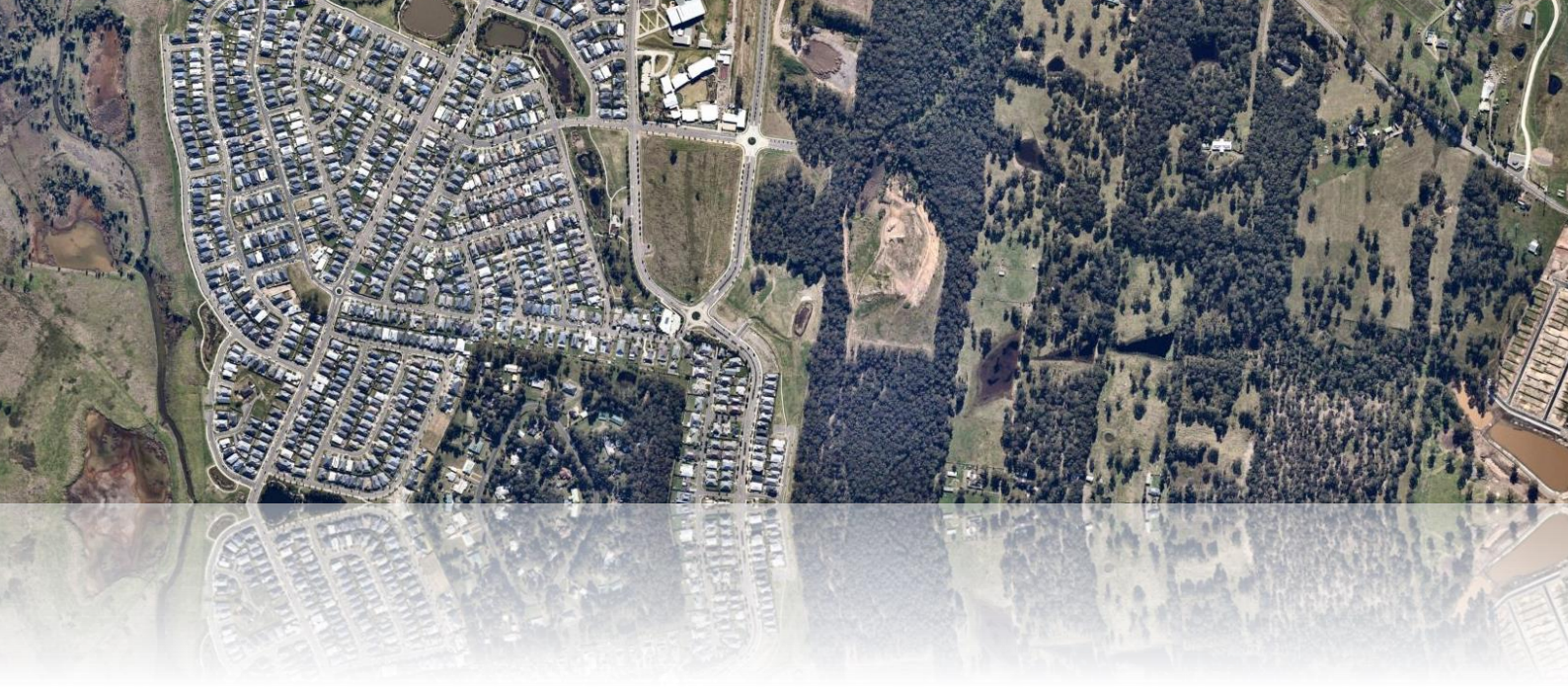

TRAFFIC AND PARKING IMPACT ASSESSMENT OF THE PROPOSED SHOPPING CENTRE AT 20 HERITAGE DRIVE, CHISHOLM

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

210550.01FB - 23 December 2021

Development Type: **Proposed Shopping Centre**

Site Address: **20 Heritage Drive, Chisholm**

Prepared for: **Revelop**

Document reference: **210550.01FB**

Status	Issue	Prepared By	Checked By	Date
Draft	A	MM	ME	1 December 2021
Draft	B	MM	ME	13 December 2021
Final	A	MM	ME	13 December 2021
Final	B	MM	ME	23 December 2021

TABLE OF CONTENTS

1 INTRODUCTION

M^{C}Laren Traffic Engineering was commissioned by *Revelop* to provide a Traffic and Parking Impact Assessment of the Proposed Shopping Centre at 20 Heritage Drive, Chisholm as depicted in **Annexure A**.

1.1 Description and Scale of Development

The proposed development and subdivision has the following characteristics relevant to traffic and parking:

- A mixed-use development containing the following land uses:
  - A supermarket of 3,912m^2 gross floor area (GFA) (includes home delivery area, loading dock and direct to boot), with a 3,500m^2 gross leasable floor area (GLFA) (not including direct to boot, home delivery area and loading dock);
  - Liquor premises (retail) of 185m^2 GFA / GLFA;
  - A major retail premises of 1,500m^2 GFA / GLFA;
  - Various secondary retail premises of 3,695m^2 GFA / GLFA;
  - A tavern premises of 890m^2 GFA / GLFA;
  - Medical centre premises of 745m^2 GFA / GLFA;
  - A kiosk (food and drink premises) of 160m^2 GFA / GLFA;
  - A child care centre accommodating 112 children;
  - A gym premises of 8,00m^2 GFA;
  - A swim school of 1,040m^2 GFA;
  - Car wash area of 475m^2 GFA / GLFA.
- Associated at-grade car parking area accommodating 535 car parking spaces with vehicular access provided via a two-way driveway from Heritage Drive, entry only driveway from Tigerhawk Drive (left in only) and a two-way driveway restricted to left in / left out on Settlers Boulevard:
  - 10 x parent / pram car parking spaces;
  - 10 x disabled car parking spaces;
  - 515 standard car parking spaces.
- Six (6) pick-up parking space to facilitate the Woolworths direct to boot service;
- Associated basement parking area accommodating 126 car parking spaces with vehicular access via Heritage Drive:
  - 4 x disabled car parking spaces;
  - 5 x electric vehicle car parking spaces;
  - 117 x standard car parking spaces.

- An access road (referred to as the Link Road) is proposed between Heritage Drive and Settlers Boulevard, separating the mixed-use development and the residential subdivision and provides vehicular access to:
    - The proposed link road to the residential subdivision;
    - The loading and servicing area for the mixed-use development;
    - An additional 21 angled car parking spaces fronting of shopping centre.

It is noted that the following development scale has been approved by Maitland City Council under *DA 18-1526* on the subject site:

- A mixed-use development of 6,325m^2 gross floor area (GFA) containing the following land uses:
    - A supermarket of 3,800m^2 GFA;
    - Retail premises of 1,425m^2 GFA;
    - Food and drink premises of 1,000m^2 GFA;
    - Café premises of 100m^2 GFA;
    - Medical centre premises of 580m^2 GFA.
- Associated at-grade car parking are accommodating 434 car parking spaces.

1.2 State Environmental Planning Policy (Infrastructure) 2007

The proposed development does qualify as a traffic generating development with relevant size and/or capacity under *Clause 104* of the *SEPP (Infrastructure) 2007*. Accordingly, formal referral to Transport for New South Wales (TfNSW) is necessary in conjunction with assessment of the application by Maitland Council officers.

1.3 Site Description

The subject development involves the development of a currently vacant lot which is currently zoned *B1: Neighbourhood Centre* and *R1: General Residential* under the *Maitland Local Environmental Plan 2011*. The site is surrounded by existing roads on all frontages, with Heritage Drive to the west, Tigerhawk Drive to the north and Settlers Boulevard to the west.

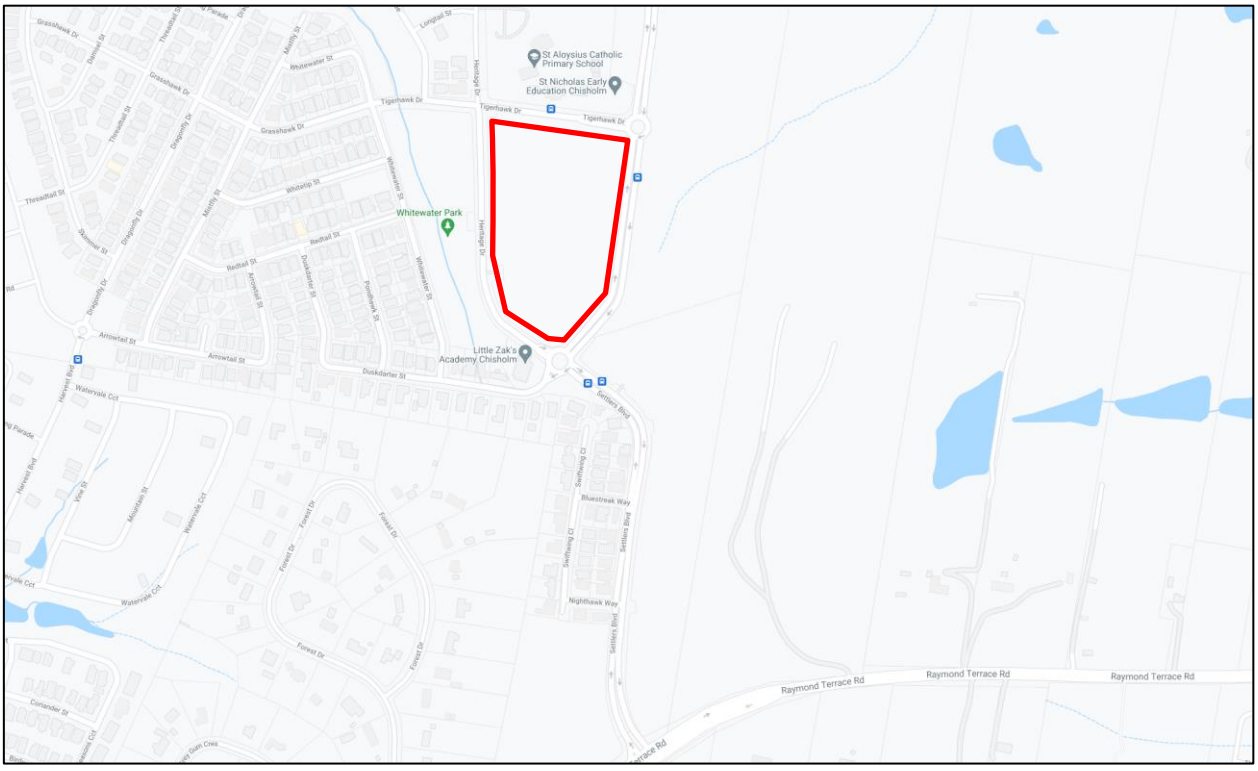
The site is generally surrounded by residential subdivision developments to the west and south with St Aloysius Catholic Primary School located directly to the north of the site and vacant land and bushland to the east. Raymond Terrace Road, facilitating traffic flow eastbound and westbound is located approximately 620m to the south of the site.

1.4 Site Context

The location of the site is shown on an aerial photo and a street map in **Figure 1** and **Figure 2** respectively.

Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 Road Hierarchy

The road network servicing the site has characteristics as described in the following sub-sections.

2.1.1 Heritage Drive

- Unclassified LOCAL Road;
- Approximately 12m wide two-way carriageway (one lane in each direction) and a line-marked kerbside parking lane on both sides of the road;
- Signposted 50km/h speed limit;
- Unrestricted kerbside parking permitted along both sides of the road within a line-marked kerbside parking lane;
- Provision of a shared path within the verge on both sides of the road.

2.1.2 Settlers Boulevard

- Unclassified LOCAL Road;
- Approximately 19m wide two-way carriageway (one lane in each direction), a line-marked bicycle lane and a line-marked kerbside parking lane on both sides of the road, divided by a central landscaped median of approximately 3m width;
- Signposted 50km/h speed limit, with 40km/h school zone restrictions;
- Unrestricted kerbside parking permitted along both sides of the road within a line-marked kerbside parking lane.
- Provision of a shared path within the verge on both sides of the road.

2.1.3 Tigerhawk Drive

- Unclassified LOCAL Road;
- Approximately 16m wide two-way carriageway (one lane in each direction), a line-marked bicycle lane and a line-marked kerbside parking lane on both sides of the road;
- Signposted 50km/h speed limit, with 40km/h school zone restrictions;
- Unrestricted kerbside parking permitted along both sides of the road within a line-marked kerbside parking lane.

2.1.4 Raymond Terrace Road

- TfNSW Classified STATE ARTERIAL Road (No. 104);
- Approximately 10m to 27m wide two-way carriageway within near vicinity of the site facilitating one (1) to two (2) lanes in each direction;
    - Carriageway typically accommodates one (1) lane in each direction;

- Widens to two (2) lanes plus auxiliary turn lanes in each direction within close proximity to Settlers Boulevard.

- Signposted 80km/h speed limit;
- Line-marked bicycle lane on both sides of the road within close proximity to Settlers Boulevard;
- No provision of kerbside parking facilities on either side of the road.

2.2 Existing Traffic Management

- Roundabout controlled intersection of Heritage Drive / Settlers Boulevard / Duskdater Street;
- Roundabout controlled intersection of Settlers Boulevard / Tigerhawk Drive;
- Give-way sign controlled intersection of Heritage Drive / Tigerhawk Drive;
- Signal controlled intersection of Settlers Boulevard / Raymond Terrace Drive;
- Existing junction of Heritage Drive / Proposed Access Lane (to be constructed);
- Existing junction of Settlers Drive / Greenling Drive (to be constructed);
- Indented blistered pedestrian crossing on Tigerhawk Drive along the northern boundary of the site.

2.3 Existing Traffic Environment

Intersection traffic surveys were conducted by The *Transport Planning Partnership (TTPP)* within a Traffic Report dated 27 June 2018 (referred to as the *TTPA Report*), prepared for the same site. Data was collected at key intersections within the vicinity of the site between 7:00am to 9:00am, and between 3:00pm to 6:00pm on Thursday 22 March 2018, and between 10:00am to 1:00pm on Saturday 24 March 2018 representing a typical operating weekday and weekend. The survey results are shown in **Annexure B** for reference, with the intersections surveyed listed as follows:

- Settlers Boulevard / Raymond Terrace Road;
- Harvest Boulevard / Raymond Terrace Road;
- Heritage Drive / Settlers Boulevard / Duskdarter Street;
- Heritage Drive / Tigerhawk Drive;
- Dragonfly Drive / Grasshawk Drive.

It should be noted that due to the NSW lockdown, it has not been possible to undertake updated traffic surveys.

2.3.1 Existing Road Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.0, **Table 1** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

TABLE 1: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE						
Settlers Boulevard / Raymond Terrace	AM	0.46	21.9	**B**	Signals	N/A
	PM	0.35	15.9	**B**		N/A
	Weekend	0.26	15.8	**B**		N/A
Harvest Boulevard / Raymond Terrace	AM	0.40	10.1	**A**	Signals	N/A
	PM	0.48	10.8	**A**		N/A
	Weekend	0.35	9.9	**A**		N/A
Settlers Boulevard / Heritage Drive / Duskdarter Street	AM	0.25	5.2 (Worst: 11.1)	**A** (Worst: B)	Roundabout	RT from Settlers Boulevard (E)
	PM	0.12	4.3 (Worst: 10.2)	**A** (Worst: B)		
	Weekend	0.08	4.5 (Worst: 9.8)	**A** (Worst: A)		
Heritage Drive / Tigerhawk Drive	AM	0.23	3.9 (Worst: 8.6)	**N/A** (Worst: A)	Priority	RT from Tigerhawk Drive (W)
	PM	0.10	3.8 (Worst: 6.8)	**N/A** (Worst: A)		
	Weekend	0.10	4.2 (Worst: 6.1)	**N/A** (Worst: A)		
Grasshawk Drive / Dragonfly Drive	AM	0.04	4.4 (Worst: 6.0)	**N/A** (Worst: A)	Priority	RT from Grasshawk Drive (E)
	PM	0.06	4.8 (Worst: 5.9)	**N/A** (Worst: A)		
	Weekend	0.05	4.8 (Worst: 5.7)	**N/A** (Worst: A)		

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.
(4) No overall Level of Service is provided for Give Way, Priority and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

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

Whilst all assessed intersections are operating at an acceptable LoS, the surrounding area is subject to significant traffic growth as a result of being located within the Thornton North Urban Release Area. Further details in relation to the Thornton North Urban Release Area is outlined in **Section 2.5**.

2.4 Public Transport

The subject site has access to a number of existing bus stops including one (1) on Tigerhawk Drive along the northern boundary of the site, two (2) on Settlers Boulevard (ID: 232282 and ID: 232225) along the eastern boundary of the site and two (2) on Settlers Boulevard (ID: 2322215 and ID: 2322118) located approximately 100m to the south of the site. All of the aforementioned bus stops service existing route 189 (Stockland Green Hills to Thornton via Chisholm) provided by Hunter Valley Buses.

There are no train stations within an accessible distance from the subject site. The location of the site subject to the surrounding public transport network is shown in **Figure 3**.

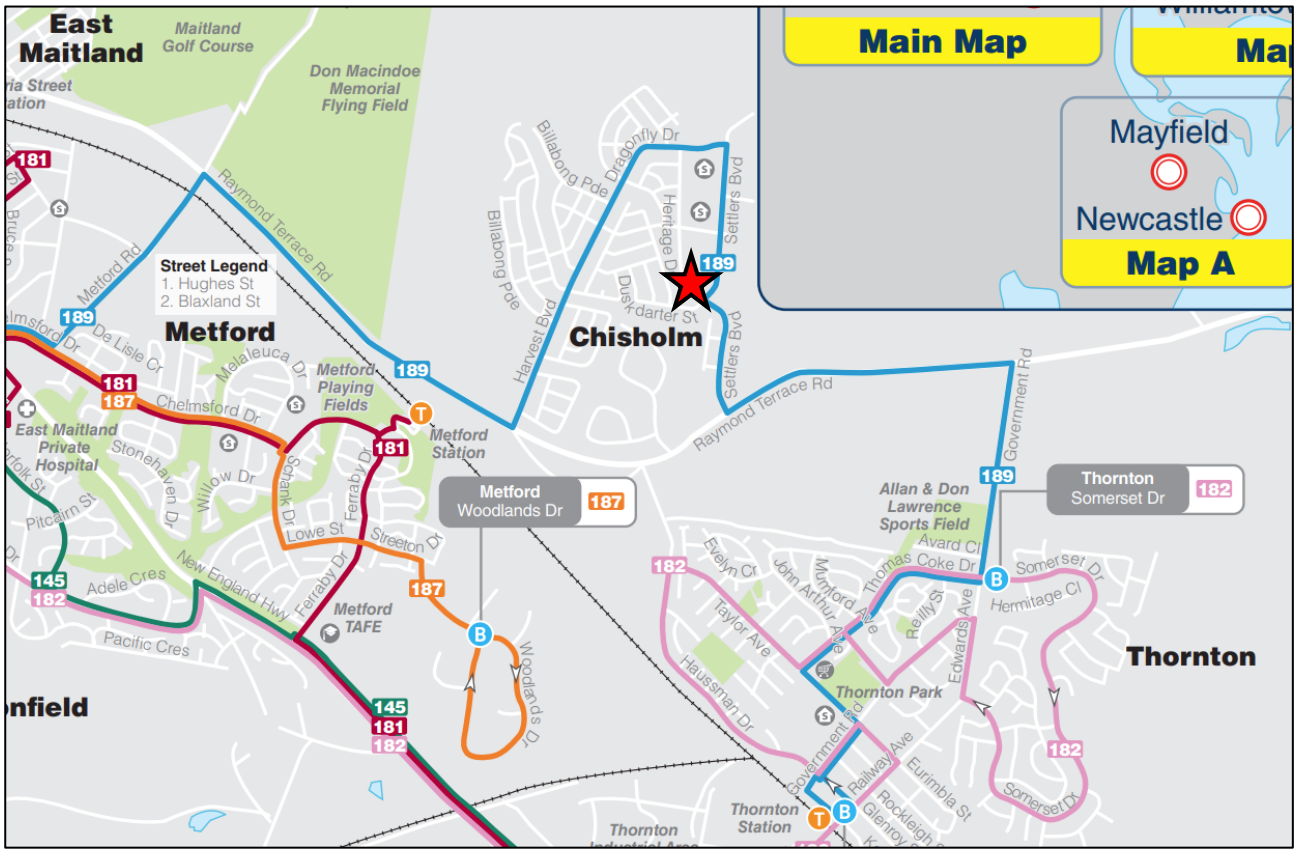


FIGURE 3: PUBLIC TRANSPORT NETWORK MAP

2.5 Future Road and Infrastructure Upgrades

As mentioned previously the subject site is located within the Thornton North Urban Release area and is subject to ongoing change within the subdivision as a result of the creation of additional housing and local infrastructure.

Section 7 of the Maitland Council Development Control Plan (MDCP) Part F – Urban Release Areas outlines that the Thornton North Urban Release area comprises a total area of 900 hectares of land with an residential yield of approximately 5,000 lots. The extent of the Thornton North Urban Release area is shown in **Figure 4** below, extracted from *MDCP Part F*.

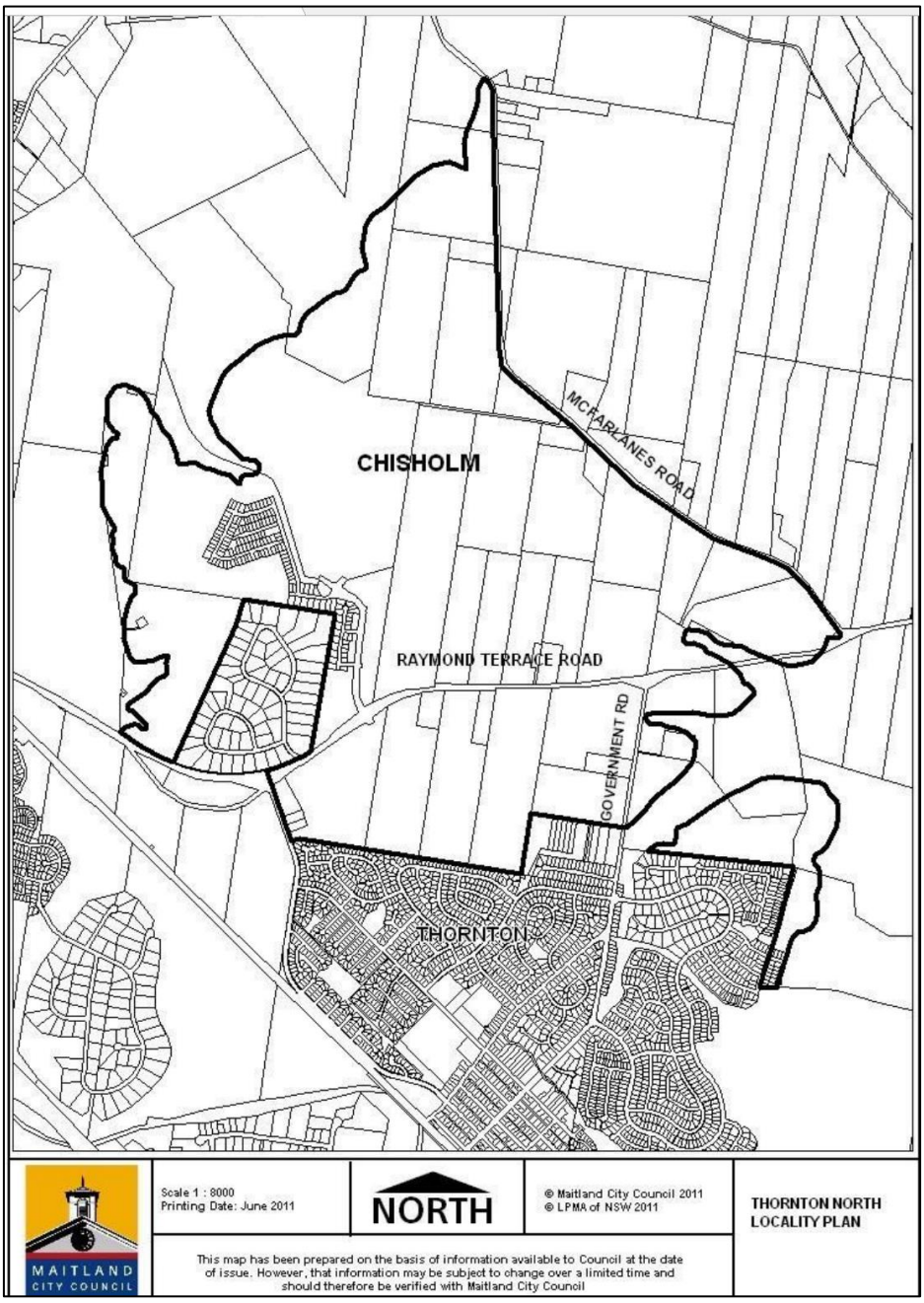


FIGURE 4: THORNTON NORTH LOCALITY PLAN – FIGURE 28 OF MDCP PART F

To support the growth within the Thornton North Urban Release Area the *Thornton North Section 94 Contributions Plan 2008* was developed, which outlines the following infrastructure upgrades as shown in **Figure 5**.

Thornton North Road & Traffic Facilities						
Facilities		**Location**	**Description**	**Est. Capital Cost**	**Est. Land Cost**	**Total Cost**
Road Upgrades	TN36	Raymond Terrace Road	Harvest Boulevard to Haussman Drive	$5,992,357	$767,604	$6,759,961
	TN37		Haussman Drive to Settlers Boulevard	$10,896,727	$303,002	$11,199,729
	TN38		Settlers Boulevard to Government Road	$6,969,829	$1,212,007	$8,181,836
	TN39		Government Road to McFarlanes Road	$6,984,612	$686,804	$7,671,416
	TN40	Haussman Drive	Raymond Terrace Road to Railway Avenue	$14,503,670	$3,313,871	$17,817,541
	TN41	Thornton Road	Railway Avenue to Glenwood Drive	$7,151,104	$59,828	$7,210,932
	TN42	McFarlanes Road	Raymond Terrace Road to TN49	$6,349,640	$579,568	$6,929,208
	TN43	Government Road	Raymond Terrace Road to Somerset Drive	$1,674,814	$246,651	$1,921,465
Intersections	TN44	Raymond Terrace Road / Harvest Boulevard		$1,216,758	$0	$1,216,758
	TN45	Raymond Terrace Road / Haussman Drive		$2,020,919	$0	$2,020,919
	TN46	Raymond Terrace Road / Settlers Boulevard		$1,246,019	$0	$1,246,019
	TN47	Raymond Terrace Road / Government Road		$2,140,733	$0	$2,140,733
	TN48	Raymond Terrace Road / McFarlanes Road		$1,432,678	$0	$1,432,678
	TN49	McFarlanes Road / Settlers Boulevard		$1,179,791	$0	$1,179,791
	TN50	Haussman Drive / Taylor Avenue		$1,981,514	$4,944	$1,986,458
	TN51	Railway Avenue / Glenroy Street		$3,794,138	$2,197,475	$5,991,613
	TN52	Huntingdale Drive / Thornton Drive		$1,137,841	$0	$1,137,841
	TN53	Thornton Road / Glenwood Drive		$3,678,586	$498,199	$4,176,785
	TN54	Government Road / Thorncliffe Avenue / Darlaston Avenue		$641,324	$0	$641,324
	TN55	Government Road / Hillgate Drive		$641,324	$0	$641,324
New Roads	TN56	Settlers Boulevard (additional 4.0m wide median)		$1,354,847	$754,000	$2,108,847
	TN57	Fringe Road (additional 6.0m reserve, 1.5m for shared way and 2.5m parking lane)		$2,583,849	$120,000	$2,703,849
TOTAL				**$85,573,074**	**$10,743,953**	**$96,317,027**

FIGURE 5: THORNTON NORTH SECTION 94 CONTRIBUTIONS PLAN – ROAD INFRASTRUCTURE

The planned road infrastructure shown above, was supported by the *Thornton North Master Plan Traffic Impact Assessment Volume 3* prepared by *Parsons Brinckerhoff* dated August 2003 (**PB Report**). From Council's website, a number of road infrastructure upgrades have been completed as shown in **Figure 6** below.

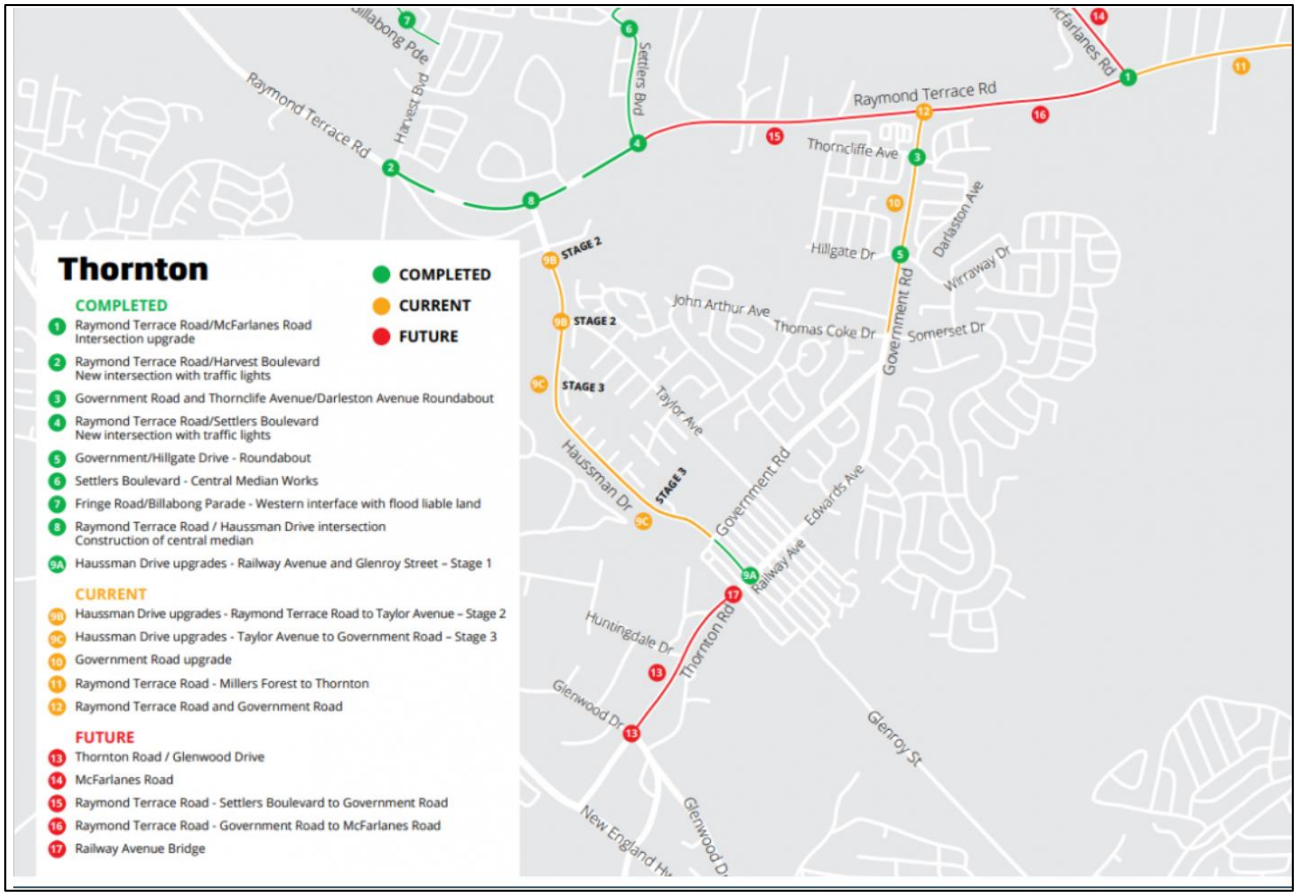


FIGURE 6: THORNTON ROAD NETWORK UPGRADE PROGRESS – MAITLAND COUNCIL

Critical intersections of Settlers Boulevard / Raymond Terrance Road and Raymond Terrace Road / Harvest Boulevard have been fully constructed to support the growth within the area. The **PB Report** does not assess non-residential uses such as the shopping centre developments and schools. As such consideration needs to be provided to the ultimate development scenario when all residential developments have been constructed and occupied in addition to the traffic generated by the proposed development.

2.6 Thornton North Urban Release Area Ultimate Development Scenario

Reference is made to the *TTPA Report* which adopted the following with consideration to additional residential development yield yet to be constructed at the time of the traffic surveys (2018):

- Additional 720 residential lots within the Waterford County Precinct, generally to be located along the eastern side of the Waterford County estate, east of Settlers Boulevard;

- Additional 2,500 residential lots within the North Thorton Urban Release Area to be located east of Waterford County Precinct.

To provide site context, the *Figure 32 from Section 7 of the Maitland Council Development Control Plan (MDCP) Part F – Urban Release Areas* is reproduced in **Figure 7** below.

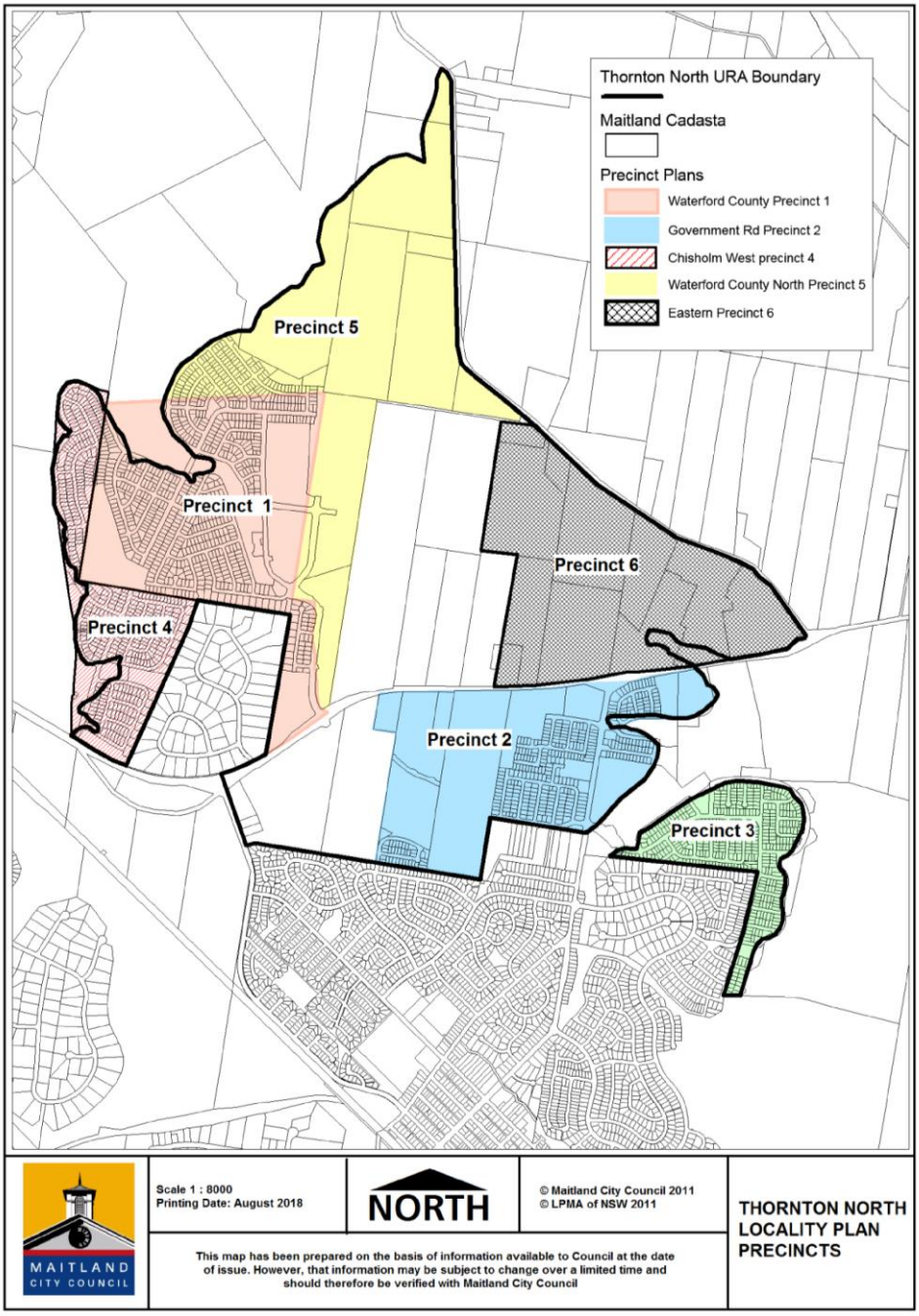


FIGURE 7: THORNTON NORTH PRECINCT PLAN – COUNCIL DCP

With reference to **Figure 7** above, Precincts 1, 4 and 5 are assumed to provide an additional residential yield of 720 residential dwellings (with the majority being within Precinct 5) and Precincts 2, 3 and 6 are assumed to provide an additional residential yield of 2,500 lots.

The general road hierarchy for the Thornton North Urban Release area is shown in **Figure 8** below which shows the following road connections:

- Precincts 2 and 3 will have access to Raymond Terrace Road via Government Road and Hillgate Drive (left in / left out);

- Precinct 6 will have access to Raymond Terrace Road via a forth leg connection to Government Road. In addition, a connection to M^{C}farlanes Road will be made to Precinct 6 with a local road connection to Waterford County Precinct 1 and 5.

- Precincts 1 and 4 will have a local road connection to Raymond Terrace Road via the extension of Harvest Boulevard which has been constructed.

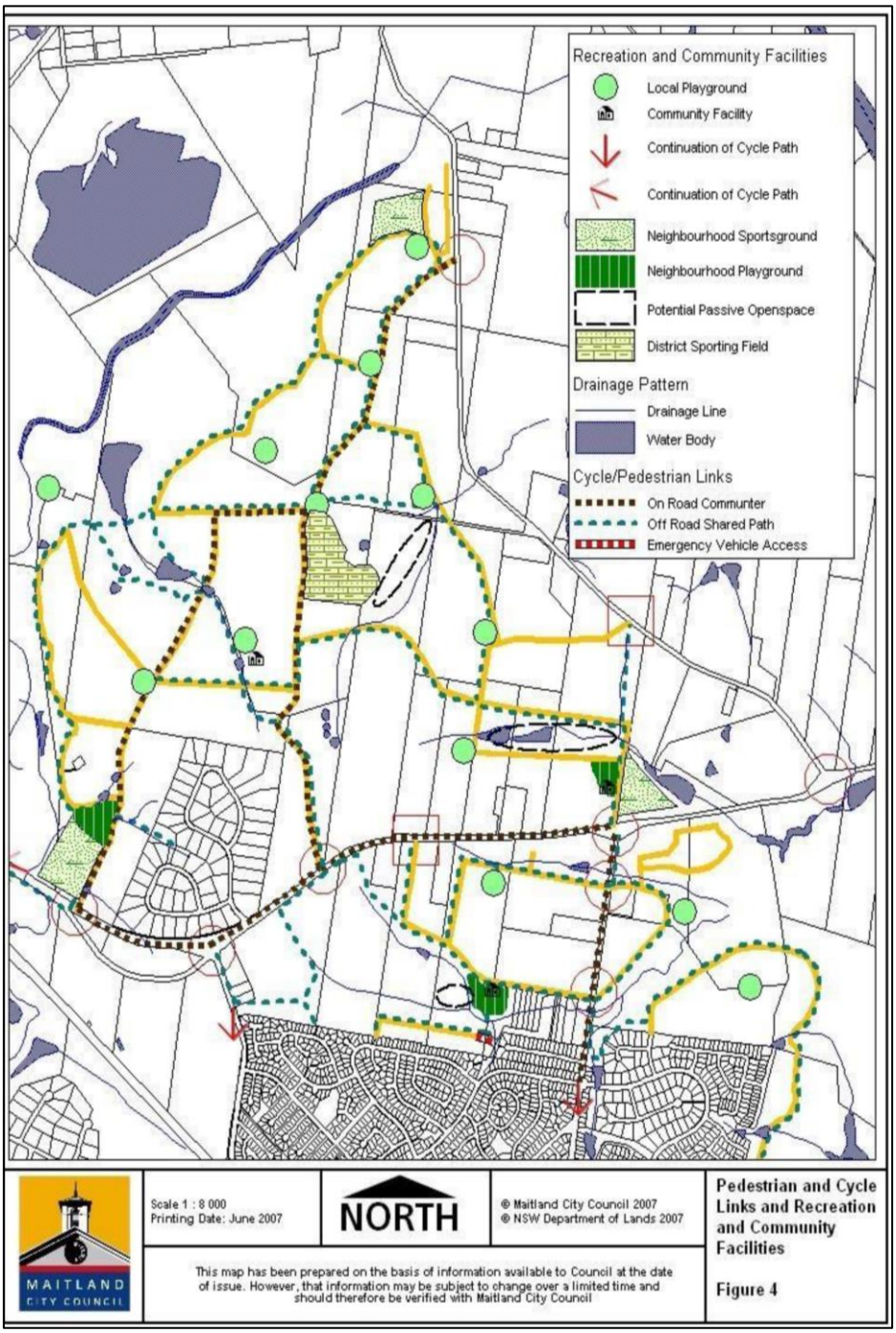


FIGURE 8: ROAD HIERARCHY, PEDESTRIAN AND CYCLE LINKS – COUNCIL DCP

In view of the above, the traffic conditions within close proximity to the site will change as a result of additional residential developments. The **PB Report** does not provide clear directional distributions of the external traffic generated by the Thornton North Urban

Release Area. Upon review of *Table 5.2* of the **PB Report**, the following distribution can be derived:

Inbound:

- 65% from the south;
- 30% from the west;
- 5% from the north and east.

Outbound:

- 60% to the south;
- 25% to the west;
- 15% to the north and east.

Based upon the above, the remaining development yield within the Thornton North Urban Release area is expected to generate vehicle trips as shown in **Table 2** below.

It should be noted that the peak hour residential traffic generation rate on the weekend has been estimated based upon the comparison of the traffic volumes from the weekday to the weekend survey. The observed traffic volumes into and out of the subdivision on the weekend is roughly 64% of that of the weekday. As such, the traffic generation on the weekend will be 64% of the PM peak hour traffic generation rate.

TABLE 2: ESTIMATED TRAFFIC GENERATION – THORNTON NORTH URBAN RELEASE AREA

Land Use	Precinct	Scale	Time Period	Traffic Generation Rate	Traffic Generation [(1)(2)]
Residential	1, 4 & 5	720 lots	AM Peak	0.71 per dwelling	511 (102 in, 409 out
			PM Peak	0.78 per dwelling	562 (450 in, 112 out)
			Weekend	0.5 per dwelling	360 (180 in, 180 out)
	2,3,6	2,500 lots	AM Peak	0.71 per dwelling	1,775 (355 in, 1,420 out)
			PM Peak	0.78 per dwelling	1,950 (1,560 in, 390 out)
			Weekend	0.5 per dwelling	1,250 (625 in, 625 out)
TOTAL	**-**	**-**	**AM Peak**	**-**	**2,286**
			PM Peak		**2,512**
			Weekend		**1,610**

Note: (1) 20% inbound, 80% outbound in AM peak hour and 80% inbound, 20% outbound in PM peak hour.
(2) 50% inbound, 50% outbound in weekend peak hour period

As shown above, the Thornton North Urban Release Area is anticipated to generate 2,286 vehicle trips in the AM peak hour period, 2,512 vehicle trips during the PM peak hour periods and 1,610 vehicle trips during the weekend peak hour period.

