

Proposed Residential Development

**183 New Canterbury Road,
Petersham**

TRAFFIC AND PARKING ASSESSMENT REPORT

3 November 2016

Ref 15883

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Document Verification

Location:	183 New Canterbury Rd, Petersham	Job Number		15883	
Revision	Details	Prepared		Approved	
Final 01	Final	By	Date	By	Date
		DL	3/11/16	RV	3/11/16

1. INTRODUCTION

This report has been prepared to accompany a planning proposal to Council for a residential development to be located at 183 New Canterbury Road, Petersham (Figures 1 and 2).

The planning proposal seeks approval to amend the planning controls on the subject site to the rezoning of the land from IN2 to R4 high density residential, thus allowing the development of a high density residential building.

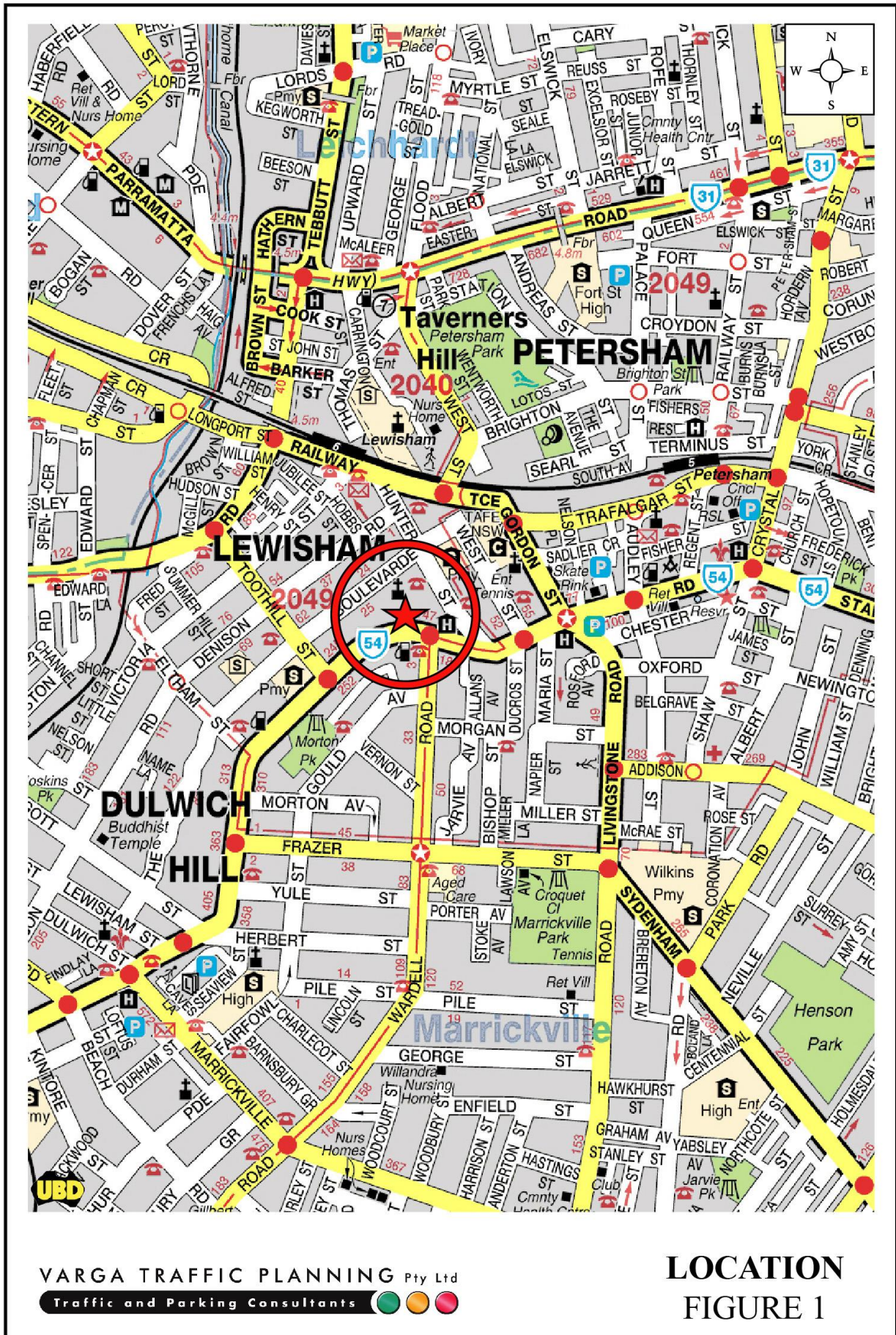
Car parking will be provided in a single-level basement car parking area, and will ultimately be designed to comply with Council's requirements.

It is understood that the planning proposal also affects 203 New Canterbury Road however this site will change from IN2 to R2 low density residential, thus there is no requirement to review this site as the site already has a dwelling and off-street car parking.

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 sites and provides details of the planning proposal
- reviews the road network in the vicinity of the sites, and the traffic conditions on that road network
- estimates the traffic generation potential of the planning proposal, and assigns that traffic generation to the road network serving the sites
- assesses the traffic implications of the planning proposal in terms of road network capacity
- reviews the geometric design features of the proposed car parking facilities for compliance with the relevant codes and standards

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





2. PLANNING PROPOSAL

Site

The subject site is located on the northern side of New Canterbury Road in Petersham, adjacent to Lewisham Officeworks. The site has a street frontage of approximately 17 metres in length to New Canterbury Road and occupies an area of approximately 1,110m².

The site is located approximately 750m walking distance south-east of Lewisham Railway Station, and 850m walking distance from Petersham Railway Station.

The site is currently occupied by a two-storey commercial building with a cumulative floor area of approximately 1,800m². Vehicular access to the site is currently provided directly via New Canterbury Road.

Existing Planning Controls

The primary instrument that governs the mass and scale of the development on the sites are contained within the *Marrickville Local Environmental Plan (MLEP) 2011*. The subject site is currently zoned *IN2 – Light Industrial*, subject to a FSR of 0.95 without height controls.

It is therefore envisaged that a light industrial development comprising a cumulative floor area of 1,055m² could be achieved under the current planning controls on No. 183 New Canterbury Road.

