



## M<sup>C</sup>LAREN TRAFFIC ENGINEERING

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Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

24 July 2020

Reference: 200285.01FA

Stevens Group  
c/- de Witt Consulting  
PO BOX 850  
Charlestown NSW 2290  
Attention: Emma Mason

### **CUMULATIVE TRAFFIC IMPACT ASSESSMENT FOR MULTIPLE PROPOSED DEVELOPMENTS AT 1, 18 & 51 BRICKWORKS ROAD, THORNTON**

Dear Emma,

Reference is made to your request to provide a cumulative traffic impact of the proposed developments at 1, 18 & 51 Brickworks Road, Thornton to the intersections of Raymond Terrace Road/Harvest Boulevard and Haussman Drive/Taylor Avenue which are the two (2) shared access points to the three sites. The results of the traffic assessment which utilised SIDRA Intersection 9.0 are presented below.

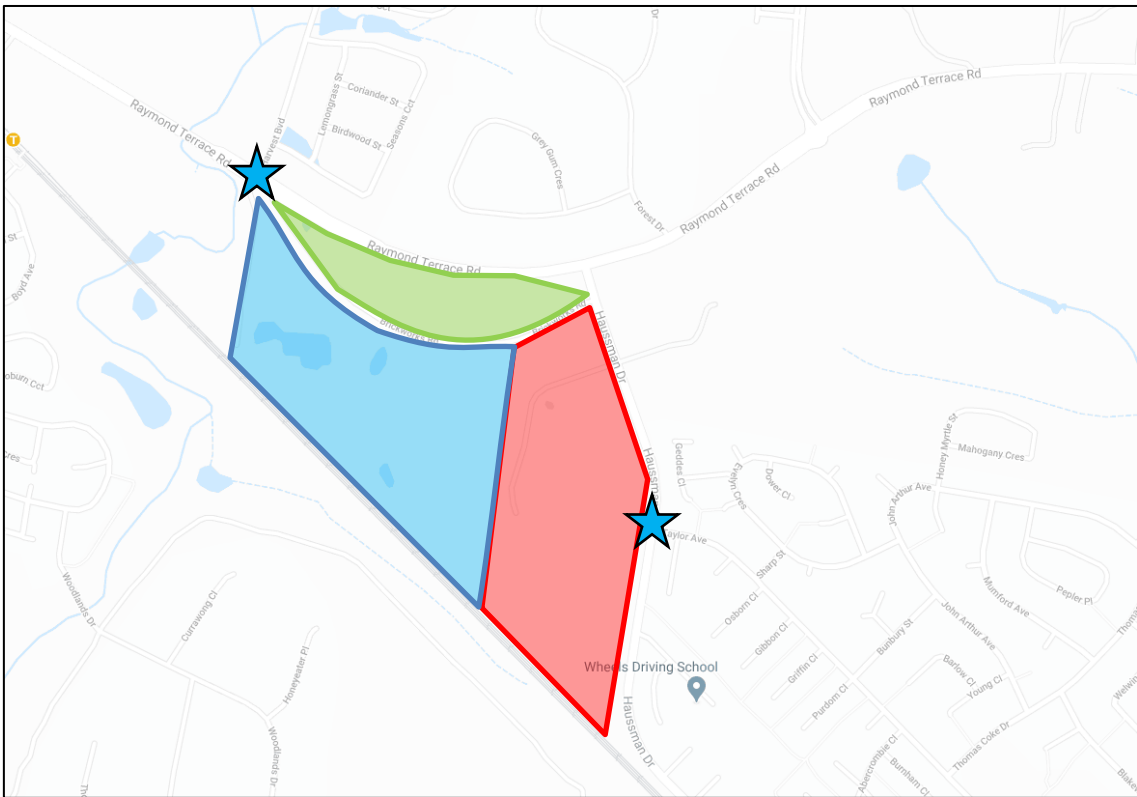
#### **1 Site and Development Context**

The location of the site and subject intersections are shown on aerial imagery and a street map in **Figure 1** and **Figure 2**, respectively.



- 1 Brickworks Road
- 51 Brickworks Road
- 18 Brickworks Road
- ★ Subject Intersections

**FIGURE 1: SITE CONTEXT – AERIAL IMAGERY**



- 1 Brickworks Road
- 51 Brickworks Road
- 18 Brickworks Road
- ★ Subject Intersections

**FIGURE 2: SITE CONTEXT – STREET MAP**

Reference is made to previous reports undertaken by **MTE** for the subject sites which are listed below:

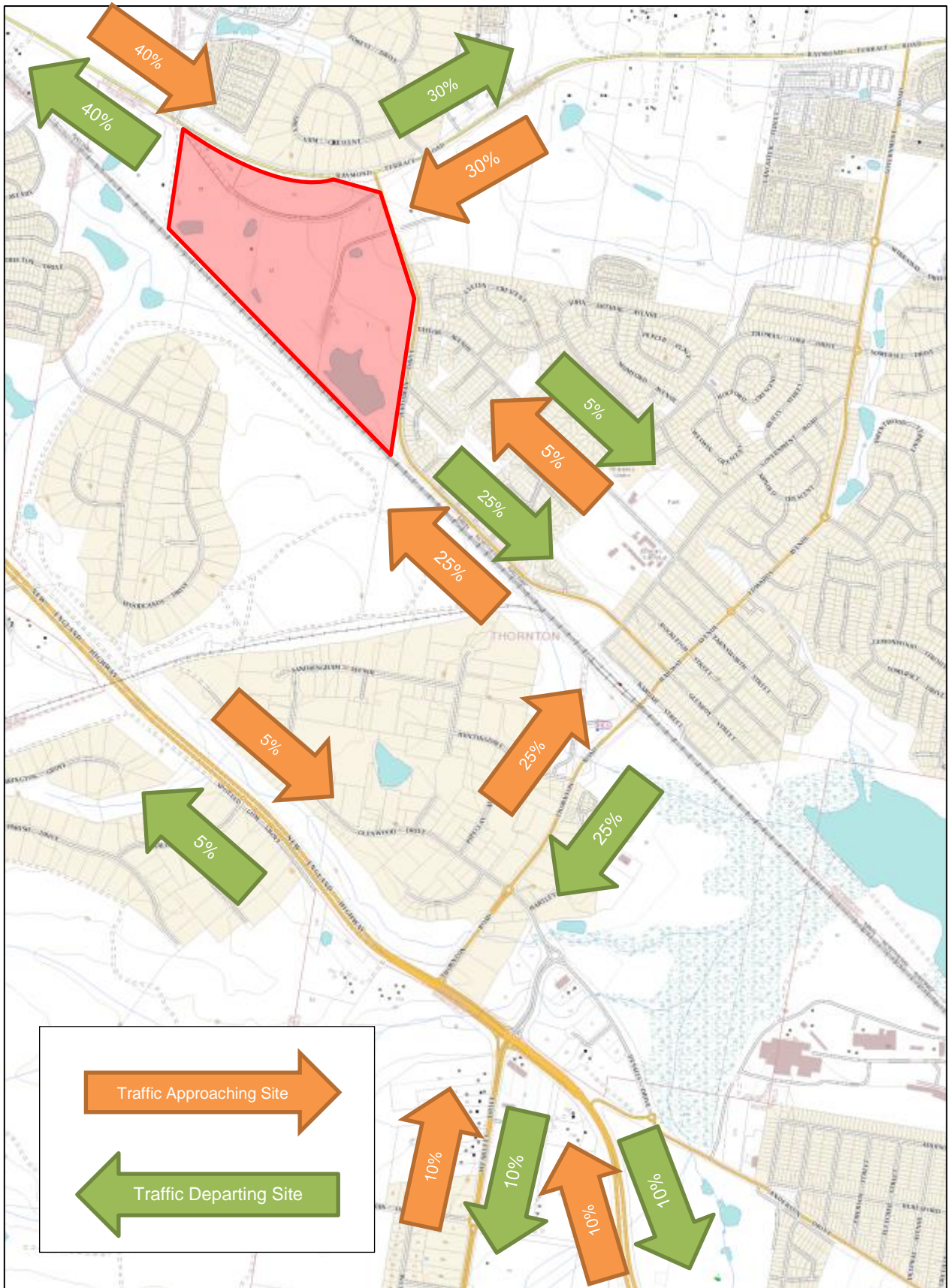
- 1 Brickworks Road, Thornton:
  - 17652.01FA - Traffic and Parking Impact Assessment - 5 February 2019.
- 51 Brickworks Road, Thornton:
  - 190106.01DB - Traffic and Parking Impact Assessment - June 2019 (Not finalised).
- 18 Brickworks Road, Thornton:
  - 190255.01FA - Traffic and Parking Impact Assessment - 28 October 2019;
  - 200152.01DA - Letter of Advice - April 2020 (Not finalised).

The traffic generations and traffic distribution in these reports have been combined in order to deduce the expected total traffic generation associated with the development. The traffic generation used for the cumulative traffic assessment is outlined in **Table 1**, with the traffic distribution consistent with these reports depicted in **Figure 3**. A detailed traffic distribution at the two subject intersections is detailed in **Figure 4**.

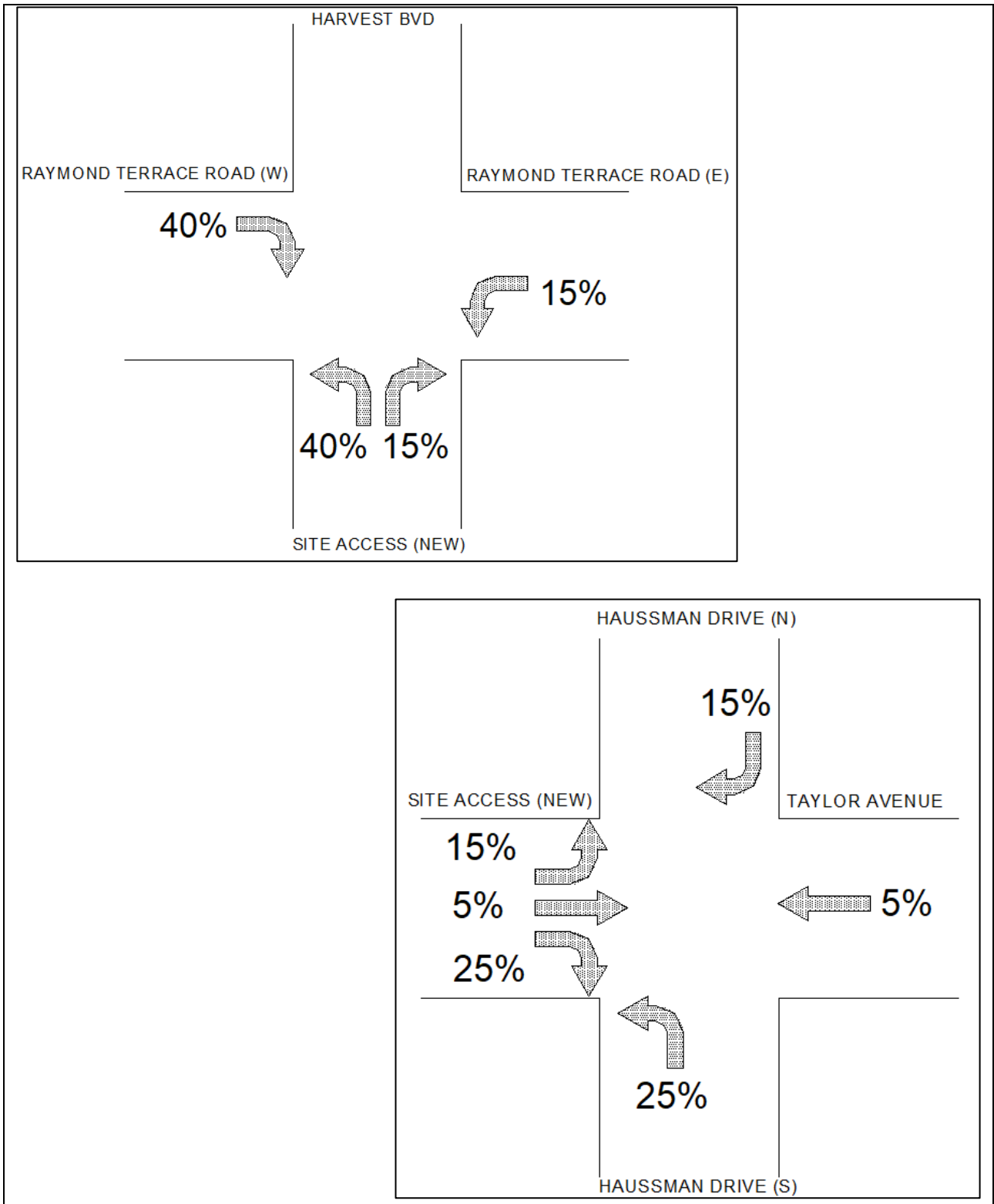
**TABLE 1: ESTIMATED CUMULATIVE TRAFFIC GENERATION**

