Upgrades to Chatswood Public School and Chatswood High School

Transport and Accessibility Impact Assessment

Prepared for:

School Infrastructure NSW

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The Transport Planning Partnership

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1 Introduction

1.1 Background

The Transport Planning Partnership (TTPP) has been engaged by School Infrastructure NSW to prepare a traffic and transport assessment to support the delivery of educational facilities as part of the '*Upgrades to Chatswood Public School and Chatswood High School*' project.

This report has been prepared to support the State Significant Development (SSD) application for the proposed school upgrades to Chatswood Public and Chatswood High Schools.

Upgrades to Chatswood Public School and Chatswood High School will deliver:

- new and refurbished innovative learning and teaching spaces
- increased quality active play space currently allocated to primary school and high school students
- specialist teaching facilities such as science, art, and music rooms
- dedicated performing arts spaces
- new sports facilities and recreational areas
- new libraries and administration facilities.

School populations (or number of students and staff) vary from year to year and are influenced by the demand for enrolments.

The proposed upgrades to Chatswood Primary and High Schools represented in the SSD application are designed to facilitate the demands for enrolment at the schools along with planning for other existing and planned future schools in the surrounding locality and more broadly across the State.

The SSD application for the Chatswood Primary and High Schools is about providing buildings and infrastructure rather than establishing set levels of school populations.

Notwithstanding the above, the travel demands of any school is determined by the number of school student and school staff attending the school. The modes of transport used to access the school is determined by a range of factors including:

- availably and accessibility of public transport modes;
- extent of school catchment and walkability from home to school
- age of the students
- availability of on site parking for staff and students.

To address the traffic and transport aspects of the Secretary's Environmental Assessment Requirements (SEARs), it has been necessary to consider future potential School populations following the implementation of the upgrade works.

In order to understand the existing travel demands and mode choice behaviour of the Chatswood Primary School and High School, extensive surveys, observations and interviews have been undertaken for the existing school populations.

It is understood that the NSW Government has committed to the construction of a new primary school in the Chatswood area which will reduce future demands for primary school places at Chatswood Primary School.

Thus, to address the SEARs, the traffic and transport assessment presented in this report has been based on the following school population scenarios:

- **moderate occupancy**: 3,200 students
  - 1,200 primary school students +
  - 2,000 high school students)
- **high occupancy**: 3,600 students
  - 1,600 primary school students +
  - 2,000 high school students).

For assessment purposes it is anticipated that the 'high occupancy' scenario would represent a temporary worst-case scenario until the new primary school is constructed.

Once the new primary school is operational the 'moderate occupancy' scenario would represent the worst case scenario.

1.2 Secretary's Environmental Assessment Requirements

On 6 August 2018, the Department of Planning and Environment (DoPE) issued the SEARs for SSD 9483. Specifically, a traffic and accessibility impact assessment is required as part of the Environmental Impact Statement (EIS), in accordance with the SEARs for the proposed development.

The issues raised in the SEARs have been considered during the preparation of this transport assessment report and are summarised in Table 1.1.

Table 1.1: Review of Compliance with SEARs

Item	SEARs Transport and Accessibility	Report Reference
1	• accurate details of the current daily and peak hour vehicle, existing and future public transport networks and pedestrian and cycle movement provided on the road network located adjacent to the proposed development	Section 2
2	• details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips based on surveys of the existing and similar schools within the local area	Section 7 and 8
3	• the adequacy of existing public transport or any future public transport infrastructure within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development	Section 7
4	• Measures to integrate the development with the existing/future public transport network	Section 8.4
5	• the impact of trips generated by the development on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for, and details of, upgrades or road improvement works, if required (Traffic modelling is to be undertaken using SIDRA network modelling for current and future years)	Section 8
6	• the identification of infrastructure required to ameliorate any impacts on traffic efficiency and road safety impacts associated with the proposed development, including details on improvements required to affected intersections, additional school bus routes along bus capable roads (i.e. minimum 3.5m wide travel lanes), additional bus stops or bus bays	Section 8.4
7	• details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of location-specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the site	Refer to TTPP's Green Travel Plan (TTPP Ref: 17356-r03v03-GTP)
8	• the proposed walking and cycling access arrangements and connections to public transport services, including travel between the site and Chatswood CBD and any capacity constraints of the existing footbridge over the Pacific Highway	Section 2.7 and 2.8
9	• the proposed access arrangements, including car and bus pick-up/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones	Section 7
10	• proposed bicycle parking provision, including end of trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance	Section 7.2 and 7.6
11	• proposed number of on-site car parking spaces for teaching staff and visitors and corresponding compliance with existing parking codes and justification for the level of car parking provided on-site	Section 7.1
12	• an assessment of the cumulative on-street parking impacts of cars and bus pick-up/drop-off, staff parking and any other parking demands associated with the development	Section 7
13	• an assessment of road and pedestrian safety adjacent to the proposed development, including consideration of the projected movement of students and staff between the two school campuses and the details of required road safety measures and personal safety in line with CPTED	Section 7.6

Item	SEARs Transport and Accessibility	Report Reference
14	• emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times)	Section 6.5 and 7.4
15	• the preparation of a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic addressing the following: o assessment of cumulative impacts associated with other construction activities (if any) o an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity o details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process o details of anticipated peak hour and daily construction vehicle movements to and from the site o details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle o details of temporary cycling and pedestrian access during construction.	Refer to Refer to TTPP's Preliminary Construction Traffic and Pedestrian Management Plan (TTPP Ref: 17356-r04v02-200219-CTMP)

1.3 Consultation Summary

This report has also been prepared in consultation with Willoughby City Council (Council) and Transport for NSW (TfNSW) as outlined in Table 1.2.

Table 1.2: Consultation Summary

Agency	Date	Type of Consultation	Purpose of Consultation	Person Contacted
TfNSW	10 Apr 2019	Meeting	Project overview and requirements	TfNSW – Ken Ho, Mark Ozinga, Allan Borg RMS – Pahee Rathan, Zhaled Alamouti
Council	16 Apr 2019	Meeting	Project overview and requirements	Ian Arnott (Planning Manager), Ritu Shankar (Planning Team Leader), Daniel Sui (Senior Traffic Engineer)
Council	29 Nov 2019	Meeting	Project update – revised masterplan	Ian Arnott (Planning Manager), Ritu Shankar (Planning Team Leader)
TfNSW	18 Oct 2019	Email	Project update – revised masterplan	Ken Ho (TfNSW)

Agency feedback obtained during the consultation process has been incorporated into the proposed project.

1.4 Purpose of this Report

This report sets out an assessment of the anticipated transport impacts of the proposed development, including the following:

- existing transport conditions surrounding the site
- car parking, pedestrian and bicycle requirements
- the traffic generating characteristics of the proposed development
- suitability of the proposed access arrangements for the site
- the transport impact of the development on the surrounding road network.

1.5 References

In preparing this report, reference has been made to the following:

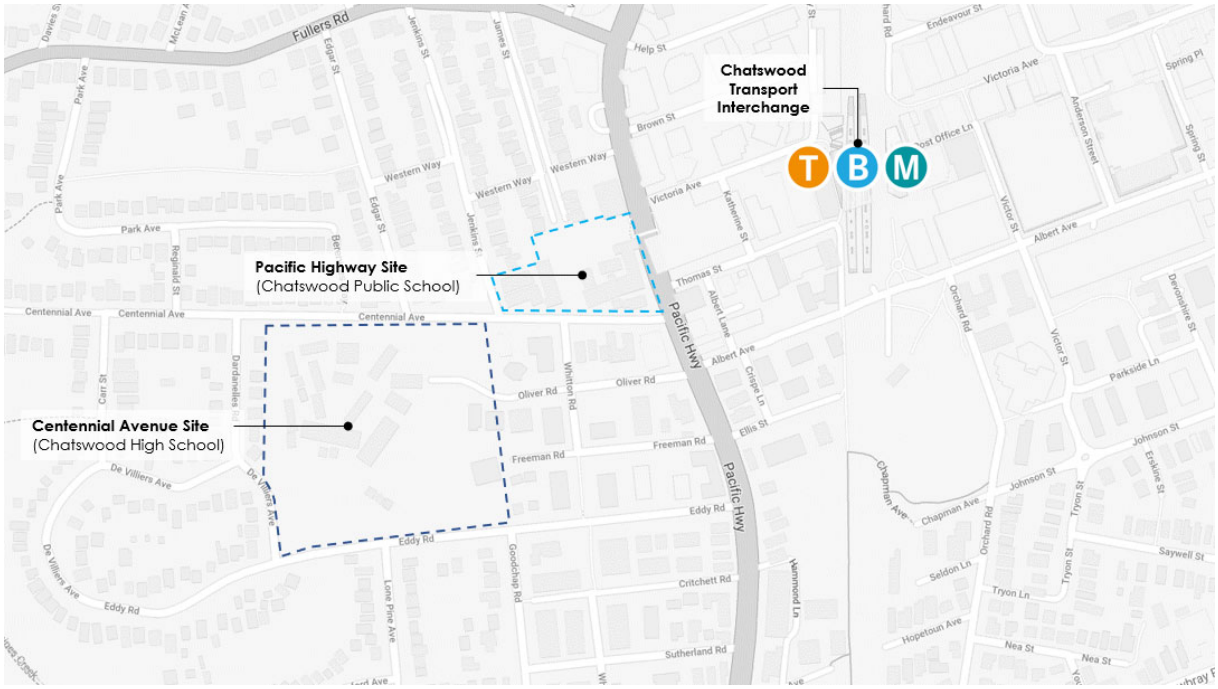
- architectural layout plans prepared by Architectus (Ref: 180326.00 dated 18/12/19)
- traffic and parking surveys undertaken by Trans Traffic Survey
- Willoughby Local Environmental Plan 2012 (LEP)
- Willoughby Development Control Plan 2012 (DCP)
- Roads and Maritime Services' Guide to Traffic Generating Developments (2002)
- NSW Planning Guidelines for Walking and Cycling (December 2004)
- other documents and data as referenced in this report.

2 Existing Conditions

2.1 Site Description

Chatswood Public School (Pacific Highway site) and Chatswood High School (Centennial Avenue site) are located at 5 Centennial Avenue and 24 Centennial Avenue, Chatswood respectively. These sites are generally bound by Pacific Highway, Centennial Avenue and Eddy Road, as shown in Figure 2.1.

Figure 2.1: Locality Map



Source: Google Maps Australia

2.2 Road Network

The sites are surrounded by a network of state and local roads including Pacific Highway, Centennial Avenue, Jenkins Street, Oliver Road, Freeman Road, Eddy Road and De Villiers Avenue. A description of these roads is provided below.

Pacific Highway

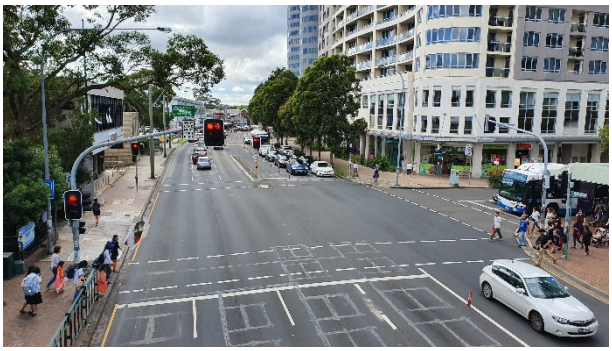
Pacific Highway is a Roads and Maritime classified State road and travels along the eastern boundary of Chatswood Public School. The road serves as a major north-south arterial link, providing connectivity between the Warringah Freeway and M1 Pacific Motorway. Within the vicinity of the site, it has a posted speed limit of 60km/h, with 40km/h school zone restrictions applicable during school hours (i.e. 8am-9.30am and 2.30pm-4pm).

The road is generally configured with six traffic lanes, with three traffic lanes in each direction, across an 18m wide road carriageway. No kerbside car parking is permitted on either side of the road. However, it is noted that tidal traffic flow arrangements are in place during evening peak periods within the vicinity of the site to provide four traffic lanes in the northbound and two traffic lanes in the southbound direction.

The road is shown in Figure 2.2 and Figure 2.3.

Figure 2.2: AM Peak Pacific Hwy (looking north)

Figure 2.3: PM Peak Pacific Hwy (looking north)



Centennial Avenue

Centennial Avenue is a two-way, two-lane local road with on-street car parking provided on both sides of the road. It has an east-west alignment and predominately serves access to/from key drop off areas associated with both Chatswood Public School and Chatswood High School. It has a posted speed limit of 50km/h, with 40km/h school zone restrictions applicable during school hours.

Jenkins Street

Jenkins Street functions as a two-way local road, generally aligned in a north-south direction. The road predominately serves residential access to properties along Jenkins Street, particularly between Western Way and Fullers Road. Notably, Jenkins Street between Western Way and Centennial Avenue was observed to function as one of the main drop off/pick up areas during school hours for the Pacific Highway site, with P5 minute parking zones provided on either side of the street, near the southern end of the road on approach to Centennial Avenue.

Oliver Road

Oliver Road is a one-way, one-lane westbound road, generally aligned in an east-west direction. A dedicated marked bicycle lane is provided on the north side of the road. Additionally, unrestricted kerbside car parking provided on the south side of the road and is generally well-occupied throughout the day due to commuter car parking to Chatswood Station. The road provides good connectivity between Pacific Highway and Whitton Road, including to/from the Chatswood Public School Bush Campus staff park at the west end of the road.

Freeman Road

Freeman Road is a two-way local cul-de-sac road with an east-west alignment. Access to the road is generally provided via Pacific Highway on the western end of the road. The road has a posted speed limit of 50km/h, with kerbside car parking provided on the north side of the road. No Parking restrictions during school hours are provided on the south side of the road.

Eddy Road

Eddy Road functions as a local road, generally aligned in an east-west direction along the southern boundary of the Centennial Avenue site. Access to this road is generally provided off Pacific Highway on the western end of the road. Kerbside car parking is generally made available on one or both sides of the road. It has a posted speed limit of 50km/h, with 40km/h school zone restrictions applicable during school hours.

De Villiers Avenue

De Villiers Avenue functions as a local road, generally aligned in a north-south direction along the western boundary of the Centennial Avenue site. This road provides vehicle access to the staff car park within the Centennial Avenue site. It has a posted speed limit of 50km/h, with 40km/h school zone restrictions applicable during school hours. No kerbside car parking is generally made available on either side of the road between De Villiers Avenue and Eddy Road.

2.3 Vehicle and Pedestrian Accessibility

Vehicle access to both schools is currently provided on Pacific Highway, Centennial Avenue, Oliver Road, Jenkins Street and De Villiers Avenue. The existing driveways provide direct vehicle access to/from the on-site car parking areas, which are generally dedicated for staff only. In addition to this, a gated vehicle access is currently provided on Eddy Road, which provides restricted access to Centennial Avenue site's sportsground.

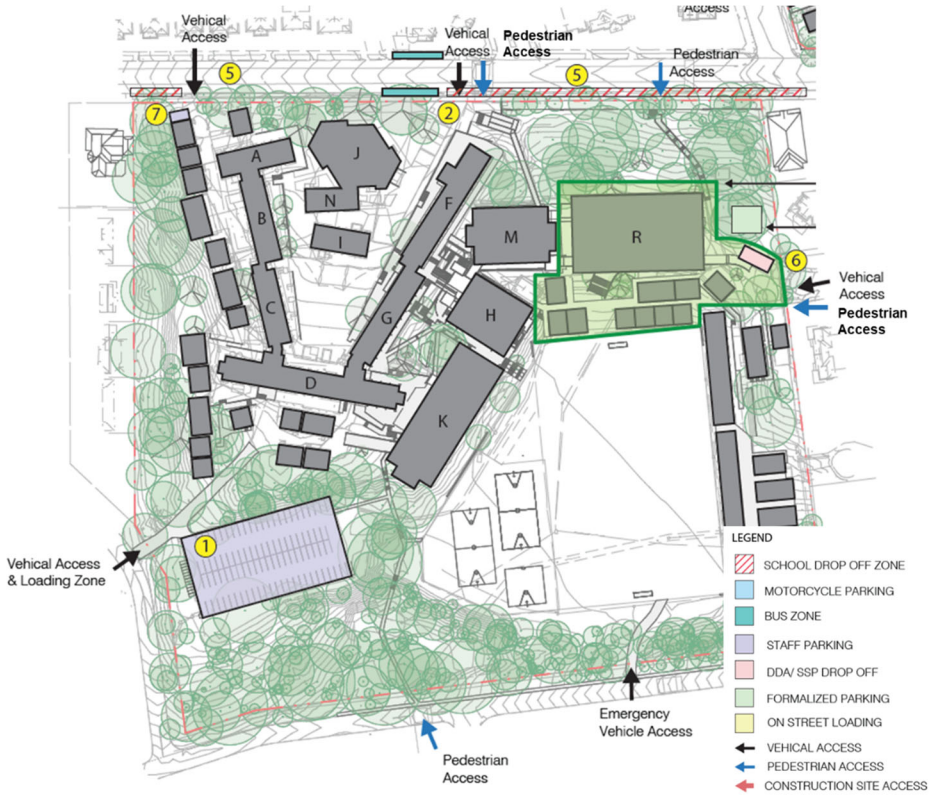
Concurrent with the above vehicle access locations, pedestrian access gates are also provided along Pacific Highway, Centennial Avenue, Oliver Road, Jenkins Street, De Villiers Avenue and Eddy Road.

The location of the existing vehicle access and pedestrian access points is shown in Figure 2.4 and Figure 2.5.

Figure 2.4: Pacific Highway Site Vehicle and Pedestrian Access - Existing

Source: Architectus

Figure 2.5: Centennial Avenue Site Vehicle and Pedestrian Access - Existing



Source: Architectus

Further to this, dedicated pedestrian facilities are provided within the vicinity of these pedestrian access points, including a pedestrian footbridge (which has no disabled access)

and signalised pedestrian crossing across Pacific Highway; and a children's pedestrian crossing across Centennial Avenue, as shown in Figure 2.6 and Figure 2.7.

Figure 2.6: Pacific Hwy – Existing Pedestrian Facilities

Figure 2.7: Centennial Ave – Existing Pedestrian Facilities

2.4 Loading Facilities and Service Vehicle Access

At present, all loading and unloading activities associated with both schools are conducted on-site. Deliveries and waste collection activities are conducted within the staff car parking areas, with access provided off Pacific Highway for the Pacific Highway site and off De Villiers Avenue for the Centennial Avenue site.

All loading and unloading activities are generally conducted during school hours, between 8am and 4pm, Monday to Friday. The exception to this would be during waste collection activities, which would generally occur in the early morning.

2.5 Emergency Vehicle Access

Emergency vehicle access to the schools are provided via existing vehicular accesses off Pacific Highway, Jenkins Street, Centennial Avenue, De Villiers Avenue, Oliver Road and Eddy Road, as shown in Figure 2.4 and Figure 2.5.

2.6 Car Parking

2.6.1 Off-Street Car Parking

The existing Pacific Highway and Centennial Avenue sites provides off-street parking facilities for staff use. The location of staff parking areas and approximate number of parking spaces provided, as observed on-site, are as follows:

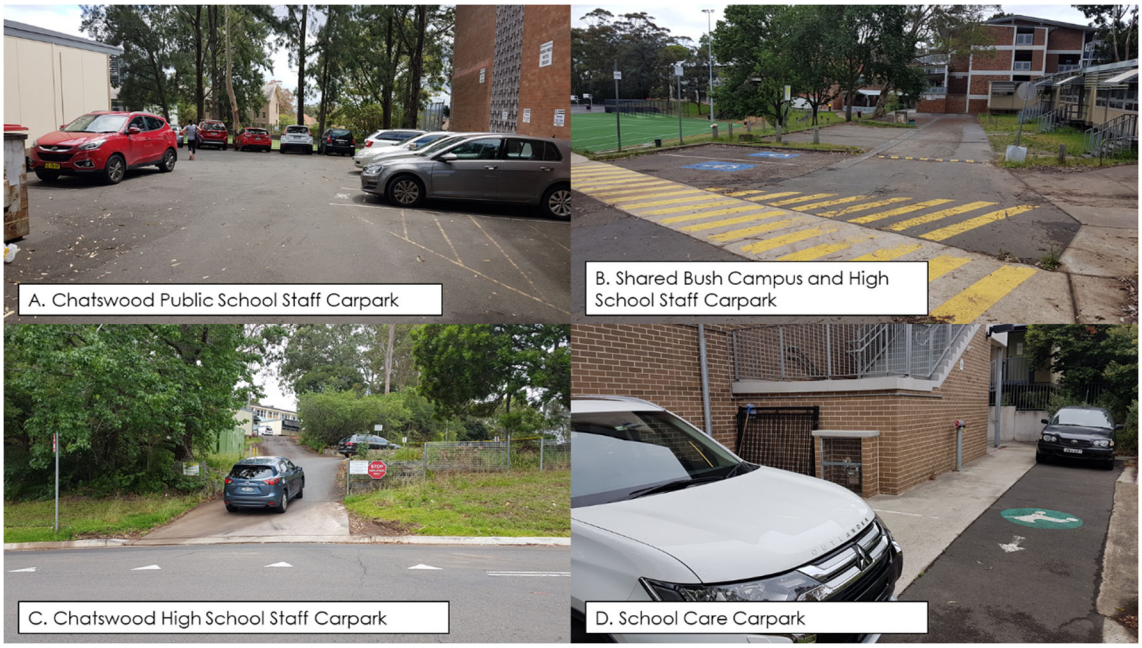
- Chatswood Public School (Pacific Highway site)
  - Pacific Highway car park – approx. 16 staff car parking spaces
  - Jenkins Street car park (dedicated to Chatswood OSHCare) – 2 staff car parking spaces
- Chatswood High School (Centennial Avenue site)
  - De Villiers Avenue car park – 104 staff car parking spaces (92 marked parking bays, 12 informal parking bays)
  - Oliver Road car park (Shared Bush Campus and High School) – 18 staff car parking spaces, including 2 spaces for drop-off/pick-up or disabled parking use. This car park is provided as shared High School and Bush Campus staff use.

The location of the existing car parks is shown in Figure 2.8, with photos provided in Figure 2.9.

Figure 2.8: Off-Street Parking Locations

Source: Google Maps Australia

Figure 2.9: Off-Street Car Park Photos



Based on on-site observations, the existing car parks generally operate near capacity. Although, it should be noted that the existing Pacific Highway car park at Chatswood Public

School currently operates at capacity, with a number of vehicles parking within unmarked parking spaces due to the demountables within the car park (refer to Picture A in Figure 2.9). Additionally, the existing 16 car parking spaces currently within the Bush Campus Staff Carpark are no longer in use due to the demountables recently installed on-site.

2.6.2 On-street Parking and Drop-off Areas

A mix of long-term and short-term on-street car parking are generally provided within the vicinity of the site. The majority of car parking is generally for short-term car parking, with one- to two-hour parking restrictions.

In addition to this, a P5 minute zone is provided along Centennial Avenue and Jenkins Street during school drop-off and pick-up times for the school, accommodating some 17 car parking spaces. No Parking Zones are also provided along Centennial Avenue to facilitate drop-off and pick-up activities associated with both of the schools.

The existing on-street parking restrictions within a 400m radius catchment from the schools is shown in Figure 2.10.

Figure 2.10: On-Street Parking Restrictions

Basemap Source: Google Maps Australia

Based on on-site observations, the existing drop-off area currently operate poorly, with the majority of drop-off and pick-up activities centralised near the Jenkins Street-Centennial Avenue intersection, as shown in Figure 2.11.

Figure 2.11: Jenkins Street-Centennial Avenue Intersection – Morning Peak Hour

Queueing at the intersection during the morning drop-off peak times

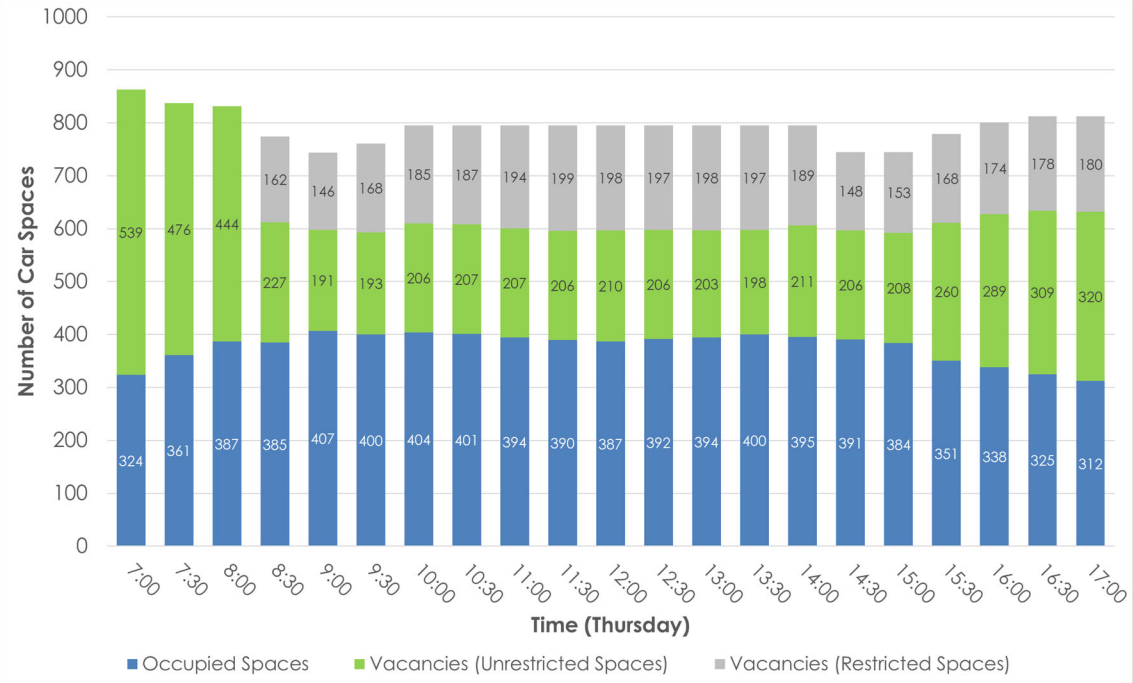
With this in mind, it is noted that fewer drop-off and pick-up activities were conducted on the south side of Centennial Avenue compared to Jenkins Street and the north side of Centennial Avenue. This may be primarily due to the presence of the existing signalised intersection at Centennial Avenue-Pacific Highway, which provides good access to the wider road network, particularly to/from Pacific Highway.

2.6.2.1 Car Parking Occupancy Surveys

A car parking inventory and occupancy survey was carried out within the immediate vicinity of the site to determine the number of available parking spaces and restrictions within the survey area. The car parking surveys were undertaken on Thursday 14 March 2019 between 7:00am and 5:30pm.

A summary of the hourly car parking profiles during the survey period is illustrated in Figure 2.12.

Figure 2.12: Weekday On-Street Parking Occupancy



Note: The total parking supply varies throughout the day due to timed parking restrictions.

Based on the parking surveys, the peak parking accumulation occurred during the weekday at 9:00am with 407 parked vehicles, which is 55 per cent of its capacity (337 remaining vacancies – 191 unrestricted and 146 restricted spaces). It is noted that the majority of the parking vacancies were observed to be located further away from the site such as along De Villiers Avenue, Pearl Avenue, Lone Pine Avenue, Beresford Avenue, Ivy Street.

Additionally, parking behaviours were observed to be generally consistent between 9am and 2:30pm on a weekday, with little fluctuation. As indicated previously, the peak parking occupancy/demand occurred between 9:00am and 9:30am, which coincides with typical school drop-off periods.

2.7 Pedestrian Facilities and Infrastructure

Well-established pedestrian facilities are available in the immediate vicinity of the site with a network of paved footpaths on both sides of the roads. Victoria Avenue, Pacific Highway and Centennial Avenue are the most utilised roads in terms of pedestrian activity as these roads provide direct connection to the Chatswood Transport Interchange.

The following pedestrian facilities are currently provided within the vicinity the site:

- signalised pedestrian crossing on all approaches at the intersection of Pacific Highway and Victoria Avenue
- pedestrian overpass on the southern leg of Pacific Highway and Victoria Avenue intersection, equipped with escalators and stairs on both ends

- signalised pedestrian crossing on west approach at the intersection of Pacific Highway and Centennial Avenue
- signalised pedestrian crossing on the east, west and south approaches at the intersection of Pacific Highway, Albert Avenue and Oliver Road, and
- pedestrian (zebra) crossings along Centennial Avenue and Edgar Street.

These provide good connectivity between the schools and key transport nodes and attractions in the area.

In addition, a dedicated children's crossing is provided across Centennial Avenue, with a Roads and Maritime accredited traffic controller, during school hours to manage the safe and efficient movement of pedestrians across Centennial Avenue.

However, some of the roads surrounding the subject site have steep slopes which could create challenges to pedestrians especially wheelchair users and the parents with prams, including along Edgar Street, Eddy Road and De Villiers Avenue.

Notwithstanding the above, it is noted that high pedestrian activity at the existing at-grade signalised pedestrian crossings across Pacific Highway was observed, particularly during the school peak hours, despite the presence of a pedestrian overpass along Pacific Highway, as shown in Figure 2.13.