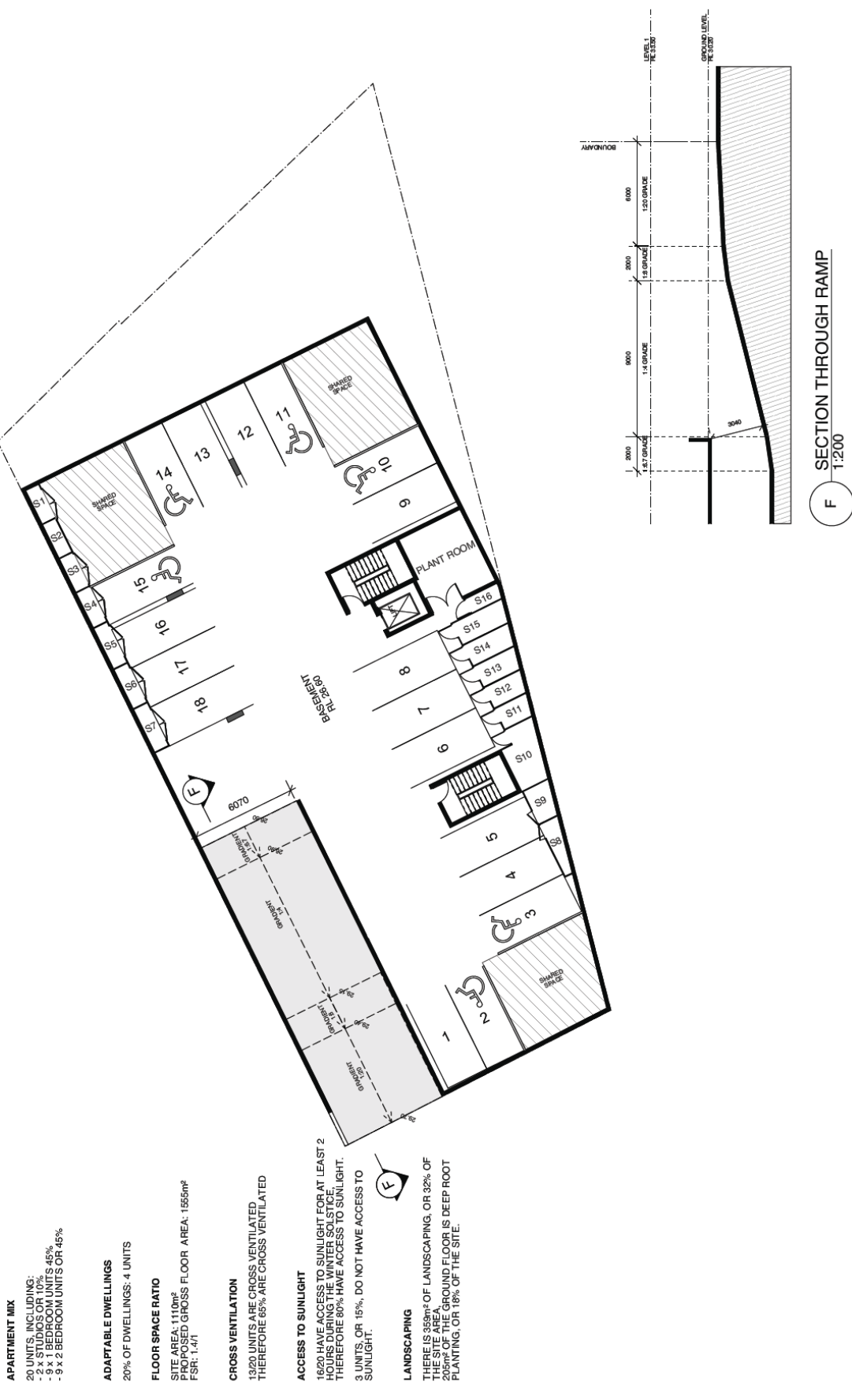
Planning Proposal

The planning proposal seeks approval to amend the planning controls of the site to permit a high density residential development comprising a total of 20 apartments as follows:

Studio apartments:	2
1 bedroom apartments:	9
2 bedroom apartments:	9
TOTAL APARTMENTS:	20

Off-street car parking will ultimately be provided in a single-level basement car parking area, and will be designed to be provided in accordance with Council's requirements.

Plans of the proposed development have been prepared by *Architects Becerra* and are reproduced in the following pages.

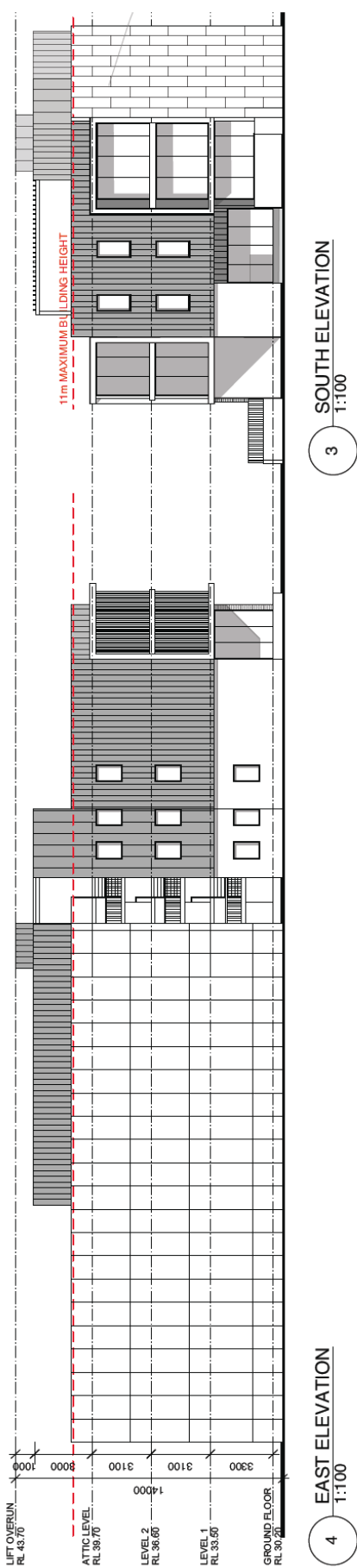
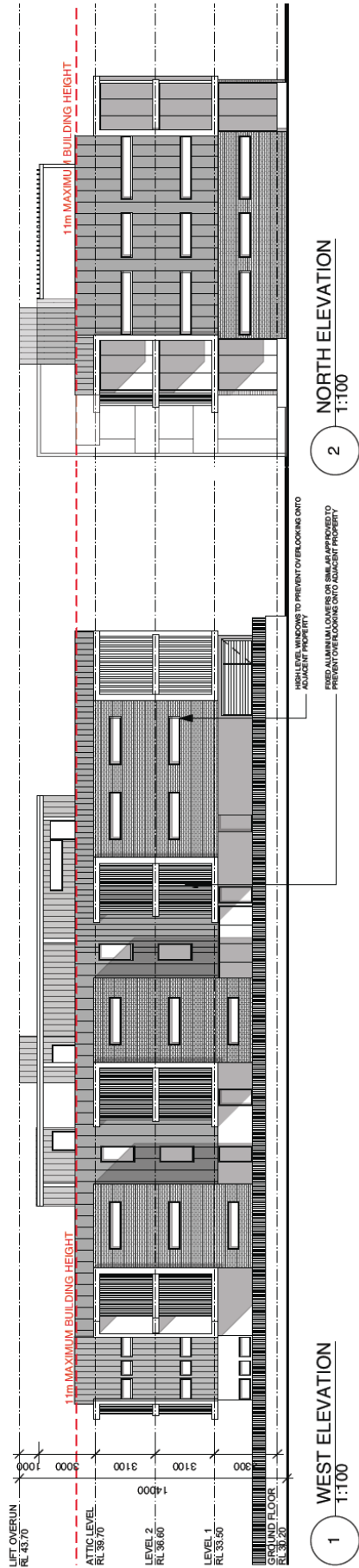


B	Issued for planning approval	VG	18/07/16	By	Date	Architects Becerra G01, 1 Layton Street Campedown NSW 2050 t 02 9557 2287 e architects@archb.com.au www.archb.com.au	Project	Planning proposal 183 & 218 New Canterbury Rd ILLUMINATE LIVING PTY LTD	Drawn By	VG	Dwg Date:	JAN 16	Project No.	1522
A	Issued for review	AB	03.06.15	By	Date									
	Amendment													



1 GROUND FLOOR PLAN
1:100

B	Issued for planning approval	VG	18/7/16	Project No.	1522
A	Issued for review	AB	03/06/15	Drawn By	VG
Revision	Amendment	By	Date	Checked By	Scale
				ILLUMINATE LIVING PTY LTD	1:200 @ A3
				183 & 218 New Canterbury Rd	A115
				Client	B
				Title	183 Ground floor
 Architects Becerra G01, 1 Layton Street Canberra ACT 2600 02 6155 2288 02 6155 2289 www.abcba.com.au				Project	
				Planning proposal	
				183 & 218 New Canterbury Rd	



	Architects Becerra G01, 1 Layton Street Campesdown NSW 2060 a.becerra@architectsbecerra.com.au				Project	Planning proposal	Drawn By	Dwg Date	Project No.
	183 & 218 New Canterbury Rd				Client	ILLUMINATE LIVING PTY LTD	Checked By	Scale	Drawing No. Rev
	183 Elevations				Title	183 Elevations	1:200 @ A3	1:200 @ A3	A119 B
B Issued for planning approval		VG	18/7/16						
A Issued for review		AB	03/05/15						
Revision		By	Date						

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.

