MUNDAMIA
TRAFFIC IMPACT STUDY

FOR

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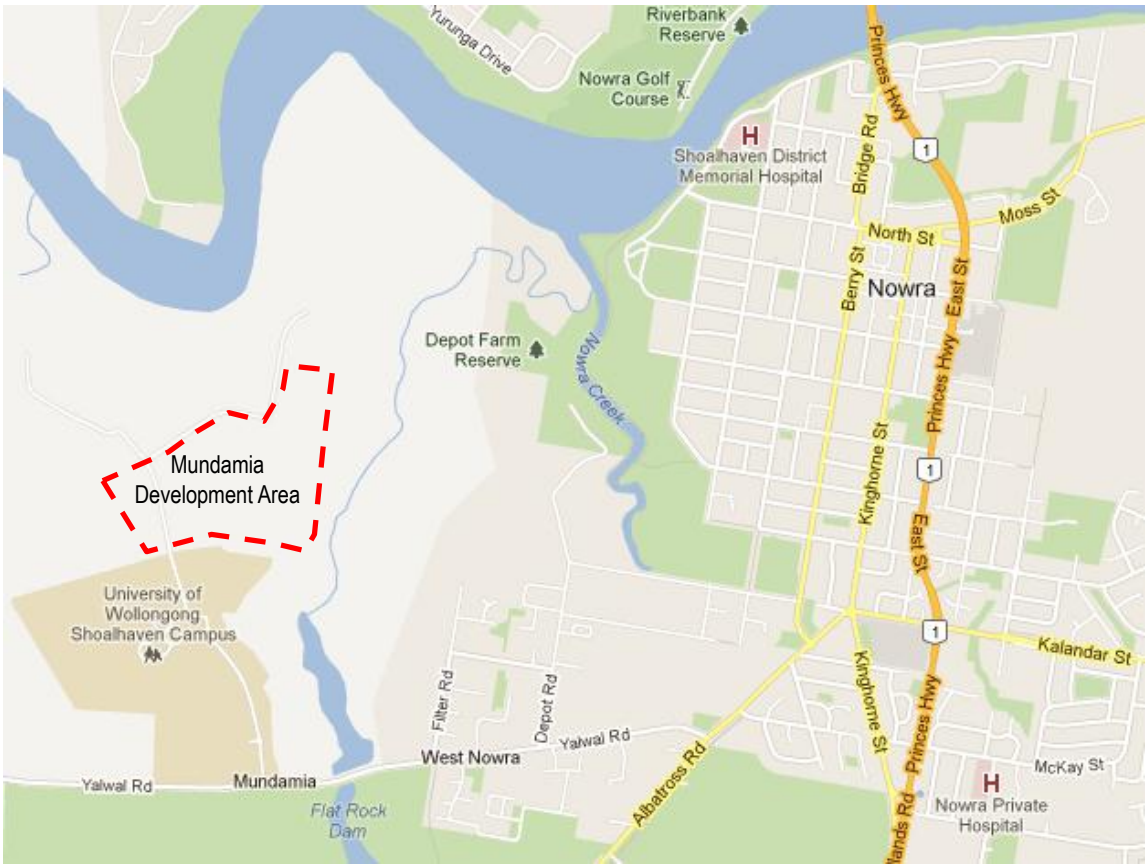
1. INTRODUCTION

1.1 PURPOSE

Bitzios Consulting have been commissioned by SET Consultants to prepare a Traffic Impact Study for the Mundamia development. SET Consulting are responsible for preparing independent planning documentation to be submitted to the Department of Planning for approval for the Council owned land within the sub-division being Lot 1 DP1021332.

1.2 LOCATION

The location of the entire Mundamia development area is shown in Figure 1.1. The site is located west of Nowra's CBD and immediately north of the University of Wollongong- Shoalhaven Campus (UOW) at George Evans Road, Mundamia.



Source: Google Maps

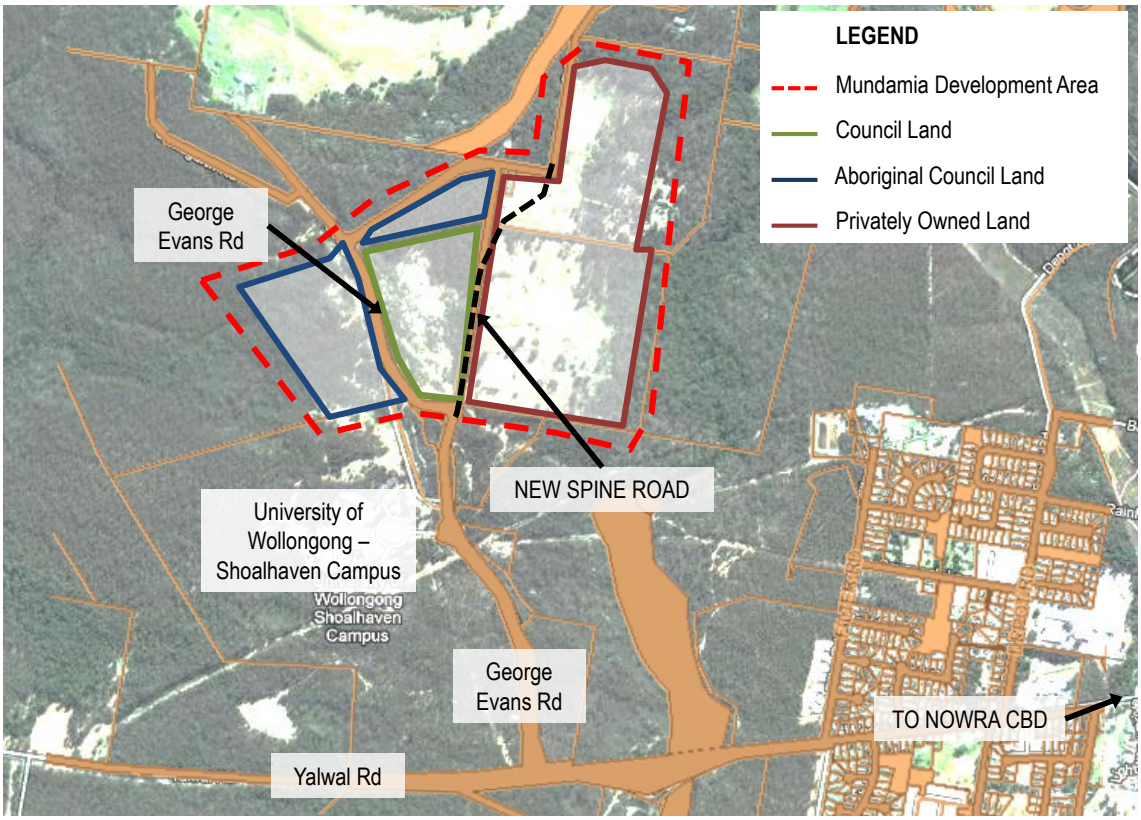
Figure 1.1: Mundamia Development Area Location

1.3 PROPOSED DEVELOPMENT

The Structure Plan identified the Mundamia living area (Area 5) as having an area of 53ha, of which the Council land component comprises 9.495ha. There are two other land holders within the development area which are:

- Aboriginal Land Council: and
- Private Land Owner.

Figure 1.2 shows the land ownership within the development area.



Source: Google Maps and Shoalhaven Council Mapping

Figure 1.2: Land Ownership Details

The proposal (on Council's land) seeks approval to undertake a residential subdivision which also includes the proposed village centre (shops and public open space).

The main access to the proposed development area is proposed to be provided via a realigned George Evans Road. A roundabout will be provided at the entrance to the development. The new spine road will reside within an existing 20m wide road reservation situated on Crown Land. It is proposed to widen the reservation by 5m into Council's land, to provide a 25m wide road reservation for the main village centre spine road.

Beyond Council's land ownership the spine road is proposed to deviate to the east to provide a direct link to Jonsson Road.

The proposed development yields are summarised in Table 1.1.

Table 1.1: Proposed Development Yields

Development Area	Land Use	Unit	Qty
Council Land (Lot 1 DP 1021332)			
	Low Density Res	Each	65
	Medium Density Res	Each	69
	Retail/Commercial GFA	m^2	5,697
	Child Care	Children	55
Aboriginal Council North (Lot 458 DP 1063107)			
	Low Density Res	Each	33
Aboriginal Council West (Lot 473 DP1102909)			
	Low Density Res	Each	60
Twynam Property Group (Lot 384 DP 755952 & Lot 3 DP588613)			
	Low Density Res	Each	285
	Medium Density Res	Each	59

1.4 SCOPE

The scope of work for this project included:

- preparation of a traffic impact study generally following the RTA Guide to Traffic Generating Developments;
- assessment of the suitability of key junctions to accommodate the proposed development;
- justification of traffic volumes and directional splits adopted;
- completion of SIDRA assessments during the AM and PM peak periods with consideration of a 10 year design horizon; and
- identification of suitable treatments required to ameliorate any traffic impacts associated with the proposal.

1.5 CONSULTATION WITH COUNCIL

1.5.1 Assessment Scope

Council was contacted during the development of the scope of work back in August 2009. Council identified the need to conduct SIDRA assessments at the following intersections:

- UOW Access and George Evans Road;
- Yalwal Road and George Evans Road;
- Albatross Road and Yalwal Road;
- Albatross Road and Berry Street; and
- Albatross Road and Kalandar Street.

1.5.2 Traffic Demand Assumptions

Council was again consulted in September 2012 to discuss the proposed traffic assessment assumptions to ensure consistency in approach with Council's previous strategic planning in the area. The final assumptions adopted in the development of traffic demands and traffic distribution is discussed in Section 2.

1.5.3 Traffic Generation – Development Area

As there are multiple developments occurring within the precinct, it was decided that the 'with' and 'without' development scenarios would include the entire Mundamia development. Once the development traffic

impacts are understood, a cost apportionment would be undertaken to distribute the costs across each development/land release areas.

1.5.4 Traffic Assessment Years

The Mundamia development area was assessed in the base year being 2012 and the design year being 2022. The assessment focussed on a typical Thursday during normal business and university periods and subsequent assessment of the impacts during both the AM and PM peak periods.

2. TRAFFIC DEMANDS

2.1 TRAFFIC COUNT DATA

Manual intersection count data was obtained at each of the assessment intersections in October 2008. The George Evans Road and Yalwal Road intersection was again counted in March 2009 as the original traffic count was outside of University session periods. All intersection counts were undertaken on a typical Thursday. The March 2009 count data was used for the George Evans Road intersections as it contained more traffic data that was more typical of the university's operations.

The George Evans Road and UOW Access intersection count data was derived from the George Evans Road / Yalwal Road intersection count data, as there are only a couple of properties currently generating trips from the Mundamia area.

Figure 2.1 summarises the 2008/2009 manual intersection traffic count data.

2.2 BACKGROUND TRAFFIC GROWTH

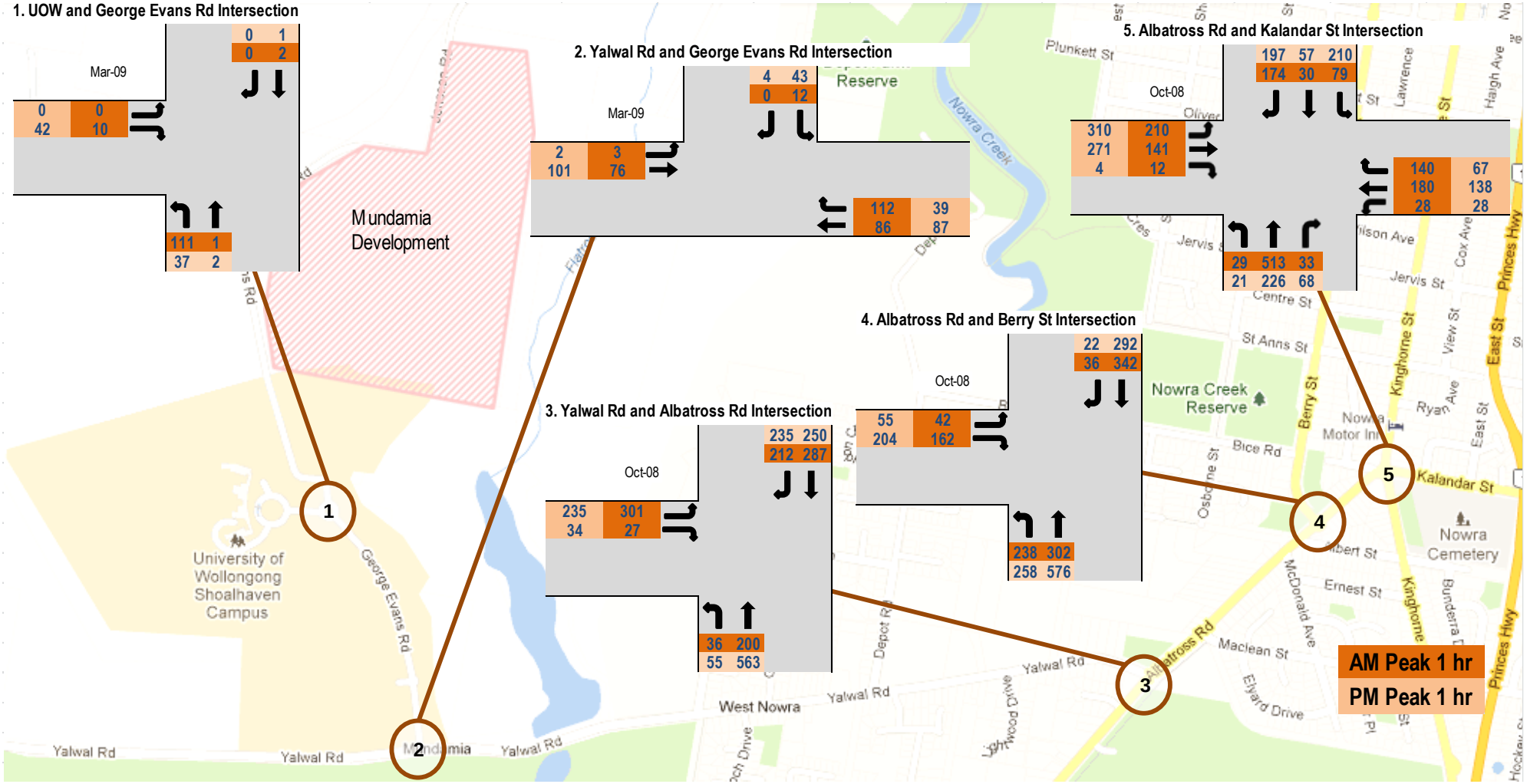
The background traffic growth assumptions adopted for the traffic study are shown in Table 2.1.

Table 2.1: Background Traffic Growth Assumptions

Location	Traffic Growth (per annum)
George Evans Rd	4.5% to 2012 and 2% to 2022
Yalwal Rd	2.0%
Albatross Rd (south of Berry St)	2.0%
Albatross Rd (north of Berry St)	3.0%
Berry St	3.0%
Kinghorne St	3.0%
Kalandar St	3.0%

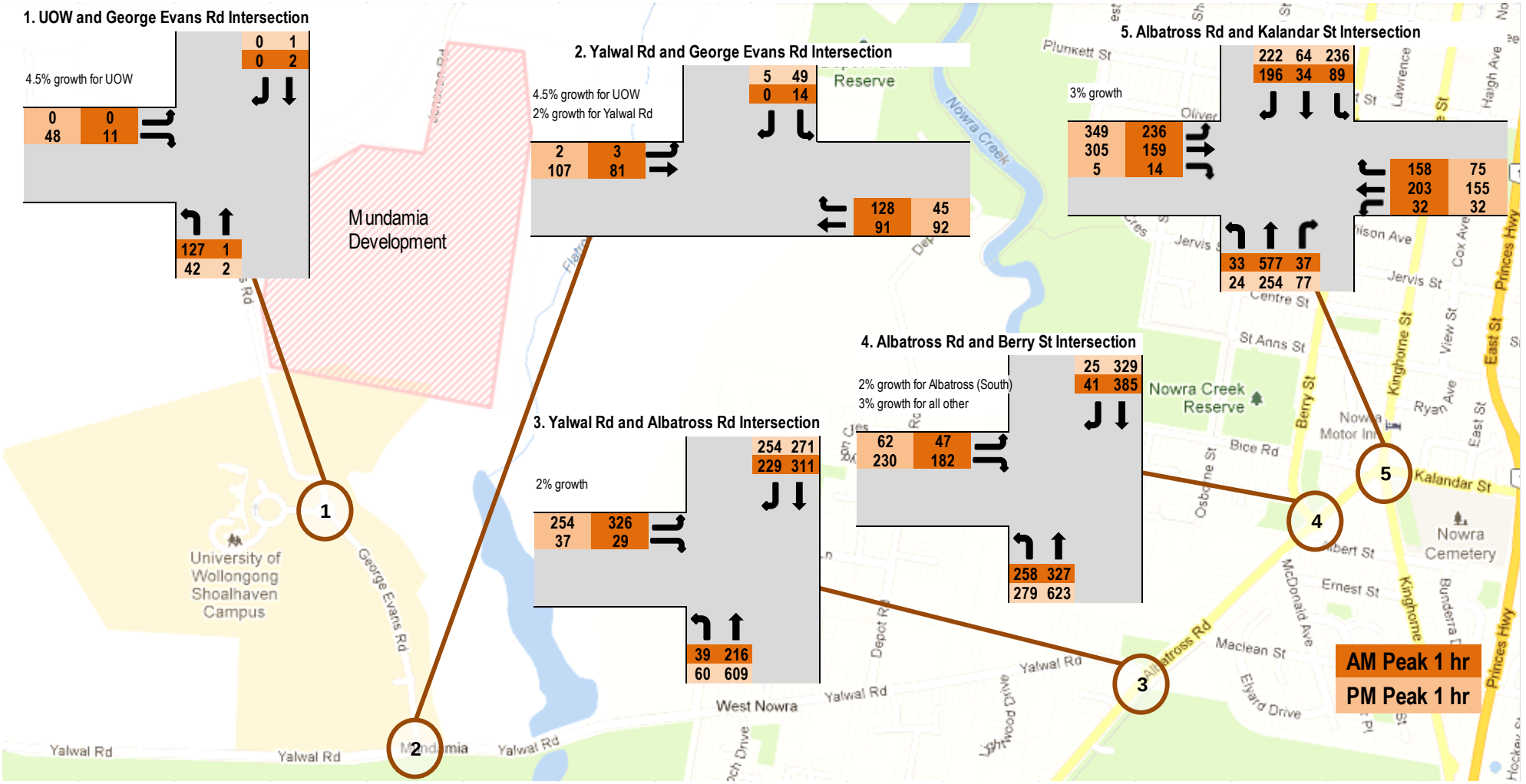
The traffic growth for the UOW Access onto George Evans Road was derived from actual traffic count data comparisons made between the 2009 typical Thursday manual intersection count data and recent tube count data obtained in April 2012. Only the Thursday traffic count data was used from the tube count data to ensure a 'like for like' comparison. The adopted growth rate on George Evans Road reduces to 2% beyond 2012, as it is assumed that the localised development within Mundamia will attract some university student accommodation (at this stage assumed to be in the order of 2.5% of the 4.5% demand). This assumption is based on the remaining assumptions provided by Council that the forecast background growth in the area is 2% per annum.