The additional vehicle trips noted above have been added to the traffic surveys undertaken in 2018 to provide a base case scenario of the ultimate development yield as a result of the Thornton North Urban Release Area. It is assumed that 80% of the traffic generated by Precincts 1,4 & 5 will utilise the intersection of Raymond Terrace Road / Settlers Boulevard and 20% will utilise the intersection of Raymond Terrace Road / Harvest Boulevard for a conservative assessment.

The resulting intersection performance of critical intersections is summarised in **Table 3**, with detailed SIDRA outputs provided in **Annexure C** for reference.

TABLE 3: INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0) – ULTIMATE RESIDENTIAL YIELD

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
THORNTON NORTH URBAN RELEASE AREA ULTIMATE DEVELOPMENT YIELD						
Settlers Boulevard / Raymond Terrace	AM	0.67	24.1	**B**	Signals	N/A
	PM	0.64	15.1	**B**		N/A
	Weekend	0.43	16.7	**B**		N/A
Harvest Boulevard / Raymond Terrace	AM	0.53	12.3	**A**	Signals	N/A
	PM	0.80	16.2	**B**		N/A
	Weekend	0.50	11.4	**A**		N/A
Settlers Boulevard / Heritage Drive / Duskdarter Street	AM	0.30	5.8 (Worst: 11.1)	**A** (Worst: B)	Roundabout	RT from Settlers Boulevard (E)
	PM	0.29	6.7 (Worst: 11.7)	**A** (Worst: B)		RT from Duskdarter Street (W)
	Weekend	0.15	5.7 (Worst: 10.4)	**A** (Worst: B)		
Heritage Drive / Tigerhawk Drive	AM	0.23	3.9 (Worst: 8.6)	**N/A** (Worst: A)	Priority	RT from Tigerhawk Drive (W)
	PM	0.10	3.8 (Worst: 6.8)	**N/A** (Worst: A)		
	Weekend	0.10	4.2 (Worst: 6.1)	**N/A** (Worst: A)		
Grasshawk Drive / Dragonfly Drive	AM	0.01	2.5 (Worst: 6.6)	**N/A** (Worst: A)	Priority	RT from Grasshawk Drive (E)
	PM	0.06	2.7 (Worst: 6.6)	**N/A** (Worst: A)		
	Weekend	0.05	3.1 (Worst: 6.1)	**N/A** (Worst: A)		

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.
(4) No overall Level of Service is provided for Give Way, Priority and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown above, with consideration to the full development yield of the Thornton North Urban Release area the relevant intersections are forecast to operate at a high level of efficiency, with a Level of Service (LoS) “A” or “B” conditions in both the AM, PM and weekend peak hour periods. The level of service “A” and “B” performance is characterised by low approach delays and spare capacity.

It should be noted that the above assessment would include the traffic generated from the residential subdivision proposed as part of this development application.

3 PARKING ASSESSMENT

3.1 Council Parking Requirement

Reference is made to the *Maitland Development Control Plan 2011 – Part C – Design Guidelines* which designates the following parking rates applicable to the proposed development:

C.11 – Vehicular Access & Car Parking

2. General Requirements

2.2 Calculation of Parking Requirements

b) Mixed Uses

For developments incorporating different categories of uses, a separate calculation will be made for each component and then added together to provide the total parking requirement. Any departure from this method will only be considered where it is demonstrated that the peak demand for each land use component of the development is staggered. In this regard the applicant should submit a parking profile showing the cumulative parking demand by time-of-day.

c) Calculation of Numbers

Where the calculation results in a fraction of a space, the total number of parking spaces required will be the next highest whole number.

Appendix A Car Parking Requirements for Specific Land Uses

Childcare Centre

1 space per 4 children in attendance or there part of.

Drive In Take Away Food Outlets

(premises which cater for customers being able to park on-site, get take away service, seating provided for on-site consumption and the addition of a drive through facility)

1 space per 8m^2 GFA plus

1 space per 3 seats

An exclusive area for queuing of cars for a drive through facility is required (queue length of 5 to 12 cars measured from pick up point). There should also be a minimum of four car parking spaces for cars queued from the ordering point. Provision should also be made for car/trailer combinations at strategic locations

Dwelling Houses

Minimum of 1 space

Registered Clubs/ Pubs

(including sexual entertainment establishments)

Outside the Maitland CBD.

1 space per 10m² of public or licensed floor area (bar, lounge, dining room, games room) shall be provided.

Gymnasium

7.5 spaces per 100m² GFA.

Restaurants, take-away food and drink premises

1 space per 6.5m² service area or

1 space per 3 seats

WHICHEVER IS GREATER

A food outlet which provides no seating will also be assessed as a "shop".

Shops

(Shops greater than 1000m² include supermarkets, department stores, regional shopping complexes etc)

Shops less than 1000m² – 1 space per 25m2 GFA.

Shops greater than 1000m² – 1 space per 16m2 GFA

Business Premises and Office Premises

1 space per 40m² GFA

It is noted that the Maitland DCP does not provide car parking rates for medical centre uses and as such, reference is made to the *RTA Guide to Traffic Generating Developments 2002* as adopted by TfNSW which designates the following parking rates applicable to this use:

5.12.2 Extended hours medical centres

4 per 100 m² gross floor area

Further, neither Council's DCP nor the TfNSW Guide provide car parking rates for swim school developments. As such, a first principles assessment of the parking demands has been conducted, assuming a rate of two (2) car parking spaces per child on-site at any one

time. This accounts for the cross over of consecutive classes (i.e. two class are on-site at any one time).

It is noted that the residential subdivision requires the provision of minimum one (1) car parking space per residential dwelling proposed as part of the development. The quantum of residential dwellings is not known at this stage, with the car parking required by the residential subdivision to be deduced at a later stage. It is expected that all parking for the residential component will be capable of being provided on each individual lot.

Table 4 presents the parking requirements of the proposal according to applicable car parking rates as extracted from Council's DCP and the TfNSW Guide.

TABLE 4: COUNCIL DCP PARKING RATES

Land Use	Scale	Document	Rate	Spaces Required
Supermarket	3,912m^2 GFA	DCP	1 per 16m^2 GFA	349.8
Liquor	185m^2 GFA	DCP		
Major Retail	1,500m^2 GFA	DCP		
Shops	3,695m^2 GFA	DCP	1 per 25m^2 GFA	147.8
Tavern	890m^2 GFA	DCP	1 per 10m^2 LFA	89
Medical Centre	745m^2 GFA	TfNSW	4 per 100m^2 GFA	29.8
Food and Drink Premises	160m^2 GFA	DCP	1 per 25m^2 GFA	6.4
Child Care Centre	112 children	DCP	1 per 4 children	28
Gymnasium	8,00m^2 GFA	DCP	7.5 per 100m^2 GFA	60
Swim School	1,040m^2 GFA 20 children per class	First Principles	2 per child	40
Car Wash	475m^2 GFA	DCP	1 space per 40m^2	11.9
TOTAL	**-**	**-**	**-**	**762.7 (763)**

As shown, strict application of the DCP requires the provision of **763** car parking spaces. The proposed plans detail the provision of **682** car parking spaces including the **21** spaces along the New Link Road, resulting in a numerical shortfall of **81** parking spaces from Council's DCP requirements.

It should be noted that Council's DCP parking rates are generally applicable to standalone developments and do not consider cross utilisation of car parking of different uses or consideration to different peak parking periods. As such, the parking required by the proposed development will been assessed against the *RTA Guide to Traffic Generating Developments 2002* which considers cross utilisation of retail uses.

As per Council's DCP, for mixed use developments any variation to the above provision of parking must demonstrate via a parking demand profile which shows the cumulative peak parking periods of the various uses throughout the day are staggered and do not overlap.

Considering this, it is evident that some land uses will not overlap with one another, particularly the following:

- The child care centre will not operate on weekends;
- Gymnasiums and swim schools do not operate at their peaks on weekends;
- Taverns peak parking periods occur in the afternoon.

Considering this, a parking demand profile has been provided with reference to the following data and documents:

- *RTA Land Use Data – Shopping Centres 1991 by Arup Transportation Planning*:
    - Only sites with no access to public transport have been relied upon (total 10 sites).
- *M^CLaren Traffic Engineering* personal experience with Taverns / Pubs which includes detailed regressions analysis including patron counts for up to 10 different taverns / pubs.
- *Trip Generation and Parking Demand Surveys of Gymnasiums Data and Analysis Report* prepared by *People Trans* dated 27 November 2014:
    - Includes data for four (4) Gymnasiums.

Using the above data, the typical parking profile for a shopping centre, gymnasium and taverns has been developed for a weekday and weekend period. Using Council's parking requirements as outlined in **Table 4**, the parking demand of the proposed development is shown in **Figure 9** and **Figure 10** below.

It should be noted that the shopping centre profile has included the parking requirements for the supermarket, liquor, major retail, shops, medical centre, food and drink premises, fast food premises and car wash.

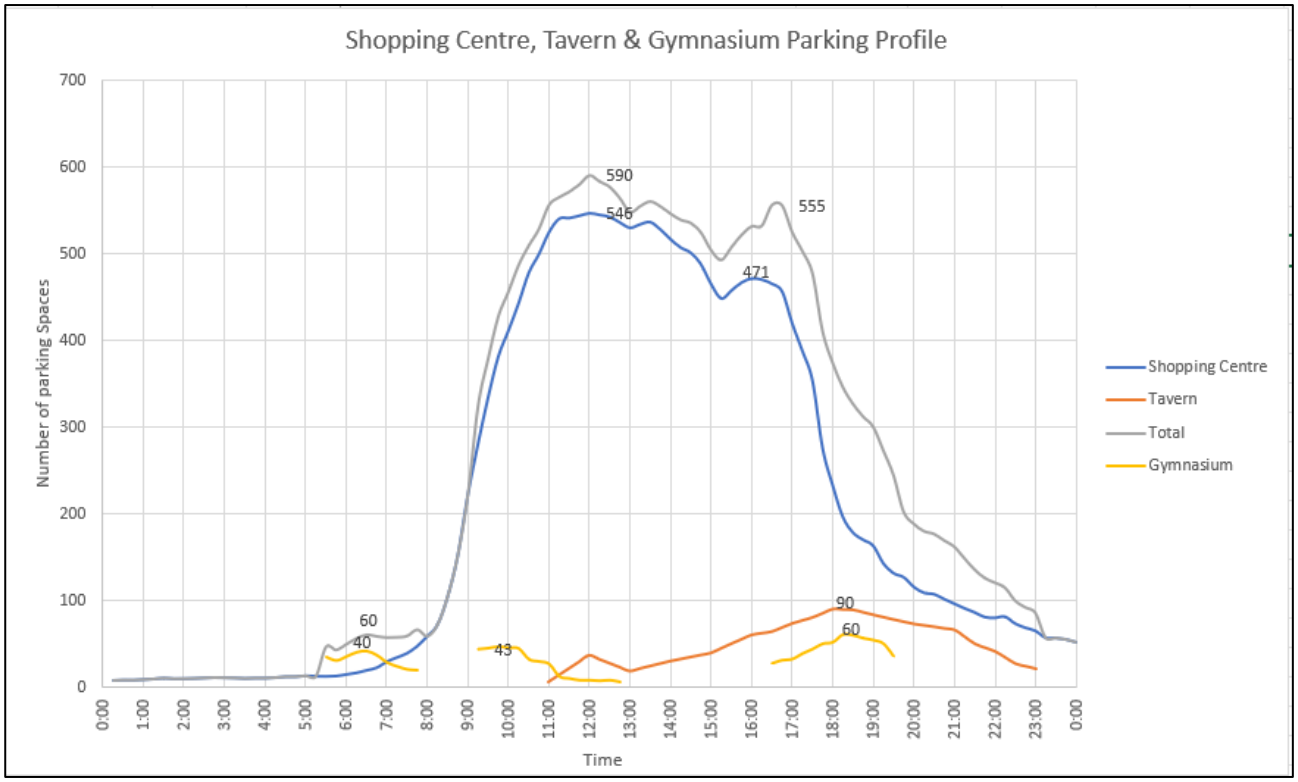


FIGURE 9: WEEKDAY PARKING PROFILE – COUNCIL DCP

As shown above, the shopping centre, tavern and gymnasium portion of the development is expected to demand **590** car parking spaces during weekdays, although this does not consider the parking demand generated by the swim school or child care centre. Including the parking demand of the swim school and child care centre results in a total anticipated parking demand of **658** (590 + 28 + 40). A further reduction could be applied as the peak parking demand occurs at 12pm, when parents are not at the child care centre. Hence, a further reduction of 14 spaces (half of 28, being staff vehicles) can be applied, resulting in the parking demand of **644** car parking spaces. The proposed development provides **682** car parking spaces, including the parking along the New Link Road, resulting in a surplus of **38** car parking spaces over the expected peak parking demand.

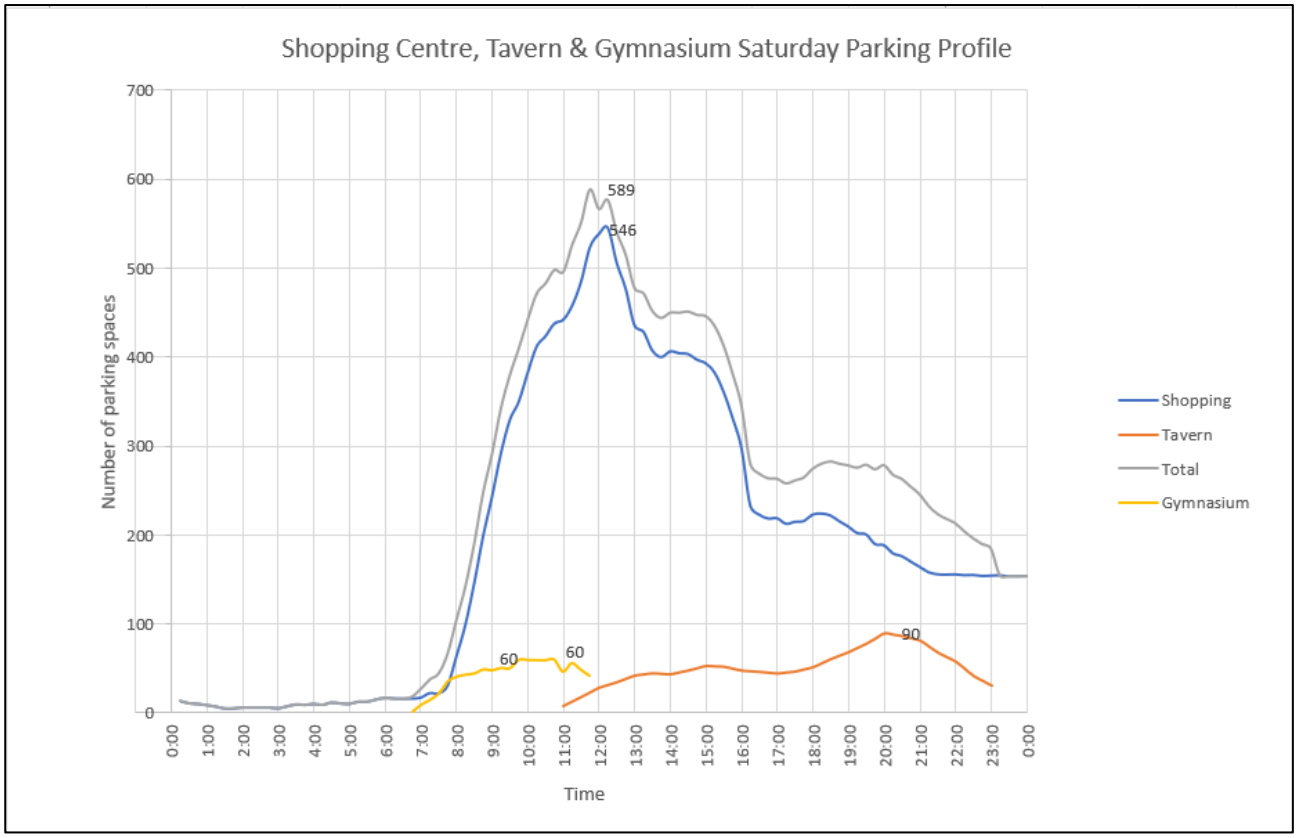


FIGURE 10: WEEKEND PARKING PROFILE – COUNCIL DCP

As shown above, the shopping centre, tavern and gymnasium portion of the development is expected to demand **589** car parking space on weekends, although this does not consider the parking generated by the swim school if it operates on weekends. Including the parking demand associated with the swim school, the proposed development will result in an anticipated parking demand of **629** (589 + 40) car parking spaces. The proposed development provides **682** car parking spaces, including the parking along the New Link Road, resulting in a surplus of **53** car parking spaces over the expected peak parking demand.

It is evident from the above, that the peak parking demand periods of the various uses of the site do not directly overlap, such that a reduction in parking based upon the peak operating periods of the site can be supported. Not only this, but there is also potential to further reduce the car parking demand of the site from Council's DCP parking requirements.

As noted previously, Council's DCP parking rates are generally applicable to standalone developments and do not consider cross utilisation of car parking between similar uses. To consider this, the parking required by the proposed development will be assessed against the *RTA Guide to Traffic Generating Developments 2002* which considers parking demand for shopping centres based upon various retail categories.

3.2 TfNSW Parking Requirement

Due to the large nature of the proposed mixed-use development, reference is made to the *RTA Guide to Traffic Generating Developments 2002* and more recent supplements as adopted by TfNSW, which contains car parking rates based upon surveys undertaken of similar sized developments and takes into consideration the cross utilisation of car parking between various land uses within shopping centres. The applicable shopping centre car parking model is extracted below:

> ***5.7.1 Shopping centres.***
>
> *Peak Parking = 24 A(S) + 40 A(F) + 42 A(SM) + 45 A(SS) + 9 A(OM)*
>
> *Demand (per 1,000m2).*
>
> *where:*
>
> *A(S): Slow Trade GLFA, includes major Department stores such as David Jones and Grace Brothers, furniture, electrical and utility goods stores.*
>
> *A(F): Faster Trade GLFA, includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.*
>
> *A(SM): Supermarket GLFA, includes stores such as Franklins and large fruit markets.*
>
> *A(SS): Speciality Shops and Secondary retail GLFA, includes speciality shops and take-away stores such as McDonalds. These stores are grouped since they tend not be primary attractors to the centre.*
>
> *A(OM): Offices, medical GLFA.*
>
> ***5.9.2 Gymnasiums.***
>
> *Metropolitan sub-regional areas.*
>
> *minimum provision: 4.5 spaces per 100m^2 GFA.*
>
> *Desirable provision: 7.5 spaces per 100m^2 GFA.*
>
> ***5.12.3 Child care centres***
>
> *One space for every four children in attendance*

Further, it is noted that the TfNSW Guide does not provide car parking rates for tavern developments and as such, the appropriate DCP rates have been applied. Similarly, neither Council's DCP nor the TfNSW Guide provide car parking rates for swim school developments. As such, a first principles assessment of the parking demands has been conducted, assuming a rate of two (2) car parking spaces per child on-site at any one time.

This accounts for the crossover of consecutive classes (i.e. two class are on-site at any one time).

Table 5 presents the parking requirements of the proposal according to applicable car parking rates as extracted from the TfNSW Guide.

TABLE 5: TFNSW / DCP PARKING RATES

Land Use	Document	Type	Scale	Rate	Spaces Required
Supermarket	TfNSW	A(SM)	3,500m^2 GLFA	4.2 per 100m^2 GLFA	147
Liquor	TfNSW	A(SM)	185m^2 GLFA	4.2 per 100m^2 GLFA	7.8
Major Retail	TfNSW	A(F)	1,500m^2 GLFA	4.0 per 100m^2 GLFA	60
Shops	TfNSW	A(SS)	3,695m^2 GLFA	4.5 per 100m^2 GLFA	166.3
Tavern	DCP	-	890m^2 GFA	1 per 10m^2 LFA	89
Medical Centre	TfNSW	A(OM)	745m^2 GLFA	0.9 per 100m^2 GFA	6.7
Food and Drink Premises	TfNSW	A(SS)	160m^2 GLFA	4.5 per 100m^2 GLFA	7.2
Child Care Centre	DCP / TFNSW	-	112 children	1 per 4 children	28
Gymnasium	TfNSW	-	800m^2 GFA	7.5 per 100m^2 GFA	60
Swim School	First Principles	-	1,040m^2 GFA 20 children	2 per child	40
Car Wash	TfNSW	A(OM)	475m^2 GLFA	0.9 per 100m^2 GFA	4.3
TOTAL	**-**	**-**	**-**	**-**	**616.3 (617)**

As shown, strict application of the TfNSW Guide requires the provision of **617** car parking spaces. The proposed plans detail the provision of **682** car parking spaces including the parking along the New Link Road, resulting in a numerical surplus of **65** parking spaces.

Similar to **Section 3.1**, the above parking requirements do not consider the different peak parking demands of the various land uses. The methodology for the parking profile as outlined in **Section 3.1** has been reproduced using the parking requirements shown in

Table 5 above, with the results shown in **Figure 11** & **Figure 12**

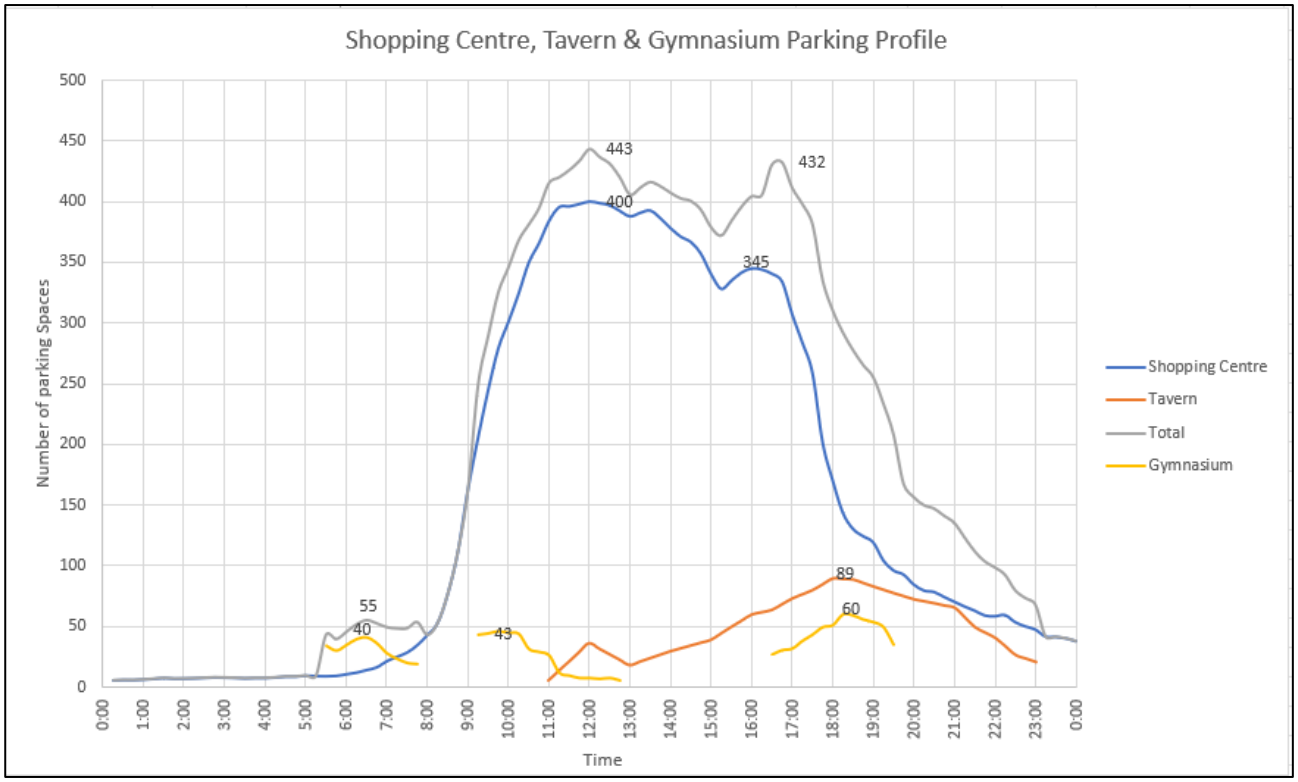


FIGURE 11: WEEKDAY PARKING PROFILE – TFNSW DATA

As shown above, the shopping centre, tavern and gymnasium portion of the development is expected to demand **443** car parking spaces during weekdays, although this does not consider the parking demand generated by the swim school or child care centre. Including the parking demand of the swim school and child care centre results in a total anticipated parking demand of **511** (443 + 28 + 40). A further reduction could be applied as the peak parking demand occurs at 12pm, when parents are not at the child care centre. Hence, a further reduction of 14 spaces (half of 28, being staff vehicles) can be applied, resulting in the parking demand of **497** car parking spaces. The proposed development provides **682** car parking spaces including the parking along the New Link Road, resulting in a surplus of **185** car parking spaces, meeting the anticipated parking demand of the site on weekdays.

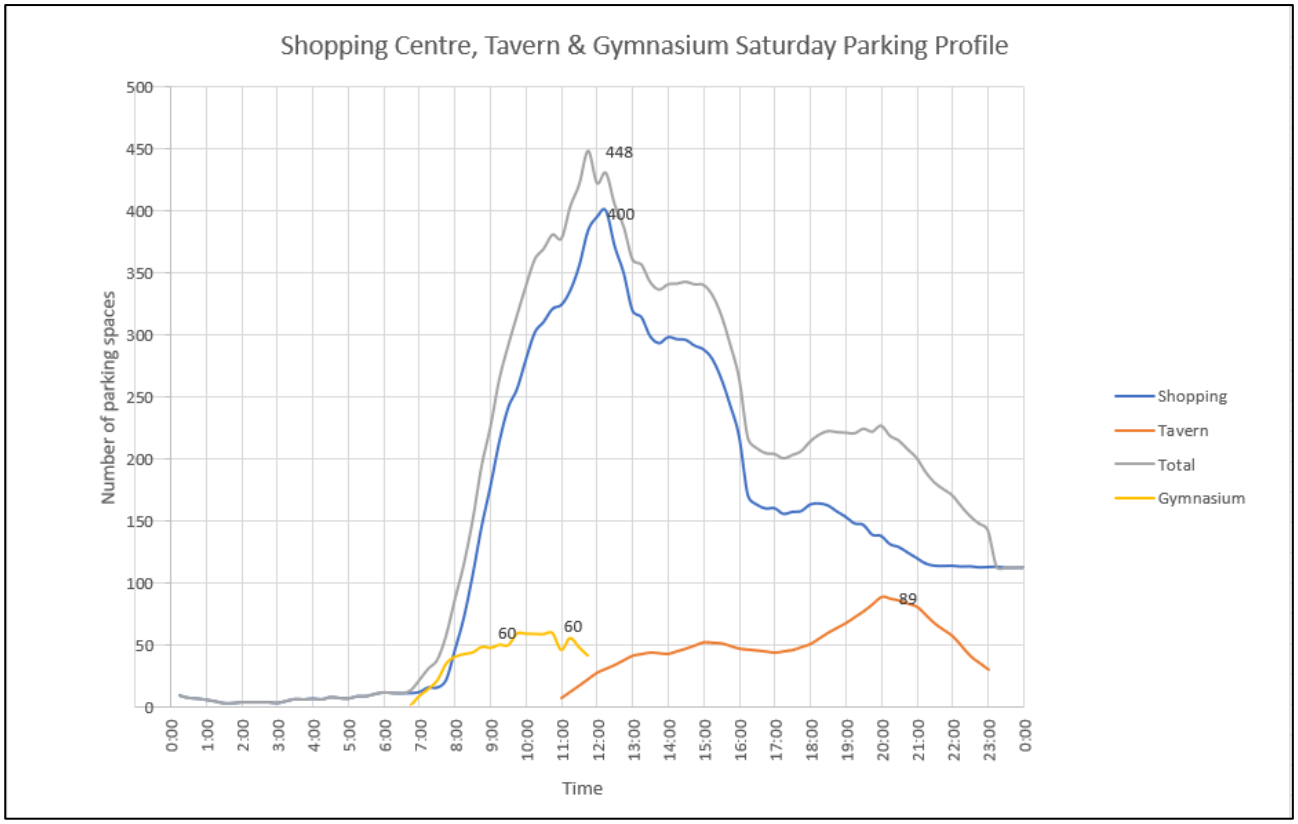


FIGURE 12: WEEKEND PARKING PROFILE – TFNSW DATA

As shown above, the shopping centre, tavern and gymnasium portion of the development is expected to demand **448** car parking space on weekends, although this does not consider the parking generated by the swim school if it operates on weekends. Including the parking demand associated with the swim school, the proposed development will result in an anticipated parking demand of **488** (448 + 40) car parking spaces. The proposed development provides **682** car parking spaces, including the parking along the New Link Road, resulting in a surplus of **194** car parking spaces.

In view of the above, the provision of **661** on-site car parking spaces in addition to the **21** on-street spaces provided along the New Link Road exceeds the anticipated parking demand of the proposed development.

3.3 Disabled Parking

The Maitland Council DCP (Part C – Design Guidelines) makes reference to the Building Code of Australia (BCA) for the provision of disabled car parking, in addition to adopting an enhanced disabled car parking provision for particular land uses. The council requires the following provision of disabled car parking spaces for large retail complexes:

> ***Large Retail complexes > 100 spaces***
>
> *Three spaces per one hundred car parking spaces*

Reference is made to *Table D3.5* of the *Building Code of Australia* (BCA) as part of the *National Construction Code 2019* (NCC) which categorises the proposed uses as a building class with an associated disabled car parking rate as extracted below:

> ***Class 5** – 1 space for every 100 carparking spaces or part thereof.*
>
> *Uses: Medical Centre*
>
> ***Class 6** – 1 space for every 50 carparking spaces or part thereof.*
>
> *Uses: Supermarket, Retail Premises, Tavern, Fast Food Premises, Gymnasium, Swim School*
>
> ***Class 9b** – 1 space for every 100 carparking spaces or part thereof.*
>
> *Uses: Child Care Centre*

The Class 6 disabled car parking rate of one (1) disabled space per 50 car parking spaces has been applied to the whole development, which therefore requires the provision of **14** (661/50) disabled car parking spaces.

The proposed car parking layout details the provision of **14** disabled car parking spaces as per with *AS2890.6:2009*, complying with BCA requirements. Consideration should be made to relocating one (1) disabled car parking space to be near the entrance of the gymnasium and child care centre.

3.4 Bicycle & Motorcycle Parking Requirements

The Maitland Council DCP 2011 states the following with respect to the provision of bicycle facilities:

> *Provision is to be made for cyclists via the installation of bicycle parking facilities in accordance with Australian Standard AS 2890.3:1993 – Bicycle Parking Facilities and AUSTROADS Guide to Traffic Engineering, Part 14.*

AS2890.3:1993 does not outline any provision of bicycle facilities for developments, as such reference is made to *AUSTROADS Guide to Traffic Engineering Practice – Part 14* which outlines the following bicycle provision:

Swimming Pool

Visitors – 2 per 20m^2 of pool area

Hotel

Staff – 1 per 25m^2 bar floor area & 1 per 100m^2 lounge area

Visitor – 1 per 25m^2 bar floor area & 1 per 100m^2 lounge area

Consulting Rooms

Staff – 1 per 8 practitioners

Visitor – 1 per 4 practitioners

Drive-In Shopping Centre

Staff – 1 per 300m^2 sales floor

Visitor – 1 per 500m^2 sales floor

Take-away

Staff - 1 per 100m^2 GFA

Visitor – 1 per 50m^2 GFA

Shop

Staff – 1 per 300m^2 sales floor

Visitor – 1 per 500m^2 sales floor over 1,000m^2

Based upon the above, the recommended bicycle provision based upon *AUSTROADS Guide to Traffic Engineering Practice – Part 14* is shown in **Table 6** below. It should be noted that the assessment has been undertaken based upon GLFA.

TABLE 6: AUSTROADS BICYCLE PARKING REQUIREMENTS

Land Use	Scale	Rate	Spaces Required
Supermarket	3,500m^2 GLFA	Staff – 1 per 300m^2 sales floor	11.7
		Visitor – 1 per 500m^2 sales floor	7
Liquor	185m^2 GLFA	Staff – 1 per 300m^2 sales floor	0.6
		Visitor – 1 per 500m^2 sales floor	0.4
Major Retail	1,500m^2 GLFA	Staff – 1 per 300m^2 sales floor	5
		Visitor – 1 per 500m^2 sales floor	3
Shops	3,695m^2 GLFA	Staff – 1 per 300m^2 sales floor	12.3
		Visitor – 1 per 500m^2 sales floor over 1,000m^2	5.4
Tavern	890m^2 GFA	Staff – 1 per 25m^2 bar floor area & 1 per 100m^2 lounge area	8.9
		Visitor – 1 per 25m^2 bar floor area & 1 per 100m^2 lounge area	8.9
Medical Centre(1)	745m^2 GLFA	Staff – 1 per 8 practitioners	1
		Visitor – 1 per 4 practitioners	2
Food and Drink Premises	160m^2 GLFA	Staff – 1 per 300m^2 sales floor	0.5
		Visitor – 1 per 500m^2 sales floor over 1,000m^2	0
Child Care Centre	112 children	N/A	N/A
Gymnasium	8,00m^2 GFA	N/A	N/A
Swim School	1,040m^2 GFA 115m^2 pool	Visitors – 2 per 20m^2 of pool area	11.5
Car Wash	475m^2 GLFA	N/A	N/A
TOTAL	**-**	**Staff**	**40**
		Visitor	**38**

Note: 1 – assumed 8 practitioners

As shown above, the proposed development requires the provision of **78** bicycle spaces, split 40 staff and 38 visitors. It is recommended that bicycle parking be provided throughout the development. There is sufficient room on-site to provide these facilities and it can be a condition of consent.

Council's DCP does not require the provision of motorcycle parking. No motorcycle has been provided, satisfying Council requirements.

3.5 Servicing & Loading

The Maitland City Council DCP Part C – Section 4 does not outline the provision of loading facilities for the proposed development, but states that the number and dimensions of the on-site loading bays must be designed having regard to the nature and scale of the proposed development.

Considering the above, it is expected that a variety of loading facilities will be required for the proposed development considering the various proposed uses and number of tenancies proposed. The largest servicing vehicle expected to travel to and from the site is a 20m length Articulated Vehicle. In addition to this it is expected that smaller loading facilities will be required to service the development, including the following vehicles:

- B99 delivery Van;
- 6.4m length Small Rigid Vehicle;
- 8.8m length Medium Rigid Vehicle;
- 12.5m length Heavy Rigid Vehicle.

It is expected that deliveries to and from the site will be undertaken from the loading dock, via the New Link Road for the shopping centre. Smaller delivery vehicles, such as B99 delivery vans may undertake loading from the on-site car park for the child care centre, swim school and gymnasium. Typically swim schools and gymnasiums do not require ongoing loading facilities after the initial fit out, whilst child care centres typically operate with deliveries conducted by B99 delivery vans.

The capacity of the loading dock from the New Link Road can accommodate parking for three (3) x 20m length Articulated Vehicle spaces (two on the western side and one on the eastern side).

To ensure the loading dock is managed by on-site tenants, it is recommended that a loading dock management plan be prepared as part of the conditions of consent. Swept path testing has been undertaken into and out of all the critical loading spaces and is reproduced in **Annexure D** for reference.

The haulage route to and from the loading dock will consist of entry via Heritage Drive or Settlers Boulevard via the New Link Road and egress onto Settlers Boulevard and undertaking a U-turn at the roundabout intersection of Tigerhawk Drive / Settlers Boulevard. Swept path testing has been undertaken for the haulage route and is reproduced in **Annexure D** for reference.

3.6 Car Park Design & Compliance

The car parking layout of the mixed-use development as depicted in **Annexure A,** has been assessed to achieve the relevant clauses and objectives of *AS2890.1:2004*, *AS2890.2:2002* and *AS2890.6:2009*. Swept path testing has been undertaken and are reproduced within **Annexure D** for reference. The design of the on-site conditions achieves the following:

The proposed car parking and vehicular access design achieves the following:

- Separated entry and exit driveways, with minimum widths of 3.6m, facilitating access to Settlers Boulevard:
    - Restricted to left in / left out.
- 6.4m width exit driveway and 4.4m width entry driveway facilitating access to / from Heritage Drive:
- 5.7m entry only driveway from Tigerhawk Drive;
- 18.6m width two-way driveway facilitating access to the New Link Road;
- Pedestrian sight triangle of 2m by 2.5m at the property boundary at all relevant driveways;
- Minimum 6.6m width parking aisles with 2.6m wide visitor spaces (User Class 3A);
- Compliant ramp grades not exceeding 20% and no grade change greater than 12.5%;
- Minimum 5.4m length, 2.6m width spaces for parents / visitors;
- Minimum 5.4m length, 2.4m width disabled spaces with adjacent associated 5.4m length, 2.4m width shared space;
- Minimum 0.3m clearance to high objects from trafficable areas;
- Minimum headroom of 2.2m for general circulation and 2.5m headroom clearance provided over disabled and adaptable parking areas.

Whilst the plans have been assessed to comply with the relevant standards, it is usual and expected that a design certificate be required at the Construction Certificate stage to account for any changes following the development application.

3.7 Subdivision Design & Compliance

Reference is made to *Maitland City Council Engineering Standards – Road Design* and *Maitland Council Development Control Plan 2011 Part C – Design Guideline* which provides the following design requirements for subdivisions as shown in **Figure 13** & **Figure 14** below:

Road Type	Max. No. Lots	ReserveWidth (m)	Carriageway or kerb –kerb (m)
Access Place	10	17	8
Local - Minor	20	17	8
Local - Secondary	50	17	8
Local - Primary	100	17	8
Collector	200	17	8
Distributor - Secondary	400	20	11
Distributor - Primary	800	22	11
Arterial or Sub-Arterial	> 800	24	13
Rural Residential (1c)	per above	20	7.5
Rural Residential (1d)	per above	20	per categories above
Rural – Minor	50	20	8
Industrial	10	20	11
Industrial	> 10	22	13

FIGURE 13: MAITLAND COUNCIL DCP PART C

ROAD TYPE	MAX NO. LOTS	RESERVE WIDTH (m) [a]	CARRIAGEWAY / KERB–KERB (m) [b]	ON-ROAD BICYCLE FACILITY	FOOTWAY VERGE (m) [c]	KERB [d]	FOOTPATH (1.5m WIDE) [e]	DESIGN ESA [f]
Local – Place [l]	10	17	8	Mixed	4.5	Rolled	As Required	1×10^5
Local – Access [l]	20	17	8	Mixed	4.5	Rolled	One side	1×10^5
Local – Secondary [l]	50	17	8	Mixed	4.5	Rolled	One side	2×10^5
Local - Primary [l]	100	17	8	Mixed	4.5	Rolled	One side	5×10^5
Collector - Secondary [l]	200	17	8	Mixed (Parking)	4.5	Upright	One side	1×10^6
Collector - Primary [lv]	300	20	11	Mixed (Parking) [p]	4.5	Upright	One side	1.5×10^6
Distributor –Secondary [v]	400	23	14	Mixed (Parking) [p]	4.5	Upright	Both sides	2×10^6
Distributor - Primary [m v]	500	24	15 [q]	1.5m Lane	4.5	Upright	Both sides	5×10^6
Sub-Arterial [n]	3500	24.4	15.4 [r]	1.7m Lane [s]	4.5	Upright	Both sides	1×10^7 min
Industrial - Secondary	10 [g]	22	13	Mixed	4.5	Upright	As Required	5×10^6
Industrial - Primary	> 10	22	13	Mixed	4.5	Upright	As Required	1×10^7
School Bus/Public Route [o]			9min / 12min					$2/5 \times 10^6$ min
Business / School Precinct			15.4	1.7m Lane	5.5 min [h]	Upright		1×10^7 min

FIGURE 14: MAITLAND CITY COUNCIL ENGINEERING STANDARDS – ROAD DESIGN

As shown above, residential subdivisions local roads require a road reserve of 17m. The New Link Road providing access between Settlers Boulevard and Heritage Drive is not outlined within Council's Road hierarchy, but would operate similar to a low scale industrial road as a result of the proposed loading dock for the shopping centre. As such, the minimum design for an industrial road is a 20m to 22m road reserve.

Council's pre-DA comments for the subject development dated 12 August 2021 provided a recommendation to match the existing stub road near Heritage Drive, being a 4.5m wide verge, 12m wide carriageway and a 5.5m verge, resulting in a road reserve of 22m.

The proposed plans detail the New Link road with a 22m wide road reserve, designed in accordance with Council's pre-DA comments.

3.8 Pedestrian & Cycleway Considerations

Reference is made to *Section 7 of the Maitland Council Development Control Plan (MDCP) Part F – Urban Release Areas – Chisholm Neighbour Centre*, which outlines the objective of the development is to provide pedestrian and cycle routes that connect the neighbourhood centre to the surrounding residential neighbourhood and local features such as the primary school; open spaces and community uses.

Figure 8 outlines the Council indicative cycleway links from the centre to the surrounding residential areas and community facilities. Tigerhawk Drive and Settlers Boulevard along the site frontage provides existing on-road and off road cycling facilities, whilst Heritage Drive provides an existing off-road shared path.

The New Link Road based upon Council's Road Design (**Figure 14**) outlines the provision of a mixed on-road bicycles facilities. Hence, no dedicated on-road bicycle lanes are required along the New Link Road. Consideration should be made to continuing the shared path along the New Link Road on both sides of the road between Heritage Drive and Settlers Boulevard. Based upon the above the development achieves the objectives of Council's DCP by providing connectivity to the greater bicycle network.

The area of influence for the proposed development for pedestrian connectivity relates to the ability for the centre to provide safe pedestrian access to and from the site from the surrounding road network, particularly along the site frontages. Council requires the following with respect to pedestrian / cycle refuges:

> *The intersection of Tigerhawk and Heritage Drives shall be upgraded to cater for pedestrian safety, bus and heavy vehicles and traffic movements. Traffic lights are envisaged for this intersection*
>
> *Pedestrian/cycle refuges, or greater, shall be provided on public roads including a central connection across Heritage Drive to the Riparian Corridor.*

Existing pedestrian facilities within close proximity to the site are outlined below:

- Tigerhawk Drive is provided with an existing signalised pedestrian crossing which provides direct pedestrian connectivity to the north;
- The roundabout intersection of Heritage Drive / Duskdarter Street / Settlers Boulevard provides pedestrian refuge facilities on the approach to all legs;

- The roundabout intersection of Tigerhawk Drive / Settlers Boulevard provides pedestrian refuge facilities on the approach to all legs.

Based upon the existing facilities, the proposed development has existing pedestrian connectivity directly to the north, east and south of the site. There are currently no existing pedestrian facilities that enables access to the west, across Heritage Drive. As part of this report investigation will be made into pedestrian infrastructure across Heritage Drive and also if the intersection of Heritage Drive / Tigerhawk Drive is required to be upgraded to a signalised intersection which is envisaged by Council for this intersection. It is relevant to note that the upgrade of Heritage Drive / Tigerhawk Drive is not part of the Section 94 Contributions as outlined in **Figure 5**. The detailed assessment is outlined in **Section 4.4**.

3.9 Provision of bus & Taxi facilities

Reference is made to *Section 7* of the *Maitland Council Development Control Plan (MDCP) Part F – Urban Release Areas – Chisholm Neighbour Centre* which outlines the following for bus and taxi facilities:

> *There are no specific requirements as provision of public facilities and services is already controlled by other provisions in the Maitland Local Environmental Plan 2011 and the Maitland Development Control Plan 2011.*

Notwithstanding the above, Council's DCP outlines locations of bus setdown facilities as part of the principle Plan for the shopping centre. The council plan is shown in **Figure 15** below.

