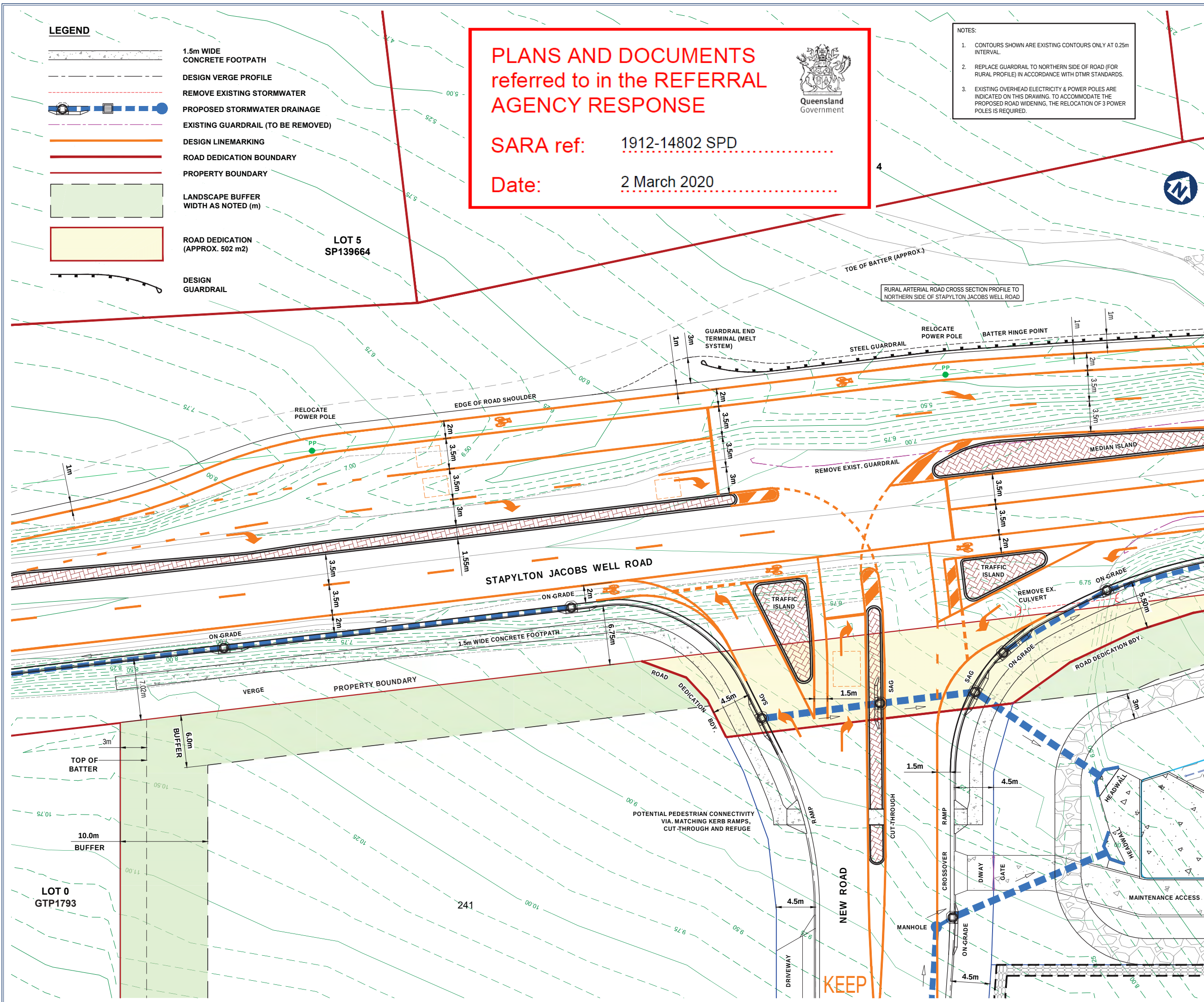
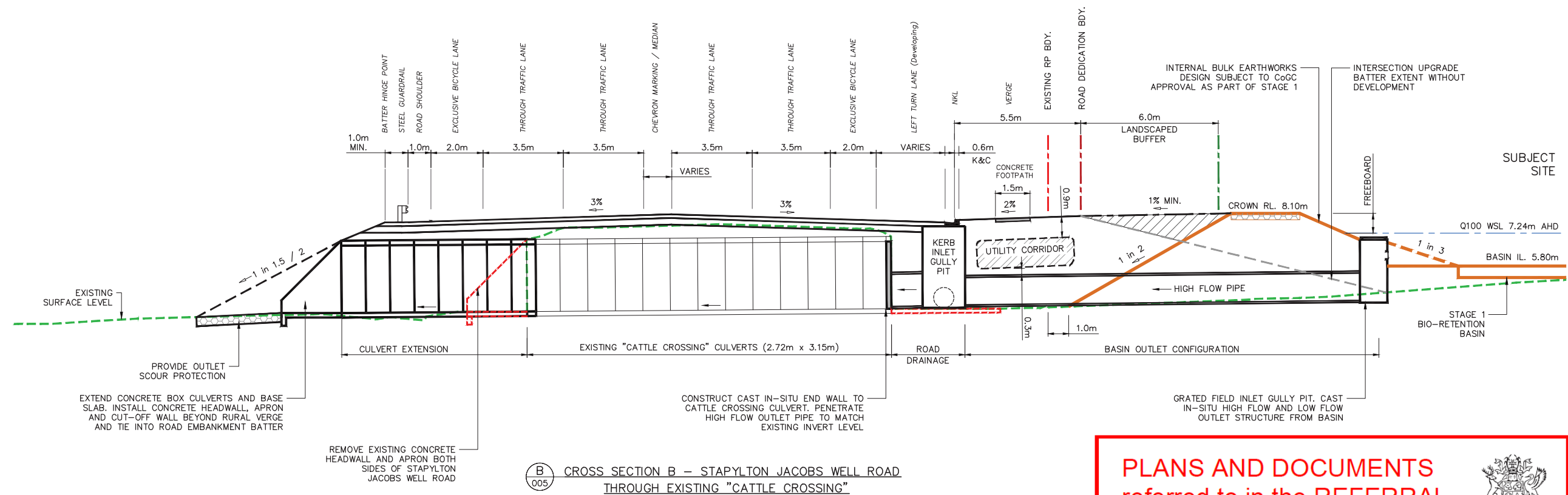
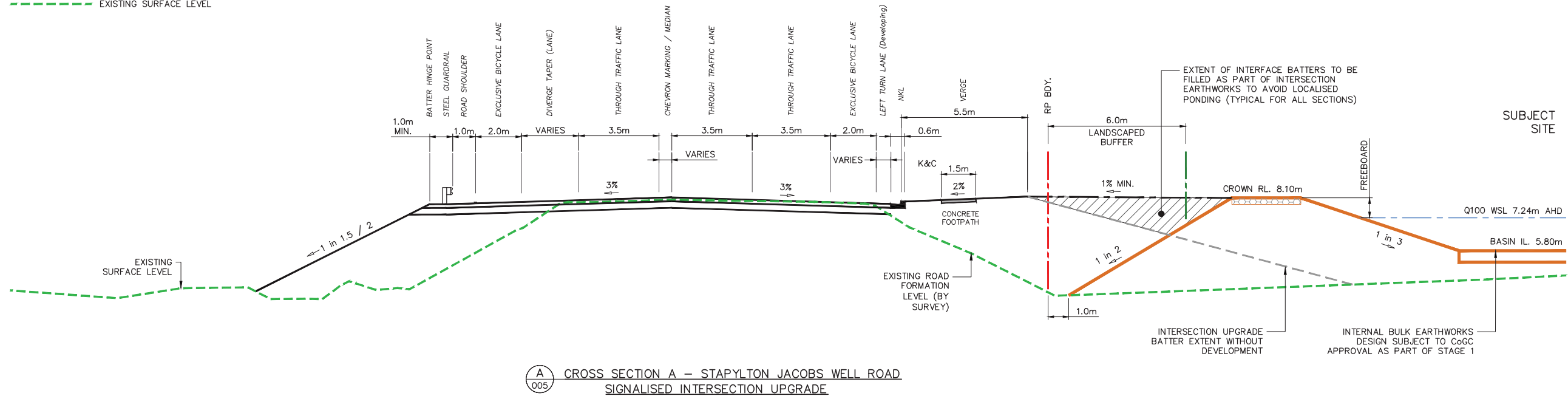






## LEGEND

- DTMR WORKS
- STAGE 1 BULK EARTHWORKS
- EXISTING SURFACE LEVEL



## PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE

SARA ref: 1912-14802 SPD  
Date: 2 March 2020



Client:

KS8 Pty. Ltd.

Site Address:

60 STAPYLTON JACOBS  
WELL ROAD, STAPYLTON

RPD:

Lot / Plan: 1 on RP6882  
240 on W31320  
4 on RP6843  
Parish: Albert  
County: Ward  
Local Authority: City of Gold Coast  
Council  
Level Datum: AHD  
Meridian: IS216853  
Contour Interval: -  
PSM: -  
RL: -

ISSUED FOR APPROVAL  
NOT FOR CONSTRUCTION

DRAWING TO BE READ IN CONJUNCTION WITH GENERAL NOTES

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## DRAWING TITLE

TYPICAL CROSS SECTIONS  
OF STAPYLTON JACOBS  
WELL ROAD

| Issue | Date     | Description                    | IG | MG | DRN | CHK |
|-------|----------|--------------------------------|----|----|-----|-----|
| B     | 24-07-18 | AMENDMENTS AS PER DTMR REQUEST | IG | MG |     |     |
| A     | 18-07-18 | ORIGINAL ISSUE                 | IG | MG |     |     |

SCALE IN METRES



Scale at A1: 1:100

|           |                    |
|-----------|--------------------|
| Designed: | IG                 |
| Drafted:  | IG                 |
| Approved: | MG                 |
| RPEQ:     | 16939              |
| Signed:   | <i>[Signature]</i> |
| Date:     | 24-07-18           |

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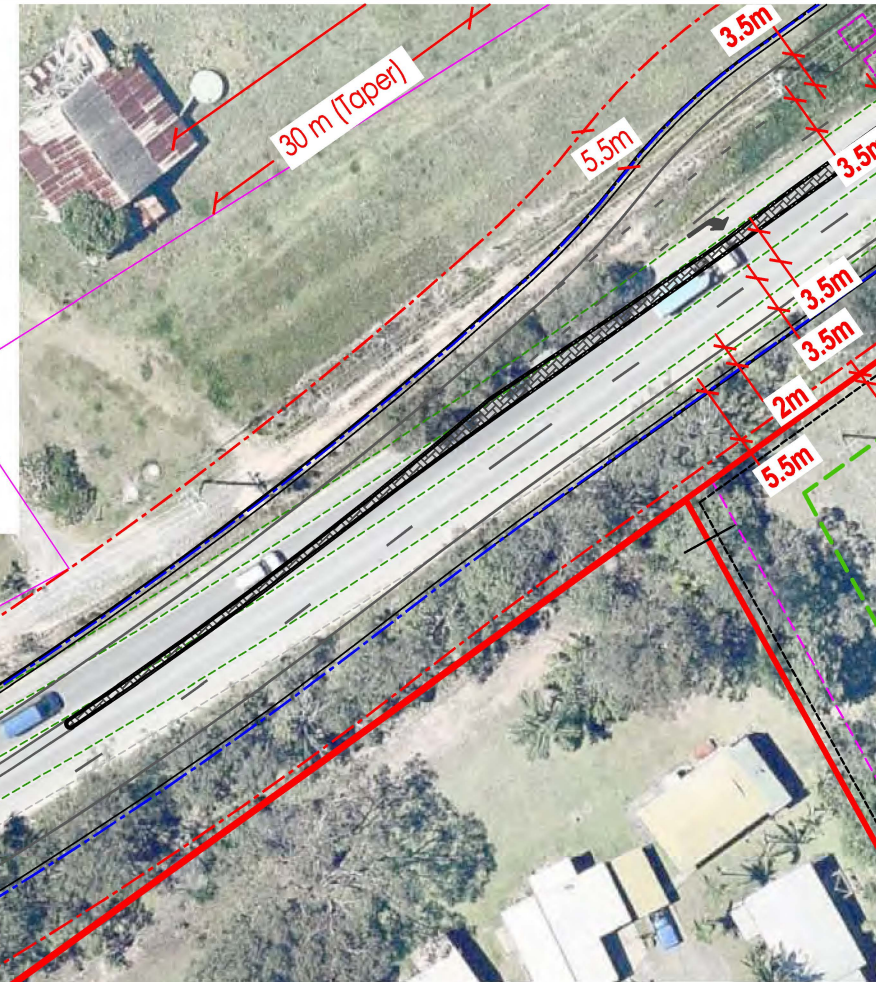
PLANS AND DOCUMENTS  
referred to in the REFERRAL  
AGENCY RESPONSE

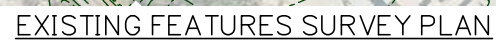


SARA ref: 1912-14802 SPD

Date: 2 March 2020

Plan: Stapylton Jacobs Well Road - Extension of Second  
Approach Lane Between Eastern Roundabout and Site  
Access  
Prepared By: Rydenskild Traffic Engineering  
Date: 18/7/2018  
Reference: 17450-01C.3



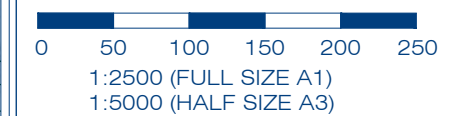


DRAWING TITLE

## EXISTING FEATURES SURVEY PLAN

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| B     | 11-05-18 | INFORMATION REQUEST RESPONSE | GOP | MG  |
| A     | 09-02-18 | ORIGINAL ISSUE               | GCP | MG  |
| ISSUE | Date     | Description                  | DRN | CHK |

## SCALE IN METRES



|              |          |
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| Scale at A1: | 1:2500   |
| Designed:    | IG       |
| Drafted:     | GCP      |
| Approved:    | MG       |
| RPEQ:        | 16939    |
| Signed:      |          |
| Date:        | 11-05-18 |



## TRAFFIC IMPACT ASSESSMENT

PROPOSED INDUSTRIAL ESTATE

60 STAPYLTON – JACOBS WELL ROAD & 82  
CHRISTENSEN ROAD, STAPYLTON

LOT 1 ON RP6882, LOT 240 ON W31330

(RESPONSE TO SARA INFORMATION REQUEST)

Prepared for

**KS8 Pty Ltd**

**13 APRIL 2018**

**PLANS AND DOCUMENTS  
referred to in the REFERRAL  
AGENCY RESPONSE**



**SARA ref:** 1912-14802 SPD .....

**Date:** 2 March 2020 .....

## DOCUMENT REGISTER

Document 60 Stapylton Jacons Well Road  
Traffic Impact Assessment (TIA)

RTG Reference 17450

Date 13 April 2018

Prepared by Dare Janzekovic, Luke Rytenskild

### Document History

| Version | Version date    | Details                     | Reviewed and Authorised               |                                                                                      |
|---------|-----------------|-----------------------------|---------------------------------------|--------------------------------------------------------------------------------------|
|         |                 |                             | Name / Position                       | Signature                                                                            |
| 1       | 30 January 2018 | DRAFT                       | Luke Rytenskild<br>Director RPEQ 6293 |   |
| 2       | 2 February 2018 | DA SUBMISSION               | Luke Rytenskild<br>Director RPEQ 6293 |   |
| 3       | 13 April 2018   | DA V2 –<br>SARA IR RESPONSE | Luke Rytenskild<br>Director RPEQ 6293 |  |

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**PLANS AND DOCUMENTS  
referred to in the REFERRAL  
AGENCY RESPONSE**



**SARA ref:** 1912-14802 SPD

**Date:** 2 March 2020

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## 1.0 INTRODUCTION

### 1.1 Background

Rytenskild Traffic Engineering (RTE) has been engaged by KS8 Pty Ltd to prepare a Traffic Impact Assessment of its proposed new intersection in Yatala.

This report forms part of a Change to Approval. The intention of the report is to re-assess the impacts upon the surrounding State – controlled road network, with a view to achieving a more practical outcome with respect to road network upgrade requirements.

The Department of Transport and Main Roads is a referral agency for the application. This report has been prepared in accordance with the Guide to Traffic Impact Assessments 2017 (GTIA) and the Further Advice letter received on 23 November 2017 (ref: 1710-2228 SPD).

The RPEQ certification of this Traffic Impact Assessment (TIA) is provided in Appendix A.

This report is an amended version of that lodged with the DA and addresses the items discussed with the State Assessment and Referral Agency (SARA) in a meeting held on 7 March 2018. A response to each action discussed in the meeting is provided below, with additional information within the report where necessary.

- 1. Applicant to provide a revised trip generation rate (along with rationale/justification) and resulting traffic estimates for the department's review.*

#### **Response**

A traffic generation survey has been carried out for an existing industrial area in the immediate vicinity of the proposal (Christensen Rd), using Metrocount equipment. A 'dead end' catchment was selected so that only traffic generated by uses in that area was recorded (ie no through traffic).

As presented in Section 4, and further discussed in Section D, the existing industrial catchment generates in the order of 0.21 peak hour trips per 100m<sup>2</sup> per peak hour. The surveyed area is similar in scale to the proposed estate and comprises a range of industrial users. The surveyed rate is consistent with surveys carried out by the NSW RMS in the Sydney area, and is considered to be appropriate for the subject site.

The trip generation rate used in the original assessment has been adopted for sensitivity testing.

- 2. Once the trip generation rate and updated traffic modelling is agreed on, the applicant will determine if proposed works are still adequate or if other works are required.*

### **Response**

An updated SIDRA analysis has been carried out at the proposed new access and the Exit 38 interchange. The revised trip generation rate of 0.21 trips per 100m<sup>2</sup> has been adopted for the assessment. As discussed in Section 5, the following mitigation works are proposed during Stages 1 and 2 to achieve a no-worsening effect to the existing road network.

- STAGE 1** –
- 1) Construction of proposed access to planned four lane profile
  - 2) Extension of the second approach lane on Stapylton Jacobs Well Road between the eastern roundabout and the proposed site access
- STAGE 2** –
- 3) Construction of the second approach lane on Christensen Road.
  - 4) Construction of the second approach lane on the northbound off-ramp (western site of the Exit 38 interchange)

The above mitigation works are considered to be sufficient to accommodate the development traffic impact upon the interchange. Additional contributions are proposed for the construction of Stage 3 and 4, to facilitate further upgrades along Christensen Road and/or Jacobs Well Road. Such contributions shall equate to the cost of constructing

3. *Applicant to provide a functional layout plan for the proposed SJW Rd signalised intersection.*

### **Response**

A functional layout plan of the proposed site access intersections with Stapylton Jacobs Well Road is provided in Section 5 of the report. The intersection has been drawn within the existing road reserve. However, is slightly modified to suit the narrow section of road reserve to the west, which is yet to be resumed.

The concept design of the intersection assumes that the signalised intersection will be built in its ultimate alignment, with the geometry between the intersection and the interchange constructed once the appropriate land to the west is resumed.

## 1.2 Subject Site

As shown in Figure 2.1, the site is located on the southern side of Stapylton Jacobs Well Road. The subject site is identified as Lot 1 on RP6882 & Lot 240 on W31330 and has an approximate site area of 62.65 hectares.



**FIGURE 1.1 – LOCATION OF SUBJECT SITE**

---

### **1.3 Comparison with Other Approvals in the Yatala Enterprise Area**

Rytenskild Traffic Engineering has been involved with numerous applications in the Yatala Enterprise Area. To our knowledge, the following requirements have been applied to various projects:

- 1 Eastern Service Road – requirement for an upgrade to the Christensen Road approach to the eastern roundabout at the Exit 38 interchange.
- Caterpillar Warehouse – 71 Elderslie Road, Yatala – Contribution of approximately \$ 225,000 for State – controlled road impacts.
- New industrial estate at 125 Pearson Road, Yatala (Frasers Property) – no requirements.
- Empire Estate (Stages 1 – 4) – Peachey Road, Luscombe – no requirements.

The Referral Agency's response from TMR requires a contribution of \$45 per square metre of Gross Floor Area to be made to offset the potential impact of the proposed development. In recent years, this rate has been applied by TMR to numerous industrial development proposals located outside of the Yatala Enterprise Area. Such has been justified on the basis that these applications are outside of the Yatala Enterprise Area and therefore have not been considered by the TMR in its planning of the surrounding State controlled road network. Given that the subject site is located within the Yatala Enterprise Area, it is considered inappropriate for the rate to have been applied to the site. This report identifies those upgrade works that are required to mitigate the impact of the development, and therefore should be required.

## 2.0 DEVELOPMENT PROPOSAL

It is proposed that the estate will be developed over four stages, with the following developable areas:

|               |                             |
|---------------|-----------------------------|
| Stage One:    | 115,945m <sup>2</sup>       |
| Stage Two:    | 288,165m <sup>2</sup>       |
| Stage Three:  | 91,992m <sup>2</sup>        |
| Stage Four:   | 10,750m <sup>2</sup>        |
| <b>Total:</b> | <b>506,852m<sup>2</sup></b> |

It is noted that the above area is conservative as it includes area required for batters. The actual developable area is in the order of 455,000m<sup>2</sup>.

It is estimated that the Gross Floor Area (GFA) will be approximately 45% of the above developable area. These calculations are shown in Section 4.0.

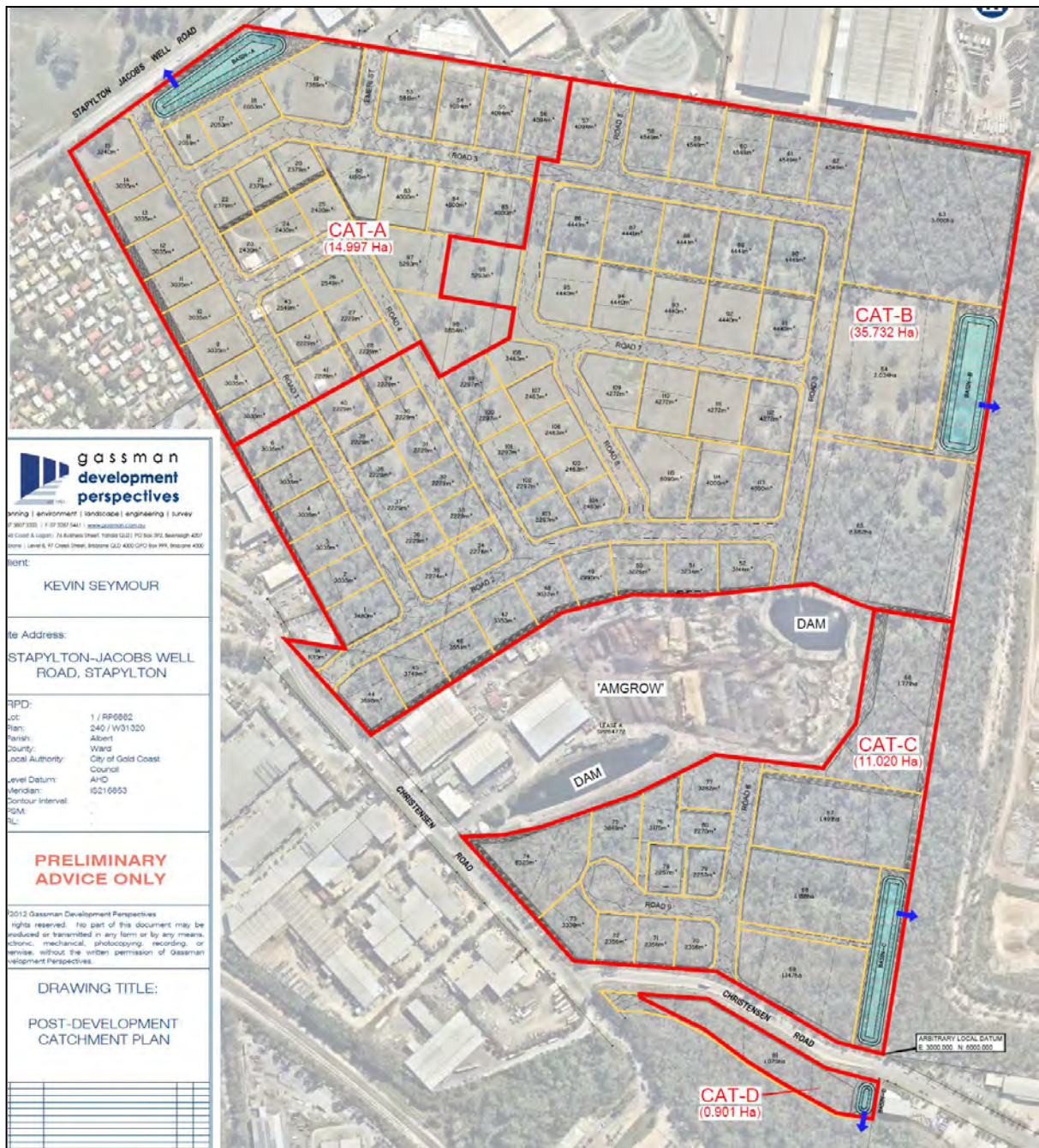
The proposed plan of development allows for future road connections to the adjoining properties to the east which will occur in due course. It is proposed that primary access be gained via a single signalised intersection on the Stapylton – Jacob's Well Road. A road connection linking Stapylton Jacobs Well Road to Christensen Road will be constructed as part of the overall project. Stages 3 and 4 will gain access from Christensen Road.

It is noted that the latest Hyder report was based on a total developable area of 262,500m<sup>2</sup>, however, the proposed master plan was amended during the Decision Notice phase of the Development Application.

The approved staging plan is shown in Figure 2.1. It is proposed that access be achieved as follows:

|           |                                                                              |
|-----------|------------------------------------------------------------------------------|
| Stage 1 - | via DeBortoli Street                                                         |
| Stage 2 - | via De Bortoli Street (through stage 1) and Stapylton – Jacob's Well Road    |
| Stage 3 - | via De Bortoli Street and Stapylton – Jacob's Well Rd (through stages 1 & 2) |
| Stage 4 - | via Christensen Road, with connectivity to S-JW Rd and DeBortoli Street.     |

It is estimated that Stage 4 will not be developed until beyond the year 2023.



**FIGURE 2.1 – PROPOSED PLAN OF DEVELOPMENT**

## **3.0 SURROUNDING ROAD NETWORK**

### **3.1 Interchange Layout**

As shown in Figure 3.1, the Exit 38 interchange comprises of a roundabout on each side of the Motorway with a four lane connection road beneath the Motorway. The western roundabout has two circulating lanes and five legs, including the northbound on and off ramps. The western roundabout has two circulating lanes and six legs, including the southbound on and off ramps.

The interchange has recently been upgraded, as follows:

Eastern roundabout:

- A second approach lane on the Stapylton – Jacob’s Well Road leg;
- A signal meter on the Elderslie Road (underpass) approach.

Western roundabout:

- A second approach lane on the Elderslie road approach;
- A signal meter on the Elderslie Road (underpass) approach.

In addition, Nyholt Drive was connected to Martens Street which has provided some relief to the interchange as local traffic is now able to access Beenleigh without using the motorway.

The existing layout of the Exit 38 interchange is shown in Figure 3.1.

### **3.2 Planned Road Upgrades**

The Department of Transport and Main Roads has carried out planning for the future upgrade of the Stapylton – Jacob’s Well Road. Current concept planning layouts are provided as Appendix B. as shown, it is planned that the Stapylton – Jacob’s Well Road will be upgraded to a four – lane divided road with provision made for a signalised intersection providing access to the subject site.

---

### **3.3 Traffic Volumes**

Traffic count data for each roundabout at the Yatala North interchange have been provided by the Department of Transport and Main Roads. The data was collected in May 2014 on a typical Thursday. This data was collected to the implementation of signal metering on Elderslie Road (underpass) and prior to the connection of Nyholt Drive to Martens Street. These works have significantly improved the performance of the interchange.

Given the above changes, RTE engaged Austraffic to carry out peak period traffic counts in January 2018 (during the first of the school term). During these surveys it was observed that the performance of the roundabouts have significantly improved, particularly with reduced queuing on the off-ramps. Overall, traffic volumes increased at a rate of approximately 3% per annum since the 2014 surveys.

A summary of the January 2018 count data is provided as Appendix C.



FIGURE 3.1 – EXISTING YATALA NORTH INTERCHANGE (PHOTO AUGUST 2015)

## 4.0 DEVELOPMENT TRAFFIC ESTIMATES

### 4.1 Trip Generation Rate

Given the size of the subject site and the proposed lot areas, it is considered appropriate that surveyed trip generation from similar developments in the area be used as a basis for estimating vehicle trip generation.

The TMR Road Planning and Design Manual states the following trip generation rates for industrial development:

**Table 3.7 Traffic generation data – industrial uses**

| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Peak rate /unit | Daily rate | Unit                  | Source* |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|-----------------------|---------|
| Factories                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1               | 5          | 100m <sup>2</sup> GFA | RTA     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | N/A             | 4-5        | 100m <sup>2</sup> GFA | QT      |
| Warehouses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.5             | 4          | 100m <sup>2</sup> GFA | RTA     |
| Light Industrial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.9             | 9          | 100m <sup>2</sup> GFA | QT      |
| Notes:<br>Factories are sites where articles are manufactured.<br>For warehouses, generation rates can vary depending on the type of goods being stored. Also, if the warehouse has a retail component, the daily generation rate may be higher.<br>The light industrial category is considered to encompass sites with established uses such as storehouses, light fabrication, building supplies and showrooms.<br>*Abbreviations are as follows:<br>RTA – Roads and Traffic Authority, NSW<br>QT – Queensland Transport |                 |            |                       |         |

Recent trip generation surveys carried out by the NSW RMS indicate the following range of trip rates for various types of industrial development:

#### Business parks and industrial estates

In 2012 eleven of these two types of sites were surveyed, four within the Sydney urban area, four within the Lower Hunter, one in the Illawarra and one in Dubbo. Summary vehicle trip generation rates were as follows:

| Weekday Rates                                                 | Sydney Average | Sydney Range | Regional Average | Regional Range |
|---------------------------------------------------------------|----------------|--------------|------------------|----------------|
| AM peak (1 hour) vehicle trips per 100 m <sup>2</sup> of GFA. | 0.52           | 0.15-1.31    | 0.70             | 0.32-1.20      |
| PM peak (1 hour) vehicle trips per 100 m <sup>2</sup> of GFA. | 0.56           | 0.16-1.50    | 0.78             | 0.39-1.30      |
| Daily total vehicle trips                                     | 4.60           | 1.89-10.47   | 7.83             | 3.78-11.99     |

In order to more accurately estimate the likely trip generation of future development in the proposed estate a traffic survey has been carried out for an existing industrial area at the southern end of Christensen Road. This area was selected because:

- It comprises a range of industrial users which are representative of what may occupy the subject site. It is a dead end area so that only trips generated by the land uses within that catchment were recorded.
- The area is in the same area as the subject site and would therefore exhibit similar travel characteristics.
- The size of the surveyed catchment is similar to the subject site.

As shown below, the results of the analysis indicate a peak hour traffic generation potential of **approximately 0.21 trips / 100m<sup>2</sup> GFA / peak hour, and 2 trips / 100m<sup>2</sup> GFA / day.**

|                          |                                                            |
|--------------------------|------------------------------------------------------------|
| Surveyed area:           | 266,224m <sup>2</sup>                                      |
| Floor area estimate:     | 119,800m <sup>2</sup> (estimate 45% floor coverage factor) |
| Daily vehicle trips:     | 1,300 trips per day                                        |
| Peak hour vehicle trips: | 245 trips per peak hour.                                   |

Detailed area calculations and the traffic survey results are shown in Appendix D.

The above rate is within the range of trip generation rates surveyed by the NSW RMS for the Sydney area.

Furthermore, in 2015, RTG in conjunction with Griffith University carried out trip generation surveys at a range of industrial developments located across the Gold Coast, Logan and Brisbane. The purpose of the study was to review the trip generation of various types of industrial developments and considering the locational characteristics of each. Of relevance is the Motorway Circuit catchment, which is considered to be similar to the proposal, given:

- The lot sizes are comparable;
- The zoning is the same (Low Impact Industry);
- It is located in the same area;
- The catchment comprises a mix of small warehouse tenancies and manufacturers.

The Motorway Circuit catchment has a total gross floor area of approximately 45,000m<sup>2</sup>. As shown in Appendix G, Motorway Circuit carries in the order of 1,900 vehicles per day and 190 vehicles per hour. **This equates to a trip generation rate of approximately 0.42 trips / 100m<sup>2</sup> GFA / peak hour, and 4 trips / 100m<sup>2</sup> GFA / day.** It is considered that this rate should be adopted for the purposes of the sensitivity analysis.

## 4.2 Development Trip Generation

Potential floor areas have been estimated through application of a 45% site coverage. Resultant estimates of development trip generation estimates are provided below.

The resultant traffic estimates and calculations for the sensitivity analysis are shown in Appendix F, with the summary of the development trip estimates (based on the 0.21 trips per 100m<sup>2</sup>) shown below in Table 4.1.

**Table 4.1 – Estimated Development Peak Hour Traffic Generation (overall estate)**

| Stage                 | Lot Area (m2)  | GFA (m2)       | Morning Peak Hour |            |            | Afternoon Peak Hour |            |            |
|-----------------------|----------------|----------------|-------------------|------------|------------|---------------------|------------|------------|
|                       |                |                | In                | Out        | Total      | In                  | Out        | Total      |
| Cat A (STAGE 1)       | 115,945        | 52,175         | 71                | 39         | <b>110</b> | 22                  | 88         | <b>110</b> |
| Cat B (STAGE 2)       | 288,165        | 129,674        | 176               | 96         | <b>272</b> | 54                  | 218        | <b>272</b> |
| Cat C (STAGE 3)       | 91,992         | 41,396         | 56                | 31         | <b>87</b>  | 17                  | 70         | <b>87</b>  |
| Cat D (STAGE 4)       | 10,750         | 4838           | 7                 | 3          | <b>10</b>  | 2                   | 8          | <b>10</b>  |
| <b>OVERALL ESTATE</b> | <b>506,852</b> | <b>228,083</b> | <b>310</b>        | <b>169</b> | <b>479</b> | <b>95</b>           | <b>384</b> | <b>479</b> |

Assumes 45% site cover

Peak Hour Distribution: AM Peak 65 / 35, PM Peak 20/80

### 4.3 Development Trip Distribution

To be consistent with the Hyder Consulting report submitted with the Development Application, it is assumed that development traffic will distribute throughout the road network in accordance with the following splits:

- 80% to and from the Pacific Motorway
- 20% to and from the east via the Stapylton – Jacob’s Well Road.

Further, it is assumed that development traffic would distribute evenly to the north and south on the Pacific Motorway. It is noted that some traffic will use Christensen Road to access Burnside Road to the south, when Christensen Road is extended in the future. Furthermore, the proposed internal road network will allow some non-development traffic to travel between the Stapylton – Jacob’s Well Road and Christensen Road without using the eastern roundabout at the Yatala North interchange.

Resultant estimates of peak hour development traffic volumes are shown in Figure 4.2. As shown, a different distribution has been applied for Stages 1, 2 and 3 / 4, to allow for the change in road network conditions. That is, the distribution has been adjusted to allow for the proposed connection between Christensen Road and the Stapylton – Jacobs Well Road.

The development traffic distribution rates have been maintained as per the current approval prepared by Hyder Consulting. Consistently with the approved traffic assessment, it is estimated that approximately 60% of development traffic will distribute via Stapylton Jacobs Well Road, with the balance distributing on Christensen Road.

The traffic distribution at each road frontage is estimated to be as follows:

#### Stapylton – Jacob’s Well Road

|                                           |     |
|-------------------------------------------|-----|
| To / from the west (via the interchange): | 80% |
| To / from the east:                       | 20% |

#### Christensen Road

|                                            |     |
|--------------------------------------------|-----|
| To / from the north (via the interchange): | 85% |
| To / from the east:                        | 15% |

The development traffic estimates at each intersection are presented in Figure 4.1 and 4.2, with the full traffic estimate at the Yatala Interchange (Exit 38) shown in Figure 4.3.

