Planning Proposal for a
Proposed Mixed Use Development

629-639 Pacific Highway, Chatswood

TRAFFIC AND PARKING ASSESSMENT REPORT

14 March 2018

Ref 17358

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants

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TABLE OF CONTENTS

1. INTRODUCTION 1

2. PLANNING PROPOSAL 5

3. TRAFFIC ASSESSMENT 13

4. PARKING ASSESSMENT 33

APPENDIX A TRAFFIC SURVEY DATA

LIST OF ILLUSTRATIONS

Figure 1 Location
Figure 2 Site
Figure 3 Road Hierarchy
Figure 4 Existing Traffic Controls
Figure 5 Existing Public Transport services
Figure 6 Existing Bicycle Routes
Figure 7 Projected Additional Traffic Flows
Figure 8 Existing Parking Restrictions

1. INTRODUCTION

This report has been prepared to accompany a planning proposal for a mixed use development to be located at 629-639 Pacific Highway, Chatswood (Figures 1 and 2).

The planning proposal involves the rezoning of the land from *B5 – Business Development* to *B4 – Mixed Use,* increasing the permissible FSR from 2.5:1 up to 6:1 and the subsequent increase of height controls from 20m up to 90m. The site is situated approximately 750m walking distance south of Chatswood Railway Station & Bus Interchange and is within easy walking distance to the Chatswood CBD.

The planning proposal envisages the construction of 81 new residential apartments above a ground and first floor level commercial/retail component.

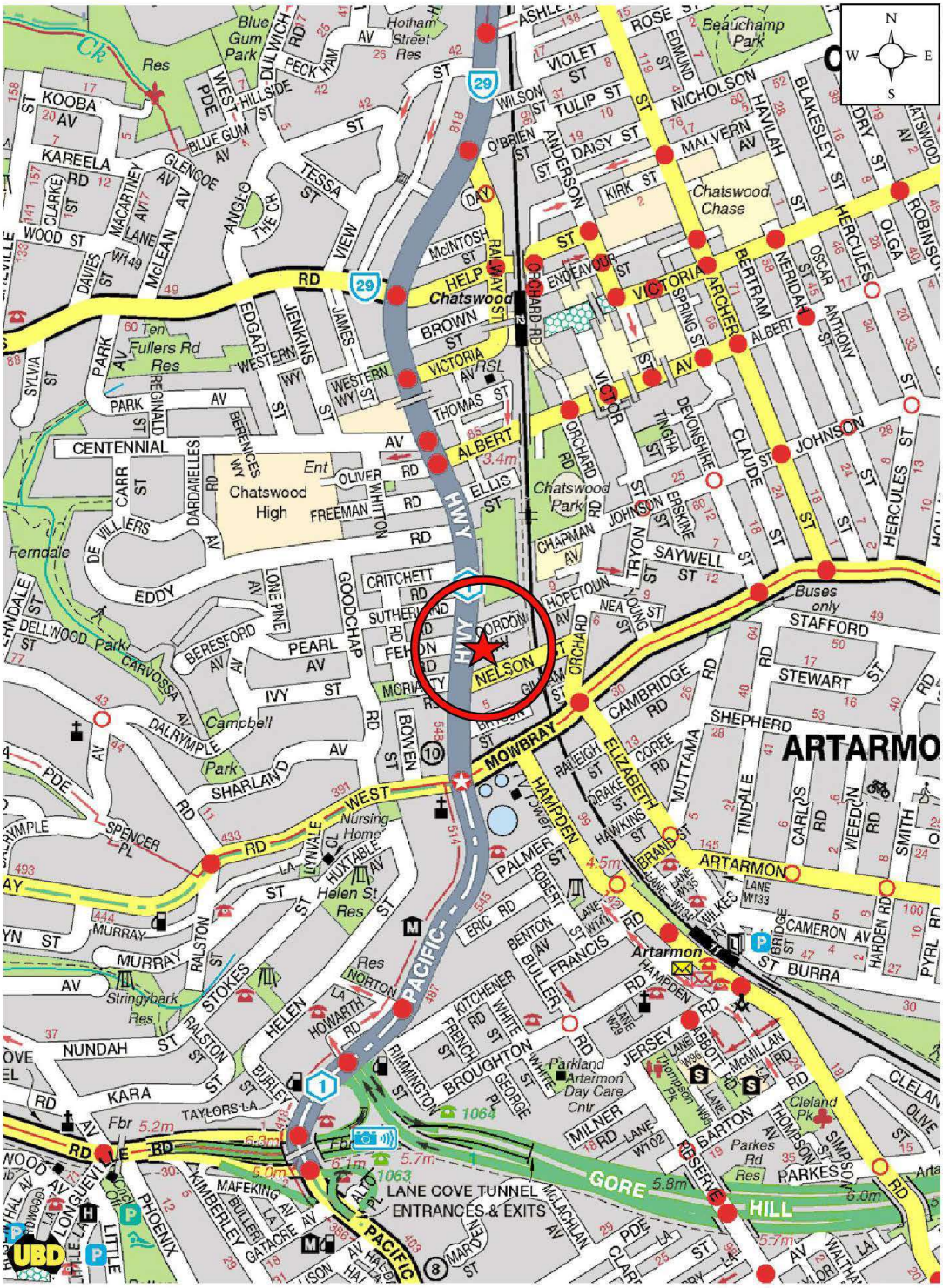
Off-street parking will be provided in a new basement car parking area located beneath the building and will ultimately be designed to comply with Council and *SEPP 65* requirements as well as the relevant Australian Standards. Vehicular access to the site is to be provided via a new entry/exit driveway located at the southern end of the Hammond Lane site frontage.

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 geometric design features of the proposed car parking and loading facilities for compliance with the relevant codes and standards

- assesses the adequacy and suitability of the quantum of off-street car parking and loading provided on the site.



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LOCATION
FIGURE 1

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SITE
FIGURE 2

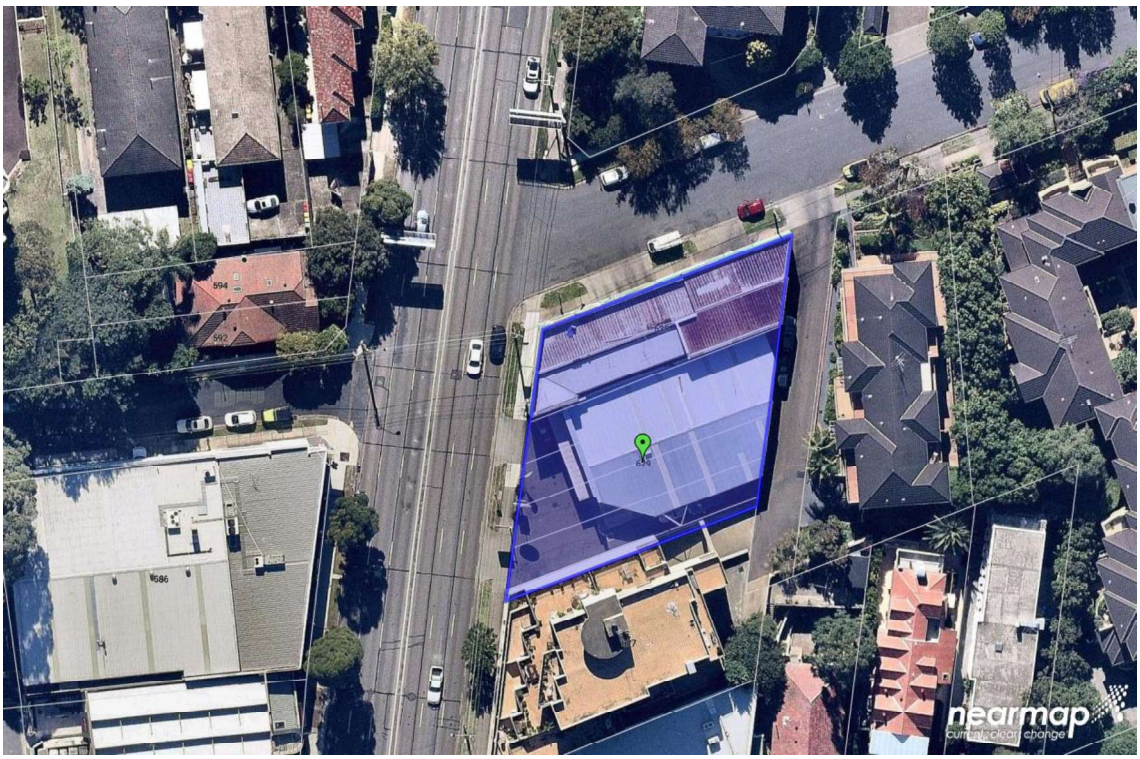
2. PLANNING PROPOSAL

Site

The subject site is located on the south-eastern corner of the Pacific Highway and Gordon Avenue intersection, and extends through to Hammond Lane. The site has street frontages approximately 37m in length to both the Pacific Highway and Hammond Lane and approximately 36m in length to Gordon Avenue. The subject site occupies an area of approximately 1,185m^2.

The site is currently zoned *B5 - Business Development* and is situated approximately 750m walking distance south of Chatswood Railway Station & Bus Interchange via a dedicated off-road path parallel to the railway line.

The site is currently occupied by two commercial buildings operating as a car tyre retail / auto-service workshop. A recent aerial image of the site and its surroundings is reproduced below.



Source: Nearmap

Off-street parking is provided at various locations throughout the site, with vehicular access provided via two driveways located off the Pacific Highway, two driveways located off Gordon Avenue and two driveways located off Hammond Lane.

Existing Planning Controls

The primary instrument that governs the mass and scale of the development on the site are contained within the *Willoughby Local Environment Plan 2012 (WLEP 2012).*

The subject site is currently zoned *B5 - Business Development* and subject to a maximum FSR of 2.5:1, with the scale of any development on the site currently limited to a building height of 20m.

It is therefore envisaged that a six-storey commercial building comprising 2,963m^2 retail/commercial floor space is achievable under the existing planning controls for the site, resulting in an increase of approximately 2,500m^2 GFA.

Notwithstanding the above, it is understood that the site may soon be rezoned to *B4 – Mixed Use Zone,* which would potentially have a prospective yield of approximately 30 apartments with a ground floor level commercial/retail component of approximately 600m^2.

Planning Proposal

The planning proposal involves the rezoning of the land from *B5 – Business Development* to *B4 – Mixed Use,* increasing the permissible FSR from 2.5:1 up to 6:1 and the subsequent increase of height controls from 20m up to 90m. The proposed changes to the planning controls have the potential to achieve approximately 81 apartments as follows:

1 bedroom apartments:	22
2 bedroom apartments:	55
3 bedroom apartments:	4
TOTAL APARTMENTS:	**81**

A number of commercial/retail tenancies are also proposed on the ground and first floor levels of the new building with a cumulative floor area of approximately 705m^2.

Off-street parking will be provided in a new basement car parking area and will ultimately be designed to comply with Council and *SEPP* requirements, as well as the relevant Australian Standards. Vehicular access to the site is to be provided via a new entry/exit driveway located at the southern end of the Hammond Lane site frontage.

State Environmental Planning Policy (Infrastructure) 2007 applies to the site, given its frontage to the Pacific Highway. *Clause 101(2)* of the *Infrastructure SEPP* states the following:

> "The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that:
>
> - where practicable, vehicular access to the land is provided by a road other than the classified road, and
>
> - the safety, efficiency and ongoing operation of the classified road will not adversely be affected by the development as a result of:
>
> (i) the design of the vehicular access to the land, or
> (ii) the emission of smoke or dust from the development, or
> (iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land, and
>
> - the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road."

Consistent with the requirements of *Clause 101(2)*, vehicular access to the site is to be provided via Hammond Lane, rather than the Pacific Highway, and the proposed development therefore complies with the requirements of the *SEPP (Infrastructure) 2007*.

Loading/servicing for the proposed development is expected to be undertaken by a variety of commercial vehicles up to and including 8.8m long MRV medium rigid trucks. A dedicated service area is to be provided on the ground floor level adjacent to the vehicular access driveway which includes a large turntable, thereby allowing all service vehicles to enter and exit the site in a forward direction at all times.

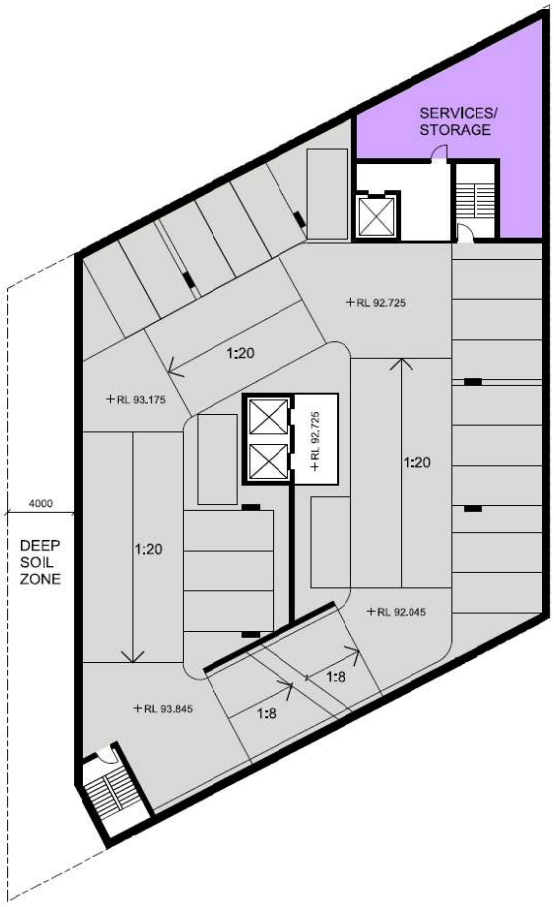
Concept plans of the planning proposal have been prepared by *DEM (Aust) Pty Ltd* and are reproduced in the following pages.

nominated architects: Rudi Valla BArch (Hons) nsw reg no 6582 Jon Pizey BArch nsw reg no 6567

COLOR LEGEND

- COMMUNAL AREA MIN. 25% OF ENTIRE SITE
- PRIVATE OPEN SPACE
- COMMERCIAL/RETAIL
- SERVICES/LOADING STORAGE/PLANT ROOM
- 1 BEDROOM MIN. 50 SQM
- 2 BEDROOM MIN. 70 SQM
- 3 BEDROOM MIN. 90 SQM
- BASEMENT LEVEL

1 TYPICAL BASEMENT PLAN
SCALE 1:250



2 BASEMENT 2
SCALE 1:250

dem

629 - 639 Pacific Highway Chatswood

Reference Concept Diagrams
Council Preferred Scheme

date 20-12-17 | scale 1:250 | drwg no. arsk3001 | proj no. 4445-00 | rev no. -03

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t: (02) 8966 9000 f: (02) 8966 9111
e: sydney@dem.com.au
date 20-12-17
scale 1:250
dwg no. arsk3002
proj no. 4445-00
rev no. -03
1 BASEMENT 1 SCALE 1:250
2 GROUND FLOOR / LEVEL 1 SCALE 1:250
SERVICES/ STORAGE
RETAIL
SERVICES
RESIDENTIAL LOBBY
COMM'L LOBBY
GARBAGE ROOM
LOADING DOCK
SERV CES
LANDSCAPE
DEEP SOIL ZONE
POSSIB.E FUTURE SHARED ACCESS TO BASEMENT
END OF TRIP FACILITIES AMENITIES
1:4
1:8
1:20
4000
3000
RL 95.625
RL 94.945
RL 96.075
RL 96.650
RL 99.750
RL 99.770
RL 99.960
RL 100.110
RL 100.260
RL 100.400
RL 100.000
RL 99.100
RL 99.250
RL 99.330
RL 99.540
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3 BEDROOM MIN. 90 SQM
BASEMENT LEVEL

nominated architects: Rudi Valla BArch (Hons) nsw reg no 6582 Jon Pizey BArch nsw reg no 6567

dem

COLOR LEGEND

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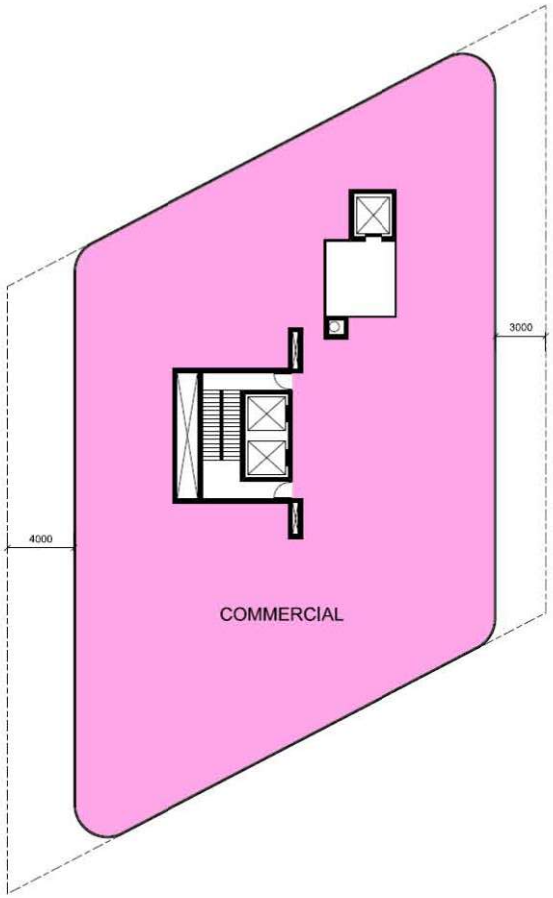
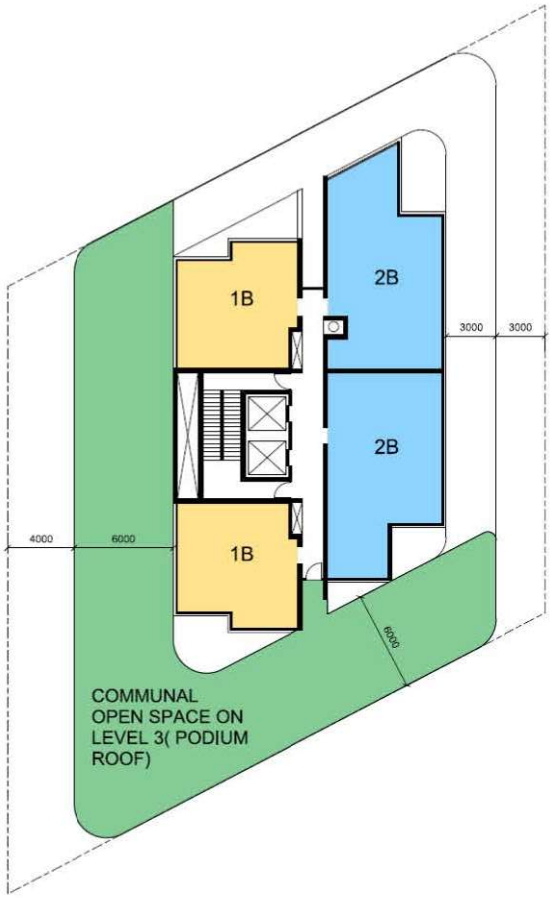
- 2 BEDROOM MIN. 70 SQM
- 3 BEDROOM MIN. 90 SQM
- BASEMENT LEVEL



1 LEVEL 2 FLOOR PLAN
SCALE 1:250



2 TYPICAL FLOOR PLAN L3-L13
SCALE 1:250

629 - 639 Pacific Highway Chatswood

Reference Concept Diagrams
Council Preferred Scheme

date 20-12-17 | scale 1:250 | proj no. 4445-00 | dwg no. arsk3003 | rev no. -03

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COLOR LEGEND

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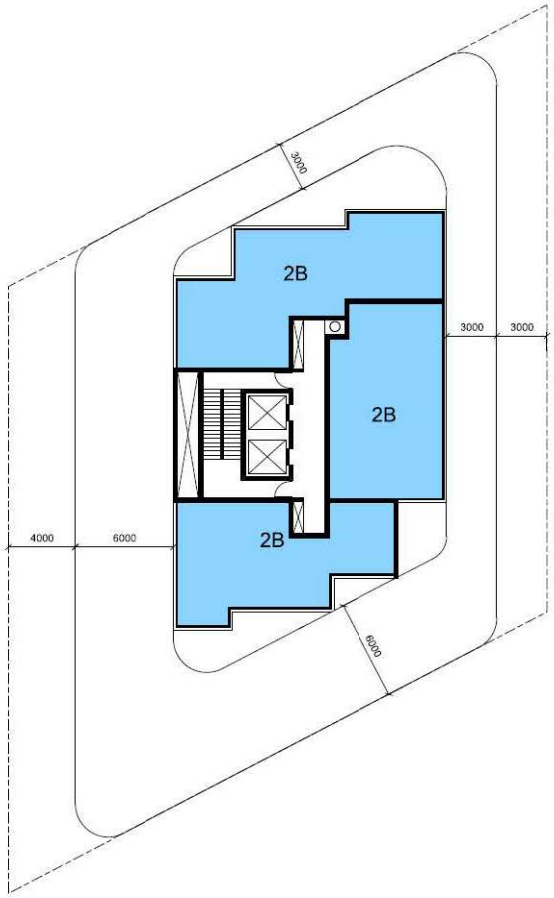
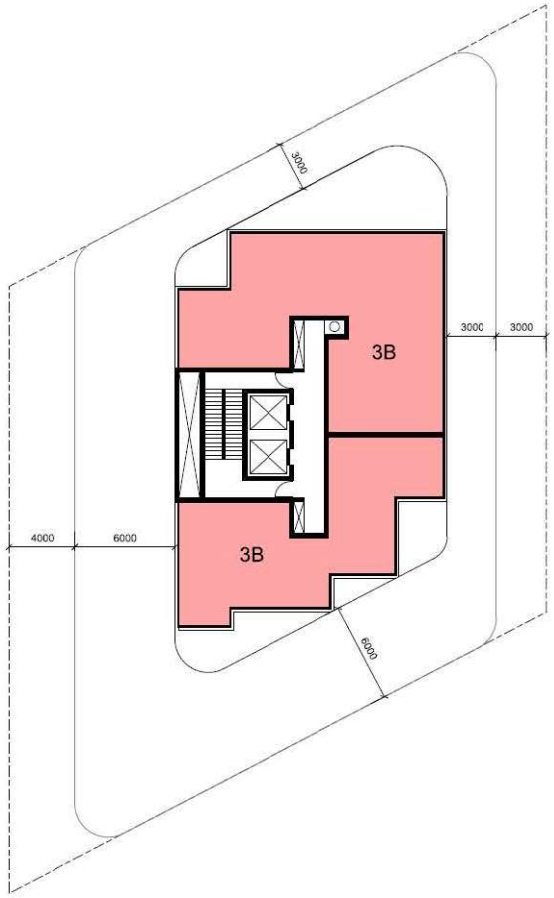
- PRIVATE OPEN SPACE
- COMMERCIAL/RETAIL
- SERVICES/LOADING STORAGE/PLANT ROOM
- 1 BEDROOM MIN. 50 SQM
- 2 BEDROOM MIN. 70 SQM
- 3 BEDROOM MIN. 90 SQM
- BASEMENT LEVEL



1 TYPICAL FLOOR PLAN L15-L25, Plant Room On L14
SCALE 1:250



2 TYPICAL FLOOR PLAN L26&L27
SCALE 1:250

dem

629 - 639 Pacific Highway Chatswood

Reference Concept Diagrams
Council Preferred Scheme

date 20-12-17 | scale 1:250 | dwg no. arsk3004 | proj no. 4445-00 | rev no. -03

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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.

