

Planning Proposal for a
Proposed Residential Development

**258 & 262 Pennant Hills Road,
17 & 20 Azile Circuit,
Carlingford**

TRAFFIC AND PARKING ASSESSMENT REPORT

3 May 2016

Ref 16259

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants 

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Document Verification

Location:	258 & 262 Pennant Hills Road, 17 & 20 Azile Circuit, Carlingford	Job Number	16259		
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		By	Date	By	Date
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1. INTRODUCTION

This report has been prepared to accompany a Planning Proposal to Parramatta City Council for a residential development to be located at 258 & 262 Pennant Hills Road and 17 & 20 Azile Circuit, Carlingford (Figures 1 and 2).

The Planning Proposal involves the rezoning of the land from *R2 – Low Density Residential* to *R4 – High Density Residential*. The site lies within 800m walking distance to the entrance of Carlingford Railway Station and is in close proximity to bus stops located along Pennant Hills Road.

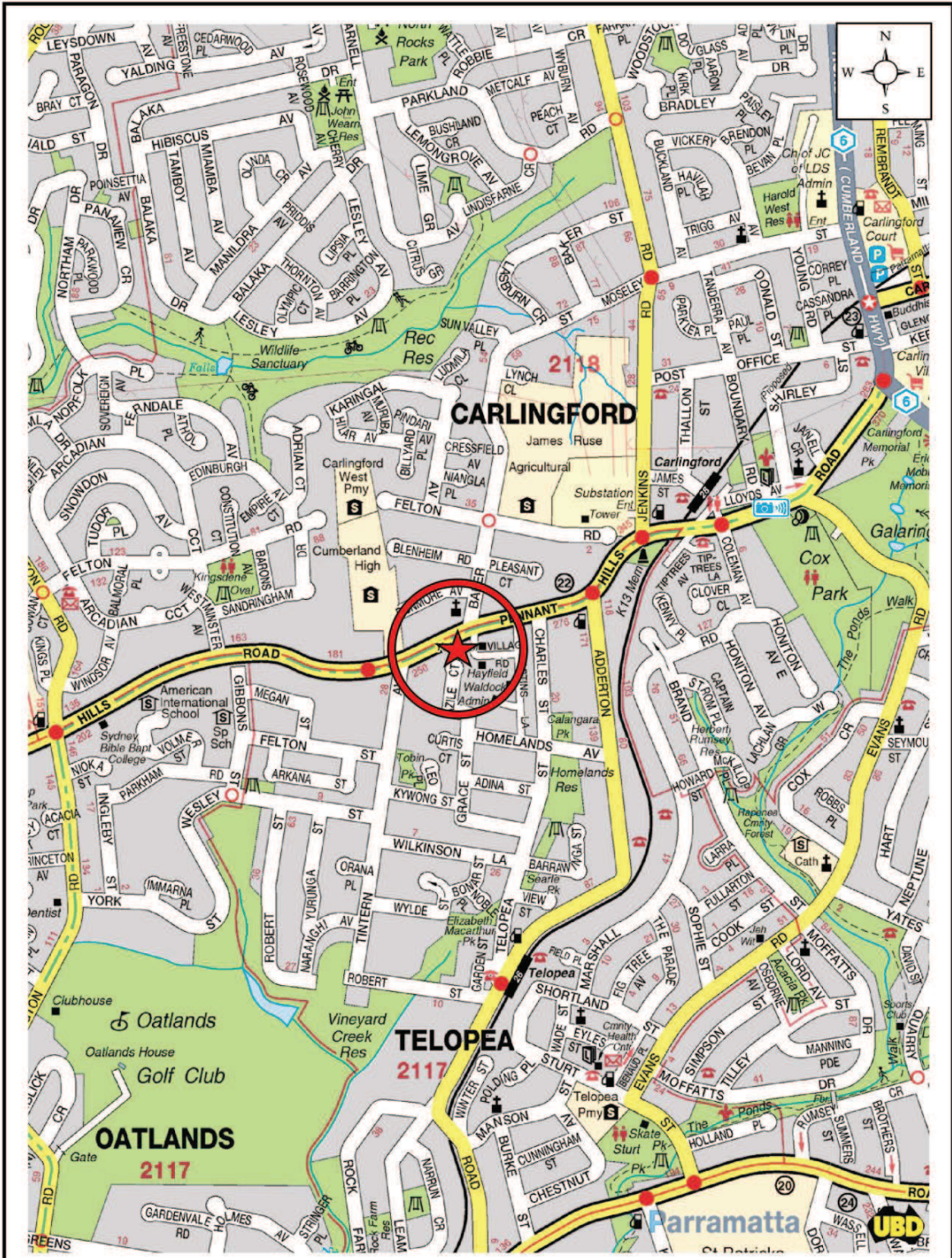
The Planning Proposal envisages the construction of approximately 150 new residential apartments in a number of new buildings whilst retaining the existing pedestrian through-link between Pennant Hills Road and Azile Circuit.

Off-street parking is to be provided in new basement car parking areas, with the number of spaces to be provided in accordance with Council's requirements. Vehicular access to the site is to be provided via Azile Circuit.

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 public transport services available in the vicinity of the site
- estimates the traffic generation potential of the Planning 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

- reviews the off-street car parking requirements applicable to the Planning Proposal.



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Traffic and Parking Consultants



LOCATION
FIGURE 1



2. PROPOSED DEVELOPMENT

Site

The subject site is located on the southern side of Pennant Hills Road, opposite Baker Street, and extends through to Azile Circuit. The site has street frontages approximately 89m in length to Pennant Hills Road and approximately 69m in length to Azile Circuit, both excluding the pedestrian through-link. The site occupies an area of approximately 6,298m².

The subject site is currently occupied by four residential dwelling houses, all with off-street parking, as shown on the aerial image below. Vehicular access to the properties is provided via respective driveways located in Pennant Hills Road and Azile Circuit.



Source: Nearmap

Proposed Development

The Planning Proposal involves the rezoning of the land from *R2 – Low Density Residential* to *R4 – High Density Residential*. to create approximately 150 new dwellings in the form of residential apartment buildings.

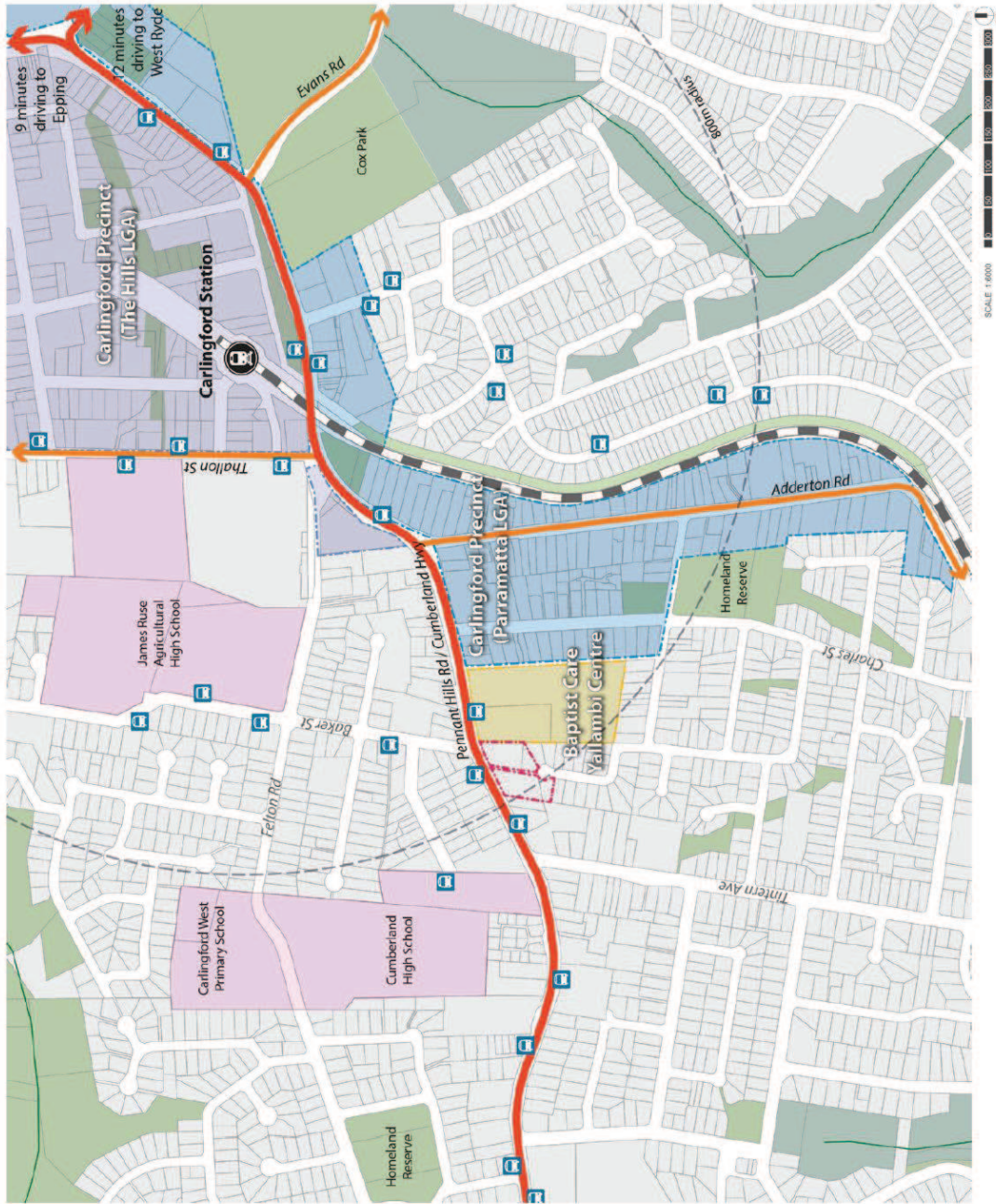
The existing pedestrian through-link between Pennant Hills Road and Azile Circuit is to be retained in order to provide the shortest possible walking route to Carlingford Railway Station and bus stops along Pennant Hills Road for future residents of the proposed development and existing residents of the surrounding area.

Off-street parking is to be provided in new basement car parking areas, with the number of spaces to be provided in accordance with Council's requirements.

Generally speaking, the location of vehicular access driveways are driven by several factors, including if a site has one frontage or two, if the site is located on a classified road (such as the subject site) as well as the site's topography. When basement parking forms part of a design, it is desirable to place the vehicular access driveway not on the classified road but on the secondary road frontage (if the site has a secondary frontage), and at the lowest point on the site as it reduces the length of ramp.

As such, vehicular access to the proposed basement car parking areas is to be provided via Azile Circuit.

