



# MERCATO ON BYRON ACCESS TRAFFIC IMPACT STUDY

FOR

**MERCATO ON BYRON  
PTY LTD**



**BITZIOS**  
consulting

**Gold Coast**

Suite 26, 58 Riverwalk Avenue  
Robina QLD 4226  
P: (07) 5562 5377  
W: [www.bitziosconsulting.com.au](http://www.bitziosconsulting.com.au)

**Brisbane**

Level 2, 428 Upper Edward Street  
Spring Hill QLD 4000  
P: (07) 3831 4442  
E: [admin@bitziosconsulting.com.au](mailto:admin@bitziosconsulting.com.au)

**Sydney**

Studio 203, 3 Gladstone Street  
Newtown NSW 2042  
P: (02) 9557 6202

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## 1. INTRODUCTION

### 1.1 BACKGROUND

Bitzios Consulting has been engaged by Mercato On Byron Pty Ltd to undertake a traffic assessment of the proposed access solution for the Mercato On Byron development located at 108-110 Jonson Street, Byron Bay. The location of this development is shown in Figure 1.1.

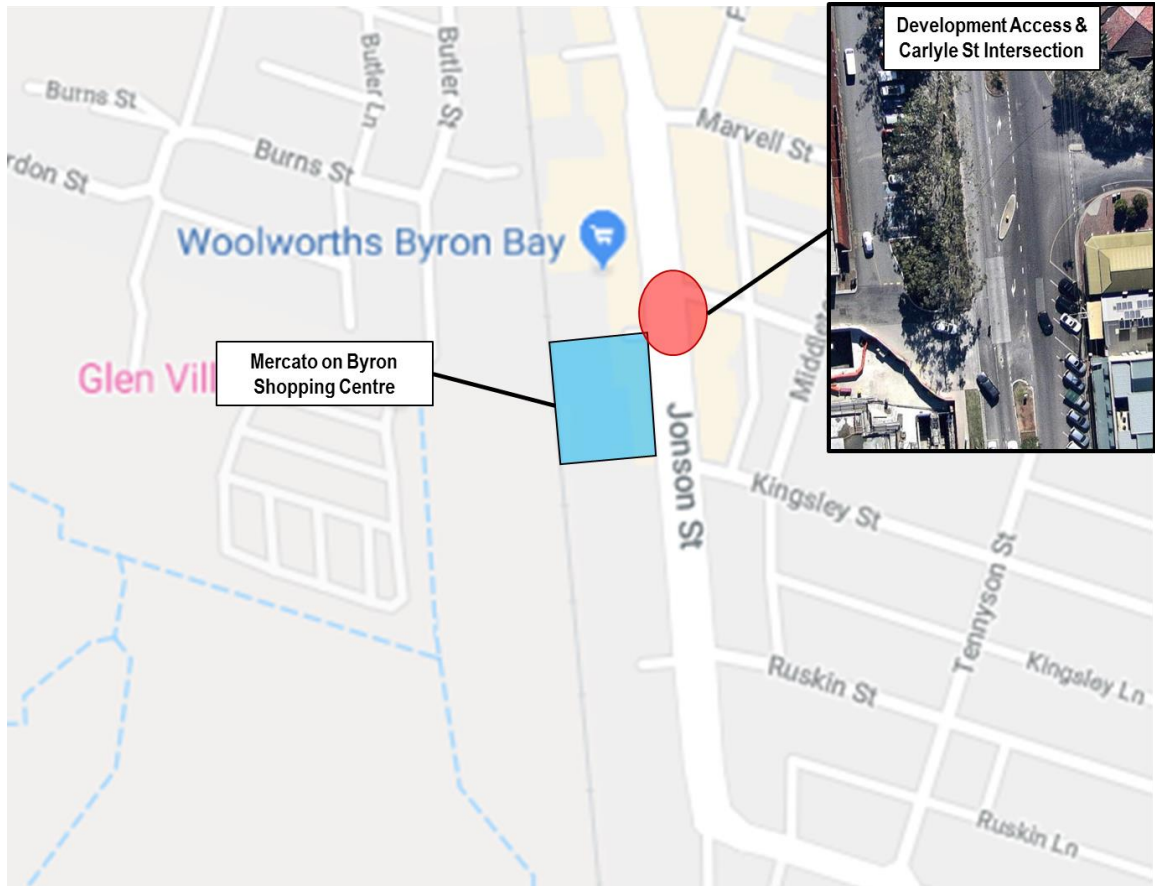


Figure 1.1: Site Location

### 1.2 SCOPE

The scope of this assessment is as follows:

- assessment of safety benefits / risks associated with the proposed access solution;
- estimation of the distribution of development traffic on the surrounding network;
- estimation of the redistribution of background traffic across the network as a result of the proposed access solution; and
- detailed traffic analysis using SIDRA Intersection software to assess the performance of intersections in the surrounding network at the expected year of opening and 10-year design horizon.



## 2. PROJECT HISTORY

The Mercato On Byron development involves the redevelopment of existing shopping centre to provide a supermarket, retail tenancies, restaurants and a gallery. Some existing shops will be removed while other existing shops and the cinema will be refurbished. New basement car parking will provide 328 car parking spaces on two (2) levels. Development plans are provided in Appendix A.

A development application (587/2013) was submitted to Byron Shire Council (Council) and subsequently approved on November 2014. As a part of the development application, a Transport and Traffic Assessment was prepared by TTM and submitted July 2014. Construction of the new shopping centre began early 2017, following the demolition of the existing retail. The development is scheduled to be operational by March 2019.

As a part of the approved development application the applicant was conditioned to provide a roundabout at the Jonson Street / Carlyle Street intersection and a short right-turn pocket for southbound traffic on Jonson Street to access the development. However, Council and Roads and Maritime Services (RMS) have since raised several matters regarding safety and operations of the proposed roundabout and access layout. These matters include:

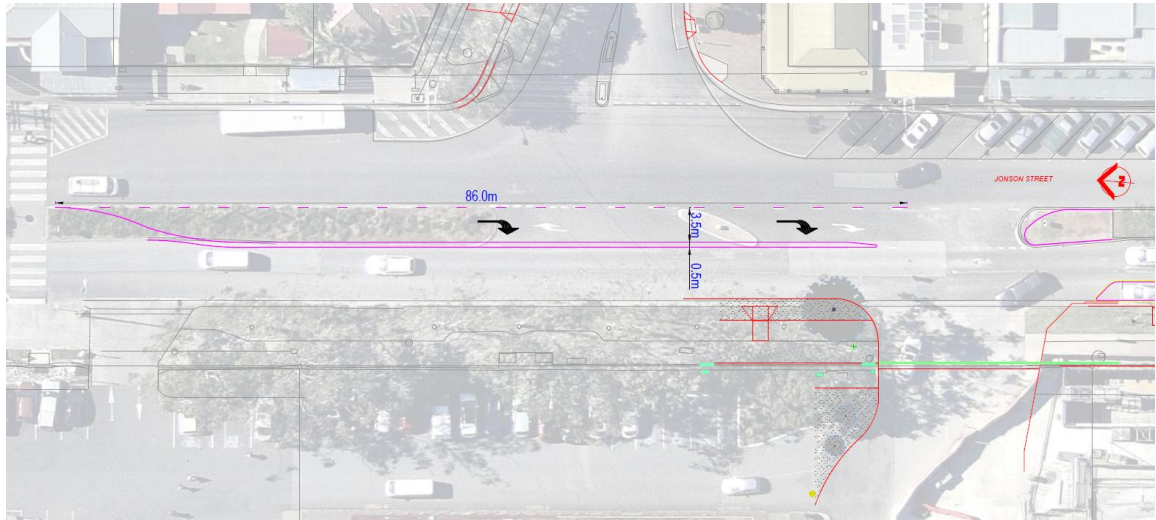
- *the roundabout creates significant deflection for southbound traffic and very little deflection for northbound traffic on Jonson Street. This is not desirable from a design perspective as it will encourage higher speeds for northbound traffic and reduce safety;*
- *the design has not adequately addressed safety for turning traffic, including service vehicles. Circulating, entering and exiting turning paths have not been provided, including the impact of the short right turn storage bay on Jonson Street;*
- *the design proposes a new pedestrian link across Jonson Street on the southern leg of the roundabout, utilising the roundabout splitter islands. Splitter islands are only intended for minimal usage. Safer pedestrian facilities should be located clear of the roundabout to avoid conflicts with entering and exiting traffic;*
- *it is understood that there may be an opportunity to explore options to rationalise and consolidate access to adjacent development at this location which could address the above concerns. This is supported in the first instance; and*
- *it is understood the development is planning to open in March 2019. If the road works have not been completed, then consideration could be given to developing a Traffic Management Plan for the interim period. Any road works within the road reserve should be managed in accordance with the current version of the RTA Traffic Control at Worksites Manual.*

As such, a solution is required to provide access to the development without adversely impacting the safety and efficiency of the surrounding road network.

### 3. PROPOSED ACCESS SOLUTION

#### 3.1 ULTIMATE SOLUTION

In order to resolve safety concerns relating to the Jonson Street / Carlyle Street roundabout initially proposed, an analysis of the problematic design components was undertaken to identify a potential access solution. A concept plan of the solution proposed is shown below in Figure 3.1. This solution incorporates restricting Carlyle Street to left-in / left-out only and providing an all-movements development access.



**Figure 3.1: Proposed Access Solution**

The proposed right-turn pocket and narrow median utilises space currently occupied by the existing median and right-turn pockets and therefore does not impact on through traffic lanes. The length of the proposed right-turn includes 19m of storage for the design service vehicle (AV) plus an additional 67m deceleration length. This exceeds the minimum comfortable deceleration length of 55m prescribed in the Austroads Guide to Road Design Part 4a for a road with a design speed of 60km/h. The taper length of the turn pocket shall be a minimum of 20m long.

##### 3.1.1 Access Solution Safety

In comparison to the previously proposed access including a roundabout at the Jonson street / Carlyle Street intersection, the proposed solution has significant safety benefits including the following:

- the previous access arrangement proposed a short right-turn pocket length non-compliant with the minimum requirements of the Austroads Guide to Road Design Part 4A whereas the proposed solution provides an 86m channelised right-turn treatment. This allows a right-turning vehicle to safely decelerate using the turn pocket rather than slowing down in front of through traffic.
- The proposed length of the right-turn treatment facilitates queuing of at least 10 cars or three (3) design service vehicles (AVs). As such, the potential for the queue of vehicles turning right to extend past the available storage area and conflict with through traffic on Jonson Street is negligible. This represents a significant safety benefit in comparison to the arrangement proposed previously in which a single AV would occupy the entire storage area available in the right-turn treatment.
- the restriction of right turn movements in to and out of Carlyle Street reduces the number of conflicts with through traffic on Jonson Street, therefore reducing the likelihood of crashes. There is also less vehicle conflict with pedestrians seeking to cross the eastern approach of the Jonson Street / Carlyle Street intersection;
- the previous arrangement would have resulted in vehicles reversing from on-street car parking spaces on the eastern side of Jonson Street onto the exit of the proposed Jonson Street / Carlyle Street roundabout. The proposed solution does not result in any safety impacts to surrounding parking nor loss of parking

As such, the proposed development access solution is considered to have significant safety benefits in comparison to the previously proposed arrangement and is a superior solution with respect to safety in the vicinity of the access.

As per the minutes from a meeting held with Council on 11<sup>th</sup> September 2018, Council raised concerns regarding traffic impacts on the surrounding road network from restricting access to Carlyle Street. The traffic assessment to follow has been conducted to address these concerns.

### **3.2 INTERIM SOLUTION**

A construction traffic management plan (CTMP) has been developed for the Mercato on Byron development. As a part of this CTMP, a traffic control plan (TCP) has been created for temporary access arrangement of the proposed ultimate access solution. This temporary layout will utilise water-filled barriers in place of the narrow, raised concrete median on Jonson Street. All temporary signage shall also be provided as per the RMS Traffic Control at Worksites Technical Manual. The TCP showing the interim access solution to be installed until the ultimate solution is constructed is provided in Appendix C.

### **3.3 SWEEP PATH ASSESSMENT**

In order to ensure that the proposed access solution can cater for the design service vehicle, in this case a 19m articulated vehicle (AV), a swept path assessment was undertaken and is provided in Appendix D. As shown, an AV can safely and efficiently turn right into or out of the development to / from Jonson Street with some reduction of the existing median. An AV can also turn left from Jonson Street into the proposed development. However, it is noted that an AV cannot turn left out of the proposed access onto Jonson Street. As such, service vehicles for the proposed supermarket would have to turn right out of the development access. This is not considered to be of significant detriment as the volume of AVs accessing the site is expected to be low and there are network route options available for an AV to travel north after leaving the site if required. As per the current operations of Woolworths Byron Bay, AV servicing will typically occur in the early hours of the morning (i.e. outside of peak / business hours). This outcome is in line with the Access and Movement Sub-Strategy 01 of the Byron Bay Town Centre Masterplan (2016) which includes a key action to limit servicing/deliveries to early morning hours.

## 4. TRAFFIC ASSESSMENT

### 4.1 TRAFFIC SURVEYS

Traffic surveys were undertaken by Traffic Data & Control (TDC) on Thursday 13<sup>th</sup> September 2018 for the AM (08:00 – 11:00) and PM (03:00 – 06:00) peak periods, and on Saturday 15<sup>th</sup> September 2018 for the midday (10:00am – 01:00pm) peak period. The intersections surveyed are as follows:

- Jonson Street / Carlyle Street priority-controlled intersection;
- Jonson Street / Kingsley Street priority-controlled intersection; and
- Jonson Street / Marvell Street priority-controlled intersection.

Detailed traffic survey results are provided in Appendix E with peak hour surveyed volumes shown in Appendix F (Sheet 1).

### 4.2 FORECAST BACKGROUND TRAFFIC

To forecast background traffic volumes at the expected year of opening (2019) and 10-year design horizon (2029) a compounding growth rate of 3% has been applied to surveyed traffic volumes as per the TTM Traffic Report. Forecast peak background traffic volumes for the expected year of opening (2019) and 10-year design horizon (2029) are provided in Appendix F (Sheet 2 & Sheet 3)

### 4.3 DEVELOPMENT TRAFFIC

As per the approved TTM Transport and Traffic Assessment, the Mercato On Byron development is expected to generate 295 peak hour trips in the PM and weekend peak periods. The distribution of these trips onto the surrounding network as per the TTM report is shown in Appendix F (Sheet 4). At the Jonson Street / Kingsley Street intersection it was assumed that 20% of development traffic would travel to / from the site via Kingsley Street and the remaining 80% would be through traffic on Jonson Street.

### 4.4 TRAFFIC REDISTRIBUTION

As a result of the proposed restriction of Carlyle Street to left-in / left-out only, vehicles turning right in and out of Carlyle Street would be distributed elsewhere onto the network. As the combined traffic volumes of both right-turn movements was surveyed to be less than 50 in total in any peak hour, the distribution of these trips is not expected to have a notable adverse impact on the wider road network. However, for the purposes of this traffic assessment background trips and development trips turning right in and out of Carlyle Street we redistributed onto the surrounding intersections with distributions shown in Appendix F (Sheet 5 & Sheet 6).

### 4.5 DESIGN TRAFFIC

Design traffic volumes were determined by adding the background and development traffic and considering the redistribution of trips as a result of the restricted access to Carlyle Street. Forecast design traffic volumes for the expected year of opening (2019) and 10-year design horizon (2029) are provided in Appendix F (Sheet 7 & Sheet 8).

### 4.6 SIDRA ANALYSIS

#### 4.6.1 Methodology

SIDRA Intersection 8 was used to model the impact of background and design traffic on the surrounding intersections for the expected year of opening (2019) and 10-year design horizon (2029). As per the TTM Transport and Traffic Assessment, the SIDRA assessment shall consider the weekday PM and weekend midday peaks. Noting that the development access intersection is not assessed for background traffic volumes, the intersections analysed are as follows:

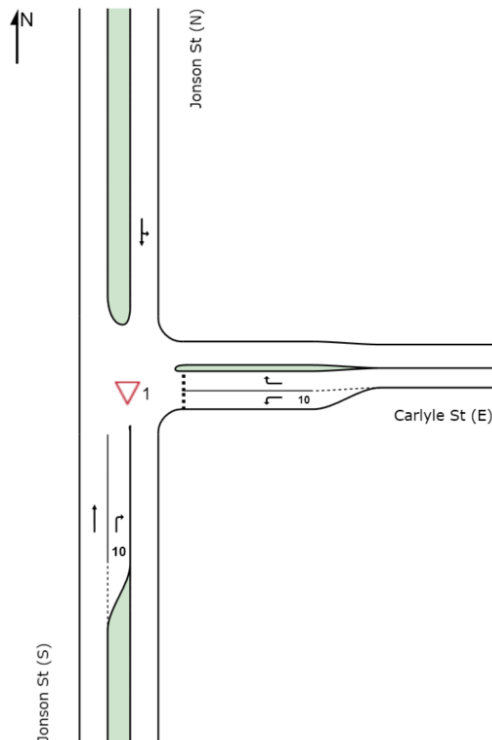
- Jonson Street / Carlyle Street intersection;

- Jonson Street / Kingsley Street intersection;
- Jonson Street / Marvell Street intersection; and
- Jonson Street / Development Access.

Detailed SIDRA results for each intersection are provided in Appendix G.

#### 4.6.2 Jonson Street / Carlyle Street Intersection & Jonson Street / Development Access

The Jonson Street / Carlyle Street intersection as assessed in SIDRA is shown in Figure 4.1.



**Figure 4.1: Jonson Street / Carlyle Street SIDRA Intersection Layout**

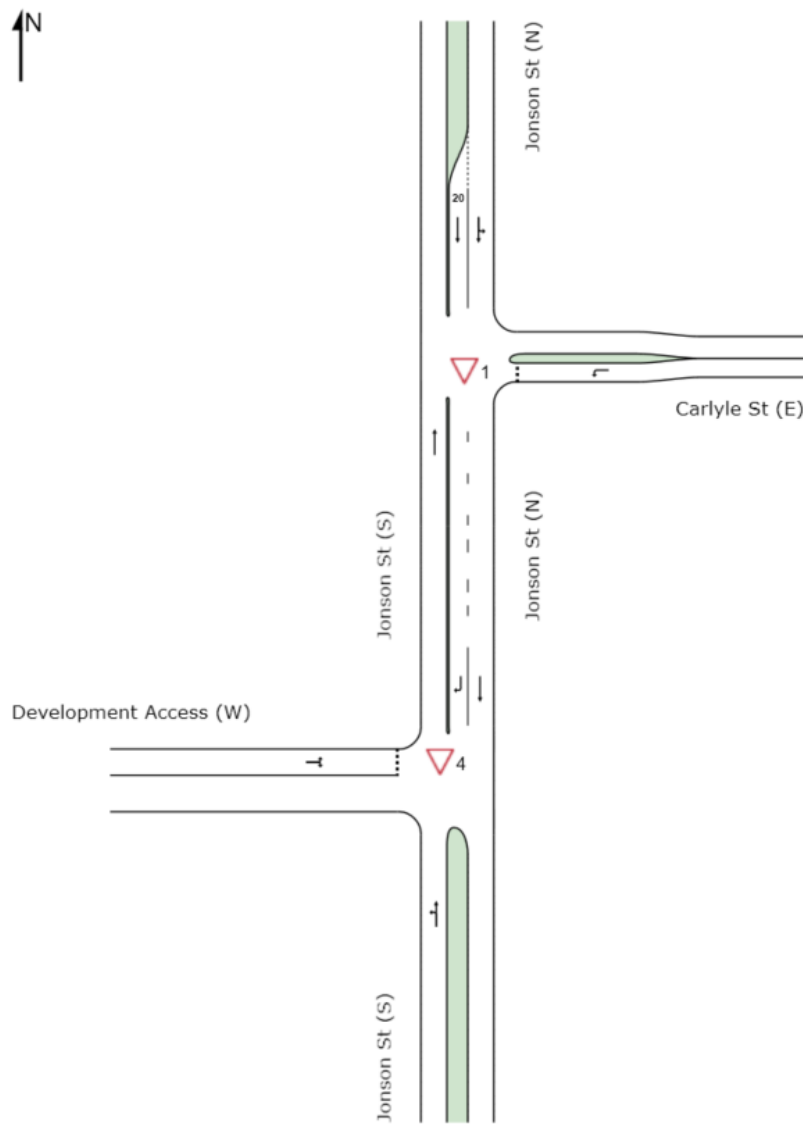
The SIDRA Intersection results for the Jonson Street / Carlyle Street intersection for the forecast background traffic volumes are summarised in Table 4.1 for years 2019 and 2029.

**Table 4.1: Jonson Street / Carlyle Street Background SIDRA Results Summary**

Intersection	Movement	PM Peak				Weekend Peak			
		LOS	Avg. Delay (s)	95%ile Queue (m)	DOS	LOS	Avg. Delay (s)	95%ile Queue (m)	DOS
<b>2019 Background</b>									
Jonson Street (S)	Through	A	0	0	0.23	A	0	0	0.23
	Right Turn	A	8.2	1.7	0.03	A	7.4	0.7	0.02
Carlyle Street (E)	Left Turn	A	8.1	2.0	0.08	A	7.0	0.8	0.03
	Right Turn	C	19.5	2.3	0.10	C	17.1	1.1	0.04
Jonson Street (N)	Left Turn	A	5.5	0	0.30	A	5.6	0	0.21
	Through	A	0	0	0.30	A	0	0	0.21
<b>Overall</b>	-	<b>N/A</b>	<b>1.2</b>	<b>2.3</b>	<b>0.30</b>	<b>N/A</b>	<b>0.8</b>	<b>1.1</b>	<b>0.23</b>
<b>2029 Background</b>									
Jonson Street (S)	Through	A	0	0	0.31	A	0	0	0.30
	Right Turn	B	10.2	0.2	0.05	A	8.4	1.2	0.04
Carlyle Street (E)	Left Turn	B	10.0	0.5	0.14	A	7.8	1.3	0.04
	Right Turn	E	43.1	0.9	0.29	D	29.4	2.7	0.11
Jonson Street (N)	Left Turn	A	5.5	0	0.40	A	5.6	0	0.29
	Through	A	0	0	0.40	A	0	0	0.29
<b>Overall</b>	-	<b>N/A</b>	<b>1.8</b>	<b>0.9</b>	<b>0.40</b>	<b>N/A</b>	<b>1.0</b>	<b>2.7</b>	<b>0.30</b>

As shown, the Jonson Street / Carlyle Street intersection operates within acceptable performance limits for forecast background traffic volumes for the expected year of opening (2019) and 10-year design horizon (2029).

Due to the proximity of the development access to the Jonson Street / Carlyle Street intersection and the proposed restriction to access to Carlyle Street, the Jonson Street / Carlyle Street intersection and development access was assessed in SIDRA as a network for design traffic volumes. The Jonson Street / Carlyle Street / Development Access intersection network as assessed in SIDRA is shown in Figure 4.2.



**Figure 4.2: Jonson Street / Carlyle Street / Development Access SIDRA Network Layout**

The SIDRA Network results for the Jonson Street / Carlyle Street intersection for the forecast design traffic volumes are summarised in Table 4.2 or years 2019 and 2029.