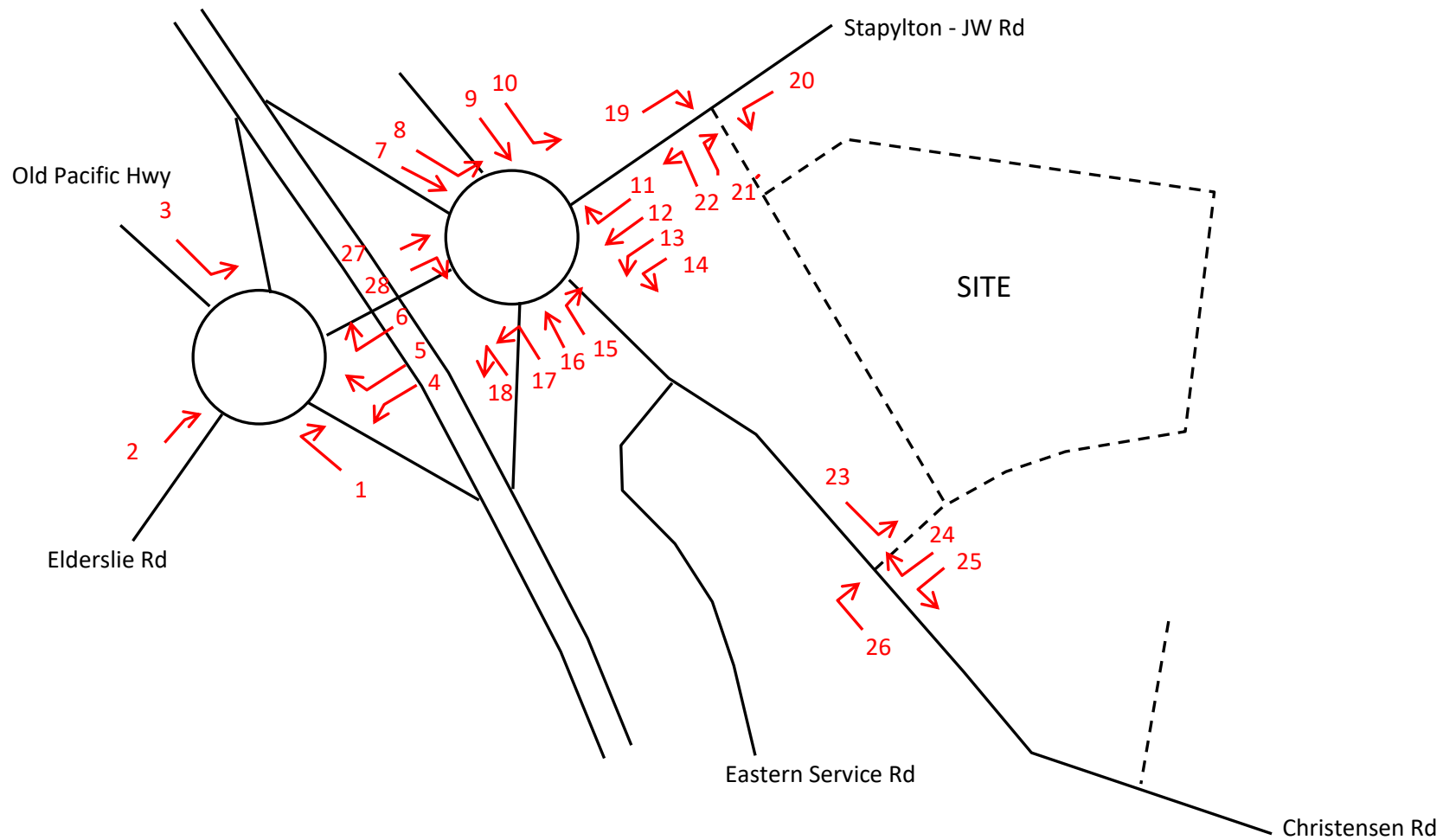


FIGURE 4.1 – KEY DIAGRAM FOR FIG 4.2

#### Morning peak hour

| Development Stage         | Intersection movement (refer to Figure 4.1) |       |      |      |      |       |       |       |       |       |      |       |       |       |       |       |       |        |      |      |      |      |      |      |      |      |       |       |
|---------------------------|---------------------------------------------|-------|------|------|------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|--------|------|------|------|------|------|------|------|------|-------|-------|
|                           | 1                                           | 2     | 3    | 4    | 5    | 6     | 7     | 8     | 9     | 10    | 11   | 12    | 13    | 14    | 15    | 16    | 17    | 18     | 19   | 20   | 21   | 22   | 23   | 24   | 25   | 26   | 27    | 28    |
| Distribution stage 1      | 0.33                                        | 0.1   | 0.02 | 0.1  | 0.02 | 0.33  | 0     | 0.31  | 0     | 0.04  | 0.02 | 0.45  | 0.35  | 0.1   | 0.1   | 0     | 0     | 0      | 0.8  | 0.2  | 0.2  | 0.8  | N/A  | N/A  | N/A  | N/A  | 0.45  | 0     |
| Distribution stage 2      | 0.33                                        | 0.1   | 0.02 | 0.1  | 0.02 | 0.33  | 0.12  | 0.19  | 0.02  | 0.02  | 0.05 | 0.3   | 0.25  | 0     | 0     | 0.05  | 0.18  | 0.07   | 0.48 | 0.2  | 0.2  | 0.48 | N/A  | N/A  | N/A  | N/A  | 0.27  | 0.18  |
| Distribution stages 3 / 4 | 0.33                                        | 0.1   | 0.02 | 0.1  | 0.02 | 0.33  | 0.31  | 0     | 0.04  | 0     | 0    | 0     | 0     | 0     | 0     | 0.04  | 0.35  | 0.41   | 0    | 0.2  | 0.2  | 0    | N/A  | N/A  | N/A  | N/A  | 0     | 0.41  |
| Surveyed 2018 Vol         | 248                                         | 232   | 91   | 652  | 100  | 267   | 197   | 234   | 38    | 60    | 63   | 273   | 95    | 31    | 14    | 36    | 140   | 24     | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 245   | 176   |
| Estimated Year 2020       | 263                                         | 246   | 96   | 691  | 106  | 283   | 209   | 248   | 40    | 64    | 67   | 289   | 101   | 33    | 15    | 38    | 148   | 25     | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 260   | 187   |
| Estimated Year 2023       | 294                                         | 275   | 108  | 774  | 119  | 317   | 234   | 278   | 45    | 71    | 75   | 324   | 113   | 37    | 17    | 43    | 166   | 28     | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 291   | 209   |
| STAGE 1                   | 23                                          | 7     | 1    | 4    | 1    | 13    | 0     | 22    | 0     | 3     | 1    | 18    | 14    | 4     | 4     | 0     | 0     | 0      | 57   | 14   | 8    | 31   | N/A  | N/A  | N/A  | N/A  | 32    | 0     |
| STAGE 2                   | 58                                          | 18    | 4    | 10   | 2    | 32    | 21    | 33    | 4     | 4     | 5    | 29    | 24    | 0     | 0     | 5     | 17    | 7      | 84   | 35   | 19   | 46   | N/A  | N/A  | N/A  | N/A  | 48    | 32    |
| STAGE 3 & 4               | 21                                          | 6     | 1    | 6    | 1    | 21    | 20    | 0     | 3     | 0     | 0    | 0     | 0     | 0     | 0     | 3     | 22    | 26     | 0    | 13   | 13   | 0    | N/A  | N/A  | N/A  | N/A  | 0     | 26    |
| STAGES 1 & 2              | 82                                          | 25    | 5    | 14   | 3    | 45    | 21    | 55    | 4     | 6     | 6    | 46    | 38    | 4     | 4     | 5     | 17    | 7      | 141  | 49   | 27   | 77   | N/A  | N/A  | N/A  | N/A  | 79    | 32    |
| ALL STAGES                | 102                                         | 31    | 6    | 20   | 4    | 65    | 41    | 55    | 6     | 6     | 6    | 46    | 38    | 4     | 4     | 7     | 39    | 33     | 141  | 62   | 40   | 77   | N/A  | N/A  | N/A  | N/A  | 79    | 58    |
| % STAGE 1                 | 8.9%                                        | 2.9%  | 1.5% | 0.6% | 0.7% | 4.5%  | 0.0%  | 8.9%  | 0.0%  | 4.5%  | 1.2% | 6.1%  | 13.6% | 11.9% | 26.3% | 0.0%  | 0.0%  | 0.0%   | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 12.3% | 0.0%  |
| % STAGES 1 & 2            | 31.0%                                       | 10.0% | 5.1% | 2.0% | 2.5% | 15.7% | 10.1% | 22.4% | 8.7%  | 10.0% | 8.4% | 16.0% | 37.4% | 11.9% | 26.3% | 12.6% | 11.6% | 26.4%  | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 30.6% | 17.0% |
| % ALL STAGES              | 34.7%                                       | 11.3% | 5.7% | 2.6% | 3.3% | 20.6% | 17.4% | 20.0% | 13.4% | 8.9%  | 7.5% | 14.3% | 33.4% | 10.6% | 23.5% | 17.1% | 23.7% | 114.2% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 27.3% | 27.5% |

#### Afternoon peak hour

| Development Stage         | Intersection movement (refer to Figure 4.1) |      |      |      |      |       |       |      |      |      |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |       |       |
|---------------------------|---------------------------------------------|------|------|------|------|-------|-------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|-------|-------|
|                           | 1                                           | 2    | 3    | 4    | 5    | 6     | 7     | 8    | 9    | 10   | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19   | 20   | 21   | 22   | 23   | 24   | 25   | 26   | 27    | 28    |
| Distribution stage 1      | 0.33                                        | 0.1  | 0.02 | 0.1  | 0.02 | 0.33  | 0     | 0.31 | 0    | 0.04 | 0.02  | 0.45  | 0.35  | 0.1   | 0.1   | 0     | 0     | 0     | 0.8  | 0.2  | 0.2  | 0.8  | N/A  | N/A  | N/A  | N/A  | 0.45  | 0     |
| Distribution stage 2      | 0.33                                        | 0.1  | 0.02 | 0.1  | 0.02 | 0.33  | 0.12  | 0.19 | 0.02 | 0.02 | 0.05  | 0.3   | 0.25  | 0     | 0     | 0.05  | 0.18  | 0.07  | 0.48 | 0.2  | 0.2  | 0.48 | N/A  | N/A  | N/A  | N/A  | 0.27  | 0.18  |
| Distribution stages 3 / 4 | 0.33                                        | 0.1  | 0.02 | 0.1  | 0.02 | 0.33  | 0.31  | 0    | 0.04 | 0    | 0     | 0     | 0     | 0     | 0     | 0.04  | 0.35  | 0.41  | 0    | 0.2  | 0.2  | 0    | N/A  | N/A  | N/A  | N/A  | 0     | 0.41  |
| Surveyed 2018 Vol         | 133                                         | 386  | 121  | 485  | 104  | 548   | 58    | 201  | 31   | 79   | 89    | 404   | 183   | 23    | 15    | 71    | 284   | 76    | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 144   | 68    |
| Estimated Year 2020       | 141                                         | 409  | 128  | 514  | 110  | 581   | 61    | 213  | 33   | 84   | 94    | 428   | 194   | 24    | 16    | 75    | 301   | 81    | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 153   | 72    |
| Estimated Year 2023       | 158                                         | 458  | 144  | 576  | 123  | 651   | 69    | 239  | 37   | 94   | 106   | 480   | 217   | 27    | 18    | 84    | 337   | 90    | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 171   | 81    |
| STAGE 1                   | 7                                           | 2    | 0    | 9    | 2    | 29    | 0     | 7    | 0    | 1    | 2     | 40    | 31    | 9     | 9     | 0     | 0     | 0     | 18   | 4    | 18   | 70   | N/A  | N/A  | N/A  | N/A  | 10    | 0     |
| STAGE 2                   | 18                                          | 5    | 1    | 22   | 4    | 72    | 6     | 10   | 1    | 1    | 11    | 65    | 55    | 0     | 0     | 11    | 39    | 15    | 26   | 11   | 44   | 105  | N/A  | N/A  | N/A  | N/A  | 15    | 10    |
| STAGE 3 & 4               | 6                                           | 2    | 0    | 2    | 0    | 6     | 6     | 0    | 1    | 0    | 0     | 0     | 0     | 0     | 0     | 1     | 7     | 8     | 0    | 4    | 4    | 0    | N/A  | N/A  | N/A  | N/A  | 0     | 8     |
| STAGES 1 & 2              | 25                                          | 8    | 2    | 31   | 6    | 101   | 6     | 17   | 1    | 2    | 13    | 105   | 85    | 9     | 9     | 11    | 39    | 15    | 44   | 15   | 61   | 175  | N/A  | N/A  | N/A  | N/A  | 24    | 10    |
| ALL STAGES                | 31                                          | 10   | 2    | 33   | 7    | 107   | 12    | 17   | 2    | 2    | 13    | 105   | 85    | 9     | 9     | 12    | 46    | 23    | 44   | 19   | 65   | 175  | N/A  | N/A  | N/A  | N/A  | 24    | 18    |
|                           |                                             |      |      |      |      |       |       |      |      |      |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |       |       |
| % STAGE 1                 | 5.1%                                        | 0.5% | 0.3% | 1.7% | 1.6% | 5.0%  | 0.0%  | 3.2% | 0.0% | 1.1% | 1.9%  | 9.2%  | 15.9% | 36.1% | 55.3% | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 6.5%  | 0.0%  |
| % STAGES 1 & 2            | 17.8%                                       | 1.9% | 1.2% | 6.0% | 5.6% | 17.4% | 10.5% | 8.0% | 3.3% | 2.3% | 13.4% | 24.5% | 44.0% | 36.1% | 55.3% | 14.5% | 13.0% | 18.9% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 16.0% | 13.5% |
| % ALL STAGES              | 19.9%                                       | 2.1% | 1.3% | 5.6% | 5.3% | 16.5% | 18.0% | 7.2% | 5.0% | 2.1% | 12.0% | 21.9% | 39.3% | 32.2% | 49.4% | 13.8% | 13.6% | 25.5% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 14.3% | 21.7% |

**FIGURE 4.2 – TRAFFIC GENERATION & % IMPACT CALCULATIONS**

## **5.0 ROAD NETWORK IMPACT**

### **5.1 General**

As shown in Figure 4.2, the traffic generation of the proposed development will exceed 5% of background traffic volumes at the Exit 38 interchange. On this basis, a detailed analysis of impacts is required to identify any mitigation works warranted.

Traffic modelling using SIDRA software has been carried out to determine the performance of the intersections under current and project future conditions, and identify upgrade works required to mitigate the impact of the proposal.

In accordance with Section 3.5 and Table 4 of the Guide to Traffic Impact Assessments (2017), the assessment is required to examine impacts for the anticipated year of opening of each stage and the final stage. For the purposes of this assessment it has been assumed that the first stage of development would be completed by the year 2020, and the full development by the year 2023.

It is proposed that the estate access intersection with the Stapylton – Jacob's Well Road be constructed to its ultimate layout (two through lanes in each direction plus turning lanes / traffic signal control) prior to the commencement of stage 1. This new intersection will benefit the operation of the eastern intersection at the Exit 38 interchange by 'metering' the westbound traffic flow on the Stapylton – Jacob's Well Road. The proposal to provide a new road link (through the site) linking Christensen Road to the Stapylton – Jacob's Well Road will also provide a significant improvement to the local road network, as traffic will be able to move between these roads without using the Exit 38 interchange.

### **5.2 SIDRA Modelling**

The proposed signalised intersection with the Stapylton – Jacob's Well Road will improve the operation of the eastern roundabout at the Exit 38 interchange by bunching the traffic flow in the westbound direction. This has been reflected in the modelling by implementing a 15% bunching factor.

As discussed in Section 4.0, the Year 2023 model (with the full development) allows for the internal connection to Christensen Road and Stapylton – Jacob's Well Road. Numerous iterations to the SIDRA modelling indicates that the following works would mitigate the impact of the proposed development :

- The introduction of the proposed signalised intersection at the estate access (resulting in bunching in the westbound approach to the eastern roundabout).
- A second lane be provided in the northbound Off- Ramp approach to the western roundabout ;
- A second departure lane be provided on the Stapylton – Jacob's Well Road leg of the eastern roundabout ;
- A second approach lane be provided in the Christensen Road approach to the eastern roundabout.

Concept drawings of these modifications are shown in Figures 5.1 – 5.2.

SIDRA modelling at the Exit 38 interchange has been carried out for the following scenarios :

#### ESTIMATED TRIP GENERATION OF SITE

- Year 2020 AM and PM peak hour conditions, without the proposed development ;
- Year 2020 AM and PM peak hour conditions, with proposed road conditions and Stage 1 traffic;
- Year 2020 AM and PM peak hour conditions, with proposed road conditions and Stage 2 traffic;
- Year 2023 AM and PM peak hour conditions, without the proposed development ;
- Year 2023 AM and PM peak hour conditions, with the proposed road conditions and the full development.

#### SENSITIVITY ANALYSIS

- Year 2020 AM and PM peak hour conditions, with proposed road conditions and Stage 1 traffic;
- Year 2020 AM and PM peak hour conditions, with proposed road conditions and Stage 2 traffic;
- Year 2023 AM and PM peak hour conditions, with the proposed road conditions and the full development.

Criteria for interpreting the SIDRA results are provided in Appendix H.

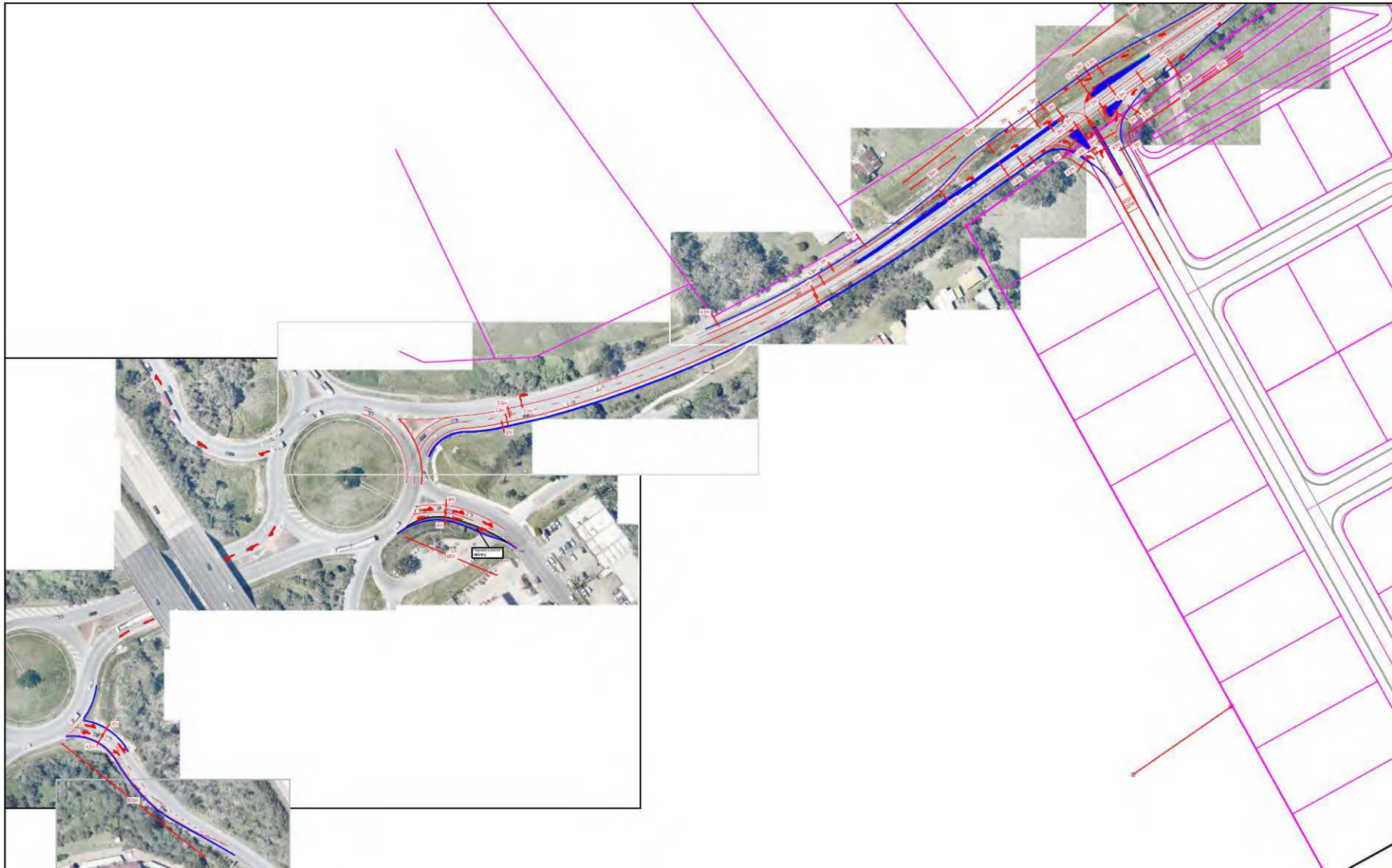
Detail results of the SIDRA modelling for the development trips and the sensitivity analysis are provided as Appendix H and I. Summarised result of the SIDRA assessment are provided below in Table 5.1. and 5.2 respectively:

**Table 5.1 – Summary of SIDRA Results (0.21 Trip Generation Rate)**

| Intersection: | Year / Period | Location Intersection | Development | Overall Degree of Saturation | Overall Level of Service | Critical Queue (m) | Off – Ramp Queuing (m) |
|---------------|---------------|-----------------------|-------------|------------------------------|--------------------------|--------------------|------------------------|
| Western       | 2020 AM       | Existing              | None        | 0.883                        | C                        | 236                | 236                    |
|               | 2020 PM       | Existing              | None        | 0.750                        | B                        | 126                | 18                     |
|               | 2023 AM       | Existing              | None        | 0.970                        | E                        | 685                | 685                    |
|               | 2023 PM       | Existing              | None        | 0.797                        | B                        | 147                | 22                     |
|               | 2020 AM       | Existing              | Stage One   | 0.905                        | C                        | 345                | 320                    |
|               | 2020 PM       | Existing              | Stage One   | 0.764                        | B                        | 137                | 19                     |
|               | 2020 AM       | Upgrade B             | Stage Two   | 0.778                        | B                        | 194                | 38                     |
|               | 2020 PM       | Upgrade B             | Stage Two   | 0.782                        | B                        | 157                | 17                     |
|               | 2023 AM       | Upgrade B             | Full        | 0.814                        | B                        | 238                | 67                     |
|               | 2023 PM       | Upgrade B             | Full        | 0.855                        | B                        | 188                | 20                     |
| Eastern       | 2020 AM       | Existing              | None        | 0.659                        | A                        | 52                 | 27                     |
|               | 2020 PM       | Existing              | None        | 1.101                        | D                        | 471                | 20                     |
|               | 2023 AM       | Existing              | None        | 0.698                        | B                        | 56                 | 40                     |
|               | 2023 PM       | Existing              | None        | 1.378                        | F                        | 1364               | 25                     |
|               | 2020 AM       | Upgrade A             | Stage One   | 0.666                        | A                        | 60                 | 28                     |
|               | 2020 PM       | Upgrade A             | Stage One   | 1.019                        | C                        | 195                | 20                     |
|               | 2020 AM       | Upgrade B             | Stage Two   | 0.670                        | A                        | 68                 | 38                     |
|               | 2020 PM       | Upgrade B             | Stage Two   | 0.753                        | B                        | 99                 | 22                     |
|               | 2023 AM       | Upgrade B             | Full        | 0.911                        | C                        | 213                | 213                    |
|               | 2023 PM       | Upgrade B             | Full        | 0.934                        | C                        | 161                | 53                     |

**Table 5.2 – Summary of SIDRA Results (SENSITIVITY ANALYSIS)**

| Intersection: | Year / Period | Location Intersection | Development | Overall Degree of Saturation | Overall Level of Service | Critical Queue (m) | Off – Ramp Queuing (m) |
|---------------|---------------|-----------------------|-------------|------------------------------|--------------------------|--------------------|------------------------|
| Western       | 2020 AM       | Existing              | Stage One   | 0.917                        | D                        | 428                | 428                    |
|               | 2020 PM       | Existing              | Stage One   | 0.777                        | B                        | 149                | 20                     |
|               | 2023 AM       | Upgrade B             | Full        | 0.801                        | B                        | 245                | 136                    |
|               | 2023 PM       | Upgrade B             | Full        | 0.920                        | C                        | 228                | 27                     |
| Eastern       | 2020 AM       | Upgrade A             | Stage One   | 1.065                        | C                        | 353                | 21                     |
|               | 2020 PM       | Upgrade A             | Stage One   | 0.658                        | A                        | 66                 | 33                     |
|               | 2020 AM       | Upgrade B             | Stage Two   | 0.751                        | B                        | 62                 | 43                     |
|               | 2020 PM       | Upgrade B             | Stage Two   | 0.898                        | B                        | 124                | 25                     |
|               | 2023 AM       | Upgrade B             | Full        | 1.040                        | F                        | 1079               | 884                    |
|               | 2023 PM       | Upgrade B             | Full        | 1.127                        | F                        | 909                | 75                     |



**FIGURE 5.1 – PROPOSED INTERSECTION ARRANGEMENTS**

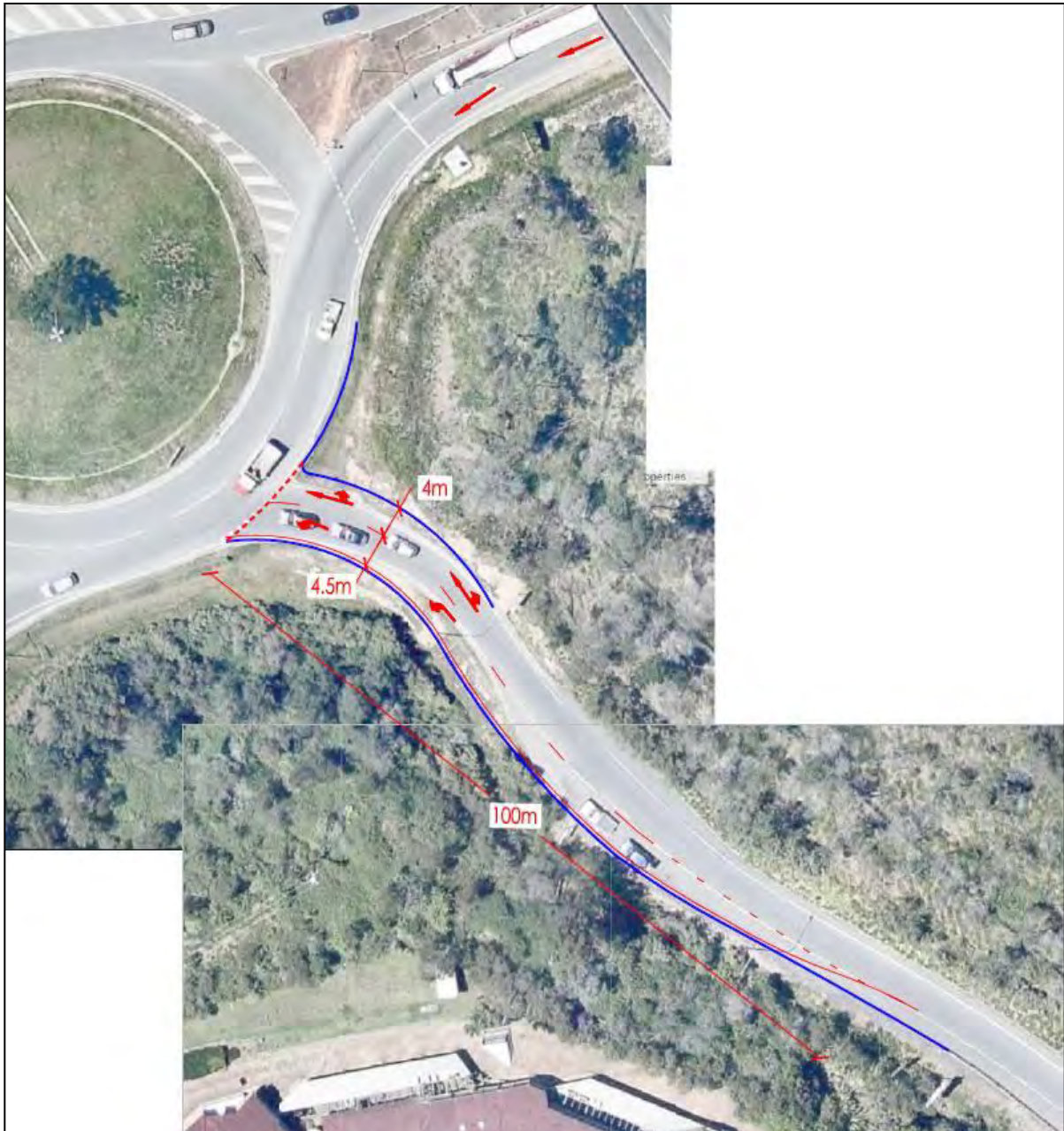


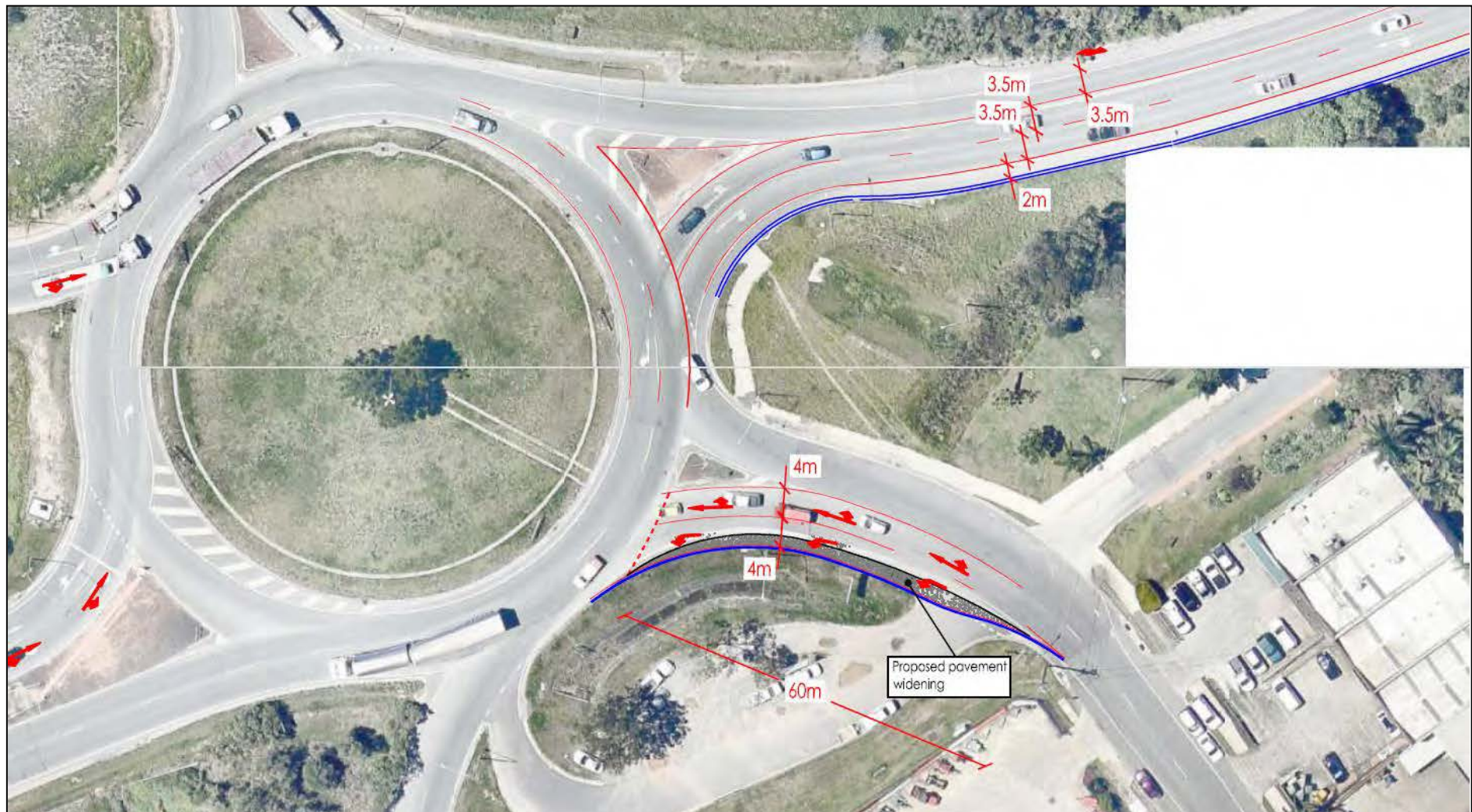
FIGURE 5.2 – PROPOSED INTERSECTION ARRANGEMENTS

**PLANS AND DOCUMENTS  
referred to in the REFERRAL  
AGENCY RESPONSE**

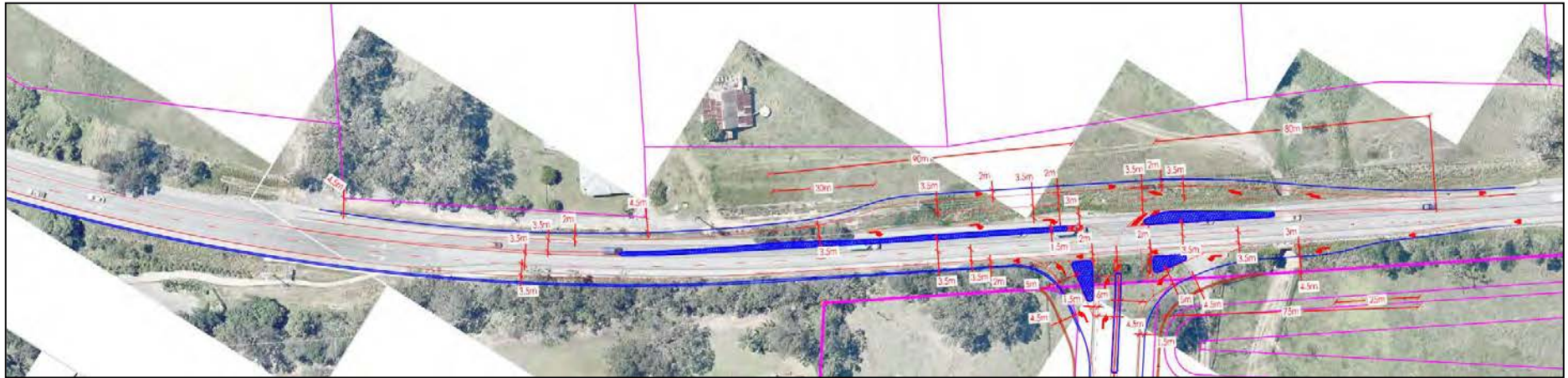


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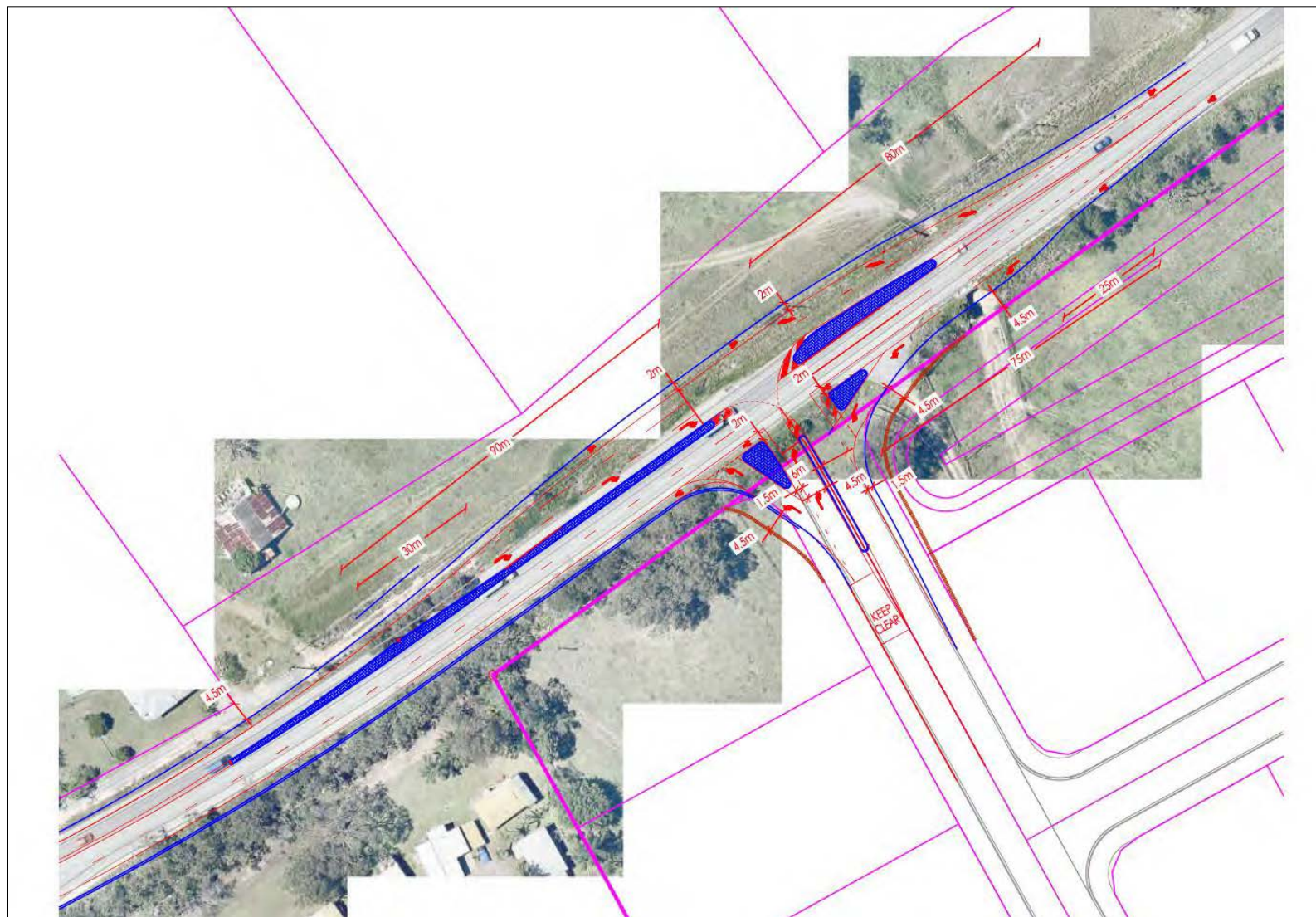
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**FIGURE 5.3 – PROPOSED INTERSECTION ARRANGEMENTS**



**FIGURE 5.4 – SIGHT DISTANCE AT PROPOSED ACCESS POINT**



**FIGURE 5.5 –PROPOSED ACCESS INTERSECTION WITH STAPYLTON JACOBS WELL ROAD**

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### **5.3 Timing of Works and Contributions**

It is proposed that the following works be carried out prior to the completion of Stage 1 (UPGRADE A):

- Construction of the proposed access intersection to its ultimate four lane profile, including traffic signals.
- Extension of the second approach lane on Stapylton Jacobs Well Road between the new intersection and the eastern roundabout at the interchange.