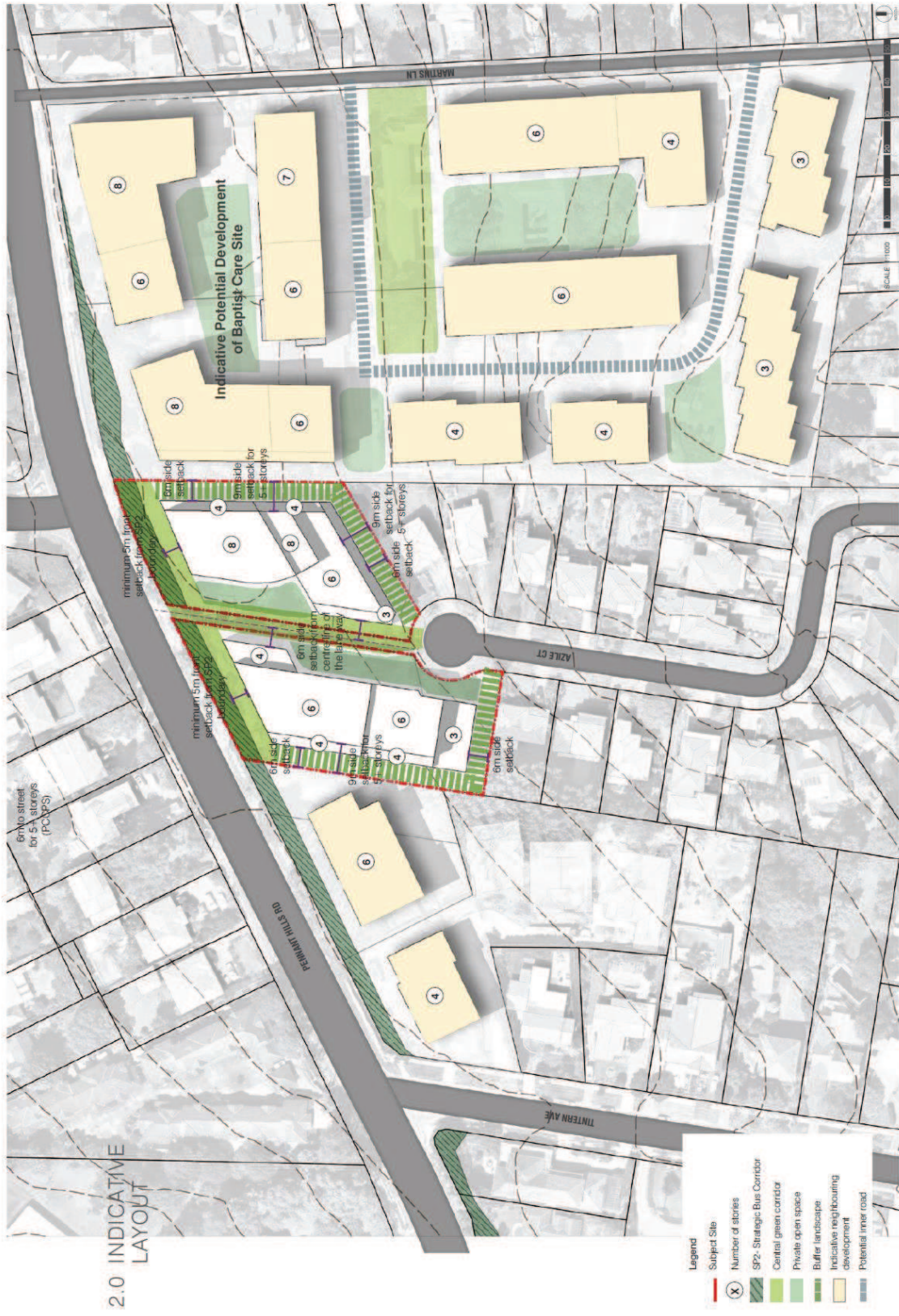
Concept plans of the Planning Proposal have been prepared by *Urbis* and are reproduced on the following pages.



1.0 THE SITE & SURROUNDS

1.1 SITE ANALYSIS

- KEY**
- Subject Site Boundary
 - Railway Station
 - Bus Stop
 - Railway
 - Motorway
 - Major Road
 - North Carlingford Precinct
 - South Carlingford Precinct
 - Baptist Care Property
 - Public Open Space
 - Environmental Conservation





256-302 PENNANT HILLS RD REDEVELOPMENT OPPORTUNITY | 7

3.1 SCHEME - BUILT FORM ENVELOPE

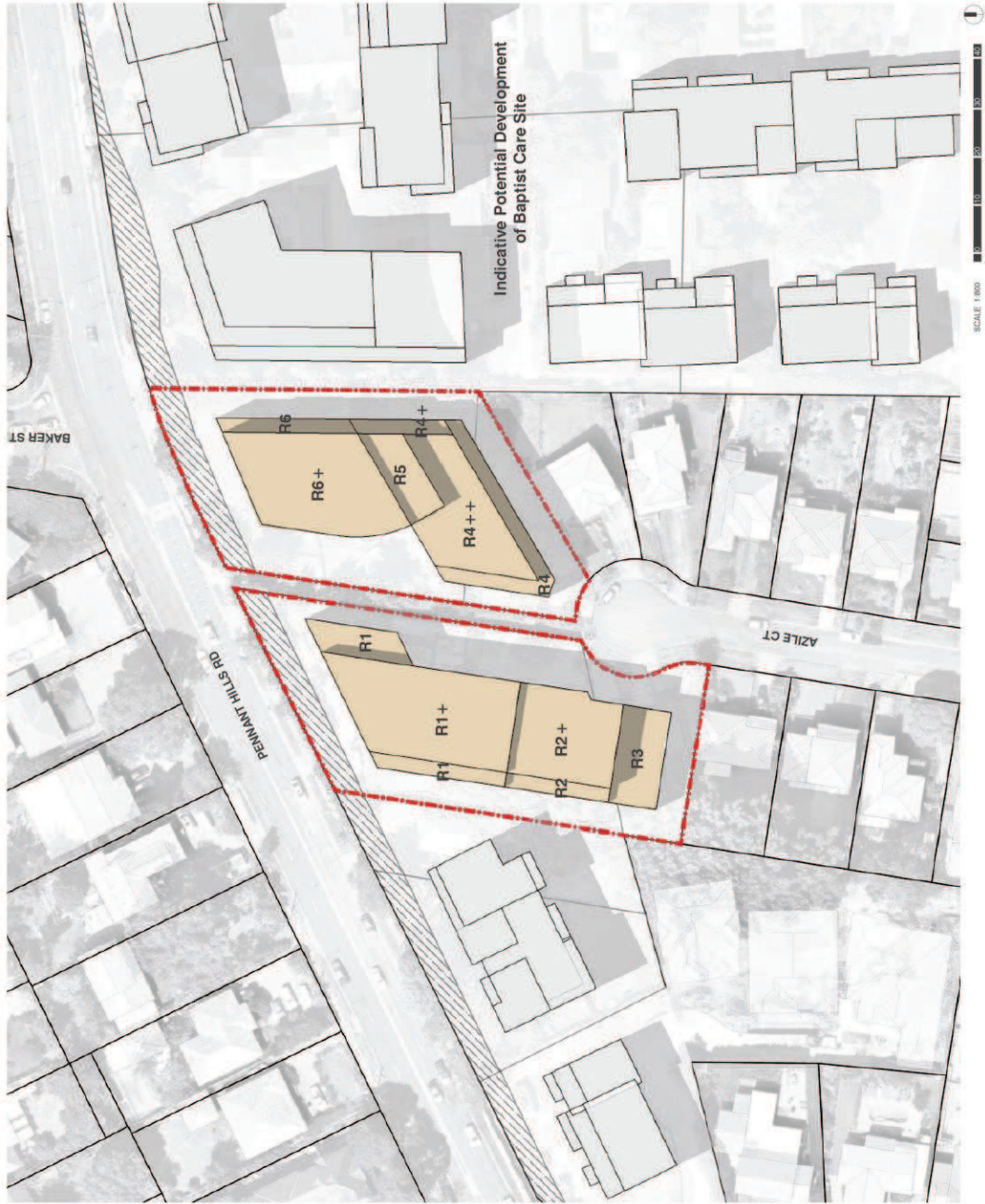


8 | 258-262 PENNANT HILLS RD REDEVELOPMENT OPPORTUNITY

3.2 INDICATIVE FUTURE ADJACENT DEVELOPMENT -
NEW SKYLINE ALONG PENNANT HILLS ROAD



258-262 PENNANT HILLS RD REDEVELOPMENT OPPORTUNITY | 9



3.3 SCHEME- CONCEPTUAL SITE PLAN

The scheme illustrates an option that seeks to investigate the possible development in consideration of the potential redevelopment of the Baptist Care site.

Elements incorporated include:

- Distribute height along Pennant Hills Rd to well formed the street.
- Create a landmark building at the north-east corner in regard to the intersection of Pennant Hills Rd and Baker St.
- Reduce building heights from north to south to soften the interface to the adjacent urban context.
- Minimise shadow and visual impact to the surrounding housings.
- 1.99:1 FSR

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.

Pennant Hills Road is classified by the RMS as a *State Road* and provides the key north-south road link in the area, linking North Parramatta to Normanhurst. It typically carries three traffic lanes in each direction in the vicinity of the site, with turning bays provided at key locations.

Kissing Point Road is also classified by the RMS as a *State Road* and provides the key east-west road link in the area, linking Silverwater Road to James Ruse Drive. It also typically carries three traffic lanes in each direction in the vicinity of the site, with turning bays provided at key locations.