Adopting the growth rates from Table 2.1, Figure 2.2 and Figure 2.3 show the forecast traffic demands for the 2012 and 2022 assessment periods respectively.



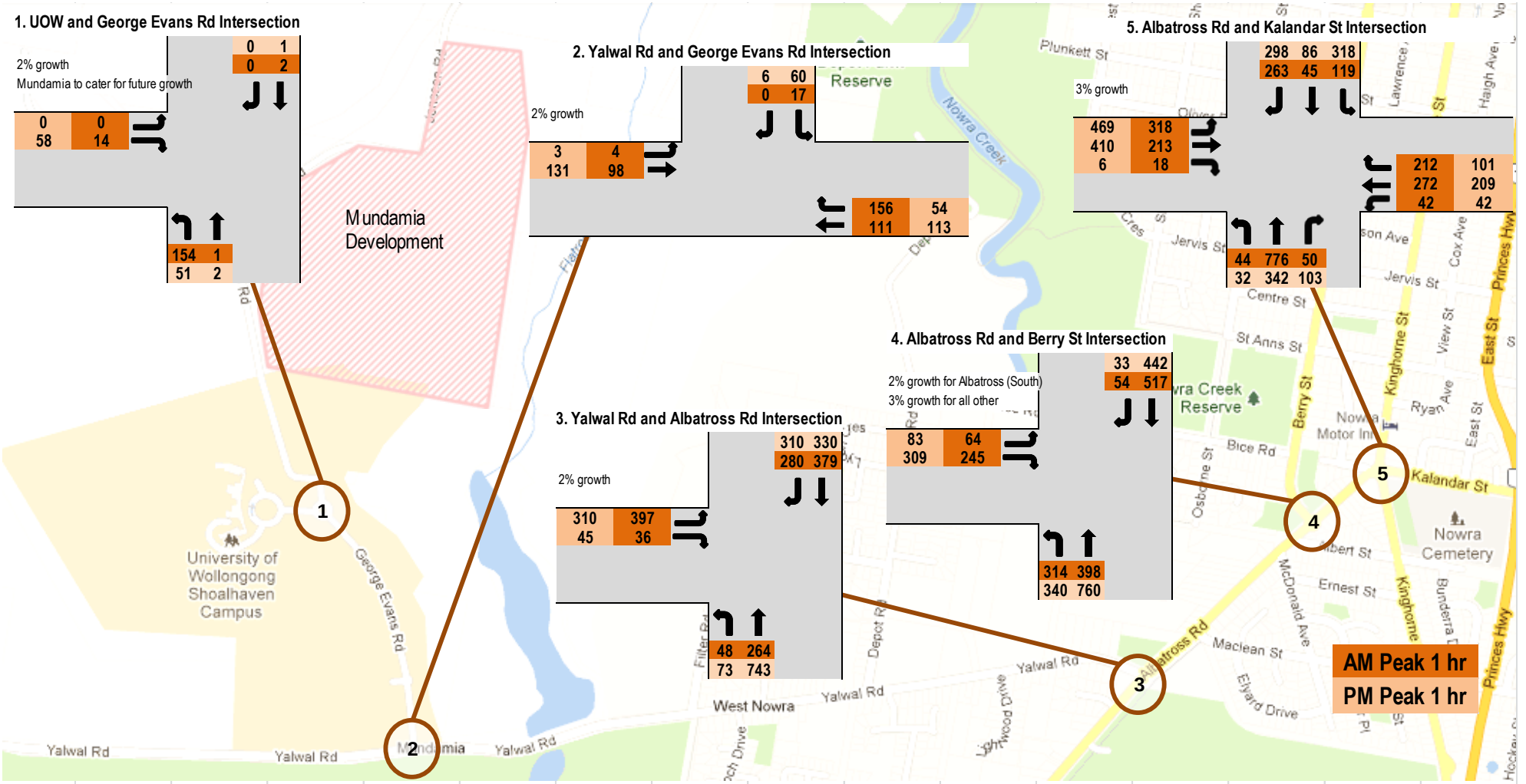
Source: Google Maps

Figure 2.1: 2008/2009 Manual Intersection Count Data



Source: Google Maps

Figure 2.2: 2012 Traffic Demands



Source: Google Maps

Figure 2.3: 2022 Traffic Demands

2.3 DEVELOPMENT TRAFFIC

The development traffic distribution from the Mundamia development onto George Evans Road is shown in Table 2.2.

Table 2.2: In/Out Trip Distribution

Land Use	AM		PM	
	In	Out	In	Out
Residential	30%	70%	60%	40%
Retail/Commercial	50%	50%	50%	50%
Child Care Centre	50%	50%	50%	50%

As agreed with Council, it was assumed that 50% of the child care centre demand and 70% of the retail/commercial demand would be generated internal to the Mundamia development.

The RTA Guide to Traffic Generating Developments has mostly been adopted in determining the sub-divisions traffic generation. The trip rate for the Child Care Centre was increased to reflect Council's current development assessment practices, which is based on two trips per child in the morning peak and one trip per child in the evening peak. Council currently requests additional trips for staff members in the PM peak, however in our experience, these rarely coincide.

It is agreed that children are usually dropped off between 7:30am and 9:00am and they are picked up between 3:00pm and 5:30pm. Child care staff typically work on shift arrangements where there is a morning shift and afternoon shift. The morning shift workers arrive before the peak period and leave in the mid-afternoon, whilst the afternoon shift workers arrive at around lunch-time and leave after the evening peak period (ie 5:30pm-6:30pm).

Using the above trip generation assumptions, the traffic generated by the Mundamia development area is shown in Table 2.3.

Table 2.3 shows that the Mundamia development will generate around 560 trips in the peak periods. Based on the forecast land use, the traffic impacts are also noted to be apportioned as follows:

- Council Land – 36%;
- Aboriginal Council Land – 14%; and
- Privately Owned Land – 50%.

Table 2.3: Mundamia Traffic Generation

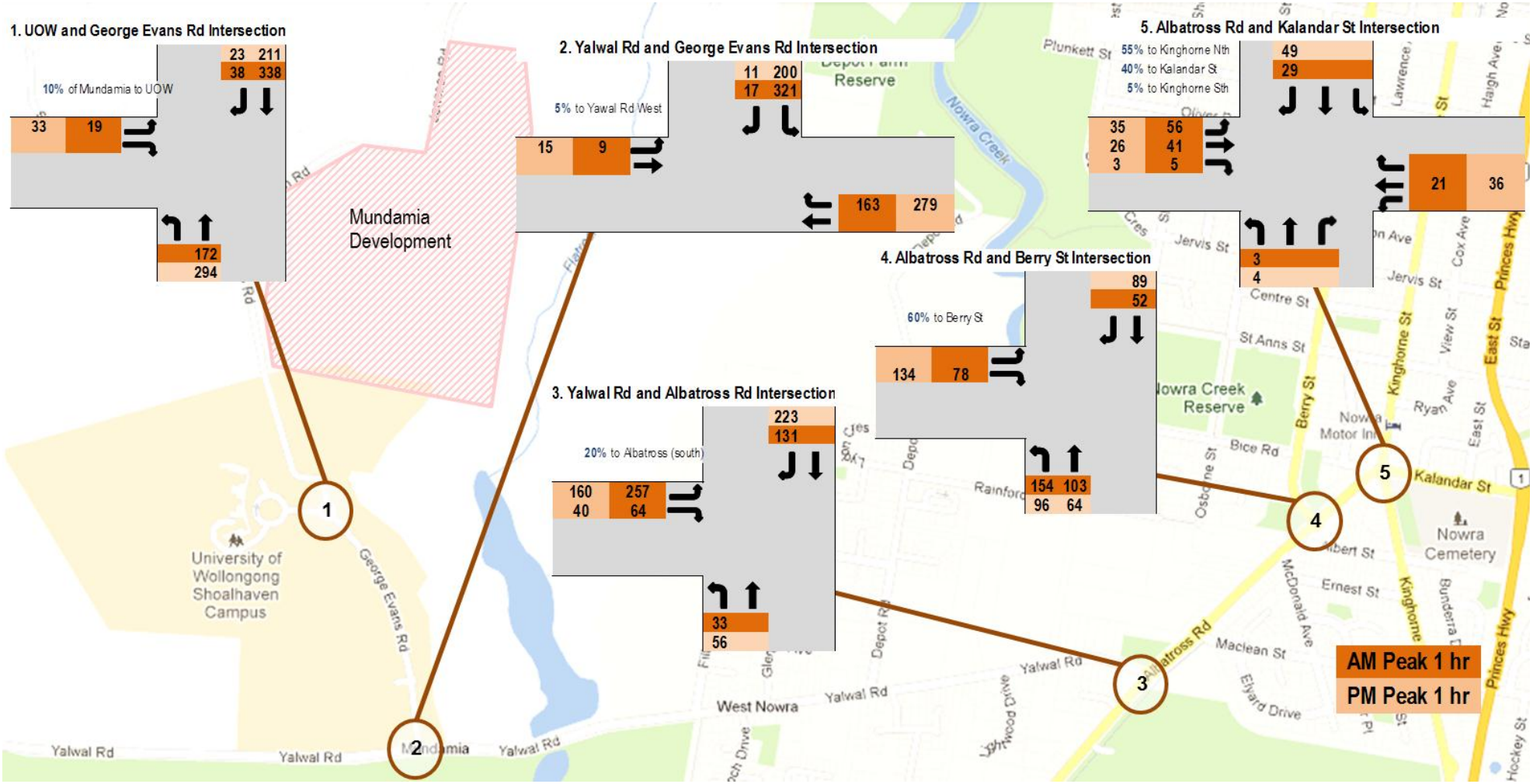
Development Trip Assumptions									AM Peak		PM Peak	
Development Area	Land Use	Unit	Qty	Peak Hour Trip Rate	AM Peak Trips	PM Peak Trips	Average Peak Trips	% Trips	In	Out	In	Out
Council Land												
Low Density Res		Each	65	0.85 per dwelling	55.3	55.3	55.3		17	39	33	22
Medium Density Res		Each	69	0.65 per dwelling	44.9	44.9	44.9		13	31	27	18
Retail/Commercial		m^2	5697	- AM - 8.61 trips per 100m^2; - PM - 12.3 trips per 100m^2: - 35% of area considered GFA; and - Plus 70% reduction based on internalisation of trips	51.5	73.6	62.5	**36%**	26	26	37	37
Child Care		Children	55	- AM - 2 trips per child; - PM - 1 trip per child; - Plus 50% reduction based on internalisation of trips	55.0	27.5	41.3		28	28	14	14
Sub-Total					**206.6**	**201.2**	**203.9**		**83**	**123**	**111**	**91**
Aboriginal Council North								**5%**				
Low Density Res		Each	33	0.85 per dwelling	**28.1**	**28.1**	**28.1**		**8**	**20**	**17**	**11**
Aboriginal Council West								**9%**				
Low Density Res		Each	60	0.85 per dwelling	**51.0**	**51.0**	**51.0**		**15**	**36**	**31**	**20**
Twynam Property Group												
Low Density Res		Each	285	0.85 per dwelling	242.3	242.3	242.3	**50%**	73	170	145	97
Medium Density Res		Each	59	0.65 per dwelling	38.4	38.4	38.4		12	27	23	15
Sub-Total					**280.6**	**280.6**	**280.6**		**84**	**196**	**168**	**112**
TOTAL					**566.3**	**560.8**	**563.5**	**100%**	**191**	**375**	**326**	**234**

2.4 DEVELOPMENT TRIP DISTRIBUTION

Adopting the trips generated by the development as shown in Table 2.3, the trips were then distributed to the road network. The following assumptions were adopted in developing the trips distribution:

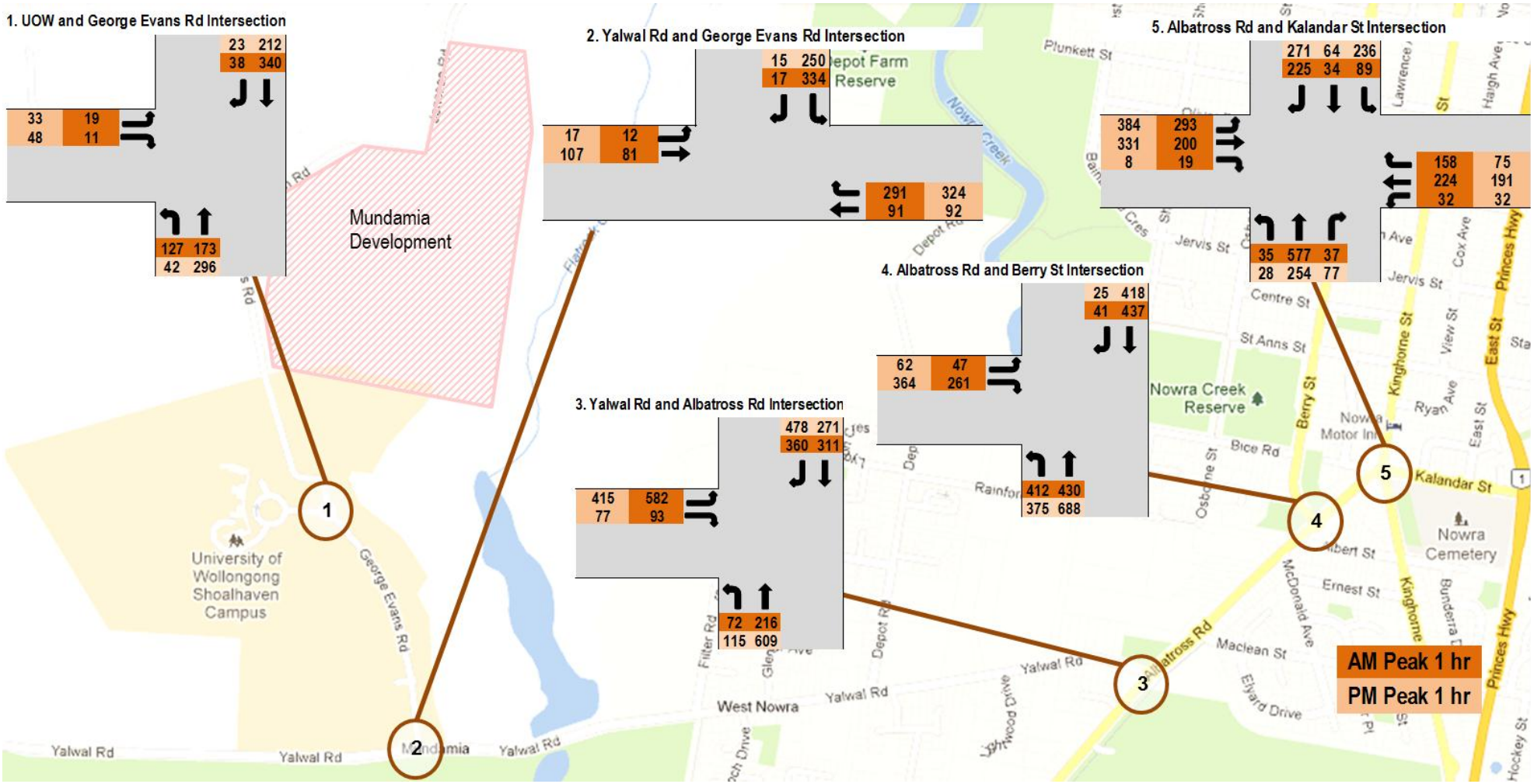
- 10% to be attracted to/from the UOW Access;
- 5% of the remaining traffic to be attracted to/from Yalwal Road (west);
- 20% of the remaining traffic to be attracted to/from Albatross Road (south);
- 60% of the remaining traffic to be attracted to/from Berry Street (higher assumption due to likely congestion avoidance at the Kalandar Street roundabout); and
- 55% of the remaining traffic to be attracted to/from Kinghorne Street (north), 40% to/from Kalander Street, and 5% to/from Kinghorne Street (south).