**Table 4.2: Jonson Street / Carlyle Street Design SIDRA Network Results Summary**

Intersection	Movement	PM Peak				Weekend Peak			
		LOS	Avg. Delay (s)	95%ile Queue (m)	DOS	LOS	Avg. Delay (s)	95%ile Queue (m)	DOS
<b>2019 Design</b>									
Jonson Street (S)	Through	A	0	0	0.29	A	0	0	0.28
Carlyle Street (E)	Left Turn	A	7.9	0.8	0.08	A	7.0	0.4	0.03
Jonson Street (N)	Left Turn	A	5.5	0	0.28	A	5.6	0	0.21
	Through	A	0	0	0.28	A	0	0	0.21
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>0.5</b>	<b>0.8</b>	<b>0.29</b>	<b>N/A</b>	<b>0.4</b>	<b>0.4</b>	<b>0.28</b>
<b>2029 Design</b>									
Jonson Street (S)	Through	A	0	0	0.37	A	0	0	0.36
Carlyle Street (E)	Left Turn	A	9.6	1.4	0.14	A	7.6	0.5	0.05
Jonson Street (N)	Left Turn	A	5.5	0	0.39	A	5.6	0	0.27
	Through	A	0	0	0.39	A	0	0	0.27
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>0.7</b>	<b>1.4</b>	<b>0.39</b>	<b>N/A</b>	<b>0.4</b>	<b>0.5</b>	<b>0.36</b>

As shown, the Jonson Street / Carlyle Street reconfigured intersection operates within acceptable performance limits for design traffic volumes for the expected year of opening (2019) and 10-year design horizon (2029). As would be expected, the restriction of right-turn movements improves intersection performance despite additional development traffic.

The SIDRA Network results for the Jonson Street / Development Access intersection for the forecast design traffic volumes are summarised in Table 4.3 for years 2019 and 2029.

**Table 4.3: Jonson Street / Development Access Design SIDRA Network Results Summary**

Intersection	Movement	PM Peak				Weekend Peak			
		LOS	Avg. Delay (s)	95%ile Queue (m)	DOS	LOS	Avg. Delay (s)	95%ile Queue (m)	DOS
<b>2019 Design</b>									
Jonson Street (S)	Left Turn	A	4.6	0	0.28	A	4.6	0	0.27
	Through	A	0	0	0.28	A	0	0	0.27
Jonson Street (N)	Through	A	0	0	0.31	A	0	0	0.21
	Right Turn	A	5.1	1.0	0.09	A	5.1	1.1	0.09
Development Access (W)	Left Turn	A	8.5	4.5	0.36	A	7.0	2.9	0.26
	Right Turn	D	29.5	4.5	0.36	C	19.2	2.9	0.26
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>2.0</b>	<b>4.5</b>	<b>0.36</b>	<b>N/A</b>	<b>1.8</b>	<b>2.9</b>	<b>0.27</b>
<b>2029 Design</b>									
Jonson Street (S)	Left Turn	A	4.6	0	0.36	A	4.6	0	0.35
	Through	A	0	0	0.36	A	0	0	0.35
Jonson Street (N)	Through	A	0	0	0.42	A	0	0	0.28
	Right Turn	A	6.6	1.3	0.12	A	6.5	1.3	0.12
Development Access (W)	Left Turn	D	34.3	12.7	0.77	B	10.7	5.1	0.41
	Right Turn	F	89.9	12.7	0.77	E	36.2	5.1	0.41
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>4.6</b>	<b>12.7</b>	<b>0.77</b>	<b>N/A</b>	<b>2.2</b>	<b>5.1</b>	<b>0.41</b>

As shown, the Jonson Street / Development access intersection operates within acceptable performance limits for design traffic volumes for the expected year of opening (2019). It is noted that average delays for vehicles exiting in the development are shown to exceed acceptable limits (LOS E/F) in the PM and weekend peaks for the 10-year design horizon. However, the proposed access intersection performance is deemed to sufficiently cater for design traffic volumes considering the following:

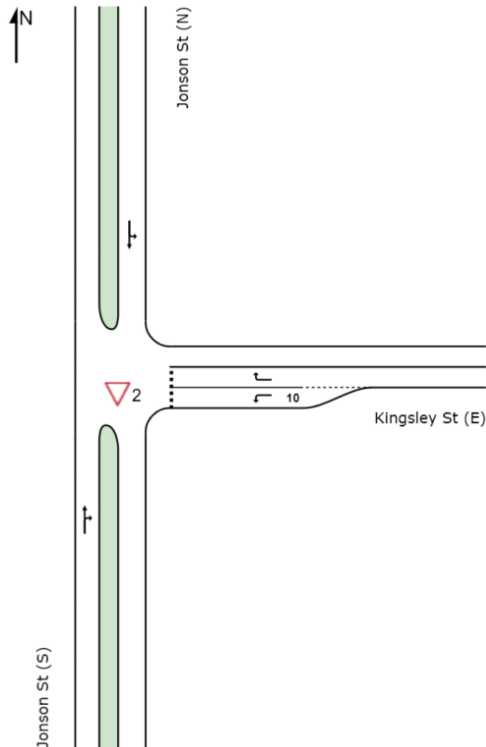
- delays and queuing on Jonson Street are negligible;
- all queues are contained wholly within either the development site or the proposed right-turn pocket and as such will not negatively influence through traffic on Jonson Street;



- as development traffic volumes exiting the site are low, queuing as a result of the delays identified are low with the 95% queue only approximately two (2) vehicles in length; and
- the Byron Bay town bypass (to be further discussed below) is expected to be constructed prior to the 10-year design horizon (2029) and significantly reduce through traffic on Jonson Street.

### 4.6.3 Jonson Street / Kingsley Street Intersection

The Jonson Street / Kingsley Street intersection as assessed in SIDRA is shown in Figure 4.3.



**Figure 4.3: Jonson Street / Kingsley Street Intersection**

The SIDRA Intersection results for the Jonson Street / Kingsley Street intersection for the forecast background traffic volumes are summarised in Table 4.4 for years 2019 and 2029.

**Table 4.4: Jonson Street / Kingsley Street Background SIDRA Results Summary**

Intersection	Movement	PM Peak				Weekend Peak			
		LOS	Avg. Delay (s)	95%ile Queue (m)	DOS	LOS	Avg. Delay (s)	95%ile Queue (m)	DOS
<b>2019 Background</b>									
Jonson Street (S)	Through	A	0.2	1.7	0.28	A	0	0.6	0.27
	Right Turn	A	8.4	1.7	0.28	A	6.7	0.6	0.27
Kingsley Street (E)	Left Turn	A	6.7	1.2	0.05	A	5.9	0.6	0.02
	Right Turn	B	13.3	3.0	0.14	B	10.2	1.3	0.06
Jonson Street (N)	Left Turn	A	4.7	0	0.29	A	4.6	0	0.19
	Through	A	0	0	0.29	A	0	0	0.19
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>1.1</b>	<b>3.0</b>	<b>0.29</b>	<b>N/A</b>	<b>0.7</b>	<b>1.3</b>	<b>0.27</b>
<b>2029 Background</b>									
Jonson Street (S)	Through	A	0.5	4.3	0.38	A	0.1	1.4	0.36
	Right Turn	A	12.1	4.3	0.38	A	8.3	1.4	0.36
Kingsley Street (E)	Left Turn	A	8.2	2.1	0.08	A	6.6	0.9	0.03
	Right Turn	B	27.2	8.2	0.36	B	15.6	2.8	0.14
Jonson Street (N)	Left Turn	A	4.7	0	0.38	A	4.6	0	0.26
	Through	A	0	0	0.38	A	0	0	0.26
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>1.9</b>	<b>8.2</b>	<b>0.38</b>	<b>N/A</b>	<b>0.9</b>	<b>2.8</b>	<b>0.36</b>

As shown, the Jonson Street / Kingsley Street intersection operates within acceptable performance limits for background traffic volumes for the expected year of opening (2019) and 10-year design horizon (2029).



The SIDRA Intersection results for the Jonson Street / Kingsley Street intersection for the forecast design traffic volumes are summarised in Table 4.5 for years 2019 and 2029.

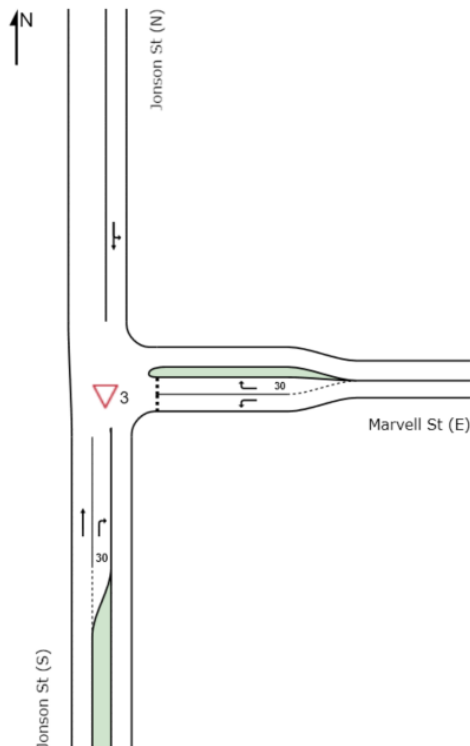
**Table 4.5: Jonson Street / Kingsley Street Design SIDRA Results Summary**

Intersection	Movement	PM Peak				Weekend Peak			
		LOS	Avg. Delay (s)	95%ile Queue (m)	DOS	LOS	Avg. Delay (s)	95%ile Queue (m)	DOS
<b>2019 Design</b>									
Jonson Street (S)	Through	A	0.5	4.6	0.33	A	0.2	2.6	0.31
	Right Turn	A	9.2	4.6	0.33	A	7.1	2.6	0.31
Kingsley Street (E)	Left Turn	A	6.9	1.3	0.05	A	6.0	0.6	0.02
	Right Turn	C	16.4	5.3	0.23	B	11.8	2.5	0.12
Jonson Street (N)	Left Turn	A	4.7	0	0.31	A	4.6	0	0.21
	Through	A	0	0	0.31	A	0	0	0.21
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>1.7</b>	<b>5.3</b>	<b>0.33</b>	<b>N/A</b>	<b>1.1</b>	<b>2.6</b>	<b>0.31</b>
<b>2029 Design</b>									
Jonson Street (S)	Through	A	1.4	11.8	0.45	A	0.5	5.9	0.42
	Right Turn	B	13.8	11.8	0.45	A	9.1	5.9	0.42
Kingsley Street (E)	Left Turn	A	8.5	2.2	0.09	A	6.8	0.9	0.03
	Right Turn	E	42.5	15.5	0.61	C	20.2	5.3	0.25
Jonson Street (N)	Left Turn	A	4.7	0	0.41	A	4.6	0	0.28
	Through	A	0	0	0.41	A	0	0	0.28
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>3.5</b>	<b>15.5</b>	<b>0.61</b>	<b>N/A</b>	<b>1.6</b>	<b>5.9</b>	<b>0.42</b>

As shown, the Jonson Street / Carlyle Street intersection operates within acceptable performance limits for forecast design traffic volumes for the expected year of opening (2019) and 10-year design horizon (2029).

#### 4.6.4 Jonson Street / Marvell Street Intersection

The Jonson Street / Marvell Street intersection as assessed in SIDRA is shown in Figure 4.4.



**Figure 4.4: Jonson Street / Marvell Street SIDRA Intersection Layout**

The SIDRA Intersection results for the Jonson Street / Marvell Street intersection for the forecast background traffic volumes are summarised in Table 4.6 for years 2019 and 2029.

**Table 4.6: Jonson Street / Marvell Street Background SIDRA Results Summary**

Intersection	Movement	PM Peak				Weekend Peak			
		LOS	Avg. Delay (s)	95%ile Queue (m)	DOS	LOS	Avg. Delay (s)	95%ile Queue (m)	DOS
<b>2019 Background</b>									
Jonson Street (S)	Through	A	0	0	0.28	A	0	0	0.23
	Right Turn	A	7.1	3.7	0.13	A	5.8	3.6	0.11
Marvell Street (E)	Left Turn	A	5.5	4.4	0.16	A	4.4	4.5	0.15
	Right Turn	C	23.7	9.7	0.35	B	13.1	5.2	0.20
Jonson Street (N)	Left Turn	A	4.6	0	0.29	A	4.6	0	0.17
	Through	A	0	0	0.29	A	0	0	0.17
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>2.7</b>	<b>9.7</b>	<b>0.35</b>	<b>N/A</b>	<b>2.4</b>	<b>5.2</b>	<b>0.23</b>
<b>2029 Background</b>									
Jonson Street (S)	Through	A	0	0	0.37	A	0	0	0.31
	Right Turn	A	8.9	6.6	0.23	A	6.4	5.5	0.17
Marvell Street (E)	Left Turn	A	7.0	7.8	0.26	A	5.0	6.8	0.22
	Right Turn	F	197.7	79.4	1.08	C	27.5	13.3	0.46
Jonson Street (N)	Left Turn	A	4.6	0	0.39	A	4.6	0	0.23
	Through	A	0	0	0.39	A	0	0	0.23
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>12.3</b>	<b>79.4</b>	<b>1.08</b>	<b>N/A</b>	<b>3.5</b>	<b>13.3</b>	<b>0.46</b>

As shown, the Jonson Street / Marvell Street intersection operates within acceptable performance limits for background traffic volumes for the expected year of opening (2019). However, significant delays and queuing of vehicles turning right out of Marvell Street are expected for background traffic volumes for the 10-year design horizon (2029).

The SIDRA Intersection results for the Jonson Street / Marvell Street intersection for the forecast design traffic volumes are summarised in Table 4.7 for years 2019 and 2029.

**Table 4.7: Jonson Street / Marvell Street Design SIDRA Results Summary**

Intersection	Movement	PM Peak				Weekend Peak			
		LOS	Avg. Delay (s)	95%ile Queue (m)	DOS	LOS	Avg. Delay (s)	95%ile Queue (m)	DOS
<b>2019 Design</b>									
Jonson Street (S)	Through	A	0	0	0.32	A	0	0	0.28
	Right Turn	A	7.6	5.1	0.17	A	6.1	4.6	0.15
Marvell Street (E)	Left Turn	A	5.9	5.3	0.19	A	4.7	5.4	0.18
	Right Turn	E	43.0	18.7	0.62	C	19.4	8.3	0.30
Jonson Street (N)	Left Turn	A	4.6	0	0.32	A	4.6	0	0.20
	Through	A	0	0	0.32	A	0	0	0.20
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>4.0</b>	<b>18.7</b>	<b>0.62</b>	<b>N/A</b>	<b>2.8</b>	<b>8.3</b>	<b>0.30</b>
<b>2029 Design</b>									
Jonson Street (S)	Through	A	0	0	0.41	A	0	0	0.36
	Right Turn	A	10.3	9.7	0.30	A	6.8	6.9	0.22
Marvell Street (E)	Left Turn	A	8.0	9.9	0.31	A	5.3	8.1	0.26
	Right Turn	F	1005.4	340.7	2.04	F	56.4	25.0	0.75
Jonson Street (N)	Left Turn	A	4.6	0	0.42	A	4.6	0	0.26
	Through	A	0	0	0.42	A	0	0	0.26
<b>Overall</b>	<b>-</b>	<b>N/A</b>	<b>61.1</b>	<b>340.7</b>	<b>2.04</b>	<b>N/A</b>	<b>5.2</b>	<b>25.0</b>	<b>0.75</b>

As shown, the Jonson Street / Marvell Street intersection operates within acceptable performance limits for design traffic volumes for the expected year of opening (2019). However, significant delays and queuing of vehicles turning right out of Marvell Street are expected for design traffic volumes for the 10-year design horizon (2029).

#### 4.6.5 SIDRA Results Summary

A summary of the SIDRA assessment is shown in Table 4.8, with green squares indicating that the intersection can sufficiently cater for the corresponding traffic scenario and red squares indicating that the intersection, under that scenario, does not operate within acceptable performance limits.

**Table 4.8: SIDRA Results Summary**

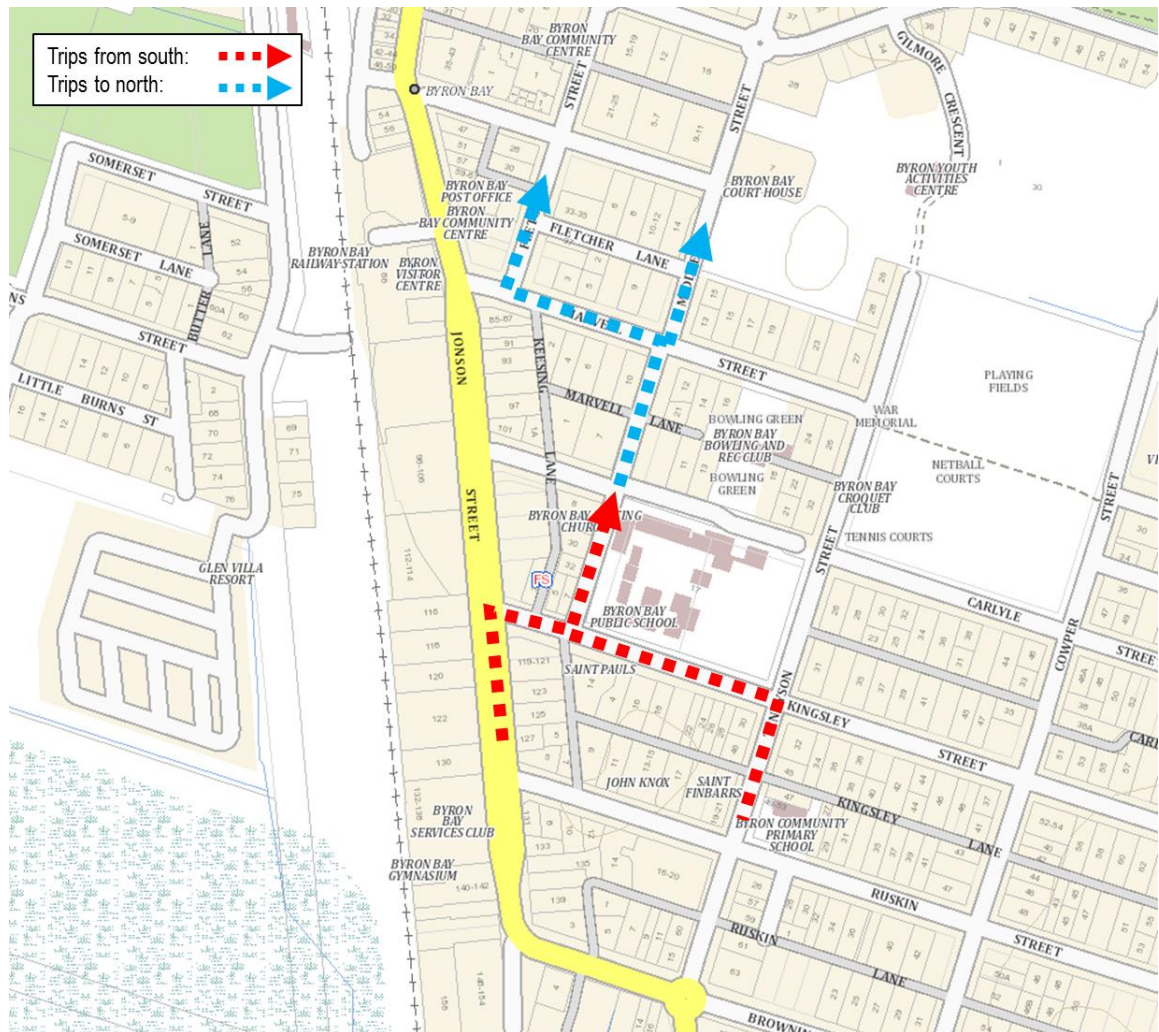
Intersection	2019 Background	2019 Design	2029 Background	2029 Design
Jonson Street / Carlyle Street				
Jonson Street / Development Access	N/A		N/A	
Jonson Street / Kingsley Street				
Jonson Street / Marvell Street				

As shown, all intersections operate within acceptable performance limits for the background and design traffic volumes for the expected year of opening (2019) and 10-year design horizon (2029) with the exception of the Jonson Street / Marvell Street intersection in 2029. However, the SIDRA assessment demonstrates that this intersection cannot cater for background traffic volumes at 2029 (i.e. failure occurs without development traffic or re-routing of Carlyle Street traffic) As such, this assessment indicates that the addition of development traffic and the redistribution of traffic as a result of the proposed Carlyle Street turn restrictions does not adversely impact the performance of surrounding intersections.

## 5. TRAFFIC MANAGEMENT

### 5.1 CARLYLE STREET RE-ROUTING

As stated the proposed access would involve restricting access to Carlyle Street and as such existing trips turning right in and right out of Carlyle Street to / from Jonson Street would be consequently re-routed. However, this is expected to have little to no impact on travel times. Due to the congestion on Jonson Street the fastest route for vehicles to travel north from Carlyle Street is via Marvell Street and either Middleton Street or Fletcher Street. The fastest route to travel south from Carlyle Street is via Kingsley Street and Tennyson Street, unless the destination is off Jonson Street (e.g. Byron Bay Services Club). These route options are illustrated in Figure 5.1.



Source: SIXMaps

**Figure 5.1: Carlyle Street Route Options**

Traffic survey volumes indicated that the highest surveyed volume of trips that would have to be re-routed is the right-turn into Carlyle Street in the weekend peak period. At this peak 24 vehicles were surveyed entering Carlyle Street from Jonson Street. This equates to less than one (1) vehicle every two (2) minutes and as such the impact of re-routing is expected to be negligible. Left-in / left-out restrictions are common in Byron Bay noting that several driveways on Jonson Street are restricted. However, as development traffic is significantly higher than traffic turning right in / out of Carlyle Street, the impacting of re-routing Carlyle Street traffic is lower.

Furthermore, the impact of the Carlyle Street re-routing will also have minimal impact on residents as very few residential properties are located on Carlyle Street. Sites fronting Carlyle Street include:

- the rear access for Byron Bay Public School & Club Byron;



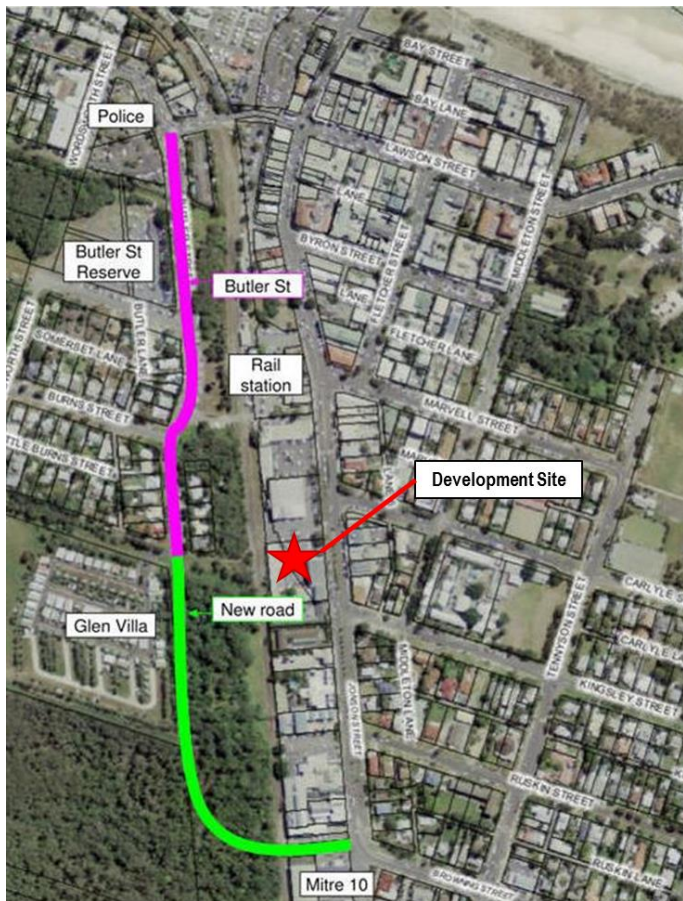
- Byron Bay YHA;
- Byron Bay Uniting Church;
- Byron Bay English Language School; and
- small retail / food outlets.

