



**INDICATIVE SCHEME FOR A MIXED USE
DEVELOPMENT, 241-245 PENNANT HILLS
ROAD, CARLINGFORD**

**TRAFFIC IMPACT
ASSESSMENT**

21 December 2015

REF: 15.16.050

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1. INTRODUCTION

This report has been prepared to assess the traffic impact of the potential yield of an indicative scheme for a mixed use development at 241-245 Pennant Hills Road, Carlingford.

This assessment has been undertaken with reference to the Urban Design and Planning Study undertaken for the subject site prepared by Architectus Group Pty Ltd (dated 26th July 2015) for Triple Eight Pty Ltd.

The mixed use indicative development scheme that this report will assess is described as Scenario 3 with a Floor Space Ratio of 2.8:1 and 18 storeys with a potential yield of:

1. 135 residential units.
2. Child Care Centre with 90 places and approximately 580m² floor area.
3. Gymnasium with approximately 400m² floor area.
4. Commercial floor space of 679m².

Basement car parking is proposed with vehicle access directly from Pennant Hills Road (via a slip lane) for the commercial component and to/from Felton Road for both residential car parking and a truck loading area.

This report examines the traffic implications of the proposal and will assess the:

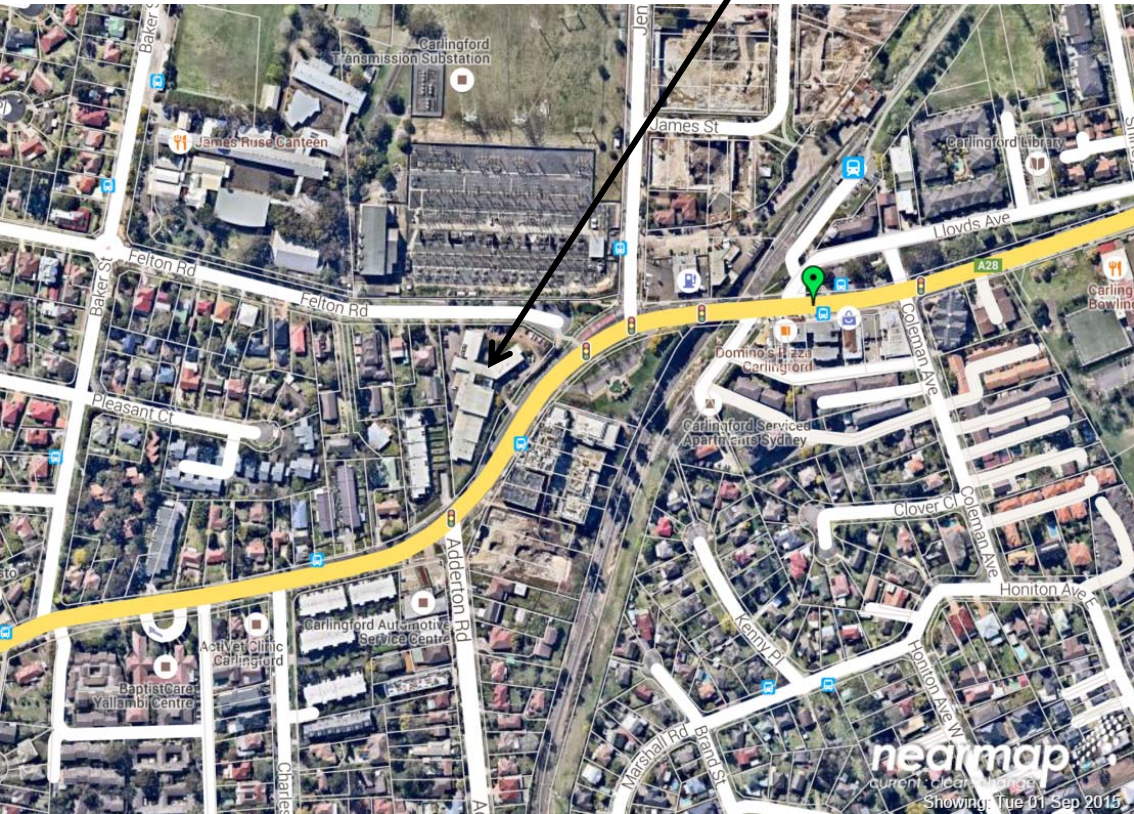
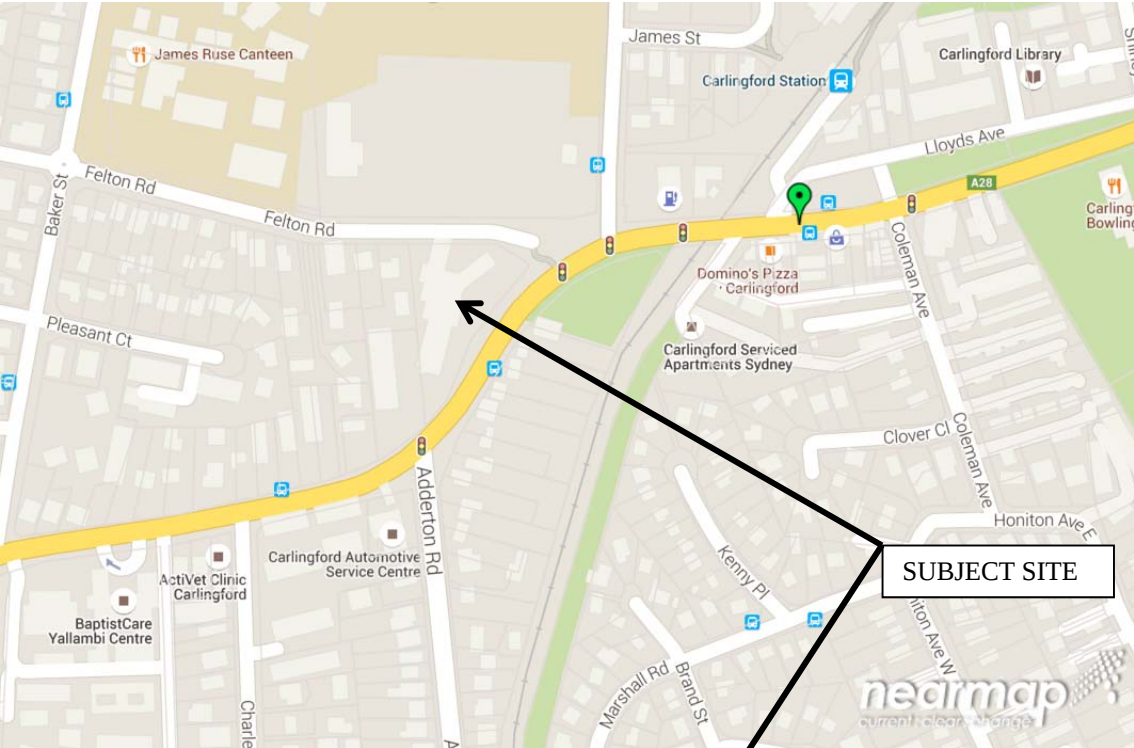
- Proposed vehicle access locations.
- Estimate the traffic generation of each component of the total indicative scheme.
- Assess the potential impacts of the estimated traffic generation on the existing road network.

2. **EXISTING DEVELOPMENT**

2.1 **SITE**

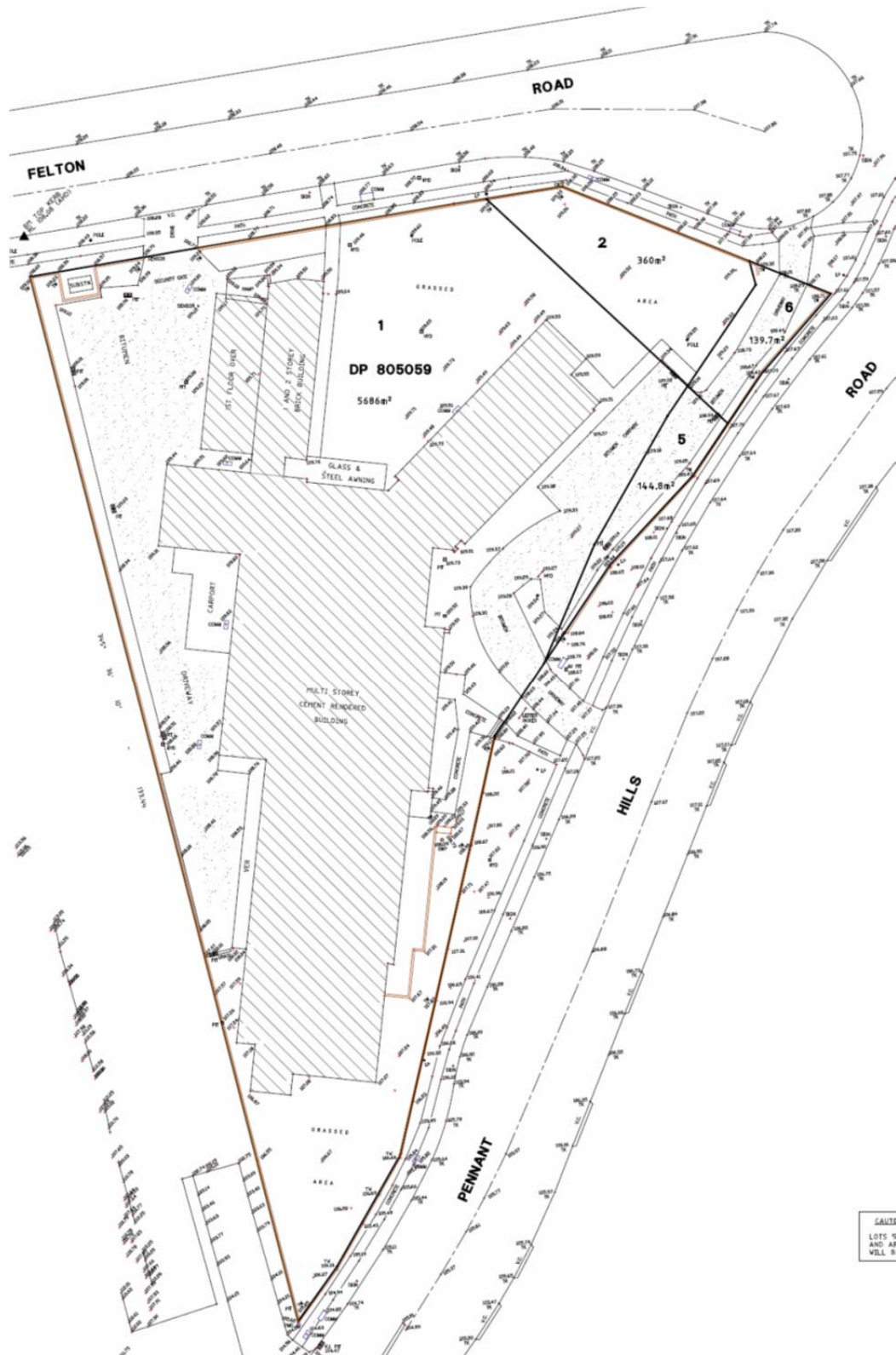
The subject site is depicted on Figure 1 and has a total area of approximately 6,330m² with an existing commercial floor area of approximately 2,940.00m². The site is described as Lots 1, 2, 5 and 6 in Deposited Plan 805059. It should be noted that Lots 5 and 6 are required for future widening of Pennant Hills Road. An extract from the site survey is provided in Figure 2.

Vehicle access to the existing commercial car parking spaces is currently available from both Pennant Hills Road (entry and exit via a single driveway) and Felton Street via two entry and exit driveways.



LOCATION

Fig 1



SITE

Fig 2

3. **EXISTING CONDITIONS**

Pennant Hills Road is classified a State Road under the care and control of the Roads and Maritime Services (RMS). Felton Road and Baker Street are classified Local Roads in this area.

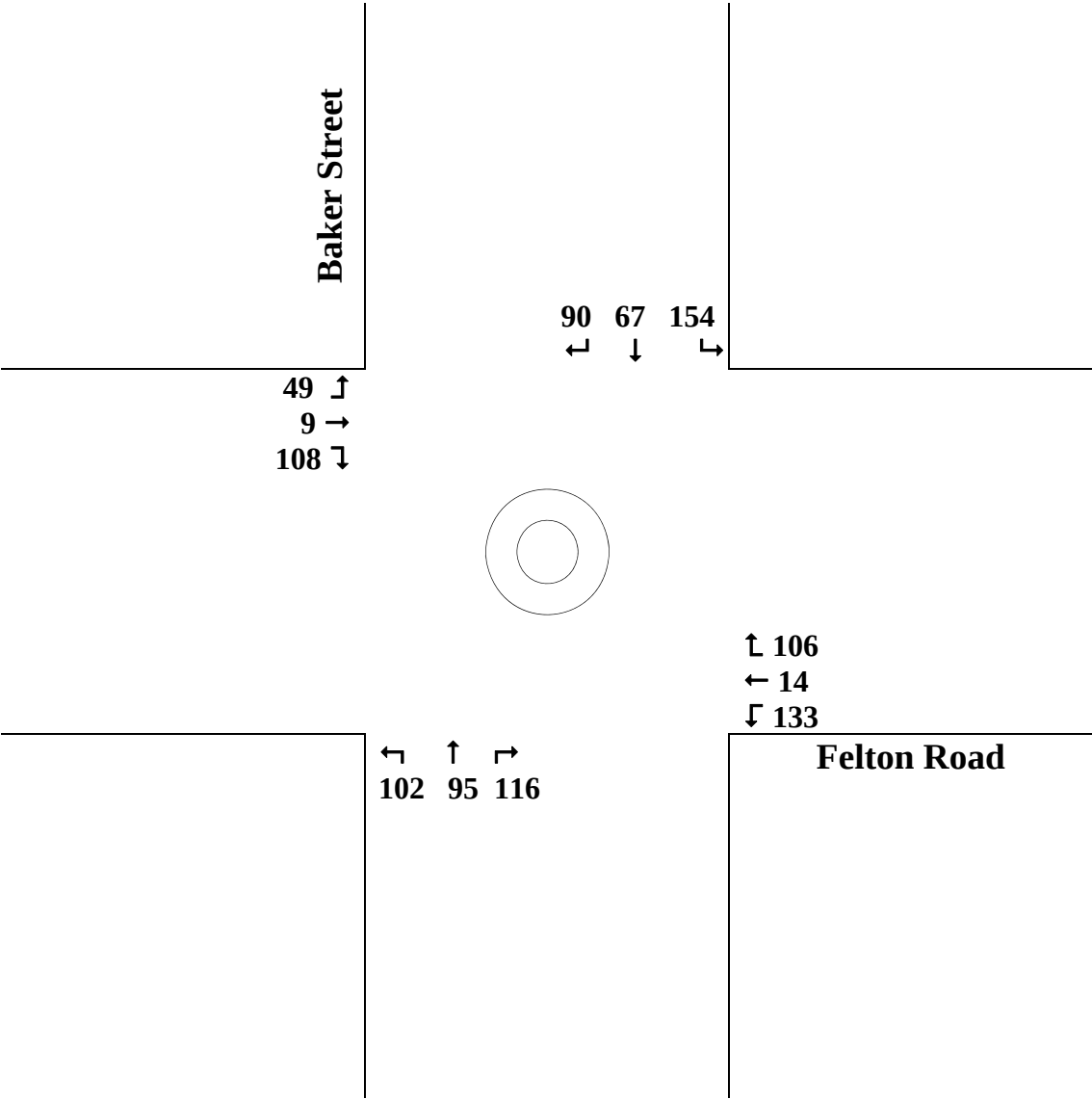
The main features of the existing traffic controls in the vicinity of the site are:

- Traffic signals at the intersection of Pennant Hills Road and Jenkins Road. These signals also provide an early start phase and lane for buses travelling easterly on Pennant Hills Road.
- Traffic signals at the intersection of Pennant Hills Road and Adderton Road.
- Felton Street is terminated at Pennant Hills Road with a cul-de-sac.
- Stop Sign at the intersection of Baker Street and Pennant Hills Road.
- A 60 Km/h speed limit exists on Pennant Hills Road.
- Roundabout at the intersection of Baker Street and Felton Road.
- A 50 km/h speed limit exists on Felton Road and Baker Street.
- A left turn bay on Pennant Hills Road at the front of the site.

Data on the vehicle and pedestrian movements at critical intersections in the vicinity of the subject site have been collected by surveys undertaken by Roar Data Pty Ltd as part of this study from 6.30am - 9.30am and 3.00pm – 6.00pm on Tuesday 13th May 2014 at the intersections of Baker Street and Felton Road, Felton Road and the Western Driveway, Felton Road and the Eastern Driveway and the Pennant Hills Road driveway. Conditions on this day were described by the traffic counting firm as fine with no unusual circumstances encountered.