Site Address	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
1 Brickworks Road	414	137	<b>551</b>	194	495	<b>689</b>
18 Brickworks Road	302	129	<b>431</b>	133	312	<b>445</b>
51 Brickworks Road	634	136	<b>770</b>	151	649	<b>800</b>
<b>Cumulative Total</b>	1350	402	<b>1752</b>	478	1456	<b>1934</b>





**FIGURE 3: TRAFFIC DISTRIBUTION – MACRO**



**FIGURE 4: TRAFFIC DISTRIBUTION – DETAILED INTERSECTION**

## 2 Existing Traffic Environment

The existing traffic environment has been modelled as a base point of comparison for the future traffic environment. The existing traffic environment has been assessed using traffic counts completed at a series of intersections surrounding the site from 7:00 am to 10:00 am and 2:30 pm to 7:00 pm on Wednesday 17 and Thursday 18 October 2018 in order to deduce the existing traffic volumes of Haussman Drive/Raymond Terrace Road & Glenroy Road/Railway Avenue and at the intersection of Raymond Terrace Road/Harvest Boulevard from 7:00 am to 10:00 am and 4:00 pm to 7:00 pm on Wednesday 18 March 2020, representing typical weekday operation. The traffic surveys are reproduced in **Annexure A** for reference.

The intersection of Haussman Drive/Taylor Avenue is proposed to be upgraded to a roundabout layout, and this layout has been applied to the existing and future traffic models. Additionally, whilst no traffic surveys were undertaken at this intersection, the turning movements into and out of Taylor Avenue have been estimated based on the difference in approach and exit movements at the intersections of Haussman Drive/Raymond Terrace Road and Glenroy Road/Railway Avenue.

### 2.1.1 Existing Road Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.0, **Table 2** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure B**.

**TABLE 2: EXISTING INTERSECTION PERFORMANCE**

Intersection	Peak Hour	Degree of Saturation <sup>(1)</sup>	Average Delay <sup>(2)</sup> (sec/veh)	Level of Service <sup>(3)</sup>	Control Type	Worst Movement
<b>EXISTING PERFORMANCE</b>						
Haussman Drive/Taylor Avenue	AM	0.21	5.6 (Worst: 9.5)	<b>A</b> (Worst: A)	Roundabout	RT from Haussman Drive
	PM	0.21	5.7 (Worst: 9.6)	<b>A</b> (Worst: A)		RT from Haussman Drive
Harvest Bvd/Raymond Terrace Rd	AM	0.56	19.7	<b>B</b>	Signals	RT from Harvest Bvd
	PM	0.53	13.7	<b>A</b>		RT from Harvest Bvd

NOTES:

(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

As shown, the two relevant intersections are currently performing at a high level of efficiency, with Level of Service (LoS) “A” or “B” conditions in both the AM and PM peak hour periods. The level of service “A” and “B” performance metrics are characterised by low approach delays and spare capacity.

### 3 Growth Traffic Environment

A ten-year growth assessment has been conducted on the subject intersections whereby 2% of through traffic volume on the major approaches (being Raymond Terrace Road and Haussman Drive) is added to the intersection traffic each year. The performance of the subject intersections under ten-year growth conditions has been assessed using SIDRA INTERSECTION 9.0, **Table 3** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure B**. It is noted no changes to phasing or intersection layout have been made in this assessment compared to the existing assessment as detailed above.

**TABLE 3: TEN-YEAR GROWTH INTERSECTION PERFORMANCE**

Intersection	Peak Hour	Degree of Saturation <sup>(1)</sup>	Average Delay <sup>(2)</sup> (sec/veh)	Level of Service <sup>(3)</sup>	Control Type	Worst Movement
<b>EXISTING PERFORMANCE</b>						
Haussman Drive/Taylor Avenue	AM	0.21	5.6 (Worst: 9.5)	<b>A</b> (Worst: A)	Roundabout	RT from Haussman Drive
	PM	0.21	5.7 (Worst: 9.6)	<b>A</b> (Worst: A)		RT from Haussman Drive
Harvest Bvd/Raymond Terrace Rd	AM	0.56	19.7	<b>B</b>	Signals	RT from Harvest Bvd
	PM	0.53	13.7	<b>A</b>		RT from Harvest Bvd
<b>TEN-YEAR GROWTH PERFORMANCE</b>						
Haussman Drive/Taylor Avenue	AM	0.25	5.7 (Worst: 9.7)	<b>A</b> (Worst: A)	Roundabout	RT from Haussman Drive
	PM	0.26	5.8 (Worst: 9.9)	<b>A</b> (Worst: A)		RT from Haussman Drive
Harvest Bvd/Raymond Terrace Rd	AM	0.61	19.2	<b>B</b>	Signals	RT from Harvest Bvd
	PM	0.60	13.6	<b>A</b>		RT from Harvest Bvd

Notes: See **Table 2**.

As shown, the two relevant intersections retain the same level of service “A” or “B” conditions in both the AM and PM peak hour periods under ten-year growth conditions. A small increase in the degree of saturation is evident due to the increase in traffic load, with a similar average delay exhibited in both AM and PM peak hour periods.

#### **4 Required Changes to Raymond Terrace Road / Harvest Boulevard**

In order for the intersection of Raymond Terrace Road/Harvest Boulevard to operate successfully with an acceptable level of service, degree of saturation and average delay under future and future plus ten-year growth conditions, a number of modifications are required to be implemented to the physical layout of the intersection and the phasing cycle. It is noted that the existing intersection does not include a southern approach and that the addition of this approach necessitates several changes to the formation and operation of the intersection. The modifications required include dedicated left turn inbound facilities from the east, dedicated right turn inbound facilities from the west, a through lane from the north in addition to the adjustment of the existing phasing.

A comparison of the existing and future intersection layouts of the Raymond Terrace Road/Harvest Boulevard intersection are depicted in **Figure 5 & Figure 6**, with a comparison of the phasing sequences depicted in **Figure 7**.

As shown, the required modifications to the intersection include:

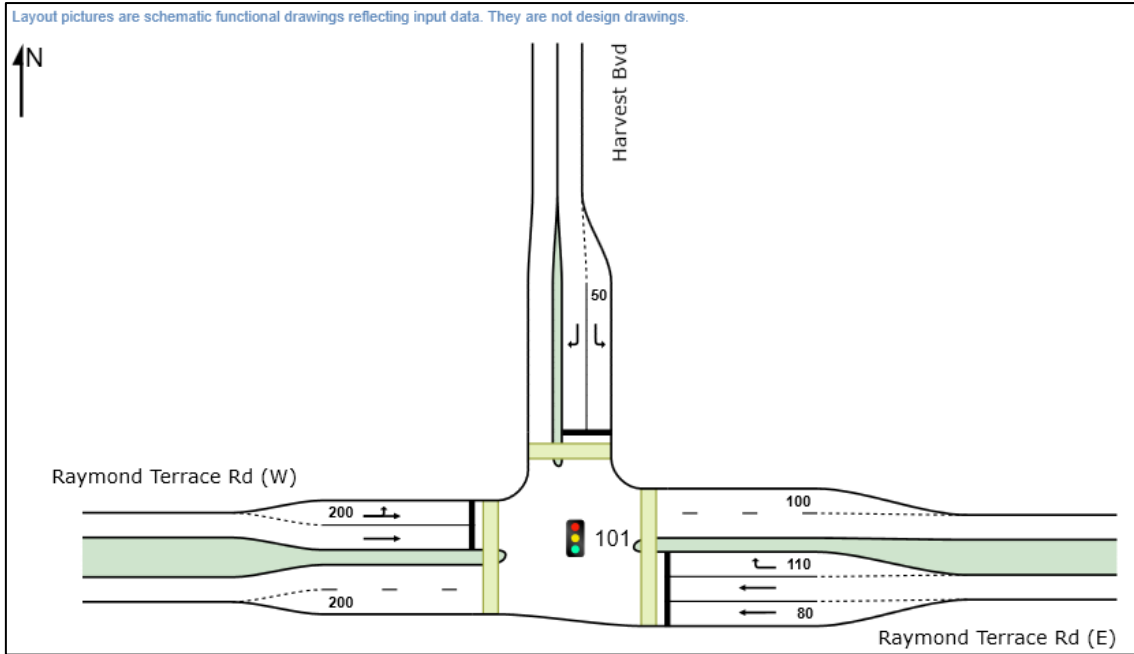
- One (1) left turn short lane from Raymond Terrace Road (eastern leg) of at least 63m in length;
- Two (2) right turn short lanes from Raymond Terrace Road (western leg) of at least 100m and 50m in length;
- The ability for vehicles to travel 'through' from Harvest Boulevard (northern leg);
  - No works required.
- The addition of a southern leg containing:
  - Two (2) full-length lanes southbound for access;
  - One (1) full-length lane northbound for egress to facilitate right turns and through movements;
  - One (1) left turn short lane northbound of at least 55m in length for egress.

Furthermore, the phasing requires some adjustment as shown in **Figure 7**. The future phasing sequence has been based upon the existing phasing sequence, with movements added/removed based upon demand.

It is noted that the design changes to the intersection layout and the phasing sequence are purely conceptual. The physical constraints of the site, road furniture, services and utilities have not been considered, nor has any contact or reference been made to TfNSW for signal operations. Appropriate approval and consent are required by TfNSW and other relevant bodies before any works.