Figure 2.13: Signalised Pedestrian Crossing at Pacific Highway and Victoria Avenue

Based on the above, it should be noted that existing left-turn movement from Victoria Avenue experience longer delays and queues as a result of the high pedestrian volumes crossing at Pacific Highway during peak school hours. Although, it is noted that the number of

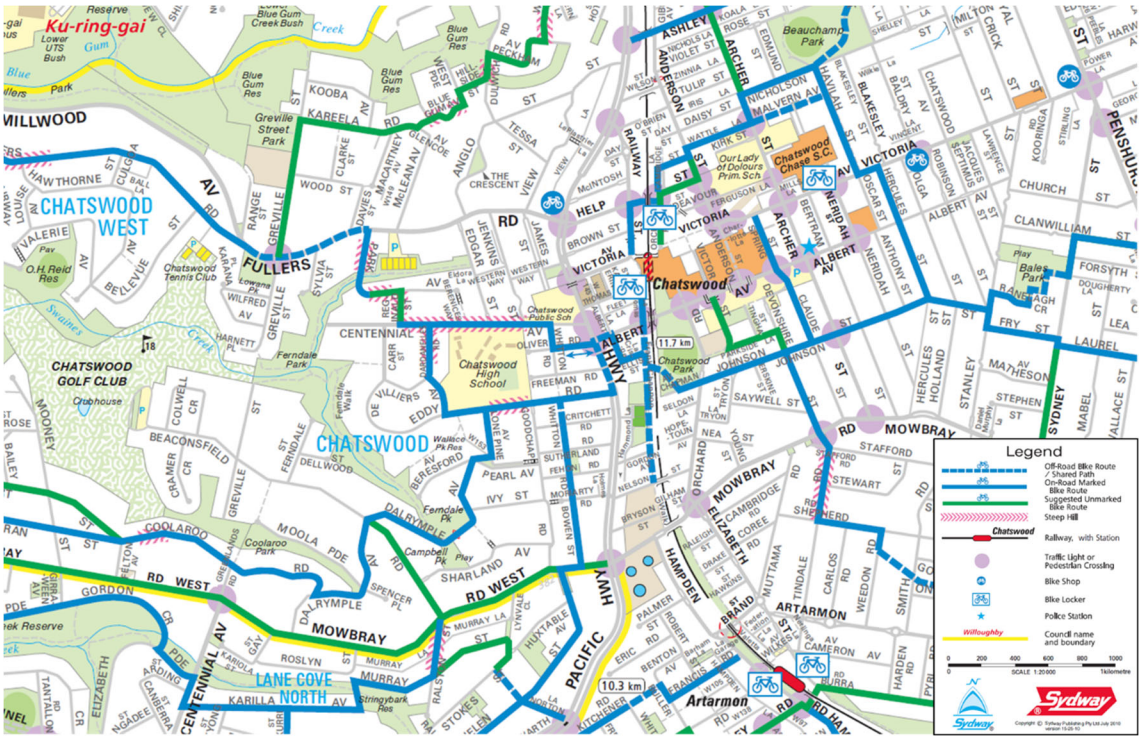
existing left-turn movements from Victoria Avenue to Pacific Highway are low to moderate, generally in the order of 92-105 left-turn movements during weekday peak periods.

2.8 Cycling Facilities and Infrastructure

A well-established cycling network providing a number of dedicated shared cycling paths and routes in the vicinity of the site.

The existing bicycle network within the vicinity is shown in Figure 2.14.

Figure 2.14: Cycling Network



Source: Northern Sydney Cycling Map

In addition to this, signage and pavement markings are provided within the vicinity of the site to indicate dedicated on-road cycle routes, including Eddy Road and De Villiers Avenue/ Dardanellles Road. Directional signages are also provided to guide cyclists to recommended routes within the wider cycle network. Samples of cycling facilities observed within the vicinity of site are shown in Figure 2.15.

Figure 2.15: Existing Cycling Facilities

2.9 Road Safety

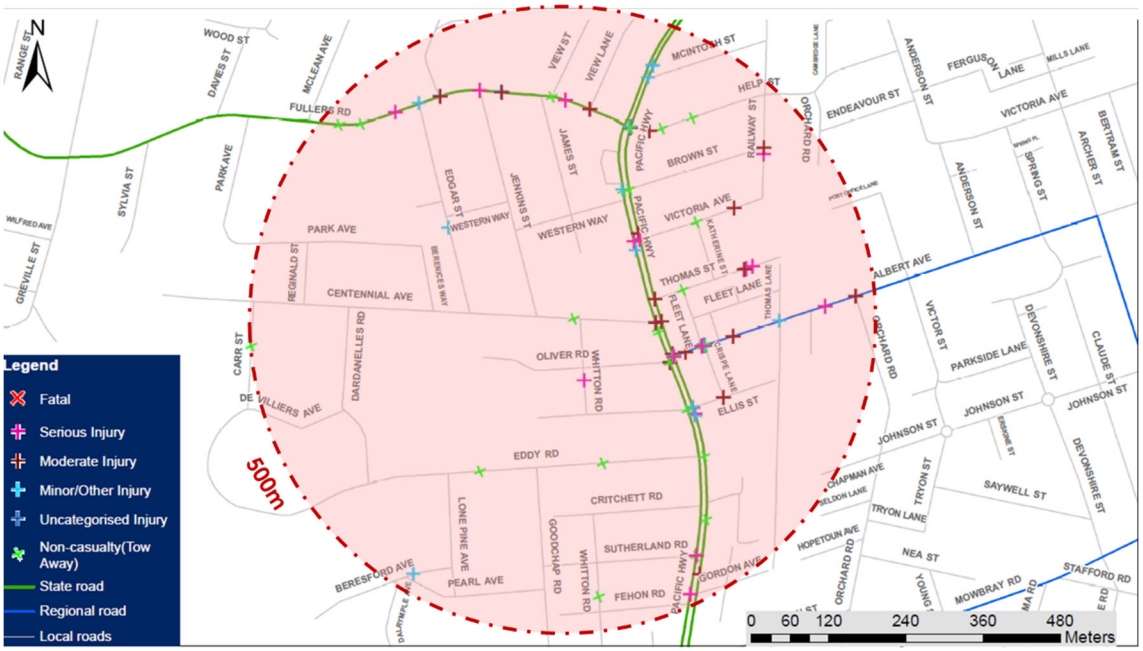
Crash data for the local area surrounding the subject site has been obtained from Roads and Maritime Services to assess the road crash history within the vicinity of the site. This data covers the most recent 5-year period, between 2013 and 2018, within a 500m radius from the sites.

A summary of the crash data is provided as follows:

- There has been a total of 112 crashes within the study area
- No crash fatalities have been recorded
- Of these crashes, 75 crashes resulted to injuries and 37 crashes were non-casualties
- Majority of the crashes occurred along Pacific Highway and Fullers Road
- 80 crashes occurred in an intersection
- Vehicular crashes on local road intersections within the immediate vicinity generally involved crashes on stationary objects only
- 16 crashes involved pedestrians, and
- 2 crashes occurred during school zone hours.

The distribution and degree of severity of the crashes are shown in Figure 2.16.

Figure 2.16: Recorded Crash Accidents Within 500m from the Subject Site (All Crashes)



Source: Road Safety, Transport for NSW (retrieved 09 January 2018)

From a detailed review of the crash data, the nature of the crash and people involved do not appear to indicate that any of the reported crashes are related to the schools.

2.10 Existing Traffic Volumes

Traffic surveys were conducted on Thursday 14 March 2019 between 8am and 9am and between 3:15pm and 8pm to record the volume of traffic at the following key intersections:

- Pacific Highway-Victoria Avenue (signalised)
- Pacific Highway-Centennial Avenue (signalised)
- Pacific Highway-Albert Avenue-Oliver Road (signalised), and
- Fullers Road-Edgar Street (unsignalised).

It is noted that the weekday survey times were selected based on the result of previous traffic surveys undertaken in December 2017 as part of the Business Case, which identified the network peak periods between 8am and 9am (AM Peak) and between 3:15pm and 4:15pm (PM Peak).

The location of the key intersections surveyed is provided in Figure 2.17.

Figure 2.17: Key Surrounding Intersections

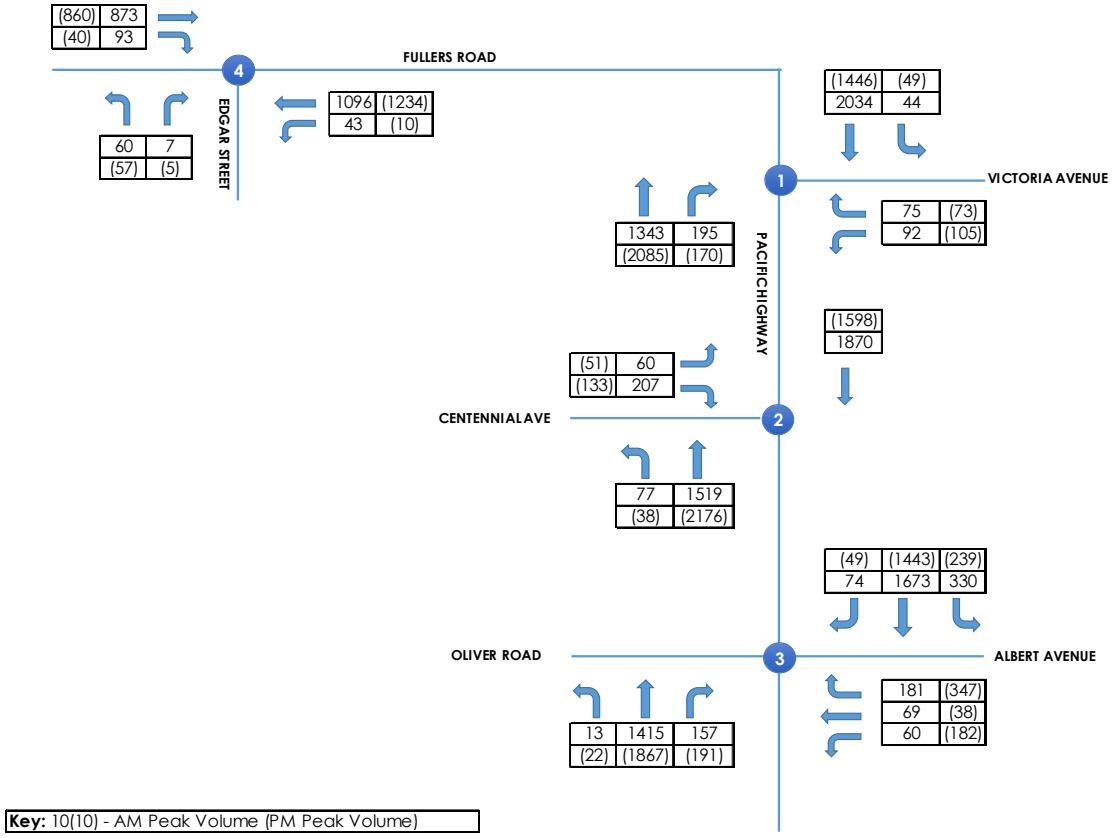
Basemap Source: Google Maps Australia

Based on the traffic surveys, the following network peak periods were identified:

- Weekday AM Peak: 8am-9am
- Weekday PM Peak: 3:15pm-4:15pm

A summary of the existing weekday network peak hour traffic volumes is shown in Figure 2.18.

Figure 2.18: Existing Weekday Peak Hour Traffic Volumes



2.11 Existing Network Performance

Network capacity analysis has been undertaken using SIDRA Intersection 8 modelling software to ascertain the existing intersection performance of key intersections surrounding the site. These traffic models have been calibrated based on site observations and SCATS traffic signal data obtained by Roads and Maritime.

Roads and Maritime uses the performance measure Level of Service (LoS) to establish the efficiency of an intersection under given prevailing traffic conditions.

LoS is directly related to the delays experienced by traffic traversing the intersection. Level of service indicators range from A (indicating good intersection operation) to F (indicating over-saturated conditions with long delays and queues). LoS D is the long-term desirable level of service.

LoS is directly related to the delays experienced by traffic traversing the intersection. Level of service indicators range from A (indicating good intersection operation) to F (indicating over-saturated conditions with long delays and queues). LoS D is the long-term desirable level of service.

At signalised intersections, the average delay is the volume weighted average of all movements. For roundabouts and priority (give way and stop sign) controlled intersections, the average delay relates to the worst movement.

Table 2.1 shows the criteria that SIDRA Intersection adopts in assessing the LoS.

Table 2.1: Roads and Maritime LoS Criteria

Level of Service (LoS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity; at signals incidents would cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode.
F	Greater than 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode or major treatment

A summary of the existing peak traffic modelling results is shown in Table 2.2.

Table 2.2: Existing Peak Hour Traffic Modelling Results

Intersection		Signal Control	AM Peak		PM Peak	
			Ave. Delay (sec)	LoS	Ave. Delay (sec)	LoS
1	Pacific Highway – Victoria Avenue	Signal	26	B	22	B
2	Pacific Highway – Centennial Avenue	Signal	26	B	55	D
3	Pacific Highway – Albert Avenue/ Oliver Rd	Signal	28	B	28	B
4	Fullers Road – Edgar Street	Priority	51	D	68	E

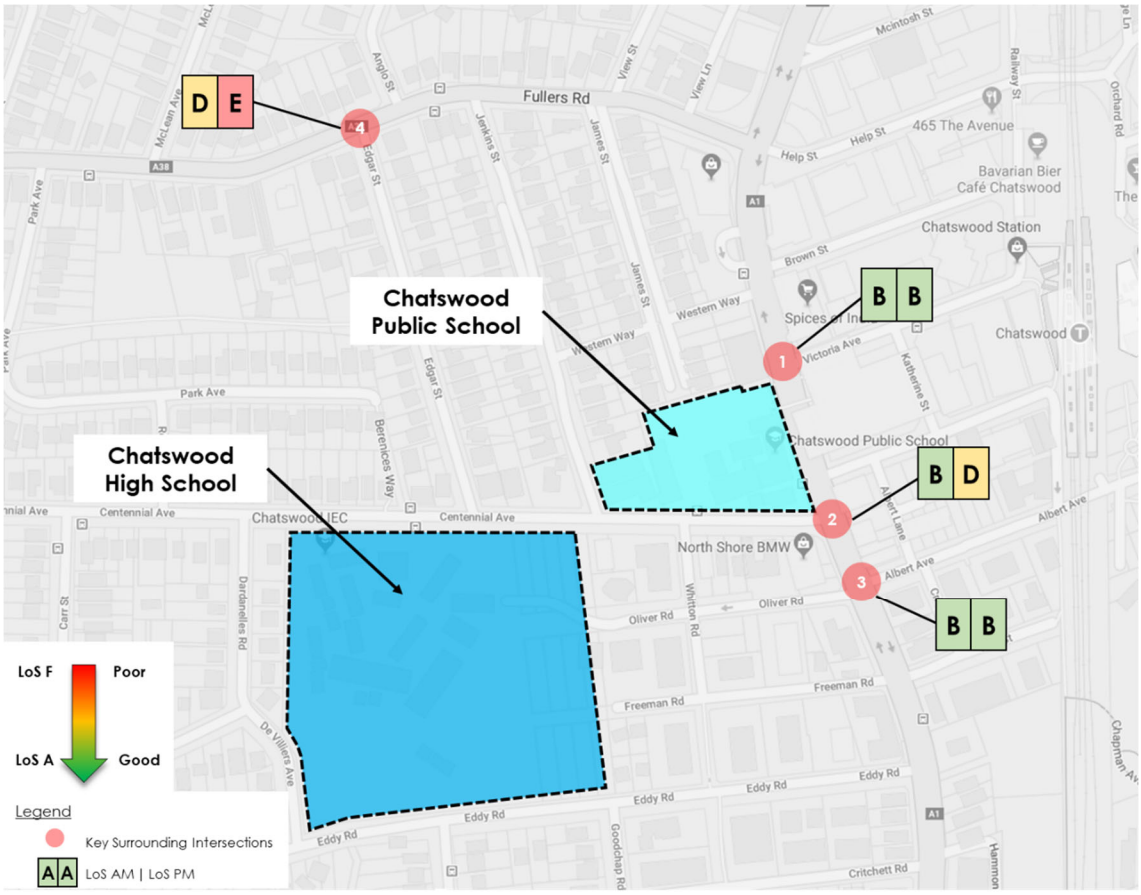
Based on the above, the surrounding key intersections generally operate satisfactorily, with the exception of the Fullers Road-Edgar Street intersection during the weekday PM peak hour.

The Fullers Road-Edgar Street intersection currently operates at LoS E during the weekday PM peak. This is primarily due to the right-turn movement out of Edgar Street into Fullers Road, as these movements are delayed by the high traffic volumes along Fullers Road. It is noted that this is only a minor movement where it has been surveyed to carried approximately five vehicles per hour.

Further to this, it should be noted that that excessive queueing along Centennial Avenue is currently present, on approach to Pacific Highway, during peak school times, with queues often extending beyond Jenkins Street.

The overall existing intersection performance at key surrounding intersections is graphically shown in Figure 2.19.

Figure 2.19: Existing LoS Summary – Weekday AM and PM Peak

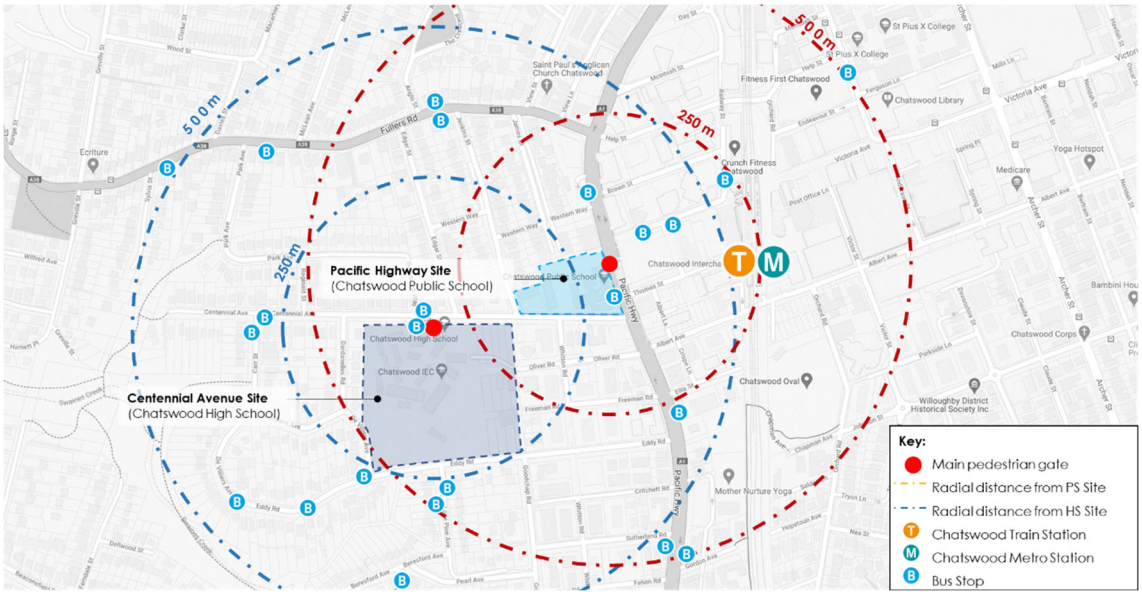


3 Public Transport Network

The Chatswood Interchange provides a number of high frequency public transport services for both rail and bus services. It is located east of the site, approximately 250m (5-minute walk) from Chatswood Public School and 650m (10-minute walk) from Chatswood High School.

The site's proximity to existing public transport services is shown in Figure 3.1.

Figure 3.1: Proximity to Public Transport Services



Basemap Source: Google Maps Australia

3.1 Rail Services

Chatswood Train Station provides frequent train services for T1 North Shore, Northern, and Western Line, as well as the new Sydney Metro Norwest between Chatswood and Tallawong.

During peak hours, T1 trains traveling from Chatswood to Sydney CBD, northern and western suburbs arrive at the station approximately every two minutes. The Sydney Metro trains arrive every four minutes during peak hours and every 10-minutes outside of peak hours.

A map of the existing rail network is provided in Figure 3.2.

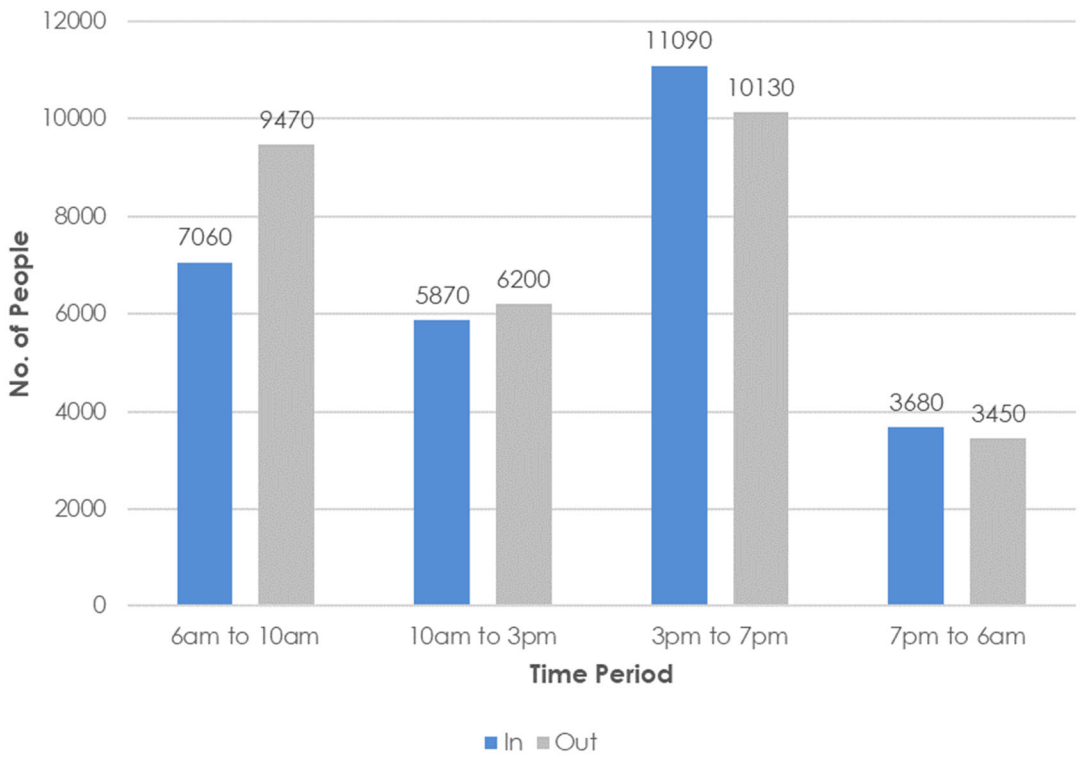
Figure 3.2: Existing Railway Network

Source: Transport for NSW (retrieved 02 May 2019)

Of note, Chatswood Train Station is identified as the seventh busiest station in Sydney based on Transport for NSW's latest Train Station Entries and Exits survey data (2016 to 2018).

The 2018 survey results indicate that a total of 27,700 people enter and 29,250 exit Chatswood Train Station within a 24-hour period. A summary of the latest 2018 station barrier counts is provided in Figure 3.3.

Figure 3.3: Summary of 2018 Station Barrier Counts at Chatswood Station



Train timetable obtained from Transport for NSW indicate that there are currently about 426 train services that run on weekdays and 308 train services on weekends at Chatswood Station in both directions. A total of 108 trains service Chatswood Station during the school AM and PM peak (i.e. from 7am to 9am and from 2pm to 4pm on weekdays).

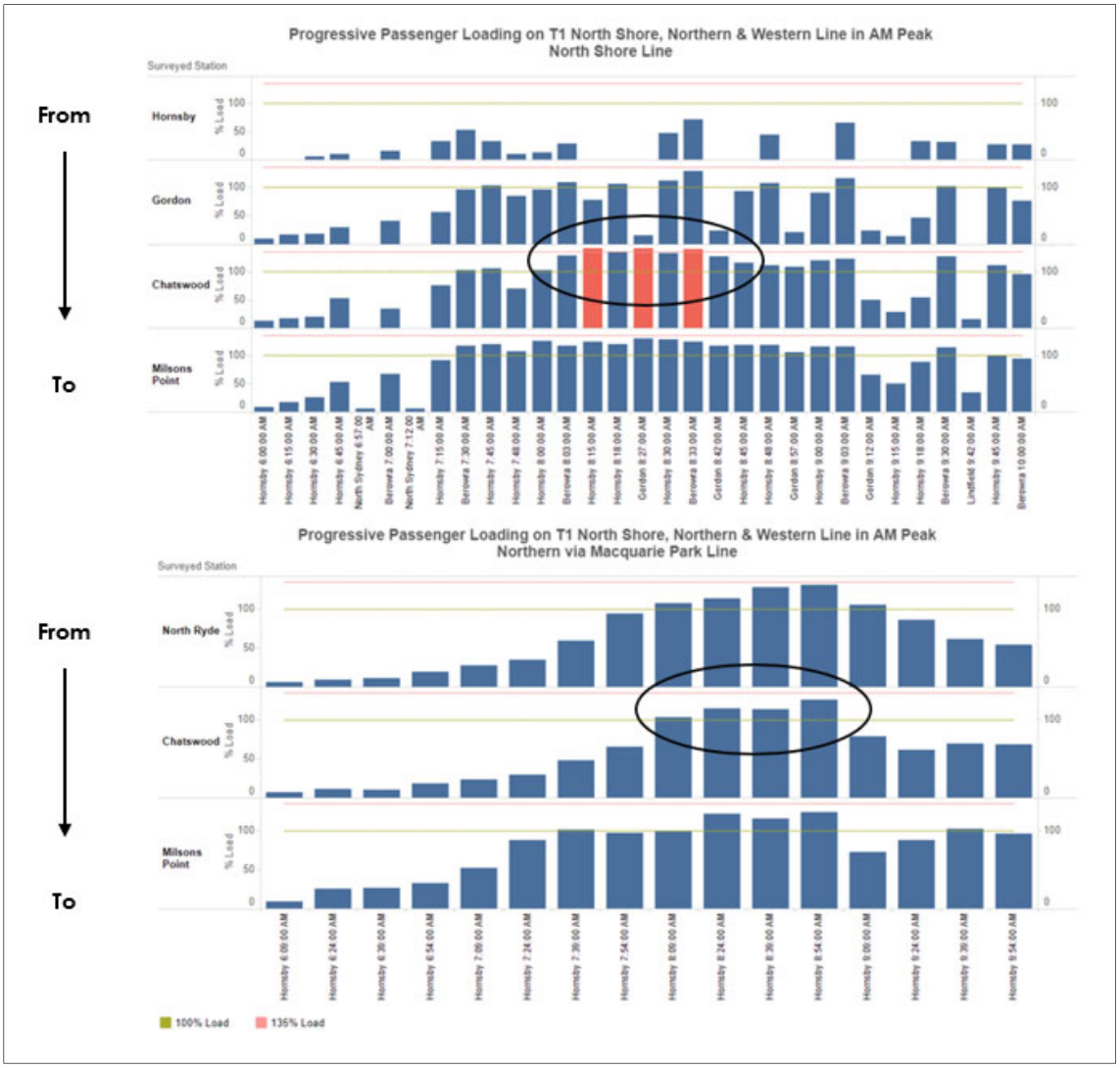
A summary of the existing rail services frequency at Chatswood Station during school peak hours is provided in Table 3.1.

Table 3.1: Summary of Rail Services at Chatswood Station During School Peak Hours

Cordon	AM Period		PM Period	
	7am-8am	8am-9am	2pm-3pm	3pm-4pm
From City	13	13	13	13
To City	14	14	14	14
Total	**27**	**27**	**27**	**27**

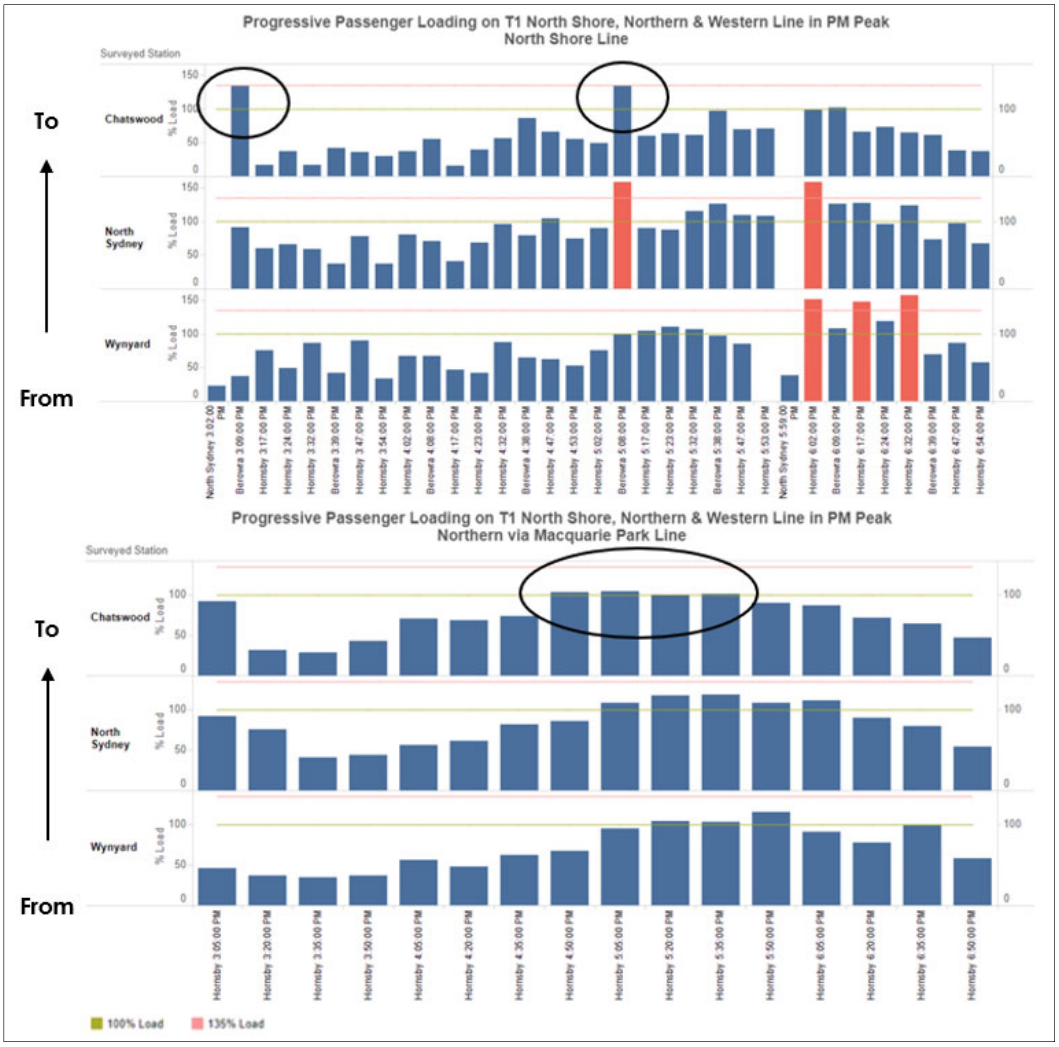
Further to this, a summary of the latest train load survey data available on the T1 North Shore, Northern and Western Line provided by Transport for NSW is shown in Figure 3.4 and Figure 3.5. It is however noted that this train load data is dated back in March 2016, when the Sydney Metro was not operational at the time and therefore, may not be best representative of current train load conditions.

