

Planning Proposal for a
Mixed-Use Development

871-877 Pacific Highway, Chatswood

TRAFFIC AND PARKING ASSESSMENT REPORT

10 July 2018

Ref 17701

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1. INTRODUCTION

This report has been prepared to accompany a planning proposal to Willoughby City Council for a mixed-use development to be located at 871-877 Pacific Highway, Chatswood (Figures 1 and 2).

Council has previously granted development consent in March 2016 for the demolition of existing structures and construction of 6-7 mixed-use development containing 2 retail tenancies and 42 residential units, car parking and associated works (DA-2015/133).

Vehicular access to the loading dock and basement car parking area was approved to be provided via new driveways to be located on the Wilson Street frontage of the site.

The planning proposal seeks approval to modify the existing planning controls on the site to permit a mixed-use residential / retail building with an increased development yield.

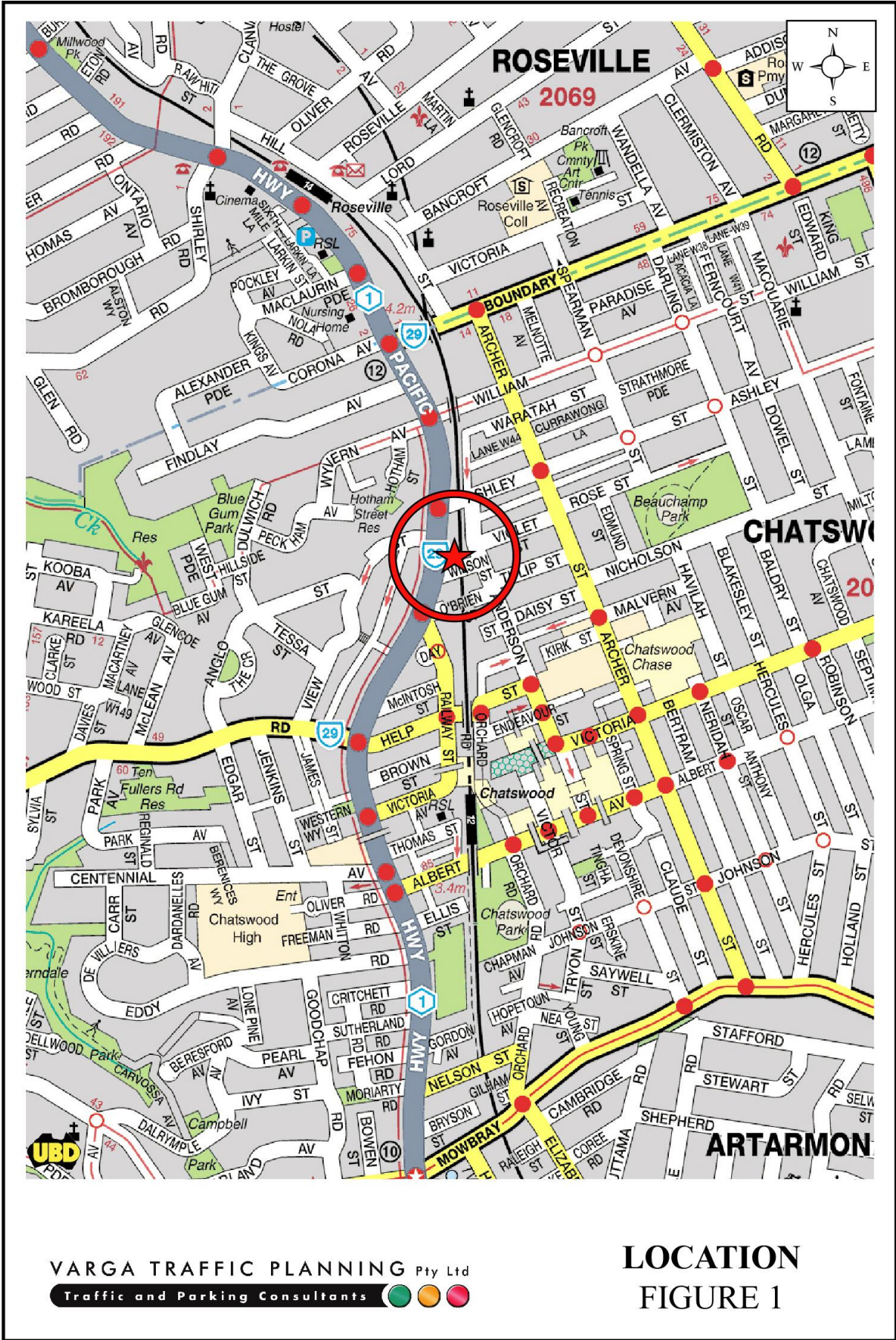
For the purposes of this assessment the planning proposal includes a similar mixed-use residential/retail development on the adjacent site immediately to the north of the subject site. Vehicular access to the adjacent site is to be provided via a through-site link which is to be located in the basement car parking area. All vehicular access to both sites is to be provided via Wilson Street, consistent with the previously approved development on the site.

Off-street parking will ultimately be provided in a multi-level basement car parking area beneath the building in accordance with Council requirements.

The purpose of this report is to assess the traffic and parking implications of the planning proposal and to that end this report:

- describes the site and provides details of the planning proposal
- reviews the road network in the vicinity of the site, and the traffic conditions on that road network

- reviews the existing public transport services in the vicinity of the site
- estimates the traffic generation potential of the development proposal, and assigns that traffic generation to the road network serving the site
- assesses the traffic implications of the planning proposal in terms of road network capacity
- assesses the parking implications of the planning proposal.





2. PROPOSED DEVELOPMENT

Site

The subject site is located on the north-eastern corner of the Pacific Highway and Wilson Street intersection. The site has a street frontage approximately 49 metres in length to the Pacific Highway, approximately 40 metres in length to Wilson Street and occupies an area of approximately 1,432m².

The subject site is currently occupied by part-one and part-two storey commercial buildings with off-street parking provided at the rear of the site.

Vehicular access to the site is currently provided via a single driveway located at the eastern end of the Wilson Street site frontage.

The adjacent site to the north which has been included in this assessment for the purposes of the planning proposal has a street frontage approximately 115m in length to the Pacific Highway only, and occupies a site area of approximately 1600m².

The adjacent site to the north is currently occupied by a petrol station and convenience store with separate entry and exit driveways off the Pacific Highway frontage of that site.

Existing Planning Controls & Current Approval (DA-2015/133)

The primary instrument that governs the mass and scale of the development on the site is stipulated in the *Willoughby Local Environmental Plan (LEP) 2012* as follows:

- Land Zoning: B5 - Business Development
- Floor Space Ratio (FSR): 2.5:1
- Height of Building (HoB): 21 metres

Council has previously granted development consent in March 2016 for the demolition of existing structures on the subject site and construction of 6-7 storey mixed-use development containing 2 retail tenancies (305m²) and 42 residential units, car parking and associated works.

Planning Proposal

The planning proposal seeks approval to amend the planning controls of the site to increase the permissible FSR from 2.5:1 to 6:1 (with a maximum non-residential FSR of 1:1) and HoB from 21 metres to 90 metres to facilitate the development of a residential apartment building with commercial/retail components on the lower levels of the building.

For the purposes of this planning proposal, the same amendment to the planning controls has been applied to the adjacent service station site to the north of the subject site to enable a cumulative traffic assessment to be undertaken as requested by Council. It should be noted however, that the service station operates on an extended lease and is unlikely to be redeveloped for many years, possibly decades.

A 2-stage traffic analysis has therefore been undertaken as follows:

- an interim traffic analysis whereby only the subject site is redeveloped, and
- a cumulative analysis whereby the adjacent site is also redeveloped.

A total of 201 residential apartments are envisaged on the two sites as follows:

	Subject Site	Adjacent Site	Total
1 bedroom apartments:	19	36	55
2 bedroom apartments:	61	62	123
3 bedroom apartments:	14	9	23
TOTAL APARTMENTS:	94	107	201

A commercial/retail component is also envisaged on ground floor level and level 1 on the subject site of 1,432 m² and on the adjacent site of 1,793 m² yielding a cumulative floor area in the order of 3,225m².

Off-street car parking is envisaged to be provided in a multi-level basement car parking area beneath the buildings which will ultimately be designed to meet the statutory car parking requirements as well as the applicable Australian Standards.

The future basement car parking areas on the two sites will be joined with below ground via a through-site link between the basement car parking areas at basement 1 level.

Vehicular access to all car parking facilities is envisaged to be provided via an entry/exit driveway located at the eastern end of the Wilson Street site frontage.

Loading / servicing for the future developments is expected to be undertaken by a variety of commercial vehicles up to and including 8.8 metres long MRV trucks. A dedicated service area will be provided at the rear of the site configured with a truck turntable to allow these MRV trucks to enter and exit the site whilst travelling in forward gear at all times. Vehicular access to the loading / servicing facilities is envisaged to be provided via a separate entry / exit driveway off Wilson Street. The proposed loading dock will serve both buildings.

Architectural concept plans for the purposes of this planning proposal have been prepared by *PBD Architects* and are reproduced in the following pages.



SCALE 1:500

INDICATIVE LEVEL 1 FLOOR PLAN



INDICATIVE LEVEL 2 / PODIUM FLOOR PLAN



1 BED APARTMENT
2 BED APARTMENT
3 BED APARTMENT



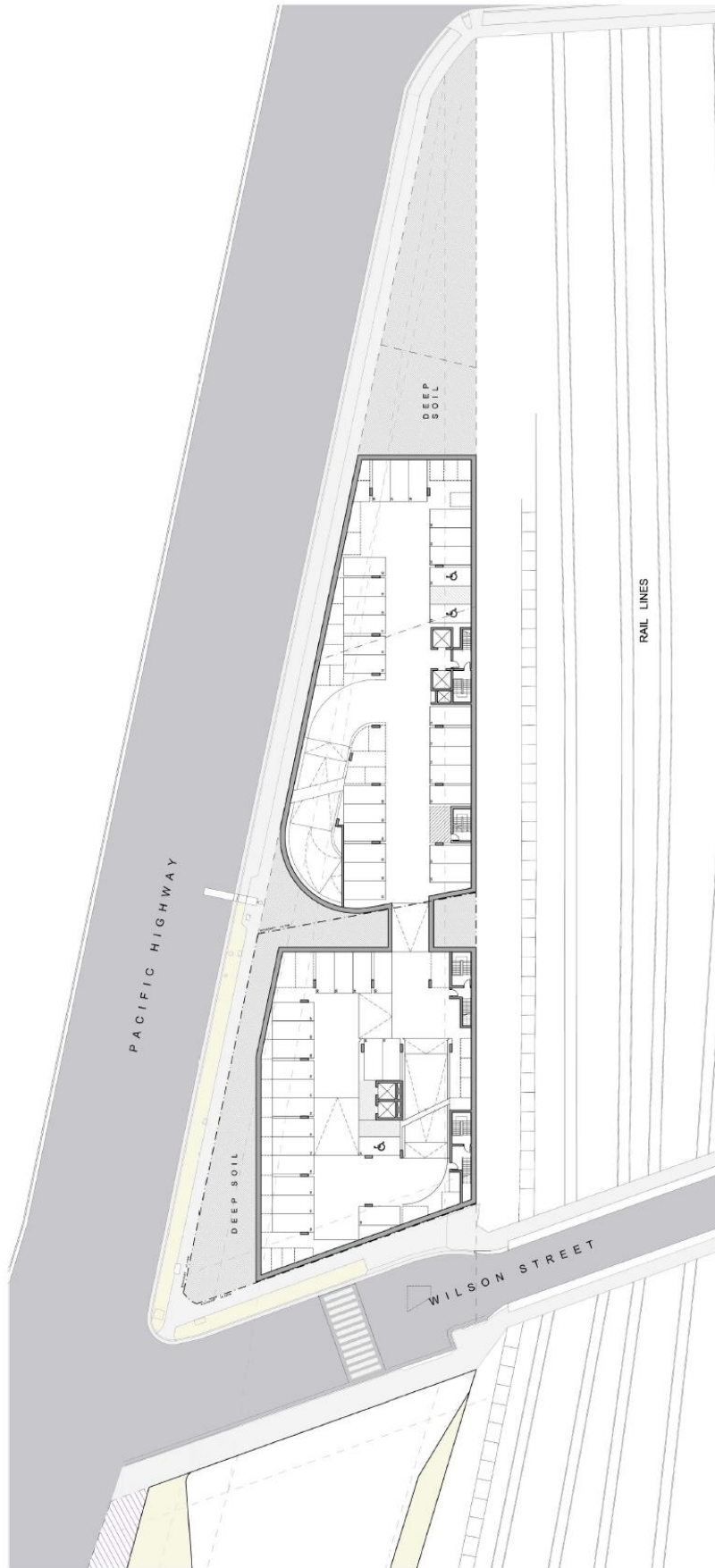
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INDICATIVE BASEMENT PLAN 1



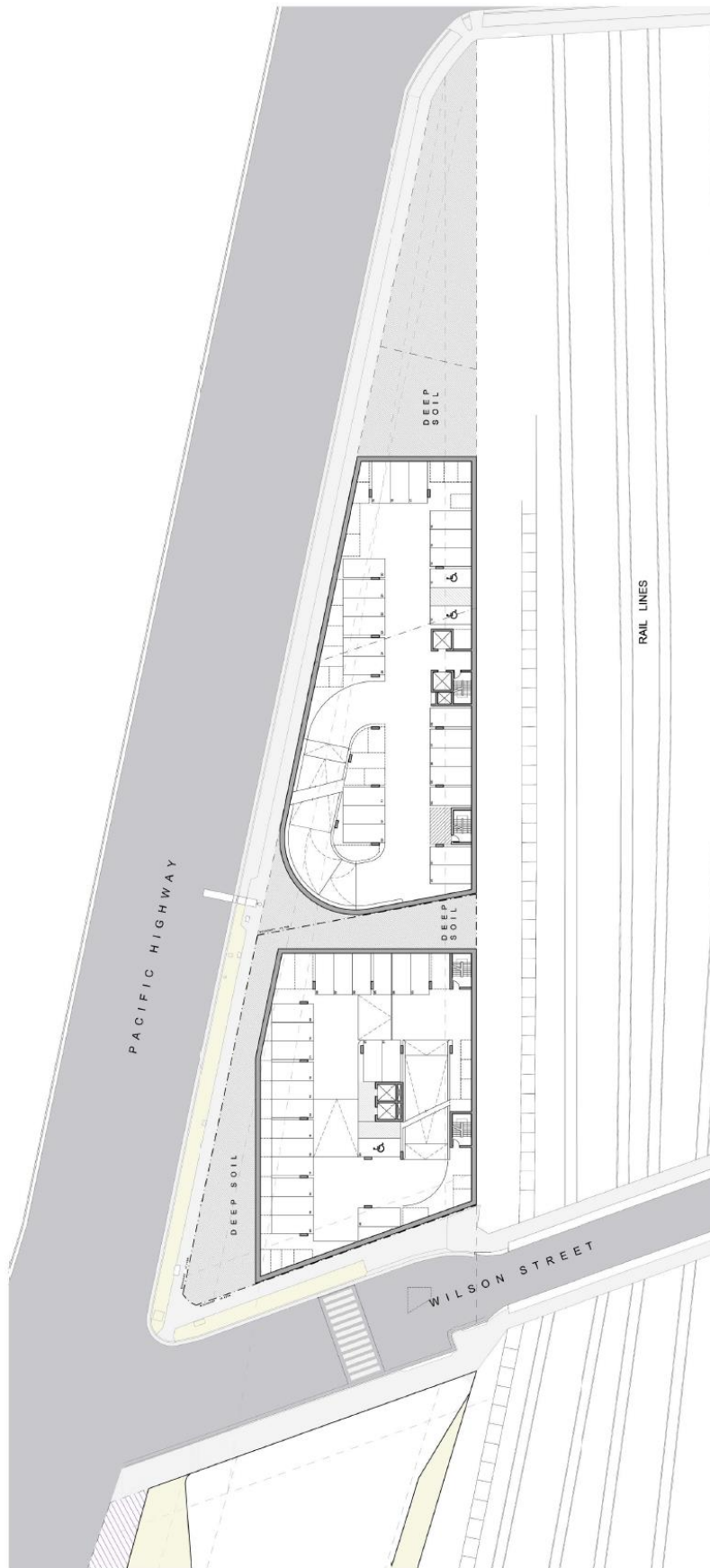
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INDICATIVE BASEMENT 2 PLAN - TYPICAL



SCALE 1:500

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3. TRAFFIC ASSESSMENT

Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by the Roads and Maritime Services is illustrated on Figure 3.

