

Appendix 2: Traffic and Parking Assessment

Proposed Mixed-Use Development

**124-142 Beamish Street,
Campsie**

TRAFFIC AND PARKING ASSESSMENT REPORT

7 December 2015

Ref 15818

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Document Verification

Location:	124-142 Beamish St, Campsie	Job Number	15818		
Revision	Details	Prepared		Approved	
Version 1	Initial Draft for Review	By	Date	By	Date
		TY	4/12/15	RV	7/12/15

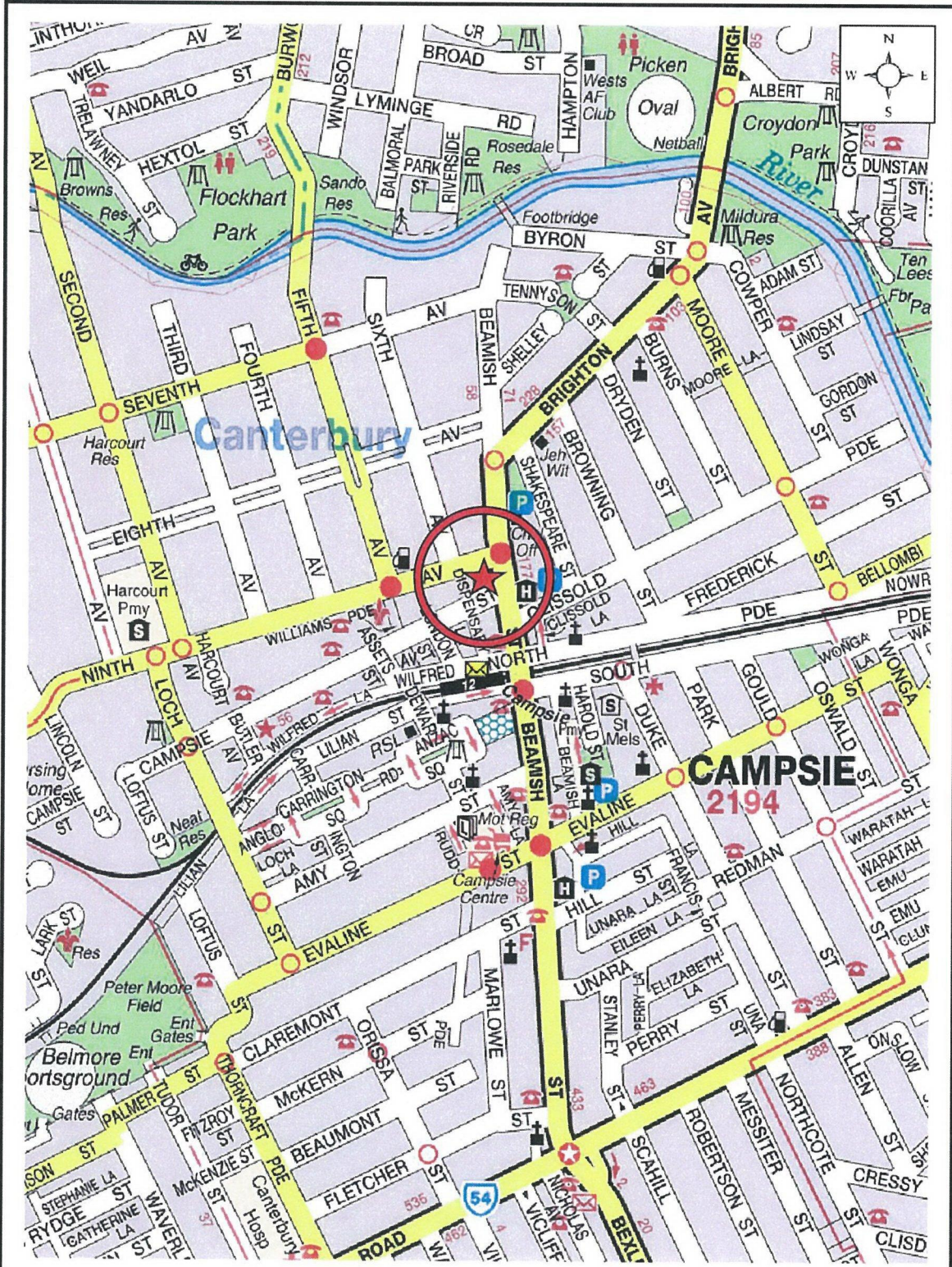
1. INTRODUCTION

This report has been prepared to accompany a planning proposal to Canterbury City Council for a mixed-use development to be located at 124-142 Beamish Street, Campsie (Figures 1 and 2)

The planning proposal seeks approval to amend the planning controls to permit a mixed-use development with an increased apartment yield. Car parking will ultimately be provided in a basement car parking area beneath the building in accordance with the Council's requirements.

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

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



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LOCATION
FIGURE 1



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SITE
FIGURE 2

2. PLANNING PROPOSAL

Site

The subject site is located in the Campsie Town Centre, bounded by Ninth Avenue, Beamish Street and Campsie Street. The site occupies an area of approximately 3,833m² and has street frontages of approximately 75 metres in length to Ninth Avenue, 52 metres in length to Beamish Street and approximately 60 metres in length to Campsie Street.

The subject site is currently occupied by a mix of two-storey retail and commercial buildings comprising a cumulative floor area of approximately 5,000m². Some on-site car parking is located behind the buildings. The existing site has one driveway to Campsie Street, one driveway to Beamish Street and two driveways to Ninth Avenue.

Existing Planning Controls

The primary instrument that governs the mass and scale of the development on the site are contained within the *Canterbury Local Environment Plan 2012 (CLEP2012)*.

The subject site is zoned *B2 – Local Centre* and is not subject to any FSR control. The scale of any development on the site is currently constrained by a building height of 21m.

It is therefore envisaged that a mixed-use development comprising 240 apartments, 3,000m² of retail floor space and 2,500m² of commercial floor space is achievable under the existing planning controls of the site.

Planning Proposal

The planning proposal seeks approval to amend the planning controls of the site to increase the development yield on the site, permitting a mixed-use development comprising buildings ranging in height from 9 to 28 storeys.

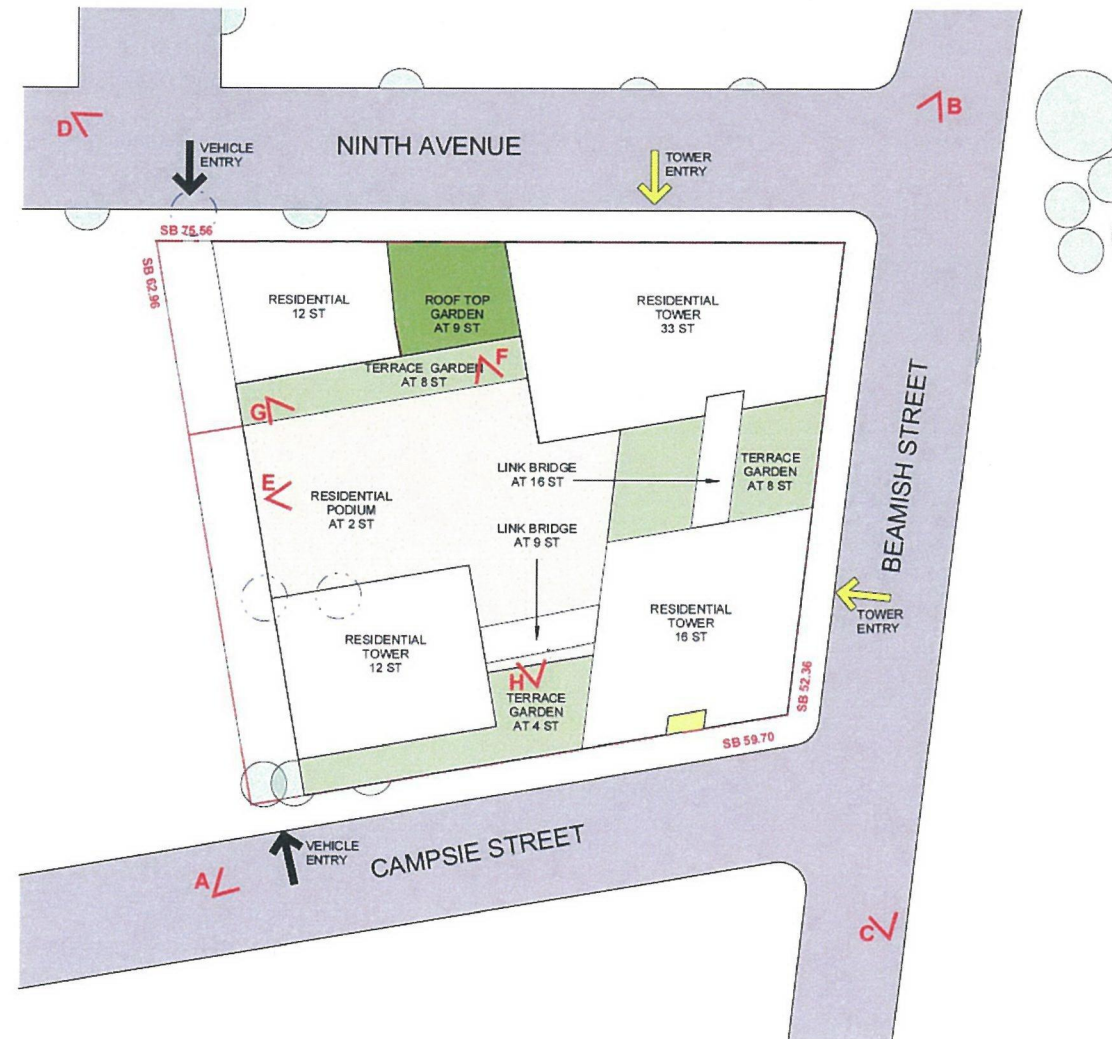
For the purposes of this traffic assessment it has been assumed that the proposed mixed-use building could comprise up to 500 apartments, with 3,000m² of retail floor space and 2,500m² of commercial floor space.

