



**488 – 498 OLD NORTHERN ROAD, DURAL
TRAFFIC AND TRANSPORT STUDY**

No.X11039.02

Prepared for Australian United Securities Pty Ltd



ORDINARY MEETING OF COUNCIL

11 DECEMBER, 2012

488 – 498 Old Northern Road, Dural Rezoning Traffic Report

Prepared for Australian United Securities Pty Ltd



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488 – 498 OLD NORTHERN ROAD, DURAL**REZONING TRAFFIC AND TRANSPORT STUDY
FOR AUSTRALIAN UNITED SECURITIES PTY LTD****TABLE OF CONTENTS**

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1 INTRODUCTION

This report has been prepared for Australian United Securities Pty Ltd to present findings of a traffic and transport assessment of the proposed rezoning of rural residential land at 488 – 498 Old Northern Road, Dural to provide a mixed use development.

The study has assessed existing traffic and transport conditions, operating conditions of surrounding intersections, potential access arrangements and future traffic conditions in the event a development was undertaken of the site.

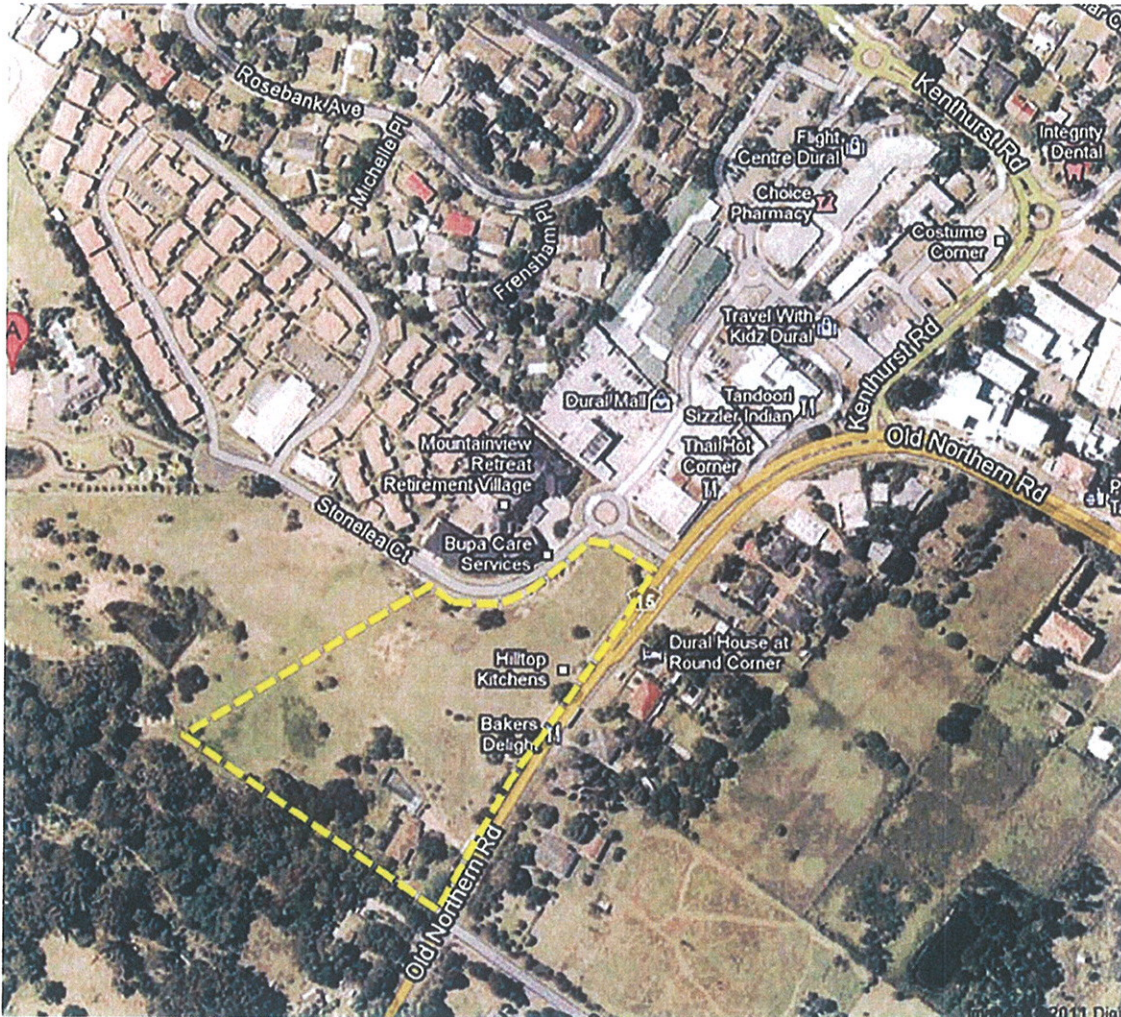
The remainder of the report is set out as follows:

- Section 2 discusses the existing traffic conditions
- Section 3 summarises the consultation undertaken to date with authorities
- Section 4 describes the proposed development;
- Section 5 assesses the potential access arrangements for any new development; and
- Section 6 provides a summary of the investigation and presents the conclusions

2 EXISTING SITUATION

The site is located on the south western corner of Stonelea Court and Old Northern Road and as shown in **Figure 1** below:

Figure 1 - Site Location



Old Northern Road forms the eastern boundary of the site with Stonelea Court forming the northern and a portion of the western boundary. The remainder of the site is bounded by private rural residential dwellings. The site is currently zoned Rural Residential and has a single residence in the south – eastern corner of the site. Old Northern Road runs along the ridgeline through the area.

Towards the southern boundary of the site that site exhibits steep topography to the west. Towards Stonelea Court, the site is generally flat in nature.

2.1 ROAD NETWORK

2.1.1 Classification Criteria

It is usual to classify roads according to a road hierarchy in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry. The RMS has set down the following guidelines for the functional classification of roads.

- Arterial Road – typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour)
- Sub-arterial Road – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour)
- Collector Road – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.
- Local Road – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

2.1.2 Existing Road Network

The existing road network in the vicinity of the proposed development is described below.

Old Northern Road – is the main north-south arterial road through the area linking rural residential areas in the north with Castle Hill in the south. Across the frontage of the site it consists of a single lane of travel in each direction. The intersection of Old Northern Road / Stonelea Court is a priority controlled intersection. Between Stonelea Court and Kenthurst Road, Old Northern Road widens to two travel lanes in each direction through the traffic signals. The posted speed limit in the vicinity of the development is 60km/h.

Stonelea Court – is a local street which provides direct access into the Round Corner shopping precinct. It also provides the route for large articulated vehicles servicing the shopping centre. It is a relatively narrow street, some 9.0m in width kerb to kerb, with a length of only 25m between the intersection with Old Northern Road and the internal roundabout. The road also serves a large seniors living development.

It should be noted that Stonelea Court is a 'private road' south of the roundabout and as such only right of way access is possible with the current rural residential developments. A rezoning of the site would not permit access from Stonelea Court with full consent from adjoining landowners.

2.1.3 Existing Traffic Condition

To examine operating conditions at the critical intersection near the site, traffic counts were undertaken at the following locations

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1. Old Northern Rd / Stonelea Court (T-intersection)
2. Stonelea Court Roundabout (The first roundabout after turning off Old Northern Road)
3. Kenthurst Road / Allen Way (roundabout)

This formed a closed system of counts around the existing Round Corner shopping centre. Counts were undertaken between the hours of 4:00pm – 7:00pm on a Thursday and 10:00am – 1:00pm on a Saturday which as per the RTA Guide to Traffic Generating Developments are considered the peak times of the retail centre.

A copy of the traffic counts are provided in **Appendix A** of this report. Existing peak hour traffic flows are summarised in **Table 1**.

Table 1 - Existing Thurs PM & Sat AM Two Way Flows

Location		Thursday Evening Peak (two way) Vph	Saturday Morning Peak (two way) Vph
Old Northern Road	North of Stonelea Court	1,596	1,503
	South of Stonelea Court	1,583	1,473
Stonelea Court	West of Old Northern Road	299	336
Kenthurst Road	West of Allen Way	1,342	996
	East of Allen Way	1,373	1,225
Allen Way	South of Kenthurst Road	575	741

From **Table 1** it can be seen that existing traffic flows on roads surrounding the development are generally in line with their classification. However, it is noted that the traffic flows on Allen Way are somewhat higher than what would expect for a local street. In reality, the street functions as an access to a shopping centre and thus the peak hour flows for a centre this size are expected.

2.1.4 Intersection Operation

The intersections in the vicinity of the subject site, excluding the hospital access driveways, have been analysed using the Sidra Intersection analysis program. Sidra Intersection determines the average delay that vehicles encounter, the degree of saturation of the intersection, and the level of service. The degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Sidra Intersection provides analysis of the operating conditions which can be compared to the performance criteria set out in Table 2.

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Table 2 – Level of Service Criteria

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

Adapted from RTA Guide to Traffic Generating Developments, 2002.

For roundabouts and priority intersections, the reported average delay is for the individual movement with the highest average delay per vehicle. At signalised intersections, the reported average delay is over all movements. The results of the analysis are presented in Table 3. Average delay is expressed in seconds per vehicle.

