Planning Proposal
Proposed Residential Development

Oakmont – Stage 2
28 Fairway Drive, Kellyville

TRAFFIC AND PARKING ASSESSMENT REPORT

23 October 2015

Ref 15550

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants

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LIST OF ILLUSTRATIONS

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Location:	Oakmont – Stage 2 28 Fairway Drive, Kellyville	**Job Number**		15550	
Revision	**Details**	**Prepared**		**Approved**	
Final	Final for Submission	**By**	**Date**	**By**	**Date**
		CP	23/10/15	RV	23/10/15

1. INTRODUCTION

This report has been prepared to accompany a Planning Proposal for a residential development to be located at 28 Fairway Drive, Kellyville (Figures 1 and 2).

The Joint Regional Planning Panel has previously approved the staged construction of a new residential apartment development on the site, comprising a total of 172 apartments with at-grade and basement car parking (DA 824/2013/JP). Stage 1 is located on the eastern side of the riparian corridor and is currently under construction.

The North West Rail Link Corridor Strategy specifically identifies the subject site as a short-term opportunity site, suitable for heights of between 7 and 12 storeys. As such, the Planning Proposal seeks to increase the maximum building height of Stage 2 to 12 storeys, yielding a potential total of approximately 240-250 apartments, compared with the previously approved 79 apartments.

Off-street parking for Stage 2 is to be provided in a new two-level basement car parking area, with vehicular access to be provided directly via Fairway Drive, as per the previous approval.

The purpose of this report is to assess the traffic and parking implications of the development 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 Planning Proposal in terms of road network capacity

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

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LOCATION
FIGURE 1


N
W
E
S
ROSETTA
WALKER
AVE
ST
CRES
HORATIO
LAURA
AVE
FAIRWAY
KIMBER
CRES
DR
PENINSULA
WAY
CENTRAL PARK
AVE
CENTRAL PARK
LAKESIDE
CRES
CENTRAL PARK
AVE
CT
SOLENT
BURBANK
PL
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
SITE
FIGURE 2

2. PROPOSED DEVELOPMENT

Site

The subject site is located on the eastern side of Fairway Drive, approximately 150m south of Laura Street, and has a secondary frontage to Horatio Avenue. The site has street frontages approximately 74m in length to Fairway Drive, 185m in length to Horatio Avenue and occupies and area of approximately 20,237m^2.

Stage 1 – i.e. east of the riparian corridor – is currently under construction.

Stage 2 – i.e. west of the riparian corridor – is currently occupied by the contractor's site office and amenities as well as used as a material storage area for Stage 1.

Proposed Development

The Planning Proposal seeks to increase the maximum building height of Stage 2 to 12 storeys, yielding a potential total of 240-250 apartments, compared with the previously approved 79 apartments.

Off-street parking for Stage 2 is to be provided in a new two-level basement car parking area, with vehicular access to be provided directly via Fairway Drive, as per the previous approval.

As part of the infrastructure upgrade within the precinct, Spurway Drive is to be extended to form a new T-junction proposed at Fairway Drive, where all turning movements will be permitted.

The proposed extension of Spurway Drive to Fairway Drive will comprise a 12.0 wide road pavement within a 20.0m wide road reservation in accordance with the requirements for an *enhanced collector road* in the Balmoral Road Release Area as specified in Part D of *The Hills DCP 2012*. That road pavement width will be capable of accommodating the introduction of new bus routes with bus stops at regular intervals on both sides of the road.

Loading/servicing for the proposed development is expected to be undertaken by a variety of vehicles up to and including medium and large rigid trucks such as garbage trucks and removalist trucks. All loading/unloading of trucks will take place from within indented on-street parking bays and not within the basement car parking areas. Garbage trucks will approach the waste storage areas via access ways designed for this purpose and in accordance with Council's requirements.

Concept plans of the Planning Proposal development are reproduced in the following pages.

North West Rail Link Corridor Strategy

As described on the Transport for NSW website, the new North West Rail Link is Australia's largest public transport infrastructure project and is currently under construction, with opening scheduled for the first half of 2019.

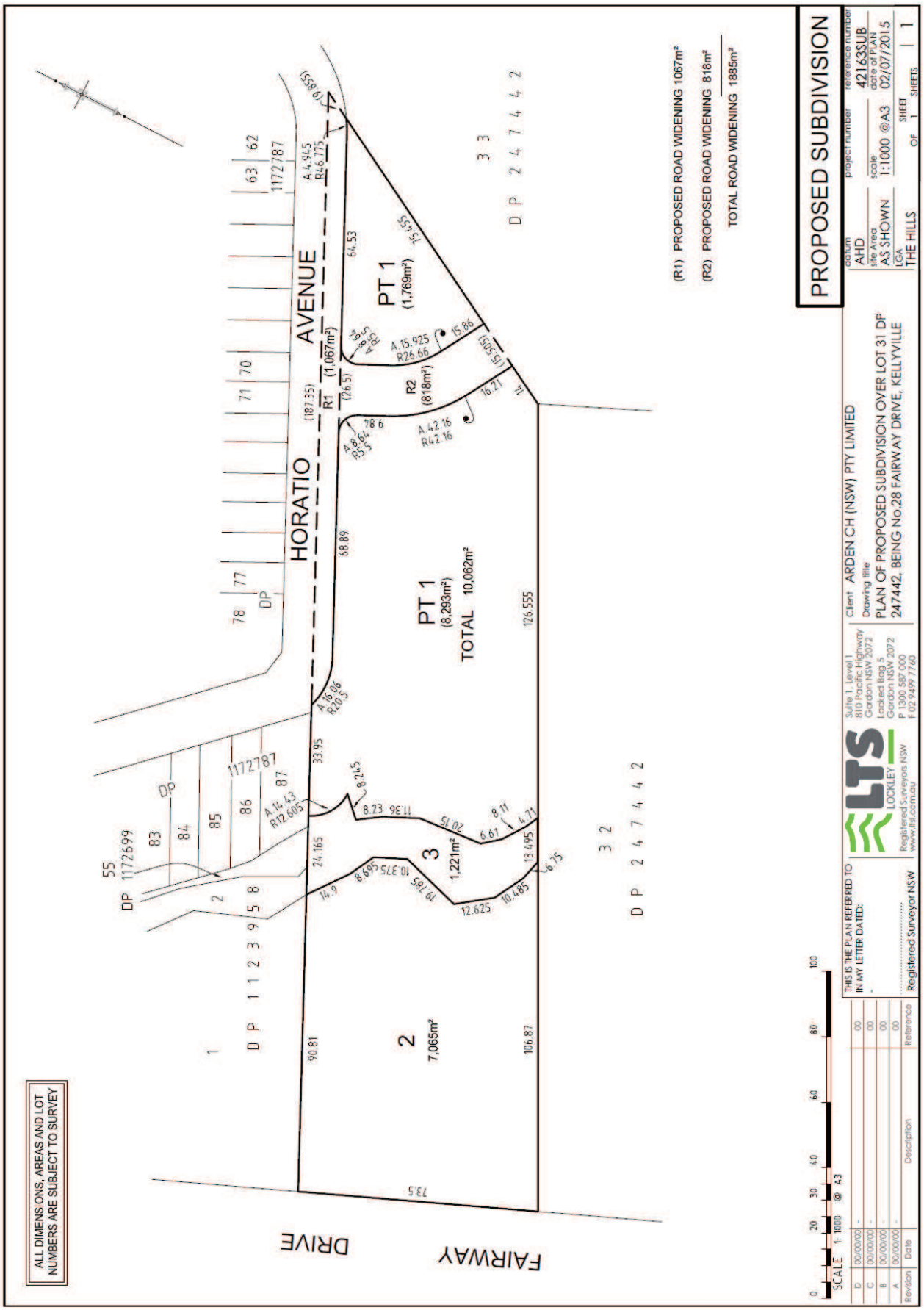
The project will deliver eight new railway stations (including Norwest and Bella Vista Stations) and 4,000 commuter car parking spaces to Sydney's growing north-west where it is expected that an extra 200,000 people will live in the coming decades.

Train services will operate every four minutes, or at least 15 services per hour, during peak periods.