Figure 3.4: AM Peak Train Load Surveys – March 2016



Source: Transport for NSW

Figure 3.5: PM Peak Train Load Surveys – March 2016



Source: Transport for NSW

Based on the above, the existing T1 North Shore, Northern & Western Line experiences relatively heavy loadings on approach to Chatswood, with seating capacity generally reached well before this station, particularly during the morning peak period. In addition to this, existing train load data indicates that the nominal capacity (135% load) is well-exceeded on approach to Chatswood Station in the morning peak period.

Notwithstanding the above, with the Sydney Metro now in operation, train loads on approach to Chatswood have been observed by TTPP to be high, generally with standing spare capacity only during peak periods, particularly during the evening peak period. It is however expected that the future Sydney Metro extension between Chatswood and Bankstown will assist alleviate pressure on the rail line once complete.

3.2 Bus Services

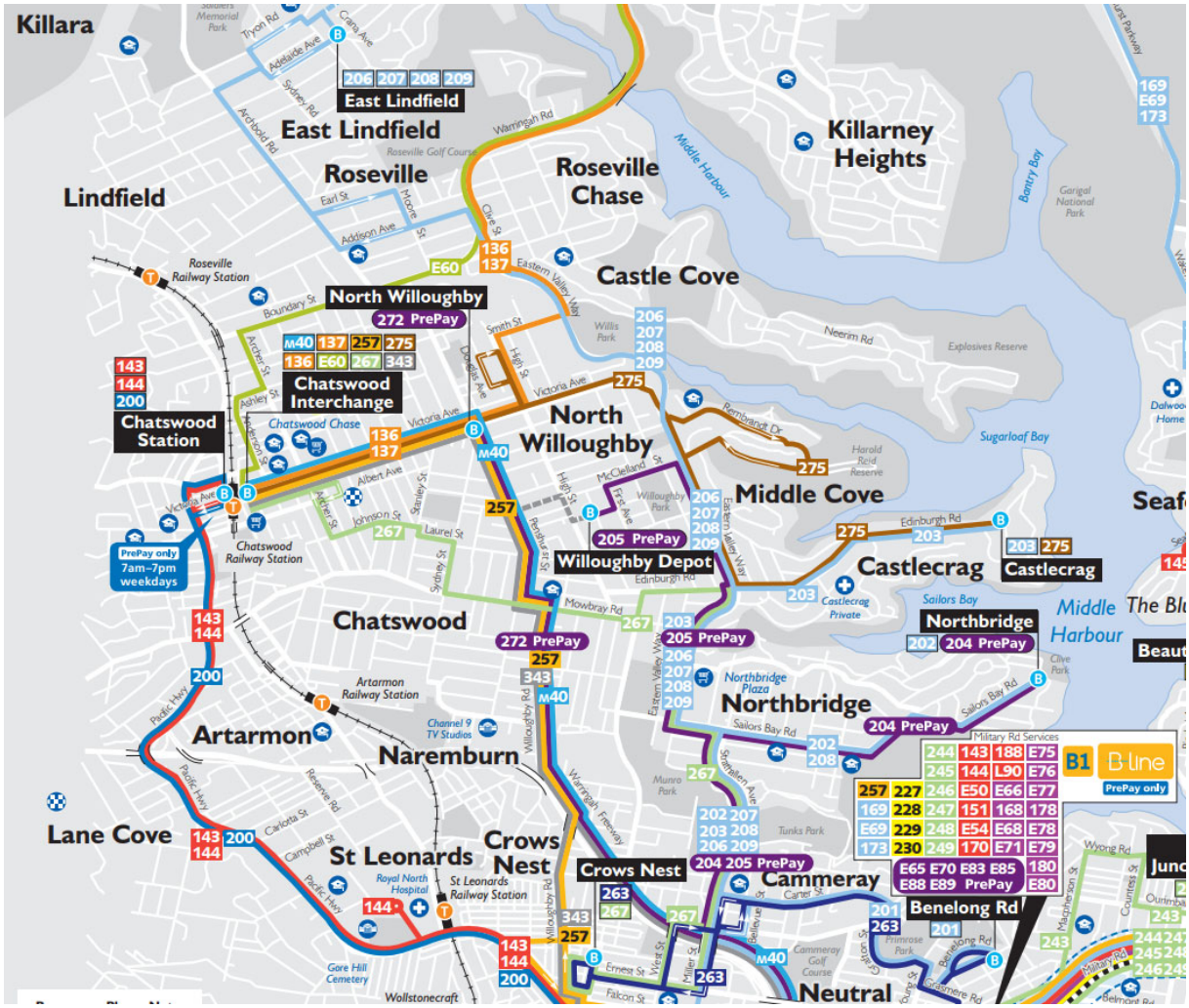
Chatswood Bus Interchange provides connection to a wide range of bus services operating to/from areas of Sydney CBD, Northern Beaches, North Shore, Willoughby, Parramatta, Macquarie University, and Bondi. Chatswood Interchange bus stands are located along Victoria Avenue, Railway Street and Orchard Road.

The existing bus network maps are presented in Figure 3.6 and Figure 3.7.

Figure 3.6: Existing Bus Network Map – North Shore and West Network Map

Source: Transport for NSW (State Transit), North Shore & West Bus Network Map

Figure 3.7: Existing Bus Network Map – Northern Beaches and Lower North Shore Network Map



Source: Transport for NSW (State Transit), Northern Beaches and Lower North Shore Bus Network Map

TfNSW conducted bus occupancy surveys from August 2016 to January 2017. The occupancy status is provided by three values:

- Standing room only – occupancy is more than the seating capacity
- Few seats available – occupancy is from 50% to 100% of the seating capacity, and
- Many seats available – occupancy is less than 50% of the seating capacity.

Based on the TfNSW survey results on a typical weekday (Tuesday, 22 November 2016), occupancy of buses servicing the interchange are classified as "Many seats available", except for the following services which are classified as "Few seats available" during the school peak hours:

- 136 – Chatswood to Manly
- 143 – Chatswood to Manly via Balgowlah and St Leonards
- 275 – Chatswood to Castlecrag

- 278 – Chatswood to Killarney Heights
- 280 – Chatswood to Warringah Mall
- 281 – Chatswood to Davidson
- 343 – Chatswood to Kingsford
- 534 – Chatswood to Ryde via North Ryde
- 536 – Chatswood to Gladesville via Hunters Hill
- 545 – Chatswood to Parramatta via Eastwood and Macquarie Centre, and
- M40 – Chatswood to Bondi Junction.

From the above, it appears that existing bus services in the area have available spare capacity based on most recent 2016 bus occupancy data available.

4 Existing School Travel Patterns

Online questionnaire surveys were distributed by the school for students and staff to complete. The key objective of the data collection was to determine all mode trip generation and parking demand of the primary and high schools, in terms of staff and student trips.

Based on information provided by the schools, the existing population of the school is as follows:

- Chatswood Public School (CPS)
  - 105 staff members
  - 1,337 primary school students
- Chatswood High School (CHS)
  - 101 staff members
  - 1,670 high school students.

The following number of responses have been collected from the online survey:

- Chatswood Public School Students – 819 out of 1,337 students (61% response rate)
- Chatswood Public School Staff – 80 out of 105 staff (76% response rate)
- Chatswood High School Students – 261 out of 1,670 students (16% response rate)
- Chatswood High School Staff – 84 out of 101 staff (83% response rate).

4.1 Staff Questionnaire

A total of 164 responses were received from the questionnaire survey conducted for school staff, consisting 80 staff responses (representing 76 per cent respondent rate) from Chatswood Public School and 84 staff responses (representing 83 per cent respondent rate) from Chatswood High School.

Figure 4.1 and Figure 4.2 provide a summary of the existing modal splits for staff at Chatswood Public School and Chatswood High School respectively. It can be seen from both figures that private car travel is the primary mode of travel for staff at both schools (i.e. 64% for the public school and 80% for the high school).

The results indicate a high dependency on car usage for staff at both schools, despite the site's close proximity to high frequency public transport services.

Figure 4.1: Existing Modal Split – Chatswood Public School Staff

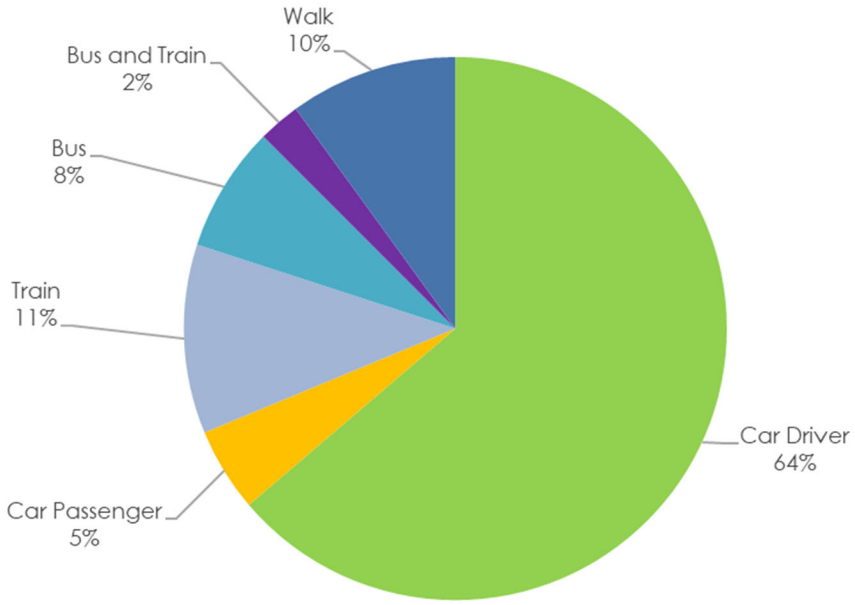
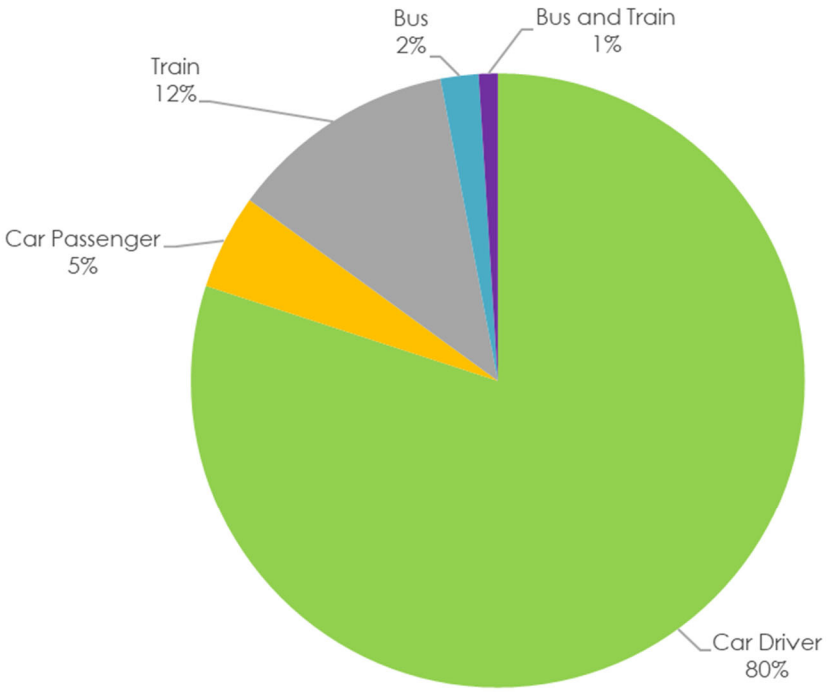


Figure 4.2: Existing Modal Split – Chatswood High School Staff



Staff traveling to/from the site using private vehicles were also asked where they would usually park their car as part of the survey questionnaire. Based on this, the majority of high school staff currently park within the school car park, whilst staff at the primary school would

generally park their cars on surrounding streets. A summary of the staff parking patterns is provided in Table 4.1.

Table 4.1: Existing Staff Parking Patterns

Parking Location	Chatswood Public School	Chatswood High School
Within the school car park	19%	98%
On-Street	77%	2%
Others (Off-site car parks)	4%	0%
TOTAL	**100%**	**100%**

In addition to this, the staff who park on the nearby street generally park along De Villiers Avenue, Dardanelles Road, Eddy Road, and Carr Street, where unrestricted street parking is provided.

4.2 Student/Parent Questionnaire

A total of 1,080 responses were received from the questionnaire survey conducted for students, consisting 819 students (representing 61 per cent respondent rate) from Chatswood Public School and 261 students (representing 16 per cent respondent rate) from Chatswood High School.

A summary of the existing modal splits of the students is presented in Figure 4.3 and Figure 4.4.

Figure 4.3: Existing Modal Split – Chatswood Public School Student

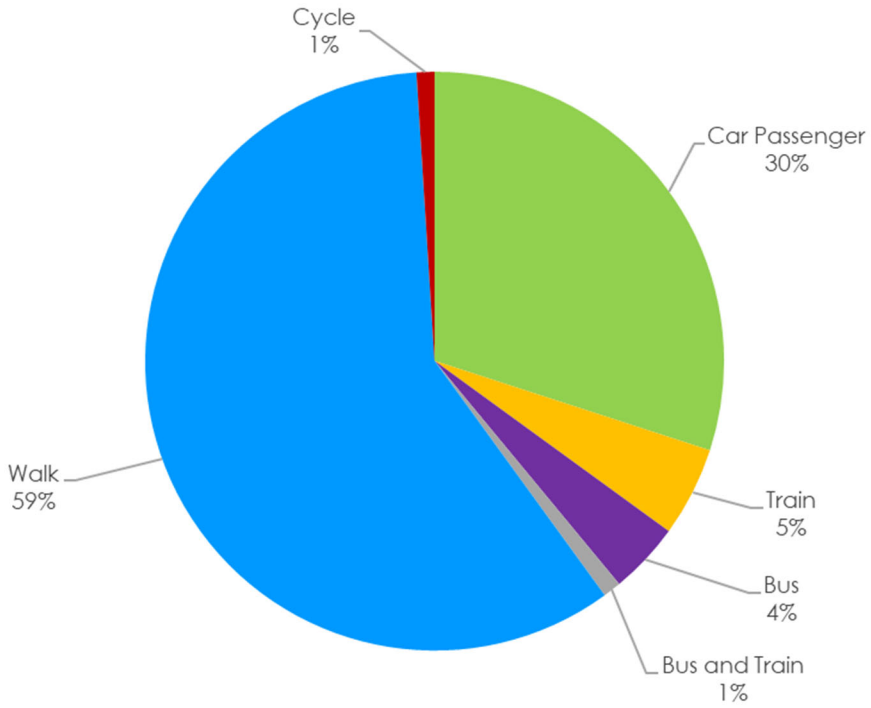
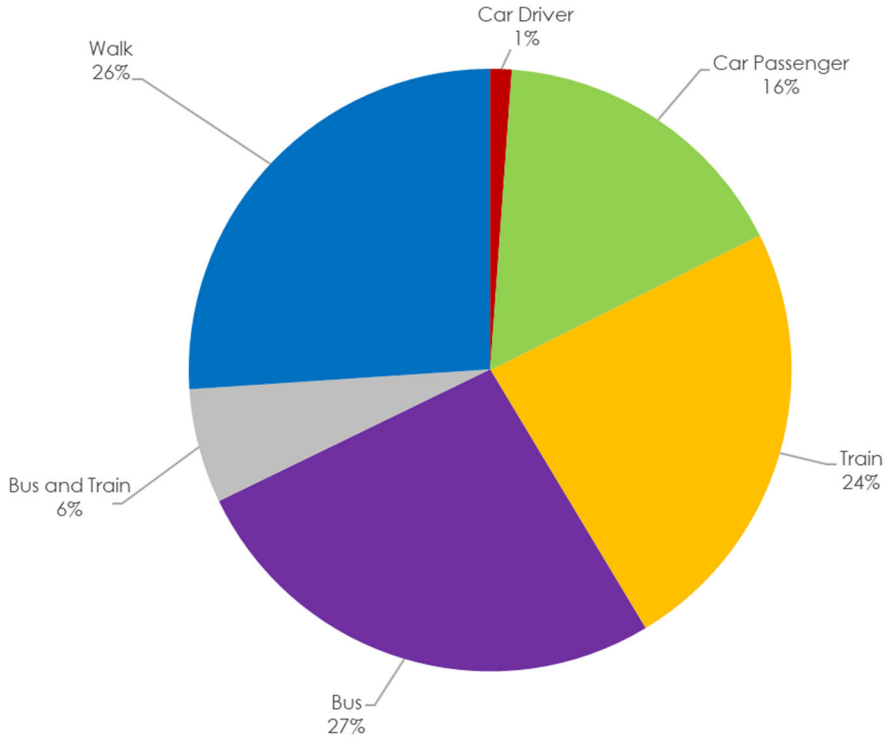


Figure 4.4: Existing Modal Split – Chatswood High School Student



Based on the above results, walking is the primary mode of travel to/from Chatswood Public School (59%) among the students, followed by private car trips (30%). For Chatswood High School, the majority of the students travel by active and public transport, with 27% of the

respondents travelling via bus, 24% via train, 6% via a combination of bus and train travel and 26% by walking.

Consultation with the High School Principal and administrative staff that the surveyed existing modal splits were representative of the overall high school students. Based on their observations, 19% of the students use car as mode of transport and the remaining 81% use other transport modes. This is comparable with the survey results which indicate 17% car use and the remaining 83% using public transport, walk or cycle.

4.3 Arrival/Departure Patterns by Car

Further to the above, car drivers and car passengers were asked what their usual arrival and departure times were to/from the school. A summary of the typical arrival and departure times is provided in Figure 4.5 and Figure 4.6, respectively.

Figure 4.5: Existing Arrival Time Pattern

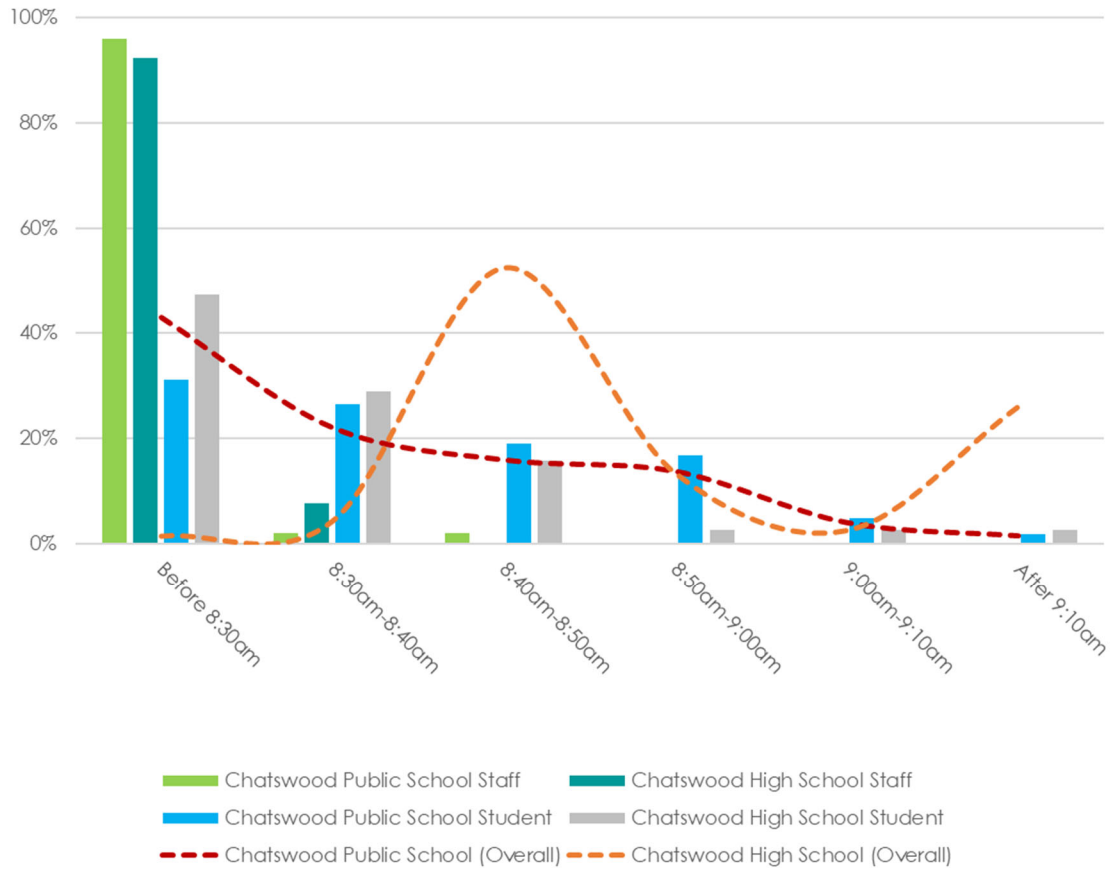
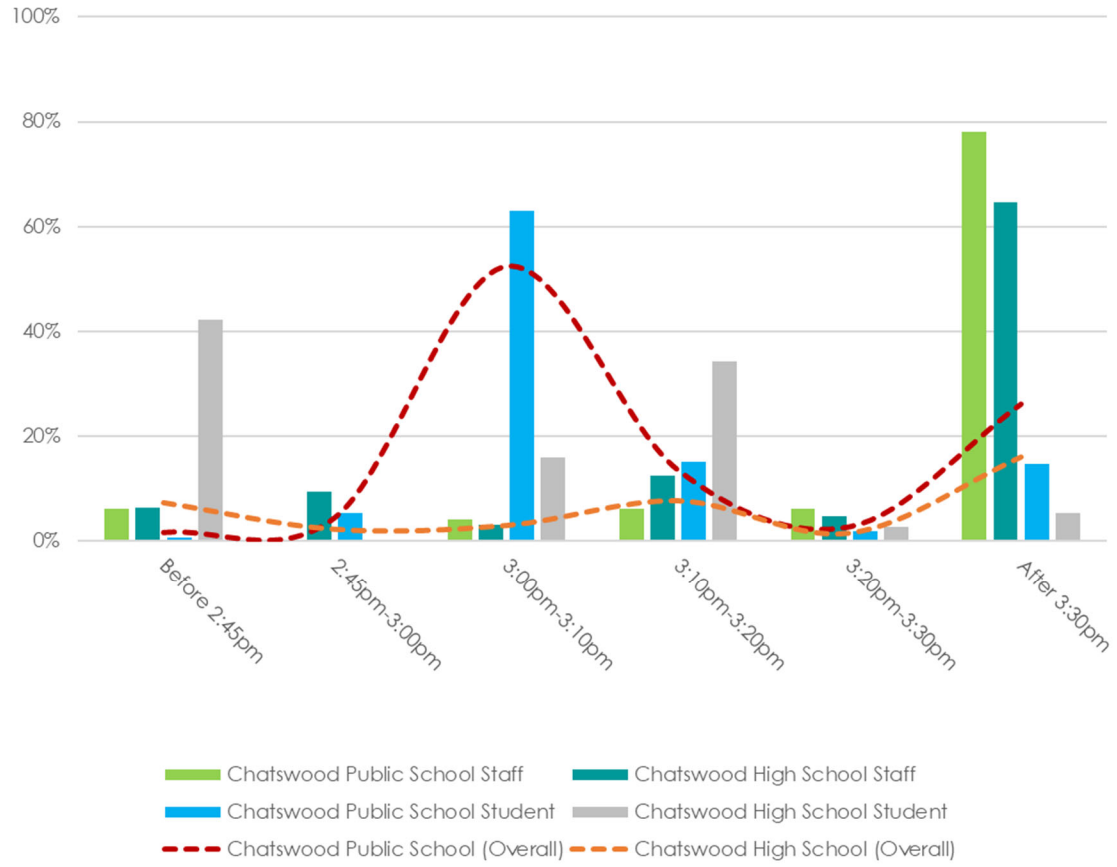


Figure 4.6: Existing Departure Time Pattern



Based on the above, staff typically arrive before 8:30am and left the school after 3:30pm.

The majority of the primary students arrived at the school after 8:30am (69%) and left from 3:00pm to 3:10pm (63%). Conversely, high school students generally arrived at the school before 8:30am (47%) and after 8:30am (53%) and left before 2:45pm (42%) and after 2:45pm (58%). Of note, based on the questionnaire survey, the majority of students arrived and left the school during the road network peak period, as summarised in Table 4.2.

Table 4.2: Car Arrival and Departure Trips during Network Peak Hours

User	Car Arrival Trips During Network AM Peak			Car Departure Trips during PM Peak		
	Parked throughout the day (i.e. Car driver, carpooled)	Dropped off	TOTAL	Parked throughout the day (i.e. Car driver, carpooled)	Dropped off	TOTAL
CPS Staff	96%	4%	100%	90%	4%	94%
CHS Staff	100%	0%	100%	94%	0%	94%
CPS Students	0%	93%	93%	0%	100%	100%
CHS Students	5%	58%	63%	0%	58%	58%

Overall, the above results indicate that some portion of school trips to/from the sites occur outside the road network morning and afternoon peak hour. It is however noted that the above arrival and departure percentages are conservative considering that respondents who answered "Before 8:30am" and "After 3:30pm" may have arrived before the start of morning peak (i.e. 8am) and left after the end of afternoon peak (i.e. 4.15pm).

In fact, previous survey questionnaires undertaken in early November 2017 suggest that a large portion of staff arrived before 8am and left the site after 4pm, as shown in Figure 4.7 and Figure 4.8.

Figure 4.7: Previous 2017 Arrival Time Patterns

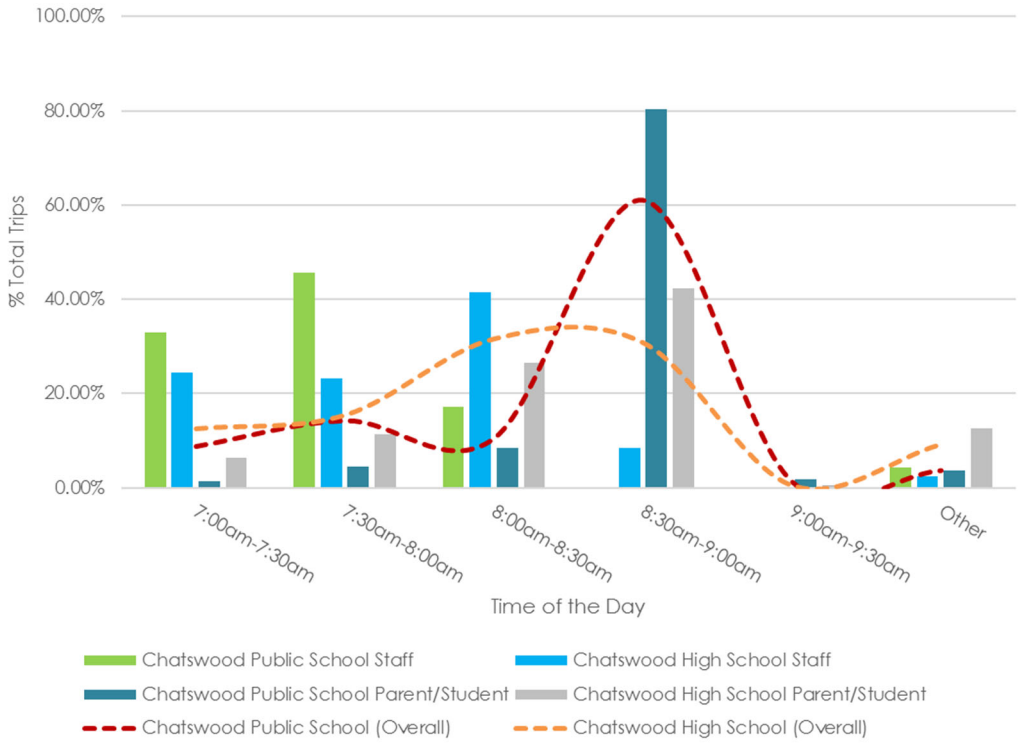
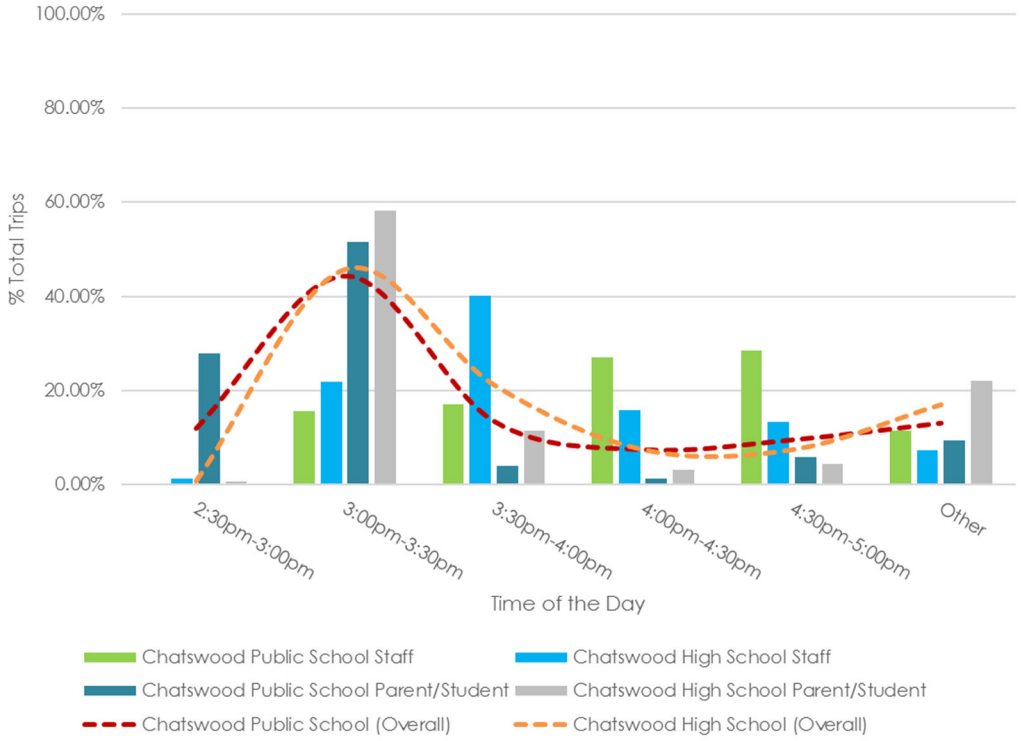


Figure 4.8: Previous 2017 Departure Time Patterns



5 Existing Site Traffic Generation

5.1 Existing Trip Generation by Travel Mode

Based on information provided by the schools, the existing population of the school is as follows:

- Chatswood Public School (CPS)
  - 105 staff members
  - 1,337 primary school students
- Chatswood High School (CHS)
  - 101 staff members
  - 1,670 high school students.