Table 3 – Existing Intersection Operating Conditions

Location	Peak	Delay	LOS
Kenthurst Rd- Allen Way	Sat AM	14	A
	Thurs PM	17.7	B
Stonelea Court- Old Northern Road	Sat AM	245.1	F
	Thurs PM	286.6	F
Stonelea Court- Roundabout	Sat AM	11.7	A
	Thurs PM	11.6	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From Table 3 it can be seen intersections in the vicinity of the development site currently operate at a satisfactory level of service except the intersection of Old Northern Road and Stonelea Court which operates at a poor level of service. It should be noted that the above table assumes SIDRA default values for Critical Gap and Follow Up Headway.

Austroads 2009 provides alternative values for Critical Gap and Follow Up Headway when designing the capacity of intersections. Applying these values from Table 3.4 of Austroads 2009 Part 4A would result in the following intersection operating conditions for Old Northern Road and Stonelea Court.

Table 4 - Austroads Critical Gap / Follow Up Headway Values Application

Location	Peak	Delay	LOS
Stonelea Court- Old Northern Road	Sat AM	37.5	C
	Thurs PM	44.4	D

From Table 4 it is noted that application of Austroads values would result in a satisfactory intersection operating conditions. In reality the intersection benefits from the breaks in traffic created by the traffic signals at the intersection of Old Northern Road and Kenthurst Road. The existing intersection operating conditions are considered to be average.

3 CONSULTATION

As part of the assessment of the site, preliminary consultation was undertaken with both representatives of the Hills Shire Council and the NSW Roads and Traffic Authority. It should be noted that these preliminary discussions were not formal pre-rezoning or pre-DA meetings but meetings undertaken in good faith to gauge initial reactions to the proposal.

3.1 THE HILLS SHIRE COUNCIL

The intersection of Old Northern Road and Stonelea Court was identified as an intersection which currently requires improvement and any additional traffic generated by the new development would add to this issue.

Thus the proponent should consider what options may be available to improve this intersection. However, it was acknowledged that the intersection was located close to the existing set of traffic signals at Old Northern Road / Kenthurst Road and signalisation of this intersection would be difficult to achieve.

It should be noted that at the time of this meeting it was not known that Stonelea Court south of the roundabout was under private ownership.

Since the time of this meeting it is understood that access from this road would not be supported by the road owners. Thus, the development has two available public road frontages to provide access. That being Old Northern Road and Stonelea Court between Old Northern Road and the internal roundabout.

Council also expressed interest in improving bus infrastructure for existing roads along Old Northern Road as part of the proposal.

3.2 NSW ROADS AND MARITIME SERVICES

The available access roads were discussed with RMS and there were concerns expressed by the RMS of the limited opportunity to upgrade the intersection of Old Northern Road / Stonelea Court other than installing a centre island and banning right turn movements into and out of Stonelea Court.

The RMS expressed concerns with the future of the surrounding area and the potential for additional traffic and in turn additional traffic demands. However, it was noted the redevelopment of the sites to the west would require approval by the road owners to use Stonelea Court and this was unlikely.

The redevelopment of lands on the eastern side of Old Northern Road was discussed and potential for combined access arrangements to service these lands.

In the end it was the initial view of the RMS that signalled access from Old Northern Road would provide the best opportunity to provide access to the site and upgrading the intersection of Old Northern Road / Stonelea Court should be a secondary consideration.

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In regards to the location of signals, the RMS indicated that preferably the signals should be located at the intersection of Old Northern Road / Franlee Road to provide a four way intersection. However, steep grades of the site near the southern boundary may preclude this from occurring. In addition, signals could be considered north of this intersection in a suitable location between Franlee Road and Stonelea Court.

4 PROPOSED DEVELOPMENT

For the purpose of assessing future traffic conditions in and around the site, the following development scenario has been based on estimates in the planning report¹.

Table 5 - Potential Site Yield

Area	Commercial Development	R3 Medium Density Development
	Site Area 12,000m ²	Site Area 8,000m ²
	- Supermarket 3000m² GFA - Restaurant / Reception Centre 3000m² GFA - Speciality Shops 3000m² GFA	95 persons / hectare = 76 persons 3.5 persons / dwelling = 22 townhouses

In addition, the development has the potential to provide high quality bus facilities for existing bus routes operating in Old Northern Road. This could take the form of bus shelters, real time timetable information and layover space for waiting buses.

On the matter of access, both Old Northern Road and Stonelea Court offer access road opportunities. However, as Stonelea Court south of the existing roundabout is under private ownership, access from this road can only be achieved through concurrence with the owners of the existing retirement village. Overall, access from Old Northern Road should be the focus for the development.

Schematic diagrams of potential site configurations with and without access from Stonelea Court are provided in **Appendix B** of this report.

4.1 TRAFFIC GENERATION

4.1.1 Retail / Commercial

The proposed development would form part of the existing retail / commercial precinct of Round Corner shops which is estimated to have some 15,000-20,000m² in floorspace.

The RTA Guide to Traffic Generating Developments provides traffic generation rates for shopping centres of differing sizes. These are summarised below:

Table 3.1
Peak hour traffic generation rate

Range in Total Floor Area. (GLFA - m ²).	Peak Hour Generation Rate. (vehicles per 100m ² GLFA)		
	Thursday. (V(P)/A)	Friday. (V(P)/A)	Saturday PVT(A)
0 - 10,000	12.3	12.5	16.3
10,000 - 20,000	7.6	6.2	7.5
20,000 - 30,000	5.9	5.6	7.5
30,000 - 40,000	4.6	3.7	6.1

As the proposed development includes some 9,000m² of retail / commercial floorspace, the rate for a centre 20,000-30,000m² has been adopted. Conservatively the restaurant / reception centre has been assumed to operate at the same peak times as the retail / commercial uses.

¹ 488 Old Northern Road Rezoning Planning Report – Brown Consulting December 2011

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4.1.2 Residential

The potential townhouses would function as standalone residencies for the purpose of estimating traffic generation. Therefore the RTA rate for single dwelling houses of 0.85 trips per dwelling has been applied.

4.1.3 Total Traffic Generation

Applying the above traffic generation rates, the development as a whole would generate the following traffic generation:

- Thursday PM:- 504 peak hour trips
- Friday PM:- 486 peak hour trips
- Saturday AM:- 606 peak hour trips

4.1.4 Franlee Road Traffic Generation

It is noted that Franlee Road currently services eight rural residential dwellings. Applying the RTA rate for single dwelling houses, this would equate to seven (7) peak hour trips. As also per the RTA Guide suggestions 80% would travel outbound in the AM peak and 20% would travel inbound. The reverse would occur in the PM peak.

5 ACCESS ARRANGEMENT REVIEW

As per the suggestions of the RMS, traffic signals to provide access to the development site have been assessed. This assessment has been undertaken assuming two access arrangement scenarios. These are:

1. Signalised T-intersection with Old Northern Road between Franlee Road and Stonelea Court, and
2. Four (4) way signalised intersection with Franlee Road.

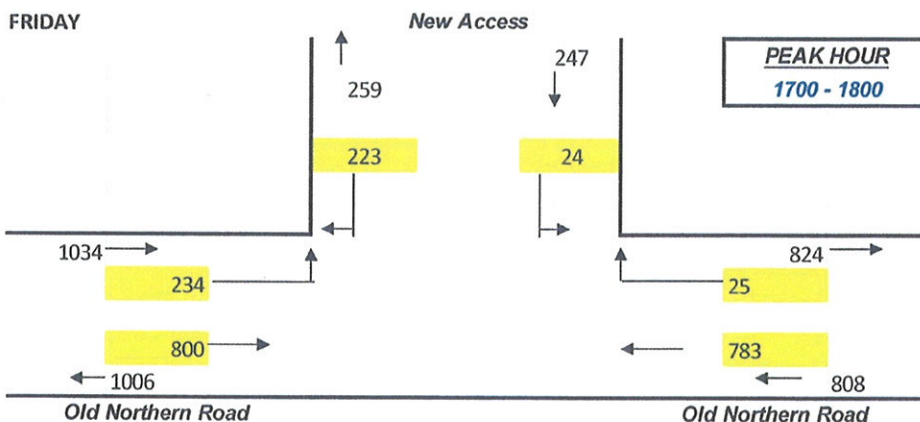
5.1 TRIP DISTRIBUTION

For the purpose of assessing future traffic conditions, it has been assumed that 90% of the traffic generated would travel to / from the south via Old Northern Road. The remainder would travel to / the north. This accounts for the limited development north of the site.