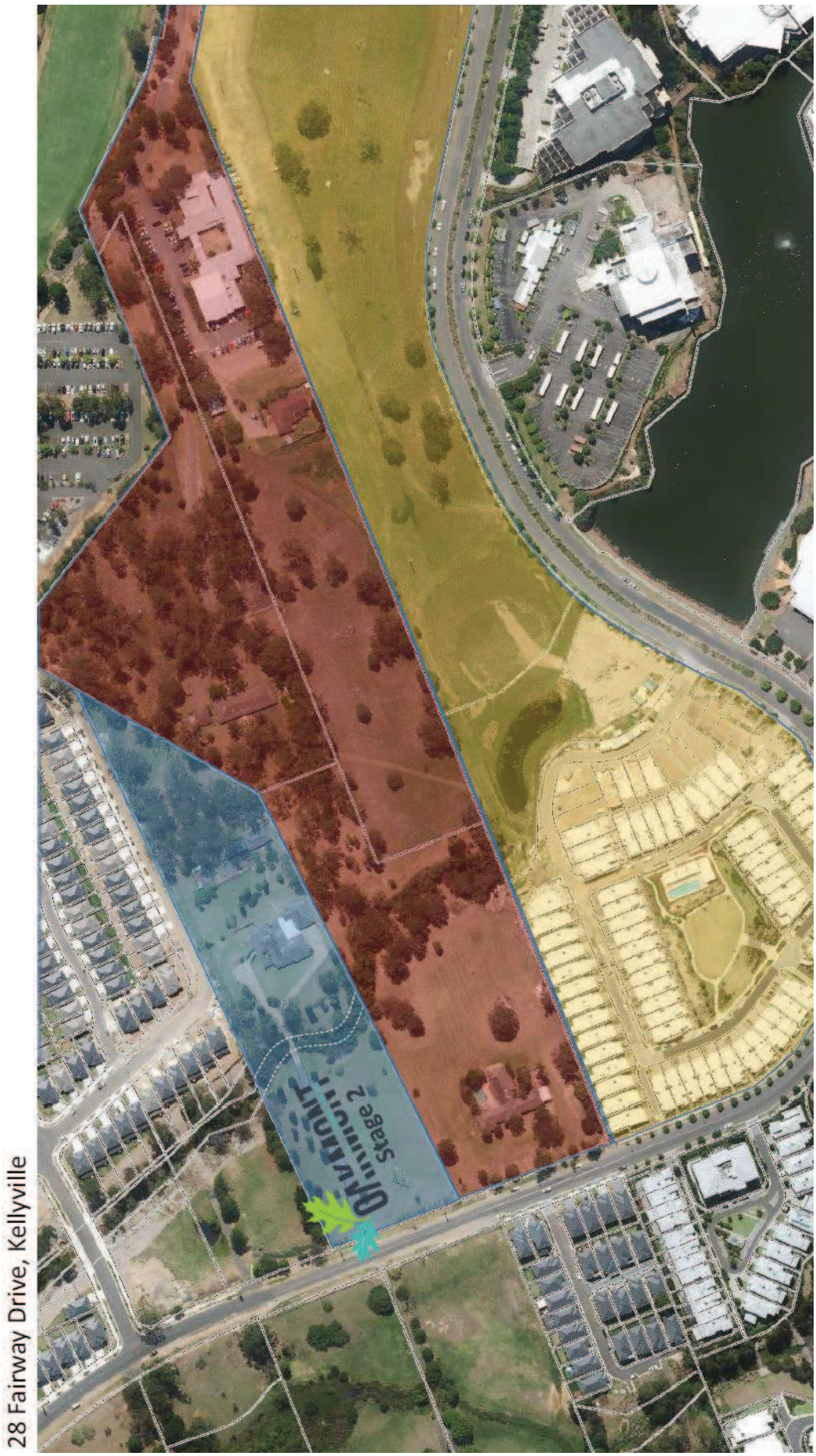
The subject site lies within the "Norwest" precinct as defined in the *North West Rail Link Corridor Strategy (September 2013)* document. The Strategy document indicates that the North West Rail Link will provide opportunities to increase residential densities within walking distance of Norwest Railway Station, including the subject site which will be approximately 8-10 minutes walking distance.

A Structure Plan for the Norwest Study Area is also reproduced in the following pages.

Figure 13. Structure Plan for the Norwest Study Area


PROPOSED SUBDIVISION
Client ARDEN CH (NSW) PTY LIMITED
Drawing title
PLAN OF PROPOSED SUBDIVISION OVER LOT 31 DP 247442, BEING No.28 FAIRWAY DRIVE, KELLYVILLE
datum AHD
site Area AS SHOWN
LGA THE HILLS
project number
scale 1:1000 @A3
reference number 42163SUB
date of PLAN 02/07/2015
SHEET 1 OF 1 SHEETS
(R1) PROPOSED ROAD WIDENING 1067m²
(R2) PROPOSED ROAD WIDENING 818m²
TOTAL ROAD WIDENING 1885m²
HORATIO AVENUE
FAIRWAY DRIVE
PT 1 (1,769m²)
R1 (1,067m²)
R2 (818m²)
PT 1 (8,293m²)
TOTAL 10,062m²
2 7,065m²
3 1,221m²
D P 247442
D P 1172787
D P 1172699
ALL DIMENSIONS, AREAS AND LOT NUMBERS ARE SUBJECT TO SURVEY
THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:
Registered Surveyor NSW
LTS LOCKLEY
Registered Surveyors NSW
www.lts.com.au
Suite 1, Level 1
810 Pacific Highway
Gordon NSW 2072
Locked Bag 5
Gordon NSW 2072
P 1300 587 000
F 02 9499 7760
SCALE 1: 1000 @ A3
Revision Date Description Reference


Castle Hill Championship Golf Club
Castle Hill TradingZone
Norwest Business Portal
Norwest Private Hospital
Norwest Specialist Hospital
Lakeside Restaurants
Norwest Marketown
North-West Rail Link Norwest Station (under construction)
Hillsong Church
Norwest Business Park
Fairway Drive
Horatio Avenue


28 Fairway Drive, Kellyville
Stage 2

Stage 2 Concept Design

3. TRAFFIC ASSESSMENT

Road Hierarchy

The road hierarchy allocated to the surrounding road network by the Roads and Maritime Services is illustrated on Figure 3.

Windsor Road is classified by the RMS as a *State Road* and provides the key north-south road link in the area, linking North Parramatta to Kellyville Ridge. It typically carries two traffic lanes in each direction in the vicinity of the site, with additional lanes provided at key intersections to accommodate turning movements.

Norwest Boulevard is also classified by the RMS as a *State Road* and provides the key east-west road link in the area, linking Windsor Road to Old Windsor Road and the M7 Motorway. It typically carries two traffic lanes in each direction in the vicinity of the site, with opposing traffic flows separated by a centre median island.

Fairway Drive and Solent Circuit are local, unclassified roads which perform the function of *collector routes* through the area, linking Windsor Road to Norwest Boulevard.