Pacific Highway is classified by the RMS as a *State Road* and provides the key north-south road link in the area and connects to the Sydney CBD. It typically carries three traffic lanes in each direction in the vicinity of the site, with opposing traffic flows separated by a central median island. Time restricted kerbside parking is available along certain sections of the road subject to sign posted restrictions and “Clearway” restrictions during commuter peak periods.

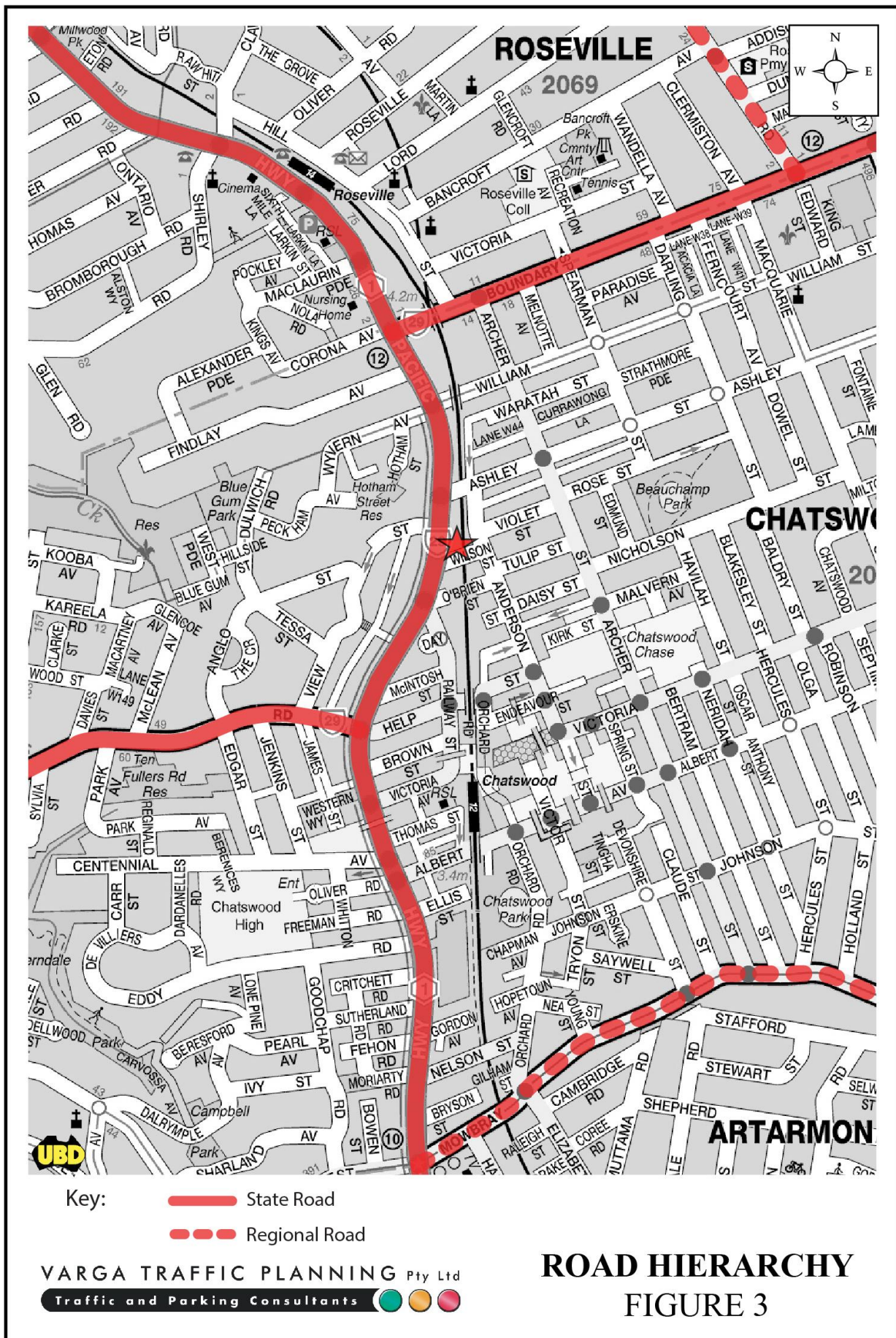
Boundary Street / Fullers Road are also classified by the RMS as *State Roads* which provide the key east-west road links in the area. They typically carry two traffic lanes in each direction in the vicinity of the site.

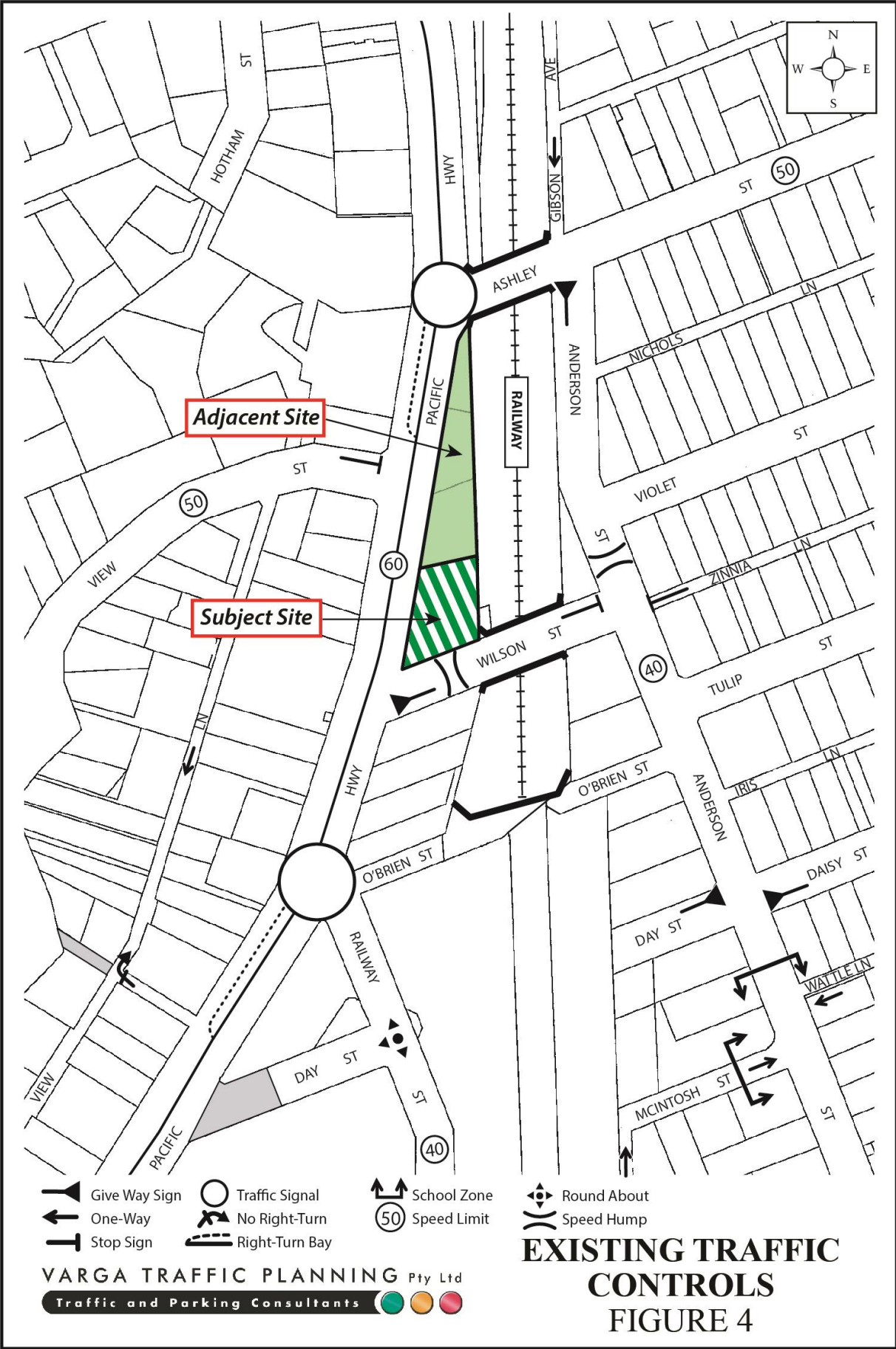
Wilson Street is a local, unclassified road which is primarily used to provide vehicular and pedestrian access to frontage properties. Kerbside parking is generally permitted on both sides of the road.

Existing Traffic Controls

The existing traffic controls which apply to the road network in the vicinity of the site are illustrated on Figure 4. Key features of those traffic controls are:

- a 60 km/h SPEED LIMIT which applies to Pacific Highway
- a 40 km/h SPEED LIMIT which applies to Wilson Street Anderson Street
- TRAFFIC SIGNALS in Pacific Highway where it intersects with Ashley Street and Railway Street
- a GIVE-WAY SIGN in Wilson Street where it intersects with the Pacific Highway





- a SPEED HUMP along Wilson Street, directly outside the site frontage
- a STOP SIGN in Wilson Street where it intersects with Anderson Street
- CENTRAL MEDIAN ISLANDS in the Pacific Highway which precludes right-turn movements into and out of Wilson Street.

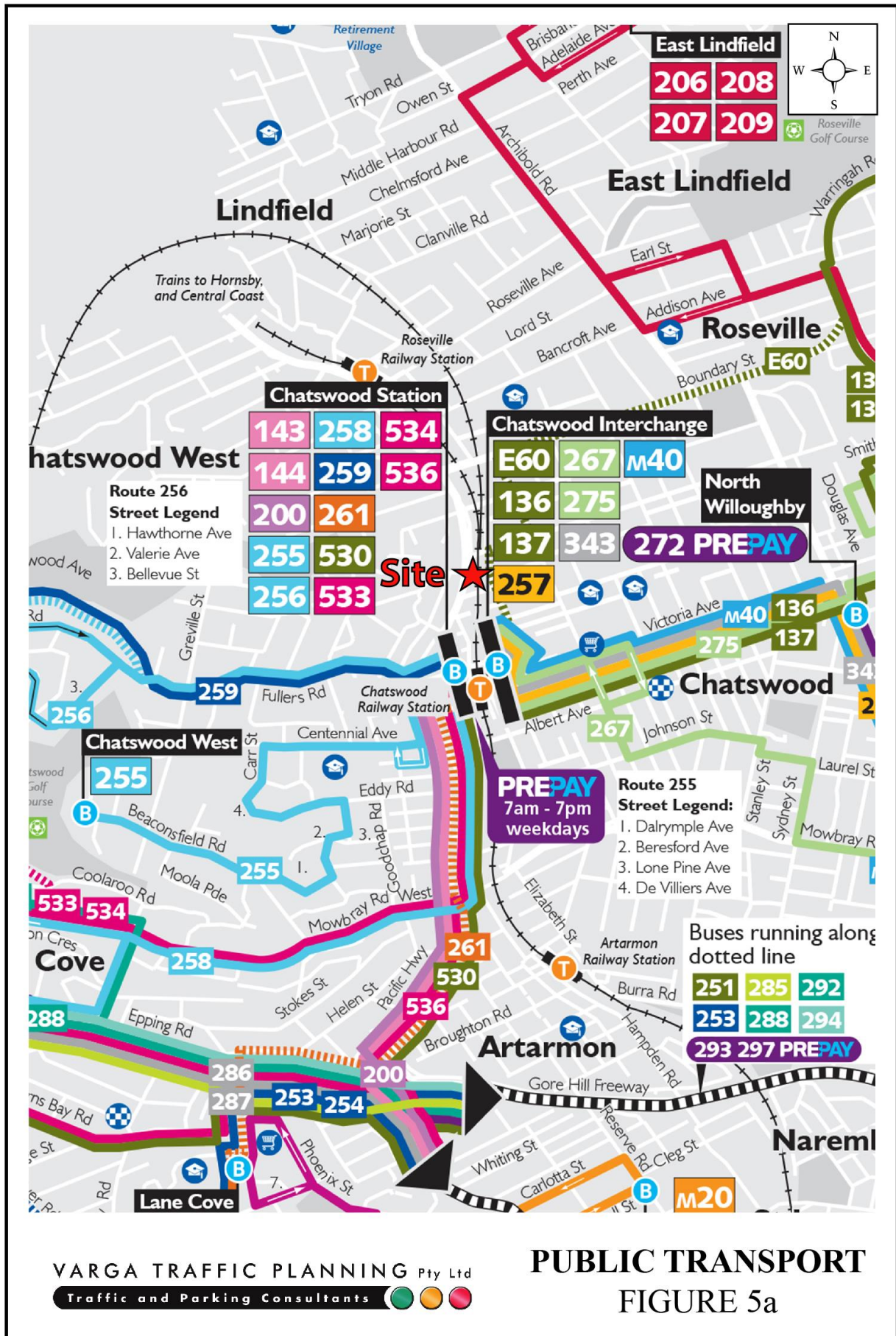
Existing Public Transport

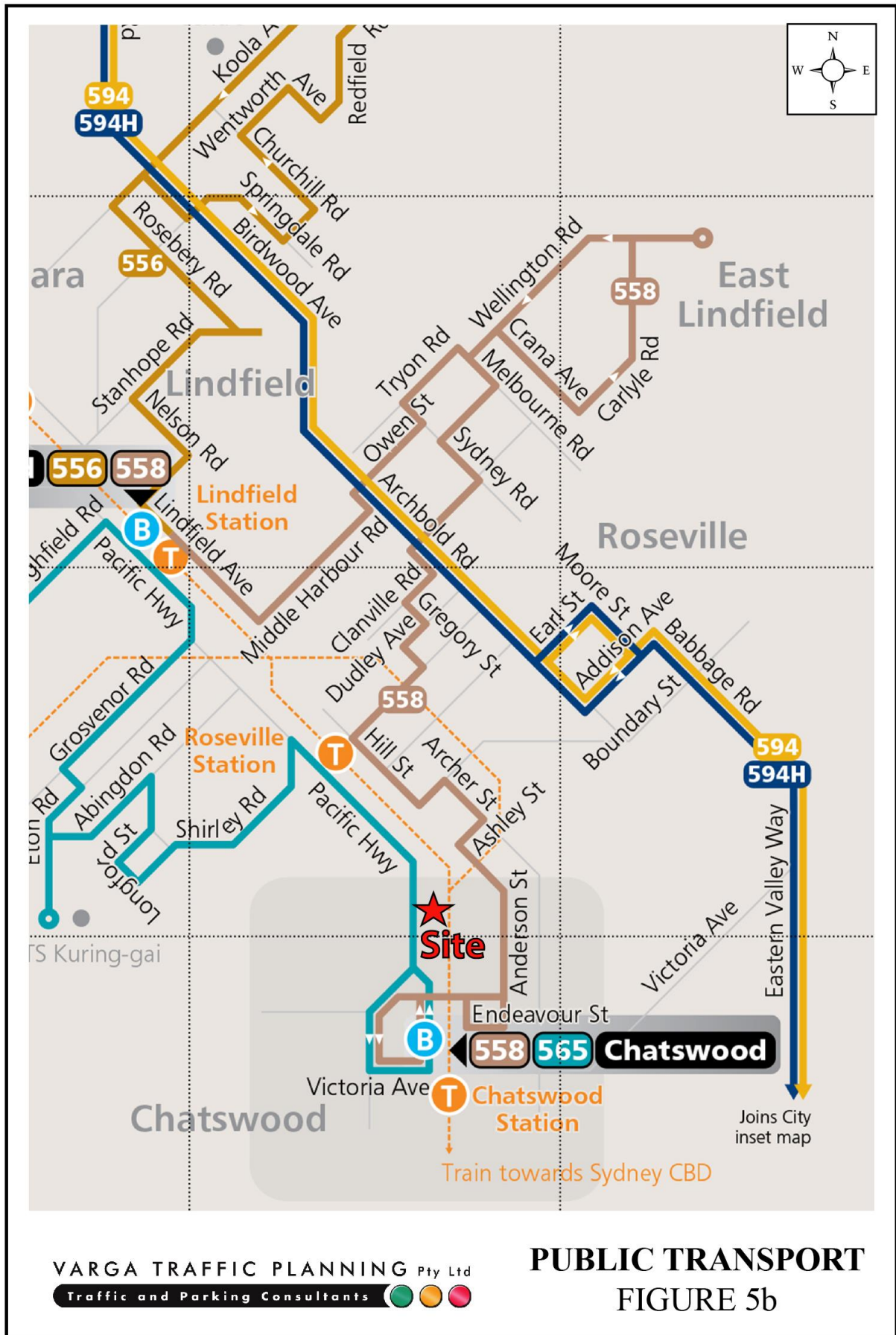
The existing public transport services available within the vicinity of the site are illustrated on Figures 5a & 5b.