5.2 SCENARIO 1 – T-INTERSECTION ACCESS WITH OLD NORTHERN ROAD

5.2.1 Future traffic flows

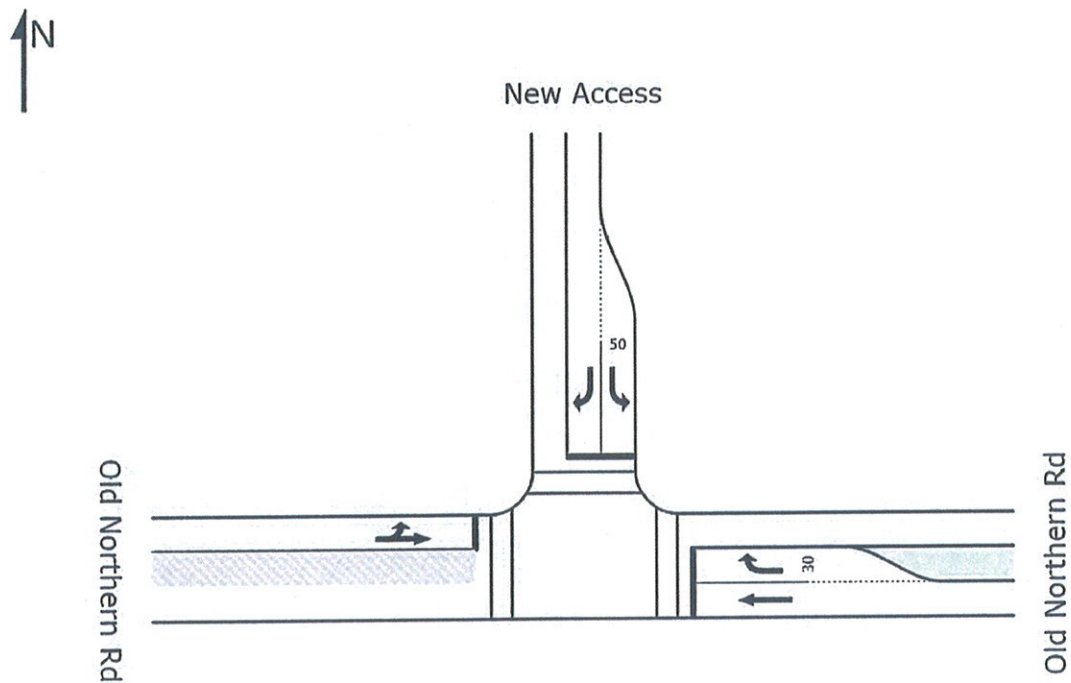
Using the existing count information at nearby intersections and applying the trip distribution assumptions in Section 5.1 would equate to the following future traffic flows at the proposed access.





The following intersection configuration as shown in Figure 2 has been adopted:

Figure 2 - T-Intersection Adopted Configuration



5.2.2 T-Intersection future operation

Future traffic conditions have been assessed using the SIDRA intersection analysis program. The findings of this analysis are presented below:

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Table 6 – T-Intersection Arrangement Future Intersection Operating Conditions

Location	Peak	Delay	LOS
Old Northern Road / Access	Thurs PM	27.7 secs	C
	Sat AM	28.1 secs	C

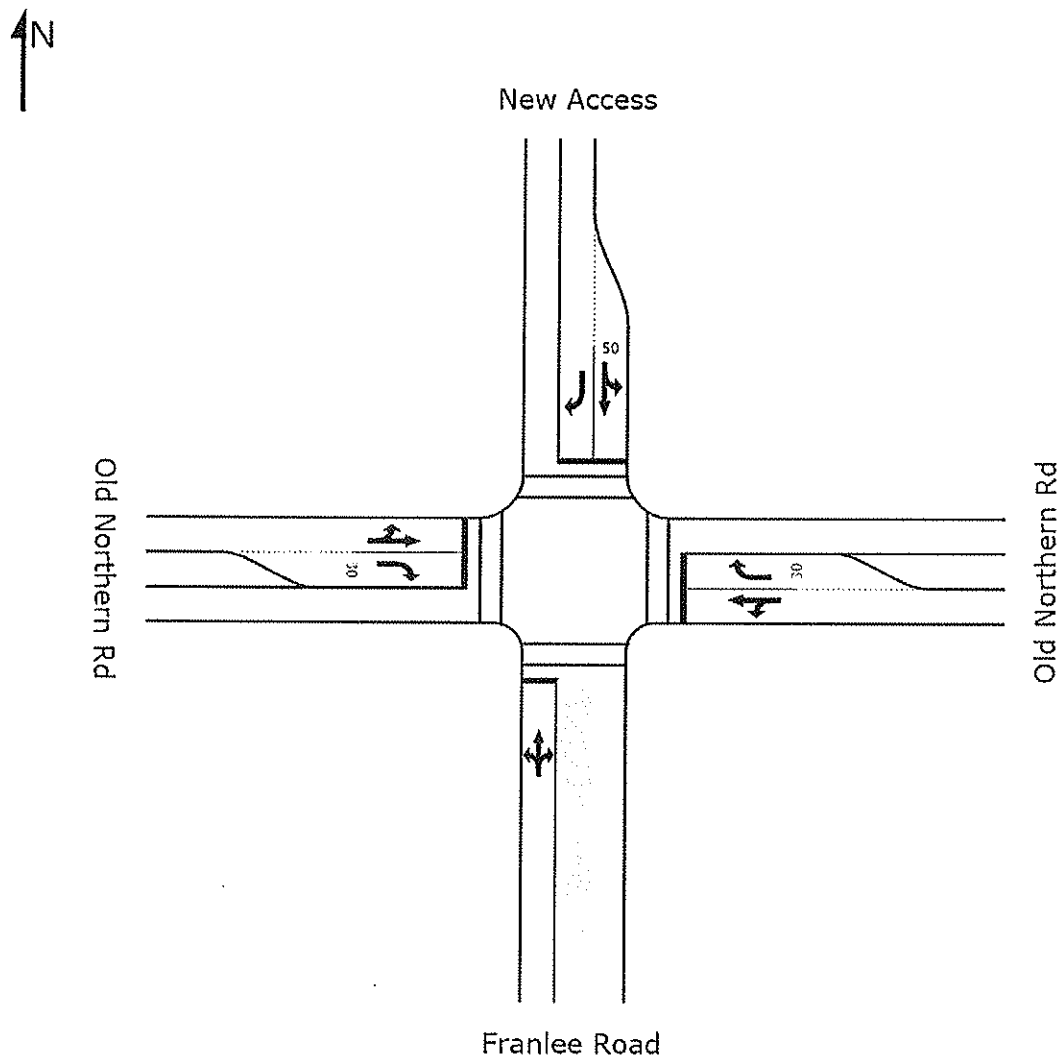
Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From Table 5 it is noted that the proposed access would operate at a satisfactory level of service during both expected peak periods and ultimate development of the site.

5.3 SCENARIO 2 – FOUR WAY INTERSECTION WITH FRANLEE ROAD

In this scenario, the following traffic signal controlled intersection arrangement has been assumed as shown in Figure 3.

Figure 3 – Four (4) Way Intersection with Franlee Road Configuration



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5.3.1 Four Way future intersection operation

The traffic generated by the existing residential dwellings in Franlee Road has been added to the future traffic flows. The same trip distribution as detailed in Section 5.1 has been applied to these vehicles. The future traffic conditions as a four way intersection with Franlee Road have been assessed using the SIDRA intersection analysis program. The findings of this analysis are presented below:

Table 7 – Four Way Arrangement Future Intersection Operating Conditions

Location	Peak	Delay	LOS
Old Northern Road / Access	Thurs PM	19.0 secs	B
	Sat AM	25.8 secs	B

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From Table 7 it is noted that the proposed access would operate at a satisfactory level of service during both expected peak periods and ultimate development of the site.

6 CONCLUSIONS AND RECOMMENDATIONS

This report has assessed the future traffic conditions and potential access arrangements of the proposed rezoning of land known as 488 – 498 Old Northern Road, Dural. The rezoning would permit retail / commercial uses on the site along with some low density housing.

The findings of these investigations are presented below.

1. The traffic generated by the rezoning of the site to allow retail and commercial uses in the form assumed in this report would not impacted markedly on existing traffic conditions.
2. Access to the site should be focused to / from Old Northern Road in the form of traffic signal control.
3. Stonelea Court does offer a potential access to the site subject to approval of the private road owner. However, this access should be limited to the residential uses only with retail / commercial uses access from Old Northern Road.
4. Access from Old Northern Road should be in the form of traffic signal control. This could be either a T-intersection arrangement between Franlee Road or Stonelea Court. Alternatively, a four way signalized intersection arrangement with Franlee Road.
5. Bus infrastructure improvements in the form of improved passenger facilities and layover areas in Old Northern Road should be considered as part of any redevelopment of the site.