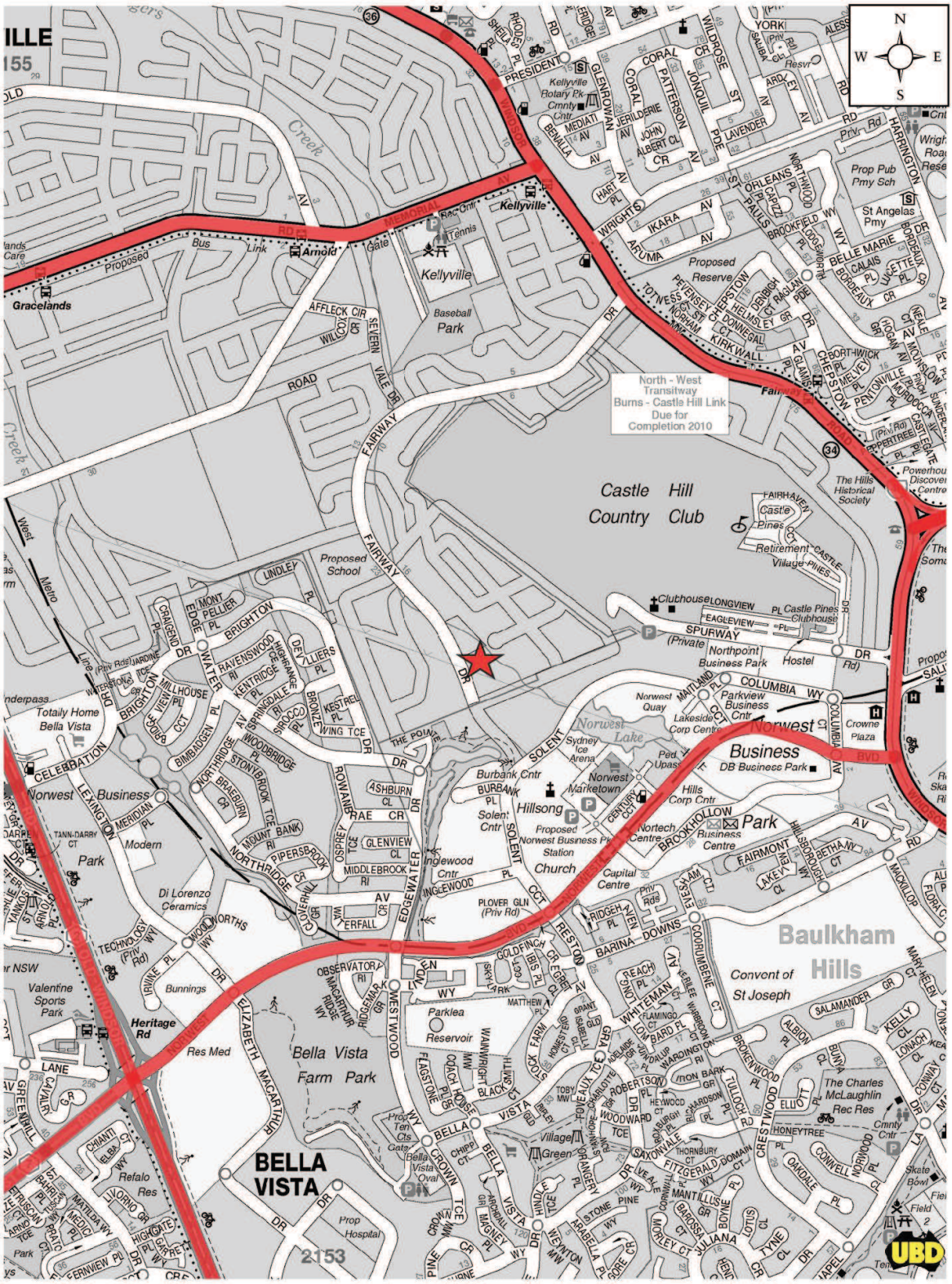
Proposed Road Network Improvements

Council is proposing to implement a number of substantial road network improvements to increase the capacity of Norwest Boulevard. These improvements are planned to be implemented over the next 5 years and will include:

- widening of Norwest Boulevard to 3 lanes in each direction, including a dedicated Bus Lane

- replacing all of the existing roundabouts on Norwest Boulevard with traffic signal controlled intersections

- provision of a new right-turn movement into Norwest Boulevard from Solent Circuit (west) in conjunction with the installation of traffic signals at that intersection.



VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants

ROAD HIERARCHY
FIGURE 3


N
W
E
S
ROSETTA
WALKER
AVE
HORATIO
ST
CRES
LAURA
AVE
FAIRWAY
KIMBER
CRES
50
DR
CENTRAL PARK
AVE
LAKESIDE
CENTRAL PARK
CRES
PENINSULA
WAY
CENTRAL PARK
AVE
50
CT
SOLENT
BURBANK
PL
Key:
Roundabout
50
Speed Limit
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
EXISTING TRAFFIC CONTROLS
FIGURE 4

The proposed road network improvements are intended to alleviate existing peak hour congestion on Norwest Boulevard as well as to cater for the future growth anticipated in the Norwest area. In addition, it is pertinent to note that the proposed improvements did not take into account the reduced traffic demands resulting from employees using the North West Rail Link. Completion of the North West Rail Link is expected to result in further improvements in traffic conditions in the area.

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 70 km/h SPEED LIMIT which applies to Norwest Boulevard
- a 50 km/h SPEED LIMIT which applies to Solent Circuit, Fairway Drive and all other local roads in the area
- TRAFFIC SIGNALS in Norwest Boulevard where it intersects with Windsor Road and also Old Windsor Road
- a ROUNDABOUT in Solent Circuit where it intersects with Fairway Drive
- NO RIGHT-TURN restrictions in Fairway Drive turning onto Windsor Road during the morning and afternoon commuter peak periods.

Existing Traffic Conditions

An indication of the existing traffic conditions on the adjacent road network is provided by detailed peak period traffic surveys conducted as part of a recent traffic study undertaken for the adjacent site located at 47 Spurway Drive. The traffic surveys were conducted at the intersection of Solent Circuit, Fairway Drive and Hillsong site access during the morning and afternoon commuter peak periods and reveal that:

- two-way traffic flows in Fairway Drive are typically in the order of 500 vph during the *morning* commuter peak period, reducing to 250 vph during the *afternoon* commuter peak period

- two-way traffic flows in Solent Circuit are typically in the order of 400-600 vph during 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 *Technical Direction TDT 2013/04a (August 2013)* which notes that the Technical Direction *must* be followed when the RMS is undertaking trip generation assessments.

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

High Density Residential Flat Buildings

AM: 0.19 peak hour vehicle trips per dwelling

PM: 0.15 peak hour vehicle trips per dwelling

Application of the above traffic generation rate to the *nett increase* of approximately 170 residential apartments as outlined in the Planning Proposal, yields an additional traffic generation potential of approximately 33 and 26 vph during the morning and afternoon commuter peak periods, respectively.

Furthermore, it is likely that the traffic generation potential of the proposed development will be slightly less than is suggested in the table above as the traffic generation rates nominated in the RMS's *Technical Direction,* because:

- the site is located in close proximity to Norwest Market Town which comprises an extensive range of shops and services that can be accessed from the site by walking

- a new underground railway station is proposed underneath the Norwest Boulevard and Brookhollow Avenue intersection, approximately 8 to 10 minutes walking distance from the site. The new railway station could be expected to reduce the need for private car ownership and usage, particularly during commuter peak periods.

Nevertheless, in order to provide a more rigorous assessment of the traffic implications of the Planning Proposal, it has been assumed that *all* of the projected future traffic flows of 33 AM & 26 PM peak hour vehicle trips will be new or *additional* to the existing traffic flows currently using the adjacent road network.

Those projected future traffic flows have been assigned to the surrounding road network as illustrated on Figure 5.

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.

As mentioned in the foregoing, a detailed traffic analysis was undertaken as part of a traffic study undertaken for the adjacent site located at 47 Spurway Drive. The projected additional traffic generation associated with that development, in addition to the existing traffic volumes, has been adopted as a "base case" for the Planning Proposal assessment.

The results of the SIDRA capacity analysis "movement summaries" of the Solent Circuit and Fairway Drive intersection are reproduced in full in Appendix B and summarised on Table 3.1 below, revealing that:

- the Solent Circuit and Fairway Drive intersection is expected to operate at *Level of Service "A"* under the existing, previously approved *and* 47 Spurway Drive traffic demands, with total average vehicle delays in the order of 5-6 seconds/vehicle

TOTAL	
AM	**PM**
7 IN	21 IN
26 OUT	5 OUT
33	**26**

PROJECTED TRAFFIC ASSIGNMENT
FIGURE 5

- under the projected future traffic demands expected to be generated by the Planning Proposal, the Solent Circuit and Fairway Drive intersection will continue to operate at *Level of Service "A",* with ***zero*** increase in average vehicle delays.

In summary therefore, it is clear that the additional traffic flows expected to be generated by the development proposal will not have any unacceptable traffic implications in terms of road network capacity, and will therefore not require any improvements or remedial treatments to increase the capacity of the nearby intersections.

TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF SOLENT CIRCUIT & FAIRWAY DRIVE

Key Indicators	Existing Traffic Demand + Previously Approval + 47 Spurway Drive		Projected Planning Proposal Traffic Demand	
	AM	PM	AM	PM
Level of Service	A	A	A	A
Degree of Saturation	0.590	0.401	0.605	0.408
Average Vehicle Delay (secs/veh)	6.0	5.0	6.0	5.0
	SOL_FAIP		SOL_FAIQ	

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 Parking Restrictions

Given the semi-rural nature of Fairway Drive and the surrounding area, there are generally no kerbside parking restrictions which apply to the road network in the vicinity of the site.