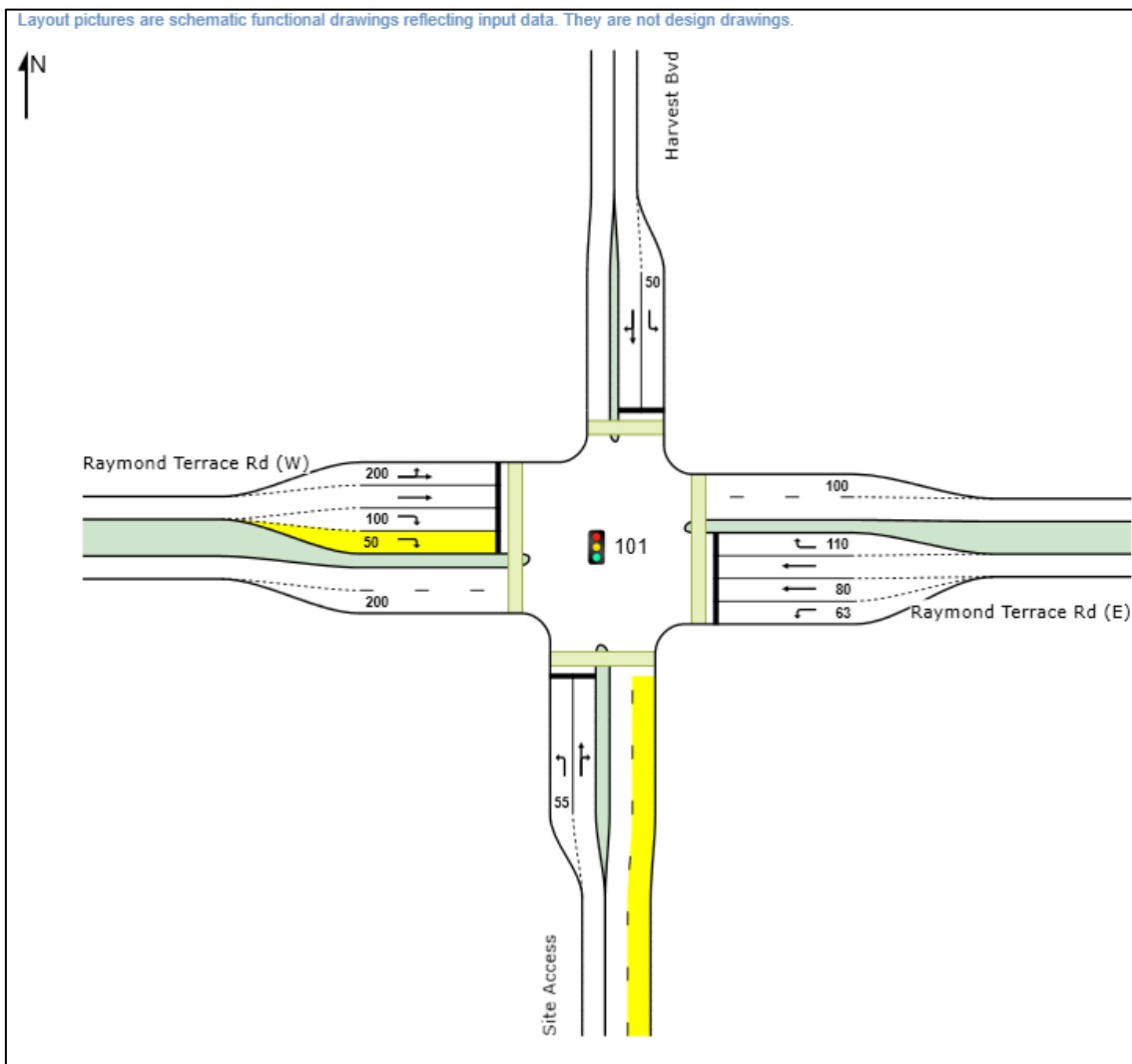


Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

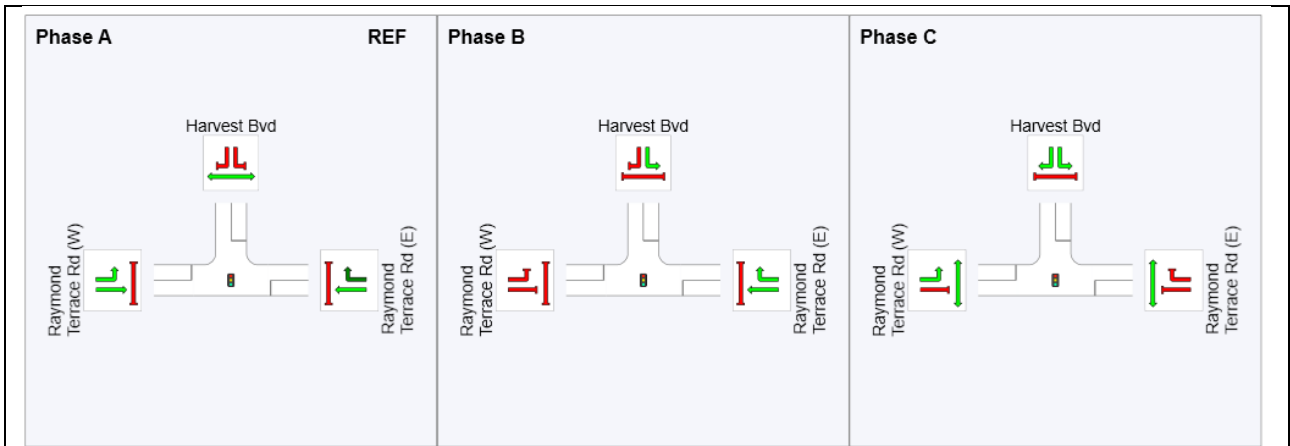


**FIGURE 5: EXISTING INTERSECTION LAYOUT**

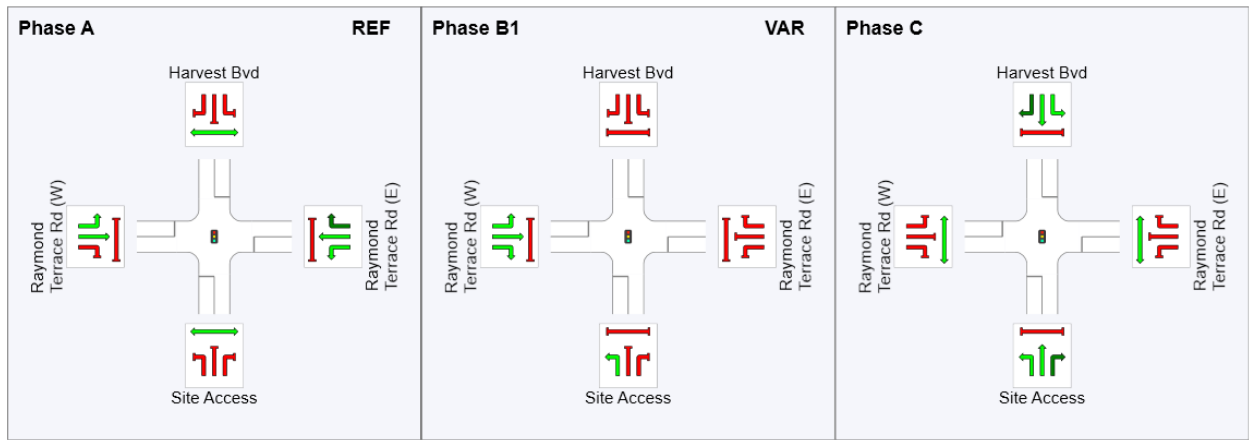
Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



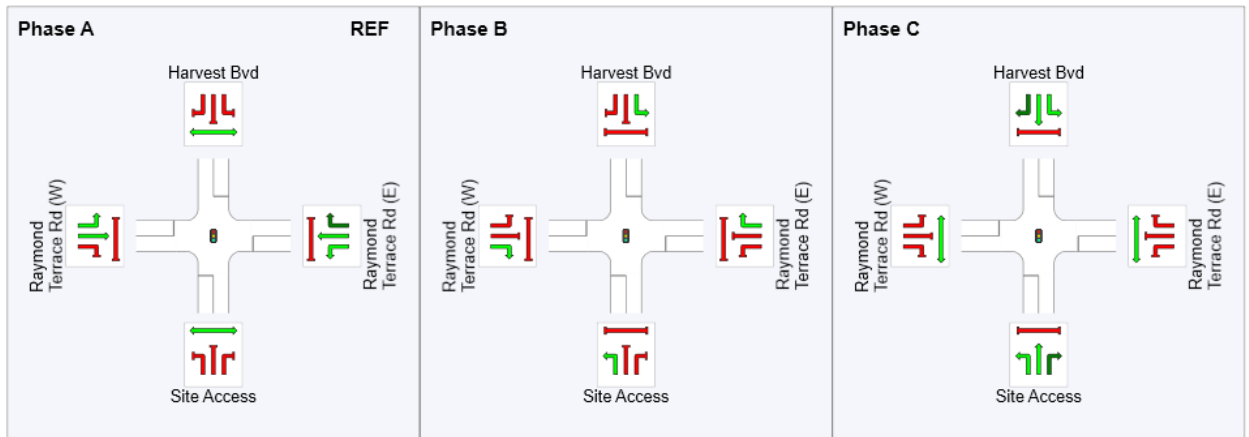
**FIGURE 6: FUTURE INTERSECTION LAYOUT**



**Existing (AM and PM)**



**Future (AM)**



**Future (PM)**

**FIGURE 7: EXISTING AND FUTURE PHASING SEQUENCE COMPARISON**

## 5 Future Traffic Environment

The traffic generation outlined in **Table 1**, has been added to the existing traffic volumes recorded. SIDRA INTERSECTION 9.0 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 4**, with full SIDRA results reproduced in **Annexure B**. It is noted the intersection changes as outlined in **Section 4** have been incorporated within the model.

**TABLE 4: FUTURE INTERSECTION PERFORMANCE**

Intersection	Peak Hour	Degree of Saturation <sup>(1)</sup>	Average Delay <sup>(2)</sup> (sec/veh)	Level of Service <sup>(3)</sup>	Control Type	Worst Movement
<b>EXISTING PERFORMANCE</b>						
Hausman Drive/Taylor Avenue	AM	0.21	5.6 (Worst: 9.5)	<b>A</b> (Worst: A)	Roundabout	RT from Hausman Drive
	PM	0.21	5.7 (Worst: 9.6)	<b>A</b> (Worst: A)		RT from Hausman Drive
Harvest Bvd/Raymond Terrace Rd	AM	0.56	19.7	<b>B</b>	Signals	RT from Harvest Bvd
	PM	0.53	13.7	<b>A</b>		RT from Harvest Bvd
<b>EXISTING + DEVELOPMENT PERFORMANCE</b>						
Hausman Drive/Taylor Avenue	AM	0.32	7.3 (Worst: 12)	<b>A</b> (Worst: A)	Roundabout	RT from Hausman Drive
	PM	0.41	8 (Worst: 11.9)	<b>A</b> (Worst: A)		RT from Hausman Drive
Harvest Bvd/Raymond Terrace Rd	AM	0.77	32.2	<b>C</b>	Signals	RT from Raymond Terrace Rd
	PM	0.83	33.2	<b>C</b>		RT from Raymond Terrace Rd

Notes: See **Table 2**.

As shown, the roundabout controlled intersection of Hausman Drive/Taylor Avenue retains the same level of service as of the existing conditions under the future conditions with an increased traffic load. The level of service 'A' conditions is characterised by low approach delays and spare capacity. It is noted that a minor increase in average delay occurs.

The signalised intersection of Raymond Terrace Road/Harvest Boulevard performs under at a level of service 'C' condition in both the AM and PM peak hour periods under the future traffic load and concept changes to the intersection arrangement. Level of service 'C' conditions are indicative of satisfactory intersection operation, with an acceptable average delay and degree of saturation.

## 6 Future Growth Traffic Environment

The traffic generation outlined in **Table 1**, has been added to the ten-year growth traffic volumes based upon the existing traffic volumes recorded. SIDRA INTERSECTION 9.0 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection and ten-year growth intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 5**, with full SIDRA results reproduced in **Annexure B**. It is noted the intersection changes as outlined in **Section 4** have been incorporated within the model.