The Chatswood Station is located within approximately 550 metres or 8 minutes walking distance to / from the sites servicing the T1 North Shore & Northern Line operating between Sydney CBD to Berowra via Gordan, Hornsby and Macquarie University. Train services typically arrive / depart the station at 5 minute intervals as well as throughout the day allowing commuters to simply turn up and go without ever needing to rely on a train timetable.

Bus route 565 (Chatswood to Macquarie University) is accessible on Pacific Highway with bus stop in both directions accessible within a 100 metre walking distance to / from the site.

A multitude of bus services is also available just outside the Chatswood Station, these include: route *Metrobus* M40 (Bondi Junction to Chatswood), 136 (Chatswood to Manly), 137 (Chatswood to Bantry Bay), 143 (Manly to Chatswood via Balgowlah & St Leonards), 144 (Manly to Chatswood via Royal North Shore Hospital), 200 (Bondi Junction to Chatswood), 255 (Colwell Cres to Chatswood), 256 (Chatswood to Fullers Road Loop Service), 257 (Chatswood to Balmoral via Crows Nest), 258 (Chatswood to Lane Cove West), 259 (Macquarie Centre to Chatswood via Macquarie Park & North Ryde), 261 (Lane Cove to City King St Wharf via Longueville), 267 (Chatswood to Crows Nest), 275 (Castlecrag to Chatswood), 343 (Kingsford to Chatswood), 530 (Burwood to Chatswood), 533 (Sydney Olympic Park to Chatswood via Rhodes & North Ryde), 534 (Ryde to Chatswood via North Ryde), 536 (Gladesville to Chatswood via Hunters Hill) and E60 (Mona Vale to Chatswood).





On the above basis, it is clear that the site has excellent connectivity to existing public transport services and is ideally located to promote the greater use of sustainable modes of transport.

Sydney Metro

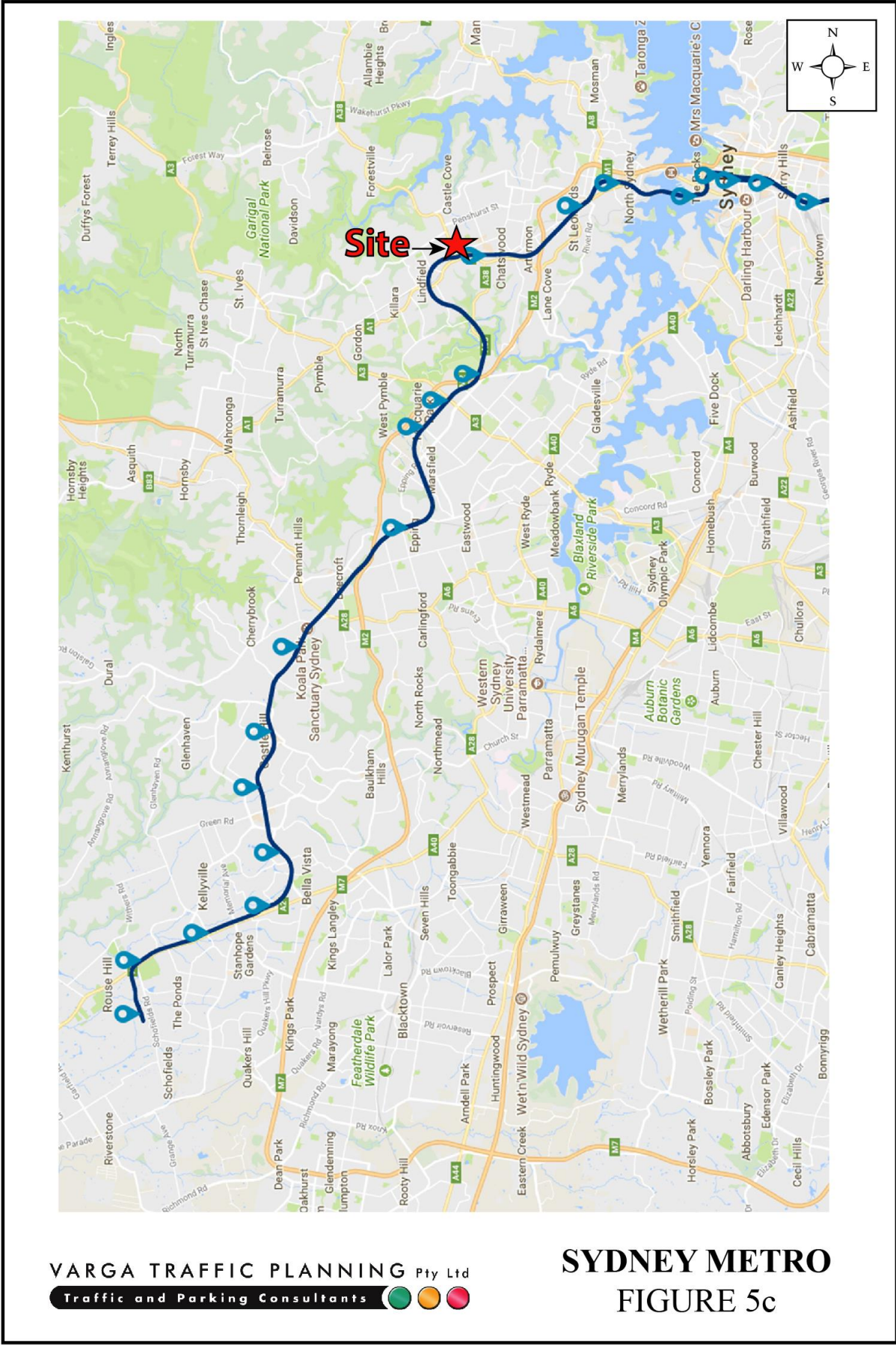
Sydney Metro is Australia's biggest public transport project. This new standalone railway will deliver 31 metro stations and more than 66 kilometres of new metro rail, revolutionising the way Australia's biggest city travels illustrated on Figure 5C.

Metro means a new generation of world-class fast, safe and reliable trains easily connecting customers to where they want to go. When services start in the first half of 2019, customers won't need timetables – they'll just turn up and go with a train every four minutes in the peak. Technology will keep customers connected at all stages of their journey, including smart phone travel apps and real time journey information at metro stations and on board trains.

When Sydney Metro is extended into the Sydney CBD and beyond in 2024, metro rail will run from Sydney's booming North West region under Sydney Harbour, through new underground stations in the CBD, and beyond to the south west.

Sydney's new metro railway will have a metro train every two minutes in each direction with a target capacity of about 40,000 customers per hour, similar to other metro systems worldwide. Sydney's current suburban system can reliably carry 24,000 people an hour per line.

Sydney Metro, together with signalling and infrastructure upgrades across the existing Sydney rail network, will increase the capacity of train services entering the Sydney CBD – from about 120 an hour today to up to 200 services beyond 2024.



Chatswood is one of five current railway stations which will be upgraded to metro standards as part of the first stage of Sydney Metro. This upgrade includes platform screen doors installed along the full length of the platforms to keep people and objects away from the tracks, improving customer safety and allowing trains to get in and out of stations much faster.

The number of train services between Epping and Chatswood will increase to 15 an hour in the peak – almost four times as many trains compared to now. Customers will also have a new direct metro service to Crows Nest, Barangaroo and Martin Place when Sydney Metro City & Southwest opens in 2024.

Existing Traffic Conditions

An indication of the existing traffic conditions on the road network in the vicinity of the site is provided by peak period traffic surveys undertaken as part of this traffic study.

The traffic surveys were undertaken at the intersections of Pacific Highway / Wilson Street and Wilson Street / Anderson Street / Zinnia Lane on Thursday 10th August 2017 between 6:30am-9:30am and 3:30pm-6:30pm. The results of the traffic surveys are reproduced in full in Appendix A and reveal that:

- southbound traffic flows in Pacific Highway are typically in the order of 3,200 vehicles per hour (vph) in the AM peak hour and 1,750 vph in the PM peak hour
- two-way traffic flows in Wilson Street are typically in the order of 40-100 vph in the AM and PM peak hours
- two-way traffic flows in Anderson Street are typically in the order of 450-600 vph in the AM and PM peak hours
- two-way traffic flows in Zinnia Lane are typically less than 2 vph in the AM and PM peak hours.

Projected Traffic Generation

The traffic implications of development proposals primarily concern the effects of the *additional* traffic flows generated as a result of a development and its impact on the operational performance of the adjacent road network during the morning and afternoon commuter peak periods.

An indication of the traffic generation potential of the planning proposal is provided by reference to the Roads and Maritime Services' publication *Guide to Traffic Generating Developments, Section 3 - Landuse Traffic Generation (October 2002)* and the updated traffic generation rates in the RMS *Technical Direction (TDT 2013/04a)* document.

The RMS *Technical Direction* document specifies that it replaces those sections of the RMS *Guidelines* indicated and must be followed when RMS is undertaken trip generation and/or parking demand assessments.

The RMS *Guidelines* and *Technical Direction* are based on extensive surveys of a wide range of land uses and nominate the following traffic generation rates which are applicable to the planning proposal:

High Density Residential Flat Dwellings

AM: 0.19 peak hour vehicle trips per unit

PM: 0.15 peak hour vehicle trips per unit

However, neither the RMS *Guidelines* nor the *Technical Direction* nominate a traffic generation rate for small, local shops, referring only to major regional shopping centres incorporating supermarkets and department stores. For the purpose of this assessment therefore, the traffic generation rate for *commercial premises* of 1.6 & 1.2 peak hour vehicle trips per 100m² GFA during the AM & PM peaks respectively has been adopted in respect of the retail component of the development proposal.

Application of the above traffic generation rates to the various components of the planning proposal yields a cumulative traffic generation potential of approximately 90 vehicle trips per hour (vph) during the AM peak hour and 69 vph during the PM peak hour as set out below:

**Projected Total Future Traffic Generation Potential
of the Site as a Consequence of the Planning Proposal on the Subject Site
and Redevelopment of the Adjacent Service Station Site**

	Subject Site		Adjacent Site		Total	
	AM	PM	AM	PM	AM	PM
Residential (94 & 107 apartments):	17.9 vph	14.1 vph	20.3 vph	16.1 vph	38.2 vph	30.2 vph
Retail (1,432m ² & 1,793m ²):	22.9 vph	17.2 vph	28.7 vph	21.5vph	51.6 vph	38.7 vph
TOTAL:	40.8 vph	31.3 vph	49.0 vph	37.6 vph	89.8 vph	68.9 vph

That projected future level of traffic generation potential should however, be offset or *discounted* by the volume of traffic which could reasonably be expected to be generated by the current approval of the site, in order to determine the *nett increase* in traffic generation potential of the planning proposal.

The traffic assessment undertaken for the previously approved development comprising 42 residential apartments and 305m² retail estimated a traffic generation potential of approximately 18 vph during both the AM and PM peak hour.

Reference to the RMS *Guidelines* indicates that the existing service station on the adjacent site has a traffic generation potential of approximately 83 vph during commuter peak periods.

It is therefore likely that the subject planning proposal *plus* redevelopment of the adjacent service station site will result in a *nett reduction* in the traffic generation potential of the site of -12 vph during the AM peak hour and approximately -33 vph during the PM peak hour, as set out below:

**Projected Nett Decrease in Peak Hour Traffic Generation Potential
as a Consequence of the Redeveloping of Both Sites**

	AM	PM
Projected Future Traffic Generation Potential Subject Site:	40.8 vph	31.3 vph
Projected Future Traffic Generation Adjacent Site:	49.0 vph	37.6 vph
Less Currently Approved Traffic Generation Potential:	-18.3 vph	-18.3 vph
Less Existing Service Station Traffic Generation Potential:	-83.2 vph	-83.2 vph
NETT CHANGE IN TRAFFIC GENERATION POTENTIAL:	-11.7 vph	-32.6 vph

It is readily acknowledged however, that the majority of that service station related traffic activity comprises “passing traffic” drawn from existing traffic flows which would continue to use the Pacific Highway if the service station was removed.

However, for the purposes of a robust traffic assessment, it has been assumed that *all* of the projected future traffic flows of 90 vph in the AM peak hour and 69 vph in PM peak hour generated by both sites, will be *new* or *additional* to the existing traffic flows currently using the adjacent road network.

It is also acknowledged that the service station on the adjacent site is unlikely to be redeveloped for many years in those circumstances.

If the redevelopment of the service station site is excluded the *nett increase* in traffic generation potential as a consequence of the planning proposal on the subject site is expected to be in the order of 23 vph and 13 vph during the AM and PM peak respectively, as set out in the table below:

Projected Nett Increase in Peak Hour Traffic Generation Potential Of the Site as a Consequence of the Planning Proposal		
	AM	PM
Planning Proposal on the Subject Site:	40.8 vph	31.3 vph
Previously Approved Development:	-18.3 vph	-18.3 vph
NETT INCREASE IN TRAFFIC GENERATION POTENTIAL:	+22.5 vph	+13.0 vph

That projected increase in the traffic generation potential of the site as a consequence of the planning proposal will clearly not have any unacceptable traffic implications in terms of road network capacity, as is demonstrated by the following section of this report.

Accordingly, two separate assessments have been undertaken as follows:

- an interim assessment which analyses the traffic implications of the planning proposal on the subject site only, and
- an ultimate assessment which analyses the traffic implications of *both* redevelopments on the *subject site* and the *adjacent site*.

Traffic Implications - Road Network Capacity

The traffic implications of those *additional* traffic flows on the operational performance of the nearby road network has been assessed using the SIDRA program which is widely used by the RMS and many LGA's. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

Pacific Highway & Wilson Street Intersection

The results of the SIDRA analysis of the subject intersection is summarised in Tables 1, revealing that:

- the intersection currently operates at *Level of Service "A"* under the existing traffic demands during both the AM and PM peak hour with total average vehicle delays in the order of 5.6-10.7 seconds/vehicle
- under the projected future *interim* traffic demands expected to be generated by the *subject* development proposal, the intersection is expected to continue to operate at *Level of Service "A"* during both the AM and PM peak hour, with increases in total average vehicle delays of ***less than*** 1 second/vehicle
- under the projected additional future traffic demands expected to be generated by both the *subject site and the adjacent site*, the intersection is expected to continue to operate at *Level of Service "A"* during both the AM and PM peak hour, with increases in total average vehicle delays of ***less than*** 1 second/vehicle.

Anderson Street, Wilson Street & Zinnia Lane Intersection

The results of the SIDRA analysis of the subject intersection is summarised in Tables 2, revealing that:

- the intersection currently operates at *Level of Service "A"* under the existing traffic demands during both the AM and PM peak hour with total average vehicle delays in the order of 8.6-9.5 seconds/vehicle

- under the projected future *interim* traffic demands expected to be generated by the subject development *proposal*, the intersection is expected to continue to operate at *existing Levels of Service* during both the AM and PM peak hour, with increases in total average vehicle delays of ***less than* 0.2 seconds/vehicle**
- under the projected additional future traffic demands expected to be generated by both the *subject site and the adjacent site*, the intersection is expected to continue to operate at *Level of Service “A”* during both the AM and PM peak hour, with increases in total average vehicle delays of ***less than* 1 second/vehicle**.