Off-Street Parking Provisions

Whilst the precise details of the basement car parking layout is not yet known, it is envisaged that the proposed parking provision will be in accordance with the requirements specified in *State Environmental Planning Policy No 65 – Design Quality of Residential Flat Development (Amendment No 3), 2015*.

The geometric design layout of the proposed vehicular access and car parking arrangements will ultimately be designed to comply with the relevant aspects specified in the Standards Australia publication *Parking Facilities Part 1: Off-Street Car Parking AS2890.1 - 2004* in respect of parking bay dimensions, aisle widths and ramp grades.

Loading/Servicing Provisions

The proposed development is expected to be serviced by a variety of commercial vehicles up to and including medium and large rigid garbage and removalist trucks.

It is therefore concluded that the Planning Proposal will not have any unacceptable parking or loading implications.

APPENDIX A

TRAFFIC SURVEY DATA

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob. 0418 239019

Client	: Varga Traffic Planning
Job No/Name	: 4422 BAULKHAM HILLS Spurway Dr
Day/Date	: Monday 3rd December 2012

Lights

	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	7	3	23	4	12	1	0	1	0	0	9	2	**62**
0715 - 0730	6	3	44	6	10	0	0	0	1	0	9	2	**81**
0730 - 0745	7	7	54	4	9	0	1	0	0	1	11	0	**94**
0745 - 0800	18	7	103	2	16	3	2	0	0	1	15	1	**168**
0800 - 0815	9	6	72	6	13	2	0	0	0	2	18	1	**129**
0815 - 0830	21	9	96	6	20	4	0	0	0	3	30	1	**190**
0830 - 0845	17	14	97	1	20	2	1	0	0	1	27	2	**182**
0845 - 0900	16	10	91	5	28	0	0	1	0	0	17	2	**170**
Period End	**101**	**59**	**580**	**34**	**128**	**12**	**4**	**2**	**1**	**8**	**136**	**11**	**1076**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	0	0	0	1	0	0	0	0	0	0	0	0	**1**
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	1	0	0	2	0	0	0	0	0	0	0	0	**3**
0800 - 0815	0	0	1	0	0	0	0	0	0	0	0	0	**1**
0815 - 0830	0	0	1	1	0	0	0	0	0	0	0	0	**2**
0830 - 0845	0	0	0	0	0	0	0	0	0	0	0	0	**0**
0845 - 0900	0	0	1	1	0	0	0	0	0	0	0	0	**2**
Period End	**1**	**0**	**3**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**

Lights

	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	38	20	224	16	47	4	3	1	1	2	44	5	**405**
0715 - 0815	40	23	273	18	48	5	3	0	1	4	53	4	**472**
0730 - 0830	55	29	325	18	58	9	3	0	0	7	74	3	**581**
0745 - 0845	65	36	368	15	69	11	3	0	0	7	90	5	**669**
0800 - 0900	63	39	356	18	81	8	1	1	0	6	92	6	**671**
PEAK HOUR	**63**	**39**	**356**	**18**	**81**	**8**	**1**	**1**	**0**	**6**	**92**	**6**	**671**

Heavies

	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	1	0	0	3	0	0	0	0	0	0	0	0	**4**
0715 - 0815	1	0	1	2	0	0	0	0	0	0	0	0	**4**
0730 - 0830	1	0	2	3	0	0	0	0	0	0	0	0	**6**
0745 - 0845	1	0	2	3	0	0	0	0	0	0	0	0	**6**
0800 - 0900	0	0	3	2	0	0	0	0	0	0	0	0	**5**
PEAK HOUR	**0**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**

Combined

	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	7	3	23	5	12	1	0	1	0	0	9	2	**63**
0715 - 0730	6	3	44	6	10	0	0	0	1	0	9	2	**81**
0730 - 0745	7	7	54	4	9	0	1	0	0	1	11	0	**94**
0745 - 0800	19	7	103	4	16	3	2	0	0	1	15	1	**171**
0800 - 0815	9	6	73	6	13	2	0	0	0	2	18	1	**130**
0815 - 0830	21	9	97	7	20	4	0	0	0	3	30	1	**192**
0830 - 0845	17	14	97	1	20	2	1	0	0	1	27	2	**182**
0845 - 0900	16	10	92	6	28	0	0	1	0	0	17	2	**172**
Period End	**102**	**59**	**583**	**39**	**128**	**12**	**4**	**2**	**1**	**8**	**136**	**11**	**1085**

Peds

	NORTH	WEST	SOUTH	EAST	
	Fairway Dr	*Solent Cct*	*Hillsong Access*	*Solent Cct*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0700 - 0715	0	0	0	0	**0**
0715 - 0730	0	0	1	0	**1**
0730 - 0745	0	0	0	0	**0**
0745 - 0800	0	1	0	0	**1**
0800 - 0815	0	0	1	0	**1**
0815 - 0830	0	0	0	0	**0**
0830 - 0845	0	0	0	0	**0**
0845 - 0900	0	0	0	0	**0**
Period End	**0**	**1**	**2**	**0**	**3**

Combined

	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	39	20	224	19	47	4	3	1	1	2	44	5	**409**
0715 - 0815	41	23	274	20	48	5	3	0	1	4	53	4	**476**
0730 - 0830	56	29	327	21	58	9	3	0	0	7	74	3	**587**
0745 - 0845	66	36	370	18	69	11	3	0	0	7	90	5	**675**
0800 - 0900	63	39	359	20	81	8	1	1	0	6	92	6	**676**
PEAK HOUR	**63**	**39**	**359**	**20**	**81**	**8**	**1**	**1**	**0**	**6**	**92**	**6**	**676**

