	48
6.5	Excursion Buses	50
6.6	Transport assessment	50
<b>7</b>	<b>Travel demand measures</b>	<b>51</b>
<b>8</b>	<b>Recommended transport actions</b>	<b>53</b>
<b>9</b>	<b>Construction traffic management planning</b>	<b>54</b>
9.1	Outline construction traffic management plan	54
<b>10</b>	<b>Conclusions</b>	<b>58</b>

## Tables

Table 1: Director General's Assessment Requirements
Table 2 Traffic Survey Results – two-way hourly traffic flow
Table 3: Investigation of crashes at intersections by road user movements
Table 4: School finishing times
Table 5: Bus services
Table 6: School bus routes
Table 7: Indicative usage profile (existing and forecast)
Table 8: Aquatic Centre utilisation
Table 9: Proposed adjustments to drop-off/pick-up/zone allocation
Table 10: Annual events in the Performing Arts Auditorium
Table 11: Aquatic Centre car parking demand
Table 12: Mode split morning arrival
Table 13: Afternoon departure mode
Table 14: Level of Service criteria for intersections
Table 15: Results of traffic modelling

## Figures

Figure 1: Site location
Figure 2: Existing site accesses
Figure 3: Traffic survey locations
Figure 4: Degree of crashes per year (2008-2013) on surrounding streets*
Figure 5: Crashes by time period
Figure 6: Crash types by road user movement categories
Figure 7: Crash investigation 2008 - 2013
Figure 8: School drop-off/pick-up zones

- Figure 9: Existing off-street parking provision
- Figure 10: Parking occupancy in surrounding streets
- Figure 11: Comparison of 5 minute walk on-street parking survey areas
- Figure 12: Available on-street spaces 7.30 – 8.00pm Saturday 3 May 2014
- Figure 13: Available on-street spaces 2.30 – 3.00pm Sunday 11 May 2014
- Figure 14: Available on-street spaces 7.30 – 8.00pm Tuesday 13 May 2014
- Figure 15: Travel demand survey summary
- Figure 16: Departure profiles
- Figure 17: JTW Census data, 2011
- Figure 18: JTW Visualiser (Travel Zone 524)
- Figure 19: Staff postcode origins
- Figure 20: Student postcode origins
- Figure 21: Surrounding bus routes
- Figure 22: School bus routes
- Figure 23: Bicycle network
- Figure 24: Campus Master Plan
- Figure 25: Proposed access arrangements
- Figure 26: RPAC Basement Car Park
- Figure 27: Proposed off-street car parking
- Figure 28: Proposed site accesses
- Figure 29: Proposed bicycle facilities
- Figure 30: Swept path of FUSO minibus at Gate 1
- Figure 31: Proposed bin store
- Figure 32: New school pedestrian access to Macpherson Street
- Figure 33: Proposed adjustments to the zebra crossing in Macpherson Street
- Figure 34: Approved trial adjustment to Bus Zone in Leichhardt Street
- Figure 35: Albion Street southern car park
- Figure 36: Albion Street northern car park
- Figure 37: Peak flow proportions
- Figure 38: Construction vehicle routes to site

## Appendices

### Appendix A

Parking Accumulation Surveys On-Street and Utilisation Of Drop-Off And Pick-Up Zones During Peak School Arrival and Departure Periods *by Lyle Marshall and Associates*

### Appendix B

Travel survey results

### Appendix C

SIDRA results



# 1 Introduction

Arup has been commissioned by St Catherine's School, Waverley (the School), to assist with the preparation of an Environmental Impact Statement (EIS) to accompany a Development Application (DA) for the School which is located at 26 Albion Street, Waverley.

The DA seeks concept approval for the School's Campus Master Plan and detailed design approval of the proposed Stage 1 works which comprise of a new Research, Performing Arts and Aquatic Centre (RPAC).

This report has been prepared to address Key Issue No. 6 Transport and Accessibility (refer below) as stated in the Director General's Environmental Assessment Requirements (DGRs) issued on 29 January 2014 – State Significant Development (SSD) 6339.

## 1.1 Director General's Assessment Requirements

Table 1: Director General's Assessment Requirements

Issue	Section
<b>Construction traffic management planning</b>	
Detail access arrangements at all stages of construction and measures to mitigate any associated pedestrian, cycleway, public transport or traffic impacts.	Section <b>9.1.3</b>
Details regarding car parking arrangements during construction, including the displacement of visitor and staff car parking. Alternative off-site arrangements should be made for staff and construction workers.	Section <b>9.1.4</b>
<b>Operational traffic management planning</b>	
Detail how the development has taken into consideration student and visitor travel patterns and contributes to the achievement of transport objectives contained in NSW 2021 and the draft Metropolitan Strategy for Sydney 2031, and Sydney's Bus Future (2013).	Chapter <b>2</b> and Section <b>4.1</b>
Provide details of the trip generation of the development by new staff and students at key stages of the development.	Section <b>6.1</b> and Section <b>6.2</b>
Assess the implications of the proposed development at key stages for non-car travel modes, including the accessibility of the site by public transport and potential implications from the proposed development for bus travel times and bus stop operation. Identify facilities or measures to increase non-car mode share for travel to and from the site, such as implementing a location-specific sustainable travel plan.	Section <b>3.8</b> and Chapter <b>7</b>
Provide details of the daily and peak vehicle movements likely to be generated by the development at the key stages of the development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required).	Section <b>6.4</b>
Detail the proposed access and parking provisions associated with the proposed development, including compliance with the requirements of the relevant parking codes and Australian Standards (ie: turn paths, sight distance requirements, aisle widths; etc).	Section <b>6.6</b>
Detail the proposed service vehicle movements (including vehicle type and the likely arrival and departure times).	Section <b>5.5</b>

## 1.2 Project background

Lyle Marshall & Associates Pty Ltd recently completed a report titled *Parking Accumulation Surveys On-Street and Utilisation Of Drop-Off And Pick-Up Zones During Peak School Arrival and Departure Periods* (Appendix A). The report assesses existing parking conditions, the morning drop-off and afternoon pick-up arrangements, and then makes management recommendations that would improve traffic conditions around the site.

## 1.3 Scope of report

This transport report supports the development application (DA) for the redevelopment of the School. The transport assessment will be based on the current mode of travel for staff and students with targets set for achieving greater use of non-car travel modes for access.

Measures will be identified with the School that could be implemented as part of a location-specific sustainable travel plan to encourage non-car travel modes. This may also apply to events held at the School. There will also be measures required to educate and encourage improved drop-off and pick-up activity on the frontage roads.

## 2 Planning to address state policies and guidelines

---

### 2.1 NSW 2021

The New South Wales (NSW) 2021 is a ten-year plan developed by NSW government primarily aimed at *making NSW number one*. The document sets a framework to guide Government policy and decision making in the delivery of economic and community priorities. The framework is based on five (5) key strategies:

- Restoring economic growth;
- Return quality service for health, transport, education, police, justice and community service, with particular focus on customer service;
- Build infrastructure that drives the economy and improves people's lives;
- Strengthen our local environments and communities; and
- Restore accountability and transparency to government.

The five key strategies are embodied within the development objectives of the Campus Master Plan for the School. The key driver of the Campus Master Plan is to strengthen the local environment and community by delivering high quality educational outcomes and first class educational facilities. The plan also aims to contribute to the economic benefits for NSW and improve quality and choice through improvements to the quality of education and community facilities, among others.

The transport strategies of the State Plan are to:

- Reduce travel time;
- Grow patronage on public transport by making it an attractive choice;
- Improve customer experience with transport services; and
- Improve road safety.

NSW 2021 outlines that an integrated transport system is required to ensure different transport modes work together and that the interests of the travelling public are put first.

The design of the School aims to integrate and promote these strategies and promote the set goals and aspirations within the School community in order to contribute to the overall target to make NSW number one again.

### 2.2 Draft Metropolitan Strategy for Sydney 2031

The draft metropolitan strategy to 2031, replaces the Metropolitan Plan for Sydney 2036. This draft strategy will better align with the Long Term Transport Master Plan and the State Infrastructure Strategy released in 2012. It will form a key link to the various plans that have been developed including the short term Regional Action Plans and NSW 2021 Plan. The metropolitan draft strategy focuses on driving sustainable growth of Sydney to 2031, with focus on the following five outcomes:

- Balanced growth;
- A liveable city;
- Productivity and prosperity;
- Healthy and resilient environment; and
- Accessibility and connectivity.

The enhancement of school facilities and improvements to teaching and learning outcomes will respond to the future student attendance and improved educational standards.

### 2.3 Sydney's Cycling Future (2013)

Sydney's Cycling Future presents a new direction in the way we plan, prioritise and provide for cycling in Sydney. This supports the change in culture we are seeing in Sydney with more people choosing to ride a bike for transport. The overarching goal of Sydney's Cycling Future is to make cycling a safe, convenient and enjoyable transport option for short trips. This is particularly relevant to school trips, many of which are short distance from surrounding residential precincts.

The following principles will be used to guide the delivery of Sydney's Cycling Future:

- Ensure cycling initiatives are based on sound evidence
- Prioritise cost effective solutions
- Deliver in collaboration with partners
- Support a culture of cycling for transport

The plan for the future of bike riding looks at how local government areas may implement strategies including lowering speed limits on certain roads and installing new signage for cyclists at major locations (such as schools and public transport hubs).

Key aspects in which the School could integrate with and benefit from these initiatives include:

- Additional way finding signage, including distances to and from major hubs close to the School
- Development and testing of alternative bus shelter design to reduce obstacles for cyclists on bus corridors. Specific opportunities apply to the Albion Street and Macpherson Street frontages
- Increased mode share of cyclists if a greater number of end of trip facilities are provided including showers and lockers with bicycle parking.

### 2.4 Planning Guidelines for Walking and Cycling

The planning guidelines for walking and cycling were developed by the NSW Government to recognise the importance of walking and cycling in NSW cities. This report looks at how to increase mode share of walking and cycling, by improving security and public amenities.

In relation to the School, passive surveillance is encouraged in design of pedestrian and bicycle facilities, to increase safety. This generally applies to major walkways or further within school grounds where pedestrian flows are higher.

- Narrow pedestrian overpasses and underpasses should be avoided for security and connectivity reasons.
- Appropriate lighting should be provided (which cannot be vandalised) along major pedestrian and cycling routes, especially for routes to and from major transport nodes or hubs
- Internal roadways should be provided to link any cul-de-sacs or road ends to minimise the distances pedestrian need to walk.

The Master Plan incorporates the following features which enhance and extend these principles:

- Redistributed pedestrian entries to the campus on Albion Street and Macpherson Street
- Reconfigured pedestrian links between campus facilities
- Provision of bicycle racks, showers and lockers

## 2.5 Sydney's Bus Future (2013)

The Sydney's Bus Future document was released in December 2013. It is the key framework for improving and delivering better bus services throughout the Sydney metropolitan area. Bus services will be focused into three key routes:

- Rapid routes, which will use priority infrastructure, connect regionally throughout the city and have stops every 800m-1km
- Suburban routes, which will have stops every 400m and have mix of frequent 'turn up and go' and timetabled services
- Local routes which will complete the network using local streets

The School has been identified along a suburban route (Bondi to Burwood via Eastgardens). Key points relating to the School are as follows:

- Extra bus services could be implemented
- A focus is on improved journey times from point to point

These initiatives will assist both regular and school bus services.



## 3 Existing conditions

### 3.1 Site location

The School is located in Waverley, in Sydney's Eastern Suburbs on a site area of 22,327m<sup>2</sup> (as per DGR request report). The School is surrounded by Albion Street, Macpherson Street and Leichhardt Street / Bronte Road. Figure 1 shows the School location.

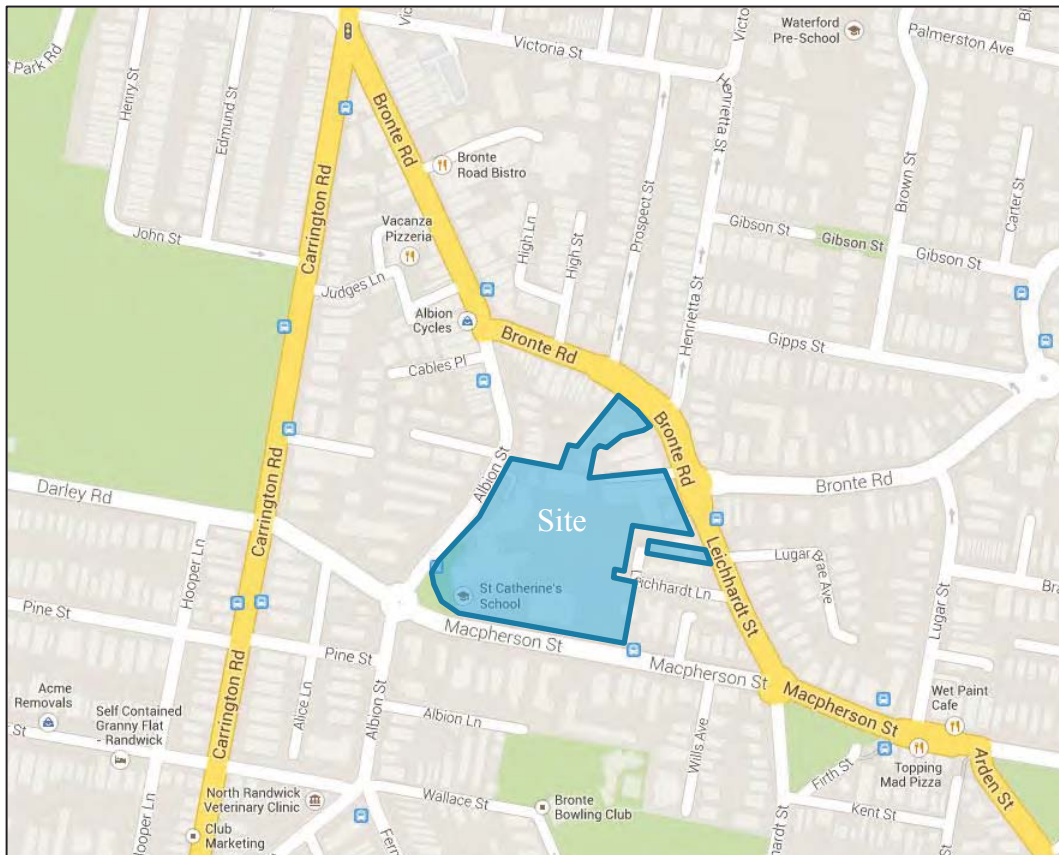


Figure 1: Site location

### 3.2 Description of the site

The School caters from Kindergarten to Year 12 day and boarding classes. It is both the oldest Anglican girls' school and the oldest independent girls' school in Australia.

The School is separated into a Junior School and Senior School, with 376 and 594 students enrolled respectively (taken from data in October 2013). There are no existing limits for student enrolment. The School also caters for up to 70 boarders and the boarders program is purposely limited in order to create 'extended family' lifestyle.

There are also currently 202 staff members consisting of 175 full-time and 27 part-time employees.

### 3.3 Site access

There is a number of vehicle and pedestrian separated accesses surrounding the School. The main vehicle accesses are located on Albion Street via three gates. On Albion Street, the northern two gates are one way, with Gate 3 an entry only and Gate 2 an exit only. The southernmost gate (Gate 1) is two-way with pedestrian access.

There are also further entry/exit locations surrounding the School to access various parts of the campus. These accesses generally provide pedestrian and vehicle access and include:

- Macpherson Street provides a vehicle and a pedestrian access to the Dame Joan Sutherland Centre (DJSC) with pedestrian access provided to the southern part of the School.
- Bronte Road provides an emergency pedestrian access only; and
- Leichhardt Street provides a number of pedestrian accesses to the Junior School.

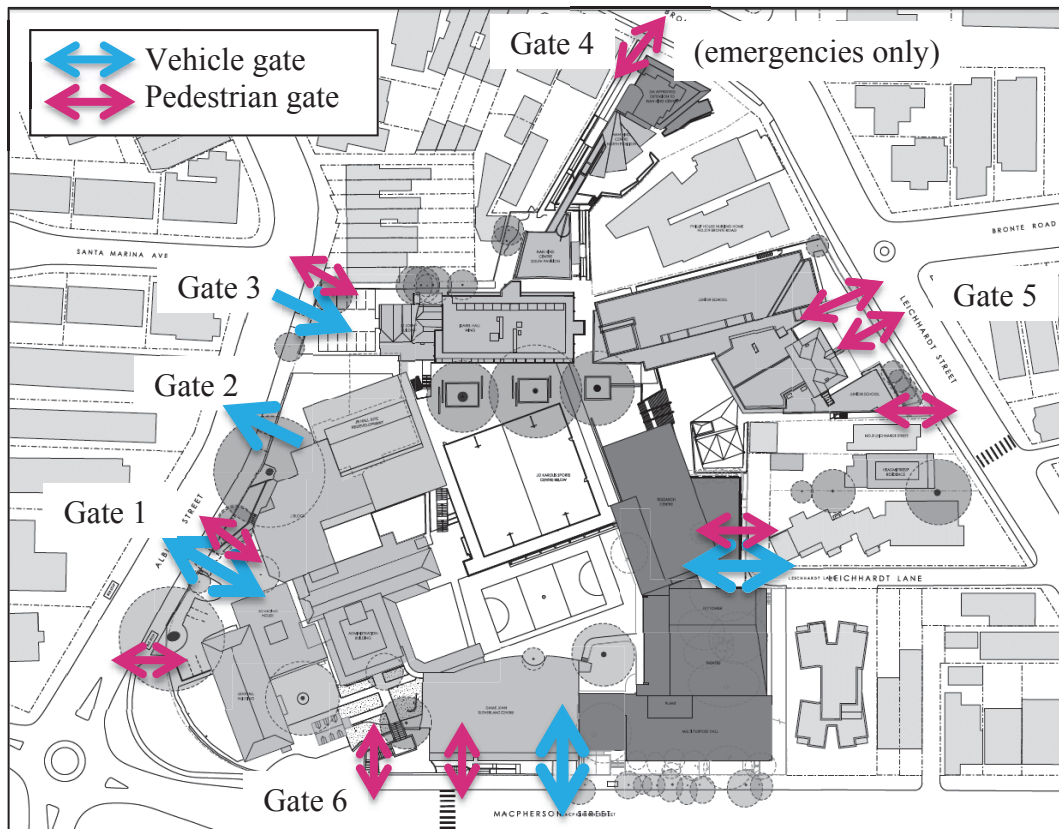


Figure 2: Existing site accesses

### 3.4 Existing traffic conditions

Bronte Road, Leichhardt Street and Macpherson Street provide regional routes for commuter traffic during the peak periods and general traffic all day. They are important streets in the functional road hierarchy for the area. Albion Street is also an important street for access from the residential areas to the south across to these regional routes.

Traffic surveys were undertaken in March 2014 during a typical Thursday and Saturday. Seven-day automatic tube counts were performed on Macpherson Street, Albion Street and Leichhardt Street. Intersection counts were performed at key intersections surrounding the site, including:

- Macpherson Street / Albion Street
- Macpherson Street / Leichhardt Street
- Bronte Road / Leichhardt Street
- Bronte Road / Albion Street.

The survey locations and shown in Figure 3 and the key results are presented in Table 2.

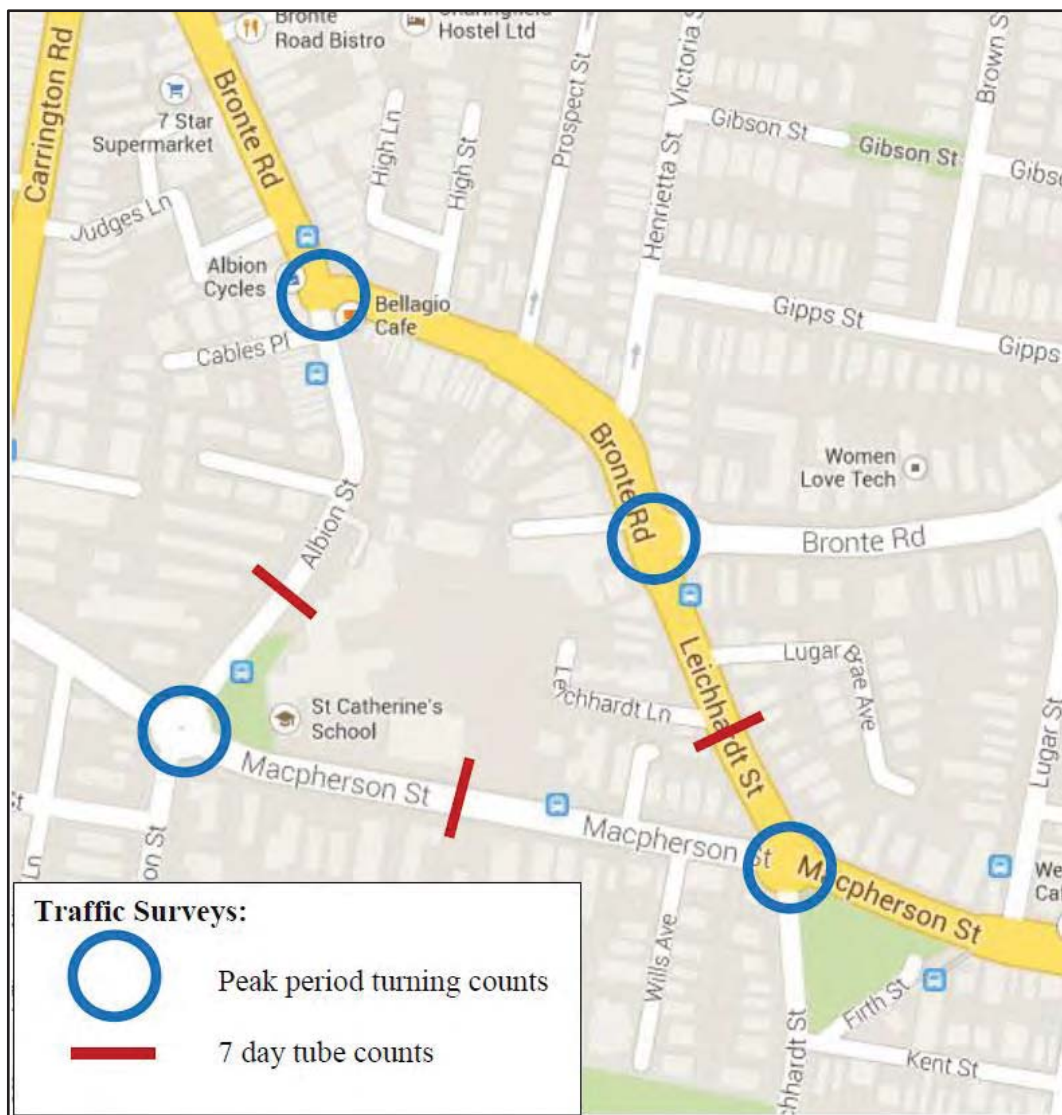


Figure 3: Traffic survey locations

Table 2 Traffic Survey Results – two-way hourly traffic flow

Peak Period	AM Peak (8am-9am)	PM School Peak (3pm-4pm)	PM Commuter Peak (5pm-6pm)	Weekend Peak (12pm-1pm)
Leichhardt Street (between Macpherson Street and Bronte Road)	1,173	1,180	1,253	1,277
Albion Street (between Macpherson Street and Bronte Road)	903	833	517	897
Macpherson Street (between Albion Street and Leichhardt Street)	1,138	1,190	1,131	1,282

The traffic flows recorded for each of the peak periods during the week indicate that the flows are fairly consistent between weekday and weekend peaks. The PM school and commuter peaks are also very similar in traffic flows.

The queuing of vehicles in Leichhardt Street and Macpherson Street during school drop-off and pick-up periods often extends into the travel lane thereby blocking and slowing the path of through traffic.

The speed limits on surrounding local roads are 50km/h, except during school hours. During 8:00am–9:30am and 2:30pm–4:00pm on school days, adjacent roads to the School have 40 km/h school zones in place.

### 3.5 Traffic safety

Crashes were analysed on the surrounding streets of the School over a five year period (from July 2008 – June 2013 inclusive). Overall, there were 45 crashes recorded, of which there were no fatalities, 28 injuries and 17 non-casualty (tow away) crashes. The data also indicates a fairly even distribution of crashes per year as shown in Figure 4.

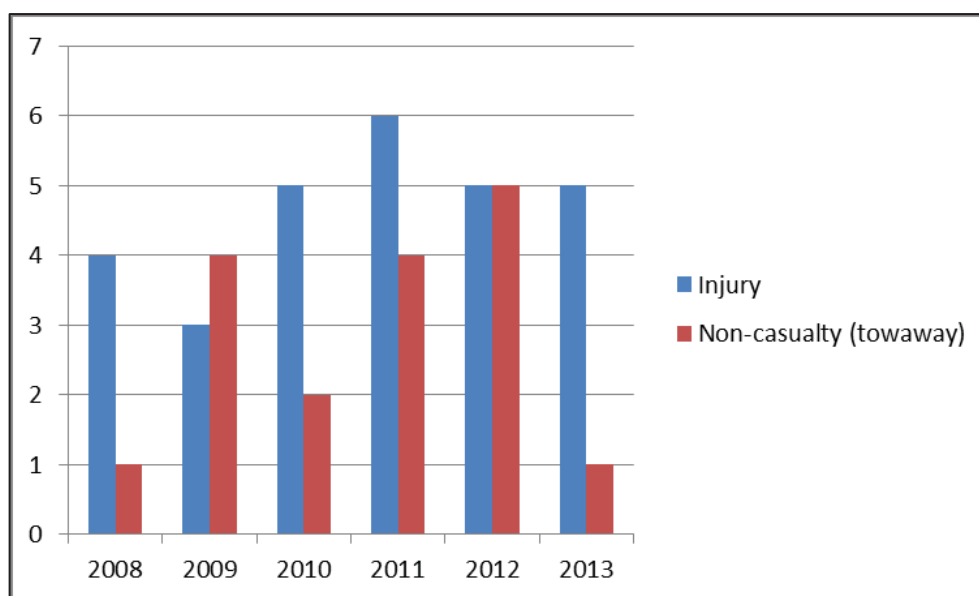


Figure 4: Degree of crashes per year (2008-2013) on surrounding streets\*

\*Note that 2008 and 2013 only had data for half of the year



The crash data was sorted into hourly time periods (Figure 5). Crashes were more concentrated in the commuter peak periods. Interestingly, the highest recorded hourly time period was in the PM peak hour (6pm-7pm), which does not coincide with the School's key operating hours.

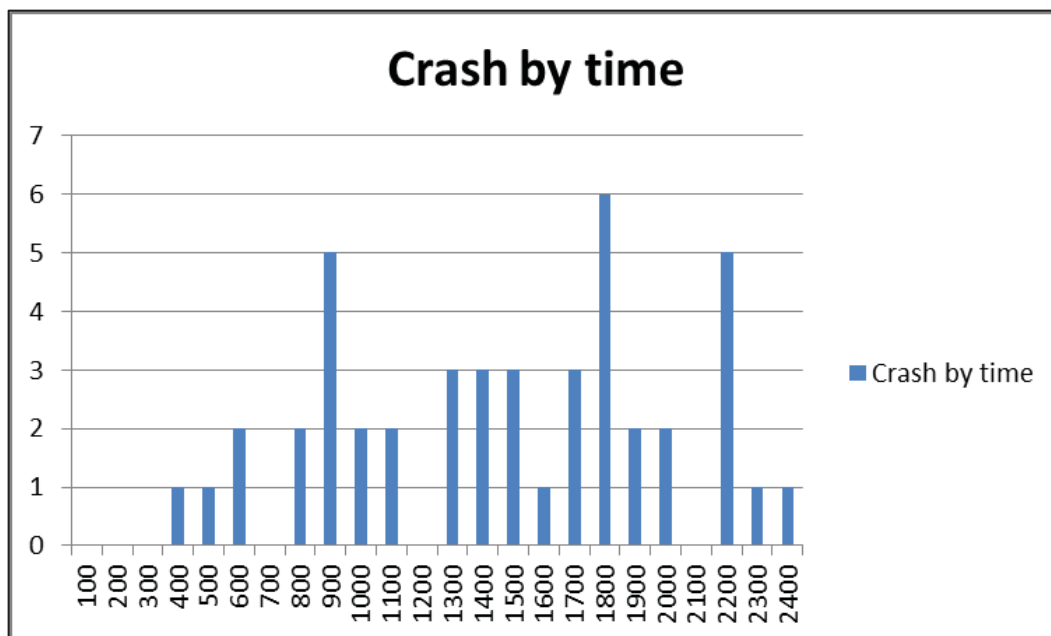


Figure 5: Crashes by time period

The crash data was classified into the various road user movement (RUM) codes to analyse crash clustering. The majority of crash types were recorded as vehicles from same direction, followed by pedestrian related crashes (Figure 6).

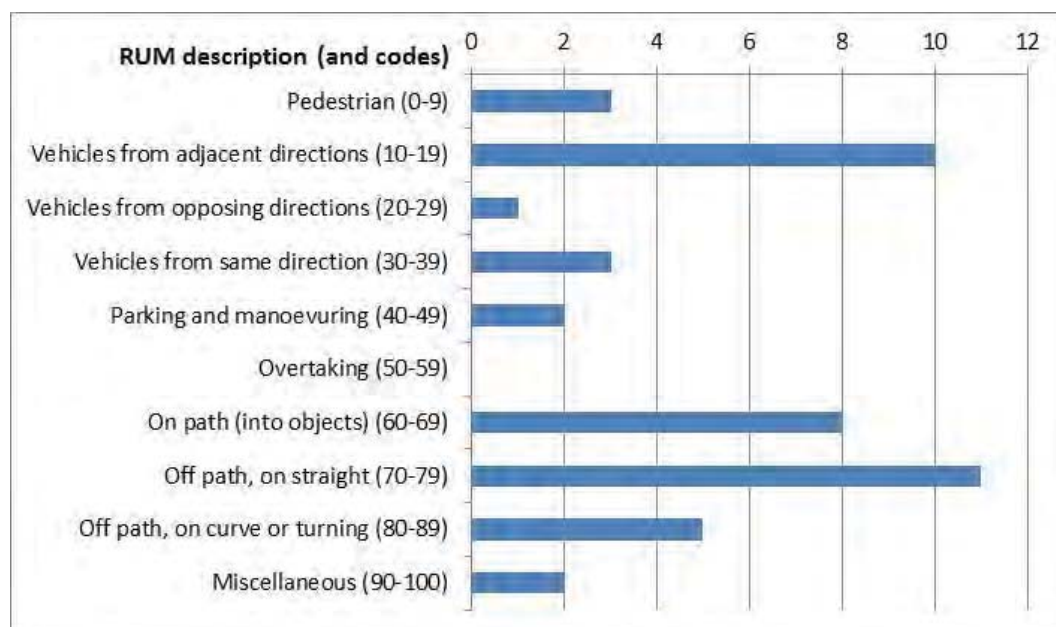


Figure 6: Crash types by road user movement categories

Crash clusters for the purposes of this study were defined as three or more crashes with the same RUM code, within 50m of each other. Crash clusters were focused around key intersections and are detailed in Table 3 and Figure 7.

Table 3: Investigation of crashes at intersections by road user movements

Primary street	Cross street	Adjacent cross traffic	Out of control	Off causeway into object	Same rear end	Opposite right through
Macpherson Street	Carrington Road	2	2		6	5
Macpherson Street	Albion Street	3	1			
Macpherson Street	Leichhardt Street	4		4		
Bronte Road	Albion Street	2	3		3	

There were also a number of crashes that involved a vehicle hitting a door, which occurred along Macpherson Street (2) and Albion Street (2).

There were 3 crashes that involved pedestrians recorded. One occurred at the zebra crossing on Macpherson Street, and two crashes occurred either side of the Bronte Road / Albion Street intersection.



Figure 7: Crash investigation 2008 - 2013

## 3.6 Parking supply and demand

### 3.6.1 On-street parking supply

All kerb space on the roads fronting the School provides unrestricted parking apart from the drop-off zones and bus zones. Restricted  $\frac{1}{2}$ P zones begin further north on Albion Street and Bronte Road near the shopping district. The parallel spaces on-street are not line marked.

### 3.6.2 Short term pick-up and set-down areas

Students who are driven to the School have designated drop-off and pick-up areas on-street known as carlines. All these carlines are located in zones which are designated 'No Parking School Days' and vary in time restrictions. However, the zones are usually split into separate areas with a 'No Stopping' zone in-between (due to either a pedestrian crossing or access).

The car line locations (and time restrictions) are:

- the west side of Leichhardt Street between Bronte Road and Leichhardt Lane. (8.00am-9.00am / 2.30pm-4.00pm)
- the north side of Macpherson Street between Albion Street and the bus stop, (8.00am-9.15am / 2.45pm-4.15pm)
- the east side of Albion Street between the pedestrian signals and Santa Marina Avenue. (8.00am-9.00am / 3.00pm-4.15pm)

A teacher is on duty in the courtyard from 7.50am until classes commence at 8.20am allowing students to be dropped off early. Parents are advised that students should arrive at school by 8.15am. The gates are open during the afternoon between at 2.45pm and 4.00pm. Finishing times are staggered between year groups to help alleviate congestion around the School as shown in Table 4.

Table 4: School finishing times

Years	Finish time	Collection location
Kindergarten	2.45pm	Courtyard
Years 1 and 2	2.50pm	Leichhardt Street car line
Years 3 and 4	3.00pm	Leichhardt Street car line
Years 5 and 6	3.00pm	MacPherson Street car line
7-10	3.20pm	Macpherson/Albion
11-12	3.20pm	Macpherson/Albion

Senior School students have varying start and finish times depending on their choice of curriculum (i.e. whether they have extra-curricular activities). Classes nominally begin at 8.20am and finish as per Table 4. The majority of students were observed to arrive after 8.00am and leave the School gates after 3.30pm (which is supported by the travel surveys).

Junior School students were seated and marshalled into vehicles as they arrived on Leichhardt Street.





Figure 8: School drop-off/pick-up zones

### 3.6.3 Off-street parking provision

There are currently a total of 56 parking spaces within the School grounds. All other staff members and visitors park on-street or use alternative methods of travel.

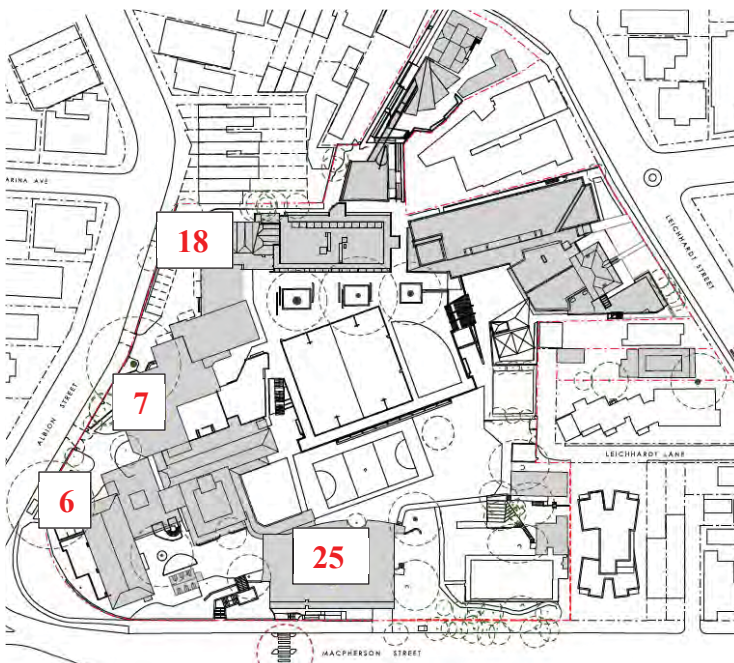


Figure 9: Existing off-street parking provision

### 3.6.4 Current on-street parking demand

Parking accumulation surveys were performed by Lyle Marshall and Associates in December 2013 to determine the extent of on-street parking occupancy. The on-street parking provision on the surrounding roads is generally unrestricted, with up to 560 parking spaces available within 5 minutes' walk. This reduces to approximately 460 spaces during the day when the time restrictions and school drop-off/pick-up zones are in operation.

Parking is heavily utilised in the surrounding streets, with occupancy around 90% in the morning dropping away to 75% occupancy in the afternoon and peaking again at approximately 90% after 9pm. Parking occupancy is summarised in Figure 10.

Parking is utilised by school staff during the day and by residents/visitors during the evenings and weekends. Students are also able to drive, but are not permitted to park on-site and are discouraged by the School to do so.

During the day, there is spare capacity for parking with occupancy between 80-90%; however during evenings, parking is utilised up to 95% occupancy by 10pm.

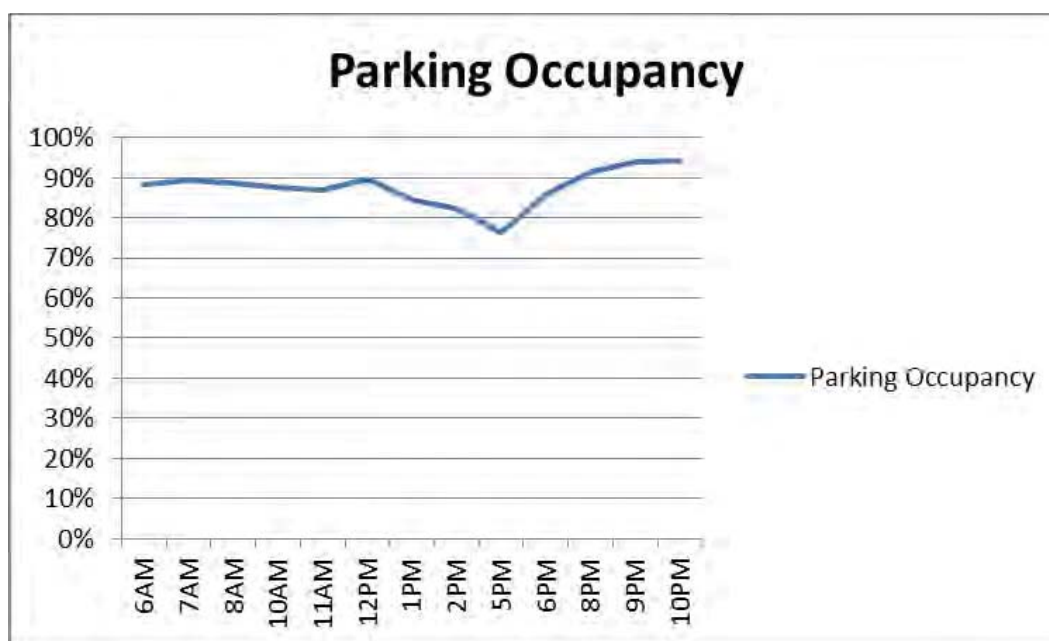


Figure 10: Parking occupancy in surrounding streets

Source: Lyle Marshall and Associates

Arup conducted further on-street parking occupancy surveys in three time periods to determine the availability of car parking within 5 minutes' walk of the new entrance to the School on Macpherson Street. The area and streets covered are shown in Figure 11. The area selected included streets further to the south when compared to the Lyle Marshall and Associates survey area.



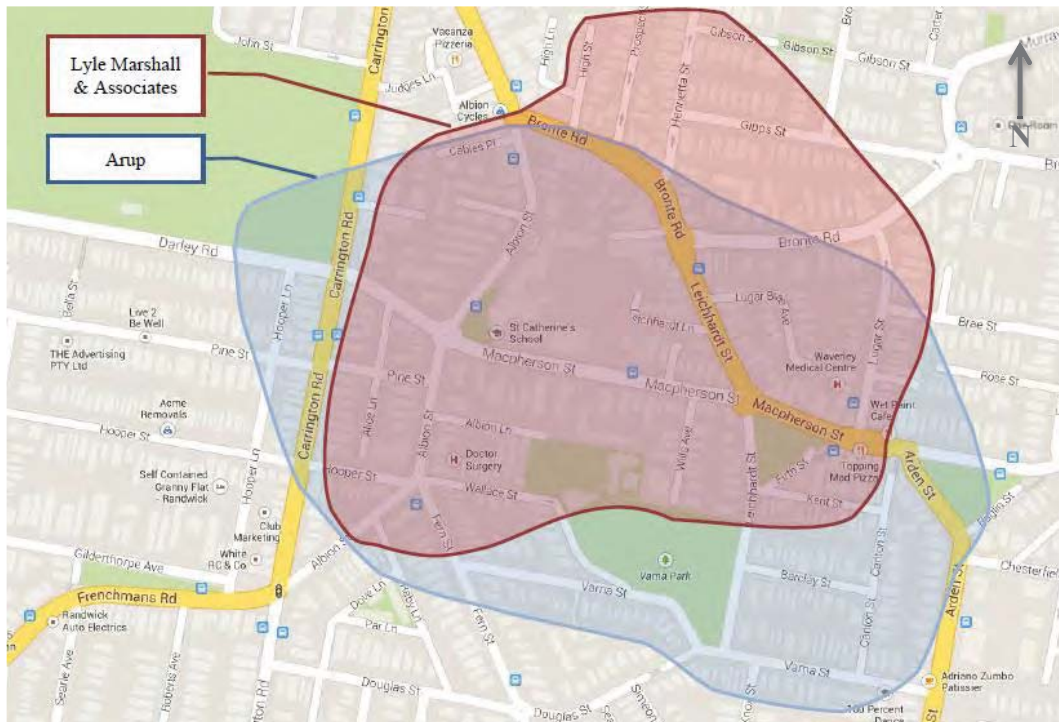


Figure 11: Comparison of 5 minute walk on-street parking survey areas

The number of available on-street car parking spaces within 5 minutes' walk of the main entrance to the School is shown in Figure 12, Figure 13 and Figure 14.

- 7.30 – 8.00pm Saturday 3 May 2014    237 spaces
- 2.30 – 3.00pm Sunday 11 May 2014    152 spaces
- 7.30 – 8.00pm Tuesday 13 May 2014    204 spaces

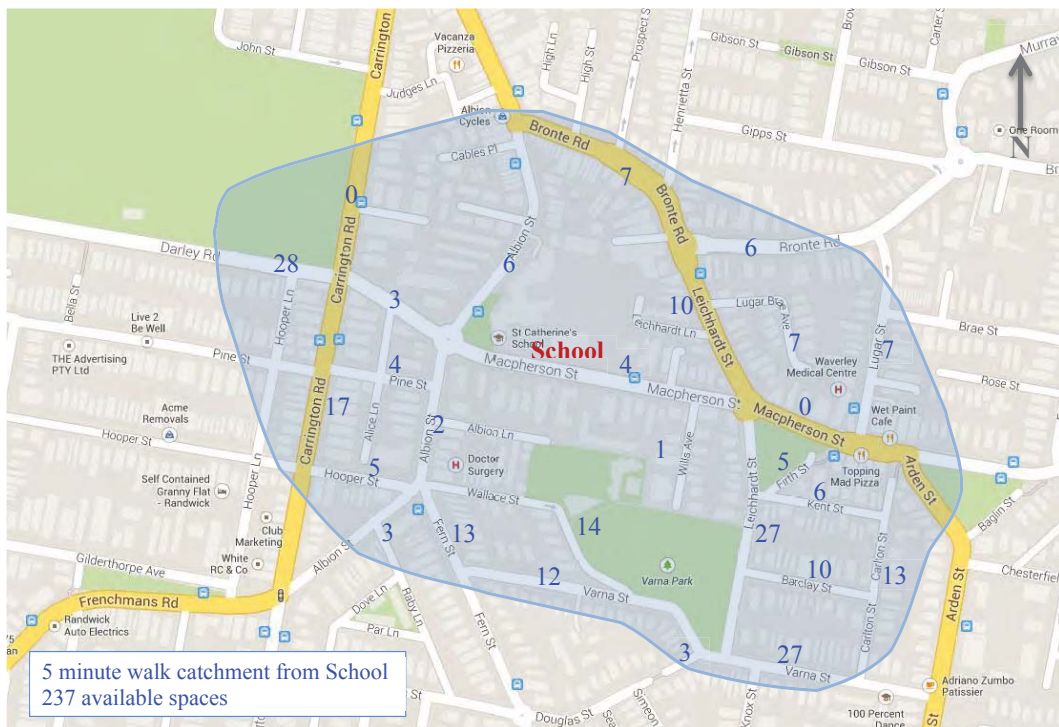


Figure 12: Available on-street spaces 7.30 – 8.00pm Saturday 3 May 2014

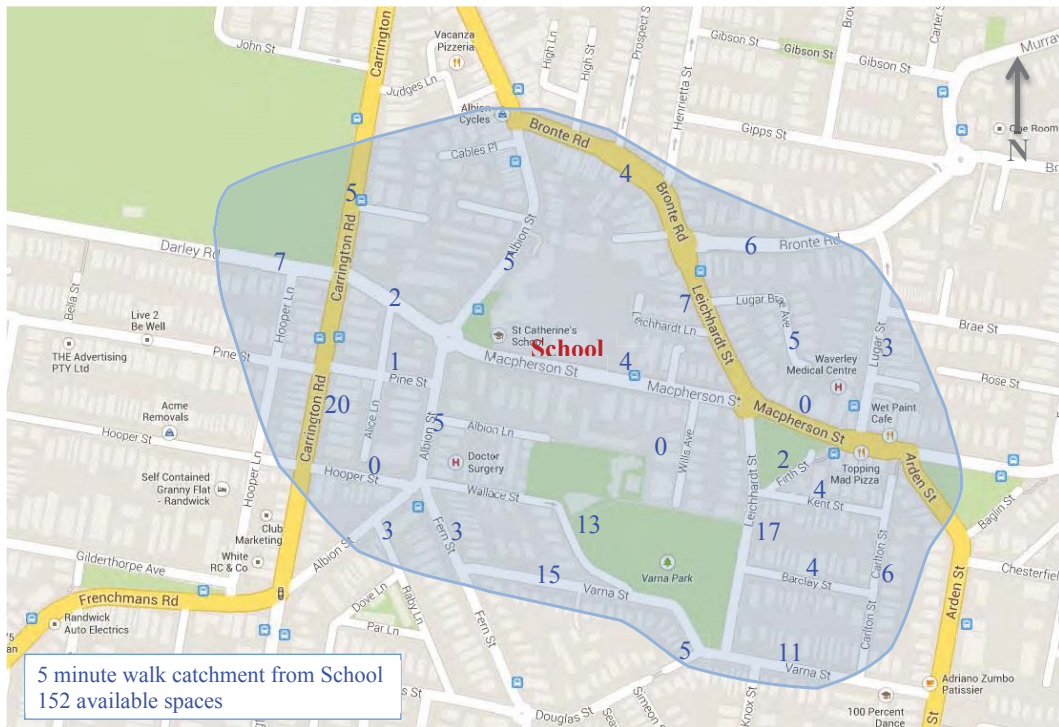


Figure 13: Available on-street spaces 2.30 – 3.00pm Sunday 11 May 2014

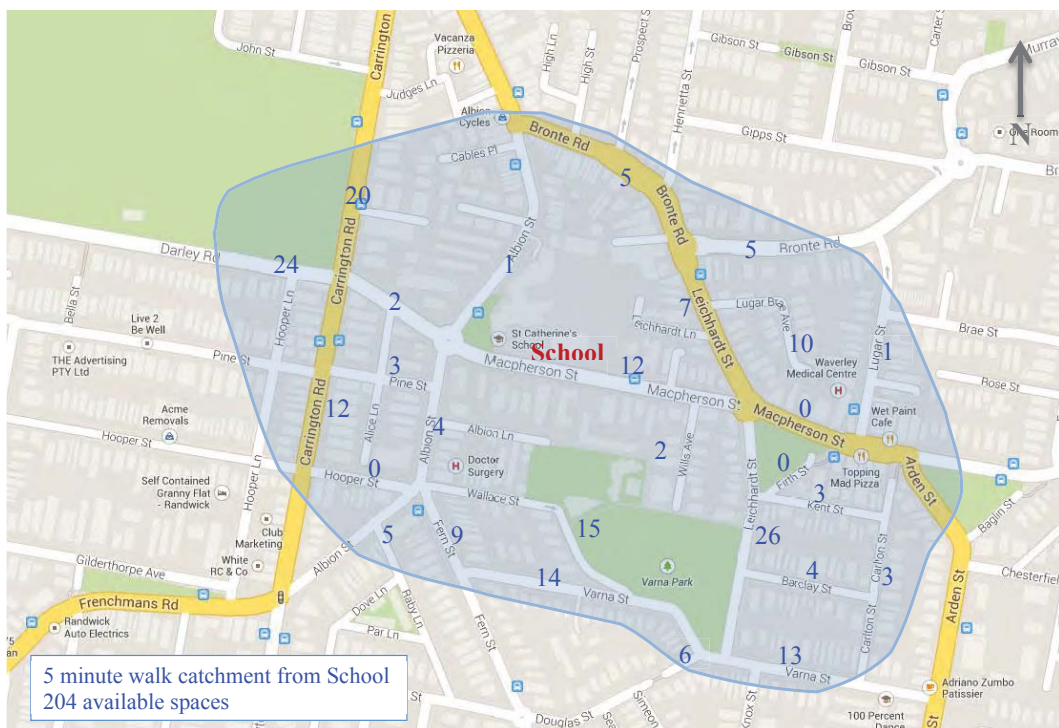


Figure 14: Available on-street spaces 7.30 – 8.00pm Tuesday 13 May 2014



### 3.7 Modal split

Travel demand surveys were completed in April 2014 by the School for both staff and students to recognise the current mode of transport to the School. The survey had a large number of responses from 579 students and 103 staff, representing more than half of the School. The results for staff and students are presented in Figure 15 and further detailed in Appendix B.