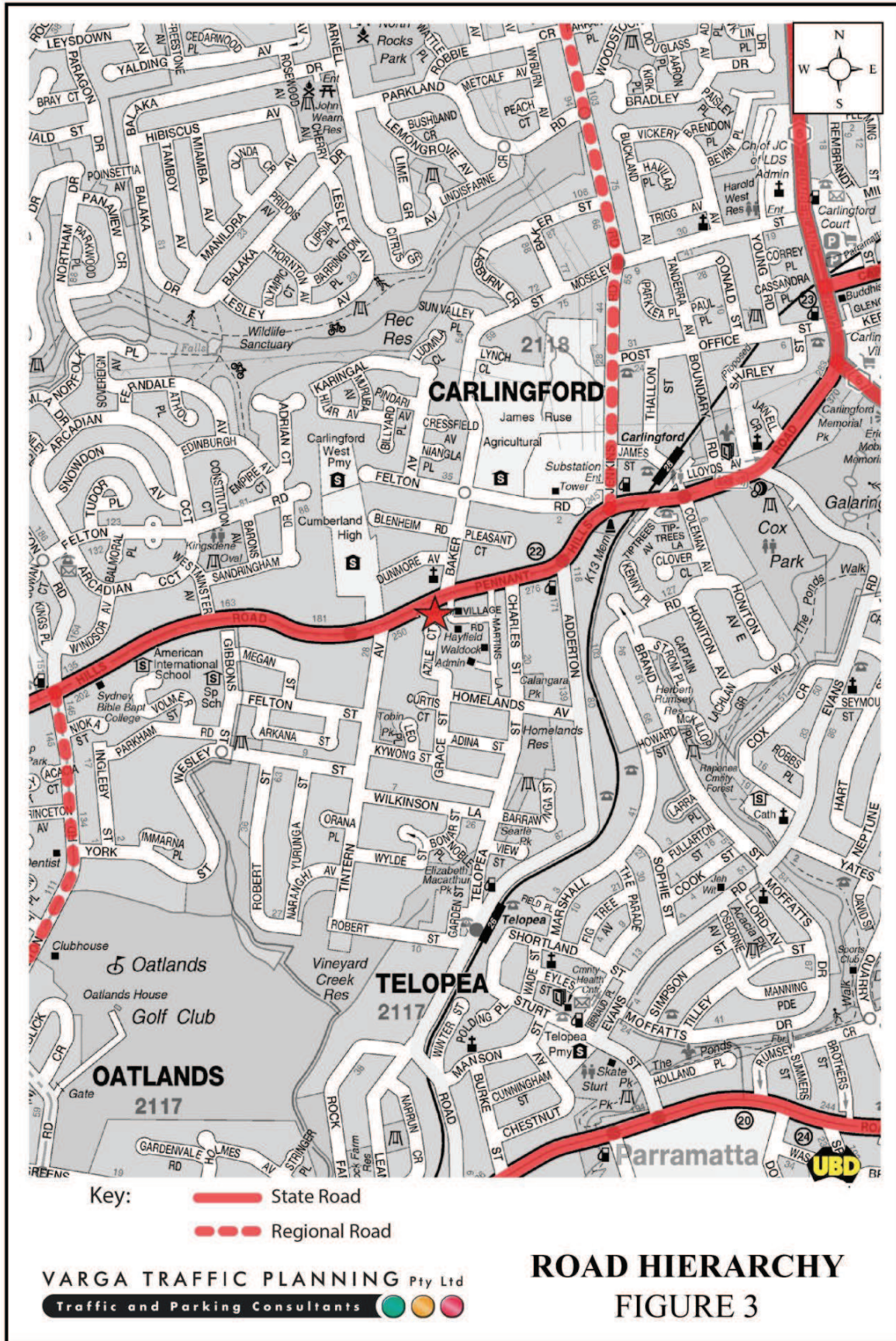
Adderton Road is a local, unclassified road which performs the function of a *collector route* through the local area, linking Pennant Hills Road to Kissing Point Road. It typically carries one traffic lane in each direction with kerbside parking generally permitted.

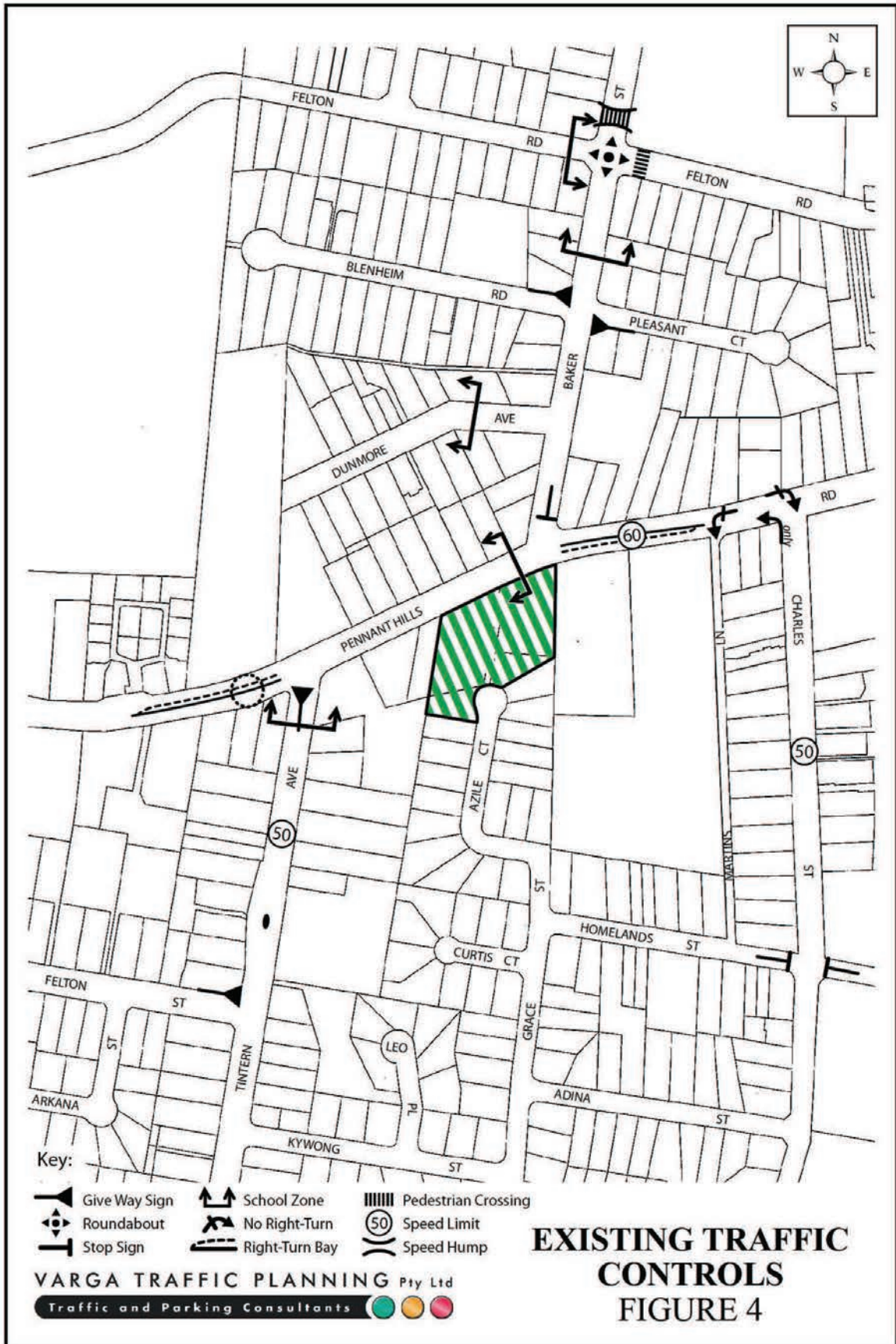
Azile Circuit is a local, unclassified cul-de-sac which are primarily used to provide vehicular and pedestrian access to frontage properties. Kerbside parking is generally permitted on both sides of the road.

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 Pennant Hills Road
- a 50 km/h SPEED LIMIT which applies to all other local roads in the area





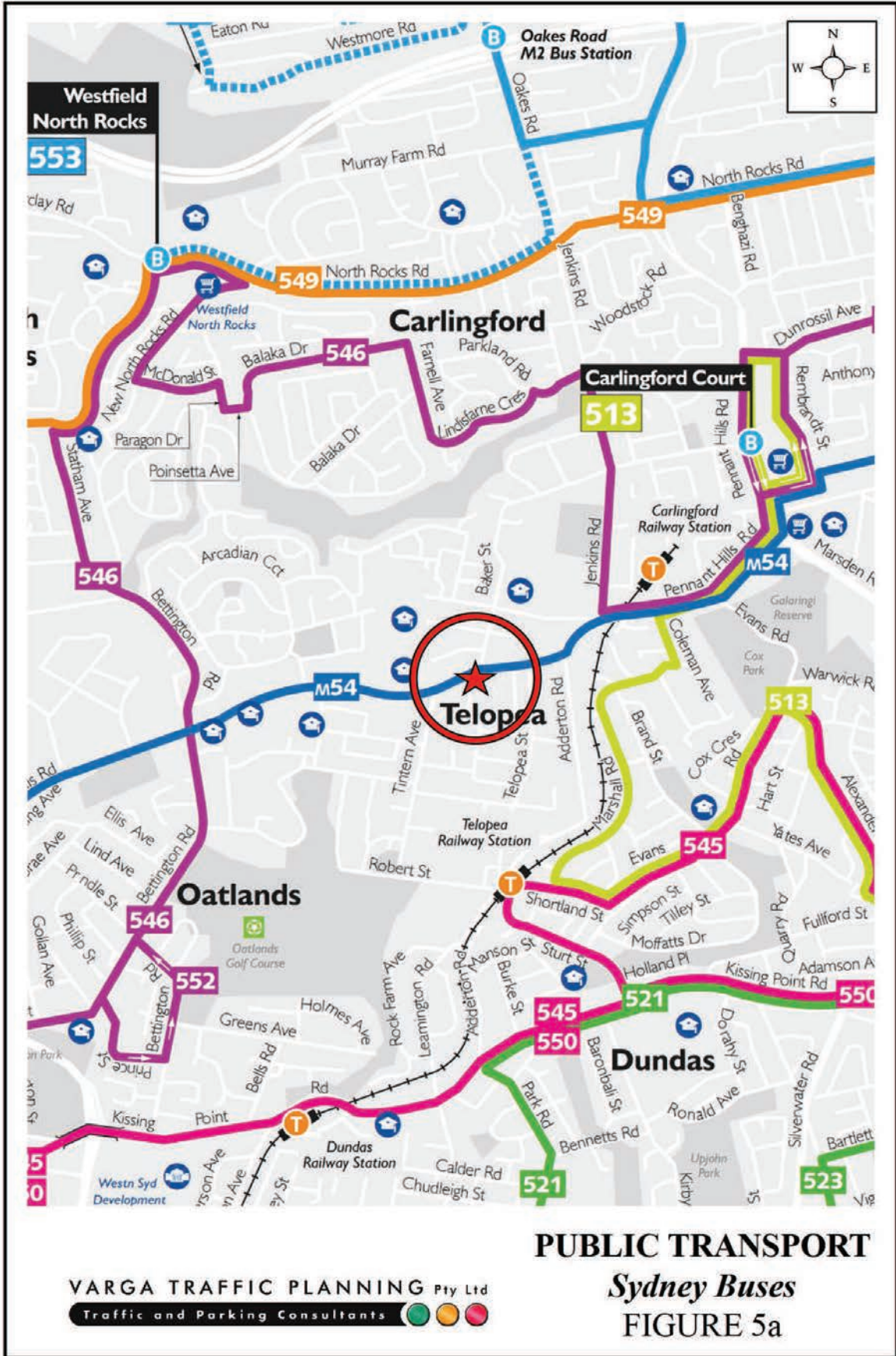
- TRAFFIC SIGNALS in Pennant Hills Road where it intersects with Adderton Road
- a SIGNALISED PEDESTRIAN CROSSING in Pennant Hills Road, just west of Tintern Avenue
- RIGHT TURN HOLDING BAYS in Pennant Hills where it intersects with Tintern Avenue and also Adderton Road.
- a NO RIGHT TURN eastbound restriction in Pennant Hills Road turning onto Charles Street
- a LEFT TURN ONLY restriction in Charles Street turning onto Pennant Hills Road
- STOP SIGNS in Homelands Street where it intersects with Charles Street.