**TABLE 5: FUTURE INTERSECTION PERFORMANCE**

Intersection	Peak Hour	Degree of Saturation <sup>(1)</sup>	Average Delay <sup>(2)</sup> (sec/veh)	Level of Service <sup>(3)</sup>	Control Type	Worst Movement
<b>EXISTING + TEN-YEAR GROWTH PERFORMANCE</b>						
Hausman Drive/Taylor Avenue	AM	0.25	5.7 (Worst: 9.7)	<b>A</b> (Worst: A)	Roundabout	RT from Hausman Drive
	PM	0.26	5.8 (Worst: 9.9)	<b>A</b> (Worst: A)		RT from Hausman Drive
Harvest Bvd/Raymond Terrace Rd	AM	0.61	19.2	<b>B</b>	Signals	RT from Harvest Bvd
	PM	0.60	13.6	<b>A</b>		RT from Harvest Bvd
<b>EXISTING + TEN-YEAR GROWTH + DEVELOPMENT PERFORMANCE</b>						
Hausman Drive/Taylor Avenue	AM	0.38	7.4 (Worst: 12.2)	<b>A</b> (Worst: A)	Roundabout	RT from Hausman Drive
	PM	0.43	8.3 (Worst: 12.1)	<b>A</b> (Worst: A)		RT from Taylor Avenue
Harvest Bvd/Raymond Terrace Rd	AM	0.83	32.7	<b>C</b>	Signals	RT from Raymond Terrace Rd
	PM	0.90	37.1	<b>C</b>		RT from Raymond Terrace Rd

Notes: See **Table 2**.

As shown, the roundabout controlled intersection of Hausman Drive/Taylor Avenue retains the same level of service as the ten-year growth conditions under the future ten-year conditions with an increased traffic load. The level of service 'A' conditions is characterised by low approach delays and spare capacity. It is noted that a minor increase in average delay occurs.

The signalised intersection of Raymond Terrace Road/Harvest Boulevard performs under at a level of service 'C' condition in both the AM and PM peak hour periods under the future traffic load and concept changes to the intersection arrangement. Level of service 'C' conditions are indicative of satisfactory intersection operation, with an acceptable average delay and degree of saturation.

## **7 Discussion and Conclusions**

The traffic modelling results presented in **Section 5** and **Section 6** are indicative only and can be considered to be a worst-case result, as the following factors have not been considered:

- a) Whether a proportion of the traffic generation of the site would be drawn from the residential subdivision which Harvest Boulevard primarily serves. A redistribution of the traffic generation of the site to take into consideration through-traffic from this northern approach of the Raymond Terrace Road/Harvest Boulevard intersection would result in reduced average delays at the intersection.
- b) A proportion of traffic approaching from the west along Raymond Terrace Road is likely to make a right turn at the Raymond Terrace Road/Haussman Drive intersection and enter the site via the Haussman Drive/Taylor Avenue intersection. It has been assumed for the purposes of the analysis that all traffic approaching from the west will enter at the Raymond Terrace/Harvest Boulevard Intersection, which is a worst-case. The lessening of demand for right turns from Raymond Terrace Road into the site would result in reduced average delays at the intersection.
- c) The future traffic signals at the Raymond Terrace Road/Haussman Drive intersection are likely to be networked with the proposed modified signals at the intersection of Raymond Terrace Road/Harvest Boulevard which will result in reduced average delays at the intersection.

Considering the traffic modelling results presented in **Section 5** and **Section 6** and the factors outlined above, the proposed modifications to the existing Raymond Terrace Road/Harvest Boulevard intersection will provide for satisfactory performance for the three proposed development applications at 1, 18 and 51 Brickworks Road.

The proposed upgrade of the intersection of Haussman Drive/Taylor Avenue will provide ample capacity for traffic entering and exiting the sites using this intersection as well as for existing and future traffic along Haussman Drive and Taylor Avenue.

Please contact Mr Matthew Elyard or the undersigned on 8355 2440 should you require further information or assistance.

Yours faithfully,

**M<sup>c</sup>Laren Traffic Engineering**



**Tom Steal**

**Senior Traffic Engineer**

BE Civil AMAITPM MIEAust

RMS Accredited Level 2 Road Safety Auditor





**ANNEXURE A: TRAFFIC SURVEYS  
(5 SHEETS)**

# TRANS TRAFFIC SURVEY

## TURNING MOVEMENT SURVEY

trafficsurvey.com.au



### Intersection of Raymond Terrace Rd and Haussman

GPS: -32.767398, 151.630756

Date: Wed 17/10/18

Weather: Overcast

Suburban: Thornton

Customer: McLaren

North: N/A

East: Raymond Terrace Rd

South: Haussman Dr

West: Raymond Terrace Rd

Survey Period

AM: 7:00 AM-10:00 AM

PM: 2:30 PM-7:00 PM

Traffic Peak

AM: 8:00 AM-9:00 AM

PM: 4:30 PM-5:30 PM

#### All Vehicles

Time		Approach Raymond Terrace			Approach Haussman Dr			Approach Raymond Terrace			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	71	37	0	14	43	0	58	53	1341	
7:15	7:30	0	106	34	0	17	38	0	52	58	1467	
7:30	7:45	0	116	45	0	12	52	0	55	80	1727	
7:45	8:00	0	151	33	0	7	49	0	56	104	1851	
8:00	8:15	0	142	39	0	24	49	0	50	98	1889	Peak
8:15	8:30	0	201	43	0	16	83	0	74	148	1833	
8:30	8:45	0	164	46	0	5	69	0	75	125	1597	
8:45	9:00	0	146	33	0	12	85	0	82	80	1418	
9:00	9:15	0	115	16	0	12	70	0	54	79	1265	
9:15	9:30	0	100	10	0	12	63	0	67	77		
9:30	9:45	0	84	13	0	13	65	0	44	86		
9:45	10:00	0	84	12	0	10	61	0	44	74		
14:30	14:45	0	114	25	0	31	70	0	57	96	1711	
14:45	15:00	0	139	38	0	17	56	0	88	102	1770	
15:00	15:15	0	113	24	0	17	86	0	61	114	1763	
15:15	15:30	0	127	15	0	24	101	0	62	134	1797	
15:30	15:45	0	116	13	0	19	91	0	74	139	1823	
15:45	16:00	0	107	24	0	19	85	0	95	103	1883	
16:00	16:15	0	112	20	0	25	105	0	48	139	1916	
16:15	16:30	0	122	22	0	27	90	0	70	158	2015	
16:30	16:45	0	130	23	0	27	96	0	72	164	2044	Peak
16:45	17:00	0	119	23	0	19	96	0	72	137	1955	
17:00	17:15	0	139	27	0	26	140	0	83	133	1872	
17:15	17:30	0	147	23	0	29	108	0	76	135	1659	
17:30	17:45	0	113	17	0	19	93	0	68	113	1455	
17:45	18:00	0	115	19	0	29	74	0	49	97	1286	
18:00	18:15	0	67	13	0	26	82	0	55	92	1114	
18:15	18:30	0	72	11	0	25	53	0	53	100		
18:30	18:45	0	63	12	0	27	65	0	41	46		
18:45	19:00	0	55	12	0	19	45	0	31	49		

# TRANS TRAFFIC SURVEY

## TURNING MOVEMENT SURVEY

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### Intersection of Raymond Terrace Rd and Haussman

GPS: -32.767398, 151.630756

Date: Thu 18/10/18

Weather: Overcast

Suburban: Thornton

Customer: McLaren

North: N/A

East: Raymond Terrace Rd

South: Haussman Dr

West: Raymond Terrace Rd

Survey

AM: 7:00 AM-10:00 AM

Period

PM: 2:30 PM-7:00 PM

Traffic

AM: 8:00 AM-9:00 AM

Peak

PM: 4:15 PM-5:15 PM

#### All Vehicles

Time		Approach Raymond Terrace			Approach Haussman Dr			Approach Raymond Terrace			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	64	29	0	10	42	0	51	52	1255	
7:15	7:30	0	92	36	0	14	39	0	49	59	1482	
7:30	7:45	0	110	41	0	6	54	0	52	87	1730	
7:45	8:00	0	135	28	0	18	44	0	59	84	1888	
8:00	8:15	0	183	31	0	18	58	0	67	118	1953	Peak
8:15	8:30	0	177	51	0	22	71	0	66	150	1838	
8:30	8:45	0	172	47	0	12	81	0	80	116	1641	
8:45	9:00	0	147	33	0	13	64	0	77	99	1458	
9:00	9:15	0	104	19	0	15	88	0	68	66	1332	
9:15	9:30	0	123	18	0	10	59	0	58	72		
9:30	9:45	0	103	21	0	12	79	0	54	56		
9:45	10:00	0	102	17	0	12	68	0	50	58		
14:30	14:45	0	127	22	0	21	63	0	63	123	1844	
14:45	15:00	0	140	32	0	17	81	0	81	123	1851	
15:00	15:15	0	99	24	0	12	97	0	84	151	1804	
15:15	15:30	0	133	18	0	20	96	0	73	144	1787	
15:30	15:45	0	113	20	0	23	77	0	77	116	1767	
15:45	16:00	0	108	20	0	28	75	0	81	115	1809	
16:00	16:15	0	127	22	0	20	86	0	73	122	1885	
16:15	16:30	0	134	26	0	21	95	0	65	123	1911	Peak
16:30	16:45	0	135	16	0	18	96	0	82	121	1906	
16:45	17:00	0	135	23	0	24	100	0	91	130	1880	
17:00	17:15	0	137	18	0	35	93	0	61	132	1781	
17:15	17:30	0	134	14	0	32	90	0	70	119	1660	
17:30	17:45	0	115	20	0	22	103	0	84	98	1526	
17:45	18:00	0	118	14	0	22	99	0	63	88	1342	
18:00	18:15	0	92	21	0	28	79	0	50	85	1174	
18:15	18:30	0	81	17	0	23	69	0	46	89		
18:30	18:45	0	69	10	0	23	58	0	40	58		
18:45	19:00	0	70	17	0	18	50	0	25	56		

# TRANS TRAFFIC SURVEY

## TURNING MOVEMENT SURVEY

trafficsurvey.com.au



### Intersection of Glenroy Rd and Railway Ave, Thornton

GPS: -32.783190, 151.641615

Date:	Wed 17/10/18	North:	Railway Ave
Weather:	Overcast	East:	Glenroy Rd
Suburban:	Thornton	South:	Railway Ave
Customer:	McLaren	West:	Glenroy Rd

Survey	AM:	7:00 AM-10:00 AM
Period	PM:	2:30 PM-7:00 PM
Traffic	AM:	7:45 AM-8:45 AM
Peak	PM:	4:15 PM-5:15 PM