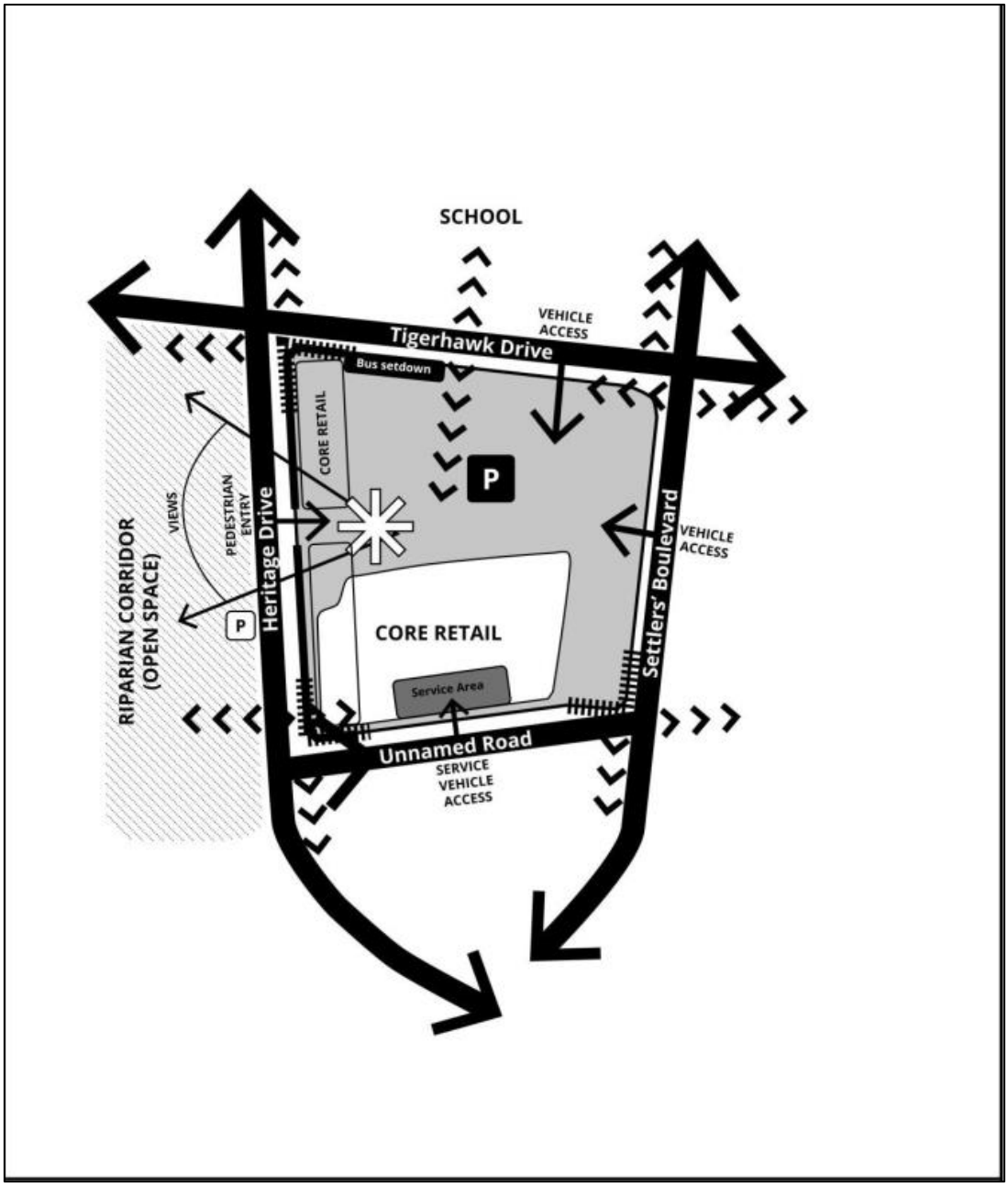


FIGURE 15: MAITLAND COUNCIL DCP – CHISHOLM CENTRE PRINCIPLE PLAN

As part of the proposed development considering the above, it is anticipated that bus and taxi facilities will be provided along Tigerhawk Drive fronting the proposed development site. Any bus and taxi facilities should be located after the proposed entry only driveway from Tigerhawk Drive. It is expected that public bus and taxi facilities will also utilise the school frontage for drop-off and pick-up outside of school hours and on weekends.

4 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

4.1 Traffic Generation

Traffic generation rates for the relevant land uses are provided in the *RTA Guide to Traffic Generating Developments (2002)* as adopted by Transport for New South Wales (TfNSW) and recent supplements and are as follows:

3.6.1 Shopping centres.

Thursday:
V(P) = 20 A(S) + 51 A(F) + 155 A(SM) + 46 A(SS) + 22 A(OM)

Friday:
V(P)= 11 A(S) + 23 A(F) + 138 A(SM) + 56 A(SS) + 5 A(OM)

Saturday:
PVT= 38 A(S) + 13 A(F) + 147 A(SM) + 107 A(SS)

(vehicle trips per 1000m2)

where:

A(S): Slow Trade GLFA, includes major Department stores such as David Jones and Grace Brothers, furniture, electrical and utility goods stores.

A(F): Faster Trade GLFA, includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.

A(SM): Supermarket GLFA, includes stores such as Franklins and large fruit markets.

A(SS): Speciality Shops and Secondary retail GLFA, includes speciality shops and take-away stores such as McDonalds. These stores are grouped since they tend not be primary attractors to the centre.

A(OM): Offices, medical GLFA.

3.7.3 Clubs.

evening peak period traffic generation of 10 veh/hr/100 m2 licensed floor area

3.8.2 Gymnasiums.

Metropolitan Sub Regional Areas.

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

3.11.3 Child care centres

Long-day care

7.00-9.00am	*0.8 peak vehicle trips per child*
4.00-6.00pm	*0.7 peak vehicle trips per child*

It is noted that that the TfNSW Guide does not provide traffic generation rates for swim school developments and as such, a first principles assessment has been conducted. This is based on a traffic generation rate of two (2) trips per child on-site at any one time (i.e. one trip inbound and one trip outbound within a single hour) based upon the occurrence of one swimming lesson per hour.

Further, it is assumed that the shopping centre exhibits a traffic generation in the AM peak hour period of 50% of the PM peak hour (consistent with **Figure 11**) and the tavern is closed during the AM peak hour period. The traffic generation of the gymnasium in the AM peak hour period will be 70% (6.3 trips per 100m^2 GFA) of the PM peak hour traffic generation, which is based upon the **Figure 11**.

To consider shared vehicle trips between the shopping centre, gymnasium, child care centre and swim school, a conservative 10% discount will be applied to the gymnasium, child care centre and swim school traffic generation to account for multi-purpose trips which are not included within the shopping centre model.

The resulting traffic generation in the weekday AM and PM peak hour period and midday weekend peak hour period is summarised **Table 7**, **Table 8** and **Table 9**.

TABLE 7: ESTIMATED WEEKDAY PM PEAK HOUR TRAFFIC GENERATION OF SHOPPING CENTRE

Land Use	Scale	Rate	Vehicle Trips	Directional Split(1)
PM Peak Hour Period				
Supermarket	3,500m^2 GLFA	155 A(SM) per 1000m^2	543	271 in, 272 out
Liquor	185m^2 GLFA	155 A(SM) per 1000m^2	29	14 in, 15 out
Major Retail	1,500m^2 GLFA	51 A(F) per 1000m^2	77	38 in, 39 out
Shops	3,695m^2 GLFA	46 A(SS) per 1000m^2	170	85 in, 85 out
Tavern	890m^2 GFA	10 per 100m^2 LFA	89	45 in, 44 out
Medical Centre	745m^2 GLFA	22 A(OM) per 1000m^2	16	8 in, 8 out
Food and Drink Premises	160m^2 GLFA	46 A(SS) per 1000m^2	7	3 in, 4 out
Child Care Centre(2)	112 children	0.7 trips per child	78	39 in, 39 out
Gymnasium(2)	800m^2 GFA	9 per 100m^2 GFA	65	32 in, 33 out
Swim School(2)	1,040m^2 GLFA 20 children	2 trips per child	36	18 in, 18 out
Car Wash	475m^2 GLFA	22 A(OM) per 1000m^2	11	5 in, 6 out
TOTAL	**-**	**-**	**1,121**	**558 in, 563 out**

Note: 1 – Directional split is 50% inbound and 50% outbound

2 – 10% discount due to shared vehicle trips

TABLE 8: ESTIMATED WEEKDAY AM PEAK HOUR TRAFFIC GENERATION OF SHOPPING CENTRE

Land Use	Scale	Rate	Vehicle Trips	Directional Split(1)
AM Peak Hour Period				
Supermarket	3,500m^2 GLFA	77.5 A(SM) per 1000m^2	272	136 in, 136 out
Liquor	185m^2 GLFA	77.5 A(SM) per 1000m^2	14	7 in, 7 out
Major Retail	1,500m^2 GLFA	25.5 A(F) per 1000m^2	39	20 in, 19 out
Shops	3,695m^2 GLFA	23 A(SS) per 1000m^2	85	43 in, 42 out
Tavern	890m^2 GFA	Closed	0	0 in, 0 out
Medical Centre	745m^2 GLFA	11 A(OM) per 1000m^2	8	4 in, 4 out
Food and Drink Premises	160m^2 GLFA	23 A(SS) per 1000m^2	4	2 in, 2 out
Child Care Centre(2)	112 children	0.8 trips per child	90	45 in, 45 out
Gymnasium(2)	800m^2 GFA	6.3 per 100m^2 GFA	45	23 in, 22 out
Swim School(2)	1,040m^2 GLFA 20 children	2 trips per child	36	18 in, 18 out
Car Wash	475m^2 GLFA	11 A(OM) per 1000m^2	5	3 in, 2 out
TOTAL	**-**	**-**	**598**	**301 in, 297 out**

Note: 1 – Directional split is 50% inbound and 50% outbound

2 – 10% discount due to shared vehicle trips

TABLE 9: ESTIMATED WEEKEND MIDDAY PEAK HOUR TRAFFIC GENERATION OF SHOPPING CENTRE

Land Use	Scale	Rate	Vehicle Trips	Directional Split(1)
Weekend Midday Peak Hour Period				
Supermarket	3,500m^2 GLFA	147 A(SM) per 1000m^2	514	257 in, 257 out
Liquor	185m^2 GLFA	147 A(SM) per 1000m^2	27	14 in, 13 out
Major Retail	1,500m^2 GLFA	13 A(F) per 1000m^2	20	10 in, 10 out
Shops	3,695m^2 GLFA	107 A(SS) per 1000m^2	396	198 in, 198 out
Tavern	890m^2 GFA	10 per 100m^2 LFA	89	45 in, 44 out
Medical Centre	745m^2 GLFA	2 per 100m^2 GFA(2)	15	8 in, 7 out
Food and Drink Premises	160m^2 GLFA	107 A(SS) per 1000m^2	17	9 in, 8 out
Child Care Centre(3)	112 children	N/A	N/A	0 in, 0 out
Gymnasium(3)	800m^2 GFA	9 per 100m^2 GFA	65	33 in, 32 out
Swim School(3)	1,040m^2 GLFA 20 children	2 trips per child	36	18 in, 18 out
Car Wash	475m^2 GLFA	2 per 100m^2	10	5 in, 5 out
TOTAL	**-**	**-**	**1,189**	**597 in, 592 out**

Note: 1 – Directional split is 50% inbound and 50% outbound

2 – Based upon an office rate within the TfNSW Guide

3 – 10% discount due to shared vehicle trips

As shown above, the proposed development is anticipated to generate 598, 1,121 and 1,189 two-way vehicle trips during the AM (301, 297 out), PM (558 in, 563 out) and midday weekday (597 in, 592 out) respectively.

Furthermore, shopping centres typically have a degree of linked trips which can potentially reduce the overall trip generation of the development. A linked trip is a trip taken as a side-track from another trip. For example, a resident travelling to the centre on the way home from work. The *RTA Guide to Traffic Generating Developments 2002* suggests an average of 20%, although no discount will be applied as a result of linked trips. This is a direct result of the adoption of the residential traffic generation rate as shown in **Table 2**, which does not consider internal trips to the subdivision, such as those trips made to local shopping centres. As such, no discount as a result of linked trips will be made to the estimated traffic generation as outlined in **Table 7**, **Table 8** and **Table 9**

4.2 Traffic Assignment

Reference is made to the *Chisholm Plaza Economic Impact Assessment* dated November 2021, prepared by *Ethos Urban* which outlines that there will be four areas catchment areas as shown in **Figure 16**.

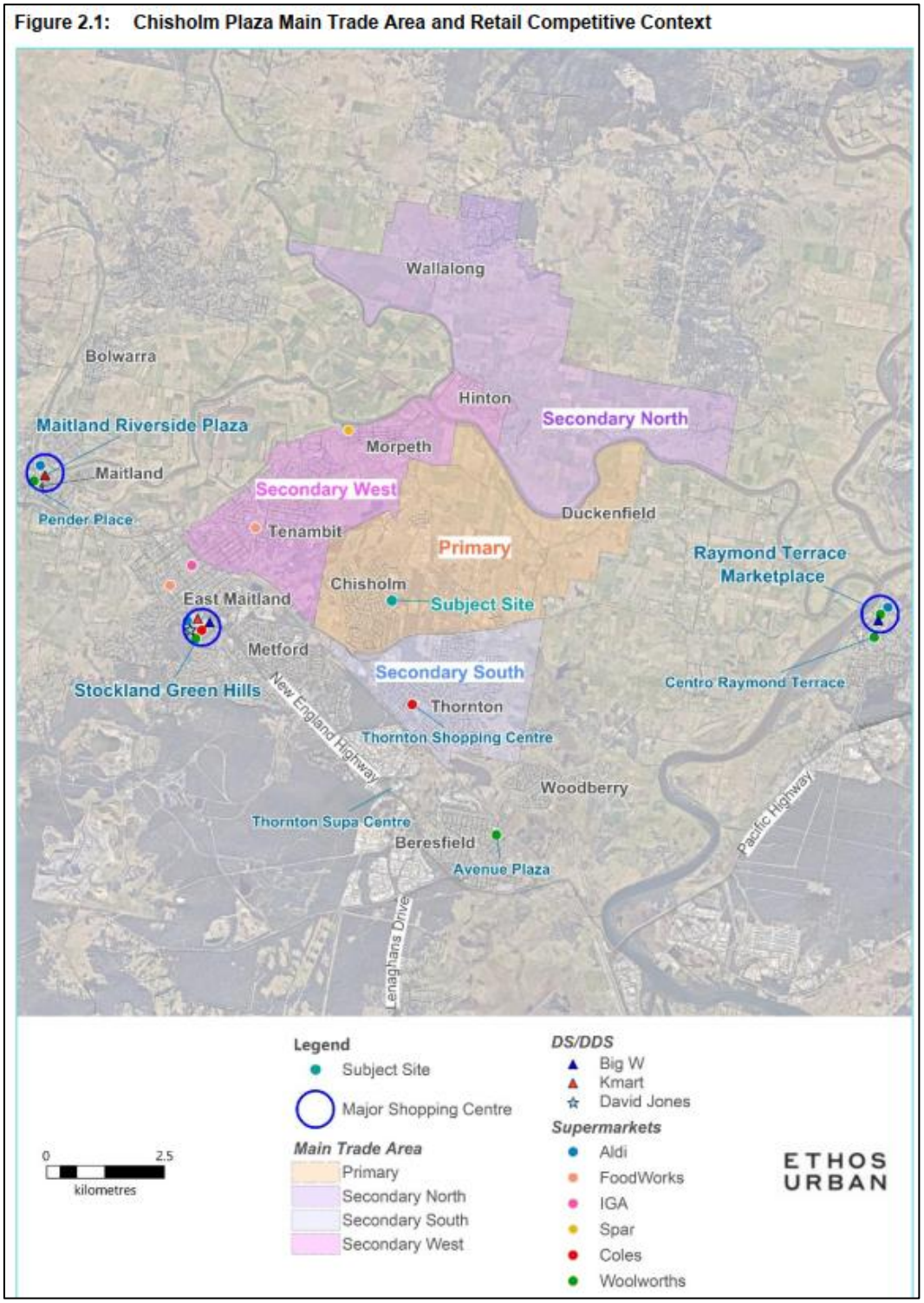


FIGURE 16: FIGURE 2.1 OF *CHISHOLM PLAZA ECONOMIC IMPACT ASSESSMENT* DATED NOVEMBER 2021, PREPARED BY *ETHOS URBAN*

Considering the anticipated population density of the four (4) areas shown in **Figure 16** above and the proximity of the areas to alternative shopping areas, the following trip distribution has been assumed:

- 75% to and from the primary trade area being the Thornton North Urban Release Area:
    - 25% from Precinct 6 (**Figure 7**), with a 50/50 split travelling to and from the site via Raymond Terrace Road and the local subdivision connection
    - 25% from Precinct 5 (**Figure 7**), with a 75/25 split travelling to and from the site from the north and south respectively.
    - 25% from Precinct 1 & 4 (**Figure 7**), with 100% travelling via Grasshawk Drive and onto Heritage Drive or Tigerhawk Drive.
- 25% to and from the site from Thornton (Secondary south) and Tenambit (secondary west):
    - Thornton:
        - 50% to / from the site via Government Road;
        - 50% to and from the site via Haussman Drive.
    - Tenambit:
        - 100% to and from the site via Raymond Terrace Road.

A high-level distribution of traffic to the site is shown in **Figure 17**, with outbound traffic being the same but in reverse direction.

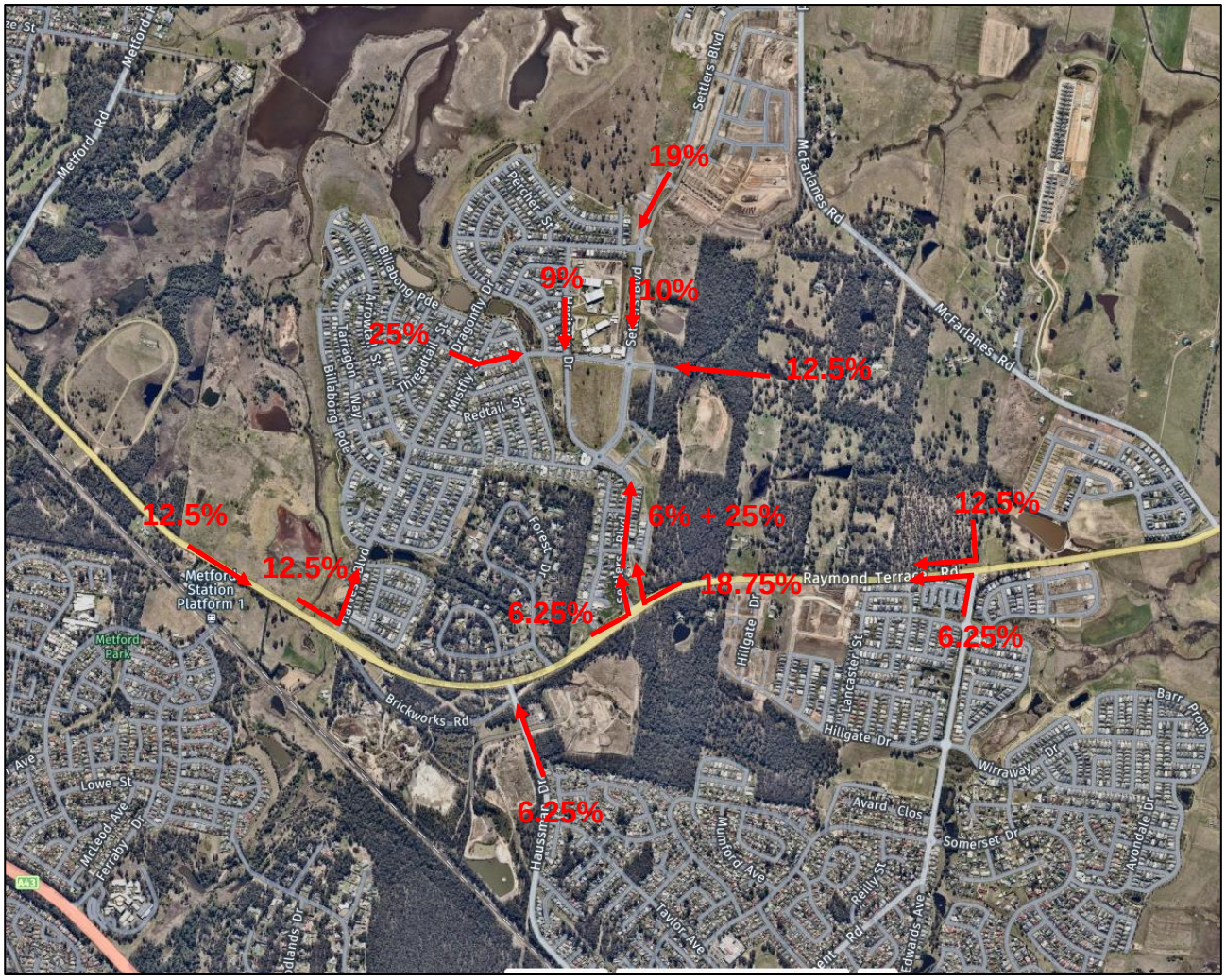


FIGURE 17: ADOPTED INBOUND TRIP DISTRIBUTION

Based upon the above, the following distribution of traffic into and out of the site will occur:

- 22.5% of traffic entering the site via the Tigerhawk Drive access and departing the site via Settlers Boulevard;
- 31% of traffic entering the site via Settlers Boulevard and departing the site via Heritage Drive / Settlers Boulevard via a U-turn at the roundabout of Tigerhawk Drive / Settlers Boulevard;
- 46.5% of traffic entering the site via Heritage Drive, with 9% leaving the site via Settlers Boulevard and 37.5% departing the site via Heritage Drive.

4.3 Traffic Impact

The traffic generation outlined in **Section 4.1** & **4.2** above 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 10**, with detailed SIDRA outputs provided in **Annexure C** for reference.

TABLE 10: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
THORNTON NORTH URBAN RELEASE AREA ULTIMATE DEVELOPMENT YIELD						
Settlers Boulevard / Raymond Terrace	AM	0.67	24.1	**B**	Signals	N/A
	PM	0.64	15.1	**B**		N/A
	Weekend	0.43	16.7	**B**		N/A
Harvest Boulevard / Raymond Terrace	AM	0.53	12.3	**A**	Signals	N/A
	PM	0.80	16.2	**B**		N/A
	Weekend	0.50	11.4	**A**		N/A
Settlers Boulevard / Heritage Drive / Duskdarter Street	AM	0.30	5.8 (Worst: 11.1)	**A** (Worst: B)	Roundabout	RT from Settlers Boulevard (E)
	PM	0.29	6.7 (Worst: 11.7)	**A** (Worst: B)		RT from Duskdarter Street (W)
	Weekend	0.15	5.7 (Worst: 10.4)	**A** (Worst: B)		
Heritage Drive / Tigerhawk Drive	AM	0.23	3.9 (Worst: 8.6)	**N/A** (Worst: A)	Priority	RT from Tigerhawk Drive (W)
	PM	0.10	3.8 (Worst: 6.8)	**N/A** (Worst: A)		
	Weekend	0.10	4.2 (Worst: 6.1)	**N/A** (Worst: A)		
Grasshawk Drive / Dragonfly Drive	AM	0.01	2.5 (Worst: 6.6)	**N/A** (Worst: A)	Priority	RT from Grasshawk Drive (E)
	PM	0.06	2.7 (Worst: 6.6)	**N/A** (Worst: A)		
	Weekend	0.05	3.1 (Worst: 6.1)	**N/A** (Worst: A)		
THORNTON NORTH URBAN RELEASE AREA ULTIMATE DEVELOPMENT YIELD + DEVELOPMENT						
Settlers Boulevard / Raymond Terrace	AM	0.73	25.2	**B**	Signals	N/A
	PM	0.75	19.2	**B**		N/A
	Weekend	0.56	20.7	**B**		N/A
Harvest Boulevard / Raymond Terrace	AM	0.53	13.0	**A**	Signals	N/A
	PM	0.82	17.9	**B**		N/A
	Weekend	0.55	13.0	**A**		N/A
Settlers Boulevard / Heritage Drive / Duskdarter Street	AM	0.36	6.3 (Worst: 11.4)	**A** (Worst: B)	Roundabout	RT from Duskdarter Street (W)
	PM	0.39	7.2 (Worst: 13.0)	**A** (Worst: B)		RT from Duskdarter Street (W)
	Weekend	0.26	6.4 (Worst: 11.3)	**A** (Worst: B)		
Heritage Drive / Tigerhawk Drive	AM	0.44	5.3 (Worst: 11.1)	**N/A** (Worst: B)	Priority	RT from Tigerhawk Drive (W)
	PM	0.41	5.7 (Worst: 9.2)	**N/A** (Worst: A)		
	Weekend	0.41	5.7 (Worst: 8.2)	**N/A** (Worst: A)		
Grasshawk Drive / Dragonfly Drive	AM	0.10	4.2 (Worst: 7.6)	**N/A** (Worst: A)	Priority	RT from Grasshawk Drive (E)
	PM	0.22	5.2 (Worst: 9.4)	**N/A** (Worst: A)		
	Weekend	0.20	5.5 (Worst: 8.4)	**N/A** (Worst: A)		

Notes: Refer to **Table 3**

As shown, the assessed signalised intersections operate at a Level of Service “A” and “B” condition, with roundabout intersections and priority controlled intersection operating with a worst turn movement of Level of Service “B” condition. This indicates acceptable delays, with spare capacity. The proposed development is therefore fully supportable on traffic flow efficiency grounds.

4.4 Midblock Assessment & Pedestrian Assessment & Signalised Intersection

As mentioned in **Section 3.8**, an investigation will be made into if Tigerhawk Drive / Hertiage Drive is required to be upgraded to a signalised intersection and if the midblock of Heritage Drive requires the provision of pedestrian facilities to the west of the site.

A summary of the midblock two-way traffic flows surrounding the site are provided in **Table 11** below for each of assessment.

TABLE 11: MIDBLOCK TRAFFIC FLOWS

Site Road Frontage	Location	Direction	Traffic Flow		
			Thursday AM Peak	Thursday PM Peak	Weekend Peak
Heritage Drive	South of Tigerhawk Drive	Northbound	350	379	359
		Southbound	458	417	393
		Two-way	808	796	752
	North of Tigerhawk Drive	Northbound	196	66	51
		Southbound	229	139	80
		Two-way	425	205	131
	South of site driveway	Northbound	241	169	130
		Southbound	367	252	205
		Two-way	608	421	335
Tigerhawk Drive	East of Heritage Drive	Eastbound	92	22	9
		Westbound	65	30	3
		Two-way	157	52	12
	West of Heritage Drive	Eastbound	278	289	323
		Westbound	176	316	312
		Two-way	454	605	635

4.4.1 Tigerhawk Drive / Heritage Drive

Reference is made to *TfNSW Traffic Signal Design: Section 2 – Warrants* which outlines the following with respect to when a signalised intersection should be installed:

a) Traffic Demand

For each of four one-hour periods of an average day:

(i) The major road flow exceeds 600 vehicles / hour in each direction; and

(ii) The minor road flow exceeds 200 vehicles / hour in one direction

b) Continuous Traffic:

For each of four one-hour periods of an average day

(i) The major road flow exceeds 900 vehicles / hour in each direction;

(ii) The minor rod flow exceeds 100 vehicles / hour in one direction; and

c) Pedestrian safety:

For each of four one-hour periods of an average day

(i) The pedestrian flow crossing the major road exceeds 150 persons/hour; and

(ii) The major road flow exceeds 600 vehicles / hour in each direction or, where there is a central median of at least 1.2m wide, 10000 vehicles / hour in each direction

With reference to the above the approach traffic flows of all legs do not exceed 600 vehicles per hour in any one peak hour period at the intersection of Tigerhawk Drive / Heritage Drive. Hence, based upon this, the forecast traffic flows at the intersection of Tigerhawk Drive / Heritage Drive do not warrant an upgrade to a signalised intersection.

4.4.2 Heritage Drive – Midblock Assessment

Reference is made to *Section 4.3.4* of the *RTA Guide to Traffic Generating Developments 2002* which outlines typical threshold limits for consideration to pedestrian safety. A limit of 300 vehicles per hour is required for aged pedestrians to safely cross the average street.

The forecast traffic flow within Heritage Drive is forecast to exceed 300 vehicle trips in a single one hour peak hour period, with a forecast traffic flow in the range of 752 to 800 two-way vehicle trips to the north of the site driveway and a forecast traffic flow of 335 to 608 two-way vehicle trips to the south of the site driveway.

Considering the above, it is recommended that a pedestrian refuge be provided and located within Heritage Drive to safely accommodate pedestrians travelling to and from the site from the west. It is recommended that the refuge be located to the south of the site driveway, due to the lower traffic flows, but also as this provides a direct link to the shopping centre.

5 CONCLUSION

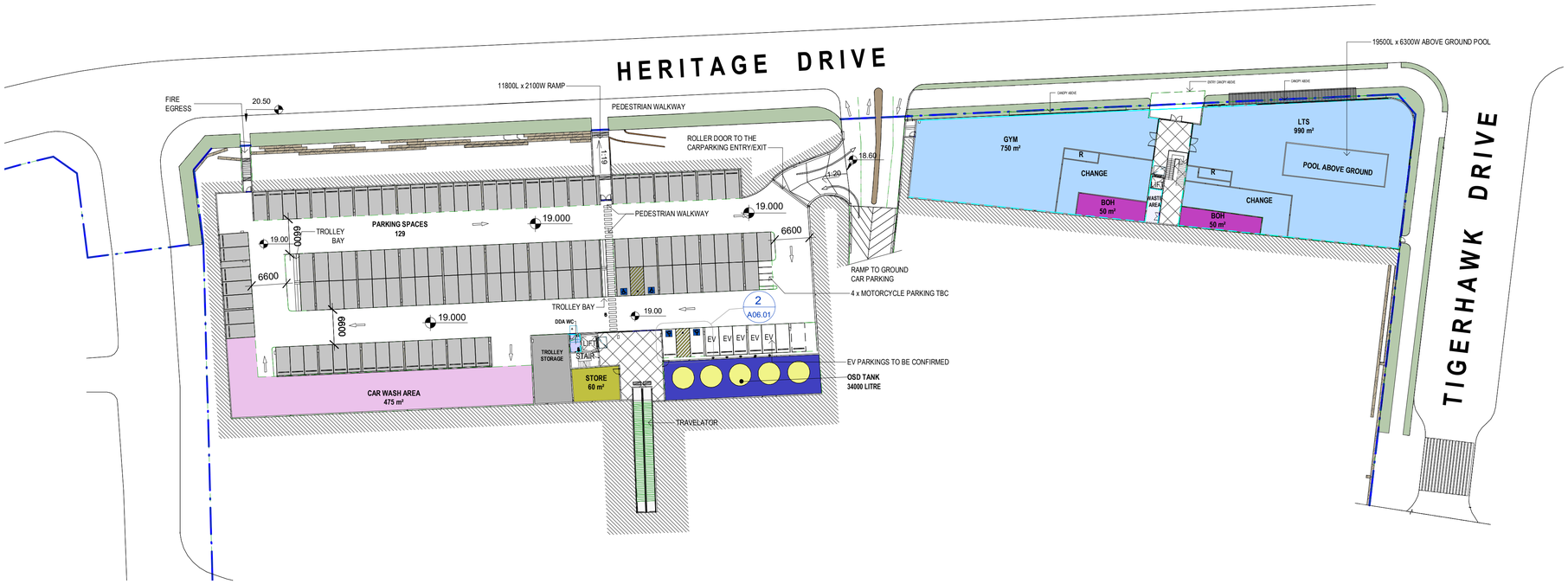
In view of the foregoing, the subject Proposed Shopping Centre proposal at 20 Heritage Drive, Chisholm (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic impact assessment are relevant to note:

- The proposal includes the provision of **661** on-site car parking spaces and an additional **21** car parking spaces located along the New Link Road, which front the site. Council's DCP requires the provision of **763** car parking spaces, resulting in a shortfall of **102** spaces when not considering the parking located on the New Link Road.
- With consideration to parking profiles for gymnasiums, shopping centres and taverns / pubs, the proposed development would operationally demand up to **644** car parking spaces based upon Council's DCP.
- Adopting the TfNSW parking rates for shopping centres and gymnasiums, the proposed development requires the provision of **617** car parking spaces. The proposed development provides **661** on-site car parking spaces resulting in a surplus of **44** car parking spaces**.**
- With consideration to parking profiles for gymnasiums, shopping centres and taverns / pubs, the proposed development would operationally demand **497** car parking spaces based upon TfNSW parking rates.
- In view of the above, the provision of **661** on-site car parking spaces accommodates the anticipated parking demand of the site. The TfNSW parking rates are the more appropriate rates for the subject site, as they consider parking demands associated with multiple land uses (i.e. shopping centres) rather than assessing each component of the site in isolation, which reflects the parking rates within the Council DCP.
- Council's DCP requires the provision of **40** staff and **33** visitor bicycle parking spaces. It is recommended this form part of a condition of consent, as there is sufficient room on-site to provide these end of trip facilities. Council's DCP does not require the provision of motorcycle parking facilities.
- The parking areas of the site have been assessed against the relevant sections of *AS2890.1:2004*, *AS2890.2:2018* and *AS2890.6:2009* and have been found to satisfy the objectives of each standard with any required changes outlined in **Annexure D**, which also shows relevant swept path testing.

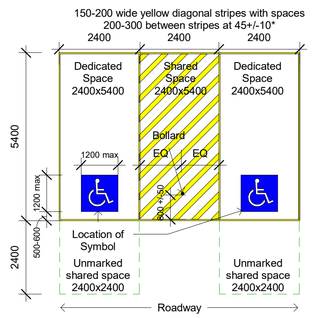
- The traffic generation of the proposed development has been estimated to be some 598, 1,121 and 1,189 two-way vehicle trips during the AM (301, 297 out), PM (558 in, 563 out) and midday weekday (597 in, 592 out) respectively. The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.0, indicating that there will be no detrimental impact to the performance of the assessed intersections as a result of the generated traffic.
- A signalised intersection warrant assessment has been undertaken for the intersection of Heritage Drive / Tigerhawk Drive and indicates that a signalised intersection does not meet the TfNSW warrants.
- To provide pedestrian connectivity to the west of the site and to ensure the safety of pedestrians crossing Heritage Drive, it is recommended that as part of the proposed development a pedestrian refuge be provided to the south of the proposed driveway on Heritage Drive. Discussions should be held with Council as to the preferred location of the refuge.

ANNEXURE A: PROPOSED PLANS
(3 SHEETS)

DEVELOPMENT APPLICATION



1 PROPOSED BASEMENT FLOOR PLAN
1 : 500



2 TYP. ACCESSIBLE PARKING BAY DETAIL
1 : 100

REVELOP

CHISHOLM SHOPPING CENTRE
HERITAGE DRIVE
CHISHOLM, NSW 2322 , AUSTRALIA

ISSUE	DATE	DESCRIPTION
A	03-11-21	FOR REVIEW
B	13.12.21	DA ISSUE

PROPOSED BASEMENT FLOOR PLAN AND MEZZANINE FLOOR PLAN

A06.01 DA - B
1:500 @ A1
1:1000 @ A3

82 Alexander Street
Crows Nest, NSW 2065
ABN 43 092 960 499

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BN Architecture Urban Design Masterplanning Graphics Interiors

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DEVELOPMENT APPLICATION


HERITAGE DRIVE
SETTLERS BLVD.
TIGERHAWK DRIVE
SCHOOL
LOT 1
PARKING SPACES
OUTLINE OF DROPDOWN CURTAINS AND FIRE COMPARTMENTS SHOWN RED TYP
OUTLINE OF THE AWNING ABOVE LOADING DOCK AND WASTE AREA
TILT UP CONCRETE WALL WITH ALUMINIUM BATTENS ON TOP
6M AWNING ABOVE
BICYCLE RACK TO THE MEDICAL CENTRE ENTRY
TAVERN 890 m²
MINI MAJOR 1500 m²
LINE OF BASEMENT PARKING UNDER
PROPOSED ROLLER DOOR TO PROVIDE ACCESS TO LOADING DOCK
WASTE AREA 95 m²
SUPERMARKET
TRADING AREA = 2470 SQM
NON-TRADE AREA (INCL. LOADING DOCK) = 1050 SQM
PLANT/AC AT MEZZANINE = 180 SQM
DTB STAGING AREA = 130 SQM
BWS TRADING = 180 SQM
HOME DELIVERY = 200 SQM
TOTAL BUILDING AREA (EXCL. PLANT) = 4030 SQM
LIQUOR 180 m²
DTB 130 m²
MEDICAL CENTRE 425 m²
MEDICAL CENTRE 320 m²
ENTRY 95 m²
KIDS WATER SPLASH / FOUNTAIN PLAYGROUND
PEDESTRIAN WALKWAY
PARKING SPACES 535
FUTURE PAD SITES
OUTLINE OF THE EASTERN OSD TANK BELOW
DOUBLE BAY TROLLEY COLLECTION
SINGLE TROLLEY BAY
SHADE SAIL ABOVE
PICK UP AREA
PLAY ROOM 1
PLAY ROOM 2
OUTDOOR PLAY
RL 20.420 m
RL 22.510 m
CANOPY ABOVE

REVELOP	CHISHOLM SHOPPING CENTRE HERITAGE DRIVE CHISHOLM, NSW 2322 , AUSTRALIA				PROPOSED GROUND FLOOR PLAN	A06.02	DA - B
		ISSUE	DATE	DESCRIPTION			1:500 @ A1 1:1000 @ A3
		A	03-11-21	FOR REVIEW			
		B	13.12.21	DA ISSUE			

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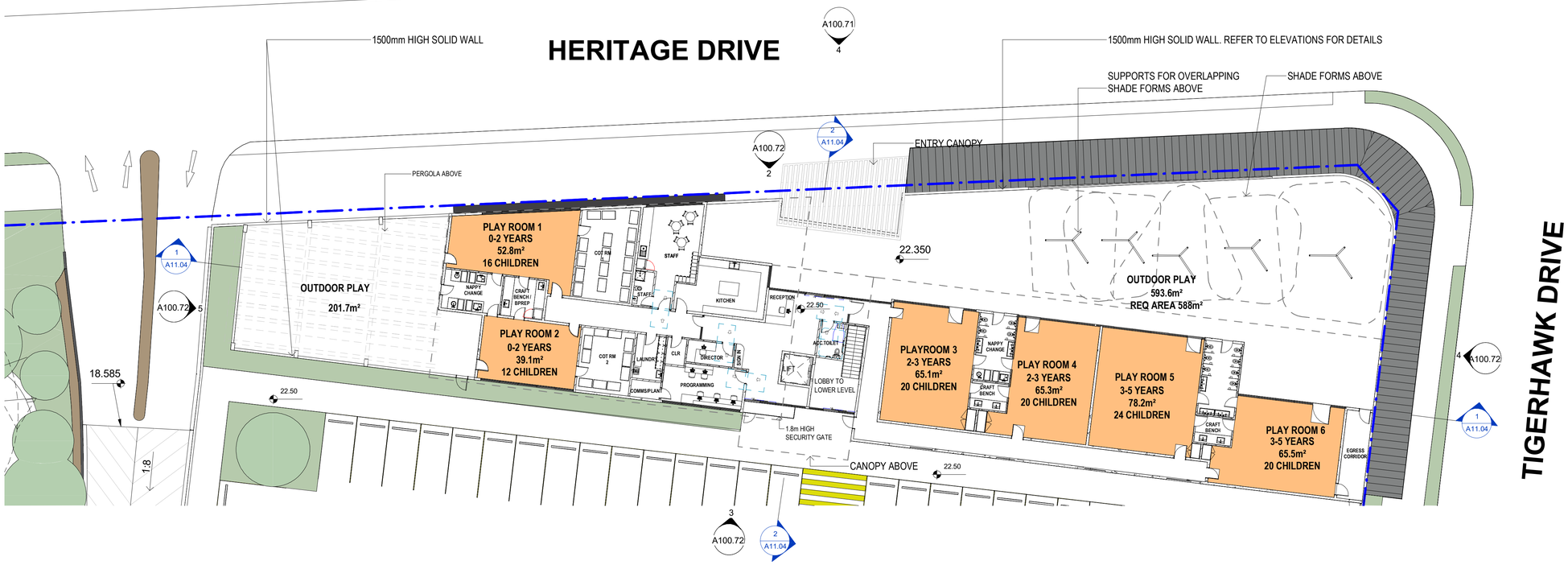
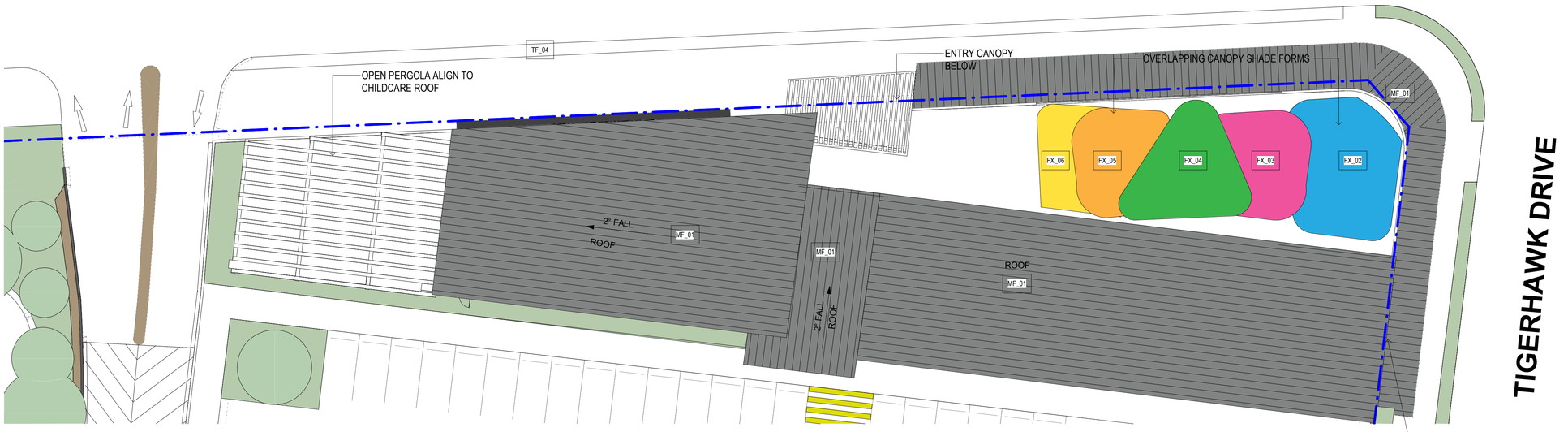
DEVELOPMENT APPLICATION



1 PROPOSED CHILDCARE GROUND FLOOR PLAN
1 : 200

HERITAGE DRIVE



2 PROPOSED CHILDCARE ROOF PLAN
1 : 200

ROOM	AGE GROUP	NO. OF CHILDREN	RM AREA UNEMCUMBERED	MIN 3.25M² PER CHILD	REQUIRED STAFF
PLAYROOM 01	0-2	16	52.8	3.3	4
PLAYROOM 02	0-2	12	39.1	3.25	3
PLAYROOM 03	2-3	20	65.1	3.25	4
PLAYROOM 04	2-3	20	65.3	3.26	4
PLAYROOM 05	3-5	24	78.2	3.25	2.4
PLAYROOM 06	3-5	20	65.5	3.27	2