It should be noted that Carlyle Street forms a cul-de-sac to the immediate west of Middleton Street. As such, Carlyle Street does not form a continuous road at this location and is not used as a through traffic route.

As a significant portion of trips to these land uses are irregular, any re-routing of trips to/from these destinations is not expected to have significant lasting impacts and very few residents would be impacted in any way.

## 5.2 FUTURE CONDITIONS

The proposed Byron Bay town bypass is expected to significantly benefit traffic conditions on the road network surrounding the Mercato On Byron development site. As shown in Figure 5.2, the bypass will connect the Butler Street / Shirley Street Intersection to the southern end of Jonson Street with the upgrade and extension of the existing Butler Street roadway.



Source: *Echo Net Daily*

**Figure 5.2: Byron Bay Bypass**

This bypass aims to minimise through traffic in the Byron Bay CBD and as such reduce traffic delays for local traffic in the CBD. The development of the bypass has been approved with construction subject to further funding. The Byron Bay Town Centre Masterplan identifies the potential for the bypass to redirect 15-20% of traffic around the town centre.

The construction of the Byron Bay town bypass will also include a roundabout at the Jonson Street / Browning Street intersection fronting 148 Jonson Street. This roundabout will provide the local street grid network with an additional U-Turn facility further benefiting network performance.

## 6. CONCLUSION

The key findings from the traffic impact study for the proposed access solution to the Marcato on Byron development located at 108-110 Jonson Road, Byron Bay are as follows:

- the shopping centre development on the subject site is approved and expected to be complete March 2019;
- safety concerns have been raised regarding the Jonson Street / Carlyle Street roundabout and development access arrangement proposed in the Transport and Traffic Assessment prepared by TTM;
- the proposed access solution is to provide an all-movements access to the site with a channelised right turn pocket on Jonson Street. Access to Carlyle Street will be restricted to left-in / left-out only;
- the proposed solution is considered to have significant safety benefits in comparison to the previously proposed arrangement and is not expected to have an adverse impact on safety in the vicinity of the access;
- a TCP has been prepared of the interim access solution to be provided prior to the construction of the ultimate solution;
- a swept path assessment demonstrates that an AV can safely enter and exit the site with the proposed access arrangement. However, an AV is unable to make a left-turn out of the development site;
- traffic growth, traffic generation and distribution were adopted as per the TTM Traffic and Transport Assessment;
- concerns were raised that the restriction of access to Carlyle street would have negative traffic impacts on the wider network. However, as per the TTM report and traffic counts undertaken September 2018, the traffic volumes that would be redistributed onto the network are low and as such any impacts are expected to be minimal. Notwithstanding this, a SIDRA assessment was conducted for intersections surrounding the subject site to determine the impacts of development traffic and the redistribution of vehicles as a result of the proposed intersection;
- the SIDRA assessment determined that the Jonson Street / Carlyle Street, Jonson Street / Kingsley Street and Jonson Street / Development Access intersections operate within acceptable performance limits for the 10-year design horizon with or without development traffic and the redistribution of trips to / from Carlyle Street;
- the SIDRA assessment determined that the Marvell Street approach of the Jonson Street / Marvell Street intersection is shown to not operate within acceptable performance limits for the 10-year design horizon. However, this failure occurs without the inclusion of development traffic or the redistribution of trips to / from Carlyle Street;
- based on the SIDRA assessment, the impact of development traffic and the redistribution of trips turning right into / out of Carlyle Street is considered to have minimal impact on the performance of intersections surrounding the site;
- the re-routing of trips to and from Carlyle Street as a result of the proposed restriction is not expected to have a significant impact on travel time for residents living in the vicinity of Carlyle Street; and
- the construction of the proposed Byron Bay town bypass will significantly reduce traffic volumes on the roads in the immediate vicinity of the development site. The roundabout proposed at the southern end of the upgrade will also provide a local street grid network with an additional U-Turn facility south of the site.

Based on the above, the proposed development access arrangement is considered to provide an effective access solution with no significant adverse safety or amenity impacts.

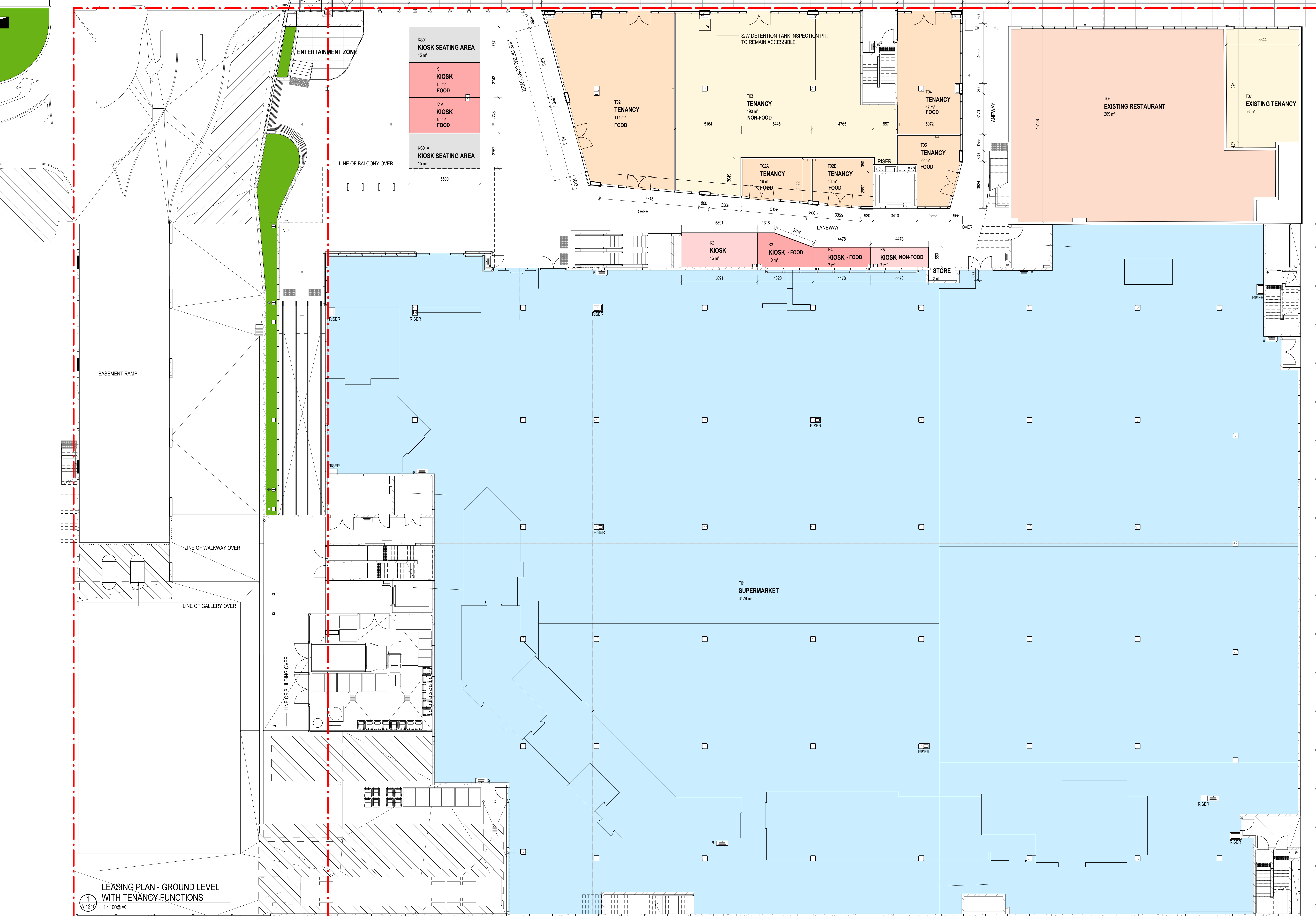
## **APPENDIX A**

### **DEVELOPMENT PLANS**



LEGEND

- CINEMA
- GALLERY
- KIOSK
- KIOSK FOOD
- LANDSCAPE
- RESTAURANT
- SEATING
- SPECIALTY TENANCY
- SUPERMARKET
- TENANCY FOOD



REV	DATE	DESCRIPTION	BY
1	06/07/2018	ISSUED FOR INFORMATION	AF

LEASING PLAN - GROUND LEVEL WITH TENANCY FUNCTIONS  
1:100 @ A0

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project  
**MERCATO ON BYRON**

108 - 110 JONSON STREET, BYRON BAY NSW 2481

MERCATO ON BYRON PTY LTD

client  
**MASTER LEASE PLAN - GROUND FLOOR**

sheet	date	scale	drawn	checked	verified
1	05/07/2018	1:100	Author	DK	CV

project no	sheet no	revision
17317	LPM-00	1

PRELIMINARY

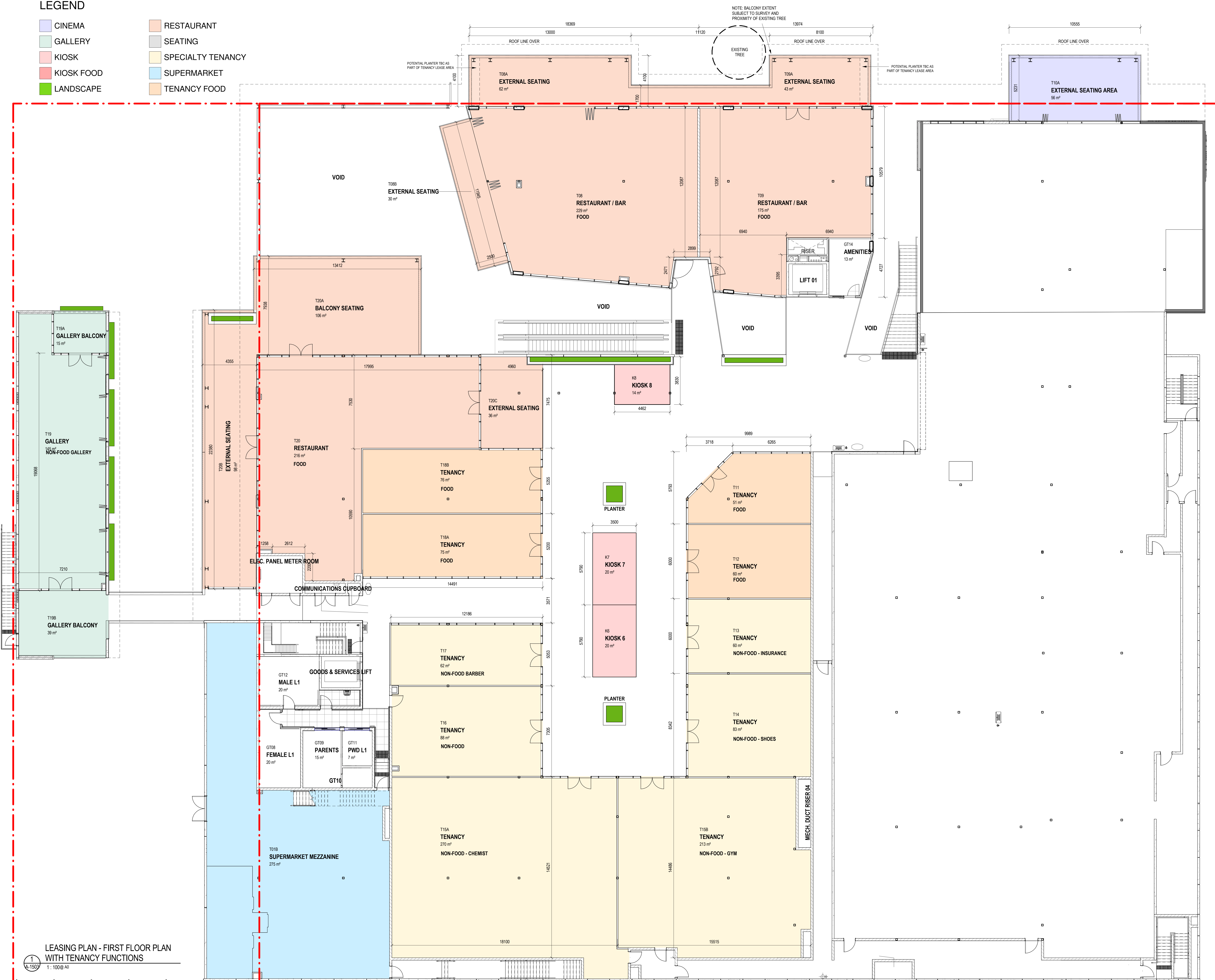
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REV	DATE	DESCRIPTION	BY
1	06/07/2018	ISSUED FOR INFORMATION	JF
2	13/07/2018	ISSUED FOR INFORMATION	JF

**LEGEND**

- CINEMA
- RESTAURANT
- GALLERY
- SEATING
- KIOSK
- SPECIALTY TENANCY
- KIOSK FOOD
- SUPERMARKET
- LANDSCAPE
- TENANCY FOOD



LEASING PLAN - FIRST FLOOR PLAN WITH TENANCY FUNCTIONS  
1:100@A0

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project  
**MERCATO ON BYRON**

108 - 110 JONSON STREET, BYRON BAY NSW 2481

MERCATO ON BYRON PTY LTD

client  
**MASTER LEASE PLAN - FIRST FLOOR**

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project no	sheet no	revision
17317	LPM-01	2

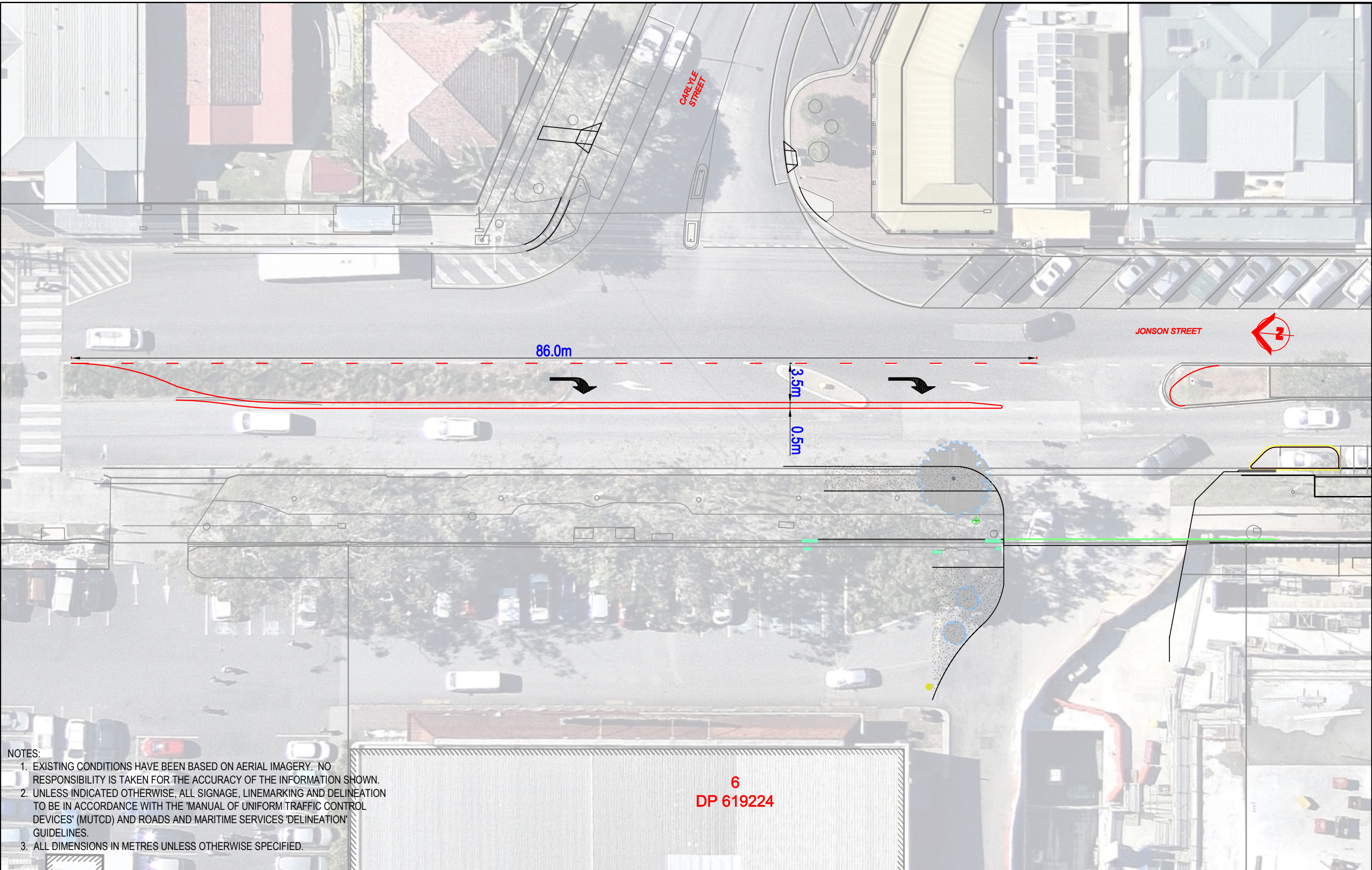
PRELIMINARY

C:\Users\Aleanza\Documents\150502 - Mercato On Byron CENTRAL - Layout\p01.dwg

## **APPENDIX B**

### **ULTIMATE ACCESS SOLUTION**





- NOTES:
- EXISTING CONDITIONS HAVE BEEN BASED ON AERIAL IMAGERY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF THE INFORMATION SHOWN.
  - UNLESS INDICATED OTHERWISE, ALL SIGNAGE, LINEMARKING AND DELINEATION TO BE IN ACCORDANCE WITH THE 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES' (MUTCD) AND ROADS AND MARITIME SERVICES 'DELINEATION' GUIDELINES.
  - ALL DIMENSIONS IN METRES UNLESS OTHERWISE SPECIFIED.

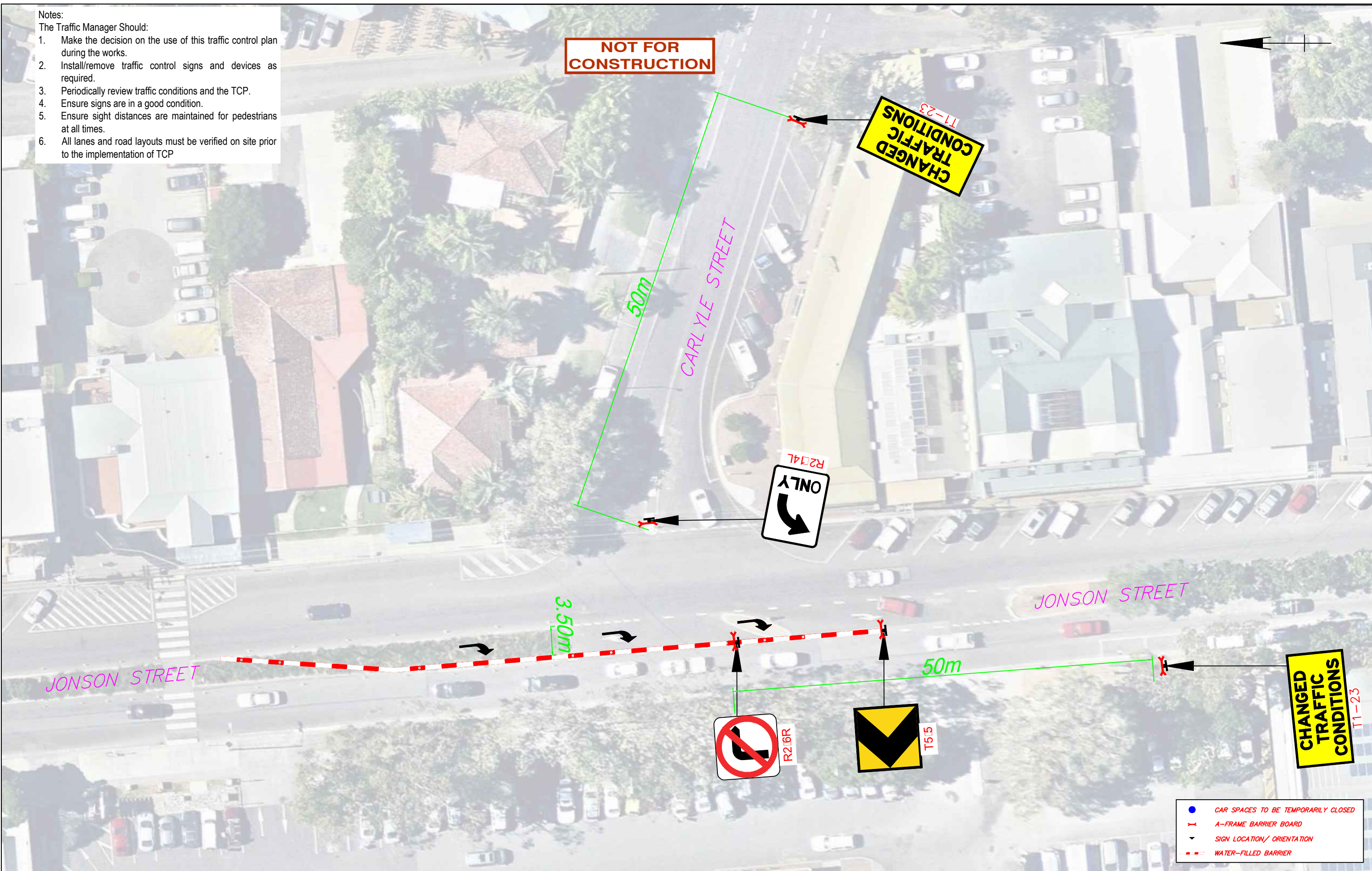
Date: 25/09/18	Drawing Name: Access Solution Concept Plan	<b>CONCEPT ONLY</b>	<b>BITZIOS</b> <small>-consulting</small>				
Project No: P3414	Project Name: Mercato on Byron			<table border="1"> <tr> <td>Sheet</td> <td>Version</td> </tr> <tr> <td>1</td> <td>001</td> </tr> </table>	Sheet	Version	1
Sheet	Version						
1	001						