#### All Vehicles

Time		North Approach Railway Ave				East Approach Glenroy Rd				South Approach Railway Ave				West Approach Glenroy Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	3	250	0	0	0	0	1	0	4	83	35	0	27	1	5	1662	
7:15	7:30	0	2	240	2	0	0	0	4	0	2	84	30	0	27	0	4	1668	
7:30	7:45	0	5	282	0	0	0	0	5	0	1	86	26	0	22	0	5	1751	
7:45	8:00	0	6	286	0	0	0	0	1	0	1	68	36	0	22	0	6	1771	Peak
8:00	8:15	0	4	258	0	0	0	1	3	0	0	91	32	0	22	0	4	1761	
8:15	8:30	0	2	282	0	0	1	0	5	0	1	122	38	0	23	1	3	1712	
8:30	8:45	0	4	262	1	0	0	0	4	0	4	110	38	0	27	0	2	1576	
8:45	9:00	0	6	223	3	0	1	0	3	0	1	111	35	0	30	0	3	1463	
9:00	9:15	0	1	178	2	0	0	0	0	0	3	112	40	0	27	0	3	1376	
9:15	9:30	0	2	132	1	0	1	0	6	0	5	117	44	0	32	0	2		
9:30	9:45	0	3	144	2	0	0	0	3	0	1	125	38	0	22	0	1		
9:45	10:00	0	1	145	3	0	2	0	2	0	1	118	28	0	28	0	1		
14:30	14:45	0	1	142	0	0	0	0	3	0	1	156	55	0	32	0	0	1779	
14:45	15:00	0	3	150	0	0	1	0	1	0	3	187	63	0	31	0	4	1885	
15:00	15:15	0	4	157	4	0	0	0	3	0	4	203	62	0	18	1	3	1942	
15:15	15:30	0	3	132	2	0	1	0	1	0	2	241	83	0	21	0	1	2007	
15:30	15:45	0	0	161	3	0	0	0	3	0	3	240	56	0	23	0	7	2049	
15:45	16:00	0	3	171	2	0	1	0	4	0	5	224	71	0	17	0	2	2105	
16:00	16:15	0	1	160	1	0	0	0	4	0	3	245	87	0	19	0	4	2129	
16:15	16:30	0	0	152	4	0	0	1	3	0	7	272	78	0	10	0	2	2156	Peak
16:30	16:45	0	4	168	3	0	0	1	5	0	5	272	72	0	14	1	7	2106	
16:45	17:00	0	4	166	1	0	0	0	2	0	7	253	76	0	10	0	5	1983	
17:00	17:15	0	6	179	0	0	0	0	4	0	12	227	105	0	12	0	6	1886	
17:15	17:30	0	2	145	2	0	0	0	3	0	5	230	74	0	18	0	0	1743	
17:30	17:45	0	2	154	2	0	0	0	4	0	4	196	46	0	21	0	0	1656	
17:45	18:00	0	3	145	2	0	0	0	4	0	7	197	56	0	11	1	1	1550	
18:00	18:15	0	3	107	2	0	0	0	2	0	4	203	75	0	10	0	2	1381	
18:15	18:30	0	1	115	0	0	0	0	1	0	3	205	47	0	18	0	2		
18:30	18:45	0	0	83	1	0	0	0	1	0	5	152	64	0	15	0	2		
18:45	19:00	0	0	75	1	0	2	0	0	0	3	135	30	0	10	0	2		

# TRANS TRAFFIC SURVEY

## TURNING MOVEMENT SURVEY

trafficsurvey.com.au



### Intersection of Glenroy Rd and Railway Ave, Thornton

GPS: -32.783190, 151.641615

Date:	Thu 18/10/18	North:	Railway Ave
Weather:	Overcast	East:	Glenroy Rd
Suburban:	Thornton	South:	Railway Ave
Customer:	McLaren	West:	Glenroy Rd

Survey	AM:	7:00 AM-10:00 AM
Period	PM:	2:30 PM-7:00 PM
Traffic	AM:	8:00 AM-9:00 AM
Peak	PM:	4:30 PM-5:30 PM

#### All Vehicles

Time		North Approach Railway Ave				East Approach Glenroy Rd				South Approach Railway Ave				West Approach Glenroy Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	3	211	0	0	1	0	2	0	0	85	36	0	29	0	4	1586	
7:15	7:30	0	4	265	2	0	0	0	2	0	2	79	30	0	28	0	3	1653	
7:30	7:45	0	8	265	0	0	0	0	3	0	0	75	19	0	19	0	7	1675	
7:45	8:00	0	2	253	0	0	0	0	2	0	2	86	35	0	23	0	1	1726	
8:00	8:15	0	5	254	2	0	1	0	1	0	3	110	36	0	21	0	5	1781	Peak
8:15	8:30	0	5	278	0	0	0	0	1	0	2	98	34	0	15	1	3	1759	
8:30	8:45	0	4	255	2	0	0	0	3	0	1	129	36	0	16	0	1	1688	
8:45	9:00	0	5	249	1	0	0	0	1	0	4	122	44	0	28	0	5	1586	
9:00	9:15	0	1	200	3	0	0	0	3	0	5	138	40	0	20	0	6	1438	
9:15	9:30	0	1	158	0	0	1	1	7	1	6	118	36	0	33	0	4		
9:30	9:45	0	2	149	0	0	1	0	2	0	1	112	44	0	34	0	0		
9:45	10:00	0	3	125	3	0	0	0	3	0	3	108	39	0	27	0	0		
14:30	14:45	0	1	127	1	0	0	1	2	0	2	191	72	0	20	0	7	1819	
14:45	15:00	0	3	148	1	0	0	1	3	0	1	187	76	0	29	0	10	1873	
15:00	15:15	0	4	161	1	0	0	0	1	0	4	194	69	0	26	0	3	1848	
15:15	15:30	0	3	160	1	0	0	0	2	0	4	208	72	0	21	0	2	1877	
15:30	15:45	0	0	161	3	0	0	0	5	0	10	213	68	0	17	0	1	1904	
15:45	16:00	0	2	130	1	0	0	0	5	0	4	209	62	0	19	0	2	1916	
16:00	16:15	0	1	164	3	0	0	0	3	0	8	237	54	0	17	1	4	1999	
16:15	16:30	0	2	168	0	0	0	0	4	0	4	224	71	0	21	1	5	2081	
16:30	16:45	0	5	151	1	0	1	0	2	0	6	250	56	0	13	0	5	2105	Peak
16:45	17:00	0	6	157	1	0	0	0	2	0	6	231	90	0	20	0	4	2086	
17:00	17:15	0	1	169	1	0	0	0	10	0	8	271	97	0	12	0	5	2020	
17:15	17:30	0	0	158	2	0	0	1	4	0	4	262	72	0	14	0	7	1840	
17:30	17:45	0	3	142	1	0	0	0	2	0	6	228	72	0	14	0	3	1628	
17:45	18:00	0	1	118	2	0	0	0	4	0	9	211	80	0	23	0	3	1436	
18:00	18:15	0	1	110	2	0	0	0	3	0	14	194	52	0	16	0	2	1246	
18:15	18:30	0	1	102	1	0	0	1	3	0	4	140	47	0	13	0	0		
18:30	18:45	0	0	99	2	0	0	1	4	0	4	118	33	0	18	0	0		
18:45	19:00	0	0	80	1	0	0	0	3	0	2	125	36	0	12	2	0		



# TRANS TRAFFIC SURVEY

## TURNING MOVEMENT SURVEY

trafficsurvey.com.au



### Intersection of Raymond Terrace Rd and Harvest Bv

<b>GPS</b>	-32.765727, 151.623437		<b>North:</b>	Harvest Bvd	<b>Survey</b>	AM: 7:00 AM-10:00 AM
<b>Date:</b>	Wed 18/03/20		<b>East:</b>	Raymond Terrace Rd	<b>Period</b>	PM: 4:00 PM-7:00 PM
<b>Weather:</b>	Overcast		<b>South:</b>	N/A	<b>Traffic</b>	AM: 8:00 AM-9:00 AM
<b>Suburban:</b>	Thornton		<b>West:</b>	Raymond Terrace Rd	<b>Peak</b>	PM: 4:45 PM-5:45 PM
<b>Customer:</b>	McLaren					

#### All Vehicles

Time		North Approach Harvest Bv			Approach Raymond Terrad			Approach Raymond Terrac			Hourly Total	
Period Star	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
7:00	7:15	0	16	31	0	14	86	0	80	11	1250	
7:15	7:30	0	21	53	0	17	97	0	78	16	1436	
7:30	7:45	0	30	35	0	20	120	0	94	12	1620	
7:45	8:00	0	52	45	0	14	163	0	132	13	1827	
8:00	8:15	0	53	43	0	16	169	0	120	23	1921	Peak
8:15	8:30	0	58	38	0	14	172	0	157	27	1892	
8:30	8:45	0	77	34	0	14	205	0	137	51	1752	
8:45	9:00	0	75	50	0	15	199	0	144	30	1543	
9:00	9:15	0	28	28	0	24	139	0	149	27	1354	
9:15	9:30	0	32	22	0	22	131	0	108	11		
9:30	9:45	0	27	24	0	20	128	0	90	20		
9:45	10:00	0	25	19	0	15	134	0	114	17		
16:00	16:15	0	34	13	0	42	173	0	157	41	1932	
16:15	16:30	0	30	13	0	43	180	0	191	39	1931	
16:30	16:45	0	24	18	0	42	175	0	174	32	1946	
16:45	17:00	0	33	16	0	51	209	0	159	43	1947	Peak
17:00	17:15	0	31	15	0	50	159	0	167	37	1818	
17:15	17:30	0	23	22	0	52	191	0	176	47	1680	
17:30	17:45	0	28	18	0	46	169	0	162	43	1491	
17:45	18:00	0	32	11	0	36	133	0	132	38	1286	
18:00	18:15	0	25	13	0	31	115	0	101	36	1155	
18:15	18:30	0	26	13	0	35	126	0	82	40		
18:30	18:45	0	26	12	0	29	84	0	81	29		
18:45	19:00	0	12	15	0	23	103	0	68	30		



**ANNEXURE B: SIDRA RESULTS  
(24 SHEETS)**

# MOVEMENT SUMMARY

Site: 101 [EX- AM- NEW- Haussman/ Taylor (Site Folder: General)]

Intersection of Haussman Drive / Taylor Avenue  
 Existing Conditions  
 AM Peak Period  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Haussman Drive														
2	T1	142	0.0	149	0.0	0.066	4.7	LOS A	0.3	2.4	0.36	0.48	0.36	54.9
3	R2	18	0.0	19	0.0	0.066	9.5	LOS A	0.3	2.3	0.36	0.52	0.36	54.4
Approach		160	0.0	168	0.0	0.066	5.2	LOS A	0.3	2.4	0.36	0.49	0.36	54.8
East: Taylor Avenue														
4	L2	13	0.0	14	0.0	0.185	4.5	LOS A	0.8	5.7	0.24	0.62	0.24	51.7
6	R2	201	0.0	212	0.0	0.185	9.2	LOS A	0.8	5.7	0.24	0.62	0.24	52.7
Approach		214	0.0	225	0.0	0.185	8.9	LOS A	0.8	5.7	0.24	0.62	0.24	52.6
North: Haussman Drive														
7	L2	340	0.0	358	0.0	0.209	4.2	LOS A	1.3	8.9	0.10	0.49	0.10	54.8
8	T1	102	0.0	107	0.0	0.089	4.2	LOS A	0.5	3.3	0.11	0.39	0.11	56.4
Approach		442	0.0	465	0.0	0.209	4.2	LOS A	1.3	8.9	0.11	0.46	0.11	55.1
All Vehicles		816	0.0	859	0.0	0.209	5.6	LOS A	1.3	8.9	0.19	0.51	0.19	54.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

**Site: 101 [EX- PM- NEW- Haussman/ Taylor (Site Folder: General)]**

Intersection of Haussman Drive / Taylor Avenue  
 Existing Conditions  
 PM Peak Period  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Haussman Drive														
2	T1	311	0.0	327	0.0	0.143	4.8	LOS A	0.8	5.4	0.38	0.50	0.38	54.8
3	R2	36	0.0	38	0.0	0.143	9.6	LOS A	0.8	5.3	0.39	0.54	0.39	54.3
Approach		347	0.0	365	0.0	0.143	5.3	LOS A	0.8	5.4	0.38	0.51	0.38	54.7
East: Taylor Avenue														
4	L2	9	0.0	9	0.0	0.177	4.2	LOS A	0.8	5.5	0.17	0.62	0.17	51.8
6	R2	210	0.0	221	0.0	0.177	9.0	LOS A	0.8	5.5	0.17	0.62	0.17	52.8
Approach		219	0.0	231	0.0	0.177	8.8	LOS A	0.8	5.5	0.17	0.62	0.17	52.8
North: Haussman Drive														
7	L2	334	0.0	352	0.0	0.214	4.3	LOS A	1.3	9.2	0.16	0.48	0.16	54.6
8	T1	58	0.0	61	0.0	0.058	4.4	LOS A	0.3	2.1	0.17	0.39	0.17	56.1
Approach		392	0.0	413	0.0	0.214	4.3	LOS A	1.3	9.2	0.16	0.47	0.16	54.8
All Vehicles		958	0.0	1008	0.0	0.214	5.7	LOS A	1.3	9.2	0.24	0.52	0.24	54.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