Off-street car parking will ultimately be provide in a basement car parking area beneath the buildings, designed to comply with Council's requirements as well as the relevant Australian Standards, subject to the number of basement levels to be excavated.

Vehicular access to the site is proposed to be provided via two separate entry/exit driveways, one of which is to be located at the western end of the Ninth Avenue site frontage and another located at the western end of the Campsie Street site frontage.

Plans for the purposes of this planning proposal have been prepared by *Stanisic Architects* and are reproduced in the following pages.

8 VIEWS KEY



8 CONCEPT VISUALISATION

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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.

Canterbury Road is classified by the RMS as a *State Road* and provides the key east-west road link in the area, linking Bankstown and Hurlstone Park. It typically carries two traffic lanes in each direction in the vicinity of the site, with clearway restrictions applying along both sides of the road during commuter peak periods.

Beamish Street and Brighton Avenue is classified by the RMS as a *Regional Road* which provides the key north-south road link in the area, linking Canterbury Road to Georges River Road. The route typically carries one traffic lane in each direction in the vicinity of the site and kerbside parking is permitted at selected locations along the road.

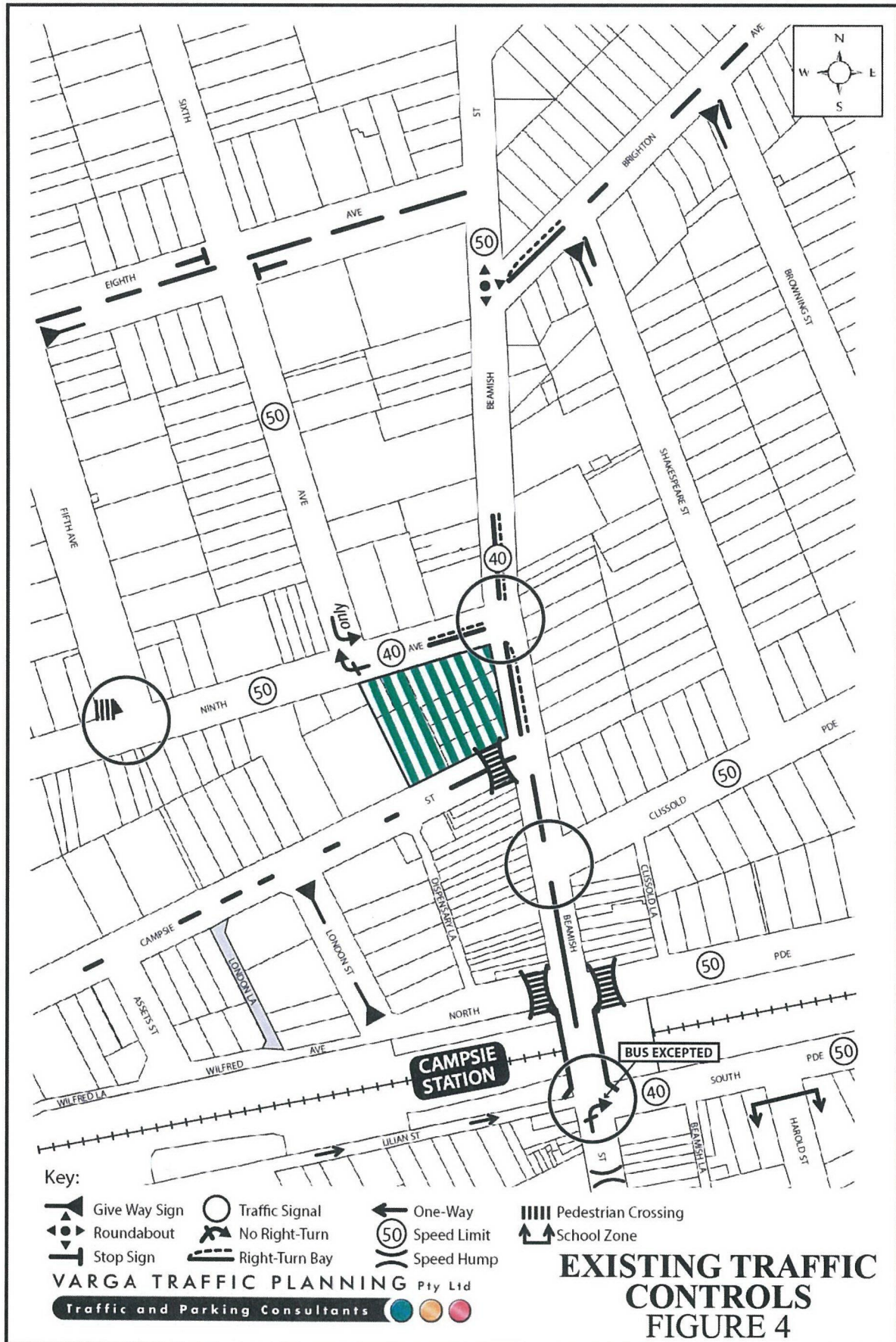
Ninth Avenue is also classified by the RMS as a *Regional Road* which provides the key east-west road link in the area, linking Campsie to Wiley Park via Albert Street and Lakemba Street. It typically carries one traffic lane in each direction in the vicinity of the site and kerbside parking is generally permitted on one or both sides of the road, subject to sign posted restrictions.

Campsie Street is a local, unclassified road which is primarily used to provide vehicular and pedestrian access to frontage properties. Kerbside parking is generally permitted along both sides the road, subject to sign posted restrictions.

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 40 km/h SPEED LIMIT which applies to Beamish Street and all other local roads in the Campsie City Centre



- TRAFFIC SIGNALS in Beamish Street where it intersects with Ninth Avenue, Clissold Parade and also South Parade/Lilian Street
- RIGHT TURN HOLDING BAYS in Beamish Street where it intersects with Ninth Avenue and also Campsie Street
- a NO RIGHT-TURN westbound restriction in Ninth Avenue onto Sixth Avenue
- a LEFT-TURN ONLY southbound restriction in Sixth Avenue onto Ninth Avenue
- RAISED PEDESTRIAN CROSSINGS in Campsie Street and also North Parade in the vicinity of Beamish Street.