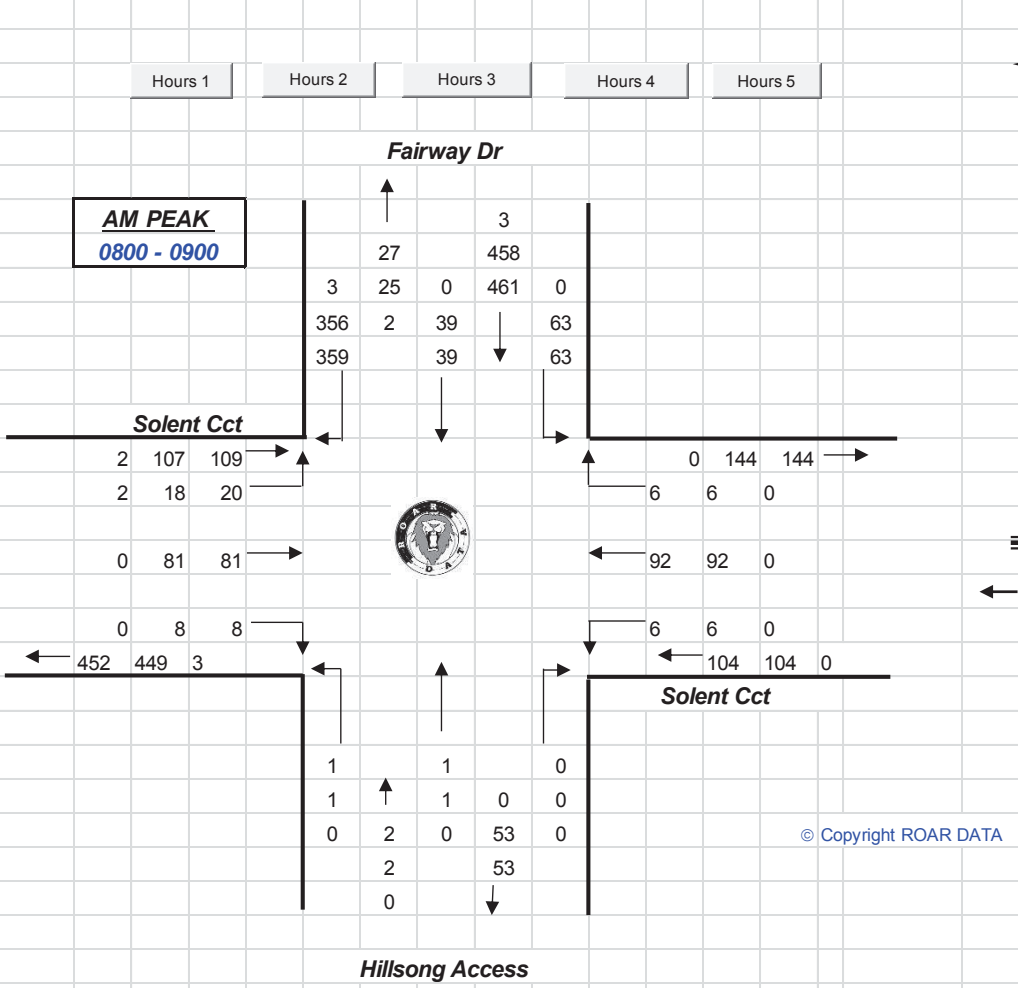
Peds

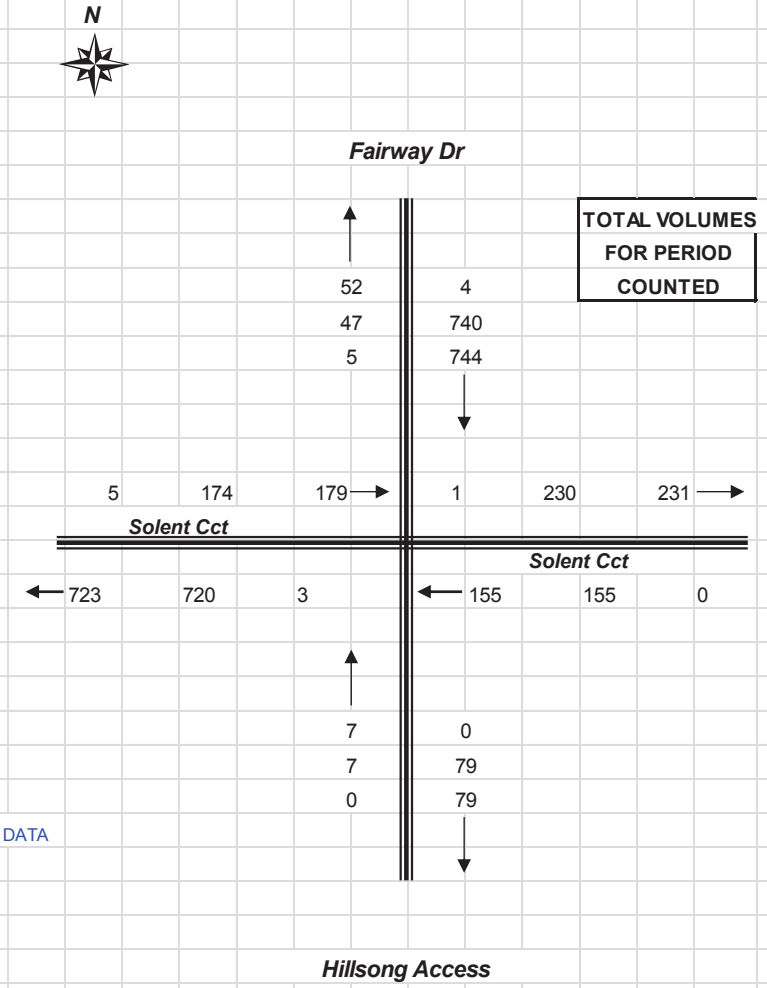
	NORTH	WEST	SOUTH	EAST	
	Fairway Dr	*Solent Cct*	*Hillsong Access*	*Solent Cct*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0700 - 0800	0	1	1	0	**2**
0715 - 0815	0	1	2	0	**3**
0730 - 0830	0	1	1	0	**2**
0745 - 0845	0	1	1	0	**2**
0800 - 0900	0	0	1	0	**1**
PEAK HR	**0**	**0**	**1**	**0**	**1**

R.O.A.R DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob. 0418 239019

Client : Varga Traffic Planning
Job No/Name : 4422 BAULKHAM HILLS Spurway Dr
Day/Date : Monday 3rd December 2012

Hours 1 | Hours 2 | Hours 3 | Hours 4 | Hours 5





R.O.A.R. DATA

Reliable, Original & Authentic Results

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Client : Varga Traffic Planning
Job No/Name : 4422 BAULKHAM HILLS Spurway Dr
Day/Date : Monday 3rd December 2012

Lights	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1630 - 1645	7	2	21	51	35	4	2	2	0	3	45	14	**186**
1645 - 1700	3	1	11	29	33	0	3	3	0	0	27	4	**114**
1700 - 1715	3	2	12	60	53	9	2	8	2	7	50	13	**221**
1715 - 1730	2	5	11	42	42	13	4	2	1	6	48	9	**185**
1730 - 1745	6	4	8	34	33	3	1	4	2	4	39	7	**145**
1745 - 1800	1	7	9	28	33	5	4	2	2	2	31	10	**134**
1800 - 1815	2	6	13	27	36	3	1	5	1	5	22	7	**128**
1815 - 1830	2	9	8	29	24	1	1	4	0	5	44	4	**131**
Period End	**26**	**36**	**93**	**300**	**289**	**38**	**18**	**30**	**8**	**32**	**306**	**68**	**1244**

Heavies	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
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**

Lights	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1630 - 1730	15	10	55	182	163	26	11	15	3	16	170	40	**706**
1645 - 1745	14	12	42	165	161	25	10	17	5	17	164	33	**665**
1700 - 1800	12	18	40	164	161	30	11	16	7	19	168	39	**685**
1715 - 1815	11	22	41	131	144	24	10	13	6	17	140	33	**592**
1730 - 1830	11	26	38	118	126	12	7	15	5	16	136	28	**538**
PEAK HOUR	**15**	**10**	**55**	**182**	**163**	**26**	**11**	**15**	**3**	**16**	**170**	**40**	**706**

Heavies	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
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	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1630 - 1645	7	2	21	51	35	4	2	2	0	3	45	14	**186**
1645 - 1700	3	1	11	29	33	0	3	3	0	0	27	4	**114**
1700 - 1715	3	2	12	60	53	9	2	8	2	7	50	13	**221**
1715 - 1730	2	5	11	42	42	13	4	2	1	6	48	9	**185**
1730 - 1745	6	4	8	34	33	3	1	4	2	4	39	7	**145**
1745 - 1800	1	7	9	28	33	5	4	2	2	2	31	10	**134**
1800 - 1815	2	6	13	27	36	3	1	5	1	5	22	7	**128**
1815 - 1830	2	9	8	29	24	1	1	4	0	5	44	4	**131**
Period End	**26**	**36**	**93**	**300**	**289**	**38**	**18**	**30**	**8**	**32**	**306**	**68**	**1244**

Peds	NORTH	WEST	SOUTH	EAST	
	Fairway Dr	*Solent Cct*	*Hillsong Access*	*Solent Cct*	
Time Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1630 - 1645	0	2	2	0	**4**
1645 - 1700	0	1	0	0	**1**
1700 - 1715	0	0	1	0	**1**
1715 - 1730	0	1	2	0	**3**
1730 - 1745	0	1	5	0	**6**
1745 - 1800	0	0	1	0	**1**
1800 - 1815	0	0	5	0	**5**
1815 - 1830	0	0	3	0	**3**
Period End	**0**	**5**	**19**	**0**	**24**