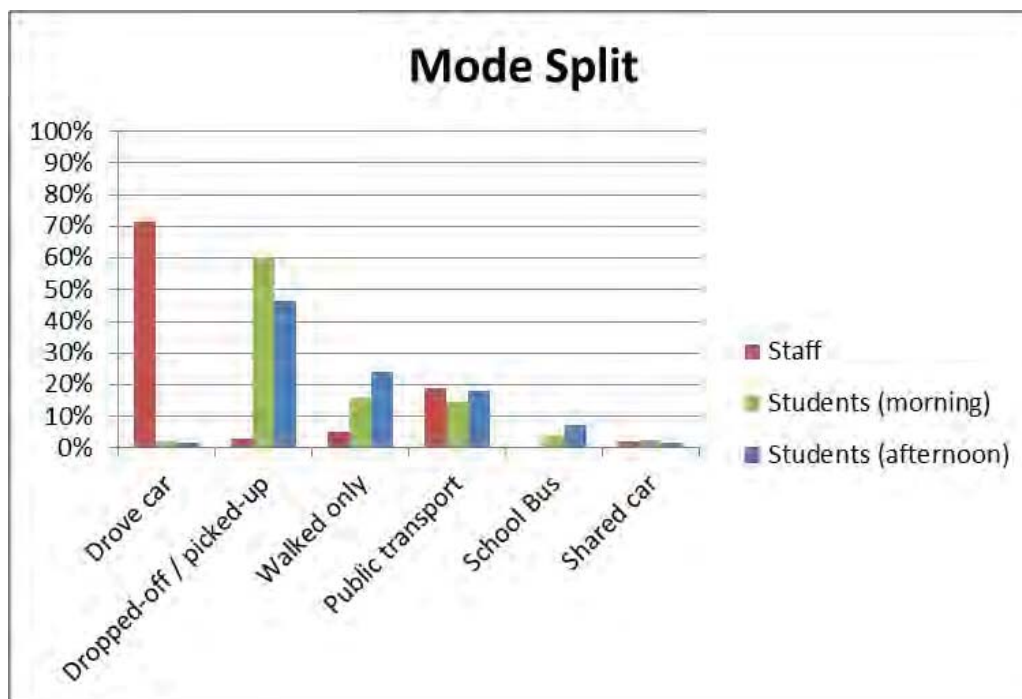


Figure 15: Travel demand survey summary

It was found that 71% of staff drove to the School with 3% as passengers. Public transport usage was approximately 19% and 5% walked to the School. Limited staff parking is available on the site and of the staff that drove, 61% of staff nominated that they park on-street.

For students, modes vary by arrival and departure. In the morning, 60% of students were dropped off at the School by car, decreasing to 46% being picked up from the School in the afternoon. As a result, there was a shift to walking in the afternoon, increasing from 16% to 24%; with slight increases to school bus usage (4% to 7%) and public transport (15% to 18%). No single student or staff member was recorded cycling to school.

The survey also asked students and staff when they normally arrive and depart the School. Departure profiles are shown in Figure 16. The majority of students arrive between 8.00am-8.20am (approximately 67%) and depart between 3.30pm-3.45pm (approximately 81%).

Comparably, staff members typically arrive between 7.30am-8.00am (35% for full-time and 30% for part-time). Full-time staff members depart fairly evenly between 4.00pm-6.00pm (approximately 20% recorded every half hour) and the majority of part-time staff departed before 4.00pm (44%). Interestingly, the departure peaks for students and staff do not coincide as shown below in the graph. **(note that school starts at 8.20am with staggered finishing times up to 3.20pm).**

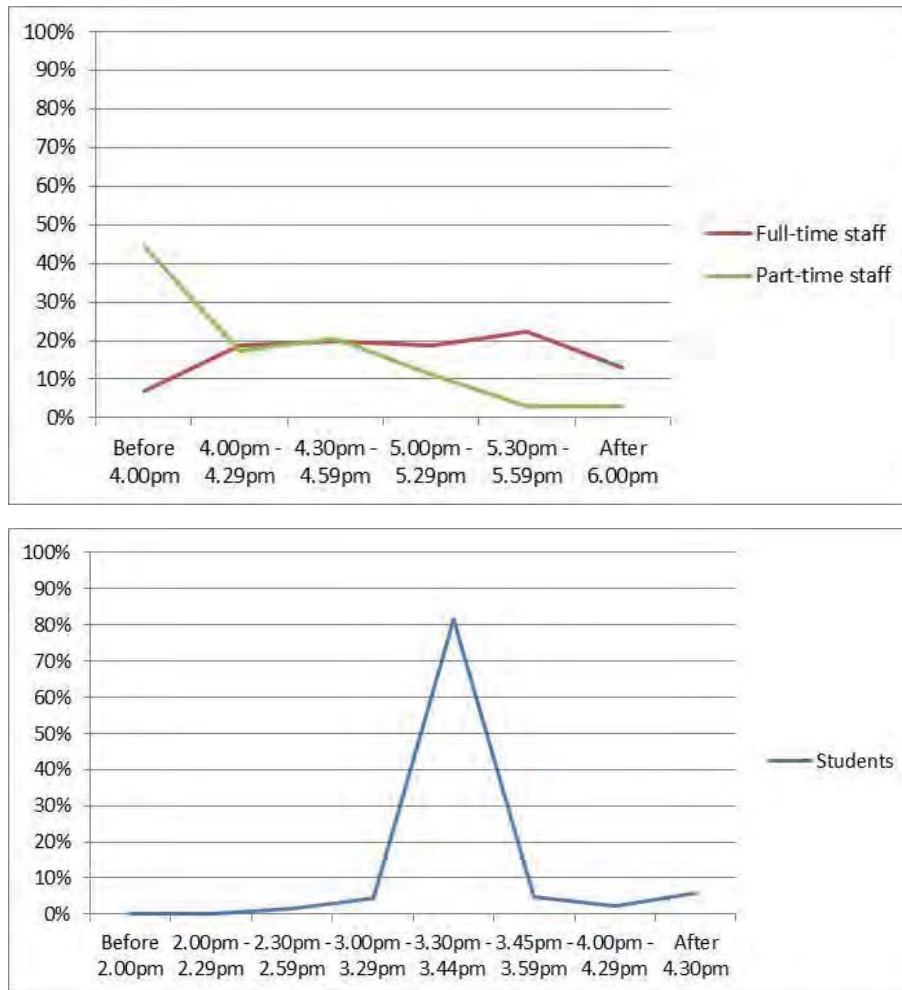


Figure 16: Departure profiles

The surveys also analysed staff and students (and parents) concerns and suggestions for improvements. The main comments provided were:

- Better organisation of drop off and pick up activity
- Possible on-site drop off/pick-up
- More staggered start/finish times
- Stop students driving to school
- Drop-off facilities going through bus stops and 'No Stopping' zones
- Junior School drop-off not sufficient on Leichhardt Street and may need to be expanded to Macpherson Street

### 3.7.1 Journey to Work 2011

The Journey to Work (JTW) census data 2011 has been reviewed for the Travel Zone (524) containing the School, which provides an indication of the mode share for staff. The modes of travel are shown in Figure 17 and the origins for the trips made to Zone 524 (highlighted in blue) are shown in Figure 18. The JTW data indicates that approximately 60% drove to work, with an additional 4% being a car passenger. Public transport usage is approximately 15% for train and 7% for buses. Walkers were high at 11%. These results are relatively consistent with the travel demand surveys completed by staff at the School.

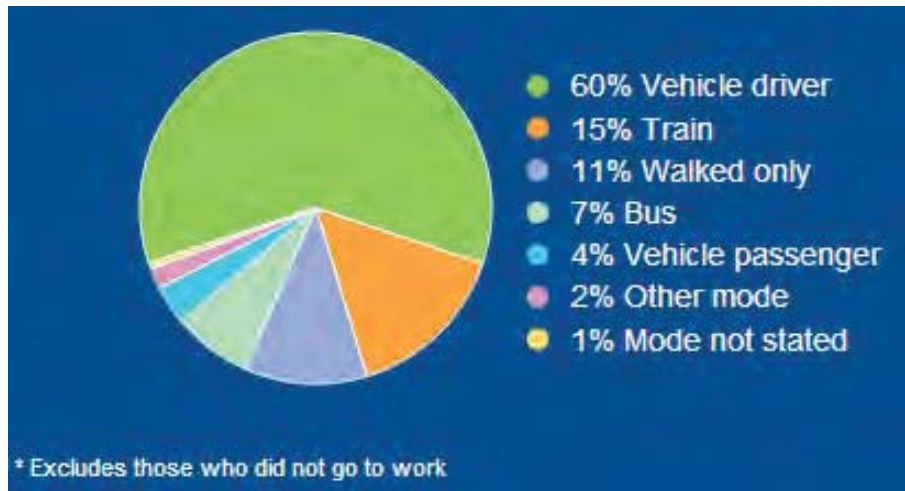


Figure 17: JTW Census data, 2011

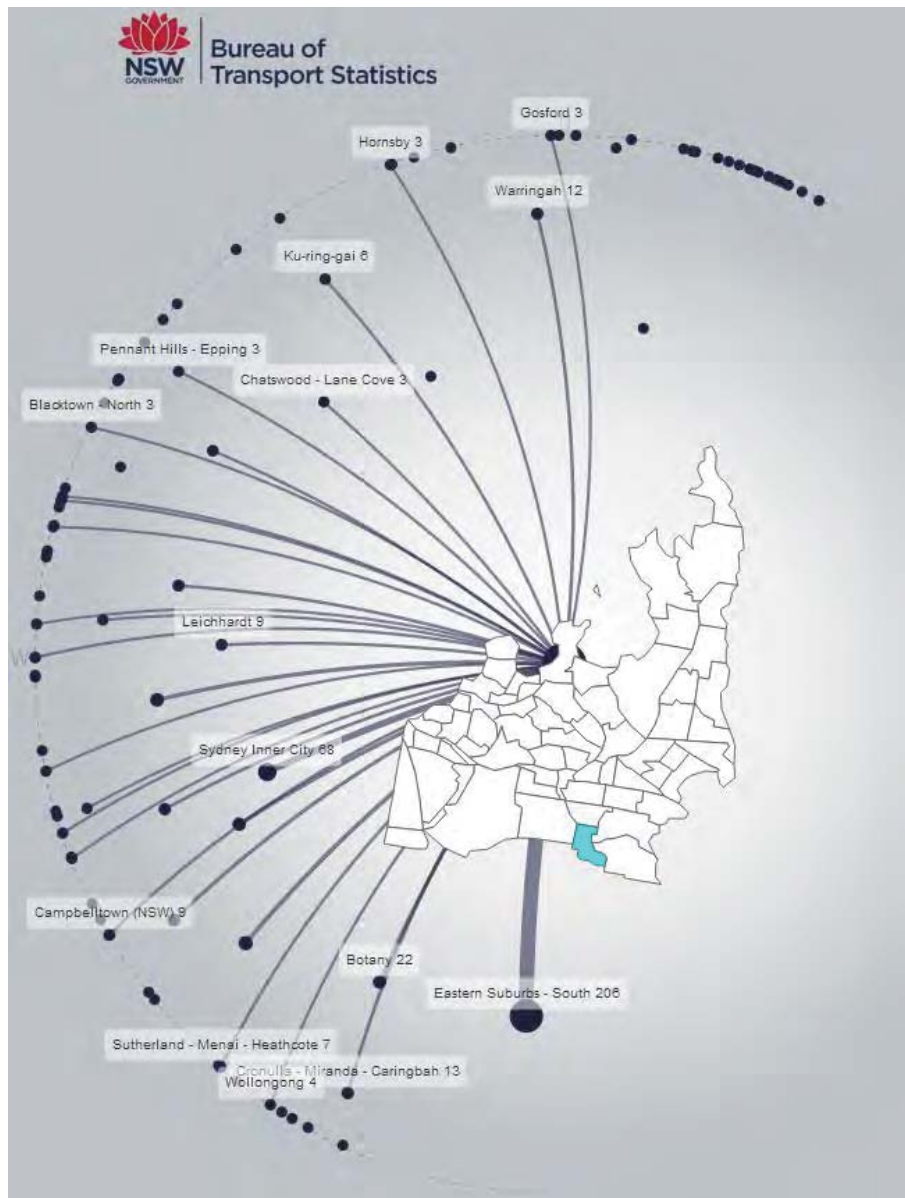


Figure 18: JTW Visualiser (Travel Zone 524)



### 3.7.2 Home locations of staff and students

Suburb data for students and staff has been plotted to indicate the accessibility to different modes of transport. Interestingly, more than 30% of staff and approximately 60% of students live within 1.5km of the School and could walk. The concentration of staff home location in the Sydney area is shown in Figure 19 and the student home locations are shown Figure 20. The vast majority of students and staff live in the eastern suburbs.

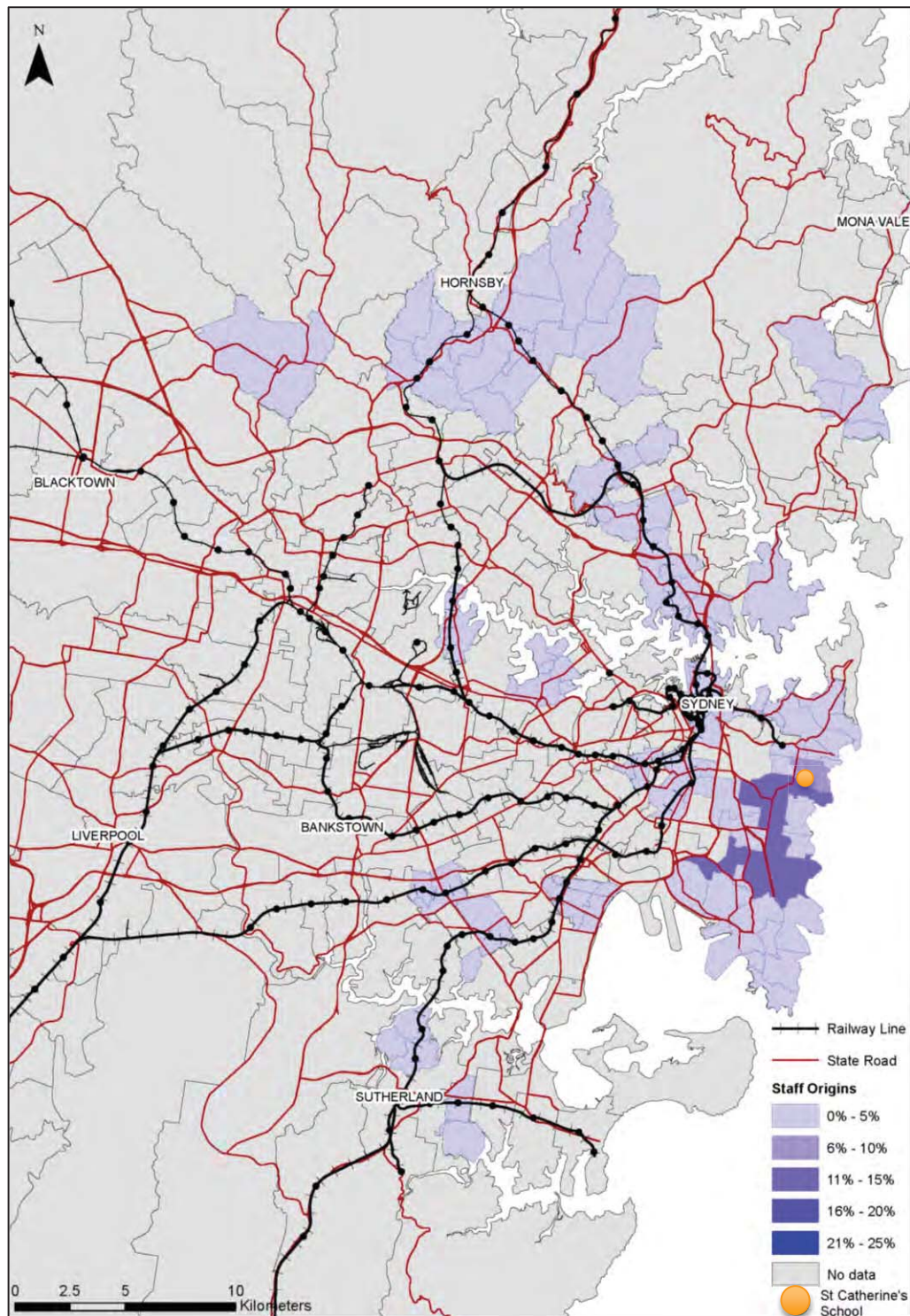


Figure 19: Staff postcode origins



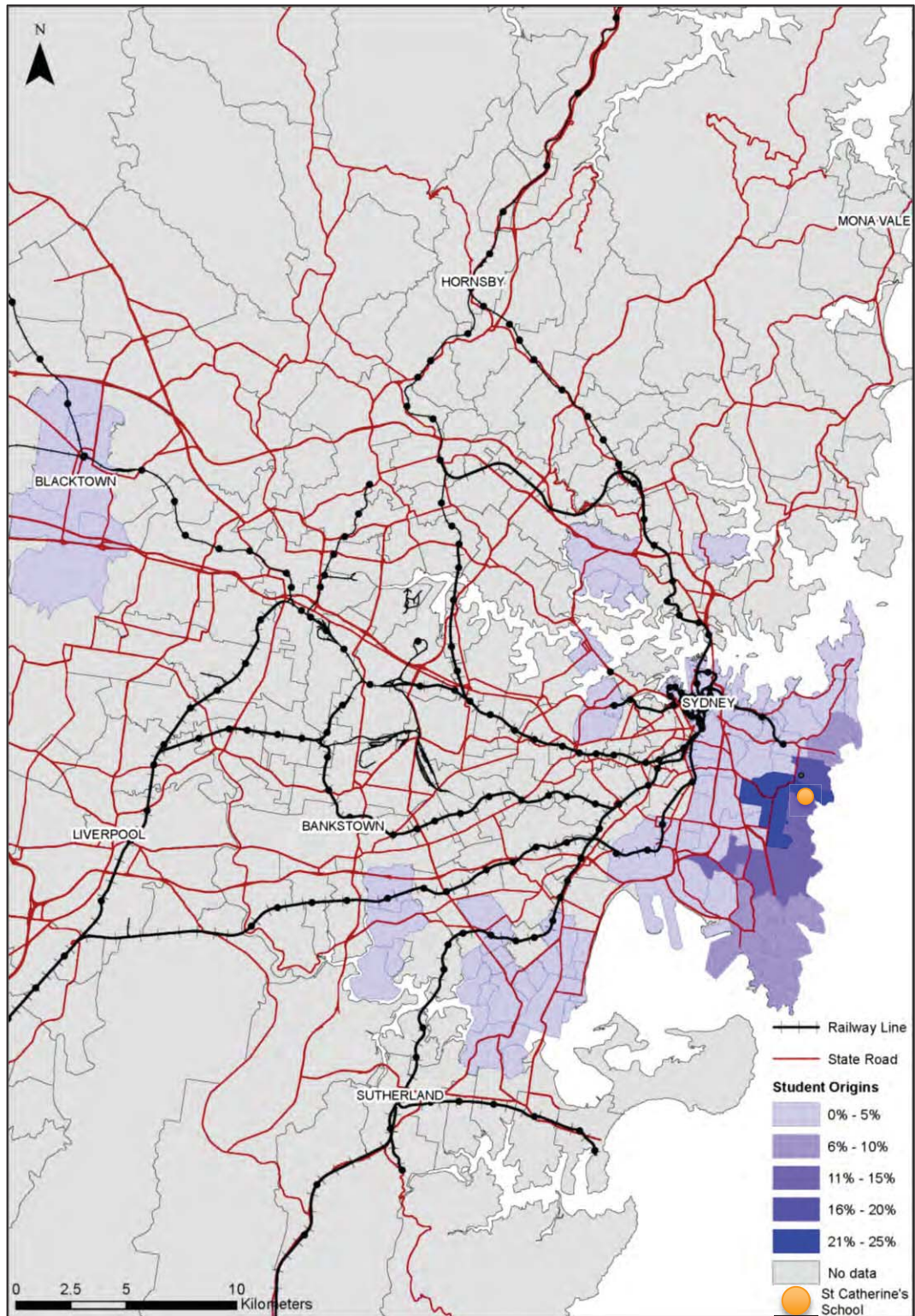


Figure 20: Student postcode origins

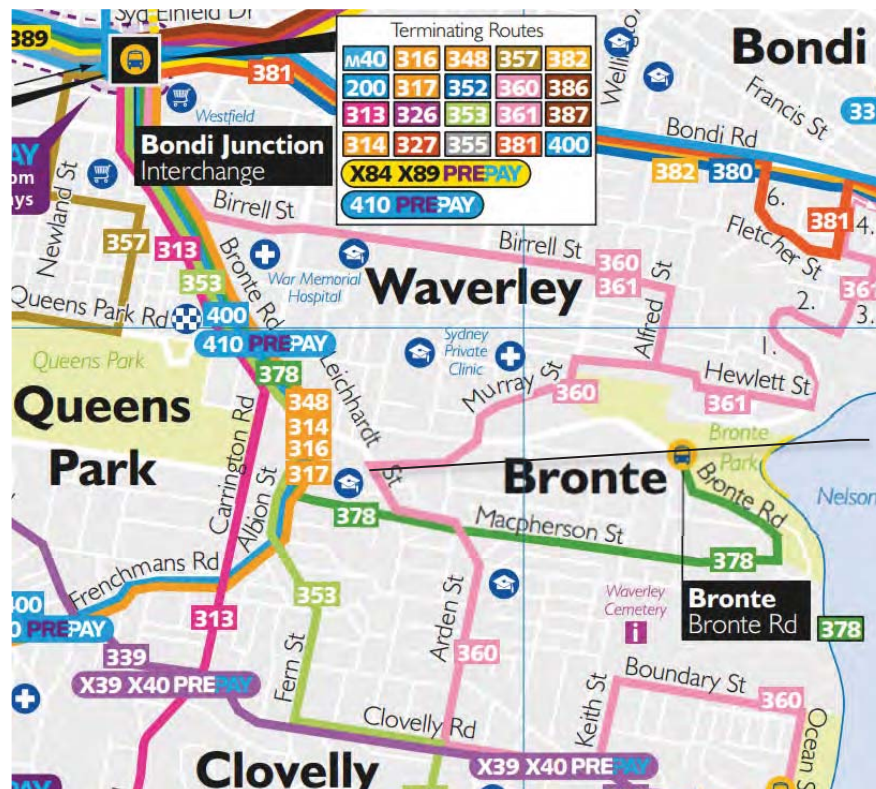
## 3.8 Public transport

### 3.8.1 General public buses

Public transport to the School, shown in Table 5, is available by bus from stops located on Macpherson Street, Albion Street and Leichhardt Street. Sydney Buses operates routes outlined in Figure 21. All buses (except route 378) listed below originate at Bondi Junction Station, providing good access to the T4 Eastern Suburbs Line.

Table 5: Bus services

Route Number	Stop	Destination	Frequency
313	Carrington Road	Coogee	2 per hour
314	Albion Street	Coogee	2 per hour
316	Albion Street	Eastgardens	2 per hour
317	Albion Street	Eastgardens	2 per hour
348	Albion Street	Wolli Creek	2 per hour
353	Albion Street	Eastgardens	2 per hour
360	Leichhardt Street	North Clovelly	2 per hour
378	Albion Street / Macpherson Street	Railway Square / Bronte Beach	Every 10 minutes
400	Albion Street	Burwood	Every 10 minutes
410	Albion Street	Rockdale	Every 10 minutes



St Catherine's  
School

Figure 21: Surrounding bus routes

Source: Sydneybuses.info



### 3.8.2 School Buses

Additionally there are school services which operate from the Albion Street bus stops in the afternoon (between 3.30pm and 4.00pm). These routes are detailed in Table 6.

Table 6: School bus routes

Route Number	Origin	Destination	Departure Time
400	Waverley College	Eastgardens	3.35pm
604	St Clare's College	King St / Botany Rd	3.31pm
657	St Clare's College	Bunnerong St / Franklin St	3.31pm
661	Cranebrook School	Randwick Junction	3.42pm
662	Cranebrook School	Maroubra Junction	3.57pm



Figure 22: School bus routes

### 3.8.3 Minibuses

The School operates three minibus services. These are usually used during school hours to move students to events and excursions. They may also be used for after-school activities such as extra-curricular events and classes.

### 3.8.4 School bus charters

For larger events, buses are chartered with student pick-up and set-down occurring in Albion Street.

### 3.9 Pedestrian / bicycle networks

The surrounding streets have pedestrian footpaths either side of the road. Each street also has a mid-block pedestrian crossing. There is a signalised crossing on Albion Street, and a zebra crossing each on Leichhardt Street and Macpherson Street.

Cycling routes surrounding the site include nearby paths at Queens Park and on-road routes (mixed traffic). These are shown below in Figure 23.

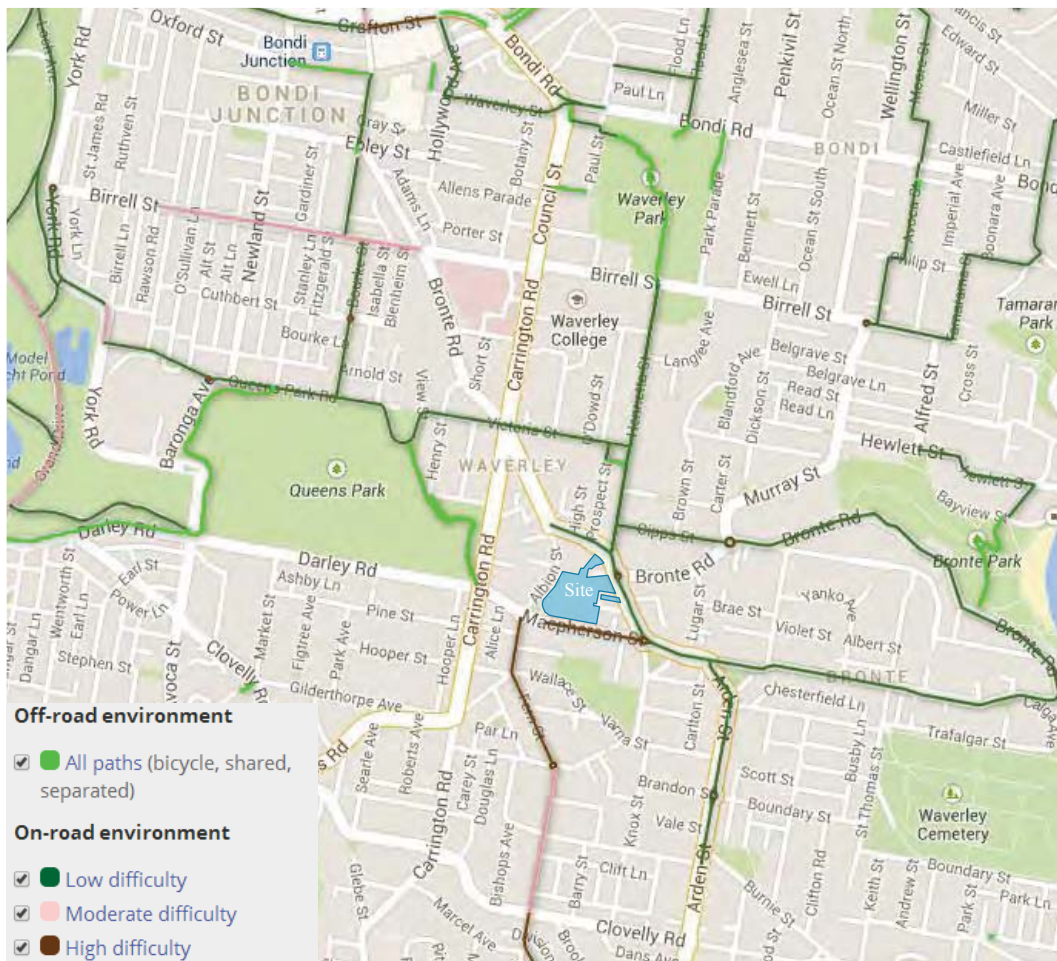


Figure 23: Bicycle network

### 3.10 Other proposed developments

A review of Waverley Council's DAs indicates that the only proposed development within close proximity to the School is a 60 place Child Care Facility at 23 Macpherson Street. This site is just to the east of the School on the southern side of Macpherson Street. The development will provide a drop off/pick up zone with time limited parking on Macpherson Street for the morning drop-off and afternoon pick-up times. This will occur on the opposite side of the street to the School's pick-up drop-off zone and will not impact on the operation of the zone.

## 4 St Catherine's School Campus Master Plan

---

### 4.1 Objectives

The School has identified the following objectives for the Campus Master Plan:

- Provide state-of-the-art facilities which complement the School's commitment to providing broad, challenging and vibrant education within a nurturing environment
- Enhance the current educational curriculum for Sport and Personal Development, Health and Physical Education by introducing an Aquatic Centre in place of the existing, aged outdoor pool
- Enhance the current educational curriculum for Performing Arts by providing a new state-of-the-art professional grade Performing Arts Auditorium which addresses the constraints of the existing "play-box theatre" within the DJSC (i.e. small spectator gallery, insufficient back-of-house facilities, inadequate size to accommodate school performances etc)
- Introduce the new Research, Performing Arts and Aquatic Centre (RPAC) which reflects a contemporary world-leading teaching and learning environment for staff and K-12 students, equipped with a broad variety of leading-edge and learning based technology within a diverse range of learning environments
- Ensure an efficient, adaptive reuse of residual spaces created by the development of new facilities to create a variety of education based precincts throughout the School campus
- Create new Junior School and Senior School entries off Albion Street and Leichhardt Street respectively, which are sympathetic to existing traffic conditions and provide a safe, accessible pedestrian link between Albion Street and Leichhardt Street for the School community
- Create a new, safe formal school entry from Macpherson Street directly to the Administration Building via the Museum, separating vehicle entry from pedestrian entry whilst emphasising the significance of the School's heritage
- Minimise dependency on external facilities to support the educational curriculum, as well as co-curricular and extracurricular activities offered by the School to the community.

### 4.2 The plan

The proposed Campus Master Plan comprises a number of new buildings, internal refurbishments and the reallocation of some internal spaces across the site. The primary new buildings (and associated demolition works) include:

- Demolition of the existing outdoor swimming pool and construction of a new multi-level building (i.e. the RPAC). The core facilities proposed within the RPAC include the new RPAC, Aquatic Centre and Multi-Purpose Hall, with pedestrian links to the existing DJSC and Jo Karaolis Sports Centre (JKSC).
- Demolition of the existing Jane Barker Hall (JBH) and construction of a new building.



- Demolition of the existing print room, reception and link building between Lenthall and the Administration Building (Level 6) and construction of new boarder's common room.

The Campus Master Plan also proposes:

- A total site Gross Floor Area (GFA) of 22,958m<sup>2</sup> which equates to a floor space ratio (FSR) of 1:1 (the existing/approved/commenced GFA on the site is 20,274m<sup>2</sup> which equates to a FSR of 0.9:1)
- A total of 75 car spaces (a net increase of 19 car spaces)

The Campus Master Plan is illustrated and explained in the *St Catherine's School, Waverley Master Plan* (November 2013) and *Gross Floor Space Calculation*, by Mayoh Architects.



Figure 24: Campus Master Plan

### 4.3 Student /staff increase

The School had an October 2013 enrolment of 970 students, with 202 employees (including 175 full time and 27 part time employees). The Campus Master Plan will provide the potential for up to:

- 14-16 additional students to be introduced progressively each year, starting at 2015 and ending at 2029 (i.e. increasing to a total of 1,200)
- 10 additional employees (approximately)

### 4.4 Description of site access / parking / loading / bicycle facilities

The School currently has numerous pedestrian entries, but there is no clear hierarchy or function of access points. The Campus Master Plan preserves and improves the pedestrian environment on the site by improving the clarity and function of the following key pedestrian access points:

- New formal pedestrian school entry from Macpherson Street
- New Senior School entry off Albion Street
- Junior School pedestrian entry from Leichhardt Street with a major internal student link to the Senior School entry from Albion Street.

Lifts are included in the RPAC and future new building on the JBH site to facilitate accessibility throughout the site. Other secondary entries will be retained or consolidated with proposed entries as shown in Figure 25 (for example the pedestrian entry to the DJSC will be consolidated with the New Performing Arts entry from Macpherson Street).

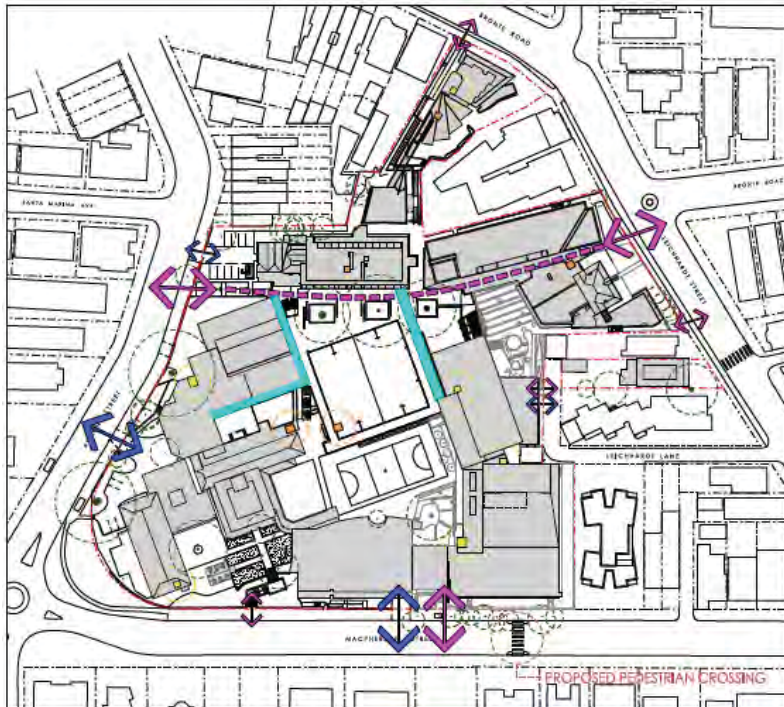


Figure 25: Proposed access arrangements

## 5 Stage 1 development

---

### 5.1 Description

The proposed SSD comprises the following:

Detailed design approval for RPAC which comprises:

- (a) Demolition of the existing swimming pool, change rooms, portable class room
- (b) Tree removal
- (c) Construction of RPAC in the location of existing swimming pool and the approved commenced Indoor Sports Complex (DA 258/89) to include basement car parking, an Aquatic Centre with associated amenities, Multi-Purpose Hall, 500 seat Performing Arts Auditorium with associated amenities and RPAC.
- (d) Landscaping of the site.

### 5.2 Proposed profile of use

#### 5.2.1 Existing venues

The School currently holds a number of events/activities both internally and externally for the public. Current event venues and their capacities are outlined below:

- JKSC holding 1,000 attendance
- Isabel Hall Courtyard holds 600 standing attendance
- DJSC holds up to 250 attendance
- JBH holds up to 250 seated attendance
- Cloisters holds up to 120 attendance
- Nan Hind Centre holds up to 100 attendance

The RPAC development proposes to consolidate events from these existing facilities into the new facilities. It is also proposed to redevelop the JBH site in a future stage of the Campus Master Plan.

#### 5.2.2 Existing profile of events/activities

There is an annual calendar of events and activities that are held in the various on-site venues. In addition to these, the School Musical event is held at NIDA Parade Playhouse, and occurs once a year periodically. A schedule of these existing events and activities and the potential future sports venue to be used is provided in Table 7. The events currently held in the JKSC will remain in this venue and there is no envisaged change in attendance. A number of the events that are moving into the new venues are envisaged to increase in size, although the majority will not change.



Table 7: Indicative usage profile (existing and forecast)

Event	Frequency (days p/yr)	Day of Week	Current indicative usage profile			Forecasted indicative usage profile			Change	Event Number for parking
			Hours	Existing facility where event is currently held	Estimated current attendance at event	Hours	New facility where event is proposed	Estimated forecasted attendance at event		
School Open Day	5	Weekday	9am - 11am	Dame Joan Sutherland	120 externals	9am - 11am	Performing Arts Auditorium	120 externals	0	120
School Open Night (Twilight Session - Term 1 and 4 only)	3	Weekday	5:30pm - 7:30pm	Dame Joan Sutherland	120 externals	5:30pm - 7:30pm	Performing Arts Auditorium	120 externals	0	120
Rehearsal Senior School Musical	5	Weekend	9am - 2pm	NIDA	60 students	9am - 1pm	Performing Arts Auditorium	60 students	0	0
Senior School Musical Event	1	Weekday	6:30pm - 9:30pm	NIDA - Parade Playhouse	659 audience with orchestra pit in use	6:30pm - 9:30pm	Performing Arts Auditorium	500 audience (school community)	500	500
Senior School Musical Event	2	Saturday	NA	NA	NA	6:30pm - 9:30pm	Performing Arts Auditorium	500 audience (school community)	500	500
Prep - St. Cath's Got Talent	2	Weekday	3pm - 6:30pm	Dame Joan Sutherland	60 students	3pm - 6:30pm	Performing Arts Auditorium	60 students	0	0
St. Cath's Got Talent Event	1	Weekday	6pm - 9pm	Dame Joan Sutherland	250 audience	6pm - 9pm	Performing Arts Auditorium	500 audience (school community)	250	500
Prep - Trinity Evening	12	Weekday	3pm - 6:30pm	Dame Joan Sutherland	60 students	3pm - 6:30pm	Performing Arts Auditorium	60 students	0	0
Rehearse BTC Showcase Event	11	Weekday	6pm - 10pm	Dame Joan Sutherland	250 audience	6pm - 10pm	Performing Arts Auditorium	500 audience (school community)	250	500
BTC Showcase Event	2	Weekday	3pm - 6:30pm	Dame Joan Sutherland	60 students	3pm - 6:30pm	Performing Arts Auditorium	60 students	0	0
Infants Christmas Musical Rehearsal	3	Weekday	6pm - 9pm	Dame Joan Sutherland	250 audience	6pm - 9pm	Performing Arts Auditorium	500 audience (school community)	250	500
Infants Christmas Musical	1	Weekday	9am - 5pm	Dame Joan Sutherland	130 students	9am - 5pm	Performing Arts Auditorium	130 students	0	0
Junior Musical Rehearsal	2	Weekend	9am - 12pm	Dame Joan Sutherland	250 students	9am - 12pm	Performing Arts Auditorium	300 audience	50	300
Junior Musical Rehearsal	2	Weekday	9am - 5pm	Dame Joan Sutherland	150 students	9am - 5pm	Performing Arts Auditorium	150 students	0	0
Junior Musical	2	Weekday	During school hours	Dame Joan Sutherland	150 students	During school hours	Performing Arts Auditorium	150 students	0	0
Stage 2 Music Evening Rehearsal	2	Weekday	8:30pm - 9:30pm	Dame Joan Sutherland	250 audience	8:30pm - 9:30pm	Performing Arts Auditorium	400 audience	150	400
Stage 2 Music Evening	2	Weekday	During school hours	Dame Joan Sutherland	100 students	During school hours	Performing Arts Auditorium	100 students	0	0
Stage 3 Music Evening Rehearsal	2	Weekday	6:30pm - 9:30pm	Dame Joan Sutherland	250 students	6:30pm - 9:30pm	Performing Arts Auditorium	300 audience	50	300
Stage 3 Music Evening	1	Weekday	During school hours	Dame Joan Sutherland	150 students	During school hours	Performing Arts Auditorium	150 students	0	0
Potential Use by Educational Establishment (Evening)	4	NA	8:30pm - 9:30pm	NA	250 audience	8:30pm - 9:30pm	Performing Arts Auditorium	350 audience	100	350
Potential Use by Educational Establishment (Matinee)	6	NA	NA	NA	NA	8:30pm - 9:30pm	Performing Arts Auditorium	500 audience	500	500
Amateur Societies Performance Evening	6	NA	NA	NA	NA	1:30pm - 4:30pm	Performing Arts Auditorium	500 audience	500	500
Amateur Societies Performance Matinee	2	NA	NA	NA	NA	6:30pm - 9:30pm	Performing Arts Auditorium	500 audience	500	500
Parent Breakfast - Junior School (K-6)	7	Weekday	7am - 9am	Jane Barker Hall	30 parents	7am - 9am	Multi-Purpose Hall	30 parents	0	0
Parent Breakfast - Senior School (7-12)	6	Weekday	7am - 9am	Jane Barker Hall	45 parents	7am - 9am	Multi-Purpose Hall	45 parents	0	0
Welcome Cocktail Party	1	Weekday	6pm - 9pm	Isabel Hall Wing Courtyard	600 externals (standing)	6pm - 9pm	Multi-Purpose Hall	600 externals (standing)	0	0
Old Girls Union - Annual 5yr Reunion	1	Weekday	6pm - 8pm	Cloisters*	60 externals	6pm - 8pm	Multi-Purpose Hall	60 externals	0	0
Alkell Scholarship Testing	1	Weekend	10am - 1pm	Dame Joan Sutherland	100 external students	10am - 1pm	Multi-Purpose Hall	100 external students	0	0
Kindergarten Parents DVD evening	1	Weekday	6pm - 9pm	Nan Hind Centre	100 parents	6pm - 9pm	Multi-Purpose Hall	100 parents	0	0
Old Girls Union - Mothers and Daughters Breakfast	1	Weekday	7:30am - 9:30am	Jane Barker Hall	60 (30/30 split)	7:30am - 9:30am	Multi-Purpose Hall	60 (30/30 split)	0	0
Old Girls Union - Jane Barker Luncheon	1	Weekday	10:30am - 1:30pm	Jane Barker Hall	80 externals	10:30am - 1:30pm	Multi-Purpose Hall	80 externals	0	0
Evening of Eminence - Junior School	1	Weekday	6pm - 8:30pm	Dame Joan Sutherland	160 parents	6pm - 8:30pm	Multi-Purpose Hall	250 externals	90	90
Creative Connections	1	Weekday	4:30pm - 8:15pm	Dame Joan Sutherland + Chapel	250 (yr 12 + parents + staff)	4:30pm - 8:15pm	Multi-Purpose Hall	250 (yr 12 + parents + staff)	0	0
Kindergarten Grandparents Morning	1	Weekday	8am - 11am	Nan Hind Centre	60 grandparents	8am - 11am	Multi-Purpose Hall	60 grandparents	0	0
Old Girls Union Year 12 Afternoon Tea	1	Weekday	2:30pm - 4pm	Jane Barker Hall	120 students (Yr 12)	2:30pm - 4pm	Multi-Purpose Hall	120 students (Yr 12)	0	0
Blues Sports Breakfast	1	Weekday	7am - 9am	Jane Barker Hall	100 students	7am - 9am	Multi-Purpose Hall	100 students	0	0
Kindergarten Orientation Day	1	Weekday	8am - 1pm	Jane Barker Hall	50 externals	8am - 1pm	Multi-Purpose Hall	50 externals	0	0
Orientation Day yr 4-11	1	Weekday	8am - 4pm	Dame Joan Sutherland	20 p/hr externals	8am - 4pm	Multi-Purpose Hall	20 p/hr external	0	0
Rowing Season Launch	1	Weekday	6pm - 10pm	Nan Hind Centre	100 parents	6pm - 10pm	Multi-Purpose Hall	100 external	0	0
Duke of Edinburgh Presentation Evening	1	Weekday	6pm - 9pm	Dame Joan Sutherland	90 parents	6pm - 9pm	Multi-Purpose Hall	90 parents	0	0
Yr 6 Graduation Dinner	1	Weekday	6pm - 9pm	Jane Barker Hall	250 (seated)	6pm - 9pm	Multi-Purpose Hall	250	0	0
Chairman's Thank You Cocktail Party	1	Weekday	6pm - 9pm	Cloisters*	80 (volunteers, parents etc.)	6pm - 9pm	Multi-Purpose Hall	80 (volunteers, parents etc.)	0	0
HSC Results Event	1	Weekday	During school hours	Cloisters*	120 students (Yr 12)	During school hours	Multi-Purpose Hall	120 students (Yr 12)	0	0
Staff Christmas Lunch	1	Weekday	During school hours	Jane Barker Hall	200 (seated)	During school hours	Multi-Purpose Hall	200	0	0
Allwell testing Yr 4	1	Weekday	During school hours	Dame Joan Sutherland	50 external students	During school hours	Multi-Purpose Hall	50 external students	0	0
Boards dance	1	Weekday	7pm - 10pm	Jane Barker Hall	300 external students and boards	7pm - 10pm	Multi-Purpose Hall	300 external students and boards	0	0
Boarder Parents Dinner	1	Weekday	6:30pm - 9:30pm	Magnolia Room	40 parents	6:30pm - 9:30pm	Multi-Purpose Hall	40 parents	0	0
Valedictory Dinner	1	Weekday	8:30pm - 9:30pm	Magnolia Room	120 boarders + parents + staff	8:30pm - 9:30pm	Multi-Purpose Hall	120 (boarders + parents + staff)	0	0
Boarders Xmas Dinner	1	Weekday	6:30pm - 9:30pm	Magnolia Room	140 boarders + parents + staff	6:30pm - 9:30pm	Multi-Purpose Hall	140 (boarders + parents + staff)	0	0
Parent Event	4	Weekday	NA	NA	NA	During school hours	Research Centre	50 parents	0	0
Book week activities	5	Weekday	During school hours	Senior/Junior Library	Students only	During school hours	Research Centre	Students + parental involvement	50	50
Boarders after school tutorials	Weekdays all year	Weekday	3:20pm - 9pm	Lenthall Building	70 students/tutors mix	3:20pm - 9pm	Research Centre	70 students/tutors mix	30	30
Speech Night Guest Supper	1	Weekday	5:30pm - 7:00pm	Reception Room	30 (parents + school council + staff)	5:30pm - 7:00pm	Board Room	30 (parents + school council + st	0	0

\*Cloisters refers to the grass area west of the central artificial netball courts

**LEGEND**

	Denotes new event to take place on the St Catherine's School site
	Denotes existing event occurring on the St Catherine's School site where the attendance will increase
	Students/staff only

### 5.2.3 Proposed Aquatic Centre

The proposed aquatic centre replaces the existing outdoor pool with two new indoor pools including a diving facility. The new pools will generate the majority of new activity as it is proposed to utilise both pools during weekends, and before/after school with Learn to Swim classes, squad swimming, diving and water polo (training and competition). Currently the diving program is held off-site at Waverley College pool and this will move to the new pool.

The anticipated utilisation of the aquatic centre is outlined in Table 8. The typical attendance at the aquatic centre will increase from 75 currently up to 250 at any one time when both Water Polo and Learn to Swim are occurring concurrently during the weekend.

Table 8: Aquatic Centre utilisation

Period	Existing			Future		
	Times	Event	Attendance (per hour)	Times	Event	Attendance (per hour)
	<b>Outdoor Pool</b>			<b>Main Pool</b>		
Before and after School	6.30am – 8.20am & 3.20pm – 6.30pm	Water Polo training	20	6.00am - 8.20am & 3.20pm – 8.00pm	Water Polo training	50
	5.00am – 8.20am & 3.20pm – 6.00pm	Squad Swimming	20		Squad Swimming	30
	6.00am - 8.20am	Diving (off-site at Waverley College)	20 students		Diving (on-site)	20 students
Weekday (school hours)	8.20am - 3.20pm	School Use Only	NA		School Use Only	NA
Weekend	7.30am - 2.00pm Sat Only	Water Polo	75	8.00am – 6.00pm Sat & Sun	Water Polo	150
	<b>Outdoor Pool</b>			<b>Shallow Pool</b>		
Weekday	3.20pm - 6.00pm	Learn to Swim	20	7.00am – 7.00pm	Learn to Swim	100
Weekend		NA		8.00am – 6.00pm	Learn to Swim	100
<b>Total maximum attendance</b>			<b>75</b>			<b>250</b>

### 5.2.4 Combined on-site activity

The various events and activities outlined in the preceding sections will be scheduled to minimise overlapping activity. For example, if a major event is to be held on a weekend in the Performing Arts Auditorium, then the Aquatic Centre activity will be scheduled to finish prior to the commencement of the major event.