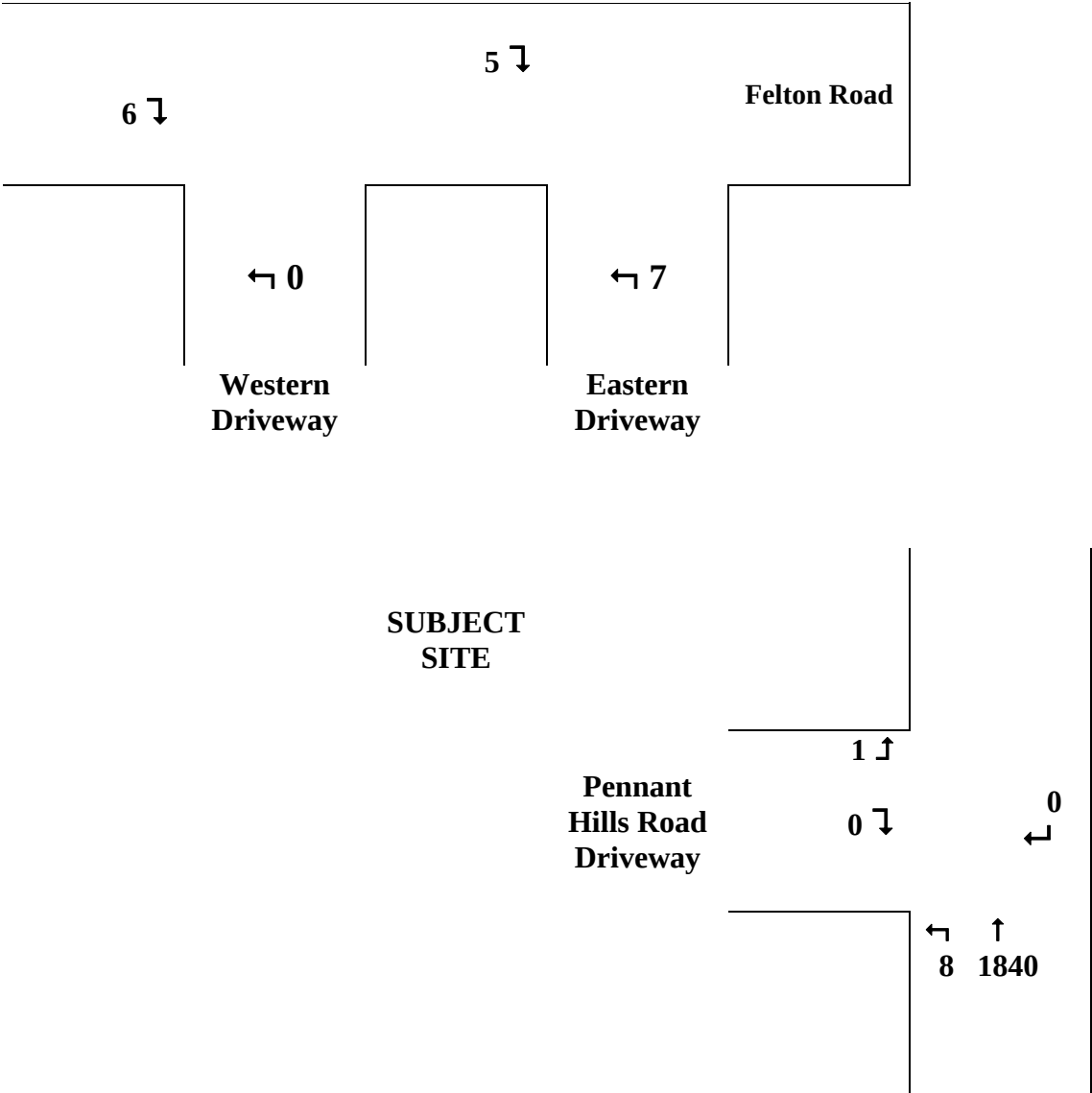
The detailed results of the surveys are attached as Appendix A. The morning and evening peak hour flows at each intersection is depicted in Figure 3, 4, 5 and 6 in the following pages.

On site observation reveal that during the drop off and pick up times associated with the start and finish times of the James Ruse School that Felton Street is experiencing some congestion, however, the peak hour traffic generation of the indicative residential component of the development proposal on the subject site is unlikely to coincide.



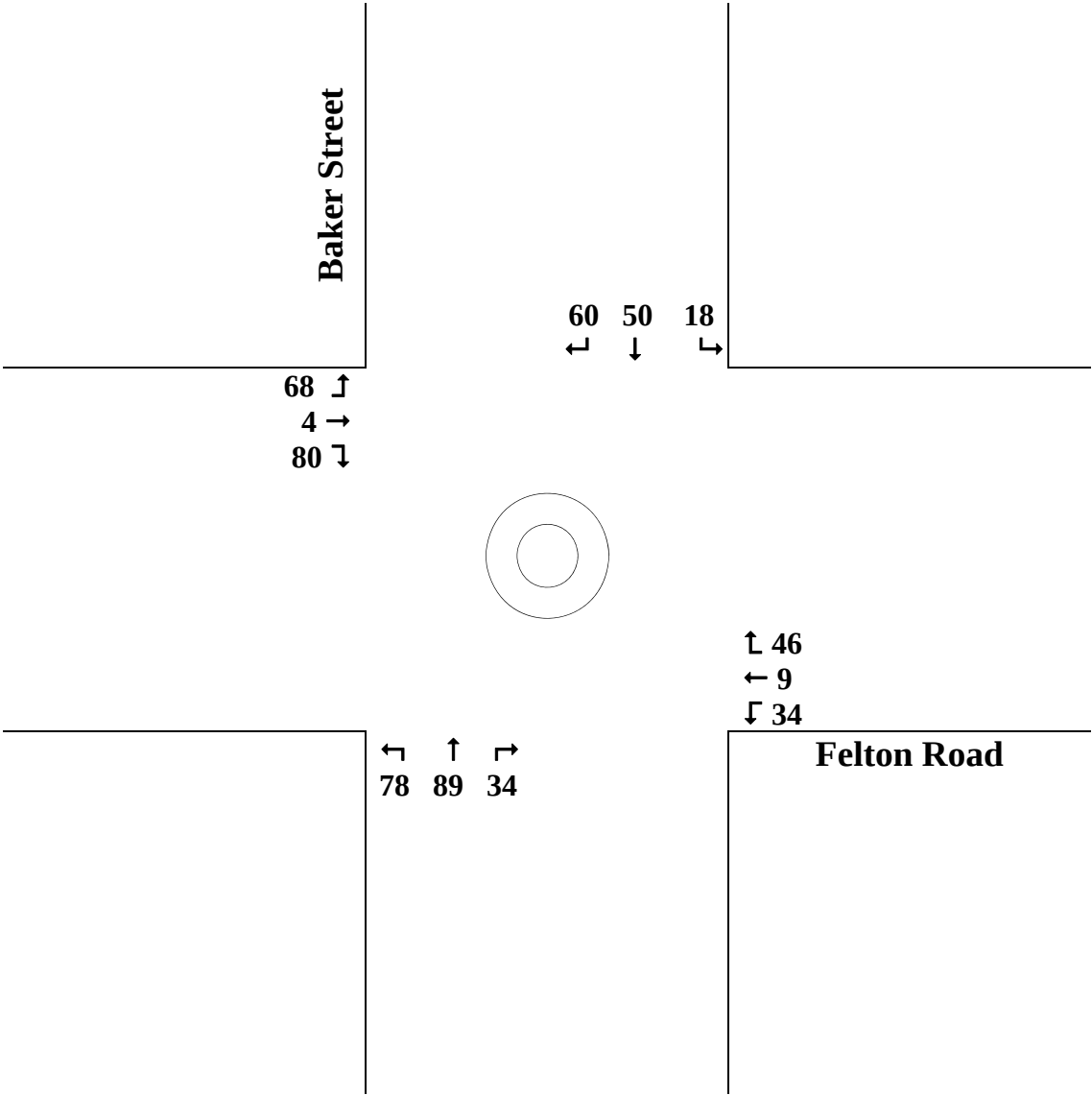
Existing
Morning Peak
Hour Flows

Fig 3



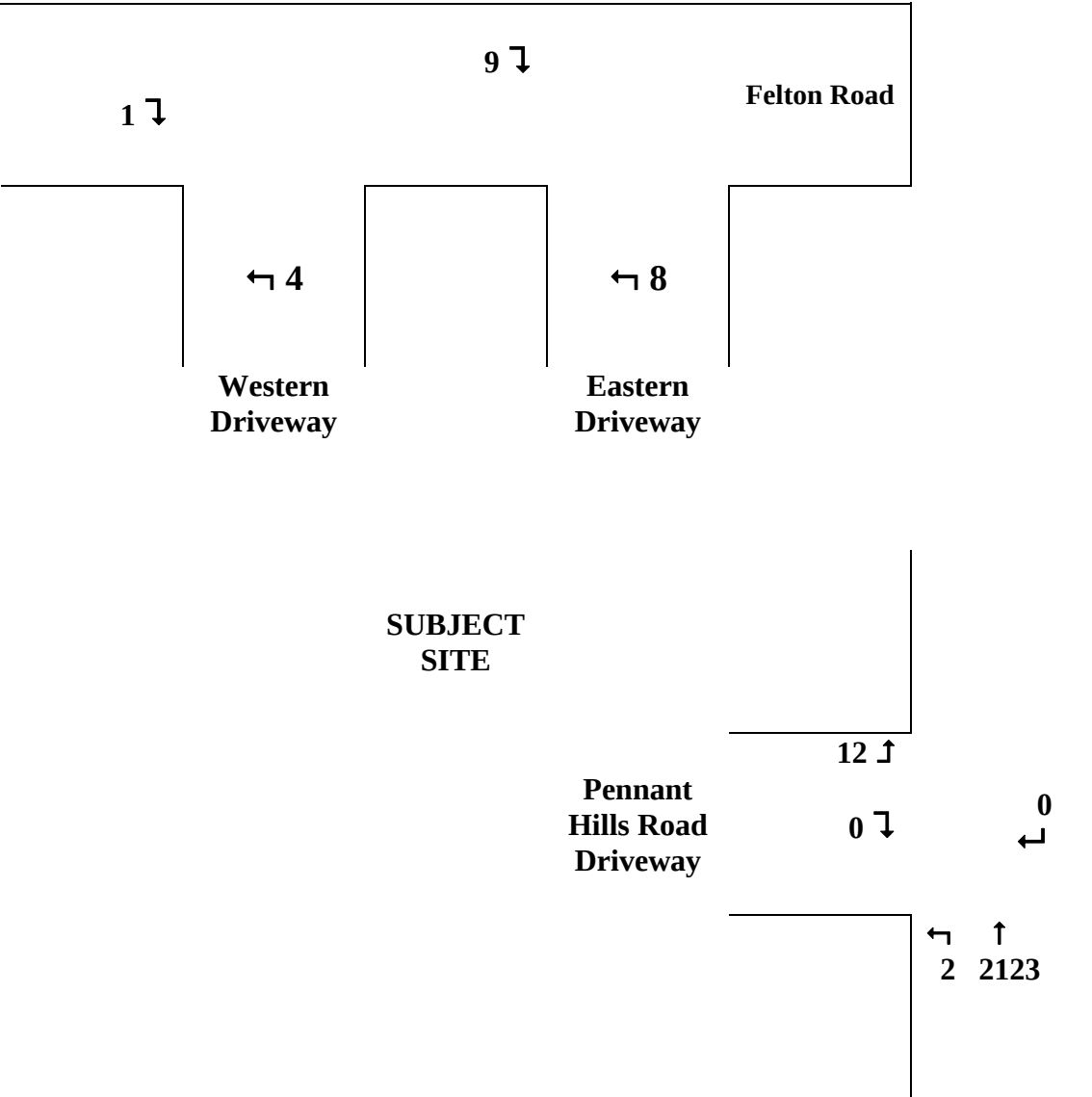
Existing site
Morning Peak
Hour Flows

Fig 4



Existing
Evening Peak
Hour Flows

Fig 5



**Existing site
Evening Peak
Hour Flows**

Fig 6

4. KEY ISSUES

4.1 VEHICLE ACCESS

Vehicular access to the subject site is considered possible to/from Felton Road and Pennant Hills Road via a slip lane. The topography of site suits vehicle access to a basement from Pennant Hills Road.

A site inspection reveals that the location of the driveways from each road frontage will provide very good sight distance which easily exceeds the desirable distances suggested by AS/NZS 2890.1:2004 for the respective speed limits

The RMS has been consulted with regards to vehicle access off Pennant Hills Road. The RMS has advised that the RMS may consider a commercial traffic access off Pennant Hills Road if a deceleration lane is provided and is physically restricted to left turns in and out only. A copy of the RMS correspondence is attached as Appendix B.

The indicative development scheme suggests a slip lane off Pennant Hills Road and is considered to be appropriate even though it is noted that a similar size residential development opposite this site (No. 302 Pennant Hills Road) was not required to provide slip lane vehicle access.

A combined off street loading/garbage area is proposed off Felton Street.

4.2 TRAFFIC

An estimation of the traffic generation of the indicative development scheme can be calculated by reference to the Roads and Traffic Authority's '*Guide to Traffic Generating Developments, Section 3 - Landuse Traffic Generation*' of October 2002. The guide specifies the following peak hour generation rates for gymnasium and child care centres developments and high density residential flat buildings:

Gymnasiums.

Metropolitan Regional (CBD) Centres.

Evening Peak Hour Vehicle Trips = 3 trips per 100m² GFA .

Metropolitan Sub Regional Areas.

Evening Peak Hour Vehicle Trips = 9 trips per 100m² GFA.

The peak generation generally occurs between 6.00pm and 7.00pm on a weekday evening.

Child Care Centres

Centre Type	Peak Vehicle Trips/Child		
	7.00-9.00am	2.30-4.00pm	4.00-6.00pm
Pre-school	1.4	0.8	--
Long day care	0.8	0.3	0.7
Before/after care	0.5	0.2	0.7

Office and Commercial

Evening peak hour vehicle trips = 2 per 100m² gross floor area

With regards to the residential component of the proposal the Roads and Maritime Services Technical Direction '*Guide to Traffic Generating Developments, Updated surveys TDT 2013/14*' of May 2013. The guide specifies the following average peak hour generation rates for High Density residential flat buildings in Sydney:

AM Peak Hour Vehicle Trips	=	0.19/unit
PM Peak Hour Vehicle Trips	=	0.15/unit

Considering the location of the proposal, (particularly with the recent announcement of the Western Sydney Light Rail network which incorporates the Carlingford Heavy Rail line), the metropolitan sub-regional centre rate will be utilised for the gymnasium component of the proposal. Accordingly, the estimated traffic generation of the site calculates as:

AM peak

400m ² Gymnasium @ 9 trips/100m ²	= 36 trips (assumed to be same as PM)
679m ² commercial @ 2 trips/100m ²	= 13.6 trips (assumed to be same as PM)
90 place child care centre @ 0.8 trips/child	= 72 trips
135 residential units @ 0.19 trips/unit	= 25.7 trips
POTENTIAL TOTAL TRIPS	= 147.3 peak hour trips

PM peak

400m ² Gymnasium @ 9 trips/100m ²	= 36 trips
679m ² commercial @ 2 trips/100m ²	= 13.6 trips
90 place child care centre @ 0.7 trips/child	= 63 trips
135 residential units @ 0.15 trips/unit	= 20.3 trips
POTENTIAL TOTAL TRIPS	= 132.9 peak hour trips

It should be noted that the above potential traffic generation rates are considered to be an absolute worse case scenario due to the fact that the peak hour generation of a

gymnasium occurs after the weekday evening commuter peak hour. Notwithstanding, the worse case scenario traffic generation rate will be modelled against the existing on street peak hours to ensure a robust assessment.

Forecast flow traffic generation distribution assumptions are as follows:

1. 80/20 split (depart/approach) for residential unit in AM peak reverse in PM peak.
2. 50/50 split (approach/depart) for gymnasium and child care centre components

Table 4.1 provides the estimated traffic flows for the proposal for each road frontage:

Table 4.1 – Indicative development scheme forecast peak hour flows				
Road	AM Peak		PM Peak	
	Approach	Departure	Approach	Departure
Felton Road	5	21	16	4
Pennant Hills Road	61	61	57	56

The estimated potential traffic generation of the subject site can be discounted by the existing recorded traffic generation of the existing buildings on the site. The existing site traffic generation was recorded as part of this assessment and is provided in table 4.2.

Table 4.2 – Existing development peak hour flows				
Road	AM Peak		PM Peak	
	Approach	Departure	Approach	Departure
Felton Road	11	7	10	12
Pennant Hills Road	8	1	2	12

Therefore the potential change in traffic flows approaching and departing the site calculate as tabled in table 4.3. Figures 7, 8, 9 and 10 provide a pictorial representation of the change in approach and departure vehicle trips as a result of the proposal.

Table 4.3 – Change in traffic flows approaching and departing the site				
Road	AM Peak		PM Peak	
	Approach	Departure	Approach	Departure
Felton Road	5 – 11 = - 6	21 – 7 = 14	16 – 10 = 6	4 – 12 = - 8
Pennant Hills Road	61 – 8 = 53	61 – 1 = 60	57 – 2 = 55	56 – 12 = 44

Table 4.3 indicates that with the commercial traffic generated by the proposal restricted to the Pennant Hills Road access driveway there is the possibility of a reduction in flows along Felton Street approaching the site in the AM peak hour and departing the site in the PM peak hour.

To assess the impact of the potential traffic generation on the intersection of Felton Street and Baker Street the estimated peak hour approach and departure vehicle trips have been assigned proportionally to the roundabout on the basis of existing traffic flows.

Also modelled is the intersection of Pennant Hills Road and slip lane driveway with left turns in and out only. This slip can be incorporated into the existing road reserve.

Figure 7, 8, 9 and 10 depict the potential morning and afternoon peak hour traffic volumes modelled.