The resultant development trips only are shown in Figure 2.4, whilst the 2012 and 2022 with development scenarios are shown in Figure 2.5 and Figure 2.6.



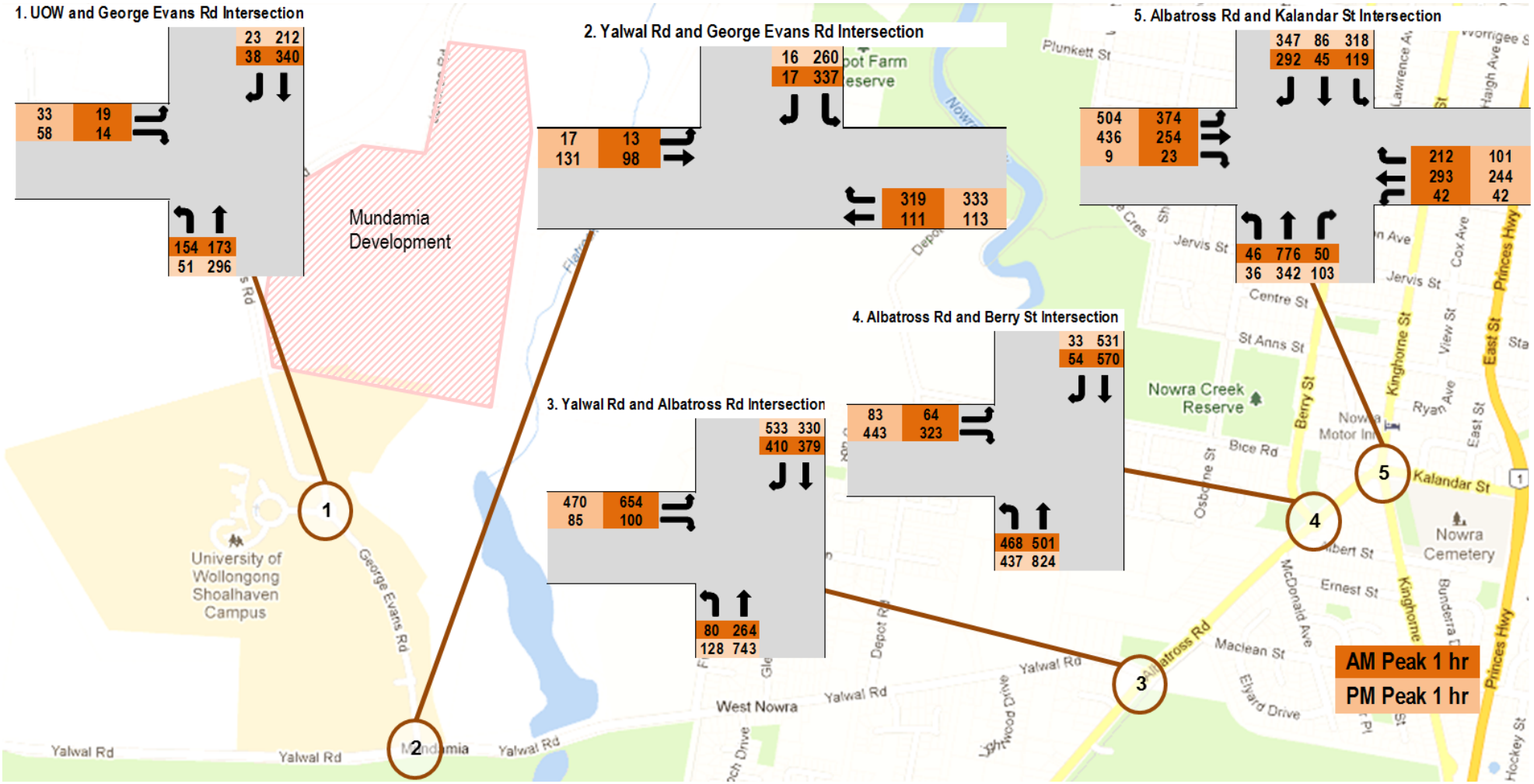
Source: Google Maps

Figure 2.4: Mundamia Development Traffic Only



Source: Google Maps

Figure 2.5: 2012 Traffic Demands with Mundamia Development

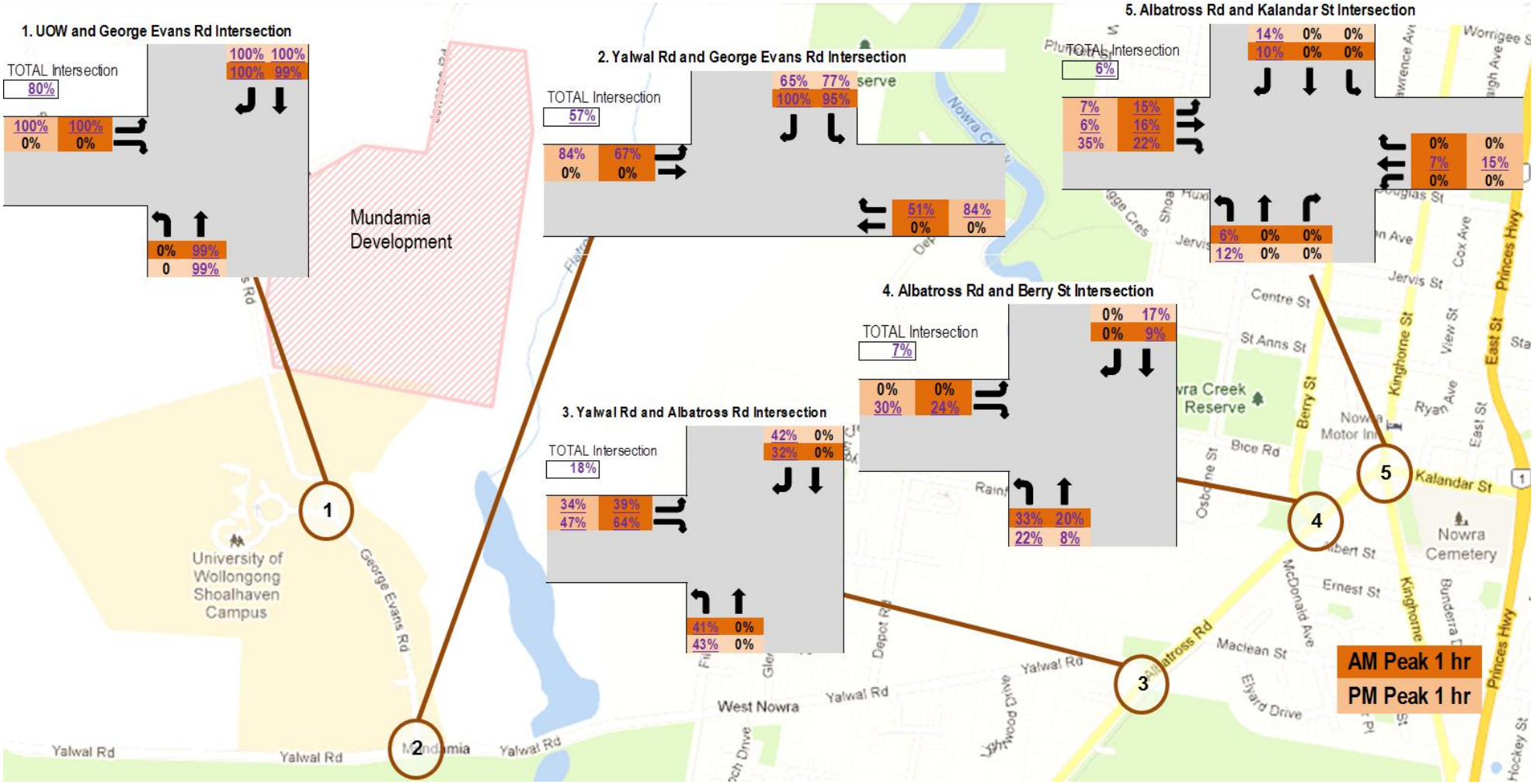


Source: Google Maps

Figure 2.6: 2022 Traffic Demands with Mundamia Development Traffic

2.5 DEVELOPMENT TRIP APPORTIONMENT

To better understand the contributing impact the Mundamia development will have on the local road environment, a comparison between the Mundamia trips and the remaining background traffic has been undertaken for each movement and for each intersection for the 2022 design year scenario. The resultant findings are shown in Figure 2.7.



Source: Google Maps

Figure 2.7: 2022 Mundamia Development Trip Apportionments

2.6 LINK VOLUMES

2.6.1 Overview

The warrants for improved intersection turning treatments are shown in Figure 2.8. Considering most of the residential side streets are not expected to attract turning movements greater than 15 vehicles in the peak hour (apart for from Depot Road), one-way link volumes above approximately 450 vehicles in the peak hour is likely to require channelised intersection treatments.

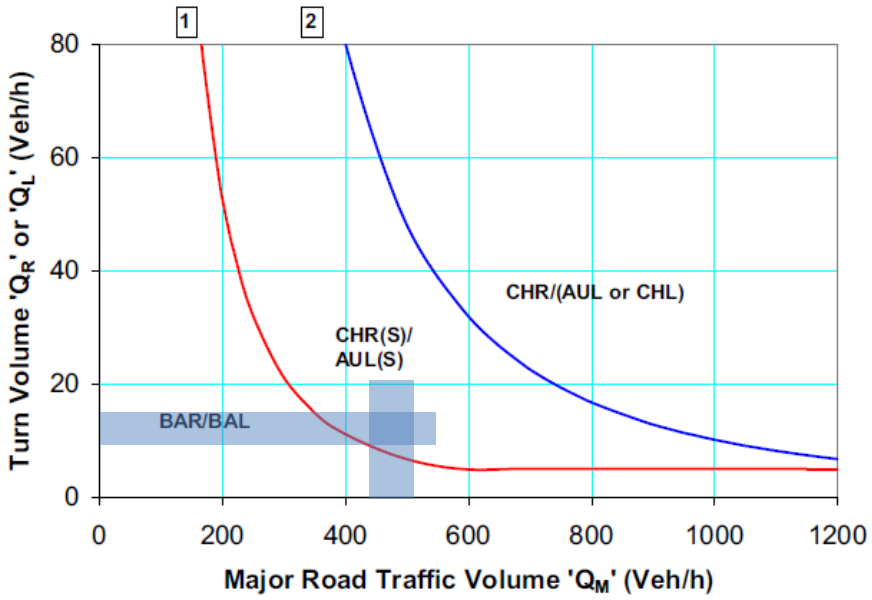


Figure 2.8: Intersection Treatment Warrants

Summarising the traffic count data from each of the intersection movements, the forecast mid-block link volumes are shown in Table 2.4. The '**red**' text highlights the scenario where the link volume exceeds the capacity threshold.

Table 2.4: Link Volume Summary

Scenario	Direction	AM		PM	
		Yawal Rd	Albatross Rd	Yawal Rd	Albatross Rd
2012	To Nowra	88	**501**	144	**798**
	From Nowra	198	**499**	126	**485**
2012 with Development	To Nowra	415	**799**	357	**1024**
	From Nowra	383	**671**	416	**748**
2022	To Nowra	115	**661**	190	**1053**
	From Nowra	267	**658**	167	**640**
2022 with Development	To Nowra	436	**918**	391	**1213**
	From Nowra	431	**789**	446	**863**

2.6.2 Yalwal Road

The outputs from Table 2.4, along with the warrants specified within Figure 2.8 suggest that Yalwal Road should mostly operate satisfactorily without dedicated turn lanes. The only intersection is likely to require dedicated turn lanes is the intersection of Depot Road.

It is not usual for a development to fund infrastructure for a side street movement not relating specifically to the development outside of its own development footprint area. Depot Road currently services in the order of 100 residential dwellings. The Depot Road subdivision should have been required to provide an appropriate treatment to facilitate safe access from its primary access intersection.

The Depot Road intersection will be required to be upgraded by 2022 with or without the development at Mundamia. However, the introduction of the Mundamia development will bring forward the need to upgrade this intersection. It is likely that when Mundamia is 20-40% developed, the intersection will require to be upgraded.

2.6.3 Albatross Road

The outputs from Table 2.4, along with the warrants specified within Figure 2.8 suggest that Albatross Road between Yalwal Road and Berry Street will require a plan of management. Whilst the right turn movements into the side streets are expected to be very low, the left turn movements 'in' and right turn movement 'out' of the side streets are expected to be high.

The capacity issues for the side streets along Albatross Road are existing issues and will be exacerbated by future traffic growth regardless of the Mundamia development.

Consideration may be given to installing a roundabout at the Yalwal Road intersection with a centre median for the entire section length. Alternatively, installing signalised intersections at Yalwal Road and/or Berry Street may provide suitable gaps in traffic for side street traffic to safely turn onto Albatross Road.

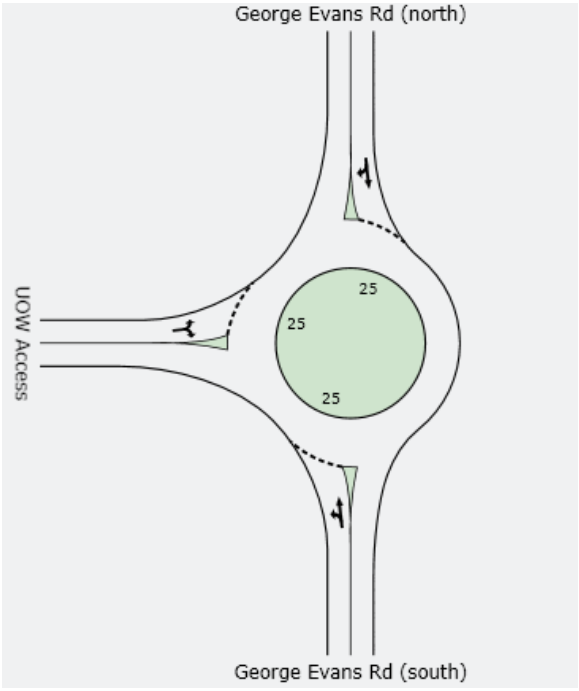
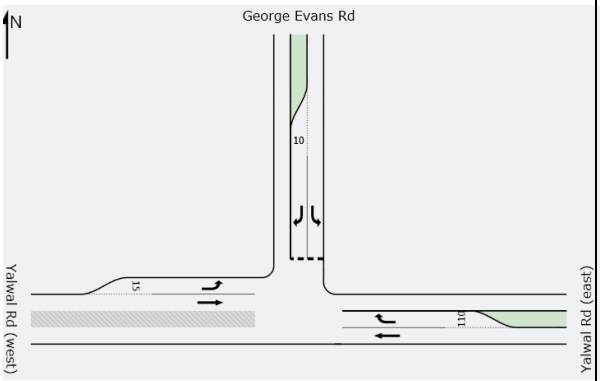
The provision of left turn lanes into the side streets is likely to be required unless the plan of management proposes to restrict all access from Albatross Road.