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7 APPENDICIES

Appendix A Intersection Counts

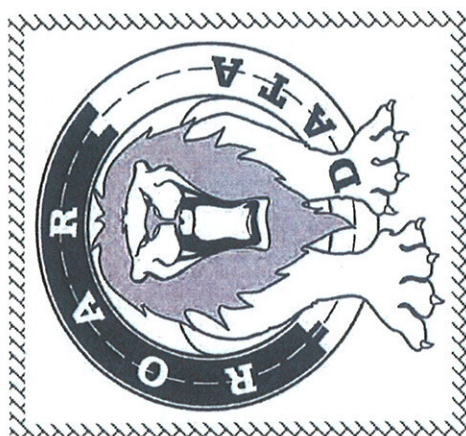
Appendix B Schematic Site Configuration Sketches

APPENDIX A

Intersection Counts

To
Avi Barua
at **Brown Consulting**
your results for
DURAL Mall Surveys
supplied by

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Kenthurst Rd & Allen Way

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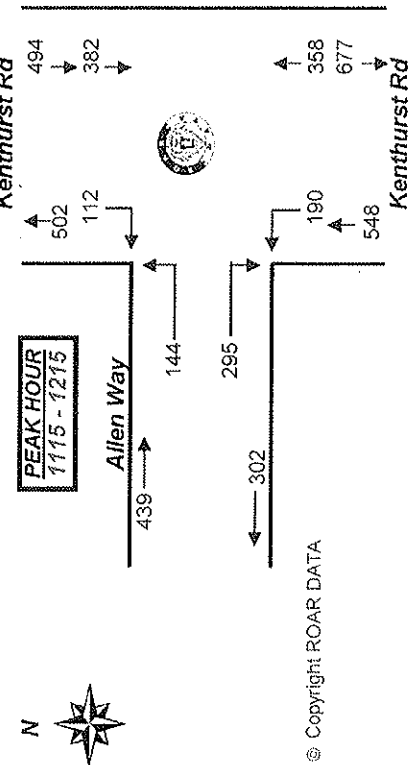
11 DECEMBER, 2012

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 Job No/Name : 3726 DURAL Mall Surveys
 Day/Date : Thursday 18th & Saturday 20th August 2011

All Vehicles

Time Per	NORTH		WEST		SOUTH		SA7
	Kenthurst Rd	I	Allen Way	I	Kenthurst Rd	I	
1000 - 1015	24	134	21	49	51	102	381
1015 - 1030	33	90	40	59	30	93	345
1030 - 1045	35	88	30	52	40	70	315
1045 - 1100	34	112	32	67	45	80	370
1100 - 1115	26	114	30	49	52	68	339
1115 - 1130	24	108	37	83	50	88	390
1130 - 1145	25	81	35	58	53	81	333
1145 - 1200	32	112	31	78	37	86	376
1200 - 1215	31	81	41	76	50	103	382
1215 - 1230	18	85	35	67	36	115	356
1230 - 1245	25	86	43	40	29	77	300
1245 - 1300	23	90	49	65	33	107	367
Period End	330	1181	424	743	506	1070	4254

Peak Per	NORTH		WEST		SOUTH		TOTAL
	Kenthurst Rd	I	Allen Way	I	Kenthurst Rd	I	
1000 - 1100	126	424	123	227	166	345	1411
1015 - 1115	128	404	132	227	167	311	1369
1030 - 1130	119	422	129	251	187	306	1414
1045 - 1145	109	415	134	257	200	317	1432
1100 - 1200	107	415	133	268	192	323	1438
1115 - 1215	112	382	144	295	190	358	1481
1130 - 1230	106	359	142	279	176	385	1447
1145 - 1245	106	364	150	261	152	381	1414
1200 - 1300	97	342	168	248	148	402	1405
PEAK HR	112	382	144	295	190	358	1481

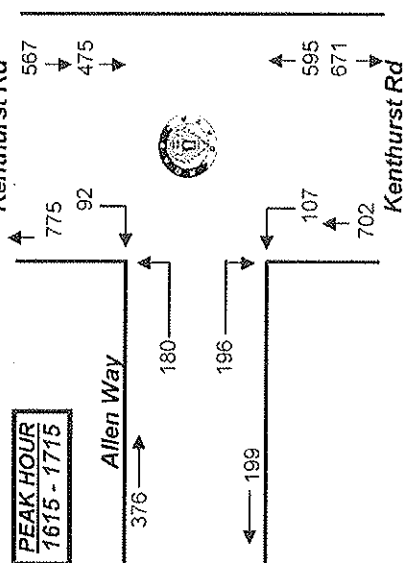


R.O.A.R. DATA
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All Vehicles

Time Per	NORTH		WEST		SOUTH		TOTAL
	Kenthurst Rd	I	Allen Way	I	Kenthurst Rd	I	
1600 - 1615	24	104	52	58	26	120	384
1615 - 1630	19	112	46	53	25	141	396
1630 - 1645	24	138	38	48	21	140	409
1645 - 1700	32	111	45	49	35	162	434
1700 - 1715	17	114	51	46	26	152	406
1715 - 1730	16	95	46	49	15	160	381
1730 - 1745	23	111	45	48	23	163	413
1745 - 1800	21	93	44	31	22	136	347
1800 - 1815	18	103	38	47	21	126	353
1815 - 1830	21	87	31	37	17	120	313
1830 - 1845	12	83	41	32	17	132	317
1845 - 1900	11	47	15	25	10	87	195
Period End	238	1198	492	523	258	1639	4348

Peak Per	NORTH		WEST		SOUTH		TOTAL
	Kenthurst Rd	I	Allen Way	I	Kenthurst Rd	I	
1600 - 1700	99	465	181	208	107	563	1623
1615 - 1715	92	475	180	196	107	595	1645
1630 - 1730	89	458	180	192	97	614	1630
1645 - 1745	88	431	187	192	99	637	1634
1700 - 1800	77	413	186	174	86	611	1547
1715 - 1815	78	402	173	175	81	585	1494
1730 - 1830	83	394	158	163	83	545	1426
1745 - 1845	72	366	154	147	77	514	1330
1800 - 1900	62	320	125	141	65	465	1178
PEAK HR	92	475	180	196	107	595	1645



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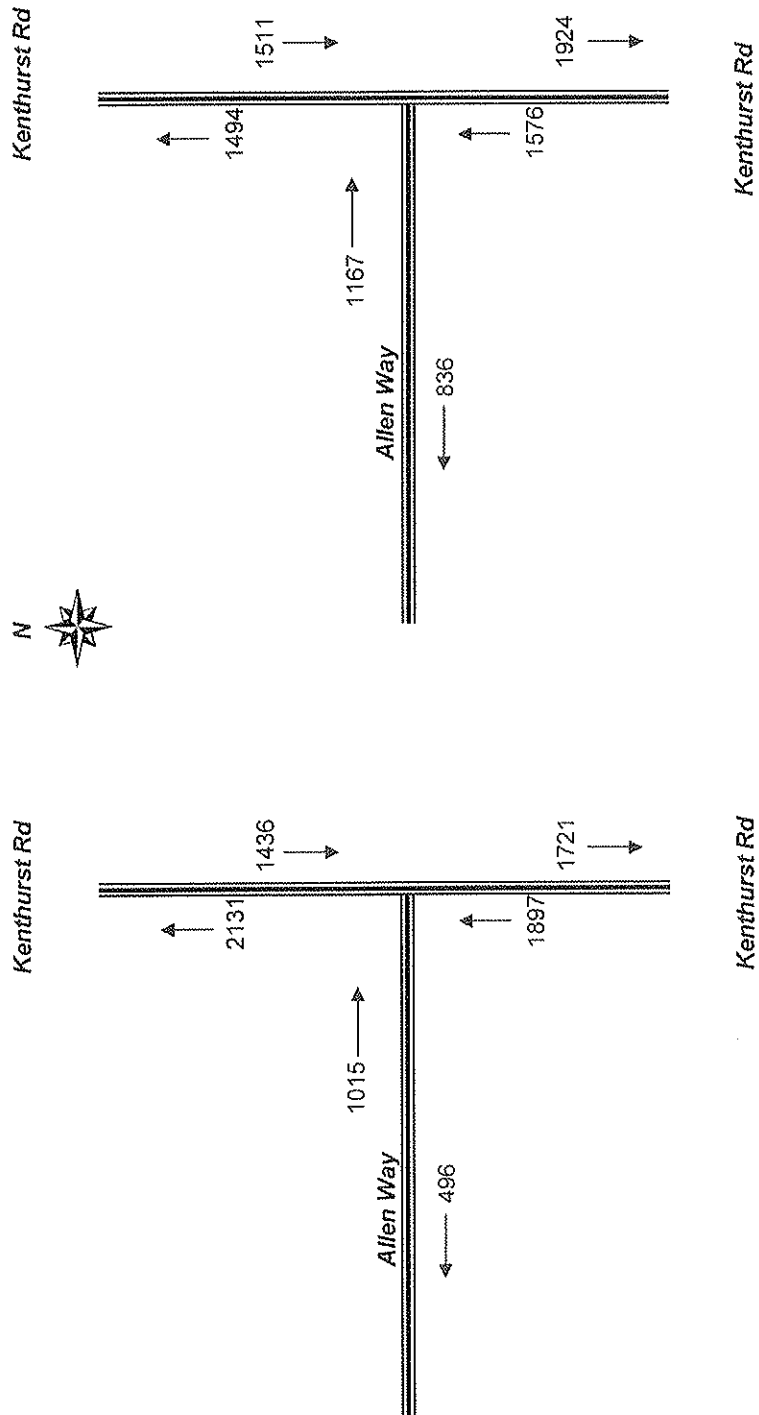
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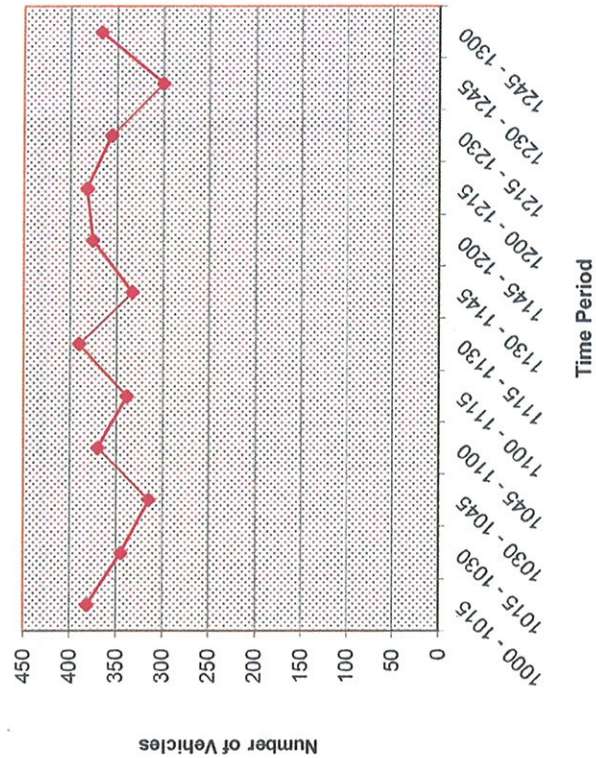
TOTAL VOLUMES
FOR PERIOD
COUNTED