The detailed SIDRA *movements summaries* are reproduced in full in Appendix B.

In summary, the SIDRA capacity analysis demonstrates that the proposed redevelopment of the site will not have any unacceptable traffic implications, and that no road improvements or intersection upgrades are required as a consequence of the development proposal.

TABLE 1 - RESULTS OF SIDRA ANALYSIS OF PACIFIC HIGHWAY & WILSON STREET INTERSECTION						
Key Indicators	Existing Traffic Demand		Projected Development Traffic Demand			
			Subject Site Only		Plus Adjacent Site	
	AM	PM	AM	PM	AM	PM
Level of Service	A	A	A	A	A	A
Degree of Saturation	0.548	0.295	0.549	0.297	0.550	0.296
Average Vehicle Delay (secs/veh)						
Wilson Street (East) L	10.7	5.6	10.8	5.7	11.5	6.1
Pacific Highway (North) L	5.6	5.6	5.6	5.6	5.6	5.6
T	0.1	0.0	0.1	0.0	0.1	0.0
TOTAL AVERAGE VEHICLE DELAYS	10.7	5.6	10.8	5.7	11.5	6.1

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**TABLE 2 - RESULTS OF SIDRA ANALYSIS OF
ANDERSON STREET, WILSTON STREET & ZINNIA LANE INTERSECTION**

Key Indicators		Existing Traffic Demand		Projected Development Traffic Demand			
				Subject Site Only		Plus Adjacent Site	
		AM	PM	AM	PM	AM	PM
Level of Service		A	A	A	A	A	A
Degree of Saturation		0.198	0.121	0.198	0.127	0.198	0.132
Average Vehicle Delay (secs/veh)							
Anderson Street (South)	L	3.4	3.4	3.6	3.5	3.7	3.6
	T	0.0	0.0	0.2	0.1	0.3	0.2
	R	4.4	4.0	4.4	4.0	4.4	4.0
Zinnia Lane (East)	L	8.7	7.7	8.7	7.7	8.7	7.7
	T	9.8	9.0	9.9	9.1	10.1	9.3
	R	9.8	8.9	9.9	9.0	10.9	9.1
Anderson Street (North)	L	3.4	3.4	3.4	3.4	3.4	3.4
	T	0.0	0.0	0.0	0.0	0.0	0.0
	R	3.8	4.0	3.8	4.1	4.1	4.5
Wilson Street (West)	L	7.2	7.6	7.2	7.6	7.6	8.1
	T	9.9	9.0	10.0	9.1	10.1	9.2
	R	9.9	9.1	10.0	9.2	10.1	9.3
TOTAL AVERAGE VEHICLE DELAYS		9.9	9.1	10.0	9.2	10.1	9.3

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Criteria for Interpreting Results of Sidra Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
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	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals¹ both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

¹ The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.

4. PARKING IMPLICATIONS

Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 6. Key features of those parking restrictions are:

- CLEARWAY restrictions on along the eastern side of the Pacific Highway during the *morning* commuter peak period
- CLEARWAY restrictions on along the western side of the Pacific Highway during the *afternoon* commuter peak period
- NO STOPPING restrictions along both sides of the Pacific Highway and sections along both sides of Wilson Street, including the Pacific Highway site frontage
- 1 HOUR PARKING restrictions along sections along both sides of Wilson Street, including the site frontage
- BUS ZONES at regular intervals along both sides of the Pacific Highway.

Off-Street Car Parking Provisions

The off-street car parking requirements applicable to the planning proposal are specified in the *Willoughby Development Control Plan 2016 (WDCP)*, *C.4 Transport requirements for Development* document in the following terms:

Shop Top Housing

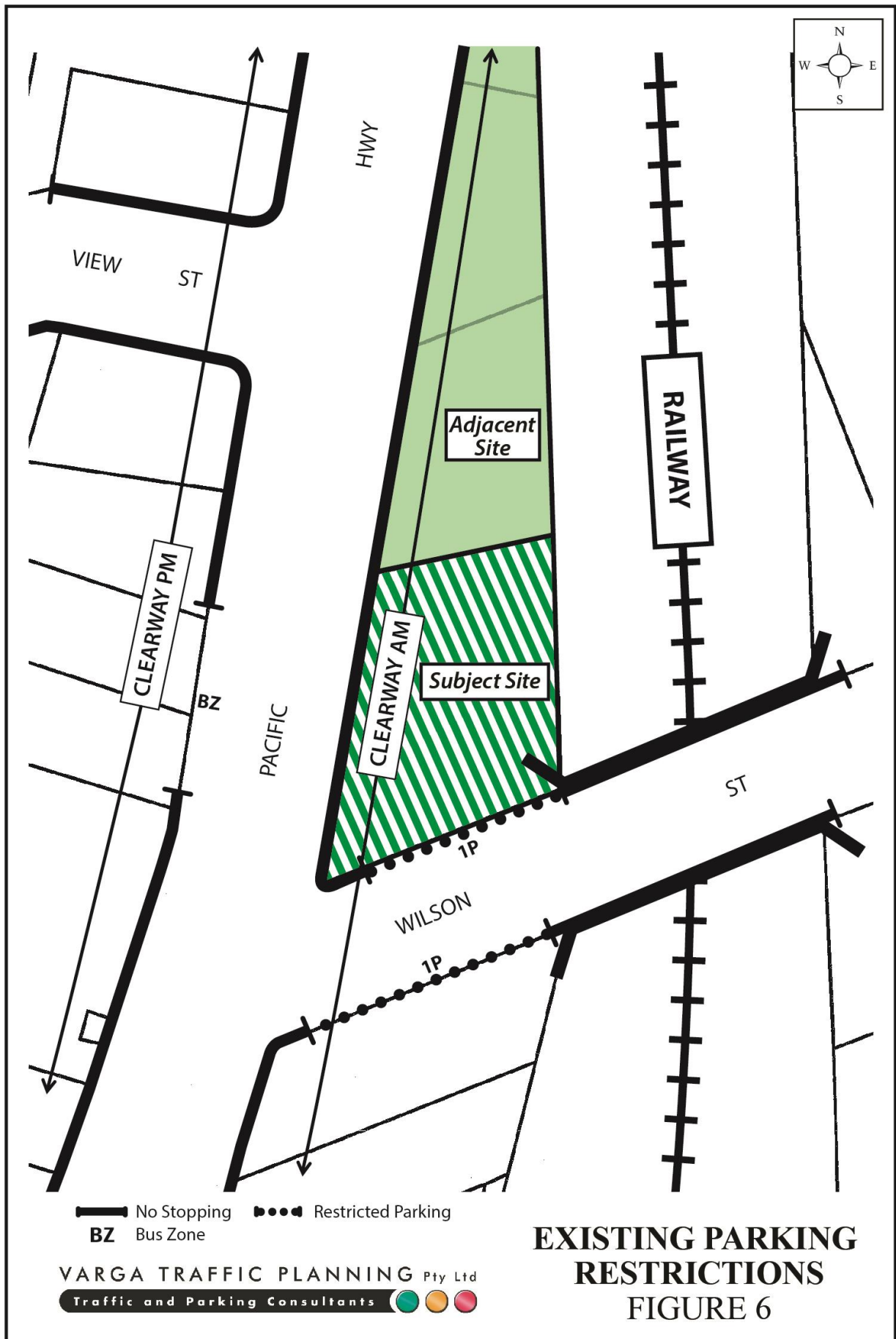
Studio - 0.5 space

1 space / dwelling (other than studios)

Visitor spaces - 1 per 4 dwellings

Shop*

1 space / 25m²



**Note: in the case of shop development proposals, where the shop selling areas are not precisely defined on the plans submitted to Council for development approval, determination of parking requirements will be based on a figure equivalent to 85 percent of the net lettable area.*

Application of the above DCP parking rates to the development proposal yields off-street car parking requirements of 173 spaces and 149 spaces for the subject site and the adjacent site respectively.

DCP PARKING REQUIREMENTS

	Subject Site	Adjacent Site
Residential (9,446m ² Apartments):	94.0 spaces	62.0 spaces
Visitors:	23.5 spaces	15.5 spaces
Retail/Commercial:	55.2 spaces	71.7 spaces
TOTAL:	172.7 spaces	149.2 spaces

Notwithstanding the above, the site is located within 800 metres of a railway station (i.e. the Chatswood Station) in the Sydney metropolitan area, and the residential component of the planning proposal is therefore subject to the parking requirements specified in the *State Environmental Planning Policy No 65 – Design Quality of Residential Flat Development (Amendment No 3), 2015* in the following terms:

30 Standards that cannot be used to refuse development consent or modification of development consent

- (1) If an application for the modification of a development consent or a development application for the carrying out of development to which this Policy applies satisfies the following design criteria, the consent authority must not refuse the application because of those matters:
 - a) if the car parking for the building will be equal to, or greater than, the recommended minimum amount of car parking specified in Part 3J of the Apartment Design Guide.

Reference is therefore made to the *Apartment Design Guide 2015, Section 3J – Bicycle and Car Parking* document which nominates the following car parking requirements:

Objective 3J-1

Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas

For development in the following locations:

- on sites that are within 800 metres of a railway station or light rail stop in the Sydney Metropolitan Area; or
- on land zoned, and sites within 400 metres of land zoned, B3 Commercial Core, B4 Mixed Use or equivalent in a nominated regional centre

the minimum car parking requirements for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less.

The car parking needs for a development must be provided off street.

Comparison therefore needs to be made between the off-street car parking requirements for residential flat buildings outlined in the Council's DCP and in the RMS *Guidelines* to determine the *lesser* requirement.

A technical note *Car Parking Requirements in SEPP 65* published by the NSW Department of Planning subsequent to the release of SEPP 65 and *Apartment Design Guide* notes that the RMS *Guidelines* nominates 2 different parking rates for "high density residential flat buildings" for use in either a *Metropolitan Regional Centre (CBD)* or a *Metropolitan Sub-Regional Centre*, and advises that:

*"... those centres defined in A Plan for Growing Sydney as a CBD, Regional City Centre or Strategic Centre should therefore apply the **Metropolitan Regional Centre (CBD)** rates of the GTGD, while the remaining Sydney centres serviced by railway or a light rail station should be classified as a **Metropolitan Sub-Regional Centre** for the purposes of the GTGD."*

In this instance, Chatswood is defined by *A Plan for Growing Sydney* as a "Strategic Centre", and the parking rates nominated in the RMS *Guidelines* for *Metropolitan Regional Centres (CBD)* are therefore applicable, as reproduced below:

High Density Residential Flat Buildings in Metropolitan Regional (CBD) Centres

0.4 spaces per 1 bedroom unit

0.7 spaces per 2 bedroom unit

1.2 spaces per 3 bedroom unit

1 space per 7 units for visitor parking

Accordingly, application of the above statutory parking requirements to the residential and retail components of the planning proposal yields a minimum off-street car parking requirement of 136 spaces and 120 spaces for the two sites as set out below:

OFF-STREET PARKING REQUIREMENTS

	Subject Site	Adjacent Site
Residents (94 & 62 Apartments):	67.1 spaces (SEPP 65, GTGD parking rates)	39.6 spaces (SEPP 65, GTGD parking rates)
Visitors:	13.4 spaces (SEPP 65, GTGD parking rates)	8.8 spaces (SEPP 65, GTGD parking rates)
Retail (1,432m ² & 1,793m ²):	55.2 spaces (WDCP parking rates)	71.7 spaces (WDCP parking rates)
TOTAL:	135.7 spaces	120.1 spaces

The architectural concept plans prepared for the purposes of this planning proposal demonstrates that both the quantum supply and geometric design layout of the off-street car parking facilities are able to ultimately comply with Council requirements as well as the relevant Australian Standards, and will be reviewed in detail in the subsequent development application subject to the approval of this planning proposal.

Off-Street Bicycle Parking Provisions

The off-street bicycle parking requirements applicable to the planning proposal are specified in the *WDCP, C.4 Transport requirements for Development* document in the following terms:

Residential

Bicycle lockers: 1 per 10 units

Bicycle rail/racks: 1 per 12 units

Retail

Bicycle lockers: 1 per 450m²

Bicycle rail/racks: 1 per 150m²

Accordingly, off-street bicycle facilities will ultimately be provided in accordance with the above requirements and designed in accordance with Standards Australia publication *Parking Facilities Part 3 – Bicycle Parking Facilities AS2890.3*.

Off-Street Motorcycle Parking Provisions

The off-street motorcycle parking requirements applicable to the planning proposal are specified in the *WDCP, C.4 Transport requirements for Development* document in the following terms:

“Motorcycle parking must be provided at a rate of 1 motorcycle space per 25 car spaces. These spaces are to have an area of 1.2 metres × 3 metres.”

Accordingly, off-street motorcycle facilities will ultimately be provided in accordance with the above requirements and designed in accordance with Council requirements.

Loading / Servicing Provisions

Loading / servicing for the future development is expected to be undertaken by a variety of commercial vehicles up to and including 8.8m long MRV trucks.

A dedicated service area will be provided at the rear of the site configured with a truck turntable to allow these MRV trucks to enter and exit the site whilst travelling in forward gear at all times.

The architectural concept plans prepared for the purposes of this planning proposal demonstrates that the geometric design layout of the loading bay is generally consistent with the existing development approval for the site and will ultimately comply with Council requirements as well as the relevant Australian Standards which will be reviewed in detail in the subsequent development application subject to the approval of this planning proposal.

Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- the planning proposal seeks approval to amend the planning controls of the subject site to permit a mixed-use residential / retail development envisaged to comprise 94 residential apartments and 1,432m² retail floor space on the subject site
- this assessment also includes a potential redevelopment of the adjacent service station site with 107 residential apartments and 1,793m² retail floor space
- the site is located within a short walking distance to the heart of Chatswood City Centre and therefore has excellent connectivity to a multitude of existing public transport services and soon the Sydney Metro due to open in 2019
- the planning proposal plus redevelopment of the adjacent service station site will result in a *nett* decrease in the traffic generation potential of the site of approximately -12 vph during the AM peak hour and -33 vph during the PM peak hour
- the planning proposal (i.e. *without* redevelopment of the adjacent service station site) will result in a *nett* increase in the traffic generation potential of the site of 23 vph and 13 vph during the AM and PM peak hours respectively
- for the purposes of a robust traffic assessment, it has been assumed that *all* of the projected future traffic flows of 90 vph in the AM peak hour and 69 vph in PM peak hour that could be generated by redevelopment of *both sites*, will be new or *additional* to the existing traffic flows currently using the adjacent road network, and SIDRA modelling found that the projected increase in traffic flows will not result in any unacceptable implications in terms of road network capacity
- the future off-street car, bicycle and motorcycle parking facilities as well as loading / servicing facilities will ultimately be designed in accordance with the statutory parking requirements as well as relevant Australian Standards.