**Site: 101 [FUT AM- NEW- Haussman/ Taylor / Site (Site Folder: General)]**

Intersection of Haussman Drive / Taylor Avenue  
 Future Conditions  
 AM Peak Period  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Haussman Drive														
1	L2	338	0.0	356	0.0	0.323	6.7	LOS A	2.2	15.2	0.65	0.70	0.65	53.0
2	T1	142	0.0	149	0.0	0.201	6.8	LOS A	1.2	8.1	0.62	0.67	0.62	54.1
3	R2	18	0.0	19	0.0	0.201	12.0	LOS A	1.2	8.1	0.62	0.67	0.62	54.0
Approach		498	0.0	524	0.0	0.323	6.9	LOS A	2.2	15.2	0.64	0.69	0.64	53.4
East: Taylor Avenue														
4	L2	13	0.0	14	0.0	0.324	6.7	LOS A	1.7	12.2	0.56	0.74	0.56	51.2
5	T1	68	0.0	72	0.0	0.324	6.5	LOS A	1.7	12.2	0.56	0.74	0.56	52.2
6	R2	201	0.0	212	0.0	0.324	11.3	LOS A	1.7	12.2	0.56	0.74	0.56	52.6
Approach		282	0.0	297	0.0	0.324	9.9	LOS A	1.7	12.2	0.56	0.74	0.56	52.5
North: Haussman Drive														
7	L2	340	0.0	358	0.0	0.249	4.7	LOS A	1.6	10.9	0.35	0.52	0.35	54.0
8	T1	102	0.0	107	0.0	0.252	4.9	LOS A	1.5	10.8	0.36	0.59	0.36	53.2
9	R2	203	0.0	214	0.0	0.252	9.4	LOS A	1.5	10.8	0.36	0.59	0.36	53.1
Approach		645	0.0	679	0.0	0.252	6.2	LOS A	1.6	10.9	0.36	0.56	0.36	53.6
West: Site														
10	L2	60	0.0	63	0.0	0.066	5.2	LOS A	0.3	2.1	0.45	0.55	0.45	54.8
11	T1	20	0.0	21	0.0	0.105	4.9	LOS A	0.5	3.6	0.44	0.65	0.44	52.8
12	R2	101	0.0	106	0.0	0.105	10.1	LOS A	0.5	3.6	0.44	0.65	0.44	52.8
Approach		181	0.0	191	0.0	0.105	7.9	LOS A	0.5	3.6	0.44	0.62	0.44	53.4
All Vehicles		1606	0.0	1691	0.0	0.324	7.3	LOS A	2.2	15.2	0.49	0.64	0.49	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

**Site: 101 [FUT PM- NEW- Haussman/ Taylor / Site (Site Folder: General)]**

Intersection of Haussman Drive / Taylor Avenue  
 Future Conditions  
 PM Peak Period  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Haussman Drive														
1	L2	120	0.0	126	0.0	0.214	5.5	LOS A	1.3	9.3	0.51	0.56	0.51	53.2
2	T1	311	0.0	327	0.0	0.214	5.3	LOS A	1.3	9.3	0.52	0.57	0.52	54.9
3	R2	36	0.0	38	0.0	0.214	10.5	LOS A	1.3	9.0	0.53	0.58	0.53	54.4
Approach		467	0.0	492	0.0	0.214	5.7	LOS A	1.3	9.3	0.52	0.57	0.52	54.4
East: Taylor Avenue														
4	L2	9	0.0	9	0.0	0.306	7.7	LOS A	1.7	12.0	0.63	0.79	0.63	50.5
5	T1	24	0.0	25	0.0	0.306	7.1	LOS A	1.7	12.0	0.63	0.79	0.63	51.4
6	R2	210	0.0	221	0.0	0.306	11.8	LOS A	1.7	12.0	0.63	0.79	0.63	51.9
Approach		243	0.0	256	0.0	0.306	11.2	LOS A	1.7	12.0	0.63	0.79	0.63	51.8
North: Haussman Drive														
7	L2	334	0.0	352	0.0	0.330	6.7	LOS A	2.3	16.4	0.69	0.71	0.69	52.9
8	T1	58	0.0	61	0.0	0.177	7.4	LOS A	1.0	7.2	0.65	0.74	0.65	52.1
9	R2	72	0.0	76	0.0	0.177	11.9	LOS A	1.0	7.2	0.65	0.74	0.65	52.0
Approach		464	0.0	488	0.0	0.330	7.6	LOS A	2.3	16.4	0.68	0.72	0.68	52.7
West: Site														
10	L2	218	0.0	229	0.0	0.264	6.0	LOS A	1.2	8.5	0.56	0.70	0.56	54.3
11	T1	73	0.0	77	0.0	0.409	5.7	LOS A	2.2	15.6	0.60	0.77	0.60	52.3
12	R2	364	0.0	383	0.0	0.409	10.9	LOS A	2.2	15.6	0.60	0.77	0.60	52.3
Approach		655	0.0	689	0.0	0.409	8.7	LOS A	2.2	15.6	0.59	0.75	0.59	52.9
All Vehicles		1829	0.0	1925	0.0	0.409	8.0	LOS A	2.3	16.4	0.60	0.70	0.60	53.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

**Site: 101 [10GR AM - NEW - Haussman/ Taylor (Site Folder: General)]**

Intersection of Haussman Drive / Taylor Avenue  
 Growth Conditions - 10yr growth @ 2% to all movements  
 AM Peak Period  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Haussman Drive														
2	T1	170	0.0	179	0.0	0.082	4.9	LOS A	0.4	3.0	0.40	0.50	0.40	54.7
3	R2	22	0.0	23	0.0	0.082	9.7	LOS A	0.4	3.0	0.41	0.54	0.41	54.2
Approach		192	0.0	202	0.0	0.082	5.5	LOS A	0.4	3.0	0.40	0.51	0.40	54.6
East: Taylor Avenue														
4	L2	16	0.0	17	0.0	0.226	4.7	LOS A	1.1	7.4	0.27	0.63	0.27	51.6
6	R2	241	0.0	254	0.0	0.226	9.3	LOS A	1.1	7.4	0.27	0.63	0.27	52.6
Approach		257	0.0	271	0.0	0.226	9.0	LOS A	1.1	7.4	0.27	0.63	0.27	52.5
North: Haussman Drive														
7	L2	408	0.0	429	0.0	0.252	4.2	LOS A	1.6	11.5	0.12	0.48	0.12	54.7
8	T1	122	0.0	128	0.0	0.108	4.2	LOS A	0.6	4.1	0.13	0.39	0.13	56.3
Approach		530	0.0	558	0.0	0.252	4.2	LOS A	1.6	11.5	0.13	0.46	0.13	55.1
All Vehicles		979	0.0	1031	0.0	0.252	5.7	LOS A	1.6	11.5	0.22	0.51	0.22	54.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

**Site: 101 [10GR PM - NEW - Haussman/ Taylor (Site Folder: General)]**

Intersection of Haussman Drive / Taylor Avenue  
 Growth Conditions - 10yr growth @ 2% to all movements  
 PM Peak Period  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Haussman Drive														
2	T1	373	0.0	393	0.0	0.177	5.1	LOS A	1.0	7.0	0.43	0.53	0.43	54.6
3	R2	43	0.0	45	0.0	0.177	9.9	LOS A	1.0	6.9	0.44	0.57	0.44	54.1
Approach		416	0.0	438	0.0	0.177	5.6	LOS A	1.0	7.0	0.43	0.53	0.43	54.5
East: Taylor Avenue														
4	L2	11	0.0	12	0.0	0.214	4.3	LOS A	1.0	7.0	0.20	0.62	0.20	51.8
6	R2	252	0.0	265	0.0	0.214	9.0	LOS A	1.0	7.0	0.20	0.62	0.20	52.7
Approach		263	0.0	277	0.0	0.214	8.8	LOS A	1.0	7.0	0.20	0.62	0.20	52.7
North: Haussman Drive														
7	L2	401	0.0	422	0.0	0.258	4.3	LOS A	1.7	11.8	0.19	0.48	0.19	54.5
8	T1	70	0.0	74	0.0	0.071	4.4	LOS A	0.4	2.6	0.19	0.40	0.19	56.0
Approach		471	0.0	496	0.0	0.258	4.3	LOS A	1.7	11.8	0.19	0.47	0.19	54.7
All Vehicles		1150	0.0	1211	0.0	0.258	5.8	LOS A	1.7	11.8	0.28	0.53	0.28	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

**Site: 101 [10GR + DEV AM- NEW- Haussman/ Taylor / Site (Site Folder: General)]**

Intersection of Haussman Drive / Taylor Avenue  
 Future Conditions - 10yr growth @ 2% to all movements and development traffic  
 AM Peak Period  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Haussman Drive														
1	L2	338	0.0	356	0.0	0.335	7.0	LOS A	2.3	16.2	0.69	0.72	0.69	52.8
2	T1	170	0.0	179	0.0	0.242	7.1	LOS A	1.5	10.2	0.67	0.70	0.67	53.9
3	R2	22	0.0	23	0.0	0.242	12.2	LOS A	1.5	10.2	0.67	0.70	0.67	53.8
Approach		530	0.0	558	0.0	0.335	7.2	LOS A	2.3	16.2	0.68	0.72	0.68	53.2
East: Taylor Avenue														
4	L2	16	0.0	17	0.0	0.379	7.0	LOS A	2.1	15.0	0.60	0.77	0.60	50.9
5	T1	68	0.0	72	0.0	0.379	6.8	LOS A	2.1	15.0	0.60	0.77	0.60	51.9
6	R2	241	0.0	254	0.0	0.379	11.6	LOS A	2.1	15.0	0.60	0.77	0.60	52.4
Approach		325	0.0	342	0.0	0.379	10.3	LOS A	2.1	15.0	0.60	0.77	0.60	52.2
North: Haussman Drive														
7	L2	408	0.0	429	0.0	0.298	4.8	LOS A	2.0	13.8	0.37	0.53	0.37	53.9
8	T1	122	0.0	128	0.0	0.274	5.0	LOS A	1.7	12.1	0.38	0.59	0.38	53.3
9	R2	203	0.0	214	0.0	0.274	9.5	LOS A	1.7	12.1	0.38	0.59	0.38	53.1
Approach		733	0.0	772	0.0	0.298	6.1	LOS A	2.0	13.8	0.38	0.56	0.38	53.6
West: Site														
10	L2	60	0.0	63	0.0	0.070	5.6	LOS A	0.3	2.3	0.49	0.58	0.49	54.6
11	T1	20	0.0	21	0.0	0.111	5.2	LOS A	0.6	3.9	0.49	0.67	0.49	52.6
12	R2	101	0.0	106	0.0	0.111	10.5	LOS A	0.6	3.9	0.49	0.67	0.49	52.6
Approach		181	0.0	191	0.0	0.111	8.3	LOS A	0.6	3.9	0.49	0.64	0.49	53.2
All Vehicles		1769	0.0	1862	0.0	0.379	7.4	LOS A	2.3	16.2	0.52	0.65	0.52	53.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