THURSSAI

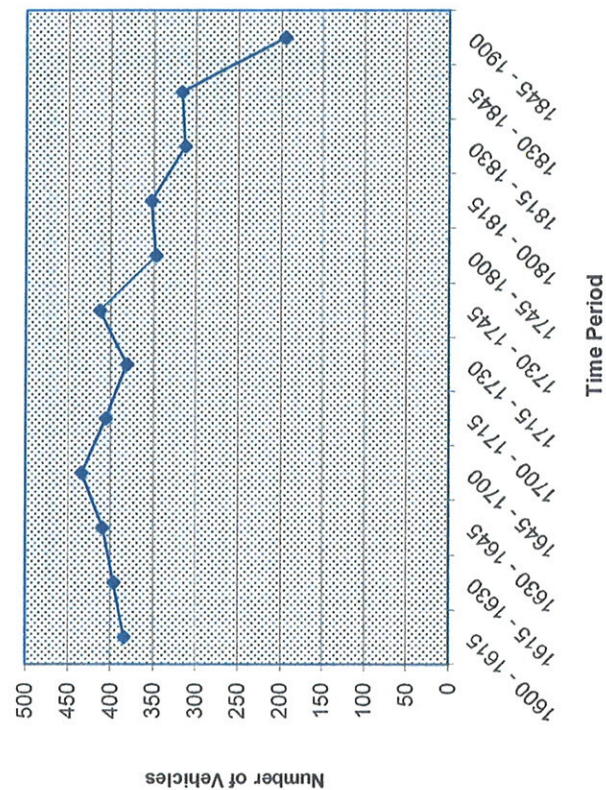
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SATKenthurst Rd & Allen Way**R.O.A.R DATA**

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THURS

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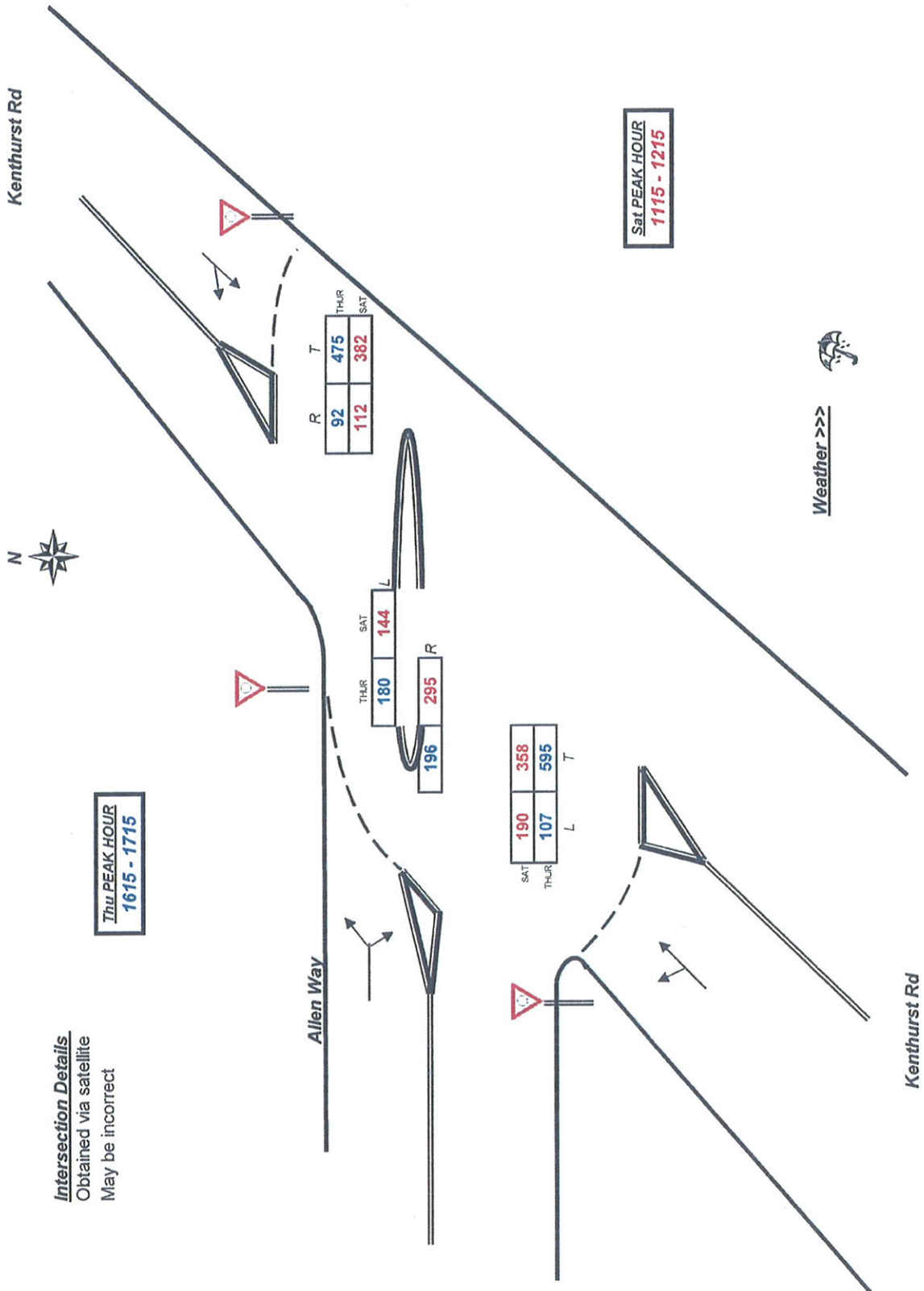
Job No/Name : 3726 DURAL Mall Surveys

Day/Date : Thursday 18th & Saturday 20th August 2011

Intersection Details

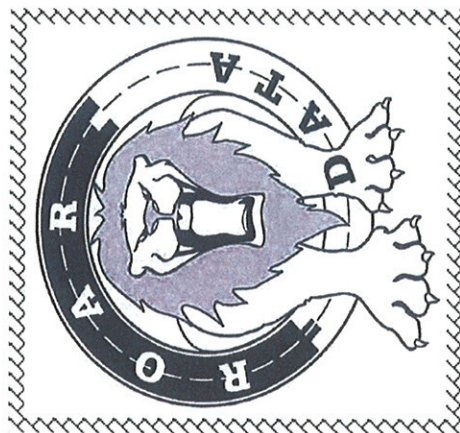
Obtained via satellite

May be incorrect

**Thu PEAK HOUR
1615 - 1715**

To
Avi Barua
at *Brown Consulting*
your results for
DURAL Mall Surveys
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Old Northern Rd & Stonelea Court

ORDINARY MEETING OF COUNCIL

11 DECEMBER, 2012

Client : Brown Consulting
 Job No/Name : 3726 DURAL Mall Surveys
 Day/Date : Thursday 18th & Saturday 20th August 2011

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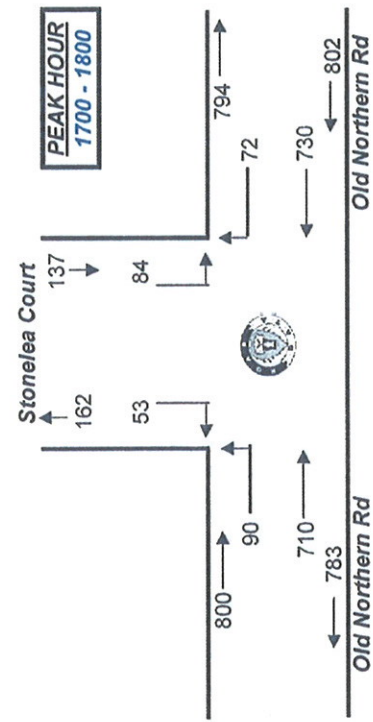
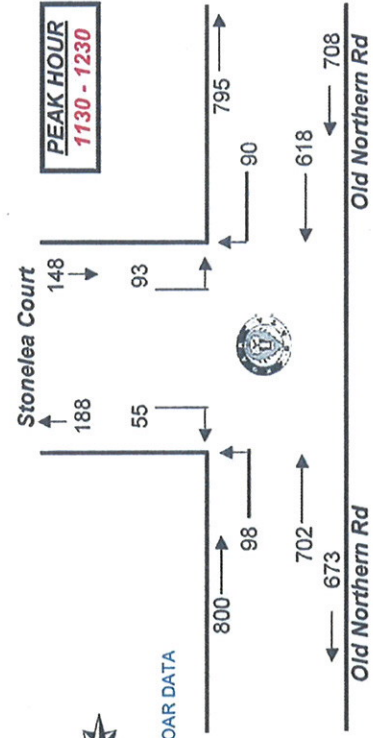