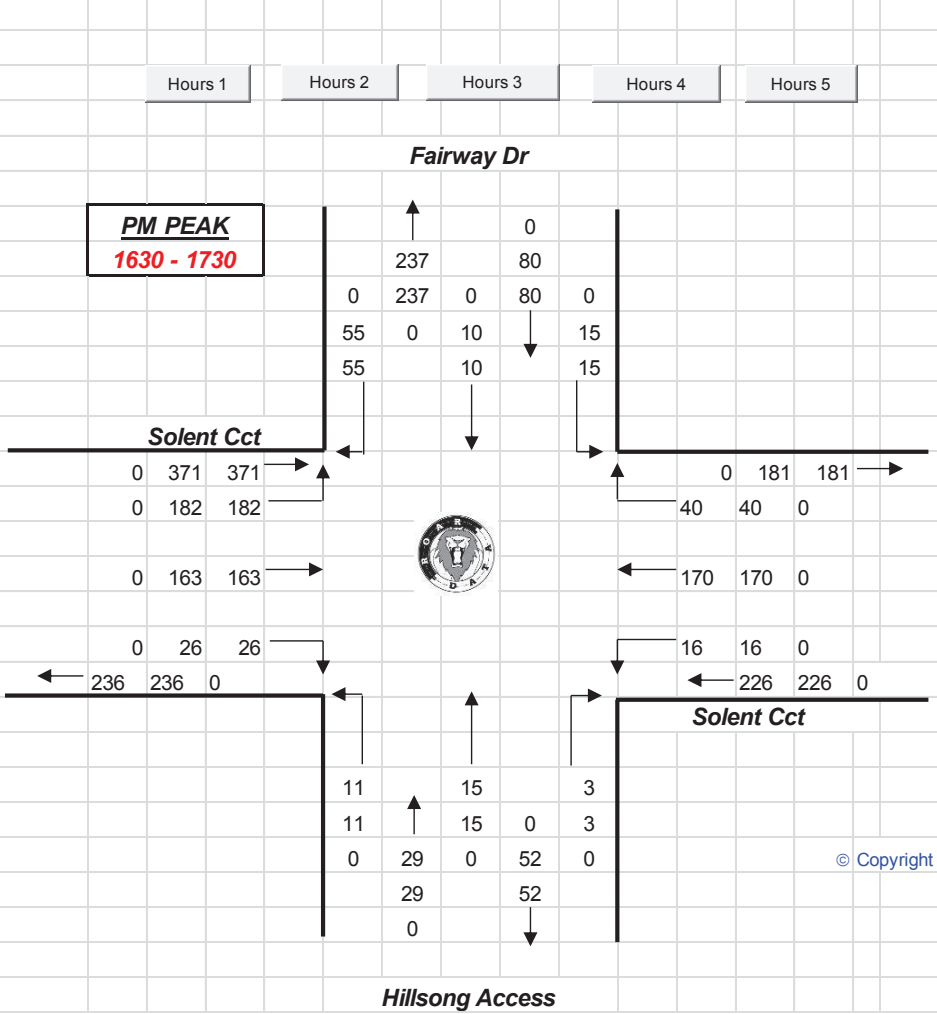
Combined	NORTH			WEST			SOUTH			EAST			
	Fairway Dr			*Solent Cct*			*Hillsong Access*			*Solent Cct*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1630 - 1730	15	10	55	182	163	26	11	15	3	16	170	40	**706**
1645 - 1745	14	12	42	165	161	25	10	17	5	17	164	33	**665**
1700 - 1800	12	18	40	164	161	30	11	16	7	19	168	39	**685**
1715 - 1815	11	22	41	131	144	24	10	13	6	17	140	33	**592**
1730 - 1830	11	26	38	118	126	12	7	15	5	16	136	28	**538**
PEAK HOUR	**15**	**10**	**55**	**182**	**163**	**26**	**11**	**15**	**3**	**16**	**170**	**40**	**706**

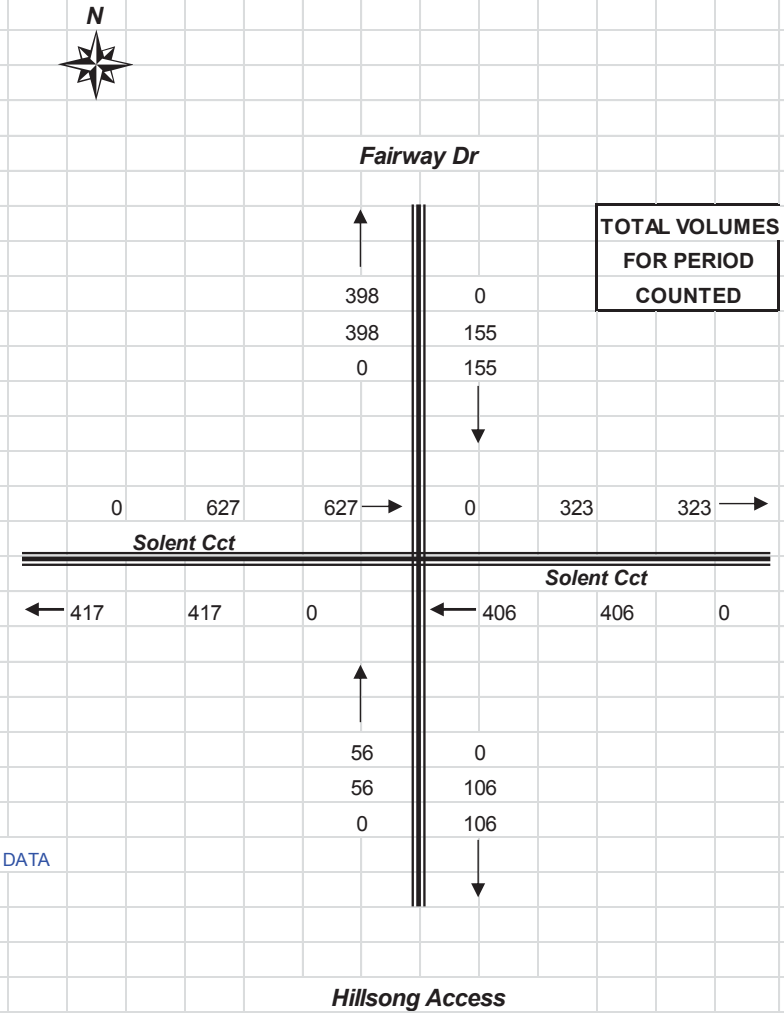
Peds	NORTH	WEST	SOUTH	EAST	
	Fairway Dr	*Solent Cct*	*Hillsong Access*	*Solent Cct*	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
1630 - 1730	0	4	5	0	**9**
1645 - 1745	0	3	8	0	**11**
1700 - 1800	0	2	9	0	**11**
1715 - 1815	0	2	13	0	**15**
1730 - 1830	0	1	14	0	**15**
PEAK HR	**0**	**4**	**5**	**0**	**9**

R.O.A.R DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob. 0418 239019

Client : Varga Traffic Planning
Job No/Name : 4422 BAULKHAM HILLS Spurway Dr
Day/Date : Monday 3rd December 2012