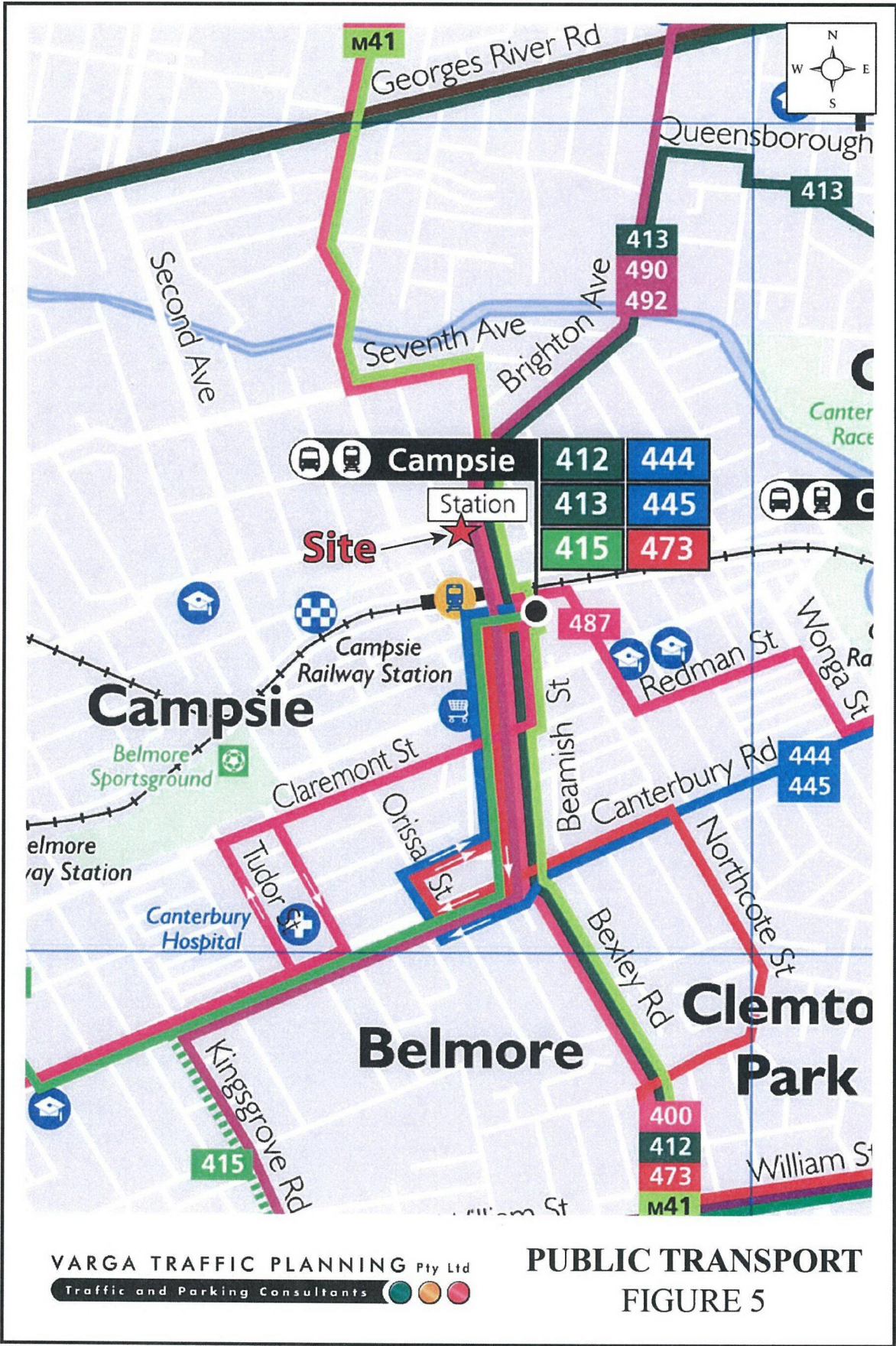
Existing Public Transport Services

The existing public transport services available to the site are illustrated on Figure 5.

The subject site is conveniently located within 200 metres of walking distance to the entrance of Campsie Railway Station. The station lies on the T3 Bankstown Line which operates between Bankstown and Sydney CBD. Services generally operate at a frequency of approximately 5-10 minutes during commuter peak periods and 15-30 minute intervals at other times.

In addition to the train services, a number of bus routes currently operate along Beamish Street with bus stops located within a 100 metres walking distance from the subject site.

Notably, the M41 bus route currently operates along Beamish Street which is part of the Sydney's *Metrobus* network that provides high-frequency, high-capacity links between key employment and growth centres across Sydney. The M41 links between Hurstville, Bexley North, Campsie, Burwood, Concord, Rhodes, Ryde, Top Ryde, North Ryde, Macquarie park and Macquarie Centre operating at 10 minute intervals during commuter peak periods, 15 minute intervals during the day and 20 minute intervals at other times.



Other bus services available in the vicinity of the subject site includes route 400, 412, 413, 415, 444, 445, 473, 487, 490, 492 and 942.

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:

- Beamish Street and Ninth Avenue intersection
- Beamish Street and Campsie Street intersection.

The results of the traffic surveys are reproduced in full in Appendix A and reveal that:

- two-way traffic flows in Beamish Street are typically in the order of 1,300 vehicles per hour (vph) during peak periods
- two-way traffic flows in Ninth Avenue are typically in the order of 1,050 vph during peak periods
- two-way traffic flows in Campsie Street are typically in the order of 250 vph during 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 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 planning proposal:

Commercial Offices

AM:	1.6 peak hour vehicle trips per 100m ² GFA
PM:	1.2 peak hour vehicle trips per 100m ² GFA

High Density Residential Flat Dwellings

AM:	0.19 peak hour vehicle trips/unit
PM:	0.15 peak hour vehicle trips/unit

The *RMS Guidelines* also make the following observation in respect of high density residential flat buildings:

Definition

A *high density residential flat building* refers to a building containing 20 or more dwellings. This does not include aged or disabled persons housing. *High density residential flat buildings* are usually more than 5 levels, have basement level car parking and are located in close proximity to public transport services. The building may contain a component of commercial use.

Factors

The above rates include visitors, staff, service/delivery and on-street movements such as taxis and pick-up/set-down activities.

However the *RMS Guidelines* and the updated *TDT 2013/04a* do not nominate a traffic generation rate for small, local shops, referring only to major regional shopping centres incorporating supermarkets and department stores. For the purpose of this assessment therefore, the commercial traffic generation rate has been adopted in respect of the retail component of the planning proposal.

Application of the above traffic generation rates to the various components of the development proposal yields a traffic generation potential of approximately 183 vehicle trips

per hour (vph) and 141 vph during the AM and PM commuter peak periods respectively, as set out below:

Planning Proposal		
Projected Future Traffic Generation Potential		
	AM	PM
Residential (240 apartments):	95.0 vph	75.0 vph
Retail Premises (3,000m ²):	48.0 vph	36.0 vph
Commercial Premises (2,500m ²):	40.0 vph	30.0 vph
TOTAL TRAFFIC GENERATION POTENTIAL:	183.0 vph	141.0 vph

That projected future level of traffic generation potential which is expected to 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 by the current *CLEP2012* planning controls (in terms of height).

Application of the above traffic generation rates to the 240 residential apartments, 3,000m² of retail floor space and 2,500m² of commercial floor space achievable under the current *LEP 2012* planning controls yields a traffic generation potential of approximately 134 vph and 102 vph during the AM and PM commuter peak period respectively, as set out below:

Current LEP 2012 Planning Controls		
Projected Future Traffic Generation Potential		
	AM	PM
Residential (500 apartments):	45.6 vph	36.0 vph
Retail Premises (3,000m ²):	48.0 vph	36.0 vph
Commercial Premises (2,500m ²):	40.0 vph	30.0 vph
TOTAL TRAFFIC GENERATION POTENTIAL:	133.6 vph	102.0 vph

Accordingly, it is likely that the planning proposal will result in a *nett* increase in the traffic generation potential of the site of approximately 49 vph during the *morning* commuter peak period and 39 vph during the *afternoon* commuter peak period when compared with the existing planning controls as set out below:

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

	AM	PM
Planning Proposal Traffic Generation Potential:	183.0 vph	141.0 vph
Existing Planning Controls Traffic Generation Potential:	-133.6 vph	-102.0 vph
NETT INCREASE IN TRAFFIC GENERATION POTENTIAL:	49.4 vph	39.0 vph

Notwithstanding, for the purposes of this assessment it has been assumed that *all* of the projected future traffic flows of 183 vph and 141 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 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 planning proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network. Those effects can be assessed using the SIDRA program which is widely used by the RMS and many LGA's for this purpose. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

The results of the SIDRA analysis of the intersections are summarised in Tables 3.1 and Table 3.2 below, revealing that:

Beamish Street and Ninth Avenue Intersection (Table 3.1)

- the intersection currently operates at *Level of Service "B"* under the existing traffic demands during the commuter peak periods with total average vehicle delays in the order of 25.6-25.9 second/vehicle
- under the projected future traffic demands expected to be generated by the planning proposal, the intersection is expected to continue to operate at *Level of Service "B"*

during the commuter peak periods, with increases in total average vehicle delays of *less than* 1.5 second/vehicle.

Beamish Street and Campsie Street Intersection (Table 3.2)

- the intersection currently operates at *Level of Service "A"* under the existing traffic demands during the commuter peak periods with total average vehicle delays in the order of 1 second/vehicle
- under the projected future traffic demands expected to be generated by the planning proposal, the intersection is expected to continue to operate at *Level of Service "A"* during the commuter peak periods, with increases in total average vehicle delays of *less than* 1 second/vehicle.

TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF BEAMISH STREET & NINTH AVENUE				
Key Indicators	Existing Traffic Demand		Projected Development Traffic Demand	
	AM	PM	AM	PM
Level of Service	B	B	B	B
Degree of Saturation	0.657	0.618	0.657	0.652
Average Vehicle Delay (secs/veh)				
Beamish Street (south) L	23.6	24.2	23.6	26.4
T	20.2	20.8	20.2	23.0
Beamish Street (north) T	9.9	11.2	9.9	10.2
R	31.0	31.9	33.2	34.5
Ninth Avenue (west) L	34.3	30.7	35.9	29.3
R	46.5	44.5	46.5	46.5
TOTAL AVERAGE VEHICLE DELAY	26.6	25.9	27.6	27.4

BEA_NINX

BEA_NINP

TABLE 3.2 - RESULTS OF SIDRA ANALYSIS OF BEAMISH STREET & CAMPSIE STREET				
Key Indicators	Existing Traffic Demand		Projected Development Traffic Demand	
	AM	PM	AM	PM
Level of Service	A	A	A	A
Degree of Saturation	0.342	0.319	0.354	0.336
Average Vehicle Delay (secs/veh)				
Beamish Street (south) L	3.5	3.5	3.5	3.5
T	0.0	0.0	0.0	0.0
Beamish Street (north) T	0.0	0.0	0.0	0.0
R	5.9	5.7	6.0	5.8
Campsie Street (west) L	6.0	5.6	6.0	5.6
R	7.4	7.3	7.6	7.5
TOTAL AVERAGE VEHICLE DELAY	0.9	1.0	1.1	1.2

BEA_CAMX

BEA_CAMP

Criteria for Interpreting Results of Sidra Analysis

1. Level of Service (LOS)

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

2. Average Vehicle Delay (AVD)

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

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

3. Degree of Saturation (DS)

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

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

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

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

4. PARKING IMPLICATIONS

Existing Kerbside Parking Restrictions

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

- ½ HOUR / 1 HOUR PARKING restrictions along selected locations on Beamish Street
- BUS ZONES located at regular intervals along both sides of Beamish Street
- 1 HOUR PARKING restrictions along the Ninth Avenue site frontage
- NO PARKING / LOADING ZONE restrictions along the southern side of Ninth Avenue in the vicinity of the site
- NO STOPPING restrictions along the northern side of Ninth Avenue in the vicinity of the site
- 1 HOUR / 2 HOUR PARKING restrictions along both sides of Campsie Street, including along the entire site frontage.

Off-Street Car Parking Provisions

The off-street car parking requirements applicable to the development proposal are specified in Council's *DCP 2012, Part 6.8 – Parking and Vehicle Access* document in the following terms:

Shop Top Housing (B2 Zones – Large Centres)

Studio apartments:	0.25 spaces per dwelling
1 bedroom apartments:	0.8 spaces per dwelling
2 bedroom apartments:	1 space per dwelling
3 bedroom apartments:	1 space per dwelling
Visitors:	Not required

*Any developments containing 10 dwellings or more is to provide at least one car wash bay.



Office Premises (B2 Zones – Large Centres)1 space per 60m² (120m² – 1,000m²)**Shops (B2 Zones – Large Centres)**1 space per 66.7m² (<120m²)1 space per 33m² (120m² – 1,000m²)1 space per 27m² (>1,000m²)

It is expected that the above car parking requirements will ultimately be satisfied by the planning proposal, subject to the number of basement levels to be excavated.

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

Off-Street Bicycle Parking Provisions

The off-street bicycle parking requirements applicable to the development proposal are also specified in the *Canterbury DCP 2012* document in the following terms:

Residential Accommodation

Residents: 1 space per 5 dwellings or part thereof

Visitors: 1 space per 10 dwellings or part thereof

Shop, Restaurant or CafeStaff: 1 space per 200m² or part thereofPatrons: 1 space per 500m² over 1,000m² or part thereof

That projected level of bicycle parking is to be ultimately satisfied by the planning proposal.

Conclusion

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

- the planning proposal seeks approval to amend the planning controls of the site to permit the redevelopment of the site to comprise up to 500 apartments, 3,000m² of retail floor space and 2,500m² of commercial floor space
- 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 bicycle parking facilities will be provided and designed in accordance with Council's requirements.

APPENDIX A

TRAFFIC SURVEY DATA



R.O.A.R. DATA

Reliable, Original & Authentic Results

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Mobile.0418239019

Client : Varga Traffic Planning
Job No/Name : 5863 CAMPSIE Beamish St
Day/Date : Thursday / 19th November 2015

PEDS	NORTH	WEST	SOUTH	
Time Per	Beamish St	Campsie St	Beamish St	TOT
0630 - 0645	0	37	2	39
0645 - 0700	0	45	1	46
0700 - 0715	0	30	0	30
0715 - 0730	0	51	0	51
0730 - 0745	0	37	0	37
0745 - 0800	1	63	0	64
0800 - 0815	0	64	0	64
0815 - 0830	2	63	0	65
0830 - 0845	1	66	0	67
0845 - 0900	2	57	0	59
0900 - 0915	3	72	5	80
0915 - 0930	7	84	1	92
Per End	16	669	9	694

PEDS	NORTH	WEST	SOUTH	
Peak Per	Beamish St	Campsie St	Beamish St	TOT
0630 - 0730	0	163	3	166
0645 - 0745	0	163	1	164
0700 - 0800	1	181	0	182
0715 - 0815	1	215	0	216
0730 - 0830	3	227	0	230
0745 - 0845	4	256	0	260
0800 - 0900	5	250	0	255
0815 - 0915	8	258	5	271
0830 - 0930	13	279	6	298

PEAK HR	8	258	5	271
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Lights	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	137	8	8	13	4	160	330
0645 - 0700	126	5	9	6	9	121	276
0700 - 0715	113	13	10	3	4	135	278
0715 - 0730	123	15	16	6	6	145	311
0730 - 0745	113	8	6	6	12	153	298
0745 - 0800	136	8	22	16	15	137	334
0800 - 0815	126	10	8	17	7	138	306
0815 - 0830	137	16	16	4	21	157	351
0830 - 0845	147	13	22	14	12	145	353
0845 - 0900	149	22	21	4	16	119	331
0900 - 0915	142	14	18	14	13	130	331
0915 - 0930	144	12	12	13	13	119	313
Per End	1593	144	168	116	132	1659	3812

Heavies	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	2	1	0	0	1	7	11
0645 - 0700	5	0	0	0	0	5	10
0700 - 0715	6	1	0	0	1	8	16
0715 - 0730	5	0	0	0	0	6	11
0730 - 0745	4	1	0	0	1	5	11
0745 - 0800	4	1	1	1	1	12	20
0800 - 0815	3	2	0	0	0	10	15
0815 - 0830	5	0	0	0	1	5	11
0830 - 0845	4	0	0	0	1	3	8
0845 - 0900	9	1	0	0	0	9	19
0900 - 0915	2	1	0	0	1	4	8
0915 - 0930	7	1	0	0	0	4	12
Per End	56	9	1	1	7	78	152

Combined	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	139	9	8	13	5	167	341
0645 - 0700	131	5	9	6	9	126	286
0700 - 0715	119	14	10	3	5	143	294
0715 - 0730	128	15	16	6	6	151	322
0730 - 0745	117	9	6	6	13	158	309
0745 - 0800	140	9	23	17	16	149	354
0800 - 0815	129	12	8	17	7	148	321
0815 - 0830	142	16	16	4	22	162	362
0830 - 0845	151	13	22	14	13	148	361
0845 - 0900	158	23	21	4	16	128	350
0900 - 0915	144	15	18	14	14	134	339
0915 - 0930	151	13	12	13	13	123	325
Per End	1649	153	169	117	139	1737	3964

Lights	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	499	41	43	28	23	561	1195
0645 - 0745	475	41	41	21	31	554	1163
0700 - 0800	485	44	54	31	37	570	1221
0715 - 0815	498	41	52	45	40	573	1249
0730 - 0830	512	42	52	43	55	585	1289
0745 - 0845	546	47	68	51	55	577	1344
0800 - 0900	559	61	67	39	56	559	1341
0815 - 0915	575	65	77	36	62	551	1366
0830 - 0930	582	61	73	45	54	513	1328

Heavies	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	18	2	0	0	2	26	48
0645 - 0745	20	2	0	0	2	24	48
0700 - 0800	19	3	1	1	3	31	58
0715 - 0815	16	4	1	1	2	33	57
0730 - 0830	16	4	1	1	3	32	57
0745 - 0845	16	3	1	1	3	30	54
0800 - 0900	21	3	0	0	2	27	53
0815 - 0915	20	2	0	0	3	21	46
0830 - 0930	22	3	0	0	2	20	47

Combined	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	517	43	43	28	25	587	1243
0645 - 0745	495	43	41	21	33	578	1211
0700 - 0800	504	47	55	32	40	601	1279
0715 - 0815	514	45	53	46	42	606	1306
0730 - 0830	528	46	53	44	58	617	1346
0745 - 0845	562	50	69	52	58	607	1398
0800 - 0900	580	64	67	39	58	586	1394
0815 - 0915	595	67	77	36	65	572	1412
0830 - 0930	604	64	73	45	56	533	1375

PEAK HR	575	65	77	36	62	551	1366
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PEAK HR	20	2	0	0	3	21	46
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PEAK HR	595	67	77	36	65	572	1412
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R.O.A.R. DATA