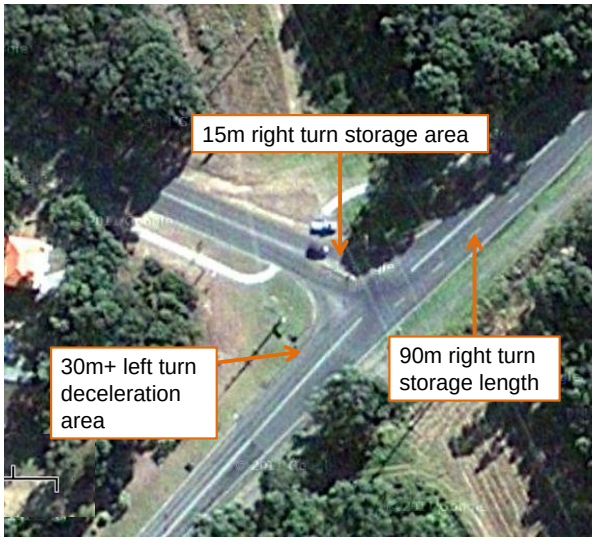
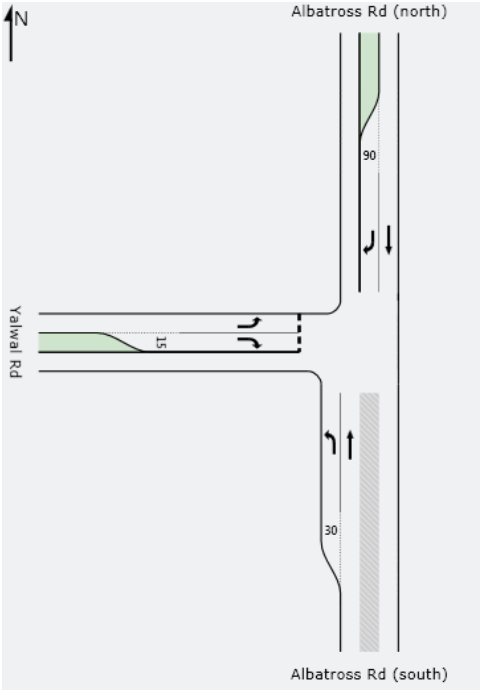
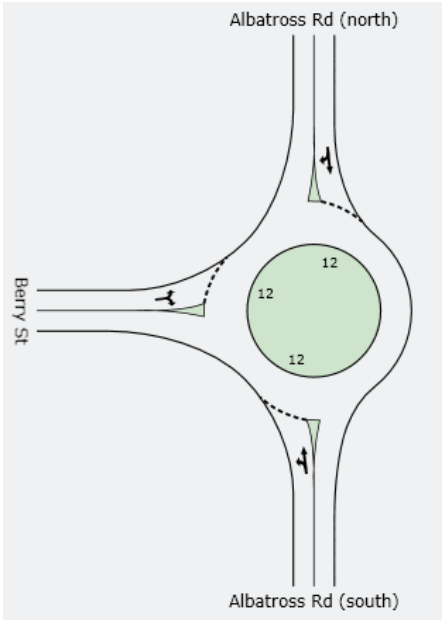
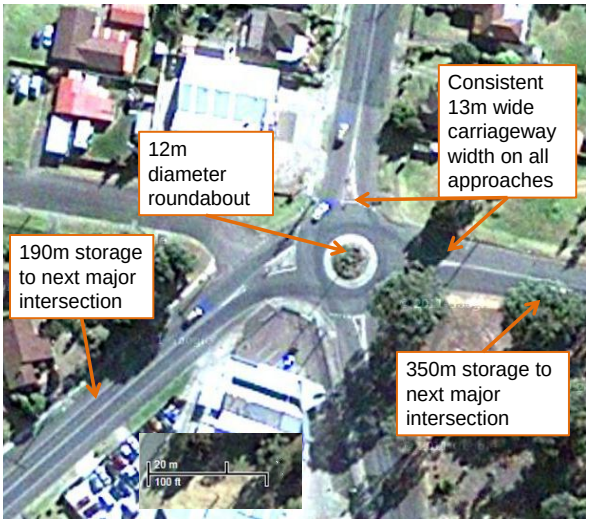
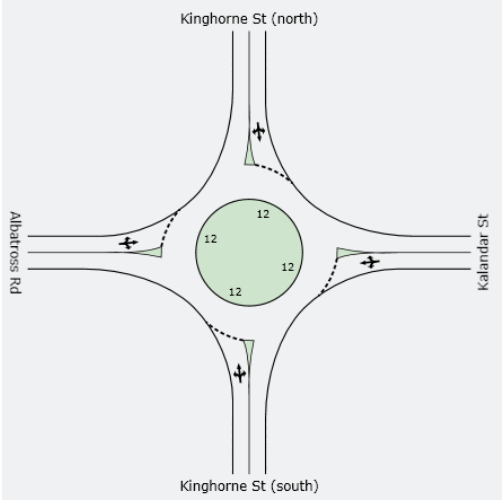
3. TRAFFIC MODELLING

3.1 INTERSECTION CONFIGURATIONS

The intersection configurations and the Sidra layouts adopted for the intersection assessments are shown in Table 3.1 below.

Table 3.1: Intersection Configurations Modelled

#	Aerial Description	Sidra Layout
1		
2		

#	Aerial Description	Sidra Layout
3		
4		
5		

3.2 HEAVY VEHICLE PROPORTIONS

The heavy vehicle proportions used in the Sidra Assessment were initially based on the manual intersection traffic count data obtained in 2008/2009.

The heavy vehicle percentages were adjusted for the 'with development' scenario acknowledging that the overall proportion of heavy vehicles would have reduced as a result of the residential /village centre development.

Table 3.2 shows the assumptions used in the Sidra assessments.

Table 3.2: Heavy Vehicle Percentages

Road	Without Development	With Development
UOW Access	2%	2%
George Evans Rd	4%	2%
Yalwal Rd	10%	8%
Albatross Rd	8%	6%
Berry St	3%	2%
Kinghorne St	6%	5%
Kalandar St	6%	5%

3.3 INTERSECTION ASSESSMENT CRITERIA

The Sidra "RTA NSW" model configuration setting was adopted for this assessment. The Level of Service (LOS) outputs are solely based on 'Average Delay' which often mis-represents the true operating condition of the intersection.

To accurately define the performance output of the scenarios modelled the 'Degree of Saturation', 'Average Delay' and '95%ile Back of Queue' output data has been captured for each approach lane. This enables a true understanding of the likely operational performance of each of the intersection approaches each of the scenarios tested.

Typically LOS is adopted to determine when the intersection has failed. Based on our experience the following criteria shown in Table 3.3 are considered to be more practical, considering the local road environment and current financial climate:

Table 3.3: Performance Criteria

Performance Measure	Degree of Saturation (DOS)	Average Delay (s)	95%ile Queue (m)
Approaching Failure	0.8-1.0	120-240	120-240
Requires Upgrade	>1.0	>240	>240

Intersections approaching failure typical revolve around vehicles have to wait more than 2 minutes with a queue of more than 20 vehicles (noting that the average delay at a typical signalised intersection is in the order of 2 minutes). Intersections in regional towns that require replacement normally experience more than a four minute delay and more than 40 queued vehicles during the peak periods.

It should re-iterated that the assessment is based on a future design horizon, where a certain level of peak spreading would be expected prior to funding being justified to be spent on an infrastructure upgrade. It is rare in the current economic climate that an intersection upgrade would be funded based on a 30 minute peak congestion issue. The above performance criterion acknowledges these issues and provides a realistic and practical assessment framework for this project.

3.4 EXISTING INTERSECTION MODEL OUTPUTS

Detailed outputs from the Sidra assessments of the existing intersection configurations are included in Appendix A.

A summary of the morning peak and evening peak operating performance is included in Table 3.4 and Table 3.5 respectively.

Table 3.4: AM Peak SIDRA Outputs – Existing Intersection Configurations

Approach	Lane	2012			2012 with development			2022			2022 with development		
		DOS	Average Delay (s)	95%ileQueue (m)	DOS	Average Delay (s)	95%ileQueue (m)	DOS	Average Delay (s)	95%ileQueue (m)	DOS	Average Delay (s)	95%ileQueue (m)
1. UOW and George Evans Rd													
George Evans Rd (south)	LT	0.08	6	3	0.21	6	8	0.09	6	3	0.23	6	9
George Evans Rd (north)	TR	0	7	0	0.24	6	11	0	7	0	0.24	6	11
UOW Access	LR	0	11	0	0.03	9	1	0.01	11	0	0.03	9	1
2. Yalwal Rd and George Evans Rd													
Yalwal Rd (east)	T	0.05	0	0	0.05	0	0	0.06	0	0	0.06	0	0
	R	0.1	9	3	0.23	9	8	0.13	9	4	0.26	9	9
George Evans Rd	L	0.01	9	0	0.32	9	11	0.02	9	0	0.33	9	11
	R	0	11	0	0.06	14	1	0	12	0	0.07	16	1
Yalwal Rd (west)	L	0	8	0	0.01	8	0	0	8	0	0.01	8	0
	T	0.05	0	0	0.05	0	0	0.06	0	0	0.06	0	0
3. Albatross Rd and Yalwal Rd													
Albatross Rd (south)	L	0.02	9	0	0.04	9	0	0.03	9	0	0.05	9	0
	T	0.12	0	0	0.12	0	0	0.15	0	0	0.15	0	0
Albatross Rd (north)	T	0.18	0	0	0.17	0	0	0.22	0	0	0.21	0	0
	R	0.23	10	8	0.37	11	15	0.31	11	11	0.45	12	23
Yalwal Rd	L	0.4	11	17	0.7	14	65	0.52	13	29	0.85	20	117
	R	0.16	26	4	0.64	50	23	0.29	40	8	>1.0	81	37
4. Albatross Rd and Berry St													
Albatross Rd (south)	LT	0.43	7	26	0.6	7	48	0.54	8	39	0.71	8	74
Albatross Rd (north)	TR	0.42	9	22	0.51	9	29	0.6	10	40	0.71	13	63
Berry St	LR	0.26	13	11	0.38	14	17	0.37	13	17	0.52	16	30
5. Albatross Rd and Kalandar St													
Kinghorne St (south)	LTR	0.93	37	169	0.97	49	211	1.62	579	1744	1.69	648	1851
Kalandar St	LTR	0.46	11	24	0.49	11	26	0.67	15	54	0.71	16	62
Kinghorne St (north)	LTR	0.34	11	17	0.37	12	19	0.47	12	27	0.49	12	29
Albatross Rd	LTR	0.87	39	105	1.05	103	299	1.06	105	329	1.17	187	604

Table 3.5: PM Peak SIDRA Outputs – Existing Intersection Configurations

Approach	Lane	2012			2012 with development			2022			2022 with development		
		DOS	Average Delay (s)	95%ileQueue (m)	DOS	Average Delay (s)	95%ileQueue (m)	DOS	Average Delay (s)	95%ileQueue (m)	DOS	Average Delay (s)	95%ileQueue (m)
1. UOW and George Evans Rd													
George Evans Rd (south)	LT	0.03	6	1	0.23	5	9	0.03	6	1	0.23	5	10
George Evans Rd (north)	TR	0	8	0	0.17	6	7	0	8	0	0.18	6	7
UOW Access	LR	0.03	11	1	0.08	11	3	0.04	11	1	0.09	11	3
2. Yalwal Rd and George Evans Rd													
Yalwal Rd (east)	T	0.05	0	0	0.05	0	0	0.07	0	0	0.06	0	0
	R	0.04	9	1	0.27	9	9	0.05	9	1	0.28	9	10
George Evans Rd	L	0.05	9	1	0.25	9	8	0.06	9	2	0.26	9	8
	R	0.02	11	0	0.06	16	1	0.02	12	0	0.07	17	1
Yalwal Rd (west)	L	0	8	0	0.01	8	0	0	8	0	0.01	8	0
	T	0.06	0	0	0.06	0	0	0.08	0	0	0.07	0	0
3. Albatross Rd and Yalwal Rd													
Albatross Rd (south)	L	0.04	9	0	0.07	9	0	0.04	9	0	0.08	9	0
	T	0.35	0	0	0.34	0	0	0.42	0	0	0.42	0	0
Albatross Rd (north)	T	0.15	0	0	0.15	0	0	0.19	0	0	0.23	0	0
	R	0.45	16	19	0.87	29	85	0.69	23	37	1.04	90	222
Yalwal Rd	L	0.56	19	25	0.94	41	115	0.86	35	62	1.35	348	712
	R	0.5	76	13	>1.0	162	37	>1.0	212	37	>1.0	167	37
4. Albatross Rd and Berry St													
Albatross Rd (south)	LT	0.63	7	53	0.72	7	81	0.77	7	101	0.87	8	184
Albatross Rd (north)	TR	0.38	9	20	0.55	11	35	0.56	10	37	0.73	15	69
Berry St	LR	0.43	16	21	0.67	23	52	0.7	26	58	1.09	137	363
5. Albatross Rd and Kalandar St													
Kinghorne St (south)	LTR	0.46	12	24	0.5	13	29	0.74	21	67	0.8	27	85
Kalandar St	LTR	0.34	11	16	0.4	11	20	0.52	13	31	0.59	14	40
Kinghorne St (north)	LTR	0.67	15	54	0.74	18	69	0.9	28	146	0.95	36	197
Albatross Rd	LTR	0.84	20	105	0.89	24	139	1.35	340	1283	1.4	384	1468

The Sidra modelling suggests that an upgrade to the Albatross Road and Yalwal Road intersection will be required to be brought forward as a result of the proposed development.

Operational failure of the Berry Street and Albatross Road intersection is expected to fail in the evening peak period only with the development in place. Mitigation measures will be required at this intersection.

The Albatross Road and Kinghorne Street intersection is nearly failing in the current year even without the development. This intersection will be required to be upgraded in the near future regardless of the proposed development.

The following section describes the intersection treatments required to manage background traffic growth to 2022, including the entire Mundamia land release.

3.5 INTERSECTION UPGRADES

3.5.1 UOW Access / George Evans Road

No intersection upgrade is required at this intersection.

3.5.2 Yalwal Road / George Evans Road

Whilst the Sidra assessment suggests that no intersection upgrade is required, it is recommended that the configuration be modified from an AUR configuration to a CHR(Short Lane) configuration. Figure 3.1 shows the current AUR arrangement and reference in Austroads that a CHR(Short Lane) is preferred. The main reason for preference of a CHR(Short Lane) is that turning traffic moves out of the through traffic lane. Research conducted in Queensland suggests that a CHR(Short Lane) intersection is 30 times safer in this regard than an AUR treatment.

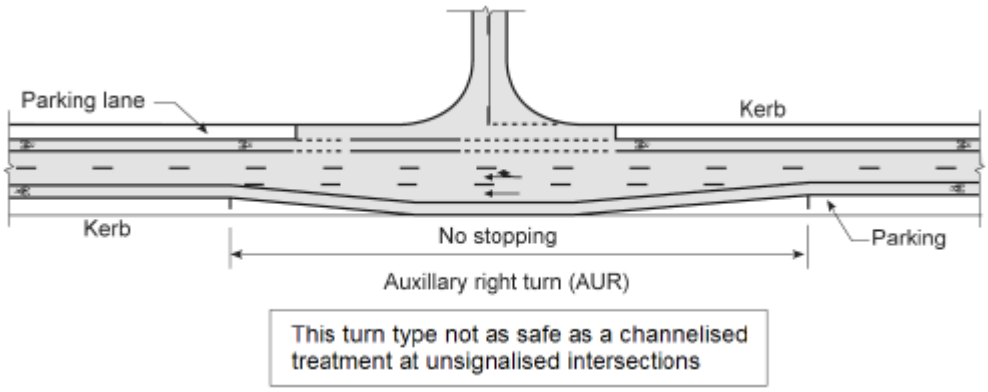


Figure 3.1: AUR Treatment (Austroads Guide to Road Design - Part 4A)

The works to convert the AUR treatment to a CHR(Short Lane) is expected to be minimal and will be subject to the pavement condition of the outer lane with some possible minor widening works to the roadside shoulders.

3.5.3 Albatross Road / Yalwal Road

The proposed configuration for the Albatross Road / Yalwal Road intersection is shown in Figure 3.2.

A roundabout is considered to be the preferred treatment as it will safely allow for u-turn manoeuvres should turn restrictions be implemented mid-block along Albatross Road. In addition, the roundabout will cause less driver frustrations outside of the peak period with motorists having to wait unnecessarily outside the peak periods under a signalised intersection arrangement.

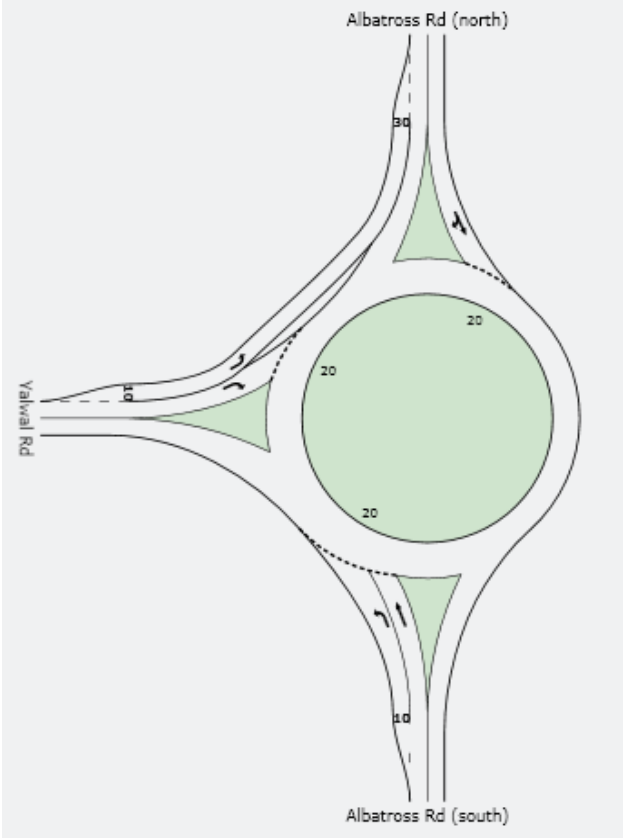


Figure 3.2: Albatross Road / Yalwal Road Proposed Intersection Configuration

3.5.4 Albatross Road / Berry Street

The proposed configuration for the Albatross Road / Berry Street intersection is shown in Figure 3.3.

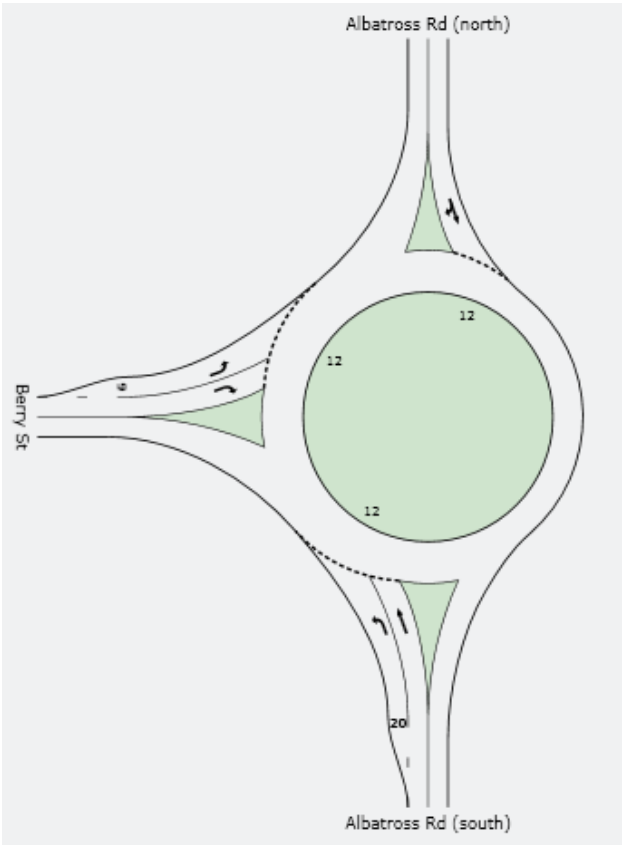


Figure 3.3: Albatross Road / Berry Street Proposed Intersection Configuration

Only minor additions to the existing roundabout are required to ensure the intersection operates under capacity with full development by 2022.