### 5.3 Car parking provision

Additional basement car parking is proposed under the new RPAC building as shown in Figure 26. Access will be via a new internal connection from the existing basement parking area under the DJSC, hence utilising the existing two-way driveway on Macpherson Street. This will add 22 spaces to the existing 25 spaces, resulting in 47 car parking spaces in the basement. Basement car parking will be allocated for staff parking during the week but will be available for visitors to the RPAC building at weekends.

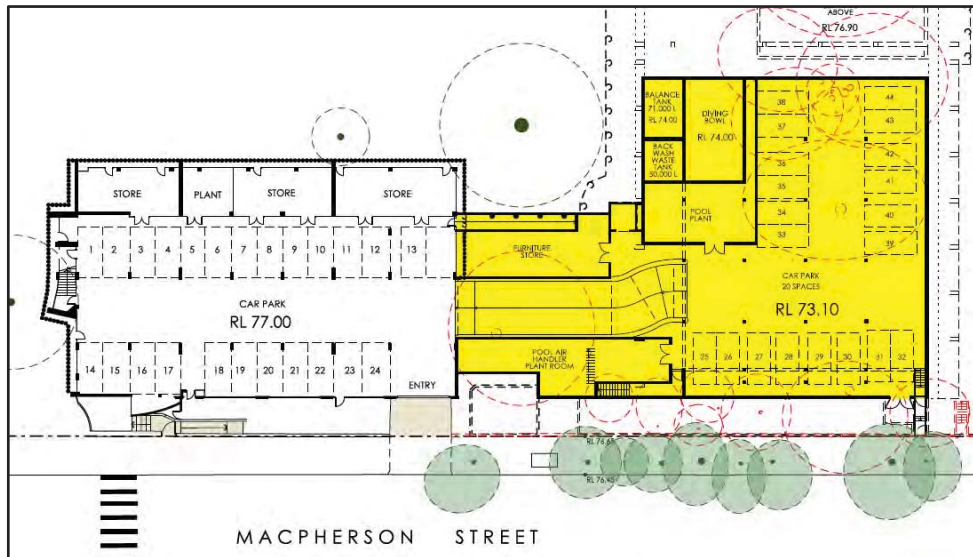


Figure 26: RPAC Basement Car Park

In addition, there will be parking space alterations in other areas of the campus, predominately along Albion Street. When the basement parking provision is included, this brings the total campus parking provision to 75 car spaces (a net increase of 19 spaces).

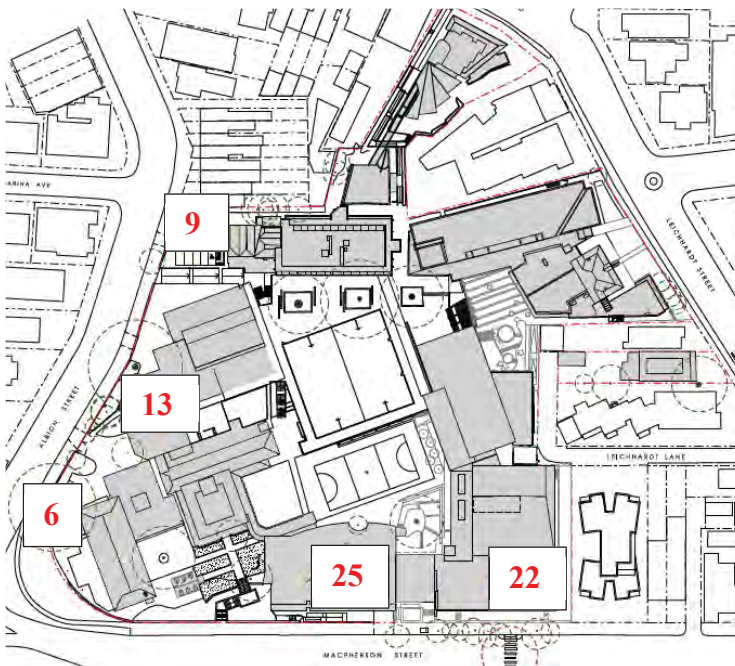


Figure 27: Proposed off-street car parking

## 5.4 Proposed site accesses

The campus will consolidate a number of entry/exit points so that access is more controlled into school grounds. This will provide an accessible through site link from Albion Street to Leichhardt Street for wet weather throughout the campus. Changes to the site accesses are shown below in Figure 28.

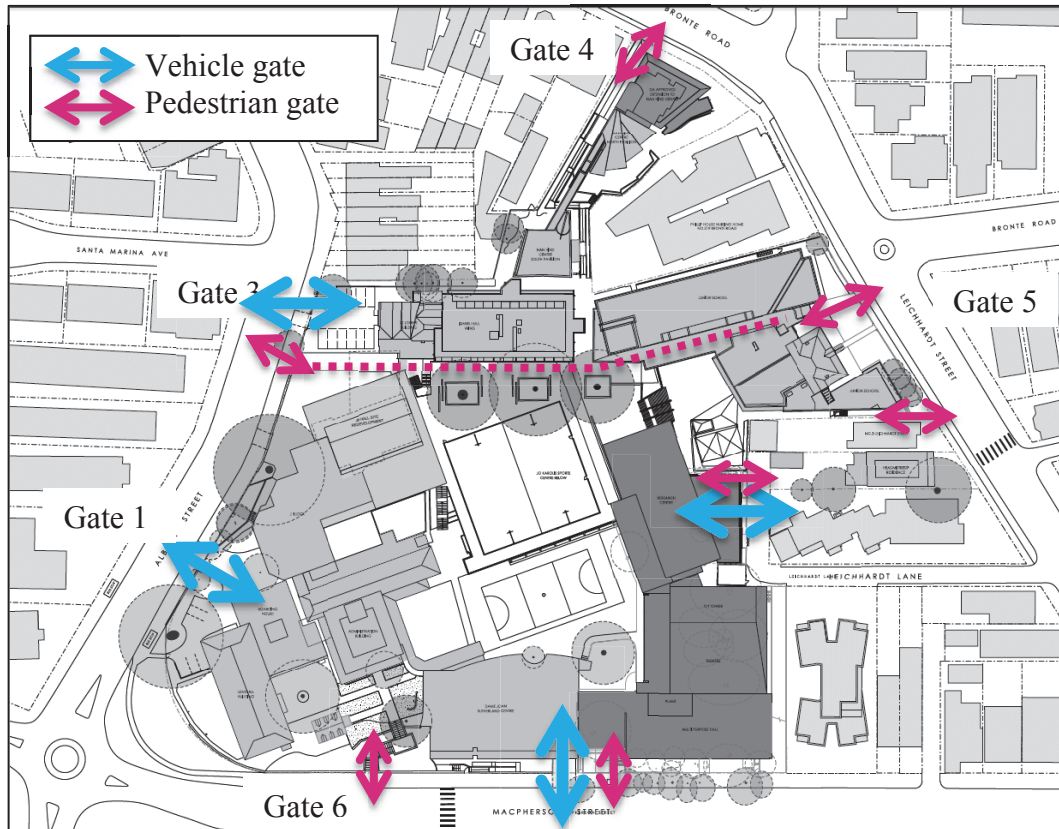


Figure 28: Proposed site accesses

## 5.5 Bicycle facilities

The School is proposing to provide bicycle facilities as part of the Campus Master Plan. Bicycle parking has been provided in accordance with the *NSW Planning Guidelines for Walking and Cycling 2004*. The School will provide (as shown in Figure 29):

- Six (6) staff bicycle racks with lockers and full bathroom including showers/toilets in the secure staff car parking area in Level 4 J Block (requires key to access); and
- Nine (9) visitor bicycle racks adjacent to the Level 6 Student Centre (in the St Johns Building), which is easily accessed from Albion Street.

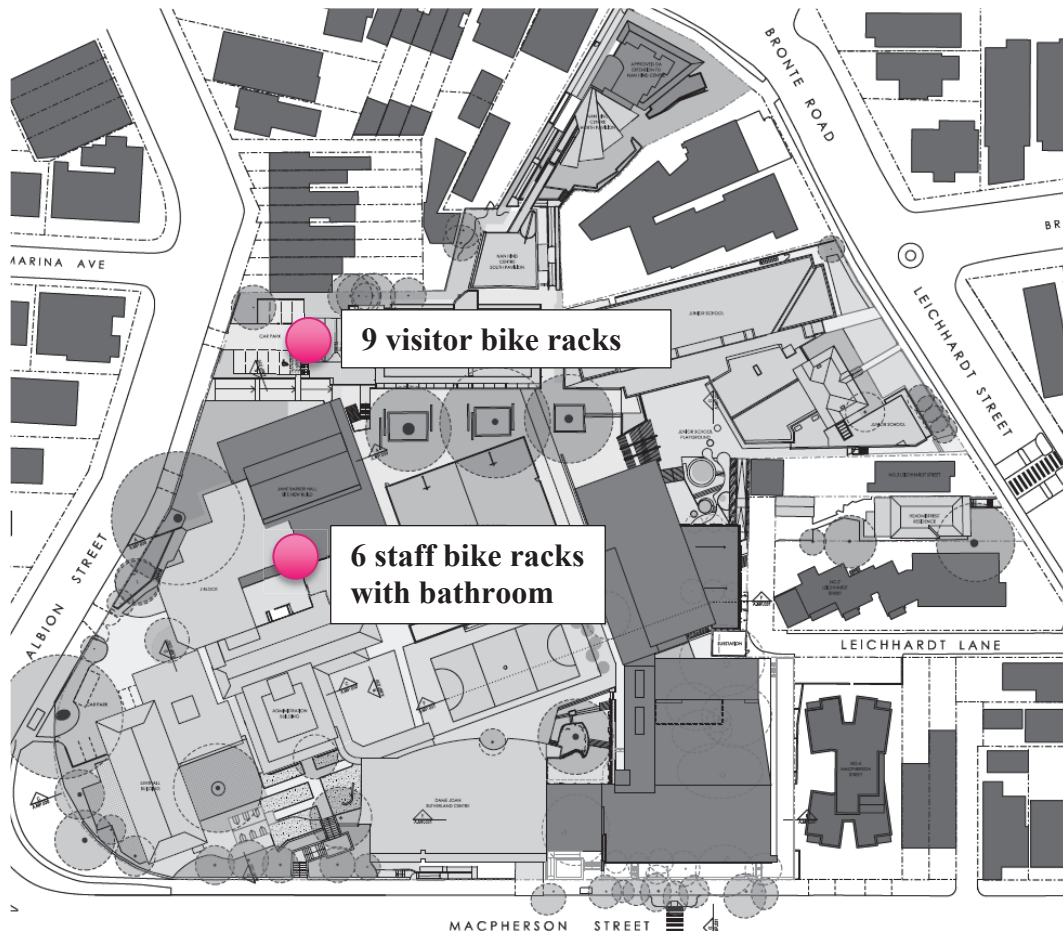


Figure 29: Proposed bicycle facilities

## 5.6 School bus parking

School bus parking currently occurs at a rear access on Leichhardt Lane, adjacent to a substation. Buses drive in a forward direction up the lane, and reverse into the access driveway, so that they are able to leave in a forwards direction.

From Stage 1 development up to when the Master Plan is finalised, it is proposed to relocate bus parking to Gate 1 at Albion Street. Buses are able to drive in and out of the site in a forwards direction. Once the Master Plan is finalised, buses may be able to move back to Leichhardt Lane via a new access. Buses will operate via the new access similarly to the existing access on Leichhardt Lane.



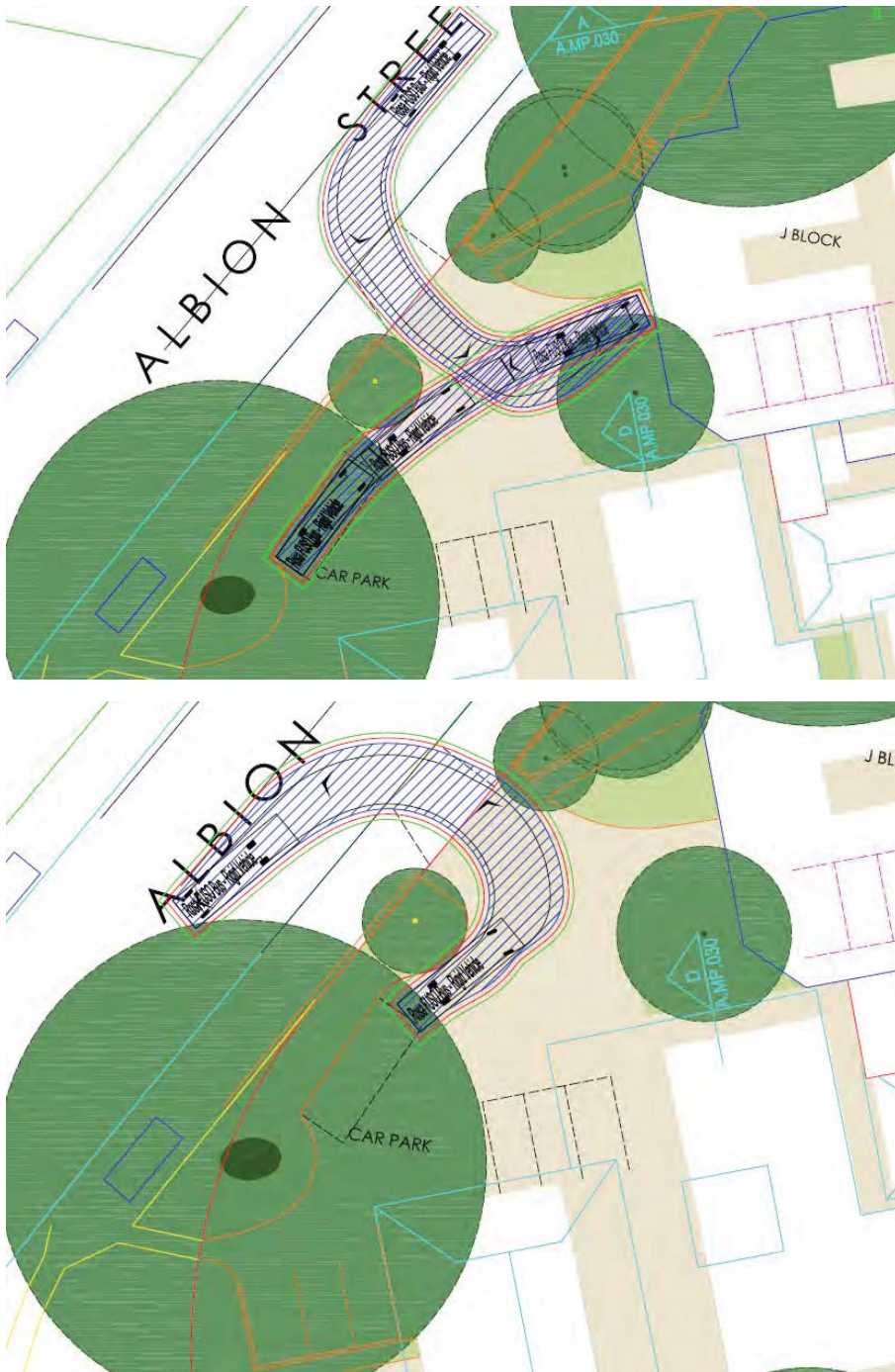


Figure 30: Swept path of FUSO minibus at Gate 1

## 5.7 Service vehicle access and waste collection

Council currently collects waste and recyclable materials in Leichhardt Lane. The Council truck reverses along Leichhardt Lane from Leichhardt Street before 7am, prior to school activity commencing and before commuter peak hours in Leichhardt Street. The bin store, shown in Figure 31 is proposed to be located adjacent to the Ausgrid substation which will provide direct access onto the lane for collection.

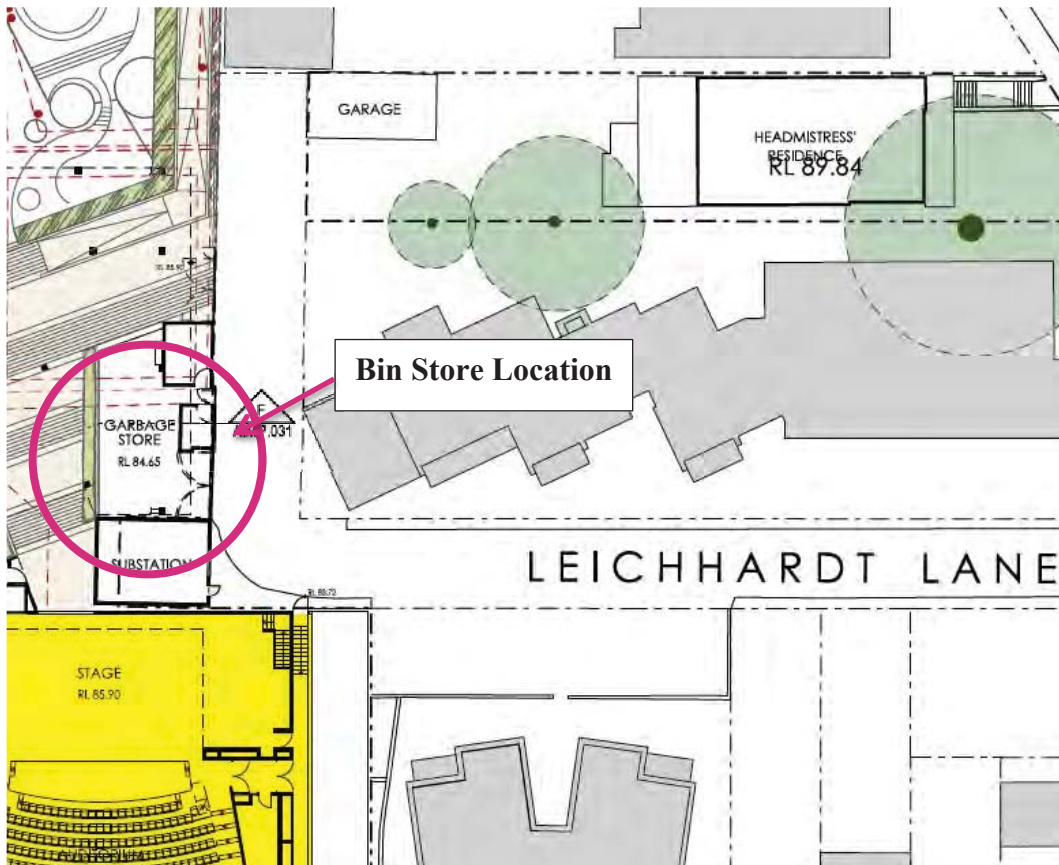


Figure 31: Proposed bin store

The main service vehicle access is Gate 1 from Albion Street. Service vehicles also access the site from Gate 3 for fire hydrants, bakery and canteen deliveries. Deliveries usually occur within the car parking area and will continue to do so under the new arrangements.

## 6 Transport impact assessment

---

### 6.1 School drop-off / pick-up zones

#### 6.1.1 Future management strategy

Observations by Arup during the morning and afternoon drop-off/pick-up peaks indicate that many of the recommendations put forward by Lyle Marshall & Associates are warranted.

- Staff to be present in Leichhardt Street, Macpherson Street and Albion Street. Staff to be briefed and given written instructions for effective traffic management.
- Seek Council approval to rationalise the “No Parking” signposting to 8:00am to 9:00am and 2:30pm – 4:00pm in all Zones in Leichhardt Street, Macpherson Street and Albion Street. There is no requirement to have different time limits in the three streets.
- Queuing Bays to be marked and numbered in all Zones.
- Circular letter to be sent to all parents at the commencement of the School Year explaining the Road Rules applying to “No Stopping” Zones and instructions to be followed when dropping-off and picking-up students.
- With effective traffic management, the existing Drop-Off and Pick-Up Zones have sufficient queuing spaces for the busiest period.

Lyle Marshall & Associates suggested that the *No Parking zones be signposted for P5, which would allow parents to effectively park and leave their vehicles rather than having to wait in the vehicle and move on within 2 minutes*. Arup disagrees with this proposal; ‘No Parking’ signposting should be retained as it gives a sense of urgency to parents that they are not to stay too long. Arup agrees that the time restrictions should be changed to be consistent as often there are parked vehicles blocking the drop-off queues in the morning.

Enforcement is required for parents that infringe on ‘No Stopping’ zones. Observations noted that parents would often stop and block the through traffic on the surrounding streets and intersections by these actions. Stopping near crossings also affects safety of children crossing by reducing available sightlines. Parents will be advised to loop around the block until a queuing space is available. Traffic controllers employed by the School would allow for this to occur.

It is recommended that the School adopt a student registration system for the Junior School. This would require each car to display a number or the child’s name on the windscreen to allow the traffic controllers to match children with their car as it approaches the pick-up area. This results in a quicker turnover of spaces in the pick-up zone.



## 6.1.2 Proposed school zone improvements

### Macpherson Street

School access to the Macpherson Street school zone will be improved by the new pedestrian access to the School via the RPAC building as shown in Figure 32.

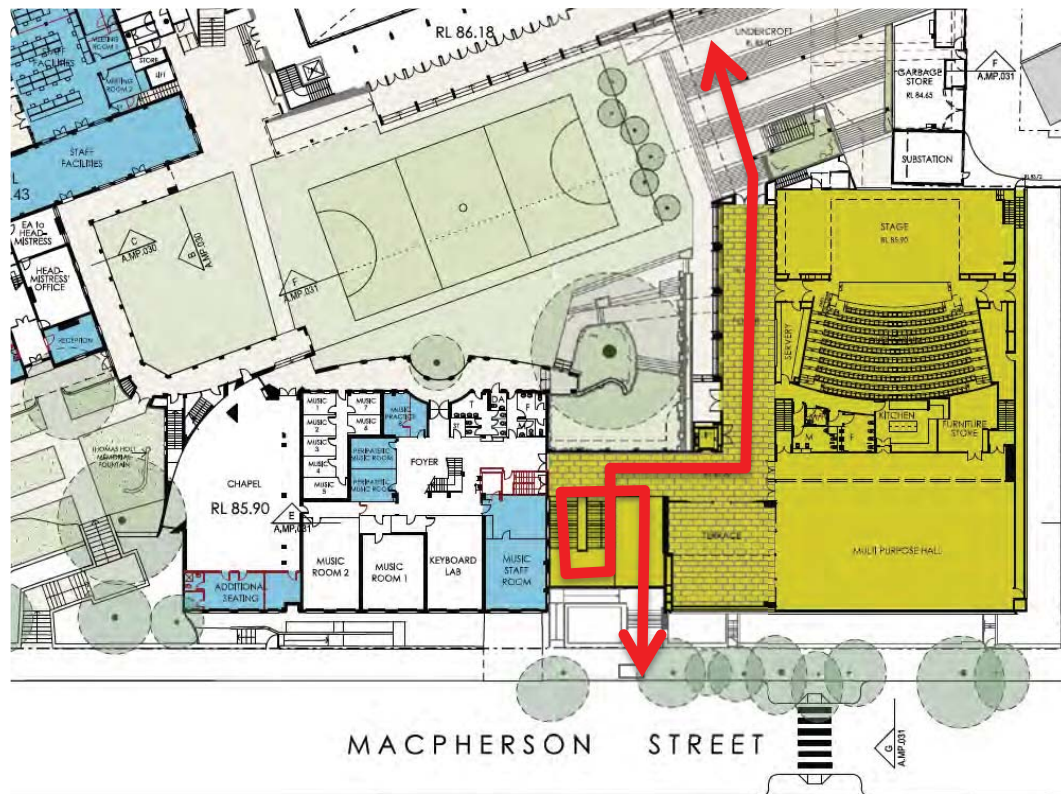


Figure 32: New school pedestrian access to Macpherson Street

With the School access being located further to the east, the existing drop-off/pick-up zone will function more efficiently as it will encourage vehicles to proceed further east and hence reduce the occurrence of vehicle queuing back towards the Albion Street roundabout. Further improvements to the Macpherson Street school zone have been identified to provide a more efficient level of operation and to allow additional use by the School. These are shown in Figure 33 and include:

- Relocating the existing zebra crossing to the east to coordinate with the existing bus zones and to relate to the new school pedestrian access via the RPAC building.
- Building integrated kerb extensions on each side of the pedestrian crossing so that the crossing is better defined and complies with Roads and Maritime Services (RMS) guidelines for appropriate 'No Stopping' areas on approach and departure
- Relocating the kerbside bus zones, so that they are on the departure side of the zebra crossing (i.e. located after passing the crossing in the respective travel lane)
- Creating a continuous 'No Parking' drop-off/pick-up zone for up to 20 vehicles which will permit an efficient flow of vehicles.

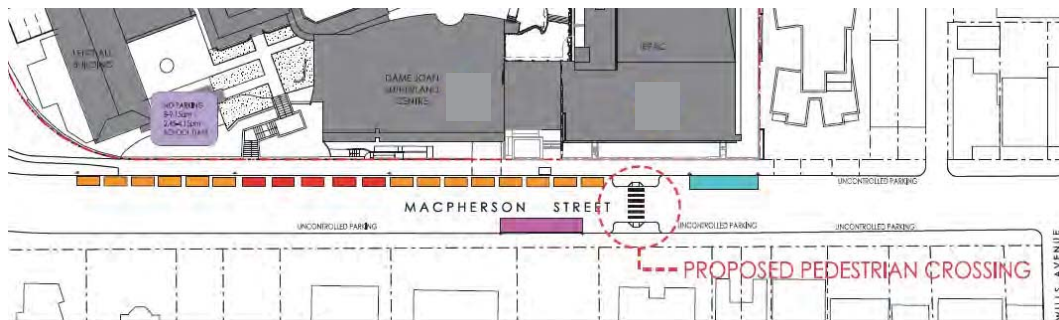


Figure 33: Proposed adjustments to the zebra crossing in Macpherson Street

With these improvements to the Macpherson Street No Parking zones, it is recommended that additional pick-up activity can occur here with use by Years 3-4 prior to Years 5-6 and Years 7-10. This adjustment is outline in Table 9.

Table 9: Proposed adjustments to drop-off/pick-up/zone allocation

Year	Existing		Proposed	
	Finish time	Pick-up location	Finish time	Pick-up location
K	2.45pm	Courtyard	2.45pm	Courtyard
1-2	2.50pm	Leichhardt Street	2.50pm	Leichhardt Street
3-4	3.00pm	Leichhardt Street	3.00pm	<b>Macpherson Street</b>
5-6	3.00pm	Macpherson Street	<b>3.15pm</b>	Macpherson Street
7-10	3.20pm	Macpherson/Albion Street	3.20pm	<b>Macpherson Street</b>
11-12	3.20pm	Macpherson/Albion Street	3.20pm	<b>Albion Street</b>

## Leichhardt Street

Waverley Council has recently approved a trial adjustment to the location of the northbound bus zone in Leichhardt Street to improve bus operations. Figure 34 shows the approved location for the bus zone moving from south of Leichhardt Lane to north of the lane.

This has the advantage of creating one feeder queue for the Junior School Years 1-4 drop-off / pick-up. It is located to the south of the bus zone and cars will need to proceed north past the bus zone to join the drop-off / pick-up zone.

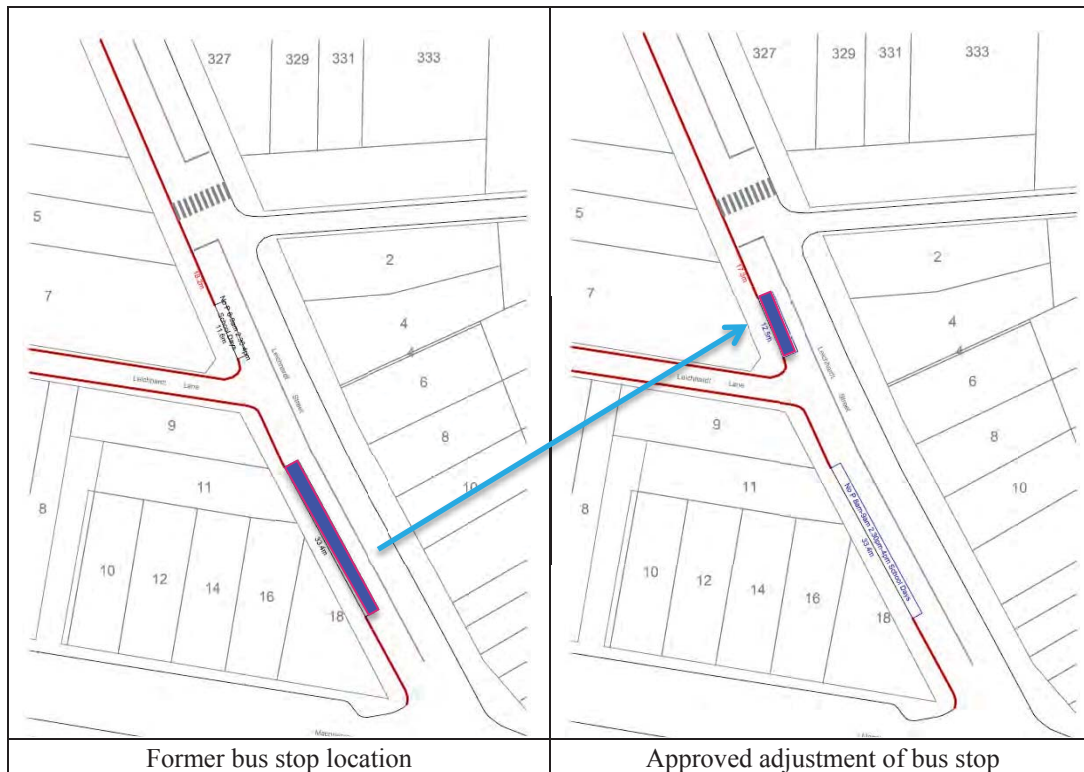


Figure 34: Approved trial adjustment to Bus Zone in Leichhardt Street

## Albion Street

No changes are proposed to the existing 'No Parking' zones in Albion Street which service the Senior School.

## 6.2 Car parking assessment

### 6.2.1 Off-street car parking areas

The basement car parking proposed under the new RPAC building, described in Section 5.3, will be accessed via a new ramp connection from the existing basement parking area under the DJSC. This will add 22 spaces to the existing 25 spaces resulting in 47 car parking spaces in the basement. The existing two-way driveway on Macpherson Street will be utilised for access meaning there will be no changes to the Macpherson Street frontage driveway. During design development the car park will be assessed for compliance against AS2890.1.

At-grade car parks accessed from Albion Street will be rationalised as shown in Figure 35 and Figure 36. There will be parking space alterations in other areas of the campus, predominately along Albion Street. When the basement parking provision is included, this brings the total campus parking provision to 75 car spaces (a net increase of 19 spaces).

The existing driveways on Albion Street will be maintained for access to these small car parking areas.





Figure 35: Albion Street southern car park



Figure 36: Albion Street northern car park

## 6.2.2 On-street car parking

Future parking demand is outlined in Section 3.6.4. There are a number of events and activities throughout the year that will increase car parking demand based on the new facilities.

### Performing Arts Auditorium, the Multi Purpose Hall, RPAC and the JKSC

A number of annual events currently held in the DJSC that will be relocated into the Performing Arts Auditorium which will increase the capacity of the event from 250 to 500. There are a number of new events also planned with a capacity of 500 that will be held in the Performing Arts Auditorium. The annual events that will attract external visitation and the number of times they occur each year are outlined in Table 10.

The number of car parking spaces required has been calculated by applying an assumed car mode of 80% and car occupancy of 2.5 people. On this basis, a car parking demand of up to 160 cars is anticipated for the large capacity events. With car parking for 47 cars in the venue, approximately 113 cars would park on-street. The on-street car parking utilisation described in Section 3.6.4 indicates that there are in excess of 200 car spaces available within 5 minutes' walk of the venue between 7.30 and 8.00pm. At this time the majority of residents have returned home for the night and hence these spaces are available for occasional use by event attendees.

Table 10: Annual events in the Performing Arts Auditorium

Performing Arts Auditorium Events	Time	Frequency	Attendance	Car Parking
School Open Day	9.00am – 11.00am	5 days/year	120	38
School Open Night (Twilight Session)	5.30pm - 7.30pm	2 days/year	120	38
<sup>t</sup> Senior School Musical Event	5.30pm - 9.30pm	2 days/year	500	160
<sup>t</sup> Senior School Musical Event	6.30pm - 9.30pm	1 day/year	500	160
St. Cath's Got Talent Event	6.00pm – 9.00pm	1 day/year	500	160
Trinity Evening	6.00pm – 10.00pm	1 day/year	500	160
BTC Showcase Event	6.00pm – 9.00pm	2 days/year	500	160
Infants Christmas Musical	9.00am – 12.00pm	1 day/year	300	96
<sup>t</sup> Junior School Musical	6.30pm - 9.30pm	2 days/year	400	128
Stage 2 Music Evening	6.30pm - 9.30pm	1 day/year	300	96
Stage 3 Music Evening	6.30pm - 9.30pm	1 day/year	350	112
* Performance Evening	6.30pm - 9.30pm	4 days/year	500	160
* Performance Matinee	1.30pm - 4.30pm	1 day/year	500	160
Amateur Societies Performance Evening	6.30pm - 9.30pm	6 days/year	500	160
Amateur Societies Performance Matinee	1.30pm - 4.30pm	2 days/year	500	160

\*This event may have potential use by another school

<sup>t</sup> These events occur every other year (not annually)

The majority of other events to be held in the Performing Arts Auditorium, the Multi Purpose Hall, the RPAC and the JKSC already occur on-site and there is no planned change to the frequency or size of these events. The venue use will be scheduled so that events in the various venues do not overlap. This leaves limited opportunity for additional external hire of the venues to that currently programmed.

## Aquatic Centre

The proposed Aquatic Centre replaces the existing Outdoor Pool with two new indoor pools including a diving facility. The new pools will generate the majority of new activity as it is expected to utilise both pools during weekends, and before/after school with Learn to Swim classes, squad swimming, diving and Water Polo (training and competition). Currently the diving program is held off-site at Waverley College pool and this will move to the new pool.

The anticipated utilisation of the aquatic centre is outlined in Section 5.2.3 and Table 8. The typical attendance at the aquatic centre will increase from 60 currently up to 250 at any one time when both Water Polo and Learn to Swim are occurring concurrently at the weekend. The anticipated car parking demand has been calculated based on anticipated car mode and car occupancy and is shown in Table 11. The maximum expected attendance is the total using the shallow pool and main pool during any expected time period. Note that events cannot occur simultaneously in the Main Pool.

Table 11: Aquatic Centre car parking demand

Period	Future		Cars /hour			Additional cars / peak hour		
	Time	Event	Attendance (per hour)	Mon-Fri	Sat-Sun	Additional attendance	Mon-Fri	Sat-Sun
<b>Main Pool</b>								
Before and after School (Weekdays)	6.00am - 8.20am & 3.20pm - 8.00pm	Water Polo training	50	41	0	30	25	0
		Squad Swimming	30	25	0	10	8	0
		Diving (on-site)	20	16	0	20	13	0
During school hours (Weekdays)	8.20am - 3.20pm	School Use Only	NA	NA	NA	0	NA	NA
Weekend	8.00am – 6.00pm Sat & Sun	Water Polo	150	0	68	75	0	34
<b>Shallow Pool</b>								
Weekday	7.00am – 7.00pm	Learn to Swim	100	45	0	100	45	0
Weekend	8.00am – 6.00pm	Learn to Swim	100	0	45	100	0	45
<b>Total maximum attendance</b>			<b>250</b>	<b>86</b>	<b>113</b>	<b>175</b>	<b>70</b>	<b>79</b>

*Note: Car mode assumed as 90% for each event and occupancy assumed as 1.1 (for before and after school events) and 2.0 (for all day events)*

The peak parking demand occurs at the weekend when 113 cars are anticipated. With car parking for 47 cars available in the venue during non-school times,

approximately 66 cars would park on-street. The on-street car parking utilisation described in Section 3.6.4 indicates that there are in excess of 150 car spaces available within 5 minutes' walk of the venue between 2.30pm and 3.00pm.

### **6.2.3 Alternative strategies for event car parking**

A number of strategies could be investigated to reduce the reliance of on-street car parking for major events at the School. These could include:

- Operating a shuttle bus loop service within the Eastern Suburbs on a route with designated pick-up points. This would operate 2 or 3 times prior to the event to pick-up event attendees and later drop them on the same route.

## **6.3 Traffic Assessment**

To undertake an assessment of likely travel for students and staff accessing the School, the transport survey data of students and staff attending the School has been considered and compared with supporting JTW Census data in 2011. All car activity for students is associated with drop-off in the morning and pick-up in the afternoon.

### **6.3.1 Mode split arrival and departure analysis**

The existing mode split for student and staff arrival for each group is shown in Table 12. The projected staff increase of 10 has been applied to full-time workers, resulting in an additional 8 vehicles. The 70 students that board (live) at the School are predominantly from the Senior School and assumed to be removed from the total Senior School students.

The analysis indicates that 599 students are currently dropped off in the morning by car. The student demographic data indicates that 20% of students also have a sister attending the School. Therefore, a car occupancy factor of 1.2 has been applied to students (assuming all girls are driven to their drop off point) which results in a total of 496 car trips. A car occupancy factor of 1.2 is consistent with the observed student drop off and pick-up activity from the Lyle Marshall & Associates report. The same mode split and occupancy factor has been applied to the proposed future maximum student numbers across each student group. This results in an increase of 126 car trips, 30 public transport trips, 8 school bus trips and 34 walk trips.



Table 12: Mode split morning arrival

Morning Arrival	No.	Car			Public Transport		Walk		School Bus		Ride-share	
		%	No. People	No. Cars	%	No. People	%	No. People	%	No. People	%	No. People
Existing		Car occupancy 1.2					Total students include 70 boarders with no travel					
Junior School	376	80%	303	252	4%	14	10%	36	2%	9	4%	14
Senior School	524	57%	299	247	19%	100	18%	95	4%	21	2%	9
Total Students	970		602	499		114		131		30		23
Full-time staff	175	75%	131	131	17%	29	6%	11	-	-	2%	4
Part-time staff	27	71%	19	19	29%	8	0%	0	-	-	0%	0
Total Staff	202		150	150		37		11		0		4
Proposed		Car occupancy 1.2					Total students include 70 boarders with no travel					
Junior School	465	80%	375	311	4%	17	10%	45	2%	11	4%	17
Senior School	665	57%	379	314	19%	127	18%	120	4%	27	2%	12
Total Students	1,200		754	625		144		165		38		29
Full-time staff	185	75%	139	139	17%	31	6%	11	-	-	2%	4
Part-time staff	27	71%	19	19	29%	8	0%	0	-	-	0%	0
Total Staff	212		158	158		39		11		0		4
Increase of trips												
Students	230		152	126		30		34		8		6
Staff	10		8	8		2		0		0		0
Total	240		160	134		32		34		8		6

The existing mode split for student and staff departures for each group is shown in Table 13. The analysis indicates that 481 students are picked up in the afternoon by car. Given the car occupancy factor of 1.2, the car trips result in a total of 398 car trips. The same mode split has been applied to the proposed future student numbers across each student group. This result is an increase in 99 car trips, 39 public transport trips, 15 school bus trips and 53 walk trips. In the afternoon, more students use non-car modes to travel home than in the morning due to the morning drop-off time coinciding with the journey to work time and the afternoon having a range of after school activities.



Table 13: Afternoon departure mode

Afternoon Departure	No.	Car			Public Transport		Walk		School Bus		Ride-share	
		%	No. People	No. Cars	%	No. People	%	No. People	%	No. People	%	No. People
Existing		Car occupancy 1.2					Total students include 70 boarders with no travel					
Junior School	376	78%	293	242	4%	16	14%	51	4%	16	0%	0
Senior School	524	36%	188	156	26%	133	29%	152	7%	39	2%	12
Total Students	970		481	398		149		203		55		12
Full-time staff	175	75%	131	131	17%	29	6%	10	-	-	2%	5
Part-time staff	27	71%	19	19	29%	8	0%	0	-	-	0%	0
Total Staff	202		150	150		37		10		0		5
Proposed		Car occupancy 1.2					Total students include 70 boarders with no travel					
Junior School	465	78%	361	299	4%	20	14%	64	4%	20	0%	0
Senior School	665	36%	240	198	26%	168	29%	192	7%	50	2%	15
Total Students	1,200		601	497		188		256		70		15
Full-time staff	185	75%	139	139	17%	31	6%	10	-	-	2%	5
Part-time staff	27	71%	19	19	29%	8	0%	0	-	-	0%	0
Total Staff	212		158	158		39		10		0		5
Increase of trips												
Students	230		120	99		39		53		15		3
Staff	10		8	8		2		0		0		0
Total	240		127	106		42		53		15		3

### 6.3.2 Traffic generation

The predicted traffic generation for the increase of school and staff population as a result of the Master Plan has been calculated based on the rates in Table 12 and Table 13. Given the site has no on-site facilities for pick-up/drop-off, it is assumed that no extra trips are generated to/from the site itself for the purposes of the student increase. However, there is an anticipated increase in traffic generation on the surrounding road network due to drop-off and pick-up increases associated with the forecast future student and staff population increases.

Pick-up and drop-off traffic volumes observed (259 vehicles in the AM peak and 153 vehicles in the PM peak) in the Lyle Marshall & Associates report suggest that these figures may in fact be approximately double the amount of car trips actually generated during the peak drop-off and pick-up times. This may be due to a number of factors such as extracurricular activities, early drop-offs / late pick-ups, vehicles using nearby streets and varying travel patterns day to day. Therefore, it is estimated that the traffic flows in Table 12 and Table 13 are more than what would occur during a nominal day during the peak hours. Hence, the additional traffic flows from students have been decreased by a factor of 30% on the road network, resulting in a total school related increase of 102 cars in the AM peak hour and 80 cars in the PM peak hour.

Additionally, there will be increases resulting from the use of the proposed Stage 1 facilities and the regular events that are scheduled to occur. The majority of trips will occur due to use of the proposed Aquatic Centre. The events at the other facilities have not been assessed as they do not occur regularly and the larger events already occur on the road network. The assumed attendances and car occupancy from Table 11 indicate an additional 70 cars in each the AM and PM peak and an additional 79 cars in the weekend peak (12pm-1pm).

Therefore, there is an additional total of 172 cars in the AM peak hour (8am-9am), 150 cars in the PM 'school' peak hour (3pm-4pm) and 79 cars in the weekend peak hour (12pm-1pm).

### 6.3.3 Traffic distribution and assignments

It has been assumed that the additional cars are applied twice onto the existing flows outlined in Section 3.4 to account for the drop-off and pick-up nature of the trips. The flow distributions have been estimated from the resident locations of the travel surveys and the respective origins/destinations (outlined in Section 3.7.2). Staff and student distributions were remarkably similar during each peak, and have been assumed as the same distribution for this analysis. Figure 37 shows the distribution of additional school traffic on each frontage road and the peak flow proportions on the approach roads.

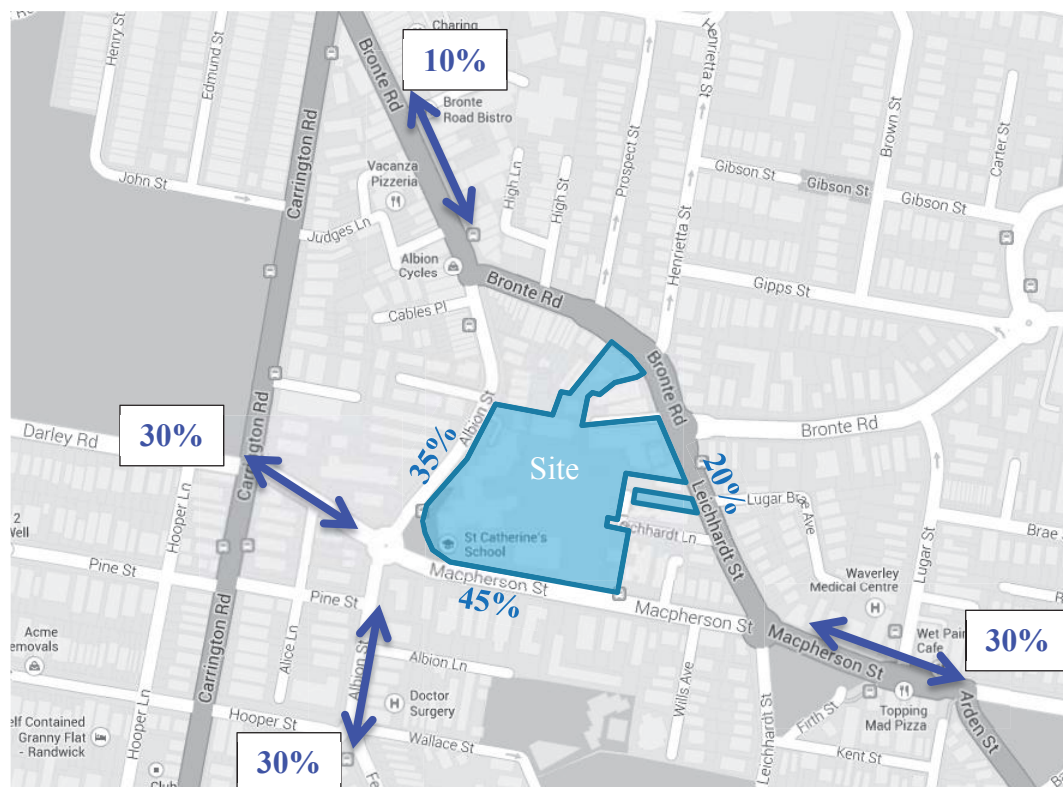


Figure 37: Peak flow proportions

For the purposes of this analysis, student car trips to the School were assumed to the nearest 'No Parking' zone as per the following:

- Trips from the east used both Leichhardt Street and Macpherson Street,
- Trips from the west used Macpherson Street
- Trips from the south used both Albion Street and Macpherson Street
- Trips from the north used both Albion Street and Macpherson Street.

The return trips that were picking up and dropping off were assumed to perform a u-turn at the following roundabout and head back to the same point of origin (except for Albion Street, where flows continued either north or south from the respective origins). It should be noted that the analysis has been conservative in that a number of u-turns have been assumed due to the increased student numbers, which utilise any spare capacity at the roundabouts. The existing traffic flows show that only a small proportion of the traffic currently perform these manoeuvres.

Additionally, all vehicle trips have been assumed to use the existing adjacent intersections to search for parking spaces in surrounding streets, which may not happen in reality. It was observed that parents would often park in surrounding streets to pick-up children.

## 6.4 Impact of generated traffic

### 6.4.1 Traffic modelling

In order to determine the road network impacts of the School, the traffic increases must be assessed with the increase of car trips by student and staff numbers, and the regular events scheduled. The surrounding intersections have been assessed using RMS approved Signalised & unsignalised Intersection Design and Research Aid (SIDRA) software. Two scenarios, existing and future were modelled in the AM, PM and Weekend peak hours.

Traffic conditions at this intersection is summarised in terms of:

- Level of Service (LoS);
- Degree of Saturation (DoS);
- Average Delay; and

In urban areas, the traffic capacity of the major road network is generally a function of the performance of traffic intersections. This performance is quantified in terms of the LoS, which is an index of the operational performance of traffic at an intersection and is based on the average delay per vehicle. LoS ranges from A = very good to F = highly congested conditions, as shown in Table 14.

Table 14: Level of Service criteria for intersections

LoS	Average Delay (seconds per vehicle)	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 may require other control mode
F	Greater than 71	Unsatisfactory with excessive queuing

Another common measure of intersection performance is the 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.

## 6.4.2 Results and analysis

The modelling undertaken shows the overall impact of the Master Plan and Stage 1 development. The results of the scenarios tested are shown in Table 15. The detailed SIDRA outputs are provided in Appendix C.

Table 15: Results of traffic modelling

Intersection	Peak Period	Scenario	LoS	Delay (s)	DoS
Bronte Road / Albion Street	AM	Existing	A	7	0.62
		Future	A	8	0.66
	PM	Existing	A	9	0.76
		Future	A	9	0.77
	Weekend	Existing	A	10	0.79
		Future	A	10	0.80
Bronte Road / Leichhardt Street	AM	Existing	A	9	0.68
		Future	A	9	0.70
	PM	Existing	A	8	0.65
		Future	A	9	0.66
	Weekend	Existing	A	10	0.69
		Future	A	10	0.69
Macpherson Street / Leichhardt Street	AM	Existing	B	20	0.92
		Future	C	36	1.01
	PM	Existing	B	26	0.97
		Future	D	44	1.05
	Weekend	Existing	B	28	0.94
		Future	C	31	0.96
Macpherson Street / Albion Street	AM	Existing	B	18	0.87
		Future	C	31	0.98
	PM	Existing	C	34	0.97
		Future	E	60	1.06
	Weekend	Existing	B	24	0.91
		Future	C	28	0.94

The traffic modelling results indicate that the intersections on Macpherson Street (Albion Street and Leichhardt Street roundabouts) are operating near capacity under all scenarios. The existing PM peak hour conditions show the most impact; however, the roundabouts operate satisfactorily at all other times, given the adequate LoS and average intersection delay.