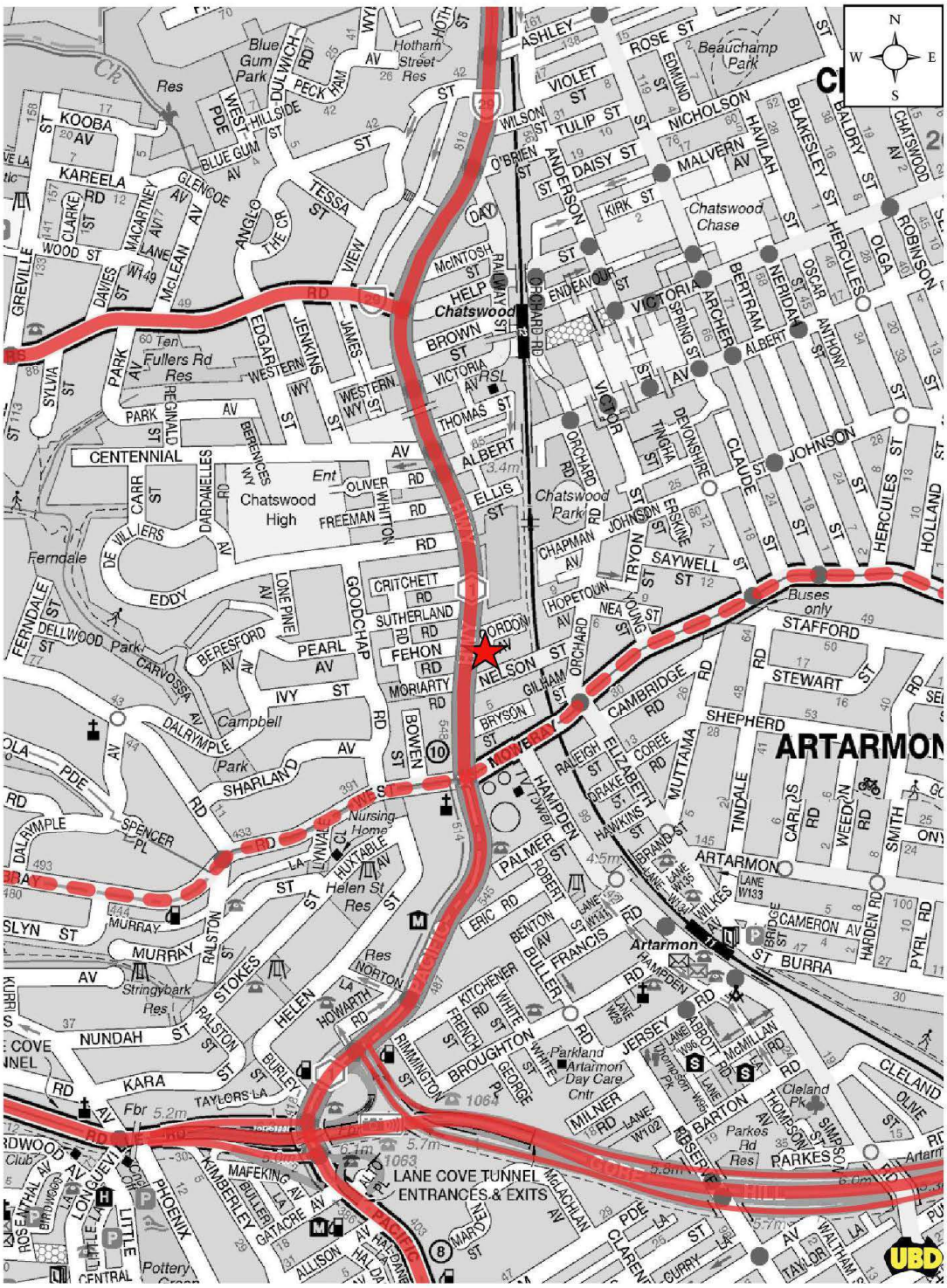
The Pacific Highway is classified by the RMS as a *State Road* and provides the key north-south road link in the area, linking North Sydney to Hornsby and beyond. It typically carries three traffic lanes in each direction in the vicinity of the site, with opposing traffic flows separated by a central median island. Clearway restrictions apply during commuter peak periods.

The Gore Hill Freeway is also classified by the RMS as a *State Road* and provides the key east-west road link in the area, linking the Warringah Freeway to the Lane Cove Tunnel. It carries multiple traffic lanes in each direction in the vicinity of the site, with opposing traffic flows separated by a central median island. All intersections with the Gore Hill Freeway are grade-separated.

Mowbray Road is classified by the RMS as a *Regional Road* which provides another key east-west road link in the local area. It typically carries two traffic lanes in each direction in the vicinity of the site, with additional lanes provided at key locations.

Gordon Avenue 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.

Hammond Lane is a local, unclassified service lane which is primarily used to provide rear vehicular and pedestrian access to properties fronting the Pacific Highway. Kerbside parking is generally permitted along one side of the laneway only.



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ROAD HIERARCHY
FIGURE 3

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:

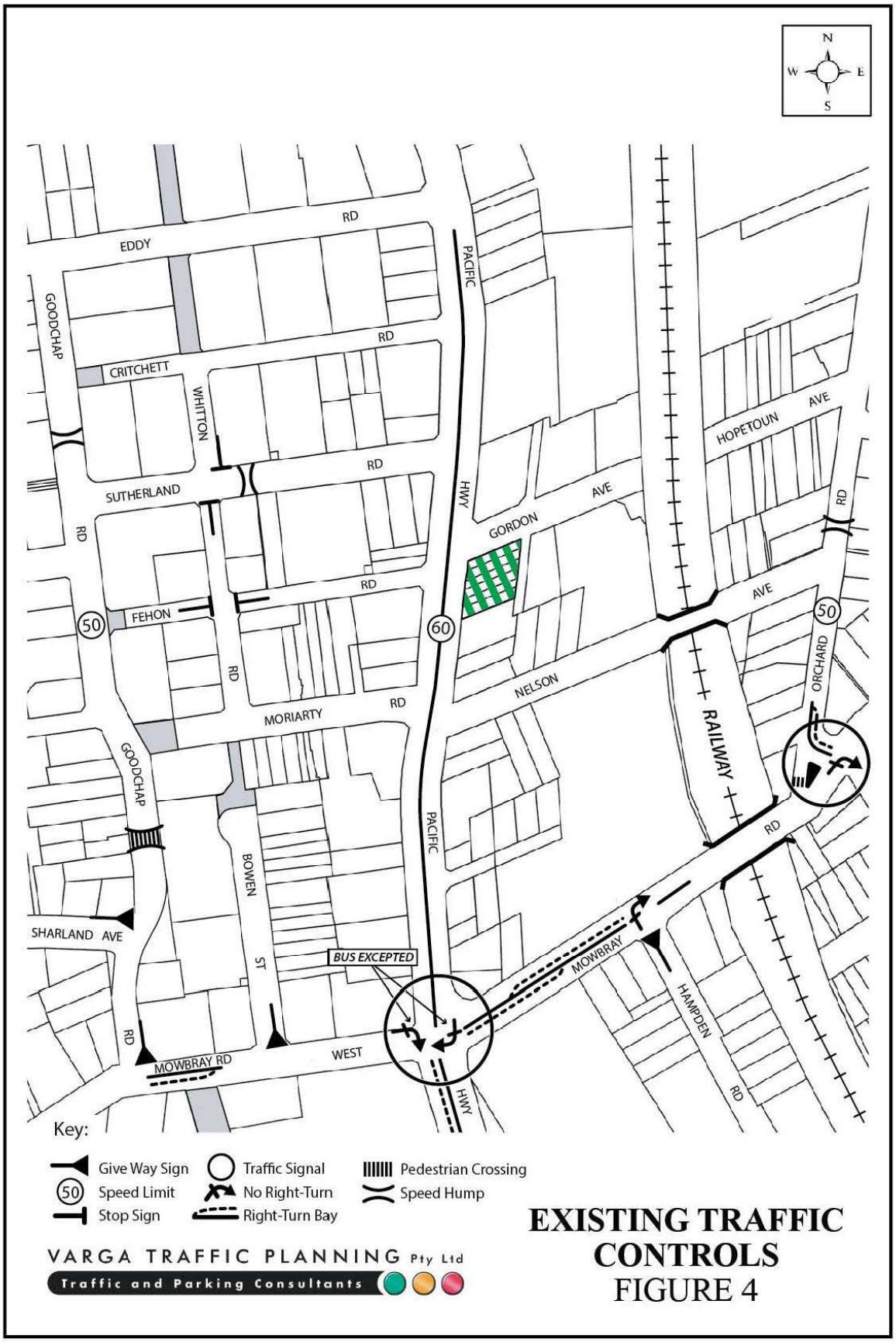
- a 60 km/h SPEED LIMIT which applies to the Pacific Highway
- a 50 km/h SPEED LIMIT which applies to Gordon Avenue and all other local roads in the area
- TRAFFIC SIGNALS in the Pacific Highway where it intersects with Mowbray Road
- a CENTRAL MEDIAN ISLAND in the Pacific Highway which precludes right-turn movements into / out of Gordon Avenue
- a NO RIGHT TURN southbound restriction in the Pacific Highway for traffic turning onto Mowbray Road (Buses Excepted)
- a NO RIGHT TURN eastbound restriction in Mowbray Road for traffic turning onto the Pacific Highway (Buses Excepted).

Existing Public Transport Services

The existing public transport services available within the vicinity of the subject site are illustrated on Figure 5.

The subject site is conveniently located within approximately 750m walking distance south of Chatswood Railway Station via a dedicated off-road path parallel to the railway. Chatswood Station lies on the T1 North Shore, Northern & Western Line, linking Berowra, Hornsby, Epping, Richmond and Emu Plains.

In addition to the train services, a major bus interchange is available outside of the Chatswood Railway Station servicing a number of bus routes, including the M40, 137, 257, 273, 136, L60, 267, 275, 143, 144 and 200 services.


N
W
E
S
EDDY RD
GOODCHAP
CRITCHETT
WHITTON
SUTHERLAND RD
FEHON RD
MORIARTY RD
PACIFIC HWY
GORDON AVE
HOPETOUN AVE
NELSON AVE
ORCHARD RD
RAILWAY
BOWEN ST
SHARLAND AVE
BUS EXCEPTED
MOWBRAY RD
WEST
MOWBRAY
HAMPDEN RD
50
60
Key:
Give Way Sign
Speed Limit
Stop Sign
Traffic Signal
No Right-Turn
Right-Turn Bay
Pedestrian Crossing
Speed Hump
VARGA TRAFFIC PLANNING Pty Ltd
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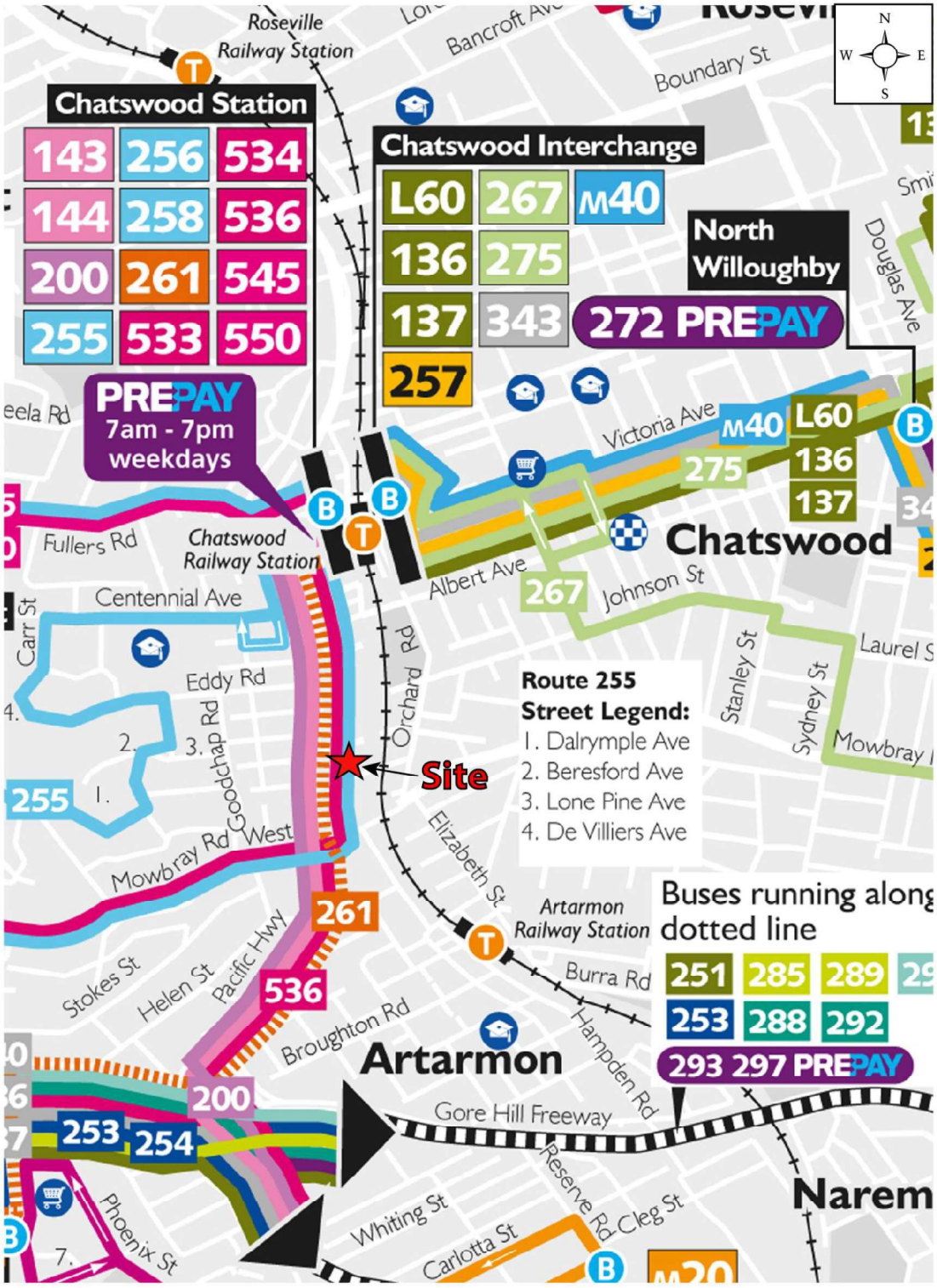
EXISTING TRAFFIC CONTROLS
FIGURE 4



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EXISTING PUBLIC TRANSPORT SERVICES
FIGURE 5

Notably, route M40 is part of the Sydney's *Metrobus* network that provides high-frequency, high-capacity intra-regional links between key employment and growth centres across Sydney. The M40 links between Chatswood, Willoughby, Naremburn, Sydney City, Darlinghurst, Paddington, Woollahra and Bondi Junction, operating at 10 minute intervals during commuter peak periods, 15 minute intervals during the day and 20 minute intervals at other times.

There is also an extensive range of bus services available within 50m walking distance north of the site along the Pacific Highway. A summary of those bus services is provided in the table below, revealing that there are more than 370 bus services per day travelling near the site on weekdays, decreasing to approximately 200 bus services per day on Saturdays and approximately 140 bus services per day on Sundays, as set out in the table below.

Bus Routes and Frequencies

Route No.	Route	Weekday		Saturday		Sunday	
		In	Out	In	Out	In	Out
143	Manly to Chatswood	32	27	-	-	-	-
144		31	32	32	32	32	32
258	Lane Cove Industrial to Chatswood	2	2	-	-	-	-
261	Longueville & Northwood to City	24	25	11	11	-	-
530	Burwood to Chatswood	42	42	32	32	27	27
533	Sydney Olympic Park to Chatswood	8	10	-	-	-	-
534	Ryde to Chatswood	31	27	20	20	10	10
536	Gladesville to Chatswood	21	20	-	-	-	-
	TOTAL	**191**	**185**	**95**	**95**	**69**	**69**

The site is also located within easy walking distance of the Chatswood City Centre which includes a wide range of essential shops and services including licenced clubs, banks, supermarkets, gymnasiums, restaurants and specialty stores.

On the above basis it is clear that the site is extremely well served by existing public transport and essential services and is ideally located to encourage reduced private car usage and an increased use of public transport and active forms of transport such as walking and cycling.

Existing Pedestrian Paths

Existing pedestrian footpaths located in the vicinity of the site provide suitable links for pedestrians accessing local facilities such as schools and shops in the local area. The site is also located within easy walking distance of the Chatswood CBD located north of the subject site.

In particular, a shared Off-Road Pedestrian and Bicycle Path running parallel to the railway line is easily accessed directly from the eastern end of Gordon Avenue. This shared path allows pedestrians and bicycles to travel safely along a 750m long off-road route which is linked directly to the Chatswood CBD, giving direct access to the Chatswood Railway Station.