The following works are proposed to be completed prior to the completion of Stage 2 (UPGRADE B):

- Construction of second approach lane in Christensen Road approach to the eastern roundabout.
- Construction of the second approach lane on the northbound off ramp (western side of Exit 38 interchange).

As previously discussed, the modelling has identified that the addition of a second departure lane on the Stapylton Jacobs Well Road leg of the eastern roundabout would mitigate the impact of the balance of the development. However, it is not proposed that these works be carried out as they are not consistent with TMR's future planning for the interchange. As an alternative, it is proposed that the cost of these works be contributed by the Applicant, to be paid prior to the ceiling of Stage 3 of the project. Gassman Development Perspectives have estimated the cost of these works at \$720,000.

## 6.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

- The subject site is located on the southern side of Stapylton Jacobs Well Road. The subject site is identified as Lot 1 on RP6882 and Lot 240 on W31330, and has an approximate site area of 62.65 hectares.
- It is proposed that the estate will be developed over four stages. The proposed plan of development allows for future road connections to the adjoining properties to the east which will occur in due course. It is proposed that primary access be gained via a single signalised intersection on the Stapylton – Jacob's Well Road. A road connection linking Stapylton Jacobs Well Road to Christensen Road will be constructed as part of the overall project. Stages 3 and 4 will gain access from Christensen Road.
- The intention of the report is to re-assess the impacts upon the surrounding State – controlled road network, with a view to achieving a more practical outcome with respect to road network upgrade requirements. More accurate trip generation data has been adopted through a survey of similar uses in the surrounding area. This approach is recommended by the GARID and other sources such as the NSW RMS Guide to Traffic Generating Developments.
- It is noted that other approvals in the area have either not been required to contribute to the surrounding road network or only been required to make minor contributions to a similar scale recommended in this report (Refer to Section 1.3).
- The impact of the proposed development upon the surrounding State controlled road network has been carried out in accordance with the Guide to Traffic Impacts Assessments (2017). The analysis has been carried out using up to date traffic count data (January 2018).
- The Exit 38 interchange has recently been upgraded to include an additional approach lane on the Elderslie Road approach to the western roundabout, an additional lane on the Stapylton Jacobs Well Road approach to the eastern roundabout. In addition, signal metering has been implemented on the Elderslie Road approach (underpass) to each roundabout. These upgrades have significantly improved conditions at the interchange and in particular reduced queuing on the north and southbound off ramps.
- It is proposed that a new signalised intersection be constructed on Stapylton Jacobs Well Road, serving as the primary access point to the new estate. Secondary access will be gained off Christensen road in due course as the estate develops. A new internal connection road will link Stapylton Jacobs Well Road to Christensen Road upon completion of the project. This future link road will significantly benefit the local area by allowing local traffic to move between Stapylton Jacobs Well Road and Christensen Road without using the Exit 38 interchange.

- The design of the proposed new signalised intersection on Stapylton Jacobs Well Road is consistent with TMR's future planning, and therefore will contribute to such works. The introduction of the signalised intersection during the initial stage of the intersection will also benefit the performance of the eastern roundabout at the Exit 38 interchange by 'bunching' the traffic flow in the westbound direction.
- The SIDRA modelling has identified some upgrade works required to mitigate the impact of the development. These works comprise of an additional lane on the northbound off-ramp to the western roundabout; an additional lane in the Christensen Road approach to the eastern roundabout; an additional departure lane on the Stapylton Jacobs Well leg of the eastern roundabout. These works will mitigate the impact of the proposal so that the various intersections function satisfactorily.
- The works proposed to be carried out as part of the project are consistent with TMR's planning for the local area and will benefit the performance of the Motorway interchange and benefit the local area by providing improved connectivity for local traffic. A monetary contribution is proposed in lieu of works that are not consistent with future planning.
- It is proposed that the required mitigation works be carried out in accordance with the timing discussed in Section 5.3. A monetary contribution is proposed to be made to mitigate the impact of traffic generated by the stages 3 and 4 of the development. This contribution (\$ 720,000) will be made prior to sealing of the Stage 3 subdivision plan.

## APPENDICES

APPENDIX A – RPEQ CERTIFICATION  
APPENDIX B – TMR CONCEPT PLANNING FOR THE STAPYLTON-JACOB'S WELL ROAD  
APPENDIX C – 2018 TRAFFIC COUNT DATA (M1 EXIT 38 INTERCHANGE)  
APPENDIX D – SURVEY OF IMMEDIATE CATCHMENT TO THE PROPOSED DEVELOPMENT  
APPENDIX E – SURVEYED TRIP GENERATION DATA (RTE / GRIFFITH UNIVERSITY)  
APPENDIX F – SENSITIVITY ANALYSIS CALCULATIONS  
APPENDIX G – CRITERIA FOR INTERPRETING THE SIDRA RESULTS  
APPENDIX H – DETAIL SIDRA RESULTS OF DEVELOPMENT TRAFFIC GENERATION  
APPENDIX I – DETAIL SIDRA RESULTS OF SENSITIVITY ANALYSIS

## APPENDIX A – RPEQ CERTIFICATION

### CERTIFICATION OF TRAFFIC IMPACT ASSESSMENT REPORT REGISTERED PROFESSIONAL ENGINEER QUEENSLAND for

|                |  |
|----------------|--|
| Project title: |  |
|----------------|--|

As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the *Professional Engineers Act 2002* as competent in my areas of nominated expertise, I understand and recognise:

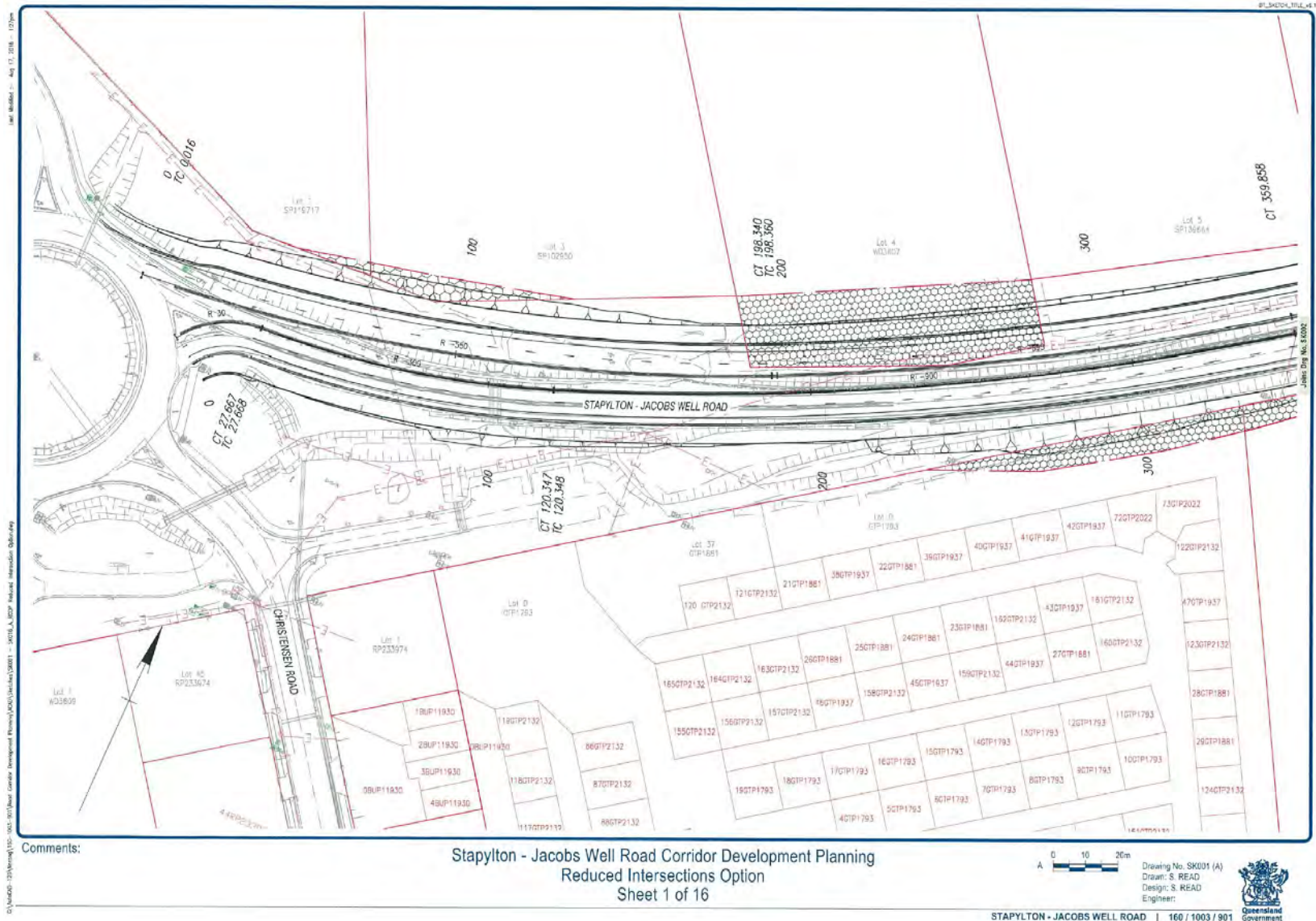
- the significant role of engineering as a profession, and that
- the community has a legitimate expectation that my certification affixed to this engineering work can be trusted, and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

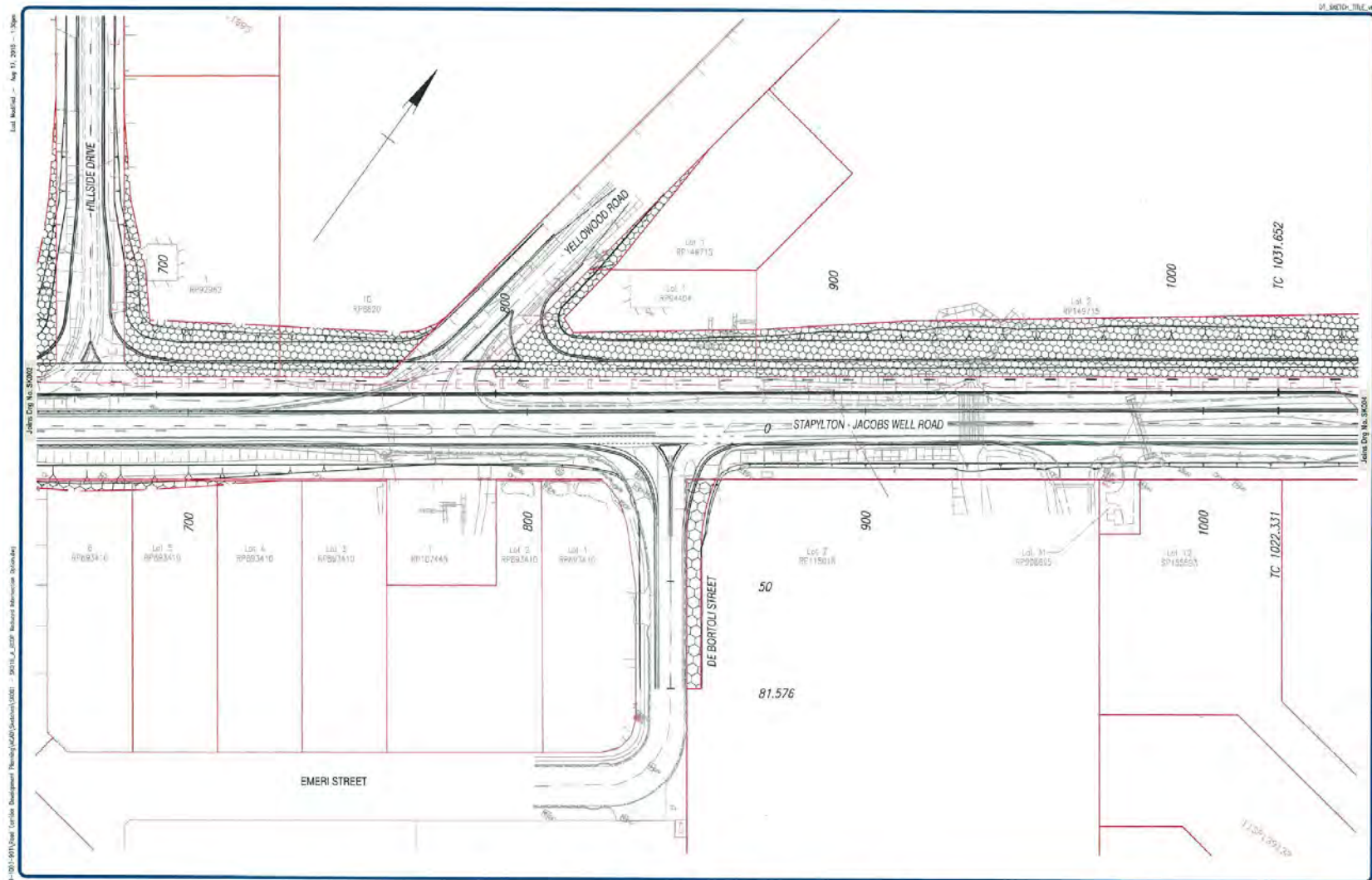
- I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the Guide to Traffic Impact Assessment published by the Queensland Department of Transport and Main Roads and using sound engineering principles, and
- where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment, and that
- the outcomes of this traffic impact assessment are a true reflection of results of assessment, and that
- I believe the strategies recommended for mitigating impacts by this traffic impact assessment, embrace contemporary practice initiatives and will deliver the desired outcomes.

|                    |                                                                                     |          |         |
|--------------------|-------------------------------------------------------------------------------------|----------|---------|
| Name:              | Luke Rytenskild                                                                     | RPEQ No: | 6293    |
| RPEQ competencies: | Civil Engineer (Traffic Engineering)                                                |          |         |
| Signature:         |  | Date:    | 13.4.18 |
| Postal address:    | Po Box 17 Surfers Paradise QLD 4217                                                 |          |         |
| Email:             | Luke@rytenskildtraffic.com                                                          |          |         |

**APPENDIX B – TMR CONCEPT PLANNING FOR THE STAPYLTON-JACOB’S WELL ROAD**







Comments:

Stapylton - Jacobs Well Road Corridor Development Planning  
Reduced Intersections Option  
Sheet 3 of 16



Drawing No. SK003 (A)  
Drawn: S. READ  
Design: S. READ  
Engineer:



STAPYLTON - JACOBS WELL ROAD | 160 / 1003 / 961

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**APPENDIX C – 2018 TRAFFIC COUNT DATA (M1 EXIT 38 INTERCHANGE)**

# AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 1 Weather: Fine  
Location: Stapylton-Jacobs Well Road/Old Pacific Highway/Stammore Road/M1 Ramps  
Day/Date: Tuesday, 23 January 2018  
Summary: AM Peak : Hour ending - 8:45 AM  
PM Peak : Hour ending - 4:30 PM

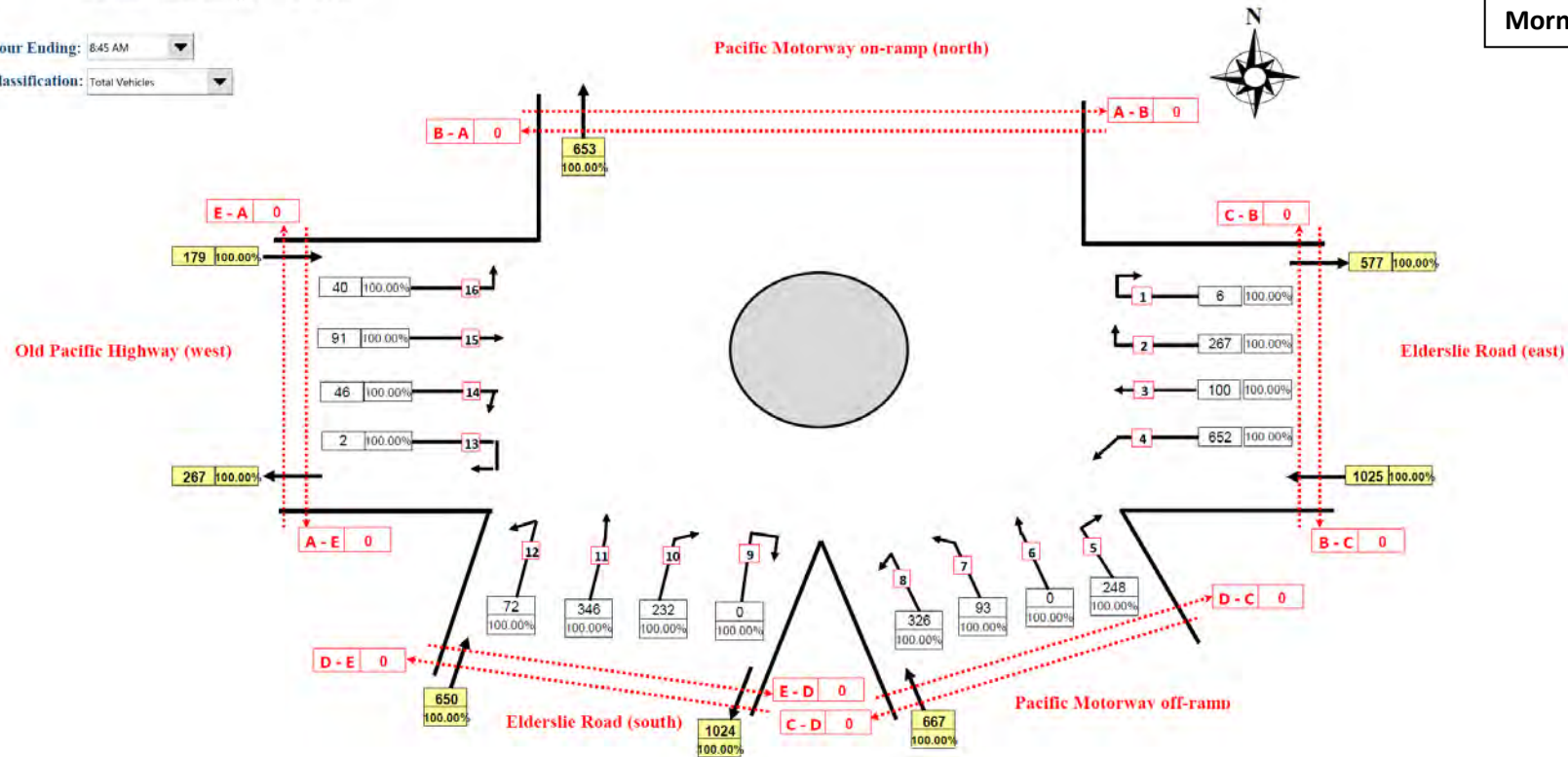
Hour Ending: 8:45 AM

Classification: Total Vehicles



Western Roundabout  
Morning Peak Hour

Western Roundabout  
Morning Peak Hour



Note: 3.28% = proportion of selected vehicle classification as a percentage of total vehicles

# AUSTRAFFIC VIDEO INTERSECTION COUNT

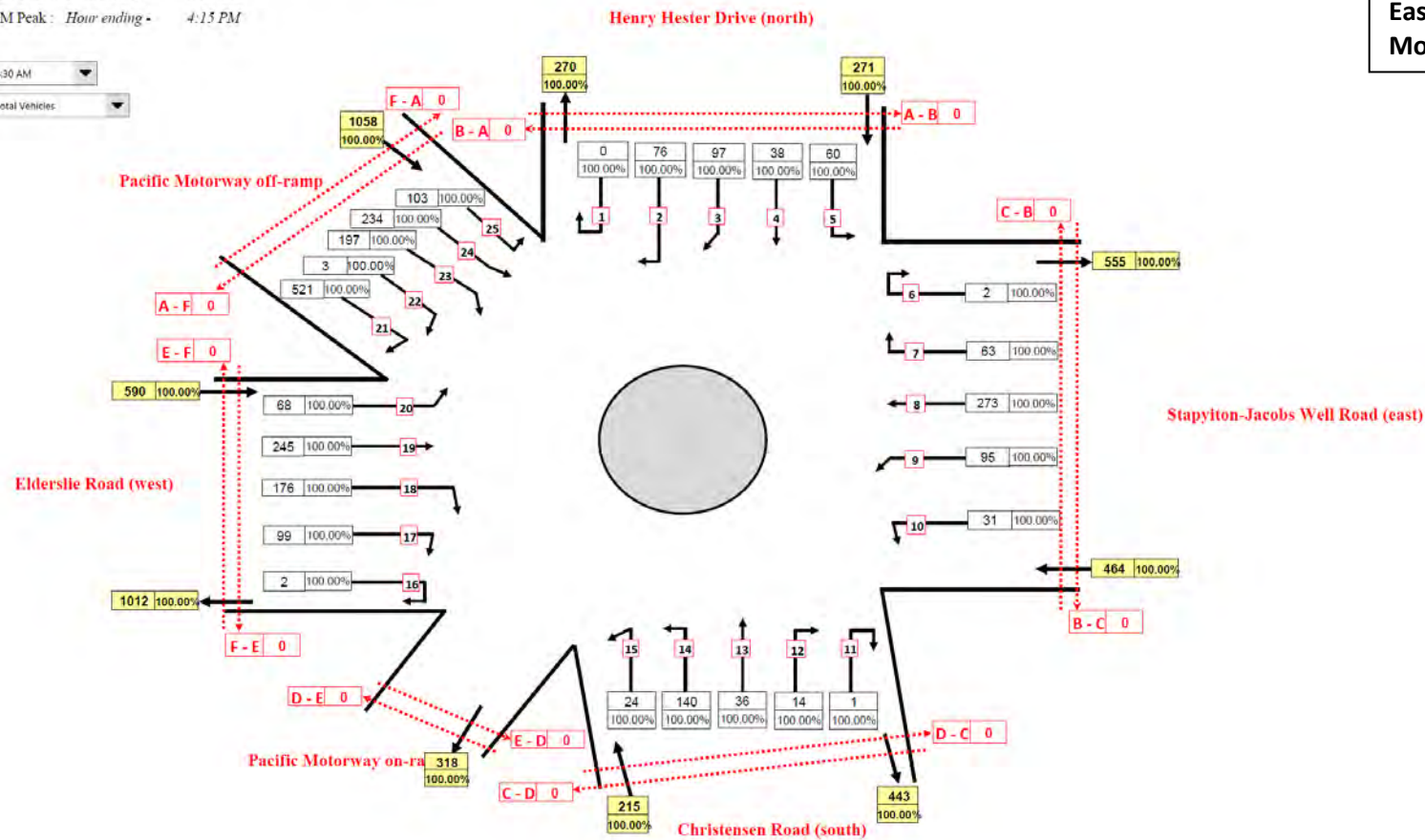
Site No.: 2 Weather: Fine  
Location: Stapylton-Jacobs Well Road/Henry Hester Drive/Christensen Road/M1 Ramps  
Day/Date: Tuesday, 23 January 2018  
Summary: AM Peak : Hour ending - 8:30 AM  
PM Peak : Hour ending - 4:15 PM

Hour Ending: 8:30 AM  
Classification: Total Vehicles



Eastern Roundabout  
Morning Peak Hour

Eastern Roundabout  
Morning Peak Hour



Note: 3.28% = proportion of selected vehicle classification as a percentage of total vehicles

## AUSTRAFFIC VIDEO INTERSECTION COUNT

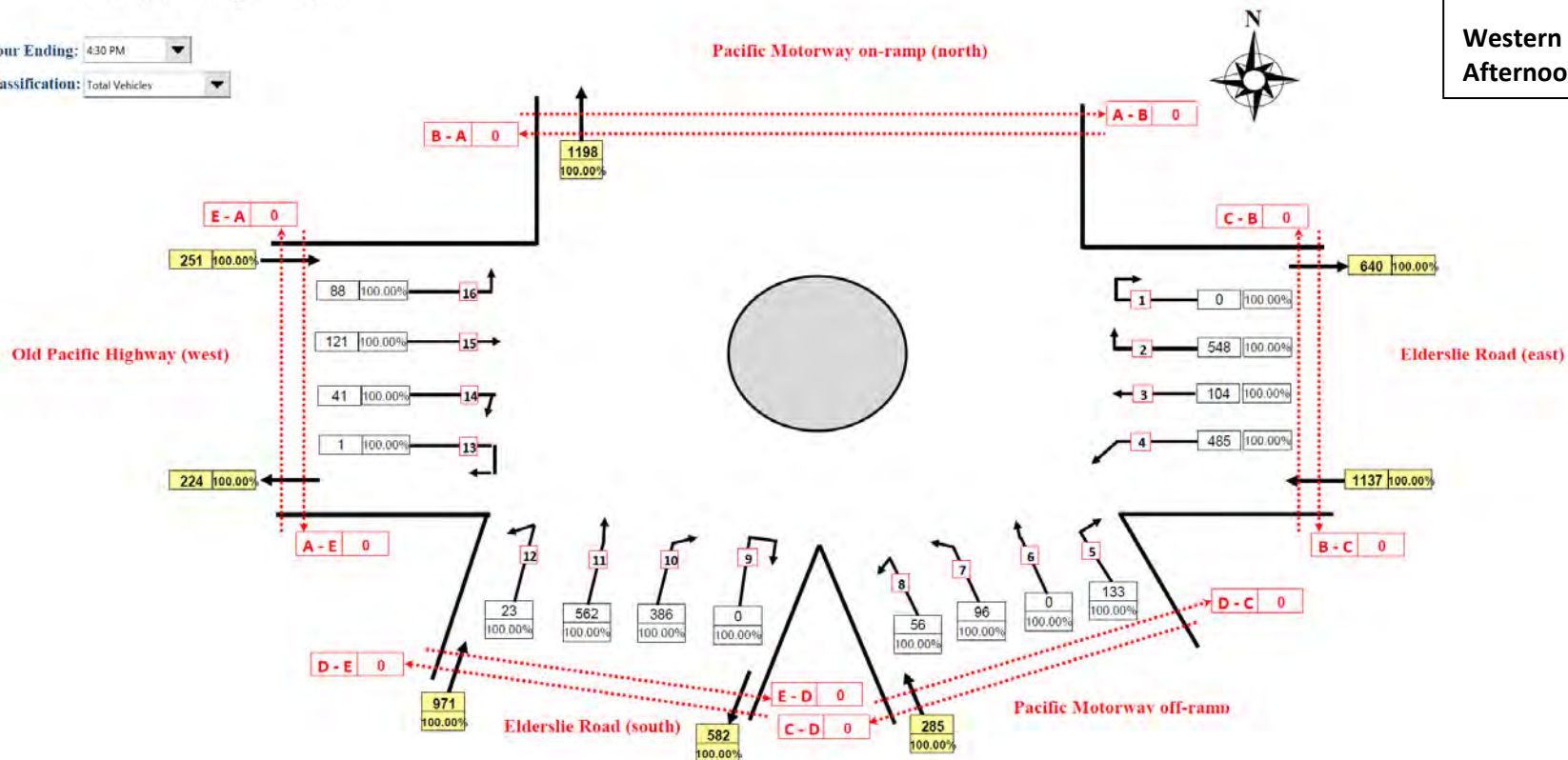


Site No.: 1 Weather: Fine  
Location: Stapylton-Jacobs Well Road/Old Pacific Highway/Stannmore Road/M1 Ramps  
Day/Date: Tuesday, 23 January 2018  
Summary: AM Peak : Hour ending - 8:45 AM  
PM Peak : Hour ending - 4:30 PM

Hour Ending: 4:30 PM  
Classification: Total Vehicles

Western Roundabout  
Afternoon Peak Hour

Western Roundabout  
Afternoon Peak Hour



Note: 3.28% = proportion of selected vehicle classification as a percentage of total vehicles

# AUSTRAFFIC VIDEO INTERSECTION COUNT

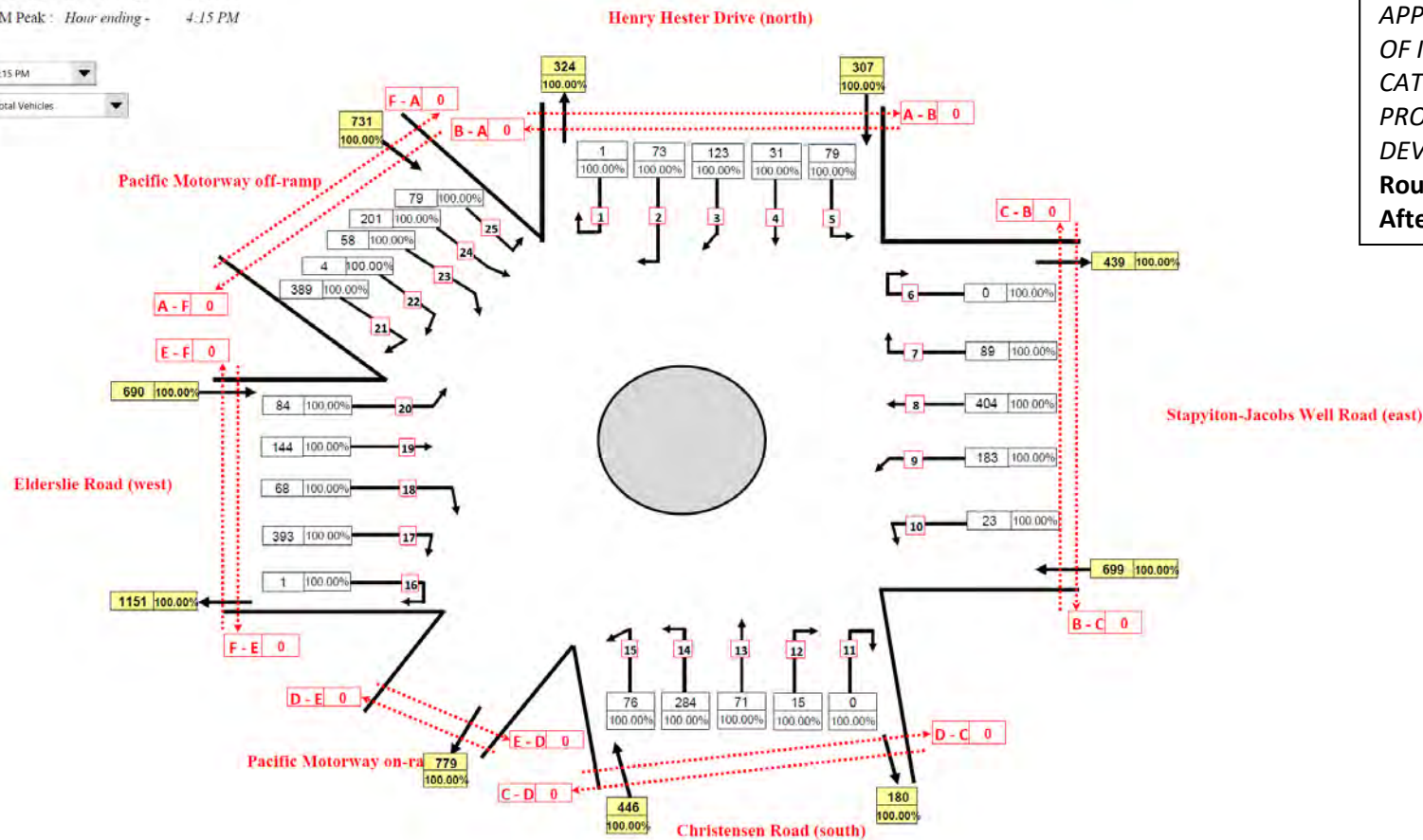
Site No.: 2 Weather: Fine  
Location: Stapyiton-Jacobs Well Road/Henry Hester Drive/Christensen Road/M1 Ramps  
Day/Date: Tuesday, 23 January 2018  
Summary: AM Peak : Hour ending - 8:30 AM  
PM Peak : Hour ending - 4:15 PM

Hour Ending: 4:15 PM  
Classification: Total Vehicles



**Eastern Roundabout  
Afternoon Peak Hour**

APPENDIX D – SURVEY  
OF IMMEDIATE  
CATCHMENT TO THE  
PROPOSED  
DEVELOPMENT Eastern  
Roundabout  
Afternoon Peak Hour



Note: 3.28% = proportion of selected vehicle classification as a percentage of total vehicles

## APPENDIX D – SURVEY OF IMMEDIATE CATCHMENT TO THE PROPOSED DEVELOPMENT (CHRISTENSEN ROAD CATCHMENT)

### AUTOMATIC TUBE COUNT OUTPUT

### Weekly Vehicle Counts

#### WeeklyVehicle-29

**Site:** Christensen Rd Yatala.0.1NS  
**Description:** Christensen Rd, Yatala just south of Maiella St  
**Filter time:** 20:21 Sunday, 11 March 2018 => 21:52 Thursday, 15 March 2018  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

|                | Mon<br>12 Mar | Tue<br>13 Mar | Wed<br>14 Mar | Thu<br>15 Mar | Fri<br>16 Mar | Sat<br>17 Mar | Sun<br>18 Mar | Averages<br>1 - 5 | 1 - 7        |
|----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|--------------|
| Hour           |               |               |               |               |               |               |               |                   |              |
| 0000-0100      | 3             | 4             | 7             | 12            | *             | *             | *             | 6.5               | 6.5          |
| 0100-0200      | 6             | 10            | 10            | 18            | *             | *             | *             | 11.0              | 11.0         |
| 0200-0300      | 6             | 7             | 6             | 10            | *             | *             | *             | 7.3               | 7.3          |
| 0300-0400      | 17            | 22            | 20            | 22            | *             | *             | *             | 20.3              | 20.3         |
| 0400-0500      | 77            | 74            | 85            | 82            | *             | *             | *             | 79.5              | 79.5         |
| 0500-0600      | <b>243</b>    | <b>242</b>    | <b>249</b>    | 230           | *             | *             | *             | <b>241.0</b>      | <b>241.0</b> |
| 0600-0700      | 196           | 226           | 208           | 180           | *             | *             | *             | 202.5             | 202.5        |
| 0700-0800      | 214           | 236           | 241           | 217           | *             | *             | *             | 227.0             | 227.0        |
| 0800-0900      | 225           | 234           | 200           | <b>235</b>    | *             | *             | *             | 223.5             | 223.5        |
| 0900-1000      | 198           | 235           | 218           | 219           | *             | *             | *             | 217.5             | 217.5        |
| 1000-1100      | 220           | 230           | 216           | 188           | *             | *             | *             | 213.5             | 213.5        |
| 1100-1200      | 209           | 216           | 192           | 216           | *             | *             | *             | 208.3             | 208.3        |
| 1200-1300      | 217           | 198           | 227           | 232           | *             | *             | *             | 218.5             | 218.5        |
| 1300-1400      | 207           | 237           | 241           | 234           | *             | *             | *             | 229.8             | 229.8        |
| 1400-1500      | <b>258</b>    | <b>244</b>    | <b>284</b>    | 267           | *             | *             | *             | <b>263.3</b>      | <b>263.3</b> |
| 1500-1600      | 244           | 239           | 245           | 243           | *             | *             | *             | 242.8             | 242.8        |
| 1600-1700      | 222           | 222           | 233           | 234           | *             | *             | *             | 227.8             | 227.8        |
| 1700-1800      | 107           | 94            | 103           | 108           | *             | *             | *             | 103.0             | 103.0        |
| 1800-1900      | 32            | 38            | 46            | 35            | *             | *             | *             | 37.8              | 37.8         |
| 1900-2000      | 15            | 14            | 19            | 0             | *             | *             | *             | 12.0              | 12.0         |
| 2000-2100      | 7             | 5             | 14            | 0             | *             | *             | *             | 6.5               | 6.5          |
| 2100-2200      | 9             | 11            | 10            | 0             | *             | *             | *             | 7.5               | 7.5          |
| 2200-2300      | 19            | 16            | 23            | *             | *             | *             | *             | 19.3              | 19.3         |
| 2300-2400      | 0             | 4             | 3             | *             | *             | *             | *             | 2.3               | 2.3          |
| <b>Totals</b>  |               |               |               |               |               |               |               |                   |              |
| 0700-1900      | 2353          | 2423          | 2446          | 2428          | *             | *             | *             | 2412.5            | 2412.5       |
| 0600-2200      | 2580          | 2679          | 2697          | 2608          | *             | *             | *             | 2641.0            | 2641.0       |
| 0600-0000      | 2599          | 2699          | 2723          | *             | *             | *             | *             | 2662.7            | 2662.7       |
| 0000-0000      | 2951          | 3058          | 3100          | *             | *             | *             | *             | 3028.2            | 3028.2       |
| <b>AM Peak</b> | 0500<br>243   | 0500<br>242   | 0500<br>249   | 0800<br>235   | *             | *             | *             |                   |              |
| <b>PM Peak</b> | 1400<br>258   | 1400<br>244   | 1400<br>284   | *             | *             | *             | *             |                   |              |