APPENDIX A

TRAFFIC SURVEY DATA



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6527 CHATSWOOD Wilson St
Day/Date : Thursday 10th August 2017

PEDS	NORTH	EAST	SOUTH	
Time Per	Pacific Hwy	Wilson St	Pacific Hwy	TOT
0630 - 0645	5	2	3	10
0645 - 0700	6	9	10	25
0700 - 0715	4	7	10	21
0715 - 0730	4	14	9	27
0730 - 0745	7	6	18	31
0745 - 0800	9	8	25	42
0800 - 0815	4	15	34	53
0815 - 0830	3	18	35	56
0830 - 0845	10	11	25	46
0845 - 0900	5	14	11	30
0900 - 0915	6	10	6	22
0915 - 0930	5	17	7	29
Per End	68	131	193	392

PEDS	NORTH	EAST	SOUTH	
Peak Per	Pacific Hwy	Wilson St	Pacific Hwy	TOT
0630 - 0730	19	32	32	83
0645 - 0745	21	36	47	104
0700 - 0800	24	35	62	121
0715 - 0815	24	43	86	153
0730 - 0830	23	47	112	182
0745 - 0845	26	52	119	197
0800 - 0900	22	58	105	185
0815 - 0915	24	53	77	154
0830 - 0930	26	52	49	127
PEAK HR	24	35	62	121

Lights	NORTH		EAST		SOUTH		
	Pacific Hwy		Wilson St		Pacific Hwy		
Time Per	I	L	R	L	R	I	TOT
0630 - 0645	476	0		5			481
0645 - 0700	587	1		2			590
0700 - 0715	802	2		6			810
0715 - 0730	768	1		8			777
0730 - 0745	780	2		12			794
0745 - 0800	793	2		8			803
0800 - 0815	744	5		7			756
0815 - 0830	713	2		22			737
0830 - 0845	698	3		16			717
0845 - 0900	654	3		17			674
0900 - 0915	598	4		21			623
0915 - 0930	527	3		9			539
Per End	8140	28	0	133	0	0	8301

Heavies	NORTH		EAST		SOUTH		
	Pacific Hwy		Wilson St		Pacific Hwy		
Time Per	I	L	R	L	R	I	TOT
0630 - 0645	5	0		1			6
0645 - 0700	4	0		0			4
0700 - 0715	10	0		1			11
0715 - 0730	12	0		0			12
0730 - 0745	6	0		0			6
0745 - 0800	7	0		0			7
0800 - 0815	7	0		0			7
0815 - 0830	10	0		0			10
0830 - 0845	5	0		0			5
0845 - 0900	11	0		0			11
0900 - 0915	8	0		0			8
0915 - 0930	19	0		0			19
Per End	104	0	0	2	0	0	106

Combined	NORTH		EAST		SOUTH		
	Pacific Hwy		Wilson St		Pacific Hwy		
Time Per	I	L	R	L	R	I	TOT
0630 - 0645	481	0	0	6	0	0	487
0645 - 0700	591	1	0	2	0	0	594
0700 - 0715	812	2	0	7	0	0	821
0715 - 0730	780	1	0	8	0	0	789
0730 - 0745	786	2	0	12	0	0	800
0745 - 0800	800	2	0	8	0	0	810
0800 - 0815	751	5	0	7	0	0	763
0815 - 0830	723	2	0	22	0	0	747
0830 - 0845	703	3	0	16	0	0	722
0845 - 0900	665	3	0	17	0	0	685
0900 - 0915	606	4	0	21	0	0	631
0915 - 0930	546	3	0	9	0	0	558
Per End	8244	28	0	135	0	0	8407

Lights	NORTH		EAST		SOUTH		
	Pacific Hwy		Wilson St		Pacific Hwy		
Peak Per	I	L	R	L	R	I	TOT
0630 - 0730	2633	4	0	21	0	0	2658
0645 - 0745	2937	6	0	28	0	0	2971
0700 - 0800	3143	7	0	34	0	0	3184
0715 - 0815	3085	10	0	35	0	0	3130
0730 - 0830	3030	11	0	49	0	0	3090
0745 - 0845	2948	12	0	53	0	0	3013
0800 - 0900	2809	13	0	62	0	0	2884
0815 - 0915	2663	12	0	76	0	0	2751
0830 - 0930	2477	13	0	63	0	0	2553

Heavies	NORTH		EAST		SOUTH		
	Pacific Hwy		Wilson St		Pacific Hwy		
Peak Per	I	L	R	L	R	I	TOT
0630 - 0730	31	0	0	2	0	0	33
0645 - 0745	32	0	0	1	0	0	33
0700 - 0800	35	0	0	1	0	0	36
0715 - 0815	32	0	0	0	0	0	32
0730 - 0830	30	0	0	0	0	0	30
0745 - 0845	29	0	0	0	0	0	29
0800 - 0900	33	0	0	0	0	0	33
0815 - 0915	34	0	0	0	0	0	34
0830 - 0930	43	0	0	0	0	0	43

Combined	NORTH		EAST		SOUTH		
	Pacific Hwy		Wilson St		Pacific Hwy		
Peak Per	I	L	R	L	R	I	TOT
0630 - 0730	2664	4	0	23	0	0	2691
0645 - 0745	2969	6	0	29	0	0	3004
0700 - 0800	3178	7	0	35	0	0	3220
0715 - 0815	3117	10	0	35	0	0	3162
0730 - 0830	3060	11	0	49	0	0	3120
0745 - 0845	2977	12	0	53	0	0	3042
0800 - 0900	2842	13	0	62	0	0	2917
0815 - 0915	2697	12	0	76	0	0	2785
0830 - 0930	2520	13	0	63	0	0	2596

PEAK HR	3143	7	0	34	0	0	3184
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PEAK HR	35	0	0	1	0	0	36
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PEAK HR	3178	7	0	35	0	0	3220
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R.O.A.R. DATA

Reliable, Original & Authentic Results

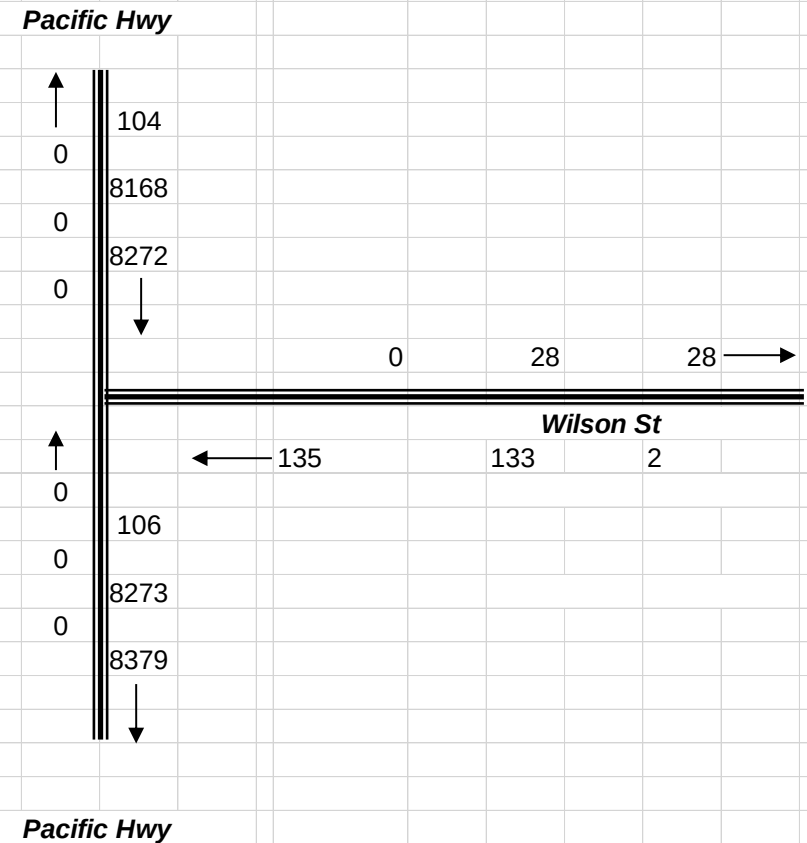
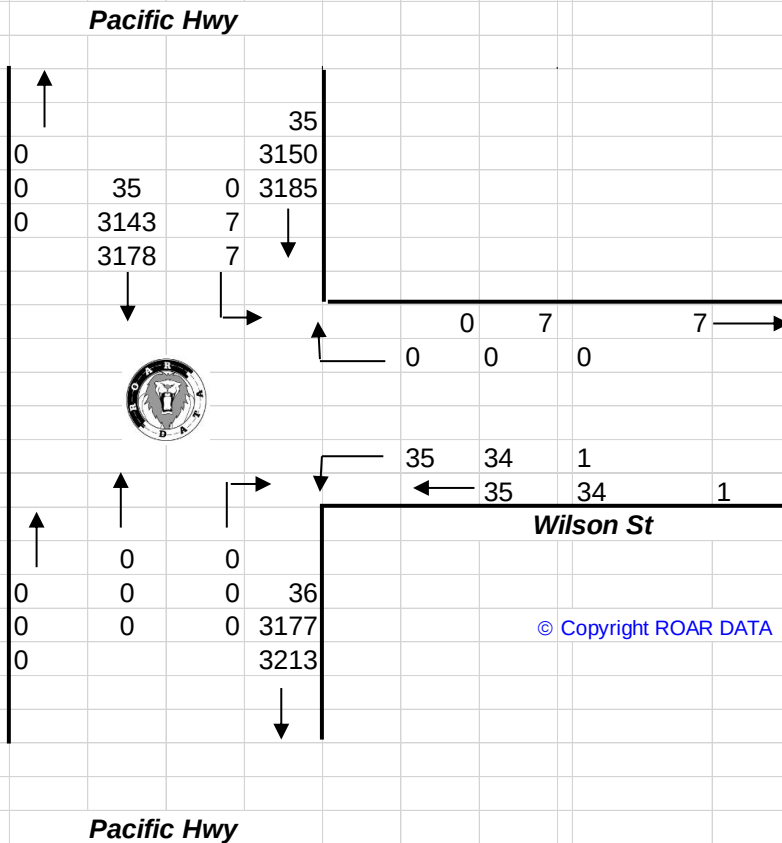
Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6527 CHATSWOOD Wilson St
Day/Date : Thursday 10th August 2017

AM PEAK
0700 - 0800

1	2	3
4	5	6
7	8	9

**TOTAL VOLUMES
FOR COUNT
PERIOD**





R.O.A.R. DATA

Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6527 CHATSWOOD Wilson St
Day/Date : Thursday 10th August 2017

<u>PEDS</u>	<u>NORTH</u>	<u>EAST</u>	<u>SOUTH</u>	
Time Per	Pacific Hwy	Wilson St	Pacific Hwy	TOT
1530 - 1545	1	7	2	10
1545 - 1600	2	8	1	11
1600 - 1615	0	7	3	10
1615 - 1630	1	4	2	7
1630 - 1645	3	5	4	12
1645 - 1700	0	12	1	13
1700 - 1715	2	12	2	16
1715 - 1730	0	14	4	18
1730 - 1745	0	19	3	22
1745 - 1800	3	15	5	23
1800 - 1815	0	12	2	14
1815 - 1830	2	11	3	16
Per End	14	126	32	172

<u>PEDS</u>	<u>NORTH</u>	<u>EAST</u>	<u>SOUTH</u>	
Peak Per	Pacific Hwy	Wilson St	Pacific Hwy	TOT
1530 - 1630	4	26	8	38
1545 - 1645	6	24	10	40
1600 - 1700	4	28	10	42
1615 - 1715	6	33	9	48
1630 - 1730	5	43	11	59
1645 - 1745	2	57	10	69
1700 - 1800	5	60	14	79
1715 - 1815	3	60	14	77
1730 - 1830	5	57	13	75
PEAK HR	5	43	11	59

<u>Lights</u>	<u>NORTH</u>		<u>EAST</u>		<u>SOUTH</u>		
	Pacific Hwy		Wilson St		Pacific Hwy		
Time Per	I	L	R	L	R	I	TOT
1530 - 1545	391	2		14			407
1545 - 1600	395	5		18			418
1600 - 1615	399	2		17			418
1615 - 1630	391	1		15			407
1630 - 1645	406	5		15			426
1645 - 1700	409	4		9			422
1700 - 1715	386	5		15			406
1715 - 1730	476	5		20			501
1730 - 1745	397	3		1			401
1745 - 1800	373	5		13			391
1800 - 1815	347	2		20			369
1815 - 1830	363	6		18			387
Per End	4733	45	0	175	0	0	4953

<u>Heavies</u>	<u>NORTH</u>		<u>EAST</u>		<u>SOUTH</u>		
	Pacific Hwy		Wilson St		Pacific Hwy		
Time Per	I	L	R	L	R	I	TOT
1530 - 1545	5	0		0			5
1545 - 1600	6	0		0			6
1600 - 1615	11	0		0			11
1615 - 1630	5	0		0			5
1630 - 1645	6	0		0			6
1645 - 1700	6	0		0			6
1700 - 1715	4	0		0			4
1715 - 1730	2	0		0			2
1730 - 1745	1	0		0			1
1745 - 1800	1	0		0			1
1800 - 1815	2	0		0			2
1815 - 1830	10	0		0			10
Per End	59	0	0	0	0	0	59

<u>Combined</u>	<u>NORTH</u>		<u>EAST</u>		<u>SOUTH</u>		
	Pacific Hwy		Wilson St		Pacific Hwy		
Time Per	I	L	R	L	R	I	TOT
1530 - 1545	396	2	0	14	0	0	412
1545 - 1600	401	5	0	18	0	0	424
1600 - 1615	410	2	0	17	0	0	429
1615 - 1630	396	1	0	15	0	0	412
1630 - 1645	412	5	0	15	0	0	432
1645 - 1700	415	4	0	9	0	0	428
1700 - 1715	390	5	0	15	0	0	410
1715 - 1730	478	5	0	20	0	0	503
1730 - 1745	398	3	0	1	0	0	402
1745 - 1800	374	5	0	13	0	0	392
1800 - 1815	349	2	0	20	0	0	371
1815 - 1830	373	6	0	18	0	0	397
Per End	4792	45	0	175	0	0	5012

<u>Lights</u>	<u>NORTH</u>		<u>EAST</u>		<u>SOUTH</u>		
	Pacific Hwy		Wilson St		Pacific Hwy		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	1576	10	0	64	0	0	1650
1545 - 1645	1591	13	0	65	0	0	1669
1600 - 1700	1605	12	0	56	0	0	1673
1615 - 1715	1592	15	0	54	0	0	1661
1630 - 1730	1677	19	0	59	0	0	1755
1645 - 1745	1668	17	0	45	0	0	1730
1700 - 1800	1632	18	0	49	0	0	1699
1715 - 1815	1593	15	0	54	0	0	1662
1730 - 1830	1480	16	0	52	0	0	1548

<u>Heavies</u>	<u>NORTH</u>		<u>EAST</u>		<u>SOUTH</u>		
	Pacific Hwy		Wilson St		Pacific Hwy		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	27	0	0	0	0	0	27
1545 - 1645	28	0	0	0	0	0	28
1600 - 1700	28	0	0	0	0	0	28
1615 - 1715	21	0	0	0	0	0	21
1630 - 1730	18	0	0	0	0	0	18
1645 - 1745	13	0	0	0	0	0	13
1700 - 1800	8	0	0	0	0	0	8
1715 - 1815	6	0	0	0	0	0	6
1730 - 1830	14	0	0	0	0	0	14

<u>Combined</u>	<u>NORTH</u>		<u>EAST</u>		<u>SOUTH</u>		
	Pacific Hwy		Wilson St		Pacific Hwy		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	1603	10	0	64	0	0	1677
1545 - 1645	1619	13	0	65	0	0	1697
1600 - 1700	1633	12	0	56	0	0	1701
1615 - 1715	1613	15	0	54	0	0	1682
1630 - 1730	1695	19	0	59	0	0	1773
1645 - 1745	1681	17	0	45	0	0	1743
1700 - 1800	1640	18	0	49	0	0	1707
1715 - 1815	1599	15	0	54	0	0	1668
1730 - 1830	1494	16	0	52	0	0	1562

PEAK HR	1677	19	0	59	0	0	1755
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PEAK HR	18	0	0	0	0	0	18
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PEAK HR	1695	19	0	59	0	0	1773
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Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name	: 6527 CHATSWOOD Wilson St
-------------	----------------------------

Day/Date	: Thursday 10th August 2017
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PM PEAK