Local Bicycle Routes

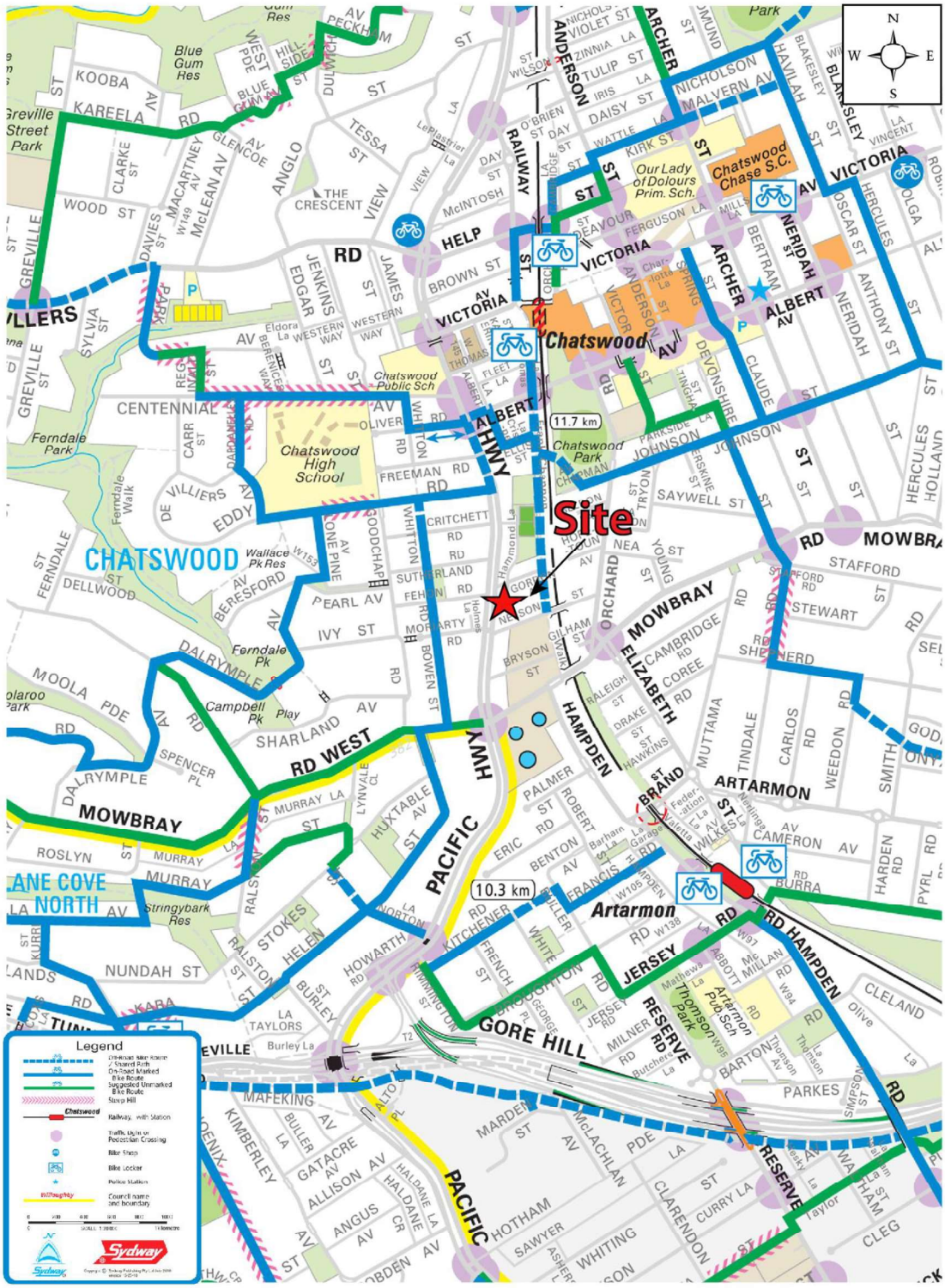
The existing bicycle routes located in the vicinity of the site are illustrated on Figure 6. The bicycle routes are readily accessible from the subject site and provide a number of on-road and off-road bicycle links through the local area, including the following routes:

- to Chatswood CBD from Gordon Avenue via the shared Off-Road Pedestrian & Bicycle Route running parallel to the railway line

- to Chatswood Public School from Gordon Avenue via the abovementioned dedicated shared Off-Road Pedestrian & Bicycle Route running parallel to the railway line

- to Willoughby via the dedicated shared Off-Road Pedestrian & Bicycle Route running parallel to the railway line and the on-road bicycle route via Johnson Street, Laurel Street & Edinburgh Road

- to Crows Nest dedicated shared Off-Road Pedestrian & Bicycle Route running parallel to the railway line, and the on-road bicycle route via Johnson Street, Devonshire Street, Shepherd Road & the shared Off-Road Pedestrian & Bicycle Route (starting along Weedon Road



EXISTING BICYCLE ROUTE
FIGURE 6

The proposed development makes provision for a bicycle parking area which is to be located on the basement floor level, which can easily be accessible from Hammond Lane and will enhance the *active* transport options available to future occupants of the site.

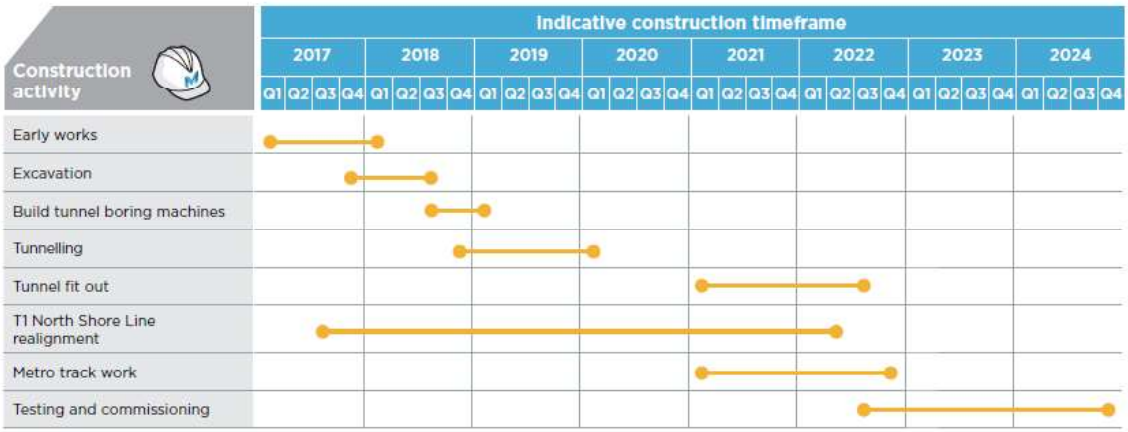
Chatswood to Sydenham

Sydney Metro is Australia's biggest public transport project, delivering 31 stations and 66 kilometres of new metro rail, and revolutionising the way Australia's biggest city travels.

Chatswood to Sydenham component of Sydney Metro City & Southwest was the subject of a separate environmental assessment process in 2016 and was granted planning approval in January 2017. This proposal included a new 15.5km twin railway tunnel, linking between the end of the Sydney Metro Northwest at Chatswood and Sydenham. Tunnel construction is currently underway, with tunnelling finished and construction progressing rapidly.

New, direct and fast services would be provided for key employment and education precincts in particular, these services will connect to Martin Place, Barangaroo, North Sydney, Chatswood and Macquarie Park, with interchanges to other rail services at Sydenham, Central and Martin Place. An indicative timeline of the construction schedule is provided below.

Overall construction timeline



Source: Transport for NSW, SydneyMetro

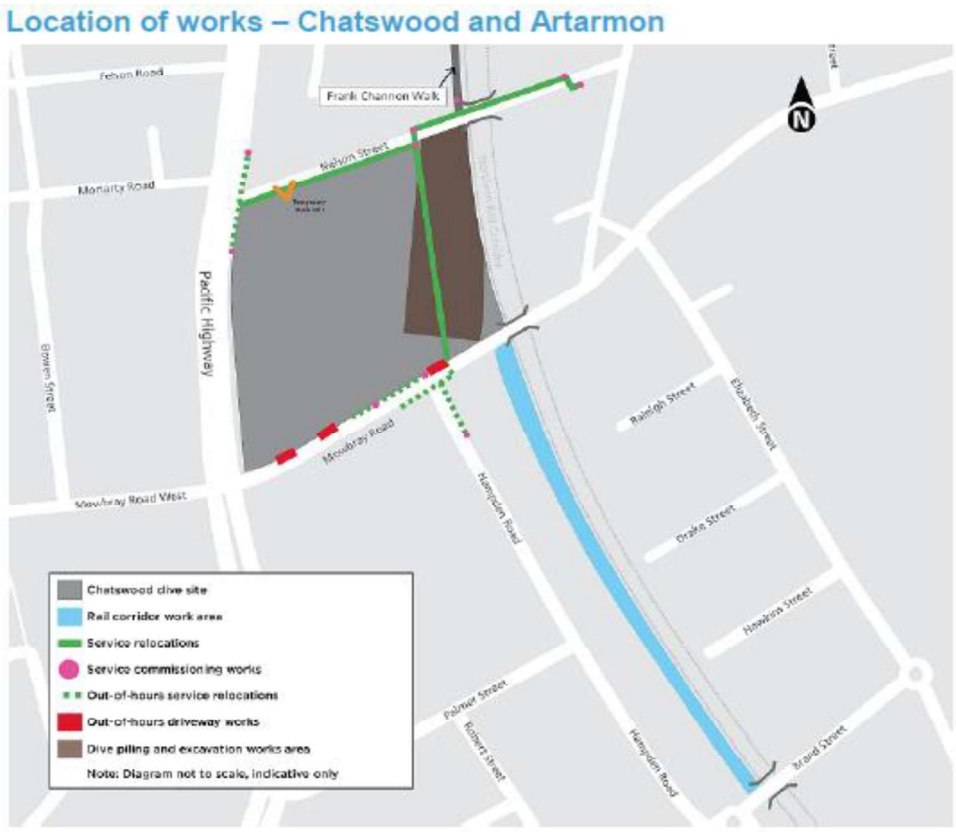
Two dive structures and tunnel portals are being built, including one located in Chatswood, approximately 100m south of the subject site, on the eastern side of Pacific Highway, in between Nelson Street and Mowbray Road.

Nelson Street Bridge will be permanently closed to traffic from the middle of 2018, with motorists travelling north redirected via Mowbray Road, Orchard Road and Albert Avenue.

Whilst the 'dive site' will prohibit the redevelopment of that part of the Chatswood precinct for several years it is not expected to result in any unacceptable traffic implications on the proposed development.

In this regard, the construction access driveway for trucks exiting the dive site is to be located towards the western end of Nelson Street, with the driveway estimated to be used for construction until mid-2018. Light passenger vehicles will continue to use this access driveway along with the access driveways located along Mowbray Road until mid-2020.

Services for the Metro rail are expected to start in 2019 using Sydney's new-generation of fully-automated metro trains, with a metro train every four minutes during peak periods.



Source: Sydney Metro Construction Notification 27th February 2018 – Location of out-of-hours works at Chatswood Dive site, Pacific Highway, Mowbray Road and Nelson Street, Chatswood

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 Pacific Highway and Gordon Avenue intersection as well as the Gordon Avenue and Hammond Lane intersection. The results of the traffic surveys are reproduced in full in Appendix A and reveal that:

- southbound traffic flows in the Pacific Highway past the site frontage are typically in the order of 1,700 vehicles per hour (vph) during the weekday commuter peak periods

- two-way traffic flows in Gordon Avenue and Hammond Lane are significantly lower, typically in the order of 10 - 20 vph during the weekday commuter peak periods.

Projected Traffic Generation

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 recently published RMS *Technical Direction (TDT 2013/04a)* document.

The *TDT 2013/04a* document specifies that it replaces those sections of the RMS *Guidelines* indicated, and that it must be followed when RMS is undertaken trip generation and/or parking demand assessments.

The RMS *Guidelines* and the updated *TDT 2013/04a* are based on extensive surveys of a wide range of land uses and nominate the following traffic generation rates which are applicable to the development proposal:

High Density Residential Flat Dwellings

AM: 0.19 peak hour vehicle trips per unit

PM: 0.15 peak hour vehicle trips per unit

Office Blocks

AM: 1.6 peak hour vehicle trips per 100m^2 GFA

PM: 1.2 peak hour vehicle trips per 100m^2 GFA

The RMS *Guidelines* do not nominate a traffic generation rate for small, local shops, referring only to major regional shopping centres incorporating supermarkets and department stores.

As requested by Council, a first principle approach has been adopted in respect of the retail/commercial component of the development proposal, with the following assumptions applied:

- Assumed 40%/60% split in retail/commercial non-residential land use
- Provision of 11 retail parking spaces (outlined in Chapter 4 of this report)
- Retail parking bays turnover once per hour
- Retail parking is assumed to be 50%/90% occupied during the AM and PM peak hour (i.e. 11 trips TO/FROM and 20 trips TO/FROM)
- RMS trip rates used for commercial trip generation

Application of the above traffic generation rates to the various components of the planning proposal yields a traffic generation potential of approximately 34 vph during the *morning* commuter peak period and approximately 25 vph during the *afternoon* commuter peak period as set out below:

Planning Proposal Projected Future Traffic Generation Potential

	AM	**PM**
Residential (81 apartments):	15.4 vph	12.2 vph
Commercial (425m^2):	6.8 vph	5.1 vph
Retail (280m^2):	11.0 vph	19.8 vph
TOTAL TRAFFIC GENERATION POTENTIAL:	**33.2 vph**	**37.1 vph**

That projected future traffic generation potential which could occur as a consequence of the planning proposal should however, be offset or *discounted* by the volume of traffic which could reasonably be expected to be generated by a development permitted under the draft (or imminent) *WLEP 2012* planning controls.

Application of the abovementioned traffic generation rates to the development potential of the site under the imminent B4 Mixed Use *WLEP 2012* planning controls yields a peak hour traffic generation potential of approximately 15 vph during the AM commuter peak period and a traffic generation potential of approximately 12 vph during the PM commuter peak period, as set out below:

Draft WLEP Additional Traffic Generation Potential

	AM	**PM**
Residential (30 apartments):	5.7 vph	4.5 vph
Commercial/retail (600m^2):	9.6 vph	7.2 vph
TOTAL TRAFFIC GENERATION POTENTIAL:	**15.3 vph**	**11.7 vph**

Accordingly, the planning proposal could result in a *nett increase* in the traffic generation potential of the site during both the AM and PM commuter peak periods when compared with a development that could be potentially approved if the site was to be rezoned to B4 Mixed Use zone, as set out below:

Projected Nett Increase in the Traffic Generation Potential of the Site as a Consequence of the Planning Proposal

	AM	**PM**
Projected Future Traffic Generation Potential (Planning Proposal):	33.2 vph	37.1 vph
Less Permissible Traffic Generation Potential (Draft WLEP Controls):	-15.3 vph	-11.7 vph
NETT INCREASE IN TRAFFIC GENERATION POTENTIAL:	**17.9 vph**	**25.4 vph**

For the purposes of this assessment it has been assumed that *all* of the projected future traffic flows of 33 vph and 37 vph during the AM and PM commuter peak periods respectively, will be new or *additional* to the existing traffic flows currently using the adjacent road network.

Journey to Work Data Analysis

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, however by analysing the behaviour of the existing nearby residents and employees and how they travel, we can provide a guide to how the future residents and employees of the development may travel. These are based on certain characteristics that can be grouped depending on the:

- purpose for their journey
- the time period of their journey
- the mode or combination of modes of transport used from the origin to the destination

The study area is contained within Travel Zone 1807 (TZ1807) as defined in the 2011 Census Journey to Work (JTW) data. An analysis of the data shows that around 31% of work trips for those working and living in the Chatswood Precinct are undertaken by private transport – i.e. 147 people employed within the Chatswood Precinct area.

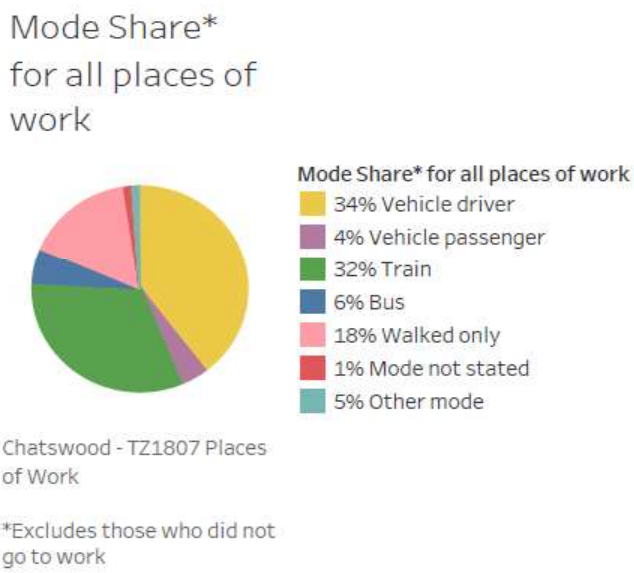
Source: Bureau of Transport Statistics, JTW 2011

The modal share of work trips for employed residents in the TZ1807 shows that both public transport (train and buses) and private transport (drivers and/or passengers) had a modal split of 38% within the travel zone, as shown tabulated below.

Mode of Travel (Top 10 Destinations of Work)									
Place of Work	Number of Trips	Private Transport		Public Transport		Walked Only	Mode not stated	Other	Total
		Car	Car Passenger	Train	Bus				
Chatswood – Lane Cove	475	31%	2%	11%	4%	40%	1%	11%	100%
Sydney Inner City	351	17%	5%	65%	9%	2%	1%	1%	100%
North Sydney – Mosman	103	40%	3%	44%	9%	4%			100%
Ryde – Hunters Hill	71	54%	4%	28%	4%			10%	100%
Warringah	38	68%	16%		16%				100%
Ku-ring-gai	31	71%	10%	19%					100%
Eastern Suburbs – North	21	48%		38%			14%		100%
Botany	20	70%	15%	15%					100%
Auburn	16	81%		19%					100%
Strathfield – Burwood – Ashfield	16	81%		19%					100%
Grand Total	**1251**	**38%**		**38%**		**18%**	**1%**	**5%**	**100 %**

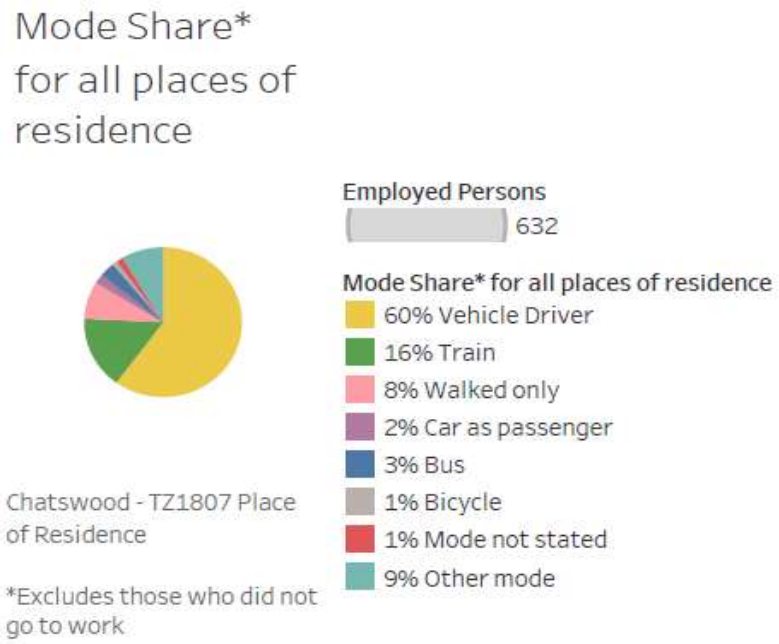
*Grand total includes all places of work

Source: Bureau of Transport Statistics, JTW 2011



Travel Mode Split for TZ1807 – Destination or place of work (SA3)

In terms of travel modal split for residents residing in travel zone 1807, the figure below shows that 62% of the people working in the study area use car (as driver and as passengers) as the mode of travel, whilst 28% used public transport or other active forms of transport within the area (i.e. – train, buses, bicycle, walking).

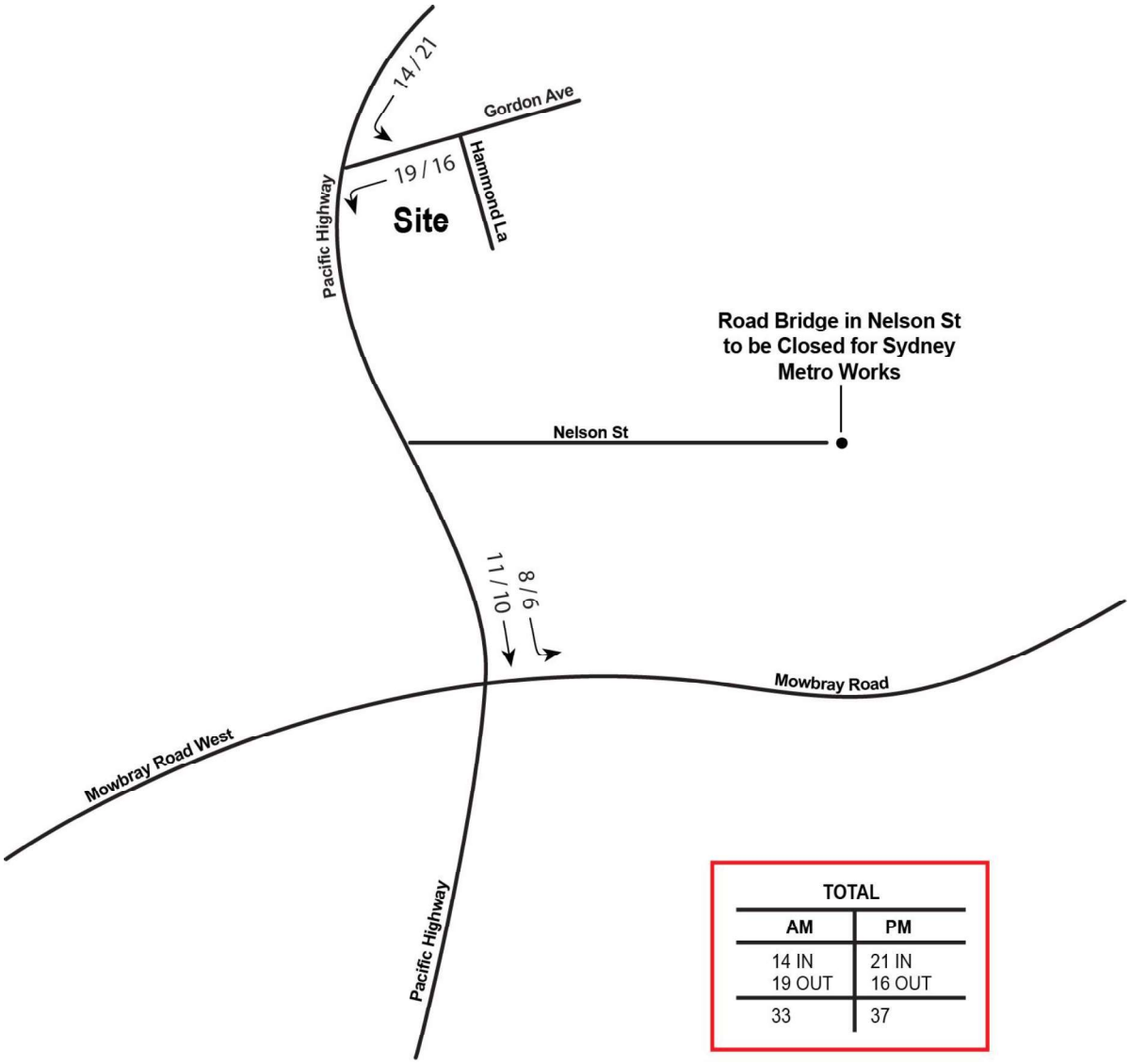


Travel Mode Split for TZ1807 – Place of Residence

The statistics show that of the 632 people living within the Chatswood study area *TZ1807*, 60% were vehicle drivers, this rate is therefore reasonable to be applied to the proposed development and will ultimately become re-distributed within the adjoining road network.