The existing trip generation by travel mode of the school has been estimated using the based on the travel survey data obtained from the students and staff questionnaire survey. The estimated trip rates have been applied to the existing school populations to estimate vehicle trip generation of the school.

A summary of the trip estimates for each method of travel is presented in Table 5.1.

Table 5.1: Estimated Existing Staff and Student Trips for Each Mode

Method of Travel	Proportion (%)				Staff/Students per Mode			
	CPS Staff	CPS Student	CHS Staff	CHS Student	CPS Staff (105 staff)	CPS Student (1,337 students)	CHS Staff (101 staff)	CHS Student (1,670 students)
Car Driver	64%	-	80%	1%	67	0	81	17
Car Passenger	5%	30%	5%	16%	5	401	5	267
Train	11%	5%	12%	24%	12	67	12	401
Bus	8%	4%	2%	27%	8	53	2	451
Bus and Train	2%	1%	1%	6%	2	13	1	100
Cycle	0%	1%	0%	0%	0	13	0	0
Walk	10%	59%	0%	26%	11	789	0	434
Total	**100%**	**100%**	**100%**	**100%**	**105**	**1,336**	**101**	**1,670**

5.2 Existing Vehicle Trip Rates

In terms of vehicle trip rates, it should be noted that given the complexities of parking patterns of schools, it would be difficult to capture all vehicle trips to/from the schools as students, parents and staff tend to park at various locations over an extensive area. As such, the vehicle trips and associated trip rate has been estimated based on travel survey data obtained from the questionnaire survey.

On this basis, Table 5.2 presents a summary of the estimated peak hour traffic generation estimate of the school.

Table 5.2: Existing Peak Hour Vehicle Trip Estimate

Method of Travel	AM Peak				PM Peak			
	CPS Staff	CPS Student	CHS Staff	CHS Student	CPS Staff	CPS Student	CHS Staff	CHS Student
Existing Population	105	1,337	101	1,670	105	1,337	101	1,670
Private Car Mode Share %	69%	30%	85%	17%	64%	-	80%	1%
Peak hour car driver + carpool %	96%	-	100%	5%		-	94%	0%
Peak hour dropped off %	4%	93%	0%	89%		100%	0%	58%
Car occupancy rate	1.06	1.65	1.08	1.76	1.06	1.65	1.08	1.76
Vehicle trips (one-way)*	69	227	79	159	64	242	75	93
Total Vehicle trips (one-way)	296		239		306		168	

** One way trip corresponds to the dominant travel direction during peak hour (i.e. inbound in AM, outbound in PM)*

Table 5.2 shows the estimated existing vehicle trips generated by the school during the peak periods. The estimated vehicle trips correspond to the dominant travel direction during peak hour (i.e. inbound in morning, outbound in afternoon).

To estimate the two-way trip generation of the school, the results presented in Roads and Maritime Services Traffic Generation Studies at Schools (2014). The average directional split of the surveyed schools indicates that about 85% of the trips recorded in the morning peak hour are inbound and 15% are outbound, with the reverse observed in the afternoon peak.

On this basis, the trips of the non-dominant travel direction (i.e. outbound in morning, inbound in afternoon) have been estimated.

Table 5.3 presents the estimated vehicle traffic generation rate of the school.

Table 5.3: Peak Hour Vehicle Trip Generation Rate

Method of Travel	AM Peak		PM Peak	
	CPS	CHS	CPS	CHS
Existing Student Population	1,337	1,670	1,337	1,670
Inbound Trips	296*	239*	54	30
Outbound Trips	52	42	306*	168*
Two-Way Trips	348	281	360	198
Peak Hour Trip Rate (veh trips per student)	**0.26**	**0.17**	**0.27**	**0.12**

** = dominant travel direction*

In summary, the combined peak hour vehicle trip generation (student plus staff trips) of the existing schools in relation to the student population has been estimated as follows:

- AM Peak (8:00am to 9:00am)
  - Chatswood Public School = 0.26 vehicle trips per student
  - Chatswood High School = 0.17 vehicle trips per student
- PM Peak (3:15pm to 4:15pm)
  - Chatswood Public School = 0.27 vehicle trips per student
  - Chatswood High School = 0.12 vehicle trips per student.

5.3 Roads and Maritime Traffic Generation Studies at Schools (2014)

Roads and Maritime has collected recent traffic generation data from schools across NSW. A total of 22 schools were surveyed over a typical school day, including metropolitan primary and secondary schools.

A comparison of the trip generation rates calculated above, and the Roads and Maritime survey results is provided in Table 5.4.

Table 5.4: Comparison Vehicle Trip Generation Rates

	Vehicle Trip per Student
Primary School	
Roads and Maritime Survey Data (Minimum and Maximum)	0.14 – 0.98
Chatswood Public School	0.26 – 0.27
Secondary School	
Roads and Maritime Survey Data (Minimum and Maximum)	0.15 – 0.83
Chatswood High School	0.12 – 0.17

Table 5.4 indicates that the vehicle trip generation rates for Chatswood Public School and Chatswood High School are within the minimum and maximum trip rates collected by Roads and Maritime. The estimated vehicle trip rates are closest to the minimum rates by Roads and Maritime.

6 Proposed School Upgrades

6.1 Overview

It is proposed that Chatswood Public School and Chatswood High School will be upgraded to deliver new and refurbished innovative learning and teaching spaces along with improved play space and administrative facilities.

In addition, the existing number of on-site car and bicycle parking facilities will be increased as part of the proposed upgrades.

The proposed site layouts of the Primary School and High School are shown in Figure 6.1 and Figure 6.2.

Figure 6.1: Proposed Site Layout – Pacific Highway Site (Primary School)

Source: Architectus

Figure 6.2: Proposed Site Layout – Centennial Avenue Site (High School)

Source: Architectus

6.2 Construction Period

The proposal seeks consent for the demolition of existing buildings, removal of demountable buildings and construction of new school buildings.

A summary of the key construction activities of the project is provided in Table 6.1, with the overall development plans provided in Appendix A.

Table 6.1: Summary of Proposed Construction Activities

Construction Activity	Description of Works
Demolition and Bulk Excavation	• Relocate/demolish existing demountables • Remove existing trees
Structure	• Construction of new school buildings
Fit out and Finishes	• Finalise external and internal works and landscape

The construction works are expected to commence in January 2021 and finish in late 2023 over a total period of approximately 36-months. The construction works will be scheduled to occur outside of school terms as far as practicable to minimise its impact on existing school operations.

t is noted that works at the two sites are expected to occur concurrently during the project, with appropriate measures in place to minimise disruption on existing school operations (e.g. decanting of students to temporary demountables during the works).

6.3 Proposed Parking Provisions

During construction works, the car parking areas on Pacific Highway site and Centennial Avenue site will not be available. Existing car park spaces on the Pacific Highway site will be removed to facilitate construction of Buildings P1, P2 and G whilst Centennial Avenue site carpark will be replaced by demountables.

Construction works will include a new parking facility with access off Jenkins Street. A new loading / emergency bay will also be delivered on Pacific Highway site which will be accessible via Pacific Highway.

Following completion of construction activities, the existing car park on Centennial Avenue site will be reinstated. The existing unmarked parking spaces which are currently being used by staff will be formalised.

Overall, the future upgrades will provide a total of 122 car parking spaces.

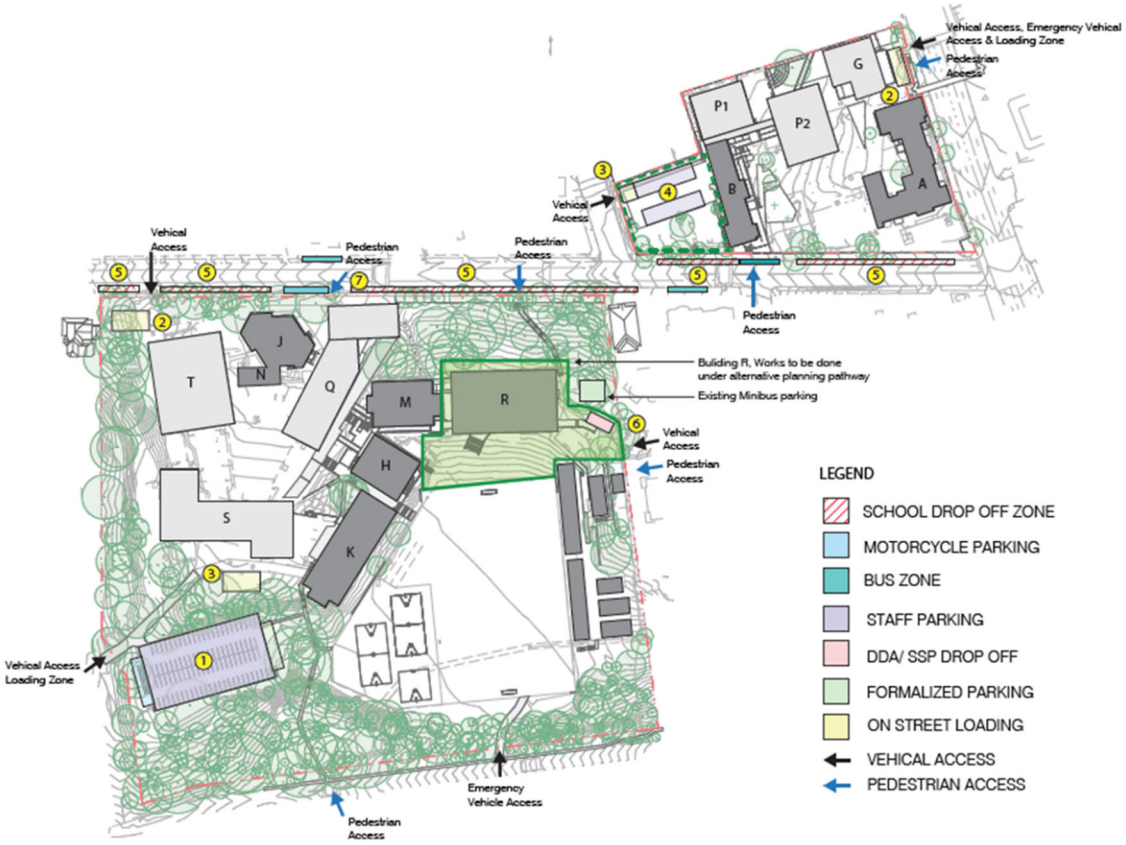
In addition, there would be four drop-off/pick-up bays that will be provided off Oliver Road for Special Education. These spaces would not be used for staff parking and are excluded in the parking calculation.

A total of 14 motorcycle bays will be provided within the staff parking area on Centennial Avenue site.

Table 6.2: Proposed Parking Provision

Parking Supply	Existing			During Construction			Post-Construction		
	Pacific Hwy	Centennial Ave	Total	Pacific Hwy	Centennial Ave	Total	Pacific Hwy	Centennial Ave	Total
Car	18	122 (including 18 Bush Campus car park spaces)	140	2	2	4	18	104	122
Bicycle	-	-	-	-	-	-	60	84	144
Motorcycle	-	-	-	-	-	-	-	14	14

Figure 6.3: Proposed Parking Facilities



Source: Architectus

6.4 Proposed Vehicle and Pedestrian Access

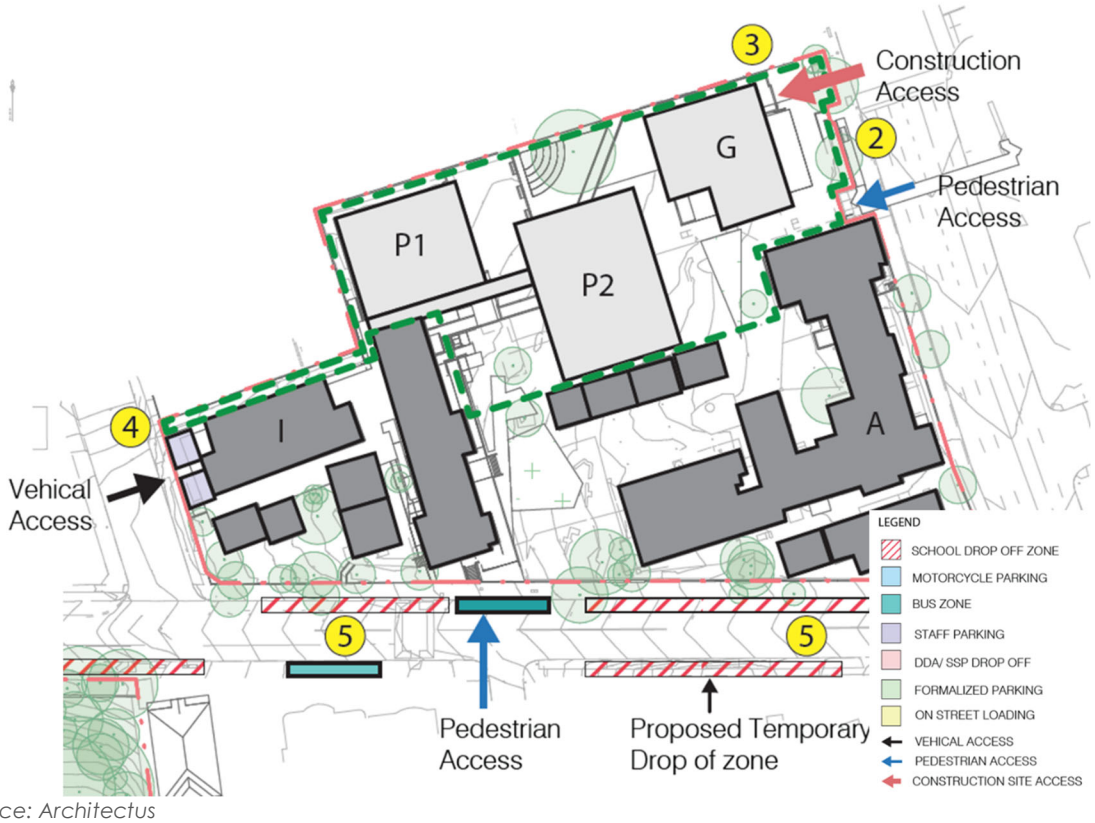
6.4.1 Access During Construction Works

During construction vehicle access off Pacific Highway will only be used by construction vehicles. In addition, a temporary drop off zone will be provided on the south side of Centennial Avenue, opposite the existing drop off zone.

Vehicle access points along Centennial Avenue will be used by construction vehicles for works on the Centennial Avenue site. The vehicle access off De Villiers Avenue will only be used by service vehicles for loading and unloading as the car park will temporarily be replaced by demountables.

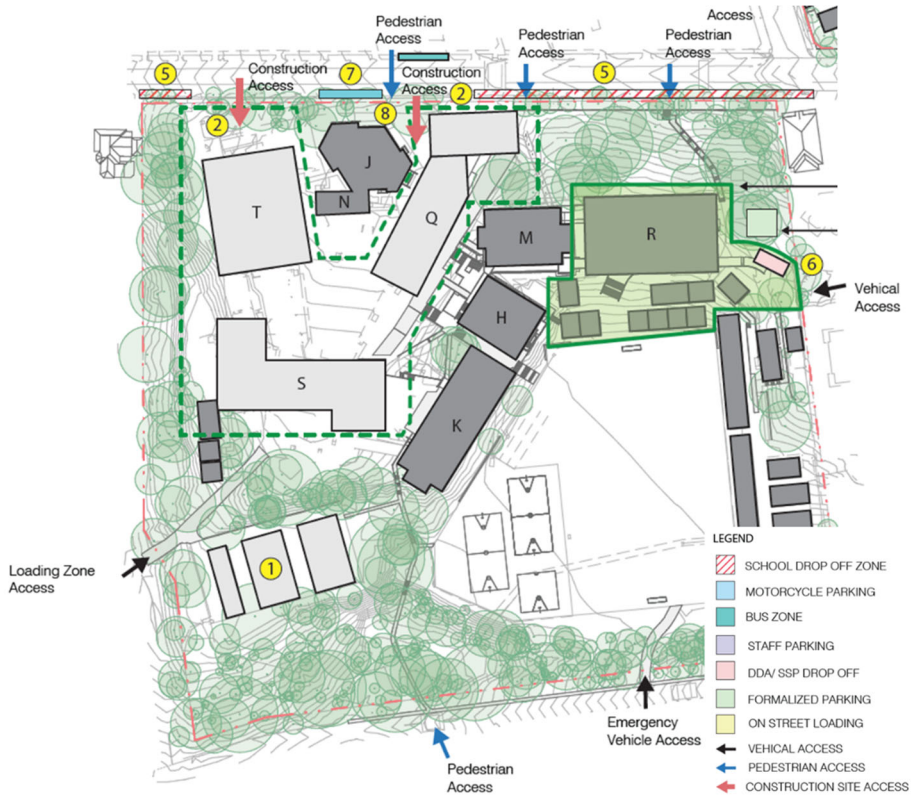
The vehicle and pedestrian access locations during construction works are shown in Figure 6.4 and Figure 6.5.

Figure 6.4: Pacific Highway Site Vehicle and Pedestrian Access – During Construction



Source: Architectus

Figure 6.5: Centennial Avenue Site Vehicle and Pedestrian Access – During Construction



Source: Architectus

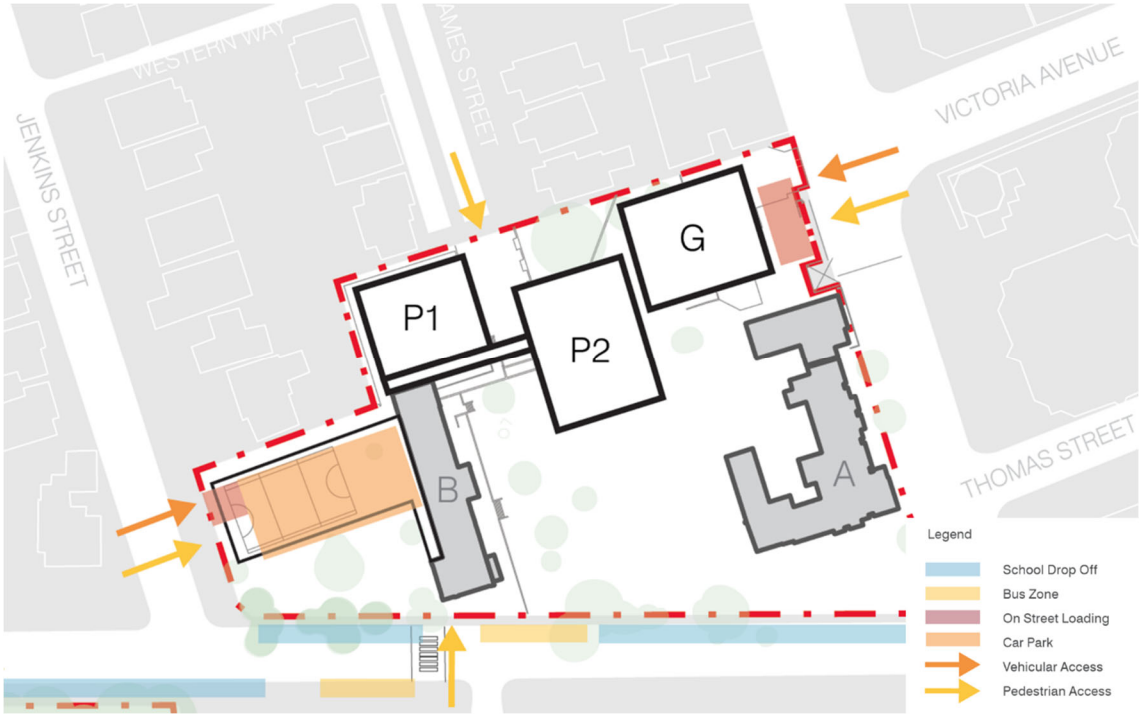
6.4.2 Operational Access After Completion of Upgrade Works

Vehicle access off Pacific Highway will be reinstated when Buildings G, P1 and P2 have been completed. Existing vehicle driveway off Jenkins Street will be modified to facilitate access to the new parking facility.

All access points at Chatswood High School site will be reinstated upon completion of the construction works.

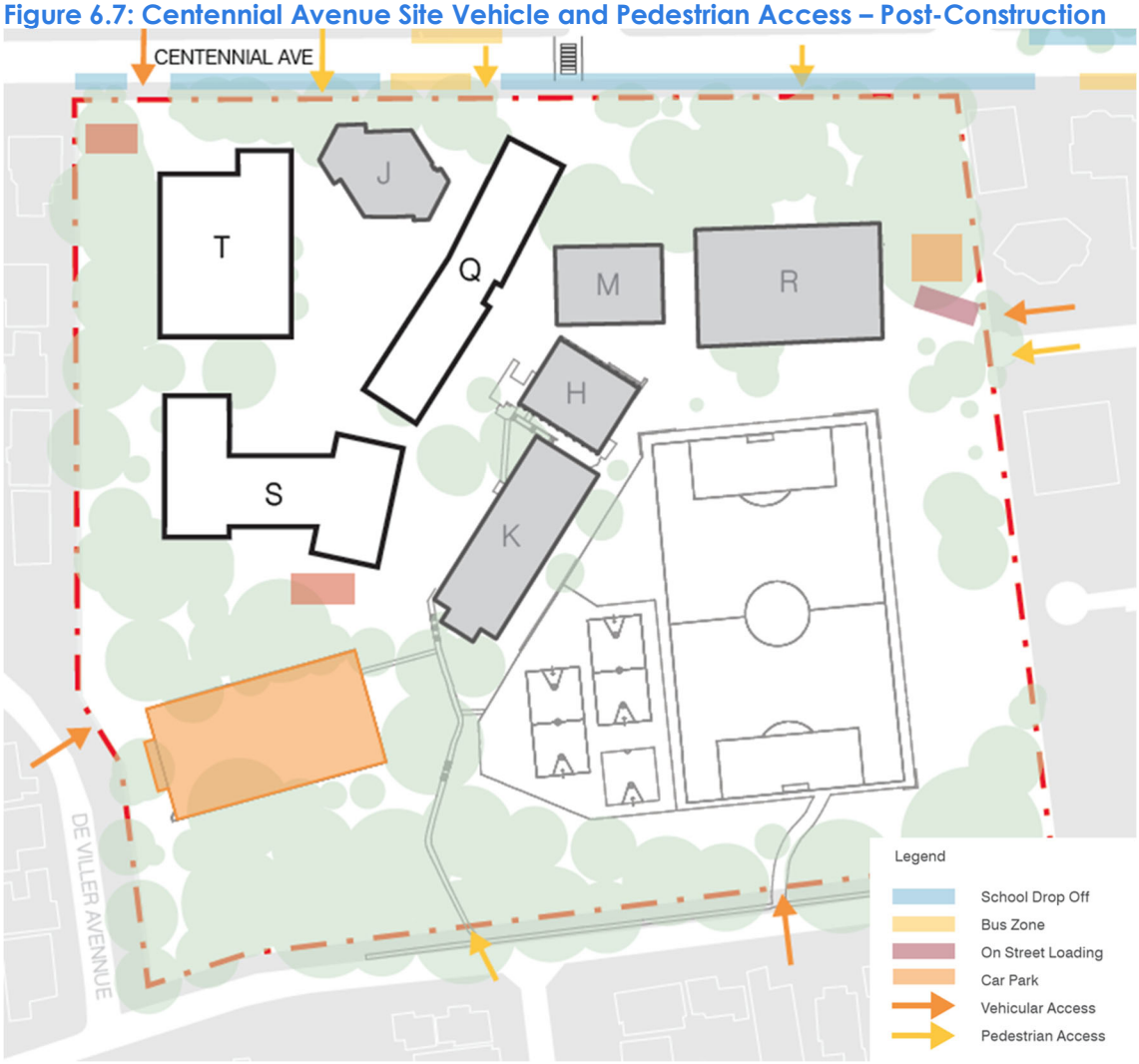
The proposed location of vehicle and pedestrian access points after the upgrade works are completed are presented in Figure 6.6 and Figure 6.7.

Figure 6.6: Pacific Highway Site Vehicle and Pedestrian Access – Post-Construction



Source: Architectus

Figure 6.7: Centennial Avenue Site Vehicle and Pedestrian Access – Post-Construction



Source: Architectus

6.5 Service Vehicle and Emergency Vehicle Access

Four loading bays will be provided on site, with two loading bays located within Pacific Highway site and three within Centennial Avenue site.

Access to the loading facilities at Pacific Highway site will be provided off Pacific Highway and Jenkins Street. Jenkins Street loading bay will be located within the new parking facility.

The loading bays within Centennial Avenue site will be accessed by the existing driveway off De Villiers Avenue and Pacific Highway.

The loading bays are designed to accommodate up to 8.8m medium rigid vehicle.

Vehicle swept path analysis of the proposed loading facilities is provided in Appendix E.

Emergency vehicle access will be provided at driveways off Pacific Highway and Eddy Road.

7 Parking and Public Transport Assessment

7.1 Car Parking Requirements

7.1.1 Assessment of Existing Car Parking Provision

The car parking requirements for the existing schools have been assessed against Council's Development Control Plan (DCP) 2016.

The Council DCP 2016 states the following car parking rates for educational establishments:

- 1 space per 2 staff, plus
- 1 space per 10 tertiary students, plus
- 1 space per 10 seats in assembly hall (may be inclusive of all other requirements).

Spaces for sports fields or educational establishments in residential zones would be determined by Council in each case.

Based on the above, a summary of the car parking requirements for the existing school as set out in Council's DCP is provided in Table 7.1. In addition, the car parking requirement has been assessed against the existing on-site car parking provision.

Table 7.1: Parking Analysis of Existing Development (DCP Rates)

Site	Existing Site Provision	DCP Car Parking Rate	DCP Car Parking Requirement	Existing Car Parking Provision
Chatswood Public School	• 105 staff • 1,337 students • 220 hall seats	• 1 space per 2 staff, plus • 1 space per 10 tertiary students, plus • 1 space per 10 seats in assembly hall.	75 car spaces	36 car spaces (including 18 spaces in Oliver Road Centennial Avenue Site)
Chatswood High School	• 101 HS staff + 23 IEC • 1,670 HS students + 150 IEC students • 400 hall seats		102 spaces	104 car spaces
Total			**177 spaces**	**140 spaces**

Table 7.1 indicates that Chatswood Public School currently provides significantly less than the car parking requirements for the existing school as set out in Council's DCP 2016. On the other hand, Chatswood High School satisfies the DCP requirements.

Notwithstanding the above, recent traffic and parking generation studies at Schools conducted by Roads and Maritime indicate the following parking demand profiles:

- **minimum:** 0.03 peak parking demand per student
- **average:** 0.11 peak parking demand per student
- **maximum:** 0.15 peak parking demand per student.

Table 7.2 presents the parking requirement of the existing school based on the Roads and Maritime rates.

Table 7.2: Parking Analysis of Existing Development (Roads and Maritime Rates)

Site	Existing Population	Roads and Maritime Car Parking Rate	Roads and Maritime Car Parking Requirement	Existing Car Parking Provision
Chatswood Public School	1,337 students	Min: 0.03 space per student Ave: 0.11 spaces per student Max: 0.15 spaces per student	Min: 40 spaces Ave: 147 spaces Max: 201 spaces	36 car spaces (including 18 spaces in Oliver Road Centennial Avenue Site)
Chatswood High School	1,670 HS students + 150 IEC students		Min: 55 spaces Ave: 200 spaces Max: 273 spaces	104 car spaces
Total			**Min: 95 spaces** **Ave: 347 spaces** **Max: 474 spaces**	**140 spaces**

Using the above methods, the existing on-site car parking provision for primary school is four spaces less than the minimum car parking demand as set out in the Roads and Maritime trip generation study for schools.

Notwithstanding, it is further noted that excessive parking provision would encourage the use of private vehicles.

7.1.2 Assessment of Proposed Car Parking Provision

For the purpose of the TAIA, the 'high occupancy' scenario for schools has considered and assessed, namely:

- 3,600 students (1,600 primary school children and 2,000 high school students),
- 256 staff, and
- 844 hall seats (264 seats in the Public School Hall + 580 seats in the High School Hall).

A summary of the DCP car parking requirements based on the future development yield is presented in Table 7.3.

Table 7.3: Parking Analysis of Proposed High Occupancy Scenario (DCP Rates)

Site	Proposed Occupancy Scenario	DCP Car Parking Rate	DCP Car Parking Requirement	Future Car Parking Provision
Chatswood Public School	• 122 staff • 1,600 students • 264 hall seats	• 1 space per 2 staff, plus • 1 space per 10 tertiary students, plus • 1 space per 10 seats in assembly hall.	87 car spaces	18 car spaces
Chatswood High School	• 134 staff • 2,000 students • 580 hall seats		145 spaces	104 car spaces
Total			**232 spaces**	**122 spaces**

Based on the proposed yield, the schools would require a total of 232 car parking spaces as per Council DCP requirements.

However, it is noted in the DCP that the parking requirement for the assembly hall component of school "*may be inclusive of all other requirements*". The application of inclusive rates for the hall seating would be appropriate for the primary use of the school assembly hall, namely the holding of school assemblies attended by students and staff. Under these typical conditions it would be unreasonable to apply demand for seating in additional to staff and students.

Thus the realistic DCP rates for parking provision of the proposed High Occupancy Scenario wold be 148 parking spaces.

Using the Roads and Maritime rates, the future schools would require the following car parking supply as summarised in Table 7.4

Table 7.4: Parking Analysis of Proposed High Occupancy Scenario (Roads and Maritime Rates)

Site	Proposed Occupancy Scenario	Roads and Maritime Car Parking Rate	Roads and Maritime Car Parking Requirement	Proposed Car Parking Provision
Chatswood Public School	1,600 students	Min: 0.03 space per student Ave: 0.11 spaces per student Max: 0.15 spaces per student	Min: 48 spaces Ave: 176 spaces Max: 240 spaces	18 car spaces
Chatswood High School	2,000 students		Min: 60 spaces Ave: 220 spaces Max: 300 spaces	104 car spaces
Total			**Min: 108 spaces** **Ave: 396 spaces** **Max: 540 spaces**	**122 spaces**

Comparably, an average of 396 car parking spaces would be required to serve both of the schools, based on recent traffic and parking generation studies undertaken at schools by Roads and Maritime.

As indicated previously, it is proposed to provide 122 car parking spaces to serve both the schools, which is less than the above DCP and Roads and Maritime car parking provisions.

However, it should be noted that the proposed car parking provision of 122 car parking spaces would satisfy the minimum car parking requirement of 108 car parking spaces, based on a car parking rate of 0.03 parking spaces per student from the Roads and Maritime trip generation study for schools.