Time Per	WEST			NORTH			EAST			Off Road
	Old Northern	Stonelea	Old Northern	Old Northern	Stonelea	Old Northern	Old Northern	Stonelea	Old Northern	
1000 - 1015	20	147	9	17	126	26	345			10
1015 - 1030	20	161	16	15	136	23	371			9
1030 - 1045	18	160	18	14	143	15	368			18
1045 - 1100	25	150	9	9	183	23	399			21
1100 - 1115	22	172	15	16	162	12	399			24
1115 - 1130	20	166	11	14	167	26	404			27
1130 - 1145	21	164	9	23	182	15	414			15
1145 - 1200	26	178	14	25	138	22	403			7
1200 - 1215	31	176	17	27	152	28	431			14
1215 - 1230	20	184	15	18	146	25	408			19
1230 - 1245	22	166	12	18	161	15	394			14
1245 - 1300	23	155	17	15	147	15	372			17
Period End	268	1979	162	211	1843	245	4708			195

Time Per	WEST			NORTH			EAST			Off Road
	Old Northern	Stonelea	Old Northern	Old Northern	Stonelea	Old Northern	Old Northern	Stonelea	Old Northern	
1600 - 1615	13	138	3	13	122	8	297			3
1615 - 1630	23	156	7	19	124	17	346			5
1630 - 1645	27	154	17	18	163	17	396			4
1645 - 1700	23	180	11	14	131	18	377			3
1700 - 1715	21	180	12	18	163	28	442			9
1715 - 1730	29	196	19	24	182	22	472			5
1730 - 1745	15	175	9	19	187	11	416			2
1745 - 1800	25	159	13	23	178	11	409			11
1800 - 1815	19	175	19	13	155	18	399			8
1815 - 1830	17	156	18	11	131	10	343			4
1830 - 1845	14	138	14	25	93	25	309			8
1845 - 1900	11	131	13	23	91	23	292			7
Period End	237	1938	155	220	1740	208	4498			69

Peak Per	WEST			NORTH			EAST			Off Road
	Old Northern	Stonelea	Old Northern	Old Northern	Stonelea	Old Northern	Old Northern	Stonelea	Old Northern	
1000 - 1100	83	618	52	55	588	87	1483			58
1015 - 1115	85	643	58	54	624	73	1537			72
1030 - 1130	85	648	53	53	655	76	1570			90
1045 - 1145	88	652	44	62	694	76	1616			87
1100 - 1200	89	680	49	78	649	75	1620			73
1115 - 1215	98	684	51	89	639	91	1652			63
1130 - 1230	98	702	55	93	618	90	1656			55
1145 - 1245	99	704	58	88	597	90	1636			54
1200 - 1300	96	681	61	78	606	83	1605			64
PEAK HR	98	702	55	93	618	90	1656			55

Peak Per	WEST			NORTH			EAST			Off Road
	Old Northern	Stonelea	Old Northern	Old Northern	Stonelea	Old Northern	Old Northern	Stonelea	Old Northern	
1600 - 1700	86	628	38	64	540	60	1416			15
1615 - 1715	94	670	47	69	601	80	1561			21
1630 - 1730	100	710	59	74	659	85	1687			21
1645 - 1745	88	731	51	75	683	79	1707			19
1700 - 1800	90	710	53	84	730	72	1739			27
1715 - 1815	88	705	60	79	702	62	1696			26
1730 - 1830	76	665	59	66	651	50	1567			25
1745 - 1845	75	628	64	72	557	64	1460			31
1800 - 1900	61	600	64	72	470	76	1343			27
PEAK HR	90	710	53	84	730	72	1739			27



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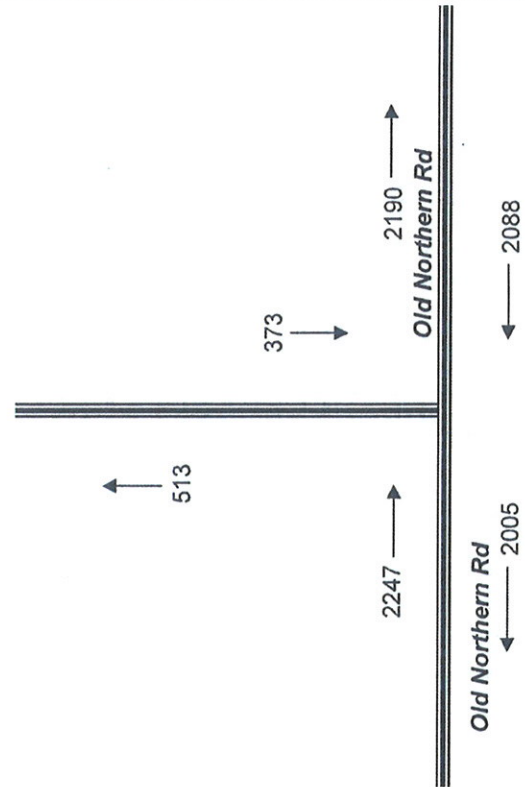
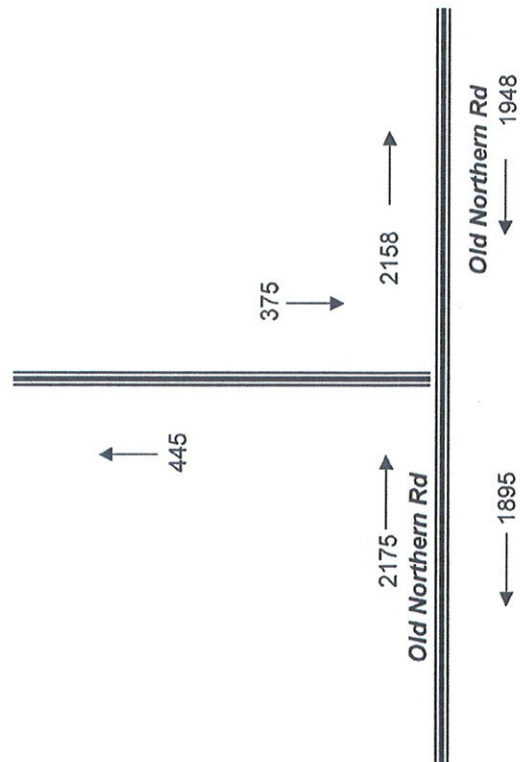
Day/Date : Thursday 18th & Saturday 20th August 2011

TOTAL VOLUMES
FOR PERIOD
COUNTED

THURSSAT

Stonelea Court

Stonelea Court

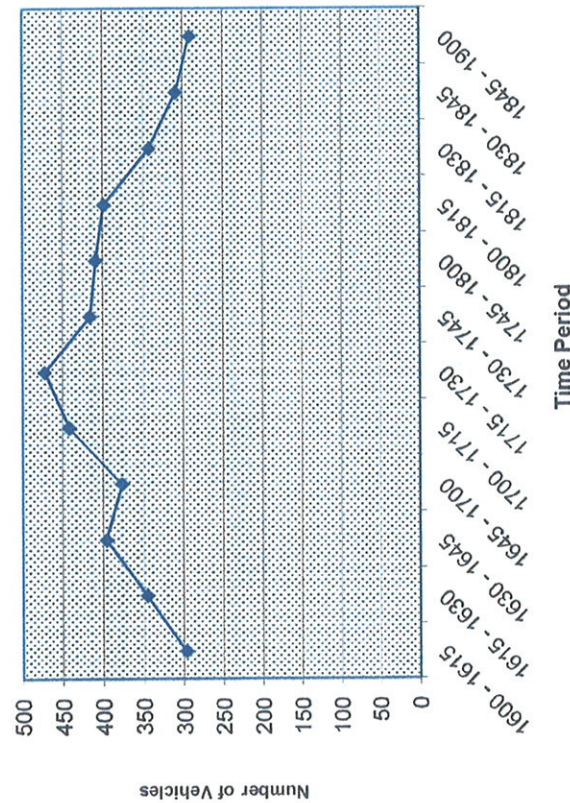
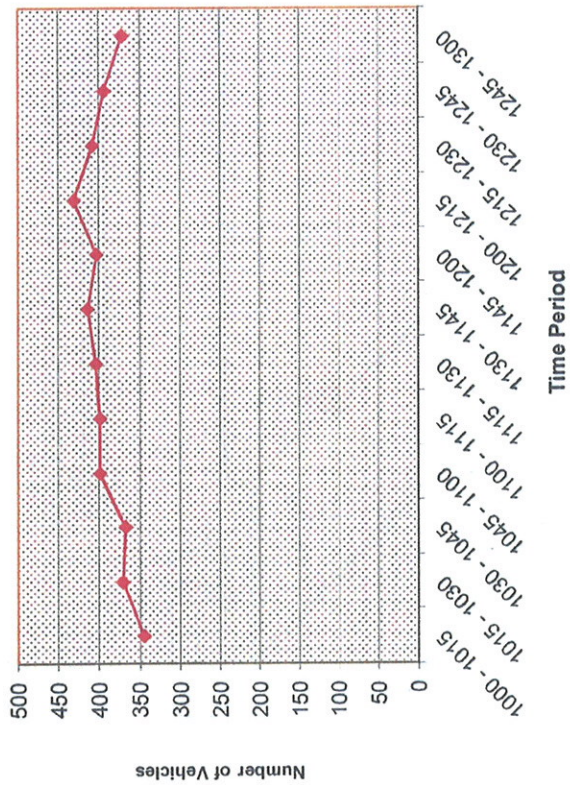