Traffic signals options were tested; however a substantial intersection footprint would be required to maintain a suitable level of operation during the peak periods. As the minor modifications to the existing roundabout addressed the traffic capacity issues, it has been recommended as the preferred treatment. The management of pedestrians using the main shared path along Albatross Road may need further signposting / delineation / lighting measures for safety purposes, particularly in the vicinity of the road crossing areas near intersections.

3.5.5 Albatross Road / Kalandar Street / Kinghorne Street

The proposed configuration for the Albatross Road / Kinghorne Street intersection is shown in Figure 3.4.

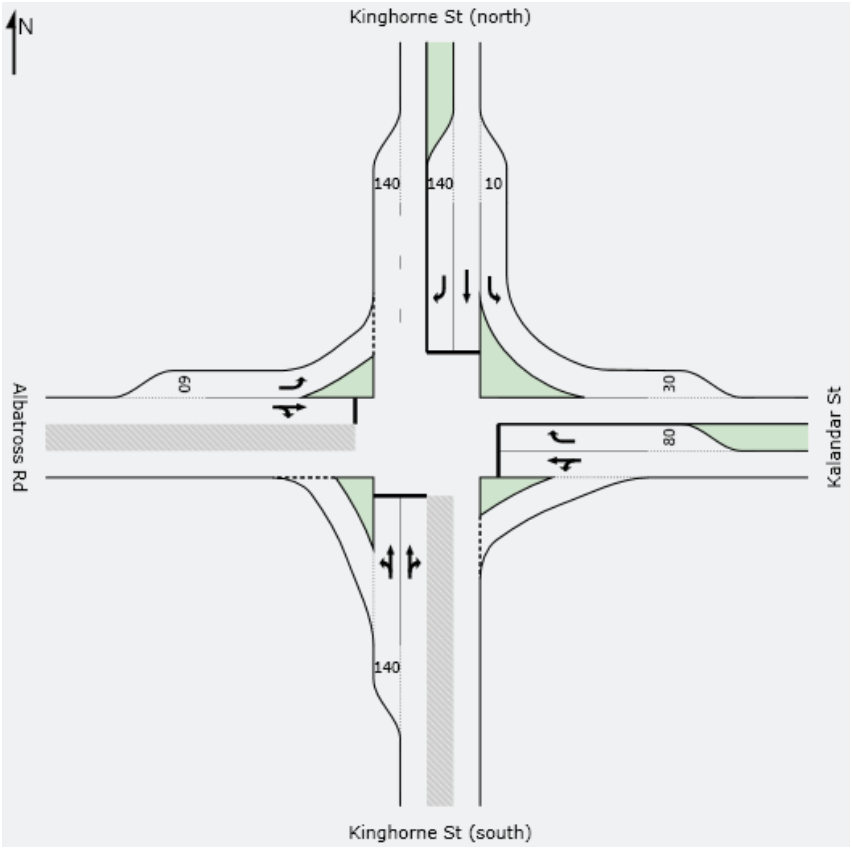


Figure 3.4: Albatross Road / Kinghorne Street Proposed Intersection Configuration

The proposed signal phasing details for the above intersection is shown in Figure 3.5.

AM Peak

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	21	6	19	30
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	27	12	25	36
Phase Split	27 %	12 %	25 %	36 %

PM Peak

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	25	6	20	15
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	31	12	26	21
Phase Split	34 %	13 %	29 %	23 %

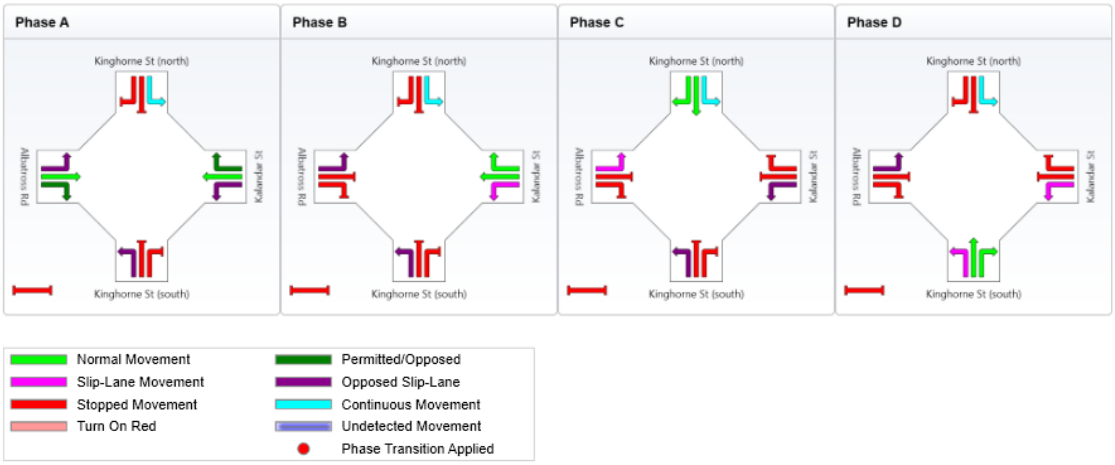


Figure 3.5: Albatross Road / Kinghorne Street Proposed Signal Phasing

3.5.6 Alternative Option

Given the likely costs to upgrade the above mentioned intersections, in the longer term Council may see it more beneficial to consider implementing a series of 'bypass routes'. One possible low cost option to deviate traffic into the Nowra town centre area via Bice Road is shown in Figure 3.6.

Source: Google Maps

Figure 3.6: Bypass Route Option

3.6 UPGRADED INTERSECTION MODEL OUTPUTS

Detailed outputs from the Sidra Assessments of the proposed intersection upgrade configurations are included in Appendix B.

A summary of the morning peak and evening peak operating performance is included in Table 3.6

Table 3.6: Sidra Outputs – Upgraded Intersection Configurations

Approach	Lane	AM			PM		
		DOS	Average Delay (s)	95%ileQueue (m)	DOS	Average Delay (s)	95%ileQueue (m)
3. Albatross Rd and Yalwal Rd							
Albatross Rd (south)	L	0.28	11	6	0.53	16	13
	T	0.27	8	14	0.86	23	134
Albatross Rd (north)	T	0.64	7	55	0.68	7	70
	R	0.64	13	55	0.68	13	70
Yalwal Rd	L	0.39	6	0	0.28	6	0
	R	0.11	13	5	0.19	18	10
4. Albatross Rd and Berry St							
Albatross Rd (south)	LT	0.6	8	20	0.6	8	42
Albatross Rd (north)	TR	0.7	13	61	0.77	17	77
Berry St	LR	0.34	14	16	0.63	22	50
5. Albatross Rd and Kalandar St							
Kinghorne St (north)	L	0.69	46	125	0.68	50	69
	T	0.88	43	206	0.88	46	104
	R	0.88	55	206	0.88	58	104
Kalandar St	L	0.56	37	102	0.39	27	65
	T	0.56	29	102	0.39	19	65
	R	0.86	59	84	0.48	46	33
Kinghorne St (south)	L	0.07	8	0	0.18	8	0
	T	0.13	37	14	0.21	31	24
	R	0.88	61	125	0.89	57	139
Albatross Rd	L	0.68	15	57	0.56	10	36
	T	0.89	55	122	0.91	49	185
	R	0.89	64	122	0.91	58	185

3.7 COST APPORTIONMENT

Ultimately the cost apportionment for any impacts associated with the proposed Mundamia development resides with Council. Based on the Sidra assessments undertaken it would be considered appropriate for the development to fund the suggested infrastructure improvements at the Yalwal Road / George Evans Road intersection, Yalwal Road / Albatross Road intersection and the Albatross Road / Berry Street intersection. The capacity absorbed by background traffic on these intersection improvements would balance out any monetary contribution required for the Albatross Road / Kinghorne Street intersection.

It would also be considered appropriate that the cost to deliver the infrastructure requirements be apportioned based on the proportion of traffic generated by each land owner within the Mundamia sub-division (refer Table 2.3).

4. CONCLUSION

Bitzios Consulting were commissioned by SET Consultants to prepare a Traffic Impact Study for the Mundamia development. SET Consulting are responsible for preparing independent planning documentation to be submitted to the Department of Planning for approval for the Council owned land within the sub-division being Lot 1 DP1021332.

The traffic assessment considered the impacts from the entire Mundamia development area which consists of three separate land owners.

The external trips generated by the development at full completion are expected to be in the order of 560 vehicle trips within the peak hour.

The development area is expected to introduce noticeable traffic impacts at the Yalwal Road / Albatross Road intersection. Minor impacts directly related to the development are expected at the Albatross Road / Berry Street intersection and the Albatross Road / Kinghorne Street intersection. The main concern relating to the latter two intersections is the fact that the early introduction of the Mundamia development could bring forward intersection capacity issues at these locations.

Based on the Sidra assessments undertaken it would be considered appropriate for the development to fund the suggested infrastructure improvements at (refer Section 3.5 for details):

- the Yalwal Road / George Evans Road intersection;
- the Yalwal Road / Albatross Road intersection; and
- the Albatross Road / Berry Street intersection.

The capacity absorbed by background traffic on these intersection improvements would balance out any monetary contribution required for the Albatross Road / Kinghorne Street intersection.

It would also be considered appropriate that the cost to deliver the infrastructure requirements be apportioned based on the proportion of traffic generated by each land owner within the Mundamia sub-division (refer Table 2.3).

The costs to upgrade the Albatross Road / Berry Street intersection and the George Evans Road / Yalwal Road intersection are not expected to be high with the majority of the works able to be catered for within the existing pavement formation. Some minor localised road widening or pavement strengthening may however be required.

The upgrade to the Yalwal Road / Albatross Road intersection is expected to be more costly as it involves the re-construction of an intersection under traffic.

Consideration should be given to further planning for a 'bypass' route from Yalwal Road to Bice Road to provide a more robust longer term solution. The construction of the 'bypass' route may remove the need to complete any upgrades to the Albatross Road intersections.

APPENDIX A

SIDRA OUTPUTS – EXISTING INTERSECTION CONFIGURATIONS

MOVEMENT SUMMARY

Site: 2012AM

UOW and George Evans Rd - 2012AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: George Evans Rd (south)											
1	L	134	2.0	0.078	6.0	LOS A	0.4	2.6	0.01	0.51	51.5
2	T	1	4.0	0.078	4.8	LOS A	0.4	2.6	0.01	0.39	52.9
Approach		135	2.0	0.078	6.0	LOS A	0.4	2.6	0.01	0.51	51.5
North: George Evans Rd (north)											
8	T	2	4.0	0.002	4.8	LOS A	0.0	0.1	0.06	0.39	52.5
9	R	1	2.0	0.002	11.2	LOS A	0.0	0.1	0.06	0.84	46.5
Approach		3	3.3	0.002	6.9	LOS A	0.0	0.1	0.06	0.54	50.2
West: UOW Access											
10	L	1	2.0	0.008	5.9	LOS A	0.0	0.2	0.01	0.46	51.5
12	R	12	2.0	0.008	11.2	LOS A	0.0	0.2	0.01	0.71	46.5
Approach		13	2.0	0.008	10.8	LOS A	0.0	0.2	0.01	0.69	46.9
All Vehicles		151	2.0	0.078	6.4	LOS A	0.4	2.6	0.02	0.52	51.1

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: 2012AM with Development

UOW and George Evans Rd - 2012AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: George Evans Rd (south)											
1	L	134	2.0	0.210	6.1	LOS A	1.2	8.2	0.15	0.51	50.7
2	T	182	2.0	0.210	5.0	LOS A	1.2	8.2	0.15	0.40	51.8
Approach		316	2.0	0.210	5.5	LOS A	1.2	8.2	0.15	0.45	51.3
North: George Evans Rd (north)											
8	T	358	2.0	0.241	4.9	LOS A	1.5	10.5	0.08	0.40	52.4
9	R	40	2.0	0.241	11.3	LOS A	1.5	10.5	0.08	0.90	46.5
Approach		398	2.0	0.241	5.5	LOS A	1.5	10.5	0.08	0.45	51.7
West: UOW Access											
10	L	20	2.0	0.026	6.7	LOS A	0.1	0.9	0.32	0.49	49.3
12	R	12	2.0	0.026	12.0	LOS A	0.1	0.9	0.32	0.70	45.8
Approach		32	2.0	0.026	8.6	LOS A	0.1	0.9	0.32	0.57	47.9
All Vehicles		745	2.0	0.241	5.6	LOS A	1.5	10.5	0.12	0.46	51.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2012PM

UOW and George Evans Rd - 2012PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: George Evans Rd (south)											
1	L	44	2.0	0.028	6.0	LOS A	0.1	0.9	0.01	0.51	51.5
2	T	2	4.0	0.028	4.8	LOS A	0.1	0.9	0.01	0.39	52.9
Approach		46	2.1	0.028	5.9	LOS A	0.1	0.9	0.01	0.50	51.6
North: George Evans Rd (north)											
8	T	1	4.0	0.002	5.0	LOS A	0.0	0.0	0.15	0.37	51.6
9	R	1	2.0	0.002	11.3	LOS A	0.0	0.0	0.15	0.75	46.3
Approach		2	3.0	0.002	8.2	LOS A	0.0	0.0	0.15	0.56	48.7
West: UOW Access											
10	L	1	2.0	0.031	5.9	LOS A	0.1	1.0	0.02	0.46	51.4
12	R	51	2.0	0.031	11.2	LOS A	0.1	1.0	0.02	0.70	46.5
Approach		52	2.0	0.031	11.1	LOS A	0.1	1.0	0.02	0.69	46.6
All Vehicles		100	2.1	0.031	8.6	LOS A	0.1	1.0	0.02	0.60	48.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2012PM with Development

UOW and George Evans Rd - 2012PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: George Evans Rd (south)											
1	L	44	2.0	0.227	6.1	LOS A	1.3	9.3	0.12	0.52	51.0
2	T	312	2.0	0.227	4.9	LOS A	1.3	9.3	0.12	0.41	52.1
Approach		356	2.0	0.227	5.1	LOS A	1.3	9.3	0.12	0.42	51.9
North: George Evans Rd (north)											
8	T	223	2.0	0.171	5.1	LOS A	1.0	7.1	0.19	0.41	51.5
9	R	24	2.0	0.171	11.4	LOS A	1.0	7.1	0.19	0.85	46.5
Approach		247	2.0	0.171	5.7	LOS A	1.0	7.1	0.19	0.45	50.9
West: UOW Access											
10	L	35	2.0	0.078	7.4	LOS A	0.4	2.8	0.44	0.55	48.5
12	R	51	2.0	0.078	12.6	LOS A	0.4	2.8	0.44	0.71	45.2
Approach		85	2.0	0.078	10.5	LOS A	0.4	2.8	0.44	0.65	46.5
All Vehicles		688	2.0	0.227	6.0	LOS A	1.3	9.3	0.18	0.46	50.8

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.