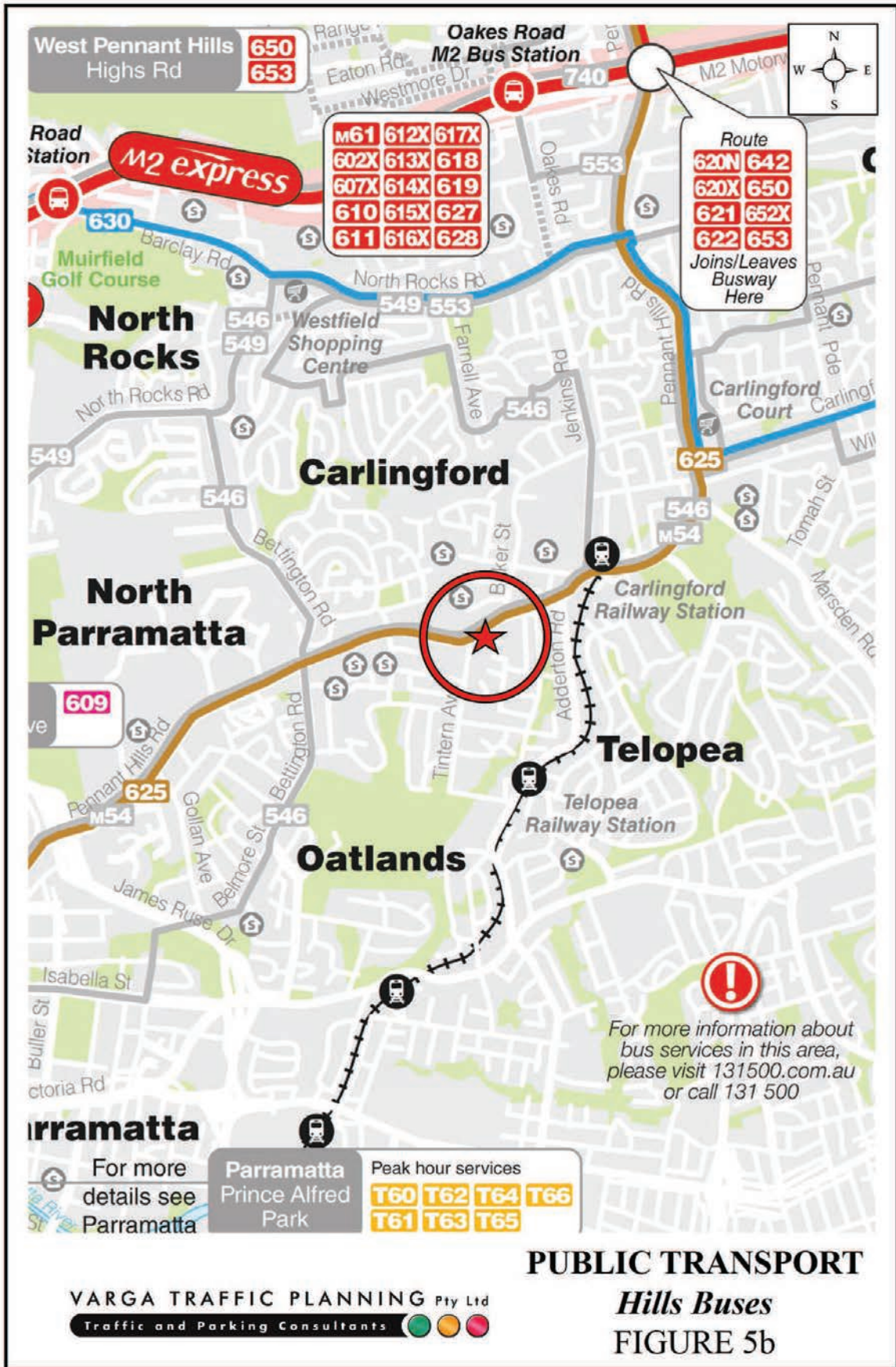
Existing Public Transport Services

The existing public transport bus services available to the site are illustrated on Figure 5a and Figure 5b. There are currently approximately three bus routes travelling within approximately 400m walking distance of the site, including the high-frequency intra-regional *Metrobus M54*. The *M54* service operates between Parramatta Railway Station and Macquarie Park Railway Station seven days per week, with weekday services every 15 minutes (every 10 minutes during the morning and afternoon peak) and weekend services every 20 minutes.

Carlingford Railway Station is situated on the Carlingford Line which operates between Carlingford and Clyde. Passengers change at Clyde for services into and out of the City. Train services operate out of Carlingford Railway Station every 30 minutes during peak periods and every hour during off-peak periods.

The site is therefore considered to be well served by public transport services.





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 Planning Proposal. The traffic surveys were undertaken at the Azile Circuit/Grace Street/Homelands St intersection as well as the Homelands Street/Charles Street intersection. The results of the traffic surveys are reproduced in full in Appendix A and reveal that:

- two-way traffic flows in Azile Street are typically in the order of 10 vehicles per hour (vph) during peak periods
- two-way traffic flows in Grace Street are typically in the order of 30 vph during peak periods
- two-way traffic flows in Homelands Street are typically in the order of 30-40 vph during peak periods west of Charles Street, and in the order of 90-100 vph east of Charles Street
- two-way traffic flows in Charles Street are typically in the order of 150-200 vph during peak periods.

Projected Traffic Generation

An indication of the traffic generation potential of the residential component of the Planning Proposal is provided by reference to the Roads and Maritime Services publication *Technical Direction TDT 2013/04a (August 2013)*.

The RMS's *Technical Direction* is based on extensive surveys of a wide range of land uses and nominates the following traffic generation rates which are applicable to the Planning Proposal:

High Density Residential Flat Buildings

AM: 0.19 peak hour vehicle trips per dwelling

PM: 0.15 peak hour vehicle trips per dwelling

Application of the above traffic generation rates to the potential yield of 150 residential apartments as outlined in the Planning Proposal yields a traffic generation potential of approximately 29 vehicle trips per hour during the *morning* commuter peak period and approximately 23 vehicle trips per hour during the *afternoon* commuter peak period.

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 existing uses of the site, in order to determine the *nett increase (or decrease)* in traffic generation potential of the site which is expected to occur as a consequence of the Planning Proposal.

The RMS's *Technical Direction* nominates the following traffic generation rates which are applicable to the existing dwelling houses on the site:

Low Density Residential Dwellings

AM: 0.95 peak hour vehicle trips per dwelling

PM: 0.99 peak hour vehicle trips per dwelling

Application of the above traffic generation rates to the four existing dwelling houses on the site yields a traffic generation potential of approximately 4 vehicle trips per hour during the *morning* and *afternoon* commuter peak periods.

Accordingly, it is likely that the Planning Proposal will result in a *nett* increase in the traffic generation potential of the site of approximately 25 vph during the *morning* commuter peak period and 19 vph during the *afternoon* commuter peak period as set out below:

Projected Nett Increase in Peak Hour Traffic Generation Potential of the Site as a consequence of the Planning Proposal		
	AM	PM
Projected Future Traffic Generation Potential:	28.5 vph	22.5 vph
Existing Traffic Generation Potential:	-3.8 vph	-4.0 vph
NETT INCREASE IN TRAFFIC GENERATION POTENTIAL:	24.7 vph	18.5 vph

For the purposes of this assessment however, it has been assumed that *all* of the projected future traffic flows of 29 vph during the *morning* commuter peak period and 23 vph during

the *afternoon* commuter peak period will be new or *additional* to the existing traffic flows currently using the adjacent road network.

That projected increase in traffic activity as a consequence of the development proposal is minimal, and will clearly not have any unacceptable traffic implications in terms of road network capacity, nor will any road upgrades/improvements/widening be required.

Environmental Capacity of Residential Streets

Research undertaken by the Roads and Maritime Services has identified a number of environmental capacity performance standards for different types of residential streets, as set out in the table below:

Table 4.6 Environmental Capacity Performance Standards on Residential Streets			
Road Class	Toad Type	Maximum Speed (km/hr)	Maximum Peak Hour Volume (veh/hr)
Local	Access Way	25	100
	Street	40	200 Environmental Goal 300 Maximum
Collector	Street	50	300 Environmental Goal 500 Maximum

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

As noted in the foregoing, existing traffic flows in Azile Circuit are typically in the order of 10 vph during the morning and afternoon commuter peak periods.

The cumulative traffic flows in Azile Street as a consequence of the Planning Proposal are therefore expected to be in the order of 40 vph, *well below* the threshold of 200 vph which is the environmental goal for a local residential street.

Traffic Implications - Road Network Capacity

The traffic implications of Planning Proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network.

Those effects can be assessed using the SIDRA program which is widely used by the RMS and many LGA's for this purpose. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

The results of the SIDRA analysis of the Azile Circuit/Grace Street/Homelands Street intersection are reproduced in Appendix B, revealing that:

- the Azile Circuit/Grace Street/Homelands Street intersection currently operates at *Level of Service "A"* under the existing traffic demands with total average vehicle delays in the order of 4 seconds/vehicle
- under the projected future traffic demands expected to be generated by the Planning Proposal, the Azile Circuit/Grace Street/Homelands Street intersection will continue to operate at *Level of Service "A"*, with **zero** increase in average vehicle delays.

The results of the SIDRA analysis of the Homelands Street/Charles Street intersection are also reproduced in Appendix B, revealing that:

- the Homelands Street/Charles Street intersection currently operates at *Level of Service "A"* under the existing traffic demands with total average vehicle delays in the order of 3 seconds/vehicle
- under the projected future traffic demands expected to be generated by the Planning Proposal, the Homelands Street/Charles Street intersection will continue to operate at *Level of Service "A"*, with increases in average vehicle delays of **less than** 1 second/vehicle.

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 ASSESSMENT

Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site comprise:

- CLEARWAY restrictions along both sides of Pennant Hills Road during the morning and afternoon commuter peak periods
- NO PARKING restrictions along both sides of Pennant Hills Road at all other times
- generally UNRESTRICTED kerbside parking along both sides of Azile Street and throughout the local area
- BUS ZONES located at regular intervals along both sides of Pennant Hills Road.