ADDITIONAL STAFF	
RECEPTION + ADMIN	2
DIRECTOR	1
TOTAL STAFF	22.4

UNENCUMBERED INDOOR SPACE	
3.25m² PER CHILD	364
SPACE PROVIDED	366

OUTDOOR SPACE	
7m² PER CHILD	789
SPACE PROVIDED	795.3

JUNIOR TOILET	
DOCS (1 PER 15)	7
NO PROVIDED	11

NAPPY CHANGE	
1/10 CHILD < 3	4.8
NO PROVIDED	6

NOTE:

- *BCA STATES THAT IF THE CENTRE ACCOMMODATES CHILDREN UNDER THE AGE OF 3 THEY MUST INCLUDE A DEDICATED BENCH TYPE BABY BATH*
- *UNENCUMBERED SPACE EXCLUDES WALLS, COLUMNS, CRAFT BENCHES AND STORES)*

REVELOP

CHISHOLM SHOPPING CENTRE
HERITAGE DRIVE
CHISHOLM, NSW 2322 , AUSTRALIA

ISSUE	DATE	DESCRIPTION
A	13.12.21	DA ISSUE

PROPOSED CHILDCARE PLAN

A06.04 DA - A
1:200 @ A1
1:400 @ A3

82 Alexander Street
Crows Nest, NSW 2065
ABN 43 092 960 499

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PRINTED: 13/12/2021 2:45:30 PM

ANNEXURE B: TRAFFIC SURVEY DATA
(15 SHEETS)

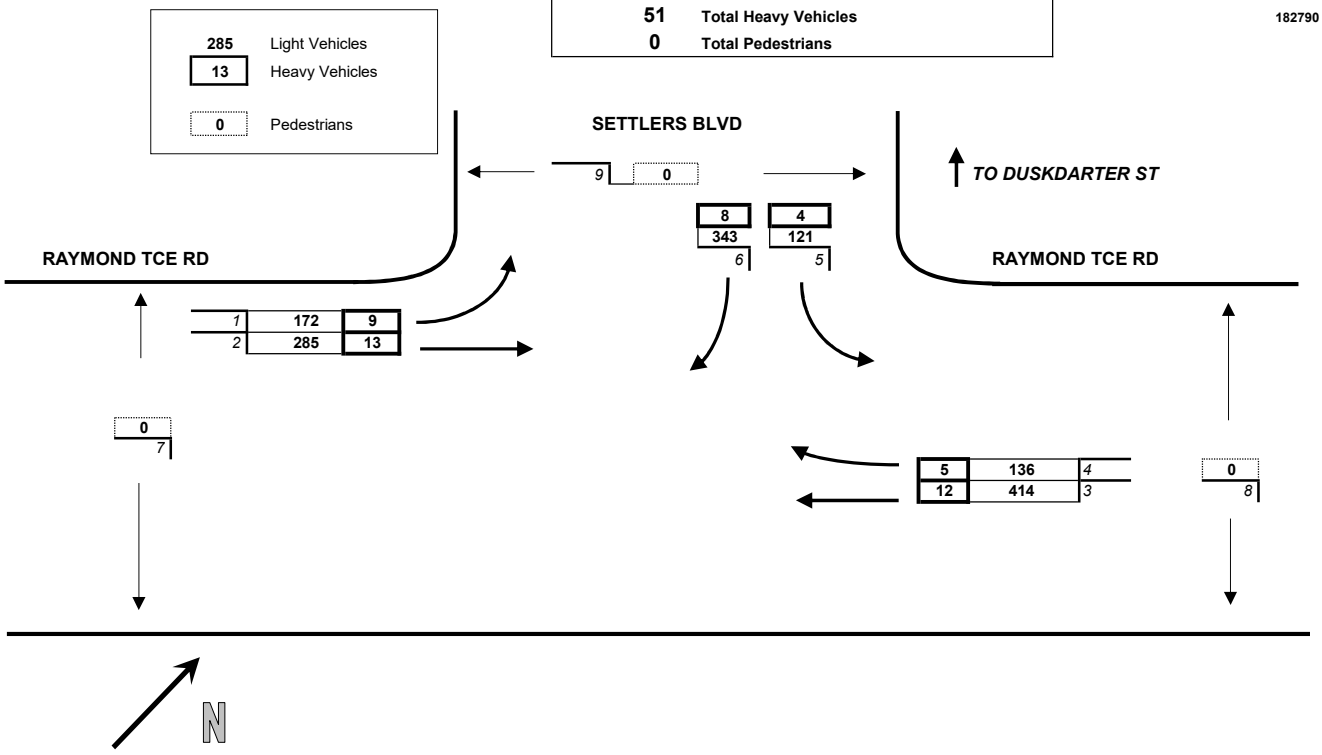
22/3/2018 - RAYMOND TCE RD / SETTLERS BLVD, CHISHOLM

9:00 <<< HOUR ENDING **Thursday**

Summary:

RAYMOND TCE RD / SETTLERS BLVD	
1471	Total Light Vehicles
51	Total Heavy Vehicles
0	Total Pedestrians

Quality Surveys
182790



22/3/2018 - RAYMOND TCE RD / SETTLERS BLVD, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR	Pedestrians 7	8	9
07:15	17	46	40	6	12	36	157		0	0	0
07:30	25	50	81	9	14	45	224		0	0	0
07:45	9	78	79	9	23	53	251		0	0	0
08:00	23	61	97	14	13	46	254	886	0	0	1 <
08:15	43	73	104	28	20	61	329	1058	0	0	0 <
08:30	46	71	113	44	32	111	417	1251	0	0	0 <
08:45	48	65	96	53 <	46	106	414	1414	0	0	0 <
09:00	35 <	76 <	101 <	11	23 <	65 <	311	1471 <	0	0	0

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
07:15	4	1	1	1	1	0	8	
07:30	1	0	1	1	0	4	7	
07:45	1	0	3	2	1	5	12	
08:00	2	3	0	1	2	0	8	35
08:15	4	1	2	1	1	1 <	10	37
08:30	1	4	1	1	1	2	10	40
08:45	2 <	2	2	3 <	2 <	5	16	44
09:00	2 <	6 <	7 <	0	0	0	15	51 <

All Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
07:15	21	47	41	7	13	36	165	
07:30	26	50	82	10	14	49	231	
07:45	10	78	82	11	24	58	263	
08:00	25	64	97	15	15	46	262	921
08:15	47	74	106	29	21	62	339	1095
08:30	47	75	114	45	33	113	427	1291
08:45	50	67	98	56 <	48	111	430	1458
09:00	37 <	82 <	108 <	11	23 <	65 <	326	1522 <

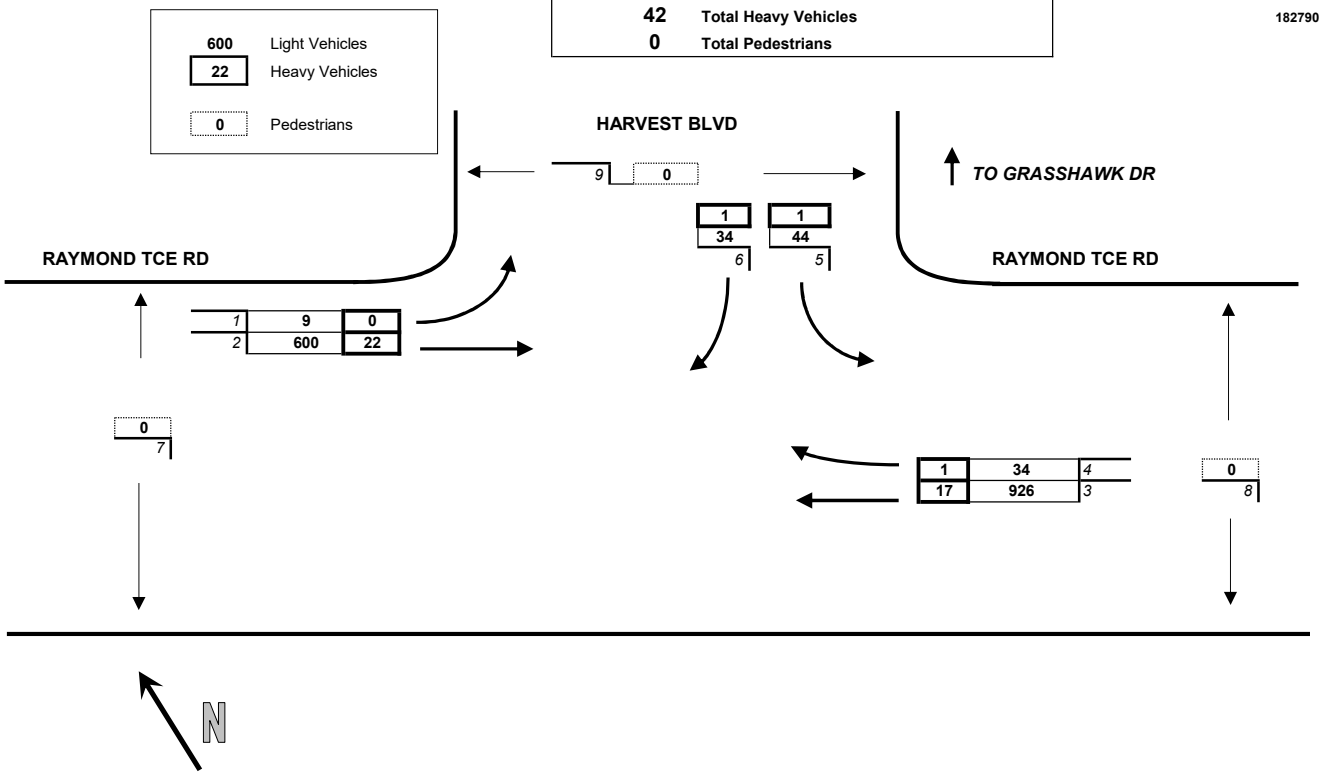
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - RAYMOND TCE RD / HARVEST BLVD, CHISHOLM

9:00 <<< HOUR ENDING **Thursday**

Quality Surveys
182790

Summary: RAYMOND TCE RD / HARVEST BLVD	
1647	Total Light Vehicles
42	Total Heavy Vehicles
0	Total Pedestrians



22/3/2018 - RAYMOND TCE RD / HARVEST BLVD, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
07:15	3	91	82	2	10	3	191	
07:30	1	99	119	10	7	3	239	
07:45	0	119	158	5	15	5	302	
08:00	4	123	177	4	8	9	325	1057
08:15	0	127	208	8	13	9	365	1231
08:30	3	171	262	7	10 <	11	464	1456
08:45	1	145	240	9	13	8 <	416	1570
09:00	5 <	157 <	216 <	10 <	8	6	402	1647 <

Pedestrians

	7	8	9
07:15	0	0	0
07:30	0	0	0
07:45	0	0	0
08:00	0	1 <	0
08:15	0	0 <	0
08:30	0	0 <	0
08:45	0	0 <	0
09:00	0	0	0

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
07:15	0	4	3	0	0	0	7	
07:30	0	3	7	1	0	0	11	
07:45	0	4	7	0	0	0	11	
08:00	0	4	2 <	0 <	1 <	0	7	36
08:15	0	2	2	0 <	0 <	0	4	33
08:30	0	5	2	1 <	0 <	0	8	30
08:45	0	6	4	0 <	0 <	1 <	11	30
09:00	0	9 <	9	0 <	1 <	0 <	19	42 <

All Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
07:15	3	95	85	2	10	3	198	
07:30	1	102	126	11	7	3	250	
07:45	0	123	165	5	15	5	313	
08:00	4	127	179	4	9	9	332	1093
08:15	0	129	210	8	13	9	369	1264
08:30	3	176	264	8	10 <	11	472	1486
08:45	1	151	244	9	13	9 <	427	1600
09:00	5 <	166 <	225 <	10 <	9	6	421	1689 <

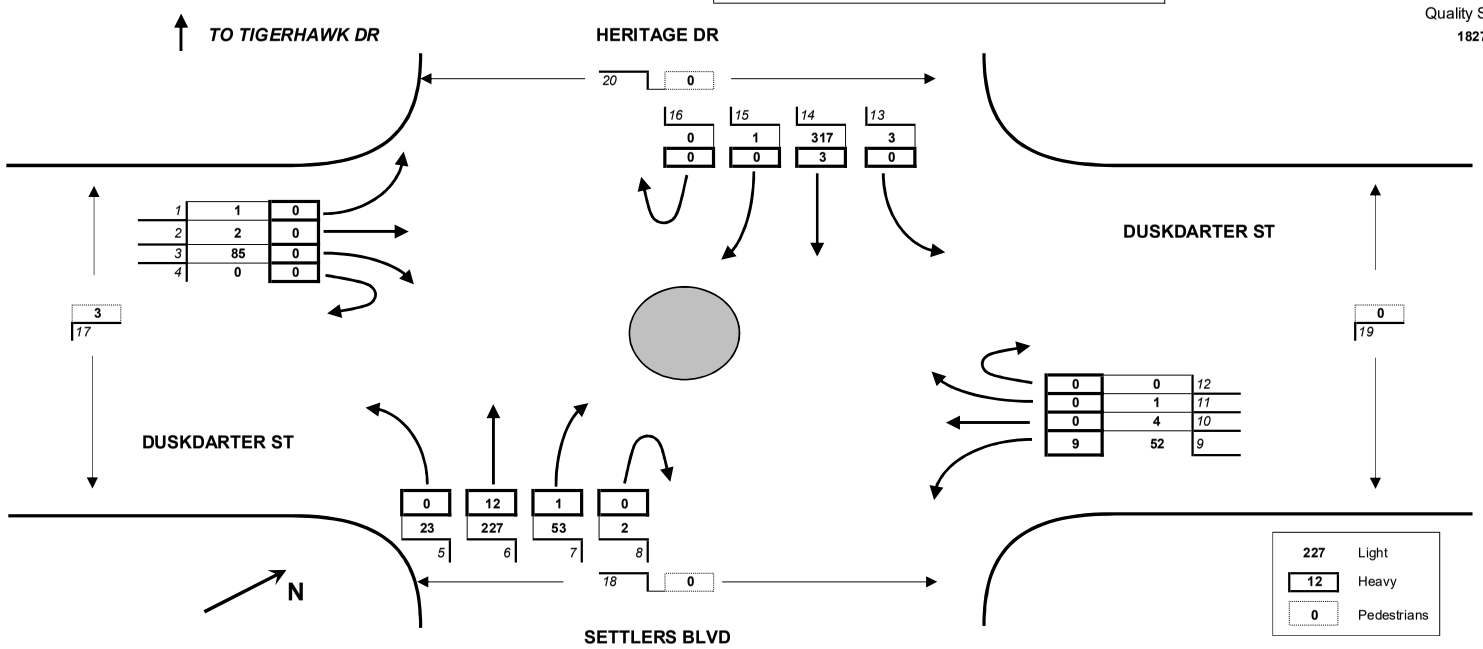
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - HERITAGE DR / DUSKDARTER ST, CHISHOLM

9:00 <<< HOUR ENDING **Thursday**

Summary:	HERITAGE DR / DUSKDARTER ST
771	Total Light Vehicles
25	Total Heavy Vehicles
3	Total Pedestrians

Quality Surveys
182790



22/3/2018 - HERITAGE DR / DUSKDARTER ST, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR	Pedestrians 17	18	19	20
07:15	0	1	4	0	2	23	2	0	2	0	0	0	0	39	0	0	73		1	0	1	1
07:30	0	0	17	0	5	24	3	0	1	0	0	0	0	37	0	0	87		3	0	0	0
07:45	0	0	22	0	3	10	1	2	1	0	0	0	0	52	0	0	91		3	0	0	0
08:00	0	0	20	0	3	29	3	3	4	0	0	0	0	34	0	0	96	347	3	0	0 <	0 <
08:15	0	0	21	0	3	56	8	1 <	5	0	0	0	0	50	0	0	144	418	2 <	0	0	0
08:30	0	0	26	0	5	62	22	0 <	20	1	1 <	0	1	109	0	0	247	578	1	0	0	0
08:45	1 <	2 <	29 <	0	7	73	21 <	1	17	3 <	0 <	0	2 <	93	1 <	0	250	737	0	0	0	0
09:00	0 <	0 <	9	0	8 <	36 <	2	0	10 <	0 <	0 <	0	0 <	65 <	0 <	0	130	771 <	0	0	0	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR
07:15	0	0	0	0	0	4	0	0	1	0	0	0	0	1	0	0	6	
07:30	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0	0	4	
07:45	0	0	0	0	0	3	0	1	3	0	0	0	0	0	0	0	7	
08:00	0	0	1 <	0	1 <	2	0	0 <	1	0	0	0	0	0	0	0	5	22
08:15	0	0	0 <	0	0 <	5	0	0 <	2	0	0	0	0	0	0	0	7	23
08:30	0	0	0 <	0	0 <	2	0	0	2	0	0	0	0	2	0	0	6	25
08:45	0	0	0 <	0	0 <	5 <	0	0	5 <	0	0	0	0	1 <	0	0	11	29 <
09:00	0	0	0	0	0	0	1 <	0	0	0	0	0	0	0 <	0	0	1	25

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR
07:15	0	1	4	0	2	27	2	0	3	0	0	0	0	40	0	0	79	
07:30	0	0	17	0	5	25	3	2	1	0	0	0	0	38	0	0	91	
07:45	0	0	22	0	3	13	1	3	4	0	0	0	0	52	0	0	98	
08:00	0	0	21	0	4	31	3	3	5	0	0	0	0	34	0	0	101	369
08:15	0	0	21	0	3	61	8	1 <	7	0	0	0	0	50	0	0	151	441
08:30	0	0	26	0	5	64	22	0	22	1	1 <	0	1	111	0	0	253	603
08:45	1 <	2 <	29 <	0	7	78	21 <	1	22	3 <	0 <	0	2 <	94	1 <	0	261	766
09:00	0 <	0 <	9	0	8 <	36 <	3 <	0	10 <	0 <	0 <	0	0 <	65 <	0 <	0	131	796 <

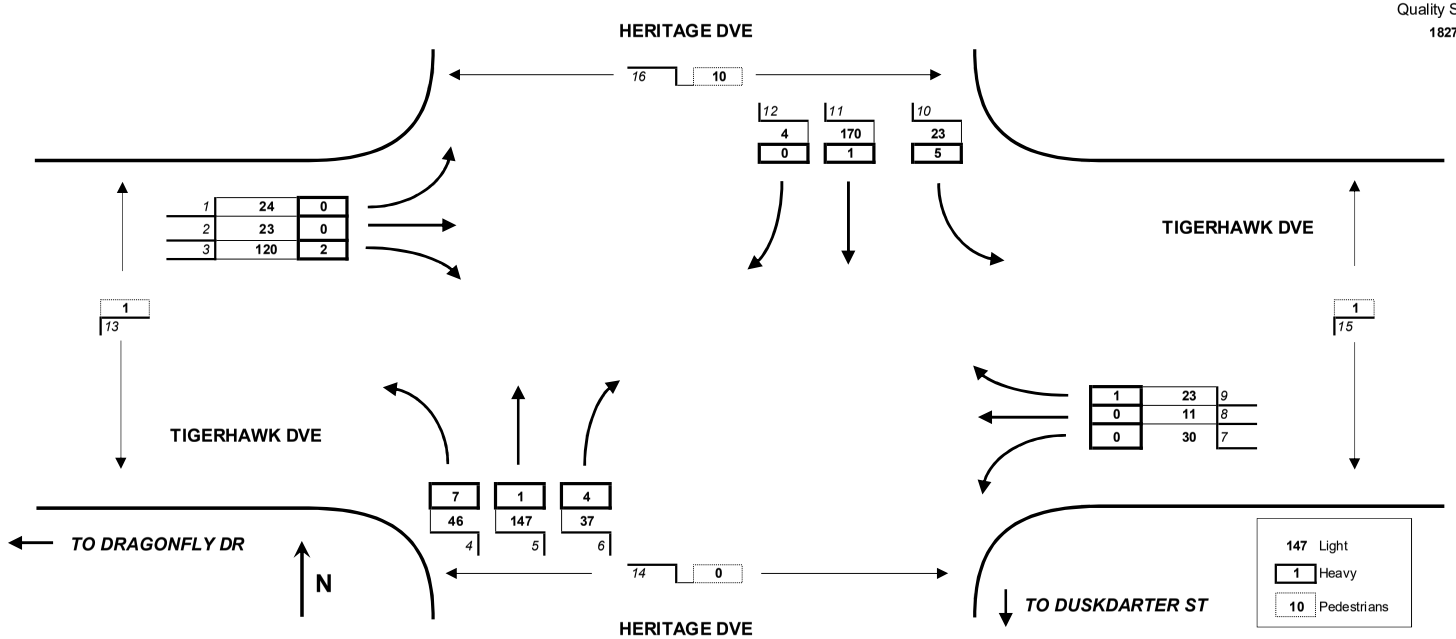
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - HERITAGE DVE / TIGERHAWK DVE, CHISHOLM

9:00 <<< HOUR ENDING **Thursday**

Summary:	HERITAGE DVE / TIGERHAWK DVE
658	Total Light Vehicles
21	Total Heavy Vehicles
12	Total Pedestrians

Quality Surveys
182790



22/3/2018 - HERITAGE DVE / TIGERHAWK DVE, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
07:15	0	0	22	7	12	3	0	0	0	0	12	0	56		0	1	0	0
07:30	0	1	22	8	12	2	1	2	1	1	14	0	64		2	0	0	6
07:45	2	0	35	2	7	0	1	1	0	3	16	0	67		0	0	0	3
08:00	1	3	25	10	12	4	0	0	0	1	13	1	70	257	1	0 <	0	0
08:15	3	6	38	15	30	11	2	4	2	5	9	0	125	326	1 <	0	0	4 <
08:30	9	12	30 <	9	41	11	13	3	6	7	68	1	210	472	0	0	0	2
08:45	11 <	5 <	26	10	55	9	13	2	11	8	61	3 <	214	619	0	0	0	4
09:00	1 <	0	26	12 <	21 <	6 <	2 <	2 <	4 <	3 <	32 <	0	109	658 <	0	0	1 <	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
07:15	0	0	1	1	2	1	0	0	0	0	0	0	5	
07:30	0	0	0	0	0	1	0	0	0	0	2	0	3	
07:45	0	0	0	0	0	2	0	0	0	0	0	0	2	
08:00	0	0	0	0	1 <	1 <	0	0	0	0	0 <	0	2	12
08:15	0	0	0	4	0	1 <	0	0	0	2	0 <	0	7	14
08:30	0	0	2 <	0	0	1 <	0	0	0	0	1	0	4	15
08:45	0	0	0 <	3 <	1	2 <	0	0	0	3 <	0	0	9	22 <
09:00	0	0	0 <	0 <	0	0	0	0	1 <	0 <	0	0	1	21

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
07:15	0	0	23	8	14	4	0	0	0	0	12	0	61	
07:30	0	1	22	8	12	3	1	2	1	1	16	0	67	
07:45	2	0	35	2	7	2	1	1	0	3	16	0	69	
08:00	1	3	25	10	13	5	0	0	0	1	13	1	72	269
08:15	3	6	38	19	30	12	2	4	2	7	9	0	132	340
08:30	9	12	32 <	9	41	12	13	3	6	7	69	1	214	487
08:45	11 <	5 <	26	13	56	11	13	2	11	11	61	3 <	223	641
09:00	1 <	0	26	12 <	21 <	6 <	2 <	2 <	5 <	3 <	32 <	0	110	679 <

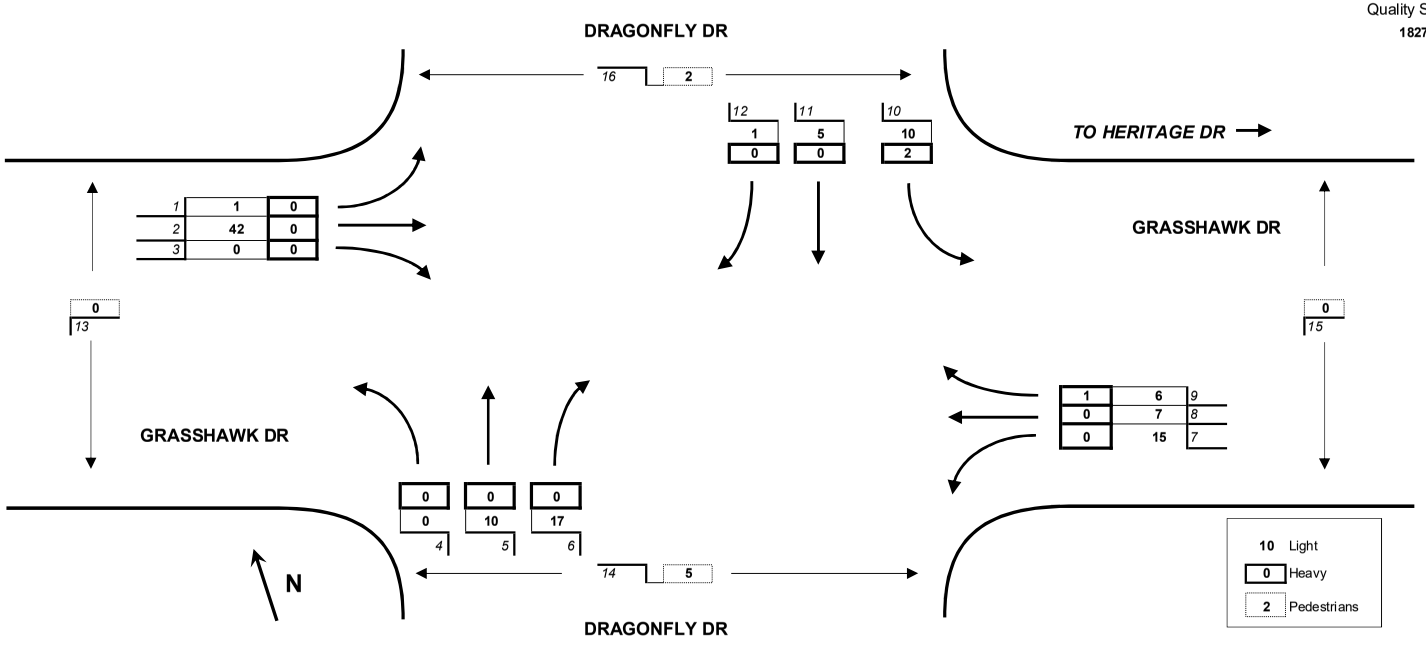
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - DRAGONFLY DR / GRASSHAWK DR, CHISHOLM

9:00 <<< HOUR ENDING **Thursday**

Summary:	DRAGONFLY DR / GRASSHAWK DR
114	Total Light Vehicles
3	Total Heavy Vehicles
7	Total Pedestrians

Quality Surveys
182790



22/3/2018 - DRAGONFLY DR / GRASSHAWK DR, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
07:15	0	2	0	0	0	2	0	1	2	4	1	0	12		0	0	0	0
07:30	1	5	0	0	0	2	1	2	1	1	0	1	14		0	0	0	3
07:45	0	14	0	0	0	3	0	0	0	3	0	1	21		0	0	0	0
08:00	1 <	5	0	0	0	3	1	3	0	2 <	0	0 <	15	62	0	1	0	1 <
08:15	0 <	13	0	0	2	6	5	1	2	2	0	0 <	31	81	0	2	0	0 <
08:30	0	11 <	0	0	6	6 <	2	0	1	3 <	2	0	31	98	0	3 <	0	0
08:45	1 <	12	0	0	2 <	3 <	3	5 <	2	3 <	2	1	34	111	0	0 <	0	2
09:00	0	6	0	0	0 <	2	5 <	1	1 <	2 <	1 <	0	18	114 <	0	0	0	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	1 <	0	0	0	1	1
08:30	0	0	0	0	0	0	0	0	0 <	2 <	0	0	2	3 <
08:45	0	0	0	0	0	0	0	0	0 <	0 <	0	0	0	3 <
09:00	0	0	0	0	0	0	0	0	0 <	0 <	0	0	0	3 <

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
07:15	0	2	0	0	0	2	0	1	2	4	1	0	12	
07:30	1	5	0	0	0	2	1	2	1	1	0	1	14	
07:45	0	14	0	0	0	3	0	0	0	3	0	1	21	
08:00	1 <	5	0	0	0	3	1	3	0	2	0	0 <	15	62
08:15	0 <	13	0	0	2	6	5	1	3	2	0	0 <	32	82
08:30	0	11 <	0	0	6	6 <	2	0	1	5 <	2	0	33	101
08:45	1 <	12	0	0	2 <	3 <	3	5 <	2	3 <	2	1	34	114
09:00	0	6	0	0	0 <	2	5 <	1	1 <	2 <	1 <	0	18	117 <

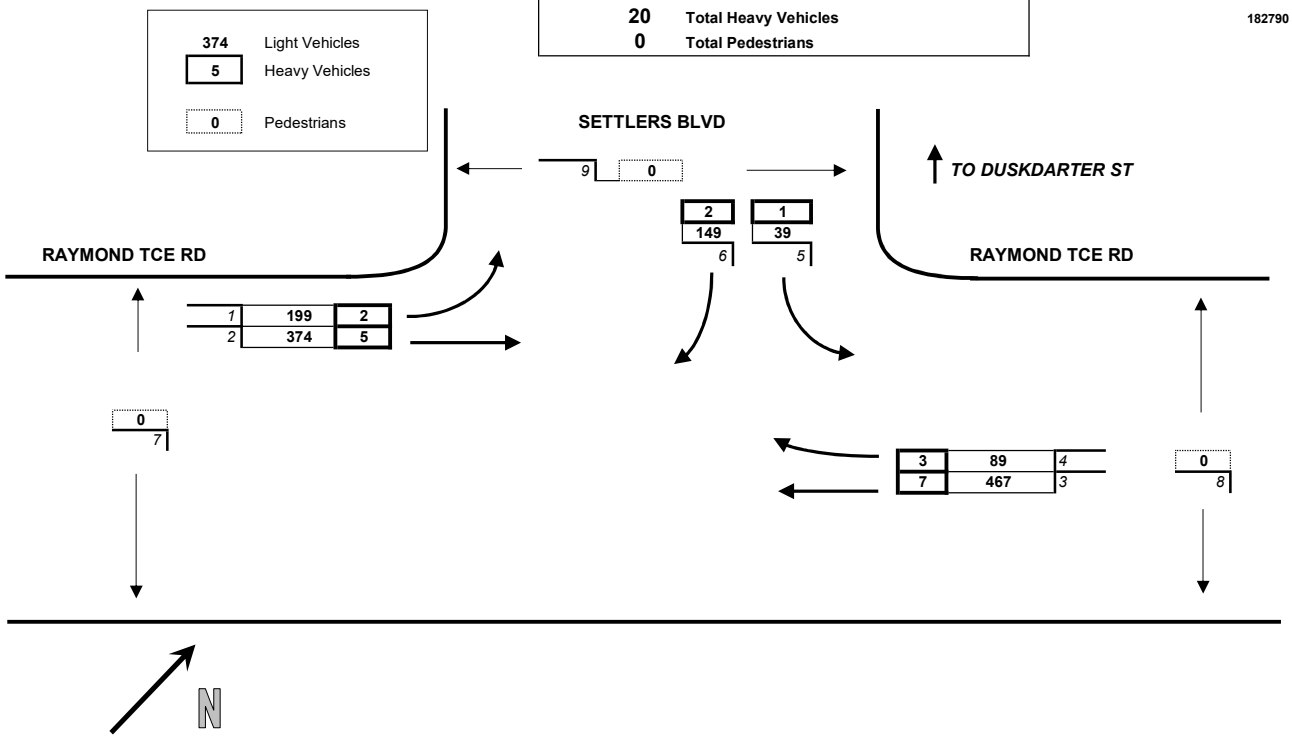
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - RAYMOND TCE RD / SETTLERS BLVD, CHISHOLM

17:30 <<< HOUR ENDING **Thursday**

Quality Surveys
182790

Summary: RAYMOND TCE RD / SETTLERS BLVD	
1317	Total Light Vehicles
20	Total Heavy Vehicles
0	Total Pedestrians



22/3/2018 - RAYMOND TCE RD / SETTLERS BLVD, CHISHOLM

	Light Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR	Pedestrians 7	8	9
15:15	36	76	70	16	19	56	273		0	0	0
15:30	47	104	81	21	9	52	314		0	0	0
15:45	34	102	105	23	12	50	326		1	0	1
16:00	51	107	105	18	9 <	34 <	324	1237	0 <	0	0 <
16:15	57	89	80	27	11	36	300	1264	0 <	0	0 <
16:30	28	105 <	111	26	7	32	309	1259	0 <	0	0 <
16:45	51	95	101	20	10	35	312	1245	0	0	0
17:00	44	103	104	26 <	9	33	319	1240	0	0	0
17:15	54	80	130	25	10	42	341	1281	0	0	0
17:30	50 <	96	132	18	10	39	345	1317 <	0	0	0
17:45	34	94	110 <	20	8	35	301	1306	0	0	0
18:00	48	66	94	21	8	32	269	1256	0	0	0

	Heavy Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
15:15	1	1	1	3	1	0	7	
15:30	2	3	3	0	2	2	12	
15:45	1	1	4	2	1	2	11	
16:00	2	3	2 <	0 <	0	1	8	38
16:15	4	1	0	0	2 <	0	7	38
16:30	4 <	3	1	2	2 <	3 <	15	41 <
16:45	1 <	2 <	3	1	0	2 <	9	39
17:00	0	1	2	1	0	0	4	35
17:15	1	1	1	0	1	0	4	32
17:30	0	1	1	1	0	0	3	20
17:45	0	1	0	0	0	1	2	13
18:00	0	1	2	0	0	0	3	12

	All Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
15:15	37	77	71	19	20	56	280	
15:30	49	107	84	21	11	54	326	
15:45	35	103	109	25	13	52	337	
16:00	53	110	107	18	9 <	35 <	332	1275
16:15	61	90	80	27	13	36	307	1302
16:30	32	108 <	112	28	9	35	324	1300
16:45	52	97	104	21	10	37	321	1284
17:00	44	104	106	27 <	9	33	323	1275
17:15	55	81	131	25	11	42	345	1313
17:30	50 <	97	133	19	10	39	348	1337 <
17:45	34	95	110 <	20	8	36	303	1319
18:00	48	67	96	21	8	32	272	1268

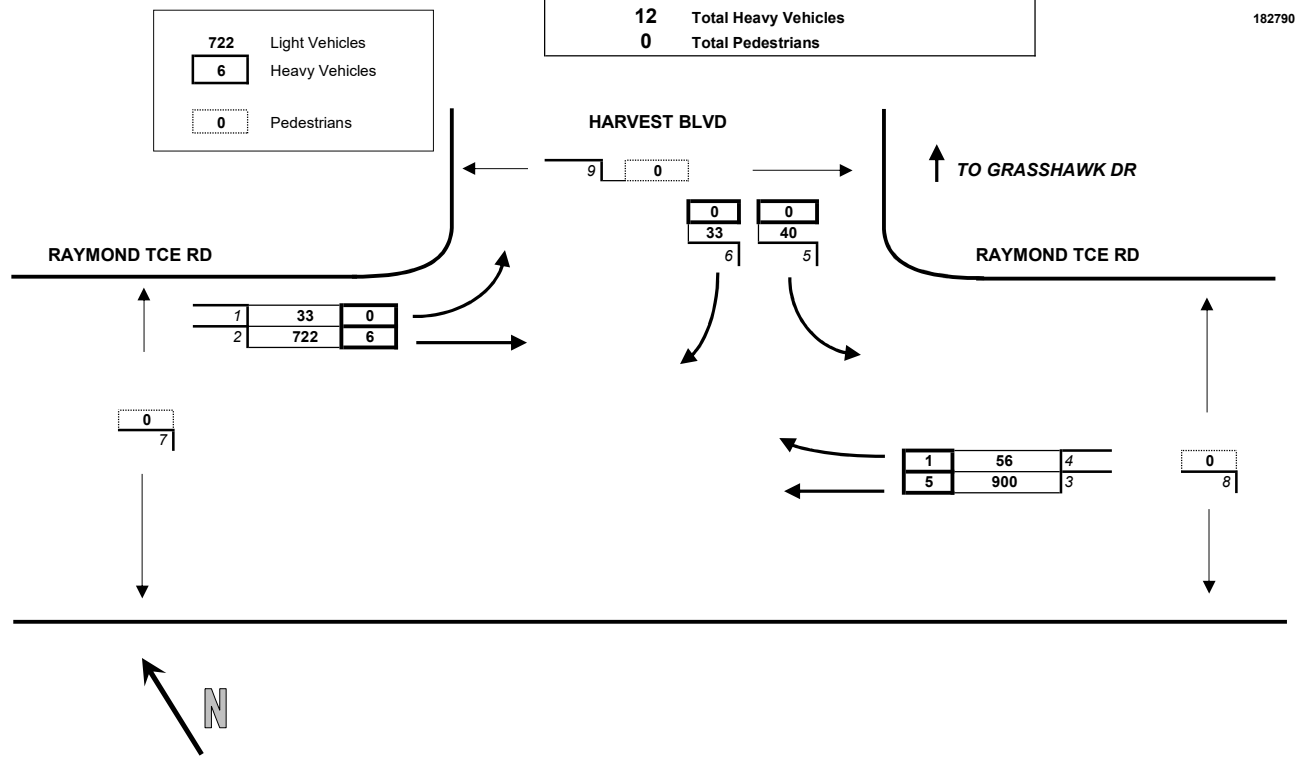
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - RAYMOND TCE RD / HARVEST BLVD, CHISHOLM

17:45 <<< HOUR ENDING **Thursday**

Quality Surveys
182790

Summary: RAYMOND TCE RD / HARVEST BLVD	
1784	Total Light Vehicles
12	Total Heavy Vehicles
0	Total Pedestrians



22/3/2018 - RAYMOND TCE RD / HARVEST BLVD, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
15:15	13	159	180	5	8	5	370	
15:30	9	197	179	12	7	10	414	
15:45	9	170	218	9	8	4	418	
16:00	7 <	203	199	6	5	7	427	1629
16:15	11	178	186	16	10	4	405	1664
16:30	9	209	212	17	9	20	476	1726
16:45	4	182 <	194	9	14	3	406	1714
17:00	5	180	186	13	7	9	400	1687
17:15	11	165	251	17 <	11	7 <	462	1744
17:30	7	213	232	15	13 <	15	495	1763
17:45	10	164	231	11 <	9	2	427	1784 <
18:00	5	130	203 <	9	8	10	365	1749

Pedestrians

	7	8	9
15:15	0	0	0
15:30	0	0	0
15:45	0	0	0
16:00	0	1 <	0
16:15	0	0 <	0
16:30	0	0 <	0
16:45	0	0 <	0
17:00	0	0	0
17:15	0	0	0
17:30	0	0	0
17:45	0	0	0
18:00	0	0	0

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
15:15	0	4	3	0	0	0	7	
15:30	0	3	4	0	0	0	7	
15:45	0	2	8	0	1	0	11	
16:00	0	4	3 <	0	0	0	7	32
16:15	0	6	1	0	0	0	7	32
16:30	0	8	3	1	0	0	12	37 <
16:45	0	3 <	2	0	2 <	0	7	33
17:00	0	1	1	0	0 <	0	2	28
17:15	0	2	1	1 <	0 <	0	4	25
17:30	0	1	1	0	0 <	0	2	15
17:45	0	2	2	0	0	0	4	12
18:00	0	3	2	0	0	0	5	15

All Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
15:15	13	163	183	5	8	5	377	
15:30	9	200	183	12	7	10	421	
15:45	9	172	226	9	9	4	429	
16:00	7 <	207	202	6	5	7	434	1661
16:15	11	184	187	16	10	4	412	1696
16:30	9	217	215	18	9	20	488	1763
16:45	4	185 <	196	9	16	3	413	1747
17:00	5	181	187	13	7	9	402	1715
17:15	11	167	252	18 <	11	7 <	466	1769
17:30	7	214	233	15	13 <	15	497	1778
17:45	10	166	233	11	9	2	431	1796 <
18:00	5	133	205 <	9	8	10	370	1764

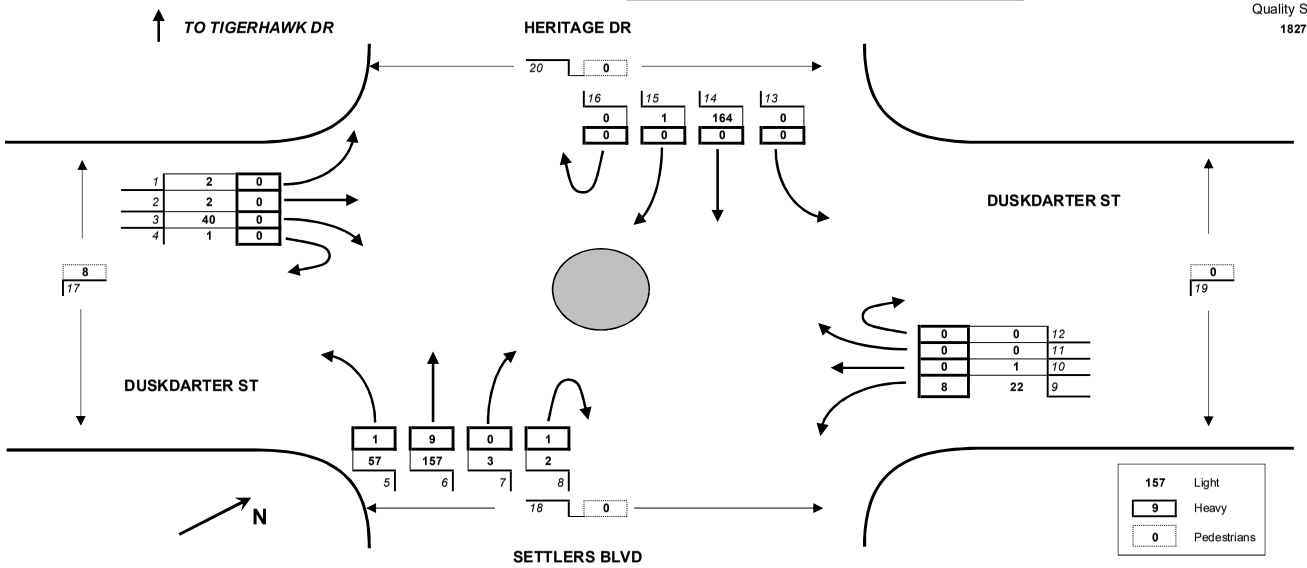
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - HERITAGE DR / DUSKDARTER ST, CHISHOLM

16:00 <<< HOUR ENDING **Thursday**

Summary:	HERITAGE DR / DUSKDARTER ST
452	Total Light Vehicles
19	Total Heavy Vehicles
8	Total Pedestrians