MOVEMENT SUMMARY

Site: 2022AM

UOW and George Evans Rd - 2022AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: George Evans Rd (south)											
1	L	162	2.0	0.094	6.0	LOS A	0.5	3.3	0.01	0.51	51.5
2	T	1	4.0	0.094	4.8	LOS A	0.5	3.3	0.01	0.39	52.9
Approach		163	2.0	0.094	6.0	LOS A	0.5	3.3	0.01	0.51	51.5
North: George Evans Rd (north)											
8	T	2	4.0	0.002	4.8	LOS A	0.0	0.1	0.07	0.38	52.4
9	R	1	2.0	0.002	11.2	LOS A	0.0	0.1	0.07	0.84	46.5
Approach		3	3.3	0.002	7.0	LOS A	0.0	0.1	0.07	0.53	50.2
West: UOW Access											
10	L	1	2.0	0.010	5.9	LOS A	0.0	0.3	0.01	0.46	51.5
12	R	15	2.0	0.010	11.2	LOS A	0.0	0.3	0.01	0.71	46.5
Approach		16	2.0	0.010	10.9	LOS A	0.0	0.3	0.01	0.69	46.8
All Vehicles		182	2.0	0.094	6.4	LOS A	0.5	3.3	0.02	0.52	51.0

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: 2022AM with Development

UOW and George Evans Rd - 2022AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: George Evans Rd (south)											
1	L	162	2.0	0.228	6.1	LOS A	1.3	9.1	0.16	0.51	50.7
2	T	182	2.0	0.228	5.0	LOS A	1.3	9.1	0.16	0.40	51.7
Approach		344	2.0	0.228	5.5	LOS A	1.3	9.1	0.16	0.45	51.2
North: George Evans Rd (north)											
8	T	358	2.0	0.244	4.9	LOS A	1.5	10.7	0.09	0.40	52.3
9	R	40	2.0	0.244	11.3	LOS A	1.5	10.7	0.09	0.89	46.5
Approach		398	2.0	0.244	5.5	LOS A	1.5	10.7	0.09	0.45	51.6
West: UOW Access											
10	L	20	2.0	0.029	6.7	LOS A	0.1	1.0	0.32	0.49	49.3
12	R	15	2.0	0.029	12.0	LOS A	0.1	1.0	0.32	0.69	45.7
Approach		35	2.0	0.029	8.9	LOS A	0.1	1.0	0.32	0.58	47.7
All Vehicles		777	2.0	0.244	5.7	LOS A	1.5	10.7	0.13	0.46	51.2

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: 2022PM

UOW and George Evans Rd - 2022PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: George Evans Rd (south)											
1	L	54	2.0	0.033	6.0	LOS A	0.2	1.1	0.01	0.51	51.5
2	T	2	4.0	0.033	4.8	LOS A	0.2	1.1	0.01	0.39	52.9
Approach		56	2.1	0.033	5.9	LOS A	0.2	1.1	0.01	0.50	51.6
North: George Evans Rd (north)											
8	T	1	4.0	0.002	5.0	LOS A	0.0	0.1	0.17	0.37	51.5
9	R	1	2.0	0.002	11.4	LOS A	0.0	0.1	0.17	0.74	46.3
Approach		2	3.0	0.002	8.2	LOS A	0.0	0.1	0.17	0.55	48.7
West: UOW Access											
10	L	1	2.0	0.038	5.9	LOS A	0.2	1.2	0.02	0.46	51.4
12	R	61	2.0	0.038	11.2	LOS A	0.2	1.2	0.02	0.70	46.5
Approach		62	2.0	0.038	11.1	LOS A	0.2	1.2	0.02	0.69	46.6
All Vehicles		120	2.1	0.038	8.7	LOS A	0.2	1.2	0.02	0.60	48.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2022PM with Development

UOW and George Evans Rd - 2022PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: George Evans Rd (south)											
1	L	54	2.0	0.232	6.1	LOS A	1.4	9.7	0.12	0.52	50.9
2	T	312	2.0	0.232	4.9	LOS A	1.4	9.7	0.12	0.41	52.1
Approach		365	2.0	0.232	5.1	LOS A	1.4	9.7	0.12	0.42	51.9
North: George Evans Rd (north)											
8	T	223	2.0	0.175	5.1	LOS A	1.0	7.2	0.21	0.42	51.3
9	R	24	2.0	0.175	11.5	LOS A	1.0	7.2	0.21	0.84	46.5
Approach		247	2.0	0.175	5.7	LOS A	1.0	7.2	0.21	0.46	50.8
West: UOW Access											
10	L	35	2.0	0.087	7.4	LOS A	0.4	3.1	0.44	0.55	48.4
12	R	61	2.0	0.087	12.6	LOS A	0.4	3.1	0.44	0.71	45.2
Approach		96	2.0	0.087	10.7	LOS A	0.4	3.1	0.44	0.65	46.3
All Vehicles		708	2.0	0.232	6.1	LOS A	1.4	9.7	0.20	0.47	50.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2012AM

Yalwal Rd and George Evans Rd - 2012AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yalwal Rd (east)											
5	T	96	10.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	135	4.0	0.104	8.8	LOS A	0.4	3.1	0.20	0.63	48.0
Approach		231	6.5	0.104	5.2	NA	0.4	3.1	0.12	0.37	52.3
North: George Evans Rd											
7	L	15	4.0	0.013	8.7	LOS A	0.0	0.3	0.19	0.61	48.1
9	R	1	4.0	0.003	11.4	LOS A	0.0	0.0	0.46	0.62	45.6
Approach		16	4.0	0.013	8.9	LOS A	0.0	0.3	0.20	0.61	48.0
West: Yalwal Rd (west)											
10	L	3	4.0	0.002	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	85	10.0	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		88	9.8	0.047	0.3	NA	0.0	0.0	0.00	0.02	59.5
All Vehicles		335	7.2	0.104	4.0	NA	0.4	3.1	0.09	0.29	53.8

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: 2012AM with Development

Yalwal Rd and George Evans Rd - 2012AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yalwal Rd (east)											
5	T	96	8.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	306	2.0	0.233	8.8	LOS A	1.1	7.9	0.24	0.64	47.8
Approach		402	3.4	0.233	6.7	NA	1.1	7.9	0.18	0.48	50.3
North: George Evans Rd											
7	L	352	2.0	0.322	8.9	LOS A	1.5	10.9	0.25	0.63	47.8
9	R	18	2.0	0.063	14.4	LOS A	0.2	1.1	0.56	0.79	43.0
Approach		369	2.0	0.322	9.1	LOS A	1.5	10.9	0.27	0.64	47.6
West: Yalwal Rd (west)											
10	L	13	2.0	0.007	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	85	8.0	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		98	7.2	0.046	1.1	NA	0.0	0.0	0.00	0.09	58.3
All Vehicles		869	3.2	0.322	7.1	NA	1.5	10.9	0.20	0.51	49.8

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: 2012PM

Yalwal Rd and George Evans Rd - 2012PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yalwal Rd (east)											
5	T	97	10.0	0.053	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	47	4.0	0.037	8.9	LOS A	0.1	1.1	0.22	0.63	47.9
Approach		144	8.0	0.053	2.9	NA	0.1	1.1	0.07	0.21	55.4
North: George Evans Rd											
7	L	52	4.0	0.049	8.9	LOS A	0.2	1.3	0.22	0.63	48.0
9	R	5	4.0	0.015	11.0	LOS A	0.0	0.2	0.42	0.65	46.2
Approach		57	4.0	0.049	9.1	LOS A	0.2	1.3	0.24	0.63	47.8
West: Yalwal Rd (west)											
10	L	2	4.0	0.001	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	113	10.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		115	9.9	0.062	0.2	NA	0.0	0.0	0.00	0.01	59.8
All Vehicles		316	8.0	0.062	3.0	NA	0.2	1.3	0.08	0.21	55.3

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: 2012PM with Development

Yalwal Rd and George Evans Rd - 2012PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yalwal Rd (east)											
5	T	97	8.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	341	2.0	0.268	9.0	LOS A	1.3	9.3	0.29	0.65	47.6
Approach		438	3.3	0.268	7.0	NA	1.3	9.3	0.22	0.50	49.9
North: George Evans Rd											
7	L	263	2.0	0.249	9.0	LOS A	1.1	7.7	0.27	0.64	47.7
9	R	16	2.0	0.060	15.6	LOS B	0.1	1.1	0.59	0.82	42.0
Approach		279	2.0	0.249	9.4	LOS A	1.1	7.7	0.29	0.65	47.4
West: Yalwal Rd (west)											
10	L	18	2.0	0.010	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	113	8.0	0.061	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		131	7.2	0.061	1.1	NA	0.0	0.0	0.00	0.09	58.2
All Vehicles		847	3.5	0.268	6.9	NA	1.3	9.3	0.21	0.49	50.1

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.

MOVEMENT SUMMARY

Site: 2022AM

Yalwal Rd and George Evans Rd - 2022AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yalwal Rd (east)											
5	T	117	10.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	164	4.0	0.127	8.9	LOS A	0.5	3.9	0.23	0.64	47.8
Approach		281	6.5	0.127	5.2	NA	0.5	3.9	0.13	0.37	52.3
North: George Evans Rd											
7	L	18	4.0	0.017	8.8	LOS A	0.1	0.4	0.21	0.62	48.0
9	R	1	4.0	0.003	12.4	LOS A	0.0	0.1	0.50	0.64	44.7
Approach		19	4.0	0.017	9.0	LOS A	0.1	0.4	0.23	0.62	47.8
West: Yalwal Rd (west)											
10	L	4	4.0	0.002	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	103	10.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		107	9.8	0.056	0.3	NA	0.0	0.0	0.00	0.03	59.5
All Vehicles		407	7.2	0.127	4.1	NA	0.5	3.9	0.10	0.29	53.8

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: 2022AM with Development

Yalwal Rd and George Evans Rd - 2022AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yalwal Rd (east)											
5	T	117	8.0	0.063	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	336	2.0	0.261	9.0	LOS A	1.3	9.0	0.27	0.64	47.7
Approach		453	3.5	0.261	6.6	NA	1.3	9.0	0.20	0.48	50.4
North: George Evans Rd											
7	L	355	2.0	0.331	9.0	LOS A	1.6	11.2	0.28	0.64	47.7
9	R	18	2.0	0.068	15.7	LOS B	0.2	1.2	0.60	0.83	41.9
Approach		373	2.0	0.331	9.3	LOS A	1.6	11.2	0.30	0.65	47.4
West: Yalwal Rd (west)											
10	L	14	2.0	0.007	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	103	8.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		117	7.3	0.056	1.0	NA	0.0	0.0	0.00	0.08	58.5
All Vehicles		942	3.4	0.331	7.0	NA	1.6	11.2	0.21	0.49	50.0

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.

MOVEMENT SUMMARY

Site: 2022PM

Yalwal Rd and George Evans Rd - 2022PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yalwal Rd (east)											
5	T	119	10.0	0.065	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	57	4.0	0.045	9.0	LOS A	0.2	1.3	0.25	0.63	47.7
Approach		176	8.1	0.065	2.9	NA	0.2	1.3	0.08	0.20	55.4
North: George Evans Rd											
7	L	63	4.0	0.061	9.0	LOS A	0.2	1.6	0.25	0.63	47.8
9	R	6	4.0	0.019	11.7	LOS A	0.0	0.3	0.46	0.68	45.4
Approach		69	4.0	0.061	9.3	LOS A	0.2	1.6	0.27	0.64	47.6
West: Yalwal Rd (west)											
10	L	3	4.0	0.002	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	138	10.0	0.075	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		141	9.9	0.075	0.2	NA	0.0	0.0	0.00	0.01	59.7
All Vehicles		386	8.0	0.075	3.1	NA	0.2	1.6	0.09	0.21	55.2

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: 2022PM with Development

Yalwal Rd and George Evans Rd - 2022PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yalwal Rd (east)											
5	T	119	8.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	351	2.0	0.283	9.2	LOS A	1.4	9.9	0.32	0.65	47.5
Approach		469	3.5	0.283	6.9	NA	1.4	9.9	0.24	0.49	50.1
North: George Evans Rd											
7	L	274	2.0	0.266	9.2	LOS A	1.2	8.3	0.31	0.65	47.6
9	R	17	2.0	0.068	16.8	LOS B	0.2	1.2	0.64	0.86	41.0
Approach		291	2.0	0.266	9.6	LOS A	1.2	8.3	0.33	0.67	47.2
West: Yalwal Rd (west)											
10	L	18	2.0	0.010	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	138	8.0	0.074	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		156	7.3	0.074	0.9	NA	0.0	0.0	0.00	0.08	58.5
All Vehicles		916	3.7	0.283	6.7	NA	1.4	9.9	0.23	0.47	50.4

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: 2012AM

Albatross Rd and Yalwal Rd - 2012AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	41	10.0	0.024	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	227	8.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		268	8.3	0.123	1.3	NA	0.0	0.0	0.00	0.10	58.0
North: Albatross Rd (north)											
8	T	327	8.0	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	241	10.0	0.233	10.2	LOS A	1.0	8.0	0.42	0.71	47.1
Approach		568	8.8	0.233	4.3	NA	1.0	8.0	0.18	0.30	53.8
West: Yalwal Rd											
10	L	343	10.0	0.398	10.9	LOS A	2.2	16.7	0.47	0.76	46.5
12	R	31	10.0	0.156	26.4	LOS B	0.5	4.0	0.80	0.94	34.9
Approach		374	10.0	0.398	12.2	LOS A	2.2	16.7	0.50	0.77	45.2
All Vehicles		1211	9.1	0.398	6.1	NA	2.2	16.7	0.24	0.40	51.6

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: 2012AM with Development

Albatross Rd and Yalwal Rd - 2012AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	76	8.0	0.043	8.5	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	227	6.0	0.121	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		303	6.5	0.121	2.1	NA	0.0	0.0	0.00	0.17	56.8
North: Albatross Rd (north)											
8	T	327	6.0	0.174	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	379	8.0	0.370	10.7	LOS A	2.0	15.2	0.49	0.75	46.6
Approach		706	7.1	0.370	5.7	NA	2.0	15.2	0.26	0.40	52.0
West: Yalwal Rd											
10	L	613	8.0	0.703	14.3	LOS A	8.6	64.6	0.67	0.98	43.3
12	R	98	8.0	0.640	49.5	LOS D	3.0	22.6	0.93	1.14	25.4
Approach		711	8.0	0.703	19.1	LOS B	8.6	64.6	0.71	1.00	39.5
All Vehicles		1720	7.4	0.703	10.6	NA	8.6	64.6	0.40	0.61	46.6

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: 2012PM

Albatross Rd and Yalwal Rd - 2012PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	63	10.0	0.036	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	641	8.0	0.346	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		704	8.2	0.346	0.8	NA	0.0	0.0	0.00	0.06	58.8
North: Albatross Rd (north)											
8	T	285	8.0	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	267	10.0	0.449	16.0	LOS B	2.5	19.0	0.70	1.01	41.9
Approach		553	9.0	0.449	7.8	NA	2.5	19.0	0.34	0.49	49.6
West: Yalwal Rd											
10	L	267	10.0	0.555	18.7	LOS B	3.2	24.6	0.75	1.07	39.9
12	R	39	10.0	0.504	75.9	LOS F	1.8	13.4	0.95	1.06	19.4
Approach		306	10.0	0.555	25.9	LOS B	3.2	24.6	0.78	1.07	35.2
All Vehicles		1563	8.8	0.555	8.2	NA	3.2	24.6	0.27	0.41	49.1

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.

MOVEMENT SUMMARY

Site: 2012PM with Development

Albatross Rd and Yalwal Rd - 2012PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	121	8.0	0.069	8.5	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	641	6.0	0.342	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		762	6.3	0.342	1.3	NA	0.0	0.0	0.00	0.11	57.9
North: Albatross Rd (north)											
8	T	285	6.0	0.152	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	503	8.0	0.869	28.7	LOS C	11.3	84.6	0.92	1.65	33.6
Approach		788	7.3	0.869	18.3	NA	11.3	84.6	0.58	1.05	40.0
West: Yalwal Rd											
10	L	458	8.0	0.939	40.6	LOS C	15.4	114.8	0.96	1.97	28.4
12	R	60	8.0	1.000[3]	161.9	LOS F	5.0	37.3	1.00	1.28	11.0
Approach		518	8.0	1.000	54.7	LOS D	15.4	114.8	0.96	1.89	24.0
All Vehicles		2068	7.1	1.000	21.2	NA	15.4	114.8	0.46	0.91	38.0

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.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

MOVEMENT SUMMARY

Site: 2022AM

Albatross Rd and Yalwal Rd - 2022AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	51	10.0	0.029	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	278	8.0	0.150	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		328	8.3	0.150	1.3	NA	0.0	0.0	0.00	0.10	58.0
North: Albatross Rd (north)											
8	T	399	8.0	0.215	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	295	10.0	0.305	10.7	LOS A	1.4	10.8	0.49	0.75	46.6
Approach		694	8.8	0.305	4.6	NA	1.4	10.8	0.21	0.32	53.5
West: Yalwal Rd											
10	L	418	10.0	0.518	12.6	LOS A	3.8	29.0	0.57	0.89	44.8
12	R	38	10.0	0.288	40.2	LOS C	1.0	7.6	0.89	1.00	28.6
Approach		456	10.0	0.518	14.9	LOS B	3.8	29.0	0.60	0.89	42.8
All Vehicles		1478	9.1	0.518	7.0	NA	3.8	29.0	0.28	0.45	50.5

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: 2022AM with Development

Albatross Rd and Yalwal Rd - 2022AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	84	8.0	0.048	8.5	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	278	6.0	0.148	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		362	6.5	0.148	2.0	NA	0.0	0.0	0.00	0.16	57.0
North: Albatross Rd (north)											
8	T	399	6.0	0.213	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	432	8.0	0.450	11.8	LOS A	3.1	22.8	0.56	0.85	45.5
Approach		831	7.0	0.450	6.1	NA	3.1	22.8	0.29	0.44	51.5
West: Yalwal Rd											
10	L	691	8.0	0.847	19.7	LOS B	15.6	116.6	0.86	1.37	39.1
12	R	103	8.0	1.000[3]	81.4	LOS F	5.0	37.3	1.00	1.19	18.5
Approach		794	8.0	1.000	27.7	LOS B	15.6	116.6	0.87	1.35	34.2
All Vehicles		1986	7.3	1.000	14.0	NA	15.6	116.6	0.47	0.75	43.5

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.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

MOVEMENT SUMMARY

Site: 2022PM

Albatross Rd and Yalwal Rd - 2022PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	77	10.0	0.044	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	782	8.0	0.422	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		859	8.2	0.422	0.8	NA	0.0	0.0	0.00	0.06	58.8
North: Albatross Rd (north)											
8	T	347	8.0	0.187	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	326	10.0	0.691	23.1	LOS B	4.9	37.0	0.86	1.23	36.8
Approach		674	9.0	0.691	11.2	NA	4.9	37.0	0.42	0.59	46.0
West: Yalwal Rd											
10	L	326	10.0	0.859	35.1	LOS C	8.2	62.0	0.93	1.54	30.6
12	R	47	10.0	1.000[3]	211.8	LOS F	4.9	37.3	1.00	1.28	8.8
Approach		374	10.0	1.000	57.5	LOS E	8.2	62.0	0.94	1.51	23.3
All Vehicles		1906	8.8	1.000	15.6	NA	8.2	62.0	0.33	0.53	42.1

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.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

MOVEMENT SUMMARY

Site: 2022PM with Development

Albatross Rd and Yalwal Rd - 2022PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	135	8.0	0.077	8.5	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	782	6.0	0.417	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		917	6.3	0.417	1.2	NA	0.0	0.0	0.00	0.10	58.1
North: Albatross Rd (north)											
8	T	428	6.0	0.231	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	481	8.0	1.042	89.6	LOS F	29.7	222.3	1.00	2.93	17.3
Approach		908	7.2	1.042	47.4	NA	29.7	222.3	0.53	1.55	26.1
West: Yalwal Rd											
10	L	524	8.0	1.354	348.0	LOS F	95.2	712.4	1.00	5.84	5.7
12	R	60	8.0	1.000[3]	166.7	LOS F	5.0	37.3	1.00	1.32	10.7
Approach		584	8.0	1.354	329.4	LOS F	95.2	712.4	1.00	5.38	6.0
All Vehicles		2409	7.1	1.354	98.2	NA	95.2	712.4	0.44	1.92	16.2

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.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

MOVEMENT SUMMARY

Site: 2012AM

Albatross Rd and Berry St -2012AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	272	3.0	0.433	7.7	LOS A	3.5	25.5	0.24	0.58	48.8
2	T	344	8.0	0.433	7.0	LOS A	3.5	25.5	0.24	0.50	49.4
Approach		616	5.8	0.433	7.3	LOS A	3.5	25.5	0.24	0.53	49.2
North: Albatross Rd (north)											
8	T	405	8.0	0.415	8.2	LOS A	3.0	22.1	0.51	0.61	47.9
9	R	43	3.0	0.415	12.4	LOS A	3.0	22.1	0.51	0.78	45.7
Approach		448	7.5	0.415	8.6	LOS A	3.0	22.1	0.51	0.63	47.7
West: Berry St											
10	L	49	3.0	0.256	9.7	LOS A	1.5	10.5	0.55	0.69	46.9
12	R	192	3.0	0.256	13.3	LOS A	1.5	10.5	0.55	0.77	44.4
Approach		241	3.0	0.256	12.5	LOS A	1.5	10.5	0.55	0.75	44.9
All Vehicles		1305	5.9	0.433	8.7	LOS A	3.5	25.5	0.39	0.61	47.8

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.