Off-Street Car Parking Provisions

The off-street car parking requirements applicable to the Planning Proposal are specified in *Parramatta Development Control Plan 2011, Section 3.6 Movement and Circulation* document in the following terms:

Residential Flat Buildings*

1 space per 1 bedroom unit

1.25 spaces per 2 bedroom unit

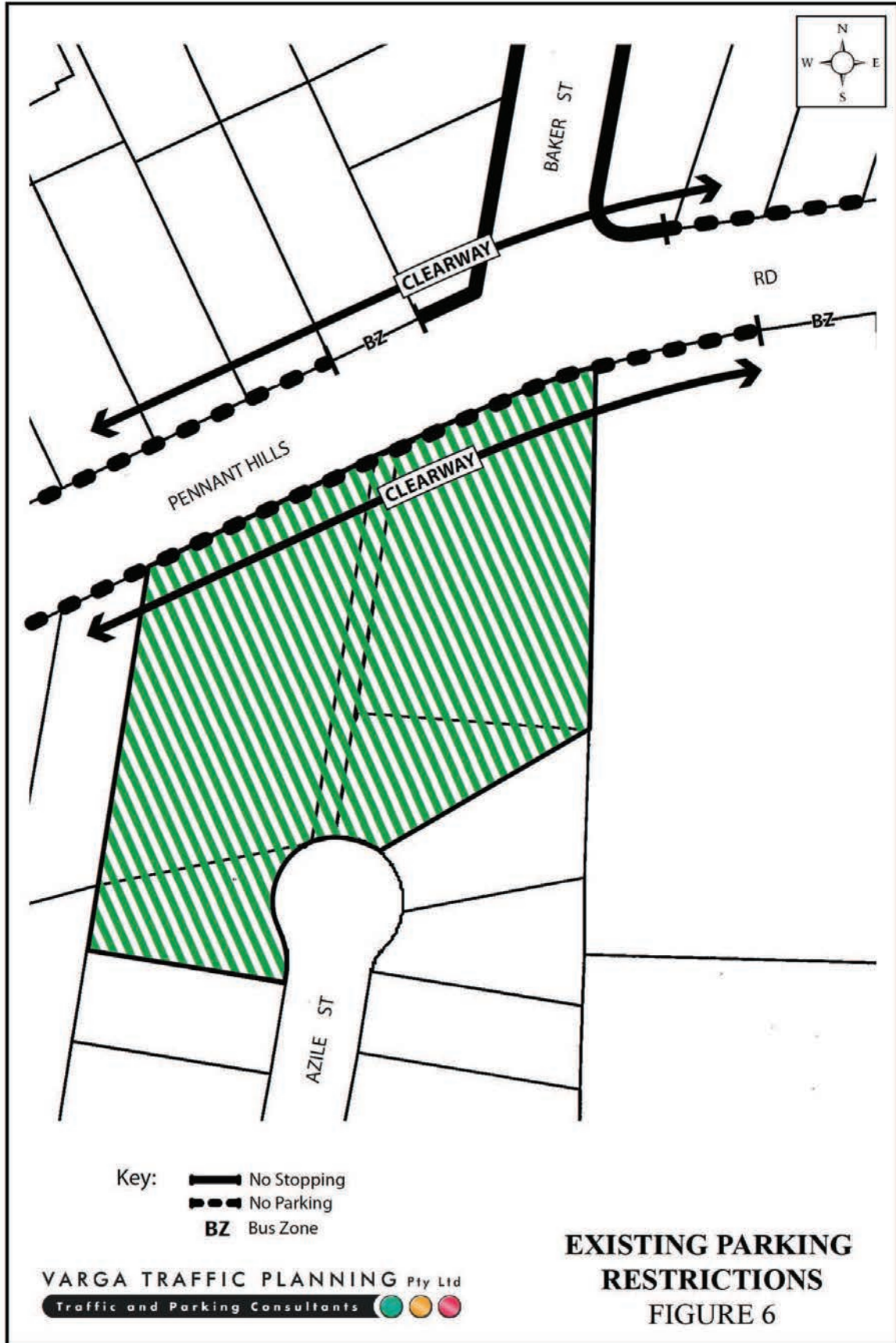
1.5 spaces per 3 bedroom unit

plus 0.25 space per dwelling for visitor parking

a car wash bay which may also be a visitor space

*Not within 400 metres walking distance of a Transitway bus stop with a service frequency of an average of 10 minutes or less during the morning peak hour (7am-9am) in either direction, or of a railway station.

Whilst the precise unit mix of the development is not yet known it is expected to be split approximately 40/50/10 for 1/2/3 bedroom apartments respectively.



Accordingly, application of the above parking requirements to the potential yield of 150 residential apartments as outlined in the Planning Proposal yields an off-street car parking requirement of 194 spaces as set out below:

Residents (150 apartments):	156.3 spaces
Visitors:	37.5 spaces
TOTAL:	193.8 spaces

Notwithstanding, the subject site is located within 800 metres of a railway station in the Sydney metropolitan area, and therefore the residential component of the Planning Proposal is also 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 drawn between the off-street car parking requirements for residential flat buildings outlined in the *Parramatta DCP 2011* and also the *RMS Guidelines* to determine the *lesser* requirement. The relevant car parking rates outlined in the *RMS Guidelines* are reproduced below:

High Density Residential Flat Buildings in Metropolitan Sub-Regional Centres

- 0.6 spaces per 1 bedroom unit
- 0.9 spaces per 2 bedroom unit
- 1.4 spaces per 3 bedroom unit
- 1 space per 5 units for visitor parking

Accordingly, the minimum off-street car parking requirement applicable to the Planning Proposal is 155 spaces, comprising 125 residential spaces and 30 visitor spaces, as set out below:

	Parramatta DCP 2011	RMS Guidelines
Residents:	156.3 spaces	124.5 spaces
Visitors:	37.5 spaces	30.0 spaces
Total:	193.8 spaces	154.5 spaces
Lesser Car Parking Requirement: 155 spaces		

Notwithstanding, preliminary design calculations indicate that the proposed development’s basement car parking area could accommodate in the order of 210 off-street parking spaces. In any event, the proposed development will ultimately satisfy the relevant parking requirements.

The geometric design layout of the future car parking facilities will ultimately be designed to comply with Standards Australia publication *Parking Facilities Part 1 - Off-Street Car Parking AS2890.1* and *Parking Facilities Part 6 - Off-Street Parking for People with Disabilities AS2890.6*.

Off-Street Bicycle Parking Provisions

The off-street bicycle parking requirements applicable to the Planning Proposal is specified in the *Parramatta DCP 2011, Section 3.6* in the following terms:

Residential Flat Buildings

1 bicycle space per 2 dwellings

That projected level of future bicycle parking will also ultimately be provided in accordance with Council's requirements and designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 3 – Bicycle Parking Facilities AS2890.3*.

Conclusion

The Planning Proposal seeks to amend the existing planning controls on the subject site to permit a high density residential uses, resulting in a potential yield of 150 residential apartments. Based on the analysis and discussions presented within this report, the following conclusions are made:

- the Planning Proposal is expected to have a traffic generation potential of approximately 29 vph during the AM commuter peak period and 23 vph during the PM commuter peak period
- the capacity analysis of nearby intersections using the SIDRA capacity analysis program indicates that:
 - the projected additional traffic flows will not have any adverse effects on the operational performance on the nearby Azile Circuit/Grace Street/Homelands Street intersection or the Homelands Street/Charles Street intersection, and
 - no road improvements or intersection upgrades would be required as a consequence of the Planning Proposal

- the future design will accommodate all of the required off-street parking within a new basement car parking area and comply with all relevant standards and guidelines.

In summary, the future parking facilities are capable of satisfying the relevant requirements specified in both Council's Parking Code, the RMS *Guidelines* as well as the Australian Standards (with detailed analysis to be undertaken at DA stage), and it is therefore concluded that the planning proposal will not have any unacceptable parking implications.

APPENDIX A

TRAFFIC SURVEY DATA



R.O.A.R. DATA

Reliable, Original & Authentic Results

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Mobile 0418239019

Client : Varga Traffic Planning

Job No/Name : 6048 CARLINGFORD Homelands Ave

Day/Date : Monday 2nd May 2016

PEDS	NORTH		EAST		SOUTH	
	Grace St	Grace St	Homelands Ave	Homelands Ave	Grace St	Grace St
Peak Per						
0630 - 0730	0	0	1	0	0	1
0645 - 0745	0	0	0	0	0	0
0700 - 0800	0	0	0	0	1	1
0715 - 0815	0	0	0	0	1	1
0730 - 0830	0	0	0	0	1	1
0745 - 0845	0	0	0	0	1	1
0800 - 0900	0	0	0	0	0	0
0815 - 0915	0	0	0	0	0	0
0830 - 0930	0	0	0	0	0	0
PEAK HR	0	0	0	0	0	0

Combined	NORTH			EAST			SOUTH		
	Grace St	Grace St	Grace St	Homelands Ave	Homelands Ave	Homelands Ave	Grace St	Grace St	Grace St
Time Per									
0630 - 0645	1	0	0	0	0	0	4	0	5
0645 - 0700	0	2	0	0	0	0	1	0	3
0700 - 0715	0	0	0	0	0	0	3	0	3
0715 - 0730	2	0	0	0	1	3	0	0	6
0730 - 0745	0	1	0	0	0	4	0	5	
0745 - 0800	0	1	0	0	1	1	0	3	
0800 - 0815	0	2	1	3	5	0	11		
0815 - 0830	1	1	0	1	5	0	8		
0830 - 0845	0	2	1	2	3	0	8		
0845 - 0900	3	0	0	4	5	1	13		
0900 - 0915	1	0	0	3	4	0	8		
0915 - 0930	0	1	0	1	3	0	5		
Per End	8	10	2	16	41	1	78		

Heavies	NORTH		EAST		SOUTH	
	Grace St	Grace St	Homelands Ave	Homelands Ave	Grace St	Grace St
Time Per						
0630 - 0645	0	0	0	0	0	0
0645 - 0700	0	0	0	0	0	0
0700 - 0715	0	0	0	0	0	0
0715 - 0730	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0
0800 - 0815	0	0	0	0	0	0
0815 - 0830	0	0	0	0	0	0
0830 - 0845	0	0	0	0	0	0
0845 - 0900	0	0	0	0	0	0
0900 - 0915	0	0	0	0	0	0
0915 - 0930	0	0	0	0	0	0
Per End	0	0	0	0	0	0

Heavies	NORTH		EAST		SOUTH	
	Grace St	Grace St	Homelands Ave	Homelands Ave	Grace St	Grace St
Time Per						
0630 - 0645	0	0	0	0	0	0
0645 - 0700	0	0	0	0	0	0
0700 - 0715	0	0	0	0	0	0
0715 - 0730	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0
0800 - 0815	0	0	0	0	0	0
0815 - 0830	0	0	0	0	0	0
0830 - 0845	0	0	0	0	0	0
0845 - 0900	0	0	0	0	0	0
0900 - 0915	0	0	0	0	0	0
0915 - 0930	0	0	0	0	0	0
Per End	0	0	0	0	0	0

Lights	NORTH		EAST		SOUTH	
	Grace St	Grace St	Homelands Ave	Homelands Ave	Grace St	Grace St
Peak Per						
0630 - 0730	3	2	0	1	11	0
0645 - 0745	2	3	0	0	11	0
0700 - 0800	2	2	0	2	11	0
0715 - 0815	2	4	1	5	13	0
0730 - 0830	1	5	1	5	15	0
0745 - 0845	1	6	2	7	14	0
0800 - 0900	4	5	2	10	18	1
0815 - 0915	5	3	1	10	17	1
0830 - 0930	4	3	1	10	15	1
PEAK HR	4	5	2	10	18	1

Lights	NORTH		EAST		SOUTH	
	Grace St	Grace St	Homelands Ave	Homelands Ave	Grace St	Grace St
Peak Per						
0630 - 0730	3	2	0	0	0	0
0645 - 0745	2	3	0	0	0	0
0700 - 0800	2	2	0	0	0	0
0715 - 0815	2	4	1	5	13	0
0730 - 0830	1	5	1	5	15	0
0745 - 0845	1	6	2	7	14	0
0800 - 0900	4	5	2	10	18	1
0815 - 0915	5	3	1	10	17	1
0830 - 0930	4	3	1	10	15	1
PEAK HR	4	5	2	10	18	1