Given that the DoS for these intersections is already over 0.9 in the existing peak hours, the intersections are sensitive to small changes in traffic volumes. As a result of the forecasted additional school traffic, it is anticipated that there will be an increase in the overall average delay. Therefore, the modelling concludes that the additional traffic generated by the School will have a modest impact on the operation of the roundabout intersections along Macpherson Street.

It is important to note that school drop off and pick up generally is quite concentrated before the indicative start and finish time. While there may be a level of congestion experienced, this is usually short-term (i.e. over the course of 15 minutes) and the expected traffic flows would not cause considerable impacts to the overall peak hour of the local road network. Additionally, the PM commuter peak hour occurs after the School's PM peak hour, which actually has higher overall traffic volumes.

As stated in Section 6.3, the assignment of traffic has conservatively assumed that **all trips** utilise the existing adjacent intersections to the School. In reality, these vehicles may use surrounding streets to pick up and drop off children and would likely not cause congestion on these intersections due to limited capacity and time restrictions of the pick-up / drop-off kerb space at the School.

## 6.5 Excursion Buses

Both the Junior School and Senior School use Albion Street to pick-up and drop-off for excursions and camps. Normally most groups have 2 buses which will park between Gate 2 and Gate 3 on Albion Street in the School days Bus Zone. Very rarely is Macpherson Street used for buses due to parking restrictions. There are no changes proposed as part of the Master Plan.

## 6.6 Transport assessment

The proposal is considered to have minimal additional impacts on the operation of the local road network. Reasons for this include the following:

- Traffic movements at the key access points into the site operate efficiently;
- Additional traffic movements estimated are conservative as many of them would likely be vehicles already counted in the surveys or not additional due to sisters at the School already;
- The total forecast increase in peak hour traffic of 172 cars in the AM peak hour, 150 cars in the PM peak hour and 79 cars in the weekend peak hour is distributed onto the overall local road network;
- There are opportunities for a mode shift away from private vehicle travel, with the site located along key bus routes to Bondi Junction, and walking and cycling available;
- It is expected there will be minimal change in staff trips with only a minor increase in staff proposed at the School and only a minimal increase in car parking on the site;
- The roundabouts encourage parents to loop and turnaround, providing more efficiency for drop-off and pick-up activity (resulting in a more localised congestion rather than overall road network congestion); and
- School drop off and pick up generally is quite concentrated before the indicative start and finish time. While there may be a level of congestion experienced, this is usually short-term (i.e. over the course of 15 minutes) and the expected traffic flows would not cause considerable impacts to the overall peak hour of the local road network.

## 7 Travel demand measures

---

Travel demand management measures, such as Work Place Travel Plans (WPTP) and car pooling, can be implemented/expanded to ensure full information regarding future site sustainable access and public transport access options is available to all site users. This may also further reduce car trips to the site.

The suburb data for students plotted in Section 3.7.2 indicates that almost 40% of students live within 1.5km of the School and could walk or cycle.

### 7.1.1 Car Pooling

Car pooling is an effective measure to reduce the reliance on private vehicle access to the site. The School have indicated they have a 'ride-share' scheme which operates in a similar matter to carshare schemes (i.e. students or staff share a private vehicle to travel to the School). However, travel survey data indicates low usage by both students and staff (less than 2%). Possible ways to further encourage ride-sharing may include Staff registering their interest in car pooling by indicating where they live and their shift times to be matched with like travellers.

### 7.1.2 Work Place Travel Plan (WPTP)

The implementation of a WPTP would contribute to reducing parking demand, particularly for staff, and encourage other forms of transport to the site. The Premier's Council for Active Living (PCAL) describes the three key objectives for a WPTP as follows:

- To reduce the need to travel
- To improve non-car travel methods
- To ensure the most efficient use of car parking spaces

The WPTP should be tailored to suit the specific requirements of site users.

Framework objectives and measures for the preparation of a WPTP for the development include the following:

- Increase of travel choices for employees, with an emphasis on improving access by sustainable modes of transport;
- Encouragement of high mode share to sustainable modes from private vehicle usage;
- Reduce the number of car journeys associated with business travel by staff and visitors with communication technologies;
- Raising awareness of sustainable transport amongst staff with travel guides (online and print planners);
- Facilitation of the sustainable and safe travel of new employees;
- Utilising the close proximity via bus routes to the train station with train / bus reimbursement schemes and services tailored to suit employee's needs;
- Ensuring adequate end-trip facilities are provided at the site to enable staff and visitors to commute by active transport modes;



- Implementation of ride sharing and car sharing schemes; and
- Further encouragement of car pooling and off-peak travel

The development of the WPTP would be undertaken using the above framework, considering Waverley Council's objectives to encourage less traffic in the area and create pedestrian friendly precincts. With the appropriate framework in place, implementation of a detailed and targeted WPTP for the eventual occupants of the buildings will be more effective.

## 8 Recommended transport actions

Action	Description	Result
Rationalisation of the “No Parking” signposting.	All zones to be 8:00am to 9:00am and 2:30pm – 4:00pm in Leichhardt Street, Macpherson Street and Albion Street.	Improved legibility of “No Parking” in school zones.
Macpherson Street Drop-off / pick-up school zone.	Increase in length from 17 to 20 spaces. It is proposed to relocate the zebra crossing so that the vehicle queue is continuous which will result in improved operation.	Improved traffic flow.
Macpherson Street Drop-off / pick-up school zone.	The new school pedestrian access is moved to the east on Macpherson Street which will move it closer to the front of the school zone.	Encourages cars to move to the front of the queue.
Leichhardt Street Drop-off / pick-up school zone.	Relocated bus zone. This was approved at the 22 April 2014 Waverly Traffic Committee meeting.	Improved single queuing area for cars. This will improve behaviour of drivers.
Leichhardt Street Drop-off / pick-up school zone.	Consider relocating Years 3-4 pick-up from Leichhardt Street to Macpherson Street.	Reduces use of Leichhardt Street zone and hence improved traffic flow.
Management of school zones.	A staff member to be present in Leichhardt Street, Macpherson Street and Albion Street. Controllers to be briefed and given written instructions for effective traffic management.	Improved traffic flow and school zone safety.
Junior School student registration scheme.	This would require each car to display a number or the child’s name on the windscreen to allow the traffic controllers to match children with their car as it approaches the pick-up area.	This results in a quicker turnover of spaces in the pick-up zone.
New car park under the RPAC Building.	This will add 22 spaces to the existing 25 spaces in the DJSC resulting in 47 car parking spaces.	These 44 spaces will be available for public use in the evenings and at weekends.
WPTP	Reduce use of private vehicle for staff access to the site	Reduced on-street car parking demand

## 9 Construction traffic management planning

### 9.1 Outline construction traffic management plan

#### 9.1.1 Construction programme and construction traffic

Anticipated duration of construction activities is estimated below. As the project is in its preliminary stages, the following timeframes are approximate within an overall two year construction period and may vary considerably once a contractor is appointed.

Table 1: Estimated Construction Timeframe

Stage	Timeframe
Demolition and excavation works	3 months
Building construction	18 months
Fit-out works	3 months

#### 9.1.2 Construction traffic

##### Construction routes

Construction activities at the School will generate vehicle trips primarily Albion Street and Macpherson Street. The main access roads will be via the state road network and vehicles will likely originate from this network. The majority of trips will likely be generated from the west and will access the site from the Eastern Distributor via Darley Road. Trips from the north may access the site via Carrington Road, while trips from the south may access the site via Frenchmans Road. These routes are shown in Figure 38.

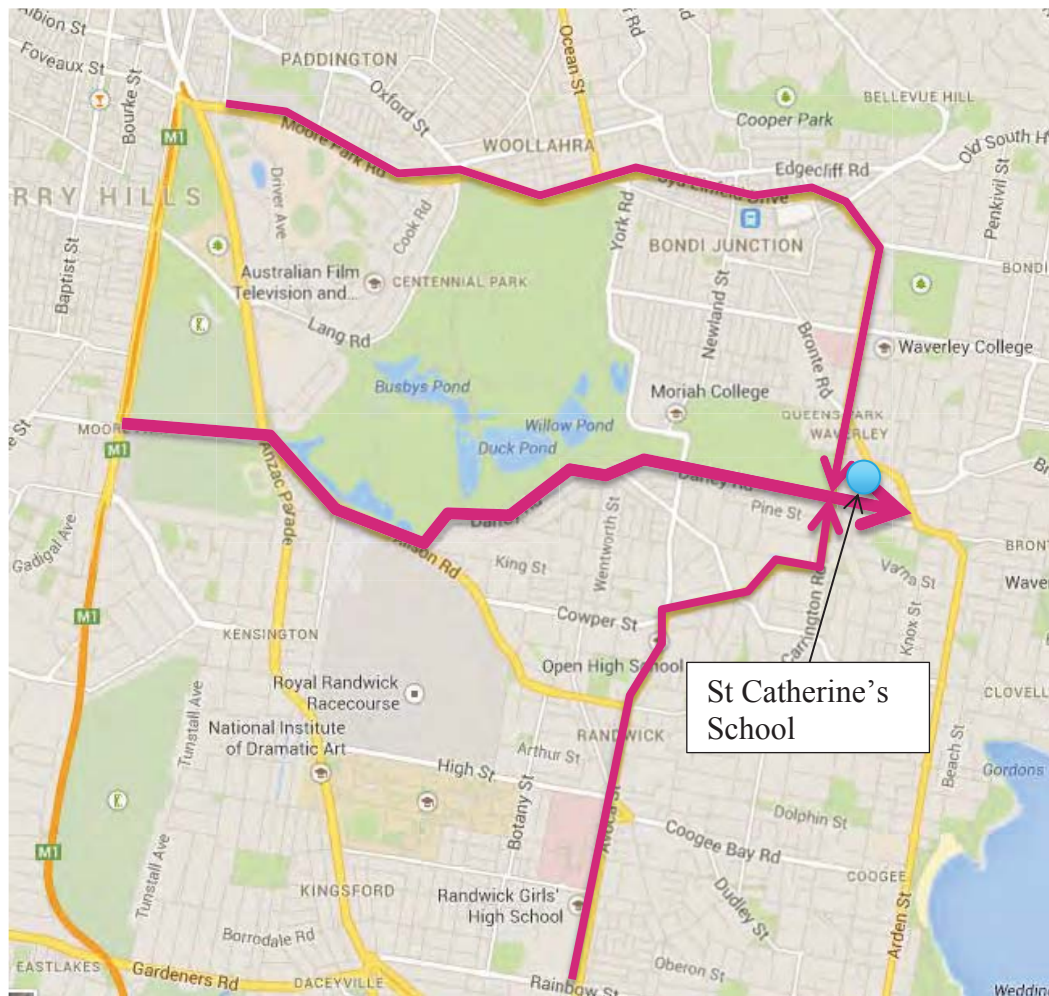


Figure 38: Construction vehicle routes to site

Vehicles that will access the site during construction will mainly comprise private vehicles for workers. Heavy vehicles including Articulated Vehicles (AV) such as precast delivery trucks and Heavy Rigid (HR) such as concrete trucks are also expected to access the site. These different types of vehicles may access the site at the same time.

Other heavy machinery plants such as cranes will have to be delivered to site in the preliminary stage. All heavy goods such as girders or machinery plants are likely to be delivered outside of peak traffic hours.

### Construction traffic

Workers will generate additional traffic to the site. Typically each stage of the construction is likely to have a workforce of approximately 75 personnel, generating a potential 75 car trips (assuming everyone drives). However, construction workers generally start earlier and finish earlier than the commuter peak periods, and would likely not coincide with the School peak periods.

Heavy vehicle trips generated would be 2,700 over the span of the excavation and demolition period resulting in the order of 42 truck movements per day or four peak hour trips.

### 9.1.3 Cumulative impact of existing site and construction traffic

#### Road network impacts

The traffic generation of this magnitude is less than the amount of trips generated and assessed for the operational phase of the development and therefore the potential impacts are anticipated to be minimal.

It is anticipated that construction of the driveway laybacks on Macpherson Street may require possession of the northern kerbside parking lane. This would be required to occur outside of peak times and near existing drop-off zones to minimise the impact on parking.

#### Parking

There will be no room on the School site for parking of construction staff and trade vehicles associated with the construction of the development. On-street car parking will be utilised by workers who drive during various stages of construction.

#### Pedestrians

Pedestrians on Macpherson Street will be impacted from walking past the site during construction. Traffic controllers with appropriate accreditation will hold construction vehicles and allow pedestrians to cross these work areas. This arrangement is envisaged to be required only during construction of vehicular access to the RPAC site from Macpherson Street and subsequent restoration of the kerb. During all other phases of construction of RPAC, construction vehicles will be required to give way to pedestrians on entry and exit to the site.

### 9.1.4 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
- Establishment and enforcement of appropriate on-site vehicle speed limits (20km/h), which would be reviewed depending on weather conditions or safety requirements
- 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

### **9.1.5 Driver code of conduct**

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.

### **9.1.6 Public transport services affected**

The construction work will be focused on Macpherson Street. A works zone is proposed along the kerbside lane, where a bus zone is located. Therefore, the bus zone may need to be relocated slightly east to allow for the works zone. Bus routes would not be impacted by construction of the driveways.

### **9.1.7 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.



## 10 Conclusions

---

This traffic and transport report assesses the proposed Campus Master Plan and Stage 1 works for St Catherine's School, Waverley. This report has been prepared to address Key Issue No. 6 Transport and Accessibility as stated in the Director General's Environmental Assessment Requirements issued on 29 January 2014 (SSD 6339).

Key conclusions resulting from this assessment are listed below.

### Event management

- There are a number of annual events currently held in existing on-site facilities that will be relocated into the Performing Arts Auditorium which will increase the capacity of events from 250 to 500. There are a number of new events also planned with a capacity of 500 that will be held in the Performing Arts Auditorium.
- The majority of other events to be held in the Performing Arts Auditorium, the Multi Purpose Hall, the RPAC and the JKSC already occur on-site and there is no planned change to the frequency or size of these events; and
- The venue use will be scheduled so that events in the various venues do not overlap leaving limited opportunity for additional external hire of the venues to that currently programmed.

### Parking assessment

- At-grade car parks accessed from Albion Street will be rationalised, and a new basement car park on Macpherson Street will bring the total campus parking provision to 75 car spaces (a net increase of 19 spaces);
- A car parking demand of up to 160 cars is anticipated for the large capacity events, with approximately 113 cars parking on-street, well within the existing on-street car parking availability of 200 car spaces (available within 5 minutes' walk of the School between 7.30 and 8.00pm);
- A number of strategies could be investigated to reduce the reliance of on-street car parking for major events at the School including operating a shuttle bus loop service within the Eastern Suburbs on a route with designated pick-up points; and
- On-street 'No Parking' zones will be amended with better management strategies for more efficient drop-off and pick-up activities to occur.

### Traffic assessment

- Traffic movements at the key access points into the site currently operate efficiently;
- The roundabouts encourage parents to loop and turnaround, providing more efficiency for drop-off and pick-up activity (resulting in a more localised congestion rather than overall road network congestion);
- Additional traffic movements estimated are conservative as many of them would likely be vehicles already counted in the surveys or not additional due to sisters at the School already;

- It is expected there will be minimal change in staff trips with only a minor increase in staff proposed at the School and only a minimal increase in car parking on the site;
- There is a forecast increase in peak hour traffic of 172 cars in the AM peak hour, 150 cars in the PM peak hour and 79 cars in the weekend peak hour as a result of the Master Plan and Stage 1 development;
- Traffic modelling indicates that additional traffic generated by the School will have a modest impact on the operation of the roundabout intersections along Macpherson Street;
- There are opportunities for a mode shift away from private vehicle travel, with the site located along key bus routes to Bondi Junction, and walking and cycling available; and
- School drop off and pick up generally is quite concentrated before the indicative start and finish time. While there may be a level of congestion experienced, this is usually short-term (i.e. over the course of 15 minutes) and the expected traffic flows would not cause considerable impacts to the overall peak hour of the local road network.

## Appendix A

Parking Accumulation Surveys  
On-Street and Utilisation Of  
Drop-Off And Pick-Up Zones  
During Peak School Arrival and  
Departure Periods

*by Lyle Marshall and Associates*

# **ST CATHERINES SCHOOL FOR GIRLS WAVERLEY**

## **PARKING ACCUMULATION SURVEYS ON-STREET AND UTILISATION OF DROP-OFF AND PICK-UP ZONES DURING PEAK SCHOOL ARRIVAL AND DEPARTURE PERIODS**

**Prepared by:**

**Lyle Marshall & Associates Pty Ltd  
Consulting Engineers,  
Transportation and Environmental Planners**

**Suite 8, 871 Pacific Highway  
CHATSWOOD NSW 2067**

**Phone: (02) 9419-8191  
Fax: (02) 9419-8107**

**Job No.: 1142/13  
Report No.: 33/13**

**DECEMBER, 2013**

# **CONTENTS**

## **1.0 INTRODUCTION**

- 1.1 Background**
- 1.2 Scope of Investigations and Report**

## **2.0 EXISTING ON-STREET PARKING SUPPLY**

- 2.1 Time Restricted and Time Limit Parking Spaces**
- 2.2 Unrestricted Parking (No Time Limit) Spaces**

## **3.0 PARKING ACCUMULATION ON-STREET**

- 3.1 Parking Accumulation in Time Restricted and Time Limit Parking Spaces**
- 3.2 Parking Accumulation in Unrestricted Parking Spaces**

## **4.0 STUDENTS DROPPED OFF BY VEHICLE IN AM ARRIVAL PERIOD AND PICKED UP BY VEHICLE IN PM DEPARTURE PERIOD**

- 4.1 Leichhardt Street No Parking Zones**
- 4.2 Macpherson Street No Parking Zones**
- 4.3 Albion Street No Parking Zones**

## **5.0 SUMMARY**

## **APPENDIX 1:**

**Table 1      Signposted Parking Restrictions within 5-7 Minutes Walk of St. Catherine's School, Waverley – Blue, Green & Red Areas.**

**Table 2      Parking Accumulation Friday 25/10/13.**

**Blue Area      5:00pm to 10:00pm.**

**Red Area      8:00pm to 10:00pm.**

**Green Area      8:00pm to 10:00pm.**

**Table 3      Parking Accumulation:**

**Blue Area      10:00am – 2:00pm      Wed. 30/10/13.**

**Red Area      10:00am – 6:00pm      Mon. 28/10/13.**

**Green Area      10:00am – 6:00pm      Mon. 28/10/13.**

**Table 4      Parking Accumulation Wednesday 30/10/2013.**

**Blue Area      6:00am – 8:00am**

**Red Area      6:00am – 8:00am**

**Green Area      6:00am – 8:00am**

**Table 5A      Student Drop-Off Leichhardt Street Area 2 Mon. 28/10/13, Area 1 Tues. 29/10/13.**

**Table 5B      Student Pick-Up Leichhardt Street Area 2 Mon. 28/10/13, Area 1 Tues. 29/10/13.**

**Table 6A      Student Drop-Off Macpherson Street Wed. 30/10/13.**

**Table 6B      Student Pick-Up Macpherson Street Fri. 25/10/13.**

**Table 7A      Student Drop-Off Albion Street Mon. 28/10/13.**

**Table 7B      Student Pick-Up Albion Street Mon. 28/10/13.**



## **1.0 INTRODUCTION**

### **1.1 Background**

St Catherine's School is embarking on a RPAC project to provide improved facilities for students in both curricular and extracurricular activities.

Redevelopment of the existing in ground swimming pool site adjacent to the Dame Joan Sutherland Centre fronting Macpherson Street is planned to provide a basement level Aquatic Centre containing a main pool and shallow pool, a 3 level Lyric Theatre with a spectator gallery to seat approximately 500 persons above the Aquatic Centre, a multifunction (256 seats) space adjacent to the theatre and a separate 2 level junior / senior combined Research Centre at the northern end of the above development.

It is understood that there will not be any increase in school enrolment and staff numbers. There are currently a total of 55 parking spaces within the school grounds.

### **1.2 Scope of Investigations and Report**

The purpose of this study is to determine the availability and existing utilisation of parking spaces on-street within 5 to 7 minutes walking distance of St Catherine's School and to determine the number of students being dropped off and picked up by vehicle in No Parking Zones in Leichhardt Street, Macpherson Street and Albion Street and the degree of utilisation of each of these zones to provide a data base for assessment of the parking and traffic impacts of the proposed RPAC development.

The attached aerial plan prepared by Chase Burke Harvey Surveying and Land Development Consultants shows the features and details of various properties comprising St Catherine's School.



## 2.0 EXISTING ON-STREET PARKING SUPPLY

The parallel spaces on-street are not line marked. All driveways, No Stopping Zones, No Parking Zones, Bus Zones were measured and located in all streets in the area surveyed, as shown on **Sheet 1 of Drawing No. 1142-13**. A space length of **6 metres** was adopted for intermediate spaces and **5.4 metres** for unobstructed end spaces in accordance with **Figure 2.5 in AS/NZS 2890.1 - 2004**

### 2.1 Time Restricted and Time Limit Parking Spaces

The *time restricted parking spaces* within **5 – 7 minutes** walking distance of St. Catherine's School are as follows:-

- **Half hour** parking between **8:30am – 6:00pm** Monday to Friday and **8:30am – 12:30pm** Saturday.
- **Two hour** parking **8:30am – 6:00pm** Monday to Saturday *Authorised Residents Vehicles Excepted*.
- **One** Loading Zone space from **8:30am – 4:00pm** Monday to Saturday.
- 'No Parking School Days' Zones in Leichhardt Street, Macpherson Street and Albion Street that are used for 'drop-off' and 'pick-up' generally from **8:00am – 9:00am** and **2:30pm – 4:00pm**.
- No Parking **7:00am – 5:00pm** Monday to Saturday Leichhardt Lane – **6** spaces.

*Outside* the above time periods the spaces are available with '*no time limit*' restrictions.

The total number of these spaces is listed in **Table 2.1** and the locations are shown on **Sheet 1 of Drawing No. 1142-13**. This means that the number of spaces available for unrestricted parking *varies* throughout the day from **7:00am** to **6:00pm** and is a *maximum* of **94** from **6:00pm** to **6:00am** on weeknights and Saturday night and for *24 hours* on *Sunday*.

### 2.2 Unrestricted Parking (No Time Limit) Spaces

There are **463 spaces** with no time limit within **5 – 7** minute walking distance of St. Catherine's School. These locations and number of spaces are shown on **Sheet 1 of Drawing No. 1142 – 13** and the **Table 1** in **Appendix 1**.

The total number of spaces **available** for *unrestricted parking* is a *maximum* of **557** from **6:00pm** to **7:00am** *Monday to Saturday* and for *24 hours* on *Sunday*. The *minimum* number of spaces **available** for *unrestricted parking* is **463** from **8:00am** to **9:00am** and **2:30pm** to **4:00pm** on *Schooldays*.



TABLE 2.1 SUMMARY KERBSIDE PARKING RESTRICTIONS AND NUMBER OF PARKING SPACES

SPACES AVAILABLE FOR UNRESTRICTED PARKING																				
				MONDAY TO FRIDAY										SATURDAY			SUNDAY	DIS	BZ	COUNCIL
1/2P	NPSD	2P	NP	LZ									8:30AM-12:30PM	12:30PM-5PM	5PM-6PM	6PM-MIDNIGHT				
8:30-6:00pm Mon to Fri	8:00-9:00am 2:30-4:00pm	8:30-6:00pm Mon to Sat ARVE	7:00-5:00pm Mon to Sat	8:30-4:00pm Mon to Sat								6PM-MIDNIGHT								
8:30-12:30 Sat			6:00 AM	7AM	8AM	8AM-9AM	9AM-2:30PM	4PM-5PM	5PM-6PM											
15	35	37	6	1	557	551	516	463	498	498	504	557	498	513	519	557	557	5	12	1

**LEGEND**  
NPSD NO PARKING SCHOOL DAYS  
ARVE AUTHORISED RESIDENTS VEHICLES EXCEPTED  
LZ LOADING ZONE  
NP NO PARKING  
DIS DISABLED PARKING  
BZ BUS ZONE  
MZ MAIL ZONE  
C COUNCIL

**NOTE:** The number of spaces available between 2:30pm and 4:00pm on Schooldays is also**463**.

### 3.0 PARKING ACCUMULATION ON-STREET

#### 3.1 Parking Accumulation in Time Restricted and Time Limit Parking Spaces

*Time Limit parking spaces* were surveyed at *hourly intervals* from **6:00am** to **10:00pm** on school days in October 2013. The surveys were completed over a 3 day period, **25<sup>th</sup>, 28<sup>th</sup> and 30<sup>th</sup>** October.

The complete Survey Data is contained in **Tables 2, 3 and 4** in **Appendix 1** and is summarised in **Table 3.1**.

The number of vehicles parked in the *half hour spaces* often *exceeded* the number of spaces calculated because many vehicles occupied *less than 6 metres* and some vehicles were parked *contrary to the signposted restrictions*. All spaces except the **6** 'No Parking spaces' in Leichhardt Lane were almost fully occupied, as shown in **Table 3.1**. **Peak** occupancy was **82** (87%) at **9:00pm**. If the **6** 'No Parking' spaces in Leichhardt Lane are *excluded*, the peak occupancy was **93%**.

The 'No Parking School Days Zones' were not fully occupied between the signposted drop-off and pick-up times **9:00am** to **2:30pm**. The signposting may deter some drivers. The drop-off and pick-up spaces should be signposted **P5 Drop-Off** and **Pick-Up School Days 8:00 – 9:00am** and **2:30 – 4:00pm**.

#### 3.2 Parking Accumulation in Unrestricted Parking Spaces

The *occupancy* at each hour from **6:00am** to **10:00pm** is shown in **Table 3.1** and ranged from a *minimum* of **367** vehicles at **5:00pm** (79.3%) to a *maximum* of **453** vehicles (97.8%). The *low occupancy* at **5:00pm** is due to *drivers who work in the area leaving and prior to the influx of residents returning home from work*.

**TABLE 3.1     PARKING ACCUMULATION ON-STREET SCHOOL DAYS ST. CATHERINES SCHOOL**

SIGNPOSTED PARKING SPACES	Number of Spaces	NUMBER OF VEHICLES												
		6AM	7AM	8AM	10AM	11AM	12	1PM	2PM	5PM	6PM	8PM	9PM	10PM
½ p 8:30 – 6:00PM Mon. to Fri. 8:30am – 12:30pm Sat.	15	10	15	19	18	19	16	16	19	12	16	15	15	14
NPSD 8:00 – 9:00am 2:30 – 4:00pm	35	14	15	8	17	15	28	15	17	16	28	24	28	24
2P 8:30 – 6:00pm Mon - Sat. ARVE.	37	28	35	37(1MB)	31	31	31	28	30	30	31	35	35	35
NP 7:00am – 5:00pm Mon. to Sat.	6	1	2	1	0	0	0	0	0	1	1			
LZ 8:30am – 4:00pm Mon. to Sat.	1	0	0	0	1	1	1	1	1	0	0	0	0	0
Disabled. 24/7	5	4	4	4	4	4	4	4	3	4	4	4	4	4
BZ Bus Zone 24/7	12(Bus Zones)													
Unrestricted No. Time Limit	463	440 (13MB)	431 (16MB)	430 (14MB)	422	418	424	410	392	367	403	436	445	453

Note: MB Motor Bike.



## 4.0 CHILDREN DROPPED OFF BY VEHICLE IN AM ARRIVAL PERIOD

### 4.1 Leichhardt Street No Parking Zones

There are 2 “No Parking Zones” on the eastern side of Leichhardt with a sign posted time restriction **8:00am – 9:00am** and **2:30pm – 4:00pm** School Days that are used to drop-off and pick-up students. These Zones are marked 1 and 2 and are separated by a marked *pedestrian crossing* with “**No Stopping**” restrictions **signposted** to the **north** and **south** of the **pedestrian crossing**. The **two Zones** are shown on **Sheet 1 of Drawing No. 1142 – 13**.

The full Survey results for **Drop-off** and **Pick-up** are in **Tables 5A** and **5B** in **Appendix 1**. The Summary follows:-

#### 4.1.1 Morning ‘Drop Off’.

Zone	Time Period	No. Vehicles in Queue	Total Vehicles	Length of Stay	No. of Vehicles	No. of Students Dropped Off
1 (2 spaces)	8:07-8:08am	2	4	< 1 min	1	5
<b>Drop-Off</b>	8:07-8:17am			1 min	2	
				2 min	1	
2 (5 spaces)	8:02 am	7	107	< 1 min	78	135
	8:03 am	4		1 min	24	
	8:06 am	8		2 min	3	
	8:08 am	5		3 min	1	
	8:12 am	8		4 min	1	
	8:20 am	9				
	8:24 am	5				
	8:25 am	7				
<b>Drop-off Period 8:00 – 8:40am</b>						
<b>TOTAL ZONES 1 AND 2</b>			<b>111</b>			<b>140</b>

**Car Occupancy:** 1.26 students / vehicle.

**Length of Stay** ≤ 2 minutes – 138 vehicles (98.6%).

#### Comments:

- **Zone 1** was under utilised.
- **Zone 2** Queues extended into “No Stopping” Zone on 5 occasions. Vehicles are not permitted to stop in a “No Stopping Zone – Infringement.
- Queues could have been reduced by 2 if Zone 1 had been utilised with effective Traffic Management.

#### Recommendations:

1. Provide effective Traffic Management.
2. Seek Council approval to **change signposting to P5 8:00am to 9:00am and 2:30 pm to 4:00pm.**
3. Mark out and number all queueing bays.

**4.1 (Continued)****4.1.2. Afternoon 'Pick-Up'**

Zone	Time Period	No. Vehicles in Queue	Total Vehicles	Length of Stay	No. of Vehicles	No. of Students Picked Up
1 (2 spaces)	1	1	1	< 1 min	1	Est 1
<b>Pick-Up</b>	<b>3:25 -3:26PM</b>					
2 (5 spaces)	2:30-2:56 pm	4	68	< 30 secs	41	82
	2:58 pm	3		1 min	10	
	3:01 pm	4		2 min	4	
	3:02 pm	5		3 min	3	
	3:10 pm	7		5 min	1	
	3:11 pm	5		8 min	2	
	3:30 pm	3		10 min	1	
				16 min	1	
				25 min	2	
				28 min	1	
				29 min	1	
<b>TOTAL ZONES 1 and 2</b>			<b>Length of Stay ≤ 2 mins</b> <b>69</b>	<b>56 Vehicles</b>	<b>81.2%</b> <b>83</b>	

**Car Occupancy: 1.20 students per vehicle.**  
**Pick-Up Period 2:30 – 4:03pm.**

**Comments:**

- Maximum length of stay in a “No Parking” Zone is 2 minutes.
- 12 vehicles overstayed the time limit – Infringement.
- 4 vehicles were queued after 4:00pm – Infringement.
- Zone 1 underutilised – With effective Traffic Management all queues would have been less than 5 vehicles.

**Recommendations:**

1. Provide effective Traffic Management.
2. Seek Council approval to change signposting (as for Morning Drop-Off).
3. Mark out Bays (as for Morning Drop Off).

## 4.2 Macpherson Street No Parking Zones

There are 3 "No Parking" Zones on the northern side of Macpherson Street along the frontage of St. Catherine's School with a signposted *Time Restriction* **8:15 – 9:15am** and **2:45 – 4:15pm** Schooldays that are used to drop-off and pick-up students. The zones are marked 1, 2 and 3 on **Sheet 1 of Drawing No. 1142-13**. Zones 1 and 2 are separated by a *marked pedestrian crossing* with "No Stopping" restrictions signposted to the east and west of the crossing.

The full Survey results for drop-off and pick-up are in **Tables 6A** and **6B** respectively in **Appendix 1**. The Summary follows with comments and recommendations.

### 4.2.1 Morning 'Drop-Off'

Zone	Time Period	No. Vehicles in Queue	Total Vehicles	Length of Stay	No. of Vehicles	No. of Students Dropped Off
1 (6 spaces)	8:00-8:01am	5		< 1 min	55	5
	8:02am	3		1 min	21	
	8:03-8:04am	4		2 min	1	
	8:05-8:06am	3		3 min	1	
	8:07-8:08am	5				
	8:09-8:10am	4				
	8:12-8:13am	4				
	8:14am	5				
	8:20am	4				
	8:21-8:22am	6				
	8:23-8:24am	4				
	8:28-8:29am	4	78			98
<b>Drop-Off Period 8:00 to 8:50am</b>						
2 (3 spaces)	8:01-8:02am	1	3	< 1 min	1	5
				1 min	1	
				2 min	1	
<b>Drop-off Period 8:00 – 8:45am</b>						
3 (7 spaces)	8:00-8:06am	4	6	< 1 min	2	6
				7 min	1	
				8 min	1	
<b>Drop-off Period 8:00 – 8:20am</b>						
<b>TOTAL</b>			<b>87</b>			<b>109</b>

**Car Occupancy:** 1.26 students / vehicle.

**Length of Stay** ≤ 2 minutes – 81 vehicles (93.1%).

### Comments:

- Vehicles queued to roundabout in Albion Street on one occasion blocking traffic in roundabout.
- Traffic Controller who was managing traffic could have prevented problems by directing vehicles to Zones 2 and 3 that were underutilised.
- Vehicles queued in "No Stopping" Zone west of "No Parking" Zone – Infringement.
- There are adequate queueing spaces in Zones 1, 2 and 3 if properly managed.

**4.2 (Continued)****Recommendations:**

1. Traffic Controller(s) to be provided with a written '*set of instructions*' and be *briefed* so that they understand the instructions and are able to effectively manage the Drop-Off Zones.
2. Seek Council approval to change signposting to **P5 8:00 to 9:00am** and **2:30 to 4:00pm** Schooldays.
3. The current **8:15am** start time is too late as **41** vehicles (37.6%) had dropped-off students *before 8:15am*. It is recommended that the hours be changed to **8:00 – 9:00am** and **2:30 – 4:00pm**, the same as in Leichhardt Street.
4. It is recommended that the queueing bays be '*marked and numbered*' in all **3 Zones**.

**4.2.2 Afternoon 'Pick-Up'**

Zone	Time Period	No. Vehicles in Queue	Total Vehicles	Length of Stay	No. of Vehicles	No. of Students Dropped Off
1 (6 spaces)	2:30-3:07pm	7		1 min	20	5
	3:07-3:15pm	6		2 min	6	
	3:20-3:22pm	8		3 min	2	
	3:25-3:27pm	5		4 min	3	
	3:27-3:29pm	4		5 min	1	
	3:37-3:39pm	5		6 min	2	
	3:39-3:40pm	4		7 min	1	
				8 min	3	
	3:41-3:42pm	5	49	10 min	3	56
				11 min	1	
				21 to 40min	7	
<b>Pick Up Period 2:30 – 4:17pm (Only 3 Vehicles after 4:00pm)</b>						
2 (3 spaces)	2:30-3:10pm	3	7	1 min.	1	9
				3 min	1	
				4 min	1	
				5 min	1	
				37 min	1	
				40 min	1	
				45 min	1	
<b>Pick-Up Period 2:30 – 3:30pm</b>						
3 (7 spaces)	2:50–3:10pm	5	8	4 min	1	9
				13 min	1	
				27 min	1	
				29 min	1	
				30 min	1	
				40 min	2	
				46 min	1	
<b>Pick-Up Period 2:30 – 3:30pm</b>						
<b>TOTAL</b>			<b>64</b>			<b>74</b>

**Car Occupancy:** 1.16 students / vehicle.**Length of Stay** ≤ 2 minutes – 27 vehicles (42.2%).

---

## 4.2 (Continued)

### Comments:

- Vehicles queued to the roundabout between **3:00** to **3:30pm** blocking traffic in roundabout.
- Vehicles queued in “**No Stopping**” Zone west of “**No Parking**” Zone. Infringement.
- 6 vehicles were queued in **Zone 1** from **2:30pm** to **3:06pm** and infringed the “**No Parking**” *Time Limit of 2 minutes*.
- **Zones 2** and **3** were underutilised.
- Traffic Controller did not effectively manage the queued vehicles.
- There are adequate queueing spaces if properly managed.
- A total of **5** vehicles parked in **Zones 1, 2** and **3** after **4:00pm**, did not pick up students and were still parked after **4:30pm** – Infringement.

### Recommendations:

1. Same comment as for ‘Drop-Off period’.
2. Same comment as for ‘Drop-Off period’.
3. Only **3** vehicles picked up after **4:00pm**. Hence the “**No Parking**” Zone should be altered as stated under *Recommendation 3* in ‘Drop Off’ period to **2:30pm** to **4:00pm**. Parents arriving after **4:30pm** can legally park to pick-up students.
4. As for *Recommendation 4* in ‘Drop-off’ period.
5. *Circular letter* to be sent to all parents to explain the *Road Rules* pertaining to “**No Parking**” and “**No Stopping**” Zones and instructions concerning the need to move to another **queueing Zone** when the **first Zone** is ‘parked out’ and to *obey the instructions* of the *Traffic Controller*.

## 4.3 Albion Street “No Parking” Zones

There are **3** “No Parking” Zones on the eastern side of Albion Street numbered **1, 2** and **3** along the frontage of St. Catherine’s School and **3** “No Parking” Zones on the western side of Albion Street numbered **4, 5** and **6** that are used to ‘Drop-Off’ and ‘Pick-Up’ students.

The signposted *Time Limit restrictions* are **8:00am – 9:15am** and **3:00 to 4:15pm** Schooldays on the eastern side and **8:00 – 9:00am** and **2:30 – 4:00pm** Schooldays on the western side.

**4.3 (Continued)**

All zones are north of a *signalised pedestrian crossing* with “No Stopping” restrictions signposted *before and after* the crossing on both sides of Albion Street.

The full Survey results for the drop-off and pick-up are in **Tables 7A** and **7B** respectively in **Appendix 1**. The summary follows with comments and recommendations.

**4.3.1 Morning ‘Drop-Off’**

Zone	Time Period	No. Vehicles in Queue	Total Vehicles	Length of Stay	No. of Vehicles	No. of Students Dropped Off
1 (2 spaces)	8:00-8:01am	3		< 1 min	18	
	8:09am	3		1 min	6	
	8:10am	5	27	2 min	2	27
				4 min	1	
	Drop-Off Period 7:59 to 9:00am					
2 (2 spaces)	8:00am	2		< 1 min	14	
	8:01am	2		1 min	2	
	8:15am	3	16			16
	Drop-Off Period 8:00 to 8:58am					
3 (3 spaces)	NOT USED					
4 (1 spaces)		1	8	< 1 min	7	
				2 min	1	8
Drop-off Period 8:00 – 8:59am						
5 (2 spaces)	NOT USED					
6 (2 spaces)	NOT USED					
TOTAL			51			51

**Car Occupancy:** 1.0 students / vehicle.

**Length of Stay** ≤ 2 minutes – 50 vehicles (98.0%).

**Comments:**

- Vehicles queued past **Gate 2** for a short period.
- Traffic Controller required to direct vehicles into **Zone 3** when Zones **1** and **2** are fully occupied.
- No vehicles dropped-off *after* 9:00am.
- Zones **3**, **5** and **6** were *not used* for drop-off.
- Only **1** vehicle exceeded the time limit of 2 minutes for parking in a “No Parking” Zone.
- There are more than adequate spaces in the Drop-Off. Zones.
- **2** vehicles parked in the drop-off Zones **2** and **3** after **9:00am** and did not drop off students.



**4.3 (Continued)****Recommendations:**

1. A Traffic Controller to be present to manage the drop-off.
2. The current time limit of **9:15am** is not required and should be rationalised **8:00 to 9:00am** Schooldays.
3. Seek Council approval to change the signposting to **P5 8:00 – 9:00am** on Schooldays.
4. That the queueing Bays be '*marked and numbered*'.

**4.3.2 Afternoon 'Pick-up'**

Zone	Time Period	No. Vehicles in Queue	Total Vehicles	Length of Stay	No. of Vehicles	No. of Students Dropped Off
1 (2 spaces)	2:33-2:42pm	2		< 1 min	1	
	3:04-3:06pm	2		1 min	2	
	3:19-3:30pm	2	10	2 min	1	10
				5 min	2	
				9 min	1	
				11 min	1	
				15 min	1	
				24 min	1	
<b>Pick Up Period 2:29 – 3:51pm</b>						
2 (2 spaces)	3:20-3:25pm	4	4	6 min.	1	4
				7 min	1	
				10 min	2	
<b>Pick-Up Period 3:19 – 3:31pm</b>						
3 (3 spaces)	3:15–3:24pm	2	2	9 min	1	2
				17 min	1	
<b>Pick-Up Period 3:15 – 3:32pm</b>						
4 (1 spaces)	3:24-3:30pm	1	1	6 min	1	1
<b>Pick-Up Period 3:24 – 3:30pm</b>						
5	2:53-2:57pm	2	3	1 min	1	2
				4 min	1	
				9 min	1	
<b>Pick-Up Period 2:53 – 3:07pm</b>						
6	2:30-2:31pm	1	1	1 min	1	0
<b>Pick-Up Period 2:30 – 2:31pm</b>						
<b>TOTAL</b>			<b>20</b>			<b>19</b>

**Car Occupancy:** 1.0 students / vehicle.  
**Length of Stay** ≤ 2 minutes – 6 vehicles (30%).

### 4.3 (Continued)

#### Comments:

- 70% (14 vehicles) overstayed the *2 minute time limit* in a “No Parking” Zone. Infringement.
- Zone 2 was ‘parked out’ over a 5 minute period with 2 vehicles *parked in the Bus Zone*. Infringement.
- There was no Traffic Controller supervising the pick-up.
- No vehicles picked-up students after **3:51pm**

#### **Recommendations:-**

1. A Traffic Controller be present to supervise the pick-up.
2. Seek Council approval to change the signposting to **P5 2:30 – 4:00pm** Schooldays.
- 3, As for *Recommendation 4* in ‘Drop-Off’ period.

## 5.0 SUMMARY

- The purpose of the Study was to determine the availability and existing utilisation of parking spaces on-street within **5 – 7** minutes walk of St. Catherine's School and the number of students being 'dropped off' and 'picked up' by vehicles in "No Parking" Zones **8:00 – 9:00am** and **2:30 – 4:00pm** Schooldays.

### Parking Supply:

- The total number of Time Limit and Time Restricted Parking spaces is **94**.
- The total number of unrestricted parking spaces is **463**.
- The total number of spaces available for unrestricted parking is a **maximum** of **557** from **6:00pm** to **7:00am** Monday to Saturday and for **24 hours** on **Sunday**.
- The **minimum** number of spaces available for unrestricted parking is **463** from **8:00am to 9:00am** and **2:30 to 4:00pm** on **Schooldays**.
- At **7:00am**, **9:00am – 2:30** and **5:00pm** Monday to Friday the number of spaces available for *unrestricted* parking is **551**, **498** and **504**.

### Parking Demand:

- The number of vehicles parked in the unrestricted parking spaces *decreased* from **440** at **6:00am** to a *minimum* of **367** at **5:00pm** and then *increased* to **453** at **10:00pm** on **Schooldays** Monday to Friday.
- The **½ P** and **2P** *time restricted parking spaces* were almost fully 'parked out' from **6:00am** to **10:00pm**.
- There were some **18 to 20 spaces** vacant in the "No Parking" Zones schooldays before and after the **8:00 – 9:00am** and **2:30 – 4:00pm** school arrival and departure periods and only **7 to 11** spaces after **6:00pm**

### School Drop-Off 8:00 – 9:00am:

- There are **2 Drop-Off, Pick-Up Zones** (7 spaces) in Leichhardt Street, **3 Zones** (16 spaces) in Macpherson Street and **6 Zones** (12 spaces) in Albion Street.
- **A total of 259 vehicles dropped off 300 students between 7:59am and 9:00am.** The number of students per vehicle was **1.26** in Leichhardt and Macpherson Streets and **1.0** in Albion Street.

## COMMENTS:

### Leichhardt Street:

**Zone 1** was underutilised.

**Zone 2** Queues extended into "No Stopping" Zones on 5 occasions. No Traffic Controller for supervision of drop-off.

---

## 5.0 (Continued)

### Macpherson Street:

- Vehicles *queued* to roundabout on 1 occasion blocking traffic in roundabout.
- Vehicles *queued* in “No Stopping” Zone. Infringement.
- Traffic Controller could have *prevented problems by directing vehicles* into **Zones 2 and 3**.

### Albion Street:

- Vehicles *queued* past **Gate 2** for a short period.
- Zones **3, 5 and 6** were not used.
- Only **1** vehicle *exceeded* the *2 minute time limit* in a “No Parking” Zone.

### School Pick-Up 2:30 – 4:00pm

- A total of **153 vehicles** picked up **176 students** between **2:30pm and 4:17pm**. The number of students per vehicle was **1.20** in **Leichhardt Street**, **1.16** in **Macpherson Street** and **1.0** in **Albion Street**.

## COMMENTS:

### Leichhardt Street

- Zone 1 was underutilised.
- No traffic Controller to supervise pick-up.
- **12** vehicles overstayed the *2 minute* time limit – Infringement.
- **4** vehicles queued after **4:00pm**.

### Macpherson Street

- Vehicles queued to roundabout between **3:00pm** and **3:30pm** blocking traffic in roundabout.
- Vehicles queued in “No Stopping” Zone. Infringement.
- **6** vehicles parked for longer than *2 minutes* between **2:30pm** and **3:06pm** in **Zone 1** – Infringement.
- There are *adequate queueing spaces* if properly managed.

### Albion Street

- **70%** (**14 vehicles**) overstayed the *2 minute* time limit. Infringement.
- **Zone 2** was ‘parked out’ for **5 minutes** with **2** vehicles queued in the Bus Zone.
- No vehicles picked-up students after **3:51pm**.
- There was no *Traffic Controller* present.

---

## 5.0 (Continued)

### RECOMMENDATIONS:

- A Traffic Controller with *RMS Blue Certificate accreditation* to be present in Leichhardt Street, Macpherson Street and Albion Street. Controllers to be briefed and given *written instructions for affective traffic management*.
- Seek Council approval to change the signposting from “No Parking” to **P5 8:00am to 9:00am and 2:30pm – 4:00pm** in **all Zones** in Leichhardt Street, Macpherson Street and Albion Street.
- The proposed signposting will be easier to understand.
- There is no requirement to have different time limits in the three streets.
- Queueing Bays to be **marked** and **numbered** in all **11 Zones**.
- *Circular letter* to be sent to all parents at the *commencement* of the School Year explaining the **Road Rules** applying to “**No Stopping**” **Zones** and instructions to be followed when *dropping-off and picking-up students*.
- With *effective traffic management*, the **existing Drop-Off** and **Pick-Up Zones** have **sufficient queueing spaces** for the **busiest period**.