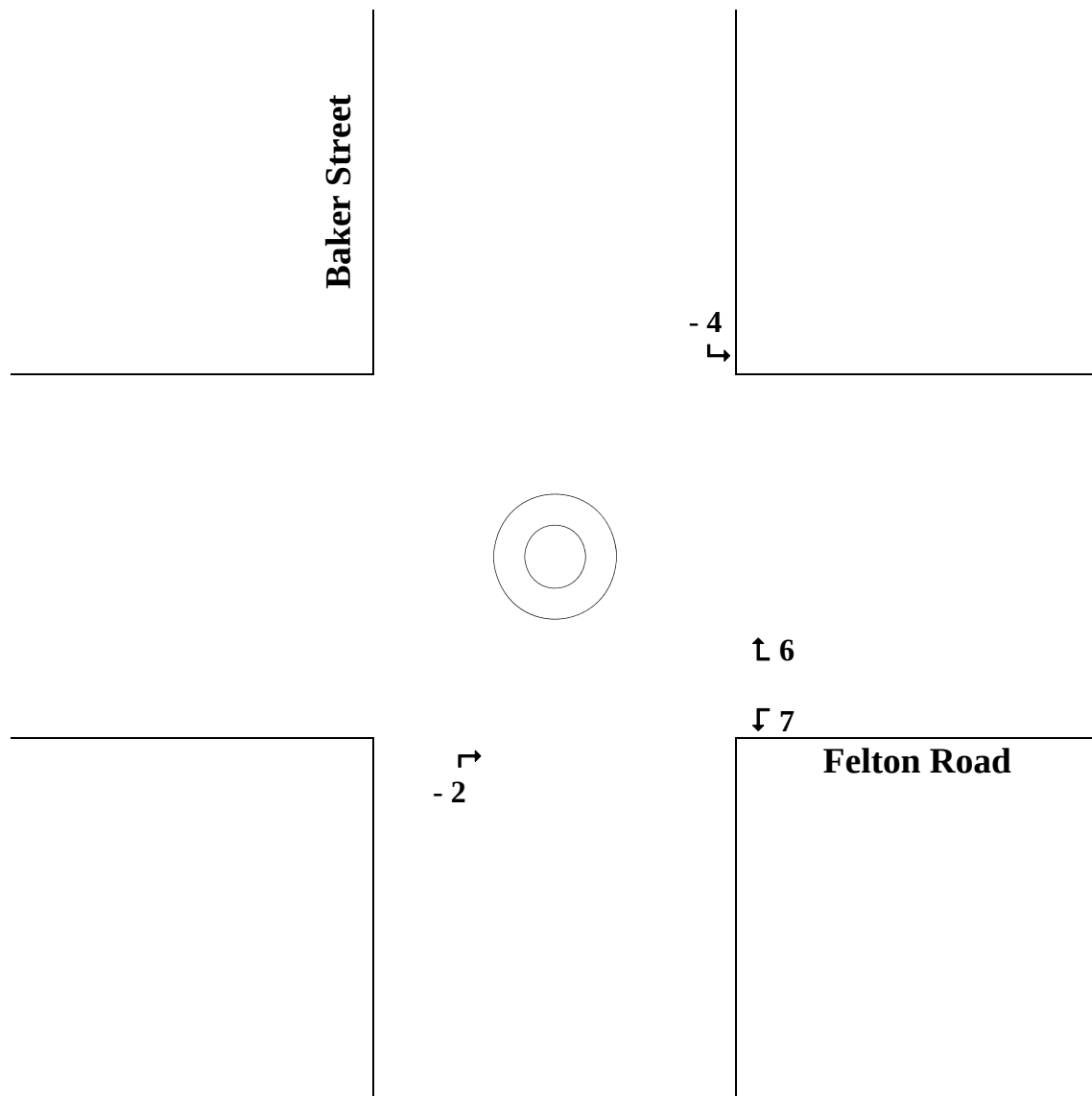
Using SIDRA a software programme developed for the purpose of analysing signalised, roundabout and sign controlled intersections, a comparison of intersection performance between the existing and projected traffic demands during the morning and evening peak hours upon the intersection has been modelled. The table below are the results of the intersection modelling and attached as Appendix are the SIDRA summary result sheets.

	Results of SIDRA analysis – Intersection of Pennant Hills Road and driveway to 241 Pennant Hills Road			
	Existing		Proposed (with slip lane)	
	AM	PM	AM	PM
Level of Service	B	B	B	B
Degree of Saturation	0.499	0.445	0.499	0.445
Total Average Delay (sec/veh)	0.0s	0.1s	0.5s	0.5s
Total Average delay for left turn from site (sec/veh)	19s	24.3s	21.3s	28s

	Results of SIDRA analysis – Intersection of Baker and Felton Streets			
	Existing		Proposed	
	AM	PM	AM	PM
Level of Service	A	A	A	A
Degree of Saturation	0.331	0.181	0.326	0.184
Total Average Delay (sec/veh)	8.8s	7.7s	8.8s	7.7s

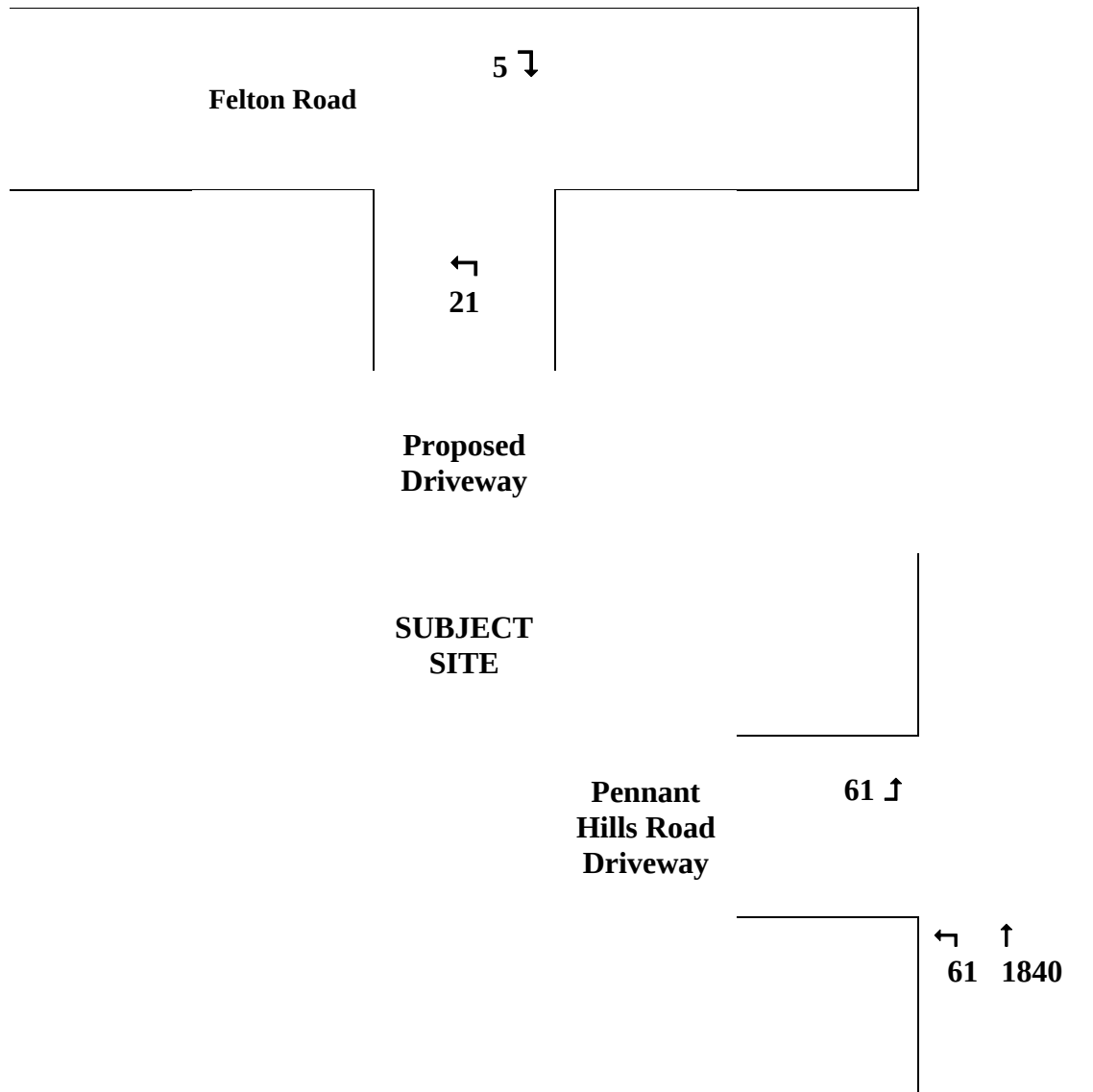
The results of the SIDRA analysis reveal that:

- The proposed intersection of Pennant Hills Road and the driveway to 241 with a left turn slip lane will operate at a very good level of service with minimal delays and spare capacity.
- The very good Level of Service at the intersection of Felton Road and Baker Street will not change with the estimated additional traffic generation of the indicative development scheme.
- The additional traffic demand on the intersections of Felton Road and Baker Street, as a consequence of the indicative development scheme will only alter the Degree of Saturation and Total Average Delay minutely at each intersection.



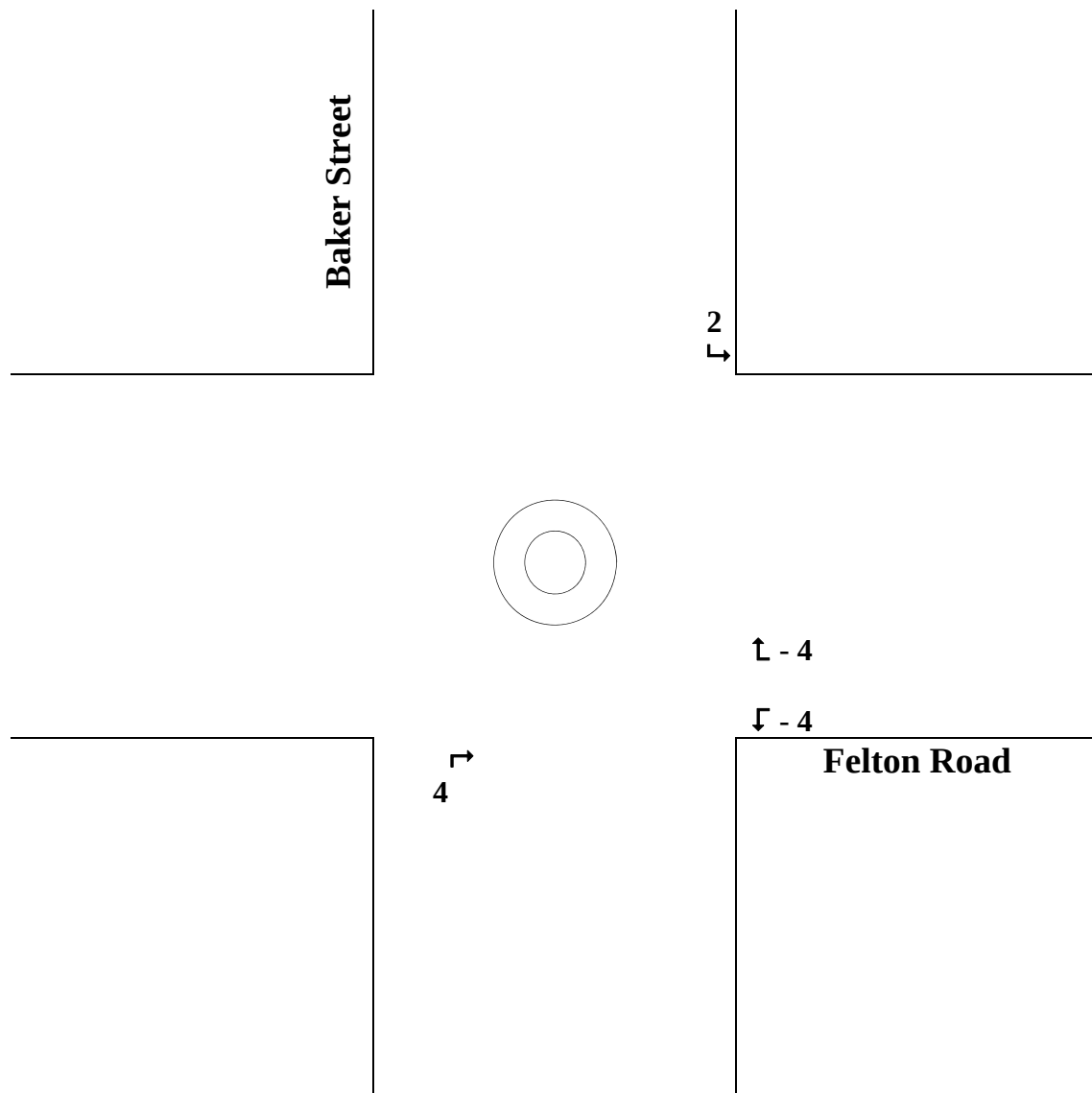
**Potential morning
peak hour flows –
Baker Street
roundabout**

Fig 7



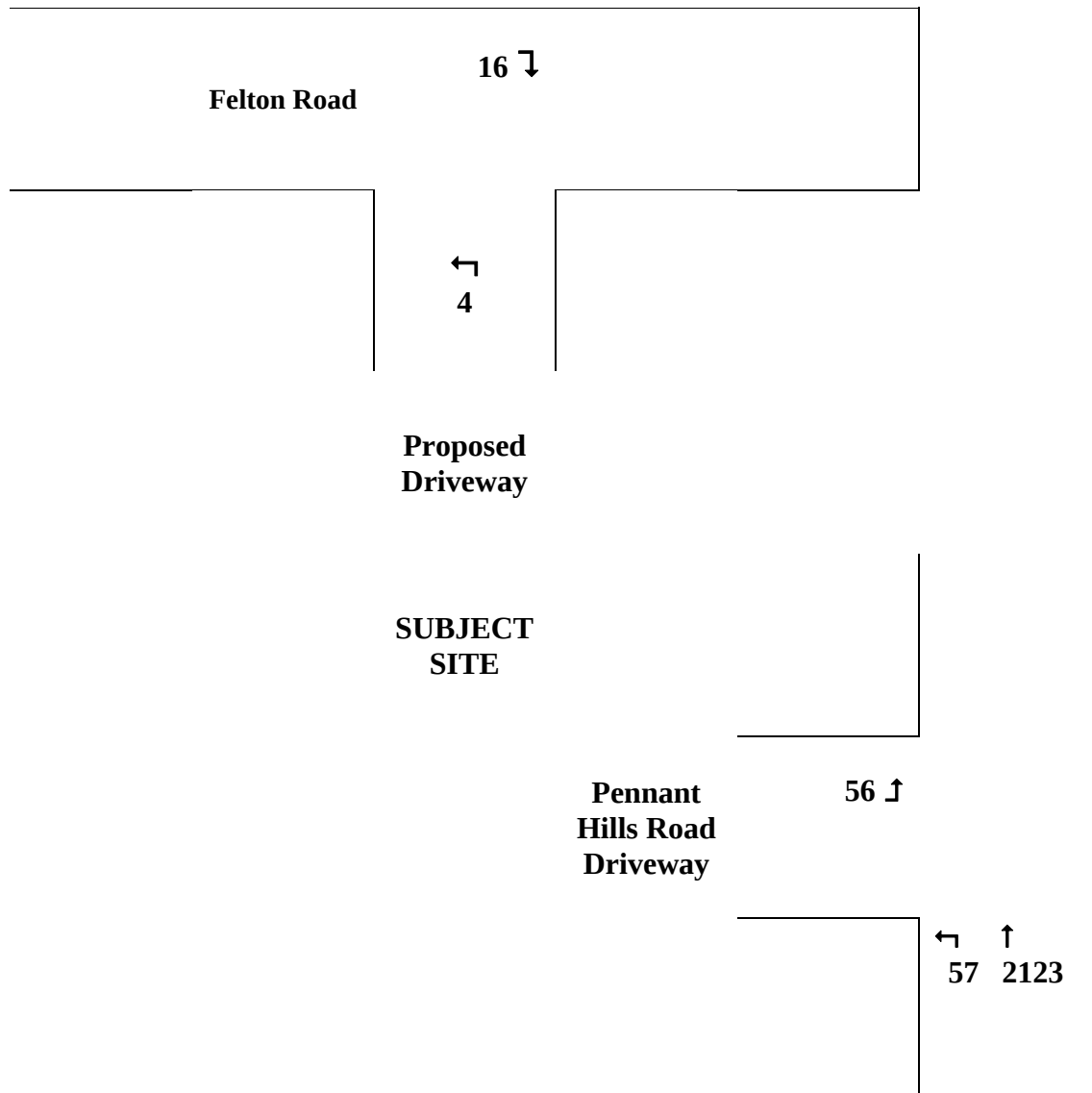
**Potential morning
peak hour flows -
Site**

Fig 8



**Potential evening
peak hour flows –
Baker Street
roundabout**

Fig 9



**Potential evening
peak hour flows -
Site**

Fig 10

5. **CONCLUSIONS**

The preceding analysis has demonstrated that:

- The vehicle access points proposed to serve the development are suitably located and will provide satisfactory sight distance.
- The proposed intersection of Pennant Hills Road and the driveway to 241 with a left turn slip lane (and left in and left out only) will operate at a very good level of service with minimal delays and spare capacity.
- The very good Level of Service at the intersection of Felton Road and Baker Street will not change with the estimated additional traffic generation of the indicative development scheme.
- The additional traffic demand on the intersections of Felton Road and Baker Street, as a consequence of the indicative development scheme will only alter the Degree of Saturation and Total Average Delay minutely at each intersection.

Therefore the indicative development scheme for the subject site is considered to be acceptable and is supported by Traffic Solutions Pty Ltd.