## **APPENDIX C**

### **INTERIM ACCESS SOLUTION**

- Notes:  
The Traffic Manager Should:
1. Make the decision on the use of this traffic control plan during the works.
  2. Install/remove traffic control signs and devices as required.
  3. Periodically review traffic conditions and the TCP.
  4. Ensure signs are in a good condition.
  5. Ensure sight distances are maintained for pedestrians at all times.
  6. All lanes and road layouts must be verified on site prior to the implementation of TCP



Date:  
24/09/2018

Project No:  
P3414

Drawing Name:  
Development Access Intersection - Interim Arrangement - Traffic Control Plan

Project Name:  
Mercato Byron Bay Construction Traffic Management Plan

Tom Wheatle  
 RMS Orange Card Design and Inspector  
 Certification Number: 0021688465

0 4 8 12 16m  
 Scale 1:400(A3)

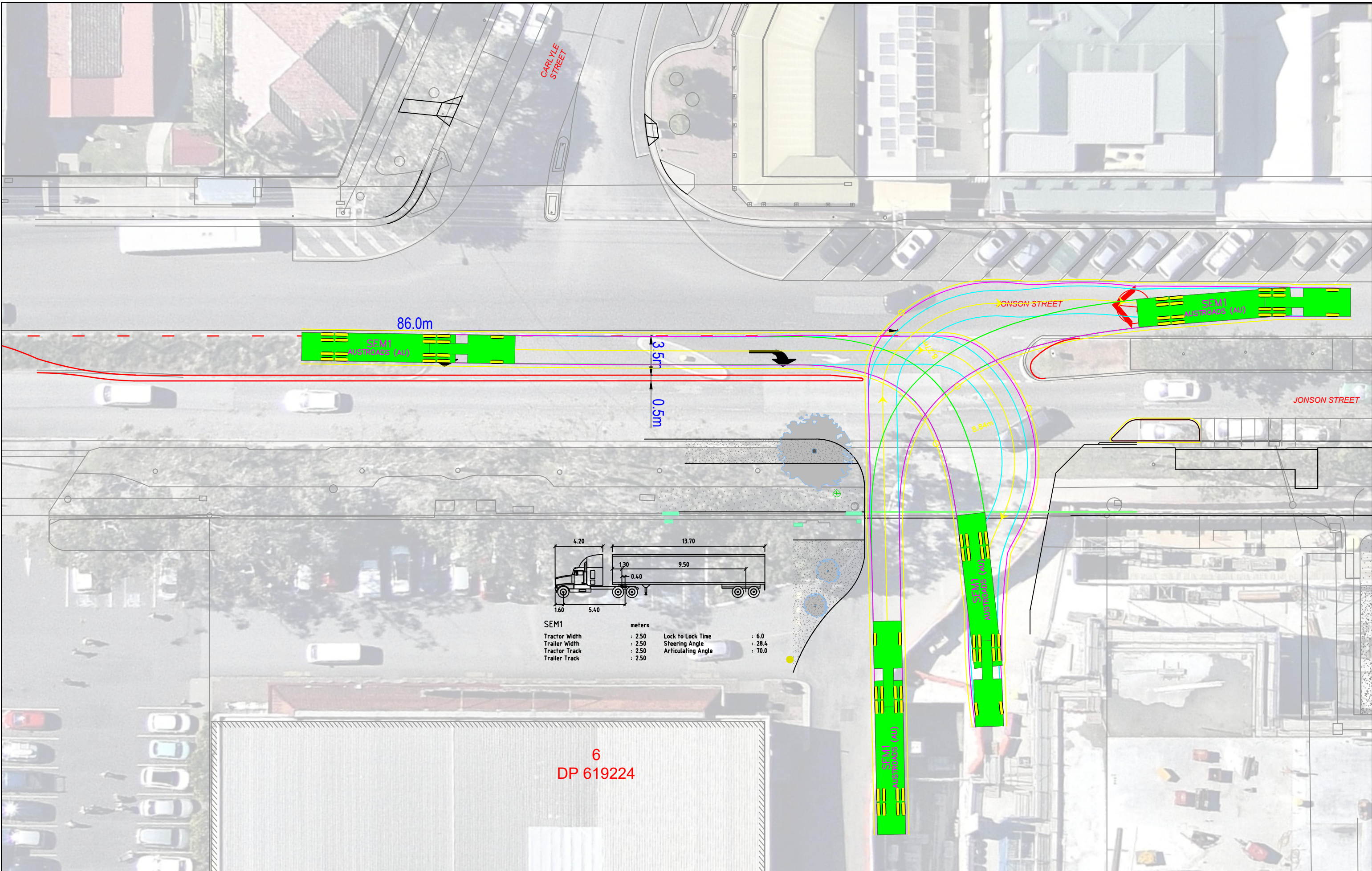
**BITZIOS**  
 consulting

Sheet 1  
 Version

## **APPENDIX D**

### **SWEPT PATH ASSESSMENT**





Date: 25/09/18  
 Project No: P3414

Drawing Name: Swept Path Assessment - 19m AV Right Turns  
 Project Name: Mercato on Byron

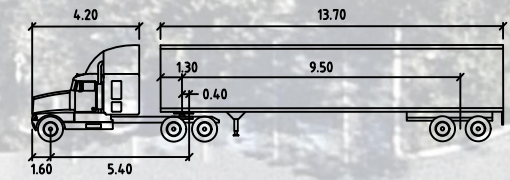
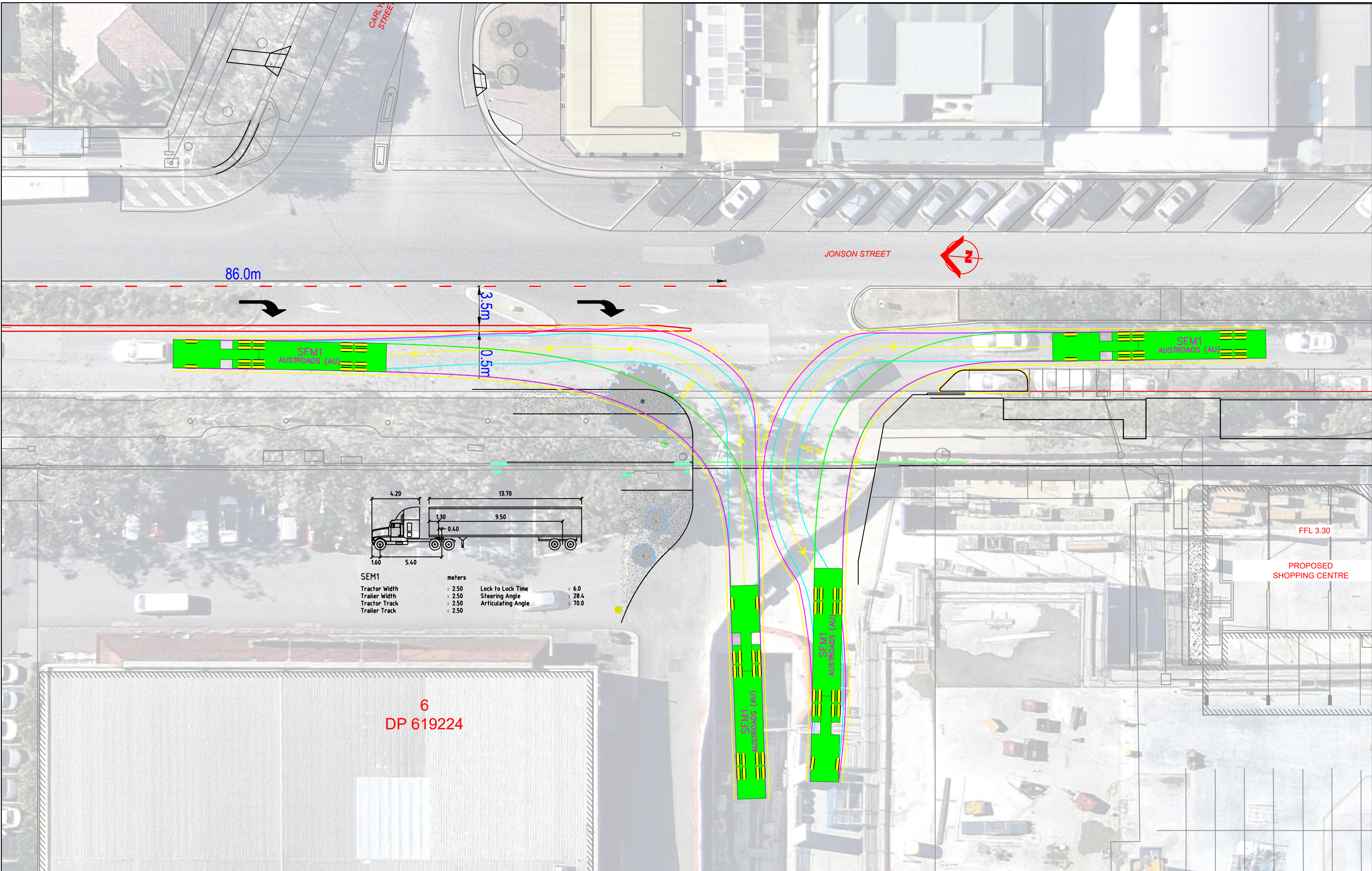
**NOT FOR CONSTRUCTION**

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 Scale 1:300 (A3)

**BITZIOS**  
 consulting

Sheet	Version
1	001





SEM1		meters	
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

6  
DP 619224

Date: 25/09/18  
Project No: P3414

Drawing Name: Swept Path Assessment - 19m AV Left Turns  
Project Name: Mercato on Byron

**NOT FOR CONSTRUCTION**

**BITZIOS**  
-consulting

Sheet	Version
2	001



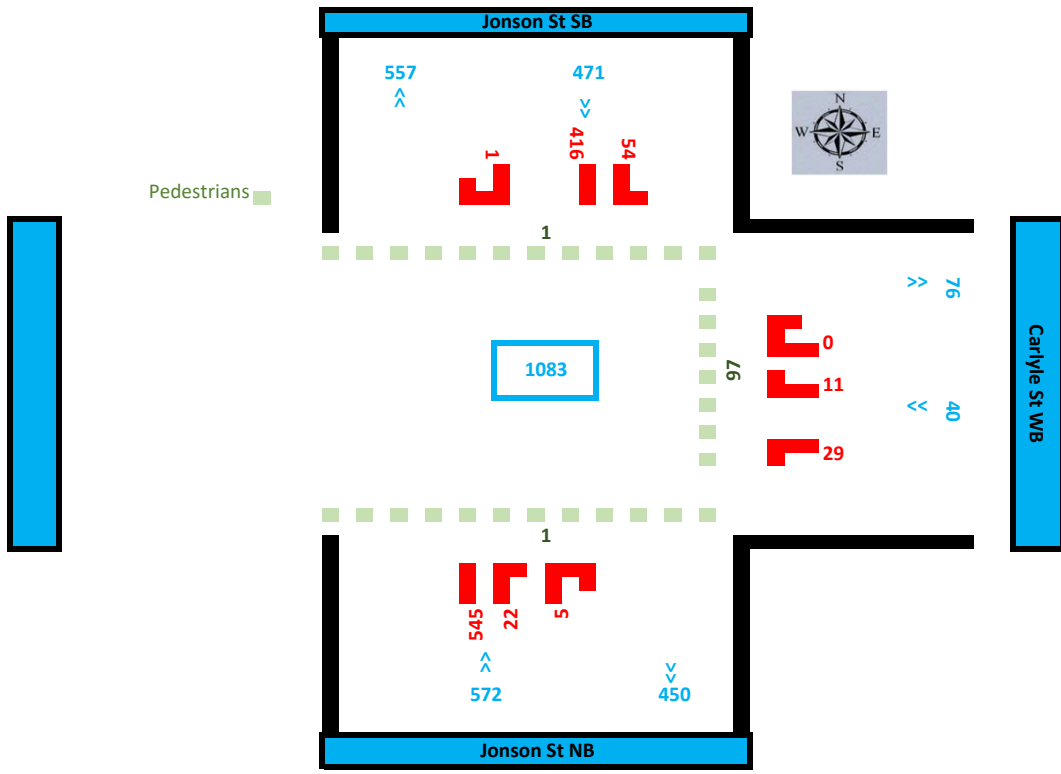
## **APPENDIX E**

### **TRAFFIC SURVEY RESULTS**

# Turning Movement Count Summary



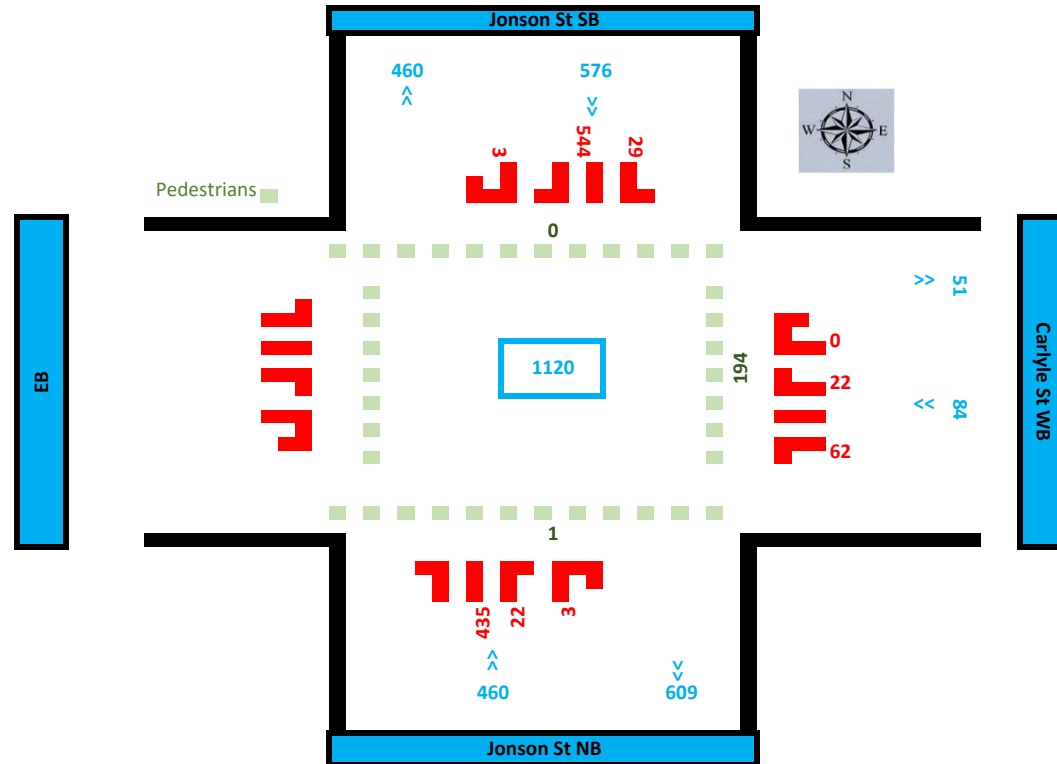
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 Location:   
 Date:   
 Surveyed Time:  to   
 Weather:   
 Data for hour starting:  to   
 Vehicle Class:



# Turning Movement Count Summary



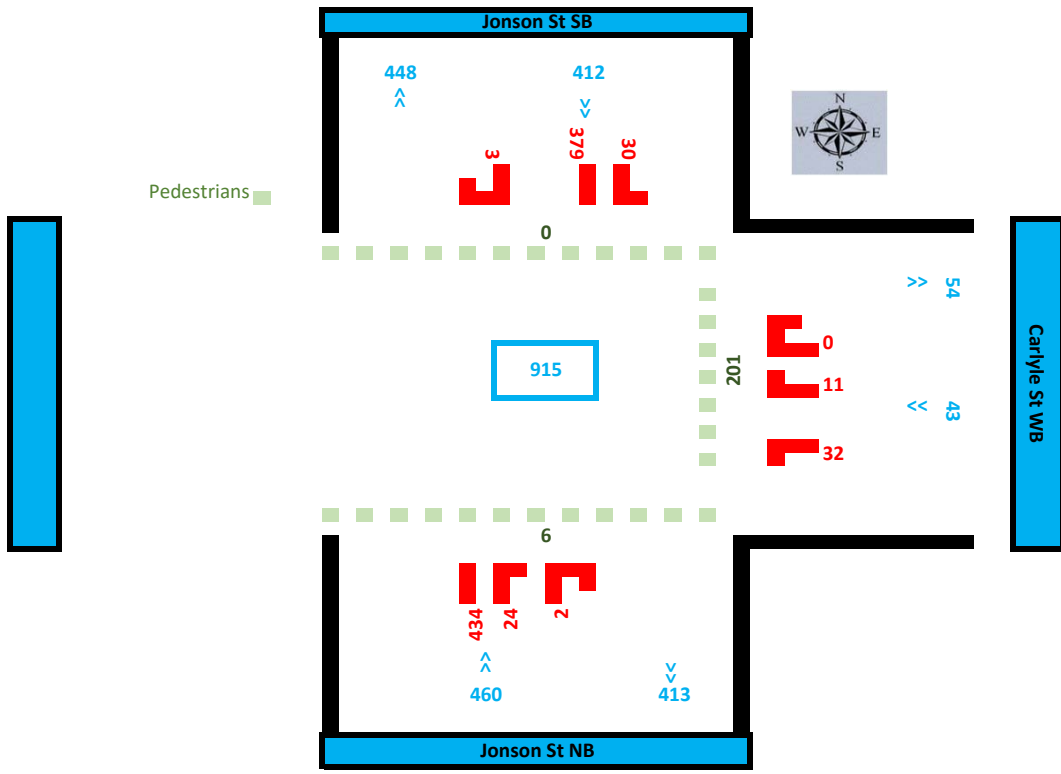
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 Date:   
 Surveyed Time:  to   
 Weather:   
 Data for hour starting:  to   
 Vehicle Class:



# Turning Movement Count Summary



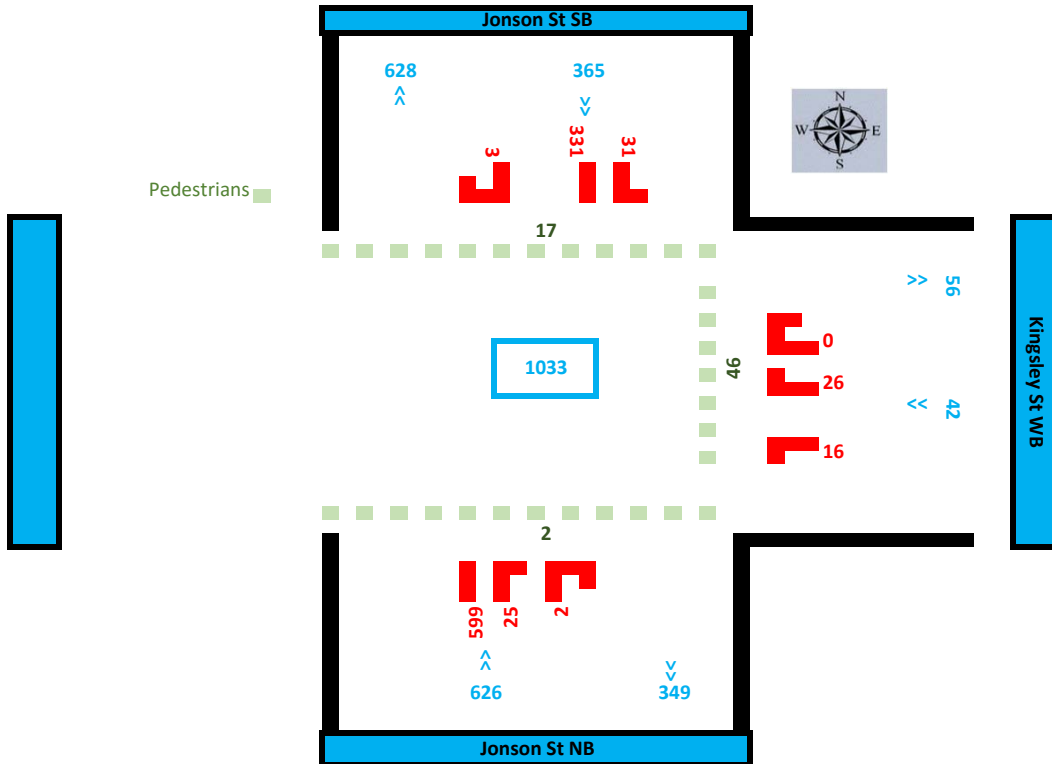
**Site ID:** 2  
**Location:** Jonson St & Carlyle St, Byron Bay  
**Date:** 15-Sept-2018  
**Surveyed Time:** 10:00 AM to 1:00 PM  
**Weather:** Fine  
**Data for hour starting:** 10:00 AM to 11:00 AM  
**Vehicle Class:** ALL VEHICLES



# Turning Movement Count Summary



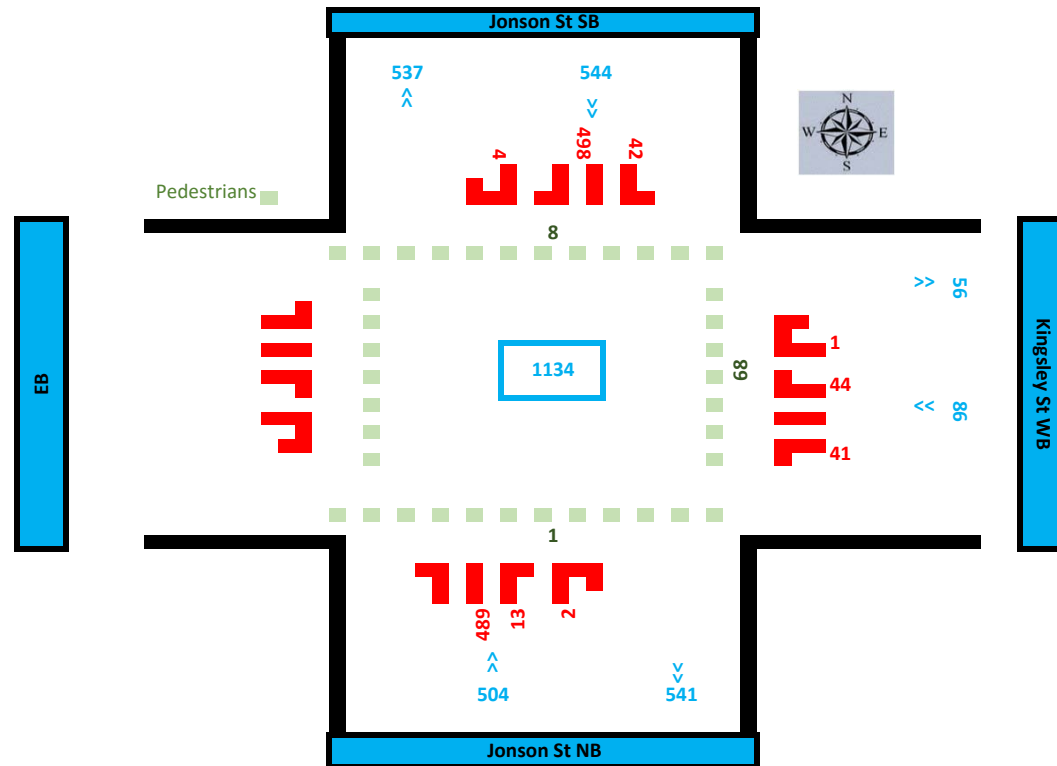
**Site ID:** 3  
**Location:** Jonson St & Kingsley St, Byron Bay  
**Date:** 13-Sept-2018  
**Surveyed Time:** 8:00 AM to 11:00 AM  
**Weather:** Fine  
**Data for hour starting:** 8:00 AM to 9:00 AM  
**Vehicle Class:** ALL VEHICLES