Reliable, Original & Authentic Results

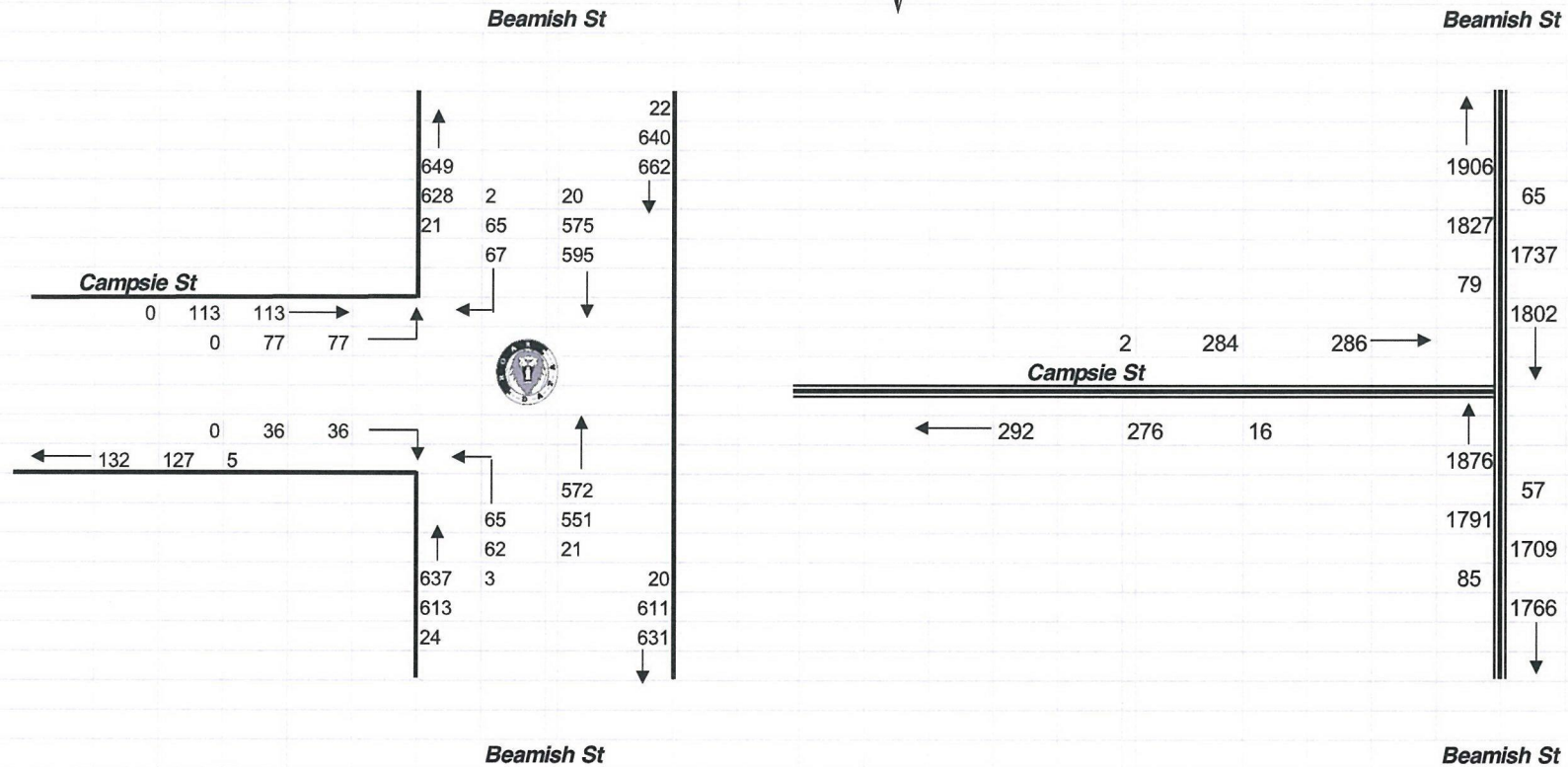
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 5863 CAMPSIE Beamish St
Day/Date : Thursday / 19th November 2015

AM PEAK
0815 - 0915

**TOTAL VOLUMES
FOR COUNT
PERIOD**

1	2	3
4	5	6
7	8	9





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Varga Traffic Planning
Job No/Name : 5863 CAMPSIE Beamish St
Day/Date : Thursday / 19th November 2015

PEDS	NORTH	WEST	SOUTH	
Time Per	Beamish St	Campsie St	Beamish St	TOT
1530 - 1545	3	99	0	102
1545 - 1600	3	135	0	138
1600 - 1615	2	103	5	110
1615 - 1630	3	118	3	124
1630 - 1645	1	103	2	106
1645 - 1700	2	86	0	88
1700 - 1715	0	90	0	90
1715 - 1730	0	116	0	116
1730 - 1745	2	88	0	90
1745 - 1800	0	102	1	103
1800 - 1815	0	92	0	92
1815 - 1830	0	114	1	115
Per End	16	1246	12	1274

PEDS	NORTH	WEST	SOUTH	
Peak Per	Beamish St	Campsie St	Beamish St	TOT
1530 - 1630	11	455	8	474
1545 - 1645	9	459	10	478
1600 - 1700	8	410	10	428
1615 - 1715	6	397	5	408
1630 - 1730	3	395	2	400
1645 - 1745	4	380	0	384
1700 - 1800	2	396	1	399
1715 - 1815	2	398	1	401
1730 - 1830	2	396	2	400
PEAK HR	11	455	8	474

Lights	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Time Per	I	R	L	R	L	I	TOT
1530 - 1545	151	24	20	2	16	152	365
1545 - 1600	137	26	13	6	17	113	312
1600 - 1615	139	21	12	8	14	125	319
1615 - 1630	143	18	20	10	23	118	332
1630 - 1645	143	27	18	5	19	119	331
1645 - 1700	122	22	8	11	17	133	313
1700 - 1715	124	22	19	4	17	125	311
1715 - 1730	135	20	19	8	27	114	323
1730 - 1745	132	26	17	7	20	136	338
1745 - 1800	134	22	20	6	11	126	319
1800 - 1815	137	17	14	7	21	139	335
1815 - 1830	131	17	23	15	23	100	309
Per End	1628	262	203	89	225	1500	3907

Heavies	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Time Per	I	R	L	R	L	I	TOT
1530 - 1545	4	2	0	0	0	5	11
1545 - 1600	8	1	0	0	0	5	14
1600 - 1615	6	1	0	0	0	8	15
1615 - 1630	7	0	0	0	1	5	13
1630 - 1645	2	1	0	0	1	5	9
1645 - 1700	5	1	0	0	0	7	13
1700 - 1715	6	1	0	0	0	4	11
1715 - 1730	3	0	0	0	0	4	7
1730 - 1745	2	1	1	0	0	3	7
1745 - 1800	7	0	0	0	1	4	12
1800 - 1815	3	2	0	0	1	4	10
1815 - 1830	7	0	0	0	0	6	13
Per End	60	10	1	0	4	60	135

Combined	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Time Per	I	R	L	R	L	I	TOT
1530 - 1545	155	26	20	2	16	157	376
1545 - 1600	145	27	13	6	17	118	326
1600 - 1615	145	22	12	8	14	133	334
1615 - 1630	150	18	20	10	24	123	345
1630 - 1645	145	28	18	5	20	124	340
1645 - 1700	127	23	8	11	17	140	326
1700 - 1715	130	23	19	4	17	129	322
1715 - 1730	138	20	19	8	27	118	330
1730 - 1745	134	27	18	7	20	139	345
1745 - 1800	141	22	20	6	12	130	331
1800 - 1815	140	19	14	7	22	143	345
1815 - 1830	138	17	23	15	23	106	322
Per End	1688	272	204	89	229	1560	4042

Lights	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
1530 - 1630	570	89	65	26	70	508	1328
1545 - 1645	562	92	63	29	73	475	1294
1600 - 1700	547	88	58	34	73	495	1295
1615 - 1715	532	89	65	30	76	495	1287
1630 - 1730	524	91	64	28	80	491	1278
1645 - 1745	513	90	63	30	81	508	1285
1700 - 1800	525	90	75	25	75	501	1291
1715 - 1815	538	85	70	28	79	515	1315
1730 - 1830	534	82	74	35	75	501	1301

Heavies	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
1530 - 1630	25	4	0	0	1	23	53
1545 - 1645	23	3	0	0	2	23	51
1600 - 1700	20	3	0	0	2	25	50
1615 - 1715	20	3	0	0	2	21	46
1630 - 1730	16	3	0	0	1	20	40
1645 - 1745	16	3	1	0	0	18	38
1700 - 1800	18	2	1	0	1	15	37
1715 - 1815	15	3	1	0	2	15	36
1730 - 1830	19	3	1	0	2	17	42

Combined	NORTH		WEST		SOUTH		
	Beamish St		Campsie St		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
1530 - 1630	595	93	65	26	71	531	1381
1545 - 1645	585	95	63	29	75	498	1345
1600 - 1700	567	91	58	34	75	520	1345
1615 - 1715	552	92	65	30	78	516	1333
1630 - 1730	540	94	64	28	81	511	1318
1645 - 1745	529	93	64	30	81	526	1323
1700 - 1800	543	92	76	25	76	516	1328
1715 - 1815	553	88	71	28	81	530	1351
1730 - 1830	553	85	75	35	77	518	1343

PEAK HR	570	89	65	26	70	508	1328
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PEAK HR	25	4	0	0	1	23	53
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PEAK HR	595	93	65	26	71	531	1381
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R.O.A.R. DATA