APPENDIX A TRAFFIC COUNTS



R.O.A.R. DATA

Reliable, Original & Authentic Results

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Mobile.0418239019

Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hill
Day/Date : Tues 13th May 2014

PEDS	NORTH	WEST	SOUTH	
Time Per	Pennant Hills	D-Way	Pennant Hills	TOT
0630 - 0645	1	1	0	2
0645 - 0700	0	2	0	2
0700 - 0715	0	1	0	1
0715 - 0730	0	6	0	6
0730 - 0745	0	0	0	0
0745 - 0800	0	1	0	1
0800 - 0815	0	8	0	8
0815 - 0830	0	3	0	3
0830 - 0845	0	6	0	6
0845 - 0900	0	7	0	7
0900 - 0915	0	8	0	8
0915 - 0930	0	9	0	9
Per End	1	52	0	53

PEDS	NORTH	WEST	SOUTH	
Peak Per	Pennant Hills	D-Way	Pennant Hills	TOT
0630 - 0730	1	10	0	11
0645 - 0745	0	9	0	9
0700 - 0800	0	8	0	8
0715 - 0815	0	15	0	15
0730 - 0830	0	12	0	12
0745 - 0845	0	18	0	18
0800 - 0900	0	24	0	24
0815 - 0915	0	24	0	24
0830 - 0930	0	30	0	30

PEAK HR	0	15	0	15
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Lights	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	236	0	0	0	0	369	605
0645 - 0700	273	0	0	0	0	389	662
0700 - 0715	376	0	0	0	0	415	791
0715 - 0730	413	0	1	0	1	487	902
0730 - 0745	445	0	0	0	0	499	944
0745 - 0800	486	0	0	0	2	435	923
0800 - 0815	448	0	0	0	5	365	818
0815 - 0830	425	0	0	0	3	392	820
0830 - 0845	365	0	0	0	2	446	813
0845 - 0900	375	0	0	0	3	381	759
0900 - 0915	322	0	0	0	0	337	659
0915 - 0930	326	0	0	0	0	341	667
Per End	4490	0	1	0	16	4856	9363

Heavies	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	6	0	0	0	0	16	22
0645 - 0700	11	0	0	0	0	15	26
0700 - 0715	9	0	0	0	0	9	18
0715 - 0730	6	0	0	0	0	11	17
0730 - 0745	7	0	0	0	0	12	19
0745 - 0800	10	0	0	0	0	18	28
0800 - 0815	11	0	0	0	0	13	24
0815 - 0830	7	0	0	0	0	10	17
0830 - 0845	18	0	0	0	0	15	33
0845 - 0900	19	0	0	0	0	14	33
0900 - 0915	12	0	0	0	0	9	21
0915 - 0930	19	0	0	0	0	21	40
Per End	135	0	0	0	0	163	298

Combined	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	242	0	0	0	0	385	627
0645 - 0700	284	0	0	0	0	404	688
0700 - 0715	385	0	0	0	0	424	809
0715 - 0730	419	0	1	0	1	498	919
0730 - 0745	452	0	0	0	0	511	963
0745 - 0800	496	0	0	0	2	453	951
0800 - 0815	459	0	0	0	5	378	842
0815 - 0830	432	0	0	0	3	402	837
0830 - 0845	383	0	0	0	2	461	846
0845 - 0900	394	0	0	0	3	395	792
0900 - 0915	334	0	0	0	0	346	680
0915 - 0930	345	0	0	0	0	362	707
Per End	4625	0	1	0	16	5019	9661

Lights	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	1298	0	1	0	1	1660	2960
0645 - 0745	1507	0	1	0	1	1790	3299
0700 - 0800	1720	0	1	0	3	1836	3560
0715 - 0815	1792	0	1	0	8	1786	3587
0730 - 0830	1804	0	0	0	10	1691	3505
0745 - 0845	1724	0	0	0	12	1638	3374
0800 - 0900	1613	0	0	0	13	1584	3210
0815 - 0915	1487	0	0	0	8	1556	3051
0830 - 0930	1388	0	0	0	5	1505	2898

Heavies	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	32	0	0	0	0	51	83
0645 - 0745	33	0	0	0	0	47	80
0700 - 0800	32	0	0	0	0	50	82
0715 - 0815	34	0	0	0	0	54	88
0730 - 0830	35	0	0	0	0	53	88
0745 - 0845	46	0	0	0	0	56	102
0800 - 0900	55	0	0	0	0	52	107
0815 - 0915	56	0	0	0	0	48	104
0830 - 0930	68	0	0	0	0	59	127

Combined	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	1330	0	1	0	1	1711	3043
0645 - 0745	1540	0	1	0	1	1837	3379
0700 - 0800	1752	0	1	0	3	1886	3642
0715 - 0815	1826	0	1	0	8	1840	3675
0730 - 0830	1839	0	0	0	10	1744	3593
0745 - 0845	1770	0	0	0	12	1694	3476
0800 - 0900	1668	0	0	0	13	1636	3317
0815 - 0915	1543	0	0	0	8	1604	3155
0830 - 0930	1456	0	0	0	5	1564	3025

PEAK HR	1792	0	1	0	8	1786	3587
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PEAK HR	34	0	0	0	0	54	88
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PEAK HR	1826	0	1	0	8	1840	3675
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R.O.A.R. DATA

Reliable, Original & Authentic Results

Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd

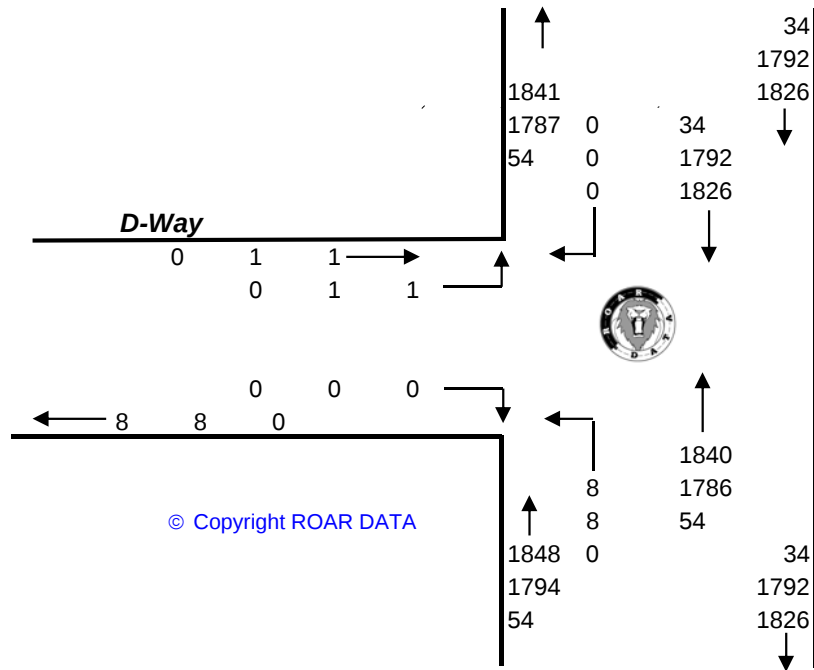


AM PEAK
0715 - 0815

**TOTAL VOLUMES
FOR COUNT
PERIOD**

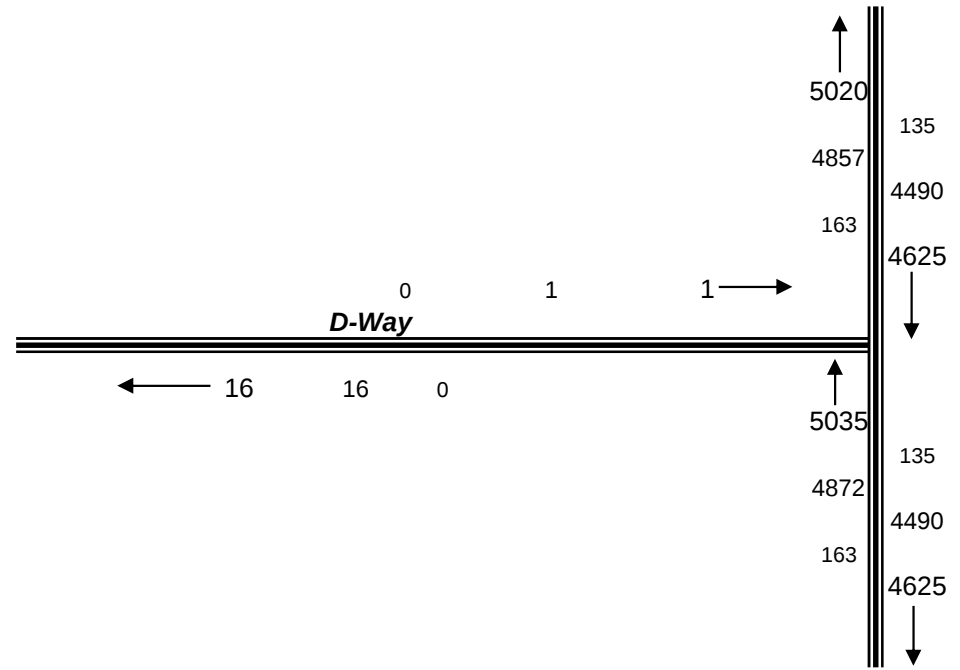


Pennant Hills Rd



Pennant Hills Rd

Pennant Hills Rd



Pennant Hills Rd



R.O.A.R. DATA

Reliable, Original & Authentic Results

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Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hill
Day/Date : Tues 13th May 2014

PEDS	NORTH	WEST	SOUTH	
Time Per	Pennant Hills	D-Way	Pennant Hills	TOT
1500 - 1515	0	8	0	8
1515 - 1530	0	11	0	11
1530 - 1545	0	10	0	10
1545 - 1600	0	7	0	7
1600 - 1615	0	2	0	2
1615 - 1630	0	0	0	0
1630 - 1645	0	1	0	1
1645 - 1700	0	0	0	0
1700 - 1715	0	2	0	2
1715 - 1730	0	2	0	2
1730 - 1745	0	2	0	2
1745 - 1800	0	0	0	0
Per End	0	45	0	45

PEDS	NORTH	WEST	SOUTH	
Peak Per	Pennant Hills	D-Way	Pennant Hills	TOT
1500 - 1600	0	36	0	36
1515 - 1615	0	30	0	30
1530 - 1630	0	19	0	19
1545 - 1645	0	10	0	10
1600 - 1700	0	3	0	3
1615 - 1715	0	3	0	3
1630 - 1730	0	5	0	5
1645 - 1745	0	6	0	6
1700 - 1800	0	6	0	6

PEAK HR	0	6	0	6
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Lights	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Time Per	T	R	L	R	L	T	TOT
1500 - 1515	315	0	0	0	1	331	647
1515 - 1530	329	0	2	0	0	418	749
1530 - 1545	385	1	0	0	0	516	902
1545 - 1600	368	0	0	0	0	413	781
1600 - 1615	352	0	0	0	0	462	814
1615 - 1630	358	0	1	0	0	450	809
1630 - 1645	381	0	4	0	0	445	830
1645 - 1700	372	0	2	0	0	542	916
1700 - 1715	379	0	4	0	1	505	889
1715 - 1730	430	0	4	0	0	521	955
1730 - 1745	415	0	2	0	1	535	953
1745 - 1800	386	0	4	0	0	509	899
Per End	4470	1	23	0	3	5647	10144

Heavies	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Time Per	T	R	L	R	L	T	TOT
1500 - 1515	14	0	0	0	0	16	30
1515 - 1530	12	0	0	0	0	13	25
1530 - 1545	17	0	0	0	0	10	27
1545 - 1600	8	0	0	0	0	15	23
1600 - 1615	10	0	0	0	0	8	18
1615 - 1630	12	0	0	0	0	4	16
1630 - 1645	9	0	0	0	0	6	15
1645 - 1700	10	0	0	0	0	6	16
1700 - 1715	7	0	0	0	0	9	16
1715 - 1730	10	0	0	0	0	4	14
1730 - 1745	6	0	0	0	0	1	7
1745 - 1800	6	0	0	0	0	4	10
Per End	121	0	0	0	0	96	217

Combined	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Time Per	T	R	L	R	L	T	TOT
1500 - 1515	329	0	0	0	1	347	677
1515 - 1530	341	0	2	0	0	431	774
1530 - 1545	402	1	0	0	0	526	929
1545 - 1600	376	0	0	0	0	428	804
1600 - 1615	362	0	0	0	0	470	832
1615 - 1630	370	0	1	0	0	454	825
1630 - 1645	390	0	4	0	0	451	845
1645 - 1700	382	0	2	0	0	548	932
1700 - 1715	386	0	4	0	1	514	905
1715 - 1730	440	0	4	0	0	525	969
1730 - 1745	421	0	2	0	1	536	960
1745 - 1800	392	0	4	0	0	513	909
Per End	4591	1	23	0	3	5743	10361

Lights	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Peak Per	T	R	L	R	L	T	TOT
1500 - 1600	1397	1	2	0	1	1678	3079
1515 - 1615	1434	1	2	0	0	1809	3246
1530 - 1630	1463	1	1	0	0	1841	3306
1545 - 1645	1459	0	5	0	0	1770	3234
1600 - 1700	1463	0	7	0	0	1899	3369
1615 - 1715	1490	0	11	0	1	1942	3444
1630 - 1730	1562	0	14	0	1	2013	3590
1645 - 1745	1596	0	12	0	2	2103	3713
1700 - 1800	1610	0	14	0	2	2070	3696

Heavies	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Peak Per	T	R	L	R	L	T	TOT
1500 - 1600	51	0	0	0	0	54	105
1515 - 1615	47	0	0	0	0	46	93
1530 - 1630	47	0	0	0	0	37	84
1545 - 1645	39	0	0	0	0	33	72
1600 - 1700	41	0	0	0	0	24	65
1615 - 1715	38	0	0	0	0	25	63
1630 - 1730	36	0	0	0	0	25	61
1645 - 1745	33	0	0	0	0	20	53
1700 - 1800	29	0	0	0	0	18	47

Combined	NORTH		WEST		SOUTH		
	Pennant Hills		D-Way		Pennant Hills		
Peak Per	T	R	L	R	L	T	TOT
1500 - 1600	1448	1	2	0	1	1732	3184
1515 - 1615	1481	1	2	0	0	1855	3339
1530 - 1630	1510	1	1	0	0	1878	3390
1545 - 1645	1498	0	5	0	0	1803	3306
1600 - 1700	1504	0	7	0	0	1923	3434
1615 - 1715	1528	0	11	0	1	1967	3507
1630 - 1730	1598	0	14	0	1	2038	3651
1645 - 1745	1629	0	12	0	2	2123	3766
1700 - 1800	1639	0	14	0	2	2088	3743

PEAK HR	1596	0	12	0	2	2103	3713
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PEAK HR	33	0	0	0	0	20	53
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PEAK HR	1629	0	12	0	2	2123	3766
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R.O.A.R. DATA

Reliable, Original & Authentic Results

Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd

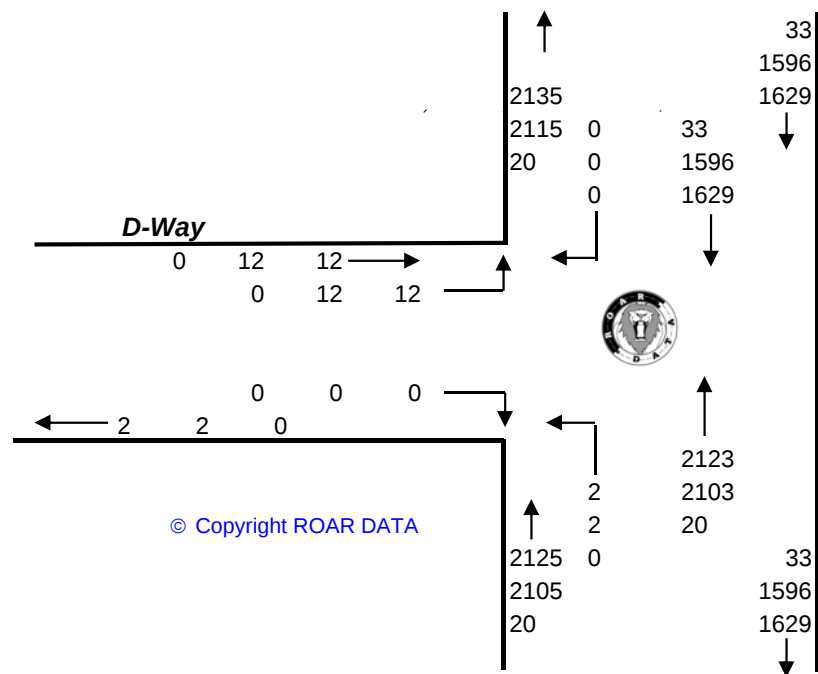


PM PEAK
1645 - 1745

**TOTAL VOLUMES
FOR COUNT
PERIOD**

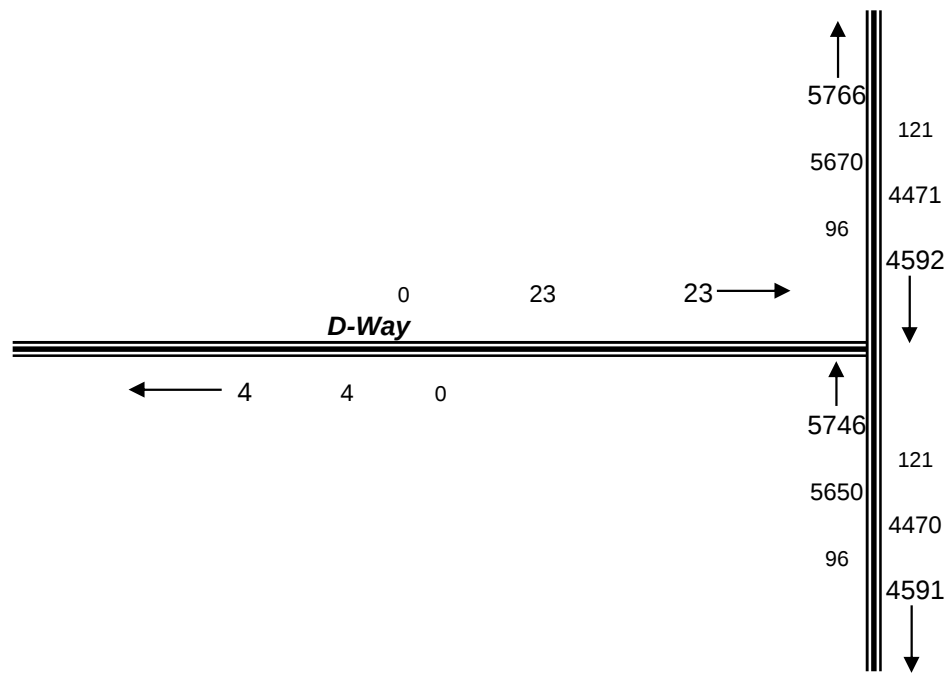


Pennant Hills Rd



Pennant Hills Rd

Pennant Hills Rd



Pennant Hills Rd



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-23901'