# Turning Movement Count Summary



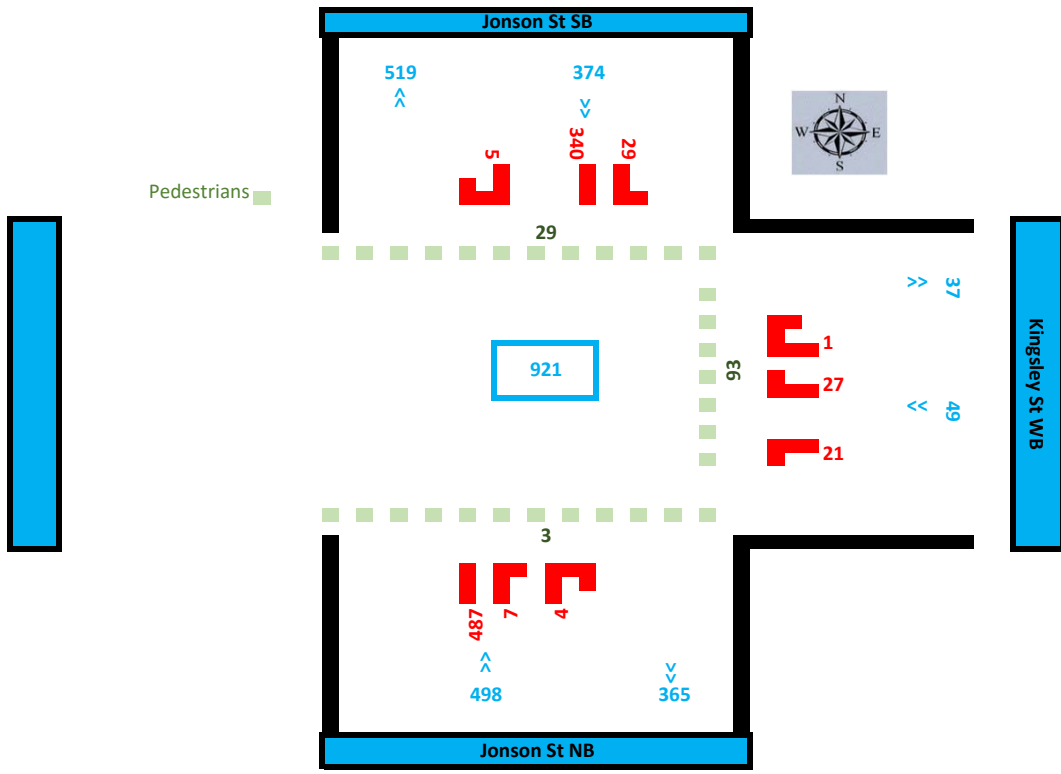
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**Location:** Jonson St & Kingsley St, Byron Bay  
**Date:** 13-Sept-2018  
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**Weather:** Fine  
**Data for hour starting:** 3:15 PM to 4:15 PM  
**Vehicle Class:** ALL VEHICLES



# Turning Movement Count Summary



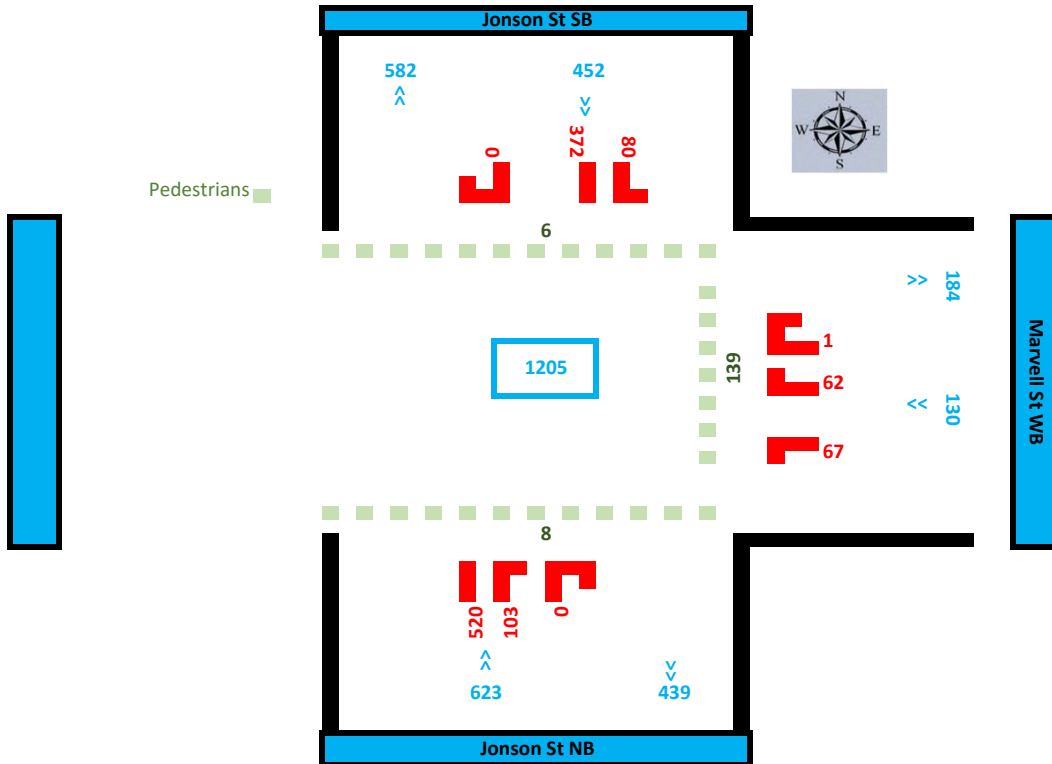
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**Weather:** Fine  
**Data for hour starting:** 10:00 AM to 11:00 AM  
**Vehicle Class:** ALL VEHICLES



# Turning Movement Count Summary



Site ID:   
 Location:   
 Date:   
 Surveyed Time:  to   
 Weather:   
 Data for hour starting:  to   
 Vehicle Class:

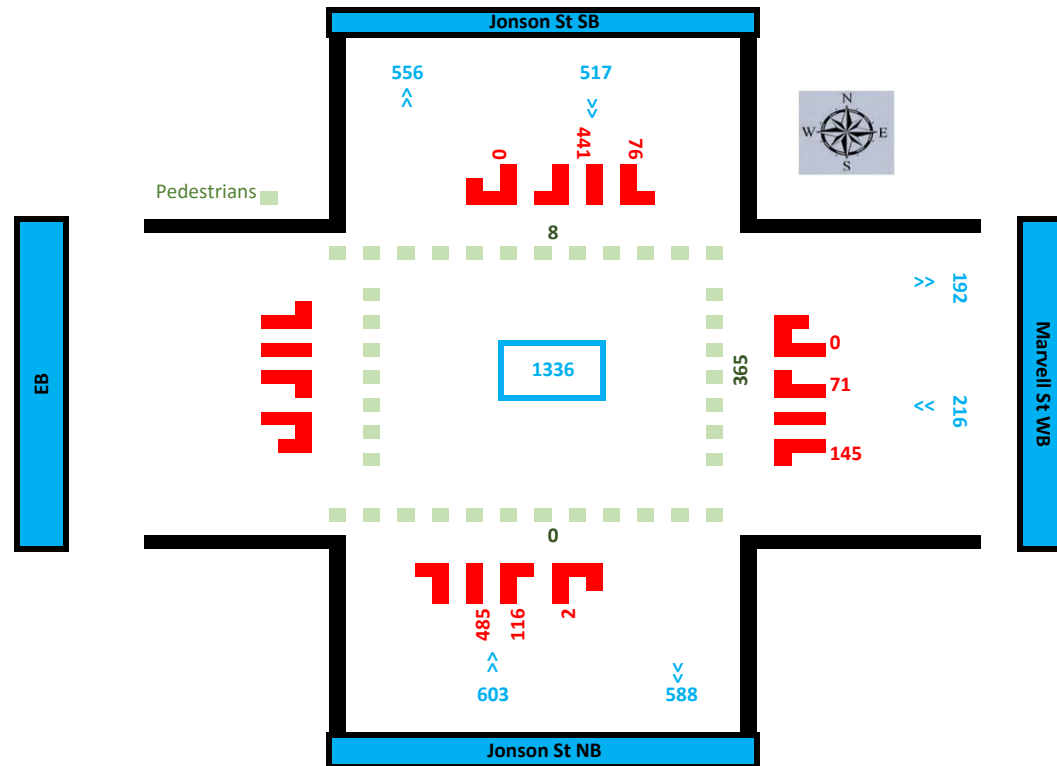




# Turning Movement Count Summary



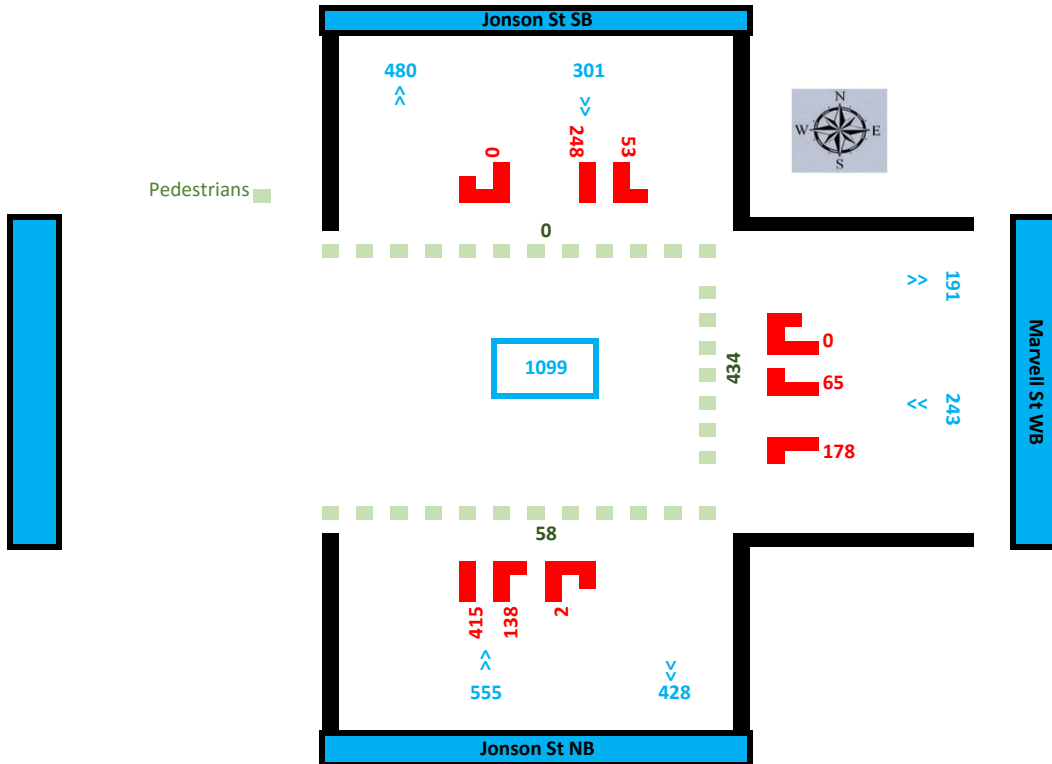
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**Weather:** Fine  
**Data for hour starting:** 3:15 PM to 4:15 PM  
**Vehicle Class:** ALL VEHICLES



# Turning Movement Count Summary



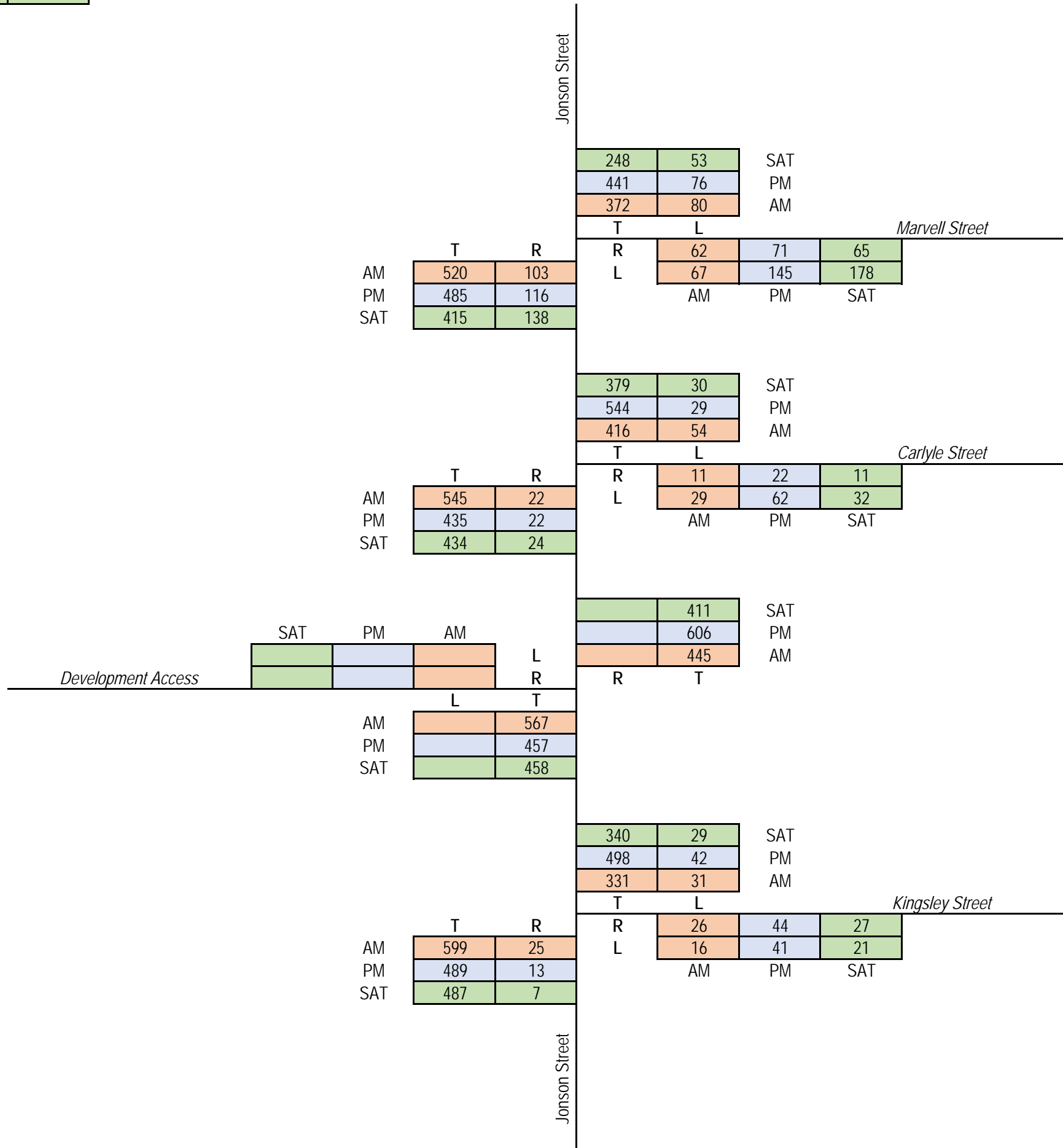
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**Weather:** Fine  
**Data for hour starting:** 10:00 AM to 11:00 AM  
**Vehicle Class:** ALL VEHICLES