Quality Surveys
182790



22/3/2018 - HERITAGE DR / DUSKDARTER ST, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR	Pedestrians 17	18	19	20
15:15	0	0	11	0	10	38	0	0	8	0	0	0	0	51	0	0	118		0	0	0	0
15:30	1	0	10	0	17	47	0	1	3	1	0	0	0	43	0	0	123		7	0	0	0
15:45	1	2	9	1	17	31	3	1	7	0	0	0	0	42	1	0	115		1	0	0	0
16:00	0 <	0 <	10	0 <	13	41	0	0 <	4 <	0	0	0	0	28 <	0 <	0	96	452 <	0 <	0	0	0
16:15	0 <	0 <	0	0 <	24	54	0	0 <	4	1 <	0	0	0	32	0 <	0	115	449	0 <	1	0	0
16:30	0	0 <	6	0 <	16	41	0	0	1	0	0	0	0	29	0 <	0	93	419	0	0	0	0
16:45	1	0	10	0	16	45	1	1	4	0	0	0	0	26	0	0	104	408	4	0	0	0
17:00	1 <	0	20	0	22 <	45	1	0	3	0	0	0	0	29	0	0	121	433	2	1 <	0	0
17:15	0 <	0	9	0	17	55	1	0	5	0	0	0	0	36	0	0	123	441	0	0	0	0
17:30	0 <	0	10	0	14	45 <	1 <	0	4	0	0	0	0	30	0	0	104	452 <	0	0	0	0
17:45	1 <	0	19 <	0	10	43	1 <	0	1	0	0	0	0	23	0	0	98	446	0	0	0	0
18:00	0	0	12	0	16	46	0	0	1	0	0	0	0	28	0	0	103	428	0	0	0	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR
15:15	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	5	
15:30	0	0	0	0	1	1	0	0	4	0	0	0	0	0	0	0	6	
15:45	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	6	
16:00	0	0	0	0	0 <	1	0	1	0	0	0	0	0	0	0	0	2	19
16:15	0	0	0	0	0 <	4	0	0	2 <	0	0	0	0	0	0	0	6	20
16:30	0	0	0	0	0	4 <	0	1 <	2	0	0	0	0	1 <	0	0	8	22 <
16:45	0	0	0	0	0	2	0	0 <	2	0	0	0	0	0 <	0	0	4	20
17:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0 <	0	0	1	19
17:15	0	0	0	0	0	1	0	0	1	0	0	0	0	0 <	0	0	2	15
17:30	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2	9
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR
15:15	0	0	11	0	10	42	0	0	9	0	0	0	0	51	0	0	123	
15:30	1	0	10	0	18	48	0	1	7	1	0	0	0	43	0	0	129	
15:45	1	2	9	1	17	34	3	1	10	0	0	0	0	42	1	0	121	
16:00	0 <	0 <	10	0 <	13	42	0	1 <	4 <	0	0	0	0	28 <	0 <	0	98	471 <
16:15	0 <	0 <	0	0 <	24	58	0	0 <	6	1 <	0	0	0	32	0 <	0	121	469
16:30	0	0 <	6	0 <	16	45	0	1 <	3	0	0	0	0	30	0 <	0	101	441
16:45	1	0	10	0	16	47	1	1 <	6	0	0	0	0	26	0	0	108	428
17:00	1 <	0	20	0	22 <	46 <	1	0	3	0	0	0	0	29	0	0	122	452
17:15	0 <	0	9	0	17	56	1	0	6	0	0	0	0	36	0	0	125	456
17:30	0 <	0	10	0	14	46	1 <	0	5	0	0	0	0	30	0	0	106	461
17:45	1 <	0	19 <	0	10	43	1 <	0	1	0	0	0	0	23	0	0	98	451
18:00	0	0	12	0	16	46	0	0	1	0	0	0	0	28	0	0	103	432

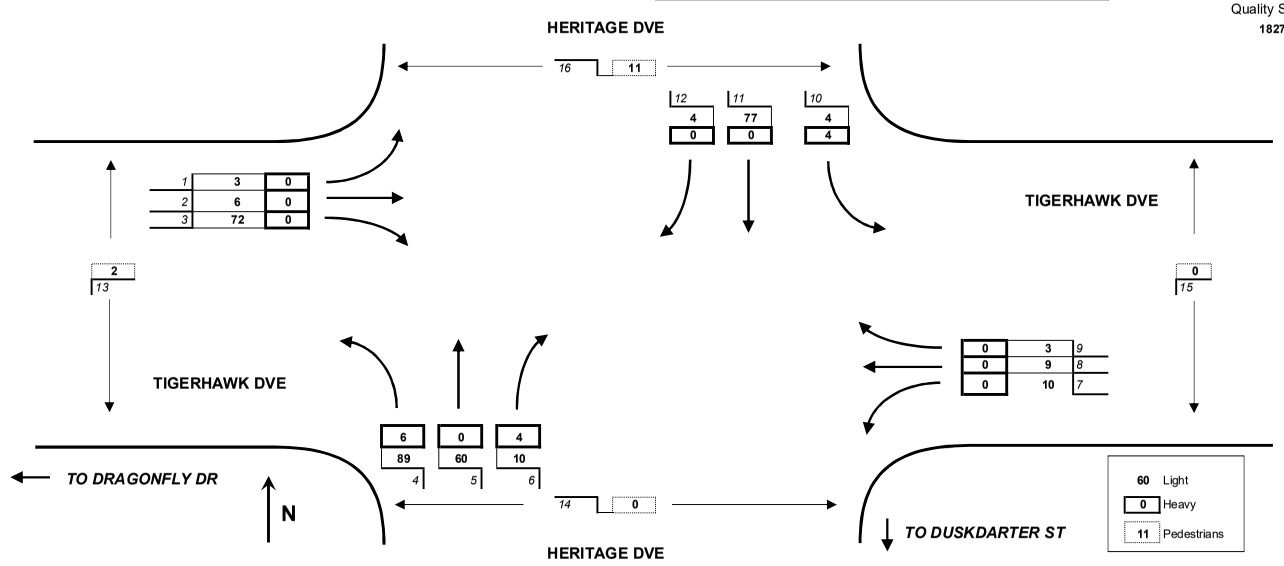
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - HERITAGE DVE / TIGERHAWK DVE, CHISHOLM

16:00 <<< HOUR ENDING **Thursday**

Summary:	HERITAGE DVE / TIGERHAWK DVE
347	Total Light Vehicles
14	Total Heavy Vehicles
13	Total Pedestrians

Quality Surveys
182790



22/3/2018 - HERITAGE DVE / TIGERHAWK DVE, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
15:15	2	0	31	21	17	0	4	0	0	2	17	2	96		0	0	0	1
15:30	0	3	13	30	12	3	1	2	0	0	26	1	91		2	0	0	5
15:45	1	2	19	14	15	5	3	5	3	1	18	0	86		0	0	0	5
16:00	0 <	1	9	24	16	2	2 <	2 <	0	1	16 <	1 <	74	347 <	0	0	0	0 <
16:15	0	0	24	32	20	2 <	0	0 <	1	0	9	1	89	340	0	0	0	1 <
16:30	1	3	13	25	15 <	2	0	2 <	1 <	1	21	0	84	333	0	0	0	3
16:45	0	2	10	30	13	2	2	1	1	1	13	0	75	322	1	0	0	2
17:00	0	0	19	27	15	3	1	2	1	3	7	1	79	327	2 <	0	0	2
17:15	0	1	24	34	21	2	2	2	2 <	2 <	9	0	99	337	0 <	0	0	1
17:30	0	4 <	18	32 <	9	1	2	2	1 <	1 <	12	1	83	336	0 <	0	0	1
17:45	1	0	21 <	26	14	2	0	2	0	0	6	0	72	333	0	1 <	0	0
18:00	0	1	16	23	21	1	0	2	1	1	8	0	74	328	0	0 <	0	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
15:15	0	0	0	5	0	1	0	0	0	0	0	0	6	
15:30	0	0	0	0	0	1	0	0	0	3	0	0	4	
15:45	0	0	0	1	0	2	0	0	0	1	0	0	4	
16:00	0	0	0	0 <	0	0	0	0	0	0 <	0	0	0	14 <
16:15	0	0	0	2	0	2	0	0	0	0 <	0	0	4	12
16:30	0	0	1 <	1	1 <	2 <	0	0	0	0	0	0	5	13
16:45	0	0	0 <	0	0 <	2 <	0	0	0	0	0	0	2	11
17:00	0	0	0 <	1	0 <	0 <	0	0	0	0	0	0	1	12
17:15	0	0	0 <	0	0 <	1	0	0	0	0	0	0	1	9
17:30	0	0	0	0	0	1	0	0	0	0	0	0	1	5
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	3
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
15:15	2	0	31	26	17	1	4	0	0	2	17	2	102	
15:30	0	3	13	30	12	4	1	2	0	3	26	1	95	
15:45	1	2	19	15	15	7	3	5	3	2	18	0	90	
16:00	0 <	1	9	24	16	2	2 <	2 <	0	1 <	16 <	1 <	74	361 <
16:15	0	0	24	34	20	4 <	0	0 <	1	0	9	1	93	352
16:30	1	3	14	26	16 <	4 <	0	2 <	1 <	1	21	0	89	346
16:45	0	2	10	30	13	4	2	1	1	1	13	0	77	333
17:00	0	0	19	28	15	3	1	2	1	3	7	1	80	339
17:15	0	1	24	34	21	3	2	2	2 <	2	9	0	100	346
17:30	0	4 <	18	32 <	9	2	2	2	1 <	1	12	1	84	341
17:45	1	0	21 <	26	14	2	0	2	0	0	6	0	72	336
18:00	0	1	16	23	21	1	0	2	1	1	8	0	74	330

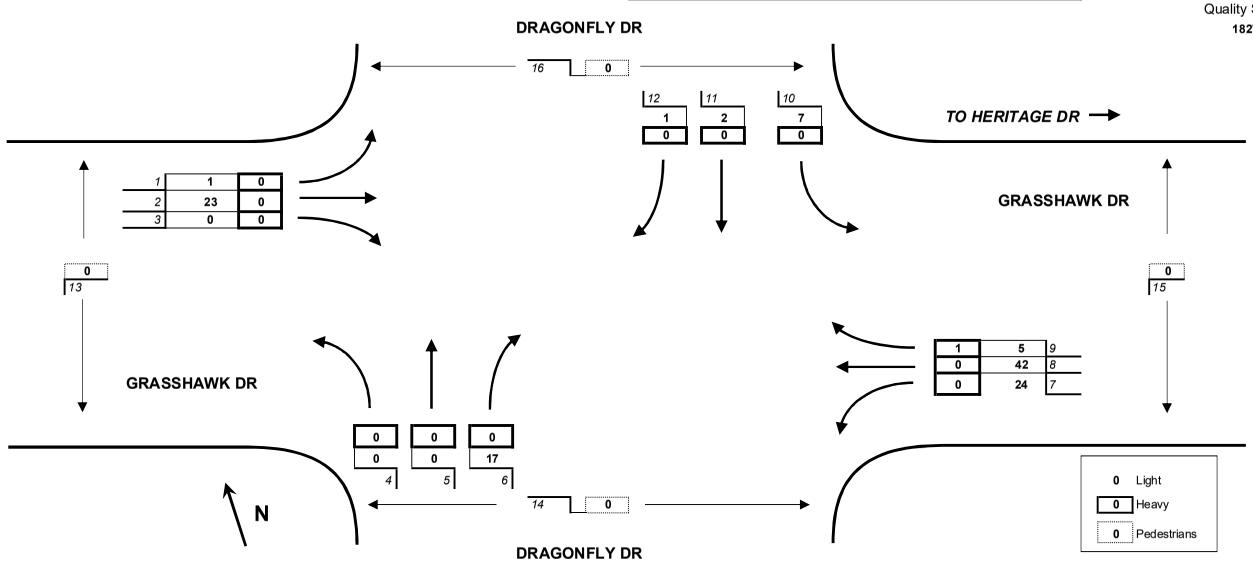
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

22/3/2018 - DRAGONFLY DR / GRASSHAWK DR, CHISHOLM

17:45 <<< HOUR ENDING **Thursday**

Summary:	DRAGONFLY DR / GRASSHAWK DR
122	Total Light Vehicles
1	Total Heavy Vehicles
0	Total Pedestrians

Quality Surveys
182790



22/3/2018 - DRAGONFLY DR / GRASSHAWK DR, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
15:15	3	4	0	0	1	9	4	7	2	2	1	0	33		0	0	0	0
15:30	0	7	1	0	1	3	6	13	1	0	0	0	32		0	0	0	0
15:45	0	4	0	0	0	2	5	2	4	3	0	0	20		0	0	0	0
16:00	0 <	5	0 <	0	1 <	2	5	6	3	2	1	0	25	110	0	0	1 <	0
16:15	1	1	0 <	0	1 <	3	6	9	3	3	1	1	29	106	0	0	0 <	1
16:30	0	3	0	0	0	4	3	8	3 <	4 <	2	0	27	101	0	0	0 <	0
16:45	0	1	0	0	1 <	5	7	9	3	0	1 <	2 <	29	110	0	1 <	0 <	3 <
17:00	0	8	0	0	0	2	6	9	0	0	0	0 <	25	110	0	0 <	0	0 <
17:15	1	3	0	0	0	5	6	6	2	4	1	0	28	109	0	0 <	0	0
17:30	0	4	0	0	0	7 <	6 <	18 <	1	0	1	1 <	38	120	0	0 <	0	0
17:45	0	8 <	0	0	0	3	6	9 <	2	3	0	0	31	122 <	0	0	0	0
18:00	0	5	0	0	0	4 <	4	9 <	0	1	0	0	23	120	0	0	0	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	1 <	0	0	0	0	1	1
16:30	0	0	0	0	0	0	0	0 <	0	0	0	0	0	1
16:45	0	0	0	0	0	0	0	0 <	0	0	0	0	0	1
17:00	0	0	0	0	0	0	0	0 <	1 <	0	0	0	1	2 <
17:15	0	0	0	0	0	0	0	0	0 <	0	0	0	0	1
17:30	0	0	0	0	0	0	0	0	0 <	0	0	0	0	1
17:45	0	0	0	0	0	0	0	0	0 <	0	0	0	0	1
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
15:15	3	4	0	0	1	9	4	7	2	2	1	0	33	
15:30	0	7	1	0	1	3	6	13	1	0	0	0	32	
15:45	0	4	0	0	0	2	5	2	4	3	0	0	20	
16:00	0 <	5	0 <	0	1 <	2	5	6	3	2	1	0	25	110
16:15	1	1	0 <	0	1 <	3	6	10	3	3	1	1	30	107
16:30	0	3	0	0	0	4	3	8	3 <	4 <	2	0	27	102
16:45	0	1	0	0	1 <	5	7	9	3	0	1 <	2 <	29	111
17:00	0	8	0	0	0	2	6	9	1	0	0	0 <	26	112
17:15	1	3	0	0	0	5	6	6	2	4	1	0	28	110
17:30	0	4	0	0	0	7 <	6 <	18 <	1	0	1	1 <	38	121
17:45	0	8 <	0	0	0	3	6	9 <	2	3	0	0	31	123 <
18:00	0	5	0	0	0	4 <	4	9 <	0	1	0	0	23	120

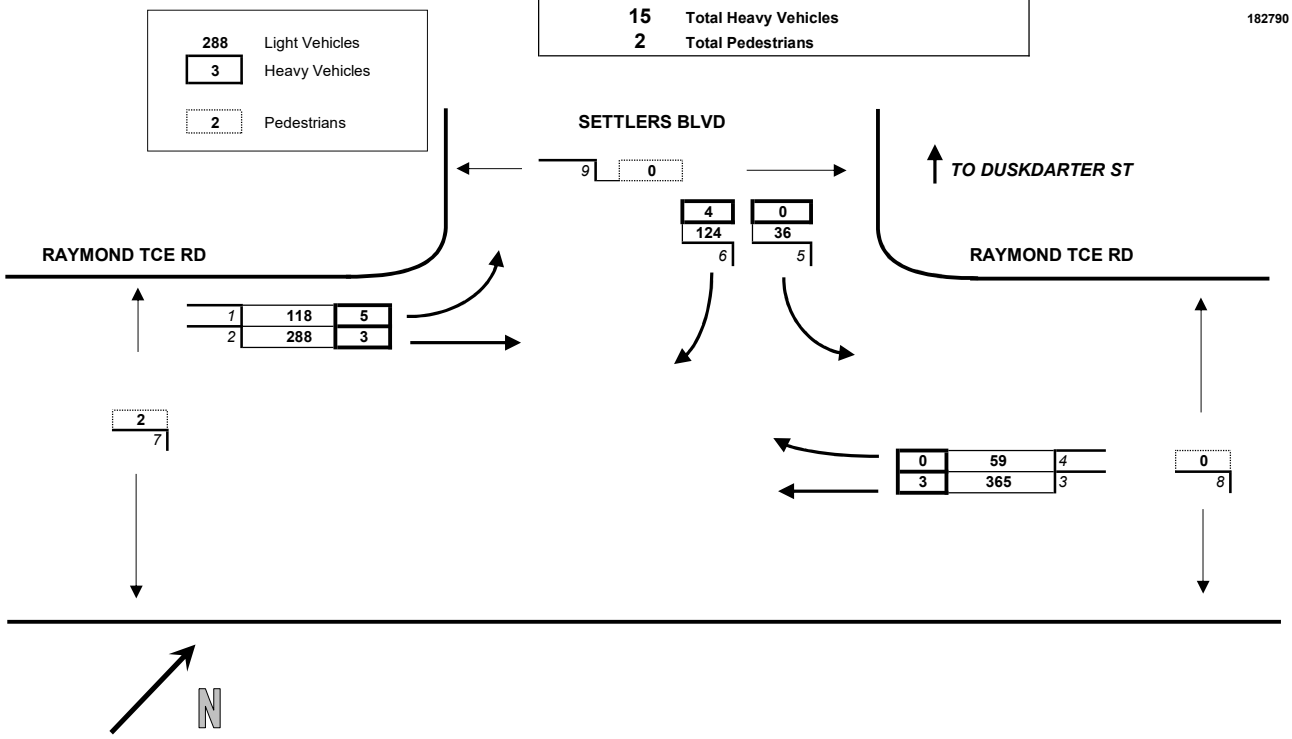
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

24/3/2018 - RAYMOND TCE RD / SETTLERS BLVD, CHISHOLM

12:00 <<< HOUR ENDING **Saturday**

Summary: RAYMOND TCE RD / SETTLERS BLVD	
990	Total Light Vehicles
15	Total Heavy Vehicles
2	Total Pedestrians

Quality Surveys
182790



24/3/2018 - RAYMOND TCE RD / SETTLERS BLVD, CHISHOLM

	Light Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR	Pedestrians 7	8	9
10:15	24	58	76	4	4	38	204		0	0	0
10:30	22	69	96	4	13	35	239		0	0	0
10:45	27	62	89	10	3	34	225		0	0	0
11:00	19	70	78	7	7	31 <	212	880	0	0	0
11:15	27	65	95	15	10	29	241	917	0	0	0
11:30	27	88	97	17	11	26	266	944	0	0	0
11:45	23	65	93	11	10 <	32	234	953	0	0	0
12:00	41	70	80 <	16 <	5	37	249	990 <	2 <	0	0
12:15	40	64	92	8	6	25	235	984	0 <	0	0
12:30	37	76	76	16	4	26	235	953	0 <	0	0
12:45	29 <	80 <	96	13	7	35	260	979	0 <	0	0
13:00	28	63	83	8	11	30	223	953	0	0	0

	Heavy Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
10:15	0	2	0	0	0	1	3	
10:30	0	0	2	0	0	2	4	
10:45	1	0	3	0	0	0	4	
11:00	1	1	0 <	0	0	0	2	13
11:15	0	0	0 <	0	0	1	1	11
11:30	1	1	1	0	0	0	3	10
11:45	1	1	1	0	0	0	3	9
12:00	3 <	1	1	0	0	3 <	8	15
12:15	0 <	1	1	0	0	1 <	3	17
12:30	0	2 <	2 <	0	0	0 <	4	18 <
12:45	0	0	1 <	0	1 <	0 <	2	17
13:00	0	0	0	0	0 <	1	1	10

	All Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
10:15	24	60	76	4	4	39	207	
10:30	22	69	98	4	13	37	243	
10:45	28	62	92	10	3	34	229	
11:00	20	71	78	7	7	31 <	214	893
11:15	27	65	95	15	10	30	242	928
11:30	28	89	98	17	11	26	269	954
11:45	24	66	94	11	10 <	32	237	962
12:00	44	71	81 <	16 <	5	40	257	1005 <
12:15	40	65	93	8	6	26	238	1001
12:30	37	78	78	16	4	26	239	971
12:45	29 <	80 <	97	13	8	35	262	996
13:00	28	63	83	8	11	31	224	963

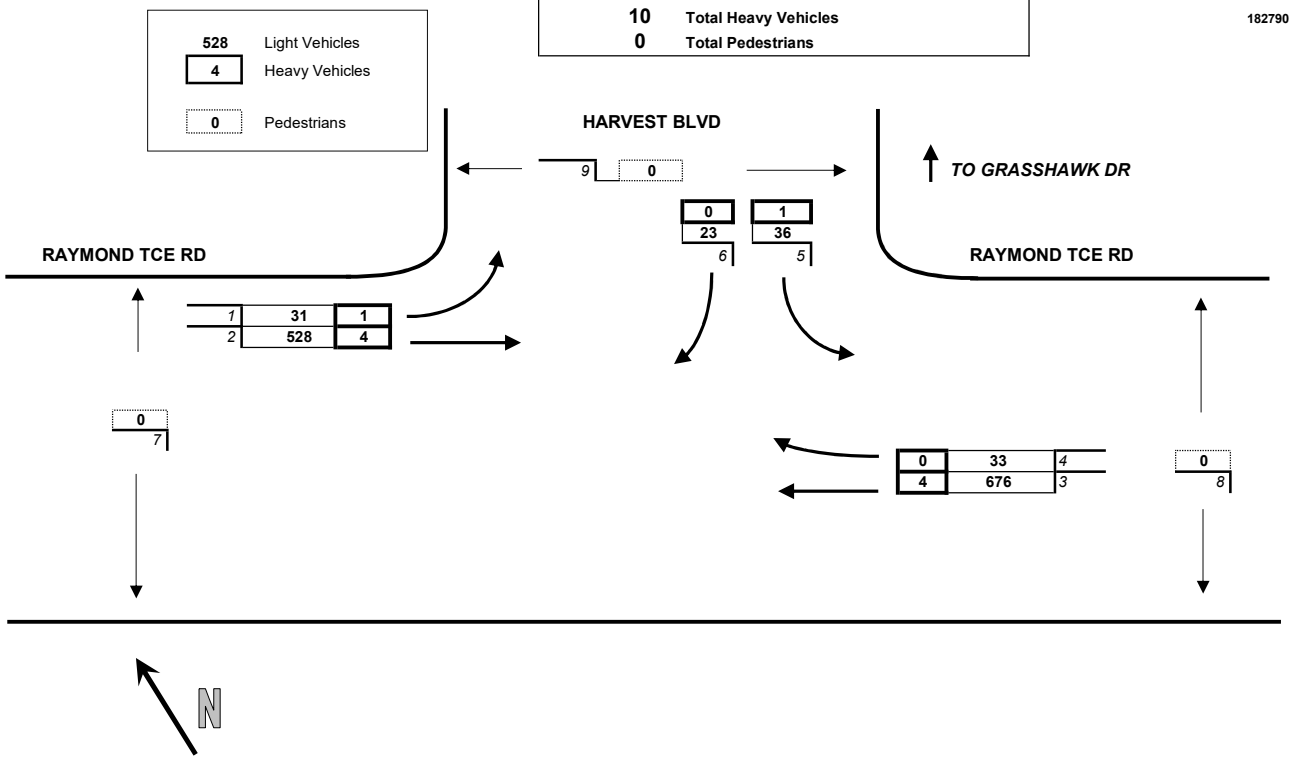
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

24/3/2018 - RAYMOND TCE RD / HARVEST BLVD, CHISHOLM

11:45 <<< HOUR ENDING **Saturday**

Summary: RAYMOND TCE RD / HARVEST BLVD	
1327	Total Light Vehicles
10	Total Heavy Vehicles
0	Total Pedestrians

Quality Surveys
182790



24/3/2018 - RAYMOND TCE RD / HARVEST BLVD, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR	Pedestrians 7	8	9
10:15	8	116	160	9	7	9	309		0	0	0
10:30	5	141	173	8	7	6	340		0	0	0
10:45	5	127	150	6	5	8	301		0	0	0
11:00	11	114	172	9	13	4	323	1273	0	0	0
11:15	4	129	173	9	8	9	332	1296	0	0	0
11:30	4	147	161	10	9	7	338	1294	0	0	0
11:45	12	138	170 <	5	6	3	334	1327 <	0	0	0
12:00	13	133	144	6	14 <	7	317	1321	0	0	0
12:15	5	142	159	12	2	3	323	1312	0	0	0
12:30	8 <	149 <	153	9	11	12	342	1316	0	0	1 <
12:45	2	133	149	11 <	8	9 <	312	1294	0	0	0 <
13:00	11	132	174	5	11	5	338	1315	0	0	0 <

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
10:15	1	1	0	0	0	0	2	
10:30	0	0	3	0	0	0	3	
10:45	0	1	3	0	0	0	4	
11:00	1 <	1	1	0	0	0	3	12
11:15	0	0	1 <	0	0	0	1	11
11:30	0	1	1	0	1 <	0	3	11
11:45	0	2	1	0	0 <	0	3	10
12:00	0	1	1	1	0 <	0	3	10
12:15	0	2 <	4	1	0 <	0	7	16
12:30	0	1 <	2 <	1 <	0	0	4	17 <
12:45	0	0	1 <	0 <	1 <	0	2	16
13:00	0	1	0	0	0 <	0	1	14

All Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
10:15	9	117	160	9	7	9	311	
10:30	5	141	176	8	7	6	343	
10:45	5	128	153	6	5	8	305	
11:00	12	115	173	9	13	4	326	1285
11:15	4	129	174	9	8	9	333	1307
11:30	4	148	162	10	10	7	341	1305
11:45	12	140	171 <	5	6	3	337	1337 <
12:00	13	134	145	7	14 <	7	320	1331
12:15	5	144	163	13	2	3	330	1328
12:30	8 <	150 <	155	10	11	12	346	1333
12:45	2	133	150	11 <	9	9 <	314	1310
13:00	11	133	174	5	11	5	339	1329

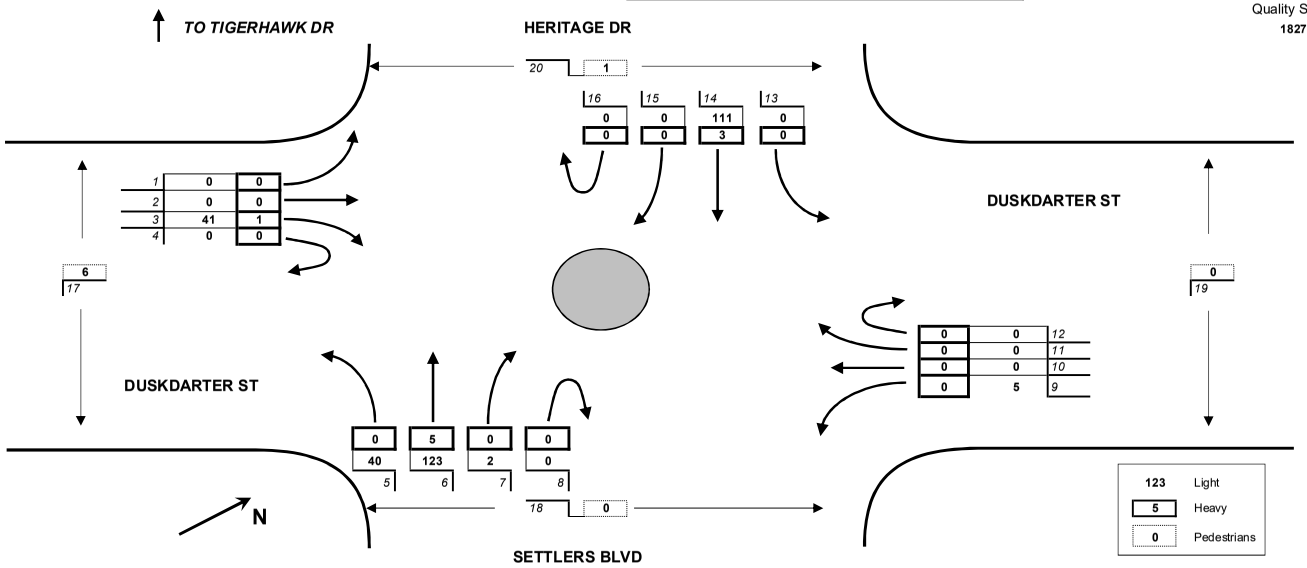
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

24/3/2018 - HERITAGE DR / DUSKDARTER ST, CHISHOLM

12:00 <<< HOUR ENDING **Saturday**

Summary:	HERITAGE DR / DUSKDARTER ST
322	Total Light Vehicles
9	Total Heavy Vehicles
7	Total Pedestrians

Quality Surveys
182790



24/3/2018 - HERITAGE DR / DUSKDARTER ST, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR	Pedestrians 17	18	19	20
10:15	0	0	14	0	6	20	0	0	0	0	0	0	0	28	0	0	68		0	0	0	1
10:30	0	0	13	0	7	16	2	2	2	0	0	0	0	28	0	0	70		2	1	1	0
10:45	0	0	14	0	12	20	2	1	0	1	0	0	0	20	0	0	70		0	0	0	0
11:00	0	0	7 <	0	6	19	1	0 <	1	0	0	0	0	25	0	0	59	267	0	0 <	0 <	0 <
11:15	0	0	9	0	12	23	1 <	0 <	2 <	0	0	0	0	28	0	0	75	274	5 <	0 <	0 <	1 <
11:30	0	0	12	0	9	32	0	0	2 <	0	0	0	0	23	0	0	78	282	0	0	0	0 <
11:45	0	0	15	0	5	32	0	0	0 <	0	0	0	0	27	0	0	79	291	1	0	0	0 <
12:00	0	0	5	0	14	36	1	0	1 <	0	0	0	0	33 <	0	0	90	322 <	0	0	0	0 <
12:15	0	0	6	0	8	36	0	0	0	2 <	0	0	0	21	0	0	73	320	1	0	0	0
12:30	0	0	6	0	11	34 <	0	0	1	0 <	0	0	0	20	0	0	72	314	0	0	0	0
12:45	0	0	8	0	12 <	28	1	1	0	0 <	0	0	0	36	0	0	86	321	0	0	0	0
13:00	0	0	7	0	8	26	2	0	3	0 <	0	0	1 <	28	0	0	75	306	0	0	0	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR
10:15	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	3	
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:45	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
11:00	0	0	0	0	1 <	0	0	0	0 <	0	0	0	0	0	0	0	1	5
11:15	0	0	0	0	0 <	0	0	0	0	0	0	0	0	1	0	0	1	3
11:30	0	0	0	0	0 <	1	0	0	0	0	0	0	0	0	0	0	1	4
11:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	4
12:00	0	0	1 <	0	0	3 <	0	0	0	0	0	0	0	2	0	0	6	9 <
12:15	0	0	0 <	0	0	0 <	0	0	0	0	0	0	0	1	0	0	1	9 <
12:30	0	0	0 <	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
12:45	0	0	0 <	0	0	0	0	0	0	0	0	0	0	1 <	0	0	1	8
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total Vehicles 15 MIN	Total Vehicles HOUR
10:15	0	0	14	0	6	20	0	0	1	0	0	0	0	30	0	0	71	
10:30	0	0	13	0	7	16	2	2	2	0	0	0	0	28	0	0	70	
10:45	0	0	14	0	13	20	2	1	0	1	0	0	0	20	0	0	71	
11:00	0	0	7 <	0	7	19	1	0 <	1	0	0	0	0	25	0	0	60	272
11:15	0	0	9	0	12	23	1 <	0 <	2 <	0	0	0	0	29	0	0	76	277
11:30	0	0	12	0	9	33	0	0	2 <	0	0	0	0	23	0	0	79	286
11:45	0	0	15	0	5	33	0	0	0 <	0	0	0	0	27	0	0	80	295
12:00	0	0	6	0	14	39	1	0	1 <	0	0	0	0	35 <	0	0	96	331 <
12:15	0	0	6	0	8	36	0	0	0	2 <	0	0	0	22	0	0	74	329
12:30	0	0	6	0	11	34 <	0	0	1	0 <	0	0	0	20	0	0	72	322
12:45	0	0	8	0	12 <	28	1	1	0	0 <	0	0	0	37 <	0	0	87	329
13:00	0	0	7	0	8	26	2	0	3	0 <	0	0	1 <	29	0	0	76	309

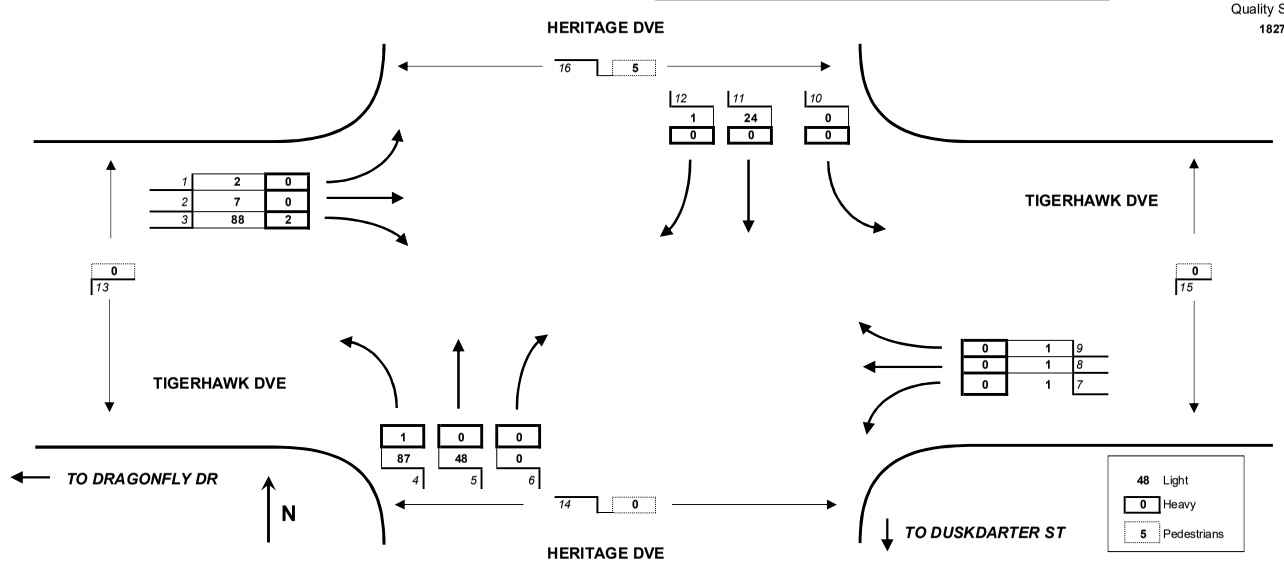
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

24/3/2018 - HERITAGE DVE / TIGERHAWK DVE, CHISHOLM

12:45 <<< HOUR ENDING **Saturday**

Summary:	HERITAGE DVE / TIGERHAWK DVE
260	Total Light Vehicles
3	Total Heavy Vehicles
5	Total Pedestrians

Quality Surveys
182790



24/3/2018 - HERITAGE DVE / TIGERHAWK DVE, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
10:15	0	1	15	13	8	0	0	1	0	0	11	0	49		1	0	0	1
10:30	0	2	20	11	5	0	1	1	1	1	7	0	49		0	0	0	1
10:45	0	0	18	13	7	0	0	1	0	0	5	1	45		0	0	0	0
11:00	1	0	21	14	5	0	0 <	0 <	0	1	3	0 <	45	188	0 <	0	0	0
11:15	0	1	21	20	3	0	0 <	0	1 <	1 <	7	0 <	54	193	1 <	0	0	0
11:30	0	1	16	26	6	0	0	0	0	0	7	0 <	56	200	0 <	0	0	1
11:45	0	1	23	21	11	0	1 <	0	0	0	2	0	59	214	0 <	0	0	0
12:00	1	3	32 <	24	13	0	0 <	0	1 <	0	6	0	80	249	0 <	0	0	2
12:15	1 <	2 <	15	28 <	8	0	0 <	1	0	0	3	1 <	59	254	0	0	0	3 <
12:30	0 <	1 <	15	21	13	0	0 <	0	0	0	5	0 <	55	253	0	0	0	0
12:45	0 <	1 <	26	14	14 <	0	1 <	0	0	0	10	0 <	66	260 <	0	0	0	0
13:00	0	2	23	17	9	0	0 <	1	2 <	0	9 <	0 <	63	243	0	0	0	2

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
10:15	0	1	1	0	0	0	0	0	0	0	0	0	2	
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00	0	0 <	0	0	0	0	0	0	0	0	0	0	0	2
11:15	0	0	1	0	0	0	0	0	0	0	0	0	1	1
11:30	0	0	0	1	0	0	0	0	0	0	0	0	1	2
11:45	0	0	0	1	0	0	0	0	0	0	0	0	1	3
12:00	0	0	1 <	1 <	0	0	0	0	0	0	0	0	2	5 <
12:15	0	0	0	0 <	0	0	0	0	0	0	0	0	0	4
12:30	0	0	1 <	0	0	0	0	0	0	0	0	0	1	4
12:45	0	0	0 <	0	0	0	0	0	0	0	0	0	0	3
13:00	0	0	0	0	0	0	0	0	0	0	1 <	0	1	2

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
10:15	0	2	16	13	8	0	0	1	0	0	11	0	51	
10:30	0	2	20	11	5	0	1	1	1	1	7	0	49	
10:45	0	0	18	13	7	0	0	1	0	0	5	1	45	
11:00	1	0	21	14	5	0	0 <	0 <	0	1	3	0 <	45	190
11:15	0	1	22	20	3	0	0 <	0	1 <	1 <	7	0 <	55	194
11:30	0	1	16	27	6	0	0	0	0	0	7	0 <	57	202
11:45	0	1	23	22	11	0	1 <	0	0	0	2	0	60	217
12:00	1	3	33 <	25	13	0	0 <	0	1 <	0	6	0	82	254
12:15	1 <	2 <	15	28 <	8	0	0 <	1	0	0	3	1 <	59	258
12:30	0 <	1 <	16	21	13	0	0 <	0	0	0	5	0 <	56	257
12:45	0 <	1 <	26	14	14 <	0	1 <	0	0	0	10	0 <	66	263 <
13:00	0	2	23	17	9	0	0 <	1	2 <	0	10 <	0 <	64	245

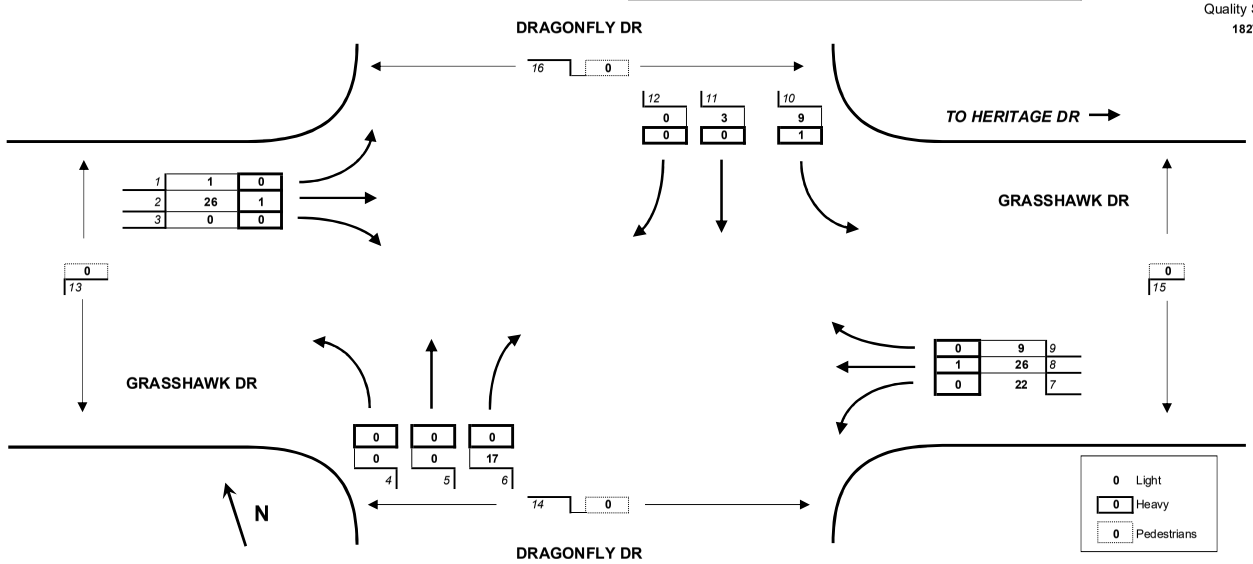
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

24/3/2018 - DRAGONFLY DR / GRASSHAWK DR, CHISHOLM

12:30 <<< HOUR ENDING **Saturday**

Summary:	DRAGONFLY DR / GRASSHAWK DR
113	Total Light Vehicles
3	Total Heavy Vehicles
0	Total Pedestrians

Quality Surveys
182790



24/3/2018 - DRAGONFLY DR / GRASSHAWK DR, CHISHOLM

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
10:15	0	4	0	0	1	1	1	5	4	5	0	0	21		0	0	0	0
10:30	0	9	0	0	0	2	3	4	0	3	1	0	22		1	0	0	0
10:45	0	4	0	0	0	2	0	4	1	2	0	0	13		0	0	0	0
11:00	0	5	0	0	1	5	1	2	0	1 <	0	0	15	71	0	0	1	0
11:15	0	7	0	0	0	7	5	6	1	1	0	1	28	78	1 <	0	0	0
11:30	0	6	0	0	1	1	1	8	0	1	0	0	18	74	0	0	1 <	1 <
11:45	0	9	0	0	0	5	6	5	2	3	0	0	30	91	0	0	0 <	0 <
12:00	0	9 <	0	0	0	5	6	6	2	4	0	0	32	108	0	0	0	0 <
12:15	0	1	0	0	0	5	4	8 <	2	2	3	0	25	105	0	0	0	0 <
12:30	1	7	0	0	0	2	6 <	7	3 <	0	0	0	26	113 <	0	0	0	0
12:45	1	4	0	0	1	3	2	6 <	0	2	3	1	23	106	0	0	0	1 <
13:00	1 <	6	0	1 <	2 <	12 <	10 <	1	1	1	2 <	1 <	38	112	0	0	0	0 <

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
10:15	0	1	0	0	0	0	0	0	0	0	1	0	2	
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00	0	0 <	0	0	0	0	0	0	1 <	0	0 <	0	1	3 <
11:15	0	0	0	0	0	0	0	0	0 <	0	0	0	0	1
11:30	0	0	0	0	0	0	0	1	0 <	0	0	0	1	2
11:45	0	0	0	0	0	0	0	0	0 <	0	0	0	0	2
12:00	0	0	0	0	0	0	0	1 <	0	1 <	0	0	2	3 <
12:15	0	0	0	0	0	0	0	0 <	0	0 <	0	0	0	3 <
12:30	0	1 <	0	0	0	0	0	0	0	0 <	0	0	1	3 <
12:45	0	0 <	0	0	0	0	0	0	0	0 <	0	0	0	3 <
13:00	0	0 <	0	0	0	0	0	0	0	0	0	0	0	1

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
10:15	0	5	0	0	1	1	1	5	4	5	1	0	23	
10:30	0	9	0	0	0	2	3	4	0	3	1	0	22	
10:45	0	4	0	0	0	2	0	4	1	2	0	0	13	
11:00	0	5	0	0	1	5	1	2	1	1 <	0	0	16	74
11:15	0	7	0	0	0	7	5	6	1	1	0	1	28	79
11:30	0	6	0	0	1	1	1	9	0	1	0	0	19	76
11:45	0	9	0	0	0	5	6	5	2	3	0	0	30	93
12:00	0	9 <	0	0	0	5	6	7	2	5	0	0	34	111
12:15	0	1	0	0	0	5	4	8 <	2	2 <	3	0	25	108
12:30	1	8	0	0	0	2	6 <	7	3 <	0	0	0	27	116 <
12:45	1	4	0	0	1	3	2	6	0	2	3	1	23	109
13:00	1 <	6	0	1 <	2 <	12 <	10 <	1	1	1	2 <	1 <	38	113