Notwithstanding the above, the assumed directional distribution of traffic has been adopted in accordance with the JTW data for the destination or place of work in the table previously mentioned. In order to provide a more rigorous assessment, it has been assumed that *all* of the projected future traffic flows of 33 vph and 37 vph during the AM and PM commuter peak periods respectively, has been assumed as vehicle drivers and has been applied to the road network / intersections in the vicinity of the site as illustrated on Figure 7 below.

The proposed additional traffic generation potential of the site as a consequence of the development proposal is *statistically insignificant* and will also clearly not have any unacceptable traffic implications in terms of road network capacity and downstream traffic issues, particularly when considered there are only 19 additional vehicles during the *morning* peak period and approximately 16 additional vehicles during the *afternoon* peak period



TOTAL	
AM	PM
14 IN 19 OUT	21 IN 16 OUT
33	37

Residential (81 Apartments)	
AM	PM
3 IN 12 OUT	10 IN 2 OUT
15	12

Commercial (425m^2)	
AM	PM
5 IN 2 OUT	1 IN 4 OUT
7	5

Retail (280m^2)	
AM	PM
6 IN 5 OUT	10 IN 10 OUT
11	20

LEGEND: AM/PM Vehicles Per Hour

PROJECTED ADDITIONAL TRAFFIC FLOWS
FIGURE 7

Traffic Implications - Road Network Capacity

The traffic implications of development 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 Pacific Highway and Gordon Avenue intersection are summarised on Table 3.1 below, revealing that:

- the Pacific Highway and Gordon Avenue intersection currently operates at *Level of Service "A"* under the existing traffic demands with total average vehicle delays in the order of ***less than*** 1 second/vehicle

- under the projected additional traffic demands which could be generated by a commercial building development permitted under the *existing planning controls*, the intersection would continue to operate at *Level of Service "A"* during the AM and PM commuter peak periods, with increases in average vehicle delays of ***less than*** 1 second/vehicle.

- under the projected future traffic demands expected to be generated by the *planning proposal*, the intersection would also continue to operate at *Level of Service "A"* during the AM and PM commuter peak periods, with increases in average vehicle delays of ***less than*** 1 second/vehicle.

In the circumstances, it is clear that the planning proposal will not have any unacceptable traffic implications in terms of road network capacity.

TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF PACIFIC HIGHWAY & GORDON AVENUE

Key Indicators		Existing Traffic Demand		Draft WLEP Traffic Demands (600m² & 30Apts)		Planning Proposal Traffic Demands (705m² & 81Apts)	
		AM	**PM**	**AM**	**PM**	**AM**	**PM**
Level of Service		A	A	A	A	A	A
Degree of Saturation		0.303	0.297	0.304	0.298	0.305	0.301
Average Vehicle Delay (secs/veh)							
Gordon Avenue (east)	L	8.4	7.7	8.0	7.7	7.9	7.7
Pacific Highway (north)	L	5.8	5.6	5.6	5.6	5.6	5.6
	T	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL AVERAGE VEHICLE DELAY		**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**
		PAC_GORX		PAC_GORPermissible		PAC_GORP	

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 signals[1] 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 8. Key features of those parking restrictions are:

- CLEARWAY restrictions along both sides of the Pacific Highway during commuter peak periods

- NO PARKING restrictions along the eastern side of the Pacific Highway in the vicinity of the site at all other times, including along the entire length of the site frontage

- 1 HOUR PARKING restrictions along the southern side of Gordon Avenue, including along the entire site frontage

- BUS ZONES located at regular intervals along both sides of the Pacific Highway, including just south of the site

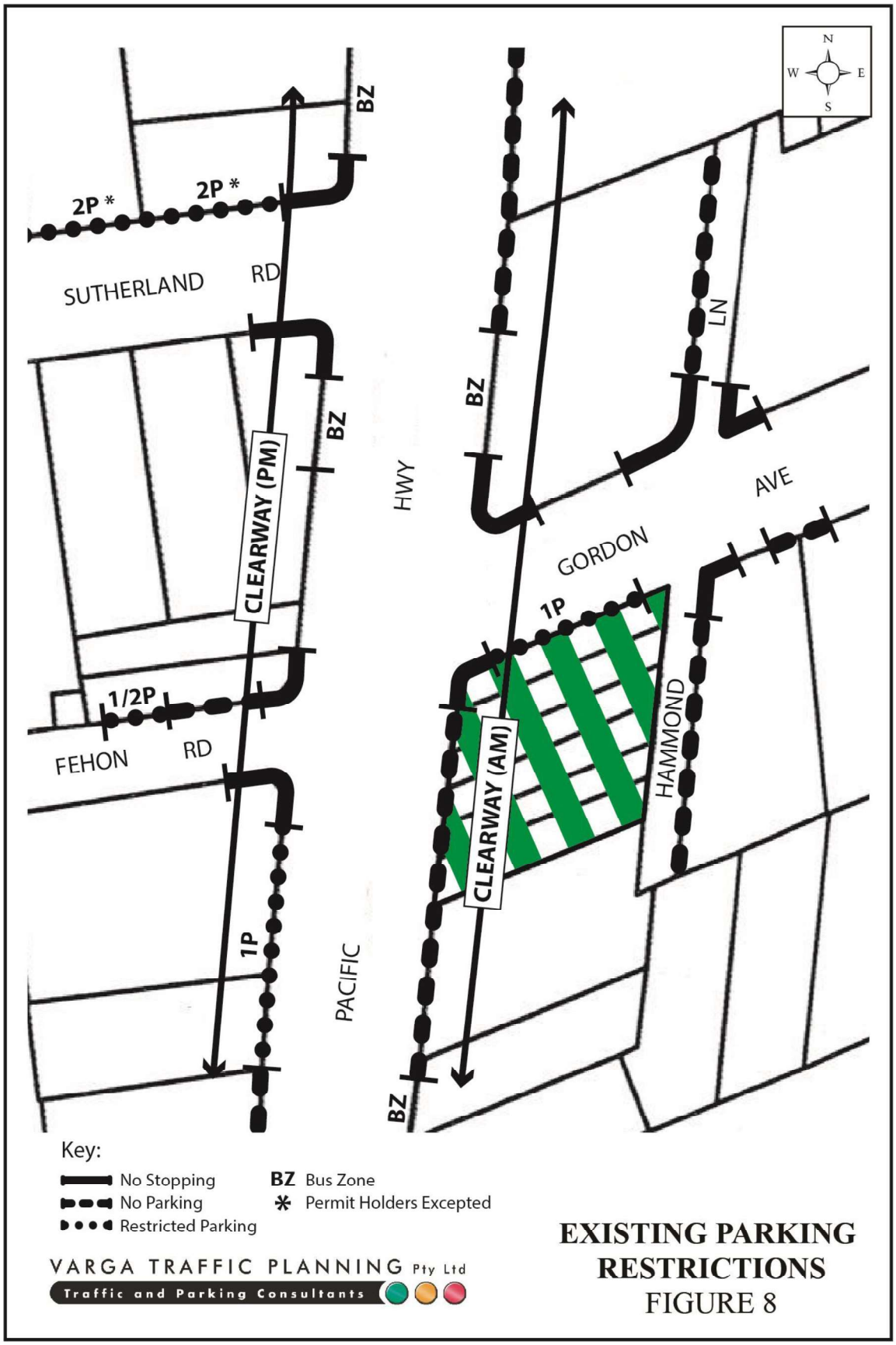
- NO PARKING restrictions along the eastern side of Hammond Lane, south of Gordon Avenue intersection

- NO PARKING restrictions along the eastern side of Hammond Lane, south of Gordon Avenue.

Off-Street Car Parking Provisions

The off-street car parking requirements applicable to the planning proposal are specified in the *Willoughby Development Control Plan Part C.4 – Transport Requirements for Development* document in the following terms:

Shop Top Housing/Residential Flat Buildings located on Major Public Transport Corridors	
Studio	0.5 spaces per dwelling
Other than studios	1 space per dwelling
Visitors	1 space per 4 dwellings


N
W
E
S
BZ
2P *
2P *
SUTHERLAND
RD
BZ
CLEARWAY (PM)
1/2P
FEHON
RD
1P
PACIFIC
HWY
BZ
LN
AVE
GORDON
1P
CLEARWAY (AM)
HAMMOND
BZ
Key:
No Stopping
No Parking
Restricted Parking
BZ Bus Zone
* Permit Holders Excepted
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
EXISTING PARKING RESTRICTIONS
FIGURE 8

Shop

1 space per 25m^2

Office/Business Premises located on Major Public Transport Corridors

1 space per 110m^2

Application of the above parking requirements to the various components of the planning proposal yields a *minimum* off-street car parking requirement of 121 spaces as set out below:

Residents (81 apartments):	81.0 spaces
Visitors:	20.3 spaces
Retail (~280m^2):	11.2 spaces
Commercial/business (~425m^2):	3.9 spaces
TOTAL:	**121.2 spaces**

However, 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 Council's *WDCP* and also in the RMS *Guidelines* to determine the *lesser* requirement. The relevant car parking rates outlined in the RMS *Guidelines* are reproduced below:

RMS Guidelines – High Density Residential Flat Buildings in Metro 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

The minimum off-street car parking requirement applicable to the residential component of the planning proposal is 85 spaces, comprising 69 residential spaces and 16 visitor spaces as set out below:

	WDCP	**RMS Guidelines**
Residents:	81.0 spaces	68.3 spaces
Visitors:	20.3 spaces	16.2 spaces
Total:	**101.3 spaces**	**84.5 spaces**
Lesser Car Parking Requirement: 85 spaces		

Accordingly, the minimum off-street car parking requirement applicable to the planning proposal is therefore 100 spaces as set out below:

Residential (81 apartments):	68.3 spaces (RMS)
Visitors:	16.2 spaces (RMS)
Retail (~280m²):	11.2 spaces (DCP)
Commercial/business (~425m²):	3.9 spaces (DCP)
TOTAL:	**99.6 spaces**

Whilst the number of parking spaces to be provided as part of the planning proposal is not yet known, it is clear that the above parking requirements can be satisfied within the provision of basement parking area on the subject site.

In preliminary discussions with Council at the pre-lodgement meeting, Council's traffic engineer suggested that parking in private developments in accessible town centre areas such as the subject site should be provided in accordance with the rates specified in the RMS *Guidelines*. It is also noted that car share space/s will be provided in accordance with Council's requirements to further encourage reduced private vehicle ownership and usage.

The geometric design layout of the future car parking facilities will ultimately be designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 1 - Off-Street Car Parking AS2890.1:2004* and *Parking Facilities Part 6 - Off-Street Parking for People with Disabilities AS2890.6*.

Off-Street Motorcycle and Bicycle Parking Provisions

The motorcycle and bicycle parking requirements applicable to the development proposal are also specified in *Willoughby Development Control Plan Part C.4 – Transport Requirements for Development* document in the following terms:

Motorcycle
1 motorcycle space per 25 car spaces

Bicycle

Residential (lockers):	1 space per 10 units	*plus*
Residential (rail/racks):	1 space per 12 units	
Commercial (lockers):	1 space per 600m^2	*plus*
Commercial (rail/racks):	1 space per 2,500m^2	

Application of the above motorcycle and bicycle parking requirements to the various components of the planning proposal yields an off-street parking requirement of 4 motorcycle spaces, 9 bicycle lockers and 7 bicycle rails/racks.

Whilst the number of parking spaces to be provided as part of the planning proposal is not yet known, it is clear that the above parking requirements can be satisfied within the proposed of basement parking area on the subject site.

Loading/Servicing Provisions

The proposed new mixed use building is expected to be serviced by a variety of commercial vehicles up to and including 8.8m long MRV medium rigid trucks. A dedicated service area is to be provided on the ground floor level adjacent to the vehicular access driveway which includes a large turntable.

The manoeuvring area has been designed to accommodate the swept turning path requirements of these 8.8m long rigid trucks, allowing them to enter and exit the site whilst travelling in a forward direction at all times, as per the attached *swept turning path* diagrams.

The geometric design layout of the proposed loading facilities will also ultimately be designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 2 - Off-Street Commercial Vehicle Facilities AS2890.2* in respect of loading dock dimensions and service area requirements for MRV trucks.

Conclusion

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

- the planning proposal seeks approval to increase the allowable FSR and height controls for the site, resulting in the potential for approximately 81 apartments and approximately 705m^2 of retail/commercial floor space

- the SIDRA capacity analysis of the Pacific Highway and Gordon Avenue intersection indicates that:

- the projected additional traffic flows as a consequence of the planning proposal will not have any adverse effects on the operational performance of the intersection, and

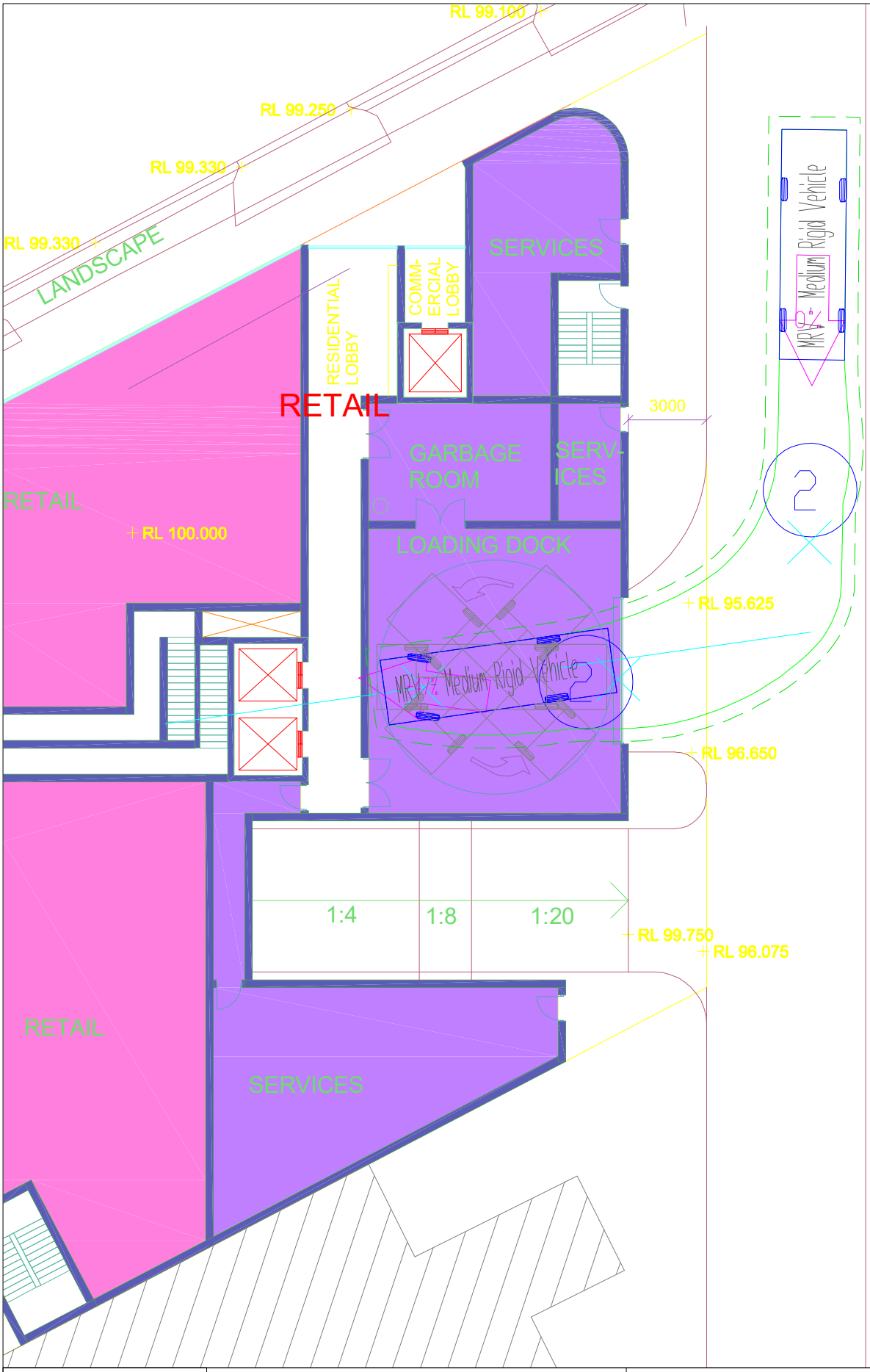
- no road improvements or intersection upgrades would be required as a consequence of the planning proposal

- retail/commercial and visitor peak parking demand periods generally occur at different times – i.e. retail/commercial parking is typically busiest during the day whilst visitor parking is typically busiest during the evenings. The potential therefore exists for the retail/commercial customers and residential visitors to utilise the same non-residential parking area

- the future car, motorcycle, bicycle and loading facilities will ultimately be provided and designed in accordance with Council's requirements, *SEPP 65* and the relevant Australian Standards

- the future vehicular access arrangements will be designed in accordance with Council and RMS requirements.

It is therefore reasonable to conclude that the planning proposal will not have any unacceptable implications in terms of road network capacity or off-street parking/loading requirements.