New Canterbury Road/Stanmore Road are classified by the RMS as a *State Road* and provide the key road link in the area, linking Hurlstone Park and Newtown. They typically carry two traffic lanes in each direction in the vicinity of the site.

Parramatta Road is classified by the RMS as a *State Road* and also provides the key east-west road link in the area, linking Parramatta and the Sydney CBD. It typically carries three traffic lanes in each in the vicinity of the site, with opposing traffic flows separated by a central concrete median island.

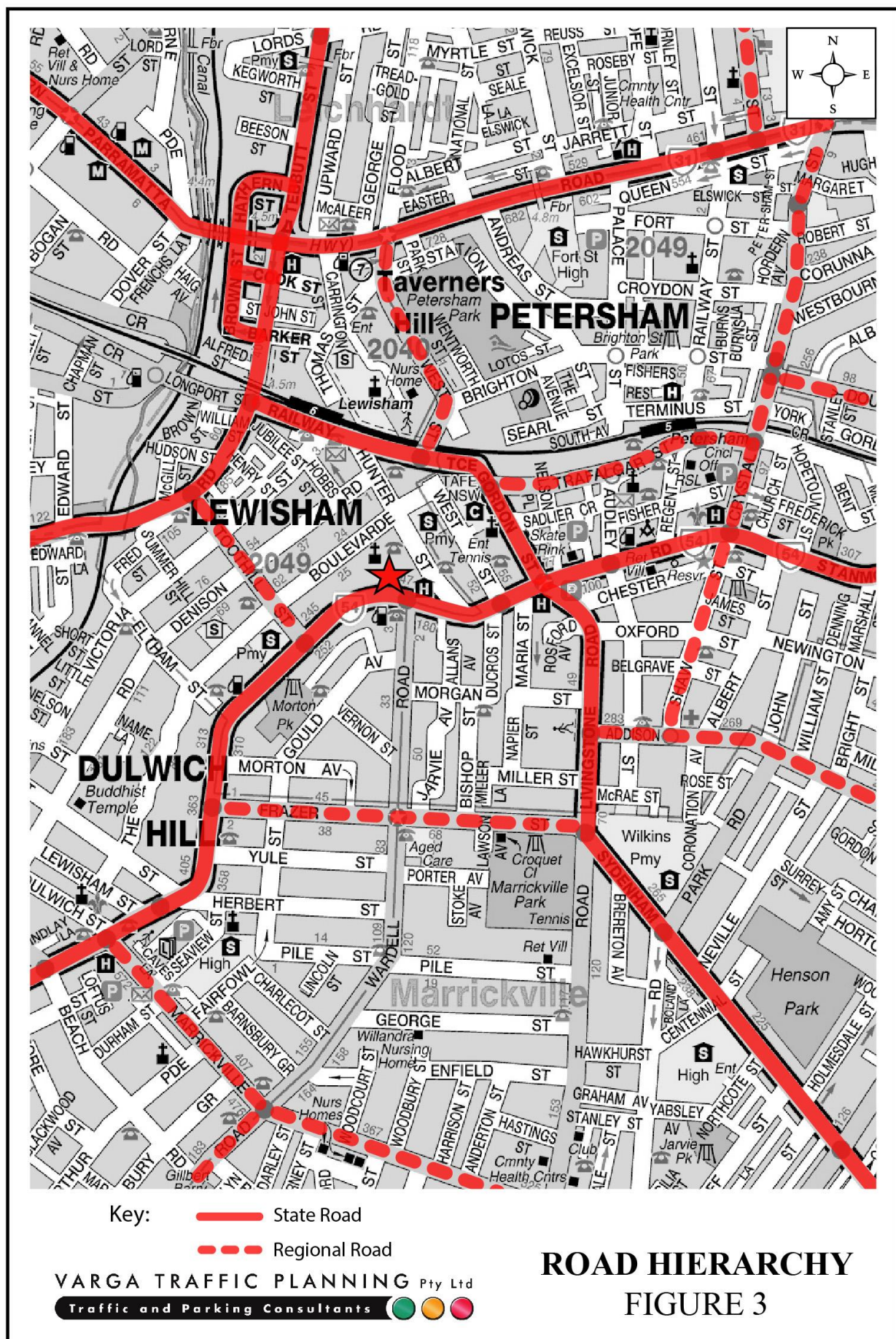
Sydenham Road, Livingstone Road, Gordon Street and Railway Terrace are also classified by the RMS as *State Roads* which provide a key north-south road link in the area, linking Sydenham to Lewisham. They typically carry two traffic lanes in each direction in the vicinity of the site.

Wardell Road 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 Wardell 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 New Canterbury Road
- a 50 km/h SPEED LIMIT which applies to Wardell Road and all other local roads in the area





- TRAFFIC SIGNALS in New Canterbury Road where it intersects with Wardell Road, West Street and also Gordon Street
- TURN BAYS at key locations along New Canterbury Road turning into side streets and vice versa.

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 in New Canterbury Road where it intersects with Wardell Road. The results of the traffic surveys are reproduced in full in Appendix A and reveal that:

- two-way traffic flows in New Canterbury Road are typically in the order of 1,400-1,700 vehicles per hour (vph) during peak periods
- two-way traffic flows in Wardell Road are typically in the order of 550 vph during peak periods.

Existing Public Transport Services

The existing public transport services located in close proximity to the site are illustrated on Figure 5.

The subject site is located approximately 750m walking distance of Lewisham Railway Station and approximately 850m walking distance to Petersham Railway Station.

Both the stations are on the T2 Inner West & South Line which operates services between Sydney CBD and Macarthur, passing by major rail network interchanges at Liverpool, Clyde, Lidcombe, Strathfield, Redfern and Central. Services at Lewisham Railway Station operate at a frequency of approximately 15 minute intervals throughout the day.



In addition to the train services, there are approximately 270 bus services travelling along New Canterbury Road on weekdays, decreasing to approximately 180 bus services per day on Saturdays and approximately 120 services on Sunday and public holidays, as set out below:

Bus Routes and Frequencies							
Route No.	Route	Weekdays		Saturday		Sunday	
		IN	OUT	IN	OUT	IN	OUT
428	Canterbury to City via Newtown	72	74	51	49	40	37
L28	Canterbury to City via Newtown	8	8	N/A	N/A	N/A	N/A
444	Campsie to Balmain East	37	35	16	9	11	8
445	Campsie to Balmain East	18	20	25	30	15	15
TOTAL		135	137	92	88	66	60

All of the abovementioned bus services provide access to suburban railway stations such as Petersham, Canterbury, Newtown, Town Hall and Central. A number of the abovementioned bus services also provide access to Lilyfield Light Rail Station and Balmain East Wharf.