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

ANNEXURE C: SIDRA RESULTS
(45 SHEETS)

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018] AM (Site Folder: Existing 2018 Volumes)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	426	12	448	2.8	0.252	12.1	LOS A	5.4	38.5	0.59	0.49	0.59	50.5
6	R2	141	5	148	3.5	* 0.437	37.6	LOS C	5.3	38.3	0.93	0.79	0.93	36.4
Approach		567	17	597	3.0	0.437	18.4	LOS B	5.4	38.5	0.67	0.57	0.67	46.0
North: Settlers Boulevarde (N)														
7	L2	125	4	132	3.2	0.380	27.2	LOS B	7.0	50.4	0.80	0.79	0.80	40.8
9	R2	351	8	369	2.3	* 0.461	29.3	LOS C	8.4	59.8	0.84	0.80	0.84	40.1
Approach		476	12	501	2.5	0.461	28.7	LOS C	8.4	59.8	0.83	0.79	0.83	40.3
West: Raymond Terrace Road (W)														
10	L2	181	9	191	5.0	0.106	6.0	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
11	T1	298	13	314	4.4	* 0.461	27.4	LOS B	7.4	53.6	0.88	0.72	0.88	41.4
Approach		479	22	504	4.6	0.461	19.3	LOS B	7.4	53.6	0.54	0.64	0.54	45.7
All Vehicles		1522	51	1602	3.4	0.461	21.9	LOS B	8.4	59.8	0.68	0.66	0.68	44.0

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018] PM (Site Folder: Existing 2018 Volumes)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	474	7	499	1.5	0.219	6.4	LOS A	4.3	30.6	0.43	0.36	0.43	54.6
6	R2	92	3	97	3.3	* 0.328	38.7	LOS C	3.5	25.0	0.93	0.77	0.93	36.0
Approach		566	10	596	1.8	0.328	11.6	LOS A	4.3	30.6	0.51	0.43	0.51	50.4
North: Settlers Boulevarde (N)														
7	L2	40	1	42	2.5	0.269	36.0	LOS C	3.3	23.1	0.89	0.76	0.89	37.2
9	R2	151	2	159	1.3	* 0.327	37.3	LOS C	3.7	26.3	0.91	0.77	0.91	36.8
Approach		191	3	201	1.6	0.327	37.0	LOS C	3.7	26.3	0.90	0.77	0.90	36.9
West: Raymond Terrace Road (W)														
10	L2	201	2	212	1.0	0.115	5.8	LOS A	0.0	0.0	0.00	0.53	0.00	54.9
11	T1	379	5	399	1.3	* 0.348	17.1	LOS B	7.5	52.8	0.71	0.59	0.71	47.0
Approach		580	7	611	1.2	0.348	13.2	LOS A	7.5	52.8	0.46	0.57	0.46	49.5
All Vehicles		1337	20	1407	1.5	0.348	15.9	LOS B	7.5	52.8	0.55	0.54	0.55	47.5

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018] Weekend (Site Folder: Existing 2018 Volumes)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]
Weekend Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	368	3	387	0.8	0.173	6.5	LOS A	3.3	23.6	0.43	0.36	0.43	54.5
6	R2	59	0	62	0.0	* 0.243	40.0	LOS C	2.3	15.8	0.93	0.75	0.93	35.6
Approach		427	3	449	0.7	0.243	11.1	LOS A	3.3	23.6	0.50	0.41	0.50	50.8
North: Settlers Boulevarde (N)														
7	L2	36	0	38	0.0	0.217	34.6	LOS C	2.7	19.4	0.86	0.75	0.86	37.8
9	R2	128	4	135	3.1	* 0.263	35.9	LOS C	3.1	22.1	0.88	0.76	0.88	37.3
Approach		164	4	173	2.4	0.263	35.6	LOS C	3.1	22.1	0.88	0.76	0.88	37.4
West: Raymond Terrace Road (W)														
10	L2	123	5	129	4.1	0.072	5.8	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	291	3	306	1.0	* 0.259	15.7	LOS B	5.4	37.9	0.67	0.55	0.67	47.8
Approach		414	8	436	1.9	0.259	12.8	LOS A	5.4	37.9	0.47	0.54	0.47	49.7
All Vehicles		1005	15	1058	1.5	0.263	15.8	LOS B	5.4	37.9	0.55	0.52	0.55	47.6

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018] AM (Site Folder: Existing 2018 Volumes)]

Harvest Boulevarde / Raymond Terrace
Existing [2018]
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	929	3	978	0.3	0.359	6.0	LOS A	7.6	53.0	0.43	0.38	0.43	55.3
6	R2	35	1	37	2.9	* 0.270	45.9	LOS D	1.5	10.5	0.98	0.72	0.98	33.6
Approach		964	4	1015	0.4	0.359	7.4	LOS A	7.6	53.0	0.45	0.39	0.45	54.1
North: Harvest Boulevarde (N)														
7	L2	45	1	47	2.2	0.086	28.3	LOS B	1.3	9.5	0.75	0.71	0.75	40.6
9	R2	35	1	37	2.9	* 0.162	40.6	LOS C	1.3	9.6	0.93	0.72	0.93	35.2
Approach		80	2	84	2.5	0.162	33.6	LOS C	1.3	9.6	0.83	0.72	0.83	38.1
West: Raymond Terrace Road (W)														
10	L2	9	0	9	0.0	0.235	15.5	LOS B	4.9	35.5	0.55	0.48	0.55	50.2
11	T1	622	22	655	3.5	* 0.399	11.0	LOS A	9.4	67.5	0.59	0.52	0.59	51.0
Approach		631	22	664	3.5	0.399	11.1	LOS A	9.4	67.5	0.59	0.52	0.59	51.0
All Vehicles		1675	28	1763	1.7	0.399	10.1	LOS A	9.4	67.5	0.52	0.46	0.52	51.8

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018] PM (Site Folder: Existing 2018 Volumes)]

Harvest Boulevarde / Raymond Terrace
Existing [2018]
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	905	5	953	0.6	0.350	5.9	LOS A	7.3	51.3	0.43	0.38	0.43	55.4
6	R2	57	1	60	1.8	* 0.436	46.7	LOS D	2.4	17.2	0.99	0.75	0.99	33.4
Approach		962	6	1013	0.6	0.436	8.3	LOS A	7.3	51.3	0.46	0.40	0.46	53.3
North: Harvest Boulevarde (N)														
7	L2	40	0	42	0.0	0.076	28.4	LOS B	1.2	8.3	0.75	0.71	0.75	40.7
9	R2	33	0	35	0.0	* 0.150	40.4	LOS C	1.3	8.8	0.92	0.72	0.92	35.3
Approach		73	0	77	0.0	0.150	33.8	LOS C	1.3	8.8	0.83	0.71	0.83	38.1
West: Raymond Terrace Road (W)														
10	L2	33	0	35	0.0	0.279	15.8	LOS B	6.1	42.9	0.57	0.52	0.57	49.7
11	T1	728	6	766	0.8	* 0.474	11.6	LOS A	11.9	84.2	0.62	0.56	0.62	50.5
Approach		761	6	801	0.8	0.474	11.8	LOS A	11.9	84.2	0.62	0.55	0.62	50.5
All Vehicles		1796	12	1891	0.7	0.474	10.8	LOS A	11.9	84.2	0.54	0.48	0.54	51.2

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018] Weekend (Site Folder: Existing 2018 Volumes)]

Harvest Boulevarde / Raymond Terrace
Existing [2018]
Weekend Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	680	4	716	0.6	0.263	5.1	LOS A	5.1	35.6	0.39	0.34	0.39	55.7
6	R2	37	4	39	10.8	* 0.301	46.3	LOS D	1.6	11.9	0.98	0.73	0.98	33.4
Approach		717	8	755	1.1	0.301	7.3	LOS A	5.1	35.6	0.42	0.36	0.42	53.8
North: Harvest Boulevarde (N)														
7	L2	37	1	39	2.7	0.071	28.0	LOS B	1.1	7.8	0.75	0.71	0.75	40.7
9	R2	23	0	24	0.0	* 0.104	40.1	LOS C	0.9	6.1	0.92	0.71	0.92	35.5
Approach		60	1	63	1.7	0.104	32.6	LOS C	1.1	7.8	0.81	0.71	0.81	38.5
West: Raymond Terrace Road (W)														
10	L2	32	1	34	3.1	0.207	15.3	LOS B	4.3	30.3	0.54	0.50	0.54	49.8
11	T1	532	4	560	0.8	* 0.351	10.7	LOS A	8.1	57.2	0.58	0.51	0.58	51.0
Approach		564	5	594	0.9	0.351	10.9	LOS A	8.1	57.2	0.58	0.51	0.58	51.0
All Vehicles		1341	14	1412	1.0	0.351	9.9	LOS A	8.1	57.2	0.50	0.44	0.50	51.7

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018] AM (Site Folder: Existing 2018 Volumes)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	23	0	24	0.0	0.018	3.7	LOS A	0.1	0.7	0.05	0.42	0.05	56.3
2	T1	239	12	252	5.0	0.167	3.6	LOS A	1.0	7.4	0.05	0.41	0.05	57.3
3	R2	54	1	57	1.9	0.167	9.2	LOS A	1.0	7.4	0.05	0.41	0.05	57.7
Approach		316	13	333	4.1	0.167	4.5	LOS A	1.0	7.4	0.05	0.41	0.05	57.3
East: Settlers Boulevarde (E)														
4	L2	61	9	64	14.8	0.051	5.4	LOS A	0.3	2.3	0.50	0.53	0.50	54.1
5	T1	4	0	4	0.0	0.006	5.5	LOS A	0.0	0.2	0.51	0.49	0.51	55.0
6	R2	1	0	1	0.0	0.006	11.1	LOS B	0.0	0.2	0.51	0.49	0.51	55.4
Approach		66	9	69	13.6	0.051	5.5	LOS A	0.3	2.3	0.50	0.53	0.50	54.2
North: Heritage Drive (N)														
7	L2	3	0	3	0.0	0.250	4.2	LOS A	1.5	10.6	0.35	0.42	0.35	54.8
8	T1	320	3	337	0.9	0.250	4.4	LOS A	1.5	10.6	0.35	0.42	0.35	56.5
9	R2	1	0	1	0.0	0.250	9.9	LOS A	1.5	10.6	0.35	0.42	0.35	56.9
Approach		324	3	341	0.9	0.250	4.4	LOS A	1.5	10.6	0.35	0.42	0.35	56.5
West: Duskdarter Street (W)														
10	L2	1	0	1	0.0	0.077	4.7	LOS A	0.4	2.7	0.42	0.64	0.42	51.2
11	T1	2	0	2	0.0	0.077	4.9	LOS A	0.4	2.7	0.42	0.64	0.42	52.6
12	R2	85	0	89	0.0	0.077	10.5	LOS B	0.4	2.7	0.42	0.64	0.42	52.9
Approach		88	0	93	0.0	0.077	10.3	LOS B	0.4	2.7	0.42	0.64	0.42	52.9
All Vehicles		794	25	836	3.1	0.250	5.2	LOS A	1.5	10.6	0.25	0.45	0.25	56.2

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018] PM (Site Folder: Existing 2018 Volumes)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	58	1	61	1.7	0.043	3.7	LOS A	0.2	1.5	0.03	0.43	0.03	56.3
2	T1	166	9	175	5.4	0.096	3.6	LOS A	0.5	3.7	0.03	0.35	0.03	58.2
3	R2	3	0	3	0.0	0.096	9.2	LOS A	0.5	3.7	0.03	0.35	0.03	58.7
Approach		227	10	239	4.4	0.096	3.7	LOS A	0.5	3.7	0.03	0.37	0.03	57.7
East: Settlers Boulevarde (E)														
4	L2	30	8	32	26.7	0.023	4.7	LOS A	0.1	1.0	0.34	0.45	0.34	54.4
5	T1	1	0	1	0.0	0.002	4.5	LOS A	0.0	0.1	0.36	0.49	0.36	54.7
6	R2	1	0	1	0.0	0.002	10.2	LOS B	0.0	0.1	0.36	0.49	0.36	55.1
Approach		32	8	34	25.0	0.023	4.8	LOS A	0.1	1.0	0.34	0.46	0.34	54.5
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.118	3.6	LOS A	0.6	4.5	0.17	0.35	0.17	55.8
8	T1	167	3	176	1.8	0.118	3.8	LOS A	0.6	4.5	0.17	0.35	0.17	57.5
9	R2	1	0	1	0.0	0.118	9.4	LOS A	0.6	4.5	0.17	0.35	0.17	58.0
Approach		169	3	178	1.8	0.118	3.8	LOS A	0.6	4.5	0.17	0.35	0.17	57.5
West: Duskdarter Street (W)														
10	L2	2	0	2	0.0	0.035	4.1	LOS A	0.2	1.2	0.31	0.59	0.31	51.8
11	T1	2	0	2	0.0	0.035	4.2	LOS A	0.2	1.2	0.31	0.59	0.31	53.3
12	R2	40	0	42	0.0	0.035	9.9	LOS A	0.2	1.2	0.31	0.59	0.31	53.6
Approach		44	0	46	0.0	0.035	9.4	LOS A	0.2	1.2	0.31	0.59	0.31	53.5
All Vehicles		472	21	497	4.4	0.118	4.3	LOS A	0.6	4.5	0.13	0.39	0.13	57.0

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018] Weekend (Site Folder: Existing 2018 Volumes)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]
Weekend Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	40	0	42	0.0	0.030	3.6	LOS A	0.1	1.0	0.03	0.43	0.03	56.3
2	T1	128	5	135	3.9	0.074	3.6	LOS A	0.4	2.7	0.03	0.35	0.03	58.3
3	R2	2	0	2	0.0	0.074	9.2	LOS A	0.4	2.7	0.03	0.35	0.03	58.7
Approach		170	5	179	2.9	0.074	3.6	LOS A	0.4	2.7	0.03	0.37	0.03	57.8
East: Settlers Boulevarde (E)														
4	L2	5	0	5	0.0	0.003	4.1	LOS A	0.0	0.1	0.27	0.41	0.27	55.4
5	T1	1	0	1	0.0	0.002	4.2	LOS A	0.0	0.1	0.30	0.49	0.30	55.0
6	R2	1	0	1	0.0	0.002	9.8	LOS A	0.0	0.1	0.30	0.49	0.30	55.3
Approach		7	0	7	0.0	0.003	4.9	LOS A	0.0	0.1	0.28	0.43	0.28	55.3
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.083	3.6	LOS A	0.4	3.0	0.16	0.35	0.16	55.8
8	T1	114	3	120	2.6	0.083	3.8	LOS A	0.4	3.0	0.16	0.35	0.16	57.5
9	R2	1	0	1	0.0	0.083	9.4	LOS A	0.4	3.0	0.16	0.35	0.16	58.0
Approach		116	3	122	2.6	0.083	3.8	LOS A	0.4	3.0	0.16	0.35	0.16	57.5
West: Duskdarter Street (W)														
10	L2	1	0	1	0.0	0.035	3.9	LOS A	0.2	1.1	0.27	0.59	0.27	51.7
11	T1	1	0	1	0.0	0.035	4.0	LOS A	0.2	1.1	0.27	0.59	0.27	53.2
12	R2	42	1	44	2.4	0.035	9.7	LOS A	0.2	1.1	0.27	0.59	0.27	53.5
Approach		44	1	46	2.3	0.035	9.5	LOS A	0.2	1.1	0.27	0.59	0.27	53.4
All Vehicles		337	9	355	2.7	0.083	4.5	LOS A	0.4	3.0	0.11	0.39	0.11	57.0

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018] AM (Site Folder: Existing 2018 Volumes)]

Heritage Drive / Tigerhawk
Existing [2018]
AM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	53	7	56	13.2	0.145	6.1	LOS A	0.4	3.1	0.17	0.21	0.17	55.3
2	T1	148	1	156	0.7	0.145	0.3	LOS A	0.4	3.1	0.17	0.21	0.17	57.5
3	R2	41	4	43	9.8	0.145	6.4	LOS A	0.4	3.1	0.17	0.21	0.17	54.9
Approach		242	12	255	5.0	0.145	2.6	NA	0.4	3.1	0.17	0.21	0.17	56.5
East: Tigerhawk Drive (E)														
4	L2	30	0	32	0.0	0.074	6.1	LOS A	0.3	1.9	0.34	0.62	0.34	52.6
5	T1	11	0	12	0.0	0.074	6.3	LOS A	0.3	1.9	0.34	0.62	0.34	52.7
6	R2	24	1	25	4.2	0.074	8.2	LOS A	0.3	1.9	0.34	0.62	0.34	51.9
Approach		65	1	68	1.5	0.074	6.9	LOS A	0.3	1.9	0.34	0.62	0.34	52.3
North: Heritage Drive (N)														
7	L2	28	5	29	17.9	0.113	5.8	LOS A	0.0	0.3	0.02	0.09	0.02	56.7
8	T1	171	1	180	0.6	0.113	0.0	LOS A	0.0	0.3	0.02	0.09	0.02	59.2
9	R2	4	0	4	0.0	0.113	6.2	LOS A	0.0	0.3	0.02	0.09	0.02	57.0
Approach		203	6	214	3.0	0.113	0.9	NA	0.0	0.3	0.02	0.09	0.02	58.8
West: Tigerhawk Drive (W)														
10	L2	24	0	25	0.0	0.234	6.1	LOS A	0.9	6.2	0.44	0.72	0.44	51.8
11	T1	23	0	24	0.0	0.234	6.5	LOS A	0.9	6.2	0.44	0.72	0.44	51.9
12	R2	122	2	128	1.6	0.234	8.6	LOS A	0.9	6.2	0.44	0.72	0.44	51.2
Approach		169	2	178	1.2	0.234	8.0	LOS A	0.9	6.2	0.44	0.72	0.44	51.4
All Vehicles		679	21	715	3.1	0.234	3.9	NA	0.9	6.2	0.21	0.34	0.21	55.4

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018] PM (Site Folder: Existing 2018 Volumes)]

Heritage Drive / Tigerhawk
Existing [2018]
PM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	95	6	100	6.3	0.103	5.7	LOS A	0.2	1.4	0.07	0.36	0.07	54.8
2	T1	60	0	63	0.0	0.103	0.1	LOS A	0.2	1.4	0.07	0.36	0.07	56.5
3	R2	16	6	17	37.5	0.103	6.3	LOS A	0.2	1.4	0.07	0.36	0.07	52.8
Approach		171	12	180	7.0	0.103	3.8	NA	0.2	1.4	0.07	0.36	0.07	55.2
East: Tigerhawk Drive (E)														
4	L2	10	0	11	0.0	0.019	5.8	LOS A	0.1	0.5	0.20	0.54	0.20	53.5
5	T1	9	0	9	0.0	0.019	5.2	LOS A	0.1	0.5	0.20	0.54	0.20	53.6
6	R2	3	0	3	0.0	0.019	6.3	LOS A	0.1	0.5	0.20	0.54	0.20	53.0
Approach		22	0	23	0.0	0.019	5.6	LOS A	0.1	0.5	0.20	0.54	0.20	53.5
North: Heritage Drive (N)														
7	L2	8	4	8	50.0	0.050	6.3	LOS A	0.0	0.3	0.04	0.08	0.04	55.3
8	T1	77	0	81	0.0	0.050	0.0	LOS A	0.0	0.3	0.04	0.08	0.04	59.3
9	R2	4	0	4	0.0	0.050	6.0	LOS A	0.0	0.3	0.04	0.08	0.04	57.1
Approach		89	4	94	4.5	0.050	0.9	NA	0.0	0.3	0.04	0.08	0.04	58.9
West: Tigerhawk Drive (W)														
10	L2	3	0	3	0.0	0.098	5.7	LOS A	0.3	2.4	0.31	0.62	0.31	52.8
11	T1	6	0	6	0.0	0.098	5.1	LOS A	0.3	2.4	0.31	0.62	0.31	53.0
12	R2	74	2	78	2.7	0.098	6.8	LOS A	0.3	2.4	0.31	0.62	0.31	52.2
Approach		83	2	87	2.4	0.098	6.6	LOS A	0.3	2.4	0.31	0.62	0.31	52.2
All Vehicles		365	18	384	4.9	0.103	3.8	NA	0.3	2.4	0.12	0.36	0.12	55.2

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018] Weekend (Site Folder: Existing 2018 Volumes)]

Heritage Drive / Tigerhawk
Existing [2018]
Weekend Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	88	1	93	1.1	0.077	5.6	LOS A	0.0	0.1	0.00	0.38	0.00	55.1
2	T1	48	0	51	0.0	0.077	0.0	LOS A	0.0	0.1	0.00	0.38	0.00	56.7
3	R2	1	0	1	0.0	0.077	5.5	LOS A	0.0	0.1	0.00	0.38	0.00	54.6
Approach		137	1	144	0.7	0.077	3.6	NA	0.0	0.1	0.00	0.38	0.00	55.7
East: Tigerhawk Drive (E)														
4	L2	1	0	1	0.0	0.003	5.6	LOS A	0.0	0.1	0.10	0.54	0.10	53.7
5	T1	1	0	1	0.0	0.003	4.7	LOS A	0.0	0.1	0.10	0.54	0.10	53.9
6	R2	1	0	1	0.0	0.003	5.8	LOS A	0.0	0.1	0.10	0.54	0.10	53.2
Approach		3	0	3	0.0	0.003	5.4	LOS A	0.0	0.1	0.10	0.54	0.10	53.6
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.014	5.8	LOS A	0.0	0.1	0.03	0.05	0.03	57.9
8	T1	24	0	25	0.0	0.014	0.0	LOS A	0.0	0.1	0.03	0.05	0.03	59.5
9	R2	1	0	1	0.0	0.014	5.8	LOS A	0.0	0.1	0.03	0.05	0.03	57.2
Approach		26	0	27	0.0	0.014	0.5	NA	0.0	0.1	0.03	0.05	0.03	59.3
West: Tigerhawk Drive (W)														
10	L2	2	0	2	0.0	0.104	5.7	LOS A	0.4	2.6	0.23	0.58	0.23	53.1
11	T1	7	0	7	0.0	0.104	4.6	LOS A	0.4	2.6	0.23	0.58	0.23	53.3
12	R2	90	2	95	2.2	0.104	6.1	LOS A	0.4	2.6	0.23	0.58	0.23	52.5
Approach		99	2	104	2.0	0.104	6.0	LOS A	0.4	2.6	0.23	0.58	0.23	52.5
All Vehicles		265	3	279	1.1	0.104	4.2	NA	0.4	2.6	0.09	0.43	0.09	54.8

MOVEMENT SUMMARY

Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018] AM (Site Folder: Existing 2018 Volumes)]

Grasshawk Drive / Dragonfly Drive
Existing [2018]
AM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.016	5.6	LOS A	0.1	0.5	0.07	0.37	0.07	55.0
2	T1	10	0	11	0.0	0.016	0.0	LOS A	0.1	0.5	0.07	0.37	0.07	56.5
3	R2	17	0	18	0.0	0.016	5.5	LOS A	0.1	0.5	0.07	0.37	0.07	54.5
Approach		28	0	29	0.0	0.016	3.6	NA	0.1	0.5	0.07	0.37	0.07	55.2
East: Grasshawk Drive (E)														
4	L2	15	0	16	0.0	0.023	5.6	LOS A	0.1	0.6	0.03	0.56	0.03	53.8
5	T1	7	0	7	0.0	0.023	4.3	LOS A	0.1	0.6	0.03	0.56	0.03	54.0
6	R2	7	1	7	14.3	0.023	6.0	LOS A	0.1	0.6	0.03	0.56	0.03	52.6
Approach		29	1	31	3.4	0.023	5.4	LOS A	0.1	0.6	0.03	0.56	0.03	53.5
North: Dragonfly Drive (N)														
7	L2	12	2	13	16.7	0.011	5.7	LOS A	0.0	0.1	0.01	0.42	0.01	54.2
8	T1	5	0	5	0.0	0.011	0.0	LOS A	0.0	0.1	0.01	0.42	0.01	56.4
9	R2	1	0	1	0.0	0.011	5.5	LOS A	0.0	0.1	0.01	0.42	0.01	54.4
Approach		18	2	19	11.1	0.011	4.1	NA	0.0	0.1	0.01	0.42	0.01	54.8
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.036	5.6	LOS A	0.1	0.9	0.12	0.51	0.12	54.3
11	T1	42	0	44	0.0	0.036	4.3	LOS A	0.1	0.9	0.12	0.51	0.12	54.5
12	R2	1	0	1	0.0	0.036	5.7	LOS A	0.1	0.9	0.12	0.51	0.12	53.8
Approach		44	0	46	0.0	0.036	4.4	LOS A	0.1	0.9	0.12	0.51	0.12	54.5
All Vehicles		119	3	125	2.5	0.036	4.4	NA	0.1	0.9	0.07	0.48	0.07	54.5

MOVEMENT SUMMARY

Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018] PM (Site Folder: Existing 2018 Volumes)]

Grasshawk Drive / Dragonfly Drive
Existing [2018]
PM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.011	5.6	LOS A	0.1	0.4	0.06	0.54	0.06	53.7
2	T1	1	0	1	0.0	0.011	0.0	LOS A	0.1	0.4	0.06	0.54	0.06	55.1
3	R2	17	0	18	0.0	0.011	5.5	LOS A	0.1	0.4	0.06	0.54	0.06	53.2
Approach		19	0	20	0.0	0.011	5.2	NA	0.1	0.4	0.06	0.54	0.06	53.3
East: Grasshawk Drive (E)														
4	L2	24	0	25	0.0	0.056	5.5	LOS A	0.2	1.5	0.02	0.55	0.02	54.2
5	T1	42	0	44	0.0	0.056	4.2	LOS A	0.2	1.5	0.02	0.55	0.02	54.4
6	R2	6	1	6	16.7	0.056	5.9	LOS A	0.2	1.5	0.02	0.55	0.02	52.9
Approach		72	1	76	1.4	0.056	4.8	LOS A	0.2	1.5	0.02	0.55	0.02	54.2
North: Dragonfly Drive (N)														
7	L2	9	2	9	22.2	0.008	5.8	LOS A	0.0	0.1	0.00	0.48	0.00	53.5
8	T1	2	0	2	0.0	0.008	0.0	LOS A	0.0	0.1	0.00	0.48	0.00	55.9
9	R2	1	0	1	0.0	0.008	5.5	LOS A	0.0	0.1	0.00	0.48	0.00	54.0
Approach		12	2	13	16.7	0.008	4.8	NA	0.0	0.1	0.00	0.48	0.00	53.9
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.020	5.5	LOS A	0.1	0.5	0.04	0.52	0.04	54.5
11	T1	23	0	24	0.0	0.020	4.2	LOS A	0.1	0.5	0.04	0.52	0.04	54.7
12	R2	1	0	1	0.0	0.020	5.8	LOS A	0.1	0.5	0.04	0.52	0.04	54.0
Approach		25	0	26	0.0	0.020	4.4	LOS A	0.1	0.5	0.04	0.52	0.04	54.6
All Vehicles		128	3	135	2.3	0.056	4.8	NA	0.2	1.5	0.03	0.53	0.03	54.1

MOVEMENT SUMMARY

Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018] Weekend (Site Folder: Existing 2018 Volumes)]

Grasshawk Drive / Dragonfly Drive
Existing [2018]
Weekend Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.011	5.6	LOS A	0.1	0.4	0.06	0.54	0.06	53.7
2	T1	1	0	1	0.0	0.011	0.0	LOS A	0.1	0.4	0.06	0.54	0.06	55.1
3	R2	17	0	18	0.0	0.011	5.5	LOS A	0.1	0.4	0.06	0.54	0.06	53.2
Approach		19	0	20	0.0	0.011	5.2	NA	0.1	0.4	0.06	0.54	0.06	53.3
East: Grasshawk Drive (E)														
4	L2	22	0	23	0.0	0.045	5.6	LOS A	0.2	1.2	0.02	0.55	0.02	54.1
5	T1	27	1	28	3.7	0.045	4.3	LOS A	0.2	1.2	0.02	0.55	0.02	54.1
6	R2	9	0	9	0.0	0.045	5.7	LOS A	0.2	1.2	0.02	0.55	0.02	53.5
Approach		58	1	61	1.7	0.045	5.0	LOS A	0.2	1.2	0.02	0.55	0.02	54.0
North: Dragonfly Drive (N)														
7	L2	10	1	11	10.0	0.008	5.7	LOS A	0.0	0.1	0.00	0.46	0.00	54.2
8	T1	3	0	3	0.0	0.008	0.0	LOS A	0.0	0.1	0.00	0.46	0.00	56.1
9	R2	1	0	1	0.0	0.008	5.5	LOS A	0.0	0.1	0.00	0.46	0.00	54.1
Approach		14	1	15	7.1	0.008	4.4	NA	0.0	0.1	0.00	0.46	0.00	54.6
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.024	5.5	LOS A	0.1	0.6	0.05	0.52	0.05	54.5
11	T1	27	1	28	3.7	0.024	4.3	LOS A	0.1	0.6	0.05	0.52	0.05	54.5
12	R2	1	0	1	0.0	0.024	5.8	LOS A	0.1	0.6	0.05	0.52	0.05	54.0
Approach		29	1	31	3.4	0.024	4.4	LOS A	0.1	0.6	0.05	0.52	0.05	54.5
All Vehicles		120	3	126	2.5	0.045	4.8	NA	0.2	1.2	0.03	0.53	0.03	54.1

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018 + Residential] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Settlers Boulevarde / Raymond Terrace
Existing [2018] + Residential
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	782	12	823	1.5	0.522	19.2	LOS B	12.8	90.5	0.75	0.65	0.75	47.1
6	R2	145	5	153	3.4	* 0.674	44.6	LOS D	6.1	44.3	1.00	0.84	1.10	34.0
Approach		927	17	976	1.8	0.674	23.2	LOS B	12.8	90.5	0.79	0.68	0.81	44.5
North: Settlers Boulevarde (N)														
7	L2	174	4	183	2.3	0.540	26.2	LOS B	11.8	84.1	0.82	0.81	0.82	41.4
9	R2	629	8	662	1.3	* 0.655	29.2	LOS C	14.8	104.7	0.86	0.83	0.86	40.8
Approach		803	12	845	1.5	0.655	28.5	LOS C	14.8	104.7	0.85	0.83	0.85	40.9
West: Raymond Terrace Road (W)														
10	L2	259	9	273	3.5	0.150	6.0	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	417	13	439	3.1	* 0.640	28.8	LOS C	10.9	78.4	0.92	0.76	0.92	40.9
Approach		676	22	712	3.3	0.640	20.1	LOS B	10.9	78.4	0.57	0.67	0.57	45.3
All Vehicles		2406	51	2533	2.1	0.674	24.1	LOS B	14.8	104.7	0.75	0.73	0.75	43.4

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018 + Residential] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Settlers Boulevarde / Raymond Terrace
Existing [2018] + Residential
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	576	7	606	1.2	0.251	5.5	LOS A	4.9	34.4	0.40	0.34	0.40	55.5
6	R2	110	3	116	2.7	* 0.636	46.0	LOS D	4.7	33.7	1.00	0.82	1.09	33.6
Approach		686	10	722	1.5	0.636	12.0	LOS A	4.9	34.4	0.49	0.42	0.51	50.3
North: Settlers Boulevarde (N)														
7	L2	54	1	57	1.9	0.501	41.7	LOS C	5.3	37.3	0.96	0.79	0.96	35.6
9	R2	227	2	239	0.9	* 0.607	42.1	LOS C	6.0	42.2	0.98	0.81	1.00	35.2
Approach		281	3	296	1.1	0.607	42.0	LOS C	6.0	42.2	0.97	0.80	0.99	35.3
West: Raymond Terrace Road (W)														
10	L2	543	2	572	0.4	0.309	6.0	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	851	5	896	0.6	* 0.627	14.6	LOS B	17.5	122.9	0.72	0.64	0.72	48.7
Approach		1394	7	1467	0.5	0.627	11.3	LOS A	17.5	122.9	0.44	0.59	0.44	51.0
All Vehicles		2361	20	2485	0.8	0.636	15.1	LOS B	17.5	122.9	0.52	0.57	0.53	48.2

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018 + Residential] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Settlers Boulevarde / Raymond Terrace
Existing [2018] + Residential
Weekend Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	527	3	555	0.6	0.262	8.5	LOS A	5.6	39.4	0.50	0.43	0.50	53.1
6	R2	66	0	69	0.0	* 0.428	45.4	LOS D	2.8	19.3	0.99	0.76	0.99	33.8
Approach		593	3	624	0.5	0.428	12.6	LOS A	5.6	39.4	0.55	0.46	0.55	49.9
North: Settlers Boulevarde (N)														
7	L2	58	0	61	0.0	0.343	33.3	LOS C	5.0	35.2	0.86	0.78	0.86	38.4
9	R2	250	4	263	1.6	* 0.416	34.5	LOS C	5.9	41.7	0.89	0.79	0.89	37.9
Approach		308	4	324	1.3	0.416	34.3	LOS C	5.9	41.7	0.88	0.79	0.88	38.0
West: Raymond Terrace Road (W)														
10	L2	260	5	274	1.9	0.149	5.8	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	484	3	509	0.6	* 0.417	16.3	LOS B	9.5	67.1	0.71	0.60	0.71	47.5
Approach		744	8	783	1.1	0.417	12.6	LOS A	9.5	67.1	0.46	0.58	0.46	49.8
All Vehicles		1645	15	1732	0.9	0.428	16.7	LOS B	9.5	67.1	0.57	0.57	0.57	47.1

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018 + Residential] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Harvest Boulevarde / Raymond Terrace
Existing [2018] + Residential
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	1366	3	1438	0.2	0.527	8.7	LOS A	13.2	92.7	0.51	0.47	0.51	54.5
6	R2	49	1	52	2.0	* 0.376	46.4	LOS D	2.1	14.7	0.99	0.74	0.99	33.5
Approach		1415	4	1489	0.3	0.527	10.0	LOS A	13.2	92.7	0.53	0.48	0.53	53.4
North: Harvest Boulevarde (N)														
7	L2	106	1	112	0.9	0.202	29.7	LOS C	3.3	23.1	0.78	0.75	0.78	40.2
9	R2	56	1	59	1.8	* 0.257	41.1	LOS C	2.2	15.5	0.94	0.75	0.94	35.1
Approach		162	2	171	1.2	0.257	33.6	LOS C	3.3	23.1	0.84	0.75	0.84	38.3
West: Raymond Terrace Road (W)														
10	L2	15	0	16	0.0	0.285	15.8	LOS B	6.2	44.4	0.57	0.50	0.57	49.9
11	T1	754	22	794	2.9	* 0.484	11.8	LOS A	12.2	87.3	0.63	0.55	0.63	50.5
Approach		769	22	809	2.9	0.484	11.9	LOS A	12.2	87.3	0.63	0.55	0.63	50.5
All Vehicles		2346	28	2469	1.2	0.527	12.3	LOS A	13.2	92.7	0.58	0.52	0.58	51.0

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018 + Residential] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Harvest Boulevarde / Raymond Terrace
Existing [2018] + Residential
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	1025	5	1079	0.5	0.380	6.4	LOS A	9.7	67.8	0.40	0.36	0.40	55.2
6	R2	120	1	126	0.8	* 0.760	58.6	LOS E	6.6	46.6	1.00	0.88	1.21	30.1
Approach		1145	6	1205	0.5	0.760	11.9	LOS A	9.7	67.8	0.47	0.42	0.49	50.7
North: Harvest Boulevarde (N)														
7	L2	57	0	60	0.0	0.108	37.8	LOS C	2.1	14.8	0.76	0.73	0.76	38.4
9	R2	38	0	40	0.0	* 0.179	49.4	LOS D	1.8	12.7	0.93	0.73	0.93	32.5
Approach		95	0	100	0.0	0.179	42.5	LOS C	2.1	14.8	0.83	0.73	0.83	35.8
West: Raymond Terrace Road (W)														
10	L2	60	0	63	0.0	0.473	18.5	LOS B	14.8	103.9	0.62	0.58	0.62	48.0
11	T1	1304	6	1373	0.5	* 0.803	18.0	LOS B	34.7	243.9	0.77	0.72	0.78	47.2
Approach		1364	6	1436	0.4	0.803	18.0	LOS B	34.7	243.9	0.77	0.71	0.77	47.2
All Vehicles		2604	12	2741	0.5	0.803	16.2	LOS B	34.7	243.9	0.64	0.58	0.65	48.1

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018 + Residential] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Harvest Boulevarde / Raymond Terrace
Existing [2018] + Residential
Weekend Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	873	4	919	0.5	0.338	5.8	LOS A	7.0	48.9	0.42	0.37	0.42	55.4
6	R2	62	4	65	6.5	* 0.490	47.1	LOS D	2.7	19.6	1.00	0.75	1.00	33.2
Approach		935	8	984	0.9	0.490	8.5	LOS A	7.0	48.9	0.46	0.40	0.46	53.1
North: Harvest Boulevarde (N)														
7	L2	64	1	67	1.6	0.122	29.0	LOS C	1.9	13.6	0.76	0.73	0.76	40.5
9	R2	32	0	34	0.0	* 0.145	40.4	LOS C	1.2	8.5	0.92	0.72	0.92	35.4
Approach		96	1	101	1.0	0.145	32.8	LOS C	1.9	13.6	0.81	0.73	0.81	38.6
West: Raymond Terrace Road (W)														
10	L2	43	1	45	2.3	0.295	15.9	LOS B	6.5	45.9	0.57	0.53	0.57	49.5
11	T1	763	4	803	0.5	* 0.501	11.9	LOS A	12.9	91.0	0.64	0.57	0.64	50.3
Approach		806	5	848	0.6	0.501	12.1	LOS A	12.9	91.0	0.63	0.57	0.63	50.3
All Vehicles		1837	14	1934	0.8	0.501	11.4	LOS A	12.9	91.0	0.55	0.49	0.55	50.8

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018 + Residential] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Settlers Boulevarde / Raymond Terrace
Existing [2018] + Residential
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	23	0	24	0.0	0.018	3.7	LOS A	0.1	0.7	0.05	0.42	0.05	56.3
2	T1	239	12	252	5.0	0.212	3.6	LOS A	1.4	9.8	0.05	0.47	0.05	56.4
3	R2	136	1	143	0.7	0.212	9.2	LOS A	1.4	9.8	0.05	0.47	0.05	56.9
Approach		398	13	419	3.3	0.212	5.5	LOS A	1.4	9.8	0.05	0.47	0.05	56.6
East: Settlers Boulevarde (E)														
4	L2	388	9	408	2.3	0.305	5.7	LOS A	2.1	15.0	0.59	0.61	0.59	54.1
5	T1	4	0	4	0.0	0.006	5.5	LOS A	0.0	0.2	0.52	0.49	0.52	55.0
6	R2	1	0	1	0.0	0.006	11.1	LOS B	0.0	0.2	0.52	0.49	0.52	55.3
Approach		393	9	414	2.3	0.305	5.7	LOS A	2.1	15.0	0.59	0.61	0.59	54.1
North: Heritage Drive (N)														
7	L2	3	0	3	0.0	0.271	4.8	LOS A	1.6	11.4	0.44	0.46	0.44	54.4
8	T1	320	3	337	0.9	0.271	4.9	LOS A	1.6	11.4	0.44	0.46	0.44	56.0
9	R2	1	0	1	0.0	0.271	10.3	LOS B	1.6	11.4	0.44	0.46	0.44	56.4
Approach		324	3	341	0.9	0.271	5.0	LOS A	1.6	11.4	0.44	0.46	0.44	56.0
West: Duskdarter Street (W)														
10	L2	1	0	1	0.0	0.082	5.1	LOS A	0.4	2.9	0.48	0.66	0.48	51.0
11	T1	2	0	2	0.0	0.082	5.4	LOS A	0.4	2.9	0.48	0.66	0.48	52.4
12	R2	85	0	89	0.0	0.082	10.9	LOS B	0.4	2.9	0.48	0.66	0.48	52.7
Approach		88	0	93	0.0	0.082	10.7	LOS B	0.4	2.9	0.48	0.66	0.48	52.7
All Vehicles		1203	25	1266	2.1	0.305	5.8	LOS A	2.1	15.0	0.36	0.53	0.36	55.3

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018 + Residential] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Settlers Boulevarde / Raymond Terrace
Existing [2018] + Residential
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	58	1	61	1.7	0.045	3.7	LOS A	0.2	1.6	0.03	0.42	0.03	56.3
2	T1	166	9	175	5.4	0.294	3.6	LOS A	1.9	13.6	0.04	0.58	0.04	55.1
3	R2	363	0	382	0.0	0.294	9.2	LOS A	1.9	13.6	0.04	0.58	0.04	55.5
Approach		587	10	618	1.7	0.294	7.1	LOS A	1.9	13.6	0.04	0.56	0.04	55.4
East: Settlers Boulevarde (E)														
4	L2	120	8	126	6.7	0.086	4.4	LOS A	0.5	3.5	0.37	0.47	0.37	54.8
5	T1	1	0	1	0.0	0.002	4.5	LOS A	0.0	0.1	0.38	0.49	0.38	54.6
6	R2	1	0	1	0.0	0.002	10.2	LOS B	0.0	0.1	0.38	0.49	0.38	55.0
Approach		122	8	128	6.6	0.086	4.5	LOS A	0.5	3.5	0.37	0.47	0.37	54.8
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.161	6.0	LOS A	0.9	6.2	0.52	0.55	0.52	53.9
8	T1	167	3	176	1.8	0.161	5.6	LOS A	0.9	6.2	0.52	0.55	0.52	55.6
9	R2	1	0	1	0.0	0.161	11.2	LOS B	0.9	6.2	0.52	0.55	0.52	56.0
Approach		169	3	178	1.8	0.161	5.7	LOS A	0.9	6.2	0.52	0.55	0.52	55.6
West: Duskdarter Street (W)														
10	L2	2	0	2	0.0	0.045	5.9	LOS A	0.2	1.7	0.55	0.67	0.55	51.0
11	T1	2	0	2	0.0	0.045	6.6	LOS A	0.2	1.7	0.55	0.67	0.55	52.4
12	R2	40	0	42	0.0	0.045	11.7	LOS B	0.2	1.7	0.55	0.67	0.55	52.7
Approach		44	0	46	0.0	0.045	11.2	LOS B	0.2	1.7	0.55	0.67	0.55	52.7
All Vehicles		922	21	971	2.3	0.294	6.7	LOS A	1.9	13.6	0.19	0.55	0.19	55.2