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Neutral Bay, NSW 2089

Phone +61 2 9904 3224
PO Box 1868
Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
MIXED USE DEVELOPMENT

N

DRAWING TITLE
8.8M MRV TRUCK TURNING PATH
Entering Loading Area

1:200 @ A4

ADDRESS
629-639 Pacific Highway,
Chatswood

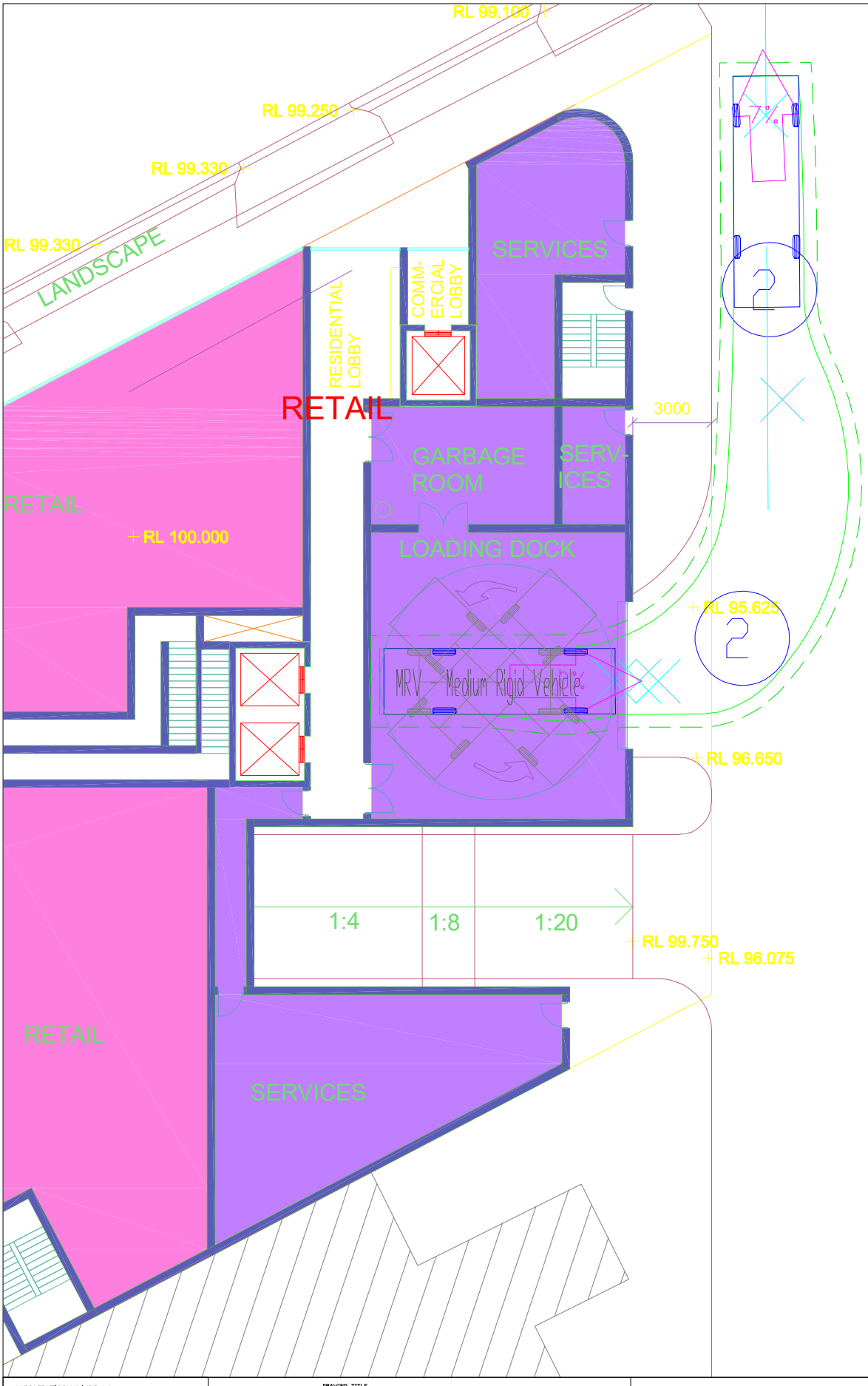
PROJECT NO.
17358

DATE DRAWN
2018-3-14

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants



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Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
MIXED USE DEVELOPMENT

N

DRAWING TITLE
8.8M MRV TRUCK TURNING PATH
Exiting Loading Area

1:200 @ A4

ADDRESS
629-639 Pacific Highway,
Chatswood

PROJECT NO.
17358

DATE DRAWN
2018-3-14

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

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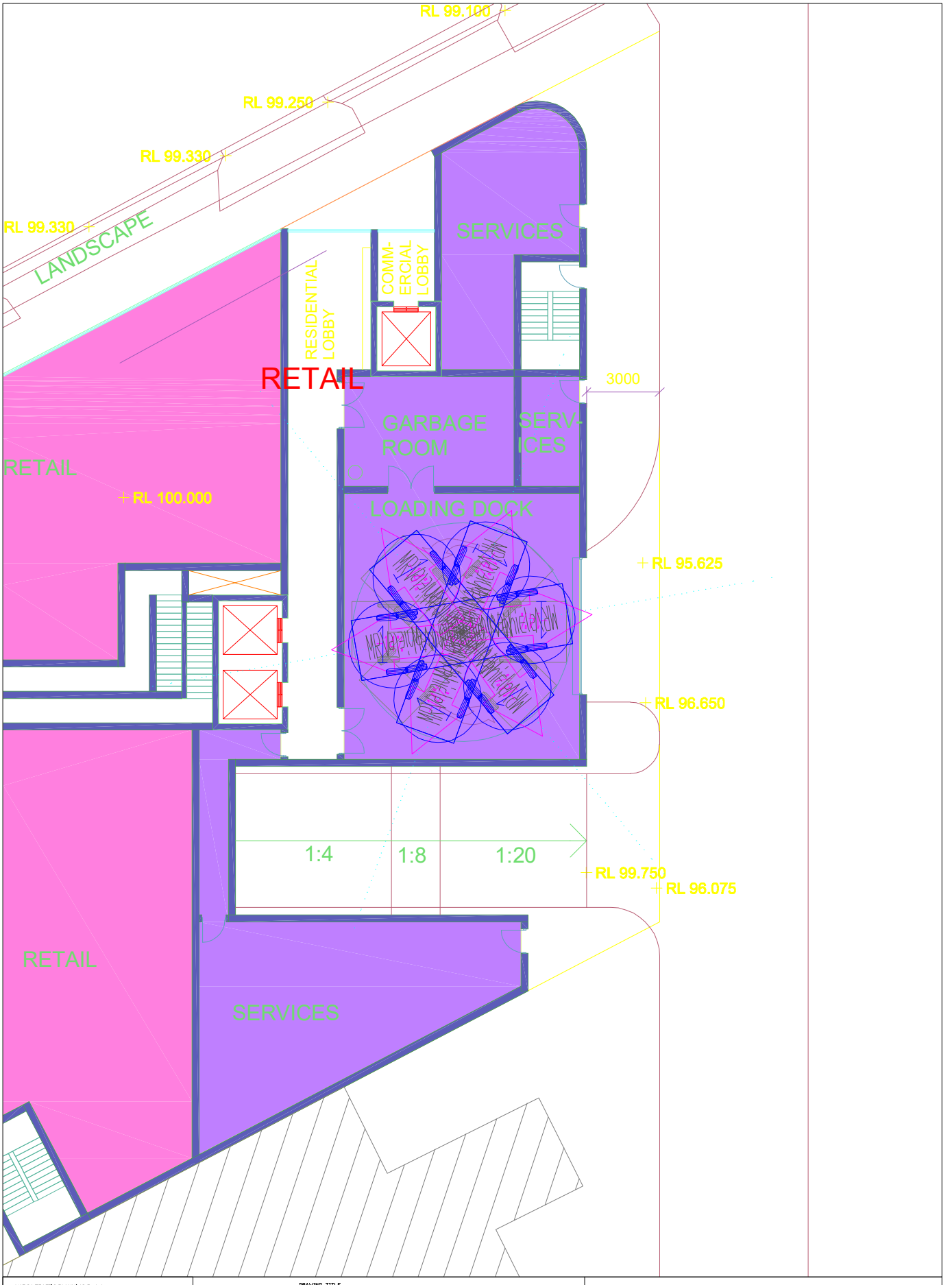

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PO Box 1868
Neutral Bay, NSW 2089
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Sydney, Australia

PROJECT
MIXED USE DEVELOPMENT

N

DRAWING TITLE
8.8M MRV TRUCK TURNING PATH
Clearance Zone

1:200 @ A4

ADDRESS
629-639 Pacific Highway,
Chatswood

PROJECT NO.
17358

DATE DRAWN
2018-3-14

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

VARGA TRAFFIC PLANNING Pty Ltd
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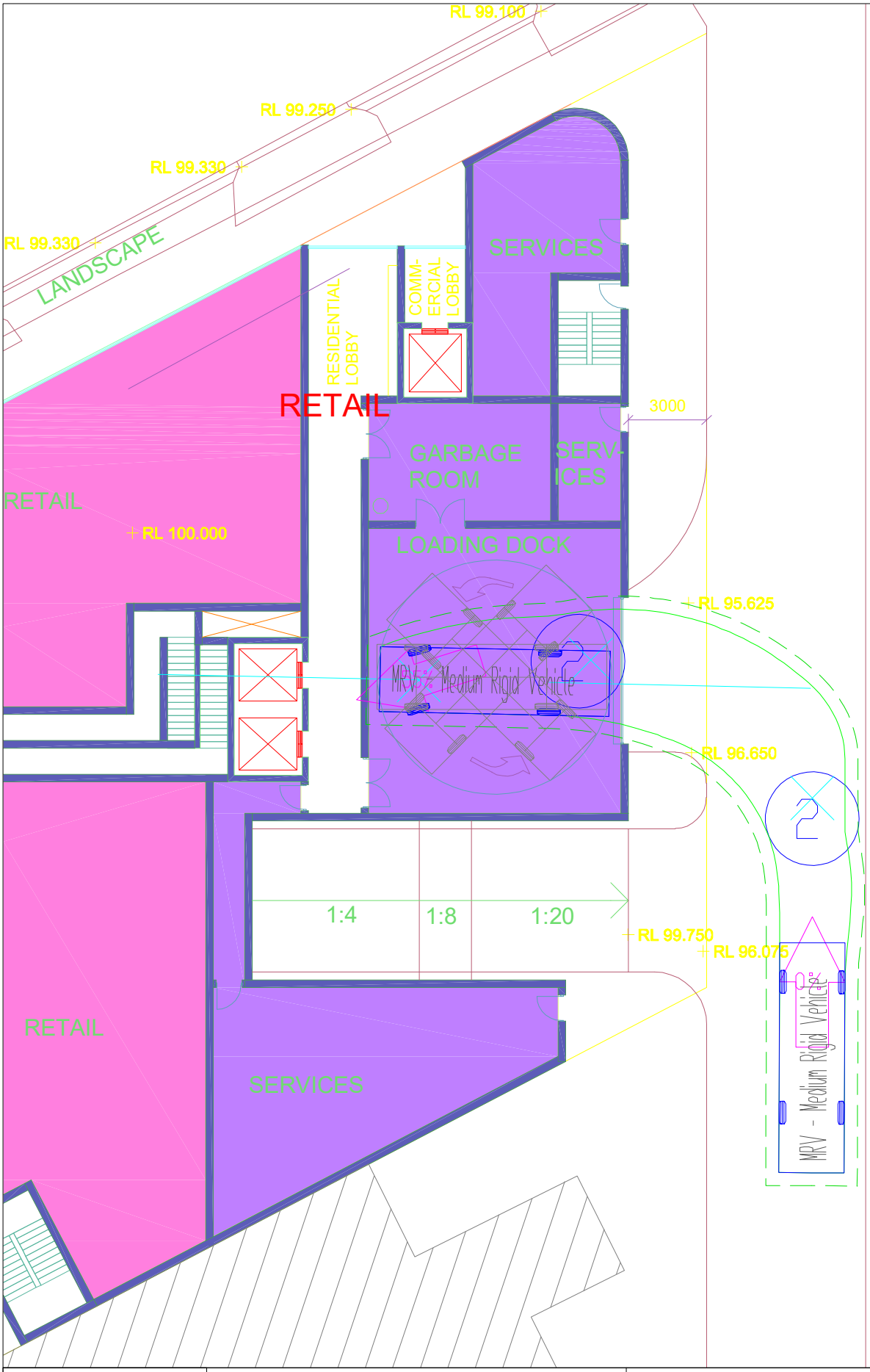

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Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
MIXED USE DEVELOPMENT

N

DRAWING TITLE
8.8M MRV TRUCK TURNING PATH
Entering Loading Area (Future)

1:200 @ A4

ADDRESS
629-639 Pacific Highway,
Chatswood

PROJECT NO.
17358

DATE DRAWN
2018-3-14

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants

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 : 6478 CHATSWOOD Gordon Ave
Day/Date : Thursday 8th June 2017

PEDS	NORTH	EAST	SOUTH	
Time Per	*Pacific Hwy*	*Gordon Ave*	*Pacific Hwy*	TOT
0630 - 0645	0	0	0	**0**
0645 - 0700	0	1	0	**1**
0700 - 0715	0	1	0	**1**
0715 - 0730	0	2	0	**2**
0730 - 0745	0	2	0	**2**
0745 - 0800	0	2	0	**2**
0800 - 0815	0	5	0	**5**
0815 - 0830	0	0	0	**0**
0830 - 0845	0	3	0	**3**
0845 - 0900	0	0	0	**0**
0900 - 0915	0	8	0	**8**
0915 - 0930	0	5	0	**5**
Per End	**0**	**29**	**0**	29

PEDS	NORTH	EAST	SOUTH	
Peak Per	*Pacific Hwy*	*Gordon Ave*	*Pacific Hwy*	TOT
0630 - 0730	0	4	0	**4**
0645 - 0745	0	6	0	**6**
0700 - 0800	0	7	0	**7**
0715 - 0815	0	11	0	**11**
0730 - 0830	0	9	0	**9**
0745 - 0845	0	10	0	**10**
0800 - 0900	0	8	0	**8**
0815 - 0915	0	11	0	**11**
0830 - 0930	0	16	0	**16**
PEAK HR	**0**	**4**	**0**	**4**

Lights	NORTH		EAST		SOUTH		
	Pacific Hwy		*Gordon Ave*		*Pacific Hwy*		
Time Per	T	L	R	L	R	T	TOT
0630 - 0645	428	1		1			**430**
0645 - 0700	419	1		1			**421**
0700 - 0715	482	1		1			**484**
0715 - 0730	399	2		1			**402**
0730 - 0745	338	3		4			**345**
0745 - 0800	454	2		3			**459**
0800 - 0815	338	4		3			**345**
0815 - 0830	332	2		4			**338**
0830 - 0845	437	3		3			**443**
0845 - 0900	446	2		7			**455**
0900 - 0915	357	5		4			**366**
0915 - 0930	419	7		4			**430**
Per End	**4849**	**33**	**0**	**36**	**0**	**0**	4918

Heavies	NORTH		EAST		SOUTH		
	Pacific Hwy		*Gordon Ave*		*Pacific Hwy*		
Time Per	T	L	R	L	R	T	TOT
0630 - 0645	6	1		1			**8**
0645 - 0700	5	0		0			**5**
0700 - 0715	10	0		0			**10**
0715 - 0730	0	0		0			**0**
0730 - 0745	9	0		0			**9**
0745 - 0800	11	1		0			**12**
0800 - 0815	8	0		1			**9**
0815 - 0830	9	0		0			**9**
0830 - 0845	9	0		0			**9**
0845 - 0900	10	1		0			**11**
0900 - 0915	16	0		0			**16**
0915 - 0930	9	0		0			**9**
Per End	**102**	**3**	**0**	**2**	**0**	**0**	107

Combined	NORTH		EAST		SOUTH		
	Pacific Hwy		*Gordon Ave*		*Pacific Hwy*		
Time Per	T	L	R	L	R	T	TOT
0630 - 0645	434	2	0	2	0	0	**438**
0645 - 0700	424	1	0	1	0	0	**426**
0700 - 0715	492	1	0	1	0	0	**494**
0715 - 0730	399	2	0	1	0	0	**402**
0730 - 0745	347	3	0	4	0	0	**354**
0745 - 0800	465	3	0	3	0	0	**471**
0800 - 0815	346	4	0	4	0	0	**354**
0815 - 0830	341	2	0	4	0	0	**347**
0830 - 0845	446	3	0	3	0	0	**452**
0845 - 0900	456	3	0	7	0	0	**466**
0900 - 0915	373	5	0	4	0	0	**382**
0915 - 0930	428	7	0	4	0	0	**439**
Per End	**4951**	**36**	**0**	**38**	**0**	**0**	5025

Lights	NORTH		EAST		SOUTH		
	Pacific Hwy		*Gordon Ave*		*Pacific Hwy*		
Peak Per	T	L	R	L	R	T	TOT
0630 - 0730	1728	5	0	4	0	0	**1737**
0645 - 0745	1638	7	0	7	0	0	**1652**
0700 - 0800	1673	8	0	9	0	0	**1690**
0715 - 0815	1529	11	0	11	0	0	**1551**
0730 - 0830	1462	11	0	14	0	0	**1487**
0745 - 0845	1561	11	0	13	0	0	**1585**
0800 - 0900	1553	11	0	17	0	0	**1581**
0815 - 0915	1572	12	0	18	0	0	**1602**
0830 - 0930	1659	17	0	18	0	0	**1694**
PEAK HR	**1728**	**5**	**0**	**4**	**0**	**0**	1737

Heavies	NORTH		EAST		SOUTH		
	Pacific Hwy		*Gordon Ave*		*Pacific Hwy*		
Peak Per	T	L	R	L	R	T	TOT
0630 - 0730	21	1	0	1	0	0	**23**
0645 - 0745	24	0	0	0	0	0	**24**
0700 - 0800	30	1	0	0	0	0	**31**
0715 - 0815	28	1	0	1	0	0	**30**
0730 - 0830	37	1	0	1	0	0	**39**
0745 - 0845	37	1	0	1	0	0	**39**
0800 - 0900	36	1	0	1	0	0	**38**
0815 - 0915	44	1	0	0	0	0	**45**
0830 - 0930	44	1	0	0	0	0	**45**
PEAK HR	**21**	**1**	**0**	**1**	**0**	**0**	23

Combined	NORTH		EAST		SOUTH		
	Pacific Hwy		*Gordon Ave*		*Pacific Hwy*		
Peak Per	T	L	R	L	R	T	TOT
0630 - 0730	1749	6	0	5	0	0	**1760**
0645 - 0745	1662	7	0	7	0	0	**1676**
0700 - 0800	1703	9	0	9	0	0	**1721**
0715 - 0815	1557	12	0	12	0	0	**1581**
0730 - 0830	1499	12	0	15	0	0	**1526**
0745 - 0845	1598	12	0	14	0	0	**1624**
0800 - 0900	1589	12	0	18	0	0	**1619**
0815 - 0915	1616	13	0	18	0	0	**1647**
0830 - 0930	1703	18	0	18	0	0	**1739**
PEAK HR	**1749**	**6**	**0**	**5**	**0**	**0**	1760

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

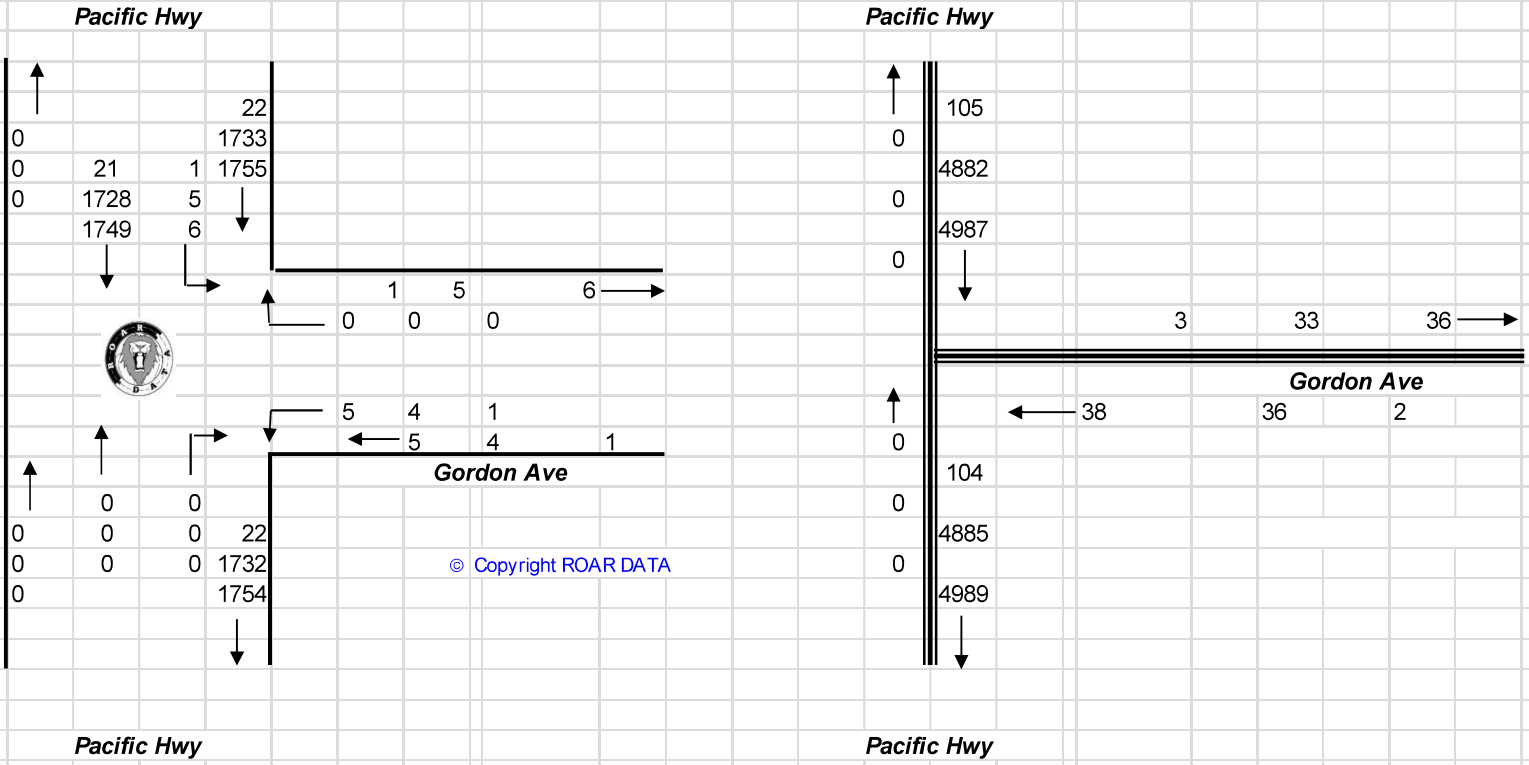
Client	: Varga Traffic Planning
Job No/Name	: 6478 CHATSWOOD Gordon Ave
Day/Date	: Thursday 8th June 2017

AM PEAK
0630 - 0730

1 2 3
4 5 6
7 8 9

N

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 : 6478 CHATSWOOD Gordon Ave
Day/Date : Thursday 8th June 2017