## Appendix B

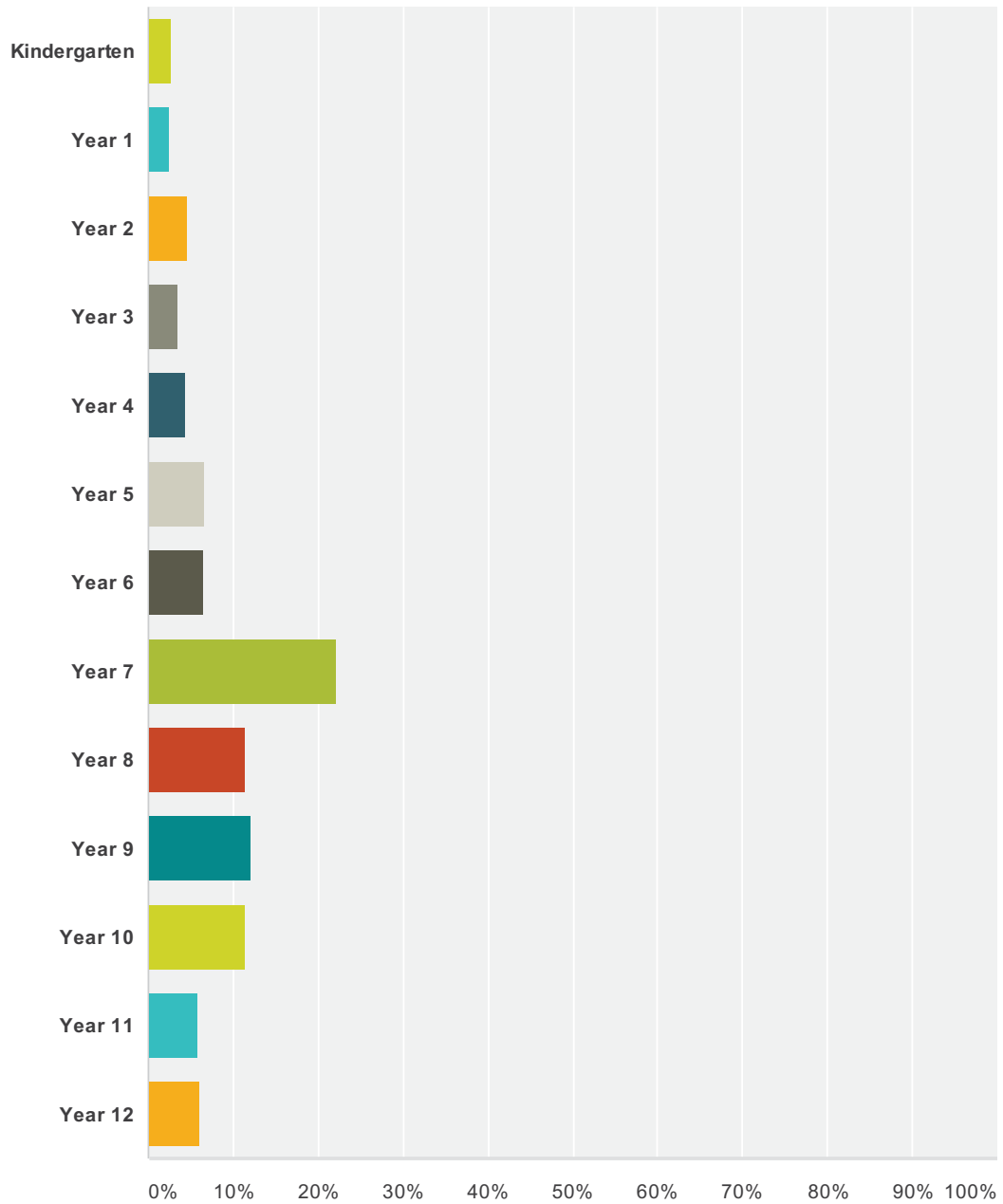
### Travel survey results



## St Catherine's School Travel Survey (for Students)

### Q1 What year are you currently attending?

Answered: 579 Skipped: 2



Answer Choices	Responses
Kindergarten	2.76% 16
Year 1	2.59% 15
Year 2	4.66% 27
Year 3	3.45% 20
Year 4	4.32% 25
Year 5	6.74% 39

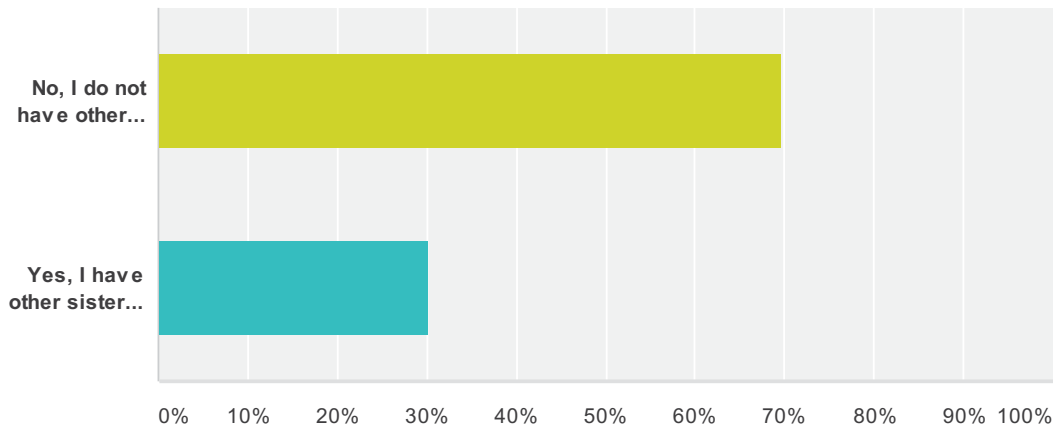
## St Catherine's School Travel Survey (for Students)

Year 6	6.56%	38
Year 7	22.11%	128
Year 8	11.40%	66
Year 9	12.09%	70
Year 10	11.40%	66
Year 11	5.87%	34
Year 12	6.04%	35
<b>Total</b>		<b>579</b>

## St Catherine's School Travel Survey (for Students)

### Q2 Do you have any sisters that attend St. Catherine's School?

Answered: 576 Skipped: 5

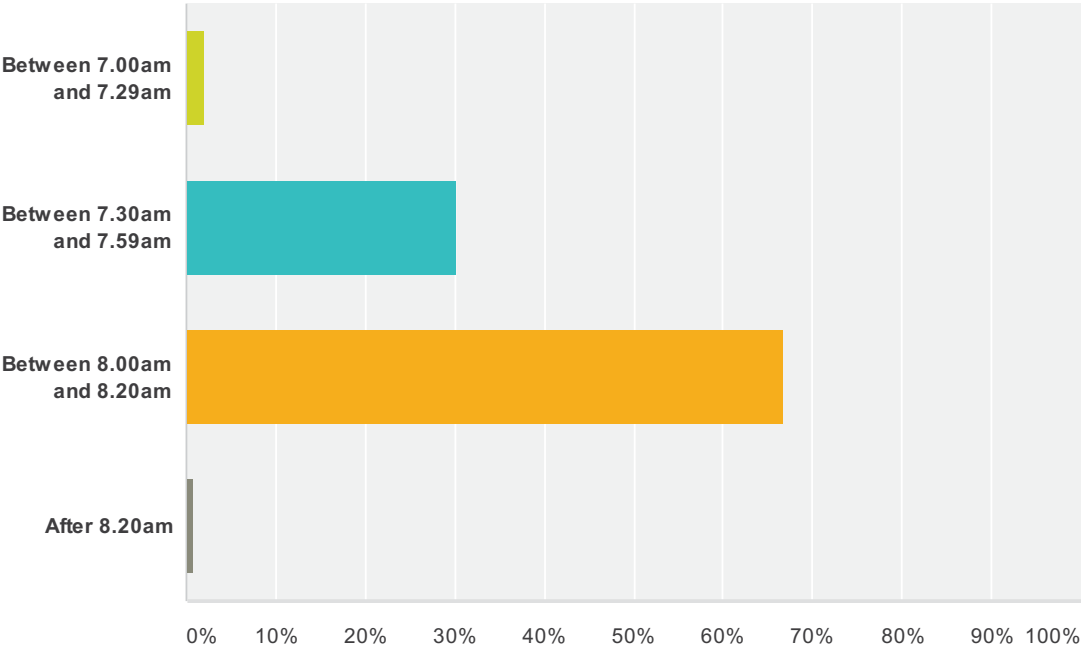


Answer Choices	Responses	
No, I do not have other sisters attending	69.79%	402
Yes, I have other sisters attending (please indicate number of sisters)	30.21%	174
Total		576

St Catherine's School Travel Survey (for Students)

**Q3 On a typical day, what time would you normally arrive at school? (i.e. on a day that you do not have sports or other co/extracurricular activities BEFORE classes start)?**

Answered: 565 Skipped: 16

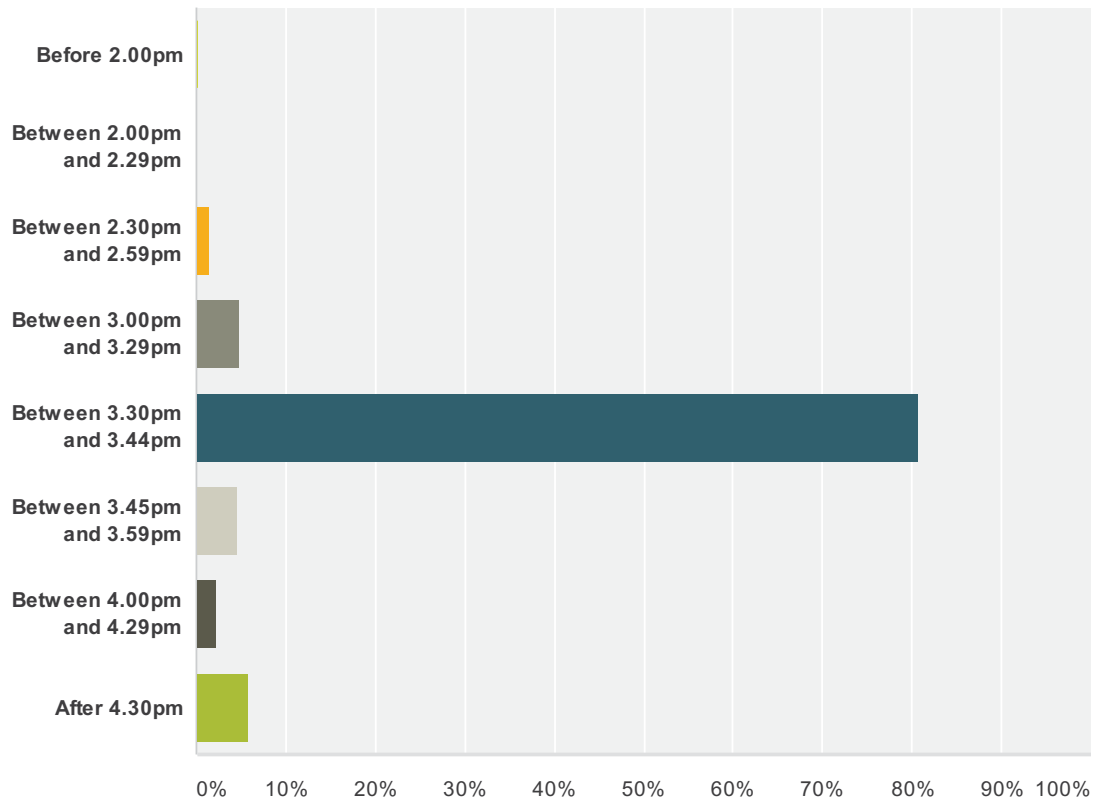


Answer Choices	Responses	
Between 7.00am and 7.29am	2.12%	12
Between 7.30am and 7.59am	30.27%	171
Between 8.00am and 8.20am	66.73%	377
After 8.20am	0.88%	5
Total		565

## St Catherine's School Travel Survey (for Students)

**Q4 On a typical afternoon when school has finished for the day, what time would you normally leave the school grounds? (i.e. on a day that you do not have sports or other co/extracurricular activities AFTER school)**

Answered: 565 Skipped: 16



Answer Choices	Responses
Before 2.00pm	0.18% 1
Between 2.00pm and 2.29pm	0.00% 0
Between 2.30pm and 2.59pm	1.42% 8
Between 3.00pm and 3.29pm	4.78% 27
Between 3.30pm and 3.44pm	80.88% 457
Between 3.45pm and 3.59pm	4.60% 26
Between 4.00pm and 4.29pm	2.30% 13
After 4.30pm	5.84% 33
<b>Total</b>	<b>565</b>

St Catherine's School Travel Survey (for Students)

**Q5 What postcode are you most likely to travel to school from in the morning? (This may be the suburb in which you live)**

Answered: 559 Skipped: 22



St Catherine's School Travel Survey (for Students)

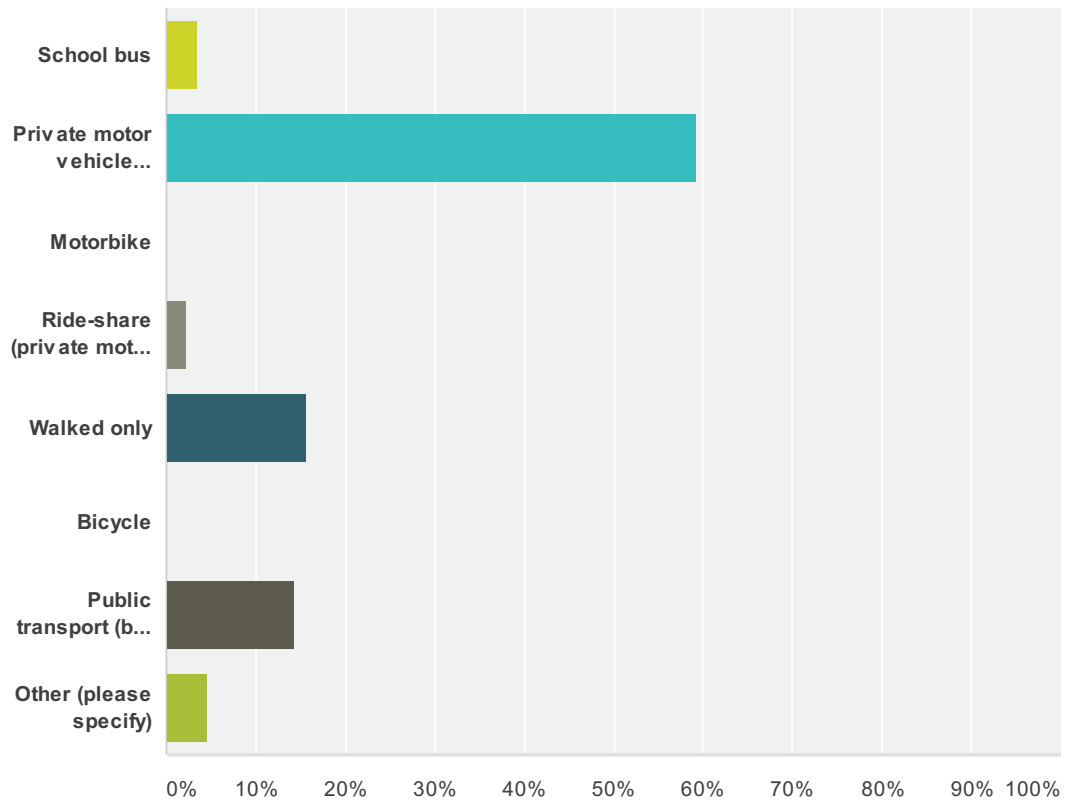
**Q6 What postcode are you most likely to travel to from school in the afternoon?  
(This may be the suburb in which you live)**

Answered: 559 Skipped: 22

## St Catherine's School Travel Survey (for Students)

### Q7 On a typical day, how are you most likely to arrive / travel to school?

Answered: 559 Skipped: 22



Answer Choices	Responses
School bus	3.58% 20
Private motor vehicle (Dropped-off)	59.39% 332
Motorbike	0.00% 0
Ride-share (private motor vehicle)	2.33% 13
Walked only	15.56% 87
Bicycle	0.00% 0
Public transport (bus and or train)	14.49% 81
Other (please specify)	4.65% 26
<b>Total</b>	<b>559</b>

St Catherine's School Travel Survey (for Students)

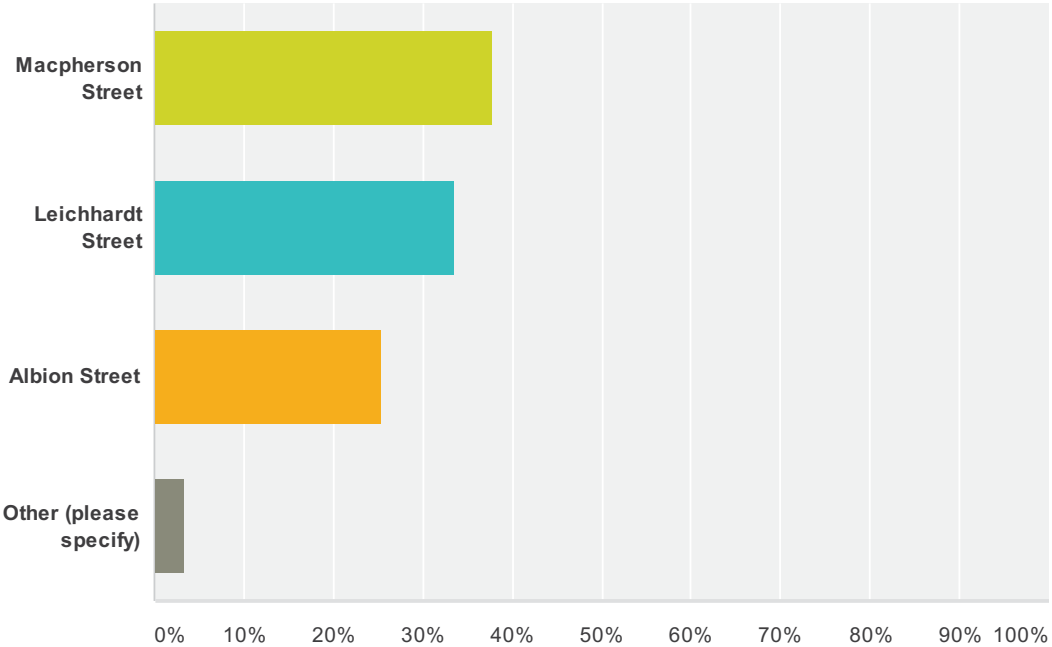
**Q8 You indicated that you ride share to school, how many other St. Catherine's School students share the car? (Note: this could be your sister(s) and/or friend(s))**

Answered: 13   Skipped: 568

St Catherine's School Travel Survey (for Students)

**Q9 When you get dropped off in the morning by a private motor vehicle, where are you most likely to get dropped off?**

Answered: 331 Skipped: 250



Answer Choices	Responses	
Macpherson Street	37.76%	125
Leichhardt Street	33.53%	111
Albion Street	25.38%	84
Other (please specify)	3.32%	11
Total		331

St Catherine's School Travel Survey (for Students)

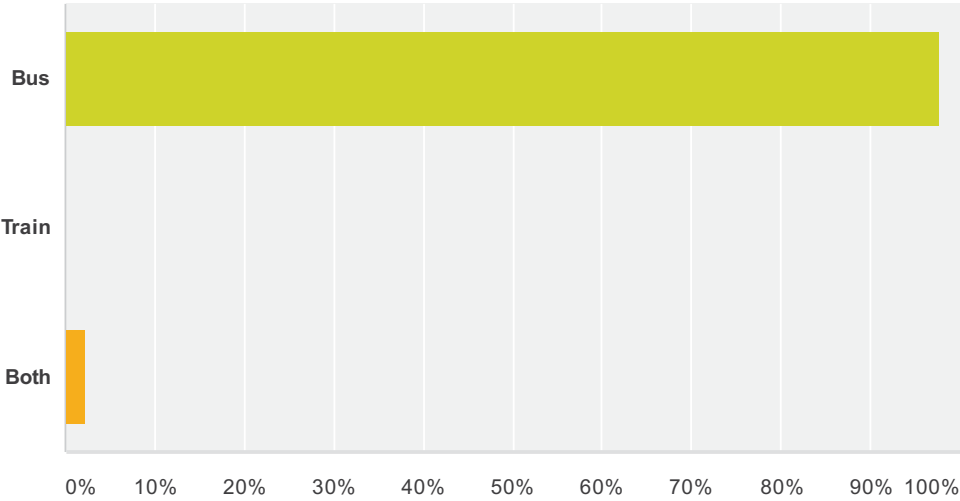
**Q10 If you travel to school by private vehicle and your parent/caretaker parks in a nearby location before walking with you to the appropriate school entrance, where is your parent/caretaker most likely to park their car?**

Answered: 188   Skipped: 393

St Catherine's School Travel Survey (for Students)

Q11 Do you take a bus or train to school?  
(Please indicate if you take both)

Answered: 88   Skipped: 493



Answer Choices	Responses	
Bus	97.73%	86
Train	0.00%	0
Both	2.27%	2
Total		88



## St Catherine's School Travel Survey (for Students)

**Q12 You indicated that you take both a train and bus to school; please provide details of the journey to school. If you take more than one train and bus, please indicate all of these below. Please indicate the departure and arrival details for each station/stop. (e.g. if you take the Western and Eastern Suburbs lines, then a 400 bus indicate the station you originally get on, transferred to and finally off from, as well as the bus stop you got on and off from. Also indicate the departure times from the stations/stop you get on.)**

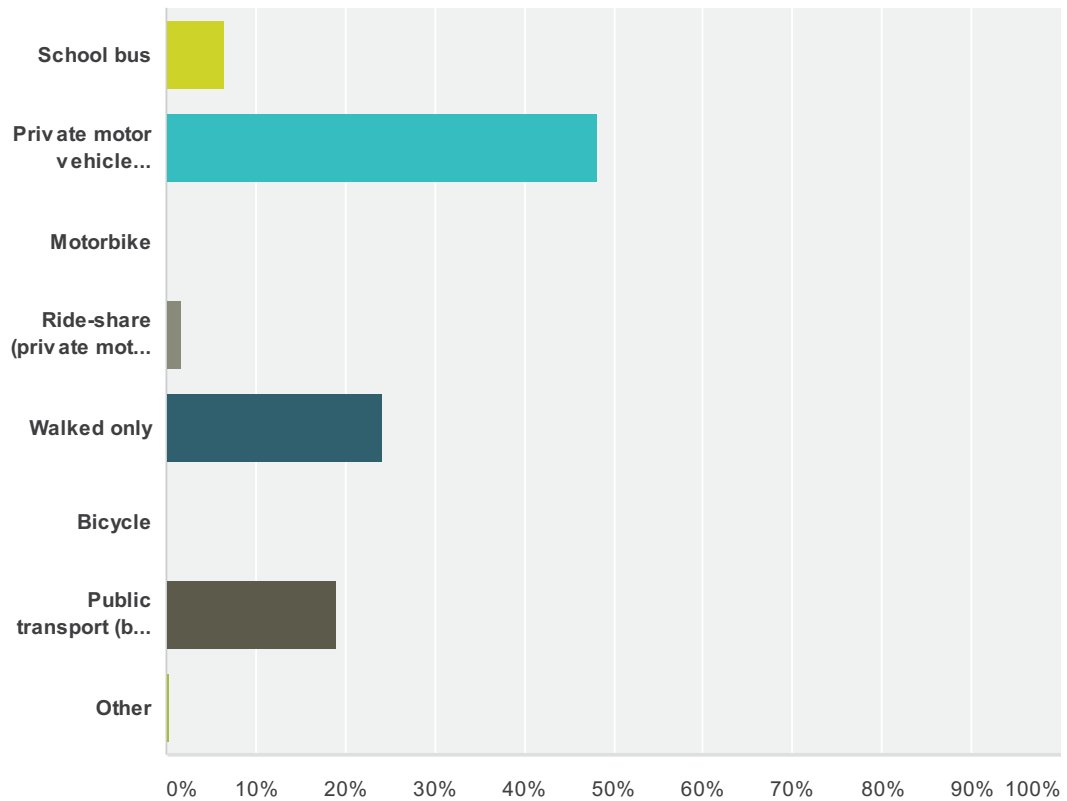
Answered: 78 Skipped: 503

Answer Choices	Responses	
Train departure station(s)	24.36%	19
Train line(s)	24.36%	19
Train departure time(s)	24.36%	19
Train arrival station	24.36%	19
Bus departure stop(s)	97.44%	76
Bus route number(s)	98.72%	77
Bus departure time(s)	97.44%	76
Bus arrival stop	97.44%	76

## St Catherine's School Travel Survey (for Students)

### Q13 On a typical day, how are you most likely to travel home/depart from work?

Answered: 552 Skipped: 29

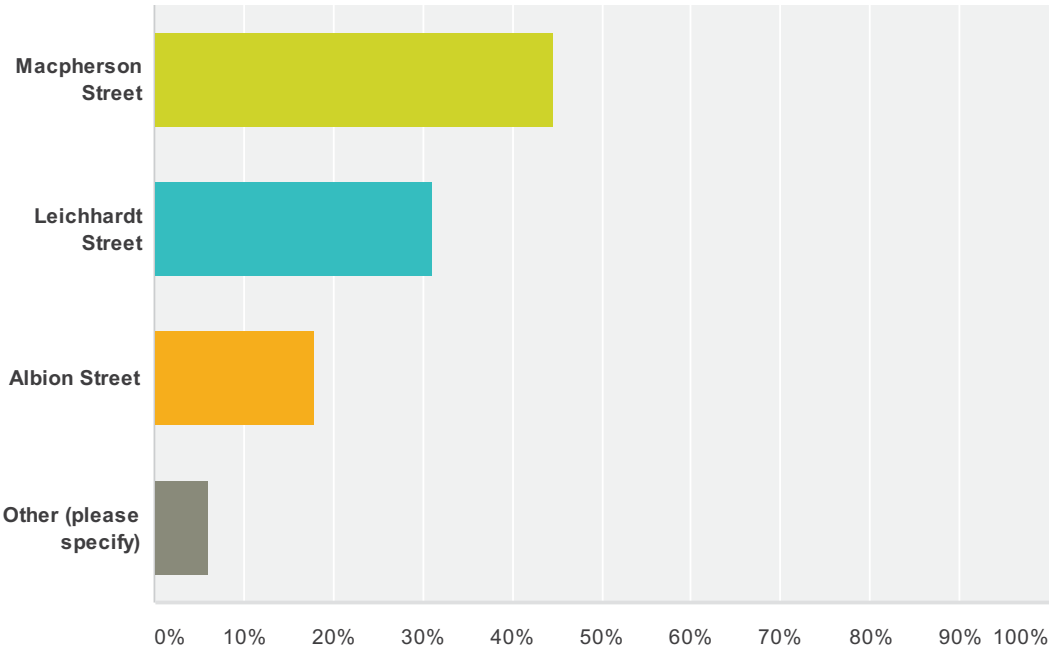


Answer Choices	Responses
School bus	6.52% 36
Private motor vehicle (Dropped-off)	48.19% 266
Motorbike	0.00% 0
Ride-share (private motor vehicle)	1.63% 9
Walked only	24.28% 134
Bicycle	0.00% 0
Public transport (bus and or train)	19.02% 105
Other	0.36% 2
<b>Total</b>	<b>552</b>

St Catherine's School Travel Survey (for Students)

Q14 When you get picked up in the afternoon by a private motor vehicle, where are you most likely to get picked up?

Answered: 266 Skipped: 315



Answer Choices	Responses	
Macpherson Street	44.74%	119
Leichhardt Street	31.20%	83
Albion Street	18.05%	48
Other (please specify)	6.02%	16
Total		266

St Catherine's School Travel Survey (for Students)

**Q15 If you ride share home from work, how many other St. Catherine's School staff share the car?**

Answered: 9 Skipped: 572

St Catherine's School Travel Survey (for Students)

**Q16 What is the primary reason you were taken by a private vehicle from school? i.e. If you do not walk home, cycle home, take the school bus home or take public transport home after school, what is the main reason for this?**

Answered: 47   Skipped: 534

St Catherine's School Travel Survey (for Students)

**Q17 If you take public transport home from work, please provide details of the trip home including: - Location of bus stop(s) (departure and arrival) - Bus route number(s) - Time(s) and/or - Train station(s) (departure and arrival) - Train route(s) - Time(s)**

Answered: 105 Skipped: 476

St Catherine's School Travel Survey (for Students)

**Q18 Do you or your parents have any suggestions to help reduce traffic congestion in and around St. Catherine's School in the morning or afternoon?**

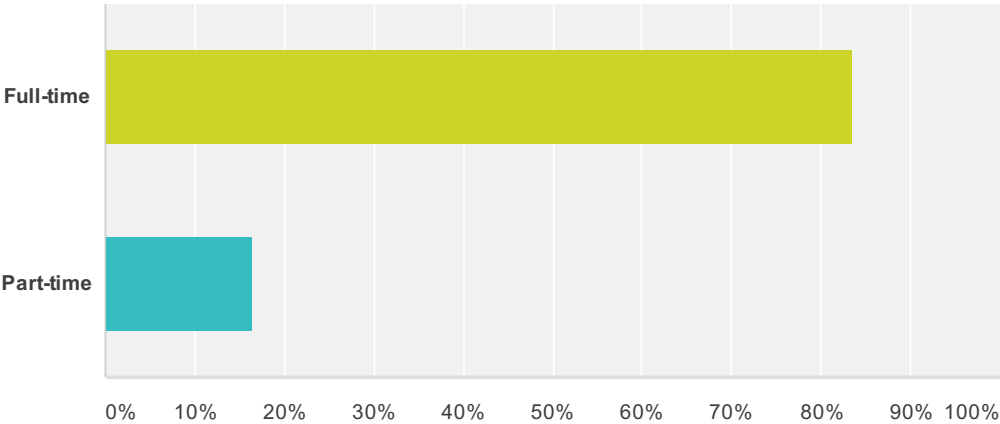
Answered: 318 Skipped: 263



St Catherine's School Travel Survey (for Staff)

Q1 Do you work full-time or part-time at St. Catherine's School?

Answered: 103 Skipped: 0

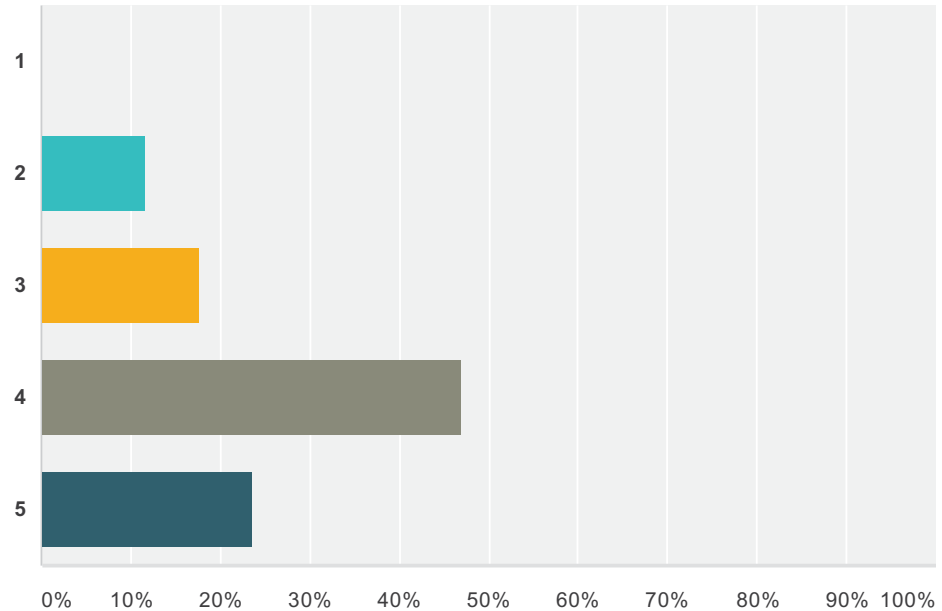


Answer Choices	Responses	
Full-time	83.50%	86
Part-time	16.50%	17
Total		103

## St Catherine's School Travel Survey (for Staff)

### Q2 How many days per week do you attend St. Catherine's School for work purposes?

Answered: 17 Skipped: 86

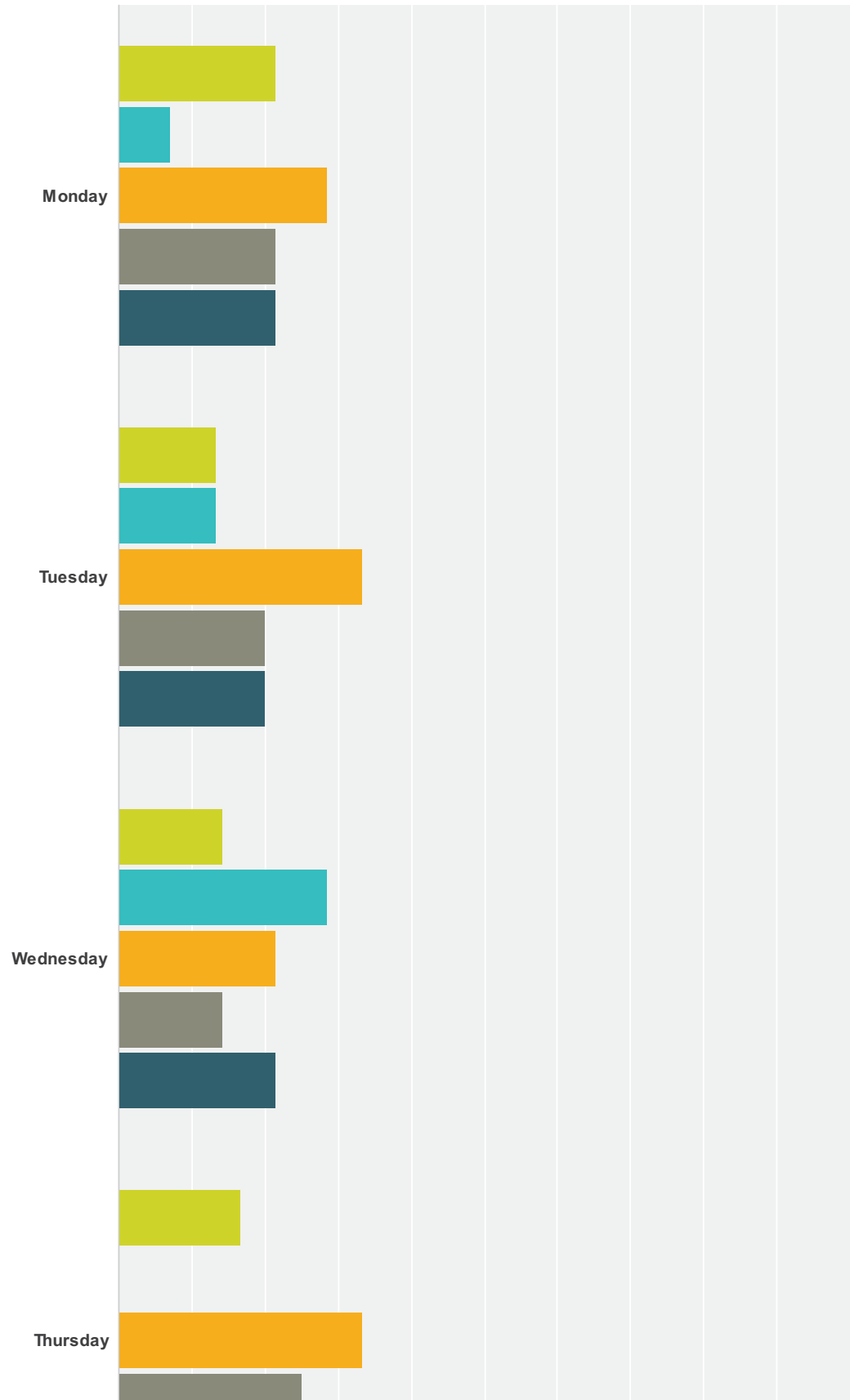


Answer Choices	Responses	
1	0.00%	0
2	11.76%	2
3	17.65%	3
4	47.06%	8
5	23.53%	4
Total		17

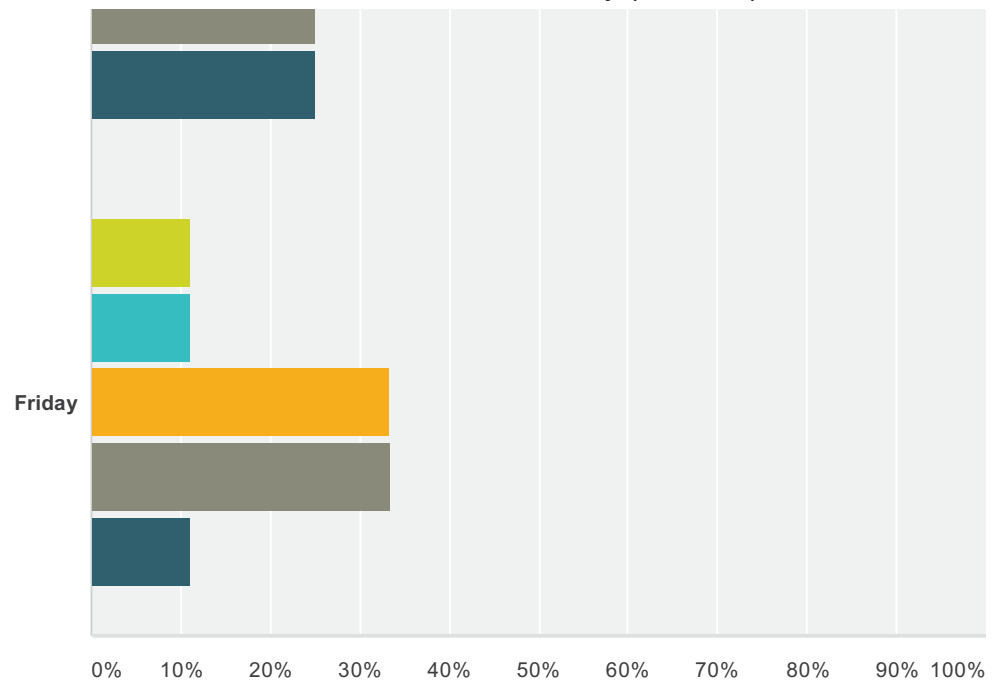
St Catherine's School Travel Survey (for Staff)

Q3 What days and times do you arrive/attend the school?

Answered: 17 Skipped: 86



## St Catherine's School Travel Survey (for Staff)

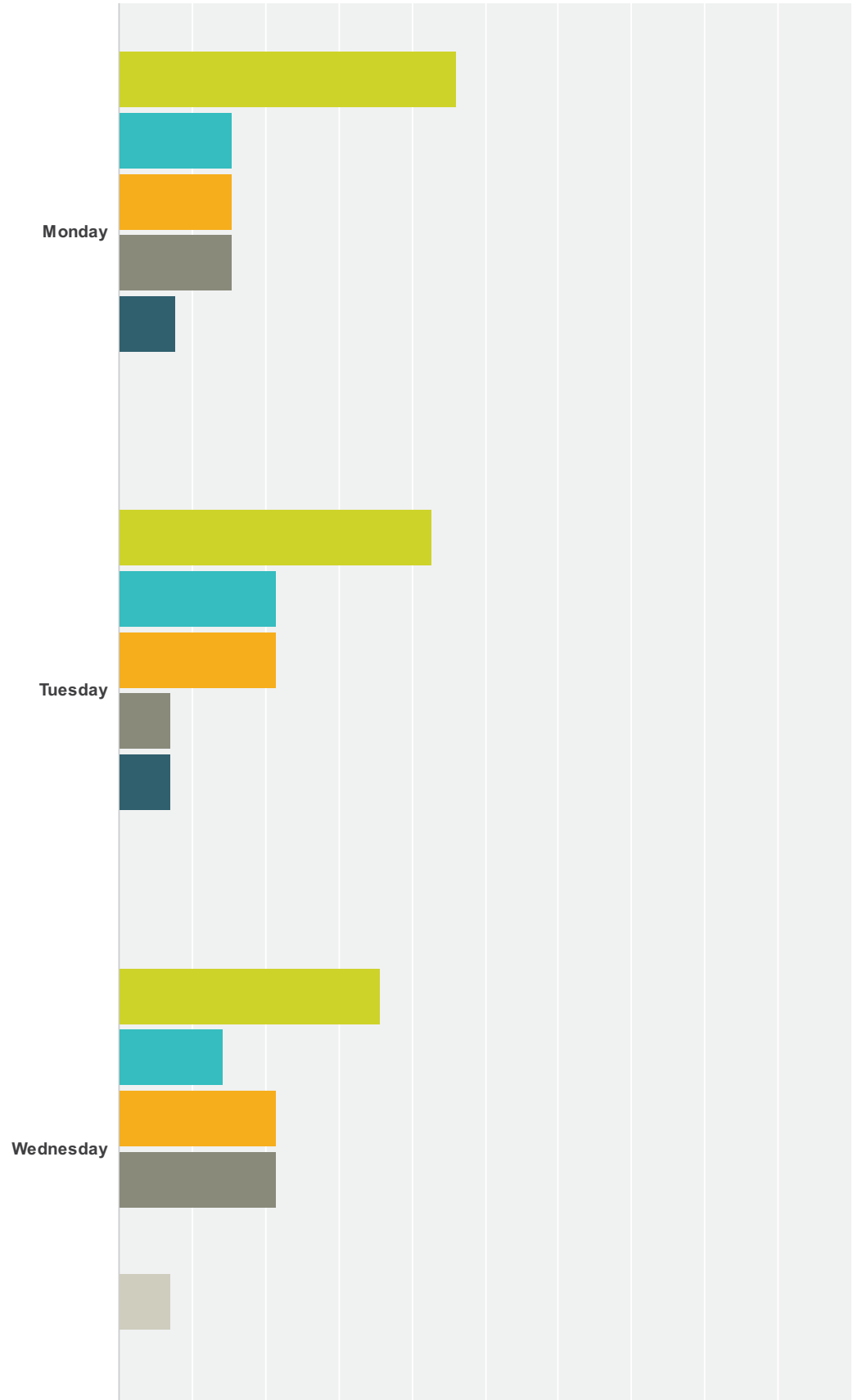


■ Before 7.00am
 ■ 7.00am - 7.29am
 ■ 7.30am - 7.59am
 ■ 8.00am - 8.29am
 ■ After 8.30am

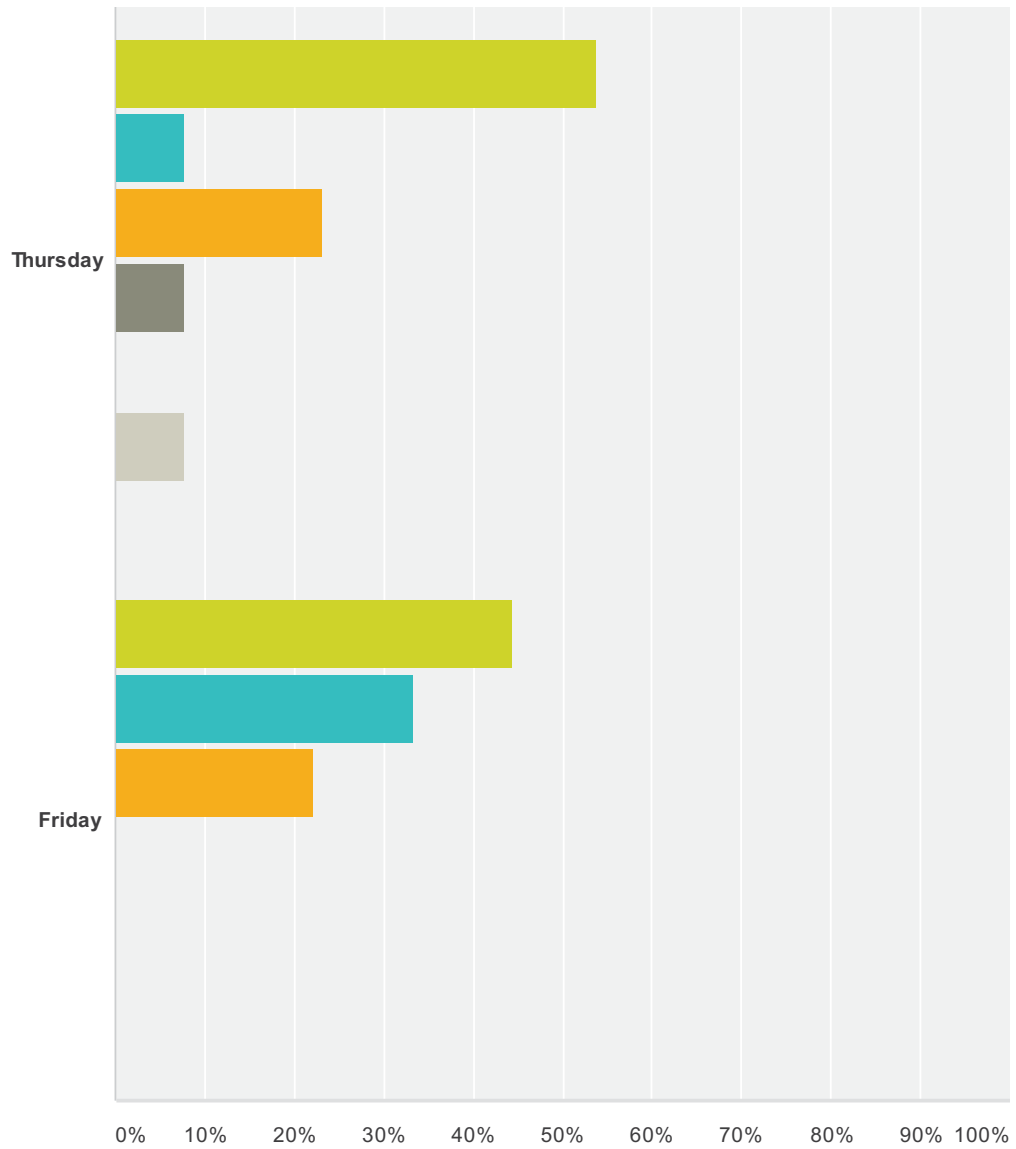
	Before 7.00am	7.00am - 7.29am	7.30am - 7.59am	8.00am - 8.29am	After 8.30am	Total
Monday	21.43% 3	7.14% 1	28.57% 4	21.43% 3	21.43% 3	14
Tuesday	13.33% 2	13.33% 2	33.33% 5	20.00% 3	20.00% 3	15
Wednesday	14.29% 2	28.57% 4	21.43% 3	14.29% 2	21.43% 3	14
Thursday	16.67% 2	0.00% 0	33.33% 4	25.00% 3	25.00% 3	12
Friday	11.11% 1	11.11% 1	33.33% 3	33.33% 3	11.11% 1	9

Q4 What days and times do you depart from the school?