Notably, the provision of less on-site car parking spaces would discourage staff, students and/or parents to travel to/from the site by private vehicles and hence reducing traffic generation, which is considered favourable given the site's proximity to the Chatswood Interchange.

7.1.3 Adequacy of On-Street Parking Supply

As presented in Table 7.3, the proposed development would be required to provide a total of 232 on-site car parking spaces if the assembly hall was considered as a separate use. When considering the use of the hall seating for school assemblies the DCP parking requirements would be 148 parking spaces. The proposed parking provision of 122 car parking spaces would result to a shortfall of 110 and 26 car parking spaces respectively as per DCP requirements.

The overflow parking demand would be accommodated by on-street parking spaces on roads surrounding the site. Since overflow parking spaces would generally be used by staff, unrestricted on-street parking would be required.

On-street parking occupancy survey results discussed in Section 2.6.2 indicates that within a 400m distance from the site, there are at least 191 car parking spaces available during the busiest period. These spaces would be more than sufficient to accommodate the parking demand generated by the proposed development which could not be accommodated on-site.

Although the parking occupancy survey results indicate that at least 191 unrestricted car parking spaces are available which is adequate for the estimated parking demand, it is recommended for the school to provide additional measures such as promotion of car pooling and public transport use amongst staff to minimise impact to surrounding public parking facilities.

With its proximity to Chatswood Transport Interchange, the site is highly accessible by public transport. There are frequent train, metro (future) and bus services which provide good connectivity to/from nearby suburbs and key destinations. Staff and students would further be encouraged to utilise public transport services and alternative transport options when going to/from the site to minimise parking demand.

7.2 Bicycle Parking Assessment

Council's DCP 2015 does not stipulate any bicycle parking rates for education establishments. However, the NSW Planning Guidelines for Walking and Cycling provides guidelines (NSW Planning Guideline) on suggested bicycle parking provision rates for different land-use types. Based on this, the NSW Planning Guideline suggests a bicycle parking provision rate of 3-5% of the number of staff to be allocated for long-term staff use and 5-10% of the number of staff to be allocated for short-term visitor use for primary and secondary schools.

On this basis, a total of 8-13 staff bicycle parking spaces and 13-26 visitor bicycle parking spaces should be provided as part of the proposal. Therefore, the proposed provision of 144 bicycle parking spaces would be adequate to accommodate the staff and visitor parking demand. The proposed provision also allows spare capacity for the use of students.

Appropriate allocation of end-of-trip facilities, such as lockers, showers and change rooms, should also be considered to ensure adequate bicycle facilities.

7.3 Motorcycle Parking Assessment

Council's DCP stipulates that motorcycle parking must be provided at a rate of 1 motorcycle space per 25 car spaces. Based on required parking provision of 174 car parking spaces, the schools would require a total of seven motorcycle parking spaces.

7.4 Loading and Unloading Facilities

Four loading bays will be accommodated on site. These loading bays are designed to accommodate service vehicles with sizes up to 8.8m long medium rigid vehicles.

Swept path figures (Appendix E) demonstrate that sufficient manoeuvring area would be provided to allow MRV to enter and exit the site in a forward direction.

It is expected that the schools would manage all deliveries to/from the site to ensure appropriate allocation and management of loading facilities. Additionally, all loading and unloading activities should be minimised during recess/lunch periods to minimise disruption and ensure safety.

7.5 School Drop Off / Pick Up Zone Operation

It is noted that the existing drop-off / pick-up zones along Centennial Avenue will be maintained as part of the proposal.

Based on the existing site conditions discussed in Section 2.6.2, it was observed that the existing drop-off / pick-up facilities are already operating at or near capacity with the

majority of drop-off and pick-up activities occurring along Jenkins Street and the north side of Centennial Avenue.

This condition is expected to be exacerbated due to the estimated increase in the school traffic generation associated with the potential population increase associated with the high occupancy scenario.

To mitigate the impacts to the drop-off and pick-up zones associated with the future expansion, it is recommended that the measures discussed in Section 8.4 be considered for implementation in effort to reduce the future school car use. In addition, the following measures could be implemented:

- Staff could be assigned on Centennial Avenue drop-off / pick-up zone in front of Chatswood Public School site to enforce compliance of the 5-minute parking/ "No Parking" restriction.
- The 5-minute parking zone along Jenkins Street could be extended further north to provide more drop-off / pick-up spaces for the primary students.
- Inform parents, especially those with primary school children, about alternative drop-off / pick-up zones along Centennial Avenue, west of Jenkins Street to better distribute parking demand.
- Stagger school start and finish times to reduce concentration of drop-off and pick-up activities in just one short period.

The above measures are anticipated to improve conditions regardless of the future population scenarios of the schools.

7.6 Road and Personal Safety (CPTED Principles)

Further to the above, a number of potential design measures have been considered to maintain road and personal safety in line with the Crime Prevention through Environmental Design (CPTED) principles of surveillance, access control and space and activity management.

The following design measures should be considered as part of the proposed development:

- Provide a mixture of long-term and short-term car parking to enhance natural/passive surveillance of the area, where practical,
- Ensure appropriate lighting is provided especially at pedestrian access points, parking areas and footpaths,
- Proposed safety signages in different languages around designated drop-off and pick-up areas to enhance awareness for a larger audience and thus mitigate the risk of any safety issues around the schools,
- Trim or remove foliage blocking sigh lights and ensure there is minimal obstruction to lines of sight near key pedestrian facilities and pedestrian access points,

- Consider the implementation of Closed Circuit Television (CCTV) where practical to maximise surveillance opportunities out of school hours,
- Install boom gates, ticketed entry or other access control devices to regular and restrict vehicle movements to/from the schools for authorised personnel only,
- Ensure security on pedestrian access points to the school to reduce opportunities for perpetrators to enter the school undetected,
- Ensure regular maintenance is in place including rubbish removal, graffiti remove, repair of light fixtures, trimming of vegetation and/or regular patrols, where feasible, and
- All staff should undergo crime awareness training to identify any potential suspicious behaviour and reporting procedures within or near the schools.

8 Traffic Assessment

8.1 Traffic Generation

As documented in Section 1 of this report, the proposed upgrade works at the Chatswood Primary School and Chatswood High School sites will deliver new and refurbished innovative learning and teaching spaces, as well increased quality active play space and new sports and recreational and administration facilities.

Traffic generation potential of a school is primarily related to the number of students and staff attending the school. School populations (or number of students and staff) vary from year to year and are influenced by the demand for enrolments.

The future population of the Chatswood Primary School and the Chatswood High School will be dependent upon:

- When the new local Primary School will be constructed; and
- Rate of enrolment demand increases (or decreases).

In order to provide a qualitative assessment of the traffic generation potential of various enrolment demand, the traffic generation potential of a number of likely enrolment scenarios has been estimated and compared to existing traffic conditions.

The four potential future traffic generation scenarios are described in Table 8.1.

Table 8.1: Potential Future Traffic Generation Scenarios

Scenario	No. of Primary School Students	No. of High School Students
Scenario 1 – Low Occupation	1,200	1,800
Scenario 2 – Moderate / High Occupation	1,600	1,800
Scenario 3 – Moderate Occupation	1,200	2,000
Scenario 4 – High Occupation	1,600	2,000

The traffic generation potential of the various potential population scenarios for the schools has been estimated for each scenario using the surveyed existing school trip rates calculated in Section 5.2. The results are summarised in Table 8.2 and Table 8.3.

These traffic generation estimates are compared with the existing school traffic generation as shown in Figure 8.1.

Table 8.2: Future Morning Peak Trip Generation

Site	Student Population				AM Trip Rate (trip / student)	Peak Hour Trip Generation			
	Scenario 1: Mid PS + Mid HS	Scenario 2 High PS + Mid HS	Scenario 3: Mid PS + High HS	Scenario 4: High PS + High HS		S1	S2	S3	S4
Chatswood Public School	1,200	1,600	1,200	1,600	0.26	312	416	312	416
Chatswood High School	1,800	1,800	2,000	2,000	0.17	303	303	336	336
AM Total						**615**	**719**	**648**	**752**

Table 8.3: Future Afternoon Peak Trip Generation

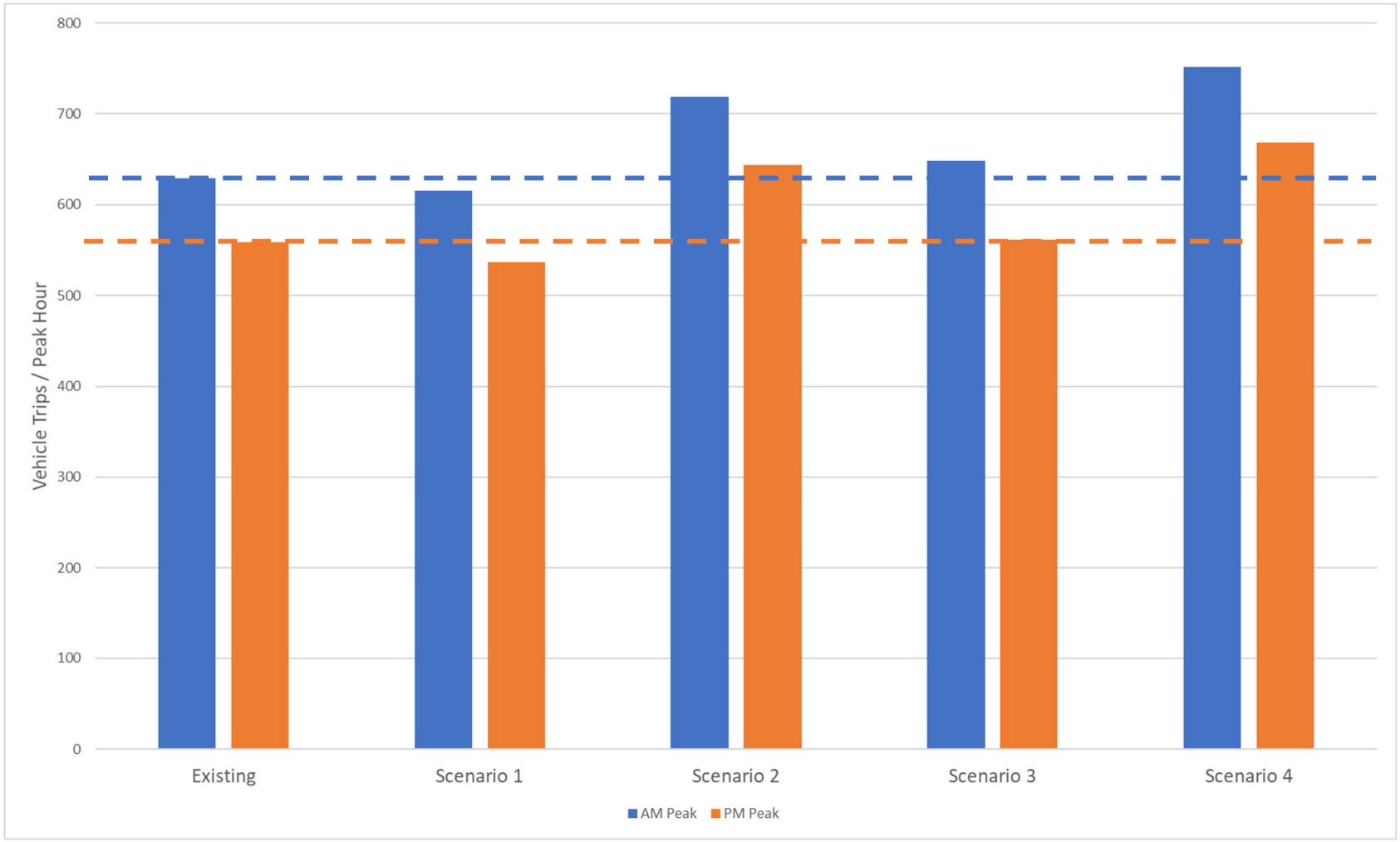
Site	Student Population				AM Trip Rate (trip / student)	Peak Hour Trip Generation			
	Scenario 1: Mid PS + Mid HS	Scenario 2 High PS + Mid HS	Scenario 3: Mid PS + High HS	Scenario 4: High PS + High HS		S1	S2	S3	S4
Chatswood Public School	1,200	1,600	1,200	1,600	0.27	324	431	324	431
Chatswood High School	1,800	1,800	2,000	2,000	0.12	213	213	237	237
PM Total						**537**	**644**	**561**	**668**

The comparative analysis presented in Figure 8.1 indicates that both Scenario 1 and Scenario 3 have similar or lower traffic generation potential compared to the existing school operation. Both these operates have lower populations for the Primary School.

It is expected that Scenario 1 or Scenario 3 would occur with the construction of the new local Primary School as committed to by the State Government.

Scenario 2 and Scenario 4 are considered to be short term scenarios until the new Primary School is operational.

Figure 8.1: Chatswood Schools Potential Traffic Generation – Scenario Comparison (Peak Hour Periods)



With regard to the 'worst case scenario' (ie. High occupancy scenario), the proposed development is estimated to generate an additional 123 vehicles per hour in the morning peak and 109 vehicles per hour in the afternoon peak as presented in Table 8.4.

Table 8.4: Comparison of Existing and Future Trip Generation – High Occupancy Scenario

Site	Student Population		Existing Trip Generation		Future Trip Generation		Net Difference	
	Existing	Future (S4)	AM	PM	AM	PM	AM	PM
Chatswood Public School	1,337	1,600	348	361	416	431	+68	+70
Chatswood High School	1,670	2,000	281	198	336	237	+55	+39
Total			**629**	**559**	**752**	**668**	**+123**	**+109**

8.2 Traffic Distribution

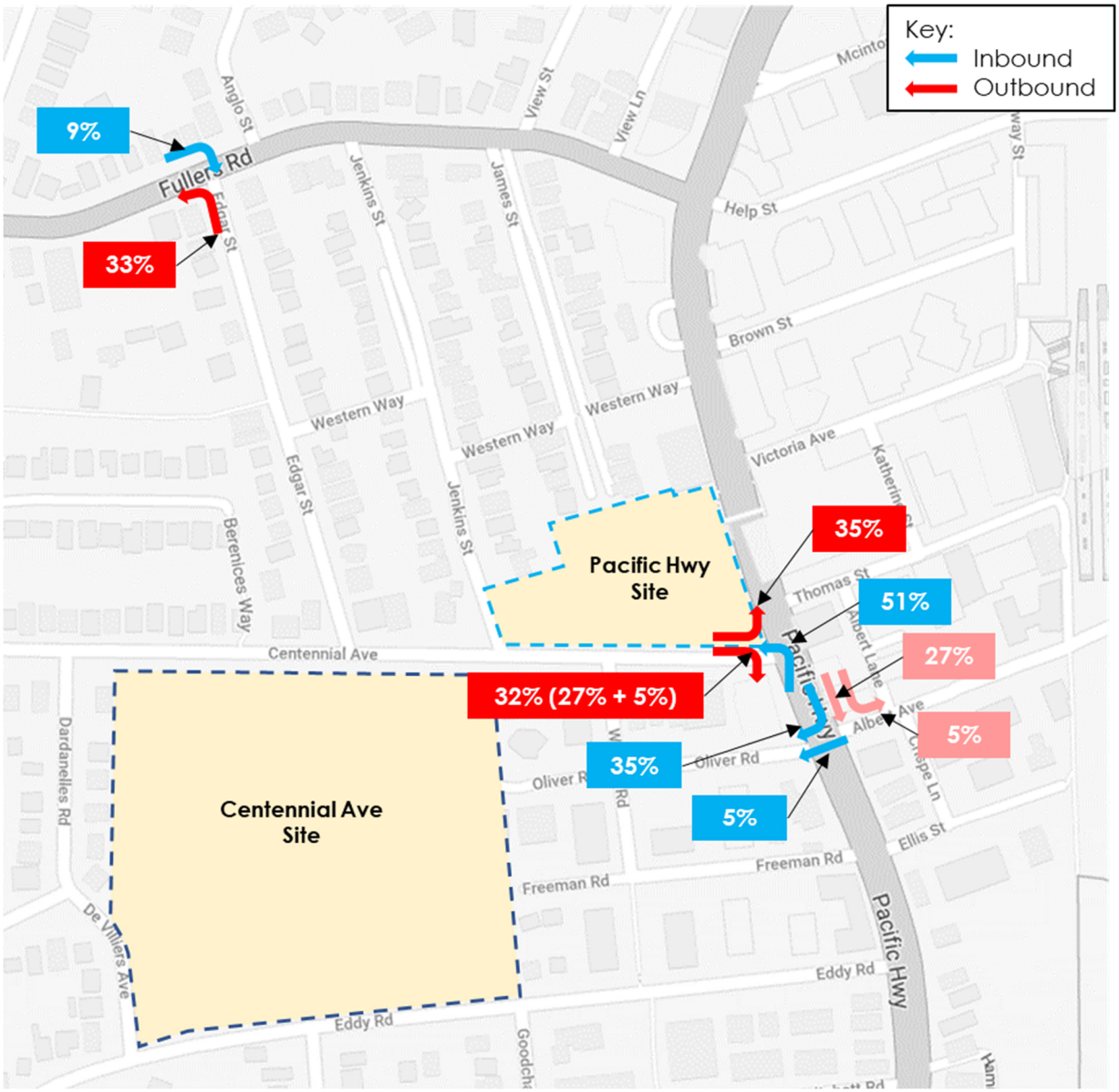
As part of the travel questionnaire survey, staff and students were asked where they currently reside. The responses from car users have been assessed to determine the likely route that they take to travel to/from the school.

Figure 8.2 presents the assumed directional distribution by using the above methodology.

It is noted that the survey results indicate that about 67% of primary school respondents and 35% of the high school respondents reside in the suburb of Chatswood. However, the survey responses do not provide further details on which area of Chatswood they travel to/from.

For this assessment, it has been assumed that 80% of car users access the sites via Edgar Street, Centennial Avenue, Oliver Road and Albert Avenue. The remaining 20% is assumed to be travelling via local streets and other intersections aside from these four key intersections. This assumption is considered conservative as some people may travel via local streets and roads which are not captured in the traffic model.

Figure 8.2: Directional Distribution



8.3 Road Network Capacity Analysis

8.3.1 Overview of Scenario Assessment

Road network capacity analysis has been undertaken using SIDRA Intersection 8 modelling software to ascertain the intersection performance of the key intersections surrounding the site as identified in Section 2.10 for the worst case scenario (ie. High Occupancy scenario).

As shown in Figure 8.1, once the new local school is operational the potential future traffic generation of the Chatswood Primary and High Schools will return to existing levels of school

traffic generation. Additionally the school related traffic generation potential for all scenarios would be reduced with travel demand management measures as per the implementation of a specific school Green Travel Plan.

It is noted that traffic generated by construction activities have not been considered in the future modelling scenarios. The anticipated construction traffic is expected to be significantly lower than existing traffic volumes along major roads (i.e. Pacific Highway and Fullers Road) and is not expected to result in any adverse impact on the surrounding road networks. Furthermore, construction vehicle activities will be minimised during network peak periods.

The network capacity analysis discussed in this report assumes the high-occupancy scenario which includes a school population of 1,600 primary school students and 2,000 high school students.

For the purpose of this assessment it is assumed that the High Occupancy scenario would occur in the future Year 2036. However, it is expected that the new primary school would be on line by this time.

The net additional traffic associated with the proposed high-occupancy population has been added to the future base model to account for any variation in the network traffic.

8.3.2 High Occupancy Scenario Road Network Operation

Future background figures and post development traffic volumes by Year 2036 are presented in Figure 8.3 and Figure 8.4. Table 8.5 presents a summary of the future intersection performance by Year 2036 with and without the additional traffic associated with the high-occupancy scenario.

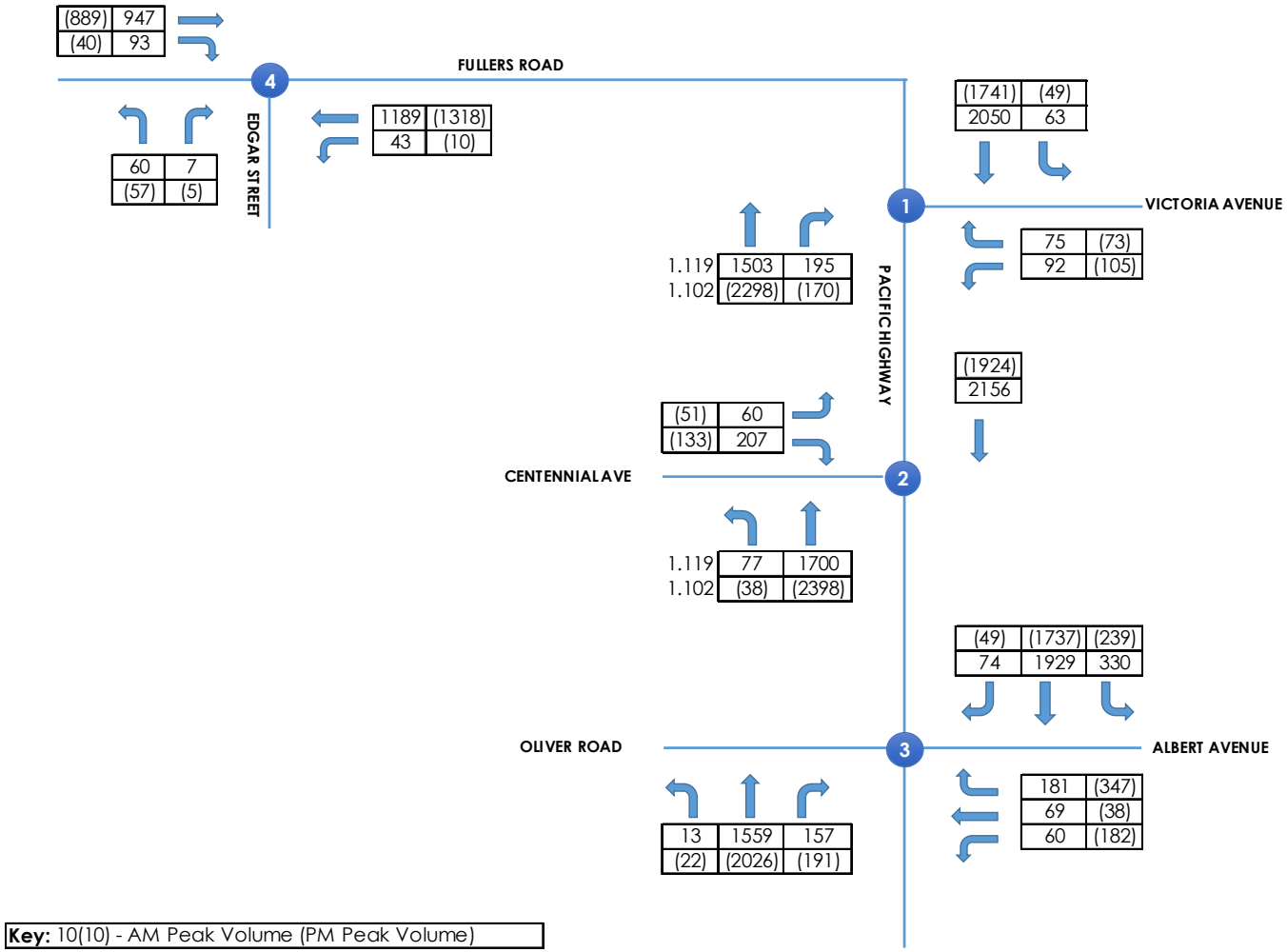
As shown in Table 8.5, the level of service of Pacific Highway-Victoria Avenue and Pacific Highway-Centennial Avenue by Year 2036 would be unsatisfactory during the morning peak with the additional school traffic. However, Pacific Highway-Victoria Avenue would still operate at LoS B during the afternoon peak.

Pacific Highway- Centennial Avenue intersection would continue to operate at LoS F during the afternoon peak period whilst Fullers Road-Edgar Street intersection would still operate above its theoretical capacity with LoS E/F during both peak periods.

The intersection performance of Fullers Road-Edgar Street intersection is primarily caused by high delays experienced by traffic turning right from Fullers Road onto Edgar Street. Nonetheless, the resulting queue during peak hour is maximum of 2 vehicles both for the right turning traffic into and out from Fullers Road even with the additional development traffic.

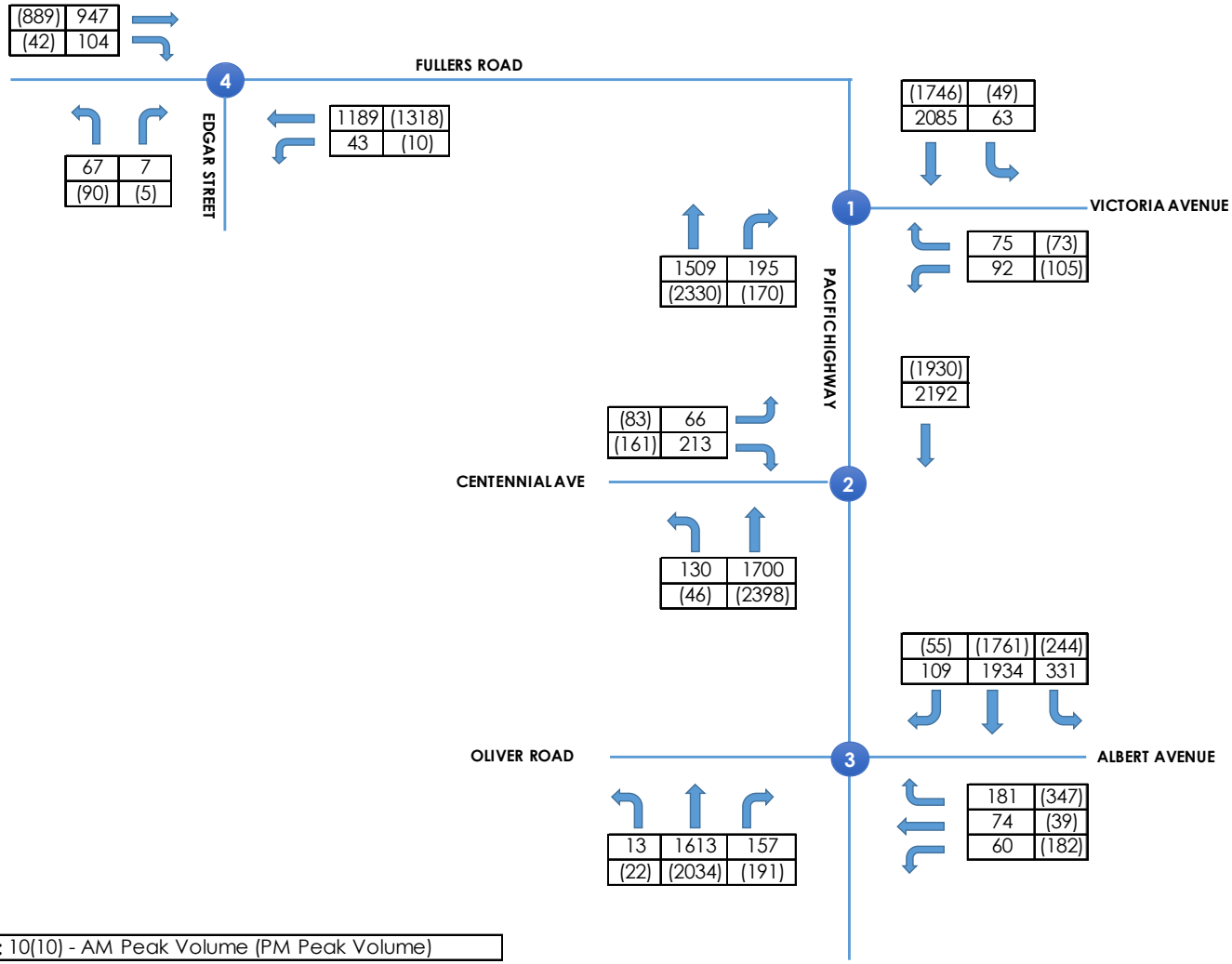
The intersection of Pacific Highway-Albert Avenue/Oliver Road would perform satisfactorily with LoS C or better during peak periods even with the additional traffic associated with a High Occupancy Scneario. The overall future performance at key surrounding intersections by Year 2036 is graphically shown in Figure 8.5 and Figure 8.6.