MOVEMENT SUMMARY

Site: 2012AM with Development

Albatross Rd and Berry St -2012AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	434	2.0	0.604	7.8	LOS A	6.6	48.1	0.32	0.56	48.5
2	T	453	6.0	0.604	7.0	LOS A	6.6	48.1	0.32	0.49	48.9
Approach		886	4.0	0.604	7.4	LOS A	6.6	48.1	0.32	0.52	48.7
North: Albatross Rd (north)											
8	T	460	6.0	0.506	8.9	LOS A	3.9	28.8	0.66	0.69	47.1
9	R	43	2.0	0.506	13.2	LOS A	3.9	28.8	0.66	0.81	45.2
Approach		503	5.7	0.506	9.3	LOS A	3.9	28.8	0.66	0.70	46.9
West: Berry St											
10	L	49	2.0	0.378	10.7	LOS A	2.4	17.1	0.67	0.77	46.0
12	R	275	2.0	0.378	14.3	LOS A	2.4	17.1	0.67	0.83	43.5
Approach		324	2.0	0.378	13.7	LOS A	2.4	17.1	0.67	0.82	43.8
All Vehicles		1714	4.1	0.604	9.1	LOS A	6.6	48.1	0.49	0.63	47.2

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: 2012PM

Albatross Rd and Berry St -2012PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	294	3.0	0.625	7.7	LOS A	7.2	53.2	0.25	0.57	48.8
2	T	656	8.0	0.625	7.0	LOS A	7.2	53.2	0.25	0.49	49.4
Approach		949	6.5	0.625	7.2	LOS A	7.2	53.2	0.25	0.51	49.2
North: Albatross Rd (north)											
8	T	346	8.0	0.378	8.5	LOS A	2.6	19.7	0.57	0.65	47.6
9	R	26	3.0	0.378	12.8	LOS A	2.6	19.7	0.57	0.80	45.5
Approach		373	7.6	0.378	8.8	LOS A	2.6	19.7	0.57	0.66	47.4
West: Berry St											
10	L	65	3.0	0.429	13.4	LOS A	3.0	21.3	0.79	0.90	43.5
12	R	242	3.0	0.429	16.9	LOS B	3.0	21.3	0.79	0.93	41.4
Approach		307	3.0	0.429	16.2	LOS B	3.0	21.3	0.79	0.93	41.8
All Vehicles		1629	6.1	0.625	9.2	LOS A	7.2	53.2	0.42	0.62	47.2

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: 2012PM with Development

Albatross Rd and Berry St -2012PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	395	2.0	0.723	7.7	LOS A	11.1	80.6	0.32	0.54	48.5
2	T	724	6.0	0.723	6.9	LOS A	11.1	80.6	0.32	0.47	48.9
Approach		1119	4.6	0.723	7.2	LOS A	11.1	80.6	0.32	0.49	48.8
North: Albatross Rd (north)											
8	T	440	6.0	0.548	10.6	LOS A	4.8	35.1	0.79	0.82	46.4
9	R	26	2.0	0.548	14.9	LOS B	4.8	35.1	0.79	0.89	43.9
Approach		466	5.8	0.548	10.8	LOS A	4.8	35.1	0.79	0.82	46.3
West: Berry St											
10	L	65	2.0	0.672	19.7	LOS B	7.2	51.6	0.94	1.15	38.5
12	R	383	2.0	0.672	23.3	LOS B	7.2	51.6	0.94	1.16	37.0
Approach		448	2.0	0.672	22.8	LOS B	7.2	51.6	0.94	1.15	37.2
All Vehicles		2034	4.3	0.723	11.5	LOS A	11.1	80.6	0.57	0.72	45.1

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: 2022AM

Albatross Rd and Berry St -2022AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	331	3.0	0.539	7.9	LOS A	5.2	38.5	0.34	0.57	48.4
2	T	419	8.0	0.539	7.2	LOS A	5.2	38.5	0.34	0.50	48.8
Approach		749	5.8	0.539	7.5	LOS A	5.2	38.5	0.34	0.53	48.6
North: Albatross Rd (north)											
8	T	544	8.0	0.597	9.4	LOS A	5.4	40.1	0.71	0.71	46.8
9	R	57	3.0	0.597	13.7	LOS A	5.4	40.1	0.71	0.81	44.8
Approach		601	7.5	0.597	9.8	LOS A	5.4	40.1	0.71	0.72	46.6
West: Berry St											
10	L	67	3.0	0.372	10.5	LOS A	2.4	17.0	0.66	0.76	46.2
12	R	258	3.0	0.372	14.1	LOS A	2.4	17.0	0.66	0.82	43.7
Approach		325	3.0	0.372	13.4	LOS A	2.4	17.0	0.66	0.80	44.2
All Vehicles		1676	5.9	0.597	9.5	LOS A	5.4	40.1	0.53	0.65	47.0

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: 2022AM with Development

Albatross Rd and Berry St -2022AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	493	2.0	0.713	8.0	LOS A	10.1	73.5	0.48	0.54	47.8
2	T	527	6.0	0.713	7.3	LOS A	10.1	73.5	0.48	0.49	47.9
Approach		1020	4.1	0.713	7.7	LOS A	10.1	73.5	0.48	0.51	47.9
North: Albatross Rd (north)											
8	T	600	6.0	0.708	12.4	LOS A	8.6	63.3	0.88	0.89	44.8
9	R	57	2.0	0.708	16.7	LOS B	8.6	63.3	0.88	0.93	42.4
Approach		657	5.7	0.708	12.8	LOS A	8.6	63.3	0.88	0.89	44.6
West: Berry St											
10	L	67	2.0	0.520	12.8	LOS A	4.2	30.1	0.80	0.90	43.9
12	R	340	2.0	0.520	16.4	LOS B	4.2	30.1	0.80	0.93	41.8
Approach		407	2.0	0.520	15.8	LOS B	4.2	30.1	0.80	0.93	42.1
All Vehicles		2084	4.2	0.713	10.9	LOS A	10.1	73.5	0.67	0.71	45.6

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: 2022PM

Albatross Rd and Berry St -2022PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	358	3.0	0.774	7.9	LOS A	13.6	100.7	0.43	0.52	48.0
2	T	800	8.0	0.774	7.2	LOS A	13.6	100.7	0.43	0.46	48.3
Approach		1158	6.5	0.774	7.4	LOS A	13.6	100.7	0.43	0.48	48.2
North: Albatross Rd (north)											
8	T	465	8.0	0.560	10.1	LOS A	5.0	37.0	0.77	0.78	46.5
9	R	35	3.0	0.560	14.3	LOS A	5.0	37.0	0.77	0.86	44.3
Approach		500	7.7	0.560	10.4	LOS A	5.0	37.0	0.77	0.78	46.4
West: Berry St											
10	L	87	3.0	0.704	23.5	LOS B	8.0	57.8	0.99	1.21	36.1
12	R	325	3.0	0.704	27.1	LOS B	8.0	57.8	0.99	1.21	34.9
Approach		413	3.0	0.704	26.3	LOS B	8.0	57.8	0.99	1.21	35.1
All Vehicles		2071	6.1	0.774	11.9	LOS A	13.6	100.7	0.63	0.70	44.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2022PM with Development

Albatross Rd and Berry St -2022PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	460	2.0	0.871	8.1	LOS A	25.2	183.5	0.64	0.46	47.1
2	T	867	6.0	0.871	7.4	LOS A	25.2	183.5	0.64	0.43	47.1
Approach		1327	4.6	0.871	7.7	LOS A	25.2	183.5	0.64	0.44	47.1
North: Albatross Rd (north)											
8	T	559	6.0	0.733	14.7	LOS B	9.4	68.7	0.96	1.02	42.8
9	R	35	2.0	0.733	19.0	LOS B	9.4	68.7	0.96	1.03	40.7
Approach		594	5.8	0.733	15.0	LOS B	9.4	68.7	0.96	1.02	42.6
West: Berry St											
10	L	87	2.0	1.089	134.4	LOS F	51.0	363.1	1.00	2.87	12.7
12	R	466	2.0	1.089	138.0	LOS F	51.0	363.1	1.00	2.87	12.8
Approach		554	2.0	1.089	137.4	LOS F	51.0	363.1	1.00	2.87	12.8
All Vehicles		2475	4.3	1.089	38.4	LOS C	51.0	363.1	0.80	1.12	28.8

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.

MOVEMENT SUMMARY

Site: 2012AM

Albatross Rd and Kalandar St - 2012AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	35	8.0	0.930	37.8	LOS C	22.9	168.5	1.00	1.64	29.7
2	T	607	6.0	0.930	36.8	LOS C	22.9	168.5	1.00	1.64	29.8
3	R	39	6.0	0.930	41.2	LOS C	22.9	168.5	1.00	1.64	29.1
Approach		681	6.1	0.930	37.1	LOS C	22.9	168.5	1.00	1.64	29.8
East: Kalandar St											
4	L	34	6.0	0.457	10.0	LOS A	3.2	23.8	0.62	0.72	47.0
5	T	214	8.0	0.457	9.1	LOS A	3.2	23.8	0.62	0.68	47.0
6	R	166	6.0	0.457	13.5	LOS A	3.2	23.8	0.62	0.80	44.7
Approach		414	7.0	0.457	11.0	LOS A	3.2	23.8	0.62	0.73	46.0
North: Kinghorne St (north)											
7	L	94	6.0	0.336	9.1	LOS A	2.3	16.9	0.54	0.65	47.1
8	T	36	6.0	0.336	8.2	LOS A	2.3	16.9	0.54	0.61	47.2
9	R	206	8.0	0.336	12.7	LOS A	2.3	16.9	0.54	0.74	44.9
Approach		336	7.2	0.336	11.3	LOS A	2.3	16.9	0.54	0.70	45.7
West: Albatross Rd											
10	L	248	8.0	0.869	38.8	LOS C	14.1	105.3	1.00	1.45	29.2
11	T	167	8.0	0.869	37.9	LOS C	14.1	105.3	1.00	1.45	29.2
12	R	15	8.0	0.869	42.3	LOS C	14.1	105.3	1.00	1.45	28.5
Approach		431	8.0	0.869	38.5	LOS C	14.1	105.3	1.00	1.45	29.2
All Vehicles		1861	7.0	0.930	27.0	LOS B	22.9	168.5	0.83	1.22	34.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2012AM with Development

Albatross Rd and Kalandar St - 2012AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	37	6.0	0.966	49.7	LOS D	28.8	210.5	1.00	1.88	25.5
2	T	607	5.0	0.966	48.8	LOS D	28.8	210.5	1.00	1.89	25.6
3	R	39	5.0	0.966	53.2	LOS D	28.8	210.5	1.00	1.89	25.1
Approach		683	5.1	0.966	49.1	LOS D	28.8	210.5	1.00	1.89	25.6
East: Kalandar St											
4	L	34	5.0	0.492	10.2	LOS A	3.6	26.1	0.67	0.74	46.8
5	T	236	6.0	0.492	9.4	LOS A	3.6	26.1	0.67	0.71	46.7
6	R	166	5.0	0.492	13.8	LOS A	3.6	26.1	0.67	0.82	44.4
Approach		436	5.5	0.492	11.1	LOS A	3.6	26.1	0.67	0.75	45.8
North: Kinghorne St (north)											
7	L	94	5.0	0.374	9.4	LOS A	2.6	19.2	0.59	0.68	46.8
8	T	36	5.0	0.374	8.5	LOS A	2.6	19.2	0.59	0.64	46.8
9	R	237	6.0	0.374	13.0	LOS A	2.6	19.2	0.59	0.75	44.8
Approach		366	5.6	0.374	11.6	LOS A	2.6	19.2	0.59	0.72	45.5
West: Albatross Rd											
10	L	308	6.0	1.049	103.6	LOS F	40.6	299.0	1.00	2.48	15.6
11	T	211	6.0	1.049	102.7	LOS F	40.6	299.0	1.00	2.48	15.6
12	R	20	6.0	1.049	107.2	LOS F	40.6	299.0	1.00	2.48	15.6
Approach		539	6.0	1.049	103.4	LOS F	40.6	299.0	1.00	2.48	15.6
All Vehicles		2024	5.5	1.049	48.6	LOS D	40.6	299.0	0.85	1.59	25.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2012PM

Albatross Rd and Kalandar St - 2012PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	25	8.0	0.463	11.9	LOS A	3.3	24.4	0.75	0.85	45.8
2	T	267	6.0	0.463	10.9	LOS A	3.3	24.4	0.75	0.82	46.1
3	R	81	6.0	0.463	15.3	LOS B	3.3	24.4	0.75	0.90	43.4
Approach		374	6.1	0.463	11.9	LOS A	3.3	24.4	0.75	0.84	45.4
East: Kalandar St											
4	L	34	6.0	0.338	10.1	LOS A	2.2	16.3	0.63	0.74	47.0
5	T	163	8.0	0.338	9.3	LOS A	2.2	16.3	0.63	0.70	47.0
6	R	79	6.0	0.338	13.6	LOS A	2.2	16.3	0.63	0.82	44.6
Approach		276	7.2	0.338	10.6	LOS A	2.2	16.3	0.63	0.74	46.3
North: Kinghorne St (north)											
7	L	248	6.0	0.666	14.0	LOS A	7.3	53.8	0.88	0.94	43.3
8	T	67	6.0	0.666	13.1	LOS A	7.3	53.8	0.88	0.93	43.5
9	R	234	8.0	0.666	17.6	LOS B	7.3	53.8	0.88	0.97	41.3
Approach		549	6.9	0.666	15.4	LOS B	7.3	53.8	0.88	0.95	42.4
West: Albatross Rd											
10	L	367	8.0	0.835	20.3	LOS B	14.1	105.3	1.00	1.17	38.8
11	T	321	8.0	0.835	19.4	LOS B	14.1	105.3	1.00	1.17	38.9
12	R	5	8.0	0.835	23.8	LOS B	14.1	105.3	1.00	1.17	37.4
Approach		694	8.0	0.835	19.9	LOS B	14.1	105.3	1.00	1.17	38.9
All Vehicles		1893	7.2	0.835	15.7	LOS B	14.1	105.3	0.86	0.98	42.1

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: 2012PM with Development

Albatross Rd and Kalandar St - 2012PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	29	6.0	0.503	13.2	LOS A	4.0	29.0	0.81	0.92	44.4
2	T	267	5.0	0.503	12.3	LOS A	4.0	29.0	0.81	0.90	44.7
3	R	81	5.0	0.503	16.7	LOS B	4.0	29.0	0.81	0.97	42.2
Approach		378	5.1	0.503	13.3	LOS A	4.0	29.0	0.81	0.92	44.1
East: Kalandar St											
4	L	34	5.0	0.400	10.6	LOS A	2.7	20.2	0.70	0.78	46.8
5	T	201	6.0	0.400	9.7	LOS A	2.7	20.2	0.70	0.75	46.6
6	R	79	5.0	0.400	14.1	LOS A	2.7	20.2	0.70	0.85	44.3
Approach		314	5.6	0.400	10.9	LOS A	2.7	20.2	0.70	0.78	46.0
North: Kinghorne St (north)											
7	L	248	5.0	0.735	15.9	LOS B	9.3	68.5	0.95	1.03	41.6
8	T	67	5.0	0.735	15.0	LOS B	9.3	68.5	0.95	1.02	41.8
9	R	285	6.0	0.735	19.5	LOS B	9.3	68.5	0.95	1.04	39.8
Approach		601	5.5	0.735	17.5	LOS B	9.3	68.5	0.95	1.03	40.8
West: Albatross Rd											
10	L	404	6.0	0.890	24.2	LOS B	18.9	138.8	1.00	1.28	36.3
11	T	348	6.0	0.890	23.3	LOS B	18.9	138.8	1.00	1.28	36.4
12	R	8	6.0	0.890	27.7	LOS B	18.9	138.8	1.00	1.28	35.1
Approach		761	6.0	0.890	23.8	LOS B	18.9	138.8	1.00	1.28	36.3
All Vehicles		2054	5.6	0.890	18.1	LOS B	18.9	138.8	0.90	1.06	40.2