## SURVEYED CATCHMENT AREAS

### CATCHMENT AREA: A



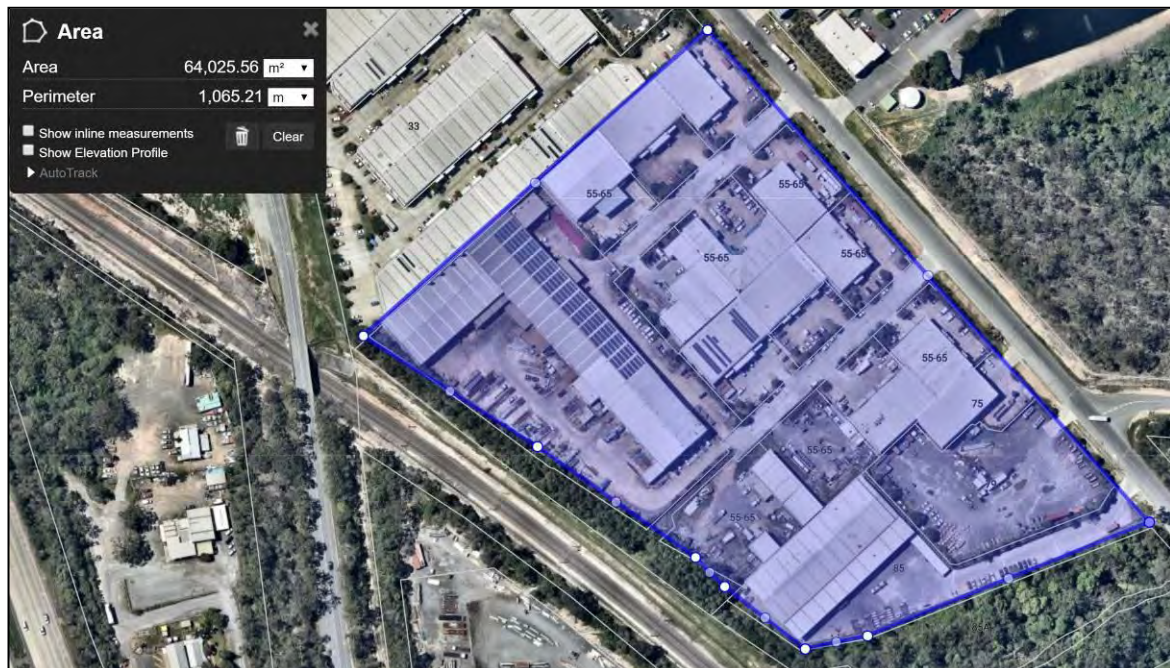
### CATCHMENT AREA: B



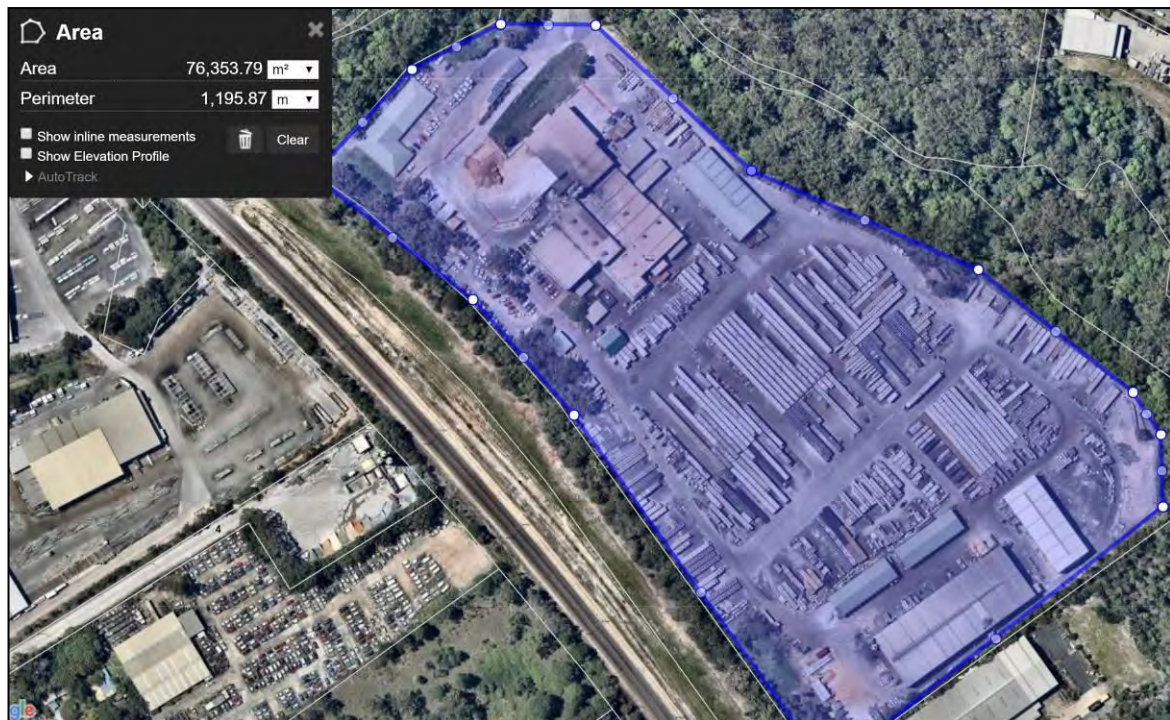
CATCHMENT AREA: C



CATCHMENT AREA: D



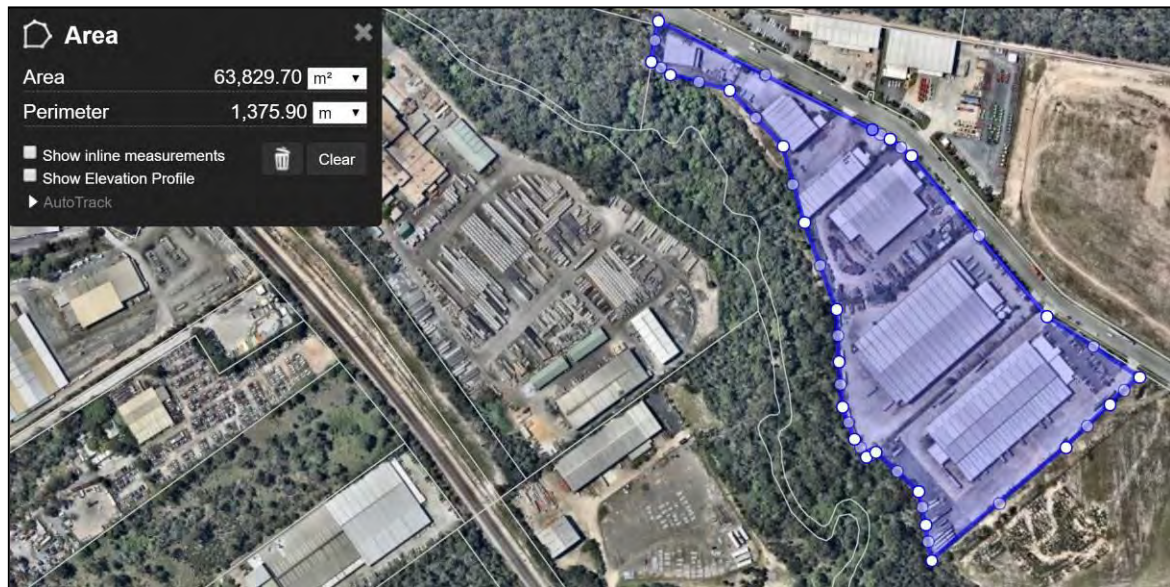
CATCHMENT AREA: E



CATCHMENT AREA: F



CATCHMENT AREA: G



APPENDIX E – SURVEYED TRIP GENERATION DATA (RTE / GRIFFITH UNIVERSITY)



Surveyed site at Motorway Circuit, Ormeau

|                           |                                                                                                            |
|---------------------------|------------------------------------------------------------------------------------------------------------|
| Location:                 | Motorway Circuit, Ormeau                                                                                   |
| Use:                      | Warehouse / manufacturing                                                                                  |
| GFA:                      | Approx 45,000m <sup>2</sup> GFA                                                                            |
| Surveyed trip generation: | AM peak - 170 vehicles per hour<br>PM peak - 190 vehicles per hour                                         |
| Surveyed trip rate:       | AM peak hour - 0.38 trips per 100m <sup>2</sup> GFA<br>PM peak hour - 0.42 trips per 100m <sup>2</sup> GFA |

## Weekly Vehicle Counts

### WeeklyVehicle-1052

**Site:** 1.0.0E 2.0.0W  
**Description:** Multiple sites - See Header sheet for site descriptions.  
**Filter time:** 14:14 Sunday, 22 March 2015 => 18:50 Sunday, 29 March 2015  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0)

|           | Mon<br>23 Mar | Tue<br>24 Mar | Wed<br>25 Mar | Thu<br>26 Mar | Fri<br>27 Mar | Sat<br>28 Mar | Sun<br>29 Mar | Averages<br>1 - 5 | 1 - 7  |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|--------|
| Hour      |               |               |               |               |               |               |               |                   |        |
| 0000-0100 | 0             | 4             | 4             | 8             | 3             | 0             | 0             | 3.8               | 2.7    |
| 0100-0200 | 2             | 0             | 0             | 0             | 0             | 0             | 0             | 0.4               | 0.3    |
| 0200-0300 | 0             | 3             | 1             | 2             | 0             | 0             | 0             | 1.2               | 0.9    |
| 0300-0400 | 6             | 11            | 14            | 11            | 3             | 0             | 0             | 9.0               | 6.4    |
| 0400-0500 | 15            | 20            | 23            | 16            | 7             | 0             | 0             | 16.2              | 11.6   |
| 0500-0600 | 115           | 127           | 128           | 124           | 120           | 0             | 0             | 122.8             | 87.7   |
| 0600-0700 | 90            | 100           | 105           | 89            | 107           | 0             | 0             | 98.2              | 70.1   |
| 0700-0800 | 139           | 143<          | 129           | 133           | 107           | 0             | 0             | 130.2             | 93.0   |
| 0800-0900 | 150           | 124           | 152           | 149           | 120           | 0             | 0             | 139.0             | 99.3   |
| 0900-1000 | 164<          | 142           | 136           | 170<          | 166<          | 0             | 0             | 155.6<            | 111.1< |
| 1000-1100 | 132           | 131           | 159<          | 125           | 129           | 0             | 0             | 135.2             | 96.6   |
| 1100-1200 | 137           | 139           | 128           | 163           | 152           | 0<            | 0<            | 143.8             | 102.7  |
| 1200-1300 | 150           | 155           | 139           | 155           | 158           | 0             | 0             | 151.4             | 108.1  |
| 1300-1400 | 163           | 149           | 128           | 178           | 149           | 0             | 0             | 153.4             | 109.6  |
| 1400-1500 | 192<          | 190<          | 186<          | 197<          | 185<          | 0             | 0             | 190.0<            | 135.7< |
| 1500-1600 | 166           | 181           | 127           | 146           | 171           | 0             | 0             | 158.2             | 113.0  |
| 1600-1700 | 161           | 165           | 164           | 145           | 117           | 0             | 0             | 150.4             | 107.4  |
| 1700-1800 | 68            | 55            | 80            | 59            | 39            | 0             | 0             | 60.2              | 43.0   |
| 1800-1900 | 17            | 31            | 25            | 22            | 15            | 0             | 0             | 22.0              | 15.7   |
| 1900-2000 | 2             | 6             | 5             | 7             | 0             | 0             | *             | 4.0               | 3.3    |
| 2000-2100 | 8             | 2             | 2             | 0             | 0             | 0             | *             | 2.4               | 2.0    |
| 2100-2200 | 9             | 5             | 6             | 5             | 0             | 0             | *             | 5.0               | 4.2    |
| 2200-2300 | 9             | 11            | 9             | 7             | 0             | 0             | *             | 7.2               | 6.0    |
| 2300-2400 | 4             | 10            | 2             | 6             | 0             | 0<            | *             | 4.4               | 3.7    |
| Totals    |               |               |               |               |               |               |               |                   |        |
| 0700-1900 | 1639          | 1605          | 1553          | 1642          | 1508          | 0             | 0             | 1589.4            | 1135.3 |
| 0600-2200 | 1748          | 1718          | 1671          | 1743          | 1615          | 0             | *             | 1699.0            | 1214.9 |
| 0600-0000 | 1761          | 1739          | 1682          | 1756          | 1615          | 0             | *             | 1710.6            | 1224.6 |
| 0000-0000 | 1899          | 1904          | 1852          | 1917          | 1748          | 0             | *             | 1864.0            | 1334.2 |
| AM Peak   | 0900<br>164   | 0700<br>143   | 1000<br>159   | 0900<br>170   | 0900<br>166   | 1100<br>0     | 1100<br>0     |                   |        |
| PM Peak   | 1400<br>192   | 1400<br>190   | 1400<br>186   | 1400<br>197   | 1400<br>185   | 2300<br>0     | *<br>*        |                   |        |

\* - No data.

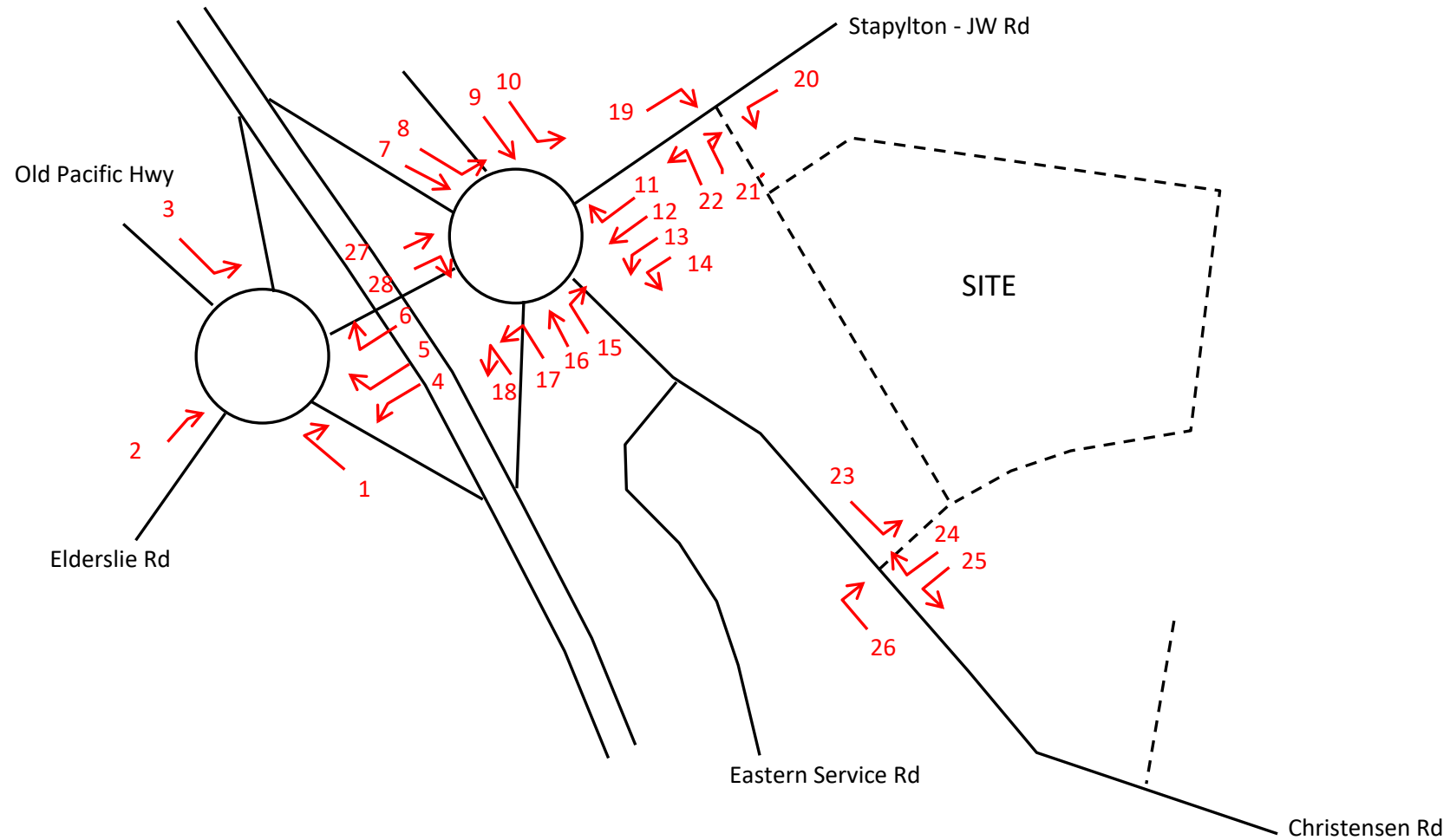
## APPENDIX F – SENSITIVITY ANALYSIS CALCULATIONS

**Table F.1 – Sensitivity Analysis Peak Hour Development Traffic Generation (overall estate)**  
**TRIG GENERATION RATE OF 0.42 TRIPS PER 100m<sup>2</sup> / PEAK HOUR**

| Stage                 | Lot Area (m2) | GFA (m2)      | Morning Peak Hour |            |            | Afternoon Peak Hour |            |            |
|-----------------------|---------------|---------------|-------------------|------------|------------|---------------------|------------|------------|
|                       |               |               | In                | Out        | Total      | In                  | Out        | Total      |
| Cat A (STAGE 1)       | 115945        | 52175         | 142               | 77         | 219        | 44                  | 175        | 219        |
| Cat B (STAGE 2)       | 288165        | 129674        | 354               | 191        | 545        | 109                 | 436        | 545        |
| Cat C (STAGE 3)       | 91992         | 41396         | 113               | 61         | 174        | 35                  | 139        | 174        |
| Cat D (STAGE 4)       | 10750         | 4838          | 13                | 7          | 20         | 8                   | 12         | 20         |
| <b>OVERALL ESTATE</b> | <b>506852</b> | <b>228083</b> | <b>623</b>        | <b>335</b> | <b>958</b> | <b>196</b>          | <b>762</b> | <b>958</b> |

Assumes 45% site cover

Peak Hour Distribution: AM Peak 65 / 35, PM Peak 20/80



**FIGURE F.1 – SENSITIVITY ANALYSIS KEY MAP (TRAFFIC DISTRIBUTION)**

#### Morning peak hour

| Development               | Intersection movement (refer to Figure F.1) |       |       |      |      |       |       |       |       |       |       |       |       |       |       |       |       |        |      |      |      |      |      |      |      |      |       |       |
|---------------------------|---------------------------------------------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|------|------|------|------|------|------|------|------|-------|-------|
| Stage                     | 1                                           | 2     | 3     | 4    | 5    | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18     | 19   | 20   | 21   | 22   | 23   | 24   | 25   | 26   | 27    | 28    |
| Distribution stage 1      | 0.33                                        | 0.1   | 0.02  | 0.1  | 0.02 | 0.33  | 0     | 0.31  | 0     | 0.04  | 0.02  | 0.45  | 0.35  | 0.1   | 0.1   | 0     | 0     | 0      | 0.8  | 0.2  | 0.2  | 0.8  | N/A  | N/A  | N/A  | N/A  | 0.45  | 0     |
| Distribution stage 2      | 0.33                                        | 0.1   | 0.02  | 0.1  | 0.02 | 0.33  | 0.12  | 0.19  | 0.02  | 0.02  | 0.05  | 0.3   | 0.25  | 0     | 0     | 0.05  | 0.18  | 0.07   | 0.48 | 0.2  | 0.2  | 0.48 | N/A  | N/A  | N/A  | N/A  | 0.27  | 0.18  |
| Distribution stages 3 / 4 | 0.33                                        | 0.1   | 0.02  | 0.1  | 0.02 | 0.33  | 0.31  | 0     | 0.04  | 0     | 0     | 0     | 0     | 0     | 0     | 0.04  | 0.35  | 0.41   | 0    | 0.2  | 0.2  | 0    | N/A  | N/A  | N/A  | N/A  | 0     | 0.41  |
| Surveyed 2018 Vol         | 248                                         | 232   | 91    | 652  | 100  | 267   | 197   | 234   | 38    | 60    | 63    | 273   | 95    | 31    | 14    | 36    | 140   | 24     | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 245   | 176   |
| Estimated Year 2020       | 263                                         | 246   | 96    | 691  | 106  | 283   | 209   | 248   | 40    | 64    | 67    | 289   | 101   | 33    | 15    | 38    | 148   | 25     | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 260   | 187   |
| Estimated Year 2023       | 294                                         | 275   | 108   | 774  | 119  | 317   | 234   | 278   | 45    | 71    | 75    | 324   | 113   | 37    | 17    | 43    | 166   | 28     | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 291   | 209   |
| STAGE 1                   | 47                                          | 14    | 3     | 8    | 2    | 25    | 0     | 44    | 0     | 6     | 2     | 35    | 27    | 8     | 8     | 0     | 0     | 0      | 114  | 28   | 15   | 61   | N/A  | N/A  | N/A  | N/A  | 64    | 0     |
| STAGE 2                   | 117                                         | 35    | 7     | 19   | 4    | 63    | 42    | 67    | 7     | 7     | 10    | 57    | 48    | 0     | 0     | 10    | 34    | 13     | 170  | 71   | 38   | 91   | N/A  | N/A  | N/A  | N/A  | 96    | 64    |
| STAGE 3 & 4               | 42                                          | 13    | 3     | 13   | 3    | 42    | 39    | 0     | 5     | 0     | 0     | 0     | 0     | 0     | 0     | 5     | 44    | 52     | 0    | 25   | 25   | 0    | N/A  | N/A  | N/A  | N/A  | 0     | 52    |
| STAGES 1 & 2              | 164                                         | 50    | 10    | 27   | 5    | 88    | 42    | 111   | 7     | 13    | 11    | 92    | 74    | 8     | 8     | 10    | 34    | 13     | 284  | 99   | 53   | 153  | N/A  | N/A  | N/A  | N/A  | 160   | 64    |
| ALL STAGES                | 205                                         | 62    | 12    | 39   | 8    | 130   | 82    | 111   | 12    | 13    | 11    | 92    | 74    | 8     | 8     | 15    | 78    | 65     | 284  | 124  | 79   | 153  | N/A  | N/A  | N/A  | N/A  | 160   | 115   |
| % STAGE 1                 | 17.9%                                       | 5.8%  | 3.0%  | 1.1% | 1.4% | 8.9%  | 0.0%  | 17.8% | 0.0%  | 9.0%  | 2.3%  | 11.9% | 26.7% | 23.3% | 51.7% | 0.0%  | 0.0%  | 0.0%   | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 24.7% | 0.0%  |
| % STAGES 1 & 2            | 62.3%                                       | 20.2% | 10.3% | 3.9% | 5.0% | 31.2% | 20.3% | 44.9% | 17.6% | 20.1% | 16.6% | 31.7% | 74.0% | 23.3% | 51.7% | 25.0% | 23.1% | 52.5%  | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 61.5% | 34.2% |
| % ALL STAGES              | 69.8%                                       | 22.6% | 11.5% | 5.1% | 6.6% | 40.9% | 34.9% | 40.1% | 26.9% | 17.9% | 14.8% | 28.3% | 66.1% | 20.8% | 46.1% | 34.1% | 47.2% | 228.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 54.9% | 55.2% |

#### Afternoon peak hour

| Development               | Intersection movement (refer to Figure F.1) |      |      |       |       |       |       |       |       |      |       |       |       |       |        |       |       |       |      |      |      |      |      |      |      |      |       |       |
|---------------------------|---------------------------------------------|------|------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|--------|-------|-------|-------|------|------|------|------|------|------|------|------|-------|-------|
| Stage                     | 1                                           | 2    | 3    | 4     | 5     | 6     | 7     | 8     | 9     | 10   | 11    | 12    | 13    | 14    | 15     | 16    | 17    | 18    | 19   | 20   | 21   | 22   | 23   | 24   | 25   | 26   | 27    | 28    |
| Distribution stage 1      | 0.33                                        | 0.1  | 0.02 | 0.1   | 0.02  | 0.33  | 0     | 0.31  | 0     | 0.04 | 0.02  | 0.45  | 0.35  | 0.1   | 0.1    | 0     | 0     | 0     | 0.8  | 0.2  | 0.2  | 0.8  | N/A  | N/A  | N/A  | N/A  | 0.45  | 0     |
| Distribution stage 2      | 0.33                                        | 0.1  | 0.02 | 0.1   | 0.02  | 0.33  | 0.12  | 0.19  | 0.02  | 0.02 | 0.05  | 0.3   | 0.25  | 0     | 0      | 0.05  | 0.18  | 0.07  | 0.48 | 0.2  | 0.2  | 0.48 | N/A  | N/A  | N/A  | N/A  | 0.27  | 0.18  |
| Distribution stages 3 / 4 | 0.33                                        | 0.1  | 0.02 | 0.1   | 0.02  | 0.33  | 0.31  | 0     | 0.04  | 0    | 0     | 0     | 0     | 0     | 0      | 0.04  | 0.35  | 0.41  | 0    | 0.2  | 0.2  | 0    | N/A  | N/A  | N/A  | N/A  | 0     | 0.41  |
| Surveyed 2018 Vol         | 133                                         | 386  | 121  | 485   | 104   | 548   | 58    | 201   | 31    | 79   | 89    | 404   | 183   | 23    | 15     | 71    | 284   | 76    | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 144   | 68    |
| Estimated Year 2020       | 141                                         | 409  | 128  | 514   | 110   | 581   | 61    | 213   | 33    | 84   | 94    | 428   | 194   | 24    | 16     | 75    | 301   | 81    | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 153   | 72    |
| Estimated Year 2023       | 158                                         | 458  | 144  | 576   | 123   | 651   | 69    | 239   | 37    | 94   | 106   | 480   | 217   | 27    | 18     | 84    | 337   | 90    | 0    | 0    | 0    | 0    | N/A  | N/A  | N/A  | N/A  | 171   | 81    |
| STAGE 1                   | 14                                          | 4    | 1    | 18    | 4     | 58    | 0     | 14    | 0     | 2    | 4     | 79    | 61    | 18    | 18     | 0     | 0     | 0     | 35   | 9    | 35   | 140  | N/A  | N/A  | N/A  | N/A  | 20    | 0     |
| STAGE 2                   | 36                                          | 11   | 2    | 44    | 9     | 144   | 13    | 21    | 2     | 2    | 22    | 131   | 109   | 0     | 0      | 22    | 78    | 30    | 52   | 22   | 87   | 209  | N/A  | N/A  | N/A  | N/A  | 29    | 20    |
| STAGE 3 & 4               | 14                                          | 4    | 1    | 4     | 1     | 14    | 13    | 0     | 2     | 0    | 0     | 0     | 0     | 0     | 0      | 2     | 15    | 18    | 0    | 9    | 9    | 0    | N/A  | N/A  | N/A  | N/A  | 0     | 18    |
| STAGES 1 & 2              | 50                                          | 15   | 3    | 61    | 12    | 202   | 13    | 34    | 2     | 4    | 25    | 210   | 170   | 18    | 18     | 22    | 78    | 30    | 87   | 31   | 122  | 349  | N/A  | N/A  | N/A  | N/A  | 49    | 20    |
| ALL STAGES                | 65                                          | 20   | 4    | 65    | 13    | 216   | 26    | 34    | 4     | 4    | 25    | 210   | 170   | 18    | 18     | 24    | 93    | 48    | 87   | 39   | 131  | 349  | N/A  | N/A  | N/A  | N/A  | 49    | 37    |
| % STAGE 1                 | 10.3%                                       | 1.1% | 0.7% | 3.4%  | 3.2%  | 10.0% | 0.0%  | 6.4%  | 0.0%  | 2.1% | 3.7%  | 18.4% | 31.6% | 71.9% | 110.3% | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 12.9% | 0.0%  |
| % STAGES 1 & 2            | 35.8%                                       | 3.7% | 2.4% | 11.9% | 11.1% | 34.7% | 21.3% | 16.1% | 6.6%  | 4.7% | 26.8% | 48.9% | 87.8% | 71.9% | 110.3% | 28.9% | 26.1% | 37.9% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 32.2% | 27.2% |
| % ALL STAGES              | 40.9%                                       | 4.3% | 2.7% | 11.4% | 10.6% | 33.2% | 38.3% | 14.4% | 10.6% | 4.2% | 23.9% | 43.7% | 78.4% | 64.2% | 98.4%  | 27.9% | 27.7% | 53.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 28.7% | 46.1% |

**FIGURE F.2– SENSITIVITY ANALYSIS TRAFFIC GENERATION & % IMPACT CALCULATIONS**

## APPENDIX G – CRITERIA FOR INTERPRETING SIDRA RESULTS

### 1. Level of Service (LOS)

| LOS | Traffic Signals and Roundabouts                                                                        | Give Way and Stop Signs                         |
|-----|--------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 'A' |                                                                                                        | Good operation.                                 |
| 'B' | Good operation.<br>Good with acceptable delays and spare capacity.                                     | Acceptable delays and spare capacity.           |
| 'C' | Satisfactory.                                                                                          | Satisfactory but accident study required.       |
| 'D' | Operating near capacity.                                                                               | Near capacity and accident study required.      |
| 'E' | At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode. | At capacity and requires other control mode.    |
| 'F' | Unsatisfactory and requires additional capacity.                                                       | Unsatisfactory and requires other control mode. |

### 2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route).

| Level of Service | Average Delay per Vehicle (secs/veh) | Traffic Signals, Roundabout                                                                               | Give Way and Stop Signs                      |
|------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------|
| A                | less than 14                         | Good operation.                                                                                           | Good operation.                              |
| B                | 15 to 28                             | Good with acceptable delays and spare capacity.                                                           | Acceptable delays and spare capacity.        |
| C                | 29 to 42                             | Satisfactory.                                                                                             | Satisfactory but accident study required.    |
| D                | 43 to 56                             | Operating near capacity.                                                                                  | Near capacity and accident study required.   |
| E                | 57 to 70                             | At capacity; at signals incidents will cause excessive delays.<br>Roundabouts require other control mode. | At capacity and requires other control mode. |

### 3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**<sup>1</sup> both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

<sup>1</sup>The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.

## APPENDIX H – DETAIL SIDRA RESULTS OF DEVELOPMENT TRIP GENERATION

Exit 38 Interchange – western roundabout, without development :

- Year 2020 AM Peak Hour, existing intersection layout;
- Year 2020 PM Peak Hour, existing intersection layout;
- Year 2023 AM Peak Hour, existing intersection layout;
- Year 2023 PM Peak Hour, existing intersection layout;

Exit 38 Interchange – eastern roundabout, without development:

- Year 2020 AM Peak Hour, existing intersection layout;
- Year 2020 PM Peak Hour, existing intersection layout;
- Year 2023 AM Peak Hour, existing intersection layout;
- Year 2023 PM Peak Hour, existing intersection layout;

Western roundabout (upgraded):

- Year 2020 AM Peak Hour, with Stage 1 development;
- Year 2020 PM Peak Hour, with Stage 1 development;
- Year 2020 AM Peak Hour, with Stage 2 development;
- Year 2020 PM Peak Hour, with Stage 2 development;
- Year 2023 AM Peak Hour full development;
- Year 2023 PM Peak Hour full development;

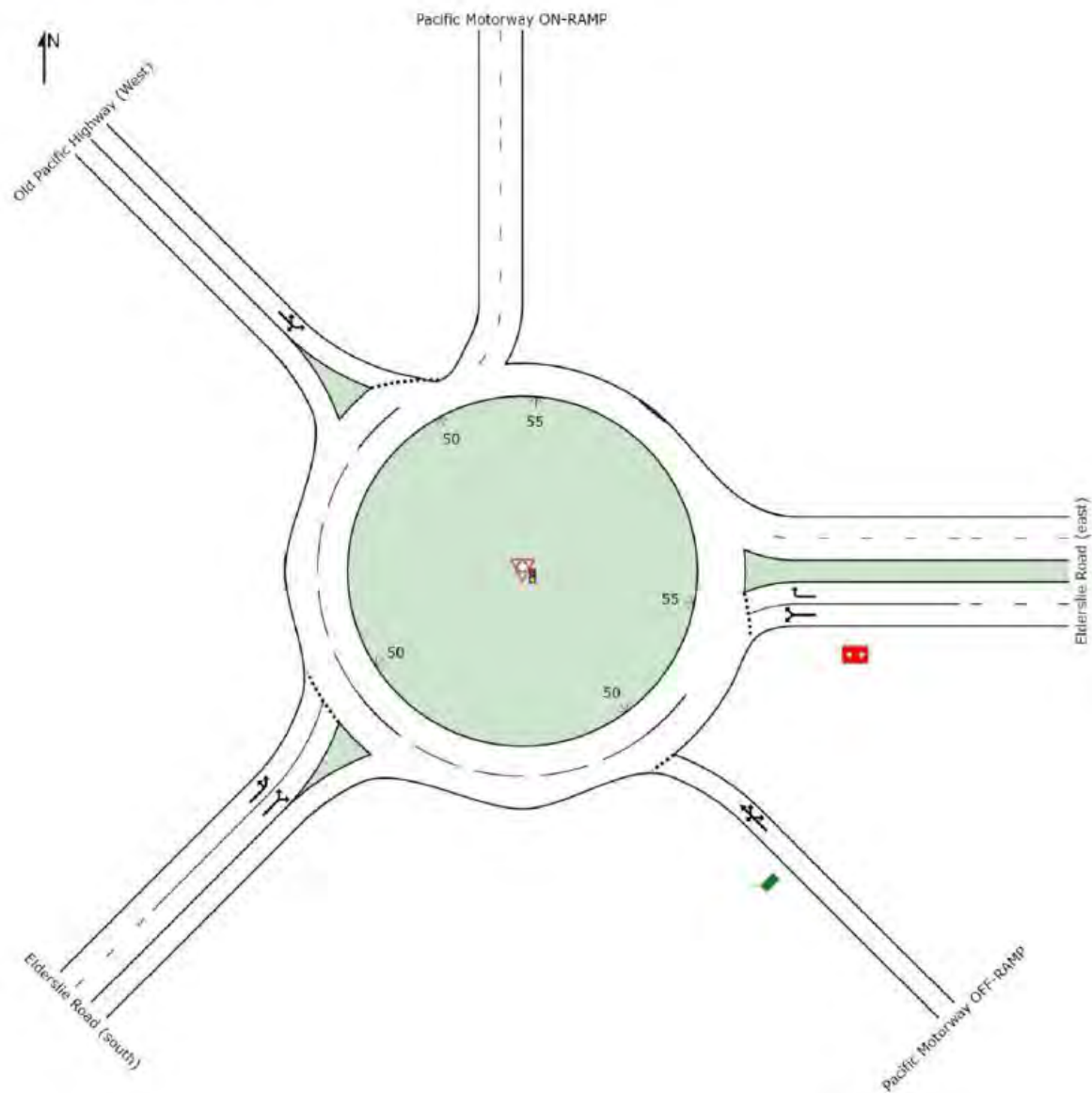
Eastern roundabout (upgraded):

- Year 2020 AM Peak Hour, with Stage 1 development (partial upgrade);
- Year 2020 PM Peak Hour, with Stage 1 development (partial upgrade);
- Year 2020 AM Peak Hour, with Stage 2 development;
- Year 2020 PM Peak Hour, with Stage 2 development;
- Year 2023 AM Peak Hour, with full development (fully upgraded intersection);
- Year 2023 PM Peak Hour, with full development (fully upgraded intersection);