**Site: 101 [10GR + DEV PM- NEW- Haussman/ Taylor / Site (Site Folder: General)]**

Intersection of Haussman Drive / Taylor Avenue  
 Future Conditions - 10yr growth @ 2% to all movements and development traffic  
 PM Peak Period  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist m ]				
South: Haussman Drive														
1	L2	120	0.0	126	0.0	0.256	5.8	LOS A	1.7	11.7	0.57	0.58	0.57	53.0
2	T1	373	0.0	393	0.0	0.256	5.6	LOS A	1.7	11.7	0.57	0.60	0.57	54.6
3	R2	43	0.0	45	0.0	0.256	10.9	LOS A	1.6	11.2	0.58	0.61	0.58	54.1
Approach		536	0.0	564	0.0	0.256	6.0	LOS A	1.7	11.7	0.57	0.59	0.57	54.2
East: Taylor Avenue														
4	L2	11	0.0	12	0.0	0.367	7.9	LOS A	2.2	15.1	0.67	0.81	0.67	50.3
5	T1	24	0.0	25	0.0	0.367	7.3	LOS A	2.2	15.1	0.67	0.81	0.67	51.2
6	R2	252	0.0	265	0.0	0.367	12.1	LOS A	2.2	15.1	0.67	0.81	0.67	51.7
Approach		287	0.0	302	0.0	0.367	11.5	LOS A	2.2	15.1	0.67	0.81	0.67	51.6
North: Haussman Drive														
7	L2	401	0.0	422	0.0	0.401	6.9	LOS A	3.0	21.1	0.73	0.74	0.73	52.8
8	T1	70	0.0	74	0.0	0.202	7.6	LOS A	1.2	8.3	0.67	0.75	0.67	52.1
9	R2	72	0.0	76	0.0	0.202	12.1	LOS A	1.2	8.3	0.67	0.75	0.67	52.0
Approach		543	0.0	572	0.0	0.401	7.7	LOS A	3.0	21.1	0.72	0.74	0.72	52.6
West: Site														
10	L2	218	0.0	229	0.0	0.283	6.4	LOS A	1.3	9.3	0.61	0.75	0.61	54.2
11	T1	73	0.0	77	0.0	0.433	6.2	LOS A	2.5	17.6	0.65	0.82	0.68	52.1
12	R2	364	0.0	383	0.0	0.433	11.4	LOS A	2.5	17.6	0.65	0.82	0.68	52.1
Approach		655	0.0	689	0.0	0.433	9.2	LOS A	2.5	17.6	0.64	0.80	0.66	52.7
All Vehicles		2021	0.0	2127	0.0	0.433	8.3	LOS A	3.0	21.1	0.65	0.73	0.65	52.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

**Site: 101 [EX AM - Raymond Terrace / Harvest (Site Folder: General)]**

Signalised intersection of Raymond Terrace Rd / Harvest Bvd

Existing Conditions

AM Peak Period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
East: Raymond Terrace Rd (E)														
5	T1	745	0.0	784	0.0	0.348	11.8	LOS A	9.0	63.0	0.57	0.49	0.57	51.0
6	R2	59	0.0	62	0.0	*0.175	25.5	LOS B	1.8	12.9	0.75	0.74	0.75	41.5
Approach		804	0.0	846	0.0	0.348	12.8	LOS A	9.0	63.0	0.58	0.51	0.58	50.2
North: Harvest Bvd														
7	L2	165	0.0	174	0.0	0.222	24.4	LOS B	4.8	33.9	0.67	0.75	0.67	42.5
9	R2	263	0.0	277	0.0	*0.559	36.6	LOS C	10.6	74.5	0.91	0.82	0.91	36.7
Approach		428	0.0	451	0.0	0.559	31.9	LOS C	10.6	74.5	0.82	0.79	0.82	38.8
West: Raymond Terrace Rd (W)														
10	L2	131	0.0	138	0.0	0.296	22.6	LOS B	6.9	48.6	0.68	0.68	0.68	44.2
11	T1	558	0.0	587	0.0	*0.549	19.4	LOS B	15.3	107.3	0.77	0.69	0.77	45.3
Approach		689	0.0	725	0.0	0.549	20.0	LOS B	15.3	107.3	0.75	0.69	0.75	45.0
All Vehicles		1921	0.0	2022	0.0	0.559	19.7	LOS B	15.3	107.3	0.69	0.64	0.69	45.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[ Ped ped	Dist ] m					
East: Raymond Terrace Rd (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	70.3	40.4	0.57
North: Harvest Bvd												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	64.7	33.1	0.51
West: Raymond Terrace Rd (W)												
P4	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	67.9	37.2	0.55
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	67.7	36.9	0.55

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

**Site: 101 [EX PM - Raymond Terrace / Harvest (Site Folder: General)]**

Signalised intersection of Raymond Terrace Rd / Harvest Bvd

Existing Conditions

PM Peak Period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
East: Raymond Terrace Rd (E)														
5	T1	728	0.0	766	0.0	0.276	5.6	LOS A	5.9	41.6	0.39	0.34	0.39	55.5
6	R2	199	0.0	209	0.0	* 0.532	21.4	LOS B	6.5	45.5	0.79	0.81	0.79	43.5
Approach		927	0.0	976	0.0	0.532	9.0	LOS A	6.5	45.5	0.47	0.44	0.47	52.4
North: Harvest Bvd														
7	L2	71	0.0	75	0.0	0.139	32.5	LOS C	2.4	17.1	0.78	0.74	0.78	39.0
9	R2	115	0.0	121	0.0	* 0.489	46.1	LOS D	5.1	36.0	0.97	0.79	0.97	33.5
Approach		186	0.0	196	0.0	0.489	40.9	LOS C	5.1	36.0	0.90	0.77	0.90	35.4
West: Raymond Terrace Rd (W)														
10	L2	170	0.0	179	0.0	0.276	15.6	LOS B	6.5	45.7	0.53	0.62	0.53	48.1
11	T1	664	0.0	699	0.0	* 0.511	12.0	LOS A	15.0	105.2	0.63	0.58	0.63	49.9
Approach		834	0.0	878	0.0	0.511	12.8	LOS A	15.0	105.2	0.61	0.59	0.61	49.5
All Vehicles		1947	0.0	2049	0.0	0.532	13.7	LOS A	15.0	105.2	0.57	0.54	0.57	48.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[ Ped ped	Dist ] m					
East: Raymond Terrace Rd (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	70.3	40.4	0.57
North: Harvest Bvd												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	64.7	33.1	0.51
West: Raymond Terrace Rd (W)												
P4	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	67.9	37.2	0.55
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	67.7	36.9	0.55

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

**Site: 101 [10GR AM - Raymond Terrace / Harvest (Site Folder: General)]**

Signallised intersection of Raymond Terrace Rd / Harvest Bvd  
 Future Conditions - 10yr growth @ 2% to Through movements

AM Peak Period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
East: Raymond Terrace Rd (E)														
5	T1	894	0.0	941	0.0	0.402	11.6	LOS A	10.8	75.4	0.57	0.50	0.57	51.5
6	R2	59	0.0	62	0.0	* 0.189	25.8	LOS B	1.9	13.2	0.76	0.74	0.76	41.3
Approach		953	0.0	1003	0.0	0.402	12.5	LOS A	10.8	75.4	0.58	0.52	0.58	50.7
North: Harvest Bvd														
7	L2	165	0.0	174	0.0	0.234	26.2	LOS B	5.0	35.2	0.70	0.75	0.70	41.9
9	R2	263	0.0	277	0.0	* 0.610	38.7	LOS C	11.0	77.1	0.94	0.83	0.94	36.0
Approach		428	0.0	451	0.0	0.610	33.8	LOS C	11.0	77.1	0.85	0.80	0.85	38.0
West: Raymond Terrace Rd (W)														
10	L2	131	0.0	138	0.0	0.327	21.6	LOS B	8.0	55.7	0.67	0.66	0.67	44.9
11	T1	670	0.0	705	0.0	* 0.607	18.8	LOS B	18.0	126.0	0.77	0.70	0.77	45.7
Approach		801	0.0	843	0.0	0.607	19.3	LOS B	18.0	126.0	0.75	0.69	0.75	45.5
All Vehicles		2182	0.0	2297	0.0	0.610	19.2	LOS B	18.0	126.0	0.70	0.64	0.70	45.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[ Ped ped	Dist ] m					
East: Raymond Terrace Rd (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	70.3	40.4	0.57
North: Harvest Bvd												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	64.7	33.1	0.51
West: Raymond Terrace Rd (W)												
P4	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	67.9	37.2	0.55
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	67.7	36.9	0.55

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

**Site: 101 [10GR PM - Raymond Terrace / Harvest (Site Folder: General)]**

Signallised intersection of Raymond Terrace Rd / Harvest Bvd  
 Future Conditions - 10yr growth @ 2% to Through movements

PM Peak Period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
East: Raymond Terrace Rd (E)														
5	T1	874	0.0	920	0.0	0.327	5.8	LOS A	7.2	50.5	0.39	0.35	0.39	55.6
6	R2	199	0.0	209	0.0	* 0.604	25.0	LOS B	7.5	52.3	0.89	0.84	0.89	41.7
Approach		1073	0.0	1129	0.0	0.604	9.4	LOS A	7.5	52.3	0.48	0.44	0.48	52.3
North: Harvest Bvd														
7	L2	71	0.0	75	0.0	0.145	33.7	LOS C	2.5	17.4	0.79	0.74	0.79	38.6
9	R2	115	0.0	121	0.0	* 0.533	47.3	LOS D	5.2	36.6	0.98	0.79	0.98	33.1
Approach		186	0.0	196	0.0	0.533	42.1	LOS C	5.2	36.6	0.91	0.77	0.91	35.0
West: Raymond Terrace Rd (W)														
10	L2	170	0.0	179	0.0	0.313	15.4	LOS B	7.6	53.4	0.54	0.61	0.54	48.5
11	T1	797	0.0	839	0.0	* 0.581	12.2	LOS A	18.1	127.0	0.65	0.61	0.65	49.8
Approach		967	0.0	1018	0.0	0.581	12.8	LOS A	18.1	127.0	0.63	0.61	0.63	49.6
All Vehicles		2226	0.0	2343	0.0	0.604	13.6	LOS A	18.1	127.0	0.58	0.54	0.58	49.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[ Ped ped	Dist ] m					
East: Raymond Terrace Rd (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	70.3	40.4	0.57
North: Harvest Bvd												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	64.7	33.1	0.51
West: Raymond Terrace Rd (W)												
P4	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	67.9	37.2	0.55
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	67.7	36.9	0.55

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.



Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

**Site: 101 [FU AM - Raymond Terrace / Harvest / Site (Site Folder: General)]**

Signallised intersection of Raymond Terrace Rd / Harvest Bvd

Future Conditions + Development - No growth

Altered Phasing + RT Lane IN + LT Lane IN

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Site Access														
1	L2	161	0.0	169	0.0	0.152	16.9	LOS B	3.2	22.6	0.47	0.70	0.47	47.7
2	T1	1	0.0	1	0.0	0.173	27.0	LOS B	2.2	15.3	0.79	0.74	0.79	39.2
3	R2	60	0.0	63	0.0	0.173	32.6	LOS C	2.2	15.3	0.79	0.74	0.79	38.7
Approach		222	0.0	234	0.0	0.173	21.2	LOS B	3.2	22.6	0.56	0.71	0.56	44.9
East: Raymond Terrace Rd (E)														
4	L2	203	0.0	214	0.0	0.471	37.3	LOS C	8.2	57.1	0.90	0.81	0.90	36.6
5	T1	745	0.0	784	0.0	* 0.754	36.4	LOS C	16.7	116.9	0.98	0.89	1.05	38.1
6	R2	59	0.0	62	0.0	0.445	48.1	LOS D	2.7	19.1	0.97	0.77	0.97	33.0
Approach		1007	0.0	1060	0.0	0.754	37.3	LOS C	16.7	116.9	0.96	0.87	1.01	37.5
North: Harvest Bvd														
7	L2	165	0.0	174	0.0	0.301	32.4	LOS C	5.8	40.8	0.80	0.77	0.80	39.0
8	T1	1	0.0	1	0.0	* 0.740	34.8	LOS C	12.0	84.1	0.96	0.89	1.07	36.2
9	R2	263	0.0	277	0.0	0.740	40.4	LOS C	12.0	84.1	0.96	0.89	1.07	35.7
Approach		429	0.0	452	0.0	0.740	37.3	LOS C	12.0	84.1	0.90	0.85	0.96	36.9
West: Raymond Terrace Rd (W)														
10	L2	131	0.0	138	0.0	0.254	18.2	LOS B	6.0	42.0	0.59	0.63	0.59	46.7
11	T1	558	0.0	587	0.0	0.456	13.9	LOS A	12.8	89.3	0.65	0.59	0.65	48.7
12	R2	540	0.0	568	0.0	* 0.765	45.8	LOS D	12.7	89.2	1.00	0.89	1.13	33.7
Approach		1229	0.0	1294	0.0	0.765	28.4	LOS B	12.8	89.3	0.80	0.73	0.85	40.6
All Vehicles		2887	0.0	3039	0.0	0.765	32.2	LOS C	16.7	116.9	0.85	0.79	0.90	39.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[ Ped ped	Dist ] m					
South: Site Access												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	67.9	37.2	0.55

East: Raymond Terrace Rd (E)												
P2 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	72.9	43.7	0.60	
North: Harvest Bvd												
P3 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	64.7	33.1	0.51	
West: Raymond Terrace Rd (W)												
P4 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	73.0	43.8	0.60	
All Pedestrians	200	211	39.3	LOS D	0.1	0.1	0.94	0.94	69.6	39.4	0.57	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

**Site: 101 [FU PM - Raymond Terrace / Harvest / Site (Site Folder: General)]**

Signallised intersection of Raymond Terrace Rd / Harvest Bvd

Future Conditions + Development - No growth

Altered Phasing + RT Lane IN + LT Lane IN

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Site Access														
1	L2	582	0.0	613	0.0	* 0.831	33.6	LOS C	22.9	160.4	0.79	0.87	0.91	39.7
2	T1	1	0.0	1	0.0	0.551	29.2	LOS C	8.7	60.9	0.89	0.81	0.89	38.3
3	R2	218	0.0	229	0.0	0.551	34.7	LOS C	8.7	60.9	0.89	0.81	0.89	37.9
Approach		801	0.0	843	0.0	0.831	33.9	LOS C	22.9	160.4	0.81	0.86	0.90	39.2
East: Raymond Terrace Rd (E)														
4	L2	72	0.0	76	0.0	0.122	27.9	LOS B	2.3	16.2	0.73	0.73	0.73	40.4
5	T1	728	0.0	766	0.0	0.553	27.3	LOS B	13.6	94.9	0.86	0.74	0.86	42.5
6	R2	199	0.0	209	0.0	0.701	44.9	LOS D	8.8	61.5	1.00	0.96	1.08	34.0
Approach		999	0.0	1052	0.0	0.701	30.8	LOS C	13.6	94.9	0.87	0.78	0.89	40.3
North: Harvest Bvd														
7	L2	71	0.0	75	0.0	0.079	19.7	LOS B	1.6	11.5	0.54	0.69	0.54	45.7
8	T1	1	0.0	1	0.0	0.488	30.0	LOS C	4.7	32.7	0.87	0.80	0.87	38.0
9	R2	115	0.0	121	0.0	0.488	35.6	LOS C	4.7	32.7	0.87	0.80	0.87	37.5
Approach		187	0.0	197	0.0	0.488	29.5	LOS C	4.7	32.7	0.75	0.76	0.75	40.2
West: Raymond Terrace Rd (W)														
10	L2	170	0.0	179	0.0	0.463	30.5	LOS C	10.3	72.4	0.83	0.77	0.83	40.2
11	T1	664	0.0	699	0.0	* 0.833	32.9	LOS C	25.9	181.4	0.96	0.93	1.06	38.9
12	R2	191	0.0	201	0.0	0.541	49.4	LOS D	4.4	31.1	0.99	0.78	0.99	32.6
Approach		1025	0.0	1079	0.0	0.833	35.6	LOS C	25.9	181.4	0.94	0.88	1.01	37.8
All Vehicles		3012	0.0	3171	0.0	0.833	33.2	LOS C	25.9	181.4	0.87	0.83	0.93	39.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
						[ Ped ped	Dist ] m					
South: Site Access												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	67.9	37.2	0.55

East: Raymond Terrace Rd (E)												
P2 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	72.9	43.7	0.60	
North: Harvest Bvd												
P3 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	64.7	33.1	0.51	
West: Raymond Terrace Rd (W)												
P4 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	73.0	43.8	0.60	
All Pedestrians	200	211	39.3	LOS D	0.1	0.1	0.94	0.94	69.6	39.4	0.57	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)  
 Pedestrian movement LOS values are based on average delay per pedestrian movement.  
 Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

**Site: 101 [10GR FU AM - Raymond Terrace / Harvest / Site (Site Folder: General)]**

Signallised intersection of Raymond Terrace Rd / Harvest Bvd  
 Future Conditions= 10yr growth @ 2% to through movements + Development  
 Altered Phasing + RT Lane IN + LT Lane IN  
 Site Category: (None)  
 Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)  
 Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Site Access														
1	L2	161	0.0	169	0.0	0.164	20.1	LOS B	3.6	25.1	0.52	0.71	0.52	46.5
2	T1	1	0.0	1	0.0	0.196	29.8	LOS C	2.3	16.1	0.83	0.74	0.83	38.1
3	R2	60	0.0	63	0.0	0.196	35.4	LOS C	2.3	16.1	0.83	0.74	0.83	37.7
Approach		222	0.0	234	0.0	0.196	24.3	LOS B	3.6	25.1	0.60	0.72	0.60	43.7
East: Raymond Terrace Rd (E)														
4	L2	203	0.0	214	0.0	0.398	33.5	LOS C	7.6	53.4	0.85	0.79	0.85	38.0
5	T1	894	0.0	941	0.0	* 0.802	36.4	LOS C	21.3	149.1	0.97	0.93	1.08	38.4
6	R2	59	0.0	62	0.0	0.431	46.3	LOS D	2.7	18.8	0.95	0.77	0.95	33.6
Approach		1156	0.0	1217	0.0	0.802	36.4	LOS C	21.3	149.1	0.95	0.89	1.03	38.0
North: Harvest Bvd														
7	L2	165	0.0	174	0.0	0.337	35.4	LOS C	6.1	43.0	0.84	0.78	0.84	37.9
8	T1	1	0.0	1	0.0	* 0.826	42.5	LOS D	13.5	94.2	1.00	0.97	1.25	33.6
9	R2	263	0.0	277	0.0	0.826	48.1	LOS D	13.5	94.2	1.00	0.97	1.25	33.2
Approach		429	0.0	452	0.0	0.826	43.2	LOS D	13.5	94.2	0.94	0.90	1.09	34.9
West: Raymond Terrace Rd (W)														
10	L2	131	0.0	138	0.0	0.277	16.2	LOS B	6.5	45.8	0.55	0.60	0.55	48.2
11	T1	670	0.0	705	0.0	0.498	12.5	LOS A	14.5	101.2	0.63	0.58	0.63	49.6
12	R2	540	0.0	568	0.0	* 0.810	48.8	LOS D	13.3	93.1	1.00	0.92	1.20	32.8
Approach		1341	0.0	1412	0.0	0.810	27.5	LOS B	14.5	101.2	0.77	0.72	0.85	41.0
All Vehicles		3148	0.0	3314	0.0	0.826	32.7	LOS C	21.3	149.1	0.85	0.81	0.93	39.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[ Ped ped	Dist ] m					
South: Site Access												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	67.9	37.2	0.55

East: Raymond Terrace Rd (E)												
P2 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	72.9	43.7	0.60	
North: Harvest Bvd												
P3 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	64.7	33.1	0.51	
West: Raymond Terrace Rd (W)												
P4 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	73.0	43.8	0.60	
All Pedestrians	200	211	39.3	LOS D	0.1	0.1	0.94	0.94	69.6	39.4	0.57	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)  
 Pedestrian movement LOS values are based on average delay per pedestrian movement.  
 Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

**Site: 101 [10GR FU PM - Raymond Terrace / Harvest / Site (Site Folder: General)]**

Signallised intersection of Raymond Terrace Rd / Harvest Bvd  
 Future Conditions= 10yr growth @ 2% to through movements + Development  
 Altered Phasing + RT Lane IN + LT Lane IN  
 Site Category: (None)  
 Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)  
 Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Site Access														
1	L2	583	0.0	614	0.0	* 0.879	45.8	LOS D	26.9	188.6	0.84	0.93	1.06	36.3
2	T1	1	0.0	1	0.0	0.666	34.9	LOS C	9.6	67.2	0.96	0.85	1.00	36.1
3	R2	218	0.0	229	0.0	0.666	40.5	LOS C	9.6	67.2	0.96	0.85	1.00	35.8
Approach		802	0.0	844	0.0	0.879	44.3	LOS D	26.9	188.6	0.87	0.91	1.04	36.2
East: Raymond Terrace Rd (E)														
4	L2	72	0.0	76	0.0	0.111	25.7	LOS B	2.2	15.3	0.69	0.72	0.69	41.4
5	T1	874	0.0	920	0.0	0.608	27.6	LOS B	16.2	113.7	0.86	0.75	0.86	43.2
6	R2	199	0.0	209	0.0	0.775	49.0	LOS D	9.2	64.6	1.00	1.01	1.19	32.7
Approach		1145	0.0	1205	0.0	0.775	31.2	LOS C	16.2	113.7	0.87	0.79	0.90	40.8
North: Harvest Bvd														
7	L2	71	0.0	75	0.0	0.084	22.2	LOS B	1.8	12.3	0.57	0.70	0.57	44.7
8	T1	1	0.0	1	0.0	0.567	34.8	LOS C	5.0	35.2	0.93	0.81	0.94	36.1
9	R2	115	0.0	121	0.0	0.567	40.4	LOS C	5.0	35.2	0.93	0.81	0.94	35.7
Approach		187	0.0	197	0.0	0.567	33.5	LOS C	5.0	35.2	0.80	0.77	0.80	38.7
West: Raymond Terrace Rd (W)														
10	L2	170	0.0	179	0.0	0.500	28.7	LOS C	12.1	85.0	0.82	0.76	0.82	41.3
11	T1	797	0.0	839	0.0	* 0.899	37.7	LOS C	33.3	233.1	0.96	1.01	1.15	37.1
12	R2	191	0.0	201	0.0	0.609	51.2	LOS D	4.6	32.0	1.00	0.80	1.06	32.1
Approach		1158	0.0	1219	0.0	0.899	38.6	LOS C	33.3	233.1	0.94	0.94	1.09	36.7
All Vehicles		3292	0.0	3465	0.0	0.899	37.1	LOS C	33.3	233.1	0.89	0.87	1.00	38.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 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.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[ Ped ped	Dist ] m					
South: Site Access												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	67.9	37.2	0.55



East: Raymond Terrace Rd (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	72.9	43.7	0.60
North: Harvest Bvd												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	64.7	33.1	0.51
West: Raymond Terrace Rd (W)												
P4	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	73.0	43.8	0.60
All		200	211	39.3	LOS D	0.1	0.1	0.94	0.94	69.6	39.4	0.57
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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