Answered: 17 Skipped: 86



## St Catherine's School Travel Survey (for Staff)



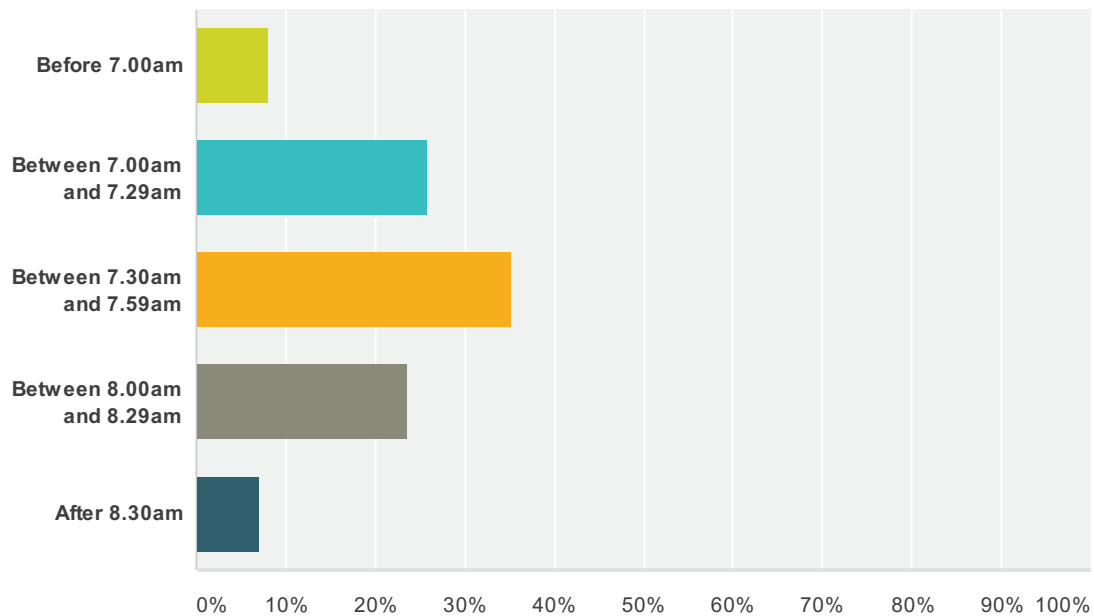
■ Before 4.00pm   
 ■ 4.00pm - 4.29pm   
 ■ 4.30pm - 4.59pm   
 ■ 5.00pm - 5.29pm  
■ 5.30pm - 5.59pm   
 ■ After 6.00pm

	Before 4.00pm	4.00pm - 4.29pm	4.30pm - 4.59pm	5.00pm - 5.29pm	5.30pm - 5.59pm	After 6.00pm	Total
Monday	46.15% 6	15.38% 2	15.38% 2	15.38% 2	7.69% 1	0.00% 0	13
Tuesday	42.86% 6	21.43% 3	21.43% 3	7.14% 1	7.14% 1	0.00% 0	14
Wednesday	35.71% 5	14.29% 2	21.43% 3	21.43% 3	0.00% 0	7.14% 1	14
Thursday	53.85% 7	7.69% 1	23.08% 3	7.69% 1	0.00% 0	7.69% 1	13
Friday	44.44% 4	33.33% 3	22.22% 2	0.00% 0	0.00% 0	0.00% 0	9

## St Catherine's School Travel Survey (for Staff)

### Q5 What time do you typically arrive at work?

Answered: 85 Skipped: 18



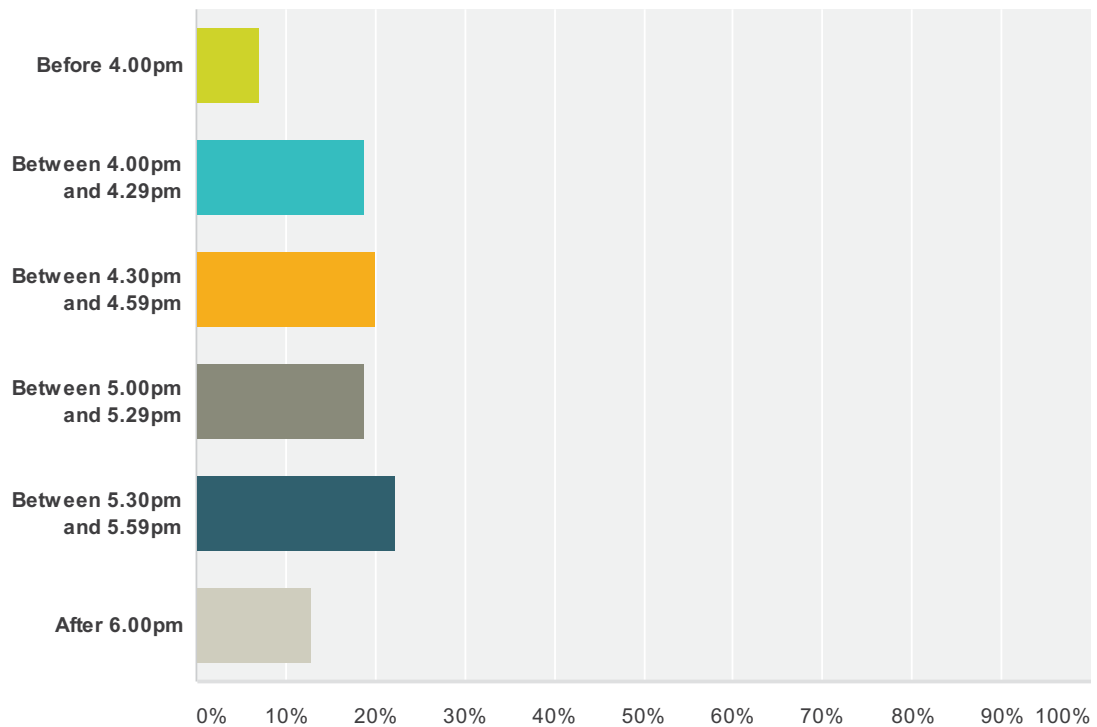
Answer Choices	Responses	
Before 7.00am	8.24%	7
Between 7.00am and 7.29am	25.88%	22
Between 7.30am and 7.59am	35.29%	30
Between 8.00am and 8.29am	23.53%	20
After 8.30am	7.06%	6
<b>Total</b>		<b>85</b>



## St Catherine's School Travel Survey (for Staff)

### Q6 What time do you typically leave work?

Answered: 85 Skipped: 18



Answer Choices	Responses	
Before 4.00pm	7.06%	6
Between 4.00pm and 4.29pm	18.82%	16
Between 4.30pm and 4.59pm	20.00%	17
Between 5.00pm and 5.29pm	18.82%	16
Between 5.30pm and 5.59pm	22.35%	19
After 6.00pm	12.94%	11
<b>Total</b>		<b>85</b>

St Catherine's School Travel Survey (for Staff)

**Q7 What postcode are you most likely to travel to school from in the morning? (This may be the postcode in which you live)**

Answered: 84 Skipped: 19

St Catherine's School Travel Survey (for Staff)

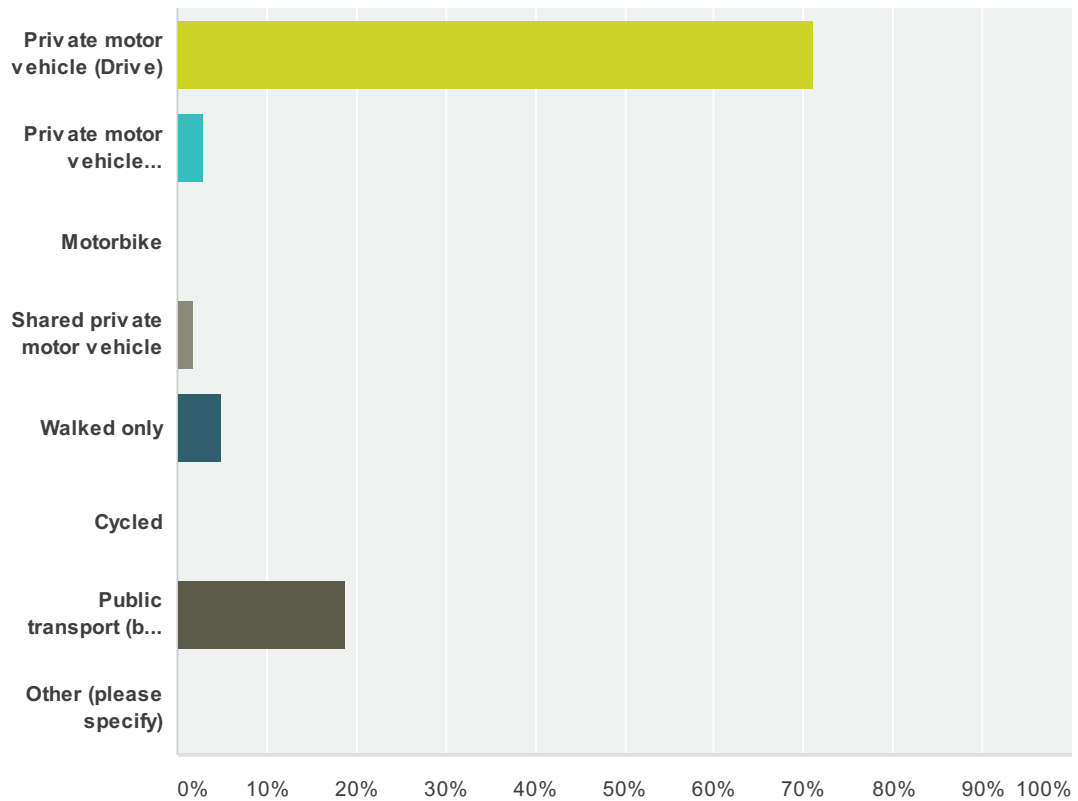
**Q8 What postcode are you most likely to travel to from school in the afternoon? (This may be the postcode in which you live)**

Answered: 84 Skipped: 19

## St Catherine's School Travel Survey (for Staff)

### Q9 On a typical day, how are you most likely to arrive / travel to work?

Answered: 101 Skipped: 2

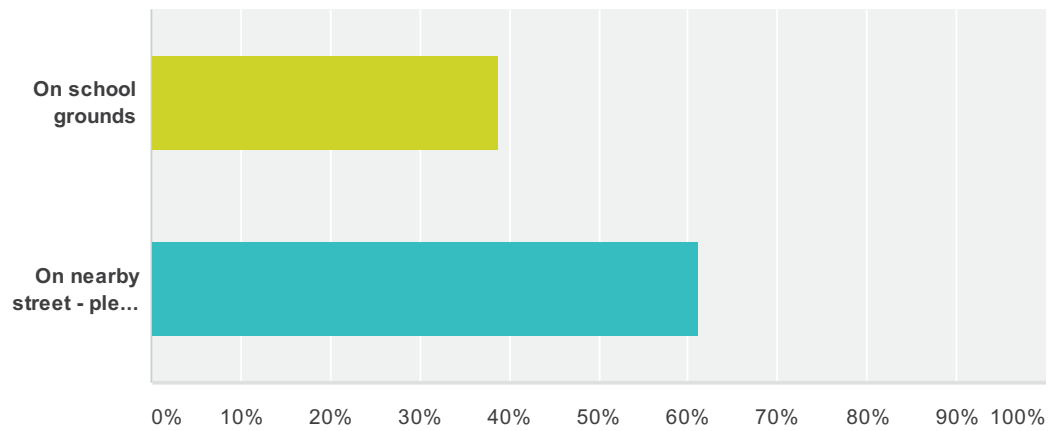


Answer Choices	Responses	
Private motor vehicle (Drive)	71.29%	72
Private motor vehicle (Dropped-off)	2.97%	3
Motorbike	0.00%	0
Shared private motor vehicle	1.98%	2
Walked only	4.95%	5
Cycled	0.00%	0
Public transport (bus and or train)	18.81%	19
Other (please specify)	0.00%	0
<b>Total</b>		<b>101</b>

## St Catherine's School Travel Survey (for Staff)

### Q10 Where are you most likely to park?

Answered: 72 Skipped: 31



Answer Choices	Responses	
On school grounds	38.89%	28
On nearby street - please specify	61.11%	44
Total		72

St Catherine's School Travel Survey (for Staff)

**Q11 You indicated that you ride share to work, how many other St. Catherine's School staff share the car?**

Answered: 2 Skipped: 101

St Catherine's School Travel Survey (for Staff)

**Q12 What is the primary reason you drive/ride a private vehicle to work?**

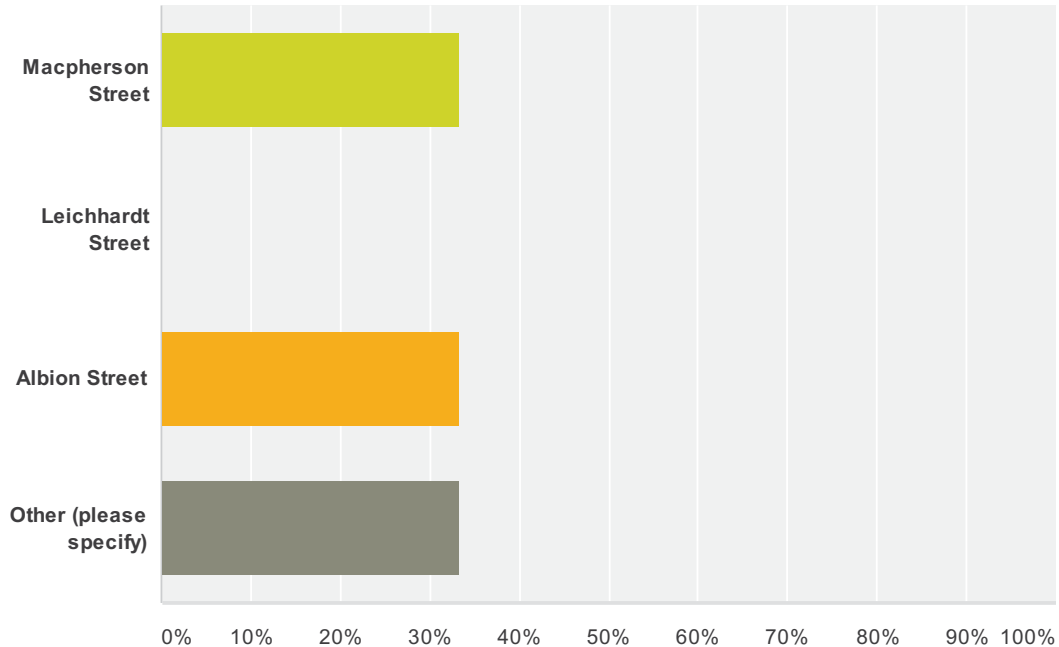
Answered: 74 Skipped: 29



## St Catherine's School Travel Survey (for Staff)

### Q13 When you get dropped off in the morning by a private motor vehicle, where are you most likely to get dropped off?

Answered: 3 Skipped: 100

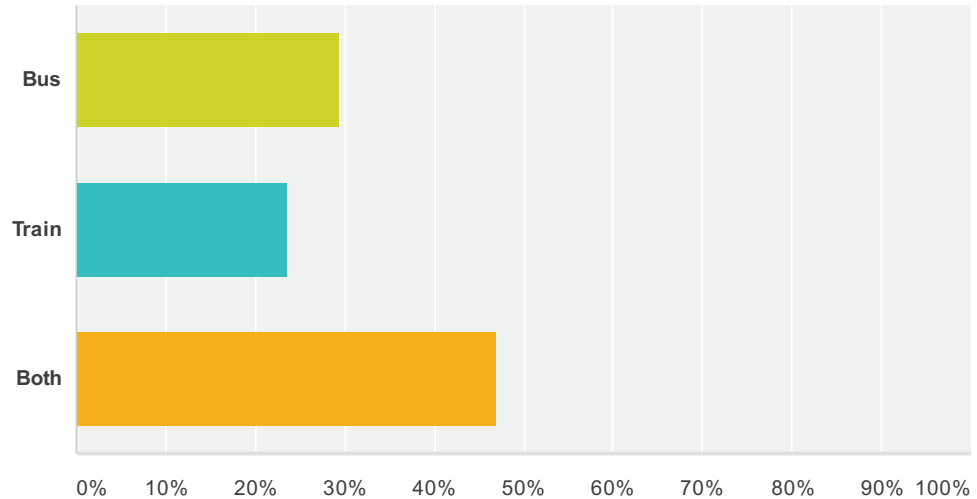


Answer Choices	Responses	
Macpherson Street	33.33%	1
Leichhardt Street	0.00%	0
Albion Street	33.33%	1
Other (please specify)	33.33%	1
Total		3

## St Catherine's School Travel Survey (for Staff)

### Q14 Do you take a bus or train to work in the morning? (Please indicate if you take both)

Answered: 17 Skipped: 86



Answer Choices	Responses
Bus	29.41% 5
Train	23.53% 4
Both	47.06% 8
Total	17

## St Catherine's School Travel Survey (for Staff)

**Q15 Please provide details of the bus and/or train journey to work. If you take more than one train and bus, please indicate all of these below. Please indicate the departure and arrival details for each station/stop. (e.g. if you take the Western and Eastern Suburbs lines, then a 400 bus indicate the station you originally get on, transferred to and finally off from, as well as the bus stop you got on and off from. Also indicate the departure times from the stations/stop you get on.)**

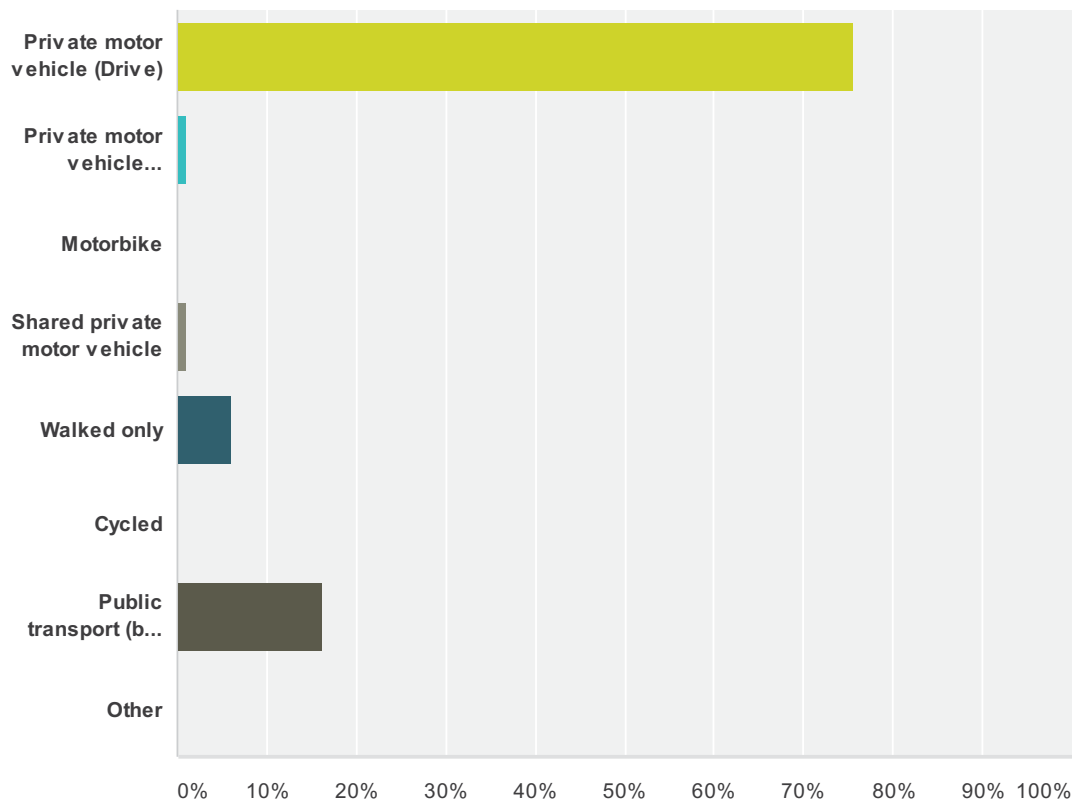
Answered: 17 Skipped: 86

Answer Choices	Responses	
Train departure station(s)	70.59%	12
Train line(s)	64.71%	11
Train departure time(s)	52.94%	9
Train arrival station	64.71%	11
Bus departure stop(s)	88.24%	15
Bus route number(s)	94.12%	16
Bus departure time(s)	76.47%	13
Bus arrival stop	88.24%	15

## St Catherine's School Travel Survey (for Staff)

### Q16 On a typical day, how are you most likely to travel home/depart from work?

Answered: 98 Skipped: 5

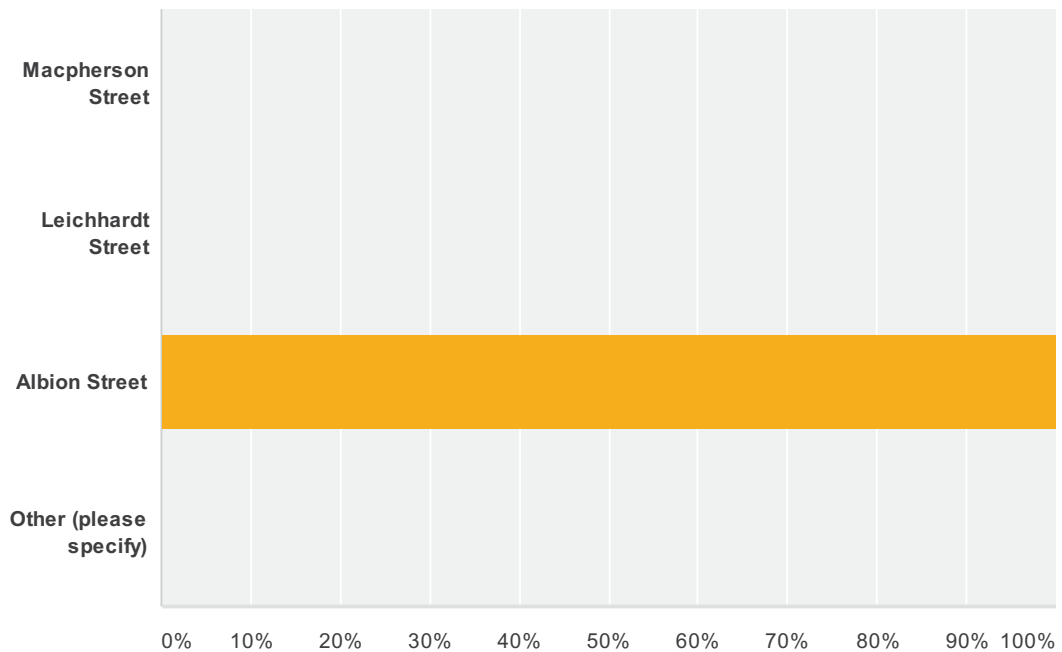


Answer Choices	Responses	
Private motor vehicle (Drive)	75.51%	74
Private motor vehicle (Dropped-off)	1.02%	1
Motorbike	0.00%	0
Shared private motor vehicle	1.02%	1
Walked only	6.12%	6
Cycled	0.00%	0
Public transport (bus and or train)	16.33%	16
Other	0.00%	0
<b>Total</b>		<b>98</b>

## St Catherine's School Travel Survey (for Staff)

### Q17 When you get picked up in the afternoon by a private motor vehicle, where are you most likely to get picked up?

Answered: 1 Skipped: 102



Answer Choices	Responses
Macpherson Street	0.00% 0
Leichhardt Street	0.00% 0
Albion Street	100.00% 1
Other (please specify)	0.00% 0
Total	1

St Catherine's School Travel Survey (for Staff)

**Q18 If you ride share home from work, how many other St. Catherine's School staff share the car?**

Answered: 1   Skipped: 102

St Catherine's School Travel Survey (for Staff)

**Q19 What is the primary reason you drive/ride a private vehicle from work? (please indicate if same reason as you drive/ride to work)**

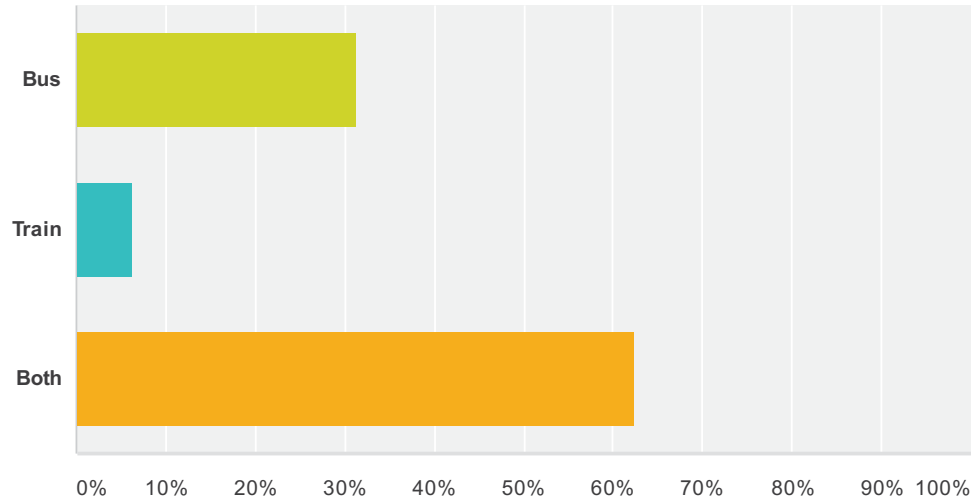
Answered: 75 Skipped: 28



## St Catherine's School Travel Survey (for Staff)

### Q20 Do you take a bus or train from work in the afternoon? (Please indicate if you take both)

Answered: 16 Skipped: 87



Answer Choices	Responses
Bus	31.25% 5
Train	6.25% 1
Both	62.50% 10
Total	16

## St Catherine's School Travel Survey (for Staff)

**Q21 Please provide details of the bus and/or train journey from work. If you take more than one train and bus, please indicate all of these below. Please indicate the departure and arrival details for each station/stop. (e.g. if you take the Western and Eastern Suburbs lines, then a 400 bus indicate the station you originally get on, transferred to and finally off from, as well as the bus stop you got on and off from. Also indicate the departure times from the stations/stop you get on.)**

Answered: 16 Skipped: 87

Answer Choices	Responses	
Train departure station(s)	68.75%	11
Train line(s)	68.75%	11
Train departure time(s)	56.25%	9
Train arrival station	68.75%	11
Bus departure stop(s)	87.50%	14
Bus route number(s)	87.50%	14
Bus departure time(s)	75.00%	12
Bus arrival stop	87.50%	14

St Catherine's School Travel Survey (for Staff)

**Q22 Do you have any suggestions to help reduce traffic congestion in and around St. Catherine's School in the morning or afternoon?**

Answered: 55 Skipped: 48

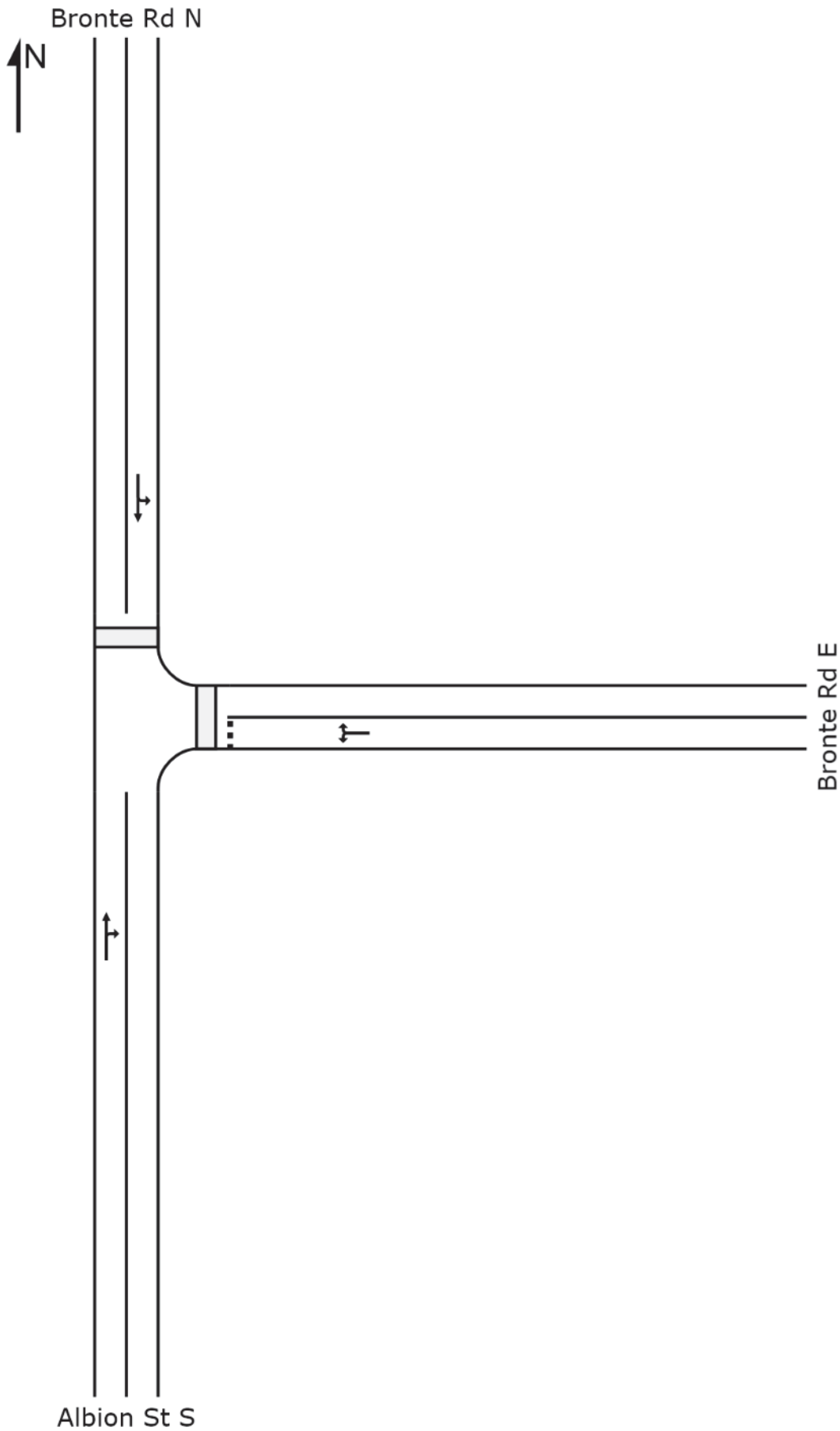
## Appendix C

### SIDRA results

# SITE LAYOUT

▽ Site: AM Existing

Albion St / Bronte Rd  
Giveaway / Yield (Two-Way)



# MOVEMENT SUMMARY

 **Site: AM Existing**

Albion St / Bronte Rd  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
2	T1	325	34.0	0.599	5.1	LOS A	5.8	48.3	0.56	0.74	53.2
3	R2	217	3.0	0.599	10.6	LOS A	5.8	48.3	0.56	0.74	51.2
Approach		542	21.6	0.599	7.3	NA	5.8	48.3	0.56	0.74	52.4
East: Bronte Rd E											
4	L2	126	0.0	0.281	7.8	LOS A	1.0	7.3	0.44	0.75	51.9
6	R2	167	2.0	0.281	7.7	LOS A	1.0	7.3	0.44	0.75	51.4
Approach		294	1.1	0.281	7.7	LOS A	1.0	7.3	0.44	0.75	51.6
North: Bronte Rd N											
7	L2	248	8.0	0.619	10.0	LOS A	6.4	54.6	0.59	0.73	51.8
8	T1	297	38.0	0.619	4.4	LOS A	6.4	54.6	0.59	0.73	53.4
Approach		545	24.3	0.619	7.0	NA	6.4	54.6	0.59	0.73	52.7
All Vehicles		1381	18.3	0.619	7.3	NA	6.4	54.6	0.55	0.74	52.3

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

▽ Site: AM Future

Albion St / Bronte Rd  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
2	T1	373	34.0	0.662	6.0	LOS A	7.5	62.6	0.59	0.80	52.6
3	R2	217	3.0	0.662	11.5	LOS A	7.5	62.6	0.59	0.80	50.7
Approach		589	22.6	0.662	8.1	NA	7.5	62.6	0.59	0.80	51.9
East: Bronte Rd E											
4	L2	126	0.0	0.298	8.0	LOS A	1.1	7.9	0.46	0.76	51.8
6	R2	172	2.0	0.298	8.0	LOS A	1.1	7.9	0.46	0.76	51.2
Approach		298	1.2	0.298	8.0	LOS A	1.1	7.9	0.46	0.76	51.4
North: Bronte Rd N											
7	L2	253	8.0	0.635	10.3	LOS A	6.9	58.6	0.60	0.74	51.7
8	T1	306	38.0	0.635	4.6	LOS A	6.9	58.6	0.60	0.74	53.3
Approach		559	24.4	0.635	7.2	NA	6.9	58.6	0.60	0.74	52.5
All Vehicles		1446	18.9	0.662	7.7	NA	7.5	62.6	0.57	0.77	52.0

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Monday, 18 August 2014 10:25:10 AM

SIDRA INTERSECTION 6.0.24.4877

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Albion.sip6  
8000047, 6019197, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

**SIDRA**  
**INTERSECTION 6**



# MOVEMENT SUMMARY

▽ Site: PM Existing

Albion St / Bronte Rd  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
2	T1	289	34.0	0.555	5.3	LOS A	4.7	38.9	0.53	0.69	53.1
3	R2	169	3.0	0.555	10.8	LOS A	4.7	38.9	0.53	0.69	51.2
Approach		459	22.6	0.555	7.4	NA	4.7	38.9	0.53	0.69	52.4
East: Bronte Rd E											
4	L2	105	0.0	0.256	8.1	LOS A	0.9	6.5	0.50	0.79	51.7
6	R2	143	4.0	0.256	8.0	LOS A	0.9	6.5	0.50	0.79	51.1
Approach		248	2.3	0.256	8.0	LOS A	0.9	6.5	0.50	0.79	51.4
North: Bronte Rd N											
7	L2	265	2.0	0.759	12.9	LOS A	11.7	101.4	0.73	0.97	49.9
8	T1	379	45.0	0.759	7.4	LOS A	11.7	101.4	0.73	0.97	51.2
Approach		644	27.3	0.759	9.7	NA	11.7	101.4	0.73	0.97	50.7
All Vehicles		1352	21.1	0.759	8.6	NA	11.7	101.4	0.62	0.84	51.4

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: PM Future**

Albion St / Bronte Rd  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
2	T1	327	34.0	0.606	6.0	LOS A	5.7	47.9	0.55	0.73	52.7
3	R2	169	3.0	0.606	11.5	LOS A	5.7	47.9	0.55	0.73	50.9
Approach		497	23.4	0.606	7.9	NA	5.7	47.9	0.55	0.73	52.1
East: Bronte Rd E											
4	L2	105	0.0	0.269	8.2	LOS A	1.0	6.9	0.52	0.80	51.6
6	R2	148	4.0	0.269	8.2	LOS A	1.0	6.9	0.52	0.80	50.9
Approach		254	2.3	0.269	8.2	LOS A	1.0	6.9	0.52	0.80	51.2
North: Bronte Rd N											
7	L2	271	2.0	0.771	13.3	LOS A	12.4	107.3	0.75	1.00	49.7
8	T1	384	45.0	0.771	7.7	LOS A	12.4	107.3	0.75	1.00	50.9
Approach		655	27.2	0.771	10.0	NA	12.4	107.3	0.75	1.00	50.4
All Vehicles		1405	21.4	0.771	8.9	NA	12.4	107.3	0.63	0.87	51.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Monday, 18 August 2014 10:25:31 AM

SIDRA INTERSECTION 6.0.24.4877

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Albion.sip6  
8000047, 6019197, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

**SIDRA  
INTERSECTION 6**

# MOVEMENT SUMMARY

▽ Site: WE Existing

Albion St / Bronte Rd  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
2	T1	368	19.0	0.678	7.1	LOS A	7.4	57.9	0.60	0.84	52.0
3	R2	208	2.0	0.678	12.6	LOS A	7.4	57.9	0.60	0.84	50.2
Approach		577	12.9	0.678	9.1	NA	7.4	57.9	0.60	0.84	51.3
East: Bronte Rd E											
4	L2	58	0.0	0.212	8.2	LOS A	0.7	4.7	0.53	0.79	51.6
6	R2	134	2.0	0.212	8.1	LOS A	0.7	4.7	0.53	0.79	51.0
Approach		192	1.4	0.212	8.2	LOS A	0.7	4.7	0.53	0.79	51.2
North: Bronte Rd N											
7	L2	289	6.0	0.792	13.9	LOS A	13.4	107.8	0.77	1.06	49.5
8	T1	405	25.0	0.792	8.3	LOS A	13.4	107.8	0.77	1.06	50.9
Approach		695	17.1	0.792	10.6	NA	13.4	107.8	0.77	1.06	50.3
All Vehicles		1463	13.4	0.792	9.7	NA	13.4	107.8	0.67	0.94	50.8

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: WE Future**

Albion St / Bronte Rd  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
2	T1	373	19.0	0.685	7.3	LOS A	7.6	59.5	0.60	0.85	51.9
3	R2	208	2.0	0.685	12.8	LOS A	7.6	59.5	0.60	0.85	50.1
Approach		581	12.9	0.685	9.2	NA	7.6	59.5	0.60	0.85	51.2
East: Bronte Rd E											
4	L2	58	0.0	0.214	8.3	LOS A	0.7	4.8	0.53	0.80	51.6
6	R2	134	2.0	0.214	8.2	LOS A	0.7	4.8	0.53	0.80	51.0
Approach		192	1.4	0.214	8.2	LOS A	0.7	4.8	0.53	0.80	51.2
North: Bronte Rd N											
7	L2	289	6.0	0.797	14.1	LOS A	13.8	110.6	0.78	1.08	49.4
8	T1	409	25.0	0.797	8.4	LOS A	13.8	110.6	0.78	1.08	50.8
Approach		699	17.1	0.797	10.8	NA	13.8	110.6	0.78	1.08	50.2
All Vehicles		1472	13.4	0.797	9.8	NA	13.8	110.6	0.68	0.95	50.7

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Monday, 18 August 2014 10:25:44 AM

SIDRA INTERSECTION 6.0.24.4877

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Albion.sip6  
8000047, 6019197, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

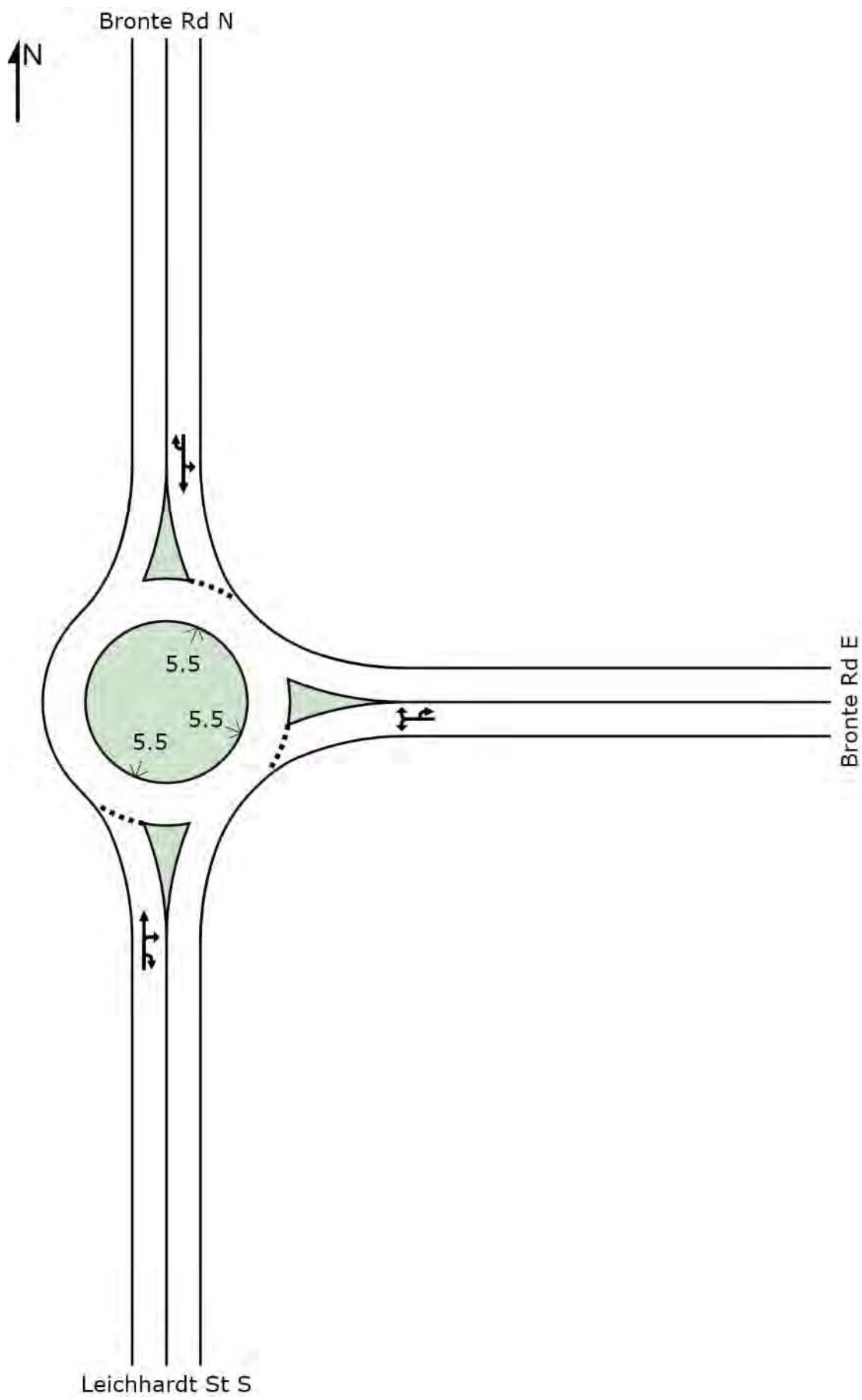
www.sidrasolutions.com

**SIDRA**  
**INTERSECTION 6**

# SITE LAYOUT

 **Site: AM Existing**

Leichhardt St / Bronte Rd  
Roundabout



# MOVEMENT SUMMARY

 **Site: AM Existing**

Leichhardt St / Bronte Rd  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
2	T1	192	1.0	0.579	6.1	LOS A	5.5	41.4	0.55	0.63	50.3
3	R2	451	13.0	0.579	8.9	LOS A	5.5	41.4	0.55	0.63	47.5
3u	U	24	0.0	0.579	10.1	LOS A	5.5	41.4	0.55	0.63	48.7
Approach		666	9.1	0.579	8.1	LOS A	5.5	41.4	0.55	0.63	48.4
East: Bronte Rd E											
4	L2	607	10.0	0.684	8.1	LOS A	7.5	56.2	0.74	0.70	47.4
6	R2	107	1.0	0.684	10.1	LOS A	7.5	56.2	0.74	0.70	49.9
6u	U	6	0.0	0.684	11.5	LOS A	7.5	56.2	0.74	0.70	48.7
Approach		721	8.6	0.684	8.5	LOS A	7.5	56.2	0.74	0.70	47.8
North: Bronte Rd N											
7	L2	119	6.0	0.387	9.5	LOS A	2.5	18.3	0.74	0.81	48.7
8	T1	154	3.0	0.387	8.9	LOS A	2.5	18.3	0.74	0.81	49.6
9u	U	14	0.0	0.387	12.8	LOS A	2.5	18.3	0.74	0.81	51.0
Approach		286	4.1	0.387	9.3	LOS A	2.5	18.3	0.74	0.81	49.3
All Vehicles		1674	8.0	0.684	8.5	LOS A	7.5	56.2	0.66	0.69	48.3

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Tuesday, 29 April 2014 5:45:39 PM

SIDRA INTERSECTION 6.0.20.4660

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Leichhardt.sip6  
8000047, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

**SIDRA**  
**INTERSECTION 6**

# MOVEMENT SUMMARY

 **Site: AM Future**

Leichhardt St / Bronte Rd  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
2	T1	196	1.0	0.599	6.2	LOS A	5.9	44.5	0.57	0.63	50.2
3	R2	458	13.0	0.599	8.9	LOS A	5.9	44.5	0.57	0.63	47.4
3u	U	38	0.0	0.599	10.1	LOS A	5.9	44.5	0.57	0.63	48.6
Approach		692	8.9	0.599	8.2	LOS A	5.9	44.5	0.57	0.63	48.4
East: Bronte Rd E											
4	L2	607	10.0	0.700	8.8	LOS A	8.1	60.8	0.77	0.73	46.8
6	R2	107	1.0	0.700	10.8	LOS A	8.1	60.8	0.77	0.73	49.4
6u	U	6	0.0	0.700	12.2	LOS A	8.1	60.8	0.77	0.73	48.1
Approach		721	8.6	0.700	9.2	LOS A	8.1	60.8	0.77	0.73	47.2
North: Bronte Rd N											
7	L2	119	6.0	0.403	9.7	LOS A	2.7	19.2	0.76	0.83	48.5
8	T1	158	3.0	0.403	9.1	LOS A	2.7	19.2	0.76	0.83	49.4
9u	U	14	0.0	0.403	13.1	LOS A	2.7	19.2	0.76	0.83	50.8
Approach		291	4.1	0.403	9.6	LOS A	2.7	19.2	0.76	0.83	49.1
All Vehicles		1703	7.9	0.700	8.8	LOS A	8.1	60.8	0.69	0.70	48.0

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Monday, 18 August 2014 10:27:24 AM

SIDRA INTERSECTION 6.0.24.4877

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Leichhardt.sip6  
8000047, 6019197, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

**SIDRA**  
**INTERSECTION 6**

# MOVEMENT SUMMARY



Site: PM Existing

Leichhardt St / Bronte Rd  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
2	T1	162	3.0	0.517	5.7	LOS A	4.7	34.2	0.45	0.61	50.4
3	R2	449	6.0	0.517	8.3	LOS A	4.7	34.2	0.45	0.61	48.1
3u	U	26	0.0	0.517	9.6	LOS A	4.7	34.2	0.45	0.61	48.9
Approach		638	5.0	0.517	7.7	LOS A	4.7	34.2	0.45	0.61	48.8
East: Bronte Rd E											
4	L2	569	13.0	0.650	8.2	LOS A	6.6	50.4	0.72	0.71	47.3
6	R2	83	1.0	0.650	10.1	LOS A	6.6	50.4	0.72	0.71	49.9
6u	U	7	0.0	0.650	11.5	LOS A	6.6	50.4	0.72	0.71	48.7
Approach		660	11.3	0.650	8.5	LOS A	6.6	50.4	0.72	0.71	47.7
North: Bronte Rd N											
7	L2	144	2.0	0.418	9.3	LOS A	2.8	19.4	0.73	0.81	49.0
8	T1	175	0.0	0.418	8.8	LOS A	2.8	19.4	0.73	0.81	49.9
9u	U	6	0.0	0.418	12.7	LOS A	2.8	19.4	0.73	0.81	51.1
Approach		325	0.9	0.418	9.1	LOS A	2.8	19.4	0.73	0.81	49.5
All Vehicles		1623	6.8	0.650	8.3	LOS A	6.6	50.4	0.62	0.69	48.5

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Tuesday, 29 April 2014 3:01:12 PM

SIDRA INTERSECTION 6.0.20.4660

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Leichhardt.sip6  
8000047, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

**SIDRA**  
**INTERSECTION 6**



# MOVEMENT SUMMARY



Site: PM Future

Leichhardt St / Bronte Rd  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
2	T1	167	3.0	0.533	5.7	LOS A	5.0	36.2	0.46	0.61	50.4
3	R2	455	6.0	0.533	8.4	LOS A	5.0	36.2	0.46	0.61	48.1
3u	U	37	0.0	0.533	9.7	LOS A	5.0	36.2	0.46	0.61	48.8
Approach		659	4.9	0.533	7.8	LOS A	5.0	36.2	0.46	0.61	48.8
East: Bronte Rd E											
4	L2	569	13.0	0.664	8.7	LOS A	7.0	53.8	0.75	0.73	46.8
6	R2	83	1.0	0.664	10.7	LOS A	7.0	53.8	0.75	0.73	49.5
6u	U	7	0.0	0.664	12.0	LOS A	7.0	53.8	0.75	0.73	48.2
Approach		660	11.3	0.664	9.0	LOS A	7.0	53.8	0.75	0.73	47.2
North: Bronte Rd N											
7	L2	144	2.0	0.431	9.7	LOS A	2.9	20.7	0.75	0.83	48.8
8	T1	180	0.0	0.431	9.1	LOS A	2.9	20.7	0.75	0.83	49.6
9u	U	6	0.0	0.431	13.1	LOS A	2.9	20.7	0.75	0.83	50.9
Approach		331	0.9	0.431	9.4	LOS A	2.9	20.7	0.75	0.83	49.3
All Vehicles		1649	6.7	0.664	8.6	LOS A	7.0	53.8	0.63	0.70	48.3

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Monday, 18 August 2014 10:27:40 AM

SIDRA INTERSECTION 6.0.24.4877

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Leichhardt.sip6  
8000047, 6019197, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

**SIDRA**  
**INTERSECTION 6**

# MOVEMENT SUMMARY

 **Site: WE Existing**

Leichhardt St / Bronte Rd  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
2	T1	112	1.0	0.586	6.2	LOS A	5.7	41.9	0.57	0.64	50.1
3	R2	562	8.0	0.586	8.9	LOS A	5.7	41.9	0.57	0.64	47.5
3u	U	1	0.0	0.586	10.1	LOS A	5.7	41.9	0.57	0.64	48.4
Approach		675	6.8	0.586	8.4	LOS A	5.7	41.9	0.57	0.64	48.0
East: Bronte Rd E											
4	L2	579	10.0	0.688	8.6	LOS A	7.9	59.4	0.78	0.72	47.0
6	R2	106	0.0	0.688	10.5	LOS A	7.9	59.4	0.78	0.72	49.6
6u	U	17	0.0	0.688	11.9	LOS A	7.9	59.4	0.78	0.72	48.3
Approach		702	8.2	0.688	9.0	LOS A	7.9	59.4	0.78	0.72	47.4
North: Bronte Rd N											
7	L2	183	0.0	0.566	12.8	LOS A	5.0	35.0	0.87	0.99	46.5
8	T1	197	0.0	0.566	12.3	LOS A	5.0	35.0	0.87	0.99	47.1
9u	U	12	0.0	0.566	16.3	LOS B	5.0	35.0	0.87	0.99	48.6
Approach		392	0.0	0.566	12.7	LOS A	5.0	35.0	0.87	0.99	46.9
All Vehicles		1768	5.9	0.688	9.6	LOS A	7.9	59.4	0.72	0.75	47.5

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Tuesday, 29 April 2014 3:03:29 PM

SIDRA INTERSECTION 6.0.20.4660

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Leichhardt.sip6  
8000047, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

**SIDRA**  
**INTERSECTION 6**

# MOVEMENT SUMMARY

 **Site: WE Future**

Leichhardt St / Bronte Rd  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
2	T1	112	1.0	0.586	6.2	LOS A	5.7	41.9	0.57	0.64	50.1
3	R2	562	8.0	0.586	8.9	LOS A	5.7	41.9	0.57	0.64	47.5
3u	U	1	0.0	0.586	10.1	LOS A	5.7	41.9	0.57	0.64	48.4
Approach		675	6.8	0.586	8.4	LOS A	5.7	41.9	0.57	0.64	48.0
East: Bronte Rd E											
4	L2	579	10.0	0.688	8.6	LOS A	7.9	59.4	0.78	0.72	47.0
6	R2	106	0.0	0.688	10.5	LOS A	7.9	59.4	0.78	0.72	49.6
6u	U	17	0.0	0.688	11.9	LOS A	7.9	59.4	0.78	0.72	48.3
Approach		702	8.2	0.688	9.0	LOS A	7.9	59.4	0.78	0.72	47.4
North: Bronte Rd N											
7	L2	183	0.0	0.566	12.8	LOS A	5.0	35.0	0.87	0.99	46.5
8	T1	197	0.0	0.566	12.3	LOS A	5.0	35.0	0.87	0.99	47.1
9u	U	12	0.0	0.566	16.3	LOS B	5.0	35.0	0.87	0.99	48.6
Approach		392	0.0	0.566	12.7	LOS A	5.0	35.0	0.87	0.99	46.9
All Vehicles		1768	5.9	0.688	9.6	LOS A	7.9	59.4	0.72	0.75	47.5

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Monday, 18 August 2014 10:27:51 AM

SIDRA INTERSECTION 6.0.24.4877

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Bronte-Leichhardt.sip6  
8000047, 6019197, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