## **APPENDIX F**

### **TRAFFIC ANALYSIS**

Peak	Hour
AM	8:00
PM	15:15
Saturday	10:00



Sheet Name:  
2018 Surveyed Traffic Volumes

Version:  
001

Sheet Number:  
1 of 8

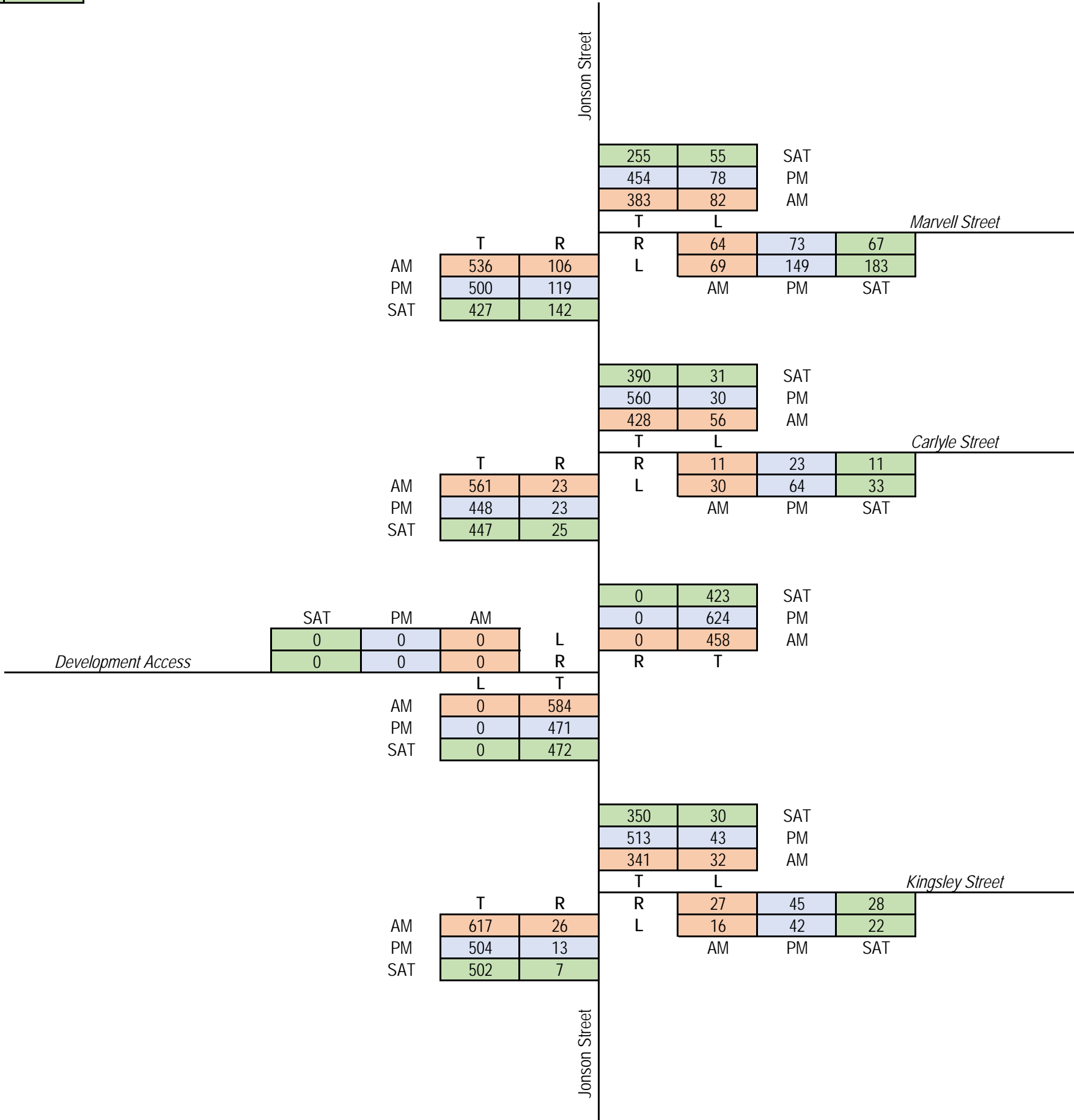
Project Name:  
Mercato on Byron

Project Number:  
P3414

Date:  
24 September 2018

Peak	Hour
AM	8:00
PM	15:15
Saturday	10:00

Growth	0.03
Growth Years	1
Growth Type	Compounding



Sheet Name:  
2019 Background Traffic Volumes

Version:  
001

Sheet Number:  
2 of 8

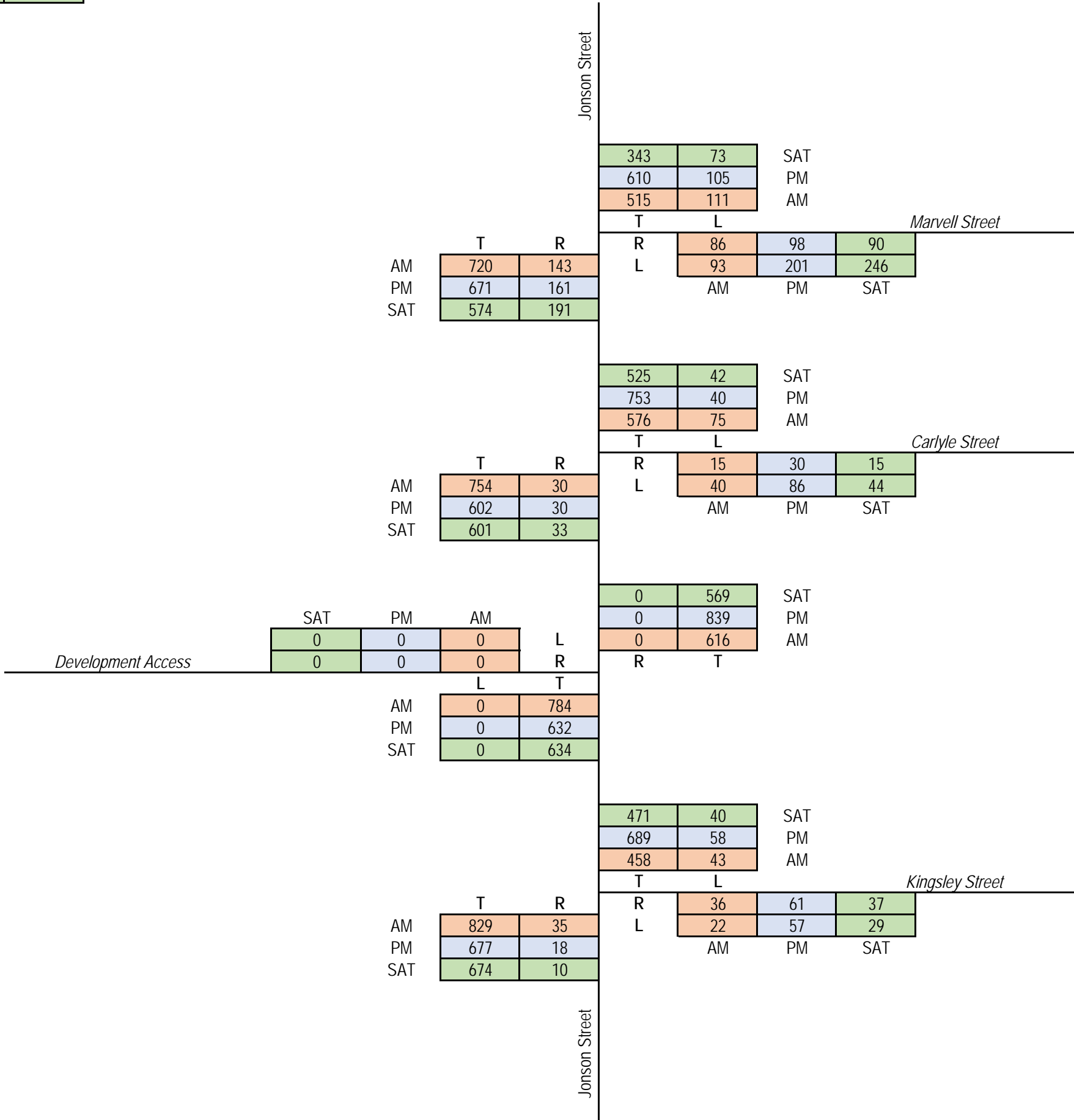
Project Name:  
Mercato on Byron

Project Number:  
P3414

Date:  
24 September 2018

Peak	Hour
AM	8:00
PM	15:15
Saturday	10:00

Growth	0.03
Growth Years	11
Growth Type	Compounding



Sheet Name:  
2029 Background Traffic Volumes

Version:  
001

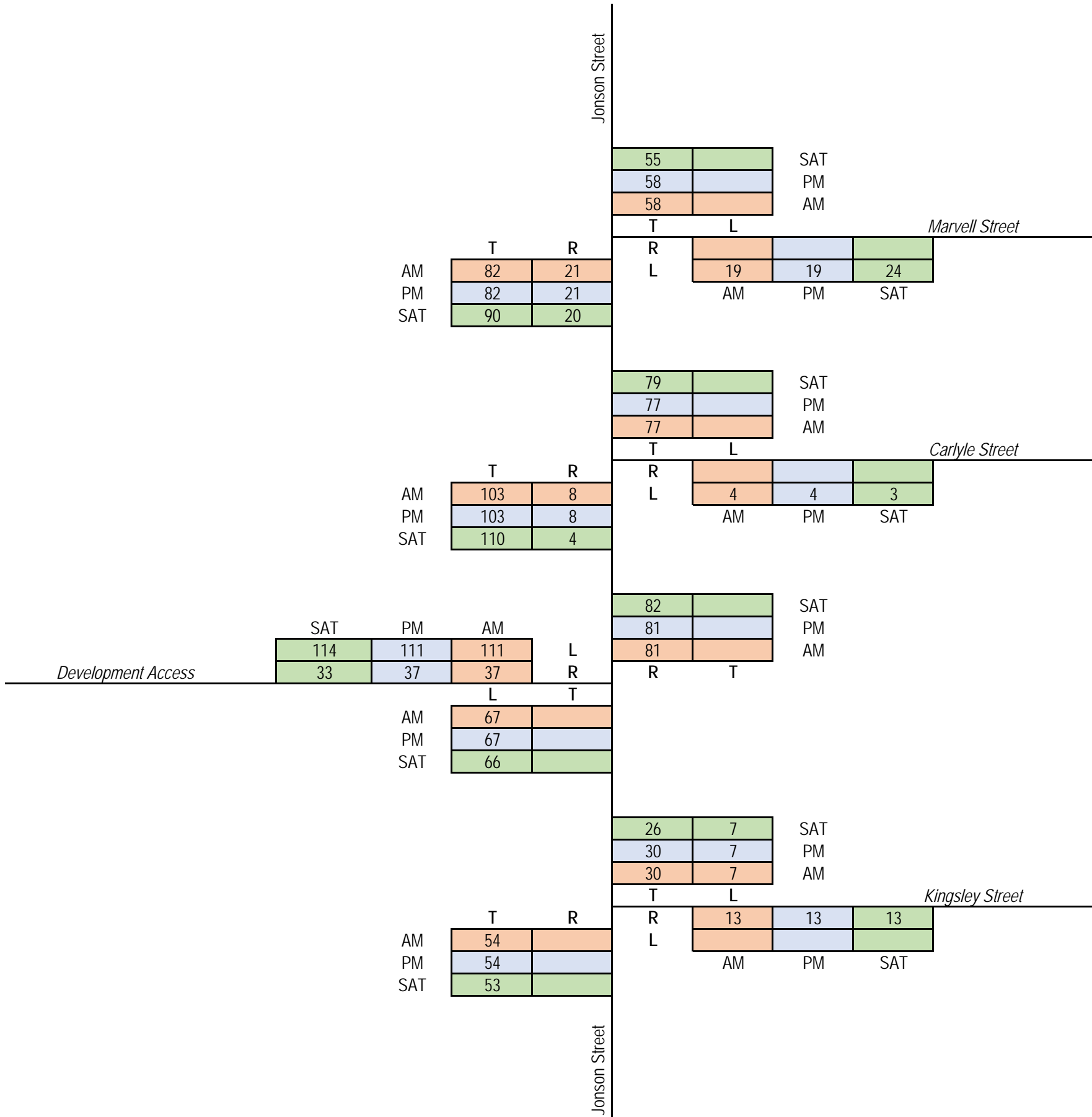
Sheet Number:  
3 of 8

Project Name:  
Mercato on Byron

Project Number:  
P3414

Date:  
24 September 2018

Peak	Hour
AM	8:00
PM	15:15
Saturday	10:00



Sheet Name:  
Development Traffic Volumes

Version:  
001

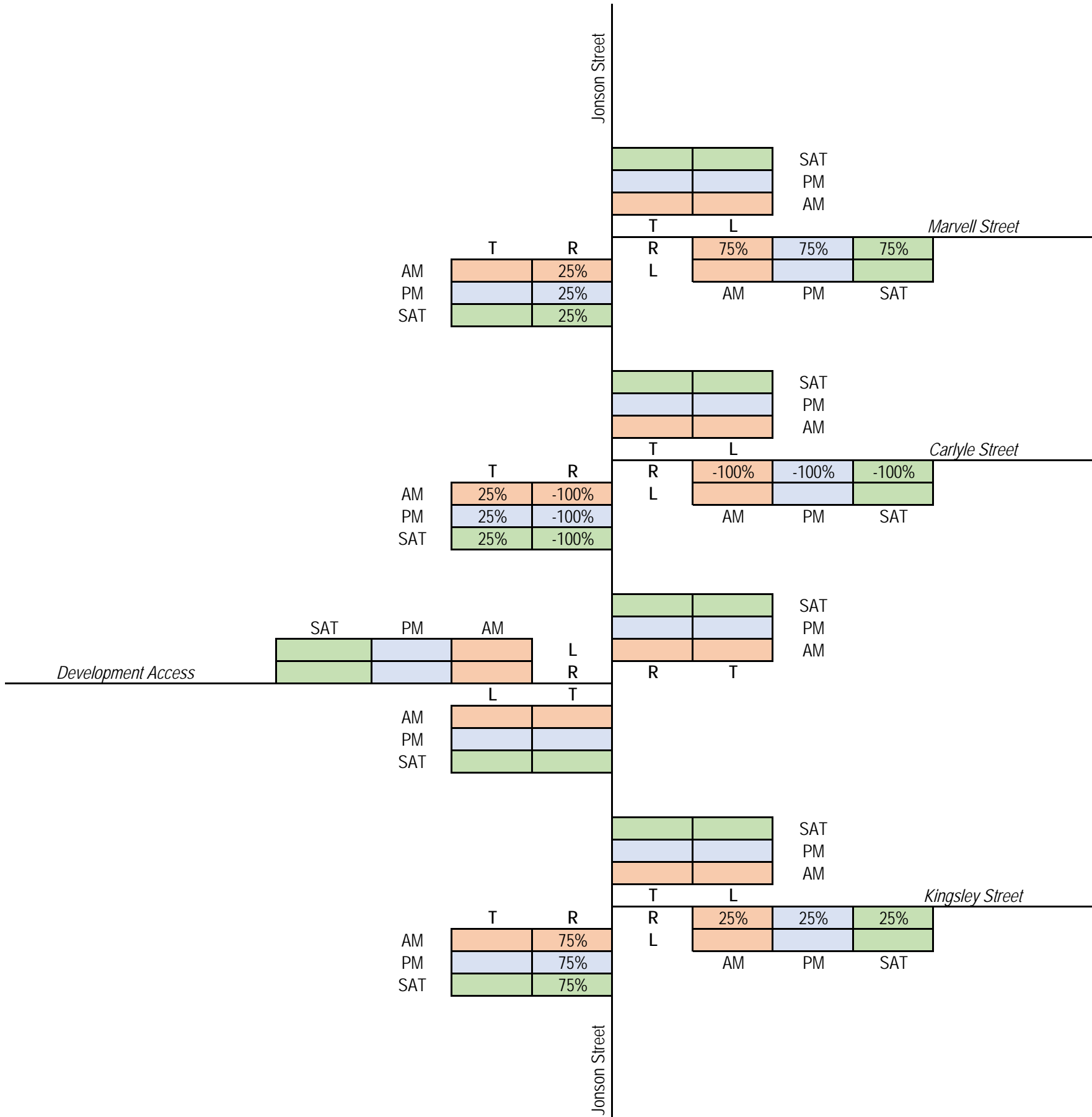
Sheet Number:  
4 of 8

Project Name:  
Mercato on Byron

Project Number:  
P3414

Date:  
24 September 2018

Peak	Hour
AM	8:00
PM	15:15
Saturday	10:00



Sheet Name:  
Redistribution of Background Traffic

Version:  
001

Sheet Number:  
5 of 8

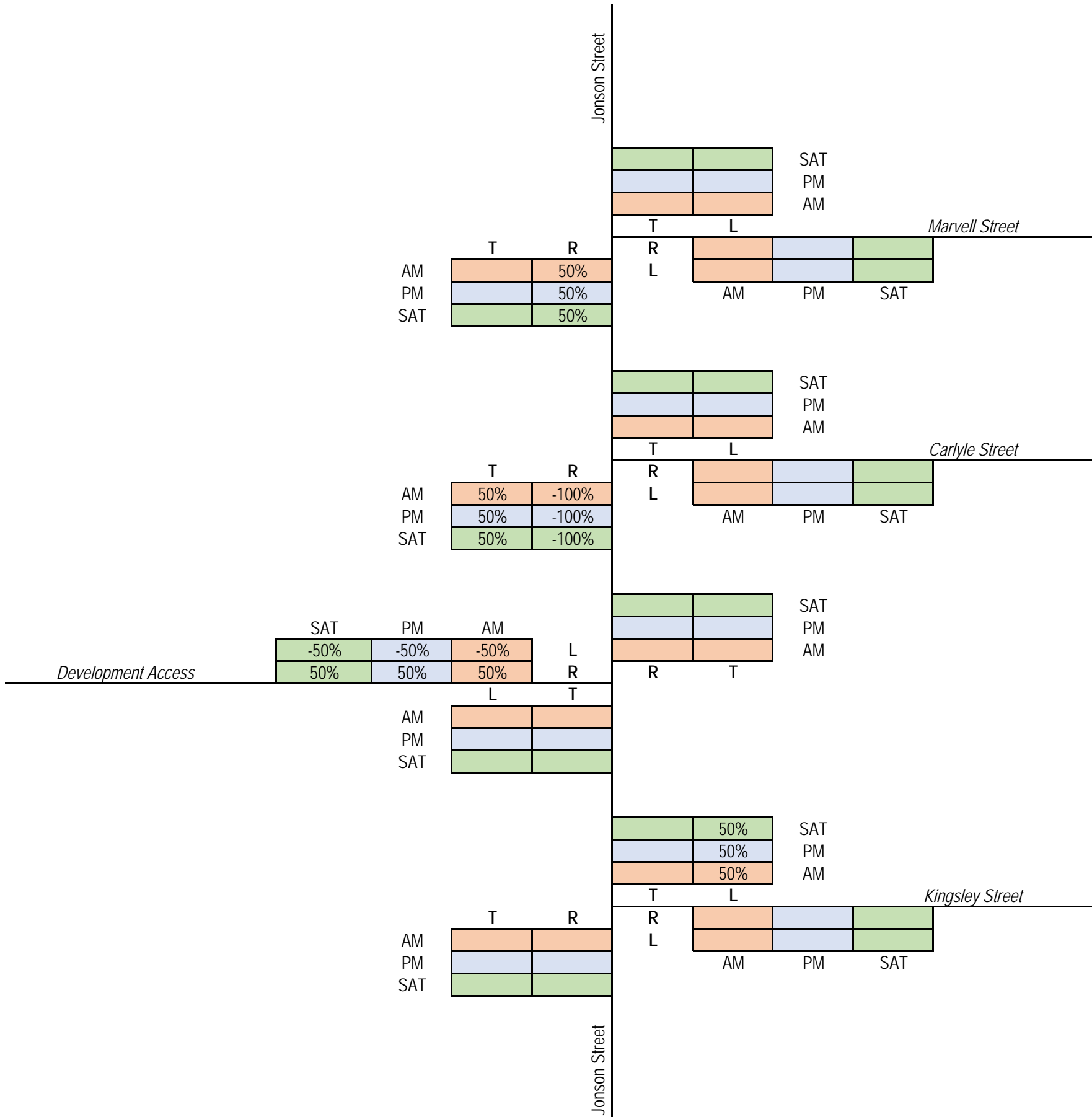
Project Name:  
Mercato on Byron

Project Number:  
P3414

Date:  
24 September 2018



Peak	Hour
AM	8:00
PM	15:15
Saturday	10:00



Sheet Name:  
Redistribution of Deveopment Traffic

Version:  
001

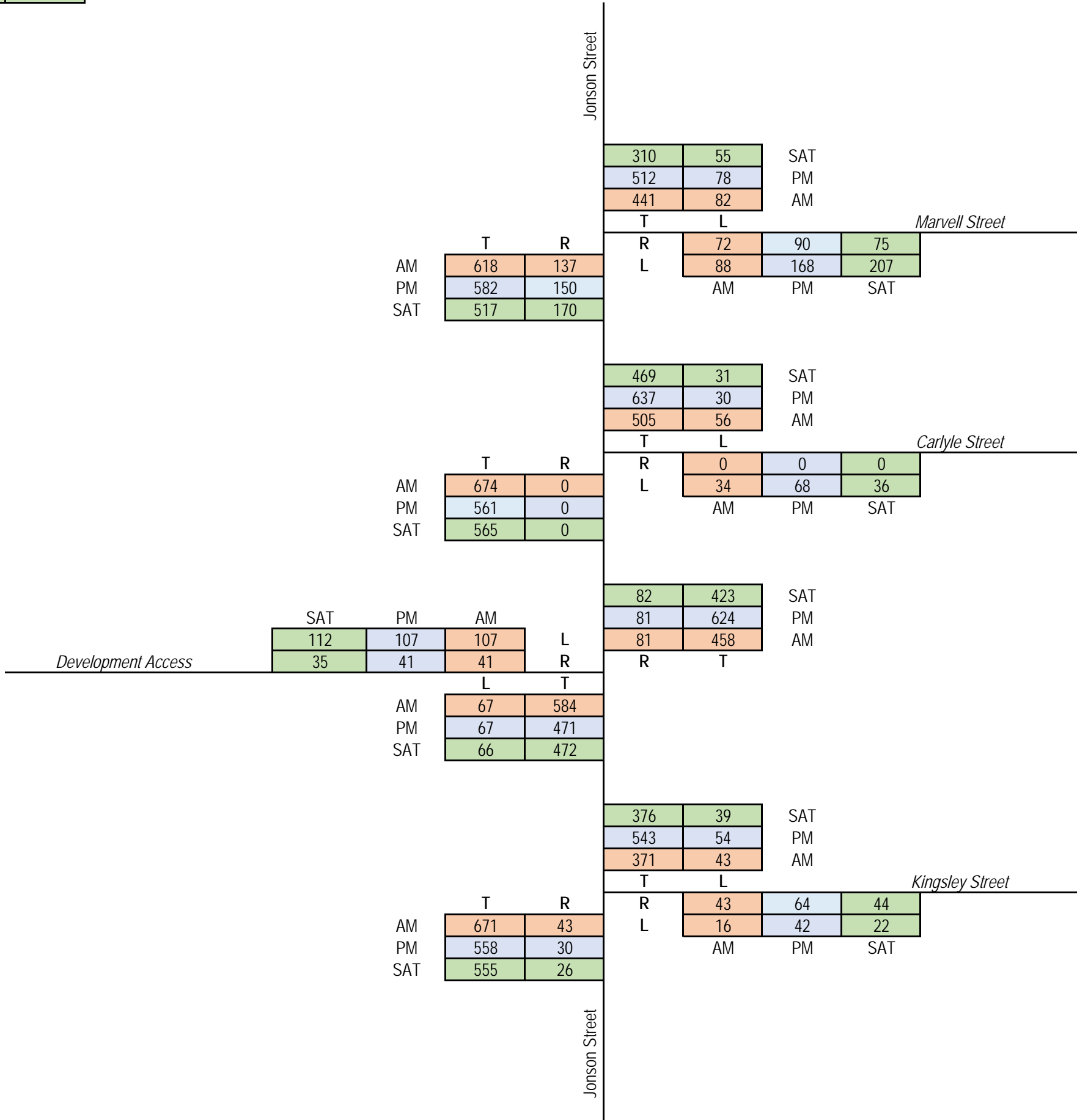
Sheet Number:  
6 of 8

Project Name:  
Mercato on Byron

Project Number:  
P3414

Date:  
24 September 2018

Peak	Hour
AM	8:00
PM	15:15
Saturday	10:00



Sheet Name:  
2019 Design Traffic Volumes

Version:  
001

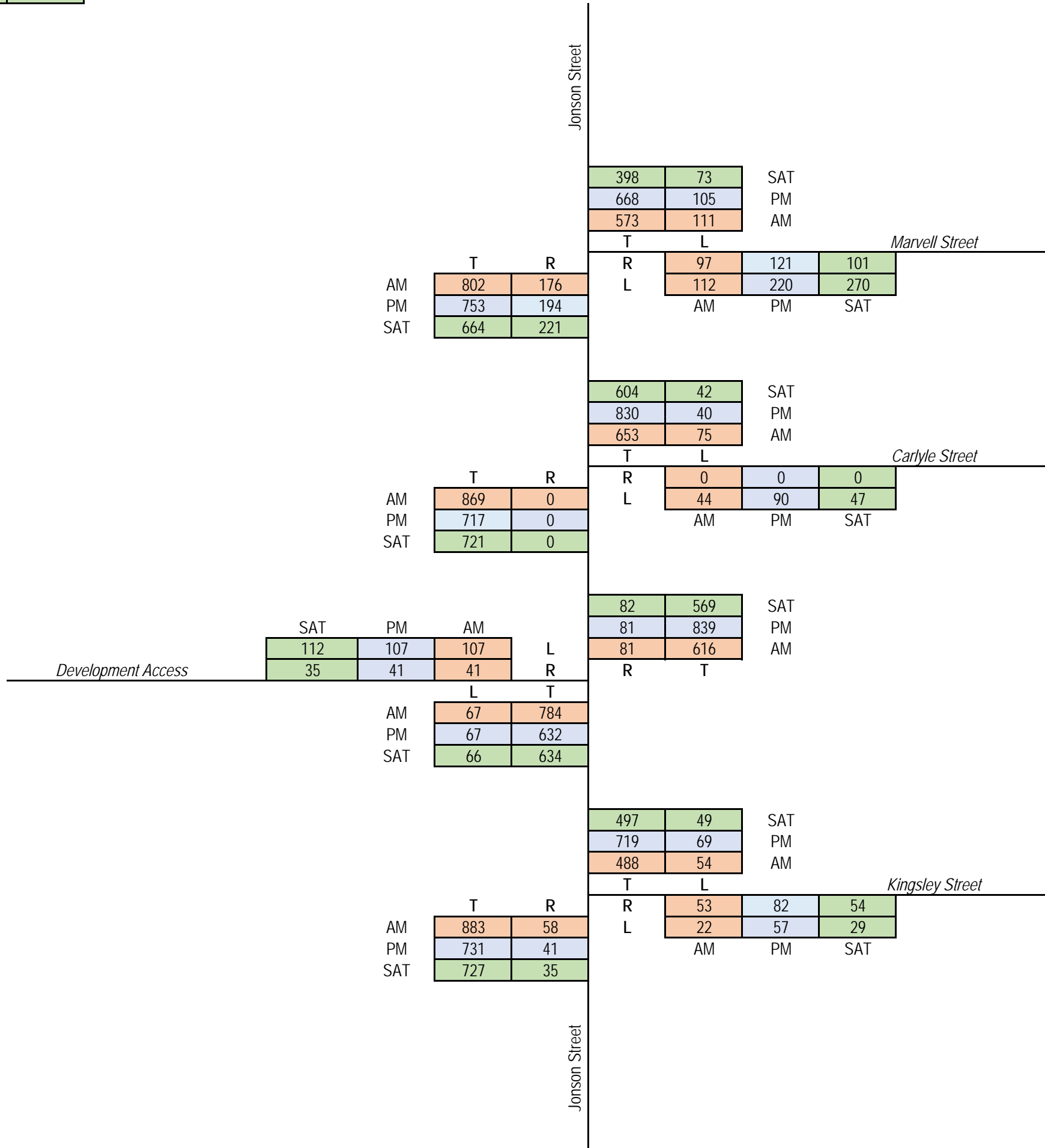
Sheet Number:  
7 of 8

Project Name:  
Mercato on Byron

Project Number:  
P3414

Date:  
24 September 2018

Peak	Hour
AM	8:00
PM	15:15
Saturday	10:00



Sheet Name:  
2029 Design Traffic Volumes

Version:  
001

Sheet Number:  
8 of 8

Project Name:  
Mercato on Byron

Project Number:  
P3414

Date:  
24 September 2018

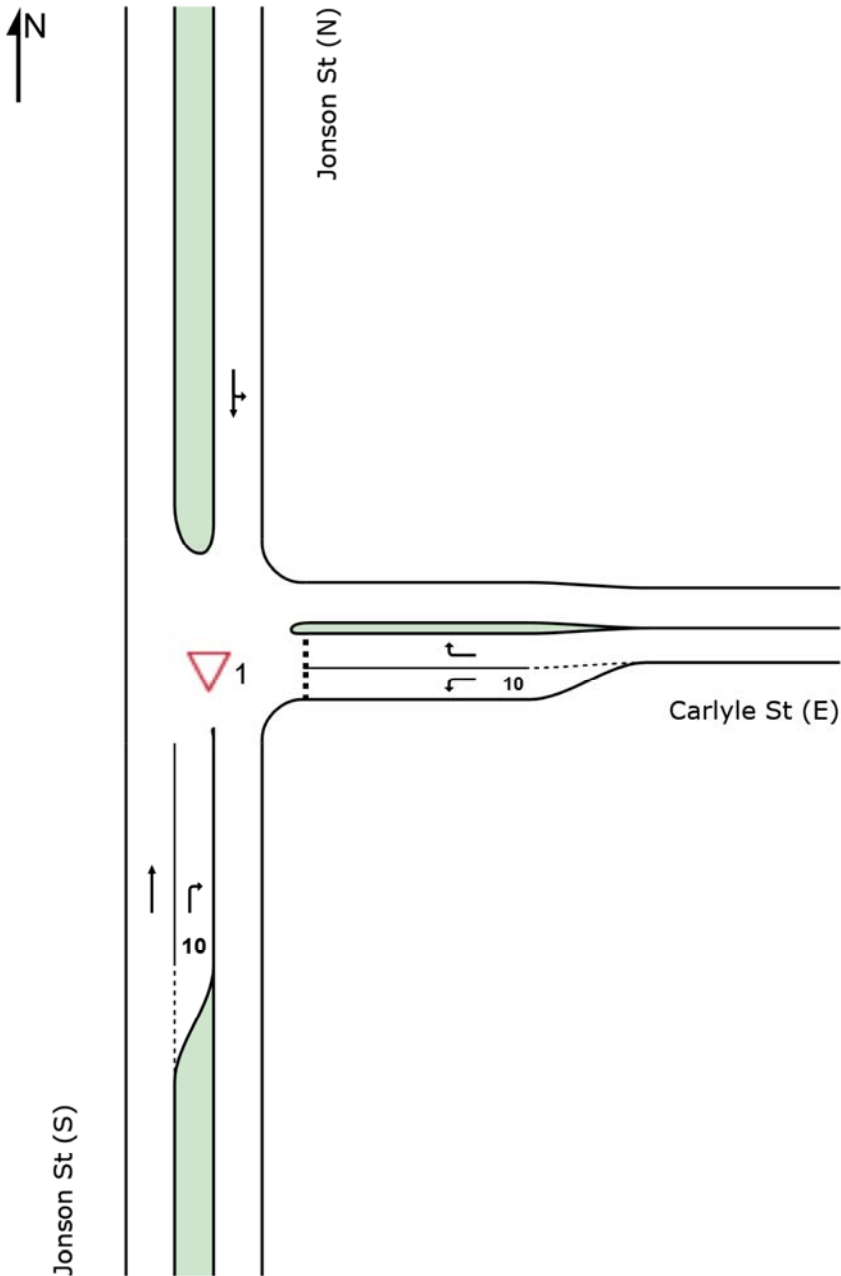
## **APPENDIX G**

### **DETAILED SIDRA RESULTS**

# SITE LAYOUT

## ▽ Site: 1 [2019 BG PM]

Jonson Street / Carlyle Street  
2019 Without Development  
Priority-Controlled Intersection  
Site Category: (None)  
Giveaway / Yield (Two-Way)