YEAR 2020 WITHOUT DEVELOPMENT

 Site: Model 1 2020AM west no dev

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering



## MOVEMENT SUMMARY

 Site: Model 1 2020AM west no dev

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|---------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | 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 per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 21                                    | L2     | 346                | 8.0        | 0.883         | 42.2              | LOS D            | 31.5                           | 235.6      | 1.00         | 1.56                        | 35.5               |
| 22                                    | T1     | 99                 | 8.0        | 0.883         | 41.7              | LOS D            | 31.5                           | 235.6      | 1.00         | 1.56                        | 36.5               |
| 23a                                   | R1     | 1                  | 8.0        | 0.883         | 47.8              | LOS D            | 31.5                           | 235.6      | 1.00         | 1.56                        | 36.5               |
| 23b                                   | R3     | 263                | 8.0        | 0.883         | 50.5              | LOS D            | 31.5                           | 235.6      | 1.00         | 1.56                        | 37.5               |
| Approach                              |        | 709                | 8.0        | 0.883         | 45.2              | LOS D            | 31.5                           | 235.6      | 1.00         | 1.56                        | 36.4               |
| East: Elderslie Road (east)           |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4a                                    | L1     | 691                | 8.0        | 0.863         | 22.6              | LOS C            | 39.6                           | 296.1      | 0.96         | 0.78                        | 45.2               |
| 6a                                    | R1     | 106                | 8.0        | 0.863         | 29.0              | LOS C            | 39.6                           | 296.1      | 0.96         | 0.78                        | 45.8               |
| 3                                     | R2     | 283                | 8.0        | 0.396         | 17.9              | LOS B            | 8.6                            | 64.0       | 0.71         | 0.61                        | 50.4               |
| Approach                              |        | 1080               | 8.0        | 0.863         | 22.0              | LOS C            | 39.6                           | 296.1      | 0.90         | 0.74                        | 46.6               |
| NorthWest: Old Pacific Highway (West) |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 27b                                   | L3     | 42                 | 8.0        | 0.259         | 6.9               | LOS A            | 1.3                            | 9.7        | 0.71         | 0.77                        | 52.6               |
| 27a                                   | L1     | 96                 | 8.0        | 0.259         | 5.8               | LOS A            | 1.3                            | 9.7        | 0.71         | 0.77                        | 55.0               |
| 29                                    | R2     | 49                 | 8.0        | 0.259         | 13.6              | LOS B            | 1.3                            | 9.7        | 0.71         | 0.77                        | 57.0               |
| Approach                              |        | 187                | 8.0        | 0.259         | 8.1               | LOS A            | 1.3                            | 9.7        | 0.71         | 0.77                        | 55.0               |
| SouthWest: Elderslie Road (south)     |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 30                                    | L2     | 76                 | 8.0        | 0.351         | 4.7               | LOS A            | 2.2                            | 16.8       | 0.67         | 0.47                        | 55.0               |
| 30a                                   | L1     | 367                | 8.0        | 0.351         | 3.9               | LOS A            | 2.2                            | 16.8       | 0.67         | 0.52                        | 56.1               |
| 32a                                   | R1     | 246                | 8.0        | 0.351         | 10.7              | LOS B            | 2.1                            | 15.6       | 0.68         | 0.73                        | 54.3               |
| Approach                              |        | 689                | 8.0        | 0.351         | 6.4               | LOS A            | 2.2                            | 16.8       | 0.68         | 0.59                        | 55.3               |
| All Vehicles                          |        | 2665               | 8.0        | 0.883         | 23.2              | LOS C            | 39.6                           | 296.1      | 0.85         | 0.92                        | 45.5               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 2 2020PM west no dev**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                       |               |                  |                      |                  |                                   |               |              |                                |                       |
|---------------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|-----------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                                | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                       |               |                  |                      |                  |                                   |               |              |                                |                       |
| 21                                    | L2     | 59                    | 8.0           | 0.361            | 6.2                  | LOS A            | 2.3                               | 17.5          | 0.75         | 0.74                           | 52.1                  |
| 22                                    | T1     | 102                   | 8.0           | 0.361            | 5.7                  | LOS A            | 2.3                               | 17.5          | 0.75         | 0.74                           | 54.2                  |
| 23a                                   | R1     | 1                     | 8.0           | 0.361            | 11.8                 | LOS B            | 2.3                               | 17.5          | 0.75         | 0.74                           | 54.2                  |
| 23b                                   | R3     | 141                   | 8.0           | 0.361            | 14.5                 | LOS B            | 2.3                               | 17.5          | 0.75         | 0.74                           | 56.3                  |
| Approach                              |        | 303                   | 8.0           | 0.361            | 9.9                  | LOS A            | 2.3                               | 17.5          | 0.75         | 0.74                           | 54.7                  |
| East: Elderslie Road (east)           |        |                       |               |                  |                      |                  |                                   |               |              |                                |                       |
| 4a                                    | L1     | 514                   | 8.0           | 0.660            | 9.0                  | LOS A            | 15.7                              | 117.1         | 0.81         | 0.62                           | 53.8                  |
| 6a                                    | R1     | 110                   | 8.0           | 0.660            | 15.4                 | LOS B            | 15.7                              | 117.1         | 0.81         | 0.62                           | 54.5                  |
| 3                                     | R2     | 580                   | 8.0           | 0.750            | 19.6                 | LOS B            | 16.9                              | 126.1         | 0.87         | 0.82                           | 49.3                  |
| Approach                              |        | 1204                  | 8.0           | 0.750            | 14.7                 | LOS B            | 16.9                              | 126.1         | 0.84         | 0.72                           | 51.5                  |
| NorthWest: Old Pacific Highway (West) |        |                       |               |                  |                      |                  |                                   |               |              |                                |                       |
| 27b                                   | L3     | 93                    | 8.0           | 0.649            | 16.4                 | LOS B            | 3.7                               | 27.5          | 0.90         | 1.08                           | 47.0                  |
| 27a                                   | L1     | 128                   | 8.0           | 0.649            | 15.4                 | LOS B            | 3.7                               | 27.5          | 0.90         | 1.08                           | 48.9                  |
| 29                                    | R2     | 43                    | 8.0           | 0.649            | 23.1                 | LOS C            | 3.7                               | 27.5          | 0.90         | 1.08                           | 50.5                  |
| Approach                              |        | 264                   | 8.0           | 0.649            | 17.0                 | LOS B            | 3.7                               | 27.5          | 0.90         | 1.08                           | 48.5                  |
| SouthWest: Elderslie Road (south)     |        |                       |               |                  |                      |                  |                                   |               |              |                                |                       |
| 30                                    | L2     | 24                    | 8.0           | 0.603            | 8.5                  | LOS A            | 6.3                               | 46.8          | 0.91         | 0.89                           | 53.8                  |
| 30a                                   | L1     | 596                   | 8.0           | 0.603            | 7.7                  | LOS A            | 6.3                               | 46.8          | 0.90         | 0.90                           | 55.1                  |
| 32a                                   | R1     | 409                   | 8.0           | 0.603            | 14.1                 | LOS B            | 5.1                               | 38.1          | 0.87         | 0.98                           | 52.2                  |
| Approach                              |        | 1029                  | 8.0           | 0.603            | 10.2                 | LOS B            | 6.3                               | 46.8          | 0.89         | 0.93                           | 53.9                  |
| All Vehicles                          |        | 2800                  | 8.0           | 0.750            | 12.7                 | LOS B            | 16.9                              | 126.1         | 0.85         | 0.83                           | 52.4                  |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 5 2023AM west existing without

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|---------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | 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 per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 21                                    | L2     | 377                | 8.0        | 0.958         | 143.2             | LOS F            | 91.6                           | 685.3      | 1.00         | 3.18                        | 18.3               |
| 22                                    | T1     | 108                | 8.0        | 0.958         | 149.1             | LOS F            | 91.6                           | 685.3      | 1.00         | 3.18                        | 18.6               |
| 23a                                   | R1     | 1                  | 8.0        | 0.958         | 138.2             | LOS F            | 91.6                           | 685.3      | 1.00         | 3.18                        | 18.6               |
| 23b                                   | R3     | 287                | 8.0        | 0.958         | 151.5             | LOS F            | 91.6                           | 685.3      | 1.00         | 3.18                        | 18.9               |
| Approach                              |        | 773                | 8.0        | 0.958         | 147.1             | LOS F            | 91.6                           | 685.3      | 1.00         | 3.18                        | 18.6               |
| East: Elderslie Road (east)           |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4a                                    | L1     | 753                | 8.0        | 0.965         | 57.8              | LOS E            | 71.5                           | 535.0      | 1.00         | 1.16                        | 31.9               |
| 6a                                    | R1     | 116                | 8.0        | 0.965         | 64.2              | LOS E            | 71.5                           | 535.0      | 1.00         | 1.16                        | 32.1               |
| 3                                     | R2     | 308                | 8.0        | 0.442         | 20.4              | LOS C            | 11.8                           | 88.5       | 0.74         | 0.58                        | 48.9               |
| Approach                              |        | 1177               | 8.0        | 0.965         | 48.6              | LOS D            | 71.5                           | 535.0      | 0.93         | 1.01                        | 35.2               |
| NorthWest: Old Pacific Highway (West) |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 27b                                   | L3     | 46                 | 8.0        | 0.302         | 7.5               | LOS A            | 1.6                            | 11.7       | 0.76         | 0.82                        | 52.3               |
| 27a                                   | L1     | 105                | 8.0        | 0.302         | 6.4               | LOS A            | 1.6                            | 11.7       | 0.76         | 0.82                        | 54.7               |
| 29                                    | R2     | 53                 | 8.0        | 0.302         | 14.2              | LOS B            | 1.6                            | 11.7       | 0.76         | 0.82                        | 56.7               |
| Approach                              |        | 204                | 8.0        | 0.302         | 8.6               | LOS A            | 1.6                            | 11.7       | 0.76         | 0.82                        | 54.7               |
| SouthWest: Elderslie Road (south)     |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 30                                    | L2     | 83                 | 8.0        | 0.400         | 5.0               | LOS A            | 2.7                            | 20.2       | 0.73         | 0.50                        | 54.8               |
| 30a                                   | L1     | 400                | 8.0        | 0.400         | 4.2               | LOS A            | 2.7                            | 20.2       | 0.73         | 0.55                        | 55.9               |
| 32a                                   | R1     | 268                | 8.0        | 0.400         | 11.1              | LOS B            | 2.5                            | 18.7       | 0.73         | 0.77                        | 54.1               |
| Approach                              |        | 751                | 8.0        | 0.400         | 6.7               | LOS A            | 2.7                            | 20.2       | 0.73         | 0.62                        | 55.1               |
| All Vehicles                          |        | 2905               | 8.0        | 0.965         | 61.2              | LOS E            | 91.6                           | 685.3      | 0.89         | 1.47                        | 31.4               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 6 2023PM west existing without**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                                |                  |                  |                         |                     |                                         |               |              |                                   |                          |
|---------------------------------------|--------|--------------------------------|------------------|------------------|-------------------------|---------------------|-----------------------------------------|---------------|--------------|-----------------------------------|--------------------------|
| Mov ID                                | OD Mov | Demand Flows<br>Total<br>veh/h | Flows<br>HV<br>% | Deg. Satn<br>v/c | Average<br>Delay<br>sec | Level of<br>Service | 95% Back of<br>Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective<br>Stop Rate<br>per veh | Average<br>Speed<br>km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                                |                  |                  |                         |                     |                                         |               |              |                                   |                          |
| 21                                    | L2     | 64                             | 8.0              | 0.415            | 7.4                     | LOS A               | 3.0                                     | 22.2          | 0.81         | 0.80                              | 51.5                     |
| 22                                    | T1     | 111                            | 8.0              | 0.415            | 6.9                     | LOS A               | 3.0                                     | 22.2          | 0.81         | 0.80                              | 53.5                     |
| 23a                                   | R1     | 1                              | 8.0              | 0.415            | 13.0                    | LOS B               | 3.0                                     | 22.2          | 0.81         | 0.80                              | 53.5                     |
| 23b                                   | R3     | 154                            | 8.0              | 0.415            | 15.7                    | LOS B               | 3.0                                     | 22.2          | 0.81         | 0.80                              | 55.6                     |
| Approach                              |        | 330                            | 8.0              | 0.415            | 11.1                    | LOS B               | 3.0                                     | 22.2          | 0.81         | 0.80                              | 54.1                     |
| East: Elderslie Road (east)           |        |                                |                  |                  |                         |                     |                                         |               |              |                                   |                          |
| 4a                                    | L1     | 560                            | 8.0              | 0.681            | 9.0                     | LOS A               | 17.9                                    | 133.8         | 0.80         | 0.60                              | 53.7                     |
| 6a                                    | R1     | 120                            | 8.0              | 0.681            | 15.5                    | LOS B               | 17.9                                    | 133.8         | 0.80         | 0.60                              | 54.5                     |
| 3                                     | R2     | 632                            | 8.0              | 0.775            | 20.4                    | LOS C               | 19.7                                    | 147.2         | 0.87         | 0.81                              | 48.8                     |
| Approach                              |        | 1312                           | 8.0              | 0.775            | 15.1                    | LOS B               | 19.7                                    | 147.2         | 0.83         | 0.70                              | 51.2                     |
| NorthWest: Old Pacific Highway (West) |        |                                |                  |                  |                         |                     |                                         |               |              |                                   |                          |
| 27b                                   | L3     | 101                            | 8.0              | 0.797            | 26.4                    | LOS C               | 5.5                                     | 40.8          | 0.95         | 1.24                              | 41.8                     |
| 27a                                   | L1     | 140                            | 8.0              | 0.797            | 25.3                    | LOS C               | 5.5                                     | 40.8          | 0.95         | 1.24                              | 43.3                     |
| 29                                    | R2     | 47                             | 8.0              | 0.797            | 33.1                    | LOS C               | 5.5                                     | 40.8          | 0.95         | 1.24                              | 44.6                     |
| Approach                              |        | 288                            | 8.0              | 0.797            | 26.9                    | LOS C               | 5.5                                     | 40.8          | 0.95         | 1.24                              | 43.0                     |
| SouthWest: Elderslie Road (south)     |        |                                |                  |                  |                         |                     |                                         |               |              |                                   |                          |
| 30                                    | L2     | 26                             | 8.0              | 0.694            | 11.8                    | LOS B               | 9.0                                     | 67.3          | 0.99         | 1.04                              | 51.6                     |
| 30a                                   | L1     | 650                            | 8.0              | 0.694            | 11.0                    | LOS B               | 9.0                                     | 67.3          | 0.99         | 1.04                              | 52.7                     |
| 32a                                   | R1     | 446                            | 8.0              | 0.694            | 17.7                    | LOS B               | 7.2                                     | 54.1          | 0.95         | 1.10                              | 49.8                     |
| Approach                              |        | 1122                           | 8.0              | 0.694            | 13.6                    | LOS B               | 9.0                                     | 67.3          | 0.97         | 1.06                              | 51.5                     |
| All Vehicles                          |        | 3052                           | 8.0              | 0.797            | 15.3                    | LOS B               | 19.7                                    | 147.2         | 0.89         | 0.90                              | 50.7                     |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

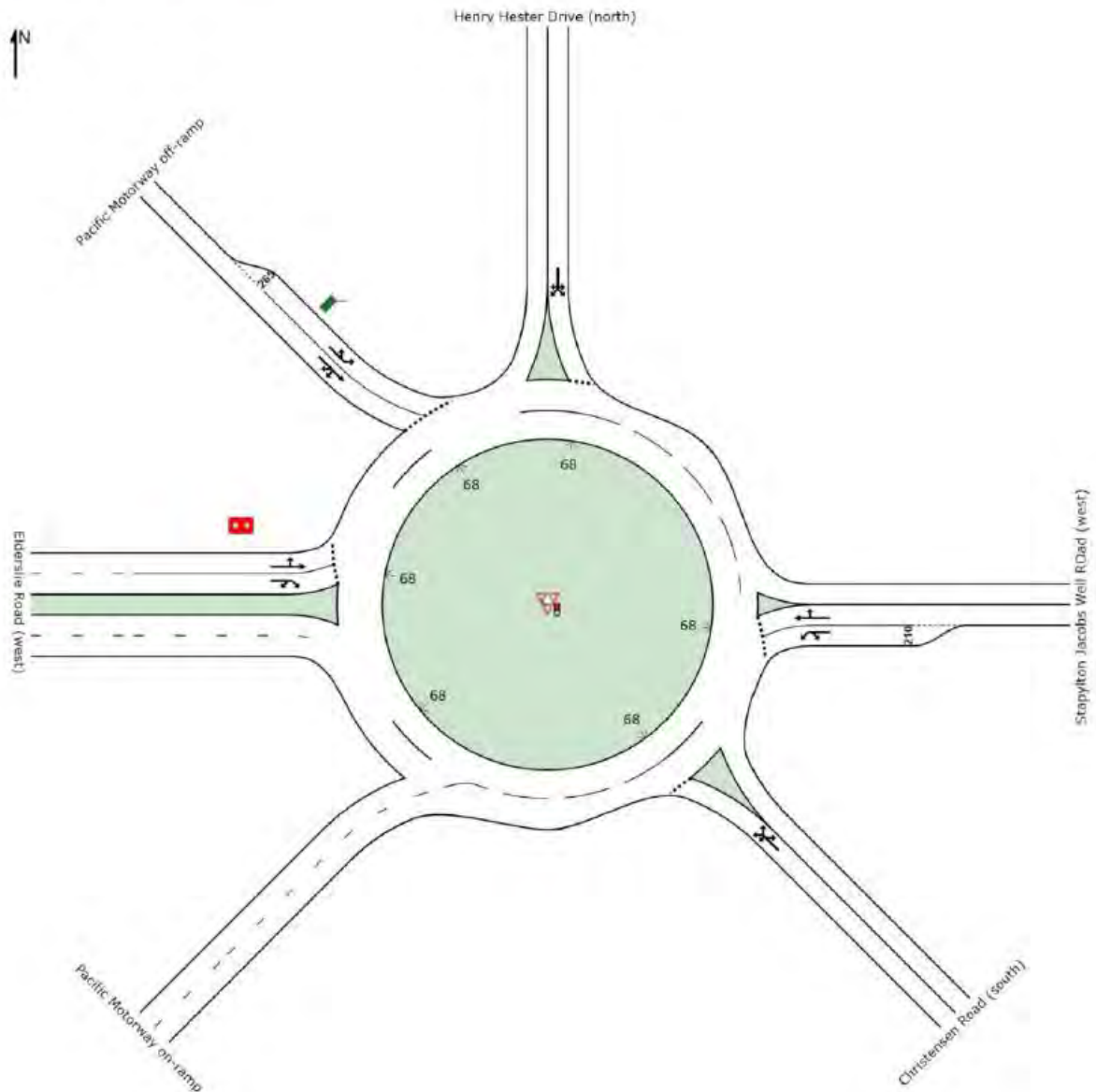
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

## SITE LAYOUT

 Site: Model 13 2020AM east without

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering



## MOVEMENT SUMMARY

 Site: Model 13 2020AM east without

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
|-----------------------------------------|--------|--------------------------------|---------|---------------------|-------------------------|---------------------|--------------------------------------|---------------|-----------------|-----------------------------------|--------------------------|
| Mov ID                                  | OD Mov | Demand Flows<br>Total<br>veh/h | HV<br>% | Deg.<br>Satn<br>v/c | Average<br>Delay<br>sec | Level of<br>Service | 85% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop.<br>Queued | Effective<br>Stop Rate<br>per veh | Average<br>Speed<br>km/h |
| SouthEast: Christensen Road (south)     |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 21                                      | L2     | 25                             | 8.0     | 0.344               | 7.0                     | LOS A               | 1.6                                  | 11.9          | 0.74            | 0.81                              | 53.7                     |
| 21a                                     | L1     | 148                            | 8.0     | 0.344               | 7.1                     | LOS A               | 1.6                                  | 11.9          | 0.74            | 0.81                              | 55.6                     |
| 23a                                     | R1     | 38                             | 8.0     | 0.344               | 13.2                    | LOS B               | 1.6                                  | 11.9          | 0.74            | 0.81                              | 56.9                     |
| 23b                                     | R3     | 15                             | 8.0     | 0.344               | 16.1                    | LOS B               | 1.6                                  | 11.9          | 0.74            | 0.81                              | 60.0                     |
| Approach                                |        | 226                            | 8.0     | 0.344               | 8.7                     | LOS A               | 1.6                                  | 11.9          | 0.74            | 0.81                              | 55.8                     |
| East: Stapylton Jacobs Well Road (west) |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 4b                                      | L3     | 33                             | 8.0     | 0.261               | 6.8                     | LOS A               | 1.0                                  | 7.6           | 0.80            | 0.71                              | 53.3                     |
| 4a                                      | L1     | 101                            | 8.0     | 0.261               | 6.4                     | LOS A               | 1.0                                  | 7.6           | 0.80            | 0.71                              | 56.5                     |
| 5                                       | T1     | 289                            | 8.0     | 0.519               | 9.0                     | LOS A               | 3.2                                  | 23.7          | 0.87            | 0.98                              | 55.7                     |
| 6                                       | R2     | 67                             | 8.0     | 0.519               | 16.1                    | LOS B               | 3.2                                  | 23.7          | 0.87            | 0.98                              | 57.2                     |
| Approach                                |        | 490                            | 8.0     | 0.519               | 9.3                     | LOS A               | 3.2                                  | 23.7          | 0.85            | 0.90                              | 55.9                     |
| North: Henry Hester Drive (north)       |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 7                                       | L2     | 64                             | 8.0     | 0.474               | 5.8                     | LOS A               | 2.1                                  | 15.7          | 0.79            | 0.88                              | 52.8                     |
| 7a                                      | L1     | 40                             | 8.0     | 0.474               | 5.9                     | LOS A               | 2.1                                  | 15.7          | 0.79            | 0.88                              | 54.5                     |
| 9a                                      | R1     | 103                            | 8.0     | 0.474               | 12.0                    | LOS B               | 2.1                                  | 15.7          | 0.79            | 0.88                              | 55.7                     |
| 9                                       | R2     | 81                             | 8.0     | 0.474               | 13.4                    | LOS B               | 2.1                                  | 15.7          | 0.79            | 0.88                              | 57.2                     |
| Approach                                |        | 288                            | 8.0     | 0.474               | 10.1                    | LOS B               | 2.1                                  | 15.7          | 0.79            | 0.88                              | 55.2                     |
| NorthWest: Pacific Motorway off-ramp    |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 27b                                     | L3     | 109                            | 8.0     | 0.367               | 3.5                     | LOS A               | 1.5                                  | 10.9          | 0.52            | 0.36                              | 55.0                     |
| 27a                                     | L1     | 248                            | 8.0     | 0.367               | 3.0                     | LOS A               | 1.5                                  | 10.9          | 0.52            | 0.36                              | 58.3                     |
| 28                                      | T1     | 209                            | 8.0     | 0.608               | 3.6                     | LOS A               | 3.6                                  | 27.2          | 0.66            | 0.66                              | 54.6                     |
| 29                                      | R2     | 1                              | 8.0     | 0.608               | 10.7                    | LOS B               | 3.6                                  | 27.2          | 0.66            | 0.66                              | 56.0                     |
| 29b                                     | R3     | 552                            | 8.0     | 0.608               | 12.1                    | LOS B               | 3.6                                  | 27.2          | 0.66            | 0.66                              | 57.4                     |
| Approach                                |        | 1119                           | 8.0     | 0.608               | 7.7                     | LOS A               | 3.6                                  | 27.2          | 0.62            | 0.57                              | 56.8                     |
| West: Elderslie Road (west)             |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 10                                      | L2     | 72                             | 8.0     | 0.589               | 10.6                    | LOS B               | 7.0                                  | 52.3          | 0.91            | 0.91                              | 52.4                     |
| 11                                      | T1     | 260                            | 8.0     | 0.589               | 10.9                    | LOS B               | 7.0                                  | 52.3          | 0.91            | 0.91                              | 55.4                     |
| 12a                                     | R1     | 187                            | 8.0     | 0.659               | 17.7                    | LOS B               | 6.6                                  | 49.3          | 0.94            | 1.05                              | 50.3                     |
| 12b                                     | R3     | 105                            | 8.0     | 0.659               | 20.5                    | LOS C               | 6.6                                  | 49.3          | 0.94            | 1.05                              | 52.6                     |
| Approach                                |        | 624                            | 8.0     | 0.659               | 14.5                    | LOS B               | 7.0                                  | 52.3          | 0.92            | 0.98                              | 52.9                     |
| All Vehicles                            |        | 2747                           | 8.0     | 0.659               | 9.9                     | LOS A               | 7.0                                  | 52.3          | 0.76            | 0.77                              | 55.5                     |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 14 2020PM east without

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
|-----------------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Flows Total veh/h | 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 per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 21                                      | L2     | 81                       | 8.0  | 1.101         | 209.9             | LOS F            | 63.0                           | 471.2            | 1.00         | 5.01                        | 14.1               |
| 21a                                     | L1     | 301                      | 8.0  | 1.101         | 210.0             | LOS F            | 63.0                           | 471.2            | 1.00         | 5.01                        | 14.2               |
| 23a                                     | R1     | 75                       | 8.0  | 1.101         | 216.1             | LOS F            | 63.0                           | 471.2            | 1.00         | 5.01                        | 14.3               |
| 23b                                     | R3     | 16                       | 8.0  | 1.101         | 218.9             | LOS F            | 63.0                           | 471.2            | 1.00         | 5.01                        | 14.5               |
| Approach                                |        | 473                      | 8.0  | 1.101         | 211.3             | LOS F            | 63.0                           | 471.2            | 1.00         | 5.01                        | 14.2               |
| East: Stapylton Jacobs Well Road (west) |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 4b                                      | L3     | 24                       | 8.0  | 0.345         | 7.7               | LOS A            | 1.8                            | 13.4             | 0.79         | 0.87                        | 52.8               |
| 4a                                      | L1     | 194                      | 8.0  | 0.345         | 8.7               | LOS A            | 1.8                            | 13.4             | 0.79         | 0.87                        | 56.0               |
| 5                                       | T1     | 428                      | 8.0  | 0.616         | 12.8              | LOS B            | 5.6                            | 42.1             | 0.92         | 1.12                        | 53.3               |
| 6                                       | R2     | 94                       | 8.0  | 0.616         | 18.3              | LOS B            | 5.6                            | 42.1             | 0.92         | 1.12                        | 54.6               |
| Approach                                |        | 740                      | 8.0  | 0.616         | 12.3              | LOS B            | 5.6                            | 42.1             | 0.88         | 1.05                        | 54.1               |
| North: Henry Hester Drive (north)       |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 7                                       | L2     | 84                       | 8.0  | 0.508         | 6.4               | LOS A            | 2.5                            | 18.9             | 0.76         | 0.92                        | 52.4               |
| 7a                                      | L1     | 33                       | 8.0  | 0.508         | 6.5               | LOS A            | 2.5                            | 18.9             | 0.76         | 0.92                        | 54.2               |
| 9a                                      | R1     | 130                      | 8.0  | 0.508         | 13.2              | LOS B            | 2.5                            | 18.9             | 0.76         | 0.92                        | 55.4               |
| 9                                       | R2     | 77                       | 8.0  | 0.508         | 14.0              | LOS B            | 2.5                            | 18.9             | 0.76         | 0.92                        | 56.8               |
| Approach                                |        | 324                      | 8.0  | 0.508         | 10.9              | LOS B            | 2.5                            | 18.9             | 0.76         | 0.92                        | 54.8               |
| NorthWest: Pacific Motorway off-ramp    |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 27b                                     | L3     | 84                       | 8.0  | 0.339         | 4.0               | LOS A            | 1.6                            | 12.0             | 0.62         | 0.42                        | 54.5               |
| 27a                                     | L1     | 213                      | 8.0  | 0.339         | 3.6               | LOS A            | 1.6                            | 12.0             | 0.62         | 0.42                        | 57.7               |
| 28                                      | T1     | 61                       | 8.0  | 0.430         | 3.9               | LOS A            | 2.6                            | 19.7             | 0.69         | 0.72                        | 53.6               |
| 29                                      | R2     | 4                        | 8.0  | 0.430         | 11.1              | LOS B            | 2.6                            | 19.7             | 0.69         | 0.72                        | 55.0               |
| 29b                                     | R3     | 412                      | 8.0  | 0.430         | 12.5              | LOS B            | 2.6                            | 19.7             | 0.69         | 0.72                        | 56.3               |
| Approach                                |        | 774                      | 8.0  | 0.430         | 8.5               | LOS A            | 2.6                            | 19.7             | 0.66         | 0.60                        | 56.2               |
| West: Elderslie Road (west)             |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 10                                      | L2     | 89                       | 8.0  | 0.472         | 10.1              | LOS B            | 5.2                            | 39.1             | 0.85         | 0.81                        | 52.7               |
| 11                                      | T1     | 153                      | 8.0  | 0.472         | 10.4              | LOS B            | 5.2                            | 39.1             | 0.85         | 0.81                        | 55.8               |
| 12a                                     | R1     | 72                       | 8.0  | 0.749         | 19.1              | LOS B            | 12.6                           | 94.1             | 0.95         | 0.97                        | 48.8               |
| 12b                                     | R3     | 417                      | 8.0  | 0.749         | 21.9              | LOS C            | 12.6                           | 94.1             | 0.95         | 0.97                        | 50.9               |
| Approach                                |        | 731                      | 8.0  | 0.749         | 17.8              | LOS B            | 12.6                           | 94.1             | 0.91         | 0.92                        | 51.8               |
| All Vehicles                            |        | 3042                     | 8.0  | 1.101         | 43.4              | LOS D            | 63.0                           | 471.2            | 0.84         | 1.51                        | 38.0               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

## MOVEMENT SUMMARY

 Site: Model 17 2023AM east without

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
|-----------------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 21                                      | L2     | 27                       | 8.0  | 0.401         | 8.0               | LOS A            | 2.0                            | 15.3       | 0.78         | 0.90                        | 53.3               |
| 21a                                     | L1     | 161                      | 8.0  | 0.401         | 8.1               | LOS A            | 2.0                            | 15.3       | 0.78         | 0.90                        | 55.1               |
| 23a                                     | R1     | 41                       | 8.0  | 0.401         | 14.2              | LOS B            | 2.0                            | 15.3       | 0.78         | 0.90                        | 56.4               |
| 23b                                     | R3     | 16                       | 8.0  | 0.401         | 17.0              | LOS B            | 2.0                            | 15.3       | 0.78         | 0.90                        | 56.5               |
| Approach                                |        | 245                      | 8.0  | 0.401         | 9.7               | LOS A            | 2.0                            | 15.3       | 0.78         | 0.90                        | 55.4               |
| East: Stapylton Jacobs Well Road (west) |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 4b                                      | L3     | 36                       | 8.0  | 0.352         | 8.2               | LOS A            | 1.3                            | 10.0       | 0.86         | 0.85                        | 52.8               |
| 4a                                      | L1     | 110                      | 8.0  | 0.352         | 7.8               | LOS A            | 1.3                            | 10.0       | 0.86         | 0.85                        | 55.9               |
| 5                                       | T1     | 315                      | 8.0  | 0.698         | 13.4              | LOS B            | 4.5                            | 33.9       | 0.93         | 1.11                        | 52.6               |
| 6                                       | R2     | 73                       | 8.0  | 0.698         | 20.5              | LOS C            | 4.5                            | 33.9       | 0.93         | 1.11                        | 53.9               |
| Approach                                |        | 534                      | 8.0  | 0.698         | 12.9              | LOS B            | 4.5                            | 33.9       | 0.91         | 1.04                        | 53.4               |
| North: Henry Hester Drive (north)       |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 7                                       | L2     | 70                       | 8.0  | 0.581         | 7.7               | LOS A            | 2.9                            | 21.8       | 0.85         | 0.98                        | 51.7               |
| 7a                                      | L1     | 44                       | 8.0  | 0.581         | 7.8               | LOS A            | 2.9                            | 21.8       | 0.85         | 0.98                        | 53.4               |
| 9a                                      | R1     | 112                      | 8.0  | 0.581         | 13.9              | LOS B            | 2.9                            | 21.8       | 0.85         | 0.98                        | 54.6               |
| 9                                       | R2     | 88                       | 8.0  | 0.581         | 15.3              | LOS B            | 2.9                            | 21.8       | 0.85         | 0.98                        | 55.9               |
| Approach                                |        | 314                      | 8.0  | 0.581         | 12.0              | LOS B            | 2.9                            | 21.8       | 0.85         | 0.98                        | 54.1               |
| NorthWest: Pacific Motorway off-ramp    |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 27b                                     | L3     | 119                      | 8.0  | 0.417         | 3.8               | LOS A            | 2.0                            | 14.7       | 0.60         | 0.41                        | 54.6               |
| 27a                                     | L1     | 270                      | 8.0  | 0.417         | 3.4               | LOS A            | 2.0                            | 14.7       | 0.60         | 0.41                        | 57.9               |
| 28                                      | T1     | 228                      | 8.0  | 0.687         | 4.4               | LOS A            | 5.4                            | 40.0       | 0.77         | 0.75                        | 54.2               |
| 29                                      | R2     | 1                        | 8.0  | 0.687         | 11.5              | LOS B            | 5.4                            | 40.0       | 0.77         | 0.75                        | 55.6               |
| 29b                                     | R3     | 602                      | 8.0  | 0.687         | 13.0              | LOS B            | 5.4                            | 40.0       | 0.77         | 0.75                        | 57.0               |
| Approach                                |        | 1220                     | 8.0  | 0.687         | 8.3               | LOS A            | 5.4                            | 40.0       | 0.72         | 0.64                        | 56.4               |
| West: Elderslie Road (west)             |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 10                                      | L2     | 78                       | 8.0  | 0.542         | 9.7               | LOS A            | 7.5                            | 56.4       | 0.87         | 0.76                        | 53.0               |
| 11                                      | T1     | 283                      | 8.0  | 0.542         | 10.0              | LOS A            | 7.5                            | 56.4       | 0.87         | 0.76                        | 56.1               |
| 12a                                     | R1     | 204                      | 8.0  | 0.609         | 16.6              | LOS B            | 7.1                            | 53.2       | 0.89         | 0.94                        | 50.9               |
| 12b                                     | R3     | 114                      | 8.0  | 0.609         | 19.5              | LOS B            | 7.1                            | 53.2       | 0.89         | 0.94                        | 53.3               |
| Approach                                |        | 679                      | 8.0  | 0.609         | 13.5              | LOS B            | 7.5                            | 56.4       | 0.88         | 0.85                        | 53.6               |
| All Vehicles                            |        | 2992                     | 8.0  | 0.698         | 10.8              | LOS B            | 7.5                            | 56.4       | 0.81         | 0.81                        | 54.9               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

## MOVEMENT SUMMARY

 Site: Model 18 2023PM east without

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
|-----------------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Flows Total veh/h | 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 per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 21                                      | L2     | 88                       | 8.0  | 1.378         | 696.0             | LOS F            | 182.4                          | 1364.1           | 1.00         | 11.03                       | 5.1                |
| 21a                                     | L1     | 328                      | 8.0  | 1.378         | 696.1             | LOS F            | 182.4                          | 1364.1           | 1.00         | 11.03                       | 5.1                |
| 23a                                     | R1     | 82                       | 8.0  | 1.378         | 702.2             | LOS F            | 182.4                          | 1364.1           | 1.00         | 11.03                       | 5.1                |
| 23b                                     | R3     | 17                       | 8.0  | 1.378         | 705.0             | LOS F            | 182.4                          | 1364.1           | 1.00         | 11.03                       | 5.1                |
| Approach                                |        | 515                      | 8.0  | 1.378         | 697.4             | LOS F            | 182.4                          | 1364.1           | 1.00         | 11.03                       | 5.1                |
| East: Stapylton Jacobs Well Road (west) |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 4b                                      | L3     | 26                       | 8.0  | 0.414         | 9.2               | LOS A            | 2.3                            | 17.1             | 0.82         | 0.93                        | 51.6               |
| 4a                                      | L1     | 211                      | 8.0  | 0.414         | 10.5              | LOS B            | 2.3                            | 17.1             | 0.82         | 0.93                        | 54.6               |
| 5                                       | T1     | 467                      | 8.0  | 0.742         | 19.4              | LOS B            | 8.5                            | 63.7             | 0.97         | 1.31                        | 49.0               |
| 6                                       | R2     | 102                      | 8.0  | 0.742         | 24.7              | LOS C            | 8.5                            | 63.7             | 0.97         | 1.31                        | 50.1               |
| Approach                                |        | 806                      | 8.0  | 0.742         | 17.4              | LOS B            | 8.5                            | 63.7             | 0.93         | 1.20                        | 50.5               |
| North: Henry Hester Drive (north)       |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 7                                       | L2     | 92                       | 8.0  | 0.599         | 8.0               | LOS A            | 3.3                            | 24.4             | 0.82         | 1.00                        | 51.2               |
| 7a                                      | L1     | 36                       | 8.0  | 0.599         | 8.1               | LOS A            | 3.3                            | 24.4             | 0.82         | 1.00                        | 52.9               |
| 9a                                      | R1     | 142                      | 8.0  | 0.599         | 15.7              | LOS B            | 3.3                            | 24.4             | 0.82         | 1.00                        | 54.0               |
| 9                                       | R2     | 84                       | 8.0  | 0.599         | 15.6              | LOS B            | 3.3                            | 24.4             | 0.82         | 1.00                        | 55.3               |
| Approach                                |        | 354                      | 8.0  | 0.599         | 12.9              | LOS B            | 3.3                            | 24.4             | 0.82         | 1.00                        | 53.4               |
| NorthWest: Pacific Motorway off-ramp    |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 27b                                     | L3     | 92                       | 8.0  | 0.386         | 4.3               | LOS A            | 2.0                            | 14.8             | 0.67         | 0.46                        | 54.3               |
| 27a                                     | L1     | 232                      | 8.0  | 0.386         | 3.9               | LOS A            | 2.0                            | 14.8             | 0.67         | 0.46                        | 57.4               |
| 28                                      | T1     | 67                       | 8.0  | 0.489         | 4.4               | LOS A            | 3.3                            | 24.9             | 0.75         | 0.75                        | 53.4               |
| 29                                      | R2     | 4                        | 8.0  | 0.489         | 11.5              | LOS B            | 3.3                            | 24.9             | 0.75         | 0.75                        | 54.7               |
| 29b                                     | R3     | 450                      | 8.0  | 0.489         | 12.9              | LOS B            | 3.3                            | 24.9             | 0.75         | 0.75                        | 56.0               |
| Approach                                |        | 845                      | 8.0  | 0.489         | 8.8               | LOS A            | 3.3                            | 24.9             | 0.72         | 0.64                        | 56.0               |
| West: Elderslie Road (west)             |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 10                                      | L2     | 97                       | 8.0  | 0.480         | 9.9               | LOS A            | 5.8                            | 43.2             | 0.83         | 0.77                        | 52.9               |
| 11                                      | T1     | 167                      | 8.0  | 0.480         | 10.2              | LOS B            | 5.8                            | 43.2             | 0.83         | 0.77                        | 55.9               |
| 12a                                     | R1     | 78                       | 8.0  | 0.763         | 19.3              | LOS B            | 14.2                           | 106.1            | 0.95         | 0.95                        | 48.7               |
| 12b                                     | R3     | 455                      | 8.0  | 0.763         | 22.2              | LOS C            | 14.2                           | 106.1            | 0.95         | 0.95                        | 50.8               |
| Approach                                |        | 797                      | 8.0  | 0.763         | 17.9              | LOS B            | 14.2                           | 106.1            | 0.91         | 0.89                        | 51.7               |
| All Vehicles                            |        | 3317                     | 8.0  | 1.378         | 120.4             | LOS F            | 182.4                          | 1364.1           | 0.87         | 2.48                        | 21.9               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