In the circumstances, it is considered that the site is readily accessible by public services.

Projected Traffic Generation

An indication of the traffic generation potential of the development 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 *Guide* 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/unit
PM:	0.15 peak hour vehicle trips/unit

Application of the above traffic generation rates to the planning proposal yields a traffic generation potential of approximately 4 vehicle trips per hour (vph) and 3 vph during the AM and PM commuter peak periods respectively.

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 current *MLEP 2011* planning controls.

Application of the *industrial* traffic generation rate of “1.0 peak hour vehicle trips per 100m² GFA” nominated in the *RMS Guidelines* to the commercial floor areas permissible under the current *MLEP 2011* planning controls yields a peak hour traffic generation potential of approximately 11 vph during the AM and PM commuter peak periods.

Accordingly, it is clear that the planning proposal would *not* result in *any* increase in the traffic generation potential of the site during both the AM and PM commuter peak periods when compared with a development permissible under the existing planning controls, as set out below:

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

	AM	PM
Projected Future Traffic Generation Potential:	3.8 vph	3.0 vph
Less Existing Traffic Generation Potential:	-10.6 vph	-10.6 vph
NETT DECREASE IN TRAFFIC GENERATION POTENTIAL:	-6.8 vph	-7.6 vph

Notwithstanding, for the purposes of this assessment it has been assumed that *all* of the projected future traffic flows of 4 vph and 3 vph in the AM and PM commuter peak periods respectively, will be new or *additional* to the existing traffic flows currently using the adjacent road network.

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

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 New Canterbury Road and Wardell Road intersection are summarised on Table 3.1 below, revealing that:

- the intersection currently operates at *Levels of Service "C" and "B"* during the AM and PM commuter peak periods respectively
- under the projected future traffic demands which could be generated by a light industrial development permitted under the *existing planning controls*, the intersection would operate at *Levels of Service "C" and "B"* during the AM and PM commuter peak periods respectively
- under the projected future traffic demands expected to be generated by the *planning proposal*, the intersection will continue to operate at *Levels of Service "C" and "B"* during the AM and PM commuter peak periods respectively, with increases in total average vehicle delays of ***less than*** 1 second/vehicle.

The SIDRA movement summaries are reproduced in Appendix B.

In summary, the results of the SIDRA capacity analysis confirm that the New Canterbury Road/Wardell Road intersection would continue to operate at current Levels of Service, with no appreciable increase in total average vehicle delays.

The capacity analysis indicates that no road improvements or intersection upgrades would be required as a consequence of the planning proposal.

TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF NEW CANTERBURY ROAD & WARDELL ROAD						
Key Indicators	Existing Traffic Demand		Existing Planning Controls Traffic Demand		Planning Proposal Traffic Demands	
	AM	PM	AM	PM	AM	PM
Level of Service	C	B	C	B	C	B
Degree of Saturation	0.535	0.456	0.538	0.477	0.537	0.456
Average Vehicle Delay (secs/veh)						
Wardell Road (South) L	11.9	38.8	11.6	37.2	11.3	38.8
R	39.2	52.2	39.3	50.6	39.2	52.2
New Canterbury Road (East) L	50.1	19.0	51.4	20.2	52.2	19.0
T	44.5	13.5	45.8	14.7	46.6	13.5
New Canterbury Road (West) T	18.9	7.6	19.0	8.5	19.0	7.6
R	26.0	21.3	26.3	22.6	26.3	21.3
TOTAL AVERAGE VEHICLE DELAY	28.1	17.3	28.7	18.4	28.6	17.3
NEW_WAR_Existing NEW_WAR_Permissible NEW_WAR_Proposed						

Criteria for Interpreting Results of Sidra Analysis

1. Level of Service (LOS)

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

2. Average Vehicle Delay (AVD)

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

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

3. Degree of Saturation (DS)

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

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

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

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

4. PARKING IMPLICATIONS

Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 6 and comprise:

- CLEARWAY restrictions along New Canterbury Road during commuter peaks
- 2 HOUR parking on the eastern side of Wardell Road
- BUS ZONES at regular intervals along both sides of New Canterbury Road
- generally UNRESTRICTED kerbside parking throughout the local area.

Off-Street Car Parking Provisions

The off-street parking requirements applicable to the development proposal are specified in Council's *Development Control Plan Part 2 – Generic Provisions 2.10 Parking* and the *SEPP (Affordable Rental Housing) 2009* documents in the following terms:

Residential Flat Buildings (Parking Area 2)

studio:	0.4 spaces per unit
1 bedroom:	0.5 spaces per unit
2 bedroom:	1.0 spaces per unit
3+ bedroom:	1.2 spaces per unit
visitors	0.1 space per unit

Application of the above parking requirements to the planning proposal yields an off-street parking requirement of 16 spaces for the proposed development, as set out in the table below:

Planning Proposal Off-Street Parking Requirements

DCP Residential Parking:	14.3 spaces
DCP Visitor Parking:	2.0 spaces
TOTAL PARKING REQUIRED:	16.3 spaces



Preliminary plans prepared for the purpose of the planning proposal have confirmed that the above parking requirements can be satisfied on the subject site.

The geometric design layout of the future car parking facilities have been 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*.

In summary, the off-street parking requirements of the planning proposal can be satisfied in accordance with the requirements of Council's DCP and the relevant Australian Standards.

Conclusion

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

- the planning proposal seeks approval to amend the planning controls of the site to permit a high density residential development on the site, comprising a total of 20 apartments
- 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 of the nearby intersections, and
 - no road improvements or intersection upgrades would be required as a consequence of the planning proposal
- the future car parking facilities will be provided and designed in accordance with Council's requirements and the relevant Australian Standards
- the future vehicular access arrangements will be developed in close accordance with Council and RMS requirements.

APPENDIX A

TRAFFIC SURVEY DATA



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Varga Traffic Planning

Job No/Name : 5924 PETERSHAM Wardell Rd

Day/Date : Friday / 5th February 2016

PEDS	WEST	SOUTH	EAST	
Time Per	New Canterbury Rd	Wardell Rd	New Canterbury Rd	TOT
0630 - 0645	0	5	0	5
0645 - 0700	6	1	2	9
0700 - 0715	3	1	2	6
0715 - 0730	4	3	1	8
0730 - 0745	7	2	2	11
0745 - 0800	8	4	4	16
0800 - 0815	7	1	4	12
0815 - 0830	3	4	0	7
0830 - 0845	9	2	1	12
0845 - 0900	4	7	2	13
0900 - 0915	6	1	0	7
0915 - 0930	2	0	0	2
Per End	59	31	18	108

PEDS	WEST	SOUTH	EAST	
Peak Per	New Canterbury Rd	Wardell Rd	New Canterbury Rd	TOT
0630 - 0730	13	10	5	28
0645 - 0745	20	7	7	34
0700 - 0800	22	10	9	41
0715 - 0815	26	10	11	47
0730 - 0830	25	11	10	46
0745 - 0845	27	11	9	47
0800 - 0900	23	14	7	44
0815 - 0915	22	14	3	39
0830 - 0930	21	10	3	34
PEAK HR	26	10	11	47