Reliable, Original & Authentic Results

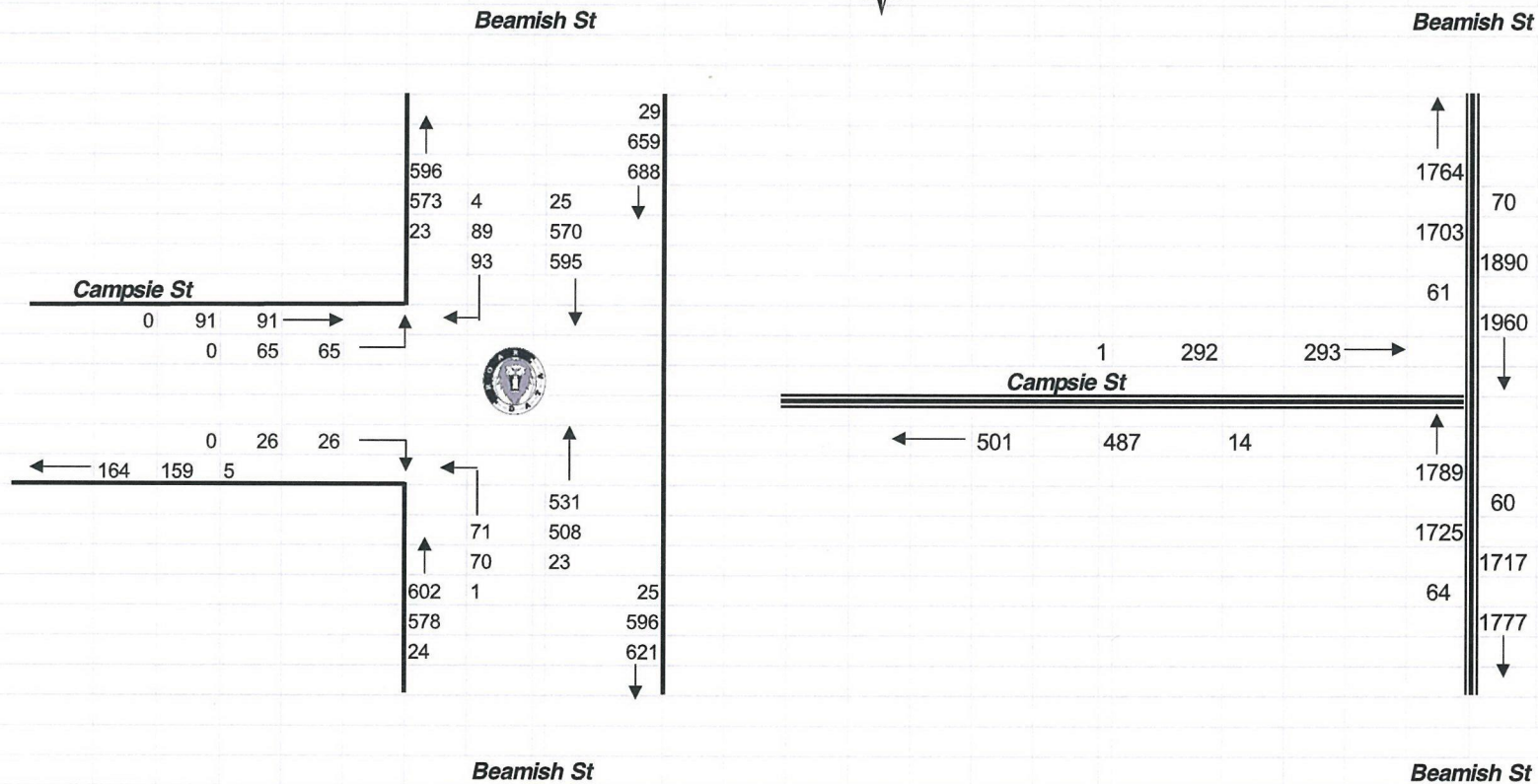
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 5863 CAMPSIE Beamish St
Day/Date : Thursday / 19th November 2015

PM PEAK
1530 - 1630

1	2	3
4	5	6
7	8	9

**TOTAL VOLUMES
FOR COUNT
PERIOD**





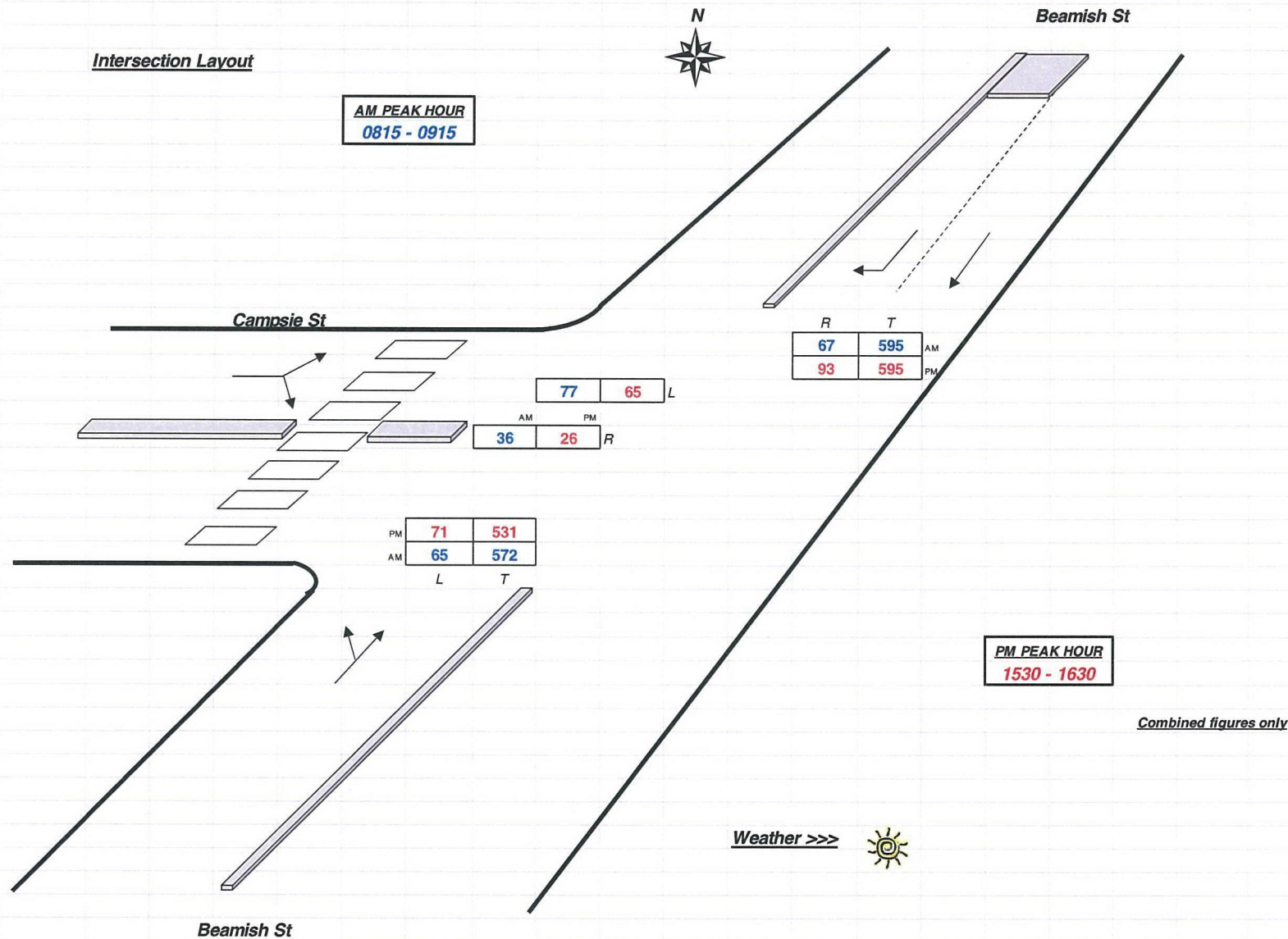
R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Client : Varga Traffic Planning
Job No/Name : 5863 CAMPSIE Beamish St
Day/Date : Thursday / 19th November 2015

Intersection Layout



**R.O.A.R. DATA****Reliable, Original & Authentic Results**

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Varga Traffic Planning
 Job No/Name : 5863 CAMPSIE Beamish St
 Day/Date : Thursday / 19th November 2015

PEDS	NORTH	WEST	SOUTH	
Time Per	Beamish St	Ninth Ave	Beamish St	TOT
0630 - 0645	2	18	0	20
0645 - 0700	3	28	1	32
0700 - 0715	2	15	1	18
0715 - 0730	3	26	0	29
0730 - 0745	2	22	0	24
0745 - 0800	2	36	1	39
0800 - 0815	5	47	0	52
0815 - 0830	6	40	1	47
0830 - 0845	6	39	0	45
0845 - 0900	20	32	5	57
0900 - 0915	9	30	1	40
0915 - 0930	8	39	4	51
Per End	68	372	14	454