Figure 8.3: Year 2036 Future Base Case Weekday Peak Hour Traffic Volumes



Key: 10(10) - AM Peak Volume (PM Peak Volume)

Figure 8.4: Year 2036 Future Base Case + High Occupation School Population Scenario - Weekday Peak Hour Traffic Volumes



Key: 10(10) - AM Peak Volume (PM Peak Volume)

Table 8.5: Year 2036 Peak Hour Intersection Analysis Results

Intersection		Signal Control	Year 2036 Future Base				Year 2036 Future Base + High Occupancy Scenario			
			AM Peak		PM Peak		AM Peak		PM Peak	
			Average Delay (sec)	Level of Service	Average Delay (sec)	Level of Service	Average Delay (sec)	Level of Service	Average Delay (sec)	Level of Service
1	Pacific Highway – Victoria Avenue	Signal	45	D	22	B	134	F	22	B
2	Pacific Highway – Centennial Avenue	Signal	52	D	135	F	60	E	150	F
3	Pacific Highway – Albert Avenue/ Oliver Road	Signal	28	B	29	B	29	C	29	B
4	Fullers Road – Edgar Street	Priority	116	F	104	F	162	F	143	F

Figure 8.5: Year 2036 LoS Summary (Future Base)

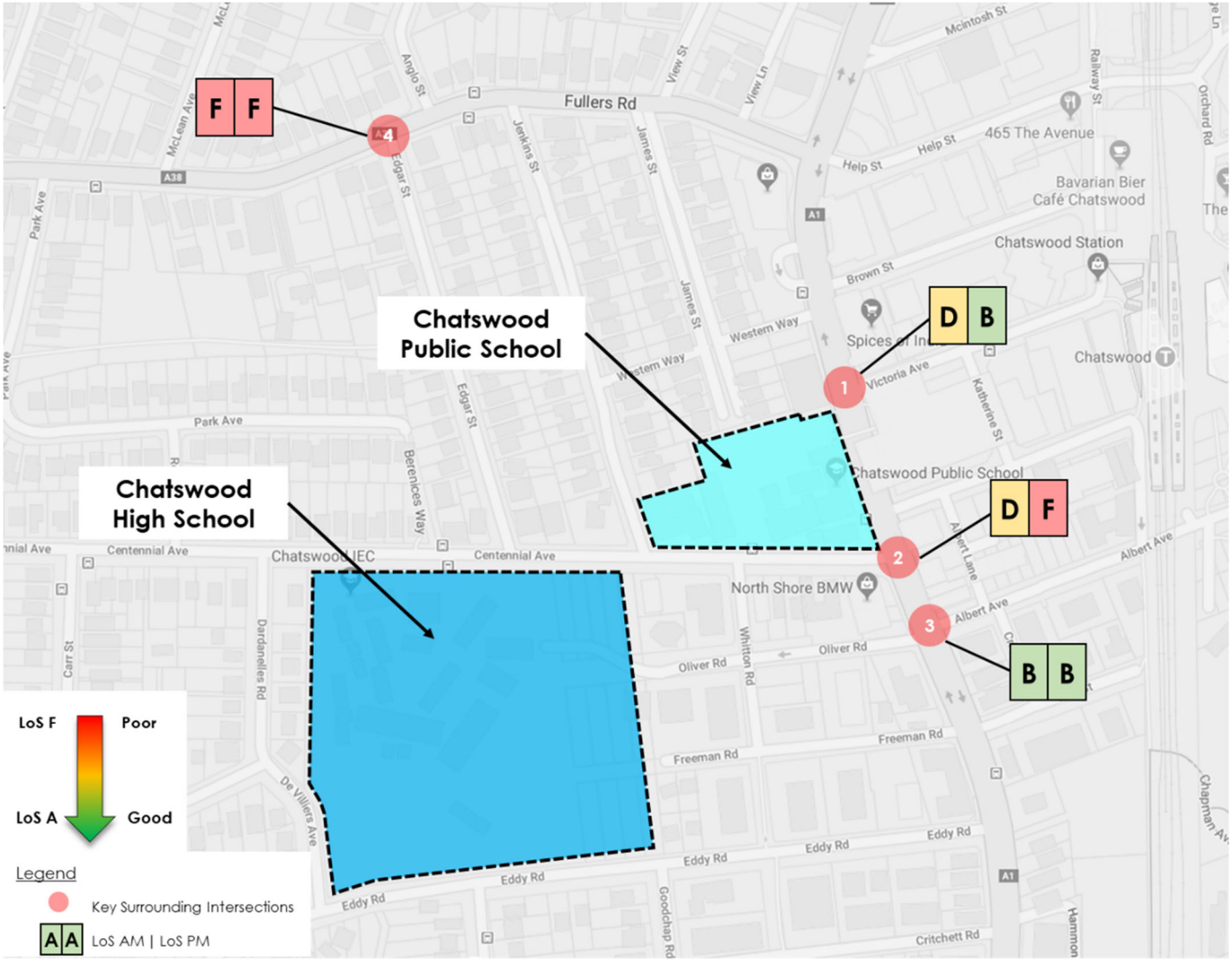
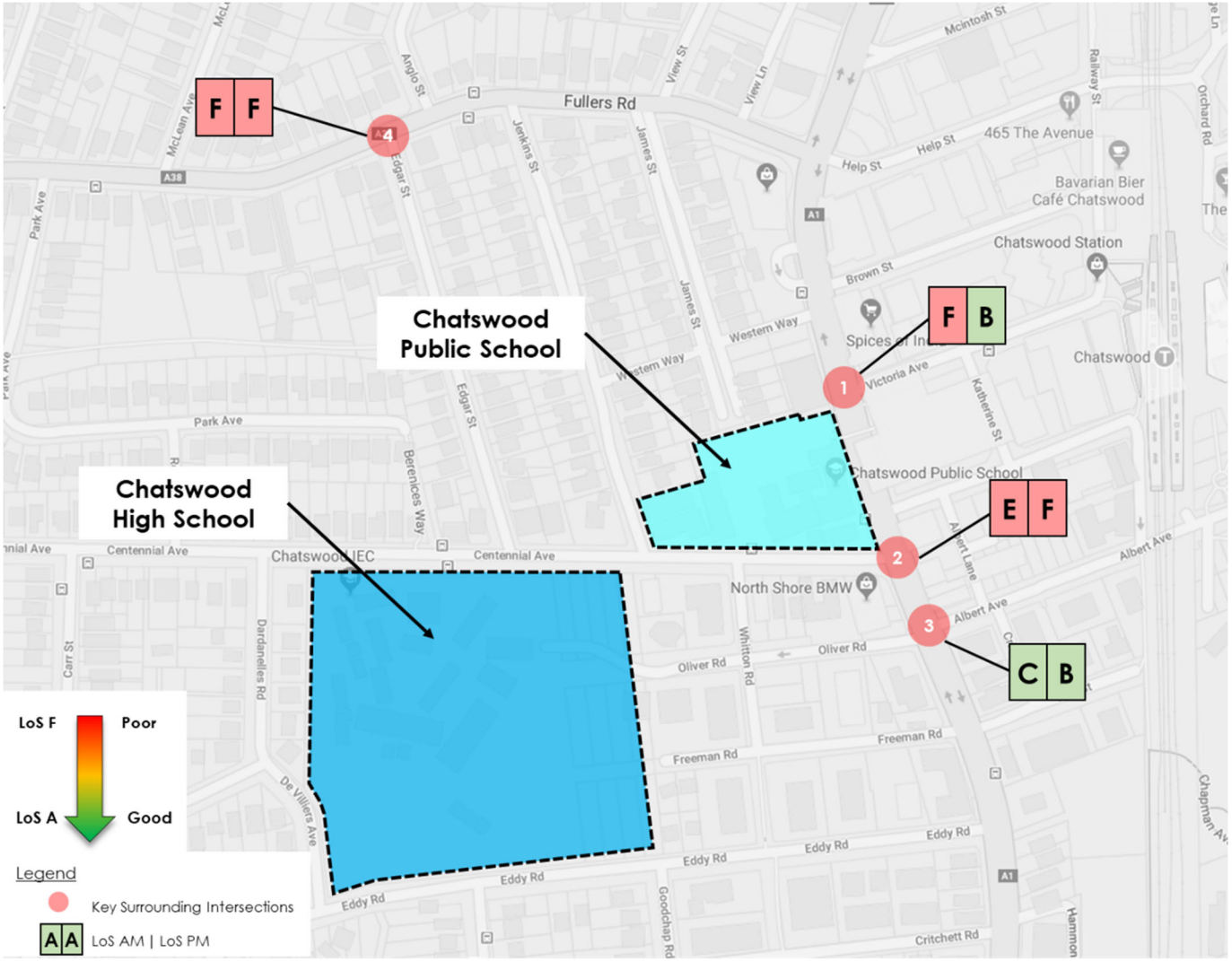


Figure 8.6: Year 2036 LoS Summary (Future Base with High Occupancy Scenario)



8.3.3 Moderate Occupancy Scenario Road Network Operation

For the Moderate Occupancy Scenario, which represents a future worst case scenario once the new local school is operational, the road network operation with Levels of Service (LoS) similar to the future base case operation represented in Figure 8.5 as the traffic generation of the school decreases to existing traffic levels.

8.4 Potential Mitigation Measures

In general, without a change in the behaviour of road users or capacity improvements, the performance of road networks can be expected to decrease over time as a result of background traffic growth or growth associated with increases to development density, population growth and other socio-economic factors.

With regard to the proposed upgrades to the Chatswood Public and Chatswood High Schools, if the current travel behaviour of the school populations remains unchanged then it would be reasonable to expect a decrease in the road network performance for the High Occupancy population scenario.

Thus, it is recommended that a range of mitigation measures be considered and implemented to improve, or at least maintain the future base road network performance if development traffic from the proposed upgrade and High Occupancy population scenario would be included.

It is noted that there are a number of potential mitigation measures that could be implemented for the proposed school upgrades. Given the broad range of factors that influence travel behaviour for public and secondary schools, it is unlikely that any one particular measure would address all additional demands. Rather it is considered that a combination of measures developed and implemented in a co-ordinated matter will have the best chance of enacting changes to travel behaviour. This is the role of a school specific green travel plan.

As discussed above, a green travel plan would include a package of measures, developed in consultation with the school community, implemented then monitored and if necessary modified over time to maximise the efficiency of the plan.

The package of mitigation measures to be considered as part of a site specific school green travel plan include:

- Increased awareness of available travel modes (walking, cycling, public transport)
- Staggering school start / finish times to reduce the volume of travel demand in peak periods
- Provision of targeted bus services (shuttle bus arrangements)

A sensitivity analysis was conducted by TTPP to determine the minimum required car trip reduction to achieve a future development traffic generation comparable with the existing so that the post-development network performance would be similar with the future base scenario (i.e. no upgrade/proposal).

In this manner, it was determined the total development traffic would need to be reduced by 16 per cent (i.e. reduction of 107-120 car trips to/from the site) so that the net difference in traffic as compared with the existing school is close to nil.

As identified above, one of the measures that could be implemented for the school is the provision of shuttle bus services, which could operate along key hot spots of staff and students. This would potentially decrease the number of car trips to/from the development.

8.4.1 Shuttle Bus Services

The introduction of a shuttle bus services (assuming bus capacity of 50 passengers) could potentially be sufficient to reduce the overall development traffic to improve intersection performance to the same level that would occur in the future base case.

It is further noted if additional shuttle bus services are provided, this would further improve the intersection performance to a level better than the future base case.

Separately, it should be noted that the proposed shuttle bus service should have adequate capacity to accommodate not only passengers who have changed from car use to the shuttle bus service, but also be made available for any other students who want to use the shuttle bus service.

However, further detailed consultation with staff and students/parents would need to be conducted to understand if the students/parents/staff are likely to use a shuttle bus service and how it is to be operated to ensure maximum usage. In this regard, a green travel plan could be an effective strategy to encourage a modal shift away from car travel to/from the site, particularly to discourage single occupancy trips.

8.4.2 Staggered School Start / Finish Times

Another measure is the consideration of staggering the start and finish for both schools. At present, Chatswood Public School begins at 8:55am and finishes at 3:00pm. Chatswood High School starts at 8:50am and finishes at 3:10pm (except for Thursday at 2:40pm). As such, both schools start and finish at similar time. This results in a concentration of school traffic during the start and finish times.

If the schools could introduce staggered start and finish times for the schools e.g. the High School could start and finish say 30 minutes before the Public School in the morning and afternoon respectively. This could effectively reduce the school traffic by at least 37 per cent.

Consideration also should be given to staggering start and finish times for students from different year groups.

8.4.3 Parking Controls to Discourage Car as Driver Modes

Several streets surrounding the schools currently have time restricted parking for non residents. The expansion of the time restrictions would potentially reduce the attractiveness of the car as a mode of travel to / from school, particularly for staff.

8.4.4 Improved Information About Available Travel Modes

As identified above, the schools are well serviced by public transport services. Through the implementation of a green travel plan, up to date information pertaining to the available transport modes would be made available to staff and students.

8.4.5 Summary

With the above in mind, the following mitigation measures could be considered as part of the proposed development and specifically included in the site specific green travel plan:

- provision of shuttle bus services to/from the school to service a wider area, where a large portion of students reside (e.g. a loop around service),
- introduce staggered start and finish times for both schools as well as for students in different year groups,
- additional parking restrictions on surrounding streets, and/or
- implementation of a green travel plan to encourage staff, students and parents to travel to the site via non-car travel modes and provide a package of initiatives to discourage car use, particularly single occupancy car trips.

9 Summary and Conclusion

This study details our assessment of the traffic and transport implications associated with the proposed upgrade of Chatswood Public School and Chatswood High School.

The key findings of this report are presented below.

- This SSD proposal relates to the proposed upgrade of Chatswood Public School and Chatswood High School.
- For the purpose of this assessment, a temporary High Occupancy population scenario for both the Primary School and High School has been considered. The temporary scenario would apply until the new nearby primary school is operational, whereby future traffic generation of the school would return to existing traffic levels.
- For a High Occupancy Scenario, the proposed upgrades would require 232 car parking spaces based on Council's DCP or 148 car parking spaces when assembly hall seats are considered inclusive of other requirements as per the DCP. Application of recent traffic generation studies conducted by Roads and Maritime at Schools would require 108 to 540 car parking spaces to be provided.
- It is proposed to provide a new parking facility in Pacific Highway site which will be accessible via Jenkins Street. The existing unmarked parking spaces in Centennial Avenue site will be formalised. Overall, a total of 122 car parking spaces will be provided as part of the proposed upgrade.
- Given that the site is located within close proximity to the Chatswood Interchange, the reduced car parking provision would assist improve and manage overall car trips to/from the area to encourage non-car modes. As such, the proposed reduced car parking provision is not considered unreasonable.
- It is anticipated that the future proposal would generate approximately 123 additional morning peak hour vehicle trips and 109 afternoon peak hour car trips.
- Traffic modelling results indicate that the Pacific Highway-Centennial Avenue and Fullers Road-Edgar Street intersections would operate unsatisfactorily due to the nature growth of the background traffic, irrespective of the proposal.
- The intersection of Pacific Highway-Victoria Avenue would operate above its theoretical capacity during the morning peak due to the additional traffic associated with the proposed upgrade.
- To minimise the impact of the proposed upgrade, the following mitigation measures could be considered to lessen the traffic impact of the school:
    - provide shuttle bus services to/from the school to service a wider area, where a large portion of students reside (e.g. a loop around service),
    - implement a green travel plan to encourage staff, students and parents to travel to the site via non-car travel modes and provide a package of initiatives to discourage car use, particularly single occupancy car trips,

- additional parking restrictions on surrounding streets,
- introduce staggered start and finish times for both schools as well as for students in different year groups.

Appendix A

Architectural Layout Plans

HIGH SCHOOL EMERGENCY VEHICULAR ENTRY

PEDESTRIAN CROSSING

HIGH SCHOOL AND COMMUNITY SECONDARY ENTRY

CENTENNIAL AVENUE

HIGH SCHOOL MAIN ENTRY

EXISTING BUILDING J

BUILDING T

NEW HIGH SCHOOL GREEN

BUILDING Q

EXISTING BUILDING M

EXISTING BUILDING R

HIGH SCHOOL SPECIAL SUPPORT DROP OFF ENTRY

EXISTING BUILDING H

NEW LANDSCAPE COURTYARD

BUILDING S

EXISTING BUILDING K

EXISTING SPORTS FIELD

FREEMAN ROAD

EXISTING SPORTS COURTS

EXISTING CARPARK

HIGH SCHOOL EXISTING MAIN VEHICULAR ENTRY

DE VILLIERS AVENUE

EDDY ROAD

HIGH SCHOOL EXISTING SECONDARY ENTRY

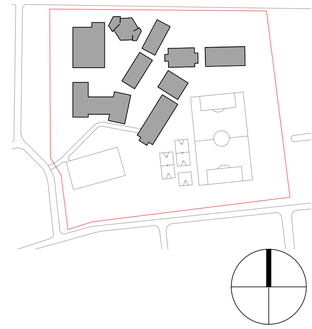
EXISTING EMERGENCY VEHICULAR ENTRY

Nominated Architect
Ray Brown, NSWARB 6359

Do not scale drawings. Verify all dimensions on site

issue	amendment	date
A	SSDA ISSUE	18/12/2019
B	ISSUE FOR SSDA COORDINATION	14/02/2020
C	FINAL SSDA ISSUE	27/02/2020
D	FINAL SSDA ISSUE	11/03/2020

KEY PLAN



NSW GOVERNMENT Education School Infrastructure

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project

Upgrades to Chatswood Public School & Chatswood High School, Centennial Avenue

drawing

SSDA - Proposed Site Plan

scale	1 : 500@A1	drawing no.	DA-AX-A0032
drawn	MR		
checked	AC	issue	D
project no	180326.00		

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Nominated Architect
Ray Brown, NSWARB 6359

Do not scale drawings. Verify all dimensions on site

issue	amendment	date
A	100% SD ISSUE	17/04/2019
B	Issue for Civil Coordination	14/12/2019
C	SSDA ISSUE	18/12/2019
D	FINAL SSDA ISSUE	27/02/2020
E	FINAL SSDA ISSUE	11/03/2020

KEY PLAN

NSW GOVERNMENT Education School Infrastructure

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Sydney
Melbourne
Adelaide
Auckland
Christchurch
Brisbane

project

Upgrades to Chatswood Public School and Chatswood High School Pacific Highway Site

drawing

Site Plan Proposed (Final)

scale	1 : 500@A1	drawing no.	**DA-BX-A0030**
drawn	MR		
checked	AC	issue	**E**
project no	180326.00		

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Appendix B

On-Street Parking Survey

TRANS TRAFFIC SURVEY
trafficsurvey.com.au

Parking Occupancy Survey

Date:	Thursday, 14 March 2019
Location:	Chatswood
Weather:	Fine
Customer:	TTPP

Public Parking (1/0)	Map Ref	Street	Section	Side	Restriction	Clear Way	Capacity	Parking Occupancy																					
								7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00
0		Centennial Ave	Pacific Hwy to Whotton Rd	S	No Stopping		5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					Authorised Car Share Vechicles		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		9	8	8	7	7	7	7	7	6	6	7	7	9	9	9	8	8	8	9	7	6	6
0					No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Whitton Rd to Dardanelles Rd	S	No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					Bus Zone		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 9:30am-2:30pm Mon-Fri	No Parking 8:30am-9:30am, 2:30pm-3:30pm School Days	12	4	7	4	0	0	0	5	6	6	6	7	7	7	9	7	0	0	0	3	3	3
1					Unrestricted		5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1					Unrestricted	No Parking 7:30am-9:30am, 2:30pm-4pm School Days	5	0	0	0	0	0	0	4	4	4	4	3	3	3	4	1	0	0	0	0	2	2
0					No Stopping		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Bus Zone 8am-4pm School Days		6	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	2	3	3	3
1					Unrestricted		8	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	6
0					No Stopping		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Reginald St to Edgar St	N	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		10	2	4	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	5
1					2P 8:30am-6pm Mon-Fri Area 6		15	5	9	11	11	13	10	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	9
0					Bus Zone		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		3	1	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	3	3	3	2	2
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Edgar St to Jenkins St	N	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	4	4	4
1					2P 8:30am-6pm Mon-Fri Area 6		3	0	0	2	2	3	3	3	3	2	2	2	3	2	2	3	3	3	2	0	0	0
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Jenkins St to Pacific Hwy	N	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 9:30am-2:30pm Mon-Fri	No Parking 8:30am-9:30am, 2:30pm-3:30pm School Days	6	0	1	1	0	0	0	3	3	3	3	3	3	3	3	1	0	0	0	3	3	3
0					No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					Bus Zone		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					P5min 8:30am-9:30am, 2:30pm-3:30pm School Days; 2P 9:30am-2:30pm Mon-Fri		10	2	4	6	5	3	8	8	8	8	8	8	8	8	8	4	8	3	4	8	5	4
0					No Stopping		7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Whitton Rd	Centennial Ave to Oliver Rd	E	No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					1P 8:30am-6pm Mon-Fri, 8:30am-12:30pm Sat		8	1	1	5	4	6	5	5	6	4	3	3	3	1	1	4	5	2	1	3	2	2
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Oliver Rd to Freeman Rd	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		8	6	5	6	7	7	7	7	7	7	7	7	7	7	7	6	7	5	6	6	5	4
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Freeman Rd to Oliver Rd	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Oliver Rd to Centennial Ave	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Oliver Rd	Western End to Whilton Rd	N	No Parking		8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Whitton Rd to Pacific Hwy	N	No Stopping		13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Pacific Hwy to Whilton Rd	S	No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1					Unrestricted		14	13	13	13	13	13	13	13	13	13	13	12	12	12	12	13	12	13	13	12	13	12
1					Authorised Council Vehicles Excepted		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Whitton Rd to Western End	S	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		5	5	5	5	5	5	5	5	5	5	5	4	4	4	5	5	5	5	5	5	5	5	5
0					No Parking		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Eddy Rd	Pacific Hwy to Goodchap Rd	S	No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		6	1	1	1	1	2	2	2	2	2	2	2	2	3	2	3	2	3	2	4	3	3
0					No Parking		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		6	1	1	1	1	3	3	3	3	3	3	3	3	4	3	1	1	1	1	1	1	1	1
0					No Parking		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		6	1	1	0	0	0	2	3	2	0	0	1	1	1	1	0	0	5	0	0	0	0	0
0					No Stopping		11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Goodchap Rd to Lone Pine Ave	S	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		12	1	1	1	1	5	5	5	5	4	3	3	3	3	4	4	7	6	2	4	2	2	2
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Lone Pine Ave to De Villers Ave	S	No Stopping		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		22	1	1	1	2	3	3	3	3	4	4	3	4	4	6	5	6	6	4	2	1	1
0					Bus Zone		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			De Villers Ave to De Villers Ave	N	Bus Zone		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					Bus Zone		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			De Villers Ave to Pacific Hwy	N	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		9	5	6	8	9	9	9	9	9	9	9	9	9	9	9	9	8	9	5	6	6	5
0					No Stopping		5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Bus Zone 9am-4pm		6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted	No Parking 8:30am-9:30am, 2:30pm-3:30pm School Days	10	0	1	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0
1					Unrestricted		2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		12	4	4	6	7	11	11	11	10	10	9	9	9	8	9	9	10	10	9	1	1	1
0					No Parking		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		9	4	6	6	7	7	7	7	7	7	7	7	7	7	7	7	8	9	7	7	7	6
0					No Parking		11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Edgar St	Centennial Ave to Fullers Rd	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1					2P 8:30am-6pm Mon-Fri Area 6		6	1	2	2	2	4	4	4	4	3	2	2	2	2	2	3	4	2	2	2	1	1
1					Unrestricted		6	3	4	4	4	4	4	4	4	4	4	4	4	5	4	4	5	4	4	4	4	4
1					Unrestricted	No Parking 8:30am-6pm Mon-Fri	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		2	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1					Work Zone		2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1					Unrestricted		8	5	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
1					2P 8:30am-6pm Mon-Fri Area 6		4	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Fullers Rd to Western Way	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		7	5	5	5	5	4	4	4	3	3	3	3	3	4	4	4	4	5	4	4	4	4	4
1					2P 8:30am-6pm Mon-Fri Area 6		3	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	1	2	2	2	2	2
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Western Way to Centennial Ave	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		3	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
1					Unrestricted		10	6	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	9	8
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Jenkins St	Centennial Ave to Western Way	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1					P5min 8:30am-9:30am, 2:30pm-3:30pm School Days; 2P 9:30am-2:30pm Mon-Fri		3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	2	3	3	2	2	2	2

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1					Unrestricted		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
0					No Stopping		6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2
1					Unrestricted		2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0				Western Way to Fullers Rd	No Stopping	W	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		3	3	3	0	1	0	0	0	1	2	2	2	2	3	3	3	3	2	2	0	1	1	1	1	1	1	1	1
0					No Stopping		6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1					2P 8:30am-6pm Mon-Fri Area 6		5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		5	4	5	5	5	5	5	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0				Fullers Rd to Western Way	No Stopping	E	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		7	5	7	7	7	7	7	7	7	7	7	7	7	6	6	7	6	7	7	7	7	7	7	7	7	7
0					No Parking		12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		3	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1
0					No Stopping		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0				Western Way to Centennial Ave	No Stopping	E	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1					2P 8:30am-6pm Mon-Fri Area 6		5	1	3	5	5	3	3	4	3	3	3	3	3	3	3	5	5	3	2	3	3	3	3	3	3	3	3	3
1					P5min 8:30am-9:30am, 2:30pm-3:30pm School Days; 2P 9:30am-2:30pm Mon-Fri		4	0	1	2	2	1	1	1	1	1	2	2	2	3	3	2	3	1	1	1	1	1	1	1	1	1	1	1
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Centennial Ave		Dardanelles Rd to Carr St	No Stopping	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		13	4	4	4	4	6	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
0					Bus Zone		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0				Car St to Western End	No Stopping	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		13	7	7	8	10	10	10	10	10	10	9	9	9	9	11	11	11	11	9	9	8	8	8	8	8	8
0					No Parking		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0				Western End to Reginald St	No Parking	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		10	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	5	5	5	5	5	5	5	5	5	5
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Freeman Rd		Western End to Whilton Rd	No Stopping	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		4	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0				Whilton Rd to Pacific Hwy	No Stopping	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		5	3	3	3	3	3	3	3	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0					No Stopping		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					1P 8:30am-6:30pm, 8:30am-12:30pm Sat		3	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0				Pacific Hwy to Western End	No Stopping	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		No Parking 6:30am-6:30pm Mon-Fri, 6:30am-12:30pm Sat	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping			1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		No Parking 6:30am-6:30pm Mon-Fri, 6:30am-12:30pm Sat	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping			4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking			3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping			3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		No Parking 6:30am-6:30pm Mon-Fri, 6:30am-12:30pm Sat	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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0					No Stopping		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		De Villers Ave	Eddy Rd to Carr St	W	Unrestricted		21	4	5	5	5	5	5	5	5	5	5	5	5	5	5	4	3	3	3	3	3	3
1			Carr St to Dardanelles Rd	N	Unrestricted		7	3	3	3	4	5	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	2
1					Unrestricted	No Parking 8am-6pm Mon-Fri	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		5	4	4	4	4	5	5	5	5	5	5	5	5	5	5	4	4	2	2	2	2	2
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Dardanelles Rd to Eddy Rd	E	No Stopping		13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Eddy Rd to Dardanelles Rd	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted	No Parking 8am-6pm	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0			Dardanelles Rd to Eddy Rd	SE	No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					Bus Zone		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Lone Pine Ave	Eddy Rd to Pearl Ave	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted	No Parking 6:30am-9:30am, 3:30pm-6:30pm Mon-Fri	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					Bus Zone		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	2
1					Unrestricted	No Parking 8am-4pm Mon-Fri	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		6	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	3	3	3
1			Pearl Ave to Beresford Ave	W	Unrestricted		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Beresford Ave to Eddy RD	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		10	6	6	6	6	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	6	6
0					Bus Zone		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		Beresford Ave	Dalrymple Ave to Lone Pine Ave	N	Unrestricted		8	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	3	3
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Lone Pine Ave to Pearl Ave	S	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Pearl Ave to Dalrymple Ave	S	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Pearl Ave	Beresford Ave to Goodchap Rd	N	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1			Goodchap Rd to Beresford Ave	S	Unrestricted		28	16	16	16	16	16	17	17	17	17	18	18	18	18	17	17	16	16	13	11	11	11
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Goodchap Rd	Eddy Rd to Sutherland Rd	E	No Stopping		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted	No Parking 8am-4pm Mon-Fri	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	7	7	7	7
0			Sutherland Rd to Pearl Ave	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0			Pearl Ave to Eddy Rd	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		28	13	13	13	15	16	16	16	16	16	16	16	16	16	16	16	15	15	14	14	12	12
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Carr St	Centennial Ave to DeVillers Ave	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		14	7	7	7	7	10	9	9	9	8	8	8	9	9	8	8	8	8	7	7	6	5
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			DeVillers Ave to Centennial Ave	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		11	8	8	8	8	8	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	5
0					Bus Zone		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Dardanelles Rd	Centennial Ave to DeVillers Ave	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		13	13	11	11	11	10	10	10	10	10	10	10	10	10	10	10	10	12	12	11	11	11
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			DeVillers Ave to Centennial Ave	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1					2P 8:30am-6pm Mon-Fri, 8:30am-12:30pm Sat		14	2	3	3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	3	3	3
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Reginald St	Centennial Ave to Park Ave	W	No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		8	4	7	8	8	8	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	6	6
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Park Ave to Centennial Ave	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted	No Parking 8:30am-6pm Mon-Fri, 8:30am-12:30pm Sat	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Park Ave	Fullers Rd to Eastern End	EN	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		15	11	11	13	13	13	13	13	13	13	13	13	13	13	13	10	10	10	10	9	9	9	9
0					No Stopping		9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		6	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		25	4	4	6	8	9	9	9	9	8	7	6	6	6	8	10	10	10	9	9	9	8
0					No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Eastern End to Reginald St	S	No Parking		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted		18	14	14	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	14	11	10	
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Reginald St to Fullers Rd	SW	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		6	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0					No Stopping		12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					2P 8:30am-6pm Mon-Fri Area 6		8	0	0	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
1					Unrestricted		6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3
0					No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Lower Jenkins St	Westernway to Northern End	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted	No Parking 8:30am-6pm Mon-Fri	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Northern End to Western Way	E	No Stopping		9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Lower James St	Southern End to Western Way	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					1P 8:30am-6pm Mon-Fri Area 6		5	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Western Way to Fullers Rd	W	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					1P 8:30am-6pm Mon-Fri Area 6		21	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0					No Stopping		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Fullers Rd to Southern End	E	No Stopping		35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Upper James St	Fullers Rd to Western Way	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					1P 8:30am-6pm Mon-Fri Area 6		14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0					No Stopping		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Western Way to Southern End	E	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted	No Parking 8:30am-6pm Mon-Fri	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Southern End to Fullers Rd	W	No Stopping		35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0		Western Way	Edgar St to Jenkins St	N	No Stopping		10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Jenkins St to Lower James St	N	No Stopping		10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Upper James St to Pacific Hwy	N	No Stopping		10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Pacific Hwy to Upper James St	S	No Stopping		10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Lower James St to Jenkins St	S	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1					Unrestricted	No Parking 8:30am-6pm Mon-Fri	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0			Jenkins St to Edgar St	S	No Stopping		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0					No Parking		9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PUBLIC CAPACITY							**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**
	PUBLIC OCCUPANCIES							**325**	**362**	**388**	**395**	**416**	**412**	**424**	**422**	**415**	**412**	**410**	**415**	**419**	**427**	**412**	**407**	**392**	**361**	**350**	**334**	**320**
	PUBLIC VACANCIES							**541**	**504**	**478**	**471**	**450**	**454**	**442**	**444**	**451**	**454**	**456**	**451**	**447**	**439**	**454**	**459**	**474**	**505**	**516**	**532**	**546**
	PUBLIC % OCCUPANCIES							**38%**	**42%**	**45%**	**46%**	**48%**	**48%**	**49%**	**49%**	**48%**	**48%**	**47%**	**48%**	**48%**	**49%**	**48%**	**47%**	**45%**	**42%**	**40%**	**39%**	**37%**
		not available for public parking					1371																					

Appendix C

Traffic Volumes

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Fullers Rd and Edgar St, Chatswood