Lights	NORTH		EAST		SOUTH	
	Grace St	Grace St	Homelands Ave	Homelands Ave	Grace St	Grace St
Peak Per						
0630 - 0730	3	2	0	1	11	0
0645 - 0745	2	3	0	1	11	0
0700 - 0800	2	2	0	2	11	0
0715 - 0815	2	4	1	5	13	0
0730 - 0830	1	5	1	5	15	0
0745 - 0845	1	6	2	7	14	0
0800 - 0900	4	5	2	10	18	1
0815 - 0915	5	3	1	10	17	1
0830 - 0930	4	3	1	10	15	1
PEAK HR	4	5	2	10	18	1



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6048 CARLINGFORD Homelands Ave

Day/Date : Monday 2nd May 2016

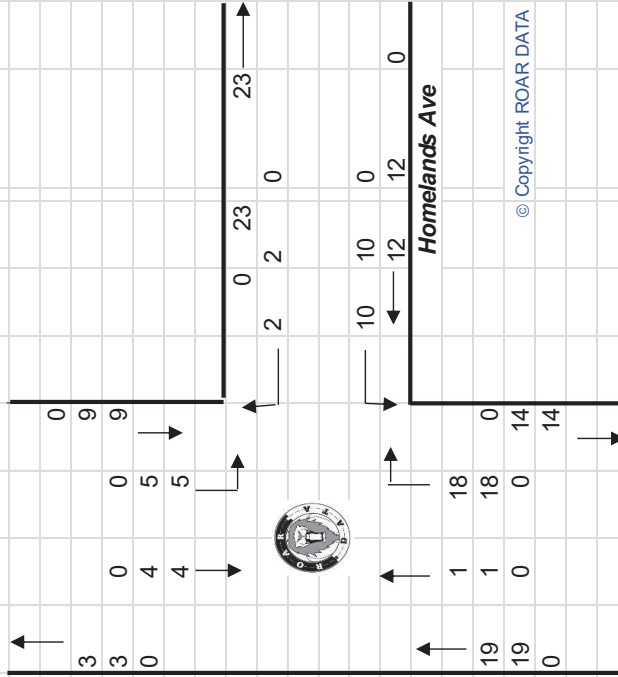
1	2	3
4	5	6
7	8	9

AM PEAK
0800 - 0900

TOTAL VOLUMES
FOR COUNT
PERIOD

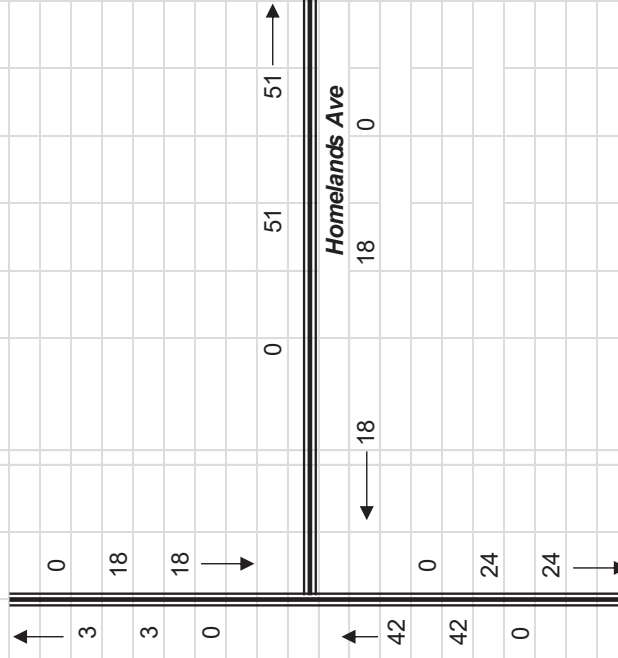


Grace St



Grace St

Grace St



Grace St



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6048 CARLINGFORD Homelands Ave

Day/Date : Monday 2nd May 2016

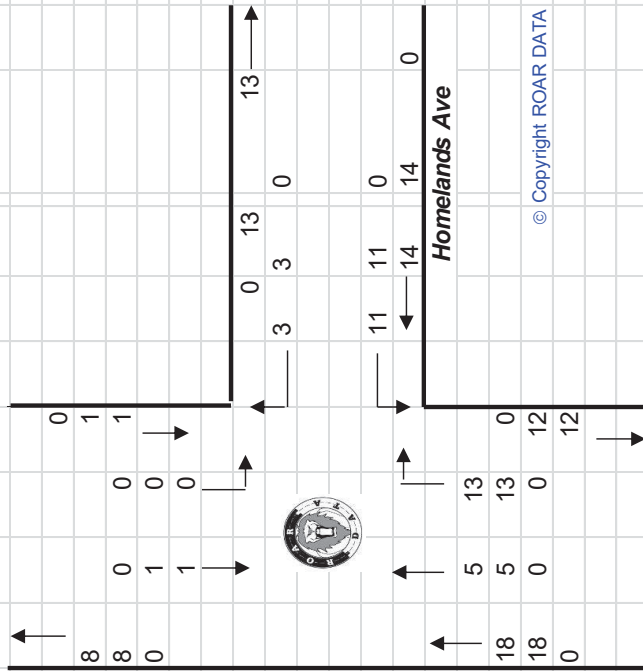
1	2	3
4	5	6
7	8	9

PM PEAK
1700 - 1800

TOTAL VOLUMES
FOR COUNT
PERIOD

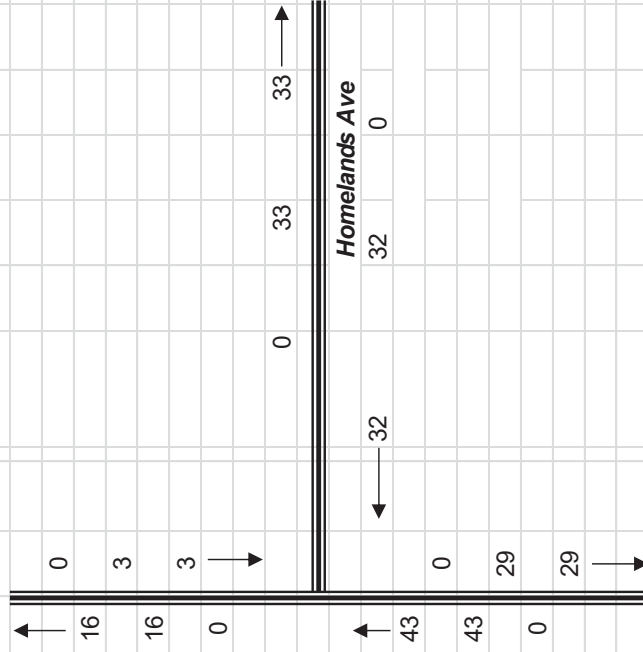


Grace St



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Grace St



Grace St



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning

Job No/Name : 6048 CARLINGFORD Homelands Ave

Day/Date : Monday 2nd May 2016



Grace St

Intersection Details

Obtained via satellite

May be incorrect

No signage or line markings

**AM PEAK HOUR
0800 - 0900**

Combined figures only

T	L	
4	5	AM
1	0	PM

R	3	PM
L	2	AM
	11	10

T	5	13	PM
	1	18	AM
			R

Homelands Ave

**PM PEAK HOUR
1700 - 1800**



Weather >>>

Grace St



R.O.A.R. DATA

Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6048 CARLINGFORD Homelands Ave
Day/Date : Monday 2nd May 2016

Lights	NORTH Charles St			WEST Homelands Ave			SOUTH Telopea St			EAST Homelands Ave			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
	Time Per	4	1	0	1	1	1	2	4	12	0	3	
0630 - 0645	5	4	0	1	3	0	2	5	7	1	2	1	31
0645 - 0700	5	4	0	1	7	1	2	5	9	0	0	5	39
0700 - 0715	3	4	1	2	2	0	2	8	8	2	0	2	34
0715 - 0730	2	5	0	3	1	2	2	19	6	1	0	8	47
0730 - 0745	4	10	0	1	1	2	1	28	7	3	2	8	67
0745 - 0800	3	11	2	1	3	2	2	26	8	3	4	14	79
0800 - 0815	2	8	1	2	1	0	2	19	7	1	3	8	54
0815 - 0830	7	6	3	1	2	1	0	35	6	2	1	7	71
0830 - 0845	5	7	2	1	3	1	1	27	11	3	1	5	57
0845 - 0900	2	7	1	1	1	2	3	17	4	3	0	11	62
0900 - 0915	4	6	0	0	2	1	2	19	4	3	1	10	52
0915 - 0930	43	76	11	29	12	12	21	212	89	22	17	79	622
Period End													

Lights												
NORTH Charles St			WEST Homelands Ave			SOUTH Telopea St			EAST Homelands Ave			TOT
L	I	R	L	I	R	L	I	R	L	I	R	
16	35	6	5	7	5	5	108	28	9	10	37	271
PEAK HOUR												

Heavies	NORTH Charles St			WEST Homelands Ave			SOUTH Telopea St			EAST Homelands Ave			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
	Time Per	0	0	0	0	0	0	0	0	0	0	0	
0630 - 0645	0	0	0	0	0	0	0	0	0	0	0	0	0
0645 - 0700	0	0	0	0	0	0	0	0	0	0	0	0	0
0700 - 0715	0	0	0	0	0	0	0	0	0	0	0	0	0
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0815	0	0	0	0	0	0	0	0	0	0	0	0	0
0815 - 0830	0	0	0	0	0	0	0	0	0	0	0	0	0
0830 - 0845	0	0	0	0	0	0	0	0	0	0	0	0	0
0845 - 0900	0	0	0	0	0	0	0	0	0	0	0	0	0
0900 - 0915	0	0	0	0	0	0	0	0	0	0	0	0	0
0915 - 0930	0	0	0	0	0	0	0	0	0	0	0	0	0
Period End	0	0	0	0	0	0	0	0	0	0	0	0	0

Lights												
NORTH Charles St			WEST Homelands Ave			SOUTH Telopea St			EAST Homelands Ave			TOT
L	I	R	L	I	R	L	I	R	L	I	R	
0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR												

Combined	NORTH Charles St			WEST Homelands Ave			SOUTH Telopea St			EAST Homelands Ave			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
	Time Per	14	16	2	4	13	2	8	22	36	3	5	
0630 - 0730	15	17	1	4	15	2	8	37	30	4	2	16	151
0645 - 0745	14	23	1	4	13	4	7	60	30	6	2	23	187
0700 - 0800	12	30	3	4	9	5	7	81	29	9	6	32	227
0715 - 0815	11	34	3	4	8	5	7	92	28	8	9	38	247
0730 - 0830	16	35	6	5	7	5	5	108	28	9	10	37	271
0745 - 0845	17	32	8	5	9	4	5	97	32	9	9	34	261
0800 - 0900	16	28	7	5	7	4	6	98	28	9	5	31	244
0815 - 0915	18	26	6	3	8	5	6	98	25	11	3	33	242
0830 - 0930	16	35	6	5	7	5	5	108	28	9	10	37	271
Period End													