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: 2022AM

Albatross Rd and Kalandar St - 2022AM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	46	8.0	1.615	579.9	LOS F	236.8	1744.3	1.00	7.55	3.5
2	T	817	6.0	1.615	578.9	LOS F	236.8	1744.3	1.00	7.59	3.5
3	R	53	6.0	1.615	583.3	LOS F	236.8	1744.3	1.00	7.59	3.6
Approach		916	6.1	1.615	579.2	LOS F	236.8	1744.3	1.00	7.59	3.5
East: Kalandar St											
4	L	44	6.0	0.673	13.8	LOS A	7.3	54.0	0.84	0.92	43.7
5	T	286	8.0	0.673	12.9	LOS A	7.3	54.0	0.84	0.90	44.0
6	R	223	6.0	0.673	17.3	LOS B	7.3	54.0	0.84	0.95	41.6
Approach		554	7.0	0.673	14.8	LOS B	7.3	54.0	0.84	0.92	43.0
North: Kinghorne St (north)											
7	L	125	6.0	0.467	9.7	LOS A	3.6	26.5	0.65	0.70	46.5
8	T	47	6.0	0.467	8.8	LOS A	3.6	26.5	0.65	0.67	46.5
9	R	277	8.0	0.467	13.3	LOS A	3.6	26.5	0.65	0.77	44.6
Approach		449	7.2	0.467	11.8	LOS A	3.6	26.5	0.65	0.74	45.3
West: Albatross Rd											
10	L	335	8.0	1.055	104.8	LOS F	44.0	329.2	1.00	2.60	15.4
11	T	224	8.0	1.055	103.9	LOS F	44.0	329.2	1.00	2.60	15.5
12	R	19	8.0	1.055	108.3	LOS F	44.0	329.2	1.00	2.60	15.5
Approach		578	8.0	1.055	104.5	LOS F	44.0	329.2	1.00	2.60	15.5
All Vehicles		2497	7.0	1.615	242.0	LOS F	236.8	1744.3	0.90	3.72	7.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2022AM with Development

Albatross Rd and Kalandar St - 2022AM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	48	6.0	1.691	648.7	LOS F	253.5	1851.1	1.00	7.77	3.2
2	T	817	5.0	1.691	647.8	LOS F	253.5	1851.1	1.00	7.79	3.2
3	R	53	5.0	1.691	652.2	LOS F	253.5	1851.1	1.00	7.79	3.2
Approach		918	5.1	1.691	648.1	LOS F	253.5	1851.1	1.00	7.79	3.2
East: Kalandar St											
4	L	44	5.0	0.711	15.0	LOS B	8.4	61.5	0.89	0.97	42.7
5	T	308	6.0	0.711	14.1	LOS A	8.4	61.5	0.89	0.97	42.9
6	R	223	5.0	0.711	18.5	LOS B	8.4	61.5	0.89	1.00	40.7
Approach		576	5.5	0.711	15.9	LOS B	8.4	61.5	0.89	0.98	42.0
North: Kinghorne St (north)											
7	L	125	5.0	0.496	9.8	LOS A	3.9	28.7	0.68	0.72	46.4
8	T	47	5.0	0.496	8.9	LOS A	3.9	28.7	0.68	0.68	46.3
9	R	307	6.0	0.496	13.4	LOS A	3.9	28.7	0.68	0.77	44.5
Approach		480	5.6	0.496	12.0	LOS A	3.9	28.7	0.68	0.75	45.1
West: Albatross Rd											
10	L	394	6.0	1.167	186.8	LOS F	82.0	603.5	1.00	3.85	9.7
11	T	267	6.0	1.167	185.9	LOS F	82.0	603.5	1.00	3.85	9.8
12	R	24	6.0	1.167	190.3	LOS F	82.0	603.5	1.00	3.85	9.9
Approach		685	6.0	1.167	186.6	LOS F	82.0	603.5	1.00	3.85	9.8
All Vehicles		2659	5.5	1.691	277.4	LOS F	253.5	1851.1	0.92	4.03	7.0

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: 2022PM

Albatross Rd and Kalandar St - 2022PM
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	34	8.0	0.740	20.9	LOS B	9.1	67.3	0.98	1.20	38.5
2	T	360	6.0	0.740	20.0	LOS B	9.1	67.3	0.98	1.20	38.6
3	R	108	6.0	0.740	24.4	LOS B	9.1	67.3	0.98	1.21	37.0
Approach		502	6.1	0.740	21.0	LOS B	9.1	67.3	0.98	1.20	38.2
East: Kalandar St											
4	L	44	6.0	0.516	12.3	LOS A	4.2	31.0	0.80	0.88	45.2
5	T	220	8.0	0.516	11.5	LOS A	4.2	31.0	0.80	0.86	45.4
6	R	106	6.0	0.516	15.8	LOS B	4.2	31.0	0.80	0.92	42.9
Approach		371	7.2	0.516	12.8	LOS A	4.2	31.0	0.80	0.88	44.6
North: Kinghorne St (north)											
7	L	335	6.0	0.900	26.2	LOS B	19.7	146.1	1.00	1.31	34.8
8	T	91	6.0	0.900	25.3	LOS B	19.7	146.1	1.00	1.31	34.9
9	R	314	8.0	0.900	29.8	LOS C	19.7	146.1	1.00	1.32	33.7
Approach		739	6.8	0.900	27.6	LOS B	19.7	146.1	1.00	1.32	34.4
West: Albatross Rd											
10	L	494	8.0	1.352	340.3	LOS F	171.6	1283.3	1.00	6.10	5.8
11	T	432	8.0	1.352	339.4	LOS F	171.6	1283.3	1.00	6.11	5.8
12	R	6	8.0	1.352	343.8	LOS F	171.6	1283.3	1.00	6.10	5.9
Approach		932	8.0	1.352	339.9	LOS F	171.6	1283.3	1.00	6.10	5.8
All Vehicles		2543	7.2	1.352	138.5	LOS F	171.6	1283.3	0.97	2.98	12.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2022PM with Development

Albatross Rd and Kalandar St - 2022PM with Development
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	38	6.0	0.803	26.7	LOS B	11.6	84.7	1.00	1.31	34.9
2	T	360	5.0	0.803	25.8	LOS B	11.6	84.7	1.00	1.32	35.0
3	R	108	5.0	0.803	30.2	LOS C	11.6	84.7	1.00	1.32	33.8
Approach		506	5.1	0.803	26.8	LOS B	11.6	84.7	1.00	1.31	34.7
East: Kalandar St											
4	L	44	5.0	0.588	13.9	LOS A	5.4	39.7	0.87	0.96	43.7
5	T	257	6.0	0.588	13.1	LOS A	5.4	39.7	0.87	0.95	43.9
6	R	106	5.0	0.588	17.5	LOS B	5.4	39.7	0.87	0.99	41.7
Approach		407	5.6	0.588	14.3	LOS A	5.4	39.7	0.87	0.96	43.3
North: Kinghorne St (north)											
7	L	335	5.0	0.947	34.0	LOS C	26.8	196.5	1.00	1.51	30.9
8	T	91	5.0	0.947	33.2	LOS C	26.8	196.5	1.00	1.51	31.0
9	R	365	6.0	0.947	37.6	LOS C	26.8	196.5	1.00	1.51	30.1
Approach		791	5.5	0.947	35.6	LOS C	26.8	196.5	1.00	1.51	30.5
West: Albatross Rd											
10	L	531	6.0	1.403	384.5	LOS F	199.5	1468.2	1.00	6.65	5.2
11	T	459	6.0	1.403	383.6	LOS F	199.5	1468.2	1.00	6.65	5.2
12	R	9	6.0	1.403	388.1	LOS F	199.5	1468.2	1.00	6.65	5.3
Approach		999	6.0	1.403	384.2	LOS F	199.5	1468.2	1.00	6.65	5.2
All Vehicles		2703	5.6	1.403	159.5	LOS F	199.5	1468.2	0.98	3.29	11.2

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.

APPENDIX B

SIDRA OUTPUTS – UPGRADED INTERSECTION CONFIGURATIONS

MOVEMENT SUMMARY

Site: 2022AM with Development - Roundabout

Albatross Rd and Yalwal Rd - 2022AM with Development - Roundabout
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	84	8.0	0.276	10.8	LOS A	0.7	5.5	0.66	0.72	46.5
2	T	278	6.0	0.268	8.1	LOS A	1.9	14.1	0.68	0.67	47.7
Approach		362	6.5	0.276	8.7	LOS A	1.9	14.1	0.67	0.68	47.4
North: Albatross Rd (north)											
8	T	399	6.0	0.638	6.8	LOS A	7.4	54.7	0.58	0.50	47.7
9	R	432	8.0	0.638	12.6	LOS A	7.4	54.7	0.58	0.67	45.3
Approach		831	7.0	0.638	9.8	LOS A	7.4	54.7	0.58	0.59	46.4
West: Yalwal Rd											
10	L	688	8.0	0.392	6.1	X	X	X	X	0.51	51.6
12	R	105	8.0	0.111	13.2	LOS A	0.7	5.1	0.53	0.69	44.4
Approach		794	8.0	0.392	7.1	LOS A	0.7	5.1	0.07	0.53	50.5
All Vehicles		1986	7.3	0.638	8.5	LOS A	7.4	54.7	0.39	0.58	48.1

X: Not applicable for Continuous movement.

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: 2022PM with Development - Roundabout

Albatross Rd and Yalwal Rd - 2022PM with Development - Roundabout
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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	135	8.0	0.525	16.3	LOS B	1.8	13.3	0.78	0.92	41.6
2	T	782	6.0	0.859	23.0	LOS B	18.3	134.4	1.00	1.30	36.9
Approach		917	6.3	0.859	22.0	LOS B	18.3	134.4	0.97	1.25	37.5
North: Albatross Rd (north)											
8	T	347	6.0	0.682	6.7	LOS A	9.4	69.5	0.62	0.48	47.3
9	R	561	8.0	0.682	12.5	LOS A	9.4	69.5	0.62	0.63	45.0
Approach		908	7.2	0.682	10.3	LOS A	9.4	69.5	0.62	0.58	45.8
West: Yalwal Rd											
10	L	495	8.0	0.282	6.1	X	X	X	X	0.51	51.6
12	R	89	8.0	0.188	17.9	LOS B	1.3	10.1	0.90	0.88	41.0
Approach		584	8.0	0.282	7.9	LOS A	1.3	10.1	0.14	0.57	49.6
All Vehicles		2409	7.1	0.859	14.2	LOS A	18.3	134.4	0.63	0.83	43.0

X: Not applicable for Continuous movement.

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: 2022AM with Development - Left Lane

Albatross Rd and Berry St -2022AM with Development - with additional left 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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	493	2.0	0.595	9.0	LOS A	2.8	19.6	0.95	0.42	45.4
2	T	527	6.0	0.346	6.9	LOS A	2.7	19.9	0.26	0.51	49.4
Approach		1020	4.1	0.595	7.9	LOS A	2.8	19.9	0.60	0.47	47.4
North: Albatross Rd (north)											
8	T	600	6.0	0.701	12.2	LOS A	8.3	60.9	0.86	0.88	44.9
9	R	57	2.0	0.701	16.5	LOS B	8.3	60.9	0.86	0.93	42.5
Approach		657	5.7	0.701	12.6	LOS A	8.3	60.9	0.86	0.88	44.7
West: Berry St											
10	L	67	2.0	0.228	12.4	LOS A	0.6	4.0	0.63	0.78	44.7
12	R	340	2.0	0.341	14.0	LOS A	2.2	15.9	0.68	0.80	43.7
Approach		407	2.0	0.341	13.7	LOS A	2.2	15.9	0.67	0.80	43.8
All Vehicles		2084	4.2	0.701	10.5	LOS A	8.3	60.9	0.69	0.66	45.8

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.

MOVEMENT SUMMARY

Site: 2022PM with Development - Left Lane

Albatross Rd and Berry St -2022PM with Development - with additional left 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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Albatross Rd (south)											
1	L	460	2.0	0.596	9.0	LOS A	2.8	19.7	1.00	0.35	45.2
2	T	867	6.0	0.535	6.9	LOS A	5.7	42.2	0.26	0.50	49.4
Approach		1327	4.6	0.596	7.6	LOS A	5.7	42.2	0.52	0.45	47.9
North: Albatross Rd (north)											
8	T	559	6.0	0.765	16.6	LOS B	10.4	76.5	0.99	1.09	41.3
9	R	35	2.0	0.765	20.9	LOS B	10.4	76.5	0.99	1.09	39.4
Approach		594	5.8	0.765	16.8	LOS B	10.4	76.5	0.99	1.09	41.2
West: Berry St											
10	L	87	2.0	0.390	18.1	LOS B	1.1	8.1	0.79	0.95	40.0
12	R	466	2.0	0.627	23.0	LOS B	7.0	49.6	0.96	1.13	37.1
Approach		554	2.0	0.627	22.2	LOS B	7.0	49.6	0.93	1.10	37.5
All Vehicles		2475	4.3	0.765	13.1	LOS A	10.4	76.5	0.72	0.75	43.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2022AM with Development - Signals

Albatross Rd and Kalandar St - 2022AM with Development - Signals
Signals - Fixed Time Cycle Time = 100 seconds (Practical Cycle Time)

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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	48	6.0	0.685	45.7	LOS D	17.2	125.5	0.94	0.90	27.8
2	T	817	5.0	0.882	42.7	LOS D	28.2	205.6	0.97	0.96	26.3
3	R	53	5.0	0.882	54.9	LOS D	28.2	205.6	1.00	1.05	25.0
Approach		918	5.1	0.882	43.6	LOS D	28.2	205.6	0.97	0.96	26.3
East: Kalandar St											
4	L	44	5.0	0.558	37.0	LOS C	13.9	102.3	0.87	0.88	31.1
5	T	308	6.0	0.558	28.9	LOS C	13.9	102.3	0.87	0.76	31.7
6	R	223	5.0	0.858	59.4	LOS E	11.4	83.5	1.00	1.04	22.9
Approach		576	5.5	0.858	41.3	LOS C	13.9	102.3	0.92	0.88	27.5
North: Kinghorne St (north)											
7	L	125	5.0	0.067	7.7	X	X	X	X	0.60	49.8
8	T	47	5.0	0.127	36.5	LOS C	1.9	14.1	0.86	0.65	28.7
9	R	307	6.0	0.877	61.3	LOS E	17.1	125.6	1.00	0.98	22.4
Approach		480	5.6	0.877	44.9	LOS D	17.1	125.6	0.73	0.85	26.9
West: Albatross Rd											
10	L	394	6.0	0.682	14.9	LOS B	7.8	57.3	0.54	0.74	42.8
11	T	267	6.0	0.888	55.3	LOS D	16.5	121.5	1.00	1.05	22.8
12	R	24	6.0	0.888	63.7	LOS E	16.5	121.5	1.00	1.05	22.7
Approach		685	6.0	0.888	32.4	LOS C	16.5	121.5	0.74	0.87	31.2
All Vehicles		2659	5.5	0.888	40.4	LOS C	28.2	205.6	0.86	0.90	27.8

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2022PM with Development - Signals

Albatross Rd and Kalandar St - 2022PM with Development -Signals
Signals - Fixed Time Cycle Time = 90 seconds (Practical Cycle Time)

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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Kinghorne St (south)											
1	L	38	6.0	0.682	50.0	LOS D	9.4	68.8	0.99	0.89	26.4
2	T	360	5.0	0.878	45.7	LOS D	14.2	103.7	1.00	0.96	25.1
3	R	108	5.0	0.878	58.1	LOS E	14.2	103.7	1.00	1.04	23.7
Approach		506	5.1	0.878	48.7	LOS D	14.2	103.7	1.00	0.97	24.9
East: Kalandar St											
4	L	44	5.0	0.385	27.1	LOS B	8.9	65.4	0.74	0.88	35.9
5	T	257	6.0	0.385	19.1	LOS B	8.9	65.4	0.74	0.64	37.3
6	R	106	5.0	0.480	45.9	LOS D	4.5	32.6	0.97	0.77	26.6
Approach		407	5.6	0.480	27.0	LOS B	8.9	65.4	0.80	0.70	33.6
North: Kinghorne St (north)											
7	L	335	5.0	0.180	7.7	X	X	X	X	0.60	49.8
8	T	91	5.0	0.208	31.1	LOS C	3.3	23.9	0.85	0.67	31.0
9	R	365	6.0	0.891	57.2	LOS E	18.9	138.9	1.00	1.01	23.4
Approach		791	5.5	0.891	33.2	LOS C	18.9	138.9	0.56	0.80	31.4
West: Albatross Rd											
10	L	531	6.0	0.562	9.5	LOS A	4.9	35.8	0.32	0.69	47.7
11	T	459	6.0	0.909	49.3	LOS D	25.1	184.5	1.00	1.12	24.4
12	R	9	6.0	0.909	57.7	LOS E	25.1	184.5	1.00	1.12	24.3
Approach		999	6.0	0.909	28.2	LOS B	25.1	184.5	0.64	0.89	33.0
All Vehicles		2703	5.6	0.909	33.3	LOS C	25.1	184.5	0.71	0.85	30.8

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