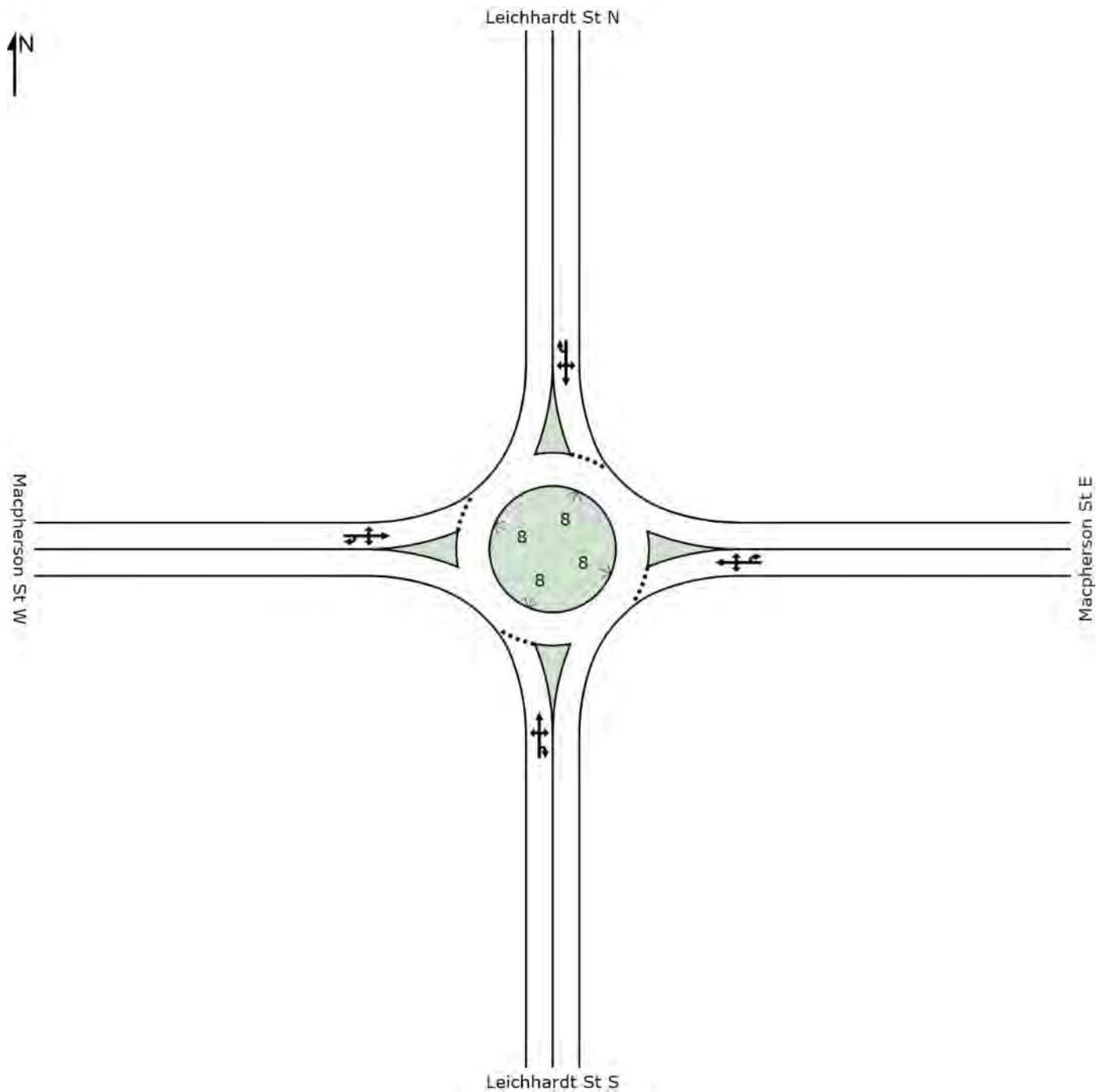
**SIDRA  
INTERSECTION 6**

# SITE LAYOUT



Site: AM Existing

Leichhardt St / Macpherson St  
Roundabout



Created: Wednesday, 7 May 2014 8:42:03 AM  
SIDRA INTERSECTION 6.0.20.4660

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Leichhardt-Macpherson.sip6  
8000047, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd  
[www.sidrasolutions.com](http://www.sidrasolutions.com)

**SIDRA**  
**INTERSECTION 6**

# MOVEMENT SUMMARY

 **Site: AM Existing**

Leichhardt St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
1	L2	37	0.0	0.429	19.4	LOS B	3.3	23.1	0.98	1.05	34.8
2	T1	118	0.0	0.429	19.3	LOS B	3.3	23.1	0.98	1.05	43.0
3	R2	6	0.0	0.429	22.3	LOS B	3.3	23.1	0.98	1.05	40.3
3u	U	1	0.0	0.429	23.8	LOS B	3.3	23.1	0.98	1.05	40.7
Approach		162	0.0	0.429	19.5	LOS B	3.3	23.1	0.98	1.05	41.5
East: Macpherson St E											
4	L2	12	0.0	0.917	30.8	LOS C	19.8	151.5	1.00	1.50	33.5
5	T1	313	13.0	0.917	30.8	LOS C	19.8	151.5	1.00	1.50	28.2
6	R2	281	9.0	0.917	33.7	LOS C	19.8	151.5	1.00	1.50	36.3
6u	U	9	0.0	0.917	35.2	LOS C	19.8	151.5	1.00	1.50	34.0
Approach		615	10.7	0.917	32.2	LOS C	19.8	151.5	1.00	1.50	32.7
North: Leichhardt St N											
7	L2	327	9.0	0.851	15.0	LOS B	16.0	120.0	1.00	0.98	44.0
8	T1	49	0.0	0.851	14.8	LOS B	16.0	120.0	1.00	0.98	45.0
9	R2	400	9.0	0.851	17.8	LOS B	16.0	120.0	1.00	0.98	40.6
9u	U	19	0.0	0.851	19.2	LOS B	16.0	120.0	1.00	0.98	46.8
Approach		796	8.2	0.851	16.5	LOS B	16.0	120.0	1.00	0.98	42.6
West: Macpherson St W											
10	L2	243	5.0	0.659	12.1	LOS A	6.9	51.4	0.88	0.97	43.6
11	T1	229	10.0	0.659	12.0	LOS A	6.9	51.4	0.88	0.97	41.0
12	R2	17	1.0	0.659	14.8	LOS B	6.9	51.4	0.88	0.97	40.9
12u	U	22	0.0	0.659	16.4	LOS B	6.9	51.4	0.88	0.97	33.4
Approach		512	6.9	0.659	12.3	LOS A	6.9	51.4	0.88	0.97	42.2
All Vehicles		2084	8.0	0.917	20.3	LOS B	19.8	151.5	0.97	1.13	39.0

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: AM Future**

Leichhardt St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
1	L2	37	0.0	0.478	24.2	LOS B	3.9	27.3	1.00	1.09	31.9
2	T1	118	0.0	0.478	24.1	LOS B	3.9	27.3	1.00	1.09	40.4
3	R2	6	0.0	0.478	27.0	LOS B	3.9	27.3	1.00	1.09	37.5
3u	U	1	0.0	0.478	28.5	LOS C	3.9	27.3	1.00	1.09	37.8
Approach		162	0.0	0.478	24.3	LOS B	3.9	27.3	1.00	1.09	38.8
East: Macpherson St E											
4	L2	12	0.0	1.012	64.9	LOS E	37.1	283.9	1.00	2.16	23.3
5	T1	335	13.0	1.012	64.9	LOS E	37.1	283.9	1.00	2.16	18.4
6	R2	303	9.0	1.012	67.8	LOS E	37.1	283.9	1.00	2.16	26.0
6u	U	9	0.0	1.012	69.2	LOS E	37.1	283.9	1.00	2.16	23.5
Approach		659	10.7	1.012	66.3	LOS E	37.1	283.9	1.00	2.16	22.4
North: Leichhardt St N											
7	L2	341	9.0	0.935	25.8	LOS B	25.4	190.0	1.00	1.25	38.2
8	T1	49	0.0	0.935	25.6	LOS B	25.4	190.0	1.00	1.25	38.9
9	R2	400	9.0	0.935	28.6	LOS C	25.4	190.0	1.00	1.25	34.2
9u	U	23	0.0	0.935	30.1	LOS C	25.4	190.0	1.00	1.25	41.1
Approach		814	8.2	0.935	27.3	LOS B	25.4	190.0	1.00	1.25	36.6
West: Macpherson St W											
10	L2	243	5.0	0.742	14.7	LOS B	9.4	69.3	0.95	1.08	41.4
11	T1	255	10.0	0.742	14.7	LOS B	9.4	69.3	0.95	1.08	38.5
12	R2	17	1.0	0.742	17.5	LOS B	9.4	69.3	0.95	1.08	38.4
12u	U	49	0.0	0.742	19.0	LOS B	9.4	69.3	0.95	1.08	30.5
Approach		564	6.7	0.742	15.2	LOS B	9.4	69.3	0.95	1.08	39.5
All Vehicles		2199	8.0	1.012	35.7	LOS C	37.1	283.9	0.99	1.47	31.3

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: PM Existing**

Leichhardt St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
1	L2	31	0.0	0.214	14.4	LOS A	1.4	10.0	0.91	0.92	38.4
2	T1	45	0.0	0.214	14.3	LOS A	1.4	10.0	0.91	0.92	46.1
3	R2	11	0.0	0.214	17.2	LOS B	1.4	10.0	0.91	0.92	43.6
3u	U	1	0.0	0.214	18.7	LOS B	1.4	10.0	0.91	0.92	44.0
Approach		87	0.0	0.214	14.7	LOS B	1.4	10.0	0.91	0.92	43.6
East: Macpherson St E											
4	L2	8	0.0	0.847	20.2	LOS B	14.3	107.2	1.00	1.24	38.8
5	T1	327	10.0	0.847	20.2	LOS B	14.3	107.2	1.00	1.24	33.9
6	R2	269	7.0	0.847	23.2	LOS B	14.3	107.2	1.00	1.24	41.4
6u	U	17	0.0	0.847	24.6	LOS B	14.3	107.2	1.00	1.24	39.5
Approach		622	8.3	0.847	21.6	LOS B	14.3	107.2	1.00	1.24	38.0
North: Leichhardt St N											
7	L2	388	12.0	0.974	39.1	LOS C	32.1	238.5	1.00	1.57	32.9
8	T1	71	0.0	0.974	38.8	LOS C	32.1	238.5	1.00	1.57	33.5
9	R2	298	3.0	0.974	41.8	LOS C	32.1	238.5	1.00	1.57	28.9
9u	U	27	0.0	0.974	43.3	LOS D	32.1	238.5	1.00	1.57	35.9
Approach		784	7.1	0.974	40.2	LOS C	32.1	238.5	1.00	1.57	31.7
West: Macpherson St W											
10	L2	306	3.0	0.796	14.6	LOS B	12.0	89.0	0.99	1.05	41.6
11	T1	293	12.0	0.796	14.6	LOS B	12.0	89.0	0.99	1.05	38.6
12	R2	18	1.0	0.796	17.4	LOS B	12.0	89.0	0.99	1.05	38.6
12u	U	58	0.0	0.796	18.9	LOS B	12.0	89.0	0.99	1.05	30.6
Approach		675	6.6	0.796	15.0	LOS B	12.0	89.0	0.99	1.05	39.7
All Vehicles		2168	7.0	0.974	26.0	LOS B	32.1	238.5	0.99	1.29	35.6

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: PM Future**

Leichhardt St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
1	L2	31	0.0	0.230	15.4	LOS B	1.6	10.9	0.93	0.94	37.6
2	T1	45	0.0	0.230	15.3	LOS B	1.6	10.9	0.93	0.94	45.4
3	R2	11	0.0	0.230	18.2	LOS B	1.6	10.9	0.93	0.94	42.8
3u	U	1	0.0	0.230	19.7	LOS B	1.6	10.9	0.93	0.94	43.2
Approach		87	0.0	0.230	15.7	LOS B	1.6	10.9	0.93	0.94	42.9
East: Macpherson St E											
4	L2	8	0.0	0.892	25.0	LOS B	18.0	134.9	1.00	1.36	36.3
5	T1	344	10.0	0.892	25.0	LOS B	18.0	134.9	1.00	1.36	31.1
6	R2	286	7.0	0.892	27.9	LOS B	18.0	134.9	1.00	1.36	39.0
6u	U	17	0.0	0.892	29.3	LOS C	18.0	134.9	1.00	1.36	36.9
Approach		656	8.3	0.892	26.3	LOS B	18.0	134.9	1.00	1.36	35.4
North: Leichhardt St N											
7	L2	394	12.0	1.052	83.2	LOS F	54.3	403.2	1.00	2.36	22.5
8	T1	71	0.0	1.052	82.9	LOS F	54.3	403.2	1.00	2.36	22.7
9	R2	298	3.0	1.052	85.9	LOS F	54.3	403.2	1.00	2.36	18.7
9u	U	33	0.0	1.052	87.4	LOS F	54.3	403.2	1.00	2.36	25.0
Approach		795	7.1	1.052	84.3	LOS F	54.3	403.2	1.00	2.36	21.3
West: Macpherson St W											
10	L2	306	3.0	0.870	19.5	LOS B	16.8	124.5	1.00	1.19	38.1
11	T1	318	12.0	0.870	19.5	LOS B	16.8	124.5	1.00	1.19	34.8
12	R2	18	1.0	0.870	22.3	LOS B	16.8	124.5	1.00	1.19	34.8
12u	U	80	0.0	0.870	23.8	LOS B	16.8	124.5	1.00	1.19	26.5
Approach		722	6.6	0.870	20.0	LOS B	16.8	124.5	1.00	1.19	35.8
All Vehicles		2260	7.0	1.052	44.3	LOS D	54.3	403.2	1.00	1.64	28.0

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

 **Site: WE Existing**

Leichhardt St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
1	L2	31	0.0	0.941	35.1	LOS C	23.6	176.7	1.00	1.60	26.3
2	T1	329	14.0	0.941	35.1	LOS C	23.6	176.7	1.00	1.60	34.7
3	R2	297	2.0	0.941	37.9	LOS C	23.6	176.7	1.00	1.60	31.9
3u	U	3	0.0	0.941	39.4	LOS C	23.6	176.7	1.00	1.60	32.2
Approach		660	7.9	0.941	36.4	LOS C	23.6	176.7	1.00	1.60	33.2
East: Macpherson St E											
4	L2	226	1.0	0.832	17.6	LOS B	13.8	98.7	1.00	1.16	40.9
5	T1	327	3.0	0.832	17.5	LOS B	13.8	98.7	1.00	1.16	36.5
6	R2	98	6.0	0.832	20.5	LOS B	13.8	98.7	1.00	1.16	43.4
6u	U	8	0.0	0.832	22.0	LOS B	13.8	98.7	1.00	1.16	41.6
Approach		660	2.7	0.832	18.1	LOS B	13.8	98.7	1.00	1.16	39.5
North: Leichhardt St N											
7	L2	83	5.0	0.753	20.4	LOS B	9.2	72.0	0.99	1.23	41.5
8	T1	298	20.0	0.753	20.5	LOS B	9.2	72.0	0.99	1.23	41.7
9	R2	52	1.0	0.753	23.2	LOS B	9.2	72.0	0.99	1.23	38.0
9u	U	21	0.0	0.753	24.7	LOS B	9.2	72.0	0.99	1.23	44.2
Approach		454	14.2	0.753	20.9	LOS B	9.2	72.0	0.99	1.23	41.5
West: Macpherson St W											
10	L2	109	1.0	0.890	37.6	LOS C	15.6	112.6	1.00	1.49	29.6
11	T1	309	5.0	0.890	37.5	LOS C	15.6	112.6	1.00	1.49	26.0
12	R2	34	0.0	0.890	40.4	LOS C	15.6	112.6	1.00	1.49	25.9
12u	U	3	0.0	0.890	41.9	LOS C	15.6	112.6	1.00	1.49	18.0
Approach		456	3.6	0.890	37.8	LOS C	15.6	112.6	1.00	1.49	26.9
All Vehicles		2229	6.8	0.941	28.1	LOS B	23.6	176.7	1.00	1.37	35.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: WE Future**

Leichhardt St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leichhardt St S											
1	L2	31	0.0	0.957	40.0	LOS C	26.1	194.9	1.00	1.70	24.6
2	T1	329	14.0	0.957	40.1	LOS C	26.1	194.9	1.00	1.70	32.9
3	R2	297	2.0	0.957	42.9	LOS D	26.1	194.9	1.00	1.70	30.1
3u	U	3	0.0	0.957	44.4	LOS D	26.1	194.9	1.00	1.70	30.4
Approach		660	7.9	0.957	41.3	LOS C	26.1	194.9	1.00	1.70	31.4
East: Macpherson St E											
4	L2	226	1.0	0.848	18.7	LOS B	14.8	106.2	1.00	1.19	40.2
5	T1	340	3.0	0.848	18.6	LOS B	14.8	106.2	1.00	1.19	35.7
6	R2	98	6.0	0.848	21.5	LOS B	14.8	106.2	1.00	1.19	42.8
6u	U	8	0.0	0.848	23.0	LOS B	14.8	106.2	1.00	1.19	41.0
Approach		673	2.7	0.848	19.1	LOS B	14.8	106.2	1.00	1.19	38.7
North: Leichhardt St N											
7	L2	83	5.0	0.766	21.4	LOS B	9.6	75.1	1.00	1.25	40.9
8	T1	298	20.0	0.766	21.5	LOS B	9.6	75.1	1.00	1.25	41.2
9	R2	52	1.0	0.766	24.2	LOS B	9.6	75.1	1.00	1.25	37.4
9u	U	21	0.0	0.766	25.7	LOS B	9.6	75.1	1.00	1.25	43.7
Approach		454	14.2	0.766	22.0	LOS B	9.6	75.1	1.00	1.25	40.9
West: Macpherson St W											
10	L2	109	1.0	0.915	42.7	LOS D	17.7	128.1	1.00	1.57	27.8
11	T1	322	5.0	0.915	42.6	LOS D	17.7	128.1	1.00	1.57	24.2
12	R2	34	0.0	0.915	45.5	LOS D	17.7	128.1	1.00	1.57	24.1
12u	U	3	0.0	0.915	47.0	LOS D	17.7	128.1	1.00	1.57	16.5
Approach		468	3.7	0.915	42.9	LOS D	17.7	128.1	1.00	1.57	25.1
All Vehicles		2255	6.7	0.957	31.1	LOS C	26.1	194.9	1.00	1.43	33.7

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

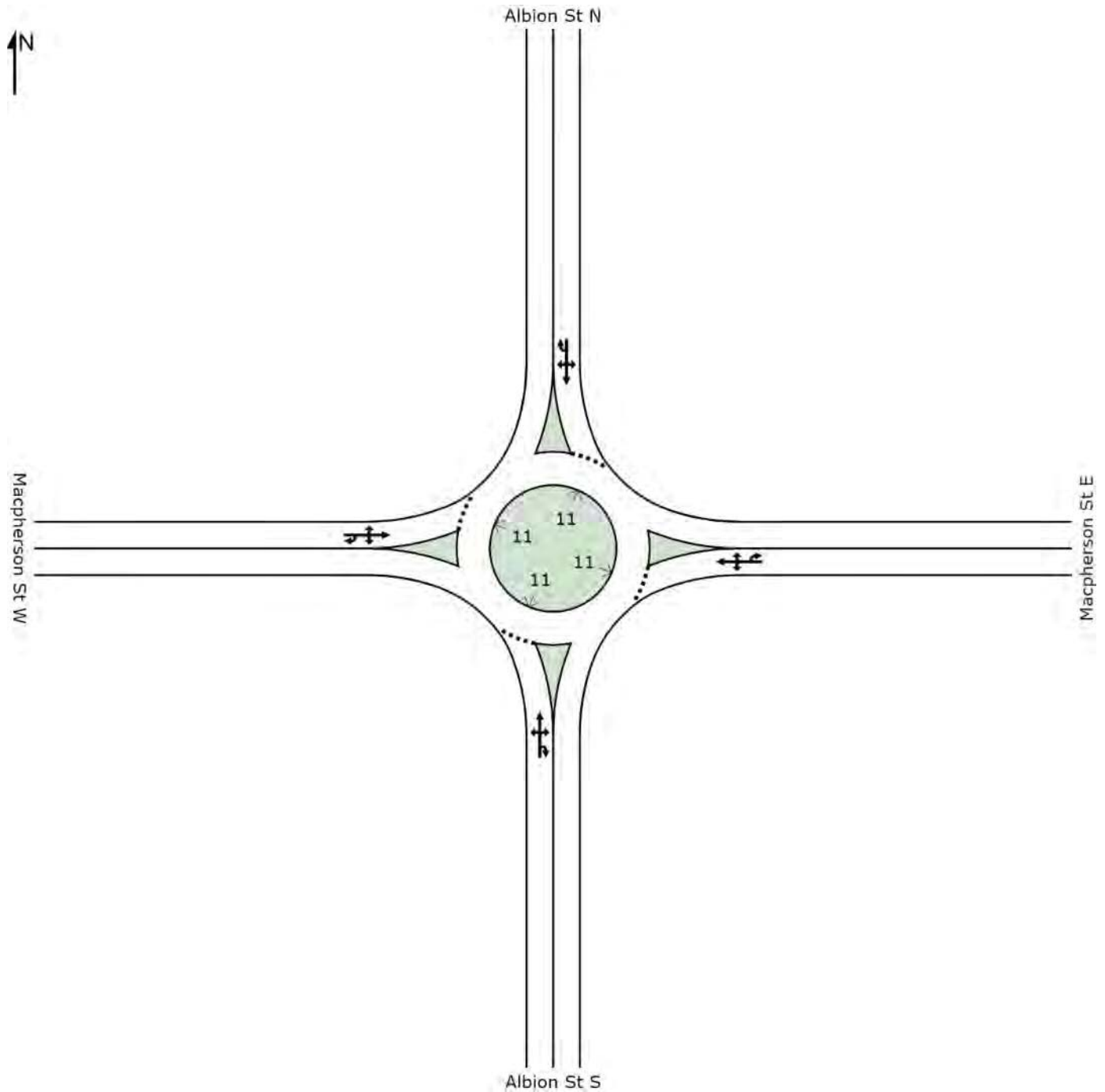
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# SITE LAYOUT



Site: AM Existing

Albion St / Macpherson St  
Roundabout



Created: Tuesday, 6 May 2014 5:00:31 PM  
SIDRA INTERSECTION 6.0.20.4660

Project: J:\236000\236045-00 St Catherines School\Work\Internal\Analysis\SIDRA\Mcpherson-Albion.sip6  
8000047, ARUP PTY LTD, PLUS / Floating

Copyright © 2000-2014 Akcelik and Associates Pty Ltd  
[www.sidrasolutions.com](http://www.sidrasolutions.com)

**SIDRA**  
**INTERSECTION 6**

# MOVEMENT SUMMARY

 **Site: AM Existing**

Albion St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
1	L2	38	0.0	0.864	25.4	LOS B	15.1	105.7	1.00	1.37	30.9
2	T1	333	0.0	0.864	25.6	LOS B	15.1	105.7	1.00	1.37	23.2
3	R2	199	0.0	0.864	29.0	LOS C	15.1	105.7	1.00	1.37	36.7
3u	U	1	0.0	0.864	30.7	LOS C	15.1	105.7	1.00	1.37	37.1
Approach		571	0.0	0.864	26.8	LOS B	15.1	105.7	1.00	1.37	28.5
East: Macpherson St E											
4	L2	242	0.0	0.866	17.5	LOS B	16.9	118.1	1.00	1.16	41.0
5	T1	403	0.0	0.866	17.7	LOS B	16.9	118.1	1.00	1.16	36.9
6	R2	120	0.0	0.866	21.1	LOS B	16.9	118.1	1.00	1.16	26.2
6u	U	18	0.0	0.866	22.8	LOS B	16.9	118.1	1.00	1.16	42.1
Approach		783	0.0	0.866	18.3	LOS B	16.9	118.1	1.00	1.16	36.7
North: Albion St N											
7	L2	77	0.0	0.522	8.2	LOS A	4.2	29.6	0.77	0.84	42.5
8	T1	268	0.0	0.522	8.4	LOS A	4.2	29.6	0.77	0.84	44.0
9	R2	68	0.0	0.522	11.8	LOS A	4.2	29.6	0.77	0.84	34.1
9u	U	27	0.0	0.522	13.5	LOS A	4.2	29.6	0.77	0.84	15.9
Approach		441	0.0	0.522	9.2	LOS A	4.2	29.6	0.77	0.84	40.8
West: Macpherson St W											
10	L2	73	0.0	0.513	11.9	LOS A	4.3	30.4	0.91	0.99	18.6
11	T1	215	0.0	0.513	12.0	LOS A	4.3	30.4	0.91	0.99	42.0
12	R2	32	0.0	0.513	15.4	LOS B	4.3	30.4	0.91	0.99	41.6
12u	U	3	0.0	0.513	17.1	LOS B	4.3	30.4	0.91	0.99	21.7
Approach		322	0.0	0.513	12.4	LOS A	4.3	30.4	0.91	0.99	36.5
All Vehicles		2117	0.0	0.866	17.8	LOS B	16.9	118.1	0.94	1.12	34.4

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: AM Future**

Albion St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
1	L2	38	0.0	0.981	54.3	LOS D	29.4	206.1	1.00	1.91	20.7
2	T1	355	0.0	0.981	54.4	LOS D	29.4	206.1	1.00	1.91	16.4
3	R2	221	0.0	0.981	57.9	LOS E	29.4	206.1	1.00	1.91	26.1
3u	U	1	0.0	0.981	59.6	LOS E	29.4	206.1	1.00	1.91	26.3
Approach		615	0.0	0.981	55.7	LOS D	29.4	206.1	1.00	1.91	20.2
East: Macpherson St E											
4	L2	261	0.0	0.947	29.1	LOS C	27.4	192.1	1.00	1.47	34.6
5	T1	422	0.0	0.947	29.3	LOS C	27.4	192.1	1.00	1.47	29.8
6	R2	120	0.0	0.947	32.7	LOS C	27.4	192.1	1.00	1.47	22.0
6u	U	32	0.0	0.947	34.4	LOS C	27.4	192.1	1.00	1.47	35.4
Approach		835	0.0	0.947	29.9	LOS C	27.4	192.1	1.00	1.47	30.5
North: Albion St N											
7	L2	77	0.0	0.578	9.8	LOS A	5.2	36.7	0.84	0.93	40.7
8	T1	279	0.0	0.578	10.0	LOS A	5.2	36.7	0.84	0.93	42.1
9	R2	74	0.0	0.578	13.4	LOS A	5.2	36.7	0.84	0.93	31.9
9u	U	32	0.0	0.578	15.1	LOS B	5.2	36.7	0.84	0.93	15.2
Approach		461	0.0	0.578	10.8	LOS A	5.2	36.7	0.84	0.93	38.7
West: Macpherson St W											
10	L2	95	0.0	0.631	15.8	LOS B	6.3	44.4	0.98	1.12	17.0
11	T1	237	0.0	0.631	16.0	LOS B	6.3	44.4	0.98	1.12	38.5
12	R2	32	0.0	0.631	19.4	LOS B	6.3	44.4	0.98	1.12	38.1
12u	U	3	0.0	0.631	21.1	LOS B	6.3	44.4	0.98	1.12	20.0
Approach		366	0.0	0.631	16.3	LOS B	6.3	44.4	0.98	1.12	32.8
All Vehicles		2277	0.0	0.981	30.8	LOS C	29.4	206.1	0.96	1.42	27.5

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: PM Existing**

Albion St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
1	L2	24	2.0	0.926	35.3	LOS C	20.5	160.2	1.00	1.59	26.2
2	T1	281	27.0	0.926	35.7	LOS C	20.5	160.2	1.00	1.59	23.5
3	R2	268	1.0	0.926	38.9	LOS C	20.5	160.2	1.00	1.59	31.9
3u	U	14	0.0	0.926	40.6	LOS C	20.5	160.2	1.00	1.59	32.2
Approach		587	13.5	0.926	37.3	LOS C	20.5	160.2	1.00	1.59	28.0
East: Macpherson St E											
4	L2	213	2.0	0.966	41.8	LOS C	28.3	203.8	1.00	1.75	29.6
5	T1	346	3.0	0.966	41.9	LOS C	28.3	203.8	1.00	1.75	24.6
6	R2	96	9.0	0.966	45.4	LOS D	28.3	203.8	1.00	1.75	18.7
6u	U	37	0.0	0.966	47.0	LOS D	28.3	203.8	1.00	1.75	30.2
Approach		692	3.4	0.966	42.6	LOS D	28.3	203.8	1.00	1.75	25.7
North: Albion St N											
7	L2	75	9.0	0.850	26.6	LOS B	13.4	113.7	1.00	1.41	28.3
8	T1	340	34.0	0.850	26.8	LOS B	13.4	113.7	1.00	1.41	28.4
9	R2	75	1.0	0.850	30.2	LOS C	13.4	113.7	1.00	1.41	19.1
9u	U	13	0.0	0.850	31.9	LOS C	13.4	113.7	1.00	1.41	13.3
Approach		502	24.5	0.850	27.4	LOS B	13.4	113.7	1.00	1.41	27.0
West: Macpherson St W											
10	L2	87	1.0	0.741	20.4	LOS B	8.9	64.6	1.00	1.21	19.9
11	T1	278	6.0	0.741	20.6	LOS B	8.9	64.6	1.00	1.21	34.8
12	R2	25	1.0	0.741	23.9	LOS B	8.9	64.6	1.00	1.21	34.7
12u	U	25	0.0	0.741	25.6	LOS B	8.9	64.6	1.00	1.21	23.0
Approach		416	4.3	0.741	21.0	LOS B	8.9	64.6	1.00	1.21	31.6
All Vehicles		2197	11.1	0.966	33.6	LOS C	28.3	203.8	1.00	1.53	27.5

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: PM Future**

Albion St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
1	L2	24	2.0	0.993	57.8	LOS E	31.7	247.7	1.00	2.03	19.8
2	T1	298	27.0	0.993	58.3	LOS E	31.7	247.7	1.00	2.03	17.7
3	R2	285	1.0	0.993	61.4	LOS E	31.7	247.7	1.00	2.03	25.0
3u	U	14	0.0	0.993	63.1	LOS E	31.7	247.7	1.00	2.03	25.2
Approach		621	13.5	0.993	59.8	LOS E	31.7	247.7	1.00	2.03	21.6
East: Macpherson St E											
4	L2	231	2.0	1.056	89.5	LOS F	52.4	377.0	1.00	2.63	19.2
5	T1	364	3.0	1.056	89.6	LOS F	52.4	377.0	1.00	2.63	14.9
6	R2	96	9.0	1.056	93.1	LOS F	52.4	377.0	1.00	2.63	12.0
6u	U	47	0.0	1.056	94.7	LOS F	52.4	377.0	1.00	2.63	19.4
Approach		738	3.3	1.056	90.4	LOS F	52.4	377.0	1.00	2.63	16.2
North: Albion St N											
7	L2	75	9.0	0.922	39.9	LOS C	19.2	162.4	1.00	1.67	22.8
8	T1	347	34.0	0.922	40.1	LOS C	19.2	162.4	1.00	1.67	22.9
9	R2	82	1.0	0.922	43.5	LOS D	19.2	162.4	1.00	1.67	14.5
9u	U	18	0.0	0.922	45.2	LOS D	19.2	162.4	1.00	1.67	10.2
Approach		522	24.1	0.922	40.8	LOS C	19.2	162.4	1.00	1.67	21.5
West: Macpherson St W											
10	L2	104	1.0	0.850	31.1	LOS C	13.3	96.5	1.00	1.39	15.7
11	T1	295	6.0	0.850	31.3	LOS C	13.3	96.5	1.00	1.39	28.9
12	R2	25	1.0	0.850	34.6	LOS C	13.3	96.5	1.00	1.39	28.8
12u	U	25	0.0	0.850	36.3	LOS C	13.3	96.5	1.00	1.39	18.5
Approach		449	4.2	0.850	31.7	LOS C	13.3	96.5	1.00	1.39	25.7
All Vehicles		2331	10.8	1.056	59.8	LOS E	52.4	377.0	1.00	2.02	19.7

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 **Site: WE Existing**

Albion St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
1	L2	31	0.0	0.909	27.6	LOS B	19.7	147.5	1.00	1.44	29.6
2	T1	329	14.0	0.909	27.9	LOS B	19.7	147.5	1.00	1.44	26.6
3	R2	297	2.0	0.909	31.2	LOS C	19.7	147.5	1.00	1.44	35.3
3u	U	3	0.0	0.909	32.9	LOS C	19.7	147.5	1.00	1.44	35.7
Approach		660	7.9	0.909	29.4	LOS C	19.7	147.5	1.00	1.44	31.1
East: Macpherson St E											
4	L2	226	1.0	0.804	15.3	LOS B	12.4	88.5	1.00	1.11	42.5
5	T1	327	3.0	0.804	15.5	LOS B	12.4	88.5	1.00	1.11	38.6
6	R2	98	6.0	0.804	18.9	LOS B	12.4	88.5	1.00	1.11	27.2
6u	U	8	0.0	0.804	20.6	LOS B	12.4	88.5	1.00	1.11	43.7
Approach		660	2.7	0.804	16.0	LOS B	12.4	88.5	1.00	1.11	38.4
North: Albion St N											
7	L2	83	5.0	0.726	17.3	LOS B	8.4	66.2	0.97	1.19	34.1
8	T1	298	20.0	0.726	17.5	LOS B	8.4	66.2	0.97	1.19	34.6
9	R2	52	1.0	0.726	20.9	LOS B	8.4	66.2	0.97	1.19	24.6
9u	U	21	0.0	0.726	22.6	LOS B	8.4	66.2	0.97	1.19	16.9
Approach		454	14.2	0.726	18.1	LOS B	8.4	66.2	0.97	1.19	33.0
West: Macpherson St W											
10	L2	109	1.0	0.856	31.2	LOS C	13.6	98.5	1.00	1.40	15.6
11	T1	309	5.0	0.856	31.5	LOS C	13.6	98.5	1.00	1.40	28.9
12	R2	34	0.0	0.856	34.8	LOS C	13.6	98.5	1.00	1.40	28.8
12u	U	3	0.0	0.856	36.5	LOS C	13.6	98.5	1.00	1.40	18.5
Approach		456	3.6	0.856	31.7	LOS C	13.6	98.5	1.00	1.40	26.1
All Vehicles		2229	6.8	0.909	23.6	LOS B	19.7	147.5	0.99	1.28	32.4

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

 **Site: WE Future**

Albion St / Macpherson St  
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albion St S											
1	L2	31	0.0	0.939	34.0	LOS C	23.6	176.6	1.00	1.59	26.8
2	T1	336	14.0	0.939	34.3	LOS C	23.6	176.6	1.00	1.59	24.1
3	R2	303	2.0	0.939	37.6	LOS C	23.6	176.6	1.00	1.59	32.5
3u	U	3	0.0	0.939	39.3	LOS C	23.6	176.6	1.00	1.59	32.9
Approach		673	7.9	0.939	35.8	LOS C	23.6	176.6	1.00	1.59	28.4
East: Macpherson St E											
4	L2	233	1.0	0.834	17.3	LOS B	14.0	100.3	1.00	1.17	41.2
5	T1	334	3.0	0.834	17.4	LOS B	14.0	100.3	1.00	1.17	37.0
6	R2	98	6.0	0.834	20.9	LOS B	14.0	100.3	1.00	1.17	26.3
6u	U	8	0.0	0.834	22.5	LOS B	14.0	100.3	1.00	1.17	42.3
Approach		673	2.7	0.834	17.9	LOS B	14.0	100.3	1.00	1.17	37.1
North: Albion St N											
7	L2	83	5.0	0.756	19.1	LOS B	9.4	73.6	0.99	1.24	32.8
8	T1	304	20.0	0.756	19.3	LOS B	9.4	73.6	0.99	1.24	33.3
9	R2	58	1.0	0.756	22.6	LOS B	9.4	73.6	0.99	1.24	23.3
9u	U	21	0.0	0.756	24.3	LOS B	9.4	73.6	0.99	1.24	16.1
Approach		466	14.1	0.756	19.9	LOS B	9.4	73.6	0.99	1.24	31.7
West: Macpherson St W											
10	L2	116	1.0	0.897	38.5	LOS C	16.5	118.8	1.00	1.51	13.7
11	T1	316	5.0	0.897	38.7	LOS C	16.5	118.8	1.00	1.51	25.8
12	R2	34	0.0	0.897	42.1	LOS C	16.5	118.8	1.00	1.51	25.8
12u	U	3	0.0	0.897	43.8	LOS D	16.5	118.8	1.00	1.51	16.3
Approach		468	3.6	0.897	39.0	LOS C	16.5	118.8	1.00	1.51	23.2
All Vehicles		2280	6.7	0.939	27.9	LOS B	23.6	176.6	1.00	1.38	30.0

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## APPENDIX B

---

CCC Letter

**Professor Roberta Ryan**  
**Chairperson**  
**St Catherine's Community Consultative Committee**  
**roberta.ryan@newcastle.edu.au**

11 October 2021

Dear Roberta,

As Chairperson of the Community Consultative Committee (CCC) for the St Catherine's Research, Performing Arts and Aquatic Centre (RPAC) development, we are writing to you regarding our concerns related to the St Catherine's Operational Transport Management Plan (OTMP) presented by Traffix at CCC meeting dated September 17<sup>th</sup>, 2021.

Our specific concerns relate to:

- Table 5 of the OTMP (Which we viewed from an email after the last meeting. (See attached)
- The collection of information from School Staff, Students and Parents
- Drop-off and pick-up zones, including illegal drop-off and pick-ups
- Survey questions

Community representatives have several concerns relating to the accuracy of the collection of data in the OTMP survey, and the impacts this inaccuracy will have on future planning and development surrounding St Catherine's School. The following expands on these concerns and outlines several recommendations for consideration.

- Table 5: It is clear from the attachment titled 'Table 5' sent by Warwick Smith, dated September 21<sup>st</sup>, that the number of participants in the survey was too low to ascertain an accurate picture of traffic conditions surrounding St Catherine's School. This is particularly apparent for numbers relating to the Junior School. For example, in Year 6 only 21 of 95 enrolments are surveyed, and for Year 4 only 17 of 49 enrolments. This is also evident in the low participation rate of staff. Given the importance of the survey for the future enrolments of the school, and for the confidence of the local community, it is important the information is accurate and reflective of conditions.

*Community representatives recommend another survey be conducted, with minimum 80% participation for parents and students.*

*Community representatives recommend compulsory participation by all Staff of St Catherine's School.*

*Community representatives recommend Table 5 be submitted with the OTMP Department of Planning as it demonstrates the scope of the sample for the survey, which forms the basis of the OTMP. It provides a better understanding of the results and their accuracy.*

Community representatives feel strongly these minimum requirements are possible for St Catherine's School to fulfil to ensure trust in the veracity of the survey data.

- Review of the Survey: According to the Development Consent by the Planning Assessment Commission (Schedule 3) Community Engagement A7. c) Review, it clearly states that the CCC is to

***“Review the implementation and effectiveness of the Operational Transport Management Plan including the results of the monitoring conducted under the plan”.***

*Community representatives reserve our right to review the OPTMP as stated above. We strongly believe the monitoring is not detailed or comprehensive enough to accurately demonstrate traffic conditions around St Catherine’s School.*

Drop-off and pick-up zones: Further in the OTMP conditions:

***A8 b), prior to the issue of any Occupation Certificate the RPAC must include details regarding the travel strategies and the final traffic management measures (including details for the management of the drop-off pick-up zones, including training for supervising staff/traffic controllers) and taking the monitoring results (required in condition A9) into account. Additionally, according to A9, the OTMP must provide details for each of the travel strategies and must address the following matters for each of the travel strategies; objectives and targets; timing; responsibility; funding; implementation; monitoring regime to evaluate each strategy; and monitoring of whether the overall strategies are meeting the targeted reductions in private car trips.***

It is clear from the survey results there are some issues monitoring pick-ups and drop-offs. For example, Table 7 on Page 38 of the Report (Drop-offs and pickups Counts Site 4 Leichhardt Street). This is the drop-off pick-up zone for Junior School students who are younger and less likely to take public transport or walk to school. In Table 7, the report details 6 drop-offs in the morning and 11 pick-ups in the afternoon. This is out of around 312 enrolments in the Junior School. And included in this report it details that around 60% of all students travel to school by car. When contrasted in this way we can clearly see there is inconsistency in these numbers. These results do not reflect local, lived experience, of what is occurring on Leichhardt Street. Most days the cars are backed to Macpherson Street with cars waiting to pull up, and staff are opening car doors to ensure the drop-offs are fast. Outside of these zones, there is consistent illegal drop-offs including parents pulling into residential driveways or stopping mid-traffic. It is clear from the traffic count, particularly in Bronte Road, there is a higher increase in traffic during school term, in an area where there are no official drop-off zones.

*Community representatives recommend a multi-day, multi-week survey is conducted, to improve the accuracy of data, particularly relating to drop-off and pick-up zones, including illegal drop-off and pick-ups.*

*Community representatives recommend clarification on why these illegal drop offs are not included in the original OTMP.*

- Survey questions: The OTMP report does not outline questions asked within the survey, impacting transparency and undermining trust.

*Community representatives recommend the inclusion of survey questions in the OTMP report and disclosure of these question to community representatives on the CCC.*

This matter is of the upmost importance to community representatives of the CCC and to local residents, especially the neighbours of St Catherine's School. We look forward to your swift reply, and engagement on solutions relating to the traffic conditions surrounding St Catherine's School.

Sincerely,

**Danny Caretti – Resident and DA Rep for Charing Cross Precinct**

**Julie McAlpin - Convenor Charing Cross Precinct**

**Domenic Egan – Resident and Neighbour of St Catherine's School**

**Chelsea Hunnisett – Representative of Bronte Beach Precinct**

**Kate Marshall - Resident and member of Charing Cross Precinct**

## APPENDIX C

---

Junior School Car Line Procedure Flayer



St Catherine's School  
Waverley



# Junior school car line procedures April 2018

We aim to assist you to drop-off and pick-up your children safely and efficiently, so we ask for your support by following the procedures in this brochure.

Eduardo De Mello - Operations Officer/Traffic Controller  
26 Albion Street, Waverley NSW 2024 [transport@stcaths.nsw.edu.au](mailto:transport@stcaths.nsw.edu.au)

## LEICHHARDT STREET

- Car line operates strictly from **7.50am - 8.15am** and **2.50pm - 3.20pm only** (see table for exact time). No supervision is offered before/after these times, and times are staggered to ease traffic flow.
- After 3.20pm students will be taken to out of school hours care where they will need to be collected and signed out.
- There is space for **two vehicles only**. Parents should safely pull forward two vehicles at a time.
- Staff will assist Years 1 and 2** to open car door and help with belongings from/into the boot.
- Years 3 to 6** should open the door themselves.
- Please ensure ALL school bags are placed in the **car boot**.
- Please stay in your vehicle as Leichhardt St has heavy traffic including buses during drop-off and pick-up times.
- If you are collecting children from multiple year groups including Years 5 and 6, use times for the **eldest child**.
- Do not join** the carline within the NO STOPPING zone immediately before/after the roundabout on Leichhardt St, it is illegal and heavy fines and demerits apply.

## MACPHERSON STREET

*Years 5 and 6 ONLY*

- Car line operates strictly **3pm - 3.20pm only**. **Only** join car line from time specified, otherwise you will be asked to drive around the block.
- After 3.20pm students will be taken to out of school hours care where they will need to be collected and signed out.