R.O.A.R. DATA

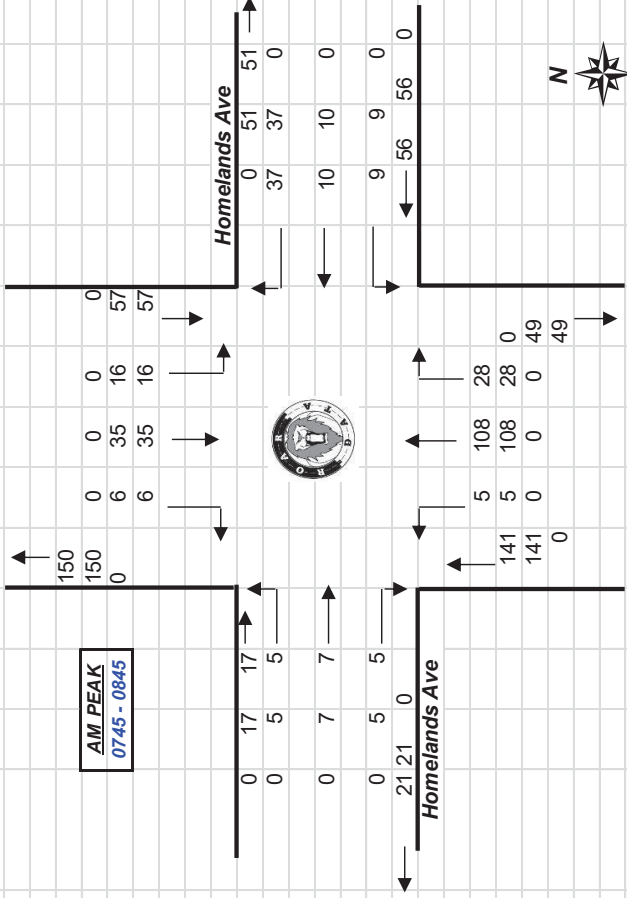
Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
 Job No/Name : 6048 CARLINGFORD Homelands Ave
 Day/Date : Monday 2nd May 2016

AM PEAK
0745 - 0845

Charles St



TOTAL VOLUMES FOR COUNT PERIOD

Peds	NORTH		WEST		SOUTH		EAST	
	Charles St	UNCLASSIFIED	Homelands Ave	UNCLASSIFIED	Telopea St	UNCLASSIFIED	Homelands Ave	UNCLASSIFIED
Time Per	1	0	2	2	1	3	0	0
0630 - 0645	1	0	2	2	1	3	0	0
0645 - 0700	0	0	2	2	1	3	0	0
0700 - 0715	0	0	1	1	1	3	0	0
0715 - 0730	0	0	1	1	1	3	0	0
0730 - 0745	0	0	1	1	0	0	0	0
0745 - 0800	1	0	1	1	0	0	0	0
0800 - 0815	0	0	1	1	1	2	0	0
0815 - 0830	0	0	0	0	2	2	1	0
0830 - 0845	0	0	0	0	3	3	1	0
0845 - 0900	0	0	0	0	2	2	0	0
0900 - 0915	0	0	3	3	1	1	0	0
0915 - 0930	0	0	0	0	1	1	0	0
Period End	2	0	12	12	16	16	3	3
TOT	1	0	5	5	3	3	0	0

Peds	NORTH		WEST		SOUTH		EAST	
	Charles St	UNCLASSIFIED	Homelands Ave	UNCLASSIFIED	Telopea St	UNCLASSIFIED	Homelands Ave	UNCLASSIFIED
Peak Per	1	0	6	6	3	6	1	1
0630 - 0730	1	0	6	6	3	6	1	1
0645 - 0745	1	0	5	5	2	2	1	1
0700 - 0800	1	0	4	4	2	2	1	1
0715 - 0815	1	0	3	3	3	3	1	1
0730 - 0830	1	0	2	2	6	6	2	2
0745 - 0845	0	0	1	1	8	8	2	2
0800 - 0900	0	0	3	3	8	8	2	2
0815 - 0915	0	0	3	3	7	7	1	1
0830 - 0930	0	0	2	2	6	6	2	2
PEAK HR	1	0	2	2	6	6	2	2
TOT	1	0	14	14	10	10	8	8

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R.O.A.R DATA

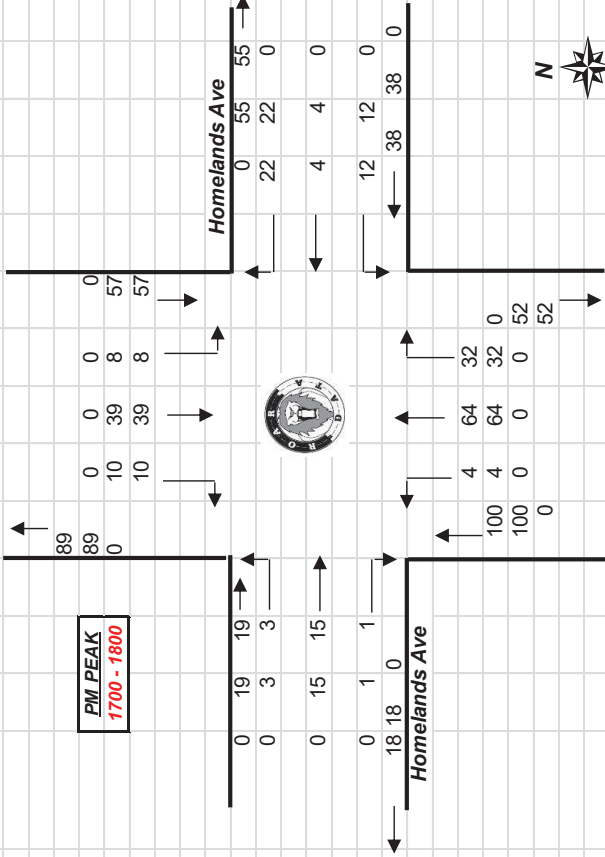
Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
 Job No/Name : 6048 CARLINGFORD Homelands Ave
 Day/Date : Monday 2nd May 2016

PM PEAK
1700 - 1800

Charles St



TOTAL VOLUMES FOR COUNT PERIOD

Charles St

Telopea St

Homelands Ave

Homelands Ave

Homelands Ave

Telopea St

Peds	NORTH		WEST		SOUTH		EAST	
	Charles St	UNCLASSIFIED	Homelands Ave	UNCLASSIFIED	Telopea St	UNCLASSIFIED	Homelands Ave	UNCLASSIFIED
1530 - 1545	0	1	0	0	0	0	0	1
1545 - 1600	0	0	0	0	0	0	0	0
1600 - 1615	1	1	1	3	1	1	6	6
1615 - 1630	0	0	0	0	0	0	0	0
1630 - 1645	0	4	4	0	1	1	5	5
1645 - 1700	0	1	1	0	2	2	2	2
1700 - 1715	0	7	7	6	6	2	15	15
1715 - 1730	0	1	1	0	0	1	2	2
1730 - 1745	0	1	1	4	4	0	5	5
1745 - 1800	0	2	2	1	1	0	3	3
1800 - 1815	0	0	0	0	0	0	0	0
1815 - 1830	0	0	0	0	0	0	0	0
Period End	1	18	18	14	14	6	39	39

Peds	NORTH		WEST		SOUTH		EAST	
	Charles St	UNCLASSIFIED	Homelands Ave	UNCLASSIFIED	Telopea St	UNCLASSIFIED	Homelands Ave	UNCLASSIFIED
1530 - 1630	1	2	2	3	3	1	7	7
1545 - 1645	1	5	5	3	3	2	11	11
1600 - 1700	1	6	6	3	3	3	13	13
1615 - 1715	0	12	12	6	6	4	22	22
1630 - 1730	0	13	13	6	6	5	24	24
1645 - 1745	0	10	10	10	10	4	24	24
1700 - 1800	0	11	11	11	11	3	25	25
1715 - 1815	0	4	4	5	5	1	10	10
1730 - 1830	0	3	3	5	5	0	8	8
PEAK HR	0	11	11	11	11	3	25	25



R.O.A.R. DATA

Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6048 CARLINGFORD Homelands Ave
Day/Date : Monday 2nd May 2016



Intersection Details

Obtained via satellite
May be incorrect

AM PEAK HOUR
0745 - 0845

Combined figures only

Homelands Ave

Homelands Ave

Charles St



	AM	PM	L	T	R
	5	3	3	15	1
	7	7	15	1	1
	5	5	1	1	1

	R	T	L	AM	PM
	6	35	16	16	8
	10	39	8	8	8

	R	T	L	AM	PM
	22	4	10	9	9
	4	10	9	9	9

	PM	AM	L	T	R
	4	64	32	28	28
	5	108	28	28	28



PM PEAK HOUR
1700 - 1800



Weather >>>

Telopea St

APPENDIX B

SIDRA MOVEMENT SUMMARIES

MOVEMENT SUMMARY

▽ Site: Existing AM

Azile Cct, Grace St & Homelands Ave, Carlingford
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Grace St (S)											
2	T1	1	0.0	0.011	0.0	LOS A	0.0	0.3	0.05	0.50	47.1
3	R2	18	0.0	0.011	4.6	LOS A	0.0	0.3	0.05	0.50	46.5
Approach		19	0.0	0.011	4.4	NA	0.0	0.3	0.05	0.50	46.5
East: Homelands Ave (E)											
4	L2	10	0.0	0.006	4.6	LOS A	0.0	0.2	0.03	0.52	46.6
6	R2	2	0.0	0.002	4.6	LOS A	0.0	0.0	0.07	0.51	46.3
Approach		12	0.0	0.006	4.6	LOS A	0.0	0.2	0.03	0.52	46.5
North: Azile Cct (N)											
7	L2	5	0.0	0.005	4.6	LOS A	0.0	0.0	0.00	0.30	47.9
8	T1	4	0.0	0.005	0.0	LOS A	0.0	0.0	0.00	0.30	48.3
Approach		9	0.0	0.005	2.5	NA	0.0	0.0	0.00	0.30	48.1
All Vehicles		40	0.0	0.011	4.0	NA	0.0	0.3	0.03	0.46	46.8

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

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

MOVEMENT SUMMARY

▽ Site: Existing PM

Azile Cct, Grace St & Homelands Ave, Carlingford
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Grace St (S)											
2	T1	5	0.0	0.010	0.0	LOS A	0.0	0.3	0.02	0.39	47.8
3	R2	13	0.0	0.010	4.6	LOS A	0.0	0.3	0.02	0.39	47.1
Approach		18	0.0	0.010	3.3	NA	0.0	0.3	0.02	0.39	47.3
East: Homelands Ave (E)											
4	L2	11	0.0	0.007	4.6	LOS A	0.0	0.2	0.01	0.52	46.6
6	R2	3	0.0	0.002	4.6	LOS A	0.0	0.1	0.06	0.52	46.3
Approach		14	0.0	0.007	4.6	LOS A	0.0	0.2	0.02	0.52	46.5
North: Azile Cct (N)											
7	L2	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.00	0.27	48.0
8	T1	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.27	48.5
Approach		2	0.0	0.001	2.3	NA	0.0	0.0	0.00	0.27	48.3
All Vehicles		34	0.0	0.010	3.8	NA	0.0	0.3	0.02	0.44	47.0