## MOVEMENT SUMMARY

 **Site: Model 3 2020AM west stage 1 - ACTUAL**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
|---------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 21                                    | L2     | 346                | 8.0        | 0.888         | 61.6              | LOS E            | 42.8                     | 320.3            | 1.00         | 1.85                        | 30.3               |
| 22                                    | T1     | 99                 | 8.0        | 0.888         | 56.0              | LOS E            | 42.8                     | 320.3            | 1.00         | 1.85                        | 31.0               |
| 23a                                   | R1     | 1                  | 8.0        | 0.888         | 62.1              | LOS E            | 42.8                     | 320.3            | 1.00         | 1.85                        | 31.0               |
| 23b                                   | R3     | 286                | 8.0        | 0.888         | 69.9              | LOS E            | 42.8                     | 320.3            | 1.00         | 1.85                        | 31.7               |
| Approach                              |        | 732                | 8.0        | 0.888         | 64.1              | LOS E            | 42.8                     | 320.3            | 1.00         | 1.85                        | 30.9               |
| East: Elderslie Road (east)           |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 4a                                    | L1     | 695                | 8.0        | 0.905         | 30.6              | LOS C            | 46.2                     | 345.6            | 1.00         | 0.91                        | 41.3               |
| 6a                                    | R1     | 107                | 8.0        | 0.905         | 37.0              | LOS D            | 46.2                     | 345.6            | 1.00         | 0.91                        | 41.7               |
| 3                                     | R2     | 296                | 8.0        | 0.430         | 19.0              | LOS B            | 9.8                      | 73.4             | 0.74         | 0.61                        | 49.7               |
| Approach                              |        | 1098               | 8.0        | 0.905         | 28.1              | LOS C            | 46.2                     | 345.6            | 0.93         | 0.83                        | 43.4               |
| NorthWest: Old Pacific Highway (West) |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 27b                                   | L3     | 43                 | 8.0        | 0.267         | 7.1               | LOS A            | 1.4                      | 10.2             | 0.73         | 0.79                        | 52.5               |
| 27a                                   | L1     | 96                 | 8.0        | 0.267         | 6.0               | LOS A            | 1.4                      | 10.2             | 0.73         | 0.79                        | 54.9               |
| 29                                    | R2     | 49                 | 8.0        | 0.267         | 13.8              | LOS B            | 1.4                      | 10.2             | 0.73         | 0.79                        | 56.9               |
| Approach                              |        | 188                | 8.0        | 0.267         | 8.3               | LOS A            | 1.4                      | 10.2             | 0.73         | 0.79                        | 54.8               |
| SouthWest: Elderslie Road (south)     |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 30                                    | L2     | 76                 | 8.0        | 0.365         | 4.9               | LOS A            | 2.4                      | 18.0             | 0.70         | 0.49                        | 54.9               |
| 30a                                   | L1     | 367                | 8.0        | 0.365         | 4.1               | LOS A            | 2.4                      | 18.0             | 0.70         | 0.53                        | 56.0               |
| 32a                                   | R1     | 253                | 8.0        | 0.365         | 10.9              | LOS B            | 2.2                      | 16.7             | 0.71         | 0.75                        | 54.1               |
| Approach                              |        | 696                | 8.0        | 0.365         | 6.6               | LOS A            | 2.4                      | 18.0             | 0.70         | 0.61                        | 55.2               |
| All Vehicles                          |        | 2714               | 8.0        | 0.905         | 30.9              | LOS C            | 46.2                     | 345.6            | 0.88         | 1.05                        | 41.7               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 4 2020PM west stage 1 - ACTUAL

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
|---------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 21                                    | L2     | 59                 | 8.0        | 0.374         | 6.7               | LOS A            | 2.5                      | 18.9             | 0.77         | 0.76                        | 51.9               |
| 22                                    | T1     | 102                | 8.0        | 0.374         | 6.2               | LOS A            | 2.5                      | 18.9             | 0.77         | 0.76                        | 53.9               |
| 23a                                   | R1     | 1                  | 8.0        | 0.374         | 12.3              | LOS B            | 2.5                      | 18.9             | 0.77         | 0.76                        | 53.9               |
| 23b                                   | R3     | 148                | 8.0        | 0.374         | 15.0              | LOS B            | 2.5                      | 18.9             | 0.77         | 0.76                        | 56.0               |
| Approach                              |        | 310                | 8.0        | 0.374         | 10.5              | LOS B            | 2.5                      | 18.9             | 0.77         | 0.76                        | 54.5               |
| East: Elderslie Road (east)           |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 4a                                    | L1     | 523                | 8.0        | 0.652         | 8.6               | LOS A            | 15.9                     | 119.0            | 0.79         | 0.59                        | 54.0               |
| 6a                                    | R1     | 112                | 8.0        | 0.652         | 15.1              | LOS B            | 15.9                     | 119.0            | 0.79         | 0.59                        | 54.8               |
| 3                                     | R2     | 609                | 8.0        | 0.764         | 20.0              | LOS C            | 18.3                     | 137.1            | 0.87         | 0.82                        | 49.1               |
| Approach                              |        | 1244               | 8.0        | 0.764         | 14.8              | LOS B            | 18.3                     | 137.1            | 0.83         | 0.70                        | 51.5               |
| NorthWest: Old Pacific Highway (West) |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 27b                                   | L3     | 93                 | 8.0        | 0.681         | 18.7              | LOS B            | 4.0                      | 29.8             | 0.92         | 1.11                        | 45.7               |
| 27a                                   | L1     | 128                | 8.0        | 0.681         | 17.7              | LOS B            | 4.0                      | 29.8             | 0.92         | 1.11                        | 47.5               |
| 29                                    | R2     | 43                 | 8.0        | 0.681         | 25.4              | LOS C            | 4.0                      | 29.8             | 0.92         | 1.11                        | 49.0               |
| Approach                              |        | 264                | 8.0        | 0.681         | 19.3              | LOS B            | 4.0                      | 29.8             | 0.92         | 1.11                        | 47.1               |
| SouthWest: Elderslie Road (south)     |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 30                                    | L2     | 24                 | 8.0        | 0.620         | 9.6               | LOS A            | 6.9                      | 51.5             | 0.94         | 0.93                        | 53.2               |
| 30a                                   | L1     | 596                | 8.0        | 0.620         | 8.8               | LOS A            | 6.9                      | 51.5             | 0.93         | 0.94                        | 54.4               |
| 32a                                   | R1     | 411                | 8.0        | 0.620         | 15.2              | LOS B            | 5.6                      | 41.6             | 0.89         | 1.01                        | 51.4               |
| Approach                              |        | 1031               | 8.0        | 0.620         | 11.3              | LOS B            | 6.9                      | 51.5             | 0.92         | 0.97                        | 53.1               |
| All Vehicles                          |        | 2849               | 8.0        | 0.764         | 13.5              | LOS B            | 18.3                     | 137.1            | 0.86         | 0.84                        | 51.9               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

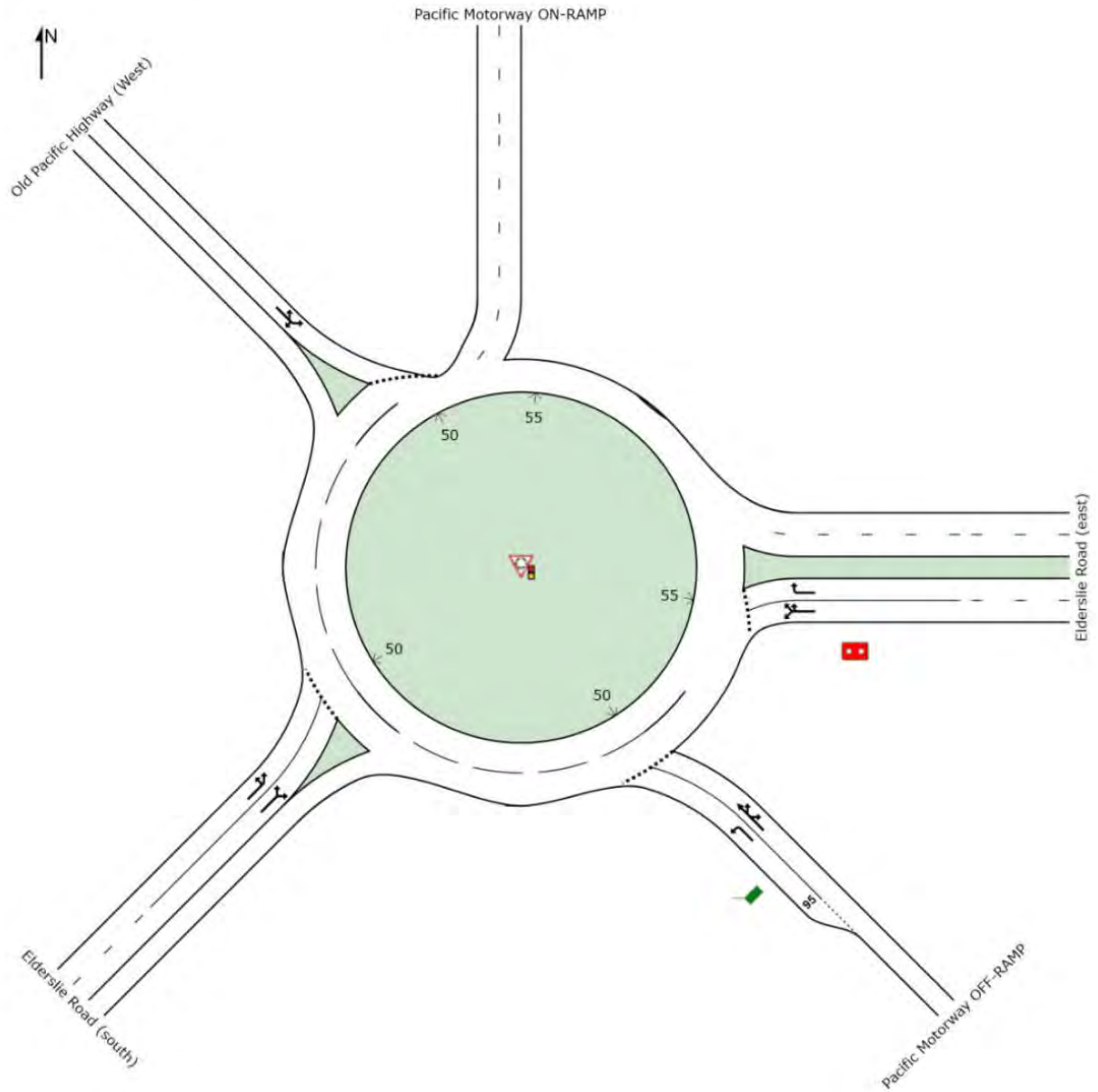
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

## UPGRADE B - WESTERN ROUNDABOUT LAYOUT

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering



## MOVEMENT SUMMARY

 **Site: Model 37 2020AM west stage 2 UPGRADED - ACTUAL**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
|---------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | 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 per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 21                                    | L2     | 346                | 8.0        | 0.491         | 10.9              | LOS B            | 4.1                            | 31.0             | 0.87         | 0.90                        | 51.5               |
| 22                                    | T1     | 99                 | 8.0        | 0.504         | 10.0              | LOS A            | 5.1                            | 37.9             | 0.93         | 0.86                        | 50.3               |
| 23a                                   | R1     | 1                  | 8.0        | 0.504         | 16.0              | LOS B            | 5.1                            | 37.9             | 0.93         | 0.86                        | 50.2               |
| 23b                                   | R3     | 344                | 8.0        | 0.504         | 18.7              | LOS B            | 5.1                            | 37.9             | 0.93         | 0.86                        | 52.0               |
| Approach                              |        | 790                | 8.0        | 0.504         | 14.2              | LOS B            | 5.1                            | 37.9             | 0.91         | 0.88                        | 51.6               |
| East: Elderslie Road (east)           |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 4a                                    | L1     | 705                | 8.0        | 0.778         | 11.9              | LOS B            | 25.9                           | 194.1            | 0.86         | 0.67                        | 51.8               |
| 6a                                    | R1     | 109                | 8.0        | 0.778         | 18.3              | LOS B            | 25.9                           | 194.1            | 0.86         | 0.67                        | 52.5               |
| 3                                     | R2     | 328                | 8.0        | 0.401         | 14.6              | LOS B            | 6.9                            | 51.8             | 0.65         | 0.63                        | 52.5               |
| Approach                              |        | 1142               | 8.0        | 0.778         | 13.3              | LOS B            | 25.9                           | 194.1            | 0.80         | 0.66                        | 52.1               |
| NorthWest: Old Pacific Highway (West) |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 27b                                   | L3     | 43                 | 8.0        | 0.304         | 8.7               | LOS A            | 1.6                            | 12.1             | 0.79         | 0.87                        | 51.6               |
| 27a                                   | L1     | 100                | 8.0        | 0.304         | 7.6               | LOS A            | 1.6                            | 12.1             | 0.79         | 0.87                        | 54.0               |
| 29                                    | R2     | 49                 | 8.0        | 0.304         | 15.4              | LOS B            | 1.6                            | 12.1             | 0.79         | 0.87                        | 55.9               |
| Approach                              |        | 192                | 8.0        | 0.304         | 9.9               | LOS A            | 1.6                            | 12.1             | 0.79         | 0.87                        | 53.9               |
| SouthWest: Elderslie Road (south)     |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 30                                    | L2     | 76                 | 8.0        | 0.393         | 4.9               | LOS A            | 2.3                            | 17.4             | 0.71         | 0.50                        | 54.9               |
| 30a                                   | L1     | 367                | 8.0        | 0.393         | 4.1               | LOS A            | 2.3                            | 17.4             | 0.71         | 0.53                        | 56.1               |
| 32a                                   | R1     | 271                | 8.0        | 0.393         | 11.2              | LOS B            | 2.2                            | 16.2             | 0.71         | 0.81                        | 53.8               |
| Approach                              |        | 714                | 8.0        | 0.393         | 6.9               | LOS A            | 2.3                            | 17.4             | 0.71         | 0.63                        | 55.1               |
| All Vehicles                          |        | 2838               | 8.0        | 0.778         | 11.7              | LOS B            | 25.9                           | 194.1            | 0.81         | 0.73                        | 52.8               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 38 2020PM west stage 2 UPGRADED - ACTUAL**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
|---------------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | Demand Flows Total veh/h | 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 per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 21                                    | L2     | 59                       | 8.0  | 0.085         | 6.8               | LOS A            | 0.5                            | 3.4              | 0.67         | 0.64                        | 54.6               |
| 22                                    | T1     | 102                      | 8.0  | 0.287         | 6.9               | LOS A            | 2.3                            | 17.0             | 0.81         | 0.74                        | 52.8               |
| 23a                                   | R1     | 1                        | 8.0  | 0.287         | 12.9              | LOS B            | 2.3                            | 17.0             | 0.81         | 0.74                        | 52.7               |
| 23b                                   | R3     | 166                      | 8.0  | 0.287         | 15.6              | LOS B            | 2.3                            | 17.0             | 0.81         | 0.74                        | 54.7               |
| Approach                              |        | 328                      | 8.0  | 0.287         | 11.3              | LOS B            | 2.3                            | 17.0             | 0.79         | 0.72                        | 54.1               |
| East: Elderslie Road (east)           |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 4a                                    | L1     | 545                      | 8.0  | 0.781         | 12.8              | LOS B            | 21.1                           | 157.8            | 0.86         | 0.75                        | 51.0               |
| 6a                                    | R1     | 116                      | 8.0  | 0.781         | 19.2              | LOS B            | 21.1                           | 157.8            | 0.86         | 0.75                        | 51.7               |
| 3                                     | R2     | 681                      | 8.0  | 0.660         | 16.2              | LOS B            | 17.5                           | 131.0            | 0.77         | 0.63                        | 51.5               |
| Approach                              |        | 1342                     | 8.0  | 0.781         | 15.1              | LOS B            | 21.1                           | 157.8            | 0.81         | 0.69                        | 51.3               |
| NorthWest: Old Pacific Highway (West) |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 27b                                   | L3     | 93                       | 8.0  | 0.782         | 29.0              | LOS C            | 5.1                            | 38.3             | 0.95         | 1.25                        | 40.5               |
| 27a                                   | L1     | 129                      | 8.0  | 0.782         | 28.3              | LOS C            | 5.1                            | 38.3             | 0.95         | 1.25                        | 42.0               |
| 29                                    | R2     | 43                       | 8.0  | 0.782         | 35.7              | LOS D            | 5.1                            | 38.3             | 0.95         | 1.25                        | 43.1               |
| Approach                              |        | 265                      | 8.0  | 0.782         | 29.8              | LOS C            | 5.1                            | 38.3             | 0.95         | 1.25                        | 41.6               |
| SouthWest: Elderslie Road (south)     |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 30                                    | L2     | 24                       | 8.0  | 0.657         | 12.2              | LOS B            | 8.2                            | 61.1             | 0.98         | 1.02                        | 51.3               |
| 30a                                   | L1     | 596                      | 8.0  | 0.657         | 11.4              | LOS B            | 8.2                            | 61.1             | 0.98         | 1.03                        | 52.4               |
| 32a                                   | R1     | 416                      | 8.0  | 0.657         | 18.8              | LOS B            | 6.8                            | 50.7             | 0.94         | 1.09                        | 49.1               |
| Approach                              |        | 1036                     | 8.0  | 0.657         | 14.4              | LOS B            | 8.2                            | 61.1             | 0.96         | 1.05                        | 51.0               |
| All Vehicles                          |        | 2971                     | 8.0  | 0.782         | 15.7              | LOS B            | 21.1                           | 157.8            | 0.88         | 0.87                        | 50.5               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 11 2023AM west full dev UPGRADED - ACTUAL**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
|---------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | 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 per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 21                                    | L2     | 377                | 8.0        | 0.585         | 16.0              | LOS B            | 6.2                            | 46.4             | 0.96         | 1.05                        | 48.1               |
| 22                                    | T1     | 108                | 8.0        | 0.627         | 17.0              | LOS B            | 9.0                            | 67.2             | 1.00         | 1.05                        | 46.1               |
| 23a                                   | R1     | 1                  | 8.0        | 0.627         | 23.1              | LOS C            | 9.0                            | 67.2             | 1.00         | 1.05                        | 46.1               |
| 23b                                   | R3     | 398                | 8.0        | 0.627         | 25.8              | LOS C            | 9.0                            | 67.2             | 1.00         | 1.05                        | 47.6               |
| Approach                              |        | 884                | 8.0        | 0.627         | 20.6              | LOS C            | 9.0                            | 67.2             | 0.98         | 1.05                        | 47.6               |
| East: Elderslie Road (east)           |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 4a                                    | L1     | 773                | 8.0        | 0.814         | 13.7              | LOS B            | 31.9                           | 238.7            | 0.88         | 0.68                        | 50.5               |
| 6a                                    | R1     | 120                | 8.0        | 0.814         | 20.1              | LOS C            | 31.9                           | 238.7            | 0.88         | 0.68                        | 51.2               |
| 3                                     | R2     | 373                | 8.0        | 0.434         | 14.5              | LOS B            | 8.2                            | 61.2             | 0.64         | 0.62                        | 52.6               |
| Approach                              |        | 1266               | 8.0        | 0.814         | 14.5              | LOS B            | 31.9                           | 238.7            | 0.81         | 0.66                        | 51.2               |
| NorthWest: Old Pacific Highway (West) |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 27b                                   | L3     | 52                 | 8.0        | 0.359         | 10.0              | LOS B            | 2.1                            | 15.5             | 0.83         | 0.92                        | 50.7               |
| 27a                                   | L1     | 105                | 8.0        | 0.359         | 8.9               | LOS A            | 2.1                            | 15.5             | 0.83         | 0.92                        | 53.0               |
| 29                                    | R2     | 53                 | 8.0        | 0.359         | 16.7              | LOS B            | 2.1                            | 15.5             | 0.83         | 0.92                        | 54.8               |
| Approach                              |        | 210                | 8.0        | 0.359         | 11.2              | LOS B            | 2.1                            | 15.5             | 0.83         | 0.92                        | 52.8               |
| SouthWest: Elderslie Road (south)     |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 30                                    | L2     | 83                 | 8.0        | 0.453         | 5.6               | LOS A            | 3.0                            | 22.3             | 0.76         | 0.60                        | 54.6               |
| 30a                                   | L1     | 400                | 8.0        | 0.453         | 4.8               | LOS A            | 3.0                            | 22.3             | 0.76         | 0.62                        | 55.8               |
| 32a                                   | R1     | 299                | 8.0        | 0.453         | 11.9              | LOS B            | 2.7                            | 20.3             | 0.76         | 0.89                        | 53.6               |
| Approach                              |        | 782                | 8.0        | 0.453         | 7.6               | LOS A            | 3.0                            | 22.3             | 0.76         | 0.72                        | 54.8               |
| All Vehicles                          |        | 3142               | 8.0        | 0.814         | 14.3              | LOS B            | 31.9                           | 238.7            | 0.85         | 0.80                        | 51.1               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 12 2023PM west full dev UPGRADED - ACTUAL**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|---------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | 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 per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 21                                    | L2     | 64                 | 8.0        | 0.107         | 7.3               | LOS A            | 0.5                            | 4.0        | 0.68         | 0.69                        | 54.2               |
| 22                                    | T1     | 111                | 8.0        | 0.354         | 7.5               | LOS A            | 2.8                            | 20.7       | 0.86         | 0.80                        | 52.4               |
| 23a                                   | R1     | 1                  | 8.0        | 0.354         | 13.6              | LOS B            | 2.8                            | 20.7       | 0.86         | 0.80                        | 52.3               |
| 23b                                   | R3     | 185                | 8.0        | 0.354         | 16.3              | LOS B            | 2.8                            | 20.7       | 0.86         | 0.80                        | 54.3               |
| Approach                              |        | 361                | 8.0        | 0.354         | 12.0              | LOS B            | 2.8                            | 20.7       | 0.83         | 0.78                        | 53.7               |
| East: Elderslie Road (east)           |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4a                                    | L1     | 593                | 8.0        | 0.785         | 12.2              | LOS B            | 25.2                           | 188.6      | 0.87         | 0.71                        | 51.0               |
| 6a                                    | R1     | 127                | 8.0        | 0.785         | 18.6              | LOS B            | 25.2                           | 188.6      | 0.87         | 0.71                        | 51.6               |
| 3                                     | R2     | 739                | 8.0        | 0.785         | 20.8              | LOS C            | 25.2                           | 188.6      | 0.87         | 0.80                        | 49.0               |
| Approach                              |        | 1459               | 8.0        | 0.785         | 17.1              | LOS B            | 25.2                           | 188.6      | 0.87         | 0.75                        | 50.0               |
| NorthWest: Old Pacific Highway (West) |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 27b                                   | L3     | 103                | 8.0        | 0.855         | 34.9              | LOS C            | 6.6                            | 49.0       | 0.97         | 1.36                        | 38.2               |
| 27a                                   | L1     | 140                | 8.0        | 0.855         | 33.8              | LOS C            | 6.6                            | 49.0       | 0.97         | 1.36                        | 39.5               |
| 29                                    | R2     | 47                 | 8.0        | 0.855         | 41.6              | LOS D            | 6.6                            | 49.0       | 0.97         | 1.36                        | 40.5               |
| Approach                              |        | 290                | 8.0        | 0.855         | 35.5              | LOS D            | 6.6                            | 49.0       | 0.97         | 1.36                        | 39.2               |
| SouthWest: Elderslie Road (south)     |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 30                                    | L2     | 26                 | 8.0        | 0.744         | 14.4              | LOS B            | 10.7                           | 80.3       | 1.00         | 1.12                        | 49.8               |
| 30a                                   | L1     | 650                | 8.0        | 0.744         | 13.6              | LOS B            | 10.7                           | 80.3       | 1.00         | 1.13                        | 50.9               |
| 32a                                   | R1     | 456                | 8.0        | 0.744         | 20.4              | LOS C            | 8.5                            | 63.3       | 0.99         | 1.19                        | 48.1               |
| Approach                              |        | 1132               | 8.0        | 0.744         | 16.3              | LOS B            | 10.7                           | 80.3       | 0.99         | 1.15                        | 49.7               |
| All Vehicles                          |        | 3242               | 8.0        | 0.855         | 17.9              | LOS B            | 25.2                           | 188.6      | 0.92         | 0.95                        | 49.1               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

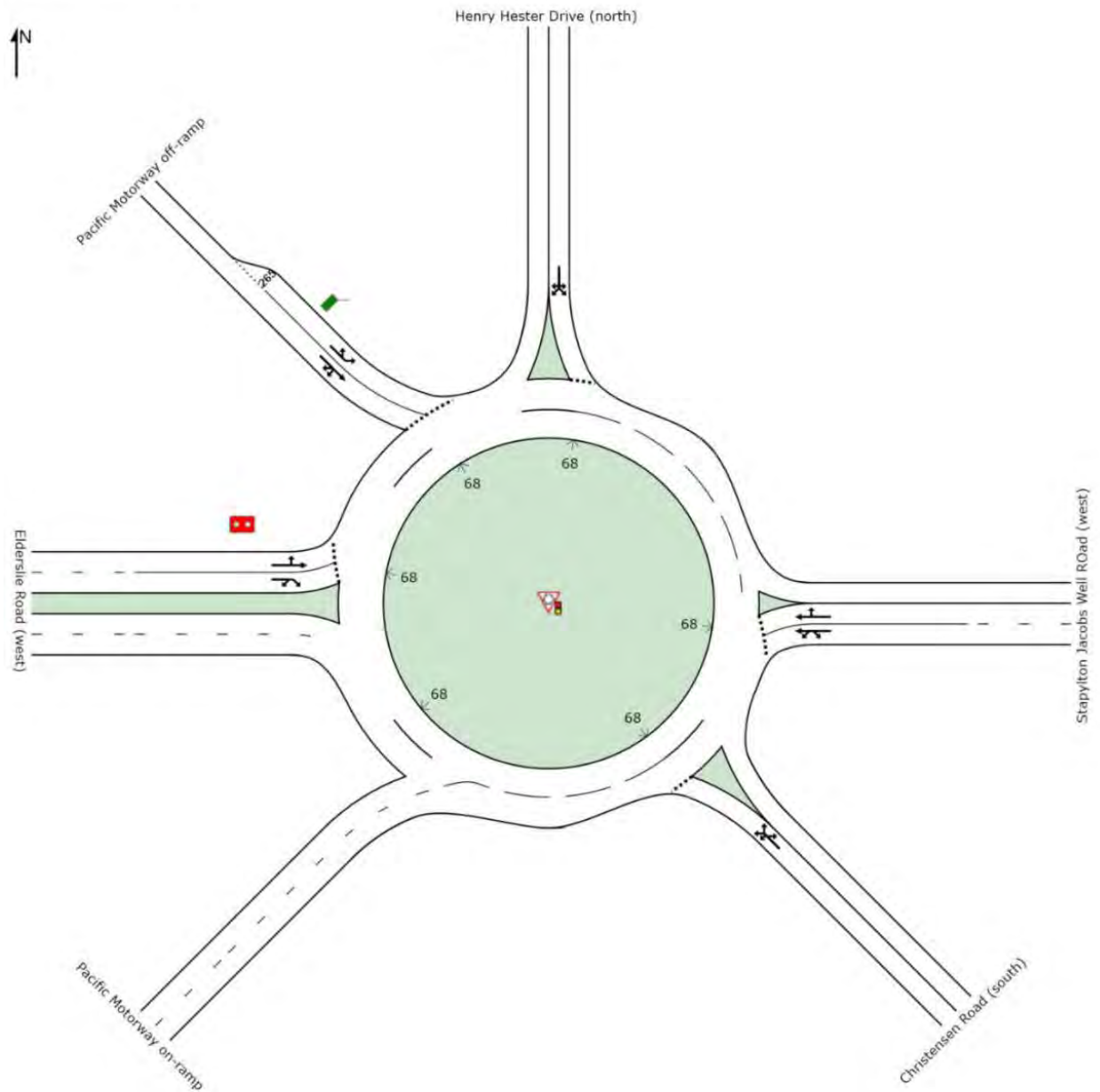
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

## UPGRADE A – EASTERN ROUNDABOUT

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering



## MOVEMENT SUMMARY

 Site: Model 21 2020AM east stage 1 UPGRADE A - ACTUAL

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
|-----------------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 21                                      | L2     | 25                       | 8.0  | 0.322         | 5.8               | LOS A            | 1.4                            | 10.6       | 0.71         | 0.71                        | 54.0               |
| 21a                                     | L1     | 148                      | 8.0  | 0.322         | 5.9               | LOS A            | 1.4                            | 10.6       | 0.71         | 0.71                        | 55.9               |
| 23a                                     | R1     | 38                       | 8.0  | 0.322         | 12.0              | LOS B            | 1.4                            | 10.6       | 0.71         | 0.71                        | 57.2               |
| 23b                                     | R3     | 19                       | 8.0  | 0.322         | 14.8              | LOS B            | 1.4                            | 10.6       | 0.71         | 0.71                        | 60.4               |
| Approach                                |        | 230                      | 8.0  | 0.322         | 7.6               | LOS A            | 1.4                            | 10.6       | 0.71         | 0.71                        | 56.3               |
| East: Stapylton Jacobs Well Road (west) |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 4b                                      | L3     | 37                       | 8.0  | 0.457         | 7.6               | LOS A            | 2.3                            | 17.5       | 0.83         | 0.80                        | 52.9               |
| 4a                                      | L1     | 115                      | 8.0  | 0.457         | 7.2               | LOS A            | 2.3                            | 17.5       | 0.83         | 0.80                        | 56.0               |
| 5                                       | T1     | 307                      | 8.0  | 0.457         | 7.4               | LOS A            | 2.3                            | 17.5       | 0.84         | 0.81                        | 56.4               |
| 6                                       | R2     | 68                       | 8.0  | 0.457         | 14.2              | LOS B            | 1.5                            | 11.3       | 0.85         | 0.81                        | 56.9               |
| Approach                                |        | 527                      | 8.0  | 0.457         | 8.2               | LOS A            | 2.3                            | 17.5       | 0.84         | 0.81                        | 56.1               |
| North: Henry Hester Drive (north)       |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 7                                       | L2     | 67                       | 8.0  | 0.480         | 5.7               | LOS A            | 2.1                            | 16.0       | 0.79         | 0.87                        | 52.8               |
| 7a                                      | L1     | 40                       | 8.0  | 0.480         | 5.8               | LOS A            | 2.1                            | 16.0       | 0.79         | 0.87                        | 54.5               |
| 9a                                      | R1     | 103                      | 8.0  | 0.480         | 11.9              | LOS B            | 2.1                            | 16.0       | 0.79         | 0.87                        | 55.7               |
| 9                                       | R2     | 81                       | 8.0  | 0.480         | 13.4              | LOS B            | 2.1                            | 16.0       | 0.79         | 0.87                        | 57.2               |
| Approach                                |        | 291                      | 8.0  | 0.480         | 10.1              | LOS B            | 2.1                            | 16.0       | 0.79         | 0.87                        | 55.2               |
| NorthWest: Pacific Motorway off-ramp    |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 27b                                     | L3     | 109                      | 8.0  | 0.395         | 3.5               | LOS A            | 1.6                            | 12.1       | 0.54         | 0.37                        | 54.9               |
| 27a                                     | L1     | 270                      | 8.0  | 0.395         | 3.1               | LOS A            | 1.6                            | 12.1       | 0.54         | 0.37                        | 58.2               |
| 28                                      | T1     | 209                      | 8.0  | 0.621         | 3.6               | LOS A            | 3.8                            | 28.1       | 0.68         | 0.67                        | 54.5               |
| 29                                      | R2     | 1                        | 8.0  | 0.621         | 10.8              | LOS B            | 3.8                            | 28.1       | 0.68         | 0.67                        | 56.0               |
| 29b                                     | R3     | 552                      | 8.0  | 0.621         | 12.2              | LOS B            | 3.8                            | 28.1       | 0.68         | 0.67                        | 57.3               |
| Approach                                |        | 1141                     | 8.0  | 0.621         | 7.7               | LOS A            | 3.8                            | 28.1       | 0.64         | 0.57                        | 56.7               |
| West: Elderslie Road (west)             |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 10                                      | L2     | 72                       | 8.0  | 0.650         | 11.2              | LOS B            | 8.0                            | 59.7       | 0.93         | 0.96                        | 52.0               |
| 11                                      | T1     | 292                      | 8.0  | 0.650         | 11.5              | LOS B            | 8.0                            | 59.7       | 0.93         | 0.96                        | 54.9               |
| 12a                                     | R1     | 187                      | 8.0  | 0.666         | 17.8              | LOS B            | 6.6                            | 49.6       | 0.94         | 1.06                        | 50.2               |
| 12b                                     | R3     | 105                      | 8.0  | 0.666         | 20.6              | LOS C            | 6.6                            | 49.6       | 0.94         | 1.06                        | 52.5               |
| Approach                                |        | 656                      | 8.0  | 0.666         | 14.7              | LOS B            | 8.0                            | 59.7       | 0.94         | 1.01                        | 52.7               |
| All Vehicles                            |        | 2845                     | 8.0  | 0.666         | 9.6               | LOS A            | 8.0                            | 59.7       | 0.76         | 0.76                        | 55.5               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 22 2020PM east stage 1 UPGRADE A - ACTUAL**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
|-----------------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Flows Total veh/h | 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 per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 21                                      | L2     | 81                       | 8.0  | 1.019         | 81.6              | LOS F            | 26.1                           | 195.6            | 1.00         | 2.75                        | 26.5               |
| 21a                                     | L1     | 301                      | 8.0  | 1.019         | 81.7              | LOS F            | 26.1                           | 195.6            | 1.00         | 2.75                        | 27.0               |
| 23a                                     | R1     | 75                       | 8.0  | 1.019         | 87.8              | LOS F            | 26.1                           | 195.6            | 1.00         | 2.75                        | 27.3               |
| 23b                                     | R3     | 25                       | 8.0  | 1.019         | 90.7              | LOS F            | 26.1                           | 195.6            | 1.00         | 2.75                        | 28.0               |
| Approach                                |        | 482                      | 8.0  | 1.019         | 83.1              | LOS F            | 26.1                           | 195.6            | 1.00         | 2.75                        | 27.0               |
| East: Stapylton Jacobs Well ROad (west) |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 4b                                      | L3     | 33                       | 8.0  | 0.593         | 10.1              | LOS B            | 4.6                            | 34.3             | 0.82         | 1.00                        | 50.8               |
| 4a                                      | L1     | 255                      | 8.0  | 0.593         | 11.5              | LOS B            | 4.6                            | 34.3             | 0.82         | 1.00                        | 53.7               |
| 5                                       | T1     | 468                      | 8.0  | 0.593         | 11.9              | LOS B            | 4.6                            | 34.3             | 0.82         | 1.00                        | 53.9               |
| 6                                       | R2     | 96                       | 8.0  | 0.593         | 19.2              | LOS B            | 3.3                            | 24.7             | 0.83         | 1.00                        | 54.5               |
| Approach                                |        | 852                      | 8.0  | 0.593         | 12.5              | LOS B            | 4.6                            | 34.3             | 0.82         | 1.00                        | 53.8               |
| North: Henry Hester Drive (north)       |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 7                                       | L2     | 85                       | 8.0  | 0.513         | 6.4               | LOS A            | 2.5                            | 19.0             | 0.77         | 0.92                        | 52.4               |
| 7a                                      | L1     | 33                       | 8.0  | 0.513         | 6.5               | LOS A            | 2.5                            | 19.0             | 0.77         | 0.92                        | 54.2               |
| 9a                                      | R1     | 130                      | 8.0  | 0.513         | 13.2              | LOS B            | 2.5                            | 19.0             | 0.77         | 0.92                        | 55.4               |
| 9                                       | R2     | 77                       | 8.0  | 0.513         | 14.0              | LOS B            | 2.5                            | 19.0             | 0.77         | 0.92                        | 56.8               |
| Approach                                |        | 325                      | 8.0  | 0.513         | 11.0              | LOS B            | 2.5                            | 19.0             | 0.77         | 0.92                        | 54.8               |
| NorthWest: Pacific Motorway off-ramp    |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 27b                                     | L3     | 84                       | 8.0  | 0.350         | 4.1               | LOS A            | 1.7                            | 12.5             | 0.63         | 0.42                        | 54.5               |
| 27a                                     | L1     | 220                      | 8.0  | 0.350         | 3.6               | LOS A            | 1.7                            | 12.5             | 0.63         | 0.42                        | 57.7               |
| 28                                      | T1     | 61                       | 8.0  | 0.435         | 4.0               | LOS A            | 2.7                            | 20.1             | 0.69         | 0.72                        | 53.6               |
| 29                                      | R2     | 4                        | 8.0  | 0.435         | 11.2              | LOS B            | 2.7                            | 20.1             | 0.69         | 0.72                        | 54.9               |
| 29b                                     | R3     | 412                      | 8.0  | 0.435         | 12.6              | LOS B            | 2.7                            | 20.1             | 0.69         | 0.72                        | 56.3               |
| Approach                                |        | 781                      | 8.0  | 0.435         | 8.5               | LOS A            | 2.7                            | 20.1             | 0.67         | 0.61                        | 56.2               |
| West: Elderslie Road (west)             |        |                          |      |               |                   |                  |                                |                  |              |                             |                    |
| 10                                      | L2     | 89                       | 8.0  | 0.498         | 10.2              | LOS B            | 5.5                            | 41.3             | 0.86         | 0.82                        | 52.6               |
| 11                                      | T1     | 163                      | 8.0  | 0.498         | 10.5              | LOS B            | 5.5                            | 41.3             | 0.86         | 0.82                        | 55.7               |
| 12a                                     | R1     | 72                       | 8.0  | 0.757         | 19.3              | LOS B            | 12.7                           | 94.9             | 0.95         | 0.98                        | 48.7               |
| 12b                                     | R3     | 417                      | 8.0  | 0.757         | 22.2              | LOS C            | 12.7                           | 94.9             | 0.95         | 0.98                        | 50.8               |
| Approach                                |        | 741                      | 8.0  | 0.757         | 17.9              | LOS B            | 12.7                           | 94.9             | 0.92         | 0.93                        | 51.7               |
| All Vehicles                            |        | 3181                     | 8.0  | 1.019         | 23.3              | LOS C            | 26.1                           | 195.6            | 0.83         | 1.14                        | 47.0               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