1630 - 1730

1

2

3

4

5

6

7

8

9

TOTAL VOLUMES

FOR COUNT

PERIOD

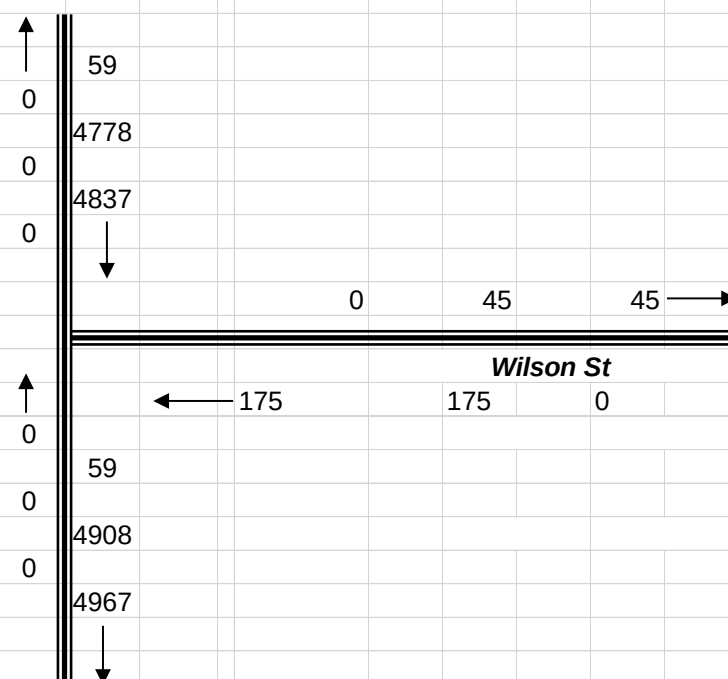


Wilson St

© Copyright ROAR DATA

Pacific Hwy

Pacific Hwy



Pacific Hwy



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6527 CHATSWOOD Wilson St
Day/Date : Thursday 10th August 2017

Intersection Details

Obtained via satellite

May be incorrect

AM PEAK HOUR
0700 - 0800

Combined figures only



Pacific Hwy

T	L	
3178	7	AM
1695	19	PM

PM	AM
L 59	35



Wilson St

PM PEAK HOUR
1630 - 1730

Weather >>>



Pacific Hwy



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6527 CHATSWOOD Wilson St
Day/Date : Thursday 10th August 2017

Lights	NORTH			WEST			SOUTH			EAST			
	Anderson St			Wilson St			Anderson St			Zinnia Lane			
Time Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
0630 - 0645	0	17	1	1	0	1	3	12	0	0	0	0	35
0645 - 0700	0	40	3	3	0	0	2	15	0	0	0	0	63
0700 - 0715	0	54	1	1	0	1	2	24	1	0	1	0	85
0715 - 0730	0	70	7	0	0	1	1	20	0	0	0	0	99
0730 - 0745	0	67	5	1	0	1	6	28	2	1	0	0	111
0745 - 0800	0	85	7	1	0	1	1	31	0	0	0	0	126
0800 - 0815	0	81	11	1	0	5	0	33	0	0	1	0	132
0815 - 0830	0	114	16	1	0	3	4	25	0	0	0	0	163
0830 - 0845	0	84	15	4	0	4	5	25	0	0	1	0	138
0845 - 0900	0	80	16	4	0	3	2	28	0	0	0	0	133
0900 - 0915	0	72	15	1	0	4	4	14	0	2	1	1	114
0915 - 0930	0	78	7	4	0	1	1	15	1	0	0	0	107
Period End	0	842	104	22	0	25	31	270	4	3	4	1	1306

Heavies	NORTH			WEST			SOUTH			EAST			
	Anderson St			Wilson St			Anderson St			Zinnia Lane			
Time Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
0630 - 0645	0	0	0	0	0	0	1	2	0	0	0	0	3
0645 - 0700	0	2	0	0	0	0	0	0	0	0	0	0	2
0700 - 0715	0	2	0	0	0	0	1	2	0	0	0	0	5
0715 - 0730	0	6	0	0	0	0	0	5	0	0	0	0	11
0730 - 0745	0	7	0	0	0	0	0	7	0	0	0	0	14
0745 - 0800	0	5	0	0	0	0	0	6	0	0	0	0	11
0800 - 0815	0	3	0	0	0	0	0	4	0	0	0	0	7
0815 - 0830	0	6	0	0	0	0	0	4	0	0	0	0	10
0830 - 0845	0	2	0	0	0	0	0	1	0	0	0	0	3
0845 - 0900	0	3	0	0	0	0	0	2	0	0	0	0	5
0900 - 0915	0	2	0	0	0	0	0	8	0	0	0	0	10
0915 - 0930	0	2	0	0	0	0	0	2	0	0	0	0	4
Period End	0	40	0	0	0	0	2	43	0	0	0	0	85

Combined	NORTH			WEST			SOUTH			EAST			
	Anderson St			Wilson St			Anderson St			Zinnia Lane			
Time Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
0630 - 0645	0	17	1	1	0	1	4	14	0	0	0	0	38
0645 - 0700	0	42	3	3	0	0	2	15	0	0	0	0	65
0700 - 0715	0	56	1	1	0	1	3	26	1	0	1	0	90
0715 - 0730	0	76	7	0	0	1	1	25	0	0	0	0	110
0730 - 0745	0	74	5	1	0	1	6	35	2	1	0	0	125
0745 - 0800	0	90	7	1	0	1	1	37	0	0	0	0	137
0800 - 0815	0	84	11	1	0	5	0	37	0	0	1	0	139
0815 - 0830	0	120	16	1	0	3	4	29	0	0	0	0	173
0830 - 0845	0	86	15	4	0	4	5	26	0	0	1	0	141
0845 - 0900	0	83	16	4	0	3	2	30	0	0	0	0	138
0900 - 0915	0	74	15	1	0	4	4	22	0	2	1	1	124
0915 - 0930	0	80	7	4	0	1	1	17	1	0	0	0	111
Period End	0	882	104	22	0	25	33	313	4	3	4	1	1391

Lights	NORTH			WEST			SOUTH			EAST			
	Anderson St			Wilson St			Anderson St			Zinnia Lane			
Peak Time	L	I	R	L	I	R	L	I	R	L	I	R	TOT
0630 - 0730	0	181	12	5	0	3	8	71	1	0	1	0	282
0645 - 0745	0	231	16	5	0	3	11	87	3	1	1	0	358
0700 - 0800	0	276	20	3	0	4	10	103	3	1	1	0	421
0715 - 0815	0	303	30	3	0	8	8	112	2	1	1	0	468
0730 - 0830	0	347	39	4	0	10	11	117	2	1	1	0	532
0745 - 0845	0	364	49	7	0	13	10	114	0	0	2	0	559
0800 - 0900	0	359	58	10	0	15	11	111	0	0	2	0	566
0815 - 0915	0	350	62	10	0	14	15	92	0	2	2	1	548
0830 - 0930	0	314	53	13	0	12	12	82	1	2	2	1	492

PEAK HOUR	0	359	58	10	0	15	11	111	0	0	2	0	566
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Heavies	NORTH			WEST			SOUTH			EAST			
	Anderson St			Wilson St			Anderson St			Zinnia Lane			
Peak Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
0630 - 0730	0	10	0	0	0	0	2	9	0	0	0	0	21
0645 - 0745	0	17	0	0	0	0	1	14	0	0	0	0	32
0700 - 0800	0	20	0	0	0	0	1	20	0	0	0	0	41
0715 - 0815	0	21	0	0	0	0	0	22	0	0	0	0	43
0730 - 0830	0	21	0	0	0	0	0	21	0	0	0	0	42
0745 - 0845	0	16	0	0	0	0	0	15	0	0	0	0	31
0800 - 0900	0	14	0	0	0	0	0	11	0	0	0	0	25
0815 - 0915	0	13	0	0	0	0	0	15	0	0	0	0	28
0830 - 0930	0	9	0	0	0	0	0	13	0	0	0	0	22

PEAK HOUR	0	14	0	0	0	0	0	11	0	0	0	0	25
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Combined	NORTH			WEST			SOUTH			EAST			
	Anderson St			Wilson St			Anderson St			Zinnia Lane			
Peak Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
0630 - 0730	0	191	12	5	0	3	10	80	1	0	1	0	303
0645 - 0745	0	248	16	5	0	3	12	101	3	1	1	0	390
0700 - 0800	0	296	20	3	0	4	11	123	3	1	1	0	462
0715 - 0815	0	324	30	3	0	8	8	134	2	1	1	0	511
0730 - 0830	0	368	39	4	0	10	11	138	2	1	1	0	574
0745 - 0845	0	380	49	7	0	13	10	129	0	0	2	0	590
0800 - 0900	0	373	58	10	0	15	11	122	0	0	2	0	591
0815 - 0915	0	363	62	10	0	14	15	107	0	2	2	1	576
0830 - 0930	0	323	53	13	0	12	12	95	1	2	2	1	514

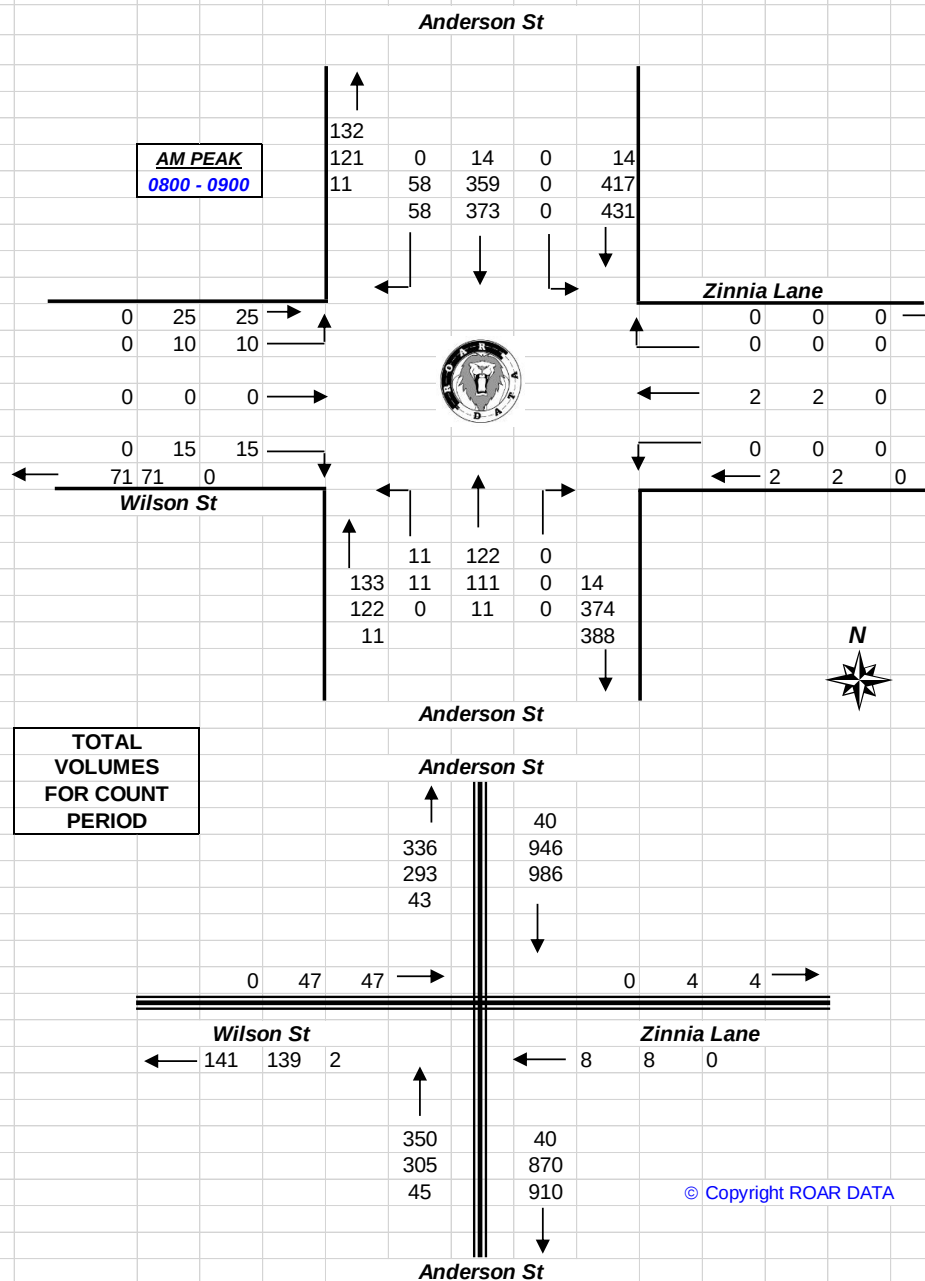
PEAK HOUR	0	373	58	10	0	15	11	122	0	0	2	0	591
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Ph.88196847, Mob.0418-239019

Client	: Varga Traffic Planning
Job No/Name	: 6527 CHATSWOOD Wilson St
Day/Date	: Thursday 10th August 2017

Peds	NORTH	WEST	SOUTH	EAST	
	Anderson St	Wilson St	Anderson St	Zinnia Lane	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0630 - 0730	1	10	4	11	26
0645 - 0745	4	18	9	14	45
0700 - 0800	5	16	10	16	47
0715 - 0815	10	21	15	25	71
0730 - 0830	11	27	16	26	80
0745 - 0845	10	21	14	31	76
0800 - 0900	11	18	16	32	77
0815 - 0915	7	16	12	27	62
0830 - 0930	8	10	12	25	55
PEAK HR	11	18	16	32	77





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Lights	NORTH Anderson St			WEST Wilson St			SOUTH Anderson St			EAST Zinnia Lane			TOT
Time Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
1530 - 1545	0	43	6	2	0	0	8	25	0	0	0	0	84
1545 - 1600	0	40	8	1	0	4	7	19	0	2	1	0	82
1600 - 1615	0	50	7	1	0	1	9	30	1	1	0	0	100
1615 - 1630	0	49	10	0	0	0	4	28	0	0	0	1	92
1630 - 1645	0	61	11	0	0	3	4	34	0	0	0	1	114
1645 - 1700	1	51	8	1	0	2	2	37	0	0	0	0	102
1700 - 1715	0	35	5	2	0	3	7	62	0	0	0	0	114
1715 - 1730	0	63	11	2	0	5	9	61	0	0	0	0	151
1730 - 1745	0	44	8	2	0	1	4	33	0	0	0	0	92
1745 - 1800	0	43	10	2	0	3	4	52	0	0	0	0	114
1800 - 1815	0	62	11	4	0	1	7	29	0	0	1	0	115
1815 - 1830	0	64	11	1	0	3	8	45	0	0	1	0	133
Period End	1	605	106	18	0	26	73	455	1	3	3	2	1293

Heavies	NORTH Anderson St			WEST Wilson St			SOUTH Anderson St			EAST Zinnia Lane			TOT
Time Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
1530 - 1545	0	7	0	0	0	0	0	5	0	0	0	0	12
1545 - 1600	0	5	0	0	0	0	0	4	0	0	0	0	9
1600 - 1615	0	0	0	0	0	0	0	3	0	0	0	0	3
1615 - 1630	0	9	0	0	0	0	0	6	0	0	0	0	15
1630 - 1645	0	4	0	0	0	0	0	1	0	0	0	0	5
1645 - 1700	0	4	0	0	0	0	0	4	0	0	0	0	8
1700 - 1715	0	3	0	0	0	0	0	3	0	0	0	0	6
1715 - 1730	0	3	0	0	0	0	0	4	0	0	0	0	7
1730 - 1745	0	4	0	0	0	0	0	1	0	0	0	0	5
1745 - 1800	0	4	0	0	0	0	0	5	0	0	0	0	9
1800 - 1815	0	6	0	0	0	0	0	1	0	0	0	0	7
1815 - 1830	0	3	0	0	0	0	0	3	0	0	0	0	6
Period End	0	52	0	0	0	0	0	40	0	0	0	0	92

Combined	NORTH Anderson St			WEST Wilson St			SOUTH Anderson St			EAST Zinnia Lane			TOT
Time Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
1530 - 1545	0	50	6	2	0	0	8	30	0	0	0	0	96
1545 - 1600	0	45	8	1	0	4	7	23	0	2	1	0	91
1600 - 1615	0	50	7	1	0	1	9	33	1	1	0	0	103
1615 - 1630	0	58	10	0	0	0	4	34	0	0	0	1	107
1630 - 1645	0	65	11	0	0	3	4	35	0	0	0	1	119
1645 - 1700	1	55	8	1	0	2	2	41	0	0	0	0	110
1700 - 1715	0	38	5	2	0	3	7	65	0	0	0	0	120
1715 - 1730	0	66	11	2	0	5	9	65	0	0	0	0	158
1730 - 1745	0	48	8	2	0	1	4	34	0	0	0	0	97
1745 - 1800	0	47	10	2	0	3	4	57	0	0	0	0	123
1800 - 1815	0	68	11	4	0	1	7	30	0	0	1	0	122
1815 - 1830	0	67	11	1	0	3	8	48	0	0	1	0	139
Period End	1	657	106	18	0	26	73	495	1	3	3	2	1385