Lights	WEST New Canterbury Rd		SOUTH Wardell Rd		EAST New Canterbury Rd		
Time Per	L	R	L	R	L	R	TOT
0630 - 0645	217	9	6	70	8	53	363
0645 - 0700	255	5	8	65	15	52	400
0700 - 0715	264	16	8	81	11	52	432
0715 - 0730	265	17	10	89	15	81	477
0730 - 0745	247	16	10	72	14	62	421
0745 - 0800	253	14	11	59	19	85	441
0800 - 0815	238	18	8	94	18	76	452
0815 - 0830	192	16	15	69	15	70	377
0830 - 0845	193	20	13	71	26	70	393
0845 - 0900	250	20	17	73	19	52	431
0900 - 0915	202	21	21	54	23	74	395
0915 - 0930	182	12	10	66	19	85	374
Per End	2758	184	137	863	202	812	4956

Heavies	WEST New Canterbury Rd		SOUTH Wardell Rd		EAST New Canterbury Rd		
Time Per	L	R	L	R	L	R	TOT
0630 - 0645	3	0	0	0	0	2	5
0645 - 0700	4	0	0	0	0	0	4
0700 - 0715	3	1	0	1	0	1	6
0715 - 0730	2	0	0	0	0	3	5
0730 - 0745	8	0	0	1	0	4	13
0745 - 0800	6	0	0	0	0	3	9
0800 - 0815	5	0	0	1	0	5	11
0815 - 0830	11	0	0	0	0	5	16
0830 - 0845	5	0	2	0	0	5	12
0845 - 0900	9	0	0	0	0	4	13
0900 - 0915	1	1	1	0	0	3	6
0915 - 0930	10	0	0	0	0	6	16
Per End	67	2	3	3	0	41	116

Combined	WEST New Canterbury Rd		SOUTH Wardell Rd		EAST New Canterbury Rd		
Time Per	L	R	L	R	L	R	TOT
0630 - 0645	220	9	6	70	8	55	368
0645 - 0700	259	5	8	65	15	52	404
0700 - 0715	267	17	8	82	11	53	438
0715 - 0730	267	17	10	89	15	84	482
0730 - 0745	255	16	10	73	14	66	434
0745 - 0800	259	14	11	59	19	88	450
0800 - 0815	243	18	8	95	18	81	463
0815 - 0830	203	16	15	69	15	75	393
0830 - 0845	198	20	15	71	26	75	405
0845 - 0900	259	20	17	73	19	56	444
0900 - 0915	203	22	22	54	23	77	401
0915 - 0930	192	12	10	66	19	91	390
Per End	2825	186	140	866	202	853	5072

Lights	WEST New Canterbury Rd		SOUTH Wardell Rd		EAST New Canterbury Rd		
Peak Per	L	R	L	R	L	R	TOT
0630 - 0730	1001	47	32	305	49	238	1672
0645 - 0745	1031	54	36	307	55	247	1730
0700 - 0800	1029	63	39	301	59	280	1771
0715 - 0815	1003	65	39	314	66	304	1791
0730 - 0830	930	64	44	294	66	293	1691
0745 - 0845	876	68	47	293	78	301	1663
0800 - 0900	873	74	53	307	78	268	1653
0815 - 0915	837	77	66	267	83	266	1596
0830 - 0930	827	73	61	264	87	281	1593

Heavies	WEST New Canterbury Rd		SOUTH Wardell Rd		EAST New Canterbury Rd		
Peak Per	L	R	L	R	L	R	TOT
0630 - 0730	12	1	0	1	0	6	20
0645 - 0745	17	1	0	2	0	8	28
0700 - 0800	19	1	0	2	0	11	33
0715 - 0815	21	0	0	2	0	15	38
0730 - 0830	30	0	0	2	0	17	49
0745 - 0845	27	0	2	1	0	18	48
0800 - 0900	30	0	2	1	0	19	52
0815 - 0915	26	1	3	0	0	17	47
0830 - 0930	25	1	3	0	0	18	47

Combined	WEST New Canterbury Rd		SOUTH Wardell Rd		EAST New Canterbury Rd		
Peak Per	L	R	L	R	L	R	TOT
0630 - 0730	1013	48	32	306	49	244	1692
0645 - 0745	1048	55	36	309	55	255	1758
0700 - 0800	1048	64	39	303	59	291	1804
0715 - 0815	1024	65	39	316	66	319	1829
0730 - 0830	960	64	44	296	66	310	1740
0745 - 0845	903	68	49	294	78	319	1711
0800 - 0900	903	74	55	308	78	287	1705
0815 - 0915	863	78	69	267	83	283	1643
0830 - 0930	852	74	64	264	87	299	1640

PEAK HR	1003	65	39	314	66	304	1791
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PEAK HR	21	0	0	2	0	15	38
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PEAK HR	1024	65	39	316	66	319	1829
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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 : 5924 PETERSHAM Wardell Rd
Day/Date : Friday / 5th February 2016