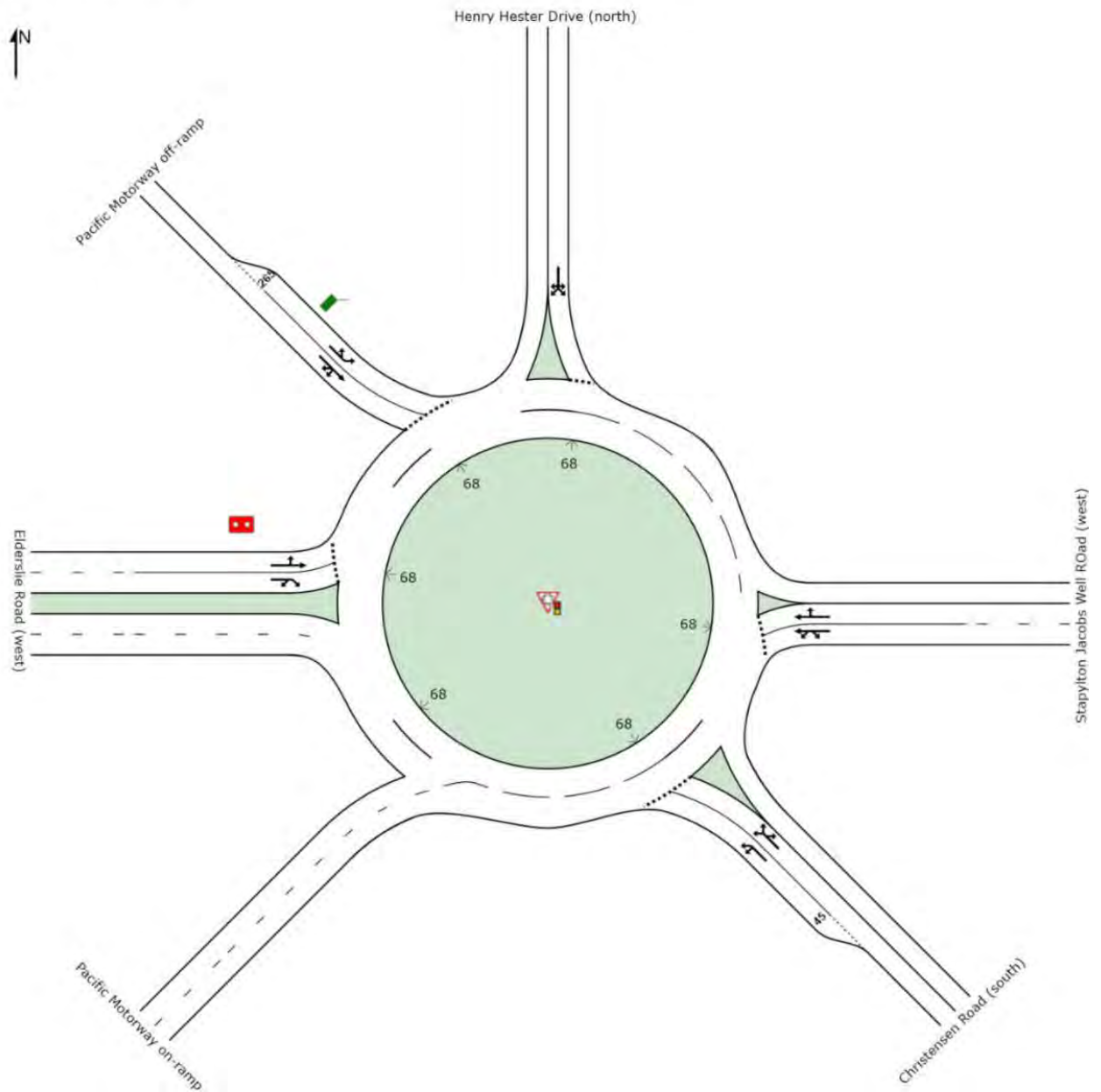
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

## UPGRADE B – EASTERN ROUNDABOUT

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering



## MOVEMENT SUMMARY

 Site: Model 21 2020AM east stage 2 UPGRADE B - ACTUAL

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
|-----------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 21                                      | L2     | 32                 | 8.0        | 0.165         | 5.1               | LOS A            | 0.9                      | 6.5              | 0.73         | 0.55                        | 54.9               |
| 21a                                     | L1     | 165                | 8.0        | 0.165         | 5.3               | LOS A            | 0.9                      | 6.5              | 0.72         | 0.61                        | 56.2               |
| 23a                                     | R1     | 43                 | 8.0        | 0.165         | 12.0              | LOS B            | 0.7                      | 5.2              | 0.69         | 0.78                        | 55.8               |
| 23b                                     | R3     | 19                 | 8.0        | 0.165         | 14.9              | LOS B            | 0.7                      | 5.2              | 0.69         | 0.78                        | 58.7               |
| Approach                                |        | 259                | 8.0        | 0.165         | 7.1               | LOS A            | 0.9                      | 6.5              | 0.71         | 0.64                        | 56.2               |
| East: Stapylton Jacobs Well ROad (west) |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 4b                                      | L3     | 37                 | 8.0        | 0.563         | 9.1               | LOS A            | 3.1                      | 23.5             | 0.88         | 0.97                        | 52.6               |
| 4a                                      | L1     | 139                | 8.0        | 0.563         | 8.7               | LOS A            | 3.1                      | 23.5             | 0.88         | 0.97                        | 55.6               |
| 5                                       | T1     | 336                | 8.0        | 0.563         | 8.7               | LOS A            | 3.1                      | 23.5             | 0.88         | 0.94                        | 56.0               |
| 6                                       | R2     | 73                 | 8.0        | 0.563         | 15.4              | LOS B            | 1.9                      | 14.6             | 0.89         | 0.91                        | 56.5               |
| Approach                                |        | 585                | 8.0        | 0.563         | 9.6               | LOS A            | 3.1                      | 23.5             | 0.88         | 0.95                        | 55.7               |
| North: Henry Hester Drive (north)       |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 7                                       | L2     | 71                 | 8.0        | 0.534         | 6.8               | LOS A            | 2.6                      | 19.6             | 0.83         | 0.94                        | 52.3               |
| 7a                                      | L1     | 44                 | 8.0        | 0.534         | 6.9               | LOS A            | 2.6                      | 19.6             | 0.83         | 0.94                        | 54.0               |
| 9a                                      | R1     | 103                | 8.0        | 0.534         | 13.0              | LOS B            | 2.6                      | 19.6             | 0.83         | 0.94                        | 55.2               |
| 9                                       | R2     | 81                 | 8.0        | 0.534         | 14.4              | LOS B            | 2.6                      | 19.6             | 0.83         | 0.94                        | 56.6               |
| Approach                                |        | 299                | 8.0        | 0.534         | 11.0              | LOS B            | 2.6                      | 19.6             | 0.83         | 0.94                        | 54.7               |
| NorthWest: Pacific Motorway off-ramp    |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 27b                                     | L3     | 109                | 8.0        | 0.451         | 4.0               | LOS A            | 2.2                      | 16.7             | 0.63         | 0.42                        | 54.4               |
| 27a                                     | L1     | 303                | 8.0        | 0.451         | 3.6               | LOS A            | 2.2                      | 16.7             | 0.63         | 0.42                        | 57.6               |
| 28                                      | T1     | 230                | 8.0        | 0.670         | 4.4               | LOS A            | 5.1                      | 38.1             | 0.78         | 0.74                        | 54.3               |
| 29                                      | R2     | 1                  | 8.0        | 0.670         | 11.6              | LOS B            | 5.1                      | 38.1             | 0.78         | 0.74                        | 55.7               |
| 29b                                     | R3     | 552                | 8.0        | 0.670         | 13.0              | LOS B            | 5.1                      | 38.1             | 0.78         | 0.74                        | 57.1               |
| Approach                                |        | 1195               | 8.0        | 0.670         | 8.1               | LOS A            | 5.1                      | 38.1             | 0.73         | 0.63                        | 56.4               |
| West: Elderslie Road (west)             |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 10                                      | L2     | 72                 | 8.0        | 0.624         | 10.5              | LOS B            | 9.1                      | 68.3             | 0.90         | 0.84                        | 52.5               |
| 11                                      | T1     | 340                | 8.0        | 0.624         | 10.8              | LOS B            | 9.1                      | 68.3             | 0.90         | 0.84                        | 55.5               |
| 12a                                     | R1     | 219                | 8.0        | 0.629         | 16.9              | LOS B            | 7.4                      | 55.2             | 0.91         | 0.97                        | 50.8               |
| 12b                                     | R3     | 105                | 8.0        | 0.629         | 19.8              | LOS B            | 7.4                      | 55.2             | 0.91         | 0.97                        | 53.1               |
| Approach                                |        | 736                | 8.0        | 0.629         | 13.8              | LOS B            | 9.1                      | 68.3             | 0.90         | 0.89                        | 53.3               |
| All Vehicles                            |        | 3074               | 8.0        | 0.670         | 10.0              | LOS A            | 9.1                      | 68.3             | 0.81         | 0.79                        | 55.3               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 22 2020PM east stage 2 UPGRADE B - ACTUAL

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                    |            |               |                   |                  |                       |                  |              |                             |                    |
|-----------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                    |            |               |                   |                  |                       |                  |              |                             |                    |
| 21                                      | L2     | 96                 | 8.0        | 0.553         | 8.8               | LOS A            | 3.2                   | 24.2             | 0.87         | 0.98                        | 53.8               |
| 21a                                     | L1     | 340                | 8.0        | 0.553         | 9.1               | LOS A            | 3.2                   | 24.2             | 0.88         | 0.99                        | 54.7               |
| 23a                                     | R1     | 86                 | 8.0        | 0.553         | 15.9              | LOS B            | 2.3                   | 17.4             | 0.89         | 1.00                        | 53.7               |
| 23b                                     | R3     | 25                 | 8.0        | 0.553         | 18.8              | LOS B            | 2.3                   | 17.4             | 0.89         | 1.00                        | 56.5               |
| Approach                                |        | 547                | 8.0        | 0.553         | 10.6              | LOS B            | 3.2                   | 24.2             | 0.88         | 0.99                        | 54.5               |
| East: Stapylton Jacobs Well ROad (west) |        |                    |            |               |                   |                  |                       |                  |              |                             |                    |
| 4b                                      | L3     | 33                 | 8.0        | 0.714         | 14.4              | LOS B            | 7.1                   | 52.8             | 0.87         | 1.15                        | 48.0               |
| 4a                                      | L1     | 310                | 8.0        | 0.714         | 16.1              | LOS B            | 7.1                   | 52.8             | 0.87         | 1.15                        | 50.5               |
| 5                                       | T1     | 533                | 8.0        | 0.714         | 16.0              | LOS B            | 7.1                   | 52.8             | 0.88         | 1.13                        | 51.0               |
| 6                                       | R2     | 107                | 8.0        | 0.714         | 23.0              | LOS C            | 4.8                   | 35.6             | 0.88         | 1.11                        | 51.9               |
| Approach                                |        | 983                | 8.0        | 0.714         | 16.7              | LOS B            | 7.1                   | 52.8             | 0.88         | 1.13                        | 50.9               |
| North: Henry Hester Drive (north)       |        |                    |            |               |                   |                  |                       |                  |              |                             |                    |
| 7                                       | L2     | 86                 | 8.0        | 0.538         | 7.1               | LOS A            | 2.8                   | 20.7             | 0.79         | 0.95                        | 52.1               |
| 7a                                      | L1     | 34                 | 8.0        | 0.538         | 7.2               | LOS A            | 2.8                   | 20.7             | 0.79         | 0.95                        | 53.8               |
| 9a                                      | R1     | 130                | 8.0        | 0.538         | 13.6              | LOS B            | 2.8                   | 20.7             | 0.79         | 0.95                        | 55.0               |
| 9                                       | R2     | 77                 | 8.0        | 0.538         | 14.7              | LOS B            | 2.8                   | 20.7             | 0.79         | 0.95                        | 56.4               |
| Approach                                |        | 327                | 8.0        | 0.538         | 11.4              | LOS B            | 2.8                   | 20.7             | 0.79         | 0.95                        | 54.4               |
| NorthWest: Pacific Motorway off-ramp    |        |                    |            |               |                   |                  |                       |                  |              |                             |                    |
| 27b                                     | L3     | 84                 | 8.0        | 0.372         | 4.3               | LOS A            | 1.9                   | 14.2             | 0.66         | 0.45                        | 54.3               |
| 27a                                     | L1     | 230                | 8.0        | 0.372         | 3.9               | LOS A            | 1.9                   | 14.2             | 0.66         | 0.45                        | 57.4               |
| 28                                      | T1     | 67                 | 8.0        | 0.450         | 4.2               | LOS A            | 3.0                   | 22.3             | 0.73         | 0.74                        | 53.5               |
| 29                                      | R2     | 4                  | 8.0        | 0.450         | 11.4              | LOS B            | 3.0                   | 22.3             | 0.73         | 0.74                        | 54.9               |
| 29b                                     | R3     | 412                | 8.0        | 0.450         | 12.8              | LOS B            | 3.0                   | 22.3             | 0.73         | 0.74                        | 56.2               |
| Approach                                |        | 797                | 8.0        | 0.450         | 8.6               | LOS A            | 3.0                   | 22.3             | 0.71         | 0.62                        | 56.1               |
| West: Elderslie Road (west)             |        |                    |            |               |                   |                  |                       |                  |              |                             |                    |
| 10                                      | L2     | 89                 | 8.0        | 0.520         | 10.2              | LOS B            | 6.0                   | 44.7             | 0.87         | 0.82                        | 52.6               |
| 11                                      | T1     | 178                | 8.0        | 0.520         | 10.5              | LOS B            | 6.0                   | 44.7             | 0.87         | 0.82                        | 55.7               |
| 12a                                     | R1     | 82                 | 8.0        | 0.753         | 19.3              | LOS B            | 13.2                  | 98.8             | 0.96         | 0.96                        | 48.7               |
| 12b                                     | R3     | 417                | 8.0        | 0.753         | 22.2              | LOS C            | 13.2                  | 98.8             | 0.96         | 0.96                        | 50.8               |
| Approach                                |        | 766                | 8.0        | 0.753         | 17.8              | LOS B            | 13.2                  | 98.8             | 0.93         | 0.91                        | 51.8               |
| All Vehicles                            |        | 3420               | 8.0        | 0.753         | 13.6              | LOS B            | 13.2                  | 98.8             | 0.84         | 0.92                        | 53.1               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 23 2023AM east full dev UPGRADED V2**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
|-----------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 21                                      | L2     | 60                 | 8.0        | 0.215         | 6.0               | LOS A            | 1.4                      | 10.1             | 0.80         | 0.66                        | 54.6               |
| 21a                                     | L1     | 200                | 8.0        | 0.215         | 6.4               | LOS A            | 1.4                      | 10.1             | 0.79         | 0.71                        | 55.7               |
| 23a                                     | R1     | 48                 | 8.0        | 0.215         | 13.4              | LOS B            | 1.2                      | 8.6              | 0.78         | 0.82                        | 55.3               |
| 23b                                     | R3     | 20                 | 8.0        | 0.215         | 16.3              | LOS B            | 1.2                      | 8.6              | 0.78         | 0.82                        | 58.2               |
| Approach                                |        | 328                | 8.0        | 0.215         | 8.0               | LOS A            | 1.4                      | 10.1             | 0.79         | 0.72                        | 55.6               |
| East: Stapylton Jacobs Well Road (west) |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 4b                                      | L3     | 40                 | 8.0        | 0.764         | 26.4              | LOS C            | 7.7                      | 57.3             | 0.95         | 1.24                        | 42.6               |
| 4a                                      | L1     | 148                | 8.0        | 0.764         | 26.0              | LOS C            | 7.7                      | 57.3             | 0.95         | 1.24                        | 44.6               |
| 5                                       | T1     | 361                | 8.0        | 0.764         | 28.9              | LOS C            | 7.7                      | 57.3             | 0.95         | 1.23                        | 43.9               |
| 6                                       | R2     | 76                 | 8.0        | 0.764         | 36.4              | LOS D            | 5.3                      | 39.4             | 0.95         | 1.21                        | 43.2               |
| Approach                                |        | 625                | 8.0        | 0.764         | 28.9              | LOS C            | 7.7                      | 57.3             | 0.95         | 1.23                        | 43.9               |
| North: Henry Hester Drive (north)       |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 7                                       | L2     | 76                 | 8.0        | 0.806         | 20.3              | LOS C            | 6.2                      | 46.4             | 0.95         | 1.20                        | 44.5               |
| 7a                                      | L1     | 50                 | 8.0        | 0.806         | 20.4              | LOS C            | 6.2                      | 46.4             | 0.95         | 1.20                        | 45.8               |
| 9a                                      | R1     | 112                | 8.0        | 0.806         | 26.5              | LOS C            | 6.2                      | 46.4             | 0.95         | 1.20                        | 46.6               |
| 9                                       | R2     | 88                 | 8.0        | 0.806         | 27.9              | LOS C            | 6.2                      | 46.4             | 0.95         | 1.20                        | 47.6               |
| Approach                                |        | 326                | 8.0        | 0.806         | 24.5              | LOS C            | 6.2                      | 46.4             | 0.95         | 1.20                        | 46.3               |
| NorthWest: Pacific Motorway off-ramp    |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 27b                                     | L3     | 119                | 8.0        | 0.314         | 4.8               | LOS A            | 2.4                      | 17.9             | 0.72         | 0.54                        | 54.2               |
| 27a                                     | L1     | 325                | 8.0        | 0.911         | 11.6              | LOS B            | 28.5                     | 213.5            | 0.88         | 0.84                        | 51.0               |
| 28                                      | T1     | 269                | 8.0        | 0.911         | 17.4              | LOS B            | 28.5                     | 213.5            | 1.00         | 1.08                        | 48.1               |
| 29                                      | R2     | 1                  | 8.0        | 0.911         | 24.6              | LOS C            | 28.5                     | 213.5            | 1.00         | 1.08                        | 49.2               |
| 29b                                     | R3     | 602                | 8.0        | 0.911         | 26.0              | LOS C            | 28.5                     | 213.5            | 1.00         | 1.08                        | 50.3               |
| Approach                                |        | 1316               | 8.0        | 0.911         | 18.8              | LOS B            | 28.5                     | 213.5            | 0.94         | 0.97                        | 50.3               |
| West: Elderslie Road (west)             |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 10                                      | L2     | 78                 | 8.0        | 0.718         | 19.8              | LOS B            | 18.3                     | 136.6            | 0.96         | 0.75                        | 46.6               |
| 11                                      | T1     | 341                | 8.0        | 0.718         | 20.1              | LOS C            | 18.3                     | 136.6            | 0.96         | 0.75                        | 49.0               |
| 12a                                     | R1     | 283                | 8.0        | 0.870         | 36.0              | LOS D            | 20.9                     | 156.5            | 1.00         | 1.07                        | 41.1               |
| 12b                                     | R3     | 114                | 8.0        | 0.870         | 38.8              | LOS D            | 20.9                     | 156.5            | 1.00         | 1.07                        | 42.6               |
| Approach                                |        | 816                | 8.0        | 0.870         | 28.2              | LOS C            | 20.9                     | 156.5            | 0.98         | 0.91                        | 44.8               |
| All Vehicles                            |        | 3411               | 8.0        | 0.911         | 22.4              | LOS C            | 28.5                     | 213.5            | 0.94         | 1.00                        | 47.7               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 24 2023PM east full dev UPGRADED V2

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
|-----------------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|------------------------|--------------|--------------------------------|-----------------------|
| Mov ID                                  | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Queue<br>Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| SouthEast: Christensen Road (south)     |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
| 21                                      | L2     | 111                   | 8.0           | 0.653            | 13.5                 | LOS B            | 4.8                                  | 36.3                   | 0.94         | 1.11                           | 50.5                  |
| 21a                                     | L1     | 374                   | 8.0           | 0.653            | 13.1                 | LOS B            | 4.8                                  | 36.3                   | 0.93         | 1.09                           | 51.8                  |
| 23a                                     | R1     | 94                    | 8.0           | 0.653            | 18.4                 | LOS B            | 3.1                                  | 23.2                   | 0.92         | 1.05                           | 52.0                  |
| 23b                                     | R3     | 26                    | 8.0           | 0.653            | 21.3                 | LOS C            | 3.1                                  | 23.2                   | 0.92         | 1.05                           | 54.6                  |
| Approach                                |        | 605                   | 8.0           | 0.653            | 14.3                 | LOS B            | 4.8                                  | 36.3                   | 0.93         | 1.08                           | 51.7                  |
| East: Stapylton Jacobs Well Road (west) |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
| 4b                                      | L3     | 35                    | 8.0           | 0.934            | 56.5                 | LOS E            | 21.5                                 | 161.0                  | 0.98         | 2.13                           | 31.3                  |
| 4a                                      | L1     | 296                   | 8.0           | 0.934            | 59.3                 | LOS E            | 21.5                                 | 161.0                  | 0.98         | 2.13                           | 32.3                  |
| 5                                       | T1     | 572                   | 8.0           | 0.934            | 53.5                 | LOS D            | 21.5                                 | 161.0                  | 0.98         | 1.93                           | 34.4                  |
| 6                                       | R2     | 115                   | 8.0           | 0.934            | 55.4                 | LOS E            | 11.9                                 | 88.8                   | 0.98         | 1.76                           | 36.5                  |
| Approach                                |        | 1018                  | 8.0           | 0.934            | 55.5                 | LOS E            | 21.5                                 | 161.0                  | 0.98         | 1.98                           | 33.9                  |
| North: Henry Hester Drive (north)       |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
| 7                                       | L2     | 94                    | 8.0           | 0.717            | 13.7                 | LOS B            | 4.9                                  | 36.6                   | 0.90         | 1.11                           | 48.0                  |
| 7a                                      | L1     | 38                    | 8.0           | 0.717            | 13.8                 | LOS B            | 4.9                                  | 36.6                   | 0.90         | 1.11                           | 49.5                  |
| 9a                                      | R1     | 142                   | 8.0           | 0.717            | 19.9                 | LOS B            | 4.9                                  | 36.6                   | 0.90         | 1.11                           | 50.5                  |
| 9                                       | R2     | 84                    | 8.0           | 0.717            | 21.4                 | LOS C            | 4.9                                  | 36.6                   | 0.90         | 1.11                           | 51.7                  |
| Approach                                |        | 358                   | 8.0           | 0.717            | 18.0                 | LOS B            | 4.9                                  | 36.6                   | 0.90         | 1.11                           | 50.0                  |
| NorthWest: Pacific Motorway off-ramp    |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
| 27b                                     | L3     | 92                    | 8.0           | 0.232            | 4.7                  | LOS A            | 1.2                                  | 9.2                    | 0.68         | 0.54                           | 54.4                  |
| 27a                                     | L1     | 244                   | 8.0           | 0.671            | 5.8                  | LOS A            | 7.1                                  | 53.0                   | 0.83         | 0.77                           | 54.3                  |
| 28                                      | T1     | 79                    | 8.0           | 0.671            | 7.1                  | LOS A            | 7.1                                  | 53.0                   | 0.92         | 0.90                           | 53.6                  |
| 29                                      | R2     | 4                     | 8.0           | 0.671            | 14.3                 | LOS B            | 7.1                                  | 53.0                   | 0.92         | 0.90                           | 55.0                  |
| 29b                                     | R3     | 450                   | 8.0           | 0.671            | 15.7                 | LOS B            | 7.1                                  | 53.0                   | 0.92         | 0.90                           | 56.4                  |
| Approach                                |        | 869                   | 8.0           | 0.671            | 11.0                 | LOS B            | 7.1                                  | 53.0                   | 0.87         | 0.82                           | 55.3                  |
| West: Elderslie Road (west)             |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
| 10                                      | L2     | 97                    | 8.0           | 0.456            | 8.8                  | LOS A            | 6.1                                  | 45.6                   | 0.81         | 0.69                           | 53.7                  |
| 11                                      | T1     | 191                   | 8.0           | 0.456            | 9.1                  | LOS A            | 6.1                                  | 45.6                   | 0.81         | 0.69                           | 56.9                  |
| 12a                                     | R1     | 96                    | 8.0           | 0.672            | 16.5                 | LOS B            | 13.6                                 | 102.0                  | 0.89         | 0.77                           | 50.4                  |
| 12b                                     | R3     | 455                   | 8.0           | 0.672            | 19.3                 | LOS B            | 13.6                                 | 102.0                  | 0.89         | 0.77                           | 52.6                  |
| Approach                                |        | 839                   | 8.0           | 0.672            | 15.4                 | LOS B            | 13.6                                 | 102.0                  | 0.87         | 0.74                           | 53.3                  |
| All Vehicles                            |        | 3689                  | 8.0           | 0.934            | 25.5                 | LOS C            | 21.5                                 | 161.0                  | 0.91         | 1.19                           | 46.0                  |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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 ACCESS / STAPYLTON JACOBS WELL ROAD INTERSECTION

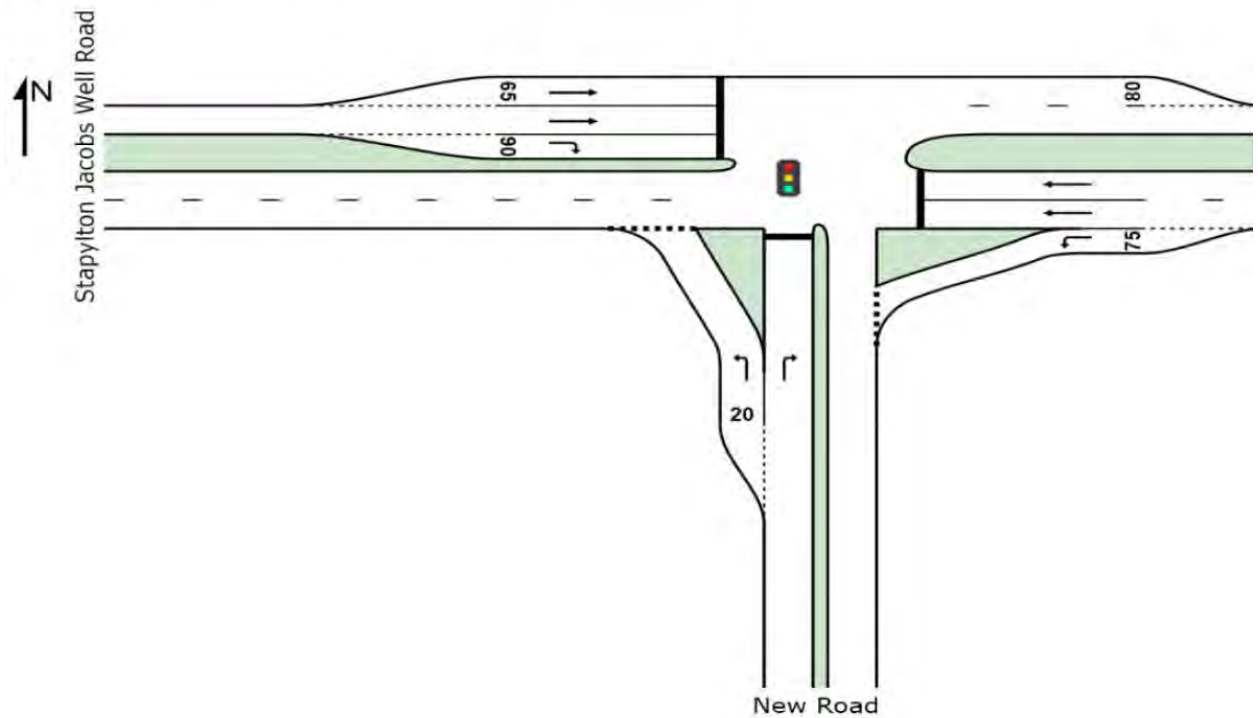
2020AM PEAK – STAGE ONE

2020PM PEAK – STAGE ONE

2030AM PEAK – FULL DEVELOPMENT

2030PM PEAK – FULL DEVELOPMENT

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated



## MOVEMENT SUMMARY

 **Site: Model 31A 2020 AM Peak (SJW Rd - New Rd Int) - STAGE 1 - ACTUAL**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
|----------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                           | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: New Road                  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 1                                | L2     | 32                 | 15.0       | 0.035         | 7.7               | LOS A            | 0.2                      | 1.3              | 0.42         | 0.63                        | 52.1               |
| 3                                | R2     | 8                  | 15.0       | 0.029         | 22.2              | LOS C            | 0.1                      | 1.1              | 0.88         | 0.65                        | 43.0               |
| Approach                         |        | 40                 | 15.0       | 0.035         | 10.6              | LOS B            | 0.2                      | 1.3              | 0.51         | 0.63                        | 50.0               |
| East: Stapylton Jacobs Well Road |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 4                                | L2     | 15                 | 15.0       | 0.014         | 6.9               | LOS A            | 0.1                      | 0.4              | 0.34         | 0.60                        | 52.5               |
| 5                                | T1     | 490                | 15.0       | 0.546         | 14.9              | LOS B            | 4.4                      | 35.0             | 0.92         | 0.76                        | 48.2               |
| Approach                         |        | 505                | 15.0       | 0.546         | 14.7              | LOS B            | 4.4                      | 35.0             | 0.90         | 0.75                        | 48.3               |
| West: Stapylton Jacobs Well Road |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 11                               | T1     | 590                | 15.0       | 0.408         | 5.5               | LOS A            | 4.7                      | 36.9             | 0.59         | 0.50                        | 55.0               |
| 12                               | R2     | 58                 | 15.0       | 0.234         | 23.3              | LOS C            | 1.1                      | 8.6              | 0.92         | 0.73                        | 42.5               |
| Approach                         |        | 648                | 15.0       | 0.408         | 7.1               | LOS A            | 4.7                      | 36.9             | 0.62         | 0.52                        | 53.6               |
| All Vehicles                     |        | 1193               | 15.0       | 0.546         | 10.4              | LOS B            | 4.7                      | 36.9             | 0.73         | 0.62                        | 51.1               |

## MOVEMENT SUMMARY

 **Site: Model 31B 2020 PM Peak (SJW Rd - New Rd Int) - STAGE 1 - ACTUAL**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
|----------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                           | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: New Road                  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 1                                | L2     | 72                 | 15.0       | 0.086         | 8.8               | LOS A            | 0.5                      | 3.9              | 0.52         | 0.66                        | 51.3               |
| 3                                | R2     | 18                 | 15.0       | 0.066         | 22.4              | LOS C            | 0.3                      | 2.5              | 0.89         | 0.68                        | 42.9               |
| Approach                         |        | 90                 | 15.0       | 0.086         | 11.5              | LOS B            | 0.5                      | 3.9              | 0.59         | 0.67                        | 49.4               |
| East: Stapylton Jacobs Well Road |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 4                                | L2     | 5                  | 15.0       | 0.004         | 6.8               | LOS A            | 0.0                      | 0.1              | 0.31         | 0.58                        | 52.6               |
| 5                                | T1     | 740                | 15.0       | 0.824         | 21.0              | LOS C            | 8.5                      | 67.2             | 1.00         | 1.04                        | 44.7               |
| Approach                         |        | 745                | 15.0       | 0.824         | 20.9              | LOS C            | 8.5                      | 67.2             | 1.00         | 1.04                        | 44.7               |
| West: Stapylton Jacobs Well Road |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 11                               | T1     | 496                | 15.0       | 0.343         | 5.3               | LOS A            | 3.8                      | 29.6             | 0.57         | 0.48                        | 55.2               |
| 12                               | R2     | 18                 | 15.0       | 0.073         | 22.6              | LOS C            | 0.3                      | 2.6              | 0.89         | 0.68                        | 42.9               |
| Approach                         |        | 514                | 15.0       | 0.343         | 5.9               | LOS A            | 3.8                      | 29.6             | 0.58         | 0.49                        | 54.7               |
| All Vehicles                     |        | 1349               | 15.0       | 0.824         | 14.6              | LOS B            | 8.5                      | 67.2             | 0.81         | 0.80                        | 48.4               |

Level of Service (LOS) Method: Delay (HCM 2000).  
Vehicle movement LOS values are based on average delay per movement  
Intersection and Approach LOS values are based on average delay for all vehicle movements.  
SIDRA Standard Delay Model 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: Model 34A 2030 AM Peak (SJW Rd - New Rd Int) - ULTIMATE - ACTUAL**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
|----------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                           | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: New Road                  |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 1                                | L2     | 77                    | 15.0          | 0.090            | 8.8                  | LOS A            | 0.5                                  | 4.2           | 0.52         | 0.66                           | 51.3                  |
| 3                                | R2     | 40                    | 15.0          | 0.146            | 22.8                 | LOS C            | 0.7                                  | 5.8           | 0.90         | 0.71                           | 42.7                  |
| Approach                         |        | 117                   | 15.0          | 0.146            | 13.6                 | LOS B            | 0.7                                  | 5.8           | 0.65         | 0.68                           | 48.0                  |
| East: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 4                                | L2     | 62                    | 15.0          | 0.060            | 7.5                  | LOS A            | 0.3                                  | 2.3           | 0.41         | 0.63                           | 52.3                  |
| 5                                | T1     | 681                   | 15.0          | 0.759            | 18.4                 | LOS B            | 7.2                                  | 56.9          | 0.98         | 0.94                           | 46.1                  |
| Approach                         |        | 743                   | 15.0          | 0.759            | 17.5                 | LOS B            | 7.2                                  | 56.9          | 0.93         | 0.92                           | 46.6                  |
| West: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 11                               | T1     | 815                   | 15.0          | 0.563            | 6.1                  | LOS A            | 7.3                                  | 57.5          | 0.65         | 0.57                           | 54.6                  |
| 12                               | R2     | 141                   | 15.0          | 0.569            | 24.8                 | LOS C            | 2.9                                  | 22.6          | 0.97         | 0.82                           | 41.8                  |
| Approach                         |        | 956                   | 15.0          | 0.569            | 8.8                  | LOS A            | 7.3                                  | 57.5          | 0.70         | 0.60                           | 52.2                  |
| All Vehicles                     |        | 1816                  | 15.0          | 0.759            | 12.7                 | LOS B            | 7.3                                  | 57.5          | 0.79         | 0.74                           | 49.5                  |

## MOVEMENT SUMMARY

 **Site: Model 34B 2030 PM Peak (SJW Rd - New Rd Int) - ULTIMATE - ACTUAL**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
|----------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                           | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: New Road                  |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 1                                | L2     | 175                   | 15.0          | 0.242            | 10.5                 | LOS B            | 1.9                                  | 14.7          | 0.58         | 0.71                           | 50.2                  |
| 3                                | R2     | 65                    | 15.0          | 0.297            | 29.1                 | LOS C            | 1.6                                  | 12.4          | 0.95         | 0.74                           | 39.8                  |
| Approach                         |        | 240                   | 15.0          | 0.297            | 15.5                 | LOS B            | 1.9                                  | 14.7          | 0.68         | 0.72                           | 46.9                  |
| East: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 4                                | L2     | 19                    | 15.0          | 0.016            | 6.7                  | LOS A            | 0.1                                  | 0.5           | 0.27         | 0.59                           | 52.7                  |
| 5                                | T1     | 1026                  | 15.0          | 0.714            | 15.3                 | LOS B            | 11.4                                 | 90.3          | 0.90         | 0.83                           | 48.0                  |
| Approach                         |        | 1045                  | 15.0          | 0.714            | 15.1                 | LOS B            | 11.4                                 | 90.3          | 0.89         | 0.83                           | 48.1                  |
| West: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 11                               | T1     | 644                   | 15.0          | 0.382            | 4.4                  | LOS A            | 5.2                                  | 40.8          | 0.48         | 0.42                           | 55.9                  |
| 12                               | R2     | 44                    | 15.0          | 0.222            | 29.0                 | LOS C            | 1.1                                  | 8.3           | 0.94         | 0.73                           | 39.9                  |
| Approach                         |        | 688                   | 15.0          | 0.382            | 6.0                  | LOS A            | 5.2                                  | 40.8          | 0.51         | 0.44                           | 54.5                  |
| All Vehicles                     |        | 1973                  | 15.0          | 0.714            | 12.0                 | LOS B            | 11.4                                 | 90.3          | 0.73         | 0.68                           | 50.0                  |

Level of Service (LOS) Method: Delay (HCM 2000).  
Vehicle movement LOS values are based on average delay per movement  
Intersection and Approach LOS values are based on average delay for all vehicle movements.  
SIDRA Standard Delay Model 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.