Client : Varga Traffic Planning
 Job No/Name : 6527 CHATSWOOD Wilson St
 Day/Date : Thursday 10th August 2017

Lights	NORTH Anderson St			WEST Wilson St			SOUTH Anderson St			EAST Zinnia Lane			TOT
Peak Time	L	I	R	L	I	R	L	I	R	L	I	R	TOT
1530 - 1630	0	182	31	4	0	5	28	102	1	3	1	1	358
1545 - 1645	0	200	36	2	0	8	24	111	1	3	1	2	388
1600 - 1700	1	211	36	2	0	6	19	129	1	1	0	2	408
1615 - 1715	1	196	34	3	0	8	17	161	0	0	0	2	422
1630 - 1730	1	210	35	5	0	13	22	194	0	0	0	1	481
1645 - 1745	1	193	32	7	0	11	22	193	0	0	0	0	459
1700 - 1800	0	185	34	8	0	12	24	208	0	0	0	0	471
1715 - 1815	0	212	40	10	0	10	24	175	0	0	1	0	472
1730 - 1830	0	213	40	9	0	8	23	159	0	0	2	0	454
PEAK HOUR	1	210	35	5	0	13	22	194	0	0	0	1	481

Heavies	NORTH Anderson St			WEST Wilson St			SOUTH Anderson St			EAST Zinnia Lane			TOT
Peak Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
1530 - 1630	0	21	0	0	0	0	0	18	0	0	0	0	39
1545 - 1645	0	18	0	0	0	0	0	14	0	0	0	0	32
1600 - 1700	0	17	0	0	0	0	0	14	0	0	0	0	31
1615 - 1715	0	20	0	0	0	0	0	14	0	0	0	0	34
1630 - 1730	0	14	0	0	0	0	0	12	0	0	0	0	26
1645 - 1745	0	14	0	0	0	0	0	12	0	0	0	0	26
1700 - 1800	0	14	0	0	0	0	0	13	0	0	0	0	27
1715 - 1815	0	17	0	0	0	0	0	11	0	0	0	0	28
1730 - 1830	0	17	0	0	0	0	0	10	0	0	0	0	27
PEAK HOUR	0	14	0	0	0	0	0	12	0	0	0	0	26

Combined	NORTH Anderson St			WEST Wilson St			SOUTH Anderson St			EAST Zinnia Lane			TOT
Peak Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
1530 - 1630	0	203	31	4	0	5	28	120	1	3	1	1	397
1545 - 1645	0	218	36	2	0	8	24	125	1	3	1	2	420
1600 - 1700	1	228	36	2	0	6	19	143	1	1	0	2	439
1615 - 1715	1	216	34	3	0	8	17	175	0	0	0	2	456
1630 - 1730	1	224	35	5	0	13	22	206	0	0	0	1	507
1645 - 1745	1	207	32	7	0	11	22	205	0	0	0	0	485
1700 - 1800	0	199	34	8	0	12	24	221	0	0	0	0	498
1715 - 1815	0	229	40	10	0	10	24	186	0	0	1	0	500
1730 - 1830	0	230	40	9	0	8	23	169	0	0	2	0	481
PEAK HOUR	1	224	35	5	0	13	22	206	0	0	0	1	507



R.O.A.R DATA

Reliable, Original & Authentic Results

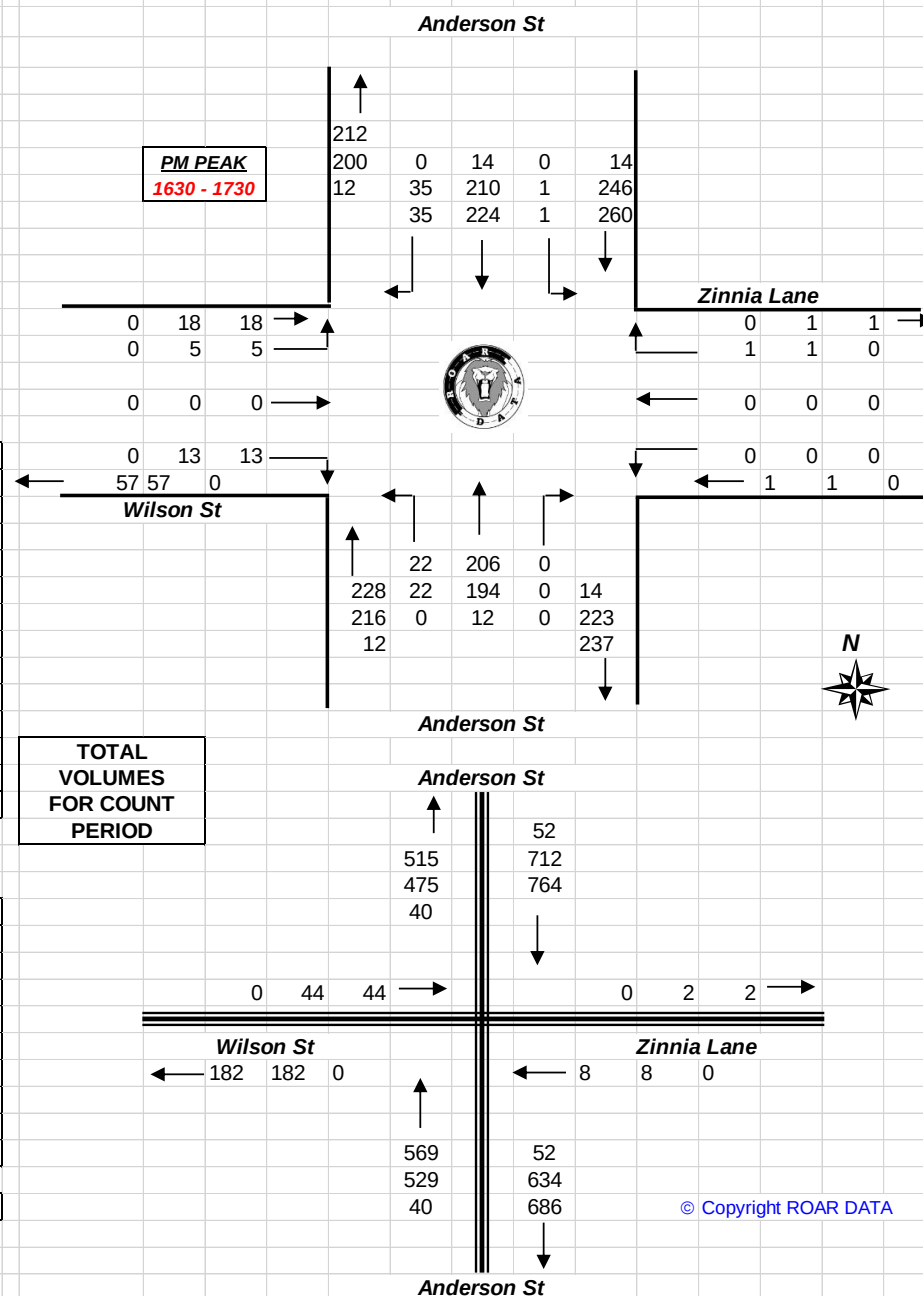
Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
 Job No/Name : 6527 CHATSWOOD Wilson St
 Day/Date : Thursday 10th August 2017

Peds	NORTH	WEST	SOUTH	EAST	
	Anderson St	Wilson St	Anderson St	Zinnia Lane	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1530 - 1545	2	7	1	6	16
1545 - 1600	1	7	2	5	15
1600 - 1615	2	1	0	3	6
1615 - 1630	1	2	1	2	6
1630 - 1645	0	3	1	1	5
1645 - 1700	2	5	2	10	19
1700 - 1715	3	5	6	9	23
1715 - 1730	0	5	3	11	19
1730 - 1745	4	9	0	5	18
1745 - 1800	0	8	0	3	11
1800 - 1815	1	3	1	7	12
1815 - 1830	0	9	2	12	23
Period End	16	64	19	74	173

Peds	NORTH	WEST	SOUTH	EAST	
	Anderson St	Wilson St	Anderson St	Zinnia Lane	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1530 - 1630	6	17	4	16	43
1545 - 1645	4	13	4	11	32
1600 - 1700	5	11	4	16	36
1615 - 1715	6	15	10	22	53
1630 - 1730	5	18	12	31	66
1645 - 1745	9	24	11	35	79
1700 - 1800	7	27	9	28	71
1715 - 1815	5	25	4	26	60
1730 - 1830	5	29	3	27	64

PEAK HR	5	18	12	31	66
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R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6527 CHATSWOOD Wilson St
Day/Date : Thursday 10th August 2017

Intersection Details

Obtained via satellite
May be incorrect

AM PEAK HOUR
0800 - 0900

Combined figures only



Anderson St



Wilson St

		AM	PM	
	L	10	5	L
	T	0	0	T
	R	15	13	R

R	T	L	
58	373	0	AM
35	224	1	PM

R	T	L	
1	0		AM
0	2		PM
0	0		

PM	L	T	R
22	206	0	
AM	11	122	0



Zinnia Lane

PM PEAK HOUR
1630 - 1730

Weather >>>



Anderson St

APPENDIX B

SIDRA MOVEMENT SUMMARIES

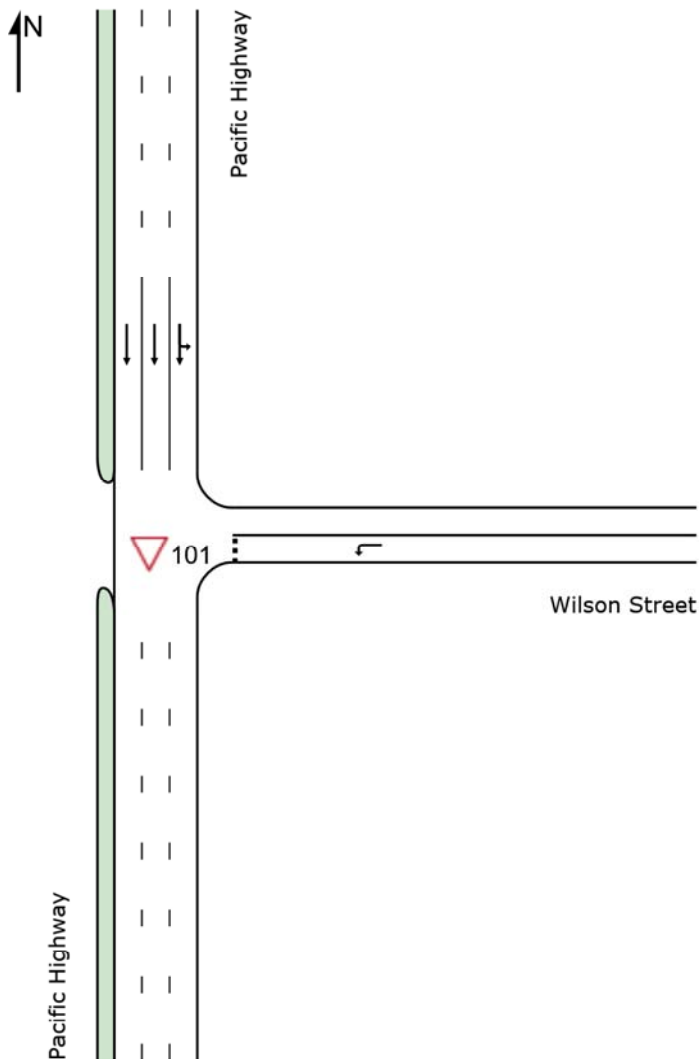
SITE LAYOUT

▽ Site: 101 [Existing AM]

Pacific Highway & Wilson Street Intersection

Site Category: (None)

Giveway / Yield (Two-Way)



SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: VARGA TRAFFIC PLANNING | Created: Friday, 25 May, 2018 5:21:32 PM

Project: Z:\DATA\Data\Jobs01\Jobs\17work\17701Y_871-877PacificHwyChatswood\SIDRA\180528\PAC_WILX.sip8

MOVEMENT SUMMARY

▽ Site: 101 [Existing AM]

Pacific Highway & Wilson Street Intersection
Site Category: (None)
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
East: Wilson Street												
4	L2	35	2.9	0.072	10.7	LOS A	0.3	2.0	0.72	0.84	0.72	41.1
Approach		35	2.9	0.072	10.7	LOS A	0.3	2.0	0.72	0.84	0.72	41.1
North: Pacific Highway												
7	L2	7	0.0	0.548	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.2
8	T1	3178	1.1	0.548	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		3185	1.1	0.548	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		3220	1.1	0.548	0.2	NA	0.3	2.0	0.01	0.01	0.01	59.5

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: 101 [Existing PM]

Pacific Highway & Wilson Street Intersection
Site Category: (None)
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
East: Wilson Street												
4	L2	59	0.0	0.059	5.6	LOS A	0.3	1.8	0.51	0.60	0.51	43.7
Approach		59	0.0	0.059	5.6	LOS A	0.3	1.8	0.51	0.60	0.51	43.7
North: Pacific Highway												
7	L2	19	0.0	0.295	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
8	T1	1695	1.1	0.295	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		1714	1.1	0.295	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
All Vehicles		1773	1.0	0.295	0.3	NA	0.3	1.8	0.02	0.03	0.02	59.1

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: 101 [Proposed AM (INTERIM)]

Pacific Highway & Wilson Street Intersection
Site Category: (None)
Giveaway / 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	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Wilson Street												
4	L2	61	1.6	0.124	10.8	LOS A	0.5	3.4	0.72	0.85	0.72	41.1
Approach		61	1.6	0.124	10.8	LOS A	0.5	3.4	0.72	0.85	0.72	41.1
North: Pacific Highway												
7	L2	10	0.0	0.549	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.1
8	T1	3178	1.1	0.549	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		3188	1.1	0.549	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		3249	1.1	0.549	0.3	NA	0.5	3.4	0.01	0.02	0.01	59.3

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: 101 [Proposed PM (INTERIM)]

Pacific Highway & Wilson Street Intersection
Site Category: (None)
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Wilson Street												
4	L2	75	0.0	0.075	5.7	LOS A	0.3	2.3	0.51	0.61	0.51	43.6
Approach		75	0.0	0.075	5.7	LOS A	0.3	2.3	0.51	0.61	0.51	43.6
North: Pacific Highway												
7	L2	23	0.0	0.296	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
8	T1	1695	1.1	0.296	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		1718	1.0	0.296	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		1793	1.0	0.296	0.3	NA	0.3	2.3	0.02	0.03	0.02	58.9

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: 101 [Proposed AM (ULTIMATE)]

Pacific Highway & Wilson Street Intersection
Site Category: (None)
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Wilson Street												
4	L2	82	1.2	0.165	11.5	LOS A	0.7	4.6	0.73	0.87	0.73	43.3
Approach		82	1.2	0.165	11.5	LOS A	0.7	4.6	0.73	0.87	0.73	43.3
North: Pacific Highway												
7	L2	14	0.0	0.550	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.1
8	T1	3178	1.1	0.550	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		3192	1.1	0.550	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		3274	1.1	0.550	0.4	NA	0.7	4.6	0.02	0.02	0.02	59.2

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.

MOVEMENT SUMMARY

Site: 101 [Proposed PM (ULTIMATE)]

Pacific Highway & Wilson Street Intersection
Site Category: (None)
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Wilson Street												
4	L2	92	0.0	0.092	6.1	LOS A	0.4	2.8	0.51	0.64	0.51	45.5
Approach		92	0.0	0.092	6.1	LOS A	0.4	2.8	0.51	0.64	0.51	45.5
North: Pacific Highway												
7	L2	26	0.0	0.296	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	58.1
8	T1	1695	1.1	0.296	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		1721	1.0	0.296	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		1813	1.0	0.296	0.4	NA	0.4	2.8	0.03	0.04	0.03	58.9

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.