**TOTAL VOLUMES
FOR COUNT
PERIOD**

**AM PEAK
0715 - 0815**

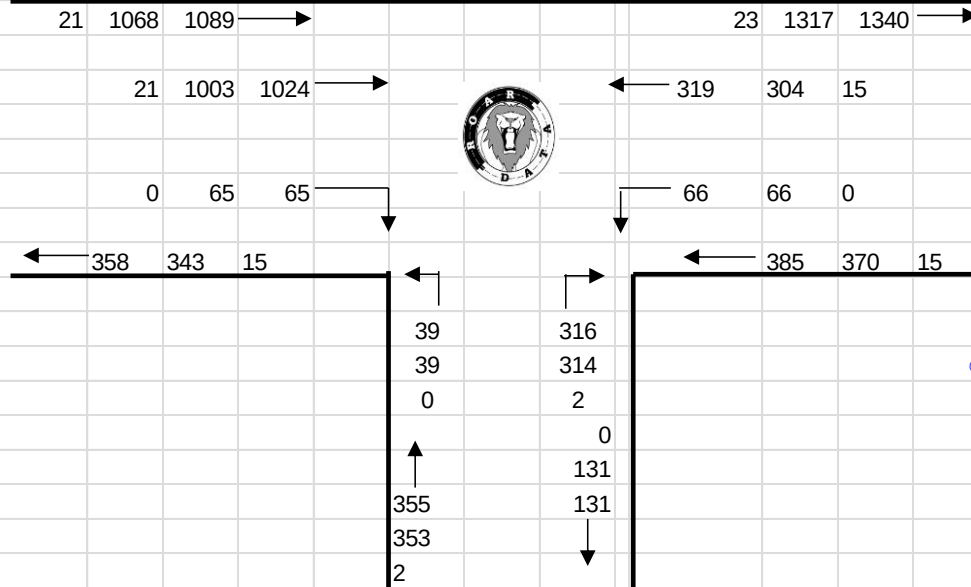


New Canterbury Rd

New Canterbury Rd

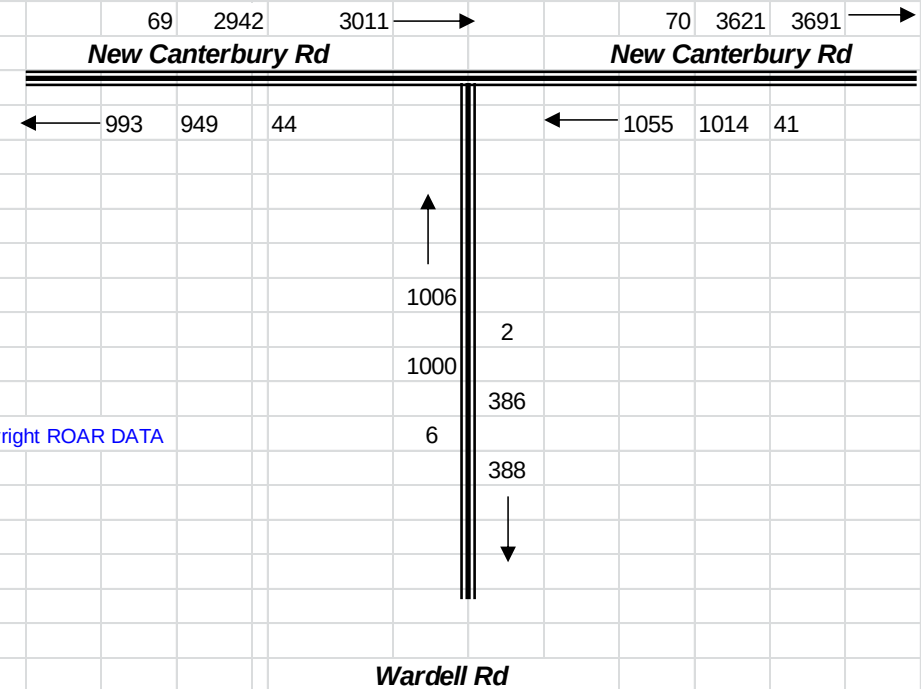
New Canterbury Rd

New Canterbury Rd



Wardell Rd

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Wardell Rd



R.O.A.R. DATA

Reliable, Original & Authentic Results

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Mobile.0418239019

Client : Varga Traffic Planning
Job No/Name : 5924 PETERSHAM Wardell Rd
Day/Date : Friday / 5th February 2016

PEDS	WEST	SOUTH	EAST	
	New Canterbury Rd	Wardell Rd	New Canterbury Rd	
Time Per				TOT
1530 - 1545	2	1	0	3
1545 - 1600	0	8	7	15
1600 - 1615	4	2	4	10
1615 - 1630	6	1	2	9
1630 - 1645	4	1	10	15
1645 - 1700	6	5	5	16
1700 - 1715	6	1	2	9
1715 - 1730	4	2	2	8
1730 - 1745	4	5	2	11
1745 - 1800	8	0	0	8
1800 - 1815	8	1	8	17
1815 - 1830	6	3	4	13
Per End	58	30	46	134

PEDS	WEST	SOUTH	EAST	
	New Canterbury Rd	Wardell Rd	New Canterbury Rd	
Peak Per				TOT
1530 - 1630	12	12	13	37
1545 - 1645	14	12	23	49
1600 - 1700	20	9	21	50
1615 - 1715	22	8	19	49
1630 - 1730	20	9	19	48
1645 - 1745	20	13	11	44
1700 - 1800	22	8	6	36
1715 - 1815	24	8	12	44
1730 - 1830	26	9	14	49
PEAK HR	20	9	19	48

Lights	WEST	SOUTH	EAST	
	New Canterbury Rd	Wardell Rd	New Canterbury Rd	
Time Per	I	R	L	TOT
1530 - 1545	120	24	8	440
1545 - 1600	122	21	10	447
1600 - 1615	101	26	25	424
1615 - 1630	104	30	14	385
1630 - 1645	119	21	10	472
1645 - 1700	113	30	17	456
1700 - 1715	127	28	20	444
1715 - 1730	115	31	15	471
1730 - 1745	109	30	22	440
1745 - 1800	121	24	17	438
1800 - 1815	121	35	16	459
1815 - 1830	156	27	17	463
Per End	1428	327	191	5339

Heavies	WEST	SOUTH	EAST	
	New Canterbury Rd	Wardell Rd	New Canterbury Rd	
Time Per	I	R	L	TOT
1530 - 1545	1	0	0	4
1545 - 1600	0	0	0	4
1600 - 1615	2	0	0	7
1615 - 1630	5	0	0	8
1630 - 1645	0	0	0	6
1645 - 1700	6	0	0	9
1700 - 1715	2	0	0	7
1715 - 1730	2	0	0	4
1730 - 1745	4	0	0	7
1745 - 1800	1	0	0	5
1800 - 1815	0	0	0	4
1815 - 1830	3	0	0	9
Per End	26	0	0	74

Combined	WEST	SOUTH	EAST	
	New Canterbury Rd	Wardell Rd	New Canterbury Rd	
Time Per	I	R	L	TOT
1530 - 1545	121	24	8	444
1545 - 1600	122	21	10	451
1600 - 1615	103	26	25	431
1615 - 1630	109	30	14	393
1630 - 1645	119	21	10	478
1645 - 1700	119	30	17	465
1700 - 1715	129	28	20	451
1715 - 1730	117	31	15	475
1730 - 1745	113	30	22	447
1745 - 1800	122	24	17	443
1800 - 1815	121	35	16	463
1815 - 1830	159	27	17	472
Per End	1454	327	191	5413

Lights	WEST	SOUTH	EAST	
	New Canterbury Rd	Wardell Rd	New Canterbury Rd	
Peak Per	I	R	L	TOT
1530 - 1630	447	101	57	1696
1545 - 1645	446	98	59	1728
1600 - 1700	437	107	66	1737
1615 - 1715	463	109	61	1757
1630 - 1730	474	110	62	1843
1645 - 1745	464	119	74	1811
1700 - 1800	472	113	74	1793
1715 - 1815	466	120	70	1808
1730 - 1830	507	116	72	1800

PEAK HR	474	110	62	156	282	759	1843
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Heavies	WEST	SOUTH	EAST	
	New Canterbury Rd	Wardell Rd	New Canterbury Rd	
Peak Per	I	R	L	TOT
1530 - 1630	8	0	0	23
1545 - 1645	7	0	0	25
1600 - 1700	13	0	0	30
1615 - 1715	13	0	0	30
1630 - 1730	10	0	0	26
1645 - 1745	14	0	0	27
1700 - 1800	9	0	0	23
1715 - 1815	7	0	0	20
1730 - 1830	8	0	0	25

PEAK HR	10	0	0	0	16	26
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Combined	WEST	SOUTH	EAST	
	New Canterbury Rd	Wardell Rd	New Canterbury Rd	
Peak Per	I	R	L	TOT
1530 - 1630	455	101	57	1719
1545 - 1645	453	98	59	1753
1600 - 1700	450	107	66	1767
1615 - 1715	476	109	61	1787
1630 - 1730	484	110	62	1869
1645 - 1745	478	119	74	1838
1700 - 1800	481	113	74	1816
1715 - 1815	473	120	70	1828
1730 - 1830	515	116	72	1825

PEAK HR	484	110	62	156	282	775	1869
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R.O.A.R. DATA

Reliable, Original & Authentic Results

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Client : Varga Traffic Planning