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11 DECEMBER, 2012

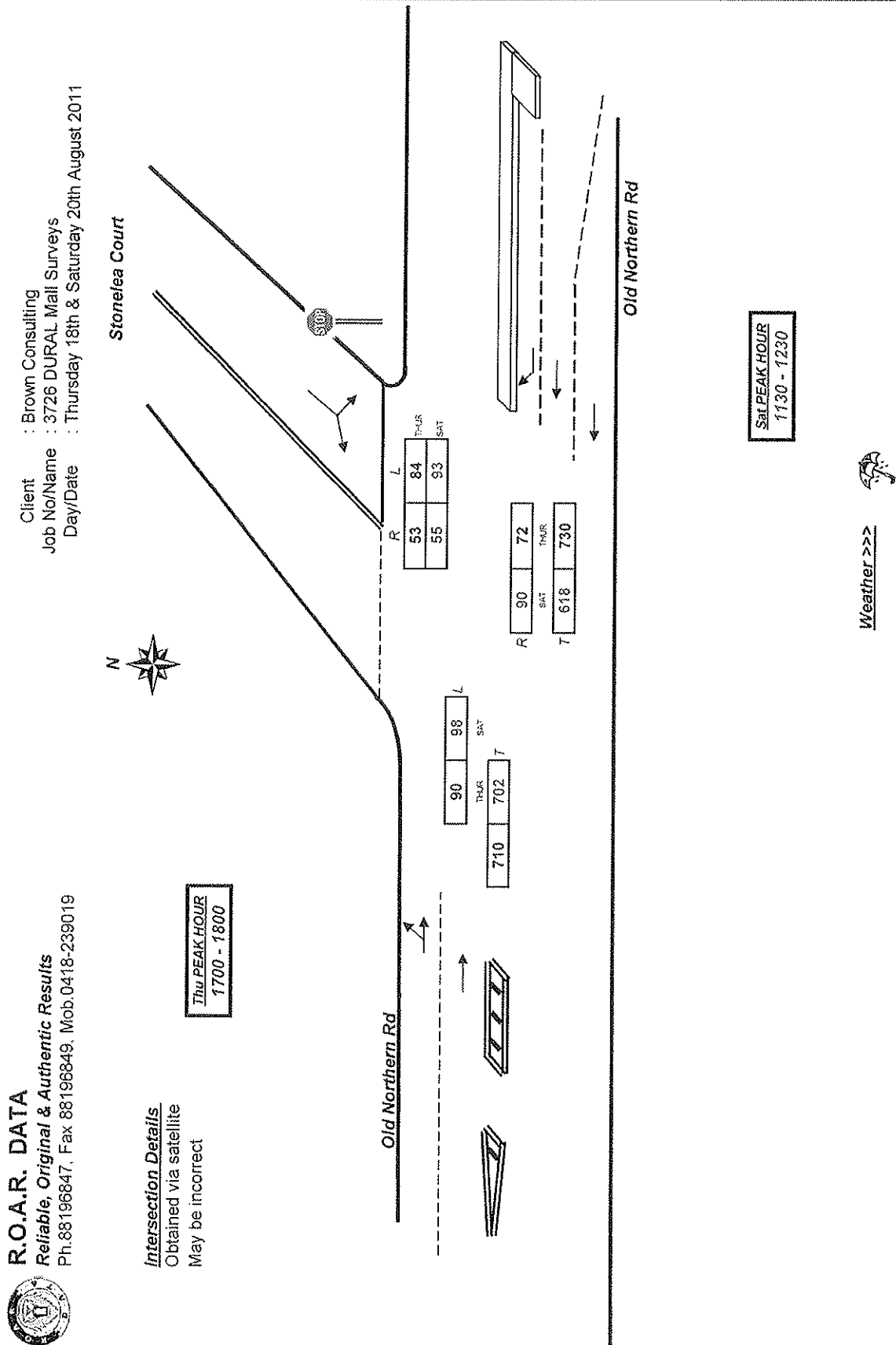
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SAIOld Northern Rd & Stonelea CourtTHURS

ORDINARY MEETING OF COUNCIL

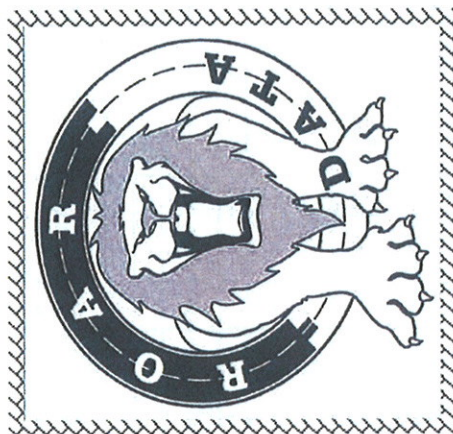
11 DECEMBER, 2012



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Stonelea Court & Private Rd

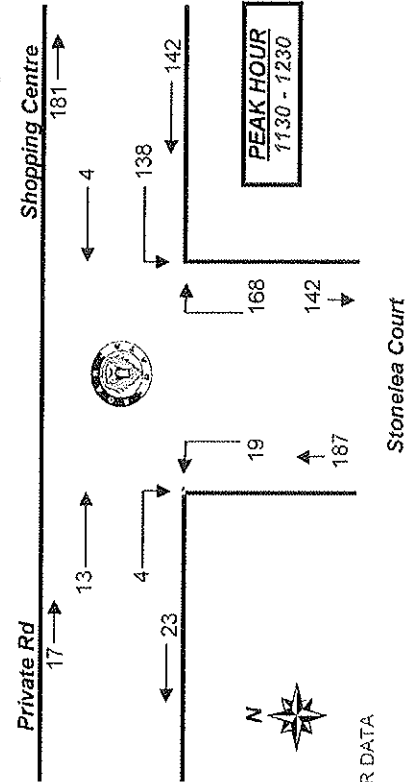
ORDINARY MEETING OF COUNCIL

11 DECEMBER, 2012

Client : Brown Consulting
 Job No/Name : 3726 DURAL Mail Surveys
 Day/Date : Thursday 18th & Saturday 20th August 2011

All Vehicles	WEST			SOUTH			EAST		
	Private Rd	R	I	Stonelea	R	I	Shopping	I	SAT
Time Per									TOTAL
1000 - 1015	1	4	4	2	42	1	26	1	76
1015 - 1030	1	5	4	3	38	2	24	1	74
1030 - 1045	1	3	3	3	29	1	30	1	67
1045 - 1100	0	4	1	49	0	15	69		
1100 - 1115	0	3	3	31	1	30	68		
1115 - 1130	2	3	1	41	0	24	71		
1130 - 1145	0	2	4	34	1	33	74		
1145 - 1200	1	2	3	44	1	37	88		
1200 - 1215	1	5	7	50	0	37	100		
1215 - 1230	2	4	5	40	2	31	84		
1230 - 1245	2	2	3	31	1	31	70		
1245 - 1300	1	2	3	35	0	31	72		
Period End	12	39		39	464	10	349		913

All Vehicles	WEST			SOUTH			EAST		
	Private Rd	R	I	Stonelea	R	I	Shopping	I	TOTAL
Peak Per									
1000 - 1100	3	16	10	158	4	95	286		
1015 - 1115	2	15	11	147	4	99	278		
1030 - 1130	3	13	8	150	2	99	275		
1045 - 1145	2	12	9	155	2	102	282		
1100 - 1200	3	10	11	150	3	124	301		
1115 - 1215	4	12	15	169	2	131	333		
1130 - 1230	4	13	19	168	4	138	346		
1145 - 1245	6	13	18	165	4	136	342		
1200 - 1300	6	13	18	156	3	130	326		
PEAK HR	4	13	19	168	4	138	346		

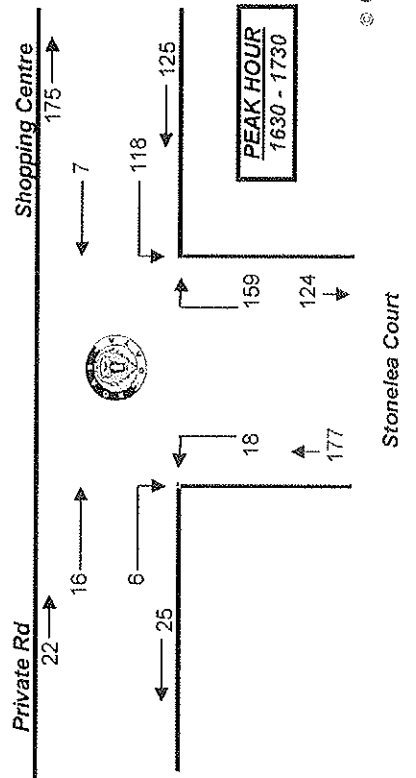


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All Vehicles	WEST			SOUTH			EAST		
	Private Rd	R	I	Stonelea	R	I	Shopping	I	THURS
Time Per									TOTAL
1600 - 1615	1	2	1	21	1	14	40		
1615 - 1630	2	5	1	32	4	22	66		
1630 - 1645	1	4	2	41	2	31	81		
1645 - 1700	2	3	5	37	2	23	72		
1700 - 1715	1	5	6	40	3	26	81		
1715 - 1730	2	4	5	41	0	38	90		
1730 - 1745	1	1	0	29	1	25	58		
1745 - 1800	3	2	4	28	0	34	71		
1800 - 1815	1	3	2	34	1	25	66		
1815 - 1830	2	1	3	27	0	29	62		
1830 - 1845	2	2	3	31	0	39	77		
1845 - 1900	1	1	1	33	1	35	72		
Period End	19	33	33	394	15	342	836		