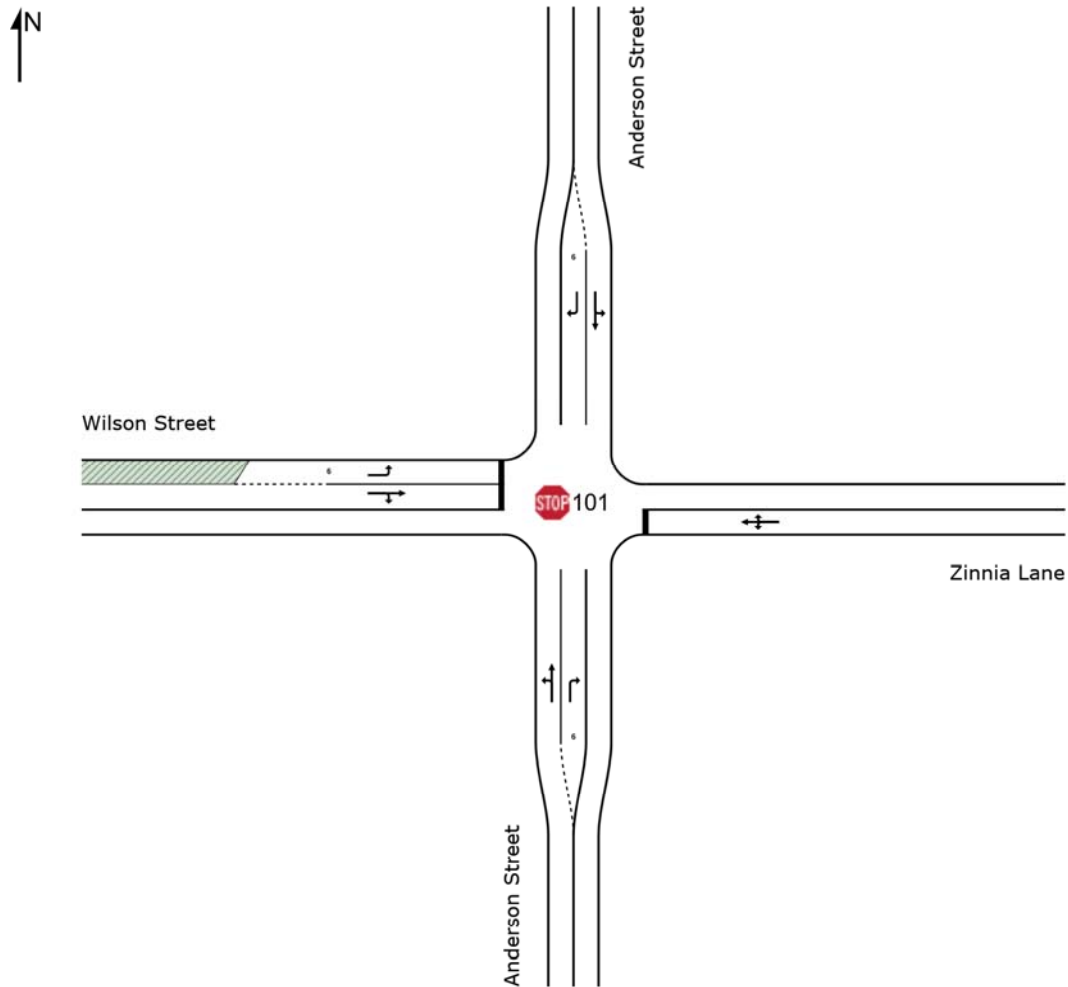
SITE LAYOUT

Site: 101 [Existing AM]

Anderson Street, Wilson Street & Zinnia Lane Intersection

Site Category: (None)

Stop (Two-Way)



MOVEMENT SUMMARY

 **Site: 101 [Existing AM]**

Anderson Street, Wilson Street & Zinnia Lane Intersection

Site Category: (None)

Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Anderson Street												
1	L2	11	0.0	0.072	3.4	LOS A	0.0	0.0	0.00	0.04	0.00	40.0
2	T1	122	9.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	39.9
3	R2	1	0.0	0.001	4.4	LOS A	0.0	0.0	0.37	0.46	0.37	37.8
Approach		134	8.2	0.072	0.3	NA	0.0	0.0	0.00	0.04	0.00	39.9
East: Zinnia Lane												
4	L2	1	0.0	0.006	8.7	LOS A	0.0	0.1	0.48	0.84	0.48	36.7
5	T1	2	0.0	0.006	9.8	LOS A	0.0	0.1	0.48	0.84	0.48	36.6
6	R2	1	0.0	0.006	9.8	LOS A	0.0	0.1	0.48	0.84	0.48	36.6
Approach		4	0.0	0.006	9.5	LOS A	0.0	0.1	0.48	0.84	0.48	36.6
North: Anderson Street												
7	L2	1	0.0	0.198	3.4	LOS A	0.0	0.0	0.00	0.00	0.00	40.1
8	T1	373	3.8	0.198	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
9	R2	58	0.0	0.027	3.8	LOS A	0.2	1.1	0.25	0.44	0.25	38.1
Approach		432	3.2	0.198	0.5	NA	0.2	1.1	0.03	0.06	0.03	39.7
West: Wilson Street												
10	L2	10	0.0	0.009	7.2	LOS A	0.0	0.2	0.22	0.86	0.22	37.4
11	T1	1	0.0	0.025	9.9	LOS A	0.1	0.6	0.51	0.90	0.51	36.5
12	R2	15	0.0	0.025	9.9	LOS A	0.1	0.6	0.51	0.90	0.51	36.4
Approach		26	0.0	0.025	8.9	LOS A	0.1	0.6	0.40	0.89	0.40	36.8
All Vehicles		596	4.2	0.198	0.9	NA	0.2	1.1	0.05	0.10	0.05	39.6

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: 101 [Existing PM]**

Anderson Street, Wilson Street & Zinnia Lane Intersection

Site Category: (None)

Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Anderson Street												
1	L2	22	0.0	0.121	3.4	LOS A	0.0	0.0	0.00	0.05	0.00	40.0
2	T1	206	5.8	0.121	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.8
3	R2	1	0.0	0.001	4.0	LOS A	0.0	0.0	0.28	0.44	0.28	37.9
Approach		229	5.2	0.121	0.4	NA	0.0	0.0	0.00	0.05	0.00	39.8
East: Zinnia Lane												
4	L2	1	0.0	0.004	7.7	LOS A	0.0	0.1	0.40	0.83	0.40	37.0
5	T1	1	0.0	0.004	9.0	LOS A	0.0	0.1	0.40	0.83	0.40	36.9
6	R2	1	0.0	0.004	8.9	LOS A	0.0	0.1	0.40	0.83	0.40	36.9
Approach		3	0.0	0.004	8.6	LOS A	0.0	0.1	0.40	0.83	0.40	36.9
North: Anderson Street												
7	L2	1	0.0	0.121	3.4	LOS A	0.0	0.0	0.00	0.00	0.00	40.1
8	T1	224	6.3	0.121	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
9	R2	35	0.0	0.018	4.0	LOS A	0.1	0.7	0.34	0.45	0.34	38.0
Approach		260	5.4	0.121	0.6	NA	0.1	0.7	0.05	0.06	0.05	39.7
West: Wilson Street												
10	L2	5	0.0	0.005	7.6	LOS A	0.0	0.1	0.30	0.84	0.30	37.3
11	T1	1	0.0	0.019	9.0	LOS A	0.1	0.5	0.46	0.87	0.46	36.8
12	R2	13	0.0	0.019	9.1	LOS A	0.1	0.5	0.46	0.87	0.46	36.7
Approach		19	0.0	0.019	8.7	LOS A	0.1	0.5	0.42	0.86	0.42	36.9
All Vehicles		511	5.1	0.121	0.8	NA	0.1	0.7	0.04	0.09	0.04	39.6

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: 101 [Proposed AM (INTERIM)]**

Anderson Street, Wilson Street & Zinnia Lane Intersection
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Anderson Street												
1	L2	20	0.0	0.077	3.6	LOS A	0.0	0.0	0.00	0.10	0.00	41.0
2	T1	122	9.0	0.077	0.2	LOS A	0.0	0.0	0.00	0.10	0.00	41.5
3	R2	1	0.0	0.001	4.4	LOS A	0.0	0.0	0.37	0.46	0.37	37.8
Approach		143	7.7	0.077	0.7	NA	0.0	0.0	0.00	0.10	0.00	41.4
East: Zinnia Lane												
4	L2	1	0.0	0.006	8.7	LOS A	0.0	0.1	0.49	0.85	0.49	36.7
5	T1	2	0.0	0.006	9.9	LOS A	0.0	0.1	0.49	0.85	0.49	36.6
6	R2	1	0.0	0.006	9.9	LOS A	0.0	0.1	0.49	0.85	0.49	36.5
Approach		4	0.0	0.006	9.6	LOS A	0.0	0.1	0.49	0.85	0.49	36.6
North: Anderson Street												
7	L2	1	0.0	0.198	3.4	LOS A	0.0	0.0	0.00	0.00	0.00	40.1
8	T1	373	3.8	0.198	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
9	R2	66	0.0	0.031	3.8	LOS A	0.2	1.3	0.26	0.44	0.26	38.1
Approach		440	3.2	0.198	0.6	NA	0.2	1.3	0.04	0.07	0.04	39.7
West: Wilson Street												
10	L2	14	0.0	0.013	7.2	LOS A	0.0	0.3	0.23	0.87	0.23	37.4
11	T1	1	0.0	0.026	10.0	LOS A	0.1	0.6	0.51	0.90	0.51	36.4
12	R2	15	0.0	0.026	10.0	LOS A	0.1	0.6	0.51	0.90	0.51	36.4
Approach		30	0.0	0.026	8.7	LOS A	0.1	0.6	0.38	0.89	0.38	36.9
All Vehicles		617	4.1	0.198	1.1	NA	0.2	1.3	0.05	0.12	0.05	39.9

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: 101 [Proposed PM (INTERIM)]**

Anderson Street, Wilson Street & Zinnia Lane Intersection
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Anderson Street												
1	L2	33	0.0	0.127	3.5	LOS A	0.0	0.0	0.00	0.09	0.00	40.7
2	T1	206	5.8	0.127	0.1	LOS A	0.0	0.0	0.00	0.09	0.00	41.2
3	R2	1	0.0	0.001	4.0	LOS A	0.0	0.0	0.28	0.44	0.28	37.9
Approach		240	5.0	0.127	0.6	NA	0.0	0.0	0.00	0.09	0.00	41.1
East: Zinnia Lane												
4	L2	1	0.0	0.004	7.7	LOS A	0.0	0.1	0.40	0.83	0.40	37.0
5	T1	1	0.0	0.004	9.1	LOS A	0.0	0.1	0.40	0.83	0.40	36.9
6	R2	1	0.0	0.004	9.0	LOS A	0.0	0.1	0.40	0.83	0.40	36.8
Approach		3	0.0	0.004	8.6	LOS A	0.0	0.1	0.40	0.83	0.40	36.9
North: Anderson Street												
7	L2	1	0.0	0.121	3.4	LOS A	0.0	0.0	0.00	0.00	0.00	40.1
8	T1	224	6.3	0.121	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
9	R2	46	0.0	0.023	4.1	LOS A	0.1	0.9	0.35	0.46	0.35	38.0
Approach		271	5.2	0.121	0.7	NA	0.1	0.9	0.06	0.08	0.06	39.6
West: Wilson Street												
10	L2	8	0.0	0.008	7.6	LOS A	0.0	0.2	0.30	0.84	0.30	37.3
11	T1	1	0.0	0.020	9.1	LOS A	0.1	0.5	0.47	0.88	0.47	36.7
12	R2	13	0.0	0.020	9.2	LOS A	0.1	0.5	0.47	0.88	0.47	36.7
Approach		22	0.0	0.020	8.6	LOS A	0.1	0.5	0.41	0.86	0.41	36.9
All Vehicles		536	4.9	0.127	1.0	NA	0.1	0.9	0.05	0.12	0.05	40.1

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: 101 [Proposed AM (ULTIMATE)]**

Anderson Street, Wilson Street & Zinnia Lane Intersection

Site Category: (None)

Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Anderson Street												
1	L2	30	0.0	0.082	3.7	LOS A	0.0	0.0	0.00	0.15	0.00	42.0
2	T1	122	9.0	0.082	0.3	LOS A	0.0	0.0	0.00	0.15	0.00	42.5
3	R2	1	0.0	0.001	4.4	LOS A	0.0	0.0	0.37	0.46	0.37	37.8
Approach		153	7.2	0.082	1.0	NA	0.0	0.0	0.00	0.15	0.00	42.4
East: Zinnia Lane												
4	L2	1	0.0	0.006	8.7	LOS A	0.0	0.1	0.49	0.85	0.49	36.6
5	T1	2	0.0	0.006	10.1	LOS A	0.0	0.1	0.49	0.85	0.49	36.6
6	R2	1	0.0	0.006	10.0	LOS A	0.0	0.1	0.49	0.85	0.49	36.5
Approach		4	0.0	0.006	9.7	LOS A	0.0	0.1	0.49	0.85	0.49	36.6
North: Anderson Street												
7	L2	1	0.0	0.198	3.4	LOS A	0.0	0.0	0.00	0.00	0.00	40.1
8	T1	373	3.8	0.198	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
9	R2	76	0.0	0.036	4.1	LOS A	0.2	1.5	0.27	0.46	0.27	40.2
Approach		450	3.1	0.198	0.7	NA	0.2	1.5	0.05	0.08	0.05	40.0
West: Wilson Street												
10	L2	18	0.0	0.017	7.6	LOS A	0.1	0.4	0.23	0.87	0.23	40.8
11	T1	1	0.0	0.026	10.1	LOS A	0.1	0.6	0.52	0.90	0.52	36.4
12	R2	15	0.0	0.026	10.1	LOS A	0.1	0.6	0.52	0.90	0.52	36.4
Approach		34	0.0	0.026	8.8	LOS A	0.1	0.6	0.36	0.89	0.36	38.6
All Vehicles		641	3.9	0.198	1.3	NA	0.2	1.5	0.06	0.14	0.06	40.5

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: 101 [Proposed PM (ULTIMATE)]**

Anderson Street, Wilson Street & Zinnia Lane Intersection

Site Category: (None)

Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Anderson Street												
1	L2	42	0.0	0.132	3.6	LOS A	0.0	0.0	0.00	0.12	0.00	41.3
2	T1	206	5.8	0.132	0.2	LOS A	0.0	0.0	0.00	0.12	0.00	41.8
3	R2	1	0.0	0.001	4.0	LOS A	0.0	0.0	0.28	0.44	0.28	37.9
Approach		249	4.8	0.132	0.8	NA	0.0	0.0	0.00	0.12	0.00	41.7
East: Zinnia Lane												
4	L2	1	0.0	0.004	7.7	LOS A	0.0	0.1	0.41	0.83	0.41	36.9
5	T1	1	0.0	0.004	9.3	LOS A	0.0	0.1	0.41	0.83	0.41	36.9
6	R2	1	0.0	0.004	9.1	LOS A	0.0	0.1	0.41	0.83	0.41	36.8
Approach		3	0.0	0.004	8.7	LOS A	0.0	0.1	0.41	0.83	0.41	36.9
North: Anderson Street												
7	L2	1	0.0	0.121	3.4	LOS A	0.0	0.0	0.00	0.00	0.00	40.1
8	T1	224	6.3	0.121	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.0
9	R2	55	0.0	0.028	4.5	LOS A	0.2	1.1	0.36	0.48	0.36	40.6
Approach		280	5.0	0.121	0.9	NA	0.2	1.1	0.07	0.10	0.07	40.1
West: Wilson Street												
10	L2	11	0.0	0.011	8.1	LOS A	0.0	0.3	0.30	0.85	0.30	41.5
11	T1	1	0.0	0.020	9.2	LOS A	0.1	0.5	0.48	0.88	0.48	36.7
12	R2	13	0.0	0.020	9.3	LOS A	0.1	0.5	0.48	0.88	0.48	36.6
Approach		25	0.0	0.020	8.7	LOS A	0.1	0.5	0.40	0.86	0.40	38.6
All Vehicles		557	4.7	0.132	1.3	NA	0.2	1.1	0.06	0.15	0.06	40.7

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.