# MOVEMENT SUMMARY

▽ Site: 1 [2019 BG PM]

Jonson Street / Carlyle Street  
 2019 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	472	4.4	0.230	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	24	0.0	0.027	8.2	LOS A	0.1	0.7	0.55	0.69	0.55	37.2
Approach		496	4.2	0.230	0.4	NA	0.1	0.7	0.03	0.03	0.03	58.3
East: Carlyle St (E)												
4	L2	67	0.0	0.076	8.1	LOS A	0.3	2.0	0.52	0.73	0.52	37.1
6	R2	24	0.0	0.099	19.5	LOS C	0.3	2.3	0.81	0.92	0.81	25.6
Approach		92	0.0	0.099	11.1	LOS B	0.3	2.3	0.60	0.78	0.60	33.2
North: Jonson St (N)												
7	L2	32	0.0	0.297	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	53.3
8	T1	589	2.2	0.297	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.9
Approach		621	2.1	0.297	0.3	NA	0.0	0.0	0.00	0.03	0.00	58.6
All Vehicles		1208	2.8	0.297	1.2	NA	0.3	2.3	0.06	0.09	0.06	55.3

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 1 [2019 BG SAT]

Jonson Street / Carlyle Street  
 2019 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	471	2.1	0.227	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	26	8.3	0.024	7.4	LOS A	0.1	0.7	0.47	0.62	0.47	37.5
Approach		497	2.4	0.227	0.4	NA	0.1	0.7	0.03	0.03	0.03	58.2
East: Carlyle St (E)												
4	L2	35	0.0	0.031	7.0	LOS A	0.1	0.8	0.42	0.62	0.42	38.4
6	R2	12	18.2	0.041	17.1	LOS C	0.1	1.1	0.75	0.90	0.75	26.5
Approach		46	4.5	0.041	9.5	LOS A	0.1	1.1	0.51	0.69	0.51	34.5
North: Jonson St (N)												
7	L2	33	3.3	0.211	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	52.4
8	T1	411	1.1	0.211	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	58.5
Approach		443	1.2	0.211	0.4	NA	0.0	0.0	0.00	0.04	0.00	58.1
All Vehicles		986	2.0	0.227	0.8	NA	0.1	1.1	0.04	0.07	0.04	56.4

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 1 [2029 BG PM]

Jonson Street / Carlyle Street  
 2029 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	634	4.4	0.310	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	32	0.0	0.049	10.2	LOS B	0.2	1.3	0.65	0.81	0.65	34.5
Approach		665	4.2	0.310	0.5	NA	0.2	1.3	0.03	0.04	0.03	58.0
East: Carlyle St (E)												
4	L2	91	0.0	0.140	10.0	LOS B	0.5	3.5	0.64	0.85	0.64	34.6
6	R2	32	0.0	0.286	43.1	LOS E	0.9	6.3	0.93	1.00	1.04	15.7
Approach		122	0.0	0.286	18.6	LOS C	0.9	6.3	0.71	0.89	0.74	26.4
North: Jonson St (N)												
7	L2	42	0.0	0.400	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	53.3
8	T1	793	2.2	0.400	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.9
Approach		835	2.1	0.400	0.3	NA	0.0	0.0	0.00	0.03	0.00	58.6
All Vehicles		1622	2.8	0.400	1.8	NA	0.9	6.3	0.07	0.10	0.07	53.6

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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



# MOVEMENT SUMMARY

Site: 1 [2029 BG SAT]

Jonson Street / Carlyle Street  
 2029 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

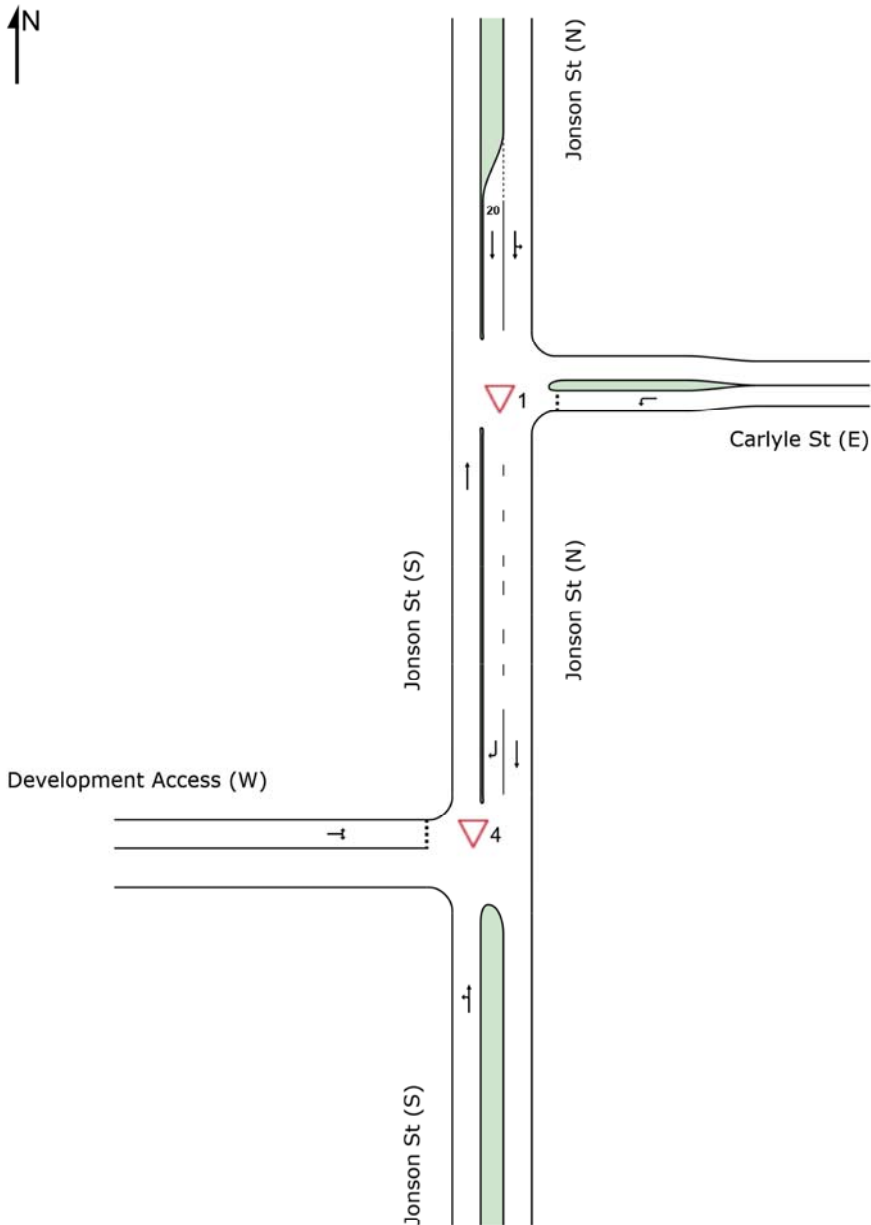
Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	633	2.1	0.304	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	35	8.3	0.039	8.4	LOS A	0.2	1.2	0.55	0.70	0.55	36.3
Approach		667	2.4	0.304	0.4	NA	0.2	1.2	0.03	0.04	0.03	58.0
East: Carlyle St (E)												
4	L2	46	0.0	0.050	7.8	LOS A	0.2	1.3	0.50	0.69	0.50	37.6
6	R2	16	18.2	0.106	29.4	LOS D	0.3	2.7	0.88	0.95	0.88	19.8
Approach		62	4.6	0.106	13.3	LOS B	0.3	2.7	0.60	0.76	0.60	30.6
North: Jonson St (N)												
7	L2	44	3.3	0.285	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	52.4
8	T1	553	1.1	0.285	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	58.5
Approach		597	1.2	0.285	0.4	NA	0.0	0.0	0.00	0.04	0.00	58.0
All Vehicles		1326	2.0	0.304	1.0	NA	0.3	2.7	0.04	0.07	0.04	55.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# NETWORK LAYOUT

## Network: 1 [2019 DES PM Reconfigured]

Jonson Street / Carlyle Street / Development Access  
 2019 With Development  
 Proposed Access Solution  
 Network Category: (None)



SITES IN NETWORK		
Site ID	CCG ID	Site Name
▽1	NA	2019 DES PM Reconfigured
▽4	NA	2019 Design PM Access

# MOVEMENT SUMMARY

Site: 1 [2019 DES PM Reconfigured]

Network: 1 [2019 DES PM Reconfigured]

Jonson Street / Carlyle Street  
 2019 With Development  
 Reconfigured Priority-Controlled Intersection  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows	Arrival Flows	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed			
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec					km/h		
South: Jonson St (S)														
2	T1	591	4.4	591	4.4	0.286	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		591	4.4	591	4.4	0.286	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Carlyle St (E)														
4	L2	72	0.0	72	0.0	0.077	7.9	LOS A	0.1	0.8	0.51	0.71	0.51	30.4
Approach		72	0.0	72	0.0	0.077	7.9	LOS A	0.1	0.8	0.51	0.71	0.51	30.4
North: Jonson St (N)														
7	L2	32	0.0	32	0.0	0.283	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	53.2
8	T1	671	2.2	671	2.2	0.283	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.2
Approach		702	2.1	702	2.1	0.283	0.3	NA	0.0	0.0	0.00	0.03	0.00	57.8
All Vehicles		1364	3.0	1364	3.0	0.286	0.5	NA	0.1	0.8	0.03	0.05	0.03	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 1 [2019 DES SAT Reconfigured]

Network: 1 [2019 DES SAT Reconfigured]

Jonson Street / Carlyle Street  
 2019 With Development  
 Reconfigured Priority-Controlled Intersection  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	Turn	Demand	Flows	Arrival	Flows	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles	Distance m			km/h
South: Jonson St (S)													
2	T1	595	2.1	595	2.1	0.284	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		595	2.1	595	2.1	0.284	0.0	NA	0.0	0.0	0.00	0.00	59.9
East: Carlyle St (E)													
4	L2	38	0.0	38	0.0	0.034	7.0	LOS A	0.1	0.4	0.42	0.62	31.7
Approach		38	0.0	38	0.0	0.034	7.0	LOS A	0.1	0.4	0.42	0.62	31.7
North: Jonson St (N)													
7	L2	33	3.3	33	3.3	0.211	5.6	LOS A	0.0	0.0	0.00	0.04	52.3
8	T1	494	1.0	494	1.0	0.211	0.0	LOS A	0.0	0.0	0.00	0.04	57.7
Approach		526	1.2	526	1.2	0.211	0.4	NA	0.0	0.0	0.00	0.04	57.1
All Vehicles		1159	1.6	1159	1.6	0.284	0.4	NA	0.1	0.4	0.01	0.04	57.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 1 [2029 DES PM Reconfigured]

Network: 1 [2029 DES PM Reconfigured]

Jonson Street / Carlyle Street  
 2029 With Development  
 Reconfigured Priority-Controlled Intersection  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %				Vehicles	Distance m				
South: Jonson St (S)														
2	T1	755	4.4	755	4.4	0.366	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		755	4.4	755	4.4	0.366	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Carlyle St (E)														
4	L2	95	0.0	95	0.0	0.135	9.6	LOS A	0.2	1.4	0.61	0.83	0.61	27.5
Approach		95	0.0	95	0.0	0.135	9.6	LOS A	0.2	1.4	0.61	0.83	0.61	27.5
North: Jonson St (N)														
7	L2	42	0.0	42	0.0	0.385	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	53.2
8	T1	874	2.2	874	2.2	0.385	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.1
Approach		916	2.1	916	2.1	0.385	0.3	NA	0.0	0.0	0.00	0.03	0.00	57.7
All Vehicles		1765	3.0	1765	3.0	0.385	0.7	NA	0.2	1.4	0.03	0.06	0.03	55.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 1 [2029 DES SAT Reconfigured]

Network: 1 [2029 DES SAT Reconfigured]

Jonson Street / Carlyle Street  
 2029 With Development  
 Reconfigured Priority-Controlled Intersection  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows	Arrival Flows	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed			
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec					km/h		
South: Jonson St (S)														
2	T1	759	2.1	759	2.1	0.362	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		759	2.1	759	2.1	0.362	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Carlyle St (E)														
4	L2	49	0.0	49	0.0	0.051	7.6	LOS A	0.1	0.5	0.49	0.68	0.49	31.0
Approach		49	0.0	49	0.0	0.051	7.6	LOS A	0.1	0.5	0.49	0.68	0.49	31.0
North: Jonson St (N)														
7	L2	44	3.3	44	3.3	0.273	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	52.3
8	T1	636	1.0	636	1.0	0.273	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	57.6
Approach		680	1.2	680	1.2	0.273	0.4	NA	0.0	0.0	0.00	0.04	0.00	56.9
All Vehicles		1488	1.6	1488	1.6	0.362	0.4	NA	0.1	0.5	0.02	0.04	0.02	57.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 4 [2019 Design PM Access]

Network: 1 [2019 DES PM Reconfigured]

Jonson Street / Development Access  
 2019 With Development  
 Priority-Controlled Intersection Reconfigured  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles	Distance m			km/h
South: Jonson St (S)													
1	L2	71	2.0	71	2.0	0.276	4.6	LOS A	0.0	0.0	0.00	0.07	48.5
2	T1	496	4.4	496	4.4	0.276	0.0	LOS A	0.0	0.0	0.00	0.07	46.4
Approach		566	4.1	566	4.1	0.276	0.6	NA	0.0	0.0	0.00	0.07	47.3
North: Jonson St (N)													
8	T1	657	2.2	657	2.2	0.314	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
9	R2	85	2.0	85	2.0	0.089	5.1	LOS A	0.1	1.0	0.55	0.68	43.6
Approach		742	2.2	742	2.2	0.314	0.6	NA	0.1	1.0	0.06	0.08	47.5
West: Development Access (W)													
10	L2	113	2.0	113	2.0	0.362	8.5	LOS A	0.6	4.5	0.68	0.91	36.1
12	R2	43	2.0	43	2.0	0.362	29.5	LOS D	0.6	4.5	0.68	0.91	37.4
Approach		156	2.0	156	2.0	0.362	14.3	LOS B	0.6	4.5	0.68	0.91	36.5
All Vehicles		1464	2.9	1464	2.9	0.362	2.0	NA	0.6	4.5	0.10	0.16	43.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 4 [2019 Design SAT Access]

Network: 1 [2019 DES SAT Reconfigured]

Jonson Street / Development Access  
 2019 With Development  
 Priority-Controlled Intersection Reconfigured  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %				Vehicles	Distance m				
South: Jonson St (S)														
1	L2	69	2.0	69	2.0	0.272	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	48.5
2	T1	497	2.1	497	2.1	0.272	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	46.5
Approach		566	2.1	566	2.1	0.272	0.6	NA	0.0	0.0	0.00	0.07	0.00	47.4
North: Jonson St (N)														
8	T1	445	1.0	445	1.0	0.211	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	86	2.0	86	2.0	0.089	5.1	LOS A	0.1	1.1	0.55	0.68	0.55	43.6
Approach		532	1.2	532	1.2	0.211	0.8	NA	0.1	1.1	0.09	0.11	0.09	46.9
West: Development Access (W)														
10	L2	118	2.0	118	2.0	0.258	7.0	LOS A	0.4	2.9	0.61	0.80	0.66	39.5
12	R2	37	2.0	37	2.0	0.258	19.2	LOS C	0.4	2.9	0.61	0.80	0.66	40.5
Approach		155	2.0	155	2.0	0.258	9.9	LOS A	0.4	2.9	0.61	0.80	0.66	39.7
All Vehicles		1253	1.7	1253	1.7	0.272	1.8	NA	0.4	2.9	0.11	0.18	0.12	44.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

Site: 4 [2029 Design PM Access]

Network: 1 [2029 DES PM Reconfigured]

Jonson Street / Development Access  
 2029 With Development  
 Priority-Controlled Intersection Reconfigured  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	Turn	Demand	Flows	Arrival	Flows	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles	Distance m			km/h
South: Jonson St (S)													
1	L2	71	2.0	71	2.0	0.358	4.6	LOS A	0.0	0.0	0.00	0.05	48.6
2	T1	665	4.4	665	4.4	0.358	0.0	LOS A	0.0	0.0	0.00	0.05	47.2
Approach		736	4.1	736	4.1	0.358	0.4	NA	0.0	0.0	0.00	0.05	47.7
North: Jonson St (N)													
8	T1	883	2.2	883	2.2	0.422	0.0	LOS A	0.0	0.0	0.00	0.00	49.9
9	R2	85	2.0	85	2.0	0.115	6.6	LOS A	0.2	1.3	0.62	0.79	42.2
Approach		968	2.2	968	2.2	0.422	0.6	NA	0.2	1.3	0.05	0.07	47.4
West: Development Access (W)													
10	L2	113	2.0	113	2.0	0.765	34.3	LOS D	1.8	12.7	0.89	1.36	21.4
12	R2	43	2.0	43	2.0	0.765	89.9	LOS F	1.8	12.7	0.89	1.36	23.3
Approach		156	2.0	156	2.0	0.765	49.7	LOS E	1.8	12.7	0.89	1.36	22.0
All Vehicles		1860	2.9	1860	2.9	0.765	4.6	NA	1.8	12.7	0.10	0.17	37.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 4 [2029 Design SAT Access]

Network: 1 [2029 DES SAT Reconfigured]

Jonson Street / Development Access  
 2029 With Development  
 Priority-Controlled Intersection Reconfigured  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

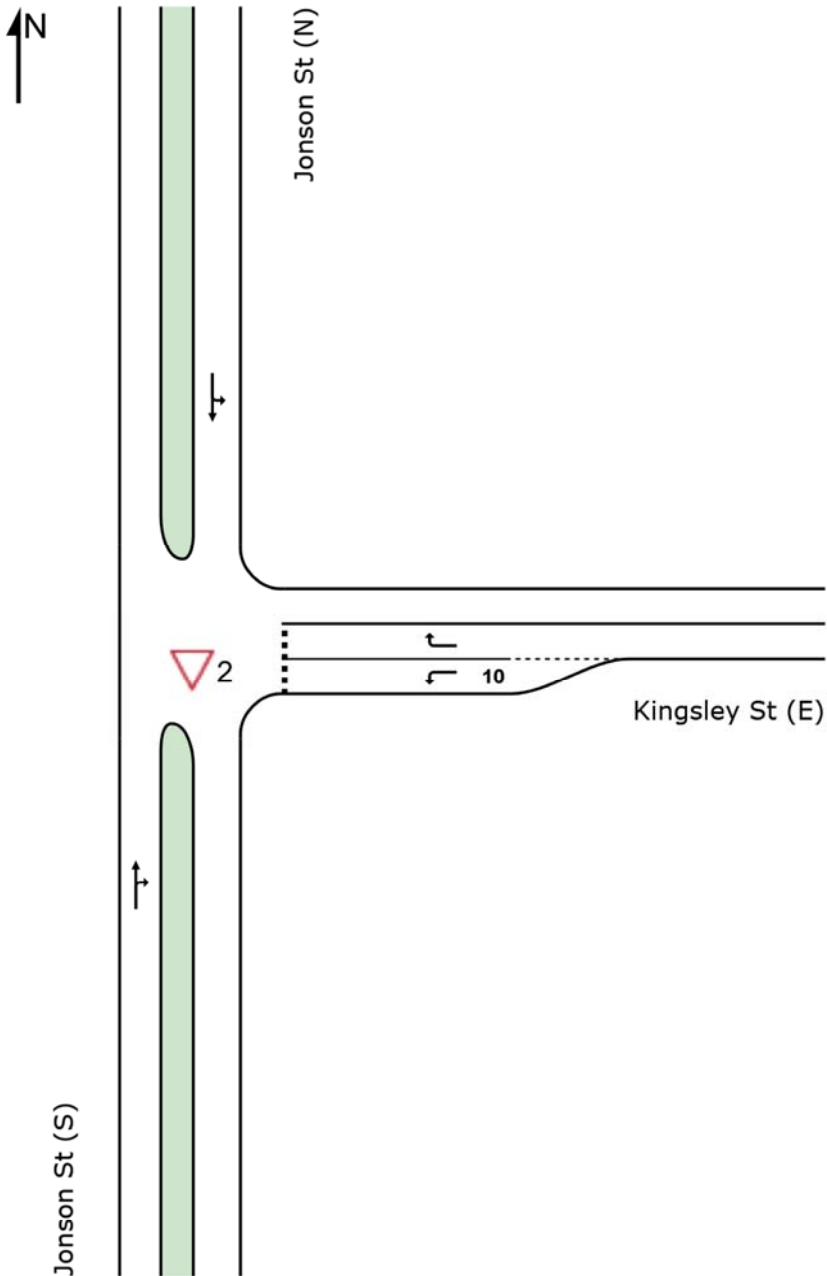
Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %				Vehicles	Distance m				
South: Jonson St (S)														
1	L2	69	2.0	69	2.0	0.354	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.6
2	T1	667	2.1	667	2.1	0.354	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	47.3
Approach		737	2.1	737	2.1	0.354	0.4	NA	0.0	0.0	0.00	0.05	0.00	47.8
North: Jonson St (N)														
8	T1	599	1.0	599	1.0	0.284	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	86	2.0	86	2.0	0.115	6.5	LOS A	0.2	1.3	0.62	0.79	0.62	42.3
Approach		685	1.1	685	1.1	0.284	0.8	NA	0.2	1.3	0.08	0.10	0.08	46.7
West: Development Access (W)														
10	L2	118	2.0	118	2.0	0.412	10.7	LOS B	0.7	5.1	0.77	0.99	1.06	34.5
12	R2	37	2.0	37	2.0	0.412	36.2	LOS E	0.7	5.1	0.77	0.99	1.06	35.9
Approach		155	2.0	155	2.0	0.412	16.8	LOS C	0.7	5.1	0.77	0.99	1.06	34.8
All Vehicles		1577	1.7	1577	1.7	0.412	2.2	NA	0.7	5.1	0.11	0.16	0.14	43.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# SITE LAYOUT