PEDS	NORTH	WEST	SOUTH	
Peak Per	Beamish St	Ninth Ave	Beamish St	TOT
0630 - 0730	10	87	2	99
0645 - 0745	10	91	2	103
0700 - 0800	9	99	2	110
0715 - 0815	12	131	1	144
0730 - 0830	15	145	2	162
0745 - 0845	19	162	2	183
0800 - 0900	37	158	6	201
0815 - 0915	41	141	7	189
0830 - 0930	43	140	10	193
PEAK HR	37	158	6	201

Lights	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	50	7	32	95	87	71	342
0645 - 0700	48	12	42	77	81	54	314
0700 - 0715	58	10	45	74	82	68	337
0715 - 0730	65	9	49	71	88	72	354
0730 - 0745	64	19	48	61	102	54	348
0745 - 0800	68	20	44	80	82	80	374
0800 - 0815	76	24	78	67	82	65	392
0815 - 0830	84	34	75	70	105	68	436
0830 - 0845	72	29	56	86	92	81	416
0845 - 0900	86	33	55	84	74	66	398
0900 - 0915	77	25	52	78	84	60	376
0915 - 0930	67	29	35	90	75	59	355
Per End	815	251	611	933	1034	798	4442

Heavies	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	3	0	2	0	0	3	8
0645 - 0700	4	1	0	1	2	6	14
0700 - 0715	4	0	0	2	2	7	15
0715 - 0730	6	0	0	0	2	4	12
0730 - 0745	3	0	0	1	0	5	9
0745 - 0800	4	1	0	2	1	12	20
0800 - 0815	5	0	1	0	2	8	16
0815 - 0830	5	0	0	0	1	4	10
0830 - 0845	2	0	0	1	0	3	6
0845 - 0900	10	0	1	1	1	7	20
0900 - 0915	2	0	1	1	1	3	8
0915 - 0930	7	0	1	1	1	4	14
Per End	55	2	6	10	13	66	152

Combined	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	53	7	34	95	87	74	350
0645 - 0700	52	13	42	78	83	60	328
0700 - 0715	62	10	45	76	84	75	352
0715 - 0730	71	9	49	71	90	76	366
0730 - 0745	67	19	48	62	102	59	357
0745 - 0800	72	21	44	82	83	92	394
0800 - 0815	81	24	79	67	84	73	408
0815 - 0830	89	34	75	70	106	72	446
0830 - 0845	74	29	56	87	92	84	422
0845 - 0900	96	33	56	85	75	73	418
0900 - 0915	79	25	53	79	85	63	384
0915 - 0930	74	29	36	91	76	63	369
Per End	870	253	617	943	1047	864	4594

Lights	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	221	38	168	317	338	265	1347
0645 - 0745	235	50	184	283	353	248	1353
0700 - 0800	255	58	186	286	354	274	1413
0715 - 0815	273	72	219	279	354	271	1468
0730 - 0830	292	97	245	278	371	267	1550
0745 - 0845	300	107	253	303	361	294	1618
0800 - 0900	318	120	264	307	353	280	1642
0815 - 0915	319	121	238	318	355	275	1626
0830 - 0930	302	116	198	338	325	266	1545

Heavies	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	17	1	2	3	6	20	49
0645 - 0745	17	1	0	4	6	22	50
0700 - 0800	17	1	0	5	5	28	56
0715 - 0815	18	1	1	3	5	29	57
0730 - 0830	17	1	1	3	4	29	55
0745 - 0845	16	1	1	3	4	27	52
0800 - 0900	22	0	2	2	4	22	52
0815 - 0915	19	0	2	3	3	17	44
0830 - 0930	21	0	3	4	3	17	48

Combined	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	238	39	170	320	344	285	1396
0645 - 0745	252	51	184	287	359	270	1403
0700 - 0800	272	59	186	291	359	302	1469
0715 - 0815	291	73	220	282	359	300	1525
0730 - 0830	309	98	246	281	375	296	1605
0745 - 0845	316	108	254	306	365	321	1670
0800 - 0900	340	120	266	309	357	302	1694
0815 - 0915	338	121	240	321	358	292	1670
0830 - 0930	323	116	201	342	328	283	1593

PEAK HR	318	120	264	307	353	280	1642
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PEAK HR	22	0	2	2	4	22	52
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PEAK HR	340	120	266	309	357	302	1694
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R.O.A.R. DATA

Reliable, Original & Authentic Results

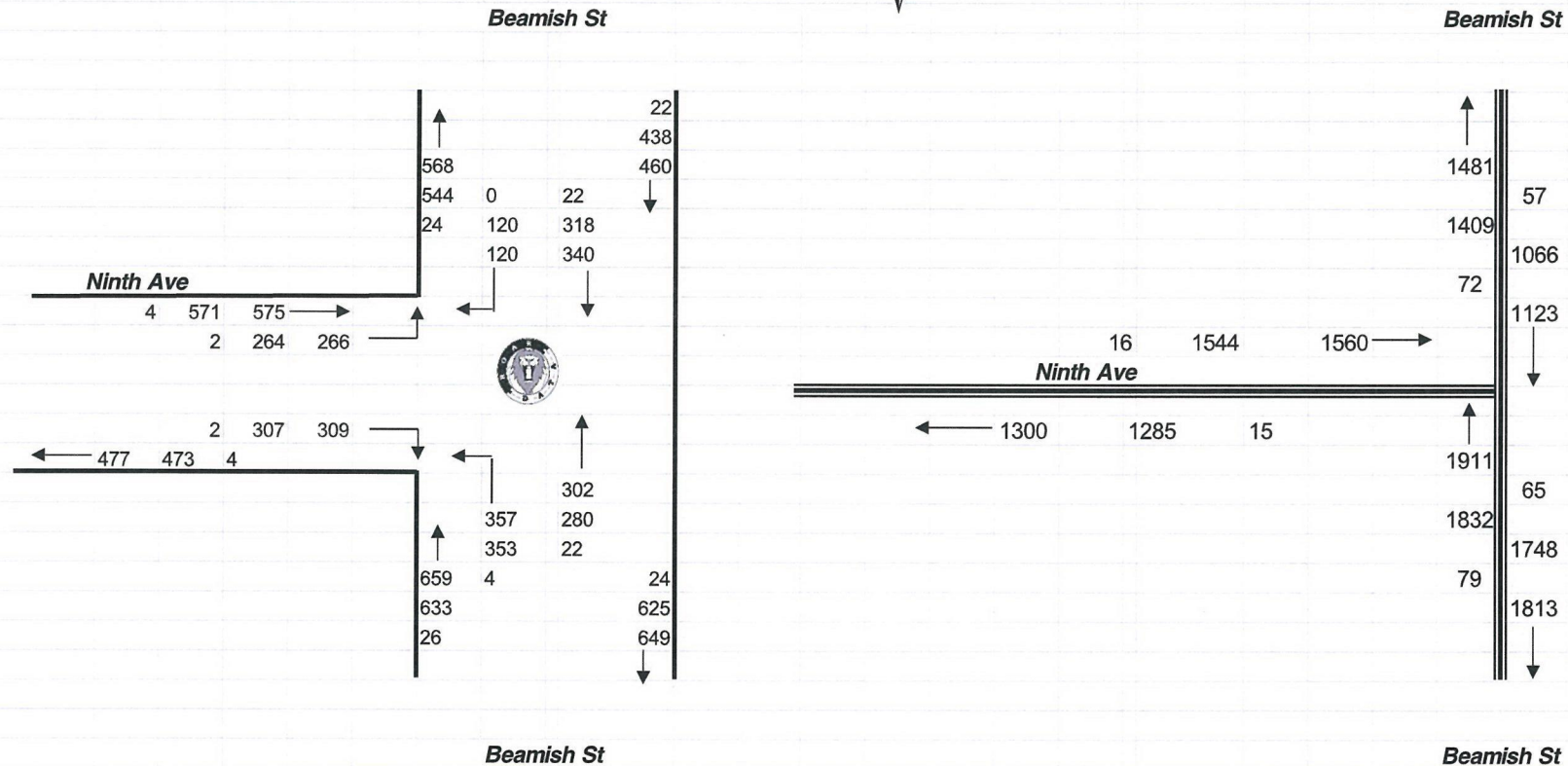
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 5863 CAMPSIE Beamish St
Day/Date : Thursday / 19th November 2015

1	2	3
4	5	6
7	8	9

**TOTAL VOLUMES
FOR COUNT
PERIOD**

AM PEAK
0800 - 0900





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Varga Traffic Planning
 Job No/Name : 5863 CAMPSIE Beamish St
 Day/Date : Thursday / 19th November 2015

PEDS	NORTH	WEST	SOUTH	
Time Per	Beamish St	Ninth Ave	Beamish St	TOT
1530 - 1545	3	68	1	72
1545 - 1600	8	74	0	82
1600 - 1615	8	46	0	54
1615 - 1630	7	51	3	61
1630 - 1645	7	53	0	60
1645 - 1700	7	51	1	59
1700 - 1715	7	44	3	54
1715 - 1730	4	77	1	82
1730 - 1745	6	59	3	68
1745 - 1800	11	54	0	65
1800 - 1815	12	65	2	79
1815 - 1830	6	52	1	59
Per End	86	694	15	795