Lights

Time Per	NORTH Baker St			WEST Felton Rd			SOUTH Baker St			EAST Felton Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
0630 - 0645	3	3	0	1	1	2	1	5	0	0	0	0	16
0645 - 0700	1	6	2	2	0	10	4	5	1	1	0	0	32
0700 - 0715	6	3	1	3	0	6	5	9	3	3	0	2	41
0715 - 0730	6	6	4	4	1	8	7	10	6	2	1	2	57
0730 - 0745	10	9	8	2	0	14	8	30	16	9	0	5	111
0745 - 0800	9	13	10	19	0	16	7	34	10	6	1	2	127
0800 - 0815	19	26	14	10	1	14	16	21	25	20	0	12	178
0815 - 0830	25	24	18	10	2	25	19	28	35	30	3	14	233
0830 - 0845	73	26	14	7	5	15	11	33	50	46	0	47	327
0845 - 0900	48	7	23	12	2	18	14	23	29	49	10	38	273
0900 - 0915	8	6	35	20	0	49	57	8	2	7	1	7	200
0915 - 0930	3	3	30	36	0	67	55	8	2	2	0	3	209
Period End	211	132	159	126	12	244	204	214	179	175	16	132	1804

Heavies

Time Per	NORTH Baker St			WEST Felton Rd			SOUTH Baker St			EAST Felton Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
0630 - 0645	0	0	0	0	0	0	0	0	0	0	0	0	0
0645 - 0700	0	0	0	0	0	0	0	0	0	0	0	0	0
0700 - 0715	0	0	0	0	0	0	0	0	0	0	0	0	0
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0815	0	2	0	0	0	0	0	2	0	0	0	0	4
0815 - 0830	0	0	0	0	0	0	0	0	0	0	0	0	0
0830 - 0845	0	1	0	0	0	0	1	2	0	0	0	0	4
0845 - 0900	0	2	0	0	0	1	0	1	0	1	0	0	5
0900 - 0915	0	1	0	0	0	0	0	0	0	0	0	0	1
0915 - 0930	0	1	0	0	0	0	0	1	0	0	0	0	2
Period End	0	7	0	0	0	1	1	6	0	1	0	0	16

Combined

Time Per	NORTH Baker St			WEST Felton Rd			SOUTH Baker St			EAST Felton Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
0630 - 0645	3	3	0	1	1	2	1	5	0	0	0	0	16
0645 - 0700	1	6	2	2	0	10	4	5	1	1	0	0	32
0700 - 0715	6	3	1	3	0	6	5	9	3	3	0	2	41
0715 - 0730	6	6	4	4	1	8	7	10	6	2	1	2	57
0730 - 0745	10	9	8	2	0	14	8	30	16	9	0	5	111
0745 - 0800	9	13	10	19	0	16	7	34	10	6	1	2	127
0800 - 0815	19	28	14	10	1	14	16	23	25	20	0	12	182
0815 - 0830	25	24	18	10	2	25	19	28	35	30	3	14	233
0830 - 0845	73	27	14	7	5	15	12	35	50	46	0	47	331
0845 - 0900	48	9	23	12	2	19	14	24	29	50	10	38	278
0900 - 0915	8	7	35	20	0	49	57	8	2	7	1	7	201
0915 - 0930	3	4	30	36	0	67	55	9	2	2	0	3	211
Period End	211	139	159	126	12	245	205	220	179	176	16	132	1820



R.O.A.R. DATA

Client : Craig Hazell Traffic Solutions P/L

Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd

Day/Date : Tuesday : 13th May 2014

Lights

Peak Time	NORTH Baker St			WEST Felton Rd			SOUTH Baker St			EAST Felton Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
0630 - 0730	16	18	7	10	2	26	17	29	10	6	1	4	146
0645 - 0745	23	24	15	11	1	38	24	54	26	15	1	9	241
0700 - 0800	31	31	23	28	1	44	27	83	35	20	2	11	336
0715 - 0815	44	54	36	35	2	52	38	95	57	37	2	21	473
0730 - 0830	63	72	50	41	3	69	50	113	86	65	4	33	649
0745 - 0845	126	89	56	46	8	70	53	116	120	102	4	75	865
0800 - 0900	165	83	69	39	10	72	60	105	139	145	13	111	1011
0815 - 0915	154	63	90	49	9	107	101	92	116	132	14	106	1033
0830 - 0930	132	42	102	75	7	149	137	72	83	104	11	95	1009

PEAK HOUR	154	63	90	49	9	107	101	92	116	132	14	106	1033
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Heavies

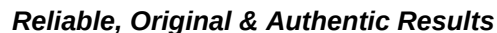
Peak Per	NORTH Baker St			WEST Felton Rd			SOUTH Baker St			EAST Felton Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
0630 - 0730	0	0	0	0	0	0	0	0	0	0	0	0	0
0645 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0
0700 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0
0715 - 0815	0	2	0	0	0	0	0	2	0	0	0	0	4
0730 - 0830	0	2	0	0	0	0	0	2	0	0	0	0	4
0745 - 0845	0	3	0	0	0	0	1	4	0	0	0	0	8
0800 - 0900	0	5	0	0	0	1	1	5	0	1	0	0	13
0815 - 0915	0	4	0	0	0	1	1	3	0	1	0	0	10
0830 - 0930	0	5	0	0	0	1	1	4	0	1	0	0	12

PEAK HOUR	0	4	0	0	0	1	1	3	0	1	0	0	10
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Combined

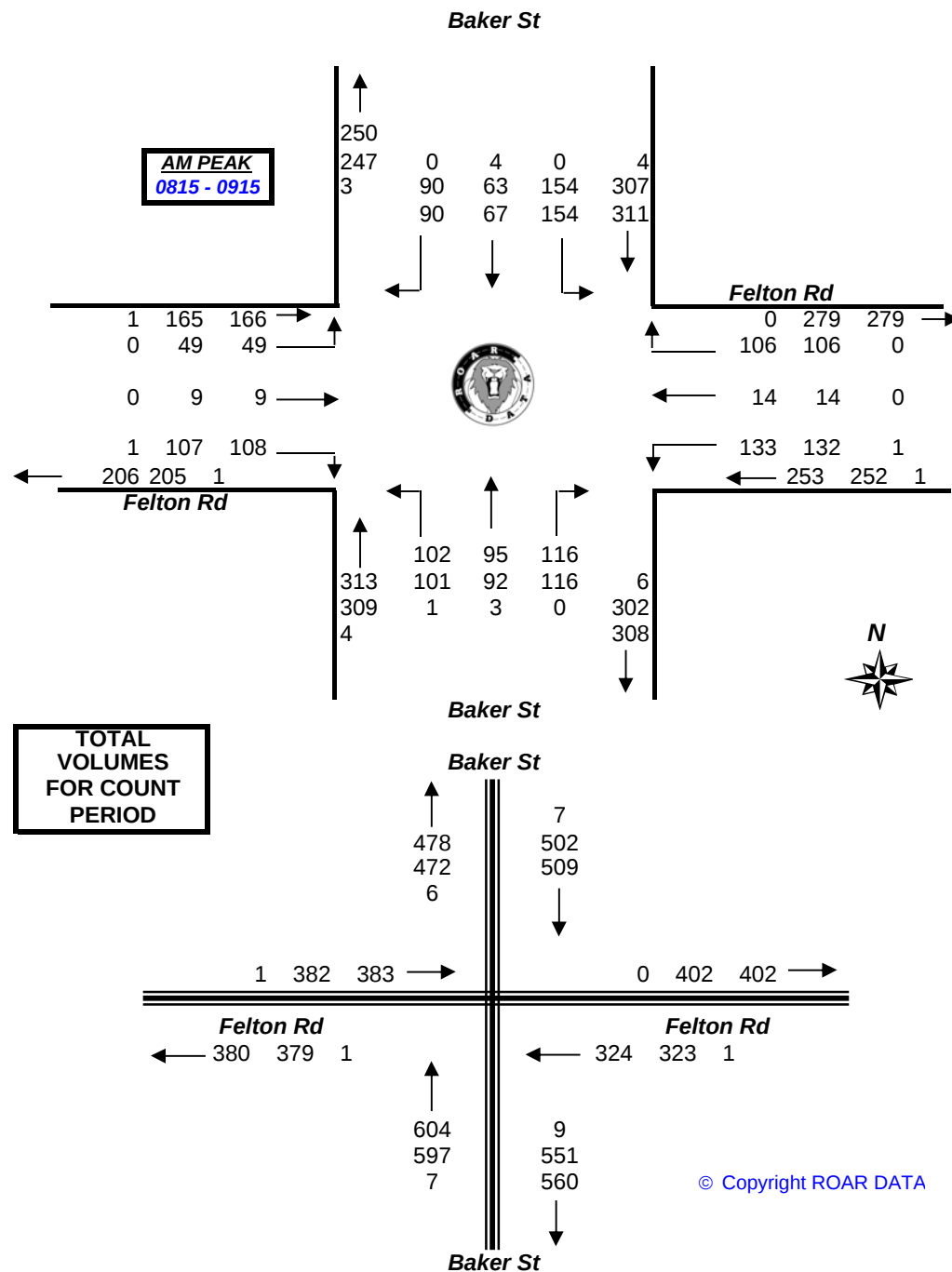
Peak Per	NORTH Baker St			WEST Felton Rd			SOUTH Baker St			EAST Felton Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
0630 - 0730	16	18	7	10	2	26	17	29	10	6	1	4	146
0645 - 0745	23	24	15	11	1	38	24	54	26	15	1	9	241
0700 - 0800	31	31	23	28	1	44	27	83	35	20	2	11	336
0715 - 0815	44	56	36	35	2	52	38	97	57	37	2	21	477
0730 - 0830	63	74	50	41	3	69	50	115	86	65	4	33	653
0745 - 0845	126	92	56	46	8	70	54	120	120	102	4	75	873
0800 - 0900	165	88	69	39	10	73	61	110	139	146	13	111	1024
0815 - 0915	154	67	90	49	9	108	102	95	116	133	14	106	1043
0830 - 0930	132	47	102	75	7	150	138	76	83	105	11	95	1021

PEAK HOUR	154	67	90	49	9	108	102	95	116	133	14	106	1043
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Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd
Day/Date : Tuesday : 13th May 2014

Peds	NORTH	WEST	SOUTH	EAST	
	Baker St	Felton Rd	Baker St	Felton Rd	
Peak Per	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	TOT
0630 - 0730	11	2	10	0	23
0645 - 0745	11	2	12	1	26
0700 - 0800	13	2	14	6	35
0715 - 0815	55	4	16	11	86
0730 - 0830	66	6	33	25	130
0745 - 0845	84	7	38	40	169
0800 - 0900	100	10	40	42	192
0815 - 0915	89	9	52	42	192
0830 - 0930	89	8	37	30	164
PEAK HR	89	9	52	42	192



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R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Lights

Lights	NORTH			WEST			SOUTH			EAST			
	Baker St			Felton Rd			Baker St			Felton Rd			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1515	10	12	15	3	3	6	33	19	12	21	5	15	154
1515 - 1530	3	10	25	2	0	5	28	20	9	9	0	19	130
1530 - 1545	4	11	17	58	1	51	9	24	5	2	2	6	190
1545 - 1600	1	6	3	5	0	18	8	20	6	2	2	3	74
1600 - 1615	5	9	9	9	0	9	3	9	7	3	0	1	64
1615 - 1630	6	3	6	8	0	8	7	17	8	7	0	2	72
1630 - 1645	15	4	8	8	0	4	5	16	5	18	0	17	100
1645 - 1700	3	8	9	2	0	4	5	12	3	12	0	8	66
1700 - 1715	4	12	6	6	1	6	8	22	1	7	0	6	79
1715 - 1730	6	8	9	6	1	3	15	24	1	7	0	6	86
1730 - 1745	2	2	4	2	0	11	11	16	1	5	1	1	56
1745 - 1800	4	9	1	2	0	4	6	16	3	2	0	2	49
Period End	63	94	112	111	6	129	138	215	61	95	10	86	1120

Heavies

Heavies	NORTH			WEST			SOUTH			EAST			TOT
	Baker St			Felton Rd			Baker St			Felton Rd			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	
1500 - 1515	0	7	0	0	0	0	0	3	1	0	0	2	13
1515 - 1530	0	3	0	0	0	0	0	2	1	0	0	1	7
1530 - 1545	0	1	0	0	0	0	0	0	0	0	0	0	1
1545 - 1600	0	0	0	0	0	0	0	1	0	0	0	0	1
1600 - 1615	0	0	0	0	0	0	0	0	0	0	0	0	0
1615 - 1630	0	0	0	0	0	0	0	0	0	0	0	0	0
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	0	0
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	0	0
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	0	0
1715 - 1730	0	0	0	0	0	0	0	0	0	0	0	0	0
1730 - 1745	0	0	0	0	0	0	0	0	0	0	0	0	0
1745 - 1800	0	0	0	0	0	0	0	0	0	0	0	0	0
Period End	0	11	0	0	0	0	0	6	2	0	0	3	22

Combined

Combined	NORTH			WEST			SOUTH			EAST			
	Baker St			Felton Rd			Baker St			Felton Rd			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1515	10	19	15	3	3	6	33	22	13	21	5	17	167
1515 - 1530	3	13	25	2	0	5	28	22	10	9	0	20	137
1530 - 1545	4	12	17	58	1	51	9	24	5	2	2	6	191
1545 - 1600	1	6	3	5	0	18	8	21	6	2	2	3	75
1600 - 1615	5	9	9	9	0	9	3	9	7	3	0	1	64
1615 - 1630	6	3	6	8	0	8	7	17	8	7	0	2	72
1630 - 1645	15	4	8	8	0	4	5	16	5	18	0	17	100
1645 - 1700	3	8	9	2	0	4	5	12	3	12	0	8	66
1700 - 1715	4	12	6	6	1	6	8	22	1	7	0	6	79
1715 - 1730	6	8	9	6	1	3	15	24	1	7	0	6	86
1730 - 1745	2	2	4	2	0	11	11	16	1	5	1	1	56
1745 - 1800	4	9	1	2	0	4	6	16	3	2	0	2	49
Period End	63	105	112	111	6	129	138	221	63	95	10	89	1142

Client : Craig Hazell Traffic Solutions P/L

Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd

Day/Date : Tuesday : 13th May 2014

Lights

Lights	NORTH			WEST			SOUTH			EAST			
	Baker St			Felton Rd			Baker St			Felton Rd			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1600	18	39	60	68	4	80	78	83	32	34	9	43	548
1515 - 1615	13	36	54	74	1	83	48	73	27	16	4	29	458
1530 - 1630	16	29	35	80	1	86	27	70	26	14	4	12	400
1545 - 1645	27	22	26	30	0	39	23	62	26	30	2	23	310
1600 - 1700	29	24	32	27	0	25	20	54	23	40	0	28	302
1615 - 1715	28	27	29	24	1	22	25	67	17	44	0	33	317
1630 - 1730	28	32	32	22	2	17	33	74	10	44	0	37	331
1645 - 1745	15	30	28	16	2	24	39	74	6	31	1	21	287
1700 - 1800	16	31	20	16	2	24	40	78	6	21	1	15	270

PEAK HOUR	18	39	60	68	4	80	78	83	32	34	9	43	548
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Heavies

Heavies	NORTH			WEST			SOUTH			EAST			TOT
	Baker St			Felton Rd			Baker St			Felton Rd			
Peak Per	<u>L</u>	<u>T</u>	<u>R</u>	<u>L</u>	<u>T</u>	<u>R</u>	<u>L</u>	<u>T</u>	<u>R</u>	<u>L</u>	<u>T</u>	<u>R</u>	
1500 - 1600	0	11	0	0	0	0	0	6	2	0	0	3	22
1515 - 1615	0	4	0	0	0	0	0	3	1	0	0	1	9
1530 - 1630	0	1	0	0	0	0	0	1	0	0	0	0	2
1545 - 1645	0	0	0	0	0	0	0	1	0	0	0	0	1
1600 - 1700	0	0	0	0	0	0	0	0	0	0	0	0	0
1615 - 1715	0	0	0	0	0	0	0	0	0	0	0	0	0
1630 - 1730	0	0	0	0	0	0	0	0	0	0	0	0	0
1645 - 1745	0	0	0	0	0	0	0	0	0	0	0	0	0
1700 - 1800	0	0	0	0	0	0	0	0	0	0	0	0	0

PEAK HOUR	0	11	0	0	0	0	0	6	2	0	0	3	22
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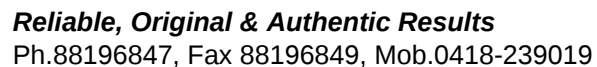
Combined

Combined	NORTH			WEST			SOUTH			EAST			
	Baker St			Felton Rd			Baker St			Felton Rd			
Peak Per	L	I	R	L	I	R	L	I	R	L	I	R	TOT
1500 - 1600	18	50	60	68	4	80	78	89	34	34	9	46	570
1515 - 1615	13	40	54	74	1	83	48	76	28	16	4	30	467
1530 - 1630	16	30	35	80	1	86	27	71	26	14	4	12	402
1545 - 1645	27	22	26	30	0	39	23	63	26	30	2	23	311
1600 - 1700	29	24	32	27	0	25	20	54	23	40	0	28	302
1615 - 1715	28	27	29	24	1	22	25	67	17	44	0	33	317
1630 - 1730	28	32	32	22	2	17	33	74	10	44	0	37	331
1645 - 1745	15	30	28	16	2	24	39	74	6	31	1	21	287
1700 - 1800	16	31	20	16	2	24	40	78	6	21	1	15	270

PEAK HOUR	18	50	60	68	4	80	78	89	34	34	9	46	570
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R.O.A.R. DATA



Baker St

PM PEAK
1500 - 1600

Felton Rd

Felton Rd

N

Vehicle counts for each approach:

- Northbound (top): 203, 194, 9 (left); 0, 60, 60 (left turn); 11, 39, 50 (through); 0, 18, 18 (right turn); 11, 117, 128 (right).
- Southbound (bottom): 201, 193, 8 (left); 78, 78, 0 (left turn); 89, 83, 6 (through); 34, 32, 2 (right turn); 11, 153, 164 (right).
- Eastbound (right): 2, 54, 56 (left); 46, 43, 3 (left turn); 9, 9, 0 (through); 34, 34, 0 (right turn); 89, 86, 3 (right).
- Westbound (left): 0, 152, 152 (left); 0, 68, 68 (left turn); 0, 4, 4 (through); 0, 80, 80 (right turn); 147, 147, 0 (right).