## ▽ Site: 2 [2019 BG PM ]

Jonson Street / Kingsley Street  
2019 Without Development  
Priority-Controlled Intersection  
Site Category: (None)  
Giveaway / Yield (Two-Way)



# MOVEMENT SUMMARY

▽ Site: 2 [2019 BG PM]

Jonson Street / Kingsley Street  
 2019 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	531	2.7	0.280	0.2	LOS A	0.2	1.7	0.05	0.01	0.05	49.1
3	R2	14	4.0	0.280	8.4	LOS A	0.2	1.7	0.05	0.01	0.05	43.8
Approach		544	2.7	0.280	0.4	NA	0.2	1.7	0.05	0.01	0.05	48.9
East: Kingsley St (E)												
4	L2	44	0.0	0.047	6.7	LOS A	0.2	1.2	0.49	0.66	0.49	34.3
6	R2	47	3.8	0.135	13.3	LOS B	0.4	3.0	0.75	0.89	0.75	25.5
Approach		92	2.0	0.135	10.1	LOS B	0.4	3.0	0.63	0.78	0.63	29.2
North: Jonson St (N)												
7	L2	45	19.4	0.286	4.7	LOS A	0.0	0.0	0.00	0.04	0.00	27.6
8	T1	540	1.8	0.286	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.3
Approach		585	3.2	0.286	0.4	NA	0.0	0.0	0.00	0.04	0.00	47.0
All Vehicles		1221	2.9	0.286	1.1	NA	0.4	3.0	0.07	0.08	0.07	46.2

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 2 [2019 BG SAT]

Jonson Street / Kingsley Street  
 2019 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	528	1.3	0.268	0.0	LOS A	0.1	0.6	0.02	0.01	0.02	49.6
3	R2	7	4.0	0.268	6.7	LOS A	0.1	0.6	0.02	0.01	0.02	44.4
Approach		536	1.4	0.268	0.1	NA	0.1	0.6	0.02	0.01	0.02	49.6
East: Kingsley St (E)												
4	L2	23	6.3	0.021	5.9	LOS A	0.1	0.6	0.40	0.57	0.40	34.3
6	R2	29	0.0	0.062	10.2	LOS B	0.2	1.3	0.65	0.84	0.65	28.8
Approach		53	2.8	0.062	8.3	LOS A	0.2	1.3	0.54	0.72	0.54	31.0
North: Jonson St (N)												
7	L2	32	0.0	0.193	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	27.8
8	T1	368	1.8	0.193	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.1
Approach		400	1.7	0.193	0.4	NA	0.0	0.0	0.00	0.04	0.00	46.9
All Vehicles		988	1.6	0.268	0.7	NA	0.2	1.3	0.04	0.06	0.04	47.3

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 2 [2029 BG PM]

Jonson Street / Kingsley Street  
 2029 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	713	2.7	0.384	0.5	LOS A	0.6	4.3	0.08	0.02	0.11	48.1
3	R2	19	4.0	0.384	12.1	LOS B	0.6	4.3	0.08	0.02	0.11	42.9
Approach		732	2.7	0.384	0.8	NA	0.6	4.3	0.08	0.02	0.11	48.0
East: Kingsley St (E)												
4	L2	60	0.0	0.083	8.2	LOS A	0.3	2.1	0.58	0.78	0.58	32.3
6	R2	64	3.8	0.358	27.2	LOS D	1.1	8.2	0.90	1.01	1.08	17.5
Approach		124	2.0	0.358	18.0	LOS C	1.1	8.2	0.75	0.90	0.84	22.6
North: Jonson St (N)												
7	L2	61	19.4	0.384	4.7	LOS A	0.0	0.0	0.00	0.04	0.00	27.5
8	T1	725	1.8	0.384	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.2
Approach		786	3.2	0.384	0.4	NA	0.0	0.0	0.00	0.04	0.00	47.0
All Vehicles		1642	2.9	0.384	1.9	NA	1.1	8.2	0.09	0.09	0.11	44.5

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 2 [2029 BG SAT]

Jonson Street / Kingsley Street  
 2029 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	709	1.3	0.362	0.1	LOS A	0.2	1.4	0.03	0.01	0.04	49.4
3	R2	11	4.0	0.362	8.3	LOS A	0.2	1.4	0.03	0.01	0.04	44.2
Approach		720	1.4	0.362	0.2	NA	0.2	1.4	0.03	0.01	0.04	49.4
East: Kingsley St (E)												
4	L2	31	6.3	0.032	6.6	LOS A	0.1	0.9	0.48	0.63	0.48	33.8
6	R2	39	0.0	0.135	15.6	LOS C	0.4	2.8	0.80	0.91	0.80	23.9
Approach		69	2.7	0.135	11.6	LOS B	0.4	2.8	0.66	0.79	0.66	27.6
North: Jonson St (N)												
7	L2	42	0.0	0.260	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	27.8
8	T1	496	1.8	0.260	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.1
Approach		538	1.7	0.260	0.4	NA	0.0	0.0	0.00	0.04	0.00	46.9
All Vehicles		1327	1.6	0.362	0.9	NA	0.4	2.8	0.05	0.06	0.05	46.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

▽ Site: 2 [2019 DES PM]

Jonson Street / Kingsley Street  
 2019 With Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	587	2.7	0.330	0.5	LOS A	0.6	4.6	0.11	0.03	0.13	47.8
3	R2	32	4.0	0.330	9.2	LOS A	0.6	4.6	0.11	0.03	0.13	42.5
Approach		619	2.7	0.330	1.0	NA	0.6	4.6	0.11	0.03	0.13	47.5
East: Kingsley St (E)												
4	L2	44	0.0	0.049	6.9	LOS A	0.2	1.3	0.51	0.68	0.51	34.0
6	R2	67	3.8	0.230	16.4	LOS C	0.7	5.3	0.81	0.94	0.89	23.1
Approach		112	2.3	0.230	12.7	LOS B	0.7	5.3	0.69	0.83	0.74	26.6
North: Jonson St (N)												
7	L2	57	19.4	0.307	4.7	LOS A	0.0	0.0	0.00	0.05	0.00	27.5
8	T1	572	1.8	0.307	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
Approach		628	3.4	0.307	0.4	NA	0.0	0.0	0.00	0.05	0.00	46.6
All Vehicles		1359	3.0	0.330	1.7	NA	0.7	5.3	0.11	0.10	0.12	44.8

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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



# MOVEMENT SUMMARY

▽ Site: 2 [2019 DES SAT]

Jonson Street / Kingsley Street  
 2019 With Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	584	1.3	0.314	0.2	LOS A	0.4	2.6	0.07	0.03	0.08	48.8
3	R2	27	4.0	0.314	7.1	LOS A	0.4	2.6	0.07	0.03	0.08	43.5
Approach		612	1.5	0.314	0.5	NA	0.4	2.6	0.07	0.03	0.08	48.5
East: Kingsley St (E)												
4	L2	23	6.3	0.022	6.0	LOS A	0.1	0.6	0.42	0.58	0.42	34.2
6	R2	46	0.0	0.115	11.8	LOS B	0.4	2.5	0.71	0.87	0.71	27.1
Approach		69	2.1	0.115	9.9	LOS A	0.4	2.5	0.61	0.77	0.61	29.2
North: Jonson St (N)												
7	L2	41	0.0	0.211	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	27.8
8	T1	396	1.8	0.211	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.9
Approach		437	1.6	0.211	0.4	NA	0.0	0.0	0.00	0.05	0.00	46.4
All Vehicles		1118	1.6	0.314	1.1	NA	0.4	2.6	0.08	0.08	0.08	46.2

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 2 [2029 DES PM]

Jonson Street / Kingsley Street  
 2029 With Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	769	2.7	0.454	1.4	LOS A	1.6	11.8	0.19	0.04	0.28	45.5
3	R2	43	4.0	0.454	13.8	LOS B	1.6	11.8	0.19	0.04	0.28	40.3
Approach		813	2.7	0.454	2.0	NA	1.6	11.8	0.19	0.04	0.28	45.3
East: Kingsley St (E)												
4	L2	60	0.0	0.087	8.5	LOS A	0.3	2.2	0.60	0.80	0.60	31.9
6	R2	86	3.8	0.614	42.5	LOS E	2.1	15.5	0.95	1.10	1.40	12.9
Approach		146	2.3	0.614	28.6	LOS D	2.1	15.5	0.81	0.98	1.07	17.3
North: Jonson St (N)												
7	L2	73	19.4	0.406	4.7	LOS A	0.0	0.0	0.00	0.05	0.00	27.5
8	T1	757	1.8	0.406	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
Approach		829	3.3	0.406	0.4	NA	0.0	0.0	0.00	0.05	0.00	46.7
All Vehicles		1788	3.0	0.614	3.5	NA	2.1	15.5	0.15	0.12	0.22	41.5

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 2 [2029 DES SAT]

Jonson Street / Kingsley Street  
 2029 With Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

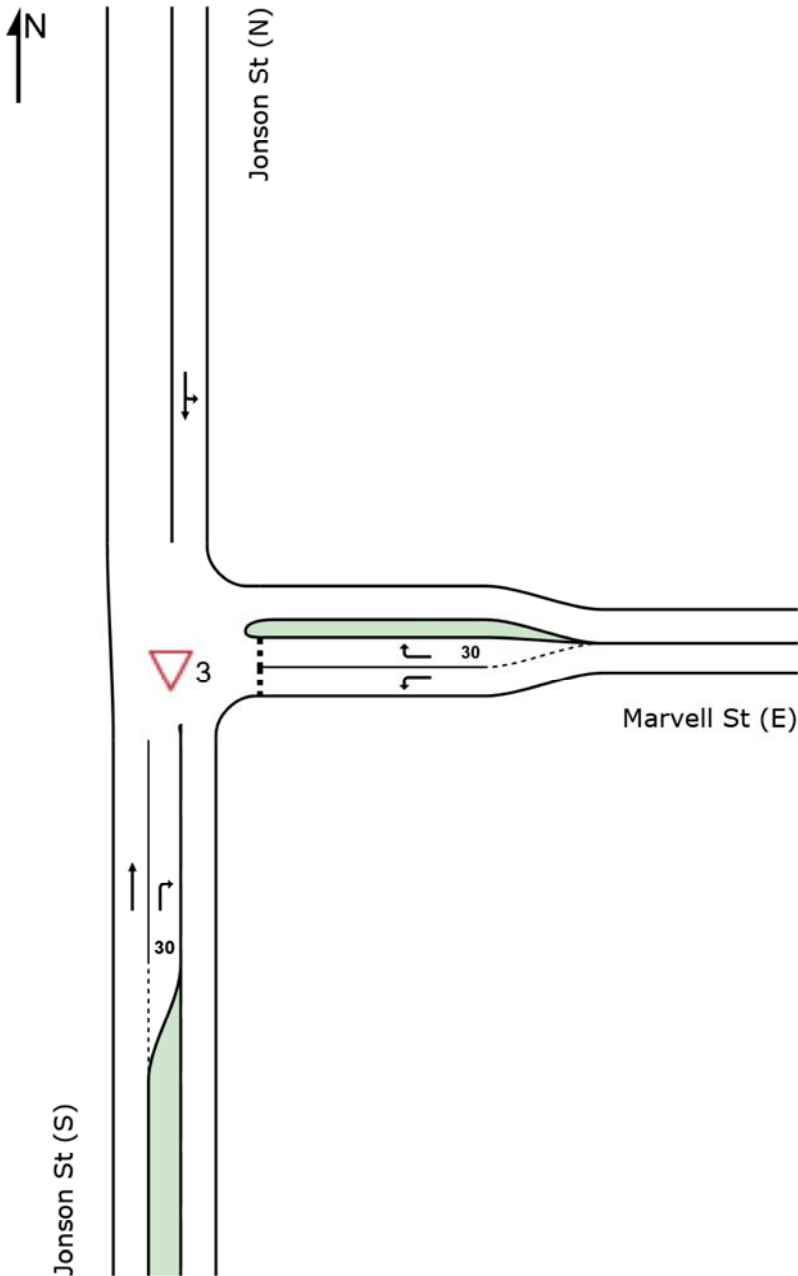
Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	765	1.3	0.418	0.5	LOS A	0.8	5.9	0.10	0.03	0.14	48.0
3	R2	37	4.0	0.418	9.1	LOS A	0.8	5.9	0.10	0.03	0.14	42.7
Approach		802	1.5	0.418	0.9	NA	0.8	5.9	0.10	0.03	0.14	47.8
East: Kingsley St (E)												
4	L2	31	6.3	0.033	6.8	LOS A	0.1	0.9	0.49	0.65	0.49	33.5
6	R2	57	0.0	0.246	20.2	LOS C	0.8	5.3	0.86	0.96	0.95	20.9
Approach		87	2.2	0.246	15.5	LOS C	0.8	5.3	0.73	0.85	0.79	24.2
North: Jonson St (N)												
7	L2	52	0.0	0.278	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	27.8
8	T1	523	1.8	0.278	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.0
Approach		575	1.7	0.278	0.4	NA	0.0	0.0	0.00	0.05	0.00	46.5
All Vehicles		1464	1.6	0.418	1.6	NA	0.8	5.9	0.10	0.09	0.12	45.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# SITE LAYOUT

## ▽ Site: 3 [2019 BG PM]

Jonson Street / Marvell Street  
2019 Without Development  
Priority-Controlled Intersection  
Site Category: (None)  
Giveaway / Yield (Two-Way)



# MOVEMENT SUMMARY

▽ Site: 3 [2019 BG PM]

Jonson Street / Marvell Street  
 2019 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	526	3.9	0.275	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	125	0.0	0.126	7.1	LOS A	0.5	3.7	0.55	0.72	0.55	29.8
Approach		652	3.2	0.275	1.4	NA	0.5	3.7	0.11	0.14	0.11	46.0
East: Marvell St (E)												
4	L2	157	1.4	0.156	5.5	LOS A	0.6	4.4	0.50	0.68	0.50	34.0
6	R2	77	4.2	0.354	23.7	LOS C	1.3	9.7	0.87	1.00	1.07	19.1
Approach		234	2.3	0.354	11.5	LOS B	1.3	9.7	0.62	0.79	0.68	26.5
North: Jonson St (N)												
7	L2	82	1.3	0.289	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	28.3
8	T1	478	2.5	0.289	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	48.5
Approach		560	2.3	0.289	0.7	NA	0.0	0.0	0.00	0.08	0.00	45.0
All Vehicles		1445	2.7	0.354	2.7	NA	1.3	9.7	0.15	0.22	0.16	42.0

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 3 [2019 BG SAT]

Jonson Street / Marvell Street  
 2019 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	449	1.9	0.231	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	149	0.7	0.114	5.8	LOS A	0.5	3.6	0.42	0.60	0.42	31.0
Approach		599	1.6	0.231	1.4	NA	0.5	3.6	0.10	0.15	0.10	45.3
East: Marvell St (E)												
4	L2	193	1.1	0.151	4.4	LOS A	0.6	4.5	0.37	0.57	0.37	35.6
6	R2	71	3.1	0.199	13.1	LOS B	0.7	5.2	0.74	0.88	0.77	26.1
Approach		263	1.6	0.199	6.7	LOS A	0.7	5.2	0.47	0.65	0.47	32.1
North: Jonson St (N)												
7	L2	58	0.0	0.168	4.6	LOS A	0.0	0.0	0.00	0.10	0.00	28.2
8	T1	268	2.0	0.168	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	48.2
Approach		326	1.7	0.168	0.8	NA	0.0	0.0	0.00	0.10	0.00	44.0
All Vehicles		1188	1.6	0.231	2.4	NA	0.7	5.2	0.16	0.25	0.16	42.1

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 3 [2029 BG PM]

Jonson Street / Marvell Street  
 2029 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	706	3.9	0.366	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	169	0.0	0.228	8.9	LOS A	0.9	6.6	0.65	0.85	0.67	27.5
Approach		876	3.2	0.366	1.7	NA	0.9	6.6	0.13	0.16	0.13	45.2
East: Marvell St (E)												
4	L2	212	1.4	0.262	7.0	LOS A	1.1	7.8	0.60	0.82	0.64	31.5
6	R2	103	4.2	1.078	197.7	LOS F	10.9	79.4	1.00	1.88	4.23	3.5
Approach		315	2.3	1.078	69.5	LOS F	10.9	79.4	0.73	1.17	1.82	8.2
North: Jonson St (N)												
7	L2	111	1.3	0.389	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	28.3
8	T1	642	2.5	0.389	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	48.4
Approach		753	2.3	0.389	0.7	NA	0.0	0.0	0.00	0.08	0.00	45.0
All Vehicles		1943	2.7	1.078	12.3	NA	10.9	79.4	0.17	0.29	0.35	29.6

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 3 [2029 BG SAT]

Jonson Street / Marvell Street  
 2029 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	604	1.9	0.311	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	201	0.7	0.174	6.4	LOS A	0.8	5.5	0.50	0.68	0.50	30.6
Approach		805	1.6	0.311	1.6	NA	0.8	5.5	0.13	0.17	0.13	45.1
East: Marvell St (E)												
4	L2	259	1.1	0.224	5.0	LOS A	1.0	6.8	0.45	0.64	0.45	35.0
6	R2	95	3.1	0.460	27.5	LOS D	1.9	13.3	0.90	1.04	1.22	17.5
Approach		354	1.6	0.460	11.0	LOS B	1.9	13.3	0.57	0.75	0.66	27.0
North: Jonson St (N)												
7	L2	77	0.0	0.225	4.6	LOS A	0.0	0.0	0.00	0.10	0.00	28.2
8	T1	361	2.0	0.225	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	48.2
Approach		438	1.7	0.225	0.8	NA	0.0	0.0	0.00	0.10	0.00	44.1
All Vehicles		1597	1.6	0.460	3.5	NA	1.9	13.3	0.19	0.28	0.21	40.4

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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



# MOVEMENT SUMMARY

Site: 3 [2019 DES PM]

Jonson Street / Marvell Street  
 2019 With Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	613	3.9	0.319	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	158	0.0	0.173	7.6	LOS A	0.7	5.1	0.59	0.77	0.59	29.1
Approach		771	3.1	0.319	1.6	NA	0.7	5.1	0.12	0.16	0.12	45.6
East: Marvell St (E)												
4	L2	177	1.4	0.190	5.9	LOS A	0.8	5.3	0.53	0.73	0.53	33.2
6	R2	95	4.2	0.618	43.0	LOS E	2.6	18.7	0.95	1.12	1.47	12.9
Approach		272	2.4	0.618	18.9	LOS C	2.6	18.7	0.68	0.87	0.86	20.8
North: Jonson St (N)												
7	L2	82	1.3	0.320	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	28.3
8	T1	539	2.5	0.320	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	48.6
Approach		621	2.3	0.320	0.6	NA	0.0	0.0	0.00	0.07	0.00	45.5
All Vehicles		1663	2.7	0.618	4.0	NA	2.6	18.7	0.17	0.24	0.20	39.9

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 3 [2019 DES SAT]

Jonson Street / Marvell Street  
 2019 With Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	544	1.9	0.280	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	179	0.7	0.145	6.1	LOS A	0.7	4.6	0.46	0.64	0.46	30.8
Approach		723	1.6	0.280	1.5	NA	0.7	4.6	0.12	0.16	0.12	45.3
East: Marvell St (E)												
4	L2	218	1.1	0.182	4.7	LOS A	0.8	5.4	0.41	0.61	0.41	35.3
6	R2	79	3.1	0.304	19.4	LOS C	1.2	8.3	0.84	0.97	0.99	21.5
Approach		297	1.6	0.304	8.6	LOS A	1.2	8.3	0.53	0.70	0.57	29.7
North: Jonson St (N)												
7	L2	58	0.0	0.198	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	28.3
8	T1	326	2.0	0.198	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	48.4
Approach		384	1.7	0.198	0.7	NA	0.0	0.0	0.00	0.08	0.00	44.9
All Vehicles		1404	1.7	0.304	2.8	NA	1.2	8.3	0.17	0.25	0.18	41.7

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

▽ Site: 3 [2029 DES PM]

Jonson Street / Marvell Street  
 2029 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	793	3.9	0.410	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	204	0.0	0.304	10.3	LOS B	1.4	9.7	0.71	0.91	0.84	26.0
Approach		997	3.1	0.410	2.1	NA	1.4	9.7	0.14	0.19	0.17	44.4
East: Marvell St (E)												
4	L2	232	1.4	0.314	8.0	LOS A	1.4	9.9	0.64	0.87	0.76	30.1
6	R2	127	4.2	2.042	1005.4	LOS F	47.0	340.7	1.00	3.22	9.40	0.7
Approach		359	2.4	2.042	361.9	LOS F	47.0	340.7	0.77	1.70	3.83	1.8
North: Jonson St (N)												
7	L2	111	1.3	0.420	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	28.3
8	T1	703	2.5	0.420	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	48.5
Approach		814	2.3	0.420	0.6	NA	0.0	0.0	0.00	0.07	0.00	45.3
All Vehicles		2169	2.7	2.042	61.1	NA	47.0	340.7	0.19	0.40	0.71	11.7

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

Vehicle movement LOS values are based on average delay per movement.

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

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

# MOVEMENT SUMMARY

Site: 3 [2029 DES SAT]

Jonson Street / Marvell Street  
 2029 Without Development  
 Priority-Controlled Intersection  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Jonson St (S)												
2	T1	699	1.9	0.361	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	233	0.7	0.216	6.8	LOS A	1.0	6.9	0.55	0.72	0.55	30.1
Approach		932	1.6	0.361	1.7	NA	1.0	6.9	0.14	0.18	0.14	45.0
East: Marvell St (E)												
4	L2	284	1.1	0.262	5.3	LOS A	1.1	8.1	0.50	0.68	0.50	34.3
6	R2	106	3.1	0.746	56.4	LOS F	3.5	25.0	0.97	1.22	1.80	10.6
Approach		391	1.7	0.746	19.2	LOS C	3.5	25.0	0.62	0.83	0.85	20.5
North: Jonson St (N)												
7	L2	77	0.0	0.255	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	28.2
8	T1	419	2.0	0.255	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	48.4
Approach		496	1.7	0.255	0.7	NA	0.0	0.0	0.00	0.08	0.00	44.7
All Vehicles		1818	1.7	0.746	5.2	NA	3.5	25.0	0.20	0.29	0.25	37.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.