All Vehicles	WEST			SOUTH			EAST		
	Private Rd	R	I	Stonelea	R	I	Shopping	I	TOTAL
Peak Per									
1600 - 1700	6	14	9	131	9	90	289		
1615 - 1715	6	17	14	150	11	102	300		
1630 - 1730	6	16	18	159	7	118	324		
1645 - 1745	6	13	16	147	6	113	301		
1700 - 1800	7	12	15	138	4	124	300		
1715 - 1815	7	10	11	132	2	123	285		
1730 - 1830	7	7	9	118	2	114	257		
1745 - 1845	8	8	12	120	1	127	276		
1800 - 1900	6	7	9	125	2	128	277		
PEAK HR	6	16	18	159	7	118	324		



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

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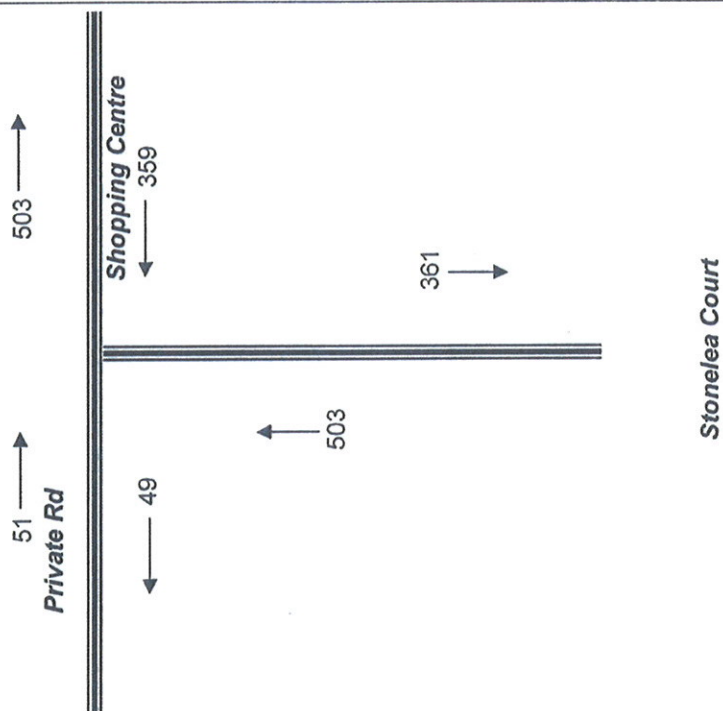
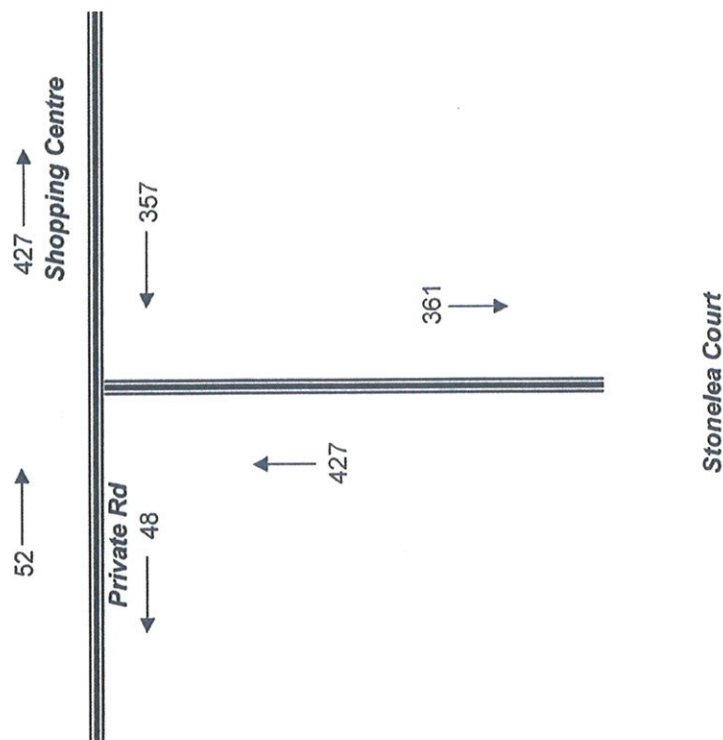
Client : Brown Consulting

Job No/Name : 3726 DURAL Mall Surveys

Day/Date : Thursday 18th & Saturday 20th August 2011

THURS

TOTAL VOLUMES
FOR COUNT
PERIOD

SAT

ORDINARY MEETING OF COUNCIL

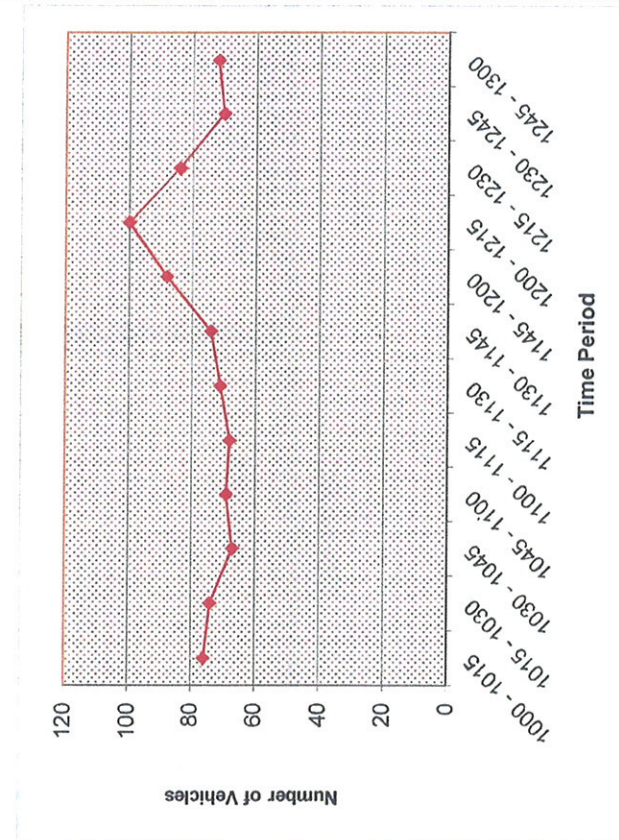
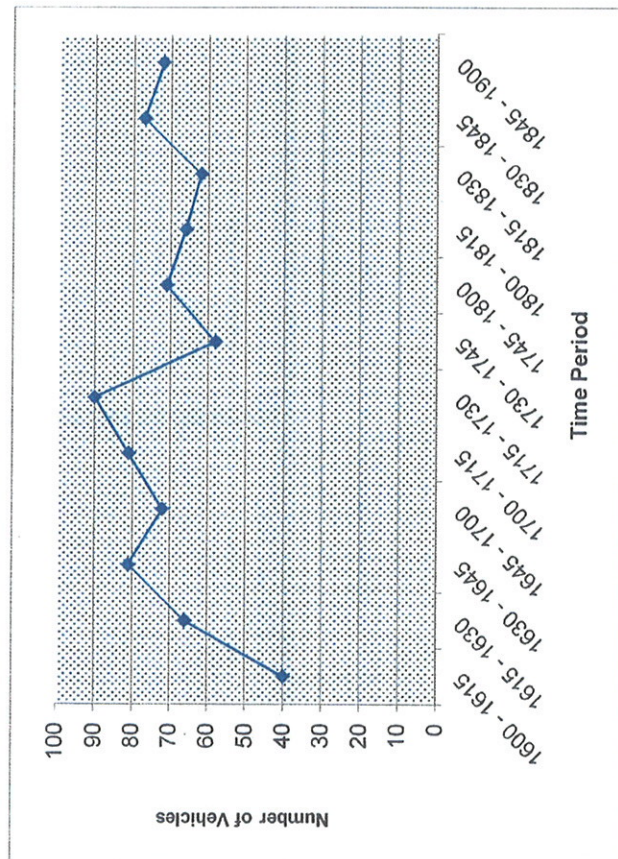
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THURSStonelea Court & Private RdSAI

Client : Brown Consulting
 Job No/Name : 3726 DURAL Mail Surveys
 Day/Date : Thursday 18th & Saturday 20th August 2011

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Intersection Details:
 Obtained via satellite
 May be incorrect

Thu PEAK HOUR
1630 - 1730



Private Rd

THUR	SAT	T
16	13	
6	4	R

T	4	7
L	138	118
	SAT	THUR

SAT	THUR	L	R
19	18		
168	159		

Shopping Centre

Sat PEAK HOUR



Weather >>>

Stonelea Court

APPENDIX B

Schematic Site Configuration Sketches