Hours 1 | Hours 2 | Hours 3 | Hours 4 | Hours 5



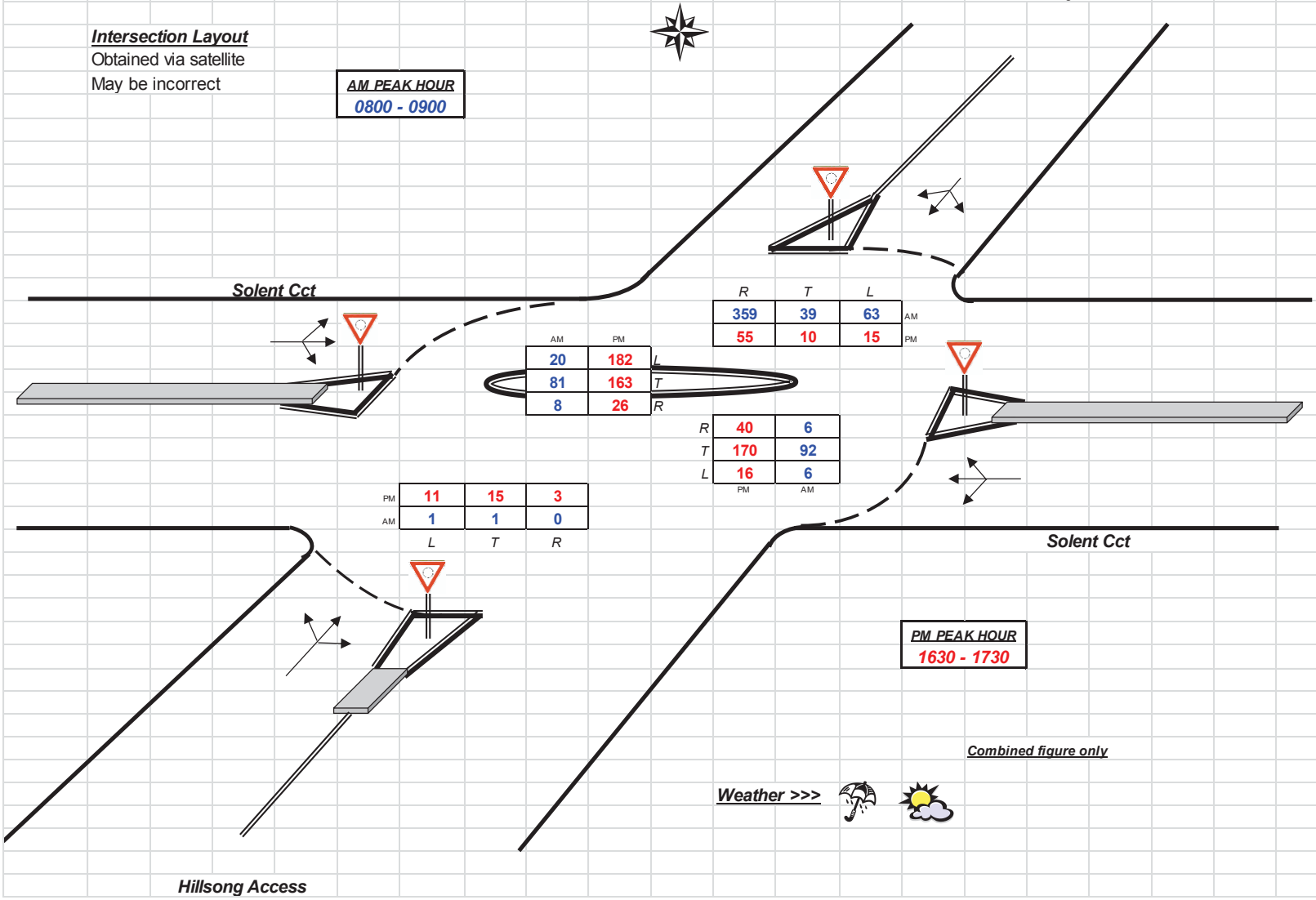


R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client	: Varga Traffic Planning
Job No/Name	: 4422 BAULKHAM HILLS Spurway Dr
Day/Date	: Monday 3rd December 2012

Intersection Layout
Obtained via satellite
May be incorrect

AM PEAK HOUR
0800 - 0900



PM PEAK HOUR
1630 - 1730

Combined figure only

Weather >>>

R.O.A.R. DATA

Reliable, Original & Authentic Results

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Client : Varga Traffic Planning

Job No/Name : 4422 BAULKHAM HILLS Spurway Dr

Day/Date : Monday 3rd December 2012

Lights

	NORTH		WEST		SOUTH		
	Windsor Rd		*Spurway Dr*		*Windsor Rd*		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	537		4		11	159	**711**
0715 - 0730	493		3		5	132	**633**
0730 - 0745	538		7		9	137	**691**
0745 - 0800	567		6		6	189	**768**
0800 - 0815	576		5		6	154	**741**
0815 - 0830	554		5		8	202	**769**
0830 - 0845	539		8		6	148	**701**
0845 - 0900	491		7		7	167	**672**
Per End	**4295**	**0**	**45**	**0**	**58**	**1288**	**5686**

Heavies

	NORTH		WEST		SOUTH		
	Windsor Rd		*Spurway Dr*		*Windsor Rd*		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	8		0		0	5	**13**
0715 - 0730	6		0		0	5	**11**
0730 - 0745	6		0		0	7	**13**
0745 - 0800	5		0		0	6	**11**
0800 - 0815	9		0		0	3	**12**
0815 - 0830	1		0		0	9	**10**
0830 - 0845	3		0		0	2	**5**
0845 - 0900	3		0		0	10	**13**
Per End	**41**	**0**	**0**	**0**	**0**	**47**	**88**

Combined

	NORTH		WEST		SOUTH		
	Windsor Rd		*Spurway Dr*		*Windsor Rd*		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	545	0	4	0	11	164	**724**
0715 - 0730	499	0	3	0	5	137	**644**
0730 - 0745	544	0	7	0	9	144	**704**
0745 - 0800	572	0	6	0	6	195	**779**
0800 - 0815	585	0	5	0	6	157	**753**
0815 - 0830	555	0	5	0	8	211	**779**
0830 - 0845	542	0	8	0	6	150	**706**
0845 - 0900	494	0	7	0	7	177	**685**
Per End	**4336**	**0**	**45**	**0**	**58**	**1335**	**5774**

Lights

	NORTH		WEST		SOUTH		
	Windsor Rd		*Spurway Dr*		*Windsor Rd*		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	2135	0	20	0	31	617	**2803**
0715 - 0815	2174	0	21	0	26	612	**2833**
0730 - 0830	2235	0	23	0	29	682	**2969**
0745 - 0845	2236	0	24	0	26	693	**2979**
0800 - 0900	2160	0	25	0	27	671	**2883**
PEAK HR	**2236**	**0**	**24**	**0**	**26**	**693**	**2979**

Heavies

	NORTH		WEST		SOUTH		
	Windsor Rd		*Spurway Dr*		*Windsor Rd*		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	25	0	0	0	0	23	**48**
0715 - 0815	26	0	0	0	0	21	**47**
0730 - 0830	21	0	0	0	0	25	**46**
0745 - 0845	18	0	0	0	0	20	**38**
0800 - 0900	16	0	0	0	0	24	**40**
PEAK HR	**18**	**0**	**0**	**0**	**0**	**20**	**38**

Combined

	NORTH		WEST		SOUTH		
	Windsor Rd		*Spurway Dr*		*Windsor Rd*		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	2160	0	20	0	31	640	**2851**
0715 - 0815	2200	0	21	0	26	633	**2880**
0730 - 0830	2256	0	23	0	29	707	**3015**
0745 - 0845	2254	0	24	0	26	713	**3017**
0800 - 0900	2176	0	25	0	27	695	**2923**
PEAK HR	**2254**	**0**	**24**	**0**	**26**	**713**	**3017**

Peds

	NORTH	WEST	SOUTH	
Time Per	Windsor Rd	Spurway Dr	Windsor Rd	TOT
0700 - 0715	0	0	0	**0**
0715 - 0730	0	0	0	**0**
0730 - 0745	0	2	0	**2**
0745 - 0800	0	0	0	**0**
0800 - 0815	0	0	0	**0**
0815 - 0830	0	0	0	**0**
0830 - 0845	0	0	0	**0**
0845 - 0900	0	0	0	**0**
Per End	**0**	**2**	**0**	**2**

	NORTH	WEST	SOUTH	
Peak Per	Windsor Rd	Spurway Dr	Windsor Rd	TOT
0700 - 0800	0	2	0	**2**
0715 - 0815	0	2	0	**2**
0730 - 0830	0	2	0	**2**
0745 - 0845	0	0	0	**0**
0800 - 0900	0	0	0	**0**
PEAK HR	**0**	**0**	**0**	**0**