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

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

MOVEMENT SUMMARY

 **Site: Proposed AM**

Azile Cct, Grace St & Homelands Ave, Carlingford
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Grace St (S)											
2	T1	4	0.0	0.012	0.1	LOS A	0.1	0.4	0.10	0.42	47.3
3	R2	18	0.0	0.012	4.7	LOS A	0.1	0.4	0.10	0.42	46.7
Approach		22	0.0	0.012	3.8	NA	0.1	0.4	0.10	0.42	46.8
East: Homelands Ave (E)											
4	L2	10	0.0	0.006	4.6	LOS A	0.0	0.2	0.06	0.51	46.5
6	R2	5	0.0	0.004	4.7	LOS A	0.0	0.1	0.10	0.51	46.2
Approach		15	0.0	0.006	4.6	LOS A	0.0	0.2	0.07	0.51	46.4
North: Azile Cct (N)											
7	L2	17	0.0	0.017	4.6	LOS A	0.0	0.0	0.00	0.29	47.9
8	T1	15	0.0	0.017	0.0	LOS A	0.0	0.0	0.00	0.29	48.4
Approach		32	0.0	0.017	2.4	NA	0.0	0.0	0.00	0.29	48.2
All Vehicles		69	0.0	0.017	3.3	NA	0.1	0.4	0.05	0.38	47.3

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

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

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Organisation: VARGA TRAFFIC PLANNING | Processed: Tuesday, May 3, 2016 12:35:13 PM

Project: Z:\Data\Jobs01\Jobs\Tram\SIDRA\16259 Pennant Hills Rd, Carlingford\AZI_HOMP.sip6

MOVEMENT SUMMARY

Site: Proposed PM

Azile Cct, Grace St & Homelands Ave, Carlingford
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Grace St (S)											
2	T1	14	0.0	0.015	0.0	LOS A	0.1	0.4	0.03	0.26	48.5
3	R2	13	0.0	0.015	4.6	LOS A	0.1	0.4	0.03	0.26	47.8
Approach		27	0.0	0.015	2.2	NA	0.1	0.4	0.03	0.26	48.1
East: Homelands Ave (E)											
4	L2	11	0.0	0.007	4.6	LOS A	0.0	0.2	0.02	0.52	46.6
6	R2	12	0.0	0.010	4.7	LOS A	0.0	0.2	0.08	0.52	46.2
Approach		23	0.0	0.010	4.6	LOS A	0.0	0.2	0.05	0.52	46.4
North: Azile Cct (N)											
7	L2	3	0.0	0.003	4.6	LOS A	0.0	0.0	0.00	0.27	48.0
8	T1	3	0.0	0.003	0.0	LOS A	0.0	0.0	0.00	0.27	48.5
Approach		6	0.0	0.003	2.3	NA	0.0	0.0	0.00	0.27	48.3
All Vehicles		56	0.0	0.015	3.2	NA	0.1	0.4	0.04	0.37	47.4

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

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

MOVEMENT SUMMARY

STOP Site: Existing AM

Homelands Ave, Charles St & Telopea St, Carlingford
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Telopea St (S)											
1	L2	5	0.0	0.075	4.7	LOS A	0.2	1.2	0.06	0.13	48.6
2	T1	108	0.0	0.075	0.0	LOS A	0.2	1.2	0.06	0.13	49.1
3	R2	28	0.0	0.075	4.7	LOS A	0.2	1.2	0.06	0.13	48.2
Approach		141	0.0	0.075	1.1	NA	0.2	1.2	0.06	0.13	48.9
East: Homelands Ave (E)											
4	L2	9	0.0	0.061	7.6	LOS A	0.2	1.5	0.20	0.93	44.9
5	T1	10	0.0	0.061	8.1	LOS A	0.2	1.5	0.20	0.93	44.6
6	R2	37	0.0	0.061	8.1	LOS A	0.2	1.5	0.20	0.93	44.5
Approach		56	0.0	0.061	8.0	LOS A	0.2	1.5	0.20	0.93	44.6
North: Charles St (N)											
7	L2	16	0.0	0.030	4.7	LOS A	0.0	0.3	0.07	0.20	48.2
8	T1	35	0.0	0.030	0.1	LOS A	0.0	0.3	0.07	0.20	48.6
9	R2	6	0.0	0.030	4.9	LOS A	0.0	0.3	0.07	0.20	47.7
Approach		57	0.0	0.030	1.9	NA	0.0	0.3	0.07	0.20	48.4
West: Homelands Ave (W)											
10	L2	5	0.0	0.017	7.8	LOS A	0.1	0.4	0.25	0.90	45.0
11	T1	7	0.0	0.017	8.0	LOS A	0.1	0.4	0.25	0.90	44.7
12	R2	5	0.0	0.017	8.0	LOS A	0.1	0.4	0.25	0.90	44.6
Approach		17	0.0	0.017	8.0	LOS A	0.1	0.4	0.25	0.90	44.8
All Vehicles		271	0.0	0.075	3.1	NA	0.2	1.5	0.10	0.36	47.6

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

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

MOVEMENT SUMMARY

STOP Site: Existing PM

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Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Telopea St (S)											
1	L2	4	0.0	0.054	4.7	LOS A	0.2	1.3	0.09	0.19	48.2
2	T1	64	0.0	0.054	0.1	LOS A	0.2	1.3	0.09	0.19	48.7
3	R2	32	0.0	0.054	4.7	LOS A	0.2	1.3	0.09	0.19	47.7
Approach		100	0.0	0.054	1.7	NA	0.2	1.3	0.09	0.19	48.4
East: Homelands Ave (E)											
4	L2	12	0.0	0.038	7.6	LOS A	0.1	0.9	0.16	0.93	45.0
5	T1	4	0.0	0.038	7.9	LOS A	0.1	0.9	0.16	0.93	44.7
6	R2	22	0.0	0.038	7.9	LOS A	0.1	0.9	0.16	0.93	44.5
Approach		38	0.0	0.038	7.8	LOS A	0.1	0.9	0.16	0.93	44.7
North: Charles St (N)											
7	L2	8	0.0	0.030	4.7	LOS A	0.1	0.5	0.07	0.17	48.4
8	T1	39	0.0	0.030	0.1	LOS A	0.1	0.5	0.07	0.17	48.8
9	R2	10	0.0	0.030	4.7	LOS A	0.1	0.5	0.07	0.17	47.9
Approach		57	0.0	0.030	1.5	NA	0.1	0.5	0.07	0.17	48.6
West: Homelands Ave (W)											
10	L2	3	0.0	0.018	7.7	LOS A	0.1	0.4	0.22	0.94	45.0
11	T1	15	0.0	0.018	7.8	LOS A	0.1	0.4	0.22	0.94	44.8
12	R2	1	0.0	0.018	7.8	LOS A	0.1	0.4	0.22	0.94	44.6
Approach		19	0.0	0.018	7.8	LOS A	0.1	0.4	0.22	0.94	44.8
All Vehicles		214	0.0	0.054	3.3	NA	0.2	1.3	0.11	0.38	47.4

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

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

MOVEMENT SUMMARY

STOP Site: Proposed AM

Homelands Ave, Charles St & Telopea St, Carlingford
Stop (Two-Way)

Movement Performance - Vehicles											
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South: Telopea St (S)											
1	L2	5	0.0	0.075	4.7	LOS A	0.2	1.2	0.06	0.13	48.6
2	T1	108	0.0	0.075	0.0	LOS A	0.2	1.2	0.06	0.13	49.1
3	R2	28	0.0	0.075	4.7	LOS A	0.2	1.2	0.06	0.13	48.2
Approach		141	0.0	0.075	1.1	NA	0.2	1.2	0.06	0.13	48.9
East: Homelands Ave (E)											
4	L2	9	0.0	0.063	7.6	LOS A	0.2	1.5	0.20	0.93	44.8
5	T1	11	0.0	0.063	8.1	LOS A	0.2	1.5	0.20	0.93	44.6
6	R2	37	0.0	0.063	8.2	LOS A	0.2	1.5	0.20	0.93	44.4
Approach		57	0.0	0.063	8.1	LOS A	0.2	1.5	0.20	0.93	44.5
North: Charles St (N)											
7	L2	16	0.0	0.032	4.7	LOS A	0.1	0.4	0.08	0.21	48.1
8	T1	35	0.0	0.032	0.1	LOS A	0.1	0.4	0.08	0.21	48.5
9	R2	8	0.0	0.032	4.9	LOS A	0.1	0.4	0.08	0.21	47.6
Approach		59	0.0	0.032	2.0	NA	0.1	0.4	0.08	0.21	48.3
West: Homelands Ave (W)											
10	L2	11	0.0	0.028	7.8	LOS A	0.1	0.7	0.25	0.91	45.0
11	T1	13	0.0	0.028	8.1	LOS A	0.1	0.7	0.25	0.91	44.7
12	R2	5	0.0	0.028	8.1	LOS A	0.1	0.7	0.25	0.91	44.6
Approach		29	0.0	0.028	8.0	LOS A	0.1	0.7	0.25	0.91	44.8
All Vehicles		286	0.0	0.075	3.4	NA	0.2	1.5	0.11	0.38	47.4

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

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

MOVEMENT SUMMARY

STOP Site: Proposed PM

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Stop (Two-Way)

Movement Performance - Vehicles											
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South: Telopea St (S)											
1	L2	4	0.0	0.054	4.7	LOS A	0.2	1.3	0.09	0.19	48.2
2	T1	64	0.0	0.054	0.1	LOS A	0.2	1.3	0.09	0.19	48.7
3	R2	32	0.0	0.054	4.7	LOS A	0.2	1.3	0.09	0.19	47.7
Approach		100	0.0	0.054	1.7	NA	0.2	1.3	0.09	0.19	48.4
East: Homelands Ave (E)											
4	L2	12	0.0	0.042	7.6	LOS A	0.1	1.0	0.16	0.93	44.9
5	T1	8	0.0	0.042	7.9	LOS A	0.1	1.0	0.16	0.93	44.7
6	R2	22	0.0	0.042	7.9	LOS A	0.1	1.0	0.16	0.93	44.5
Approach		42	0.0	0.042	7.8	LOS A	0.1	1.0	0.16	0.93	44.7
North: Charles St (N)											
7	L2	8	0.0	0.033	4.7	LOS A	0.1	0.7	0.09	0.20	48.2
8	T1	39	0.0	0.033	0.1	LOS A	0.1	0.7	0.09	0.20	48.6
9	R2	15	0.0	0.033	4.7	LOS A	0.1	0.7	0.09	0.20	47.7
Approach		62	0.0	0.033	1.8	NA	0.1	0.7	0.09	0.20	48.3
West: Homelands Ave (W)											
10	L2	4	0.0	0.021	7.7	LOS A	0.1	0.5	0.22	0.94	45.0
11	T1	17	0.0	0.021	7.9	LOS A	0.1	0.5	0.22	0.94	44.8
12	R2	1	0.0	0.021	7.9	LOS A	0.1	0.5	0.22	0.94	44.6
Approach		22	0.0	0.021	7.8	LOS A	0.1	0.5	0.22	0.94	44.8
All Vehicles		226	0.0	0.054	3.5	NA	0.2	1.3	0.12	0.40	47.3

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

Vehicle movement LOS values are based on average delay per movement

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