PEDS	NORTH	WEST	SOUTH	
Peak Per	Beamish St	Ninth Ave	Beamish St	TOT
1530 - 1630	26	239	4	269
1545 - 1645	30	224	3	257
1600 - 1700	29	201	4	234
1615 - 1715	28	199	7	234
1630 - 1730	25	225	5	255
1645 - 1745	24	231	8	263
1700 - 1800	28	234	7	269
1715 - 1815	33	255	6	294
1730 - 1830	35	230	6	271

PEAK HR	26	239	4	269
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Lights	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Time Per	I	R	L	R	L	I	TOT
1530 - 1545	83	43	42	83	90	85	426
1545 - 1600	88	38	41	83	70	55	375
1600 - 1615	92	38	37	70	68	70	375
1615 - 1630	87	48	36	75	89	50	385
1630 - 1645	84	35	36	80	83	55	373
1645 - 1700	85	46	35	65	75	66	372
1700 - 1715	75	35	34	73	81	65	363
1715 - 1730	100	46	51	52	70	62	381
1730 - 1745	79	42	51	79	70	84	405
1745 - 1800	92	41	34	69	85	62	383
1800 - 1815	78	44	32	75	80	73	382
1815 - 1830	89	34	35	62	70	54	344
Per End	1032	490	464	866	931	781	4564

Heavies	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Time Per	I	R	L	R	L	I	TOT
1530 - 1545	6	1	0	0	0	5	12
1545 - 1600	7	1	0	1	1	4	14
1600 - 1615	6	0	0	0	0	8	14
1615 - 1630	10	0	0	0	2	4	16
1630 - 1645	3	1	0	0	0	5	9
1645 - 1700	6	0	0	0	0	6	12
1700 - 1715	6	0	0	1	0	4	11
1715 - 1730	3	0	0	0	0	4	7
1730 - 1745	3	0	0	0	0	4	7
1745 - 1800	5	0	0	2	0	4	11
1800 - 1815	4	0	0	0	0	4	8
1815 - 1830	7	0	0	0	0	6	13
Per End	66	3	0	4	3	58	134

Combined	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Time Per	I	R	L	R	L	I	TOT
1530 - 1545	89	44	42	83	90	90	438
1545 - 1600	95	39	41	84	71	59	389
1600 - 1615	98	38	37	70	68	78	389
1615 - 1630	97	48	36	75	91	54	401
1630 - 1645	87	36	36	80	83	60	382
1645 - 1700	91	46	35	65	75	72	384
1700 - 1715	81	35	34	74	81	69	374
1715 - 1730	103	46	51	52	70	66	388
1730 - 1745	82	42	51	79	70	88	412
1745 - 1800	97	41	34	71	85	66	394
1800 - 1815	82	44	32	75	80	77	390
1815 - 1830	96	34	35	62	70	60	357
Per End	1098	493	464	870	934	839	4698

Lights	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
1530 - 1630	350	167	156	311	317	260	1561
1545 - 1645	351	159	150	308	310	230	1508
1600 - 1700	348	167	144	290	315	241	1505
1615 - 1715	331	164	141	293	328	236	1493
1630 - 1730	344	162	156	270	309	248	1489
1645 - 1745	339	169	171	269	296	277	1521
1700 - 1800	346	164	170	273	306	273	1532
1715 - 1815	349	173	168	275	305	281	1551
1730 - 1830	338	161	152	285	305	273	1514

Heavies	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
1530 - 1630	29	2	0	1	3	21	56
1545 - 1645	26	2	0	1	3	21	53
1600 - 1700	25	1	0	0	2	23	51
1615 - 1715	25	1	0	1	2	19	48
1630 - 1730	18	1	0	1	0	19	39
1645 - 1745	18	0	0	1	0	18	37
1700 - 1800	17	0	0	3	0	16	36
1715 - 1815	15	0	0	2	0	16	33
1730 - 1830	19	0	0	2	0	18	39

Combined	NORTH		WEST		SOUTH		
	Beamish St		Ninth Ave		Beamish St		
Peak Per	I	R	L	R	L	I	TOT
1530 - 1630	379	169	156	312	320	281	1617
1545 - 1645	377	161	150	309	313	251	1561
1600 - 1700	373	168	144	290	317	264	1556
1615 - 1715	356	165	141	294	330	255	1541
1630 - 1730	362	163	156	271	309	267	1528
1645 - 1745	357	169	171	270	296	295	1558
1700 - 1800	363	164	170	276	306	289	1568
1715 - 1815	364	173	168	277	305	297	1584
1730 - 1830	357	161	152	287	305	291	1553

PEAK HR	350	167	156	311	317	260	1561
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PEAK HR	29	2	0	1	3	21	56
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PEAK HR	379	169	156	312	320	281	1617
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R.O.A.R. DATA

Reliable, Original & Authentic Results

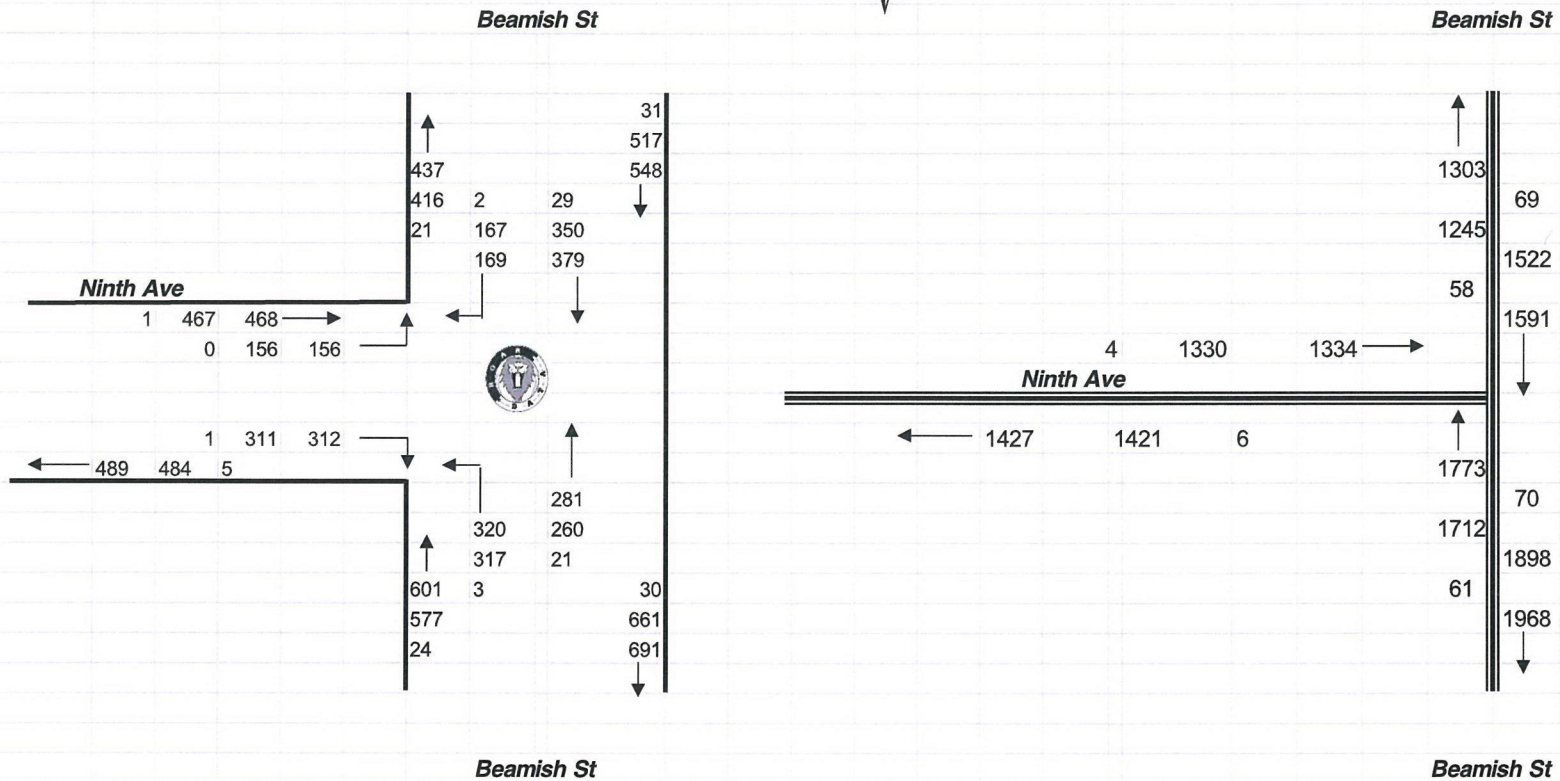
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Varga Traffic Planning
Job No/Name : 5863 CAMPSIE Beamish St
Day/Date : Thursday / 19th November 2015

PM PEAK
1530 - 1630

1	2	3
4	5	6
7	8	9

**TOTAL VOLUMES
FOR COUNT
PERIOD**





R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Client : Varga Traffic Planning
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Intersection Layout