**TOTAL
VOLUMES
FOR COUNT
PERIOD**

Baker St

Baker St

11
269
280

421
412
9

0 246 246 →

2 130 132 →

Felton Rd

Felton Rd

← 260 260 0

← 194 191 3

422
414
8

11
318
329

Baker St

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R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hill
Day/Date : Tues 13th May 2014

PEDS	WEST	SOUTH	EAST	
Time Per	Felton Rd	West D-Way	Felton Rd	TOT
0630 - 0645				0
0645 - 0700				0
0700 - 0715				0
0715 - 0730	Not	Not	Not	0
0730 - 0745	Required	Required	Required	0
0745 - 0800				0
0800 - 0815				0
0815 - 0830				0
0830 - 0845				0
0845 - 0900				0
0900 - 0915				0
0915 - 0930				0
Per End	0	0	0	0

PEDS	WEST	SOUTH	EAST	
Peak Per	Felton Rd	West D-Way	Felton Rd	TOT
0630 - 0730	0	0	0	0
0645 - 0745	0	0	0	0
0700 - 0800	0	0	0	0
0715 - 0815	0	0	0	0
0730 - 0830	0	0	0	0
0745 - 0845	0	0	0	0
0800 - 0900	0	0	0	0
0815 - 0915	0	0	0	0
0830 - 0930	0	0	0	0

PEAK HR	0	0	0	0
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Lights	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645		1	0	0	0		1
0645 - 0700		0	0	0	0		0
0700 - 0715		0	0	0	0		0
0715 - 0730		0	0	0	1		1
0730 - 0745		3	0	0	0		3
0745 - 0800		2	0	0	1		3
0800 - 0815		1	0	0	3		4
0815 - 0830		0	0	0	0		0
0830 - 0845		1	0	0	0		1
0845 - 0900		0	0	0	0		0
0900 - 0915		0	1	0	0		1
0915 - 0930		0	0	0	0		0
Per End	0	8	1	0	5	0	14

Heavies	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645		0	0	0	0		0
0645 - 0700		0	0	0	0		0
0700 - 0715		0	0	0	0		0
0715 - 0730		0	0	0	0		0
0730 - 0745		0	0	0	0		0
0745 - 0800		0	0	0	0		0
0800 - 0815		0	0	0	0		0
0815 - 0830		0	0	0	0		0
0830 - 0845		0	0	0	0		0
0845 - 0900		0	0	0	0		0
0900 - 0915		0	0	0	0		0
0915 - 0930		0	0	0	0		0
Per End	0	0	0	0	0	0	0

Combined	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Time Per	I	R	L	R	L	I	TOT
0630 - 0645	0	1	0	0	0	0	1
0645 - 0700	0	0	0	0	0	0	0
0700 - 0715	0	0	0	0	0	0	0
0715 - 0730	0	0	0	0	1	0	1
0730 - 0745	0	3	0	0	0	0	3
0745 - 0800	0	2	0	0	1	0	3
0800 - 0815	0	1	0	0	3	0	4
0815 - 0830	0	0	0	0	0	0	0
0830 - 0845	0	1	0	0	0	0	1
0845 - 0900	0	0	0	0	0	0	0
0900 - 0915	0	0	1	0	0	0	1
0915 - 0930	0	0	0	0	0	0	0
Per End	0	8	1	0	5	0	14

Lights	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	0	1	0	0	1	0	2
0645 - 0745	0	3	0	0	1	0	4
0700 - 0800	0	5	0	0	2	0	7
0715 - 0815	0	6	0	0	5	0	11
0730 - 0830	0	6	0	0	4	0	10
0745 - 0845	0	4	0	0	4	0	8
0800 - 0900	0	2	0	0	3	0	5
0815 - 0915	0	1	1	0	0	0	2
0830 - 0930	0	1	1	0	0	0	2

Heavies	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	0	0	0	0	0	0	0
0645 - 0745	0	0	0	0	0	0	0
0700 - 0800	0	0	0	0	0	0	0
0715 - 0815	0	0	0	0	0	0	0
0730 - 0830	0	0	0	0	0	0	0
0745 - 0845	0	0	0	0	0	0	0
0800 - 0900	0	0	0	0	0	0	0
0815 - 0915	0	0	0	0	0	0	0
0830 - 0930	0	0	0	0	0	0	0

Combined	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Peak Per	I	R	L	R	L	I	TOT
0630 - 0730	0	1	0	0	1	0	2
0645 - 0745	0	3	0	0	1	0	4
0700 - 0800	0	5	0	0	2	0	7
0715 - 0815	0	6	0	0	5	0	11
0730 - 0830	0	6	0	0	4	0	10
0745 - 0845	0	4	0	0	4	0	8
0800 - 0900	0	2	0	0	3	0	5
0815 - 0915	0	1	1	0	0	0	2
0830 - 0930	0	1	1	0	0	0	2

PEAK HR	0	6	0	0	5	0	11
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PEAK HR	0	0	0	0	0	0	0
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PEAK HR	0	6	0	0	5	0	11
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R.O.A.R. DATA

Reliable, Original & Authentic Results

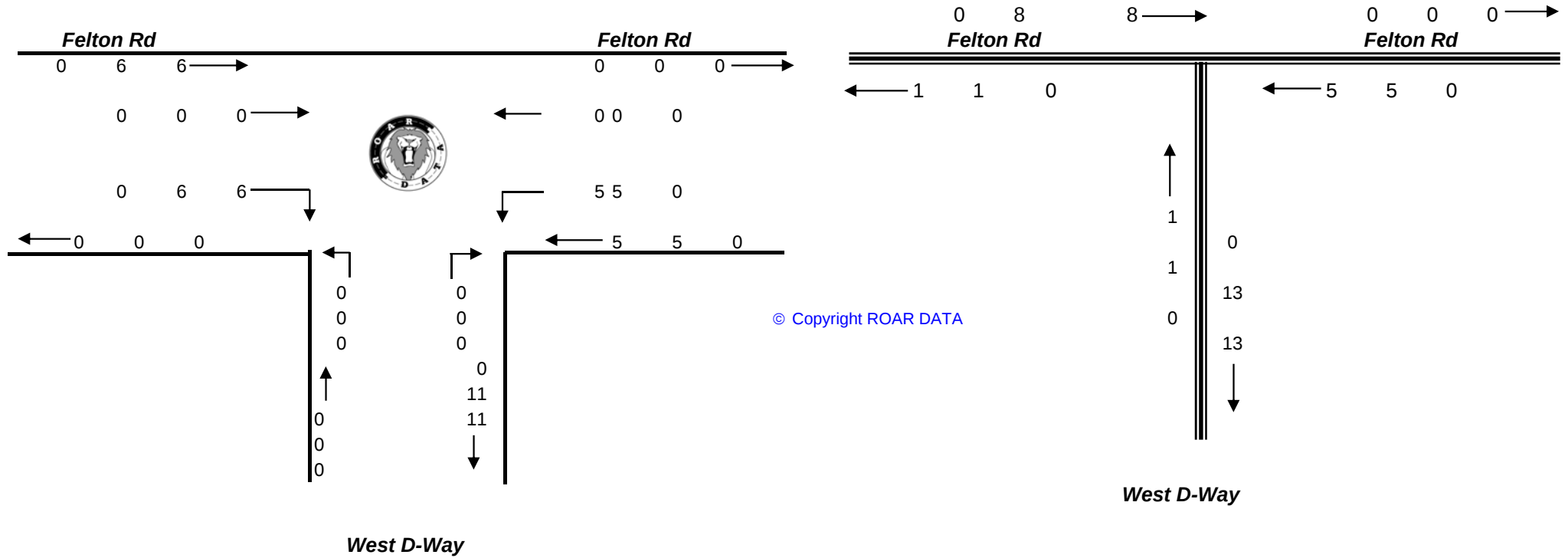
Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd



AM PEAK
0715 - 0815



TOTAL VOLUMES
FOR COUNT
PERIOD





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hill
Day/Date : Tues 13th May 2014

PEDS	WEST	SOUTH	EAST	
Time Per	Felton Rd	West D-Way	Felton Rd	TOT
1500 - 1515				0
1515 - 1530				0
1530 - 1545				0
1545 - 1600	Not	Not	Not	0
1600 - 1615	Required	Required	Required	0
1615 - 1630				0
1630 - 1645				0
1645 - 1700				0
1700 - 1715				0
1715 - 1730				0
1730 - 1745				0
1745 - 1800				0
Per End	0	0	0	0

PEDS	WEST	SOUTH	EAST	
Peak Per	Felton Rd	West D-Way	Felton Rd	TOT
1500 - 1600	0	0	0	0
1515 - 1615	0	0	0	0
1530 - 1630	0	0	0	0
1545 - 1645	0	0	0	0
1600 - 1700	0	0	0	0
1615 - 1715	0	0	0	0
1630 - 1730	0	0	0	0
1645 - 1745	0	0	0	0
1700 - 1800	0	0	0	0

PEAK HR	0	0	0	0
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Lights	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Time Per	I	R	L	R	L	I	TOT
1500 - 1515		1	1	0	0		2
1515 - 1530		0	0	0	0		0
1530 - 1545		0	1	0	0		1
1545 - 1600		1	0	0	0		1
1600 - 1615		0	0	0	0		0
1615 - 1630		0	1	1	0		2
1630 - 1645		1	0	0	0		1
1645 - 1700		0	1	0	0		1
1700 - 1715		0	0	1	0		1
1715 - 1730		1	2	1	0		4
1730 - 1745		0	1	2	0		3
1745 - 1800		0	0	0	0		0
Per End	0	4	7	5	0	0	16

Heavies	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Time Per	I	R	L	R	L	I	TOT
1500 - 1515		0	0	0	0		0
1515 - 1530		0	0	0	0		0
1530 - 1545		0	0	0	0		0
1545 - 1600		0	0	0	0		0
1600 - 1615		0	0	0	0		0
1615 - 1630		0	0	0	0		0
1630 - 1645		0	0	0	0		0
1645 - 1700		0	0	0	0		0
1700 - 1715		0	0	0	0		0
1715 - 1730		0	0	0	0		0
1730 - 1745		0	0	0	0		0
1745 - 1800		0	0	0	0		0
Per End	0	0	0	0	0	0	0

Combined	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Time Per	I	R	L	R	L	I	TOT
1500 - 1515	0	1	1	0	0	0	2
1515 - 1530	0	0	0	0	0	0	0
1530 - 1545	0	0	1	0	0	0	1
1545 - 1600	0	1	0	0	0	0	1
1600 - 1615	0	0	0	0	0	0	0
1615 - 1630	0	0	1	1	0	0	2
1630 - 1645	0	1	0	0	0	0	1
1645 - 1700	0	0	1	0	0	0	1
1700 - 1715	0	0	0	1	0	0	1
1715 - 1730	0	1	2	1	0	0	4
1730 - 1745	0	0	1	2	0	0	3
1745 - 1800	0	0	0	0	0	0	0
Per End	0	4	7	5	0	0	16

Lights	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Peak Per	I	R	L	R	L	I	TOT
1500 - 1600	0	2	2	0	0	0	4
1515 - 1615	0	1	1	0	0	0	2
1530 - 1630	0	1	2	1	0	0	4
1545 - 1645	0	2	1	1	0	0	4
1600 - 1700	0	1	2	1	0	0	4
1615 - 1715	0	1	2	2	0	0	5
1630 - 1730	0	2	3	2	0	0	7
1645 - 1745	0	1	4	4	0	0	9
1700 - 1800	0	1	3	4	0	0	8

Heavies	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Peak Per	I	R	L	R	L	I	TOT
1500 - 1600	0	0	0	0	0	0	0
1515 - 1615	0	0	0	0	0	0	0
1530 - 1630	0	0	0	0	0	0	0
1545 - 1645	0	0	0	0	0	0	0
1600 - 1700	0	0	0	0	0	0	0
1615 - 1715	0	0	0	0	0	0	0
1630 - 1730	0	0	0	0	0	0	0
1645 - 1745	0	0	0	0	0	0	0
1700 - 1800	0	0	0	0	0	0	0

Combined	WEST		SOUTH		EAST		
	Felton Rd		West D-Way		Felton Rd		
Peak Per	I	R	L	R	L	I	TOT
1500 - 1600	0	2	2	0	0	0	4
1515 - 1615	0	1	1	0	0	0	2
1530 - 1630	0	1	2	1	0	0	4
1545 - 1645	0	2	1	1	0	0	4
1600 - 1700	0	1	2	1	0	0	4
1615 - 1715	0	1	2	2	0	0	5
1630 - 1730	0	2	3	2	0	0	7
1645 - 1745	0	1	4	4	0	0	9
1700 - 1800	0	1	3	4	0	0	8

PEAK HR	0	1	4	4	0	0	9
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PEAK HR	0	0	0	0	0	0	0
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PEAK HR	0	1	4	4	0	0	9
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R.O.A.R. DATA

Reliable, Original & Authentic Results

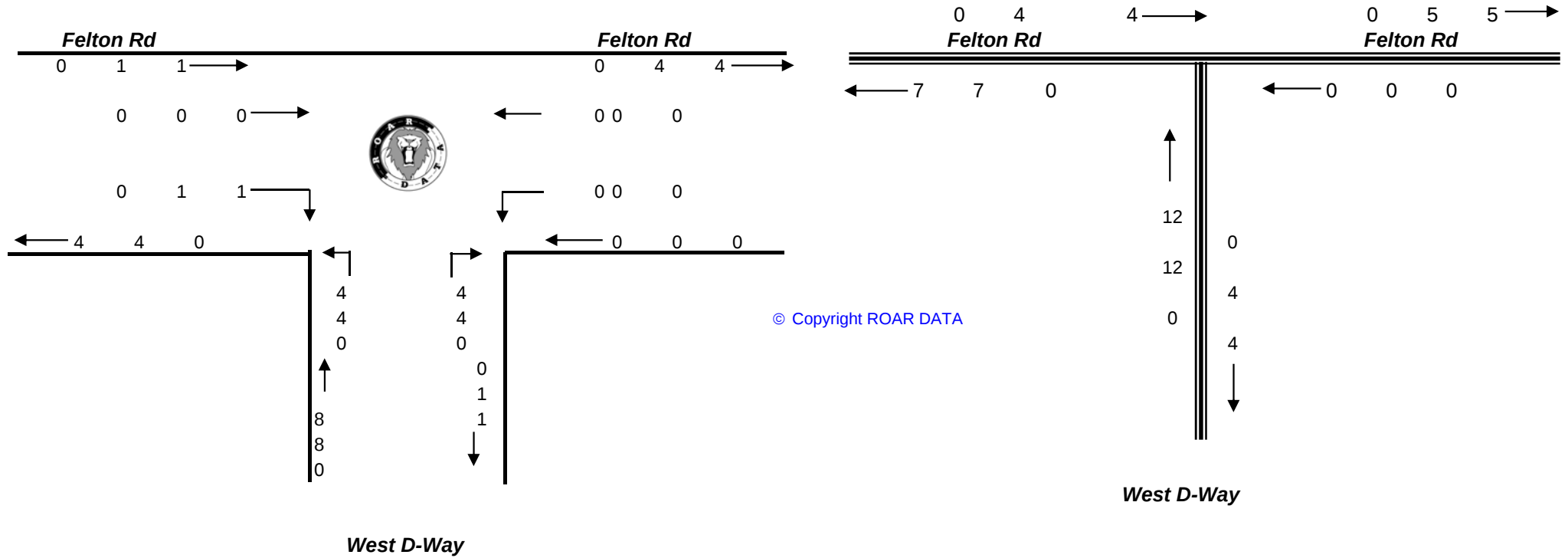
Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd



PM PEAK
1645 - 1745



TOTAL VOLUMES
FOR COUNT
PERIOD





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd
Day/Date : Tues 13th May 2014

PEDS	WEST	SOUTH	EAST	
Time Per	Felton Rd	East D-Way	Felton Rd	TOT
0630 - 0645	0	0	0	0
0645 - 0700	0	0	0	0
0700 - 0715	0	1	0	1
0715 - 0730	0	0	0	0
0730 - 0745	0	0	0	0
0745 - 0800	0	0	0	0
0800 - 0815	0	2	0	2
0815 - 0830	0	3	0	3
0830 - 0845	0	7	0	7
0845 - 0900	0	9	0	9
0900 - 0915	0	6	0	6
0915 - 0930	0	3	0	3
Per End	0	31	0	31

PEDS	WEST	SOUTH	EAST	
Peak Per	Felton Rd	East D-Way	Felton Rd	TOT
0630 - 0730	0	1	0	1
0645 - 0745	0	1	0	1
0700 - 0800	0	1	0	1
0715 - 0815	0	2	0	2
0730 - 0830	0	5	0	5
0745 - 0845	0	12	0	12
0800 - 0900	0	21	0	21
0815 - 0915	0	25	0	25
0830 - 0930	0	25	0	25

PEAK HR	0	12	0	12
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Lights	WEST		SOUTH		EAST		
Time Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
0630 - 0645		0	0				0
0645 - 0700		0	0				0
0700 - 0715		0	0				0
0715 - 0730		1	1				2
0730 - 0745		0	0				0
0745 - 0800		1	2				3
0800 - 0815		1	4				5
0815 - 0830		2	1				3
0830 - 0845		1	0				1
0845 - 0900		1	0				1
0900 - 0915		0	0				0
0915 - 0930		0	0				0
Per End	0	7	8	0	0	0	15

Heavies	WEST		SOUTH		EAST		
Time Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
0630 - 0645		0	0				0
0645 - 0700		0	0				0
0700 - 0715		0	0				0
0715 - 0730		0	0				0
0730 - 0745		0	0				0
0745 - 0800		0	0				0
0800 - 0815		0	0				0
0815 - 0830		0	0				0
0830 - 0845		0	0				0
0845 - 0900		0	0				0
0900 - 0915		0	0				0
0915 - 0930		0	0				0
Per End	0	0	0	0	0	0	0