## REMINDERS

- Always display your visor sign
- Stay in your vehicle
- Never make a u-turn, always go with the flow

## CAR LINE TIMES

**DROP-OFF - Leichhardt St**

YEAR	FROM	TO
1-6	7.50am	8.15am

**PICK-UP - Leichhardt St**

**Only** join car line from time specified, otherwise you will be asked to drive around the block.

YEAR	FROM	TO
1	2.50pm	3.20pm
2		
3	3.05pm	
4		

**To avoid car line completely, book a seat on the school bus via the transport tab [StCathsConnect](#).**

For more information  
[stcatherines.nsw.edu.au](http://stcatherines.nsw.edu.au)  
or email  
[transport@stcaths.nsw.edu.au](mailto:transport@stcaths.nsw.edu.au)



*Thank you!*

*Don't forget...*

**NO STOPPING means NO STOPPING**  
HEAVY FINES and DEMERIT POINTS APPLY

A St Catherine's School initiative supported by:



Transport  
**Roads & Maritime  
Services**

## APPENDIX D

---

### St Catherine's Major Events Schedule



ST CATHERINE'S SCHOOL

26 Albion St, Waverley  
Stage 1 (RPAC) - Usage Profile  
Revision 14  
10/03/2017

OPERATING HOURS GENERALLY

	Mon. to Fri.	Sat. and Sun.
Auditorium	Must finish by 9:30pm (excl. Boarders dance)	
Aquatic Centre	6am to 8pm	8am to 6pm

LEGEND

	Denotes new event to take place on the St Catherine's School site
	Denotes existing event occurring on the St Catherine's School site where the attendance will increase

Event	Current indicative usage profile						Forecasted indicative usage profile					
	Day of Week	Frequency (days p/yr)	Hours	Existing facility where event is currently held	Duration of each session	Estimated current attendance at event (participants)	Day of Week	Frequency (days p/yr)	Hours	New facility where event is proposed	Duration of each session	Forecasted attendance at event (participants)
AQUATIC CENTRE												
Water Polo												
Water polo training (Term 1 and 4)	Weekdays	Everyday	7:00-8:00am 3:20-5:00pm	Outdoor Pool	1hr in the am 1 1/2 hr in the pm	30 p/session	Weekdays	4 days per week (AM) & every afternoon	6am - 8:00am & 3:30pm - 8pm	Aquatic Centre (Main Pool)	2hr session in the am 3 x 90 minute sessions in the pm	50 p/session
Water Polo (Term 1 and 4)	Saturday	Every Saturday throughout Term 1 and Term 4	7:30am - 12pm	Outdoor Pool	Approx. 45mins	22 p/session	Saturday	Every Saturday throughout Term 1 and Term 4	8am - 6pm	Aquatic Centre (Main Pool)	Approx. 45mins	44 p/session
Water Polo (Term 1 and 4) - Boys and Men's league	Sunday	NA	NA	NA	NA	NA	Sunday	Every Sunday throughout Term 1 and Term 4	8am - 6pm	Aquatic Centre (Main Pool)	Approx. 45mins	44 p/session
Winter Water Polo (Term 2 and 3)	Saturday	NA	NA	NA	NA	NA	Saturday	Every Saturday throughout Term 2 and Term 3	8am - 6pm	Aquatic Centre (Main Pool)	Approx. 45mins	44 p/session
Squad + Diving												
Squad swimming	Weekdays	2 days per week	6:00am - 8:00am 3:30pm - 6pm	Outdoor Pool	1 class of JS 45 mins (3:00-3:45) all St Caths girls twice per week. S.School 1 hour session twice per week 7-8:00am.	20 p/session	Weekdays	Every day	6am - 8:00am & 3:30pm - 8pm	Aquatic Centre (Main Pool)	2hr session in the am 3 x 90 minute sessions in the pm	40 p/session based on roughly 7 girls per lane with 6 lanes available
Diving program	Weekdays	1 day per week		Waverley College	1 hour before school	30 p/session	Weekdays	1 day per week	6am - 8:00am	Aquatic Centre (Main Pool)	2 hours	30 p/session
Diving program	Saturday	1 day per week		Waverley College	2 hours on weekend	30 p/session	Saturday	1 day per week	2:00pm-4:00pm	Aquatic Centre (Main Pool)	2 hours	30 p/session
Learn to Swim												
Learn to swim (weekdays) (6months to 5 yrs)	Weekdays	NA	NA	NA	NA	NA	Weekdays	Mon - Fri	9:30am to 2pm	Aquatic Centre (Shallow Pool)	30 minutes	24 p/session
Learn to swim (weekdays) (K-2 or +5 years)	Weekdays	Mon - Fri	7:30-8:10am 3:00-3:30pm 5:00-6:00pm	Outdoor Pool	30 minutes	4 p/session	Weekdays	Mon - Fri	7:30am to 8:00 am (St Cath's girls only)	Aquatic Centre (Shallow Pool)	30 minutes	24 p/session
Learn to swim (weekdays) (K-2 or +5 years)	Weekdays	Mon - Fri	7:30-8:10am 3:00-3:30pm 5:00-6:00pm	Outdoor Pool	30 minutes	4 p/session	Weekdays	Mon - Fri	4pm - 8pm	Aquatic Centre (Shallow Pool)	30 minutes	24 p/session
Learn to swim (weekends)	Weekends	NA	NA	NA	NA	NA	Weekends	Saturday and Sunday throughout the year	8am - 6pm	Aquatic Centre (Shallow Pool)	30 minutes	24 p/session
PERFORMING ARTS AND SOCIAL EVENTS												
School Open Day	Weekday	5	9am - 11am	Dame Joan Sutherland		120 externals	Weekday	5	9am - 11am	Performing Arts Auditorium		120 externals
School Open Night (Twilight Session - Term 1 and 4 only)	Weekday	3	5:30pm - 7:30pm	Dame Joan Sutherland		120 externals	Weekday	3	6:30pm - 8:30pm	Performing Arts Auditorium		120 externals
Rehersal Senior School Musical	Weekend	5	9am - 2pm	NIDA		60 students	Weekend	5	10am - 1pm	Performing Arts Auditorium		60 students
Senior School Musical Event	Weekday	2	6:30pm - 9:30pm	NIDA - Parade Playhouse		659 audience with orchestra pit in use	Weekday	2	6:30pm - 9:30pm	Performing Arts Auditorium		500 audience (school community)
Music Showcase	Weekday	1	7pm - 9pm	DJSC		220	Weekday	1	6:30pm - 9:30pm	Performing Arts Auditorium		500 audience (school community)
Prep - St. Cath's Got Talent	Weekday	2	3pm - 6:30pm	Dame Joan Sutherland		60 students	Weekday	2	3pm - 6:30pm	Performing Arts Auditorium		60 students
St. Cath's Got Talent Event	Weekday	1	6pm - 9pm	Dame Joan Sutherland		250 audience	Weekday	1	6:30pm - 9:30pm	Performing Arts Auditorium		500 audience (school community)
Prep - Trinity Evening	Weekday	12	3pm - 6:30pm	Dame Joan Sutherland		60 students	Weekday	12	3pm - 6:30pm	Performing Arts Auditorium		60 students
Trinity Evening	Weekday	1	6pm - 10pm	Dame Joan Sutherland		250 audience	Weekday	1	6:30pm - 9:30pm	Performing Arts Auditorium		500 audience (school community)
Reherse BTC Showcase Event	Weekday	11	3pm - 6:30pm	Dame Joan Sutherland		60 students	Weekday	11	3pm - 6:30pm	Performing Arts Auditorium		60 students
BTC Showcase Event	Weekday	2	6pm - 9pm	Dame Joan Sutherland		250 audience	Weekday	2	6:30pm - 9:30pm	Performing Arts Auditorium		500 audience (school community)
Infants Christmas Musical Rehersal	Weekday	3	9am - 5pm	Dame Joan Sutherland		130 students	Weekday	3	9am - 5pm	Performing Arts Auditorium		130 students
Infants Christmas Musical	Weekday	1	9am - 12pm	Dame Joan Sutherland		250 audience	Weekday	1	9am - 12pm	Performing Arts Auditorium		300 audience
Junior Musical Rehersal	Weekend	2	9am - 5pm	Dame Joan Sutherland		150 students	Weekend	2	9am - 5pm	Performing Arts Auditorium		150 students
Junior Musical Rehersal	Weekday	2	During school hours	Dame Joan Sutherland		150 students	Weekday	2	During school hours	Performing Arts Auditorium		150 students
Junior Musical	Weekday	2	6:30pm - 9:30pm	Dame Joan Sutherland		250 audience	Weekday	2	6:30pm - 9:30pm	Performing Arts Auditorium		400 audience
Stage 2 Music Evening Rehersal	Weekday	2	During school hours	Dame Joan Sutherland		100 students	Weekday	2	During school hours	Performing Arts Auditorium		100 students
Stage 2 Music Evening	Weekday	1	6:30pm - 9:30pm	Dame Joan Sutherland		250 audience	Weekday	1	6:30pm - 9:30pm	Performing Arts Auditorium		300 audience
Stage 3 Music Evening Rehersal	Weekday	2	During school hours	Dame Joan Sutherland		150 students	Weekday	2	During school hours	Performing Arts Auditorium		150 students
Stage 3 Music Evening	Weekday	1	6:30pm - 9:30pm	Dame Joan Sutherland		250 audience	Weekday	1	6:30pm - 9:30pm	Performing Arts Auditorium		350 audience
Parent Breakfast - Junior School (K-6)	Weekday	7	7am - 9am	Jane Barker Hall		30 parents	Weekday	7	7am - 9am	Multi-Purpose Hall		30 parents
Parent Breakfast - Senior School (7-12)	Weekday	6	7am - 9am	Jane Barker Hall		45 parents	Weekday	6	7am - 9am	Multi-Purpose Hall		45 parents
Welcome Cocktail Party	Weekday	1	6pm - 9pm	Isabell Hall Wing Courtyard		600 externals (standing)	Weekday	1	6:30pm - 9:30pm	Multi-Purpose Hall		600 externals (standing)
Old Girls Union - Annual 5yr Reunion	Weekday	1	6pm - 8pm	Cloisters*		60 externals	Weekday	1	6:30pm - 8:30pm	Multi-Purpose Hall		60 externals
Allwell Scholarship Testing	Weekend	1	10am - 1pm	Dame Joan Sutherland		100 external students	Weekend	1	10am - 1pm	Multi-Purpose Hall		100 external students
Kindergarten Parents DVD evening	Weekday	1	6pm - 9pm	Nan Hind Centre		100 parents	Weekday	1	6:30pm - 9:30pm	Multi-Purpose Hall		100 parents
Old Girls Union - Mothers and Daughters Breakfast	Weekday	1	7:30am - 9:30am	Jane Barker Hall		60 (30/30 split)	Weekday	1	7:30am - 9:30am	Multi-Purpose Hall		60 (30/30 split)
Old Girls Union - Jane Barker Luncheon	Weekday	1	10:30am - 1:30pm	Jane Barker Hall		80 externals	Weekday	1	10:30am - 1:30pm	Multi-Purpose Hall		80 externals
Evening of Eminence - Junior School	Weekday	1	6pm - 8:30pm	Dame Joan Sutherland		160 parents	Weekday	1	6:30pm - 9pm	Multi-Purpose Hall		250 externals
Creative Connections	Weekday	1	4:30pm - 8:15pm	Dame Joan Sutherland + Chapel		250 (yr 12 + parents + staff)	Weekday	1	4:30pm - 8:15pm	Multi-Purpose Hall		250 (yr 12 + parents + staff)
Kindergarten Grandparents Morning	Weekday	1	8am - 11am	Nan Hind Centre		60 grandparents	Weekday	1	8am - 11am	Multi-Purpose Hall		60 grandparents
Old Girls Union Year 12 Afternoon Tea	Weekday	1	2:30pm - 4pm	Jane Barker Hall		120 students (Yr 12)	Weekday	1	2:30pm - 4pm	Multi-Purpose Hall		120 students (y12)
Blues Sports Breakfast	Weekday	1	7am - 9am	Jane Barker Hall		100 students	Weekday	1	7am - 9am	Multi-Purpose Hall		100 externals
Kindergarten Orientation Day	Weekday	1	8am - 1pm	Jane Barker Hall		50 externals	Weekday	1	8am - 1pm	Multi-Purpose Hall		50 parents
Orientation Day yr 4-11	Weekday	1	9am - 4pm	Dame Joan Sutherland		20 p/hr externals	Weekday	1	9am - 4pm	Multi-Purpose Hall		20 p/hr external
Rowing Season Launch	Weekday	1	6pm - 10pm	Nan Hind Centre		100 parents	Weekday	1	6:30pm - 9:30pm	Multi-Purpose Hall		100 external
Duke of Edinburgh Presentation Evening	Weekday	1	6pm - 9pm	Dame Joan Sutherland		90 parents	Weekday	1	6:30pm - 9:30pm	Multi-Purpose Hall		90 parents
Yr 6 Graduation Dinner	Weekday	1	6pm - 9pm	Jane Barker Hall		250 (seated)	Weekday	1	6:30pm - 9:30pm	Multi-Purpose Hall		250
Chairman's Thank You Cocktail Party	Weekday	1	6pm - 9pm	Cloisters*		80 (volunteers, parents etc.)	Weekday	1	6:30pm - 9:30pm	Multi-Purpose Hall		80 (volunteers, parents etc)
HSC Results Event	Weekday	1	During school hours	Cloisters*		120 students (Yr 12)	Weekday	1	During school hours	Multi-Purpose Hall		120 students (Yr 12)
Staff Christmas Lunch	Weekday	1	During school hours	Jane Barker Hall		200 (seated)	Weekday	1	During school hours	Multi-Purpose Hall		200
Allwell testing Yr 4	Weekday	1	During school hours	Dame Joan Sutherland		50 external students	Weekday	1	During school hours	Multi-Purpose Hall		50 external students
Boarders dance	Weekday	1	7pm - 10pm	Jane Barker Hall		300 external students and boards	Weekday	1	7pm - 10pm	Multi-Purpose Hall		300 external students and boarders
Boarder Parents Dinner	Weekdays	1	6:30pm - 9:30pm	Magnolia Room		40 parents	Weekdays	1	6:30pm - 9:30pm	Multi-Purpose Hall		40 parents
Valedictory Dinner	Weekdays	1	6:30pm - 9:30pm	Magnolia Room		120 (boarders + parents + staff)	Weekdays	1	6:30pm - 9:30pm	Multi-Purpose Hall		120 (boarders + parents + staff)
Boarders Xmas Dinner	Weekdays	1	6:30pm - 9:30pm	Magnolia Room		140 (boarders + parents + staff)	Weekdays	1	6:30pm - 9:30pm	Multi-Purpose Hall		140 (boarders + parents + staff)
Parent Event	Weekday	4	NA	NA		NA	Weekday	4	During school hours	Research Centre		50 parents
Book week activities	Weekday	5	During school hours	Senior/Junior Library		Students only	Weekday	5	During school hours	Research Centre		Students + parental involvement
Boarders after school tutorials	Weekdays	Weekdays throughout the yr	3:20pm - 9pm	Lenthall Building		70 students/tutors mix	Weekday	Weekdays throughout the yr	3:20pm - 9pm	Research Centre		70 students/tutors mix
Speech Night Guest Supper	Weekday	1	5:30pm - 7:00pm	Reception Room		30 (parents + school council)	Weekday	1	6:30pm - 8:00pm	Board Room		30 (parents + school council + staff)

Conditions of Consent Impacting Use

- E5 a) all performing arts and social evening events (starting after 5pm) shall not commence until 6:30pm  
E5 b) all performing arts and social evening events must finish by 9:30pm except for the annual boarders dance which shall finish by 10pm  
E5 c) the inclusion of non-school student participants is limited to either the squad swimming or the water polo training evening sessions (from 6pm)  
E5 d) 'learn to swim' for non-students on weekdays outside of school hours is only permitted after 4pm  
E5 e) a minimum 15 minutes transition period shall be provided between scheduled sessions for each activity on weekends

F1) An up to date event schedule shall be maintained and must:

- o a) identify the dates for all the annual events (excl. student only events), time of events and the number of attendees  
o b) be displayed in a convenient and publicly accessible location or distributed to surrounding residents on an annual basis, including notification of any changes to events  
o c) establish a notification process (e.g. letterbox drop or e-comm.) for informing surrounding residents within 1x week to a fortnight before the event of the upcoming event

F8) The hours of operation for the aquatic centre shall be restricted to between:

- o a) 6am and 8pm; Mondays to Fridays inclusive  
o b) 8am and 6pm; Saturdays and Sundays

F9) the aquatic centre must not be used by external attendees when any evening or weekend events are being held in the auditorium hall

## APPENDIX E

---

### St Catherine's School Travel Access Guide

St Catherine's students are encouraged to take advantage of the wide range of convenient transport options available.

Most students travel to school on public bus and rail services. When planning your daughter's trip to school we recommend consulting the **TripView app** for detailed information on Sydney trains and buses.



**Bondi Junction** is the nearest retail and commercial centre to St Catherine's. It is connected to Sydney's Central Station by rail. The Transport NSW site may be helpful and it offers information in a number of languages [www.transportnsw.info](http://www.transportnsw.info) or call **131 500**.

## Public transport

From the **Bondi Junction** rail and bus interchange buses **400, 440, 353, 348, 316 and 314** all stop close to the School.

## Travel pass

The **School Opal card** enables free travel for eligible school students on public transport between home and school on trains, buses and ferries, within the Opal network.

Students need to live a minimum distance from St Catherine's to be eligible for a **School Opal card**.

The distances are:

<b>Years K-2</b> Infants	No minimum distance.
<b>Years 3-6</b> Primary	1.6km straight line distance or 2.3km walking or further.
<b>Years 7-12</b> Secondary	2.0km straight line distance or 2.9km walking or further.

## St Catherine's School private bus service

The School provides subsidised private bus services to students from Monday to Friday. There are three bus routes in surrounding suburbs:

**Taren Point:** Little Bay, Malabar, Matraville, Maroubra, Randwick

**Randwick:** Kingsford, Kensington, Centennial Park, Clovelly, Randwick

**Maroubra:** Pagewood, Maroubra, South Coogee, Coogee

See our website for route details: [www.stcatherines.nsw.edu.au/about/our-school/Pages/Transport](http://www.stcatherines.nsw.edu.au/about/our-school/Pages/Transport)

Email the school for more information: [transport@stcaths.nsw.edu.au](mailto:transport@stcaths.nsw.edu.au)

## Green transport

The School supports annual health and environmental initiatives such as the national Walk Safely to School Day and encourages all students, and staff, to try whenever possible, to 'Go Green to School'. Visit Local Pathways - Green Links for picturesque walks to and from the school: [www.waverley.nsw.gov.au/greenlinks](http://www.waverley.nsw.gov.au/greenlinks)

## APPENDIX F

---

### Student Travel Mode Surveys



## St Catherine's School

Waverley

### St Catherine's School - Waverley - 2021 Travel Survey (STUDENT or PARENT ON BEHALF)

Please complete within one (1) week of receiving this.

**For parents/guardians completing the survey on behalf of students, please complete one survey for each student in the household**

\* 1. Please enter the Street, Suburb and Postcode you usually travel from to attend St Catherine's School?

Street:

Suburb:

Postcode:

\* 2. What school year are you currently in at St Catherine's School?

☐ Kindergarten

☐ Year 7

☐ Year 1

☐ Year 8

☐ Year 2

☐ Year 9

☐ Year 3

☐ Year 10

☐ Year 4

☐ Year 11

☐ Year 5

☐ Year 12

☐ Year 6

\* 3. Do you have any sisters also attending St Catherine's School?

☐ No

☐ Yes. (please specify how many)



\* 4. What time do you usually arrive at school each weekday?

Note: Tick One box per Column

	MON	TUE	WED	THU	FRI
Before 7:00am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:00 - 7:29am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:30 - 7:59am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8:00 - 8:20am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After 8:20am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\* 5. What time do you usually depart from school each weekday?

Note: Tick One box per Column

	MON	TUE	WED	THU	FRI
Before 2:00pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2:00 - 2:29pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2:30 - 2:59pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3:00 - 3:29pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3:30 - 3:59pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4:00 - 4:30pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After 4:30pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\* 6. How do you travel to School, from home?

Note: Tick One box per Column

	MON	TUE	WED	THU	FRI
Walk only (from home to school)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car as passenger (Dropped-Off)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
St Catherine's Bus Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public transport (Sydney Bus and/or Sydney Train)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car as driver (for senior students with licence)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. If you travel to school as a passenger in a car, how many additional passengers (excluding yourself) that are also St Catherine's Student(s), share the car ride to school?

☐ 0, None

☐ 3

☐ 1

☐ 4

☐ 2

Comments

8. If you travel to school as a passenger in a car, where are you dropped off?

☐ Macpherson Street

☐ Albion Street

☐ Leichhardt Street

☐ Parent/caretaker parks and walks you to the school entrance

☐ Other (Please specify Street)

\* 9. How do you travel home, from school?

Note: Tick One box per Column

	MON	TUE	WED	THU	FRI
Walk only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car as passenger (picked-up)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
St Catherine's Bus Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public transport (Sydney Bus and/or Sydney Train)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car as driver (for senior students with licence)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. If you travel home from school as a passenger in a car, how many additional passengers (excluding yourself) that are also St Catherine's Student(s), share the car ride home?

☐ 0, None

☐ 3

☐ 1

☐ 4

☐ 2

Comments

11. If you travel home from school as a passenger in a car, where are you picked-up from in the afternoon?

☐ Macpherson Street

☐ Albion Street

☐ Leichhardt Street

☐ Parent/caretaker walks you from the school gate to the parked car

☐ Other (Please specify Street)

12. If you use the St Catherine's Bus Service to travel to and from school, please specify which bus route you use: (Refer to St Catherine's Bus Service Route Map presented after question 13)

☐ Taren Point

☐ Randwick

☐ Maroubra

☐ Bondi

13. If you do not currently use the St Catherine's Bus Service, could you please tell us why? (Multiple answers are accepted)

For all Bus Services Available, please see the map or visit the link below.

☐ I do not know about this bus service

☐ My parent/caretaker drops me off and picks me up to/from school

☐ The bus service is too expensive

☐ The timetable of the bus services does not suit my schedule (e.g. extracurricular activities)

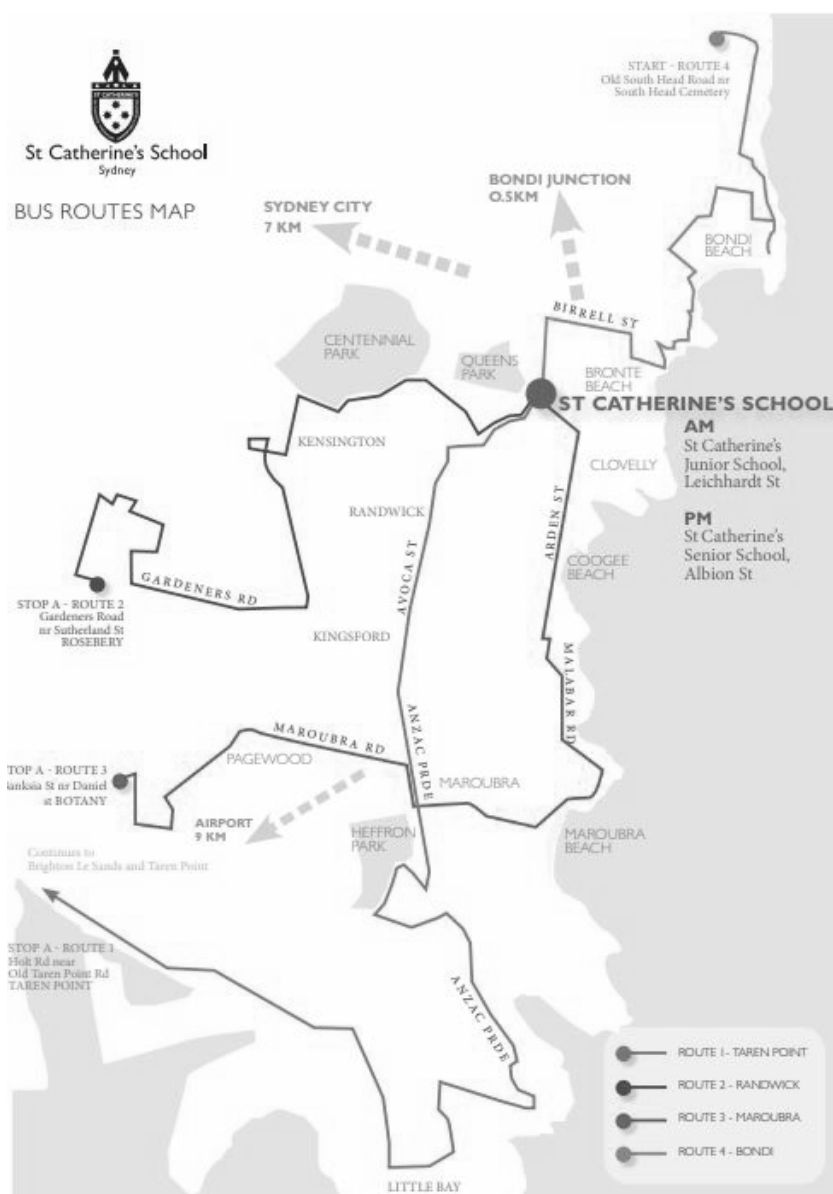
☐ The bus service routes do not pass by my house or is not close enough

Other (please specify) or provide comments



## St Catherine's Bus Service Route Map

<https://www.stcatherines.nsw.edu.au/About/Documents/Bus%20services%20NOV%202020%282%29.pdf>



14. If St Catherine's School expanded its existing bus service to your suburb, would you consider using this service?

☐ Yes

☐ No (please specify, why not)

15. If you do not currently walk to school, could you please tell us why? (Multiple answers are accepted)

☐ Carrying bag that is too heavy or too many items

☐ My parent/guardian drops me off and/or picks me up by car

☐ Walking route is unsafe

☐ Hilly topography surrounding the school

☐ Too far to walk

Other (please specify) or provide comments

16. What would encourage you to walk, or take public transport to School? (or reasons why you do not)

17. Would any of the following encourage you to choose an alternative to the private car for your journey to and from school? (Multiple answers are accepted)

☐ Further discounted/subsidised bus service

☐ Change in school policy to allow cycling to school

☐ House Points

☐ A multi-day once a term

☐ Access to School organised car-pooling scheme

☐ Nothing

Other (please specify) or provide comments

18. Thank you for participating in this survey. This information will be used to assist St Catherine's School study into reducing traffic congestion around the school particularly during the morning drop-off and afternoon pick-up periods.

If you have any further suggestions, we would love to hear your feedback.

**We thank you for your valuable time and input.**

**Note: The aggregated data collected in this survey will be made public.**

## APPENDIX G

---

### Staff Travel Mode Surveys



# St Catherine's School

Waverley

## St Catherine's School - Waverley - 2021 Travel Survey (STAFF)

Please complete within one (1) week of receiving this.

Please note that there is no need to identify oneself when answering this survey.

\* 1. Please enter the Street, Suburb and Postcode you typically travel to and from work (St Catherine's School)? (i.e. may be where you live)

Street:

Suburb:

Postcode:

\* 2. What is your Employment Type at St Catherine's School?

- ☐ Full-Time
- ☐ Part-Time
- ☐ Casual

\* 3. What time do you usually arrive to school on the following weekdays? (For a typical week)

Note: Tick One box per Column

	MON	TUE	WED	THU	FRI
Before 7:00am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:00 - 7:29am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:30 - 7:59am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8:00 - 8:30am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After 8:30am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\* 4. What time do you usually depart from school? (For a typical week)

Note: Tick One box per Column

	MON	TUE	WED	THU	FRI
Before 4:00pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4:00 - 4:29pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4:30 - 4:59pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5:00 - 5:29pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5:30 - 6:00pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After 6:00pm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\* 5. How do you travel between home and work? (For a typical week)

Note: Tick One box per Column

	MON	TUE	WED	THU	FRI
Do not work this day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car as driver alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car as driver with passenger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car as passenger (dropped-off / picked-up)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public transport (Bus and/or Train)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walk only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motorbike	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taxi / Uber	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. If you travel to work by car as a driver (indicated in Question 5, above), where do you most commonly park?

- ☐ Within School Grounds/Property
- ☐ On Nearby Street (kerbside parking).  
Please Specify (subject street)

7. If you have indicated above in Question 5, that you travel to/from work by "car as driver with passenger", how many passenger(s) are also St Catherine's School staff member(s)?

☐ 0 (None)

☐ 3

☐ 1

☐ 4

☐ 2

Other (Comments)

8. If you have indicated above in Question 5, that you travel to/from work by "car as passenger" is the driver also a St Catherine's School staff member?

☐ Yes

☐ No

9. What is your main reason for choosing the travel mode elected in Question 5?

☐ Cheapest

☐ Habit

☐ Quickest

☐ Personal Safety

☐ Environmentally-friendly

☐ Other commitments

☐ Lack of alternative

☐ Reliability

☐ Less stressful

Other or Comments

10. Would any of the following encourage you to choose an alternative to the car (alone) on your commute? (Multiple answers are accepted)

☐ Discounted/subsidised public transport tickets (e.g. discounted or school funded Opal Cards)

☐ Improved Bicycle facilities, such as parking, showers and lockers

☐ Bicycle purchase discount scheme

☐ Access to School organised car-pooling scheme

☐ Financial measures such as monetary incentive for opting not to drive

☐ Dedicated parking space within school for car-pool vehicles/users only (e.g. for cars with 3 or more staff)

☐ Nothing

Other or Comments

11. If you do not currently walk or cycle to work, could you please tell us why? (Please rank by order of importance, with 1 being the main reason)



Carrying bag/items that is too heavy or too many



Walking or Cycling route is unsafe



Too far to walk



Too far to cycle



Family member/partner/friend/colleague drops me off or picks me up



Hilly topography surrounding the school



Not enough bike racks or showers at work

12. Please comment on what would encourage you to cycle or walk to work?

13. Thank you for participating in this survey. This information will be used to assist St Catherine's School study into reducing traffic congestion around the school particularly during the morning drop-off and afternoon pick-up periods.

If you have any further suggestions, we would love to hear your feedback.

**We thank you for your valuable time and input.**

**Note: The aggregated data collected in this survey will be made public.**





## APPENDIX H

---

### Bus Stops & Routes Map



St Catherine's School  
Waverley



# Bus Travel

St Catherine's provides subsidised private bus services to all St Catherine's students. There are four bus routes available to students.

---

## ROUTES

ROUTE 1 - TAREN POINT SUBURBS

Taren Point, Little Bay, Malabar, Maroubra, Randwick

ROUTE 2 - RANDWICK SUBURBS

Rosebery, Kingsford, Kensington, Centennial Park, Randwick

ROUTE 3 - MAROUBRA SUBURBS

Botany, Pagewood, Maroubra, Maroubra Beach, South Coogee

ROUTE 4 - BONDI SUBURBS

Bondi, Tamarama, Bronte

---

## PAYMENT OPTIONS - *Charges will appear on the term fees*

FULL TERM - \$150.00

*This option allows you use the service every morning and afternoon for the full term.*

BOOK OF 10 TICKETS - \$25.00

*Please collect from the junior school and senior school receptions.*

---

## SERVICE INSTRUCTIONS

Stop times are subject to traffic conditions. Morning bus drop off at junior school on Leichhardt Street. Afternoon bus pick up from Albion Street gates.

**Buses depart promptly at 3.30pm.**

For any problems regarding the pick up of your daughter, please contact the bus company

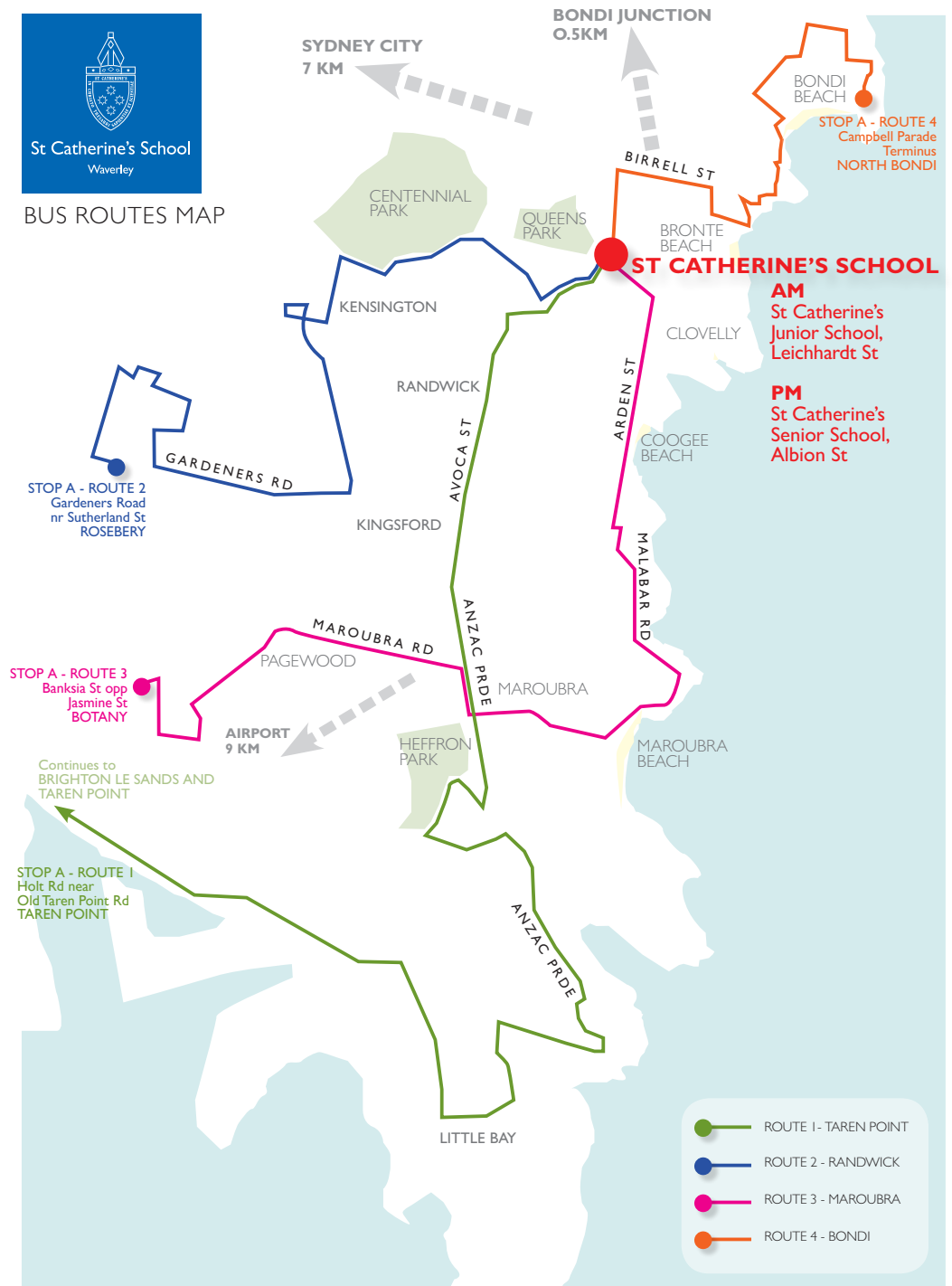
**Kingsford Smith Transport** on **9666 4141** or **0403 559 343**

*To use the school bus, students must book a seat via the transport tab - StCathsConnect.*

*For more information please email [transport@stcaths.nsw.edu.au](mailto:transport@stcaths.nsw.edu.au)*



## BUS ROUTES MAP



# ROUTE 1 - TAREN POINT

Morning (AM)	Time	Afternoon (PM)	Time
<b>Stop A - Taren Point</b> Holt Rd near Old Taren Point Rd Bus stop 222920	<b>6.45 am</b>	<b>Stop N - Waverley</b> St Catherines Senior School, Albion Street Bus stop 202428	<b>3.30 pm</b>
<b>Stop B - Brighton-Le-Sands</b> Brighton-Le-Sands Public School	<b>7.00 am</b>	<b>Stop M - Randwick</b> Avoca Street near Frances St (opposite St Jude's Church) Bus stop 2031110	<b>3.35 pm</b>
<b>Stop C - Little Bay</b> Bunnerong Rd and Anzac Pde Bus stop 203620	<b>7.25 am</b>	<b>Stop L - Randwick</b> Avoca St near Rainbow St Bus stop 2031172	<b>3.40 pm</b>
<b>Stop D - Little Bay</b> Anzac Pde near Little Bay Rd Bus stop 2036125	<b>7.27 am</b>	<b>Stop K - Matraville</b> Corner Anzac Pde and Beauchamp Rd Bus stop 2036136	<b>3.48 pm</b>
<b>Stop E - Chifley</b> Anzac Pde near McKenzie Ave	<b>7.29 am</b>	<b>Stop J - Matraville</b> Corner Robey and Jersey Rd (best stop for Des Renford Aquatic Centre)	<b>3.50 pm</b>
<b>Stop F - Chifley</b> Corner Anzac Pde and Little Bay Rd    Bus stop 2036126	<b>7.30 am</b>	<b>Stop I - Matraville</b> Corner Knowles Ave and Pozieres Ave	<b>3.53 pm</b>
<b>Stop G - Malabar</b> Nix Av near Adams Av Bus stop 2036179	<b>7.33 am</b>	<b>Stop H - Malabar</b> Prince Edward St near Napier St    Bus stop 2036184	<b>3.57 pm</b>
<b>Stop H - Malabar</b> Prince Edward St near Napier St Bus stop 2036184	<b>7.35 am</b>	<b>Stop G - Malabar</b> Nix Av near Adams Av Bus stop 2036179	<b>3.58 pm</b>
<b>Stop I - Matraville</b> Corner Knowles Ave and Pozieres Ave	<b>7.40 am</b>	<b>Stop F - Chifley</b> Anzac Pde near Gubbutteh Rd Bus stop 2036117	<b>4.02 pm</b>
<b>Stop J - Matraville</b> Corner Anzac Pde and Beauchamp Rd Bus stop 2036136	<b>7.42 am</b>	<b>Stop E - Chifley</b> Anzac Pde, Pine Ave Bus stop 2036119	<b>4.03 pm</b>
<b>Stop K - Maroubra</b> Anzac Pde near Murray St Bus stop 203568	<b>7.43 am</b>	<b>Stop D - Little Bay</b> Anzac Pde after Little Bay Rd Bus stop 2036126	<b>4.06 pm</b>
<b>Stop L - Randwick</b> Randwick Boys School, Avoca St Bus stop STAND L620	<b>7.50 am</b>	<b>Stop C</b> Bunnerong Rd and Anzac Pde Bus stop 203620	<b>4.08 pm</b>
<b>Stop M - Randwick</b> Avoca Street near Frances St (outside St Jude's Church)    Bus stop 2031117	<b>7.56 am</b>	<b>Stop B - Brighton-Le-Sands</b> Brighton-Le-Sands Public School	<b>4.30 pm</b>
<b>Stop N - Waverley</b> St Catherines Junior School, Leichhardt St Bus stop 202473	<b>8.10 am</b>	<b>Stop A - Taren Point</b> Holt Rd near Old Taren Point Rd    Bus stop 222920	<b>4.39 pm</b>

## ROUTE 2 - RANDWICK

Morning (AM)	Time
<b>STOP A - Rosebery</b> Gardeners Rd nr Sutherland St (outside old cinema) Bus stop 201826	<b>7.05 am</b>
<b>STOP B - Rosebery</b> Queens Street nr Rothschild Av - Bus stop 201883	<b>7.07 am</b>
<b>STOP C - Rosebery</b> Kimberley Gr nr Dalmeny Av (opp St Joseph's) Bus stop 201883	<b>7.09 am</b>
<b>STOP D - Rosebery</b> Bannerman Crescent Reserve	<b>7.11 am</b>
<b>STOP E - Rosebery</b> Dalmeny Ave and Harcourt Pde - Bus stop 201854	<b>7.13 am</b>
<b>STOP F - Kingsford</b> Gardeners Road nr Eastern Ave Bus stop 203232	<b>7.16 am</b>
<b>STOP G - Kingsford</b> Kingsford Nine Ways, Anzac Pde STAND C Bus stop 203214	<b>7.20 am</b>
<b>STOP H - Kingsford</b> Anzac Pde nr Strachan St Bus stop 203215	<b>7.22 am</b>
<b>STOP I - Kensington</b> Anzac Pde STAND C - Opposite UNSW Bus stop 203312	<b>7.24 am</b>
<b>STOP J - Kensington</b> Anzac Pde nr Addison St Bus stop 203346	<b>7.26 am</b>
<b>STOP K - Kensington</b> Anzac Pde nr Todman Av (by Auto One) Bus picking up in Duke St	<b>7.28 am</b>
<b>STOP L - Randwick</b> Darley Rd nr Main Gate Centennial Pk (Just after roundabout at park gates) Bus stop 203145	<b>7.36 am</b>
<b>STOP M - Randwick</b> Darley Rd opp Govett St, Centennial Park Bus stop 203146	<b>7.38 am</b>
<b>STOP N - Randwick</b> Clovelly Rd nr Darley Rd Bus stop 203148	<b>7.41 am</b>
<b>STOP O - Waverley</b> St Catherine's School, Leichhardt St - Bus stop 202473	<b>7.50 am</b>

Afternoon (PM)	Time
<b>STOP O - Waverley</b> St Catherine's School, Albion St Bus stop 202428	<b>3.30 pm</b>
<b>STOP N - Randwick</b> Clovelly Rd near Darley Rd (nr bike shop) Bus stop 203104	<b>3.35 pm</b>
<b>STOP M - Randwick</b> Darley Rd near Govett St, Bus stop 2031106	<b>3.38 pm</b>
<b>STOP L - Randwick</b> Darley Rd opposite Main Gate Centennial Park (just after roundabout) Bus stop 2031107	<b>3.39 pm</b>
<b>STOP K - Kensington</b> Anzac Pde near Todman Av (outside Post Office) Bus stop 20320	<b>3.46 pm</b>
<b>STOP J - Kensington</b> Anzac Pde nr Darling St Bus stop 203324	<b>3.48 pm</b>
<b>STOP I - Kensington</b> Anzac Pde STAND D at UNSW Bus stop 203311	<b>3.50 pm</b>
<b>STOP H - Kingsford</b> Anzac Pde nr Middle St Bus stop 203274	<b>3.52 pm</b>
<b>STOP G - Kingsford</b> Nine Ways, Anzac Pde - STAND D Bus stop 203214	<b>3.54 pm</b>
<b>STOP F - Kingsford</b> East Courts Tennis Club, corner Borrodale Rd and Court Ave	<b>3.56 pm</b>
<b>STOP E - Rosebery</b> Gardeners Rd nr Sutherland St (outside old cinema) Bus stop 201826	<b>4.06 pm</b>
<b>STOP D - Rosebery</b> Queens Street nr Rothschild Av Bus stop 201883	<b>4.08 pm</b>
<b>STOP C - Rosebery</b> Kimberley Gr nr Dalmeny Av (opposite St Joseph's) Bus stop 201883	<b>4.10 pm</b>
<b>STOP B - Rosebery</b> Bannerman Crescent Reserve	<b>4.12 pm</b>
<b>STOP A - Rosebery</b> Dalmeny Ave and Harcourt Pde Bus stop 201854	<b>4.14 pm</b>

## ROUTE 3 - MAROUBRA AM

Morning (AM)	Time		
<b>*NEW* Botany</b> Banksia St nr Daniel St Bus stop 201946	<b>7.19 am</b>	<b>STOP O - Maroubra</b> Torrington Rd nr Inman St Bus stop 2035159	<b>7.42 am</b>
<b>*NEW* Botany</b> Banksia St nr William St Bus stop 201951	<b>7.21 am</b>	<b>STOP P - South Coogee</b> Malabar Rd opp Mermaid Ave Bus stop 203418	<b>7.44 am</b>
<b>STOP A - Botany</b> William St nr Hambly St Bus stop 201954	<b>7.23 am</b>	<b>STOP Q - South Coogee</b> Malabar Rd opp Liguria St Bus stop 203419	<b>7.45 am</b>
<b>STOP B - Botany</b> Swinbourne St nr Queen St Bus stop 201955	<b>7.24 am</b>	<b>STOP R - Coogee</b> Malabar Rd nr Moverly Rd Bus stop 203421	<b>7.46 am</b>
<b>STOP C - Botany</b> Swinbourne St nr Stephen Rd Bus stop 201956	<b>7.25 am</b>	<b>STOP S - Coogee</b> Arden St nr Malabar Rd Bus stop 203422	<b>7.47 am</b>
<b>STOP D - Pagewood</b> Page St nr Dudley St Bus stop 203543	<b>7.27 am</b>	<b>STOP T - Coogee</b> Arden St opp Neptune St - Bus stop 203480	<b>7.48 am</b>
<b>STOP E - Pagewood</b> Page St nr Holloway St Bus stop 203544	<b>7.28 am</b>	<b>STOP U - Coogee Beach</b> Arden St nr Carr St Bus stop 203468	<b>7.50 am</b>
<b>STOP F - Pagewood</b> Page St nr Cowper Av Bus stop 203546	<b>7.30 am</b>	<b>STOP V - Coogee</b> Arden St nr Alison Rd - Bus stop 203481	<b>7.55 am</b>
<b>STOP G - Pagewood</b> Heffron Rd opp Kenny Rd Bus stop 2036195	<b>7.32 am</b>	<b>STOP W - Waverley</b> St Catherines Junior School, Leichhardt Street - Bus stop 202473	<b>8.00 am</b>
<b>STOP H - Maroubra</b> Maroubra Rd nr Royal St Bus stop 203582	<b>7.33 am</b>		
<b>STOP I - Maroubra</b> Anzac Pde nr Byng St Bus stop 203559	<b>7.35 am</b>		
<b>STOP J - Maroubra</b> Fitzgerald Av nr Beatty Av Bus stop 2035183	<b>7.36 am</b>		
<b>STOP K - Maroubra</b> Fitzgerald Av nr Camira St Bus stop 2035185	<b>7.37 am</b>		
<b>STOP L - Maroubra Beach</b> Marine Pde terminus Bus stop 203595	<b>7.38 am</b>		
<b>STOP M - Maroubra</b> Marine Pde nr Maroubra Rd Bus stop 2035143	<b>7.39 am</b>		
<b>STOP N - Maroubra</b> Torrington Rd nr Wilson Street Bus stop 2035193	<b>7.41 am</b>		

# ROUTE 3 - MAROUBRA PM

Afternoon (PM)	Time		
<b>STOP W - Waverley</b> St Catherines Senior School, Albion St Bus stop 202473	<b>3.30 pm</b>	<b>STOP H - Maroubra</b> Maroubra Rd nr Hinkler St Bus stop 203579	<b>3.52 pm</b>
<b>STOP V - Coogee</b> Arden St nr Alison Rd Bus stop 203478	<b>3.33 pm</b>	<b>STOP G - Pagewood</b> Heffron Rd after Kenny Rd	<b>3.53 pm</b>
<b>STOP U - Coogee Beach</b> Arden St nr Coogee Bay Rd Bus stop 203471	<b>3.35 pm</b>	<b>STOP F - Pagewood</b> Page St nr Cowper Av Bus stop 203539	<b>3.55 pm</b>
<b>STOP T - Coogee</b> Arden St nr Dudley St Bus stop 203479	<b>3.37 pm</b>	<b>STOP E - Pagewood</b> Page St nr Holloway St Bus stop 203541	<b>3.57 pm</b>
<b>STOP S - South Coogee</b> Arden St nr Malabar Rd Bus stop 203414	<b>3.39 pm</b>	<b>STOP D - Pagewood</b> Page St nr Dudley St Bus stop 203542	<b>3.59 pm</b>
<b>STOP R - South Coogee</b> Malabar Rd nr Napper St Bus stop 203415	<b>3.40 pm</b>	<b>STOP C - Botany</b> Swinbourne St nr Stephen Rd Bus stop 201938	<b>4.01 pm</b>
<b>STOP Q - South Coogee</b> Malabar Rd nr Liguria St Bus stop 203417	<b>3.41 pm</b>	<b>STOP B - Botany</b> Swinbourne St nr Trevelyn St Bus stop 201939	<b>4.02 pm</b>
<b>STOP P - South Coogee</b> Malabar Rd nr Mermaid Av Bus stop 203586	<b>3.42 pm</b>	<b>STOP A - Botany</b> William St nr Aylesbury St Bus stop 201940	<b>4.03 pm</b>
<b>STOP O - Maroubra</b> Torrington Rd nr Inman St Bus stop 203588	<b>3.43 pm</b>	<b>*NEW* Botany</b> Banksia St nr William St Bus stop 201951	<b>4.05 pm</b>
<b>STOP N - Maroubra</b> Torrington Rd nr Marine Parade Bus stop 203590	<b>3.45 pm</b>	<b>*NEW* Botany</b> Banksia St opp Jasmine St Bus stop 201943	<b>4.07 pm</b>
<b>STOP M - Maroubra</b> Marine Pde opp Bond St Bus stop 203592	<b>3.46 pm</b>		
<b>STOP L - Maroubra Beach</b> Marine Pde opp Mons Ave Bus stop 203585	<b>3.48 pm</b>		
<b>STOP K - Maroubra</b> Fitzgerald Av cnr Malabar Rd Bus stop 2035180	<b>3.49 pm</b>		
<b>STOP J - Maroubra</b> Fitzgerald Av nr Chester St Bus stop 2035182	<b>3.50 pm</b>		
<b>STOP I - Maroubra</b> Anzac Pde nr Fitzgerald Av Bus stop 203570	<b>3.51 pm</b>		

# ROUTE 4 - BONDI

Morning (AM)	Time
<b>Stop A - North Bondi</b> Campbell Pde Terminus Bus stop 202626	<b>7.15 am</b>
<b>Stop B - North Bondi</b> Military Rd nr Wallis Pde Bus stop 202628	<b>7.16 am</b>
<b>Stop C - North Bondi</b> Blair St nr Wairoa Ave Bus stop 202676	<b>7.18 am</b>
<b>Stop D - North Bondi</b> Murrivier Rd nr Knowles Ave Bus stop 202679	<b>7.20 am</b>
<b>Stop E - North Bondi</b> Murrivier Rd nr Mitchell St Bus stop 202680	<b>7.22 am</b>
<b>Stop F - North Bondi</b> Mitchell St nr O'Donnell St Bus stop 202687	<b>7.24 am</b>
<b>Stop G - Bondi Beach</b> Glenayr Ave nr Warners Ave Bus stop 202692	<b>7.27 am</b>
<b>Stop H - Bondi Beach</b> Glenayr Ave nr Curlewis St Bus stop 202693	<b>7.28 am</b>
<b>Stop I - Bondi Beach</b> Glenayr Ave nr O'Brien St Bus stop 202666	<b>7.29 am</b>
<b>Stop J - Bondi Beach</b> Campbell Pde nr Notts Ave Bus stop 202654	<b>7.34 am</b>
<b>Stop K - Bondi Beach</b> Sandridge St nr Fletcher St Bus stop 2026109	<b>7.36 am</b>
<b>Stop L - Tamarama</b> Pacific St nr Gaerloch Ave Bus stop 2026110	<b>7.38 am</b>
<b>Stop M - Tamarama</b> Tamarama Marine Drive opp Tamarama park Bus stop 2026111	<b>7.39 am</b>
<b>Stop N - Bronte</b> Hewlett St nr Alfred St Bus stop 202461	<b>7.42 am</b>
<b>Stop O - Bronte</b> Alfred St nr Birrell St Bus stop 202462	<b>7.43 am</b>
<b>Stop P - Bondi</b> Birrell St opp Bennett St Bus stop 202464	<b>7.45 am</b>
<b>Stop Q - Waverley</b> St Catherine's Junior School Leichhardt St Bus stop 202473	<b>7.55 am</b>

Afternoon (PM)	Time
<b>Stop Q - Waverley</b> St Catherine's School, Albion St, St John's Car Park Bus stop 202428	<b>3.30 pm</b>
<b>Stop P - Bondi</b> Birrell St nr Ocean St Bus stop 2026103	<b>3.40 pm</b>
<b>Stop O - Bondi</b> Birrell St nr Tasman St Bus stop 202610	<b>3.42 pm</b>
<b>Stop N - Bronte</b> Alfred St nr Hewlett St Bus stop 202448	<b>3.43 pm</b>
<b>Stop M - Tamarama</b> Tamarama Marine Drive nr Tamarama Park Bus stop 2026106	<b>3.46 pm</b>
<b>Stop L - Tamarama</b> Dellview St opp Gaerloch Ave Bus stop 2026107	<b>3.47 pm</b>
<b>Stop K - Bondi Beach</b> Cnr Sandridge and Fletcher St	<b>3.48 pm</b>
<b>Stop J - Bondi Beach</b> Campbell Pde nr Francis St Bus stop 202620	<b>3.49 pm</b>
<b>Stop I - Bondi Beach</b> Glenayr Ave nr Hall St Bus stop 202694	<b>3.51 pm</b>
<b>Stop H - Bondi Beach</b> Glenayr Ave nr Curlewis St Bus stop 202667	<b>3.56 pm</b>
<b>Stop G - Bondi Beach</b> Glenayr Ave nr Blair St Bus stop 202668	<b>3.57 pm</b>
<b>Stop F - North Bondi</b> Mitchell St nr O'Donnell St Bus stop 202670	<b>4.01 pm</b>
<b>Stop E - North Bondi</b> Murrivier Rd nr Hardy St Bus stop 202671	<b>4.03 pm</b>
<b>Stop D - North Bondi</b> Murrivier Rd opp Frederick St Bus stop 202672	<b>4.05 pm</b>
<b>Stop C - North Bondi</b> Blair St nr Wairoa Ave Bus stop 202675	<b>4.07 pm</b>
<b>Stop B - North Bondi</b> Military Rd opp Wallis Pde Bus stop 202633	<b>4.09 pm</b>
<b>Stop A - North Bondi</b> North Bondi Terminus Campbell Pde Bus stop 202634	<b>4.10 pm</b>