PEDS	NORTH	EAST	SOUTH	
Time Per	*Pacific*	*Gordon*	*Pacific*	TOT
1530 - 1545	0	7	0	**7**
1545 - 1600	0	2	0	**2**
1600 - 1615	0	2	0	**2**
1615 - 1630	0	2	0	**2**
1630 - 1645	0	6	0	**6**
1645 - 1700	0	3	0	**3**
1700 - 1715	0	5	0	**5**
1715 - 1730	0	7	0	**7**
1730 - 1745	0	8	0	**8**
1745 - 1800	0	3	0	**3**
1800 - 1815	0	5	0	**5**
1815 - 1830	0	2	0	**2**
Per End	**0**	**52**	**0**	52

PEDS	NORTH	EAST	SOUTH	
Peak Per	*Pacific*	*Gordon*	*Pacific*	TOT
1530 - 1630	0	13	0	**13**
1545 - 1645	0	12	0	**12**
1600 - 1700	0	13	0	**13**
1615 - 1715	0	16	0	**16**
1630 - 1730	0	21	0	**21**
1645 - 1745	0	23	0	**23**
1700 - 1800	0	23	0	**23**
1715 - 1815	0	23	0	**23**
1730 - 1830	0	18	0	**18**
PEAK HR	**0**	**16**	**0**	**16**

Lights	NORTH		EAST		SOUTH		
	Pacific		*Gordon*		*Pacific*		
Time Per	T	L	R	L	R	T	TOT
1530 - 1545	325	7		5			**337**
1545 - 1600	365	5		3			**373**
1600 - 1615	356	5		5			**366**
1615 - 1630	397	2		2			**401**
1630 - 1645	437	2		1			**440**
1645 - 1700	385	5		4			**394**
1700 - 1715	427	2		5			**434**
1715 - 1730	359	3		3			**365**
1730 - 1745	397	5		1			**403**
1745 - 1800	374	2		2			**378**
1800 - 1815	347	2		3			**352**
1815 - 1830	365	4		1			**370**
Per End	**4534**	**44**	**0**	**35**	**0**	**0**	4613

Heavies	NORTH		EAST		SOUTH		
	Pacific		*Gordon*		*Pacific*		
Time Per	T	L	R	L	R	T	TOT
1530 - 1545	12	0		0			**12**
1545 - 1600	5	0		0			**5**
1600 - 1615	18	0		0			**18**
1615 - 1630	14	0		0			**14**
1630 - 1645	14	0		0			**14**
1645 - 1700	11	0		0			**11**
1700 - 1715	10	0		0			**10**
1715 - 1730	7	0		0			**7**
1730 - 1745	11	0		0			**11**
1745 - 1800	10	0		0			**10**
1800 - 1815	14	0		0			**14**
1815 - 1830	8	0		0			**8**
Per End	**134**	**0**	**0**	**0**	**0**	**0**	134

Combined	NORTH		EAST		SOUTH		
	Pacific		*Gordon*		*Pacific*		
Time Per	T	L	R	L	R	T	TOT
1530 - 1545	337	7	0	5	0	0	**349**
1545 - 1600	370	5	0	3	0	0	**378**
1600 - 1615	374	5	0	5	0	0	**384**
1615 - 1630	411	2	0	2	0	0	**415**
1630 - 1645	451	2	0	1	0	0	**454**
1645 - 1700	396	5	0	4	0	0	**405**
1700 - 1715	437	2	0	5	0	0	**444**
1715 - 1730	366	3	0	3	0	0	**372**
1730 - 1745	408	5	0	1	0	0	**414**
1745 - 1800	384	2	0	2	0	0	**388**
1800 - 1815	361	2	0	3	0	0	**366**
1815 - 1830	373	4	0	1	0	0	**378**
Per End	**4668**	**44**	**0**	**35**	**0**	**0**	4747

Lights	NORTH		EAST		SOUTH		
	Pacific		*Gordon*		*Pacific*		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	1443	19	0	15	0	0	**1477**
1545 - 1645	1555	14	0	11	0	0	**1580**
1600 - 1700	1575	14	0	12	0	0	**1601**
1615 - 1715	1646	11	0	12	0	0	**1669**
1630 - 1730	1608	12	0	13	0	0	**1633**
1645 - 1745	1568	15	0	13	0	0	**1596**
1700 - 1800	1557	12	0	11	0	0	**1580**
1715 - 1815	1477	12	0	9	0	0	**1498**
1730 - 1830	1483	13	0	7	0	0	**1503**
PEAK HR	**1646**	**11**	**0**	**12**	**0**	**0**	1669

Heavies	NORTH		EAST		SOUTH		
	Pacific		*Gordon*		*Pacific*		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	49	0	0	0	0	0	**49**
1545 - 1645	51	0	0	0	0	0	**51**
1600 - 1700	57	0	0	0	0	0	**57**
1615 - 1715	49	0	0	0	0	0	**49**
1630 - 1730	42	0	0	0	0	0	**42**
1645 - 1745	39	0	0	0	0	0	**39**
1700 - 1800	38	0	0	0	0	0	**38**
1715 - 1815	42	0	0	0	0	0	**42**
1730 - 1830	43	0	0	0	0	0	**43**
PEAK HR	**49**	**0**	**0**	**0**	**0**	**0**	49

Combined	NORTH		EAST		SOUTH		
	Pacific		*Gordon*		*Pacific*		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	1492	19	0	15	0	0	**1526**
1545 - 1645	1606	14	0	11	0	0	**1631**
1600 - 1700	1632	14	0	12	0	0	**1658**
1615 - 1715	1695	11	0	12	0	0	**1718**
1630 - 1730	1650	12	0	13	0	0	**1675**
1645 - 1745	1607	15	0	13	0	0	**1635**
1700 - 1800	1595	12	0	11	0	0	**1618**
1715 - 1815	1519	12	0	9	0	0	**1540**
1730 - 1830	1526	13	0	7	0	0	**1546**
PEAK HR	**1695**	**11**	**0**	**12**	**0**	**0**	1718

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

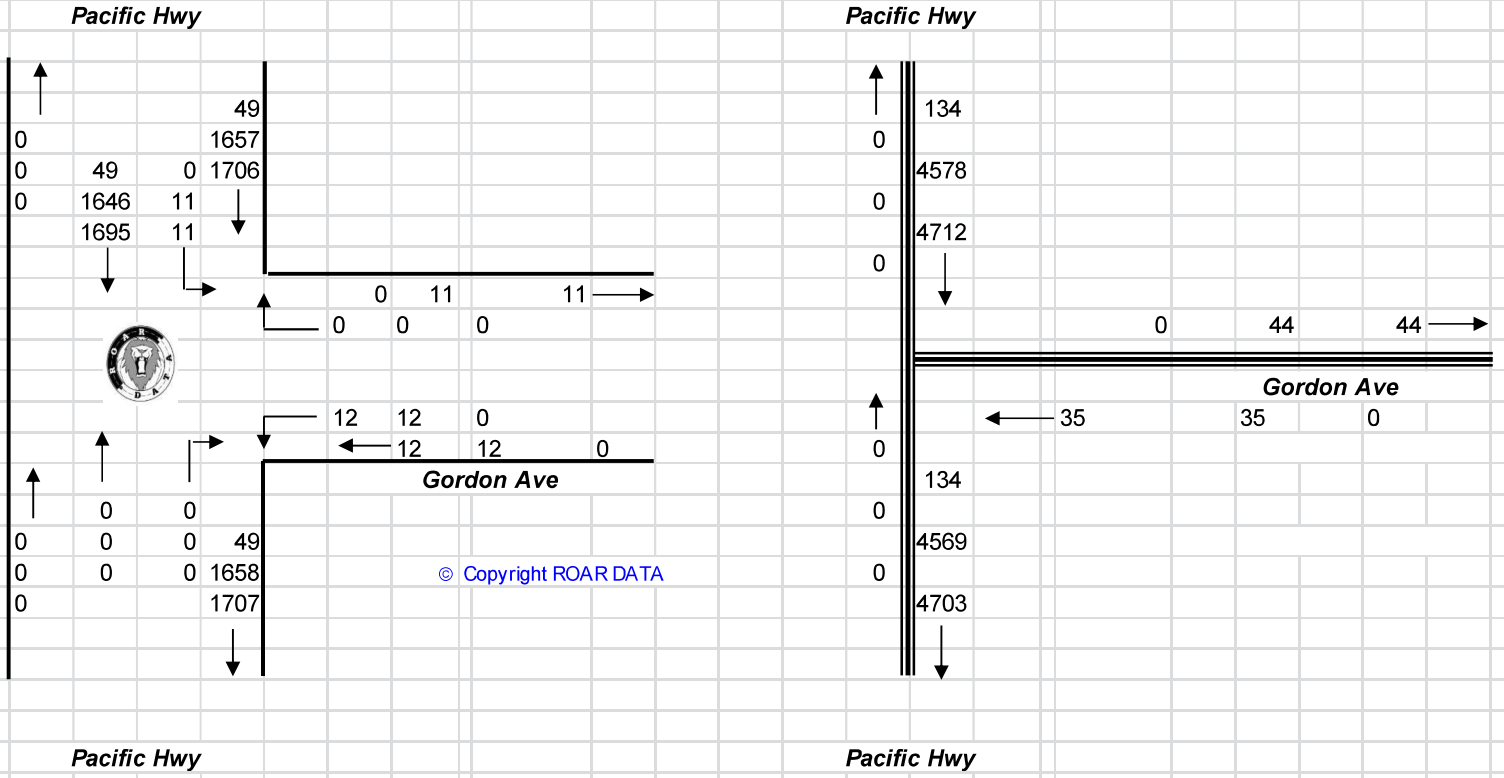
Client	: Varga Traffic Planning
Job No/Name	: 6478 CHATSWOOD Gordon Ave
Day/Date	: Thursday 8th June 2017

PM PEAK
1615 - 1715

1	2	3
4	5	6
7	8	9

TOTAL VOLUMES FOR COUNT PERIOD

N



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client	: Varga Traffic Planning
Job No/Name	: 6478 CHATSWOOD Gordon Ave
Day/Date	: Thursday 8th June 2017

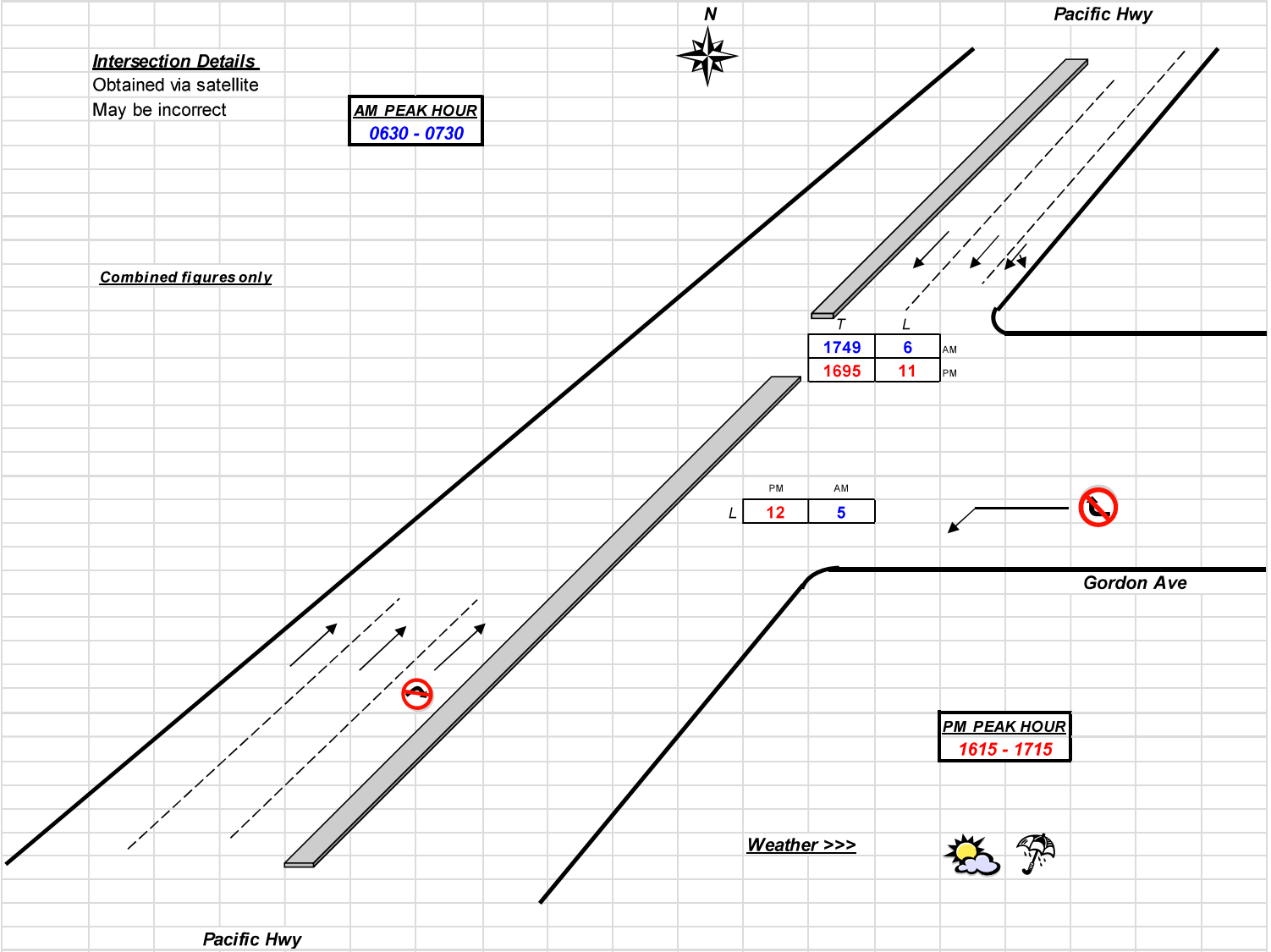
Intersection Details

Obtained via satellite

May be incorrect

AM PEAK HOUR
0630 - 0730

Combined figures only



PM PEAK HOUR
1615 - 1715

Weather >>>

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6478 CHATSWOOD Gordon Ave
Day/Date : Thursday 8th June 2017

Lights

	NORTH			WEST			SOUTH			EAST			
	Hammond Lane			*Gordon Ave*			*Hammond Lane*			*Gordon Ave*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0630 - 0645	0	0	0	0	1	0	0	0	0	0	1	0	2
0645 - 0700	0	0	1	0	0	0	0	0	0	0	0	0	1
0700 - 0715	0	0	0	1	0	0	0	0	0	0	0	0	1
0715 - 0730	0	0	0	0	0	2	1	0	1	1	0	0	5
0730 - 0745	0	0	0	0	1	2	3	0	0	0	1	0	7
0745 - 0800	0	0	0	0	1	0	3	0	0	0	0	0	4
0800 - 0815	0	0	0	3	0	1	3	0	0	0	0	0	7
0815 - 0830	0	0	0	0	1	0	1	0	1	1	0	0	4
0830 - 0845	0	0	0	0	0	0	1	0	0	0	2	0	3
0845 - 0900	0	0	0	0	0	0	3	0	0	0	1	0	4
0900 - 0915	0	0	0	1	0	2	1	0	0	0	0	0	4
0915 - 0930	0	0	0	2	2	1	1	0	0	1	3	0	10
Period End	**0**	**0**	**1**	**7**	**6**	**8**	**17**	**0**	**2**	**3**	**8**	**0**	**52**

Lights

	NORTH			WEST			SOUTH			EAST			
	Hammond Lane			*Gordon Ave*			*Hammond Lane*			*Gordon Ave*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0630 - 0730	0	0	1	1	1	2	1	0	1	1	1	0	9
0645 - 0745	0	0	1	1	1	4	4	0	1	1	1	0	14
0700 - 0800	0	0	0	1	2	4	7	0	1	1	1	0	17
0715 - 0815	0	0	0	3	2	5	10	0	1	1	1	0	23
0730 - 0830	0	0	0	3	3	3	10	0	1	1	1	0	22
0745 - 0845	0	0	0	3	2	1	8	0	1	1	2	0	18
0800 - 0900	0	0	0	3	1	1	8	0	1	1	3	0	18
0815 - 0915	0	0	0	1	1	2	6	0	1	1	3	0	15
0830 - 0930	0	0	0	3	2	3	6	0	0	1	6	0	21
PEAK HOUR	**0**	**0**	**0**	**3**	**2**	**5**	**10**	**0**	**1**	**1**	**1**	**0**	**23**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Hammond Lane			*Gordon Ave*			*Hammond Lane*			*Gordon Ave*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0630 - 0645	0	0	0	0	1	0	0	0	0	0	1	0	2
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	1	0	0	0	0	0	0	0	1
0800 - 0815	0	0	0	0	0	0	0	0	0	0	1	0	1
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	1	0	0	0	0	0	0	0	1
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**	**3**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**5**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Hammond Lane			*Gordon Ave*			*Hammond Lane*			*Gordon Ave*			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0630 - 0730	0	0	0	0	1	0	0	0	0	0	1	0	2
0645 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0
0700 - 0800	0	0	0	0	1	0	0	0	0	0	0	0	1
0715 - 0815	0	0	0	0	1	0	0	0	0	0	1	0	2
0730 - 0830	0	0	0	0	1	0	0	0	0	0	1	0	2
0745 - 0845	0	0	0	0	1	0	0	0	0	0	1	0	2
0800 - 0900	0	0	0	0	1	0	0	0	0	0	1	0	2
0815 - 0915	0	0	0	0	1	0	0	0	0	0	0	0	1
0830 - 0930	0	0	0	0	1	0	0	0	0	0	0	0	1
PEAK HOUR	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**

Combined

	NORTH			WEST			SOUTH			EAST			
	Hammond Lane			*Gordon Ave*			*Hammond Lane*			*Gordon Ave*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0630 - 0645	0	0	0	0	2	0	0	0	0	0	2	0	4
0645 - 0700	0	0	1	0	0	0	0	0	0	0	0	0	1
0700 - 0715	0	0	0	1	0	0	0	0	0	0	0	0	1
0715 - 0730	0	0	0	0	0	2	1	0	1	1	0	0	5
0730 - 0745	0	0	0	0	1	2	3	0	0	0	1	0	7
0745 - 0800	0	0	0	0	2	0	3	0	0	0	0	0	5
0800 - 0815	0	0	0	3	0	1	3	0	0	0	1	0	8
0815 - 0830	0	0	0	0	1	0	1	0	1	1	0	0	4
0830 - 0845	0	0	0	0	0	0	1	0	0	0	2	0	3
0845 - 0900	0	0	0	0	1	0	3	0	0	0	1	0	5
0900 - 0915	0	0	0	1	0	2	1	0	0	0	0	0	4
0915 - 0930	0	0	0	2	2	1	1	0	0	1	3	0	10
Period End	**0**	**0**	**1**	**7**	**9**	**8**	**17**	**0**	**2**	**3**	**10**	**0**	**57**

Combined

	NORTH			WEST			SOUTH			EAST			
	Hammond Lane			*Gordon Ave*			*Hammond Lane*			*Gordon Ave*			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0630 - 0730	0	0	1	1	2	2	1	0	1	1	2	0	11
0645 - 0745	0	0	1	1	1	4	4	0	1	1	1	0	14
0700 - 0800	0	0	0	1	3	4	7	0	1	1	1	0	18
0715 - 0815	0	0	0	3	3	5	10	0	1	1	2	0	25
0730 - 0830	0	0	0	3	4	3	10	0	1	1	2	0	24
0745 - 0845	0	0	0	3	3	1	8	0	1	1	3	0	20
0800 - 0900	0	0	0	3	2	1	8	0	1	1	4	0	20
0815 - 0915	0	0	0	1	2	2	6	0	1	1	3	0	16
0830 - 0930	0	0	0	3	3	3	6	0	0	1	6	0	22
PEAK HOUR	**0**	**0**	**0**	**3**	**3**	**5**	**10**	**0**	**1**	**1**	**2**	**0**	**25**

R.O.A.R DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6478 CHATSWOOD Gordon Ave
Day/Date : Thursday 8th June 2017

Peds	NORTH	WEST	SOUTH	EAST	
	Hammond Lane	*Gordon Ave*	*Hammond Lane*	*Gordon Ave*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0630 - 0645	0	2	0	2	**4**
0645 - 0700	0	0	1	0	**1**
0700 - 0715	0	0	1	1	**2**
0715 - 0730	0	0	3	4	**7**
0730 - 0745	0	3	5	1	**9**
0745 - 0800	0	0	2	2	**4**
0800 - 0815	0	2	1	3	**6**
0815 - 0830	0	2	2	0	**4**
0830 - 0845	0	2	0	4	**6**
0845 - 0900	0	0	0	0	**0**
0900 - 0915	0	1	0	0	**1**
0915 - 0930	0	1	0	0	**1**
Period End	**0**	**13**	**15**	**17**	**45**