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018 + Residential] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Settlers Boulevarde / Raymond Terrace
Existing [2018] + Residential
Weekend Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	40	0	42	0.0	0.031	3.6	LOS A	0.1	1.0	0.03	0.42	0.03	56.3
2	T1	128	5	135	3.9	0.153	3.6	LOS A	0.8	6.0	0.03	0.54	0.03	55.8
3	R2	146	0	154	0.0	0.153	9.2	LOS A	0.8	6.0	0.03	0.54	0.03	56.2
Approach		314	5	331	1.6	0.153	6.2	LOS A	0.8	6.0	0.03	0.52	0.03	56.0
East: Settlers Boulevarde (E)														
4	L2	149	0	157	0.0	0.098	4.2	LOS A	0.5	3.7	0.30	0.45	0.30	55.3
5	T1	1	0	1	0.0	0.002	4.3	LOS A	0.0	0.1	0.32	0.49	0.32	54.9
6	R2	1	0	1	0.0	0.002	9.9	LOS A	0.0	0.1	0.32	0.49	0.32	55.2
Approach		151	0	159	0.0	0.098	4.2	LOS A	0.5	3.7	0.30	0.45	0.30	55.3
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.096	4.4	LOS A	0.5	3.4	0.34	0.42	0.34	54.8
8	T1	114	3	120	2.6	0.096	4.5	LOS A	0.5	3.4	0.34	0.42	0.34	56.5
9	R2	1	0	1	0.0	0.096	10.0	LOS A	0.5	3.4	0.34	0.42	0.34	56.9
Approach		116	3	122	2.6	0.096	4.5	LOS A	0.5	3.4	0.34	0.42	0.34	56.5
West: Duskdarter Street (W)														
10	L2	1	0	1	0.0	0.038	4.5	LOS A	0.2	1.3	0.40	0.62	0.40	51.3
11	T1	1	0	1	0.0	0.038	4.9	LOS A	0.2	1.3	0.40	0.62	0.40	52.8
12	R2	42	1	44	2.4	0.038	10.4	LOS B	0.2	1.3	0.40	0.62	0.40	53.0
Approach		44	1	46	2.3	0.038	10.1	LOS B	0.2	1.3	0.40	0.62	0.40	53.0
All Vehicles		625	9	658	1.4	0.153	5.7	LOS A	0.8	6.0	0.18	0.49	0.18	55.7

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018 + Residential] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Heritage Drive / Tigerhawk
Existing [2018] + Residential
AM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	53	7	56	13.2	0.145	6.1	LOS A	0.4	3.1	0.17	0.21	0.17	55.3
2	T1	148	1	156	0.7	0.145	0.3	LOS A	0.4	3.1	0.17	0.21	0.17	57.5
3	R2	41	4	43	9.8	0.145	6.4	LOS A	0.4	3.1	0.17	0.21	0.17	54.9
Approach		242	12	255	5.0	0.145	2.6	NA	0.4	3.1	0.17	0.21	0.17	56.5
East: Tigerhawk Drive (E)														
4	L2	30	0	32	0.0	0.074	6.1	LOS A	0.3	1.9	0.34	0.62	0.34	52.6
5	T1	11	0	12	0.0	0.074	6.3	LOS A	0.3	1.9	0.34	0.62	0.34	52.7
6	R2	24	1	25	4.2	0.074	8.2	LOS A	0.3	1.9	0.34	0.62	0.34	51.9
Approach		65	1	68	1.5	0.074	6.9	LOS A	0.3	1.9	0.34	0.62	0.34	52.3
North: Heritage Drive (N)														
7	L2	28	5	29	17.9	0.113	5.8	LOS A	0.0	0.3	0.02	0.09	0.02	56.7
8	T1	171	1	180	0.6	0.113	0.0	LOS A	0.0	0.3	0.02	0.09	0.02	59.2
9	R2	4	0	4	0.0	0.113	6.2	LOS A	0.0	0.3	0.02	0.09	0.02	57.0
Approach		203	6	214	3.0	0.113	0.9	NA	0.0	0.3	0.02	0.09	0.02	58.8
West: Tigerhawk Drive (W)														
10	L2	24	0	25	0.0	0.234	6.1	LOS A	0.9	6.2	0.44	0.72	0.44	51.8
11	T1	23	0	24	0.0	0.234	6.5	LOS A	0.9	6.2	0.44	0.72	0.44	51.9
12	R2	122	2	128	1.6	0.234	8.6	LOS A	0.9	6.2	0.44	0.72	0.44	51.2
Approach		169	2	178	1.2	0.234	8.0	LOS A	0.9	6.2	0.44	0.72	0.44	51.4
All Vehicles		679	21	715	3.1	0.234	3.9	NA	0.9	6.2	0.21	0.34	0.21	55.4

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018 + Residential] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Heritage Drive / Tigerhawk
Existing [2018] + Residential
PM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	95	6	100	6.3	0.103	5.7	LOS A	0.2	1.4	0.07	0.36	0.07	54.8
2	T1	60	0	63	0.0	0.103	0.1	LOS A	0.2	1.4	0.07	0.36	0.07	56.5
3	R2	16	6	17	37.5	0.103	6.3	LOS A	0.2	1.4	0.07	0.36	0.07	52.8
Approach		171	12	180	7.0	0.103	3.8	NA	0.2	1.4	0.07	0.36	0.07	55.2
East: Tigerhawk Drive (E)														
4	L2	10	0	11	0.0	0.019	5.8	LOS A	0.1	0.5	0.20	0.54	0.20	53.5
5	T1	9	0	9	0.0	0.019	5.2	LOS A	0.1	0.5	0.20	0.54	0.20	53.6
6	R2	3	0	3	0.0	0.019	6.3	LOS A	0.1	0.5	0.20	0.54	0.20	53.0
Approach		22	0	23	0.0	0.019	5.6	LOS A	0.1	0.5	0.20	0.54	0.20	53.5
North: Heritage Drive (N)														
7	L2	8	4	8	50.0	0.050	6.3	LOS A	0.0	0.3	0.04	0.08	0.04	55.3
8	T1	77	0	81	0.0	0.050	0.0	LOS A	0.0	0.3	0.04	0.08	0.04	59.3
9	R2	4	0	4	0.0	0.050	6.0	LOS A	0.0	0.3	0.04	0.08	0.04	57.1
Approach		89	4	94	4.5	0.050	0.9	NA	0.0	0.3	0.04	0.08	0.04	58.9
West: Tigerhawk Drive (W)														
10	L2	3	0	3	0.0	0.098	5.7	LOS A	0.3	2.4	0.31	0.62	0.31	52.8
11	T1	6	0	6	0.0	0.098	5.1	LOS A	0.3	2.4	0.31	0.62	0.31	53.0
12	R2	74	2	78	2.7	0.098	6.8	LOS A	0.3	2.4	0.31	0.62	0.31	52.2
Approach		83	2	87	2.4	0.098	6.6	LOS A	0.3	2.4	0.31	0.62	0.31	52.2
All Vehicles		365	18	384	4.9	0.103	3.8	NA	0.3	2.4	0.12	0.36	0.12	55.2

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018 + Residential] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Heritage Drive / Tigerhawk
Existing [2018] + Residential
Weekend Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	88	1	93	1.1	0.077	5.6	LOS A	0.0	0.1	0.00	0.38	0.00	55.1
2	T1	48	0	51	0.0	0.077	0.0	LOS A	0.0	0.1	0.00	0.38	0.00	56.7
3	R2	1	0	1	0.0	0.077	5.5	LOS A	0.0	0.1	0.00	0.38	0.00	54.6
Approach		137	1	144	0.7	0.077	3.6	NA	0.0	0.1	0.00	0.38	0.00	55.7
East: Tigerhawk Drive (E)														
4	L2	1	0	1	0.0	0.003	5.6	LOS A	0.0	0.1	0.10	0.54	0.10	53.7
5	T1	1	0	1	0.0	0.003	4.7	LOS A	0.0	0.1	0.10	0.54	0.10	53.9
6	R2	1	0	1	0.0	0.003	5.8	LOS A	0.0	0.1	0.10	0.54	0.10	53.2
Approach		3	0	3	0.0	0.003	5.4	LOS A	0.0	0.1	0.10	0.54	0.10	53.6
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.014	5.8	LOS A	0.0	0.1	0.03	0.05	0.03	57.9
8	T1	24	0	25	0.0	0.014	0.0	LOS A	0.0	0.1	0.03	0.05	0.03	59.5
9	R2	1	0	1	0.0	0.014	5.8	LOS A	0.0	0.1	0.03	0.05	0.03	57.2
Approach		26	0	27	0.0	0.014	0.5	NA	0.0	0.1	0.03	0.05	0.03	59.3
West: Tigerhawk Drive (W)														
10	L2	2	0	2	0.0	0.104	5.7	LOS A	0.4	2.6	0.23	0.58	0.23	53.1
11	T1	7	0	7	0.0	0.104	4.6	LOS A	0.4	2.6	0.23	0.58	0.23	53.3
12	R2	90	2	95	2.2	0.104	6.1	LOS A	0.4	2.6	0.23	0.58	0.23	52.5
Approach		99	2	104	2.0	0.104	6.0	LOS A	0.4	2.6	0.23	0.58	0.23	52.5
All Vehicles		265	3	279	1.1	0.104	4.2	NA	0.4	2.6	0.09	0.43	0.09	54.8

MOVEMENT SUMMARY

Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018+ Residential] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Grasshawk Drive / Dragonfly Drive
Existing [2018] + Residential
AM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.028	5.8	LOS A	0.1	0.7	0.15	0.22	0.15	56.0
2	T1	30	0	32	0.0	0.028	0.2	LOS A	0.1	0.7	0.15	0.22	0.15	57.5
3	R2	17	0	18	0.0	0.028	5.7	LOS A	0.1	0.7	0.15	0.22	0.15	55.4
Approach		48	0	51	0.0	0.028	2.3	NA	0.1	0.7	0.15	0.22	0.15	56.7
East: Grasshawk Drive (E)														
4	L2	15	0	16	0.0	0.025	5.8	LOS A	0.1	0.7	0.20	0.54	0.20	53.3
5	T1	7	0	7	0.0	0.025	4.7	LOS A	0.1	0.7	0.20	0.54	0.20	53.5
6	R2	7	1	7	14.3	0.025	6.6	LOS A	0.1	0.7	0.20	0.54	0.20	52.1
Approach		29	1	31	3.4	0.025	5.7	LOS A	0.1	0.7	0.20	0.54	0.20	53.1
North: Dragonfly Drive (N)														
7	L2	12	2	13	16.7	0.055	5.7	LOS A	0.0	0.1	0.00	0.08	0.00	56.9
8	T1	87	0	92	0.0	0.055	0.0	LOS A	0.0	0.1	0.00	0.08	0.00	59.4
9	R2	1	0	1	0.0	0.055	5.5	LOS A	0.0	0.1	0.00	0.08	0.00	57.2
Approach		100	2	105	2.0	0.055	0.7	NA	0.0	0.1	0.00	0.08	0.00	59.1
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.040	5.6	LOS A	0.1	1.0	0.23	0.52	0.23	54.0
11	T1	42	0	44	0.0	0.040	4.7	LOS A	0.1	1.0	0.23	0.52	0.23	54.2
12	R2	1	0	1	0.0	0.040	6.2	LOS A	0.1	1.0	0.23	0.52	0.23	53.5
Approach		44	0	46	0.0	0.040	4.8	LOS A	0.1	1.0	0.23	0.52	0.23	54.1
All Vehicles		221	3	233	1.4	0.055	2.5	NA	0.1	1.0	0.11	0.26	0.11	56.7

MOVEMENT SUMMARY

Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018 + Residential] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Grasshawk Drive / Dragonfly Drive
Existing [2018] + Residential
PM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.060	5.6	LOS A	0.1	0.8	0.04	0.10	0.04	57.4
2	T1	91	0	96	0.0	0.060	0.0	LOS A	0.1	0.8	0.04	0.10	0.04	59.0
3	R2	17	0	18	0.0	0.060	5.5	LOS A	0.1	0.8	0.04	0.10	0.04	56.8
Approach		109	0	115	0.0	0.060	0.9	NA	0.1	0.8	0.04	0.10	0.04	58.6
East: Grasshawk Drive (E)														
4	L2	24	0	25	0.0	0.061	5.6	LOS A	0.2	1.6	0.11	0.54	0.11	53.9
5	T1	42	0	44	0.0	0.061	4.7	LOS A	0.2	1.6	0.11	0.54	0.11	54.1
6	R2	6	1	6	16.7	0.061	6.6	LOS A	0.2	1.6	0.11	0.54	0.11	52.6
Approach		72	1	76	1.4	0.061	5.2	LOS A	0.2	1.6	0.11	0.54	0.11	53.9
North: Dragonfly Drive (N)														
7	L2	9	2	9	22.2	0.019	5.8	LOS A	0.0	0.1	0.02	0.17	0.02	56.0
8	T1	24	0	25	0.0	0.019	0.0	LOS A	0.0	0.1	0.02	0.17	0.02	58.6
9	R2	1	0	1	0.0	0.019	5.7	LOS A	0.0	0.1	0.02	0.17	0.02	56.4
Approach		34	2	36	5.9	0.019	1.7	NA	0.0	0.1	0.02	0.17	0.02	57.8
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.023	5.8	LOS A	0.1	0.6	0.24	0.52	0.24	53.9
11	T1	23	0	24	0.0	0.023	4.7	LOS A	0.1	0.6	0.24	0.52	0.24	54.1
12	R2	1	0	1	0.0	0.023	6.4	LOS A	0.1	0.6	0.24	0.52	0.24	53.4
Approach		25	0	26	0.0	0.023	4.8	LOS A	0.1	0.6	0.24	0.52	0.24	54.1
All Vehicles		240	3	253	1.3	0.061	2.7	NA	0.2	1.6	0.08	0.28	0.08	56.5

MOVEMENT SUMMARY

Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018 + Residential] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield)]

Grasshawk Drive / Dragonfly Drive
Existing [2018] + Residential
Weekend Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.031	5.7	LOS A	0.1	0.7	0.09	0.19	0.09	56.4
2	T1	37	0	39	0.0	0.031	0.1	LOS A	0.1	0.7	0.09	0.19	0.09	57.9
3	R2	17	0	18	0.0	0.031	5.6	LOS A	0.1	0.7	0.09	0.19	0.09	55.8
Approach		55	0	58	0.0	0.031	1.9	NA	0.1	0.7	0.09	0.19	0.09	57.2
East: Grasshawk Drive (E)														
4	L2	22	0	23	0.0	0.048	5.7	LOS A	0.2	1.3	0.14	0.54	0.14	53.7
5	T1	27	1	28	3.7	0.048	4.6	LOS A	0.2	1.3	0.14	0.54	0.14	53.7
6	R2	9	0	9	0.0	0.048	6.1	LOS A	0.2	1.3	0.14	0.54	0.14	53.2
Approach		58	1	61	1.7	0.048	5.2	LOS A	0.2	1.3	0.14	0.54	0.14	53.6
North: Dragonfly Drive (N)														
7	L2	10	1	11	10.0	0.028	5.7	LOS A	0.0	0.1	0.01	0.13	0.01	56.8
8	T1	40	0	42	0.0	0.028	0.0	LOS A	0.0	0.1	0.01	0.13	0.01	58.9
9	R2	1	0	1	0.0	0.028	5.6	LOS A	0.0	0.1	0.01	0.13	0.01	56.7
Approach		51	1	54	2.0	0.028	1.2	NA	0.0	0.1	0.01	0.13	0.01	58.4
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.026	5.6	LOS A	0.1	0.7	0.19	0.51	0.19	54.1
11	T1	27	1	28	3.7	0.026	4.6	LOS A	0.1	0.7	0.19	0.51	0.19	54.1
12	R2	1	0	1	0.0	0.026	6.1	LOS A	0.1	0.7	0.19	0.51	0.19	53.5
Approach		29	1	31	3.4	0.026	4.7	LOS A	0.1	0.7	0.19	0.51	0.19	54.1
All Vehicles		193	3	203	1.6	0.048	3.1	NA	0.2	1.3	0.10	0.33	0.10	55.9

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018 + Residential + Development] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Settlers Boulevarde / Raymond Terrace
Existing [2018] + Residential + Development
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	782	12	823	1.5	0.508	18.7	LOS B	12.5	88.3	0.73	0.64	0.73	47.6
6	R2	199	5	209	2.5	* 0.707	42.6	LOS D	8.3	59.5	1.00	0.86	1.10	34.7
Approach		981	17	1033	1.7	0.707	23.5	LOS B	12.5	88.3	0.79	0.68	0.81	44.3
North: Settlers Boulevarde (N)														
7	L2	228	4	240	1.8	0.602	26.9	LOS B	13.5	95.9	0.85	0.83	0.85	41.1
9	R2	647	8	681	1.2	* 0.730	31.2	LOS C	17.1	121.2	0.90	0.86	0.93	39.9
Approach		875	12	921	1.4	0.730	30.0	LOS C	17.1	121.2	0.89	0.85	0.91	40.2
West: Raymond Terrace Road (W)														
10	L2	277	9	292	3.2	0.161	6.1	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	417	13	439	3.1	* 0.711	31.7	LOS C	11.6	83.6	0.95	0.82	0.99	39.6
Approach		694	22	731	3.2	0.711	21.5	LOS B	11.6	83.6	0.57	0.70	0.60	44.6
All Vehicles		2550	51	2684	2.0	0.730	25.2	LOS B	17.1	121.2	0.76	0.75	0.78	42.9

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018 + Residential + Development] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]+ Residential + Development
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	576	7	606	1.2	0.256	6.0	LOS A	5.1	35.8	0.41	0.36	0.41	55.2
6	R2	213	3	224	1.4	* 0.750	43.7	LOS D	9.1	64.7	1.00	0.89	1.16	34.3
Approach		789	10	831	1.3	0.750	16.2	LOS B	9.1	64.7	0.57	0.50	0.61	47.4
North: Settlers Boulevarde (N)														
7	L2	158	1	166	0.6	0.615	39.4	LOS C	8.6	60.6	0.96	0.82	0.96	36.6
9	R2	262	2	276	0.8	* 0.746	43.0	LOS D	8.6	60.6	0.99	0.87	1.11	34.9
Approach		420	3	442	0.7	0.746	41.7	LOS C	8.6	60.6	0.98	0.85	1.05	35.5
West: Raymond Terrace Road (W)														
10	L2	577	2	607	0.3	0.328	6.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	851	5	896	0.6	* 0.734	19.8	LOS B	20.5	144.2	0.83	0.74	0.84	45.7
Approach		1428	7	1503	0.5	0.734	14.3	LOS A	20.5	144.2	0.50	0.65	0.50	49.0
All Vehicles		2637	20	2776	0.8	0.750	19.2	LOS B	20.5	144.2	0.59	0.64	0.62	45.8

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Raymond Terrace EX [2018 + Residential + Development] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]+ Residential + Development
Weekend Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	527	3	555	0.6	0.268	9.1	LOS A	5.8	40.7	0.51	0.44	0.51	52.7
6	R2	178	0	187	0.0	* 0.538	38.3	LOS C	6.8	47.9	0.95	0.81	0.95	36.2
Approach		705	3	742	0.4	0.538	16.5	LOS B	6.8	47.9	0.62	0.53	0.62	47.3
North: Settlers Boulevarde (N)														
7	L2	170	0	179	0.0	0.443	30.3	LOS C	7.8	54.8	0.85	0.80	0.85	39.7
9	R2	287	4	302	1.4	* 0.537	34.1	LOS C	8.2	58.2	0.91	0.81	0.91	38.0
Approach		457	4	481	0.9	0.537	32.7	LOS C	8.2	58.2	0.88	0.81	0.88	38.6
West: Raymond Terrace Road (W)														
10	L2	267	5	281	1.9	0.153	6.0	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	484	3	509	0.6	* 0.562	23.7	LOS B	11.6	81.5	0.85	0.72	0.85	43.3
Approach		751	8	791	1.1	0.562	17.4	LOS B	11.6	81.5	0.55	0.65	0.55	46.9
All Vehicles		1913	15	2014	0.8	0.562	20.7	LOS B	11.6	81.5	0.66	0.64	0.66	44.7

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018 + Residential + Development] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Harvest Boulevarde / Raymond Terrace
Existing [2018]+ Residential + Development
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	1366	3	1438	0.2	0.527	9.1	LOS A	13.2	92.7	0.51	0.47	0.51	54.5
6	R2	49	1	52	2.0	* 0.376	46.4	LOS D	2.1	14.7	0.99	0.74	0.99	33.5
Approach		1415	4	1489	0.3	0.527	10.4	LOS A	13.2	92.7	0.53	0.48	0.53	53.4
North: Harvest Boulevarde (N)														
7	L2	106	1	112	0.9	0.202	29.7	LOS C	3.3	23.1	0.78	0.75	0.78	40.2
9	R2	92	1	97	1.1	* 0.420	42.1	LOS C	3.7	25.9	0.97	0.77	0.97	34.8
Approach		198	2	208	1.0	0.420	35.5	LOS C	3.7	25.9	0.87	0.76	0.87	37.5
West: Raymond Terrace Road (W)														
10	L2	52	0	55	0.0	0.299	15.9	LOS B	6.5	46.8	0.57	0.54	0.57	49.4
11	T1	754	22	794	2.9	* 0.508	12.0	LOS A	13.0	93.3	0.64	0.58	0.64	50.2
Approach		806	22	848	2.7	0.508	12.3	LOS A	13.0	93.3	0.64	0.57	0.64	50.2
All Vehicles		2419	28	2546	1.2	0.527	13.0	LOS A	13.2	93.3	0.59	0.53	0.59	50.5

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018 + Residential + Development] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Harvest Boulevarde / Raymond Terrace
Existing [2018]+ Residential + Development
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	1025	5	1079	0.5	0.372	6.5	LOS A	10.0	70.1	0.38	0.34	0.38	55.3
6	R2	120	1	126	0.8	* 0.753	63.1	LOS E	7.2	50.7	1.00	0.87	1.18	29.1
Approach		1145	6	1205	0.5	0.753	12.5	LOS A	10.0	70.1	0.45	0.40	0.46	50.5
North: Harvest Boulevarde (N)														
7	L2	57	0	60	0.0	0.111	41.5	LOS C	2.3	16.4	0.77	0.73	0.77	37.0
9	R2	107	0	113	0.0	* 0.513	56.3	LOS D	5.9	41.2	0.98	0.79	0.98	30.6
Approach		164	0	173	0.0	0.513	51.2	LOS D	5.9	41.2	0.91	0.77	0.91	32.6
West: Raymond Terrace Road (W)														
10	L2	129	0	136	0.0	0.481	18.7	LOS B	16.5	115.8	0.61	0.60	0.61	47.4
11	T1	1304	6	1373	0.5	* 0.817	18.4	LOS B	39.6	278.6	0.78	0.73	0.78	46.8
Approach		1433	6	1508	0.4	0.817	18.4	LOS B	39.6	278.6	0.76	0.72	0.76	46.8
All Vehicles		2742	12	2886	0.4	0.817	17.9	LOS B	39.6	278.6	0.64	0.59	0.65	47.0

MOVEMENT SUMMARY

Site: 101 [Harvest Boulevarde / Raymond Terrace EX [2018 + Residential + Development] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Harvest Boulevarde / Raymond Terrace
Existing [2018]+ Residential + Development
Weekend Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Raymond Terrace Road (E)														
5	T1	873	4	919	0.5	0.338	6.0	LOS A	7.0	48.9	0.42	0.37	0.42	55.4
6	R2	62	4	65	6.5	* 0.490	47.1	LOS D	2.7	19.6	1.00	0.75	1.00	33.2
Approach		935	8	984	0.9	0.490	8.7	LOS A	7.0	48.9	0.46	0.40	0.46	53.1
North: Harvest Boulevarde (N)														
7	L2	64	1	67	1.6	0.122	29.1	LOS C	1.9	13.6	0.76	0.73	0.76	40.5
9	R2	106	0	112	0.0	* 0.481	42.4	LOS C	4.3	29.9	0.97	0.78	0.97	34.7
Approach		170	1	179	0.6	0.481	37.4	LOS C	4.3	29.9	0.89	0.76	0.89	36.7
West: Raymond Terrace Road (W)														
10	L2	118	1	124	0.8	0.324	16.1	LOS B	7.2	50.8	0.58	0.60	0.58	48.6
11	T1	763	4	803	0.5	* 0.550	12.3	LOS A	14.8	103.7	0.66	0.61	0.66	49.8
Approach		881	5	927	0.6	0.550	12.8	LOS A	14.8	103.7	0.65	0.61	0.65	49.6
All Vehicles		1986	14	2091	0.7	0.550	13.0	LOS A	14.8	103.7	0.58	0.52	0.58	49.6

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018 + Residential + Development] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]+ Residential + Development
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	23	0	24	0.0	0.018	3.7	LOS A	0.1	0.7	0.05	0.42	0.05	56.3
2	T1	239	12	252	5.0	0.262	3.6	LOS A	1.8	12.9	0.06	0.51	0.06	55.8
3	R2	227	1	239	0.4	0.262	9.2	LOS A	1.8	12.9	0.06	0.51	0.06	56.3
Approach		489	13	515	2.7	0.262	6.2	LOS A	1.8	12.9	0.06	0.51	0.06	56.1
East: Settlers Boulevarde (E)														
4	L2	434	9	457	2.1	0.355	6.0	LOS A	2.6	18.6	0.66	0.65	0.66	53.9
5	T1	4	0	4	0.0	0.006	5.7	LOS A	0.0	0.2	0.55	0.50	0.55	54.8
6	R2	1	0	1	0.0	0.006	11.3	LOS B	0.0	0.2	0.55	0.50	0.55	55.1
Approach		439	9	462	2.1	0.355	6.0	LOS A	2.6	18.6	0.66	0.65	0.66	53.9
North: Heritage Drive (N)														
7	L2	3	0	3	0.0	0.329	5.6	LOS A	2.0	14.4	0.53	0.52	0.53	53.9
8	T1	363	3	382	0.8	0.329	5.6	LOS A	2.0	14.4	0.53	0.52	0.53	55.5
9	R2	1	0	1	0.0	0.329	11.0	LOS B	2.0	14.4	0.53	0.52	0.53	55.9
Approach		367	3	386	0.8	0.329	5.6	LOS A	2.0	14.4	0.53	0.52	0.53	55.5
West: Duskdarter Street (W)														
10	L2	1	0	1	0.0	0.087	5.6	LOS A	0.5	3.2	0.54	0.68	0.54	50.8
11	T1	2	0	2	0.0	0.087	6.1	LOS A	0.5	3.2	0.54	0.68	0.54	52.2
12	R2	85	0	89	0.0	0.087	11.4	LOS B	0.5	3.2	0.54	0.68	0.54	52.6
Approach		88	0	93	0.0	0.087	11.2	LOS B	0.5	3.2	0.54	0.68	0.54	52.5
All Vehicles		1383	25	1456	1.8	0.355	6.3	LOS A	2.6	18.6	0.40	0.57	0.40	55.0

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018 + Residential + Development] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]+ Residential + Development
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	58	1	61	1.7	0.045	3.7	LOS A	0.2	1.6	0.03	0.42	0.03	56.3
2	T1	166	9	175	5.4	0.387	3.6	LOS A	2.9	20.5	0.04	0.59	0.04	54.7
3	R2	533	0	561	0.0	0.387	9.2	LOS A	2.9	20.5	0.04	0.59	0.04	55.2
Approach		757	10	797	1.3	0.387	7.5	LOS A	2.9	20.5	0.04	0.58	0.04	55.1
East: Settlers Boulevarde (E)														
4	L2	209	8	220	3.8	0.157	4.8	LOS A	1.0	7.1	0.48	0.53	0.48	54.5
5	T1	1	0	1	0.0	0.002	4.9	LOS A	0.0	0.1	0.46	0.50	0.46	54.3
6	R2	1	0	1	0.0	0.002	10.5	LOS B	0.0	0.1	0.46	0.50	0.46	54.7
Approach		211	8	222	3.8	0.157	4.8	LOS A	1.0	7.1	0.48	0.53	0.48	54.5
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.269	7.8	LOS A	1.6	11.5	0.65	0.67	0.65	53.3
8	T1	250	3	263	1.2	0.269	7.0	LOS A	1.6	11.5	0.65	0.67	0.65	54.9
9	R2	1	0	1	0.0	0.269	12.5	LOS B	1.6	11.5	0.65	0.67	0.65	55.2
Approach		252	3	265	1.2	0.269	7.0	LOS A	1.6	11.5	0.65	0.67	0.65	54.9
West: Duskdarter Street (W)														
10	L2	2	0	2	0.0	0.051	7.2	LOS A	0.3	2.0	0.65	0.70	0.65	50.2
11	T1	2	0	2	0.0	0.051	8.4	LOS A	0.3	2.0	0.65	0.70	0.65	51.6
12	R2	40	0	42	0.0	0.051	13.0	LOS B	0.3	2.0	0.65	0.70	0.65	51.9
Approach		44	0	46	0.0	0.051	12.5	LOS B	0.3	2.0	0.65	0.70	0.65	51.8
All Vehicles		1264	21	1331	1.7	0.387	7.2	LOS A	2.9	20.5	0.26	0.59	0.26	54.9

MOVEMENT SUMMARY

Site: 101 [Settlers Boulevarde / Heritage Drive / Duskdarter EX [2018 + Residential + Developme] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Settlers Boulevarde / Raymond Terrace
Existing [2018]+ Residential + Development
Weekend Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Settlers Boulevarde (S)														
1	L2	40	0	42	0.0	0.031	3.6	LOS A	0.2	1.1	0.03	0.42	0.03	56.3
2	T1	128	5	135	3.9	0.254	3.6	LOS A	1.6	11.3	0.03	0.58	0.03	54.9
3	R2	331	0	348	0.0	0.254	9.2	LOS A	1.6	11.3	0.03	0.58	0.03	55.4
Approach		499	5	525	1.0	0.254	7.3	LOS A	1.6	11.3	0.03	0.57	0.03	55.3
East: Settlers Boulevarde (E)														
4	L2	244	0	257	0.0	0.172	4.6	LOS A	1.0	7.3	0.43	0.51	0.43	54.8
5	T1	1	0	1	0.0	0.002	4.7	LOS A	0.0	0.1	0.41	0.50	0.41	54.5
6	R2	1	0	1	0.0	0.002	10.3	LOS B	0.0	0.1	0.41	0.50	0.41	54.9
Approach		246	0	259	0.0	0.172	4.6	LOS A	1.0	7.3	0.43	0.51	0.43	54.8
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.191	5.8	LOS A	1.1	7.5	0.51	0.53	0.51	54.0
8	T1	203	3	214	1.5	0.191	5.5	LOS A	1.1	7.5	0.51	0.53	0.51	55.6
9	R2	1	0	1	0.0	0.191	11.0	LOS B	1.1	7.5	0.51	0.53	0.51	56.0
Approach		205	3	216	1.5	0.191	5.5	LOS A	1.1	7.5	0.51	0.53	0.51	55.6
West: Duskdarter Street (W)														
10	L2	1	0	1	0.0	0.044	5.5	LOS A	0.2	1.6	0.51	0.66	0.51	50.9
11	T1	1	0	1	0.0	0.044	6.1	LOS A	0.2	1.6	0.51	0.66	0.51	52.4
12	R2	42	1	44	2.4	0.044	11.3	LOS B	0.2	1.6	0.51	0.66	0.51	52.6
Approach		44	1	46	2.3	0.044	11.1	LOS B	0.2	1.6	0.51	0.66	0.51	52.6
All Vehicles		994	9	1046	0.9	0.254	6.4	LOS A	1.6	11.3	0.25	0.55	0.25	55.1

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018 + Residential + Development] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Heritage Drive / Tigerhawk
Existing [2018]+ Residential + Development
AM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	161	7	169	4.3	0.207	5.9	LOS A	0.5	3.6	0.15	0.30	0.15	54.9
2	T1	148	1	156	0.7	0.207	0.3	LOS A	0.5	3.6	0.15	0.30	0.15	56.5
3	R2	41	4	43	9.8	0.207	6.6	LOS A	0.5	3.6	0.15	0.30	0.15	54.1
Approach		350	12	368	3.4	0.207	3.6	NA	0.5	3.6	0.15	0.30	0.15	55.5
East: Tigerhawk Drive (E)														
4	L2	30	0	32	0.0	0.078	6.2	LOS A	0.3	2.0	0.37	0.64	0.37	52.3
5	T1	11	0	12	0.0	0.078	7.4	LOS A	0.3	2.0	0.37	0.64	0.37	52.5
6	R2	24	1	25	4.2	0.078	8.5	LOS A	0.3	2.0	0.37	0.64	0.37	51.6
Approach		65	1	68	1.5	0.078	7.2	LOS A	0.3	2.0	0.37	0.64	0.37	52.1
North: Heritage Drive (N)														
7	L2	28	5	29	17.9	0.128	5.9	LOS A	0.0	0.4	0.03	0.08	0.03	56.8
8	T1	197	1	207	0.5	0.128	0.0	LOS A	0.0	0.4	0.03	0.08	0.03	59.2
9	R2	4	0	4	0.0	0.128	6.7	LOS A	0.0	0.4	0.03	0.08	0.03	57.0
Approach		229	6	241	2.6	0.128	0.9	NA	0.0	0.4	0.03	0.08	0.03	58.9
West: Tigerhawk Drive (W)														
10	L2	24	0	25	0.0	0.443	7.2	LOS A	2.4	16.8	0.56	0.88	0.78	49.9
11	T1	23	0	24	0.0	0.443	8.7	LOS A	2.4	16.8	0.56	0.88	0.78	50.1
12	R2	231	2	243	0.9	0.443	11.1	LOS B	2.4	16.8	0.56	0.88	0.78	49.4
Approach		278	2	293	0.7	0.443	10.5	LOS B	2.4	16.8	0.56	0.88	0.78	49.5
All Vehicles		922	21	971	2.3	0.443	5.3	NA	2.4	16.8	0.26	0.44	0.32	54.1

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018 + Residential + Development] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Heritage Drive / Tigerhawk
Existing [2018]+ Residential + Development
PM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	303	6	319	2.0	0.222	5.6	LOS A	0.2	1.7	0.05	0.47	0.05	54.1
2	T1	60	0	63	0.0	0.222	0.2	LOS A	0.2	1.7	0.05	0.47	0.05	55.6
3	R2	16	6	17	37.5	0.222	6.7	LOS A	0.2	1.7	0.05	0.47	0.05	52.0
Approach		379	12	399	3.2	0.222	4.8	NA	0.2	1.7	0.05	0.47	0.05	54.2
East: Tigerhawk Drive (E)														
4	L2	10	0	11	0.0	0.023	5.9	LOS A	0.1	0.6	0.28	0.57	0.28	53.0
5	T1	9	0	9	0.0	0.023	6.8	LOS A	0.1	0.6	0.28	0.57	0.28	53.1
6	R2	3	0	3	0.0	0.023	6.6	LOS A	0.1	0.6	0.28	0.57	0.28	52.5
Approach		22	0	23	0.0	0.023	6.4	LOS A	0.1	0.6	0.28	0.57	0.28	53.0
North: Heritage Drive (N)														
7	L2	8	4	8	50.0	0.078	6.6	LOS A	0.0	0.3	0.04	0.05	0.04	55.5
8	T1	127	0	134	0.0	0.078	0.1	LOS A	0.0	0.3	0.04	0.05	0.04	59.5
9	R2	4	0	4	0.0	0.078	6.9	LOS A	0.0	0.3	0.04	0.05	0.04	57.3
Approach		139	4	146	2.9	0.078	0.6	NA	0.0	0.3	0.04	0.05	0.04	59.2
West: Tigerhawk Drive (W)														
10	L2	3	0	3	0.0	0.412	6.4	LOS A	2.2	15.3	0.52	0.84	0.66	50.9
11	T1	6	0	6	0.0	0.412	7.2	LOS A	2.2	15.3	0.52	0.84	0.66	51.0
12	R2	280	2	295	0.7	0.412	9.2	LOS A	2.2	15.3	0.52	0.84	0.66	50.4
Approach		289	2	304	0.7	0.412	9.2	LOS A	2.2	15.3	0.52	0.84	0.66	50.4
All Vehicles		829	18	873	2.2	0.412	5.7	NA	2.2	15.3	0.22	0.53	0.27	53.5

MOVEMENT SUMMARY

Site: 101 [Heritage Drive / Tigerhawk Drive EX [2018 + Residential + Development] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Heritage Drive / Tigerhawk
Existing [2018]+ Residential + Development
Weekend Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Heritage Drive (S)														
1	L2	310	1	326	0.3	0.203	5.5	LOS A	0.0	0.1	0.00	0.50	0.00	54.2
2	T1	48	0	51	0.0	0.203	0.0	LOS A	0.0	0.1	0.00	0.50	0.00	55.6
3	R2	1	0	1	0.0	0.203	5.7	LOS A	0.0	0.1	0.00	0.50	0.00	53.7
Approach		359	1	378	0.3	0.203	4.8	NA	0.0	0.1	0.00	0.50	0.00	54.4
East: Tigerhawk Drive (E)														
4	L2	1	0	1	0.0	0.003	5.8	LOS A	0.0	0.1	0.20	0.54	0.20	53.3
5	T1	1	0	1	0.0	0.003	6.1	LOS A	0.0	0.1	0.20	0.54	0.20	53.4
6	R2	1	0	1	0.0	0.003	6.0	LOS A	0.0	0.1	0.20	0.54	0.20	52.7
Approach		3	0	3	0.0	0.003	6.0	LOS A	0.0	0.1	0.20	0.54	0.20	53.1
North: Heritage Drive (N)														
7	L2	1	0	1	0.0	0.044	6.3	LOS A	0.0	0.1	0.02	0.02	0.02	58.2
8	T1	78	0	82	0.0	0.044	0.0	LOS A	0.0	0.1	0.02	0.02	0.02	59.8
9	R2	1	0	1	0.0	0.044	6.8	LOS A	0.0	0.1	0.02	0.02	0.02	57.5
Approach		80	0	84	0.0	0.044	0.2	NA	0.0	0.1	0.02	0.02	0.02	59.7
West: Tigerhawk Drive (W)														
10	L2	2	0	2	0.0	0.412	6.2	LOS A	2.2	15.6	0.47	0.76	0.56	51.6
11	T1	7	0	7	0.0	0.412	6.4	LOS A	2.2	15.6	0.47	0.76	0.56	51.8
12	R2	314	2	331	0.6	0.412	8.2	LOS A	2.2	15.6	0.47	0.76	0.56	51.1
Approach		323	2	340	0.6	0.412	8.2	LOS A	2.2	15.6	0.47	0.76	0.56	51.1
All Vehicles		765	3	805	0.4	0.412	5.7	NA	2.2	15.6	0.20	0.56	0.24	53.4

MOVEMENT SUMMARY

Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018+ Residential + Development] AM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Grasshawk Drive / Dragonfly Drive
Existing [2018]+ Residential + Development
AM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.098	5.9	LOS A	0.5	3.3	0.22	0.46	0.22	53.9
2	T1	30	0	32	0.0	0.098	0.3	LOS A	0.5	3.3	0.22	0.46	0.22	55.2
3	R2	126	0	133	0.0	0.098	5.8	LOS A	0.5	3.3	0.22	0.46	0.22	53.3
Approach		157	0	165	0.0	0.098	4.7	NA	0.5	3.3	0.22	0.46	0.22	53.7
East: Grasshawk Drive (E)														
4	L2	123	0	129	0.0	0.102	5.8	LOS A	0.4	3.0	0.19	0.55	0.19	53.1
5	T1	7	0	7	0.0	0.102	5.3	LOS A	0.4	3.0	0.19	0.55	0.19	53.2
6	R2	7	1	7	14.3	0.102	7.6	LOS A	0.4	3.0	0.19	0.55	0.19	51.9
Approach		137	1	144	0.7	0.102	5.9	LOS A	0.4	3.0	0.19	0.55	0.19	53.0
North: Dragonfly Drive (N)														
7	L2	12	2	13	16.7	0.055	5.7	LOS A	0.0	0.1	0.00	0.08	0.00	56.9
8	T1	87	0	92	0.0	0.055	0.0	LOS A	0.0	0.1	0.00	0.08	0.00	59.4
9	R2	1	0	1	0.0	0.055	5.5	LOS A	0.0	0.1	0.00	0.08	0.00	57.2
Approach		100	2	105	2.0	0.055	0.7	NA	0.0	0.1	0.00	0.08	0.00	59.1
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.045	5.6	LOS A	0.2	1.1	0.30	0.56	0.30	53.8
11	T1	42	0	44	0.0	0.045	5.2	LOS A	0.2	1.1	0.30	0.56	0.30	53.9
12	R2	1	0	1	0.0	0.045	7.6	LOS A	0.2	1.1	0.30	0.56	0.30	53.3
Approach		44	0	46	0.0	0.045	5.3	LOS A	0.2	1.1	0.30	0.56	0.30	53.9
All Vehicles		438	3	461	0.7	0.102	4.2	NA	0.5	3.3	0.17	0.41	0.17	54.6

MOVEMENT SUMMARY

Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018 + Residential + Development] PM (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Grasshawk Drive / Dragonfly Drive
Existing [2018]+ Residential + Development
PM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.216	6.5	LOS A	1.2	8.1	0.39	0.45	0.39	53.8
2	T1	91	0	96	0.0	0.216	0.9	LOS A	1.2	8.1	0.39	0.45	0.39	55.1
3	R2	223	0	235	0.0	0.216	6.4	LOS A	1.2	8.1	0.39	0.45	0.39	53.2
Approach		315	0	332	0.0	0.216	4.9	NA	1.2	8.1	0.39	0.45	0.39	53.8
East: Grasshawk Drive (E)														
4	L2	24	0	25	0.0	0.080	5.6	LOS A	0.3	2.1	0.11	0.56	0.11	53.0
5	T1	42	0	44	0.0	0.080	6.4	LOS A	0.3	2.1	0.11	0.56	0.11	53.1
6	R2	6	1	6	16.7	0.080	9.4	LOS A	0.3	2.1	0.11	0.56	0.11	51.7
Approach		72	1	76	1.4	0.080	6.4	LOS A	0.3	2.1	0.11	0.56	0.11	52.9
North: Dragonfly Drive (N)														
7	L2	217	2	228	0.9	0.137	5.6	LOS A	0.0	0.1	0.00	0.52	0.00	54.0
8	T1	24	0	25	0.0	0.137	0.0	LOS A	0.0	0.1	0.00	0.52	0.00	55.4
9	R2	1	0	1	0.0	0.137	5.8	LOS A	0.0	0.1	0.00	0.52	0.00	53.5
Approach		242	2	255	0.8	0.137	5.0	NA	0.0	0.1	0.00	0.52	0.00	54.2
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.036	5.8	LOS A	0.1	0.9	0.45	0.66	0.45	52.5
11	T1	23	0	24	0.0	0.036	7.0	LOS A	0.1	0.9	0.45	0.66	0.45	52.6
12	R2	1	0	1	0.0	0.036	7.8	LOS A	0.1	0.9	0.45	0.66	0.45	52.0
Approach		25	0	26	0.0	0.036	7.0	LOS A	0.1	0.9	0.45	0.66	0.45	52.6
All Vehicles		654	3	688	0.5	0.216	5.2	NA	1.2	8.1	0.22	0.49	0.22	53.8