Job No/Name : 5924 PETERSHAM Wardell Rd

Day/Date : Friday / 5th February 2016

1

2

3

4

5

6

PM PEAK

1630 - 1730

7

8

9

N



**TOTAL VOLUMES
FOR COUNT
PERIOD**

New Canterbury Rd

10 584 594 →

10 474 484 →

0 110 110 →

← 837 821 16

62
62
0
↑
218
218
0

New Canterbury Rd

10 630 640 →

← 775 759 16

282 282 0

← 1057 1041 16

156
156
0
↓
392
392
↓

New Canterbury Rd

26 1755 1781 →

← 2396 2350 46

New Canterbury Rd

26 1919 1945 →

← 2950 2902 48

↑
682
682
0
↓
1070
1072
↓

Wardell Rd

Wardell Rd

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R.O.A.R. DATA

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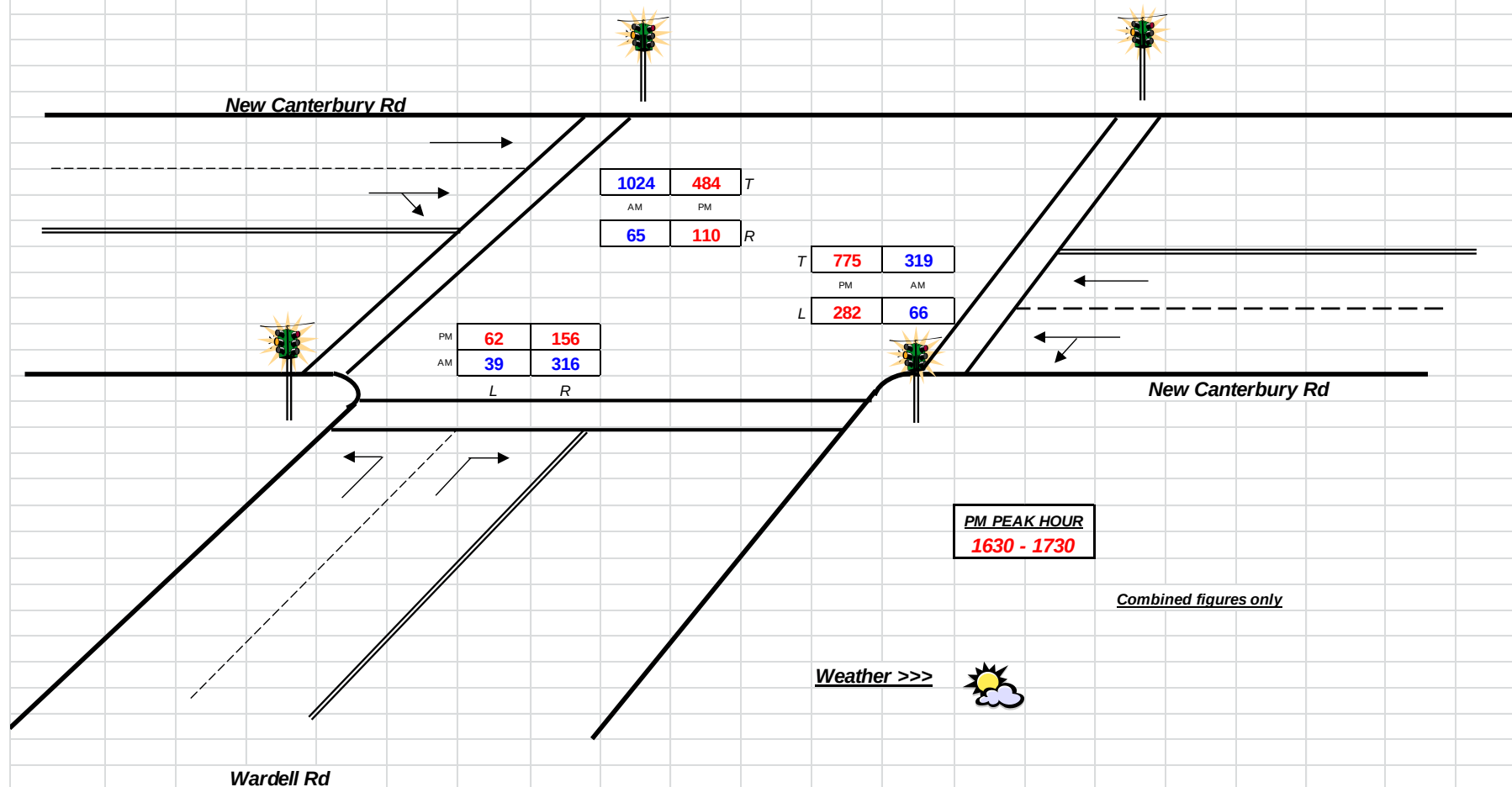
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 5924 PETERSHAM Wardell Rd
Day/Date : Friday / 5th February 2016

Intersection Layout



AM PEAK HOUR
0715 - 0815



APPENDIX B

SIDRA MOVEMENT SUMMARIES

MOVEMENT SUMMARY

 **Site: Existing AM**

New Canterbury Road & Wardell Road Intersection

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

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	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Wardell Road (south)											
1	L2	39	0.0	0.031	11.9	LOS A	0.7	5.0	0.34	0.64	49.0
3	R2	316	0.6	0.531	39.2	LOS C	14.6	103.1	0.85	0.82	35.8
Approach		355	0.6	0.531	36.2	LOS C	14.6	103.1	0.79	0.80	36.9
East: New Canterbury Road (east)											
4	L2	66	0.0	0.471	50.1	LOS D	9.9	71.1	0.92	0.78	33.5
5	T1	319	4.7	0.471	44.5	LOS D	10.0	72.5	0.92	0.77	34.4
Approach		385	3.9	0.471	45.5	LOS D	10.0	72.5	0.92	0.77	34.2
West: New Canterbury Road (west)											
11	T1	1024	2.1	0.535	18.9	LOS B	20.9	148.8	0.70	0.63	45.6
12	R2	65	0.0	0.535	26.0	LOS B	20.3	144.5	0.73	0.65	43.6
Approach		1089	1.9	0.535	19.3	LOS B	20.9	148.8	0.70	0.63	45.5
All Vehicles		1829	2.1	0.535	28.1	LOS B	20.9	148.8	0.77	0.69	40.8

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	10	42.5	LOS E	0.0	0.0	0.84	0.84	
P2	East Full Crossing	11	33.0	LOS D	0.0	0.0	0.74	0.74	
P4	West Full Crossing	26	33.0	LOS D	0.1	0.1	0.74	0.74	
All Pedestrians		47	35.1	LOS D			0.76	0.76	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: Z:\Data\Jobs01\Jobs\Thomas\Sidra\15883 183&218 New Canterbury Rd, Petersham\NEW_WAR_Existing.sip6

MOVEMENT SUMMARY

Site: Existing PM

New Canterbury Road & Wardell Road Intersection

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

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 Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Wardell Road (south)											
1	L2	62	0.0	0.114	38.8	LOS C	2.6	18.5	0.77	0.73	36.1
3	R2	156	0.0	0.452	52.2	LOS D	8.2	57.2	0.93	0.80	31.7
Approach		218	0.0	0.452	48.4	LOS D	8.2	57.2	0.88	0.78	32.8
East: New Canterbury Road (east)											
4	L2	282	0.0	0.456	19.0	LOS B	16.3	115.1	0.58	0.66	46.2
5	T1	775	2.1	0.456	13.5	LOS A	16.6	118.4	0.58	0.57	48.5
Approach		1057	1.5	0.456	14.9	LOS B	16.6	118.4	0.58	0.59	47.9
West: New Canterbury Road (west)											
11	T1	484	2.1	0.331	7.6	LOS A	9.8	70.2	0.42	0.39	53.1
12	R2	110	0.0	0.331	21.3	LOS B	4.6	32.6	0.63	0.70	44.2
Approach		594	1.7	0.331	10.1	LOS A	9.8	70.2	0.46	0.45	51.2
All Vehicles		1869	1.4	0.456	17.3	LOS B	16.6	118.4	0.58	0.57	46.4