Peds	NORTH	WEST	SOUTH	EAST	
	Hammond Lane	*Gordon Ave*	*Hammond Lane*	*Gordon Ave*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0630 - 0730	0	2	5	7	**14**
0645 - 0745	0	3	10	6	**19**
0700 - 0800	0	3	11	8	**22**
0715 - 0815	0	5	11	10	**26**
0730 - 0830	0	7	10	6	**23**
0745 - 0845	0	6	5	9	**20**
0800 - 0900	0	6	3	7	**16**
0815 - 0915	0	5	2	4	**11**
0830 - 0930	0	4	0	4	**8**
PEAK HR	**0**	**5**	**11**	**10**	**26**

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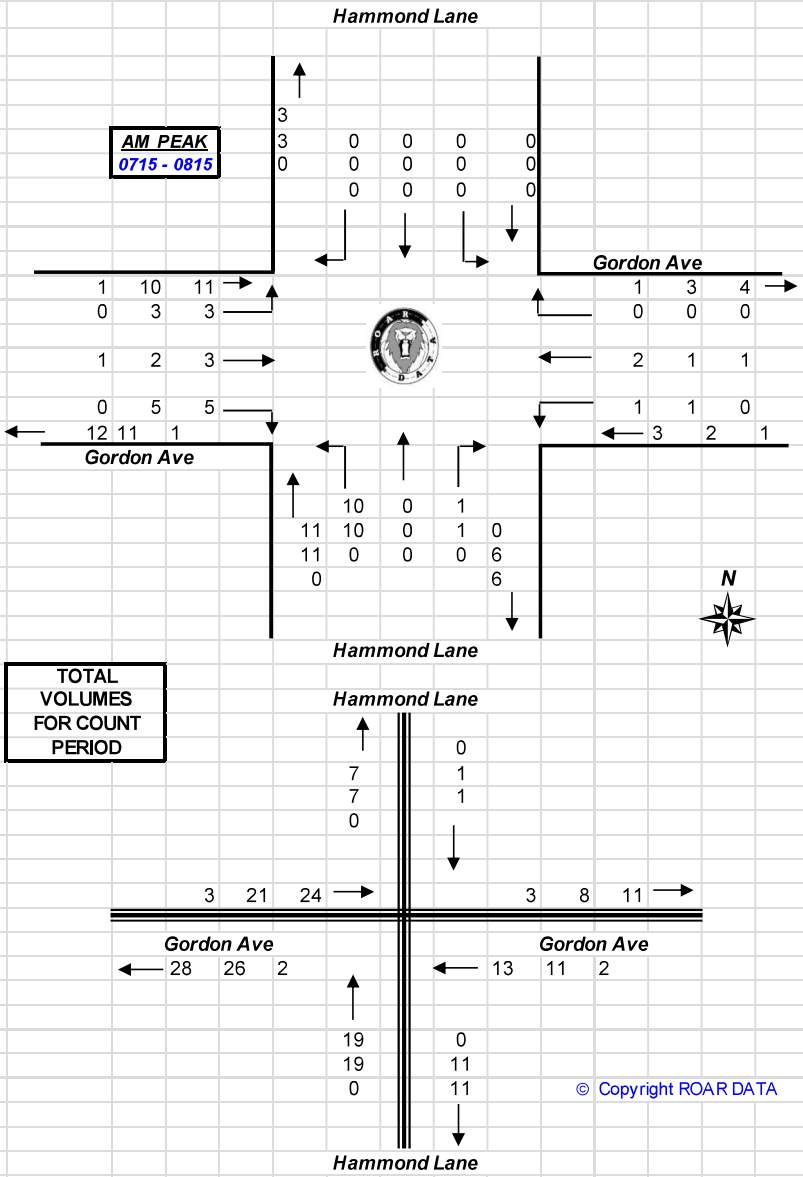


R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 6478 CHATSWOOD Gordon Ave
Day/Date : Thursday 8th June 2017

Lights

Time Per	NORTH Hammond Lane L	T	R	WEST Gordon Ave L	T	R	SOUTH Hammond Lane L	T	R	EAST Gordon Ave L	T	R	TOT
1530 - 1545	0	0	0	1	1	0	2	0	0	0	0	0	4
1545 - 1600	0	0	0	1	2	2	0	0	0	0	2	0	7
1600 - 1615	0	0	0	2	1	0	1	0	0	0	2	0	6
1615 - 1630	0	0	0	1	0	0	0	0	0	0	1	0	2
1630 - 1645	0	0	0	1	0	0	0	0	0	0	0	0	1
1645 - 1700	0	0	1	0	0	1	0	0	1	0	0	1	4
1700 - 1715	0	0	0	0	1	0	1	0	0	0	1	0	3
1715 - 1730	0	0	0	1	0	0	1	0	1	0	0	0	3
1730 - 1745	0	1	0	1	0	3	1	0	0	1	0	0	7
1745 - 1800	0	0	0	1	0	1	0	0	0	0	0	0	2
1800 - 1815	0	0	0	1	1	0	2	0	0	0	1	0	5
1815 - 1830	0	0	0	0	2	1	0	0	0	0	1	0	4
Period End	**0**	**1**	**1**	**10**	**8**	**8**	**8**	**0**	**2**	**1**	**8**	**1**	**48**

Lights

Peak Time	NORTH Hammond Lane L	T	R	WEST Gordon Ave L	T	R	SOUTH Hammond Lane L	T	R	EAST Gordon Ave L	T	R	TOT
1530 - 1630	0	0	0	5	4	2	3	0	0	0	5	0	19
1545 - 1645	0	0	0	5	3	2	1	0	0	0	5	0	16
1600 - 1700	0	0	1	4	1	1	1	0	1	0	3	1	13
1615 - 1715	0	0	1	2	1	1	1	0	1	0	2	1	10
1630 - 1730	0	0	1	2	1	1	2	0	2	0	1	1	11
1645 - 1745	0	1	1	2	1	4	3	0	2	1	1	1	17
1700 - 1800	0	1	0	3	1	4	3	0	1	1	1	0	15
1715 - 1815	0	1	0	4	1	4	4	0	1	1	1	0	17
1730 - 1830	0	1	0	3	3	5	3	0	0	1	2	0	18
PEAK HOUR	**0**	**0**	**0**	**5**	**4**	**2**	**3**	**0**	**0**	**0**	**5**	**0**	**19**

Heavies

Time Per	NORTH Hammond Lane L	T	R	WEST Gordon Ave L	T	R	SOUTH Hammond Lane L	T	R	EAST Gordon Ave L	T	R	TOT
1530 - 1545	0	0	0	0	0	0	0	0	0	0	0	0	0
1545 - 1600	0	0	0	0	0	0	0	0	0	0	0	0	0
1600 - 1615	0	0	0	0	0	0	0	0	0	0	0	0	0
1615 - 1630	0	0	0	0	0	0	0	0	0	0	0	0	0
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	0	0
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	0	0
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	0	0
1715 - 1730	0	0	0	0	0	0	0	0	0	0	0	0	0
1730 - 1745	0	0	0	0	0	0	0	0	0	0	0	0	0
1745 - 1800	0	0	0	0	0	0	0	0	0	0	0	0	0
1800 - 1815	0	0	0	0	0	0	0	0	0	0	0	0	0
1815 - 1830	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**

Heavies

Peak Per	NORTH Hammond Lane L	T	R	WEST Gordon Ave L	T	R	SOUTH Hammond Lane L	T	R	EAST Gordon Ave L	T	R	TOT
1530 - 1630	0	0	0	0	0	0	0	0	0	0	0	0	0
1545 - 1645	0	0	0	0	0	0	0	0	0	0	0	0	0
1600 - 1700	0	0	0	0	0	0	0	0	0	0	0	0	0
1615 - 1715	0	0	0	0	0	0	0	0	0	0	0	0	0
1630 - 1730	0	0	0	0	0	0	0	0	0	0	0	0	0
1645 - 1745	0	0	0	0	0	0	0	0	0	0	0	0	0
1700 - 1800	0	0	0	0	0	0	0	0	0	0	0	0	0
1715 - 1815	0	0	0	0	0	0	0	0	0	0	0	0	0
1730 - 1830	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Combined

Time Per	NORTH Hammond Lane L	T	R	WEST Gordon Ave L	T	R	SOUTH Hammond Lane L	T	R	EAST Gordon Ave L	T	R	TOT
1530 - 1545	0	0	0	1	1	0	2	0	0	0	0	0	4
1545 - 1600	0	0	0	1	2	2	0	0	0	0	2	0	7
1600 - 1615	0	0	0	2	1	0	1	0	0	0	2	0	6
1615 - 1630	0	0	0	1	0	0	0	0	0	0	1	0	2
1630 - 1645	0	0	0	1	0	0	0	0	0	0	0	0	1
1645 - 1700	0	0	1	0	0	1	0	0	1	0	0	1	4
1700 - 1715	0	0	0	0	1	0	1	0	0	0	1	0	3
1715 - 1730	0	0	0	1	0	0	1	0	1	0	0	0	3
1730 - 1745	0	1	0	1	0	3	1	0	0	1	0	0	7
1745 - 1800	0	0	0	1	0	1	0	0	0	0	0	0	2
1800 - 1815	0	0	0	1	1	0	2	0	0	0	1	0	5
1815 - 1830	0	0	0	0	2	1	0	0	0	0	1	0	4
Period End	**0**	**1**	**1**	**10**	**8**	**8**	**8**	**0**	**2**	**1**	**8**	**1**	**48**

Combined

Peak Per	NORTH Hammond Lane L	T	R	WEST Gordon Ave L	T	R	SOUTH Hammond Lane L	T	R	EAST Gordon Ave L	T	R	TOT
1530 - 1630	0	0	0	5	4	2	3	0	0	0	5	0	19
1545 - 1645	0	0	0	5	3	2	1	0	0	0	5	0	16
1600 - 1700	0	0	1	4	1	1	1	0	1	0	3	1	13
1615 - 1715	0	0	1	2	1	1	1	0	1	0	2	1	10
1630 - 1730	0	0	1	2	1	1	2	0	2	0	1	1	11
1645 - 1745	0	1	1	2	1	4	3	0	2	1	1	1	17
1700 - 1800	0	1	0	3	1	4	3	0	1	1	1	0	15
1715 - 1815	0	1	0	4	1	4	4	0	1	1	1	0	17
1730 - 1830	0	1	0	3	3	5	3	0	0	1	2	0	18
PEAK HOUR	**0**	**0**	**0**	**5**	**4**	**2**	**3**	**0**	**0**	**0**	**5**	**0**	**19**

R.O.A.R DATA

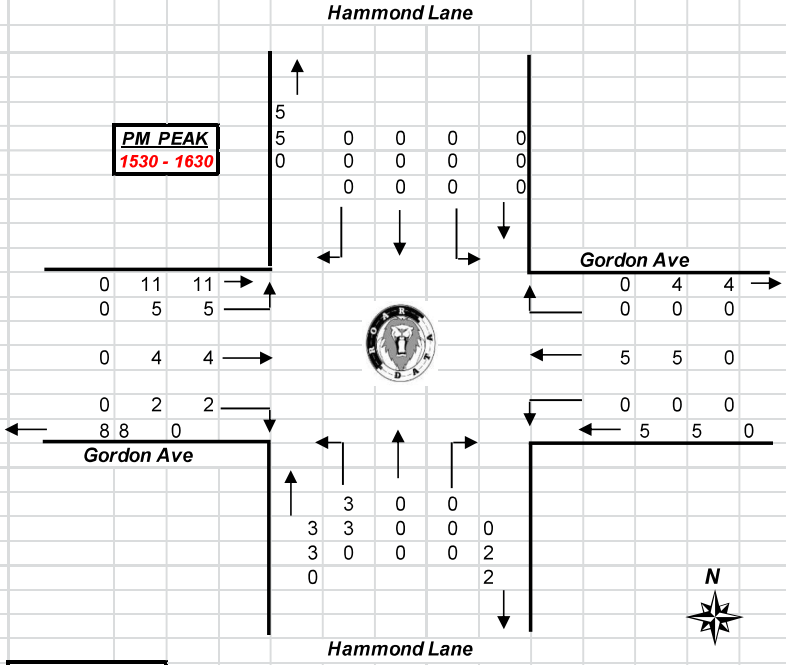
Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

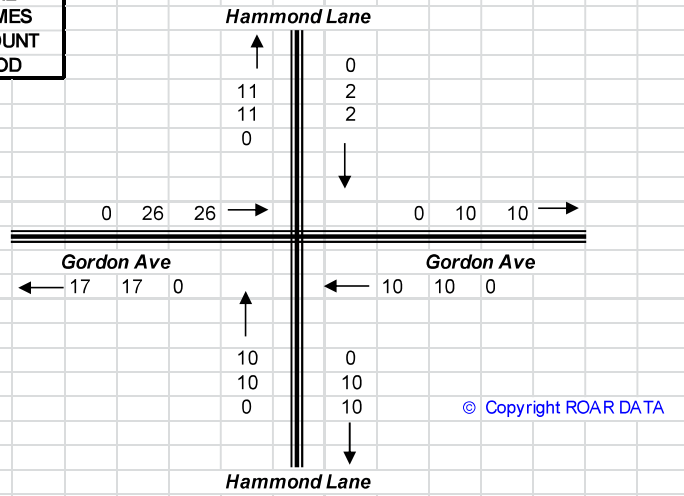
Client : Varga Traffic Planning
Job No/Name : 6478 CHATSWOOD Gordon Ave
Day/Date : Thursday 8th June 2017

Peds	NORTH	WEST	SOUTH	EAST	
	Hammond Lane	*Gordon Ave*	*Hammond Lane*	*Gordon Ave*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1530 - 1545	0	2	0	1	**3**
1545 - 1600	1	6	2	2	**11**
1600 - 1615	0	1	0	1	**2**
1615 - 1630	0	0	0	0	**0**
1630 - 1645	0	1	4	5	**10**
1645 - 1700	1	2	5	1	**9**
1700 - 1715	0	0	0	1	**1**
1715 - 1730	0	0	0	0	**0**
1730 - 1745	1	1	0	0	**2**
1745 - 1800	0	0	2	0	**2**
1800 - 1815	0	2	2	0	**4**
1815 - 1830	1	3	2	1	**7**
Period End	**4**	**18**	**17**	**12**	**51**

Peds	NORTH	WEST	SOUTH	EAST	
	Hammond Lane	*Gordon Ave*	*Hammond Lane*	*Gordon Ave*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1530 - 1630	1	9	2	4	**16**
1545 - 1645	1	8	6	8	**23**
1600 - 1700	1	4	9	7	**21**
1615 - 1715	1	3	9	7	**20**
1630 - 1730	1	3	9	7	**20**
1645 - 1745	2	3	5	2	**12**
1700 - 1800	1	1	2	1	**5**
1715 - 1815	1	3	4	0	**8**
1730 - 1830	2	6	6	1	**15**
PEAK HR	**1**	**9**	**2**	**4**	**16**



TOTAL VOLUMES FOR COUNT PERIOD



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R.O.A.R. DATA

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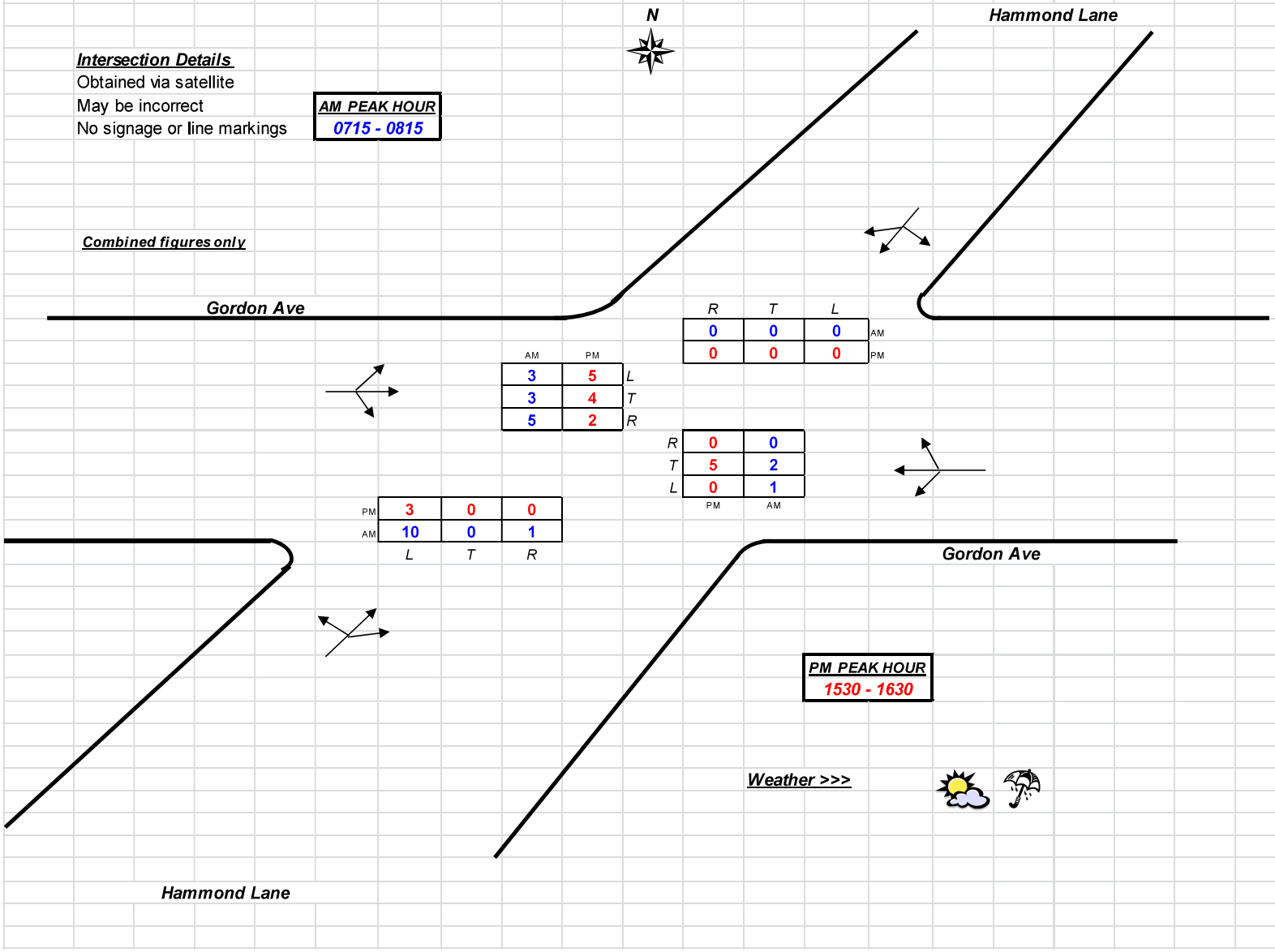
Client	: Varga Traffic Planning
Job No/Name	: 6478 CHATSWOOD Gordon Ave
Day/Date	: Thursday 8th June 2017



DCP Controls –
Draft Section for 629-639 Pacific Highway, Chatswood

1.0 General

These controls apply to land bounded by 629-639 Pacific Highway, being Lot 9 DP4138, Lot 10 DP 4138, Lot11 DP 4138, Lot 12 DP 4138, Lot 13 DP 4138 and Lot 14 DP 4138 and shown on the map below:

The aims and objectives of these controls are to:

1. Provide a mixed commercial and residential development within the southern precinct of the Chatswood CBD that contributes to the vitality of the centre and supports public transport use.
2. Develop the site within the CBD without impacting the viability of adjoining lots for future development.
3. Ensure that building form and articulation addresses the corner of the Pacific Highway and Gordon Avenue.
4. Ensure development on the site minimises impacts to the amenity of neighbouring residential properties.
5. Establish environmental standards which achieve high levels of residential amenity for occupants of the development.
6. Minimise traffic impacts from redevelopment of the site.
7. Provide landscaping that enhances the setting of the building as well as the amenity of the development and the amenity of neighbouring properties.
8. Provide a planted buffer along the Pacific Highway to reinforce the 'greening' of Chatswood CBD and provide increased amenity to the ground level retail and lobby
9. The site is to be developed for Mixed Use in accordance with the controls in WLEP 2012.
10. Ground Floor (Level 1) and Level 2 must provide for B4 retail /commercial permitted uses other than residential development.

2.0 Building Form

A. Building Height and Floor Space Ratio

Performance Criteria

The built form of new development should:

1. Provide a slender tower building form.
2. Incorporate a two storey podium.
3. Minimise overshadowing of adjoining properties.
4. Articulate the building on the corner of Pacific Highway and Gordon Avenue to reinforce a gateway to Chatswood.

Controls

1. The maximum building height that applies to this site is 90m.
2. The maximum permissible FSR that applies to this site is 6:1.
3. The maximum building height is to include any lift overrun and roof plant room.
4. Provide a maximum podium height of 8 metres addressing the Pacific Highway, Gordon Avenue and Hammond Lane.
5. The maximum building height is to be in accordance with Figure 1 “Maximum Building Height” below.