MOVEMENT SUMMARY

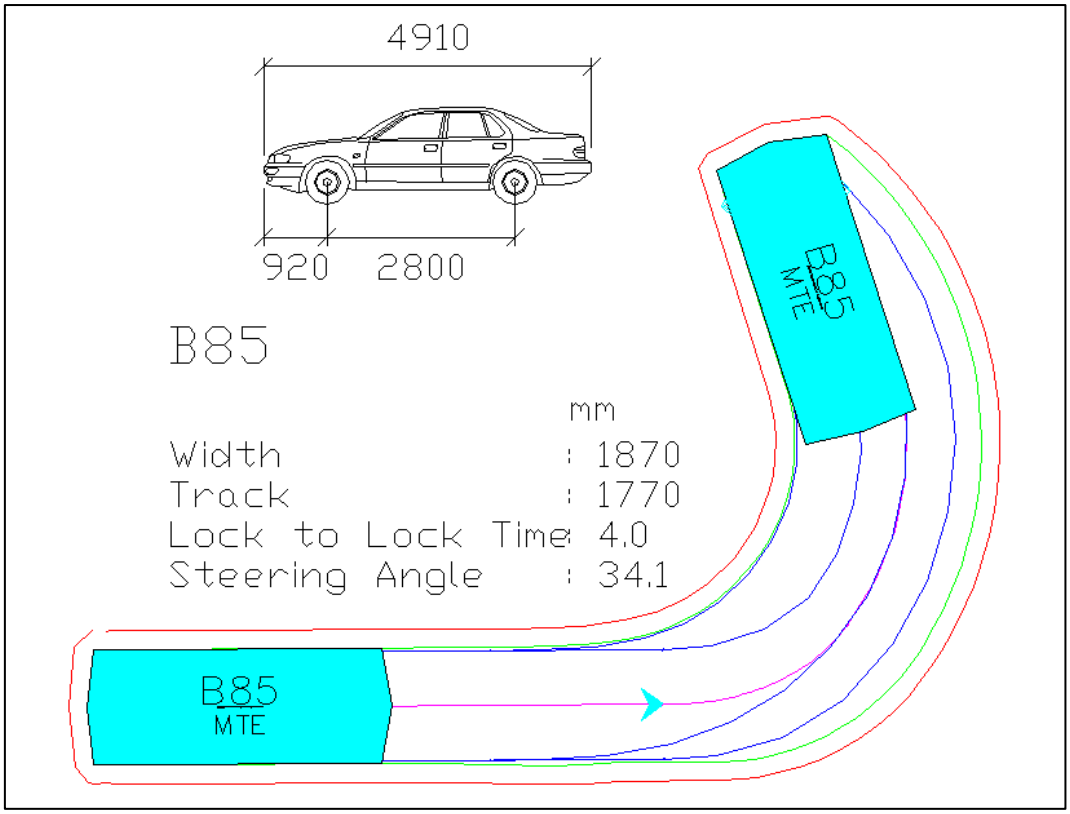
Site: 101 [Grasshawk Drive / Dragonfly Drive EX [2018 + Residential + Development] Weekend (Site Folder: Existing 2018 Volumes + Thorton North Residential Yield + Development)]

Grasshawk Drive / Dragonfly Drive
Existing [2018]+ Residential + Development
Weekend Peak
Site Category: (None)
Give-Way (Two-Way)

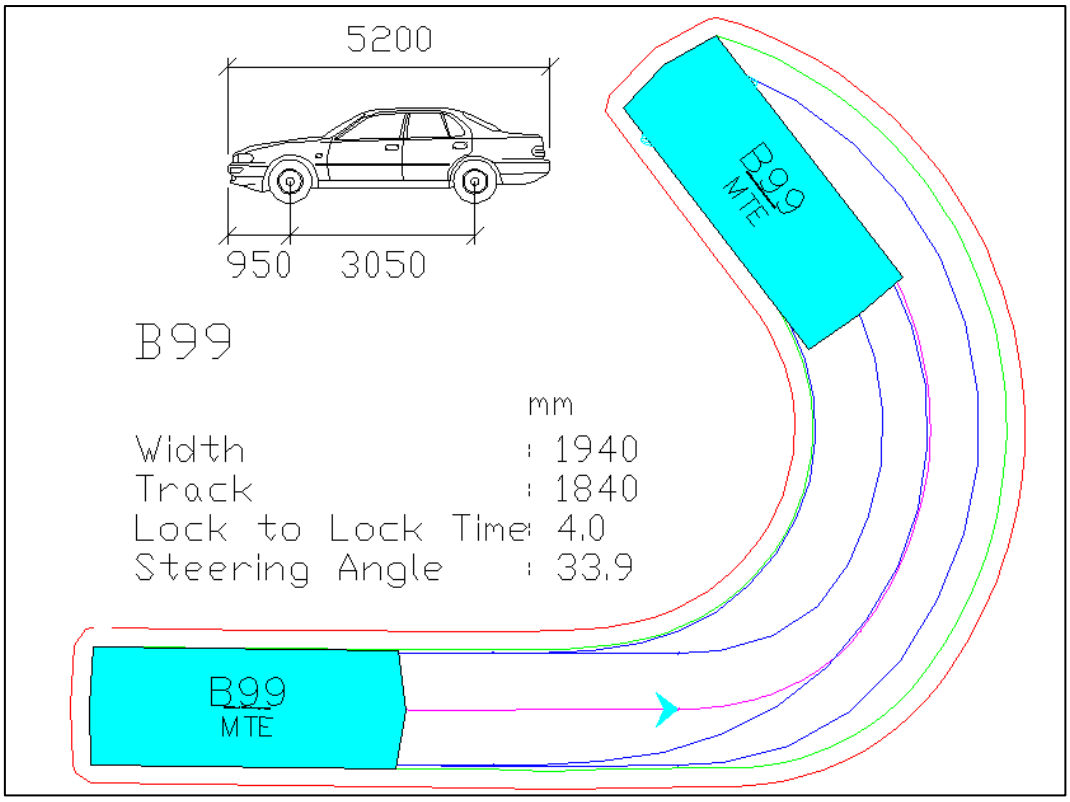
Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dragonfly Drive (S)														
1	L2	1	0	1	0.0	0.205	6.7	LOS A	1.0	7.3	0.42	0.55	0.42	53.0
2	T1	37	0	39	0.0	0.205	1.1	LOS A	1.0	7.3	0.42	0.55	0.42	54.4
3	R2	241	0	254	0.0	0.205	6.6	LOS A	1.0	7.3	0.42	0.55	0.42	52.5
Approach		279	0	294	0.0	0.205	5.8	NA	1.0	7.3	0.42	0.55	0.42	52.8
East: Grasshawk Drive (E)														
4	L2	22	0	23	0.0	0.064	5.7	LOS A	0.2	1.6	0.15	0.57	0.15	52.9
5	T1	27	1	28	3.7	0.064	6.4	LOS A	0.2	1.6	0.15	0.57	0.15	52.9
6	R2	9	0	9	0.0	0.064	8.4	LOS A	0.2	1.6	0.15	0.57	0.15	52.4
Approach		58	1	61	1.7	0.064	6.4	LOS A	0.2	1.6	0.15	0.57	0.15	52.8
North: Dragonfly Drive (N)														
7	L2	232	1	244	0.4	0.154	5.5	LOS A	0.0	0.1	0.00	0.50	0.00	54.2
8	T1	40	0	42	0.0	0.154	0.0	LOS A	0.0	0.1	0.00	0.50	0.00	55.7
9	R2	1	0	1	0.0	0.154	5.6	LOS A	0.0	0.1	0.00	0.50	0.00	53.7
Approach		273	1	287	0.4	0.154	4.7	NA	0.0	0.1	0.00	0.50	0.00	54.5
West: Grasshawk Drive (W)														
10	L2	1	0	1	0.0	0.042	5.6	LOS A	0.1	1.0	0.40	0.65	0.40	52.4
11	T1	27	1	28	3.7	0.042	7.1	LOS A	0.1	1.0	0.40	0.65	0.40	52.4
12	R2	1	0	1	0.0	0.042	7.5	LOS A	0.1	1.0	0.40	0.65	0.40	51.9
Approach		29	1	31	3.4	0.042	7.1	LOS A	0.1	1.0	0.40	0.65	0.40	52.4
All Vehicles		639	3	673	0.5	0.205	5.5	NA	1.0	7.3	0.21	0.53	0.21	53.5

ANNEXURE D: SWEPT PATH TESTING
(11 SHEETS)



AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)

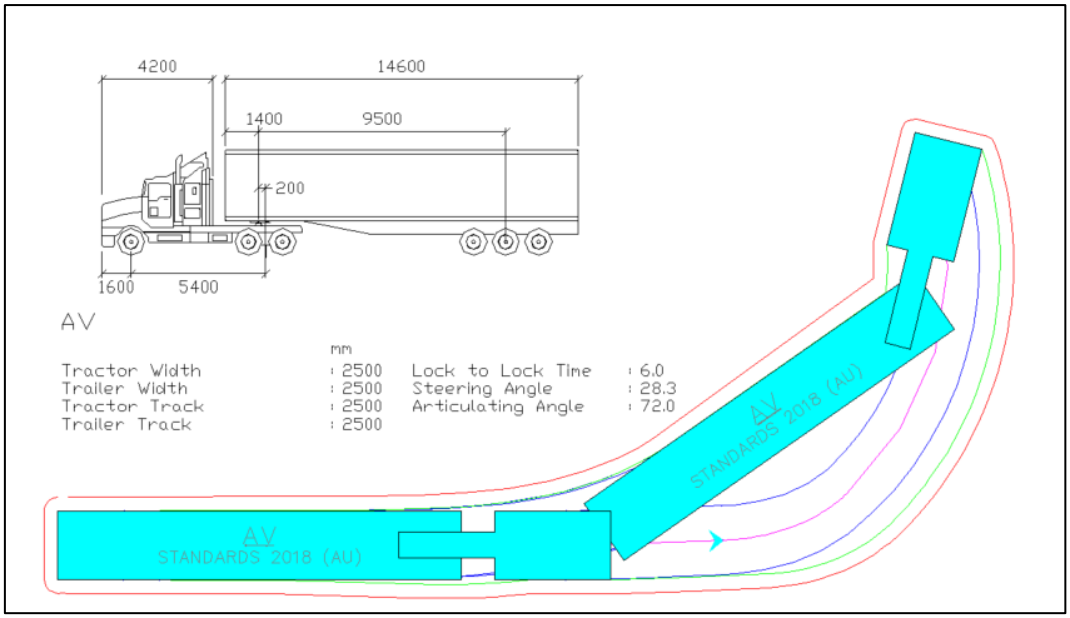


AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

Blue – Tyre Path

Green – Vehicle Body

Red – 300mm Clearance

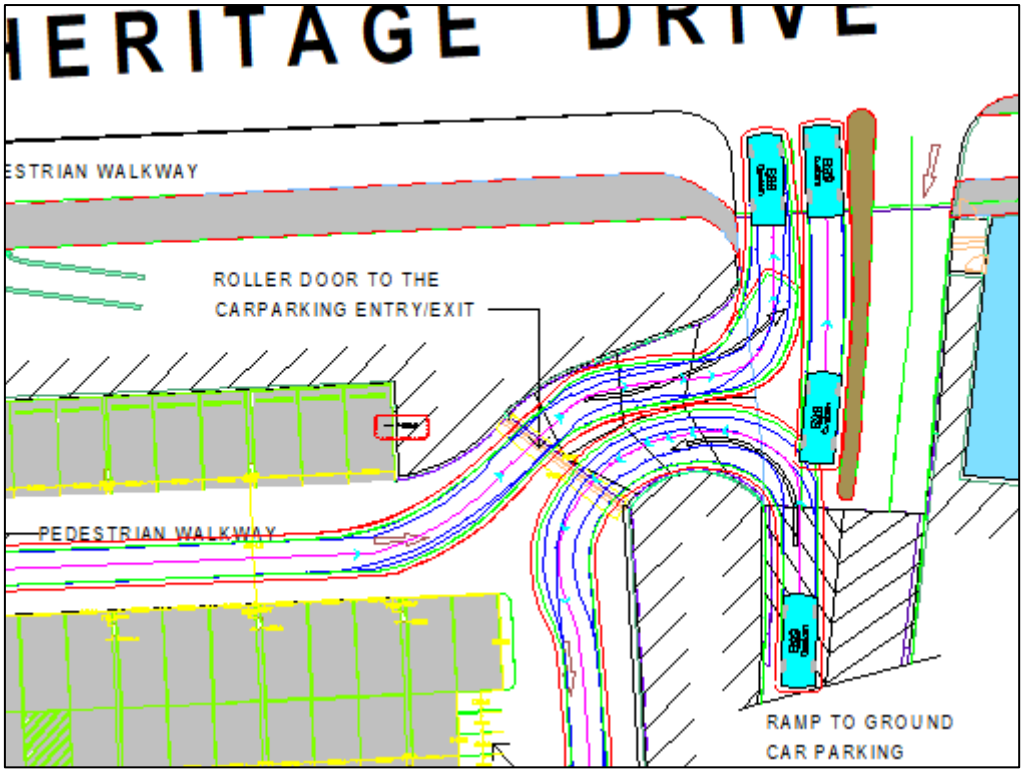


AUSTRALIAN STANDARD ARTICULATED VEHICLE (AV)

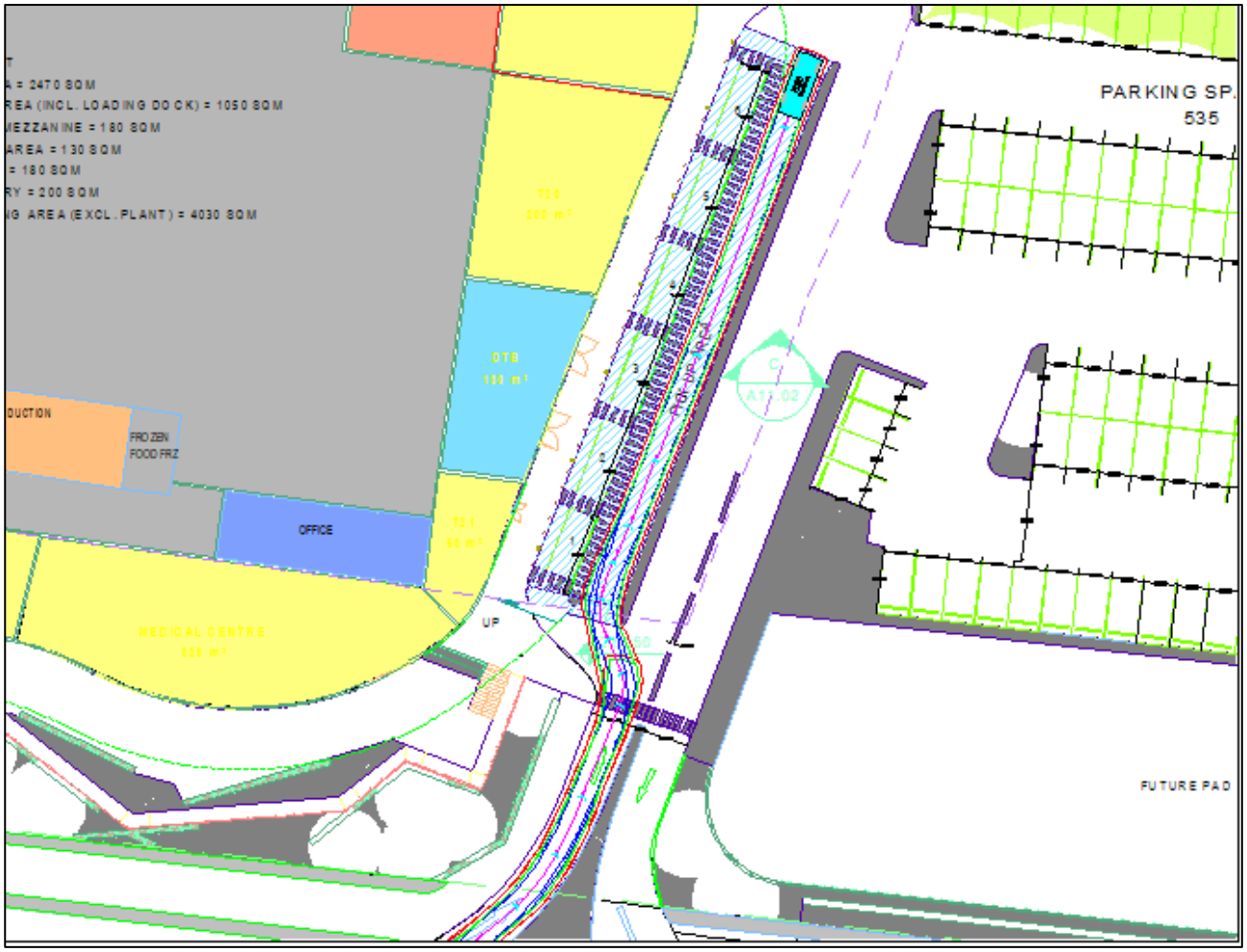
Blue – Tyre Path

Green – Vehicle Body

Red – 500mm Clearance

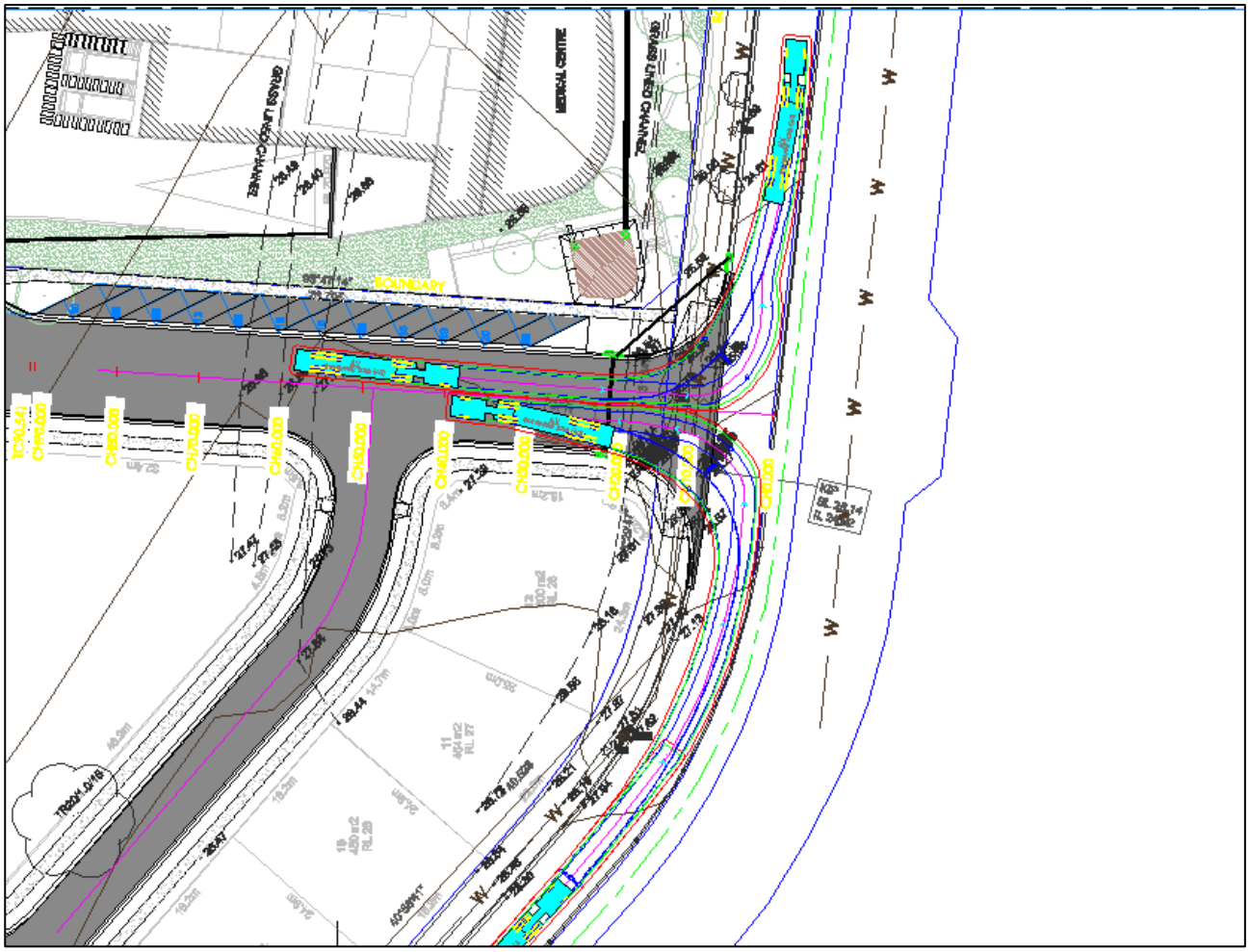


B99 passing B99 into the basement
Successful

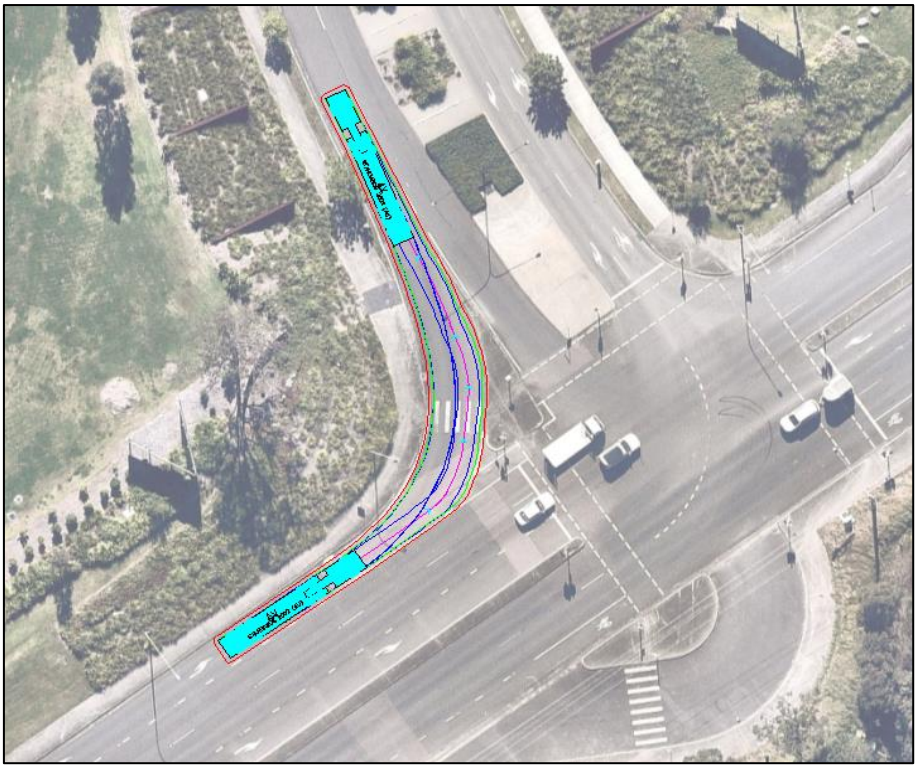


B99 circulation through the direct to boot pick-up area

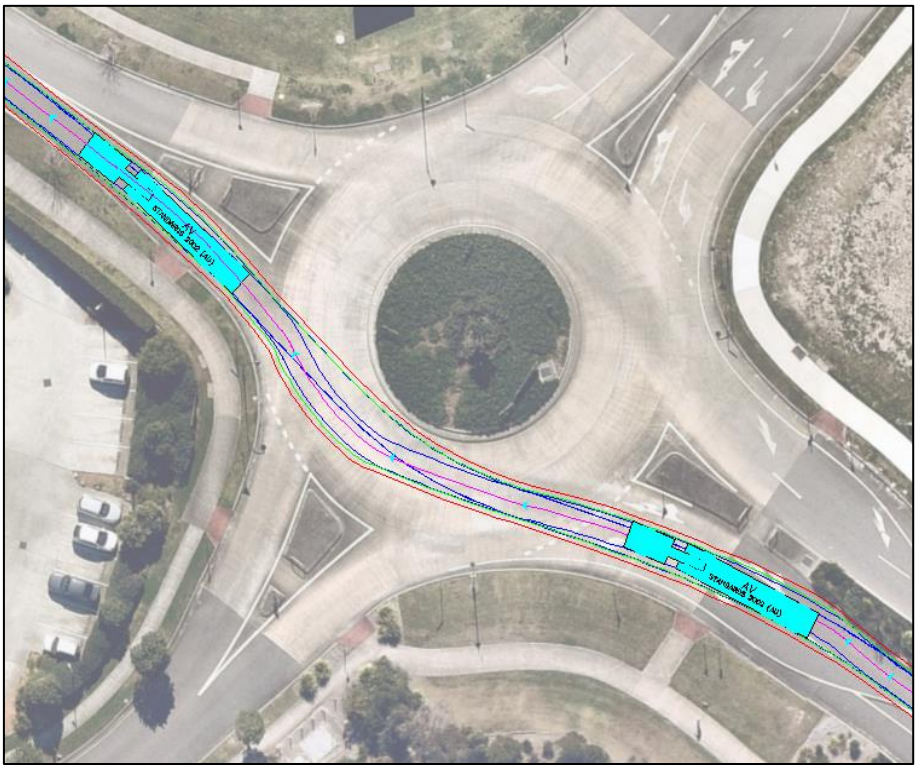
Successful



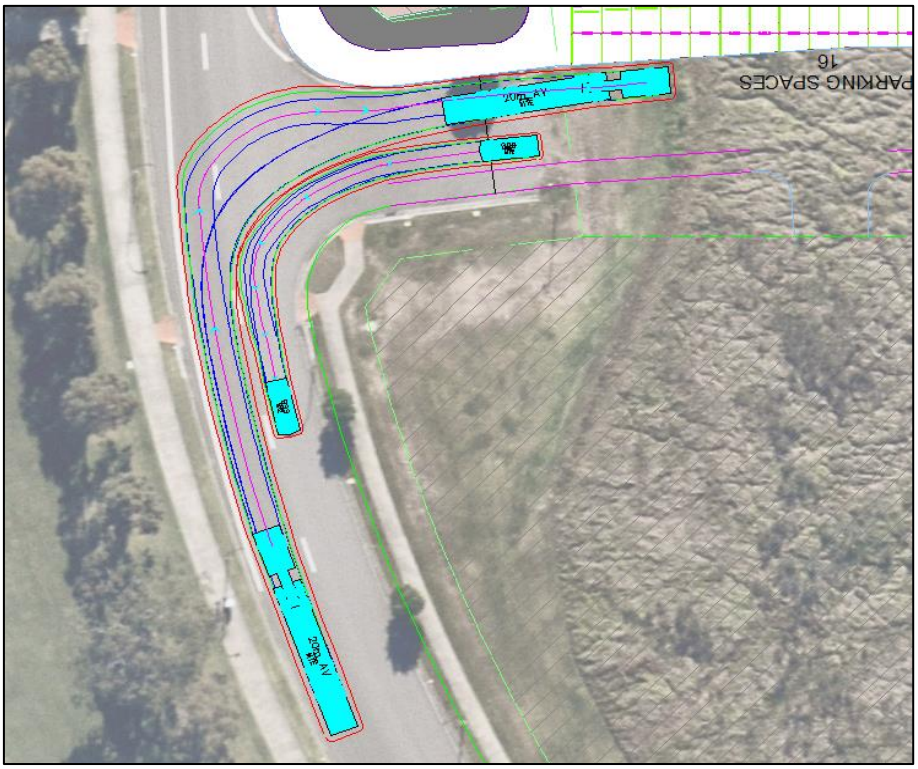
AV into and out of New Link Road from Settlers Boulevard
Successful



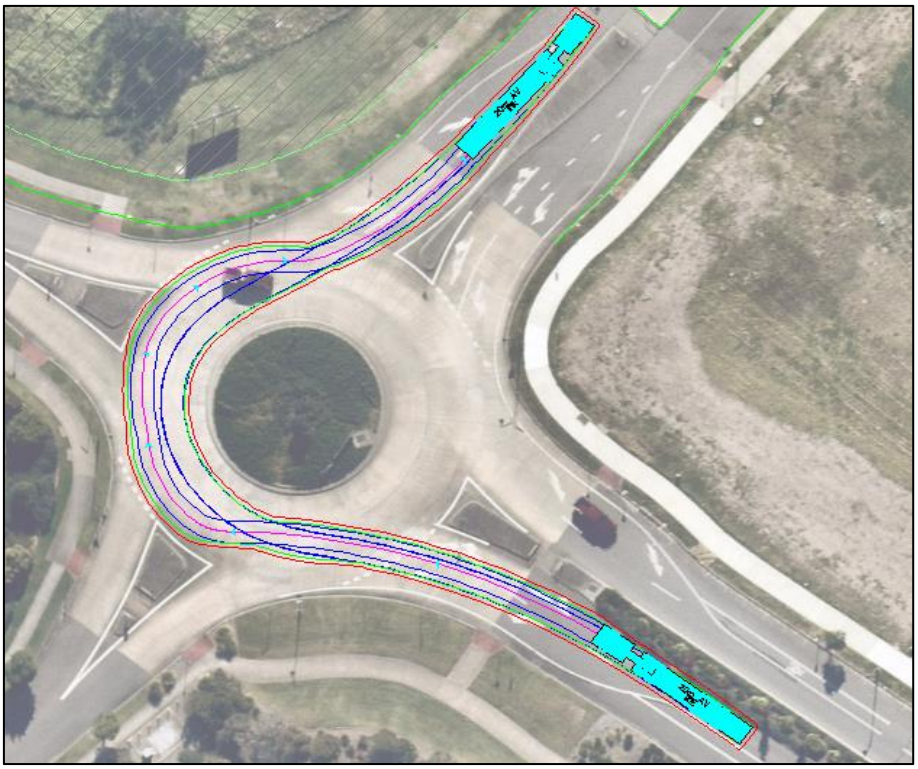
Entry Route – AV Left Turn Into Settlers Boulevard From Raymond Terrace Drive Successful



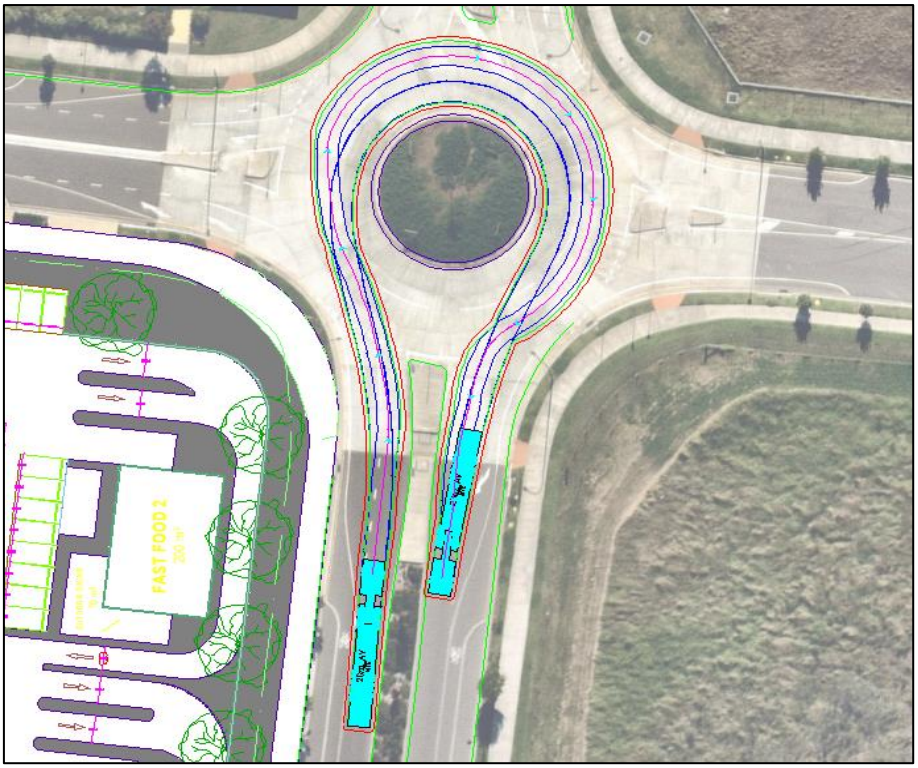
Entry Route – AV Through The Roundabout Onto Hertiage Drive Successful



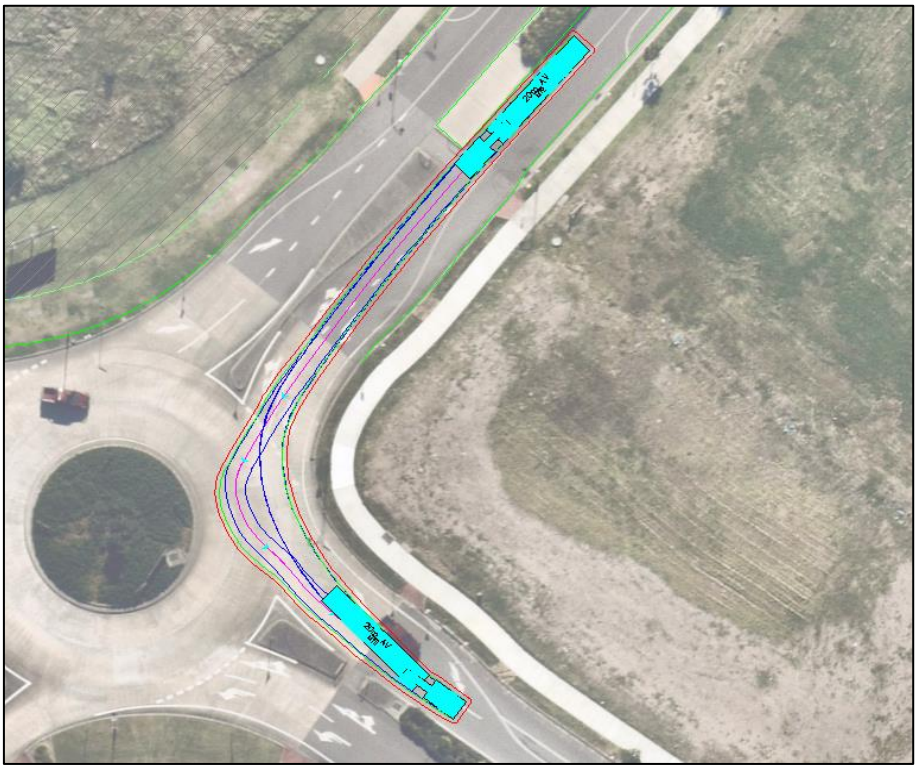
Entry Route – AV Right Turn Into Proposed Road From Heritage Drive (Including Two-Way Passing With B99)
Successful



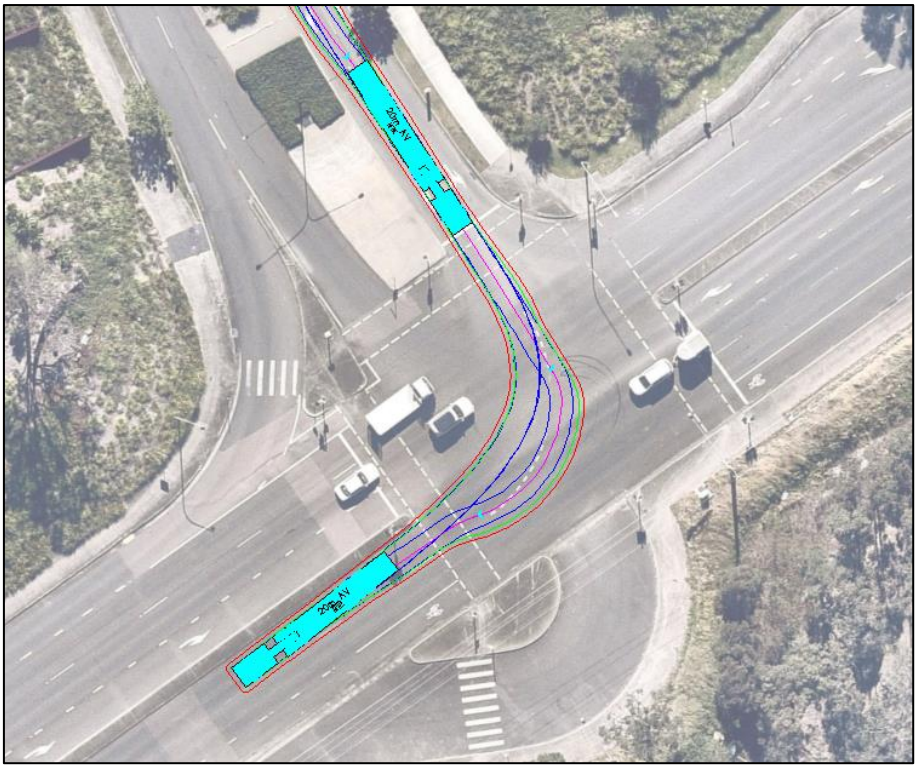
Entry Route – AV Right Turn Into Settlers Boulevard
Successful



Exit Route – AV U-Turn On Settlers Boulevard / Tigerhawk Drive Successful

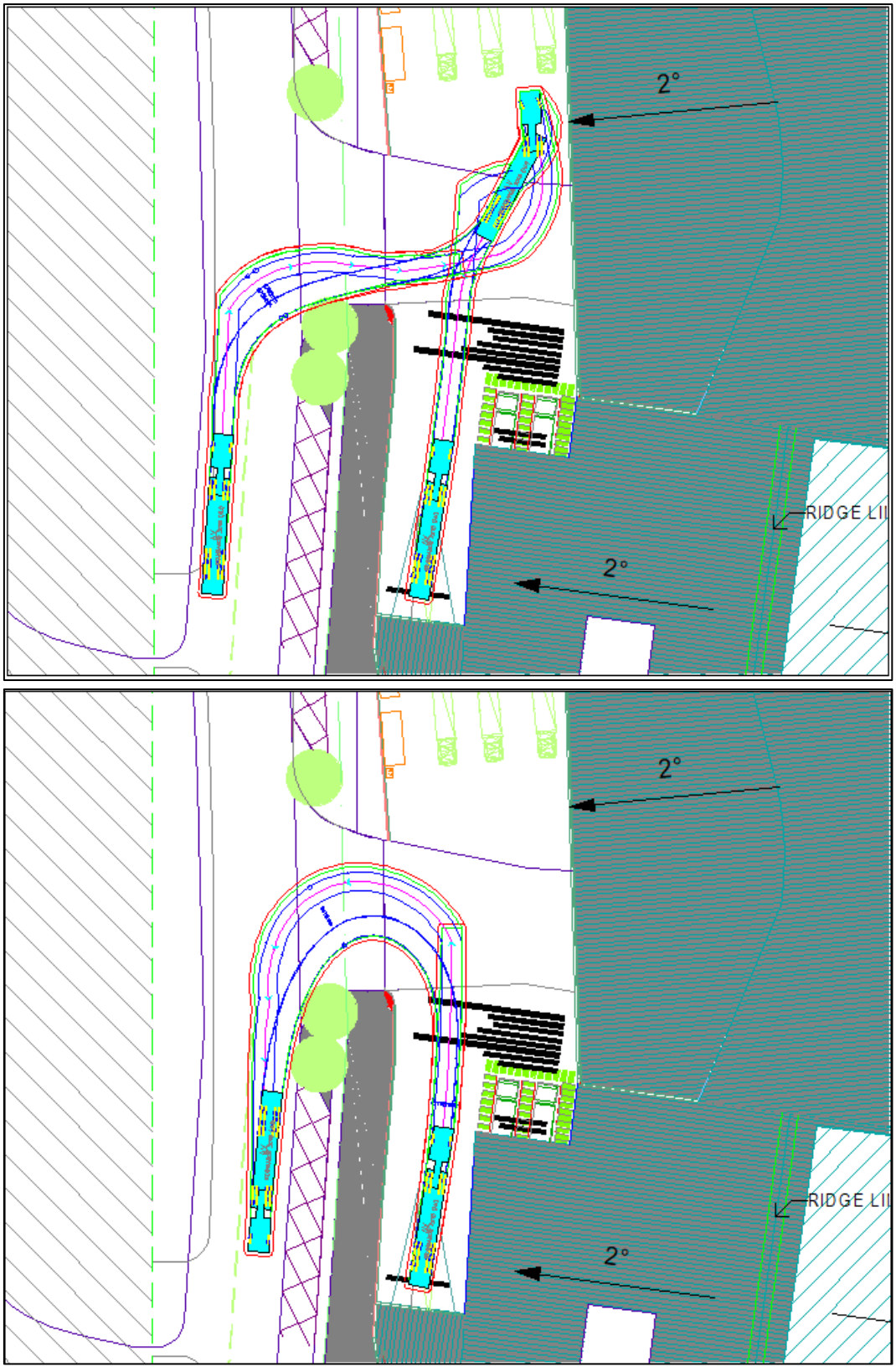


Exit Route – AV Left Turn Into Settlers Boulevard Successful



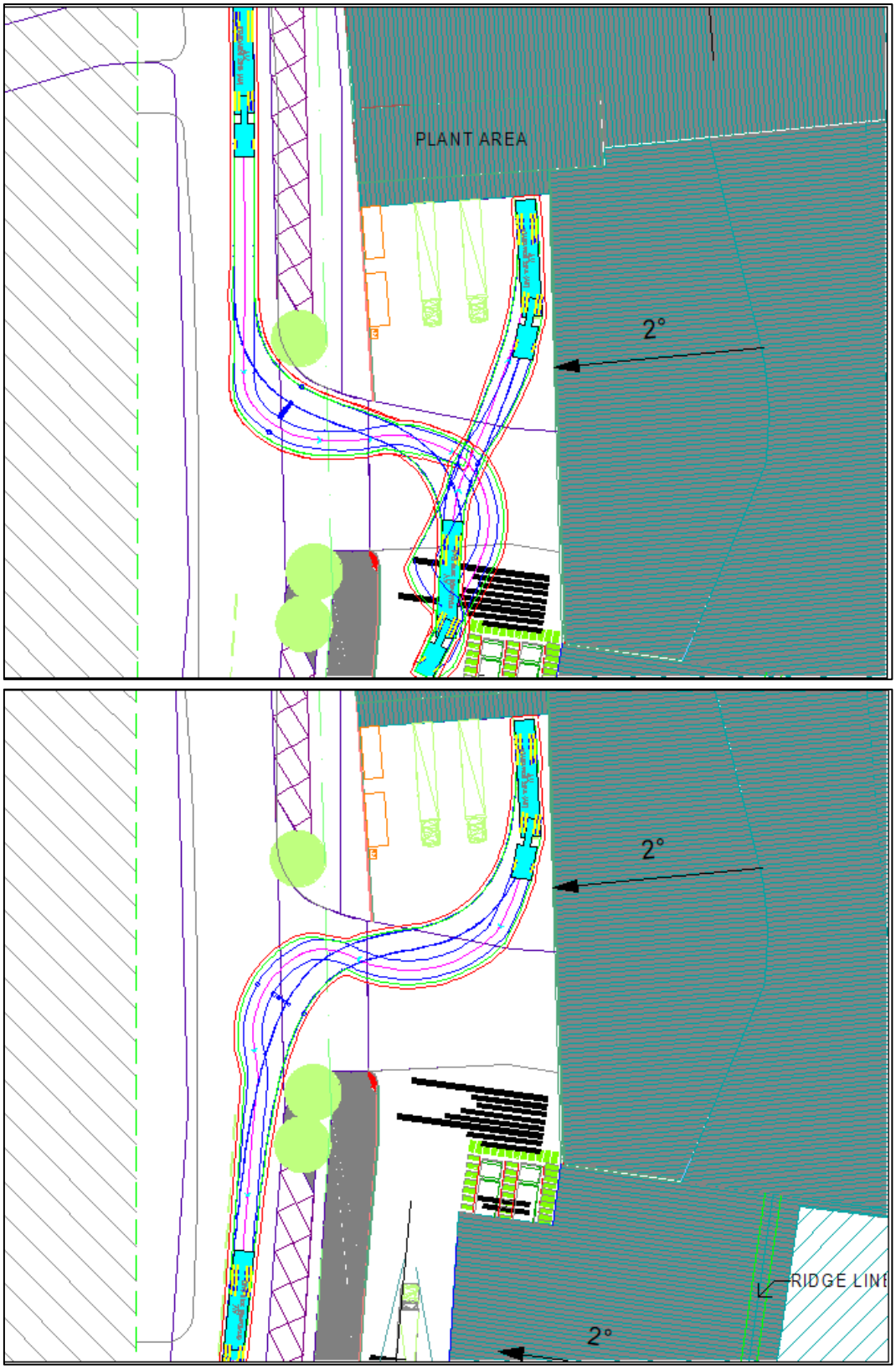
Exit Route – AV Right Turn Into Raymond Terrace Drive From Settlers Boulevard

Successful



AV Entry and exit from New Link Road

Successful



AV Entry and exit from New Link Road

Successful