GPS *-33.7959, 151.17453*

Date:	Thu 14/03/19
Weather:	Overcast
Suburban:	Chatswood
Customer:	TTPP

North:	N/A
East:	Fullers Rd
South:	Edgar St
West:	Fullers Rd

Survey Period	AM:	8:00 AM-9:00 AM
	PM:	3:15 PM-8:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	3:15 PM-4:15 PM

All Vehicles

Time		East Approach Fullers Rd			South Approach Edgar St			West Approach Fullers Rd			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
8:00	8:15	0	296	5	0	1	14	0	19	243	2172	Peak
8:15	8:30	0	294	7	0	0	17	0	17	238		
8:30	8:45	0	252	14	0	1	10	0	30	209		
8:45	9:00	0	254	17	0	5	19	0	27	183		
15:15	15:30	0	307	6	0	1	21	0	8	199	2184	Peak
15:30	15:45	0	306	0	0	2	15	0	12	241	2182	
15:45	16:00	0	302	3	0	1	13	0	11	209	2114	
16:00	16:15	0	306	1	0	1	8	0	11	200	2056	
16:15	16:30	0	316	5	0	1	10	0	6	202	2050	
16:30	16:45	0	295	4	0	0	7	0	10	192	2064	
16:45	17:00	0	266	6	0	1	7	0	12	189	2104	
17:00	17:15	0	276	9	0	1	4	0	10	221	2183	
17:15	17:30	0	318	5	0	1	3	0	11	216	2182	
17:30	17:45	0	309	5	0	1	14	0	7	212	2177	
17:45	18:00	0	312	8	0	2	4	0	14	220	2125	
18:00	18:15	0	270	6	0	2	4	0	11	227	2053	
18:15	18:30	0	289	6	0	0	9	0	22	223	2010	
18:30	18:45	0	275	6	0	0	7	0	16	192	1909	
18:45	19:00	0	255	2	0	0	5	0	15	211	1872	
19:00	19:15	0	260	2	0	1	4	0	6	204	1780	
19:15	19:30	0	224	1	0	0	4	0	4	215		
19:30	19:45	0	239	5	0	0	4	0	9	202		
19:45	20:00	0	223	1	0	1	2	0	7	162		

Peak Time		East Approach Fullers Rd			South Approach Edgar St			West Approach Fullers Rd			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
8:00	9:00	0	1096	43	0	7	60	0	93	873	2172
15:15	16:15	0	1221	10	0	5	57	0	42	849	2184

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Victoria Ave and Pacific Hwy, Chatswood

GPS *-33.79769, 151.17829*

Date:	Thu 14/03/19
Weather:	Overcast
Suburban:	Chatswood
Customer:	TTPP

North:	Pacific Hwy
East:	Victoria Ave
South:	Pacific Hwy
West:	Car park

Survey Period	AM:	8:00 AM-9:00 AM
	PM:	3:15 PM-8:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	5:15 PM-6:15 PM

All Vehicles

Time		North Approach Pacific Hwy				East Approach Victoria Ave				South Approach Pacific Hwy				West Approach Car park				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
8:00	8:15	0	0	525	13	0	23	0	18	0	45	364	5	0	0	0	0	3617	Peak
8:15	8:30	0	0	455	17	0	19	0	21	0	44	340	3	0	0	0	0		
8:30	8:45	0	0	438	14	0	20	0	31	0	52	328	2	0	0	1	0		
8:45	9:00	0	0	414	19	0	13	1	22	0	54	311	3	0	1	0	1		
15:15	15:30	0	0	308	13	0	15	0	29	0	46	446	0	0	1	0	1	3936	
15:30	15:45	0	0	364	10	0	16	0	22	0	38	549	0	0	0	0	0	4059	
15:45	16:00	0	0	369	16	0	21	1	28	0	45	594	0	0	0	0	2	4108	
16:00	16:15	0	0	405	10	0	21	0	26	0	41	496	1	0	0	0	2	4105	
16:15	16:30	0	0	368	13	0	16	0	21	0	29	532	0	0	0	1	2	4147	
16:30	16:45	0	0	394	14	0	24	0	25	0	36	553	0	0	1	0	1	4216	
16:45	17:00	0	0	395	12	0	19	0	22	0	31	593	1	0	0	0	0	4211	
17:00	17:15	0	0	376	16	0	25	0	11	0	24	590	0	0	1	1	0	4189	
17:15	17:30	0	0	382	10	0	26	0	25	0	37	569	1	0	1	0	0	4217	Peak
17:30	17:45	0	0	381	16	0	26	0	24	0	25	569	1	0	0	0	1	4195	
17:45	18:00	0	0	394	9	0	20	0	30	0	31	566	0	0	0	0	1	4089	
18:00	18:15	0	0	393	11	0	20	0	21	0	40	586	1	0	0	0	0	3893	
18:15	18:30	0	0	338	18	0	37	0	29	0	48	557	1	0	0	0	1	3653	
18:30	18:45	0	0	358	10	0	21	0	22	0	31	491	4	0	0	0	0	3405	
18:45	19:00	0	0	302	19	0	22	0	24	0	37	450	0	0	1	0	0	3163	
19:00	19:15	0	0	251	11	0	21	0	22	0	40	486	1	0	0	0	0	3025	
19:15	19:30	0	0	211	12	0	22	0	27	0	45	461	1	0	0	0	2		
19:30	19:45	0	0	218	16	0	19	0	22	0	37	383	0	0	0	0	0		
19:45	20:00	0	0	228	16	0	24	0	24	0	36	386	0	0	1	0	2		

Peak Time		North Approach Pacific Hwy				East Approach Victoria Ave				South Approach Pacific Hwy				West Approach Car park				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	0	1832	63	0	75	1	92	0	195	1343	13	0	1	1	1	3617
17:15	18:15	0	0	1550	46	0	92	0	100	0	133	2290	3	0	1	0	2	4217

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Centennial Ave and Pacific Hwy, Chatswoo

GPS *-33.79884, 151.17866*

Date:	Thu 14/03/19
Weather:	Overcast
Suburban:	Chatswood
Customer:	TTPP

North:	Pacific Hwy
East:	Centennial Ave
South:	Pacific Hwy
West:	N/A

Survey Period	AM:	8:00 AM-9:00 AM
	PM:	3:15 PM-8:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	5:00 PM-6:00 PM

All Vehicles

Time		North Approach Pacific Hwy			South Approach Pacific Hwy			West Approach N/A			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
8:00	8:15	0	0	521	0	418	15	0	41	11	3733	Peak
8:15	8:30	0	0	464	0	358	17	0	57	12		
8:30	8:45	0	0	458	0	376	18	0	48	23		
8:45	9:00	0	0	427	0	367	27	0	61	14		
15:15	15:30	0	0	352	0	486	8	0	52	19	3996	
15:30	15:45	0	0	394	0	609	12	0	30	11	4112	
15:45	16:00	0	0	415	0	577	7	0	28	12	4128	
16:00	16:15	0	0	437	0	504	11	0	23	9	4180	
16:15	16:30	0	0	398	0	575	11	0	37	12	4275	
16:30	16:45	0	0	430	0	582	15	0	33	12	4324	
16:45	17:00	0	0	406	0	631	10	0	28	16	4356	
17:00	17:15	0	0	408	0	612	4	0	46	9	4396	Peak
17:15	17:30	0	0	448	0	571	9	0	38	16	4386	
17:30	17:45	0	0	433	0	624	8	0	21	18	4315	
17:45	18:00	0	0	452	0	607	8	0	41	23	4119	
18:00	18:15	0	0	385	0	616	11	0	45	12	3889	
18:15	18:30	0	0	389	0	561	8	0	38	15	3697	
18:30	18:45	0	0	340	0	513	10	0	32	13	3434	
18:45	19:00	0	0	327	0	533	6	0	28	7	3225	
19:00	19:15	0	0	275	0	560	12	0	25	5	3037	
19:15	19:30	0	1	212	0	488	10	0	25	12		
19:30	19:45	0	0	247	0	420	7	0	21	4		
19:45	20:00	0	0	262	0	433	4	0	12	2		

Peak Time		North Approach Pacific Hwy			South Approach Pacific Hwy			West Approach N/A			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
8:00	9:00	0	0	1870	0	1519	77	0	207	60	3733
17:00	18:00	0	0	1741	0	2414	29	0	146	66	4396

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Albert Ave and Pacific Hwy, Chatswood

GPS *-33.79934, 151.17897*

Date:	Thu 14/03/19
Weather:	Overcast
Suburban:	Chatswood
Customer:	TTPP

North:	Pacific Hwy
East:	Albert Ave
South:	Pacific Hwy
West:	Oliver Rd

Survey Period	AM:	8:00 AM-9:00 AM
	PM:	3:15 PM-8:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	5:15 PM-6:15 PM

All Vehicles

Time		North Approach Pacific Hwy				East Approach Albert Ave				South Approach Pacific Hwy				West Approach Oliver Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
8:00	8:15	0	19	446	97	0	39	20	16	0	36	394	2	0	0	0	0	3972	Peak
8:15	8:30	0	17	413	91	0	53	11	14	0	37	322	1	0	0	0	0		
8:30	8:45	0	18	416	72	0	48	17	12	0	40	346	8	0	0	0	0		
8:45	9:00	0	20	398	70	0	41	21	18	0	44	353	2	0	0	0	0		
15:15	15:30	0	5	340	59	0	92	9	65	0	55	402	9	0	0	0	0	4378	
15:30	15:45	0	9	351	64	0	91	11	45	0	43	530	5	0	0	0	0	4472	
15:45	16:00	0	21	371	51	0	91	10	35	0	51	493	2	0	0	0	0	4471	
16:00	16:15	0	14	381	65	0	73	8	37	0	42	442	6	0	0	0	0	4527	
16:15	16:30	0	9	376	50	0	69	14	51	0	38	517	6	0	0	0	0	4602	
16:30	16:45	0	13	399	51	0	83	4	46	0	33	514	5	0	0	0	0	4647	
16:45	17:00	0	14	363	57	0	71	14	48	0	41	570	3	0	0	0	0	4679	
17:00	17:15	0	12	400	42	0	65	10	28	0	33	551	2	0	0	0	0	4712	
17:15	17:30	0	15	406	65	0	70	9	52	0	45	510	3	0	0	0	0	4724	Peak
17:30	17:45	0	10	395	49	0	69	15	37	0	38	563	4	0	0	0	0	4651	
17:45	18:00	0	18	426	49	0	83	14	51	0	39	532	2	0	0	0	0	4468	
18:00	18:15	0	18	348	64	0	76	12	39	0	46	551	1	0	0	0	0	4256	
18:15	18:30	0	16	329	82	0	84	9	45	0	45	485	7	0	0	0	0	4075	
18:30	18:45	0	27	270	75	0	65	9	32	0	57	458	4	0	0	0	0	3812	
18:45	19:00	0	16	277	62	0	83	10	30	0	67	456	1	0	0	0	0	3599	
19:00	19:15	0	11	225	64	0	86	15	32	0	53	486	2	0	0	0	0	3389	
19:15	19:30	0	12	168	57	0	95	12	27	0	63	403	2	0	0	0	0		
19:30	19:45	0	8	214	46	0	111	10	31	0	47	316	1	0	0	0	0		
19:45	20:00	0	13	228	33	0	86	8	34	0	37	351	2	0	0	0	0		

Appendix D

SIDRA Results

MOVEMENT SUMMARY

Site: 2 [Pacific Hwy - Victoria Ave - Ex AM]

Network: 1 [Ex AM]

Pacific Hwy - Victoria Ave - 2019 AM
TCS 718
Site Category: Existing AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
2	T1	1414	6.6	1409	6.6	0.501	3.1	LOS A	9.6	71.0	0.18	0.16	0.18	50.8
3	R2	205	10.3	205	10.3	1.043	145.2	LOS F	22.5	171.1	1.00	1.28	1.77	11.0
Approach		1619	7.1	1614 N1	7.1	1.043	21.1	LOS B	22.5	171.1	0.28	0.31	0.38	34.8
East: Victoria Avenue														
4	L2	97	26.1	97	26.1	0.352	46.0	LOS D	5.4	46.0	0.80	0.74	0.80	20.1
6	R2	79	10.7	79	10.7	1.172	242.8	LOS F	11.4	87.1	1.00	1.47	2.38	11.0
Approach		176	19.2	176	19.2	1.172	134.4	LOS F	11.4	87.1	0.89	1.07	1.51	13.3
North: Pacific Highway														
7	L2	66	47.6	66	47.6	0.623	23.5	LOS B	24.4	183.9	0.68	0.64	0.68	32.8
8	T1	1928	3.2	1928	3.2	0.623	19.3	LOS B	32.6	234.7	0.68	0.63	0.68	28.2
Approach		1995	4.7	1995	4.7	0.623	19.4	LOS B	32.6	234.7	0.68	0.63	0.68	28.5
All Vehicles		3789	6.4	3784 N1	6.4	1.172	25.5	LOS B	32.6	234.7	0.52	0.51	0.59	28.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 2 [Pacific Hwy - Victoria Ave - Ex PM]

Network: 2 [Ex PM]

Pacific Hwy - Victoria Ave - 2019 PM
TCS 718
Site Category: Existing PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
2	T1	2195	2.9	2195	2.9	0.496	2.6	LOS A	8.0	57.3	0.16	0.15	0.16	51.5
3	R2	179	8.8	179	8.8	0.853	80.9	LOS F	13.9	104.4	1.00	0.93	1.19	16.4
Approach		2374	3.3	2374	3.3	0.853	8.5	LOS A	13.9	104.4	0.22	0.21	0.24	44.3
East: Victoria Avenue														
4	L2	111	27.6	111	27.6	0.591	51.0	LOS D	6.8	58.7	0.86	0.78	0.86	19.1
6	R2	77	11.0	77	11.0	1.398	430.6	LOS F	15.2	116.7	1.00	1.72	3.05	6.8
Approach		187	20.8	187	20.8	1.398	206.6	LOS F	15.2	116.7	0.92	1.17	1.76	9.4
North: Pacific Highway														
7	L2	52	32.7	52	32.7	0.670	23.1	LOS B	36.1	262.5	0.71	0.66	0.71	32.9
8	T1	1522	2.4	1522	2.4	0.670	19.5	LOS B	37.0	264.6	0.71	0.66	0.71	28.1
Approach		1574	3.4	1574	3.4	0.670	19.6	LOS B	37.0	264.6	0.71	0.66	0.71	28.4
All Vehicles		4135	4.1	4135	4.1	1.398	21.7	LOS B	37.0	264.6	0.44	0.42	0.48	31.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 3 [Pacific Hwy - Centennial Ave - Ex AM]

Network: 1 [Ex AM]

Pacific Hwy - Centennial Ave - 2019 AM
TCS 892
Site Category: Existing AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	81	1.3	81	1.3	0.574	3.9	LOS A	2.8	20.4	0.05	0.10	0.09	39.5
2	T1	1599	6.9	1599	6.9	0.574	0.7	LOS A	2.8	20.4	0.05	0.07	0.07	34.4
Approach		1680	6.6	1680	6.6	0.574	0.8	LOS A	2.8	20.4	0.05	0.07	0.07	35.9
North: Pacific Highway														
8	T1	1968	4.8	1968	4.8	0.869	12.5	LOS A	23.5	171.4	0.28	0.31	0.34	18.6
Approach		1968	4.8	1968	4.8	0.869	12.5	LOS A	23.5	171.4	0.28	0.31	0.34	18.6
West: Centennial Avenue														
10	L2	63	3.3	63	3.3	1.197	265.2	LOS F	24.2	171.2	1.00	1.62	2.38	5.7
12	R2	218	0.0	218	0.0	1.197	266.8	LOS F	24.2	171.2	1.00	1.64	2.41	5.7
Approach		281	0.7	281	0.7	1.197	266.4	LOS F	24.2	171.2	1.00	1.63	2.40	5.7
All Vehicles		3929	5.3	3929	5.3	1.197	25.7	LOS B	24.2	171.4	0.23	0.30	0.37	12.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 3 [Pacific Hwy - Centennial Ave - Ex PM]

Network: 2 [Ex PM]

Pacific Hwy - Centennial Ave - 2019 PM
TCS 892
Site Category: Existing PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	40	0.0	40	0.0	0.502	3.7	LOS A	2.2	16.1	0.04	0.07	0.09	39.7
2	T1	2291	3.5	2291	3.5	0.502	0.5	LOS A	2.2	16.1	0.04	0.05	0.06	35.8
Approach		2331	3.5	2331	3.5	0.502	0.6	LOS A	2.2	16.1	0.04	0.05	0.06	36.4
North: Pacific Highway														
8	T1	1682	3.8	1682	3.8	1.069	116.5	LOS F	23.7	171.4	1.00	1.45	1.63	3.4
Approach		1682	3.8	1682	3.8	1.069	116.5	LOS F	23.7	171.4	1.00	1.45	1.63	3.4
West: Centennial Avenue														
10	L2	54	7.8	54	7.8	1.065	164.6	LOS F	12.9	93.9	1.00	1.37	1.97	8.6
12	R2	140	1.5	140	1.5	1.065	166.9	LOS F	12.9	93.9	1.00	1.35	2.00	8.5
Approach		194	3.3	194	3.3	1.065	166.3	LOS F	12.9	93.9	1.00	1.36	1.99	8.6
All Vehicles		4206	3.6	4206	3.6	1.069	54.6	LOS D	23.7	171.4	0.47	0.67	0.78	6.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 4 [Pacific Hwy - Albert Ave - Ex AM]

Network: 1 [Ex AM]

Pacific Hwy - Albert Ave - 2019 AM
TCS 882
Site Category: Existing AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	13	0.0	13	0.0	0.607	19.3	LOS B	29.3	218.0	0.59	0.69	0.59	43.6
2	T1	1489	7.3	1489	7.3	0.607	16.2	LOS B	29.3	218.0	0.59	0.69	0.59	39.4
3	R2	165	3.8	165	3.8	1.173	243.6	LOS F	23.9	172.8	1.00	1.36	2.27	11.1
Approach		1667	6.9	1667	6.9	1.173	38.7	LOS C	29.3	218.0	0.63	0.76	0.76	27.2
East: Albert Road														
4	L2	63	5.0	63	5.0	0.319	70.7	LOS F	4.3	31.7	0.96	0.76	0.96	24.5
5	T1	73	0.0	73	0.0	0.603	69.0	LOS E	9.5	66.9	1.00	0.80	1.00	24.3
6	R2	191	1.7	191	1.7	0.603	72.3	LOS F	9.5	66.9	1.00	0.80	1.00	15.8
Approach		326	1.9	326	1.9	0.603	71.2	LOS F	9.5	66.9	0.99	0.79	0.99	19.9
North: Pacific Highway														
7	L2	347	0.3	344	0.3	0.240	7.6	LOS A	6.4	45.1	0.28	0.57	0.28	35.0
8	T1	1761	5.2	1747	5.2	0.459	12.0	LOS A	8.9	65.3	0.50	0.46	0.50	42.6
9	R2	78	2.7	77	2.7	0.538	77.5	LOS F	5.7	40.5	1.00	0.77	1.00	16.6
Approach		2186	4.3	2168[N1]	4.4	0.538	13.6	LOS A	8.9	65.3	0.48	0.49	0.48	39.1
All Vehicles		4180	5.2	4162[N1]	5.2	1.173	28.2	LOS B	29.3	218.0	0.58	0.62	0.63	30.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 4 [Pacific Hwy - Albert Ave - Ex PM]

Network: 2 [Ex PM]

Pacific Hwy - Albert Ave - 2019 PM
TCS 882
Site Category: Existing PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	23	0.0	23	0.0	0.542	19.7	LOS B	25.1	181.5	0.57	0.68	0.57	43.3
2	T1	1965	4.0	1965	4.0	0.542	16.6	LOS B	25.1	181.5	0.57	0.68	0.57	39.0
3	R2	201	0.0	201	0.0	0.926	95.2	LOS F	17.2	120.5	1.00	0.99	1.39	21.4
Approach		2189	3.6	2189	3.6	0.926	23.8	LOS B	25.1	181.5	0.61	0.71	0.65	34.4
East: Albert Road														
4	L2	192	2.2	192	2.2	0.538	61.7	LOS E	12.6	90.2	0.95	0.81	0.95	26.1
5	T1	40	0.0	40	0.0	0.673	64.1	LOS E	14.2	100.0	0.99	0.83	1.00	24.8
6	R2	365	0.9	365	0.9	0.673	67.4	LOS E	14.2	100.0	0.99	0.83	1.00	16.4
Approach		597	1.2	597	1.2	0.673	65.4	LOS E	14.2	100.0	0.98	0.82	0.98	20.6
North: Pacific Highway														
7	L2	252	0.8	252	0.8	0.185	6.8	LOS A	2.9	20.6	0.18	0.52	0.18	35.4
8	T1	1519	4.1	1519	4.1	0.679	20.2	LOS B	9.0	65.3	0.65	0.60	0.65	36.3
9	R2	52	4.1	52	4.1	0.544	85.0	LOS F	4.0	28.7	1.00	0.75	1.01	15.8
Approach		1822	3.6	1822	3.6	0.679	20.2	LOS B	9.0	65.3	0.60	0.60	0.60	34.9
All Vehicles		4608	3.3	4608	3.3	0.926	27.8	LOS B	25.1	181.5	0.65	0.68	0.67	31.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 1 [Fullers Rd - Edgar St - Ex AM]

Fullers Rd - Edgar St - 2019 AM
Site Category: Existing AM
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Edgar Street												
1	L2	63	0.0	0.484	37.5	LOS C	1.7	11.8	0.94	1.05	1.22	32.4
3	R2	7	0.0	0.484	51.0	LOS D	1.7	11.8	0.94	1.05	1.22	32.2
Approach		71	0.0	0.484	38.9	LOS C	1.7	11.8	0.94	1.05	1.22	32.4
East: Fullers Rd												
4	L2	45	0.0	0.640	4.7	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
5	T1	1154	6.2	0.640	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		1199	6.0	0.640	0.3	NA	0.0	0.0	0.00	0.02	0.00	49.7
West: Fullers Road												
11	T1	919	6.5	0.248	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	98	0.0	0.613	43.6	LOS D	2.5	17.2	0.96	1.11	1.42	30.9
Approach		1017	5.9	0.613	4.2	NA	2.5	17.2	0.09	0.11	0.14	47.2
All Vehicles		2286	5.8	0.640	3.2	NA	2.5	17.2	0.07	0.09	0.10	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: 1 [Fullers Rd - Edgar St - Ex PM]

Fullers Rd - Edgar St - 2019 PM
Site Category: Existing PM
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Edgar Street												
1	L2	60	0.0	0.421	31.0	LOS C	1.4	9.5	0.94	1.03	1.15	33.9
3	R2	5	0.0	0.421	67.9	LOS E	1.4	9.5	0.94	1.03	1.15	33.7
Approach		65	0.0	0.421	34.0	LOS C	1.4	9.5	0.94	1.03	1.15	33.9
East: Fullers Rd												
4	L2	11	0.0	0.696	4.7	LOS A	0.0	0.0	0.00	0.00	0.00	49.2
5	T1	1299	5.6	0.696	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	49.7
Approach		1309	5.5	0.696	0.2	NA	0.0	0.0	0.00	0.00	0.00	49.7
West: Fullers Road												
11	T1	905	4.8	0.241	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	41	0.0	0.401	51.0	LOS D	1.3	9.0	0.96	1.03	1.13	29.1
Approach		946	4.6	0.401	2.2	NA	1.3	9.0	0.04	0.04	0.05	48.5
All Vehicles		2321	5.0	0.696	2.0	NA	1.4	9.5	0.04	0.05	0.05	48.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: 2 [Pacific Hwy - Victoria Ave - FB AM]

Network: 1 [FB AM]

Pacific Hwy - Victoria Ave - FB AM
TCS 718
Site Category: AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
2	T1	1582	6.6	1577	6.6	0.561	3.0	LOS A	10.8	80.2	0.18	0.17	0.18	50.9
3	R2	205	10.3	205	10.3	1.044	145.4	LOS F	22.5	171.2	1.00	1.28	1.77	11.0
Approach		1787	7.0	1782 N1	7.1	1.044	19.4	LOS B	22.5	171.2	0.28	0.30	0.36	35.9
East: Victoria Avenue														
4	L2	97	26.1	97	26.1	0.504	48.9	LOS D	5.7	49.2	0.84	0.77	0.84	19.5
6	R2	79	10.7	79	10.7	1.266	320.0	LOS F	13.3	101.8	1.00	1.60	2.69	8.8
Approach		176	19.2	176	19.2	1.266	170.7	LOS F	13.3	101.8	0.91	1.14	1.67	11.2
North: Pacific Highway														
7	L2	66	47.6	66	47.6	0.938	69.4	LOS E	50.5	379.8	0.99	1.13	1.26	23.2
8	T1	2158	3.2	2158	3.2	0.938	55.5	LOS D	69.8	502.3	0.99	1.08	1.19	18.2
Approach		2224	4.5	2224	4.5	0.938	55.9	LOS D	69.8	502.3	0.99	1.08	1.19	18.4
All Vehicles		4187	6.2	4182 N1	6.2	1.266	45.1	LOS D	69.8	502.3	0.68	0.75	0.86	22.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 2 [Pacific Hwy - Victoria Ave - FB PM]

Network: 2 [FB PM]

Pacific Hwy - Victoria Ave - FB PM
TCS 718
Site Category: PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
2	T1	2419	2.9	2419	2.9	0.547	2.7	LOS A	9.9	70.7	0.17	0.16	0.17	51.3
3	R2	179	8.8	179	8.8	0.853	80.9	LOS F	13.9	104.6	1.00	0.93	1.19	16.4
Approach		2598	3.3	2598	3.3	0.853	8.1	LOS A	13.9	104.6	0.23	0.21	0.24	44.7
East: Victoria Avenue														
4	L2	111	27.6	111	27.6	0.591	51.0	LOS D	6.8	58.7	0.86	0.78	0.86	19.1
6	R2	77	11.0	77	11.0	1.398	430.6	LOS F	15.2	116.7	1.00	1.72	3.05	6.8
Approach		187	20.8	187	20.8	1.398	206.6	LOS F	15.2	116.7	0.92	1.17	1.76	9.4
North: Pacific Highway														
7	L2	52	32.7	52	32.7	0.800	26.2	LOS B	50.3	364.7	0.82	0.77	0.82	32.0
8	T1	1833	2.4	1833	2.4	0.800	22.6	LOS B	51.4	367.3	0.82	0.77	0.82	26.8
Approach		1884	3.2	1884	3.2	0.800	22.7	LOS B	51.4	367.3	0.82	0.77	0.82	27.1
All Vehicles		4669	4.0	4669	4.0	1.398	22.0	LOS B	51.4	367.3	0.50	0.48	0.54	31.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 3 [Pacific Hwy - Centennial Ave - FB AM]

Network: 1 [FB AM]

Pacific Hwy - Centennial Ave - FB AM
TCS 892
Site Category: AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	81	1.3	81	1.3	0.639	3.9	LOS A	3.6	26.7	0.06	0.10	0.10	39.4
2	T1	1789	6.9	1789	6.9	0.639	0.7	LOS A	3.6	26.7	0.06	0.08	0.08	34.1
Approach		1871	6.7	1871	6.7	0.639	0.9	LOS A	3.6	26.7	0.06	0.08	0.08	35.6
North: Pacific Highway														
8	T1	2269	4.8	2269	4.8	1.002	68.0	LOS E	23.5	171.4	1.00	1.25	1.37	5.5
Approach		2269	4.8	2269	4.8	1.002	68.0	LOS E	23.5	171.4	1.00	1.25	1.37	5.5
West: Centennial Avenue														
10	L2	63	3.3	63	3.3	1.197	265.2	LOS F	24.2	171.2	1.00	1.62	2.38	5.7
12	R2	218	0.0	218	0.0	1.197	266.8	LOS F	24.2	171.2	1.00	1.64	2.41	5.7
Approach		281	0.7	281	0.7	1.197	266.4	LOS F	24.2	171.2	1.00	1.63	2.40	5.7
All Vehicles		4421	5.3	4421	5.3	1.197	52.2	LOS D	24.2	171.4	0.60	0.78	0.89	7.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 3 [Pacific Hwy - Centennial Ave - FB PM]

Network: 2 [FB PM]

Pacific Hwy - Centennial Ave - FB PM
TCS 892
Site Category: PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	40	0.0	40	0.0	0.552	3.8	LOS A	2.7	19.6	0.05	0.07	0.09	39.7
2	T1	2524	3.5	2524	3.5	0.552	0.6	LOS A	2.7	19.6	0.05	0.05	0.06	35.6
Approach		2564	3.5	2564	3.5	0.552	0.6	LOS A	2.7	19.6	0.05	0.05	0.06	36.1
North: Pacific Highway														
8	T1	2025	3.8	2025	3.8	1.287	302.6	LOS F	23.7	171.4	1.00	2.13	2.47	1.4
Approach		2025	3.8	2025	3.8	1.287	302.6	LOS F	23.7	171.4	1.00	2.13	2.47	1.4
West: Centennial Avenue														
10	L2	54	7.8	54	7.8	1.065	164.6	LOS F	12.9	93.9	1.00	1.37	1.97	8.6
12	R2	140	1.5	140	1.5	1.065	166.9	LOS F	12.9	93.9	1.00	1.35	2.00	8.5
Approach		194	3.3	194	3.3	1.065	166.3	LOS F	12.9	93.9	1.00	1.36	1.99	8.6
All Vehicles		4783	3.6	4783	3.6	1.287	135.2	LOS F	23.7	171.4	0.49	0.99	1.16	2.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 4 [Pacific Hwy - Albert Ave - FB AM]

Network: 1 [FB AM]