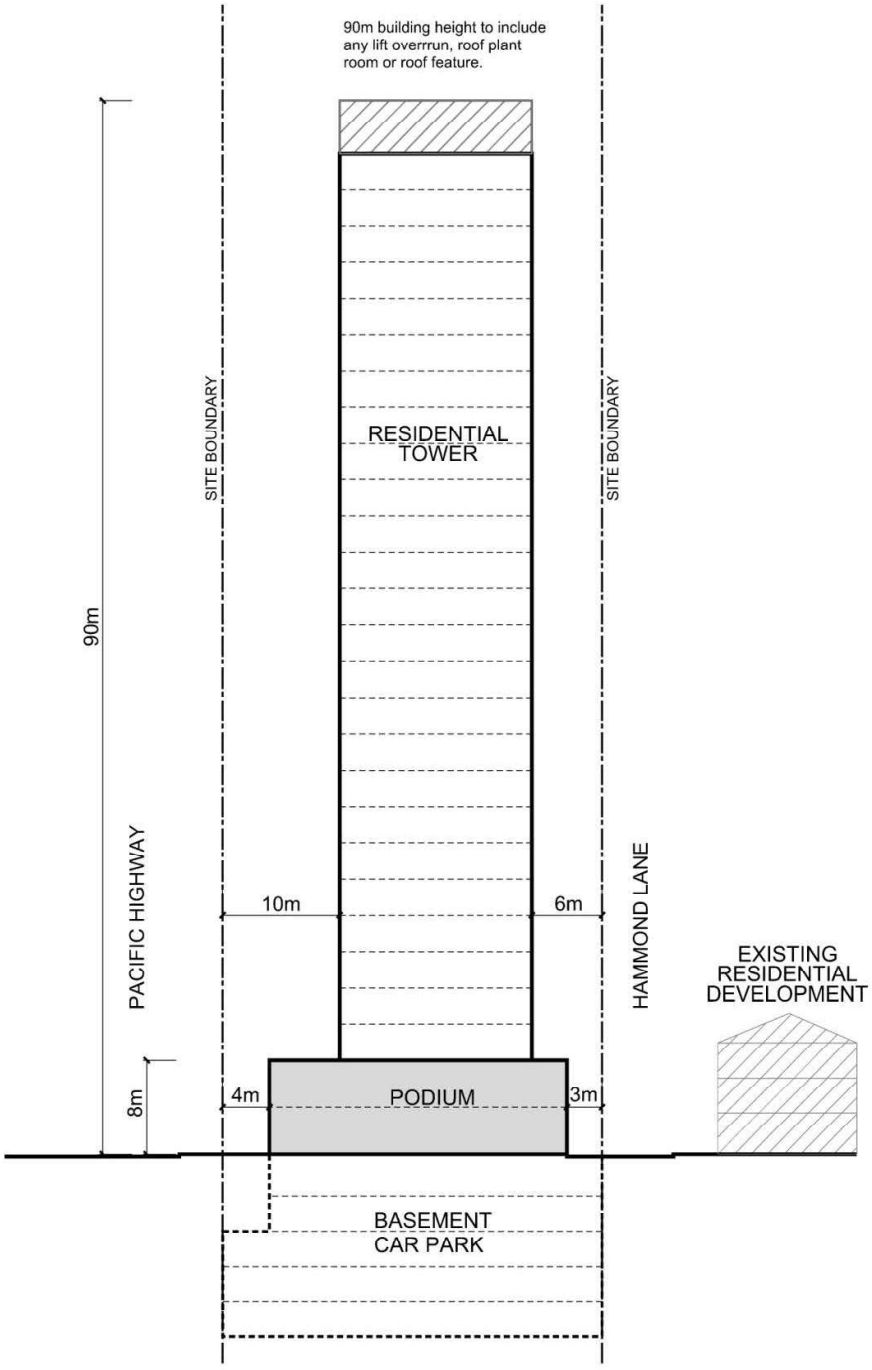


Figure 1: Maximum Building Height

B. Setbacks

Performance Criteria

Setbacks should:

6. Provide good solar access to surrounding public realm areas.
7. Ground floor setbacks to provide for broad planting and footpaths.
8. Minimise the effects of adverse wind conditions at street level.
9. Be consistent with setbacks of adjacent properties.

Controls

1. Provide a minimum 4 metre podium setback for levels 1 and 2 from the western boundary adjacent to the Pacific Highway.
2. Provide a minimum 10 metre setback above level 2 from the western boundary adjacent to the Pacific Highway.
3. Provide a minimum 3 metre podium setback for levels 1 and 2 from the eastern boundary adjacent to Hammond Lane
4. Provide a minimum 6 metre setback above level 2 from the eastern boundary adjacent to Hammond Lane.
5. Provide a minimum 0 metre podium setback for levels 1 and 2 from the northern boundary adjacent to Gordon Avenue.
6. Provide a minimum 3 metre setback above level 2 from the northern boundary adjacent to Gordon Avenue.
7. Provide a minimum 0 metre podium setback for levels 1 and 2 from the southern boundary.
8. Provide a minimum 6 metre setback above level 2 from the southern boundary.
9. Provide a minimum 4 metre setback from the pacific highway boundary for the first two basement levels to provide for tree planting.
10. The building setbacks are to be in accordance with Figure 2 “Minimum Building Setbacks” below.

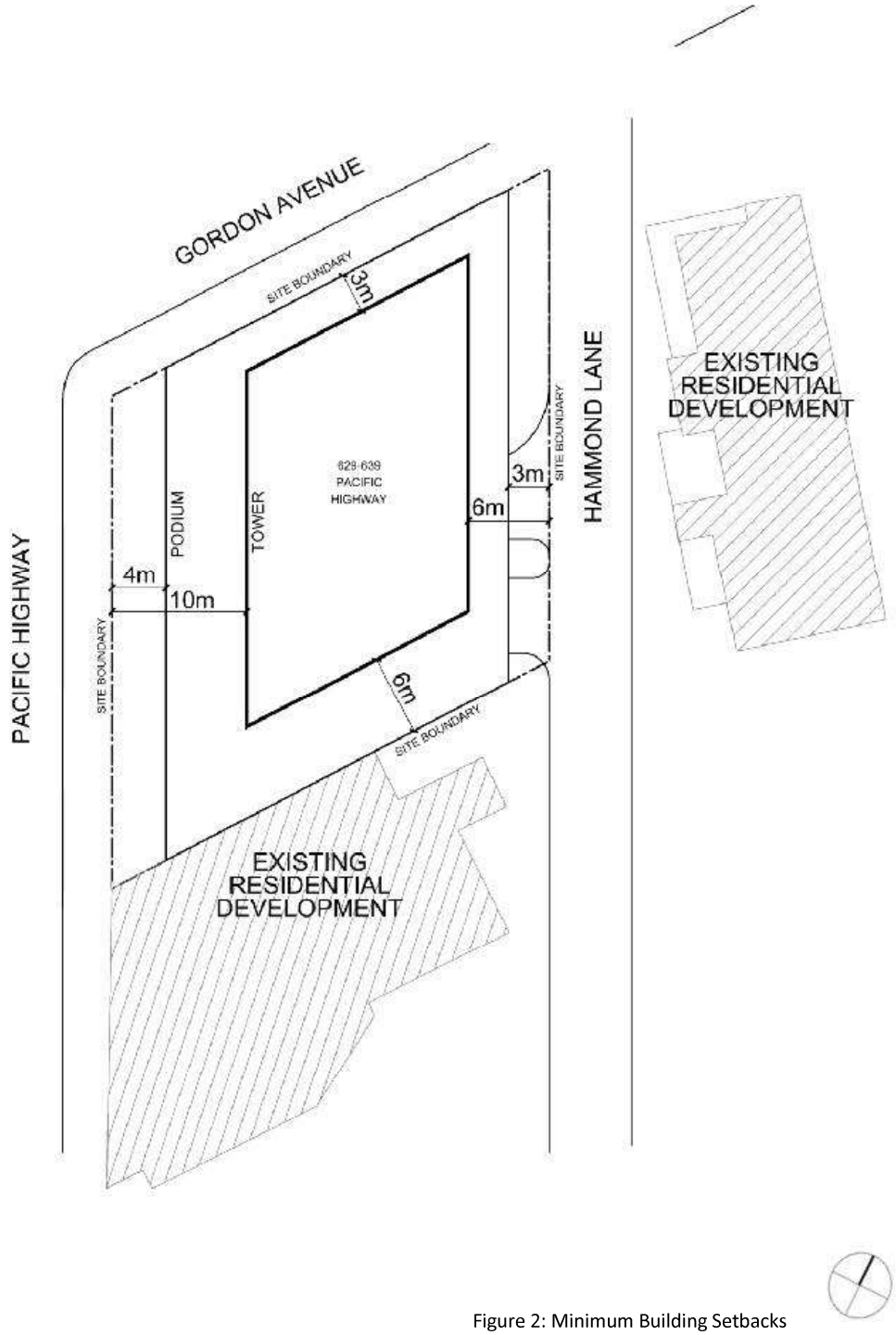


Figure 2: Minimum Building Setbacks

3.0 Building Exterior

A. Facades

Performance Criteria

1. Building facades should complement the character of the area and contribute to creating attractive pedestrian environments and streetscapes.
2. High quality façade materials and finishes are to be used which contribute positively to the built environment by visually enhancing their setting and ensuring low maintenance.
3. The building façades should be a product of quality design which reflects the sites gateway location.
4. Below awning façades should address the street and provide interest to pedestrians.
5. Facade design to encourage active street frontages to Pacific Highway and Gordon Avenue.

Controls

1. Façades above street level are to be designed with materials which provide surface relief and integration with use of low maintenance materials.
2. Façade proportions are to reflect horizontal or vertical emphasis as appropriate to their context.
3. Glazing is to be set back from the structure and modulated.
4. Façades are to be articulated and should incorporate recesses and projecting elements as appropriate.
5. External finishes are to be hard-wearing and low maintenance to retain the initial attractiveness of the development.
6. Extensive blank walls should be avoided at street level.

B. Building Entrances

Performance Criteria

1. Building entrances should be clear, unambiguous and appropriate to their purpose.
2. Distinct entrances to separate building functions should provide a legible and safe environment.

Controls

1. Pedestrian entrances to specific functions of the development are to be easily distinguished in the façades and be legible to the public.
2. Provide a legible separate building entry lobby for the commercial and residential functions.
3. Retail and commercial entry lobbies are to be visible from streets.
4. Retail pedestrian entrances are to be directly accessed from the street level.

C. Roofscapes

Performance Criteria

1. Roofscapes should provide a richness of detail that enhances the quality of buildings and their visual contribution to the built environment.

Controls

1. Roof design is to contribute to a visually interesting skyline through the provision of “sculpted forms”.
2. Flat roof areas may be incorporated where designed as useable outdoor recreation space.
3. All rooftop lift overruns or exposed structures are to be suitably screened and integrated with the building.
4. Green roofs to be provided on roofs up to 30m from ground.

4.0 Streetscape Amenity

A. Active Frontage Activities

Performance Criteria

1. Development should provide interest and amenity for pedestrians at ground level.
2. Vehicular entries and main service doors are to be located in Hammond Lane.

Controls

1. The building design is to recognise the primary frontages of the Pacific Highway and Gordon Avenue.
2. The ground level frontage facing the Pacific Highway and Gordon Avenue are to include retail uses.

B. Awnings

Performance Criteria

1. Awnings, particularly over entrances, should be provided for weather protection and to improve pedestrian amenity.

Controls

1. All pedestrian entrances are to have awnings integrally designed with the façade.
2. Awnings are to be designed to provide good natural light to the ground level uses.

C. Vehicle Access

Performance Criteria

1. Minimise the number of vehicle access points to the development.
2. Vehicular access points are designed to minimise their impact on pedestrians and the flow of traffic.
3. Vehicular access points should be unobtrusive in the streetscape but ensure visibility for motorists and approaching pedestrians.
4. Potential vehicular access (by right-of-way and breakout style wall) to any future high rise development of the property to the south of the site could be considered via the first basement level.

Controls

1. Vehicle access points for the development are to be limited to Hammond Lane (refer to Figure 3 “Vehicle Access” below).
2. The access driveways to below ground car parking shall have a maximum gradient of 1 in 4.

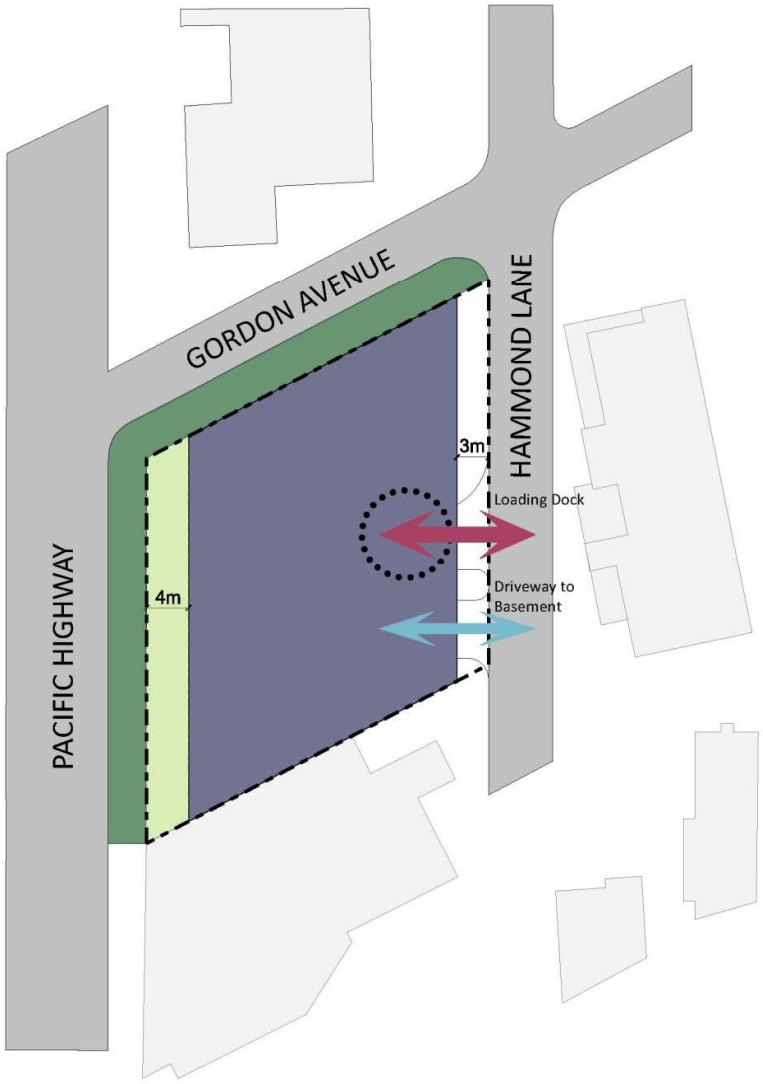


Figure 3: Vehicle Access

5.0 Car Parking and Access

A. Provision

Performance Criteria

1. The development shall meet Council's car parking requirements.

Controls

1. Car parking for retail and commercial use shall be provided at the following rates:
    - 1 space per 25m2 for retail use.
    - 1 space per 110m2 for commercial use.
2. Car parking for residential use shall be provided at the following rates:
    - 1 space per residential unit.
    - 1 per 4 units for residential visitor car parking.
3. Opportunities should be explored to reduce on-site car parking through the provision of shared residential visitor / commercial car parking and car share spaces.

B. Location

Performance Criteria

1. The location of car parking is integrally designed as part of the building.

Controls

1. All car parking is to be located below ground level.

   Note: Vehicle parking at ground level is restricted to the loading dock area.

C. Delivery and Service Vehicles

Performance Criteria

1. Provision for delivery and service vehicles on-site shall ensure ease of access and reduce the need for on-street parking; and
2. The size of loading dock shall provide for garbage handling and goods handling of deliveries.

Controls

1. A loading dock for delivery and service vehicles is to be provided which provides for vehicles to enter and leave in a forward direction.
2. Loading areas are to be screened from the street with safety management.

6.0 Design Excellence and Building Sustainability

A. Design Excellence

Performance Criteria

1. Design excellence and building sustainability is to be required for all developments exceeding the base FSR and with a height greater than 35m.

Controls

1. The development must demonstrate higher building sustainability standards.
2. The Architect for the design excellence scheme should be maintained through the DA process and can only be substituted with agreement of Council.

3. A design review panel is to be established to review design options. The panel is to include the following members:
    - Willoughby Council representative with urban design qualification;
    - Client Representative; and a
    - Peer review architect/ urban designer.
4. Architects are to prepare the following:
    - An extensive urban design analysis and visual assessment of the site and its surrounding context.
    - Three different concept design options for review by Design Review Panel.
5. The preferred concept design for DA approval submission to be selected by Design Review Panel.
6. The Architect is to present urban design analysis, visual assessment and preferred concept design options to the Design Review Panel prior to attending a Pre DA lodgement meeting with Council.

B. Sustainability Criteria

Performance Criteria

1. Commercial space is to be designed to achieve a 4 Star minimum NABERS rating.
2. A SEPP 65 – Design Quality of Residential Flat Development report is to be provided at Development Application stage.
3. Appropriate BASIX documentation is to be submitted at Development Application stage.
4. A detailed contamination assessment is to be provided at Development Application stage in accordance with SEPP 55 – Remediation of Contaminated Land.
5. An acoustic assessment is to be provided at Development Application stage.
6. A wind assessment is to be provided at Development Application stage.

7.0 Open Space and Landscaping

Performance Criteria

1. The development shall be consistent to the landscape buffer along the Pacific Highway illustrated in the Chatswood CBD Strategy.
2. The development is to provide a planted buffer along the Pacific Highway to reinforce the ‘greening’ of Chatswood CBD and provide increased amenity to the ground level retail and lobby.
3. Create a permeable street frontage providing safe, legible access to the building.

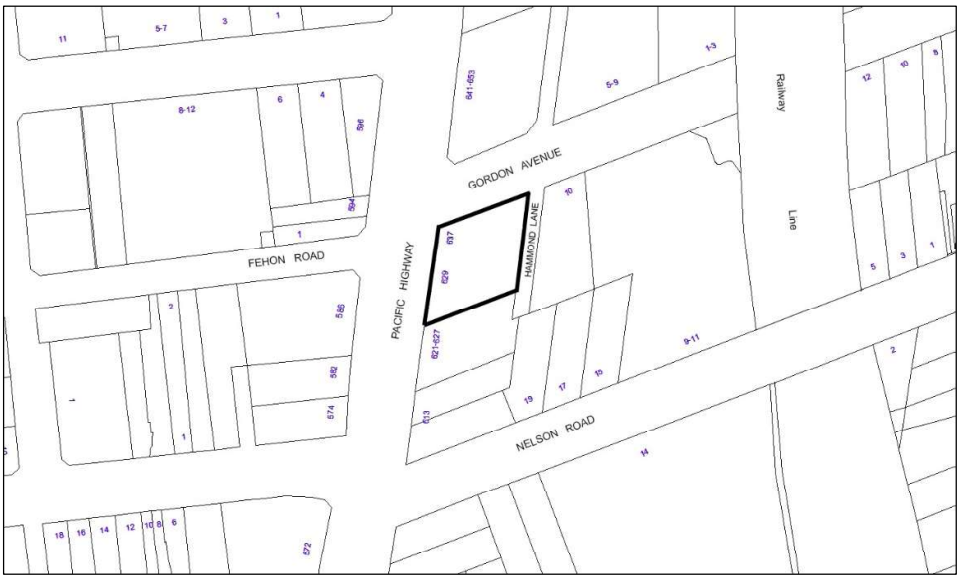
Controls

4. Green roofs to be provided on roofs up to 30m in height from ground.
5. A minimum of 20% of the site area is to provide vegetation cover.
6. Tree planting to be provided within the 4 metre set back adjacent to the Pacific highway.
7. Maximise area for soft landscaping within the 4 metre setback along the Pacific Highway without impacting on footpaths.
8. A landscape plan is to be provided at Development Application stage detailing all vegetation proposed including species, container size at planting, spacing and approximate size of maturity.

8.0 Site Isolation

Controls

1. Site isolation to be discouraged and where unavoidable joined basements and zero-setback podiums should be provided.
2. Where sites will unavoidably be isolated - joined basements and zero setback podium should be provided to allow the neighbour to develop to an appropriate potential under the controls.
3. Prior to construction works commencing, all existing allotments within the site are to be amalgamated to form a single development lot, as detailed in the plan of consolidation shown below.



9.0 Substations and Services

Controls

1. Substations to be provided within buildings, not within the streets, open spaces or setbacks, and are to be designed to ensure protection of residents from Electro Magnetic Radiation (EMR) emissions.

10.0 Public Art

Controls

1. A development achieving an FSR uplift should contribute towards public art in accordance with Willoughby's Public Art Policy which may include public art being provided on the site or a monetary contribution for an installation elsewhere in the CBD.

11.0 Affordable Housing

Controls

1. The development achieving FSR uplift through the Chatswood CBD Strategy should provide affordable housing at the rate of 4% of proposed private residential floor space.

12.0 Overland Flooding

Performance Criteria

1. An overland flooding assessment is to be provided at Development Application stage.