Combined	WEST		SOUTH		EAST		
Time Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
0630 - 0645	0	0	0	0	0	0	0
0645 - 0700	0	0	0	0	0	0	0
0700 - 0715	0	0	0	0	0	0	0
0715 - 0730	0	1	1	0	0	0	2
0730 - 0745	0	0	0	0	0	0	0
0745 - 0800	0	1	2	0	0	0	3
0800 - 0815	0	1	4	0	0	0	5
0815 - 0830	0	2	1	0	0	0	3
0830 - 0845	0	1	0	0	0	0	1
0845 - 0900	0	1	0	0	0	0	1
0900 - 0915	0	0	0	0	0	0	0
0915 - 0930	0	0	0	0	0	0	0
Per End	0	7	8	0	0	0	15

Lights	WEST		SOUTH		EAST		
Peak Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
0630 - 0730	0	1	1	0	0	0	2
0645 - 0745	0	1	1	0	0	0	2
0700 - 0800	0	2	3	0	0	0	5
0715 - 0815	0	3	7	0	0	0	10
0730 - 0830	0	4	7	0	0	0	11
0745 - 0845	0	5	7	0	0	0	12
0800 - 0900	0	5	5	0	0	0	10
0815 - 0915	0	4	1	0	0	0	5
0830 - 0930	0	2	0	0	0	0	2

Heavies	WEST		SOUTH		EAST		
Peak Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
0630 - 0730	0	0	0	0	0	0	0
0645 - 0745	0	0	0	0	0	0	0
0700 - 0800	0	0	0	0	0	0	0
0715 - 0815	0	0	0	0	0	0	0
0730 - 0830	0	0	0	0	0	0	0
0745 - 0845	0	0	0	0	0	0	0
0800 - 0900	0	0	0	0	0	0	0
0815 - 0915	0	0	0	0	0	0	0
0830 - 0930	0	0	0	0	0	0	0

Combined	WEST		SOUTH		EAST		
Peak Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
0630 - 0730	0	1	1	0	0	0	2
0645 - 0745	0	1	1	0	0	0	2
0700 - 0800	0	2	3	0	0	0	5
0715 - 0815	0	3	7	0	0	0	10
0730 - 0830	0	4	7	0	0	0	11
0745 - 0845	0	5	7	0	0	0	12
0800 - 0900	0	5	5	0	0	0	10
0815 - 0915	0	4	1	0	0	0	5
0830 - 0930	0	2	0	0	0	0	2

PEAK HR	0	5	7	0	0	0	12
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PEAK HR	0	0	0	0	0	0	0
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PEAK HR	0	5	7	0	0	0	12
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R.O.A.R. DATA

Reliable, Original & Authentic Results

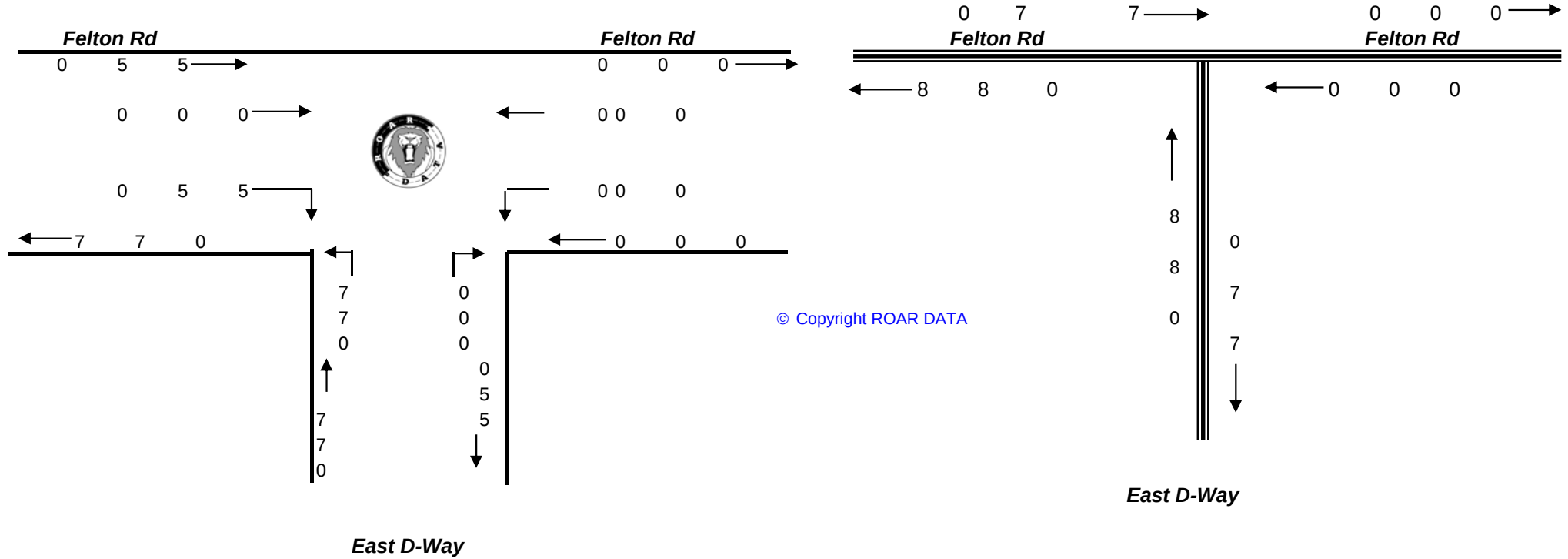
Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd



AM PEAK
0745 - 0845



TOTAL VOLUMES
FOR COUNT
PERIOD





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd
Day/Date : Tuesday 13th May 2014

PEDS	WEST	SOUTH	EAST	
Time Per	Felton Rd	East D-Way	Felton Rd	TOT
1500 - 1515	0	2	0	2
1515 - 1530	0	2	0	2
1530 - 1545	0	9	0	9
1545 - 1600	0	5	0	5
1600 - 1615	0	0	0	0
1615 - 1630	0	0	0	0
1630 - 1645	0	0	0	0
1645 - 1700	0	1	0	1
1700 - 1715	0	0	0	0
1715 - 1730	0	0	0	0
1730 - 1745	0	0	0	0
1745 - 1800	0	0	0	0
Per End	0	19	0	19

PEDS	WEST	SOUTH	EAST	
Peak Per	Felton Rd	East D-Way	Felton Rd	TOT
1500 - 1600	0	18	0	18
1515 - 1615	0	16	0	16
1530 - 1630	0	14	0	14
1545 - 1645	0	5	0	5
1600 - 1700	0	1	0	1
1615 - 1715	0	1	0	1
1630 - 1730	0	1	0	1
1645 - 1745	0	1	0	1
1700 - 1800	0	0	0	0

PEAK HR	0	0	0	0
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Lights	WEST		SOUTH		EAST		
Time Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
1500 - 1515		1	0				1
1515 - 1530		1	0				1
1530 - 1545		1	1				2
1545 - 1600		2	1				3
1600 - 1615		0	2				2
1615 - 1630		1	1				2
1630 - 1645		1	2				3
1645 - 1700		2	1				3
1700 - 1715		4	1				5
1715 - 1730		2	1				3
1730 - 1745		2	4				6
1745 - 1800		1	2				3
Per End	0	18	16	0	0	0	34

Heavies	WEST		SOUTH		EAST		
Time Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
1500 - 1515		0	0				0
1515 - 1530		0	0				0
1530 - 1545		0	0				0
1545 - 1600		0	0				0
1600 - 1615		0	0				0
1615 - 1630		0	0				0
1630 - 1645		0	0				0
1645 - 1700		0	0				0
1700 - 1715		0	0				0
1715 - 1730		0	0				0
1730 - 1745		0	0				0
1745 - 1800		0	0				0
Per End	0	0	0	0	0	0	0

Combined	WEST		SOUTH		EAST		
Time Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
1500 - 1515	0	1	0	0	0	0	1
1515 - 1530	0	1	0	0	0	0	1
1530 - 1545	0	1	1	0	0	0	2
1545 - 1600	0	2	1	0	0	0	3
1600 - 1615	0	0	2	0	0	0	2
1615 - 1630	0	1	1	0	0	0	2
1630 - 1645	0	1	2	0	0	0	3
1645 - 1700	0	2	1	0	0	0	3
1700 - 1715	0	4	1	0	0	0	5
1715 - 1730	0	2	1	0	0	0	3
1730 - 1745	0	2	4	0	0	0	6
1745 - 1800	0	1	2	0	0	0	3
Per End	0	18	16	0	0	0	34

Lights	WEST		SOUTH		EAST		
Peak Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
1500 - 1600	0	5	2	0	0	0	7
1515 - 1615	0	4	4	0	0	0	8
1530 - 1630	0	4	5	0	0	0	9
1545 - 1645	0	4	6	0	0	0	10
1600 - 1700	0	4	6	0	0	0	10
1615 - 1715	0	8	5	0	0	0	13
1630 - 1730	0	9	5	0	0	0	14
1645 - 1745	0	10	7	0	0	0	17
1700 - 1800	0	9	8	0	0	0	17

Heavies	WEST		SOUTH		EAST		
Peak Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
1500 - 1600	0	0	0	0	0	0	0
1515 - 1615	0	0	0	0	0	0	0
1530 - 1630	0	0	0	0	0	0	0
1545 - 1645	0	0	0	0	0	0	0
1600 - 1700	0	0	0	0	0	0	0
1615 - 1715	0	0	0	0	0	0	0
1630 - 1730	0	0	0	0	0	0	0
1645 - 1745	0	0	0	0	0	0	0
1700 - 1800	0	0	0	0	0	0	0

Combined	WEST		SOUTH		EAST		
Peak Per	Felton Rd		East D-Way		Felton Rd		TOT
	I	R	L	R	L	I	
1500 - 1600	0	5	2	0	0	0	7
1515 - 1615	0	4	4	0	0	0	8
1530 - 1630	0	4	5	0	0	0	9
1545 - 1645	0	4	6	0	0	0	10
1600 - 1700	0	4	6	0	0	0	10
1615 - 1715	0	8	5	0	0	0	13
1630 - 1730	0	9	5	0	0	0	14
1645 - 1745	0	10	7	0	0	0	17
1700 - 1800	0	9	8	0	0	0	17

PEAK HR	0	9	8	0	0	0	17
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PEAK HR	0	0	0	0	0	0	0
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PEAK HR	0	9	8	0	0	0	17
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R.O.A.R. DATA

Reliable, Original & Authentic Results

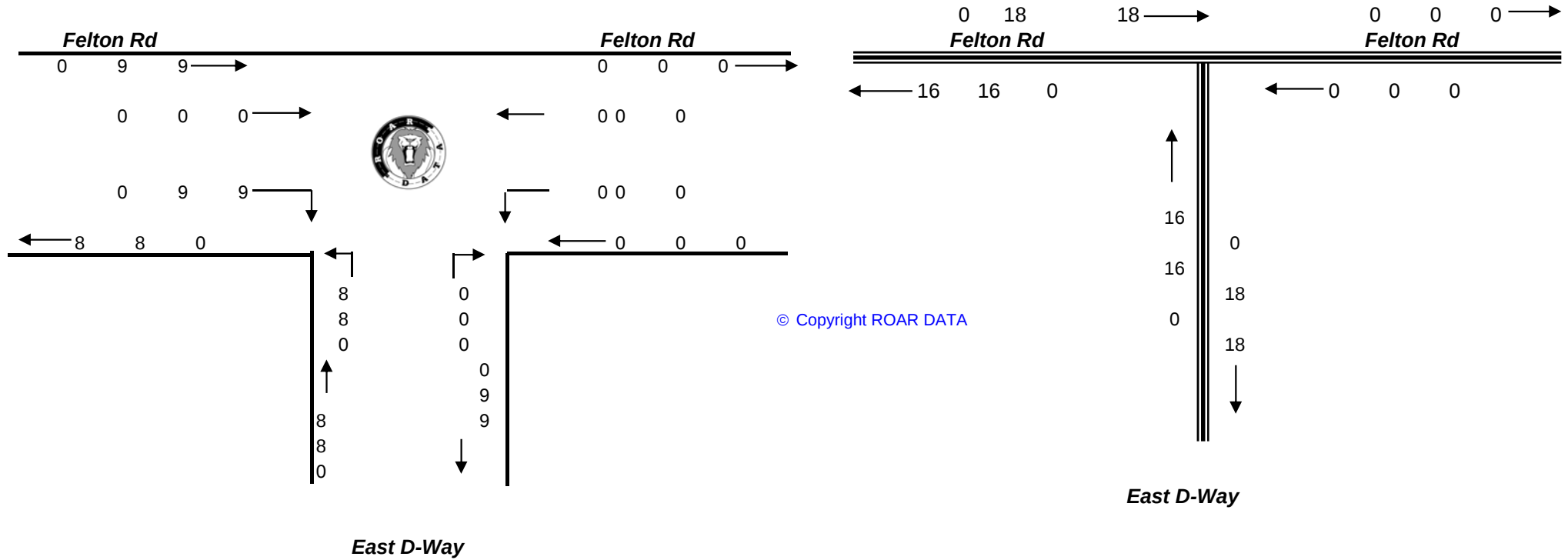
Client : Craig Hazell Traffic Solutions P/L
Job No/Name : 3585 CARLINGFORD 241-245 Pennant Hills Rd



PM PEAK
1700 - 1800



TOTAL VOLUMES
FOR COUNT
PERIOD



APPENDIX B RMS CORRESPONDENCE

From: RATHAN Pahee [Pahee.RATHAN@rms.nsw.gov.au]
Sent: Friday, April 04, 2014 2:48 PM
To: 'Danny Jones'
Subject: RE: 241-245 Pennant Hills Road Carlingford
Attachments: 04042014142744-0001.pdf

Hi Danny,

I refer to your email below regarding the proposed rezoning of land at 241-245 Pennant Hills Road, Carlingford and provides the following comments for your consideration:

1. Please find attached plans showing the road reservation (in grey colour) and land required for road widening (in pink colour).
2. The land included for FSR is determined by the consent authority. However, Roads and Maritime Services (Roads and Maritime) would support your application for the inclusion of land dedicated for road widening in FSR calculations.
3. Roads and Maritime would not object to left-in only garbage vehicle access from Pennant Hills Road to service the site. However, Roads and Maritime may consider a commercial traffic access if a deceleration lane is provided outside the land required for road widening. The access needs to be restricted to left-in and left-out only by means of physical measures.

I trust this information is of assistance.

If you like to discuss this matter further, please call me on 8849 2219.

Regards

Pahee Rathan

Senior Land Use Planner

Land Use | Network & Safety

T 02 8849 2219 F 02 8849 2918

www.rms.nsw.gov.au

Roads and Maritime Services
27 Argyle Street Parramatta NSW 2150 | PO Box 973 PARRAMATTA CBD NSW 2150

From: Danny Jones [<mailto:danny@planningdirection.com.au>]

Sent: Thursday, 27 March 2014 4:41 PM

To: Development Sydney

Subject: 241-245 Pennant Hills Road Carlingford

Hi Pahee

Thank you for your time today- appreciated.

Please find attached our initial planning concept plans. Please note that they will need to be revised to reflect the matters discussed today.

It would be appreciated if you could forward correspondence to me regarding the RTAs position/requirements as soon as possible so that I can progress the proposal with The Hills Council.