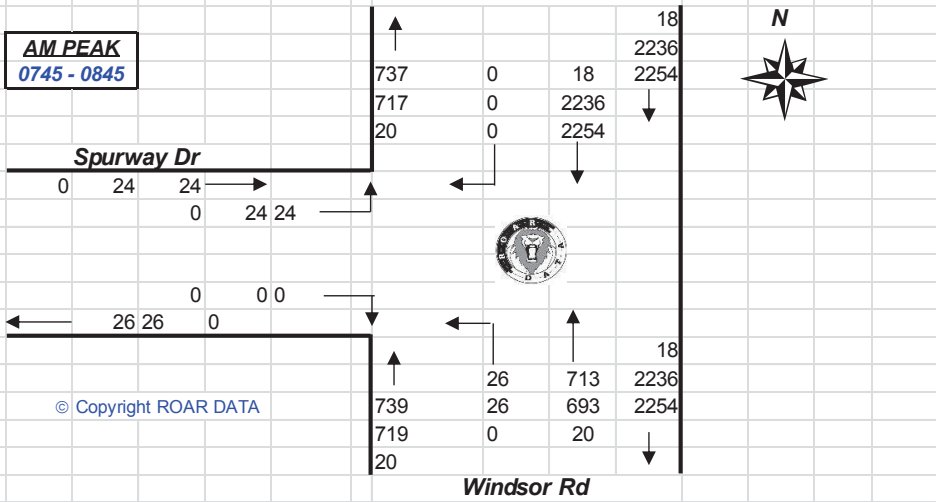
Hours 1

Hours 2

Hours 3

Hours 4

Hours 5



APPENDIX B

SIDRA TRAFFIC MODELLING RESULTS

MOVEMENT SUMMARY

Site: Existing + 47 Spurway Dr + Previous Approval AM

Solent Cct & Fairway Dr, Baulkham Hills
Roundabout

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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hillsong Access (S)											
1	L2	3	0.0	0.006	6.1	LOS A	0.0	0.2	0.63	0.55	45.5
2	T1	1	0.0	0.006	6.1	LOS A	0.0	0.2	0.63	0.55	46.5
3	R2	1	0.0	0.006	10.4	LOS A	0.0	0.2	0.63	0.55	46.6
Approach		5	0.0	0.006	7.0	LOS A	0.0	0.2	0.63	0.55	45.9
East: Solent Cct (E)											
4	L2	7	0.0	0.162	6.1	LOS A	0.9	6.6	0.64	0.68	45.2
5	T1	90	0.0	0.162	6.0	LOS A	0.9	6.6	0.64	0.68	46.1
6	R2	42	0.0	0.162	10.3	LOS A	0.9	6.6	0.64	0.68	46.2
Approach		139	0.0	0.162	7.3	LOS A	0.9	6.6	0.64	0.68	46.1
North: Fairway Dr (N)											
7	L2	310	0.3	0.590	3.6	LOS A	5.5	38.3	0.38	0.53	45.6
8	T1	36	0.0	0.590	3.6	LOS A	5.5	38.3	0.38	0.53	46.6
9	R2	505	0.4	0.590	7.9	LOS A	5.5	38.3	0.38	0.53	46.7
Approach		851	0.4	0.590	6.2	LOS A	5.5	38.3	0.38	0.53	46.3
West: Solent Cct (W)											
10	L2	64	4.7	0.105	3.2	LOS A	0.6	4.3	0.18	0.39	47.2
11	T1	69	0.0	0.105	3.1	LOS A	0.6	4.3	0.18	0.39	48.3
12	R2	11	0.0	0.105	7.4	LOS A	0.6	4.3	0.18	0.39	48.4
Approach		144	2.1	0.105	3.5	LOS A	0.6	4.3	0.18	0.39	47.8
All Vehicles		1139	0.5	0.590	6.0	LOS A	5.5	38.3	0.39	0.53	46.5

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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Existing + 47 Spurway Dr + Previous Approval PM

Solent Cct & Fairway Dr, Baulkham Hills
Roundabout

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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hillsong Access (S)											
1	L2	11	0.0	0.030	4.9	LOS A	0.2	1.1	0.51	0.52	46.2
2	T1	15	0.0	0.030	4.9	LOS A	0.2	1.1	0.51	0.52	47.2
3	R2	3	0.0	0.030	9.1	LOS A	0.2	1.1	0.51	0.52	47.3
Approach		29	0.0	0.030	5.3	LOS A	0.2	1.1	0.51	0.52	46.8
East: Solent Cct (E)											
4	L2	16	0.0	0.261	3.7	LOS A	1.6	11.1	0.35	0.52	45.9
5	T1	170	0.0	0.261	3.7	LOS A	1.6	11.1	0.35	0.52	46.9
6	R2	145	0.0	0.261	8.0	LOS A	1.6	11.1	0.35	0.52	47.0
Approach		331	0.0	0.261	5.5	LOS A	1.6	11.1	0.35	0.52	46.9
North: Fairway Dr (N)											
7	L2	97	0.0	0.179	4.0	LOS A	1.0	7.2	0.40	0.56	45.8
8	T1	10	0.0	0.179	3.9	LOS A	1.0	7.2	0.40	0.56	46.8
9	R2	99	0.0	0.179	8.2	LOS A	1.0	7.2	0.40	0.56	46.9
Approach		206	0.0	0.179	6.0	LOS A	1.0	7.2	0.40	0.56	46.4
West: Solent Cct (W)											
10	L2	313	0.0	0.401	4.0	LOS A	2.8	19.6	0.44	0.50	46.6
11	T1	163	0.0	0.401	4.0	LOS A	2.8	19.6	0.44	0.50	47.6
12	R2	26	0.0	0.401	8.3	LOS A	2.8	19.6	0.44	0.50	47.7
Approach		502	0.0	0.401	4.2	LOS A	2.8	19.6	0.44	0.50	47.0
All Vehicles		1068	0.0	0.401	5.0	LOS A	2.8	19.6	0.41	0.52	46.9

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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Existing + 47 Spurway Dr + Previous Approval + Planning Proposal AM

Solent Cct & Fairway Dr, Baulkham Hills
Roundabout

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: Hillsong Access (S)											
1	L2	3	0.0	0.006	6.2	LOS A	0.0	0.2	0.64	0.55	45.5
2	T1	1	0.0	0.006	6.2	LOS A	0.0	0.2	0.64	0.55	46.4
3	R2	1	0.0	0.006	10.5	LOS A	0.0	0.2	0.64	0.55	46.6
Approach		5	0.0	0.006	7.1	LOS A	0.0	0.2	0.64	0.55	45.9
East: Solent Cct (E)											
4	L2	7	0.0	0.166	6.1	LOS A	1.0	6.8	0.65	0.69	45.1
5	T1	90	0.0	0.166	6.1	LOS A	1.0	6.8	0.65	0.69	46.1
6	R2	44	0.0	0.166	10.4	LOS A	1.0	6.8	0.65	0.69	46.2
Approach		141	0.0	0.166	7.5	LOS A	1.0	6.8	0.65	0.69	46.1
North: Fairway Dr (N)											
7	L2	324	0.3	0.605	3.6	LOS A	5.7	40.3	0.39	0.53	45.6
8	T1	36	0.0	0.605	3.6	LOS A	5.7	40.3	0.39	0.53	46.6
9	R2	513	0.4	0.605	7.9	LOS A	5.7	40.3	0.39	0.53	46.7
Approach		873	0.3	0.605	6.1	LOS A	5.7	40.3	0.39	0.53	46.3
West: Solent Cct (W)											
10	L2	66	4.5	0.107	3.2	LOS A	0.6	4.4	0.19	0.39	47.2
11	T1	69	0.0	0.107	3.1	LOS A	0.6	4.4	0.19	0.39	48.3
12	R2	11	0.0	0.107	7.4	LOS A	0.6	4.4	0.19	0.39	48.4
Approach		146	2.1	0.107	3.5	LOS A	0.6	4.4	0.19	0.39	47.8
All Vehicles		1165	0.5	0.605	6.0	LOS A	5.7	40.3	0.40	0.53	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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Existing + 47 Spurway Dr + Previous Approval + Planning Proposal PM

Solent Cct & Fairway Dr, Baulkham Hills
Roundabout

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: Hillsong Access (S)											
1	L2	11	0.0	0.030	4.9	LOS A	0.2	1.1	0.51	0.53	46.2
2	T1	15	0.0	0.030	4.9	LOS A	0.2	1.1	0.51	0.53	47.2
3	R2	3	0.0	0.030	9.2	LOS A	0.2	1.1	0.51	0.53	47.3
Approach		29	0.0	0.030	5.3	LOS A	0.2	1.1	0.51	0.53	46.8
East: Solent Cct (E)											
4	L2	16	0.0	0.266	3.7	LOS A	1.6	11.4	0.36	0.52	45.9
5	T1	170	0.0	0.266	3.7	LOS A	1.6	11.4	0.36	0.52	46.9
6	R2	150	0.0	0.266	8.0	LOS A	1.6	11.4	0.36	0.52	47.0
Approach		336	0.0	0.266	5.6	LOS A	1.6	11.4	0.36	0.52	46.9
North: Fairway Dr (N)											
7	L2	100	0.0	0.183	4.0	LOS A	1.1	7.4	0.40	0.57	45.8
8	T1	10	0.0	0.183	3.9	LOS A	1.1	7.4	0.40	0.57	46.8
9	R2	101	0.0	0.183	8.2	LOS A	1.1	7.4	0.40	0.57	46.9
Approach		211	0.0	0.183	6.0	LOS A	1.1	7.4	0.40	0.57	46.4
West: Solent Cct (W)											
10	L2	319	0.0	0.408	4.0	LOS A	2.9	20.1	0.45	0.50	46.6
11	T1	163	0.0	0.408	4.0	LOS A	2.9	20.1	0.45	0.50	47.6
12	R2	26	0.0	0.408	8.3	LOS A	2.9	20.1	0.45	0.50	47.7
Approach		508	0.0	0.408	4.2	LOS A	2.9	20.1	0.45	0.50	47.0
All Vehicles		1084	0.0	0.408	5.0	LOS A	2.9	20.1	0.41	0.52	46.8

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.
Roundabout Capacity Model: SIDRA Standard.
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.