Pacific Hwy - Albert Ave - FB AM
TCS 882
Site Category: AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	14	0.0	14	0.0	0.668	20.3	LOS B	34.8	258.8	0.64	0.72	0.64	43.1
2	T1	1641	7.3	1641	7.3	0.668	17.2	LOS B	34.8	258.8	0.64	0.72	0.64	38.5
3	R2	165	3.8	165	3.8	1.173	243.6	LOS F	23.9	172.8	1.00	1.36	2.27	11.1
Approach		1820	6.9	1820	6.9	1.173	37.8	LOS C	34.8	258.8	0.67	0.78	0.79	27.5
East: Albert Road														
4	L2	63	5.0	63	5.0	0.319	70.7	LOS F	4.3	31.7	0.96	0.76	0.96	24.5
5	T1	73	0.0	73	0.0	0.603	69.0	LOS E	9.5	66.9	1.00	0.80	1.00	24.3
6	R2	191	1.7	191	1.7	0.603	72.3	LOS F	9.5	66.9	1.00	0.80	1.00	15.8
Approach		326	1.9	326	1.9	0.603	71.2	LOS F	9.5	66.9	0.99	0.79	0.99	19.9
North: Pacific Highway														
7	L2	347	0.3	345	0.3	0.240	7.6	LOS A	6.4	45.2	0.28	0.57	0.28	35.0
8	T1	2031	5.2	2015	5.2	0.529	13.0	LOS A	8.9	65.3	0.52	0.48	0.52	41.7
9	R2	78	2.7	77	2.7	0.539	77.5	LOS F	5.7	40.5	1.00	0.77	1.00	16.6
Approach		2456	4.4	2437[N1]	4.5	0.539	14.3	LOS A	8.9	65.3	0.50	0.50	0.50	38.8
All Vehicles		4602	5.2	4584[N1]	5.3	1.173	27.7	LOS B	34.8	258.8	0.61	0.63	0.65	31.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 4 [Pacific Hwy - Albert Ave - FB PM]

Network: 2 [FB PM]

Pacific Hwy - Albert Ave - FB PM
TCS 882
Site Category: PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	23	0.0	23	0.0	0.587	20.4	LOS B	28.6	206.6	0.60	0.70	0.60	43.0
2	T1	2133	4.0	2133	4.0	0.587	17.3	LOS B	28.6	206.6	0.60	0.70	0.60	38.5
3	R2	201	0.0	201	0.0	0.926	95.2	LOS F	17.2	120.5	1.00	0.99	1.39	21.4
Approach		2357	3.6	2357	3.6	0.926	24.0	LOS B	28.6	206.6	0.64	0.72	0.67	34.3
East: Albert Road														
4	L2	192	2.2	192	2.2	0.538	61.7	LOS E	12.6	90.2	0.95	0.81	0.95	26.1
5	T1	40	0.0	40	0.0	0.673	64.1	LOS E	14.2	100.0	0.99	0.83	1.00	24.8
6	R2	365	0.9	365	0.9	0.673	67.4	LOS E	14.2	100.0	0.99	0.83	1.00	16.4
Approach		597	1.2	597	1.2	0.673	65.4	LOS E	14.2	100.0	0.98	0.82	0.98	20.6
North: Pacific Highway														
7	L2	252	0.8	225	0.8	0.166	7.3	LOS A	2.9	20.7	0.20	0.53	0.20	35.1
8	T1	1828	4.1	1634	4.1	0.730	22.8	LOS B	9.0	65.3	0.73	0.67	0.73	34.6
9	R2	52	4.1	46	4.1	0.486	84.6	LOS F	3.5	25.6	1.00	0.74	1.00	15.8
Approach		2132	3.7	1905[N1]	3.7	0.730	22.5	LOS B	9.0	65.3	0.67	0.66	0.67	33.7
All Vehicles		5085	3.4	4859[N1]	3.5	0.926	28.5	LOS B	28.6	206.6	0.69	0.71	0.71	31.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 1 [Fullers Rd - Edgar St - FB AM]

Fullers Rd - Edgar St - FB AM
Site Category: AM
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Edgar Street												
1	L2	63	0.0	0.716	72.3	LOS F	2.7	18.6	0.98	1.14	1.54	24.6
3	R2	7	0.0	0.716	93.0	LOS F	2.7	18.6	0.98	1.14	1.54	24.5
Approach		71	0.0	0.716	74.5	LOS F	2.7	18.6	0.98	1.14	1.54	24.6
East: Fullers Rd												
4	L2	45	0.0	0.692	4.7	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
5	T1	1252	6.2	0.692	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	49.6
Approach		1297	6.0	0.692	0.4	NA	0.0	0.0	0.00	0.02	0.00	49.6
West: Fullers Road												
11	T1	997	6.5	0.268	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	98	0.0	0.914	115.7	LOS F	5.1	35.4	0.99	1.39	2.47	19.2
Approach		1095	5.9	0.914	10.4	NA	5.1	35.4	0.09	0.12	0.22	43.7
All Vehicles		2462	5.8	0.914	6.9	NA	5.1	35.4	0.07	0.10	0.14	45.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: 1 [Fullers Rd - Edgar St - FB PM]

Fullers Rd - Edgar St - FB PM
Site Category: PM
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Edgar Street												
1	L2	60	0.0	0.600	51.7	LOS D	2.0	13.8	0.97	1.08	1.32	28.2
3	R2	5	0.0	0.600	103.5	LOS F	2.0	13.8	0.97	1.08	1.32	28.0
Approach		65	0.0	0.600	55.9	LOS D	2.0	13.8	0.97	1.08	1.32	28.2
East: Fullers Rd												
4	L2	11	0.0	0.743	4.8	LOS A	0.0	0.0	0.00	0.00	0.00	49.2
5	T1	1387	5.6	0.743	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	49.6
Approach		1398	5.5	0.743	0.3	NA	0.0	0.0	0.00	0.00	0.00	49.6
West: Fullers Road												
11	T1	936	4.8	0.250	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	42	0.0	0.636	99.2	LOS F	2.1	14.5	0.98	1.08	1.31	21.0
Approach		978	4.6	0.636	4.3	NA	2.1	14.5	0.04	0.05	0.06	47.2
All Vehicles		2441	5.0	0.743	3.4	NA	2.1	14.5	0.04	0.05	0.06	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: 2 [Pacific Hwy - Victoria Ave - FB + Dev AM]

Network: 1 [FB + Dev AM]

Pacific Hwy - Victoria Ave - FB + Dev AM
TCS 718
Site Category: AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
2	T1	1588	6.6	1581	6.6	0.562	3.2	LOS A	12.0	88.7	0.19	0.18	0.19	50.7
3	R2	205	10.3	204	10.3	1.042	144.3	LOS F	22.3	170.2	1.00	1.27	1.77	11.1
Approach		1794	7.0	1785 N1	7.1	1.042	19.3	LOS B	22.3	170.2	0.28	0.30	0.37	35.9
East: Victoria Avenue														
4	L2	97	26.1	97	26.1	0.504	48.9	LOS D	5.7	49.2	0.84	0.77	0.84	19.5
6	R2	79	10.7	79	10.7	1.266	320.0	LOS F	13.3	101.8	1.00	1.60	2.69	8.8
Approach		176	19.2	176	19.2	1.266	170.7	LOS F	13.3	101.8	0.91	1.14	1.67	11.2
North: Pacific Highway														
7	L2	66	47.6	66	47.6	1.164	226.9	LOS F	108.1	805.8	1.00	1.78	2.10	11.4
8	T1	2196	3.2	2196	3.2	1.164	220.6	LOS F	124.0	892.1	1.00	1.79	2.08	6.8
Approach		2262	4.5	2262	4.5	1.164	220.8	LOS F	124.0	892.1	1.00	1.79	2.08	7.0
All Vehicles		4232	6.2	4223 N1	6.2	1.266	133.5	LOS F	124.0	892.1	0.69	1.13	1.34	11.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 2 [Pacific Hwy - Victoria Ave - FB + Dev PM]

Network: 2 [FB + Dev PM]

Pacific Hwy - Victoria Ave - FB + Dev PM
TCS 718
Site Category: PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
2	T1	2453	2.9	2437	2.9	0.551	2.8	LOS A	10.6	75.9	0.18	0.17	0.18	51.2
3	R2	179	8.8	178	8.8	0.847	80.4	LOS F	13.7	103.4	1.00	0.92	1.18	16.4
Approach		2632	3.3	2615 N1	3.3	0.847	8.1	LOS A	13.7	103.4	0.23	0.22	0.25	44.7
East: Victoria Avenue														
4	L2	111	27.6	111	27.6	0.591	51.0	LOS D	6.8	58.7	0.86	0.78	0.86	19.1
6	R2	77	11.0	77	11.0	1.398	430.6	LOS F	15.2	116.7	1.00	1.72	3.05	6.8
Approach		187	20.8	187	20.8	1.398	206.6	LOS F	15.2	116.7	0.92	1.17	1.76	9.4
North: Pacific Highway														
7	L2	52	32.7	52	32.7	0.803	26.3	LOS B	50.7	367.2	0.82	0.77	0.82	32.0
8	T1	1839	2.4	1839	2.4	0.803	22.7	LOS B	51.7	369.7	0.82	0.77	0.82	26.8
Approach		1891	3.2	1891	3.2	0.803	22.8	LOS B	51.7	369.7	0.82	0.77	0.82	27.0
All Vehicles		4709	4.0	4693 N1	4.0	1.398	21.9	LOS B	51.7	369.7	0.50	0.48	0.54	31.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 3 [Pacific Hwy - Centennial Ave - FB + Dev AM]

Network: 1 [FB + Dev AM]

Pacific Hwy - Centennial Ave - FB + Dev AM
TCS 892
Site Category: AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	138	1.3	138	1.3	0.660	4.3	LOS A	5.4	39.9	0.09	0.15	0.13	39.0
2	T1	1789	6.9	1789	6.9	0.660	0.9	LOS A	5.4	39.9	0.07	0.10	0.09	32.6
Approach		1927	6.5	1927	6.5	0.660	1.2	LOS A	5.4	39.9	0.07	0.10	0.10	35.1
North: Pacific Highway														
8	T1	2307	4.8	2307	4.8	1.019	79.0	LOS F	23.5	171.4	1.00	1.30	1.43	4.8
Approach		2307	4.8	2307	4.8	1.019	79.0	LOS F	23.5	171.4	1.00	1.30	1.43	4.8
West: Centennial Avenue														
10	L2	69	3.3	69	3.3	1.243	302.4	LOS F	27.3	193.2	1.00	1.71	2.53	5.1
12	R2	224	0.0	224	0.0	1.243	303.9	LOS F	27.3	193.2	1.00	1.72	2.55	5.1
Approach		294	0.8	294	0.8	1.243	303.6	LOS F	27.3	193.2	1.00	1.72	2.54	5.1
All Vehicles		4528	5.3	4528	5.3	1.243	60.4	LOS E	27.3	193.2	0.61	0.82	0.94	6.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 3 [Pacific Hwy - Centennial Ave - FB + Dev PM]

Network: 2 [FB + Dev PM]

Pacific Hwy - Centennial Ave - FB + Dev PM
TCS 892
Site Category: PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	48	0.0	48	0.0	0.554	3.8	LOS A	2.9	21.2	0.05	0.08	0.10	39.6
2	T1	2524	3.5	2524	3.5	0.554	0.6	LOS A	2.9	21.2	0.05	0.06	0.06	35.4
Approach		2573	3.5	2573	3.5	0.554	0.7	LOS A	2.9	21.2	0.05	0.06	0.06	36.0
North: Pacific Highway														
8	T1	2032	3.8	2032	3.8	1.291	306.2	LOS F	23.7	171.4	1.00	2.14	2.49	1.4
Approach		2032	3.8	2032	3.8	1.291	306.2	LOS F	23.7	171.4	1.00	2.14	2.49	1.4
West: Centennial Avenue														
10	L2	87	7.8	87	7.8	1.363	402.2	LOS F	28.8	210.5	1.00	1.92	2.90	4.0
12	R2	169	1.5	169	1.5	1.363	404.1	LOS F	28.8	210.5	1.00	1.87	2.93	4.0
Approach		257	3.7	257	3.7	1.363	403.4	LOS F	28.8	210.5	1.00	1.89	2.92	4.0
All Vehicles		4861	3.6	4861	3.6	1.363	149.6	LOS F	28.8	210.5	0.50	1.02	1.23	2.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		53	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 4 [Pacific Hwy - Albert Ave - FB + Dev AM]

Network: 1 [FB + Dev AM]

Pacific Hwy - Albert Ave - FB + Dev AM
TCS 882
Site Category: AM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	14	0.0	14	0.0	0.727	21.6	LOS B	37.0	274.8	0.69	0.75	0.69	42.4
2	T1	1698	7.3	1698	7.3	0.727	18.4	LOS B	40.6	302.2	0.69	0.75	0.69	37.6
3	R2	165	3.8	165	3.8	1.173	243.6	LOS F	23.9	172.8	1.00	1.36	2.27	11.1
Approach		1877	6.9	1877	6.9	1.173	38.3	LOS C	40.6	302.2	0.72	0.81	0.83	27.3
East: Albert Road														
4	L2	63	5.0	63	5.0	0.319	70.7	LOS F	4.3	31.7	0.96	0.76	0.96	24.5
5	T1	78	0.0	78	0.0	0.629	69.4	LOS E	9.6	67.3	1.00	0.81	1.01	24.2
6	R2	191	1.7	191	1.7	0.629	72.6	LOS F	9.6	68.5	1.00	0.81	1.01	15.8
Approach		332	1.9	332	1.9	0.629	71.5	LOS F	9.6	68.5	0.99	0.80	1.00	19.9
North: Pacific Highway														
7	L2	348	0.3	344	0.3	0.240	7.6	LOS A	6.4	45.1	0.28	0.57	0.28	35.0
8	T1	2036	5.2	2014	5.3	0.529	13.0	LOS A	8.9	65.3	0.53	0.48	0.53	41.7
9	R2	116	2.7	115	2.7	0.798	83.2	LOS F	8.9	63.9	1.00	0.90	1.21	15.9
Approach		2500	4.4	2473[N1]	4.5	0.798	15.5	LOS B	8.9	65.3	0.51	0.51	0.52	37.9
All Vehicles		4708	5.2	4681[N1]	5.3	1.173	28.6	LOS C	40.6	302.2	0.63	0.65	0.68	30.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 4 [Pacific Hwy - Albert Ave - FB + Dev PM]

Network: 2 [FB + Dev PM]

Pacific Hwy - Albert Ave - FB + Dev PM
TCS 882
Site Category: PM
Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival 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	Aver. No. Cycles	Average Speed km/h
South: Pacific Highway														
1	L2	23	0.0	23	0.0	0.590	20.5	LOS B	28.8	207.9	0.60	0.70	0.60	43.0
2	T1	2141	4.0	2141	4.0	0.590	17.3	LOS B	28.8	207.9	0.60	0.70	0.60	38.4
3	R2	201	0.0	201	0.0	0.926	95.2	LOS F	17.2	120.5	1.00	0.99	1.39	21.4
Approach		2365	3.6	2365	3.6	0.926	24.0	LOS B	28.8	207.9	0.64	0.72	0.67	34.3
East: Albert Road														
4	L2	192	2.2	192	2.2	0.538	61.7	LOS E	12.6	90.2	0.95	0.81	0.95	26.1
5	T1	40	0.0	40	0.0	0.673	64.1	LOS E	14.2	100.0	0.99	0.83	1.00	24.8
6	R2	365	0.9	365	0.9	0.673	67.4	LOS E	14.2	100.0	0.99	0.83	1.00	16.4
Approach		597	1.2	597	1.2	0.673	65.4	LOS E	14.2	100.0	0.98	0.82	0.98	20.6
North: Pacific Highway														
7	L2	257	0.8	225	0.8	0.166	7.2	LOS A	2.9	20.1	0.19	0.53	0.19	35.2
8	T1	1854	4.1	1627	4.1	0.727	22.6	LOS B	9.0	65.3	0.73	0.67	0.73	34.8
9	R2	58	4.1	51	4.1	0.536	84.9	LOS F	3.9	28.3	1.00	0.75	1.00	15.8
Approach		2168	3.7	1903[N1]	3.7	0.727	22.4	LOS B	9.0	65.3	0.67	0.66	0.67	33.7
All Vehicles		5131	3.4	4865[N1]	3.5	0.926	28.5	LOS B	28.8	207.9	0.69	0.71	0.71	31.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

Site: 1 [Fullers Rd - Edgar St - FB + Dev AM]

Fullers Rd - Edgar St - FB + Dev AM
Site Category: AM
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Edgar Street												
1	L2	71	0.0	0.810	88.5	LOS F	3.3	23.4	0.99	1.21	1.82	22.1
3	R2	7	0.0	0.810	121.3	LOS F	3.3	23.4	0.99	1.21	1.82	22.0
Approach		78	0.0	0.810	91.6	LOS F	3.3	23.4	0.99	1.21	1.82	22.1
East: Fullers Rd												
4	L2	45	0.0	0.692	4.7	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
5	T1	1252	6.2	0.692	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	49.6
Approach		1297	6.0	0.692	0.4	NA	0.0	0.0	0.00	0.02	0.00	49.6
West: Fullers Road												
11	T1	997	6.5	0.467	1.9	LOS A	3.4	24.8	0.12	0.00	0.12	48.7
12	R2	109	0.0	1.023	162.1	LOS F	8.6	60.1	1.00	1.71	3.64	15.3
Approach		1106	5.9	1.023	17.8	NA	8.6	60.1	0.20	0.17	0.47	40.1
All Vehicles		2481	5.8	1.023	11.0	NA	8.6	60.1	0.12	0.12	0.27	43.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: 1 [Fullers Rd - Edgar St - FB + Dev PM]

Fullers Rd - Edgar St - FB + Dev PM
Site Category: PM
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Edgar Street												
1	L2	95	0.0	0.881	89.3	LOS F	4.1	28.5	0.99	1.31	2.20	22.0
3	R2	5	0.0	0.881	143.4	LOS F	4.1	28.5	0.99	1.31	2.20	21.9
Approach		100	0.0	0.881	92.2	LOS F	4.1	28.5	0.99	1.31	2.20	22.0
East: Fullers Rd												
4	L2	11	0.0	0.743	4.8	LOS A	0.0	0.0	0.00	0.00	0.00	49.2
5	T1	1387	5.6	0.743	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	49.6
Approach		1398	5.5	0.743	0.3	NA	0.0	0.0	0.00	0.00	0.00	49.6
West: Fullers Road												
11	T1	936	4.8	0.250	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	44	0.0	0.667	103.9	LOS F	2.2	15.5	0.99	1.09	1.35	20.4
Approach		980	4.6	0.667	4.7	NA	2.2	15.5	0.04	0.05	0.06	46.9
All Vehicles		2478	4.9	0.881	5.7	NA	4.1	28.5	0.06	0.07	0.11	46.2

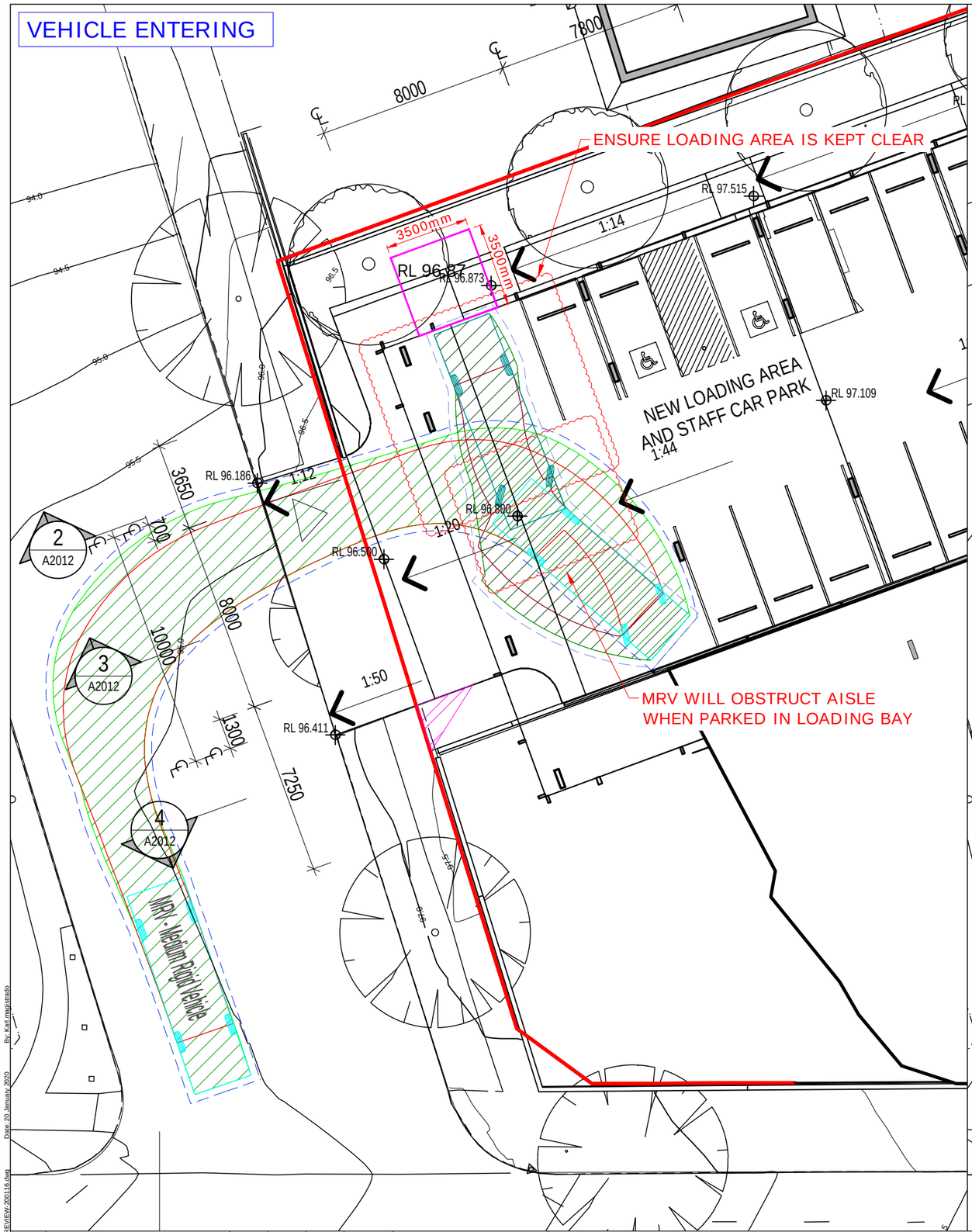
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS 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.

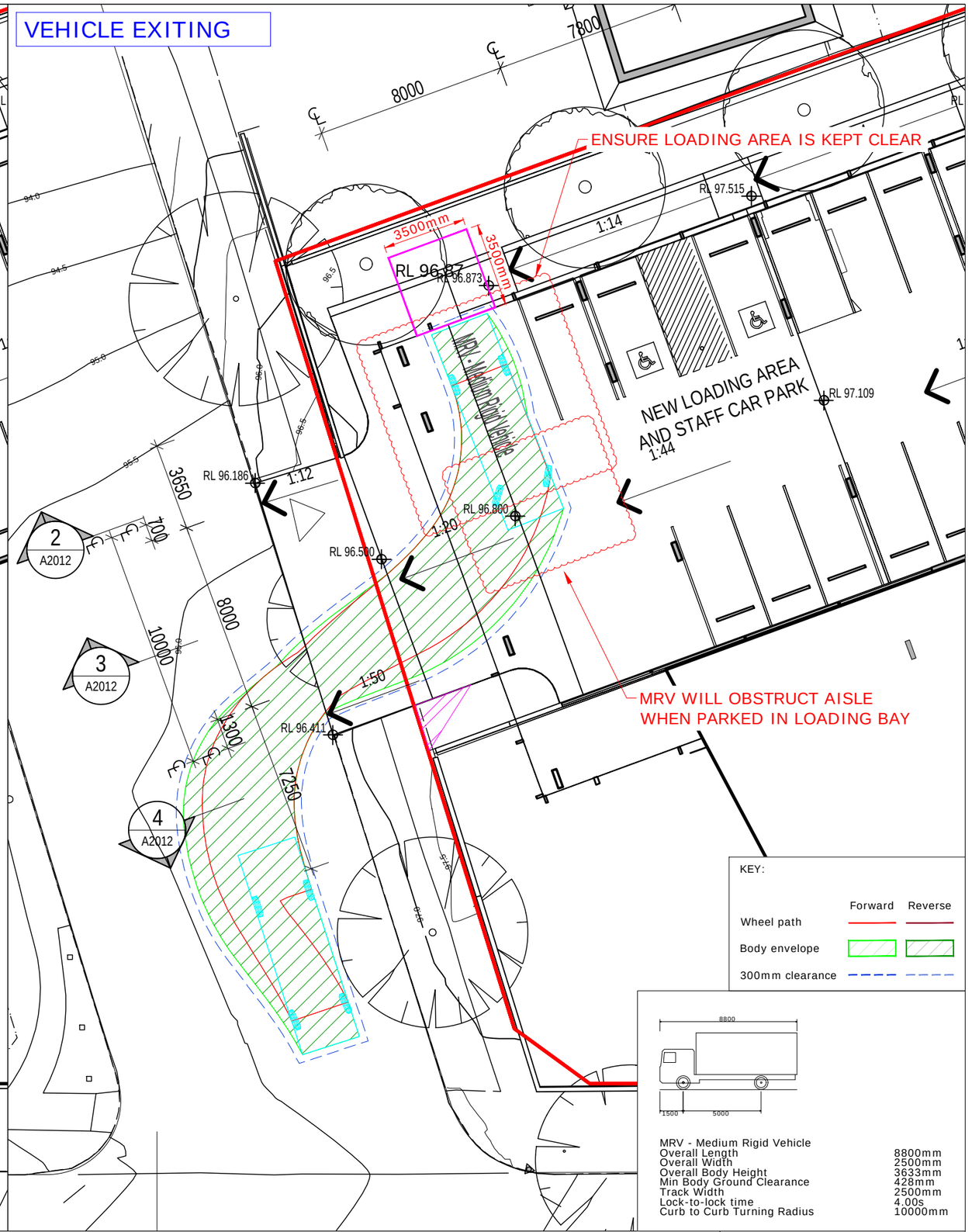
Appendix E

Swept Path Analysis – Loading Facilities

VEHICLE ENTERING

VEHICLE EXITING





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/01/20

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PROJECT

UPGRADES TO CHATSWOOD PUBLIC SCHOOL AND CHATSWOOD HIGH SCHOOL

TITLE

SWEPT PATH ANALYSIS
AS2890.2 8.8m MEDIUM RIGID VEHICLE

DWG No. 17356CAD012
FIGURE 10

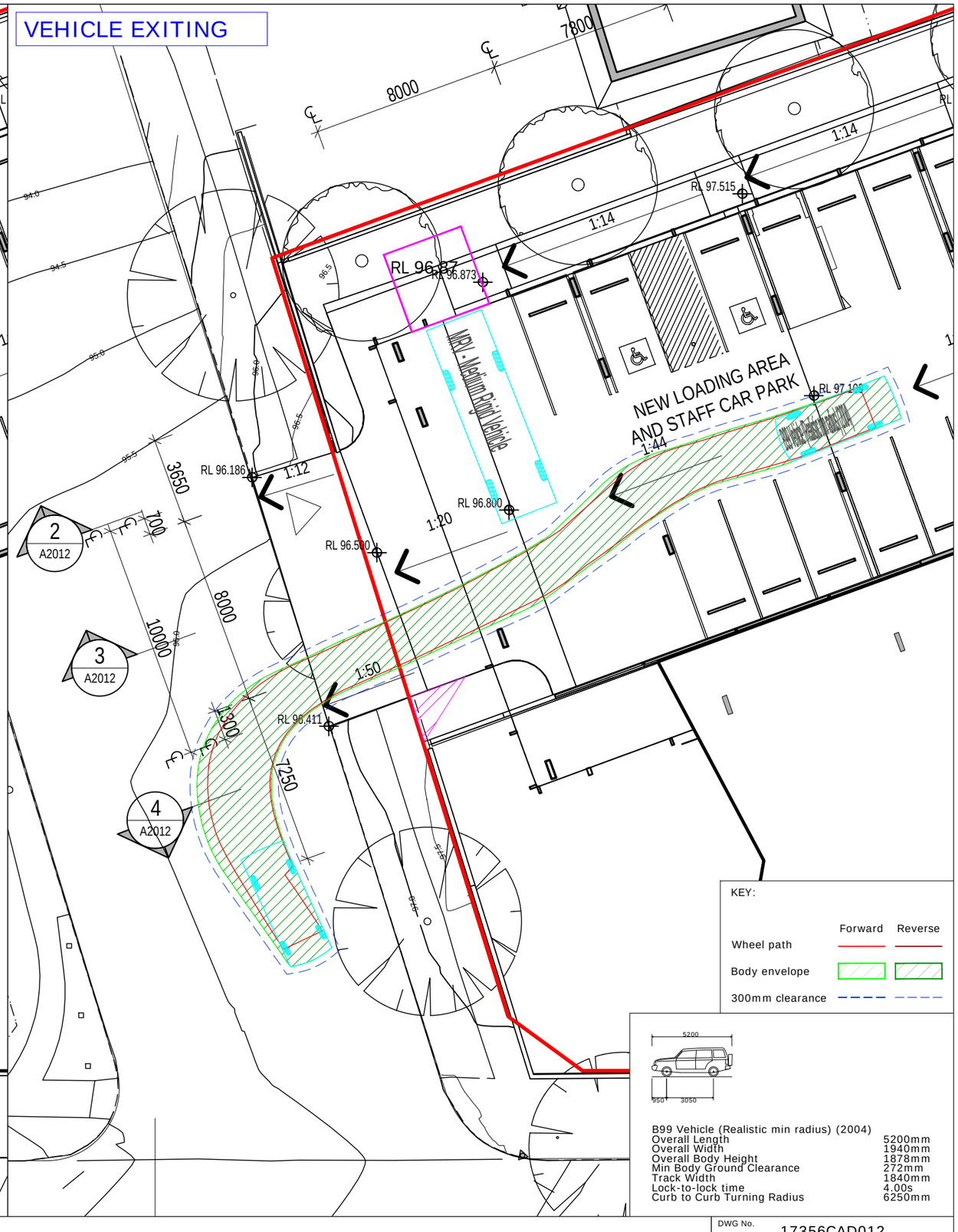
DATE STAMP 16 JANUARY 2020

PROJECT No.	SCALE	REV.
17356	1:200 @A3	A

By: Karl.magistrado
Date: 20 January 2020
Filename: 17356CAD012-CAR PARK REVIEW-200116.dwg

VEHICLE ENTERING

VEHICLE EXITING



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/01/20

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PROJECT

UPGRADES TO CHATSWOOD PUBLIC SCHOOL AND CHATSWOOD HIGH SCHOOL

TITLE

SWEPT PATH ANALYSIS
AS2890.1 5.2m B99 VEHICLE

DWG No. 17356CAD012
FIGURE 11

DATE STAMP 16 JANUARY 2020

PROJECT No.	SCALE	REV.
17356	1:200 @A3	A

By: Karl.magistrado
Date: 20 January 2020
Filename: 17356CAD012- CAR PARK REVEV-200116.dwg

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