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	9	12.2	LOS B	0.0	0.0	0.45	0.45	
P2	East Full Crossing	19	47.7	LOS E	0.1	0.1	0.89	0.89	
P4	West Full Crossing	20	47.7	LOS E	0.1	0.1	0.89	0.89	
All Pedestrians		48	41.1	LOS E			0.81	0.81	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: Permissible AM

New Canterbury Road & Wardell Road Intersection

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		veh	Distance m	per veh	km/h	
South: Wardell Road (south)											
1	L2	39	0.0	0.030	11.6	LOS A	0.7	4.9	0.33	0.64	49.2
3	R2	320	0.6	0.538	39.3	LOS C	14.9	104.7	0.85	0.82	35.7
Approach		359	0.6	0.538	36.3	LOS C	14.9	104.7	0.79	0.80	36.8
East: New Canterbury Road (east)											
4	L2	84	0.0	0.513	51.4	LOS D	10.5	75.5	0.94	0.79	33.0
5	T1	319	4.7	0.513	45.8	LOS D	10.6	77.3	0.94	0.78	33.9
Approach		403	3.7	0.513	47.0	LOS D	10.6	77.3	0.94	0.78	33.7
West: New Canterbury Road (west)											
11	T1	1026	2.0	0.538	19.0	LOS B	21.0	149.7	0.70	0.63	45.5
12	R2	65	0.0	0.538	26.3	LOS B	20.1	143.0	0.73	0.66	43.3
Approach		1091	1.9	0.538	19.5	LOS B	21.0	149.7	0.71	0.63	45.3
All Vehicles		1853	2.1	0.538	28.7	LOS C	21.0	149.7	0.77	0.70	40.5

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate		
		ped/h	sec		Pedestrian ped	Distance m	per ped		
P1	South Full Crossing	10	43.4	LOS E	0.0	0.0	0.85	0.85	
P2	East Full Crossing	11	33.0	LOS D	0.0	0.0	0.74	0.74	
P4	West Full Crossing	26	33.0	LOS D	0.1	0.1	0.74	0.74	
All Pedestrians		47	35.2	LOS D			0.77	0.77	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: Permissible PM

New Canterbury Road & Wardell Road Intersection

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

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: Wardell Road (south)											
1	L2	62	0.0	0.108	37.2	LOS C	2.6	18.0	0.75	0.73	36.6
3	R2	174	0.0	0.477	50.6	LOS D	9.0	63.0	0.92	0.80	32.2
Approach		236	0.0	0.477	47.1	LOS D	9.0	63.0	0.88	0.78	33.2
East: New Canterbury Road (east)											
4	L2	286	0.0	0.471	20.2	LOS B	17.1	120.7	0.61	0.67	45.5
5	T1	775	2.1	0.471	14.7	LOS B	17.4	124.2	0.61	0.59	47.8
Approach		1061	1.5	0.471	16.2	LOS B	17.4	124.2	0.61	0.61	47.1
West: New Canterbury Road (west)											
11	T1	493	2.0	0.345	8.5	LOS A	10.6	75.8	0.45	0.41	52.4
12	R2	110	0.0	0.345	22.6	LOS B	4.9	34.4	0.65	0.71	43.5
Approach		603	1.7	0.345	11.1	LOS A	10.6	75.8	0.49	0.47	50.5
All Vehicles		1900	1.4	0.477	18.4	LOS B	17.4	124.2	0.60	0.58	45.7

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	9	13.1	LOS B	0.0	0.0	0.47	0.47	
P2	East Full Crossing	19	46.0	LOS E	0.1	0.1	0.88	0.88	
P4	West Full Crossing	20	46.0	LOS E	0.1	0.1	0.88	0.88	
All Pedestrians		48	39.8	LOS D			0.80	0.80	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: Z:\Data\Jobs01\Jobs\Thomas\Sidra\15883 183&218 New Canterbury Rd, Petersham\NEW_WAR_Permissible.sip6

MOVEMENT SUMMARY



Site: Proposed AM

New Canterbury Road & Wardell Road Intersection

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

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 Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Wardell Road (south)											
1	L2	39	0.0	0.030	11.3	LOS A	0.7	4.7	0.32	0.64	49.5
3	R2	316	0.6	0.531	39.2	LOS C	14.6	103.1	0.85	0.82	35.8
Approach		355	0.6	0.531	36.1	LOS C	14.6	103.1	0.79	0.80	36.9
East: New Canterbury Road (east)											
4	L2	66	0.0	0.510	52.2	LOS D	10.1	72.8	0.94	0.79	32.9
5	T1	319	4.7	0.510	46.6	LOS D	10.2	74.3	0.94	0.78	33.7
Approach		385	3.9	0.510	47.6	LOS D	10.2	74.3	0.94	0.78	33.6
West: New Canterbury Road (west)											
11	T1	1026	2.0	0.537	19.0	LOS B	21.0	149.5	0.70	0.63	45.5
12	R2	67	0.0	0.537	26.3	LOS B	20.0	142.1	0.73	0.66	43.3
Approach		1093	1.9	0.537	19.5	LOS B	21.0	149.5	0.70	0.63	45.3
All Vehicles		1833	2.1	0.537	28.6	LOS C	21.0	149.5	0.77	0.70	40.5

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	10	44.2	LOS E	0.0	0.0	0.86	0.86	
P2	East Full Crossing	11	33.0	LOS D	0.0	0.0	0.74	0.74	
P4	West Full Crossing	26	33.0	LOS D	0.1	0.1	0.74	0.74	
All Pedestrians		47	35.4	LOS D			0.77	0.77	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY



Site: Proposed PM

New Canterbury Road & Wardell Road Intersection

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Wardell Road (south)											
1	L2	62	0.0	0.114	38.8	LOS C	2.6	18.5	0.77	0.73	36.1
3	R2	156	0.0	0.452	52.2	LOS D	8.2	57.2	0.93	0.80	31.7
Approach		218	0.0	0.452	48.4	LOS D	8.2	57.2	0.88	0.78	32.8
East: New Canterbury Road (east)											
4	L2	282	0.0	0.456	19.0	LOS B	16.3	115.1	0.58	0.66	46.2
5	T1	775	2.1	0.456	13.5	LOS A	16.6	118.4	0.58	0.57	48.5
Approach		1057	1.5	0.456	14.9	LOS B	16.6	118.4	0.58	0.59	47.9
West: New Canterbury Road (west)											
11	T1	486	2.1	0.333	7.6	LOS A	9.9	70.7	0.43	0.39	53.1
12	R2	111	0.0	0.333	21.3	LOS B	4.7	32.7	0.63	0.70	44.1
Approach		597	1.7	0.333	10.1	LOS A	9.9	70.7	0.46	0.45	51.2
All Vehicles		1872	1.4	0.456	17.3	LOS B	16.6	118.4	0.58	0.57	46.4

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

Vehicle movement LOS values are based on average delay per movement

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

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	9	12.2	LOS B	0.0	0.0	0.45	0.45	
P2	East Full Crossing	19	47.7	LOS E	0.1	0.1	0.89	0.89	
P4	West Full Crossing	20	47.7	LOS E	0.1	0.1	0.89	0.89	
All Pedestrians		48	41.1	LOS E			0.81	0.81	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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