Can you confirm the following in your correspondence:

1. The dimensions/area of road widening affecting the southern corner of the site.
2. Confirmation as to whether road widening is required in the northern corner of the site (the area that is zoned B2 rather than proposed road widening). I would assume that if required it would correlate with lots 5 and 6 on the subdivision plan.
3. Confirmation that you support the ability of the developer to utilize the floor space potential of the road widening in the development of the site on the strict proviso that the land required for road widening is dedicated to the RTA as no cost at DA stage. As discussed this will ensure that the developer is not penalized by the road widening affectation, ensures that the RTA gets the widening at no cost, and avoids any potential for protracted negotiations and potential disagreements down the track about land values and compulsory acquisition. Basically it provides a clear cut solution whereby all parties achieve their desired outcome in a simple and straightforward manner.
4. Confirmation on the vehicle access restrictions to Pennant Hills Road. Basically I think the position was that the only access that would be considered was for commercial traffic (only if a slip lane was provided within the site boundaries as determined by the property boundaries after road widening) or garbage vehicle access only from Pennant Hills Road (a slip lane would not be required but the servicing hours would be limited so as not to conflict with peak traffic periods)

Thanks again for your assistance- once I have your response I can refine the design and hold further discussions with Council

Regards Danny
0414254882

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APPENDIX C SIDRA OUTPUT SUMMARY FILES

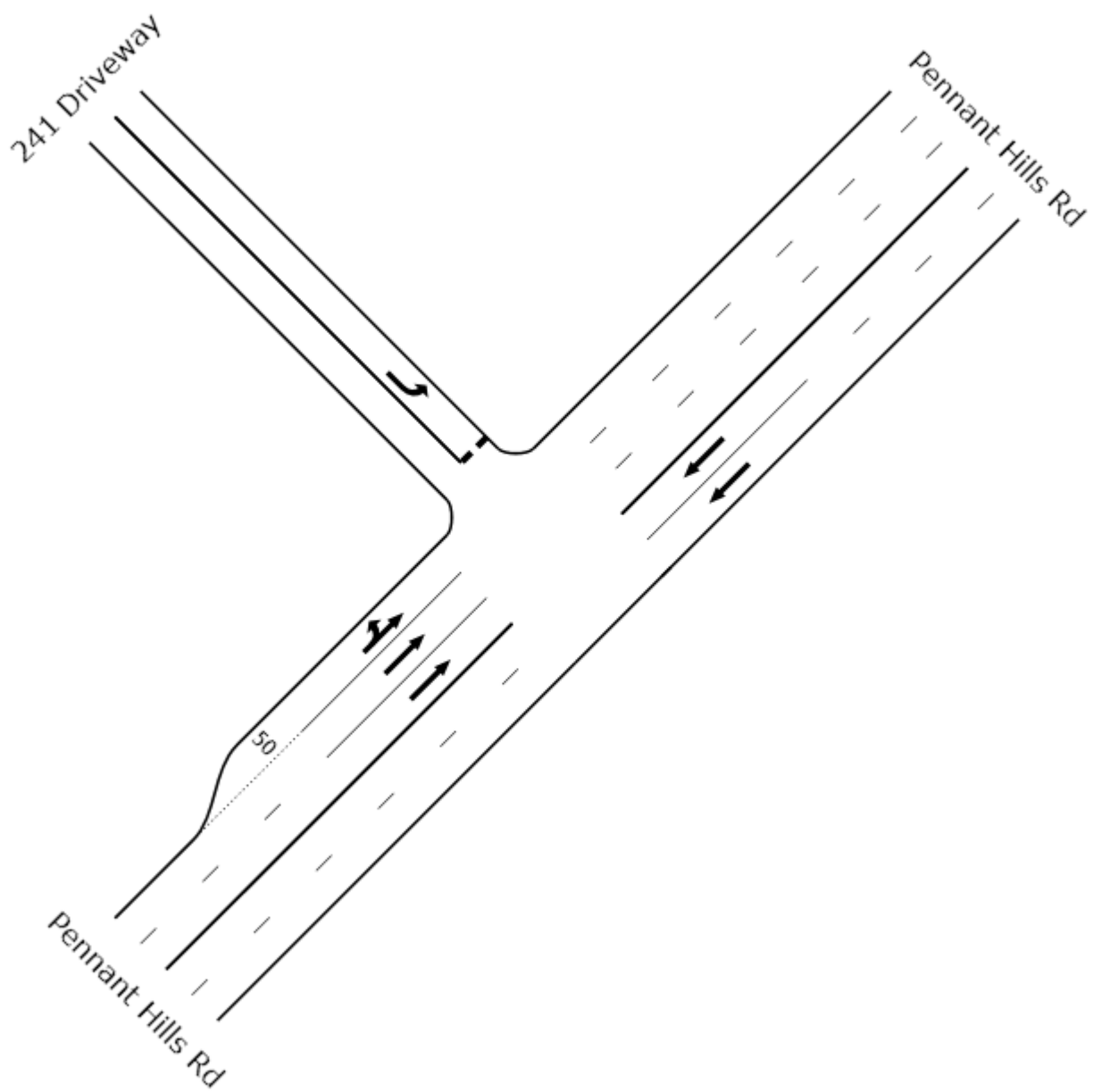


241 Driveway

Pennant Hills Rd

Pennant Hills Rd

50



MOVEMENT SUMMARY

Site: Existing AM Peak

Pennant Hills Road and existing driveway to no. 241
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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
North East: Pennant Hills Rd											
11	T	1922	1.9	0.499	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1922	1.9	0.499	0.0	NA	0.0	0.0	0.00	0.00	60.0
North West: 241 Driveway											
1	L	1	0.0	0.003	19.0	LOS B	0.0	0.1	0.81	0.79	39.4
Approach		1	0.0	0.003	19.0	LOS B	0.0	0.1	0.81	0.79	39.4
South West: Pennant Hills Rd											
4	L	8	0.0	0.340	8.2	LOS A	0.0	0.0	0.00	1.08	49.0
5	T	1945	2.9	0.340	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1954	2.9	0.340	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		3877	2.4	0.499	0.0	NA	0.0	0.1	0.00	0.00	60.0

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

Vehicle movement LOS values are based on average delay per movement

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

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

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Existing PM Peak

Pennant Hills Road and existing driveway to no. 241
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
North East: Pennant Hills Rd											
11	T	1715	2.0	0.445	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1715	2.0	0.445	0.0	NA	0.0	0.0	0.00	0.00	60.0
North West: 241 Driveway											
1	L	13	0.0	0.056	24.3	LOS B	0.2	1.3	0.87	0.96	35.9
Approach		13	0.0	0.056	24.3	LOS B	0.2	1.3	0.87	0.96	35.9
South West: Pennant Hills Rd											
4	L	2	0.0	0.385	8.2	LOS A	0.0	0.0	0.00	1.09	49.0
5	T	2235	0.9	0.385	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		2237	0.9	0.385	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		3964	1.4	0.445	0.1	NA	0.2	1.3	0.00	0.00	59.9

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

Vehicle movement LOS values are based on average delay per movement

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

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

SIDRA Standard Delay Model used.

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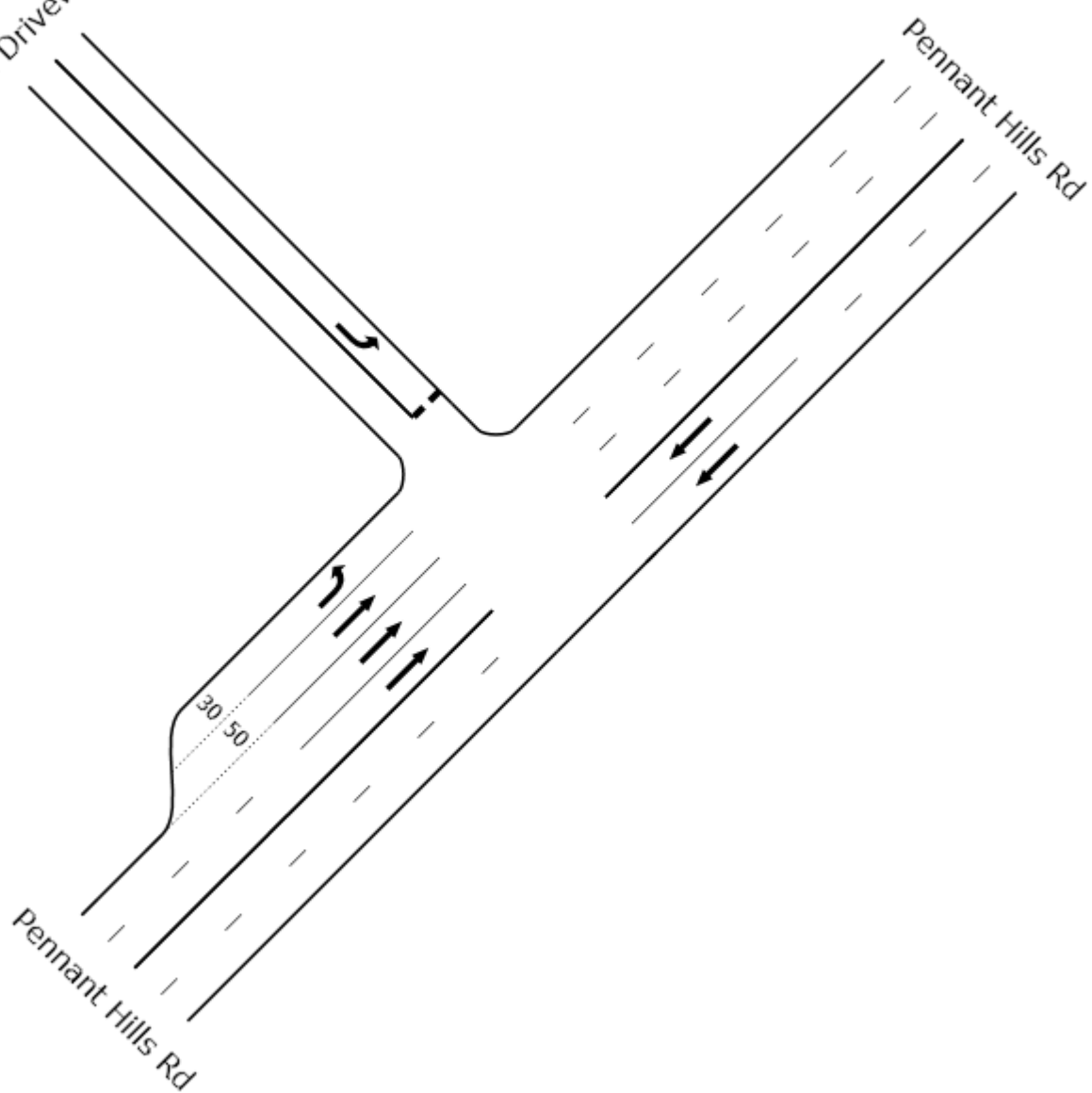


241 Driveway

Pennant Hills Rd

Pennant Hills Rd

30 50



MOVEMENT SUMMARY

Site: Potential AM Peak

Pennant Hills Road and proposed left turn slip lane to no. 241
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
North East: Pennant Hills Rd											
11	T	1922	1.9	0.499	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1922	1.9	0.499	0.0	NA	0.0	0.0	0.00	0.00	60.0
North West: 241 Driveway											
1	L	64	0.0	0.212	21.3	LOS B	0.8	5.4	0.85	0.96	37.8
Approach		64	0.0	0.212	21.3	LOS B	0.8	5.4	0.85	0.96	37.8
South West: Pennant Hills Rd											
4	L	64	0.0	0.035	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	1945	2.9	0.339	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		2009	2.8	0.339	0.3	NA	0.0	0.0	0.00	0.02	59.6
All Vehicles		3996	2.3	0.499	0.5	NA	0.8	5.4	0.01	0.03	59.2

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

Vehicle movement LOS values are based on average delay per movement

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

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

SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: Potential PM Peak

Pennant Hills Road and proposed left turn slip lane to no. 241
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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
North East: Pennant Hills Rd											
11	T	1715	2.0	0.445	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1715	2.0	0.445	0.0	NA	0.0	0.0	0.00	0.00	60.0
North West: 241 Driveway											
1	L	59	0.0	0.270	28.0	LOS B	1.0	6.7	0.90	0.99	33.9
Approach		59	0.0	0.270	28.0	LOS B	1.0	6.7	0.90	0.99	33.9
South West: Pennant Hills Rd											
4	L	60	0.0	0.032	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	2235	0.9	0.384	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		2295	0.9	0.384	0.2	NA	0.0	0.0	0.00	0.02	59.6
All Vehicles		4068	1.4	0.445	0.5	NA	1.0	6.7	0.01	0.02	59.1

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

Vehicle movement LOS values are based on average delay per movement

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

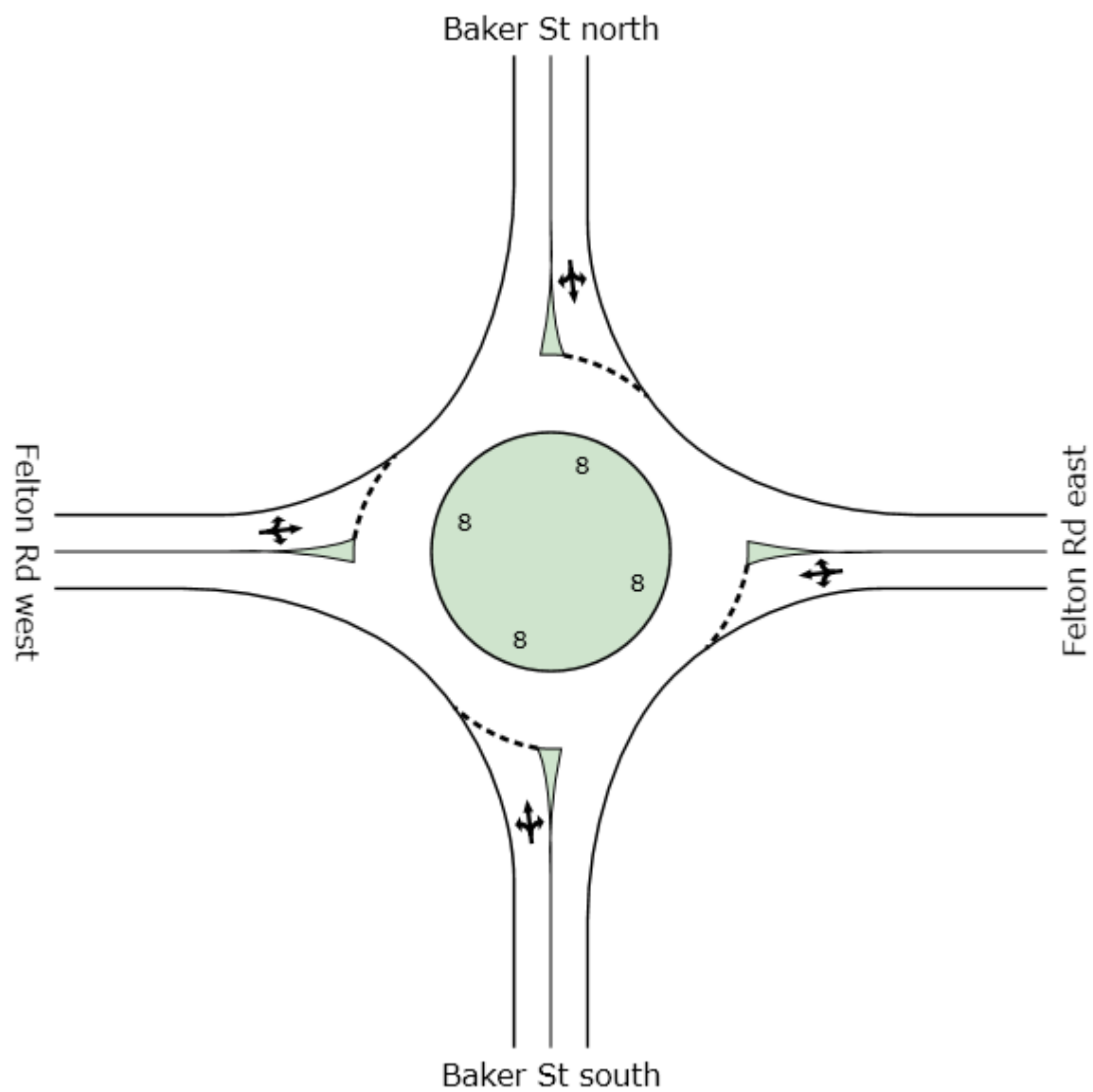
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: Potential AM peak

Felton Rd and Baker St, Carlingford Roundabout with 1-lane

Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: Baker St south											
1	L	107	0.0	0.314	7.6	LOS A	1.9	13.4	0.48	0.65	41.9
2	T	100	0.0	0.314	6.7	LOS A	1.9	13.4	0.48	0.58	42.1
3	R	120	0.0	0.314	10.4	LOS A	1.9	13.4	0.48	0.74	40.3
Approach		327	0.0	0.314	8.4	LOS A	1.9	13.4	0.48	0.66	41.3
East: Felton Rd east											
4	L	147	0.0	0.285	7.9	LOS A	1.7	11.8	0.52	0.66	41.7
5	T	15	0.0	0.285	7.0	LOS A	1.7	11.8	0.52	0.60	41.8
6	R	118	0.0	0.285	10.8	LOS A	1.7	11.8	0.52	0.74	40.0
Approach		280	0.0	0.285	9.1	LOS A	1.7	11.8	0.52	0.69	40.9
North: Baker St north											
7	L	158	0.0	0.326	7.7	LOS A	1.9	13.4	0.49	0.66	41.8
8	T	71	0.0	0.326	6.8	LOS A	1.9	13.4	0.49	0.59	42.0
9	R	95	0.0	0.326	10.6	LOS A	1.9	13.4	0.49	0.75	40.2
Approach		323	0.0	0.326	8.4	LOS A	1.9	13.4	0.49	0.67	41.4
West: Felton Rd west											
10	L	52	0.0	0.187	8.1	LOS A	1.0	7.2	0.52	0.67	41.6
11	T	9	0.0	0.187	7.2	LOS A	1.0	7.2	0.52	0.61	41.7
12	R	114	0.0	0.187	11.0	LOS A	1.0	7.2	0.52	0.74	39.8
Approach		175	0.0	0.187	9.9	LOS A	1.0	7.2	0.52	0.71	40.4
All Vehicles		1105	0.0	0.326	8.8	LOS A	1.9	13.4	0.50	0.68	41.1

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 used.

MOVEMENT SUMMARY

Site: Potential PM peak

Felton Rd and Baker St, Carlingford Roundabout with 1-lane

Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	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: Baker St south											
1	L	82	0.0	0.184	6.7	LOS A	1.0	6.9	0.30	0.59	42.6
2	T	94	0.0	0.184	5.8	LOS A	1.0	6.9	0.30	0.50	43.0
3	R	40	0.0	0.184	9.6	LOS A	1.0	6.9	0.30	0.73	40.8
Approach		216	0.0	0.184	6.8	LOS A	1.0	6.9	0.30	0.57	42.4
East: Felton Rd east											
4	L	32	0.0	0.081	7.1	LOS A	0.4	2.8	0.37	0.59	42.2
5	T	9	0.0	0.081	6.2	LOS A	0.4	2.8	0.37	0.51	42.5
6	R	44	0.0	0.081	10.0	LOS A	0.4	2.8	0.37	0.69	40.5
Approach		85	0.0	0.081	8.5	LOS A	0.4	2.8	0.37	0.63	41.3
North: Baker St north											
7	L	21	0.0	0.126	6.8	LOS A	0.6	4.4	0.31	0.58	42.5
8	T	53	0.0	0.126	5.8	LOS A	0.6	4.4	0.31	0.49	42.9
9	R	63	0.0	0.126	9.6	LOS A	0.6	4.4	0.31	0.71	40.7
Approach		137	0.0	0.126	7.7	LOS A	0.6	4.4	0.31	0.61	41.8
West: Felton Rd west											
10	L	72	0.0	0.149	7.1	LOS A	0.8	5.4	0.37	0.59	42.2
11	T	4	0.0	0.149	6.1	LOS A	0.8	5.4	0.37	0.51	42.5
12	R	84	0.0	0.149	9.9	LOS A	0.8	5.4	0.37	0.69	40.4
Approach		160	0.0	0.149	8.6	LOS A	0.8	5.4	0.37	0.64	41.2
All Vehicles		598	0.0	0.184	7.7	LOS A	1.0	6.9	0.33	0.61	41.8

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 used.