## APPENDIX I – DETAIL SIDRA RESULTS OF SENSITIVITY ANALYSIS

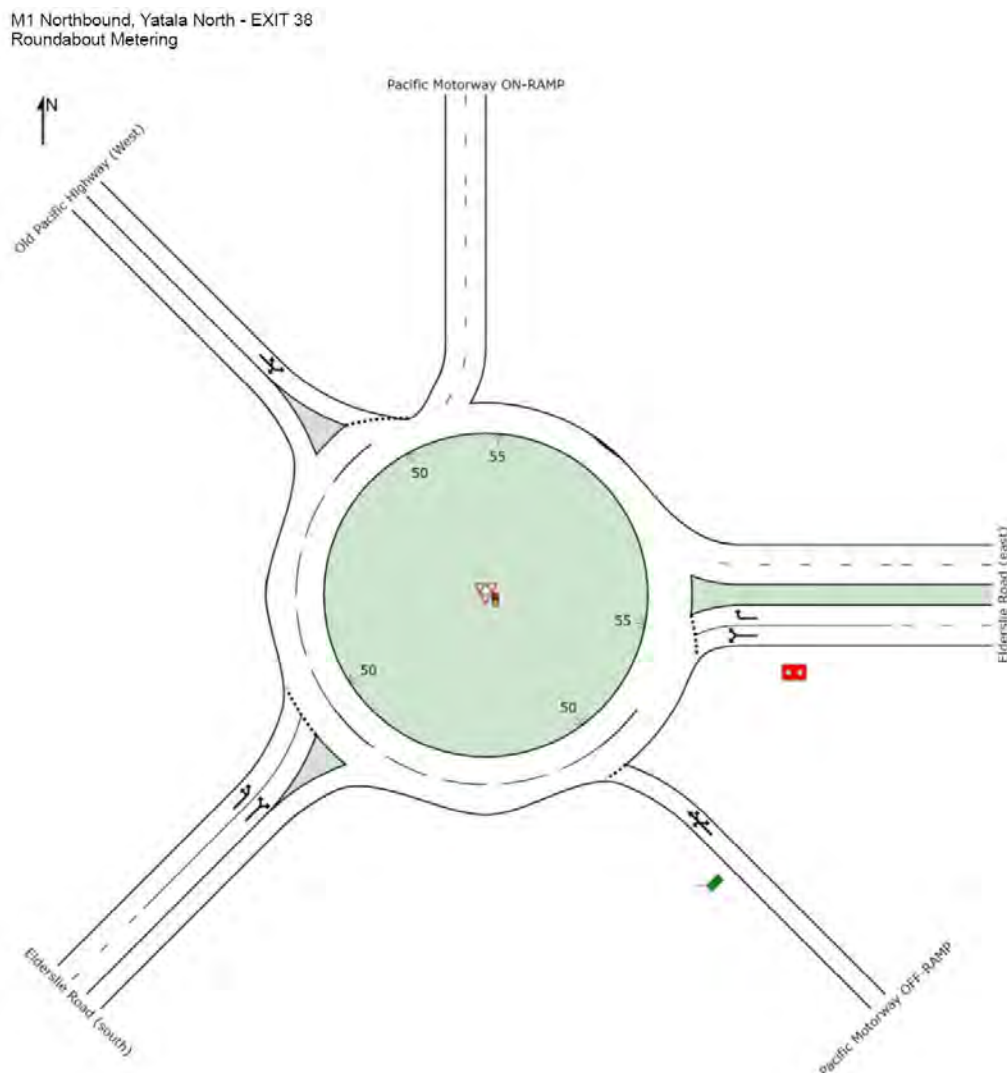
Western roundabout (upgraded):

- Year 2020 AM Peak Hour, with Stage 1 - EXISTING;
- Year 2020 PM Peak Hour, with Stage 1 - EXISTING;
- Year 2023 AM Peak Hour full development – UPGRADE B;
- Year 2023 PM Peak Hour full development – UPGRADE B;

Eastern roundabout:

- Year 2020 AM Peak Hour, with Stage 1 development UPGRADE A;
- Year 2020 PM Peak Hour, with Stage 1 development UPGRADE A;
- Year 2020 AM Peak Hour, with Stage 2 development UPGRADE B;
- Year 2020 PM Peak Hour, with Stage 2 development UPGRADE B;
- Year 2023 AM Peak Hour, with full development UPGRADE B;
- Year 2023 PM Peak Hour, with full development UPGRADE B;

### EXISTING – WESTERN ROUNDABOUT



## MOVEMENT SUMMARY

 **Site: Model 3 2020AM west stage 1**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
|---------------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|-----------------------------|---------------------|--------------|--------------------------------|-----------------------|
| Mov ID                                | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Vehicles<br>veh | Queue Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 21                                    | L2     | 346                   | 8.0           | 0.917            | 83.3                 | LOS F            | 57.3                        | 428.6               | 1.00         | 2.21                           | 25.9                  |
| 22                                    | T1     | 99                    | 8.0           | 0.917            | 75.7                 | LOS E            | 57.3                        | 428.6               | 1.00         | 2.21                           | 26.5                  |
| 23a                                   | R1     | 1                     | 8.0           | 0.917            | 81.8                 | LOS F            | 57.3                        | 428.6               | 1.00         | 2.21                           | 26.4                  |
| 23b                                   | R3     | 310                   | 8.0           | 0.917            | 91.6                 | LOS F            | 57.3                        | 428.6               | 1.00         | 2.21                           | 27.0                  |
| Approach                              |        | 756                   | 8.0           | 0.917            | 85.7                 | LOS F            | 57.3                        | 428.6               | 1.00         | 2.21                           | 26.4                  |
| East: Elderslie Road (east)           |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 4a                                    | L1     | 699                   | 8.0           | 0.910            | 32.4                 | LOS C            | 48.8                        | 364.7               | 1.00         | 0.91                           | 40.5                  |
| 6a                                    | R1     | 108                   | 8.0           | 0.910            | 38.8                 | LOS D            | 48.8                        | 364.7               | 1.00         | 0.91                           | 40.9                  |
| 3                                     | R2     | 308                   | 8.0           | 0.446            | 19.5                 | LOS B            | 10.7                        | 79.9                | 0.74         | 0.61                           | 49.4                  |
| Approach                              |        | 1115                  | 8.0           | 0.910            | 29.4                 | LOS C            | 48.8                        | 364.7               | 0.93         | 0.83                           | 42.7                  |
| NorthWest: Old Pacific Highway (West) |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 27b                                   | L3     | 42                    | 8.0           | 0.277            | 7.3                  | LOS A            | 1.4                         | 10.6                | 0.74         | 0.81                           | 52.4                  |
| 27a                                   | L1     | 99                    | 8.0           | 0.277            | 6.3                  | LOS A            | 1.4                         | 10.6                | 0.74         | 0.81                           | 54.8                  |
| 29                                    | R2     | 49                    | 8.0           | 0.277            | 14.0                 | LOS B            | 1.4                         | 10.6                | 0.74         | 0.81                           | 56.8                  |
| Approach                              |        | 190                   | 8.0           | 0.277            | 8.5                  | LOS A            | 1.4                         | 10.6                | 0.74         | 0.81                           | 54.8                  |
| SouthWest: Elderslie Road (south)     |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 30                                    | L2     | 76                    | 8.0           | 0.377            | 5.0                  | LOS A            | 2.5                         | 18.9                | 0.72         | 0.50                           | 54.8                  |
| 30a                                   | L1     | 367                   | 8.0           | 0.377            | 4.2                  | LOS A            | 2.5                         | 18.9                | 0.72         | 0.54                           | 55.9                  |
| 32a                                   | R1     | 260                   | 8.0           | 0.377            | 11.1                 | LOS B            | 2.3                         | 17.4                | 0.73         | 0.77                           | 54.0                  |
| Approach                              |        | 703                   | 8.0           | 0.377            | 6.8                  | LOS A            | 2.5                         | 18.9                | 0.72         | 0.62                           | 55.1                  |
| All Vehicles                          |        | 2764                  | 8.0           | 0.917            | 37.6                 | LOS D            | 57.3                        | 428.6               | 0.88         | 1.15                           | 38.9                  |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 4 2020PM west stage 1

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                                |         |                  |                         |                     |                                |                        |                 |                                   |                          |
|---------------------------------------|--------|--------------------------------|---------|------------------|-------------------------|---------------------|--------------------------------|------------------------|-----------------|-----------------------------------|--------------------------|
| Mov ID                                | OD Mov | Demand Flows<br>Total<br>veh/h | HV<br>% | Deg. Satn<br>v/c | Average<br>Delay<br>sec | Level of<br>Service | 95% Back of<br>Vehicles<br>veh | Queue<br>Distance<br>m | Prop.<br>Queued | Effective<br>Stop Rate<br>per veh | Average<br>Speed<br>km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                                |         |                  |                         |                     |                                |                        |                 |                                   |                          |
| 21                                    | L2     | 59                             | 8.0     | 0.388            | 7.2                     | LOS A               | 2.7                            | 20.4                   | 0.80            | 0.78                              | 51.5                     |
| 22                                    | T1     | 102                            | 8.0     | 0.388            | 6.7                     | LOS A               | 2.7                            | 20.4                   | 0.80            | 0.78                              | 53.6                     |
| 23a                                   | R1     | 1                              | 8.0     | 0.388            | 12.8                    | LOS B               | 2.7                            | 20.4                   | 0.80            | 0.78                              | 53.5                     |
| 23b                                   | R3     | 155                            | 8.0     | 0.388            | 15.5                    | LOS B               | 2.7                            | 20.4                   | 0.80            | 0.78                              | 55.7                     |
| Approach                              |        | 317                            | 8.0     | 0.388            | 11.1                    | LOS B               | 2.7                            | 20.4                   | 0.80            | 0.78                              | 54.2                     |
| East: Elderslie Road (east)           |        |                                |         |                  |                         |                     |                                |                        |                 |                                   |                          |
| 4a                                    | L1     | 532                            | 8.0     | 0.645            | 8.3                     | LOS A               | 16.2                           | 121.0                  | 0.78            | 0.57                              | 54.2                     |
| 6a                                    | R1     | 114                            | 8.0     | 0.645            | 14.8                    | LOS B               | 16.2                           | 121.0                  | 0.78            | 0.57                              | 55.0                     |
| 3                                     | R2     | 638                            | 8.0     | 0.777            | 20.5                    | LOS C               | 19.9                           | 149.2                  | 0.87            | 0.81                              | 48.8                     |
| Approach                              |        | 1284                           | 8.0     | 0.777            | 15.0                    | LOS B               | 19.9                           | 149.2                  | 0.82            | 0.69                              | 51.4                     |
| NorthWest: Old Pacific Highway (West) |        |                                |         |                  |                         |                     |                                |                        |                 |                                   |                          |
| 27b                                   | L3     | 93                             | 8.0     | 0.716            | 21.6                    | LOS C               | 4.4                            | 32.7                   | 0.93            | 1.15                              | 44.2                     |
| 27a                                   | L1     | 129                            | 8.0     | 0.716            | 20.5                    | LOS C               | 4.4                            | 32.7                   | 0.93            | 1.15                              | 45.8                     |
| 29                                    | R2     | 43                             | 8.0     | 0.716            | 28.3                    | LOS C               | 4.4                            | 32.7                   | 0.93            | 1.15                              | 47.2                     |
| Approach                              |        | 265                            | 8.0     | 0.716            | 22.1                    | LOS C               | 4.4                            | 32.7                   | 0.93            | 1.15                              | 45.5                     |
| SouthWest: Elderslie Road (south)     |        |                                |         |                  |                         |                     |                                |                        |                 |                                   |                          |
| 30                                    | L2     | 24                             | 8.0     | 0.638            | 10.6                    | LOS B               | 7.4                            | 55.7                   | 0.96            | 0.97                              | 52.5                     |
| 30a                                   | L1     | 596                            | 8.0     | 0.638            | 9.7                     | LOS A               | 7.4                            | 55.7                   | 0.96            | 0.97                              | 53.7                     |
| 32a                                   | R1     | 413                            | 8.0     | 0.638            | 16.5                    | LOS B               | 6.1                            | 45.4                   | 0.92            | 1.04                              | 50.6                     |
| Approach                              |        | 1033                           | 8.0     | 0.638            | 12.4                    | LOS B               | 7.4                            | 55.7                   | 0.94            | 1.00                              | 52.3                     |
| All Vehicles                          |        | 2899                           | 8.0     | 0.777            | 14.3                    | LOS B               | 19.9                           | 149.2                  | 0.87            | 0.85                              | 51.4                     |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

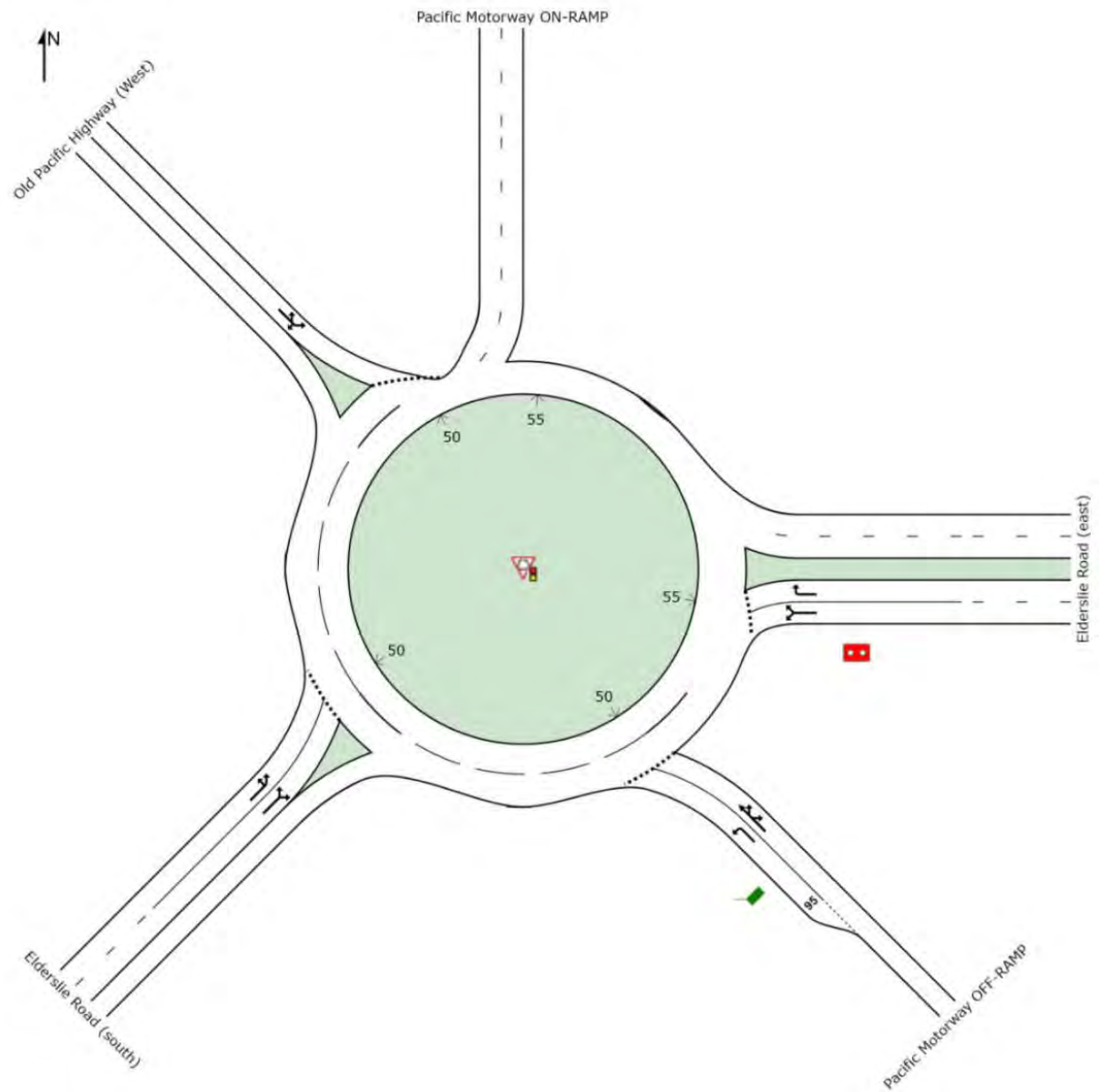
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

## UPGRADE B – WESTERN ROUNDABOUT

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering



## MOVEMENT SUMMARY

 Site: Model 11 2023AM west full dev UPGRADED

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                                |                  |                  |                         |                     |                                         |                        |                 |                                   |                          |
|---------------------------------------|--------|--------------------------------|------------------|------------------|-------------------------|---------------------|-----------------------------------------|------------------------|-----------------|-----------------------------------|--------------------------|
| Mov ID                                | OD Mov | Demand Flows<br>Total<br>veh/h | Flows<br>HV<br>% | Deg. Satn<br>v/c | Average<br>Delay<br>sec | Level of<br>Service | 95% Back of<br>Queue<br>Vehicles<br>veh | Queue<br>Distance<br>m | Prop.<br>Queued | Effective<br>Stop Rate<br>per veh | Average<br>Speed<br>km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                                |                  |                  |                         |                     |                                         |                        |                 |                                   |                          |
| 21                                    | L2     | 377                            | 8.0              | 0.617            | 20.7                    | LOS C               | 7.5                                     | 55.8                   | 1.00            | 1.13                              | 45.3                     |
| 22                                    | T1     | 108                            | 8.0              | 0.768            | 32.9                    | LOS C               | 18.3                                    | 136.8                  | 1.00            | 1.37                              | 39.0                     |
| 23a                                   | R1     | 1                              | 8.0              | 0.768            | 39.0                    | LOS D               | 18.3                                    | 136.8                  | 1.00            | 1.37                              | 39.0                     |
| 23b                                   | R3     | 492                            | 8.0              | 0.768            | 41.7                    | LOS D               | 18.3                                    | 136.8                  | 1.00            | 1.37                              | 40.1                     |
| Approach                              |        | 978                            | 8.0              | 0.768            | 32.6                    | LOS C               | 18.3                                    | 136.8                  | 1.00            | 1.27                              | 41.7                     |
| East: Elderslie Road (east)           |        |                                |                  |                  |                         |                     |                                         |                        |                 |                                   |                          |
| 4a                                    | L1     | 792                            | 8.0              | 0.801            | 12.5                    | LOS B               | 32.8                                    | 245.5                  | 0.85            | 0.62                              | 51.4                     |
| 6a                                    | R1     | 124                            | 8.0              | 0.801            | 18.9                    | LOS B               | 32.8                                    | 245.5                  | 0.85            | 0.62                              | 52.1                     |
| 3                                     | R2     | 438                            | 8.0              | 0.485            | 14.4                    | LOS B               | 10.2                                    | 76.1                   | 0.65            | 0.60                              | 52.7                     |
| Approach                              |        | 1354                           | 8.0              | 0.801            | 13.7                    | LOS B               | 32.8                                    | 245.5                  | 0.79            | 0.62                              | 51.9                     |
| NorthWest: Old Pacific Highway (West) |        |                                |                  |                  |                         |                     |                                         |                        |                 |                                   |                          |
| 27b                                   | L3     | 46                             | 8.0              | 0.415            | 12.8                    | LOS B               | 2.6                                     | 19.6                   | 0.88            | 0.98                              | 49.0                     |
| 27a                                   | L1     | 117                            | 8.0              | 0.415            | 11.7                    | LOS B               | 2.6                                     | 19.6                   | 0.88            | 0.98                              | 51.0                     |
| 29                                    | R2     | 53                             | 8.0              | 0.415            | 19.5                    | LOS B               | 2.6                                     | 19.6                   | 0.88            | 0.98                              | 52.7                     |
| Approach                              |        | 216                            | 8.0              | 0.415            | 13.9                    | LOS B               | 2.6                                     | 19.6                   | 0.88            | 0.98                              | 51.0                     |
| SouthWest: Elderslie Road (south)     |        |                                |                  |                  |                         |                     |                                         |                        |                 |                                   |                          |
| 30                                    | L2     | 83                             | 8.0              | 0.510            | 6.5                     | LOS A               | 3.7                                     | 27.4                   | 0.82            | 0.73                              | 54.3                     |
| 30a                                   | L1     | 400                            | 8.0              | 0.510            | 5.7                     | LOS A               | 3.7                                     | 27.4                   | 0.82            | 0.74                              | 55.7                     |
| 32a                                   | R1     | 330                            | 8.0              | 0.510            | 13.1                    | LOS B               | 3.2                                     | 24.2                   | 0.81            | 0.97                              | 52.7                     |
| Approach                              |        | 813                            | 8.0              | 0.510            | 8.8                     | LOS A               | 3.7                                     | 27.4                   | 0.82            | 0.83                              | 54.3                     |
| All Vehicles                          |        | 3361                           | 8.0              | 0.801            | 18.0                    | LOS B               | 32.8                                    | 245.5                  | 0.86            | 0.88                              | 48.8                     |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 12 2023PM west full dev UPGRADED**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles       |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
|---------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                                | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Pacific Motorway OFF-RAMP  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 21                                    | L2     | 64                 | 8.0        | 0.118         | 9.1               | LOS A            | 0.6                      | 4.7              | 0.73         | 0.73                        | 52.9               |
| 22                                    | T1     | 111                | 8.0        | 0.432         | 10.0              | LOS A            | 3.7                      | 27.8             | 0.93         | 0.85                        | 50.8               |
| 23a                                   | R1     | 1                  | 8.0        | 0.432         | 16.0              | LOS B            | 3.7                      | 27.8             | 0.93         | 0.85                        | 50.8               |
| 23b                                   | R3     | 219                | 8.0        | 0.432         | 18.7              | LOS B            | 3.7                      | 27.8             | 0.93         | 0.85                        | 52.7               |
| Approach                              |        | 395                | 8.0        | 0.432         | 14.7              | LOS B            | 3.7                      | 27.8             | 0.90         | 0.83                        | 52.2               |
| East: Elderslie Road (east)           |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 4a                                    | L1     | 625                | 8.0        | 0.813         | 13.5              | LOS B            | 30.6                     | 228.9            | 0.87         | 0.70                        | 49.9               |
| 6a                                    | R1     | 133                | 8.0        | 0.813         | 19.9              | LOS B            | 30.6                     | 228.9            | 0.87         | 0.70                        | 50.6               |
| 3                                     | R2     | 848                | 8.0        | 0.813         | 22.3              | LOS C            | 30.6                     | 228.9            | 0.87         | 0.78                        | 48.2               |
| Approach                              |        | 1606               | 8.0        | 0.813         | 18.7              | LOS B            | 30.6                     | 228.9            | 0.87         | 0.74                        | 49.0               |
| NorthWest: Old Pacific Highway (West) |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 27b                                   | L3     | 101                | 8.0        | 0.920         | 58.5              | LOS E            | 9.6                      | 72.2             | 0.98         | 1.65                        | 30.8               |
| 27a                                   | L1     | 144                | 8.0        | 0.920         | 57.5              | LOS E            | 9.6                      | 72.2             | 0.98         | 1.65                        | 31.6               |
| 29                                    | R2     | 47                 | 8.0        | 0.920         | 65.2              | LOS E            | 9.6                      | 72.2             | 0.98         | 1.65                        | 32.3               |
| Approach                              |        | 292                | 8.0        | 0.920         | 59.1              | LOS E            | 9.6                      | 72.2             | 0.98         | 1.65                        | 31.5               |
| SouthWest: Elderslie Road (south)     |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 30                                    | L2     | 26                 | 8.0        | 0.817         | 21.6              | LOS C            | 14.7                     | 110.1            | 1.00         | 1.30                        | 45.5               |
| 30a                                   | L1     | 650                | 8.0        | 0.817         | 20.8              | LOS C            | 14.7                     | 110.1            | 1.00         | 1.30                        | 46.5               |
| 32a                                   | R1     | 466                | 8.0        | 0.817         | 29.3              | LOS C            | 11.9                     | 88.7             | 1.00         | 1.35                        | 43.3               |
| Approach                              |        | 1142               | 8.0        | 0.817         | 24.3              | LOS C            | 14.7                     | 110.1            | 1.00         | 1.32                        | 45.1               |
| All Vehicles                          |        | 3435               | 8.0        | 0.920         | 23.5              | LOS C            | 30.6                     | 228.9            | 0.93         | 1.02                        | 45.9               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

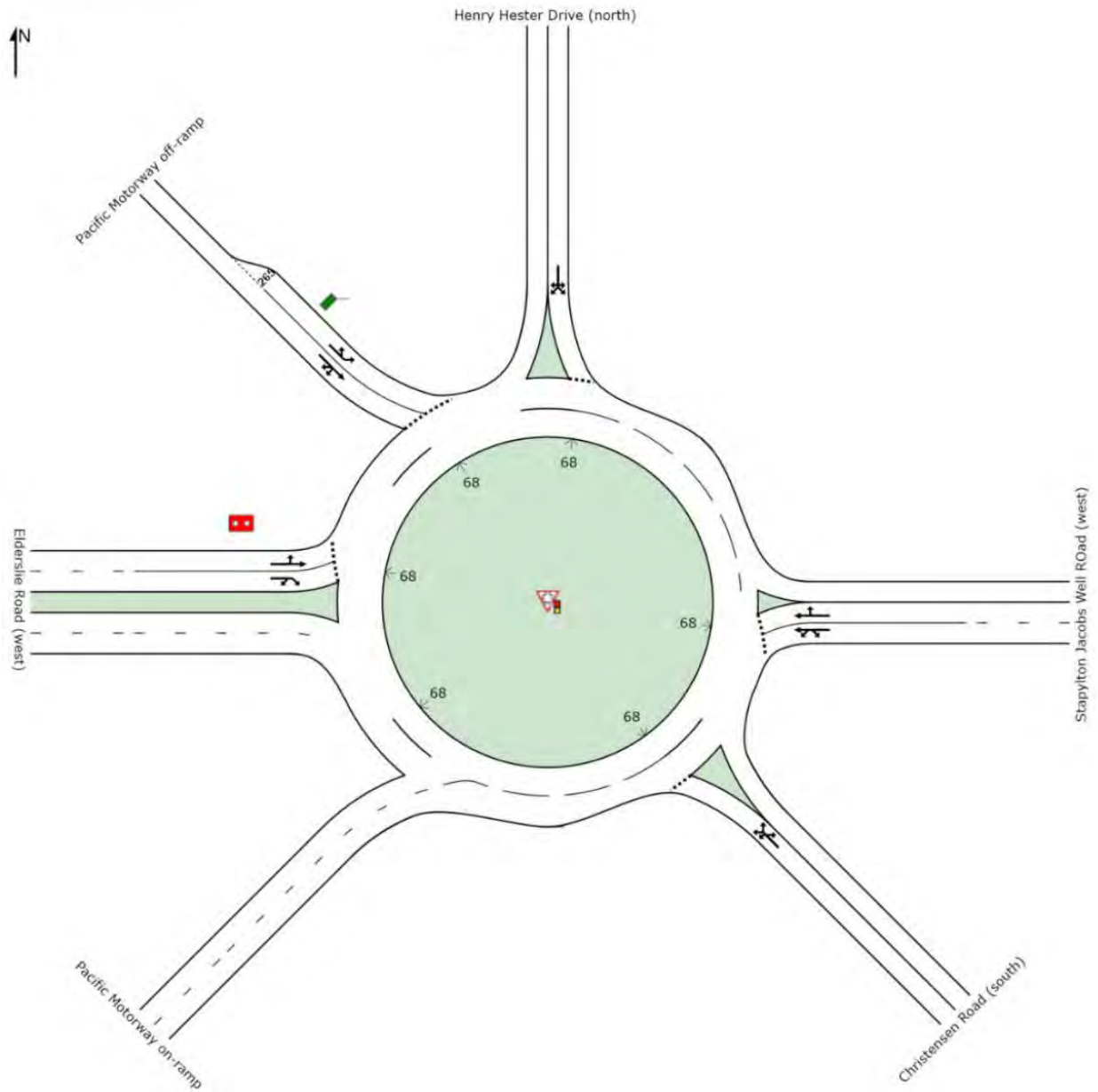
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

## UPGRADE A – EASTERN ROUNDABOUT

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering



## MOVEMENT SUMMARY

 **Site: Model 21 2020AM east stage 1 UPGRADE A - SENSITIVITY**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|-----------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | 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 per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 21                                      | L2     | 25                 | 8.0        | 0.340         | 6.1               | LOS A            | 1.6                            | 11.9       | 0.74         | 0.75                        | 53.8               |
| 21a                                     | L1     | 148                | 8.0        | 0.340         | 6.2               | LOS A            | 1.6                            | 11.9       | 0.74         | 0.75                        | 55.6               |
| 23a                                     | R1     | 38                 | 8.0        | 0.340         | 12.3              | LOS B            | 1.6                            | 11.9       | 0.74         | 0.75                        | 56.9               |
| 23b                                     | R3     | 23                 | 8.0        | 0.340         | 15.2              | LOS B            | 1.6                            | 11.9       | 0.74         | 0.75                        | 60.1               |
| Approach                                |        | 234                | 8.0        | 0.340         | 8.1               | LOS A            | 1.6                            | 11.9       | 0.74         | 0.75                        | 56.0               |
| East: Stapylton Jacobs Well Road (west) |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4b                                      | L3     | 41                 | 8.0        | 0.495         | 7.5               | LOS A            | 2.7                            | 20.2       | 0.84         | 0.80                        | 52.9               |
| 4a                                      | L1     | 128                | 8.0        | 0.495         | 7.1               | LOS A            | 2.7                            | 20.2       | 0.84         | 0.80                        | 56.0               |
| 5                                       | T1     | 324                | 8.0        | 0.495         | 7.4               | LOS A            | 2.7                            | 20.2       | 0.85         | 0.81                        | 56.3               |
| 6                                       | R2     | 78                 | 8.0        | 0.495         | 14.5              | LOS B            | 1.7                            | 13.0       | 0.86         | 0.83                        | 56.7               |
| Approach                                |        | 571                | 8.0        | 0.495         | 8.3               | LOS A            | 2.7                            | 20.2       | 0.85         | 0.81                        | 56.0               |
| North: Henry Hester Drive (north)       |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 7                                       | L2     | 70                 | 8.0        | 0.495         | 6.1               | LOS A            | 2.3                            | 17.3       | 0.80         | 0.90                        | 52.7               |
| 7a                                      | L1     | 40                 | 8.0        | 0.495         | 6.2               | LOS A            | 2.3                            | 17.3       | 0.80         | 0.90                        | 54.4               |
| 9a                                      | R1     | 103                | 8.0        | 0.495         | 12.3              | LOS B            | 2.3                            | 17.3       | 0.80         | 0.90                        | 55.6               |
| 9                                       | R2     | 81                 | 8.0        | 0.495         | 13.7              | LOS B            | 2.3                            | 17.3       | 0.80         | 0.90                        | 57.0               |
| Approach                                |        | 294                | 8.0        | 0.495         | 10.4              | LOS B            | 2.3                            | 17.3       | 0.80         | 0.90                        | 55.1               |
| NorthWest: Pacific Motorway off-ramp    |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 27b                                     | L3     | 109                | 8.0        | 0.433         | 3.8               | LOS A            | 2.0                            | 14.8       | 0.60         | 0.40                        | 54.6               |
| 27a                                     | L1     | 292                | 8.0        | 0.433         | 3.4               | LOS A            | 2.0                            | 14.8       | 0.60         | 0.40                        | 57.8               |
| 28                                      | T1     | 209                | 8.0        | 0.645         | 4.0               | LOS A            | 4.4                            | 32.7       | 0.74         | 0.70                        | 54.3               |
| 29                                      | R2     | 1                  | 8.0        | 0.645         | 11.2              | LOS B            | 4.4                            | 32.7       | 0.74         | 0.70                        | 55.7               |
| 29b                                     | R3     | 552                | 8.0        | 0.645         | 12.6              | LOS B            | 4.4                            | 32.7       | 0.74         | 0.70                        | 57.1               |
| Approach                                |        | 1163               | 8.0        | 0.645         | 7.9               | LOS A            | 4.4                            | 32.7       | 0.69         | 0.60                        | 56.5               |
| West: Elderslie Road (west)             |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 10                                      | L2     | 72                 | 8.0        | 0.658         | 11.1              | LOS B            | 8.9                            | 66.4       | 0.93         | 0.92                        | 52.0               |
| 11                                      | T1     | 324                | 8.0        | 0.658         | 11.4              | LOS B            | 8.9                            | 66.4       | 0.93         | 0.92                        | 54.9               |
| 12a                                     | R1     | 187                | 8.0        | 0.625         | 17.2              | LOS B            | 6.6                            | 49.1       | 0.92         | 1.02                        | 50.6               |
| 12b                                     | R3     | 105                | 8.0        | 0.625         | 20.0              | LOS B            | 6.6                            | 49.1       | 0.92         | 1.02                        | 52.9               |
| Approach                                |        | 688                | 8.0        | 0.658         | 14.3              | LOS B            | 8.9                            | 66.4       | 0.93         | 0.97                        | 53.0               |
| All Vehicles                            |        | 2950               | 8.0        | 0.658         | 9.7               | LOS A            | 8.9                            | 66.4       | 0.79         | 0.77                        | 55.4               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 22 2020PM east stage 1 UPGRADE A - SENSITIVITY**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                          |      |               |                   |                  |                       |                     |              |                             |                    |
|-----------------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                          |      |               |                   |                  |                       |                     |              |                             |                    |
| 21                                      | L2     | 81                       | 8.0  | 1.065         | 146.9             | LOS F            | 47.3                  | 353.5               | 1.00         | 4.05                        | 18.4               |
| 21a                                     | L1     | 301                      | 8.0  | 1.065         | 147.0             | LOS F            | 47.3                  | 353.5               | 1.00         | 4.05                        | 18.6               |
| 23a                                     | R1     | 75                       | 8.0  | 1.065         | 153.1             | LOS F            | 47.3                  | 353.5               | 1.00         | 4.05                        | 18.7               |
| 23b                                     | R3     | 34                       | 8.0  | 1.065         | 155.9             | LOS F            | 47.3                  | 353.5               | 1.00         | 4.05                        | 19.0               |
| Approach                                |        | 491                      | 8.0  | 1.065         | 148.5             | LOS F            | 47.3                  | 353.5               | 1.00         | 4.05                        | 18.6               |
| East: Stapylton Jacobs Well Road (west) |        |                          |      |               |                   |                  |                       |                     |              |                             |                    |
| 4b                                      | L3     | 42                       | 8.0  | 0.628         | 10.8              | LOS B            | 5.1                   | 38.5                | 0.83         | 1.03                        | 50.4               |
| 4a                                      | L1     | 255                      | 8.0  | 0.628         | 12.2              | LOS B            | 5.1                   | 38.5                | 0.83         | 1.03                        | 53.2               |
| 5                                       | T1     | 507                      | 8.0  | 0.628         | 12.6              | LOS B            | 5.1                   | 38.5                | 0.84         | 1.03                        | 53.4               |
| 6                                       | R2     | 98                       | 8.0  | 0.628         | 19.8              | LOS B            | 3.6                   | 27.3                | 0.84         | 1.03                        | 54.1               |
| Approach                                |        | 902                      | 8.0  | 0.628         | 13.2              | LOS B            | 5.1                   | 38.5                | 0.83         | 1.03                        | 53.3               |
| North: Henry Hester Drive (north)       |        |                          |      |               |                   |                  |                       |                     |              |                             |                    |
| 7                                       | L2     | 86                       | 8.0  | 0.519         | 6.5               | LOS A            | 2.6                   | 19.1                | 0.77         | 0.93                        | 52.4               |
| 7a                                      | L1     | 33                       | 8.0  | 0.519         | 6.6               | LOS A            | 2.6                   | 19.1                | 0.77         | 0.93                        | 54.1               |
| 9a                                      | R1     | 130                      | 8.0  | 0.519         | 13.3              | LOS B            | 2.6                   | 19.1                | 0.77         | 0.93                        | 55.3               |
| 9                                       | R2     | 77                       | 8.0  | 0.519         | 14.1              | LOS B            | 2.6                   | 19.1                | 0.77         | 0.93                        | 56.7               |
| Approach                                |        | 326                      | 8.0  | 0.519         | 11.0              | LOS B            | 2.6                   | 19.1                | 0.77         | 0.93                        | 54.7               |
| NorthWest: Pacific Motorway off-ramp    |        |                          |      |               |                   |                  |                       |                     |              |                             |                    |
| 27b                                     | L3     | 84                       | 8.0  | 0.361         | 4.1               | LOS A            | 1.8                   | 13.1                | 0.64         | 0.43                        | 54.4               |
| 27a                                     | L1     | 227                      | 8.0  | 0.361         | 3.7               | LOS A            | 1.8                   | 13.1                | 0.64         | 0.43                        | 57.6               |
| 28                                      | T1     | 61                       | 8.0  | 0.439         | 4.0               | LOS A            | 2.7                   | 20.4                | 0.70         | 0.73                        | 53.5               |
| 29                                      | R2     | 4                        | 8.0  | 0.439         | 11.2              | LOS B            | 2.7                   | 20.4                | 0.70         | 0.73                        | 54.9               |
| 29b                                     | R3     | 412                      | 8.0  | 0.439         | 12.6              | LOS B            | 2.7                   | 20.4                | 0.70         | 0.73                        | 56.2               |
| Approach                                |        | 788                      | 8.0  | 0.439         | 8.5               | LOS A            | 2.7                   | 20.4                | 0.68         | 0.61                        | 56.2               |
| West: Elderslie Road (west)             |        |                          |      |               |                   |                  |                       |                     |              |                             |                    |
| 10                                      | L2     | 89                       | 8.0  | 0.518         | 10.3              | LOS B            | 5.8                   | 43.3                | 0.87         | 0.83                        | 52.6               |
| 11                                      | T1     | 173                      | 8.0  | 0.518         | 10.6              | LOS B            | 5.8                   | 43.3                | 0.87         | 0.83                        | 55.6               |
| 12a                                     | R1     | 72                       | 8.0  | 0.758         | 19.4              | LOS B            | 12.7                  | 95.1                | 0.96         | 0.99                        | 48.7               |
| 12b                                     | R3     | 417                      | 8.0  | 0.758         | 22.2              | LOS C            | 12.7                  | 95.1                | 0.96         | 0.99                        | 50.8               |
| Approach                                |        | 751                      | 8.0  | 0.758         | 17.8              | LOS B            | 12.7                  | 95.1                | 0.92         | 0.93                        | 51.7               |
| All Vehicles                            |        | 3258                     | 8.0  | 1.065         | 33.3              | LOS C            | 47.3                  | 353.5               | 0.84         | 1.35                        | 42.1               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

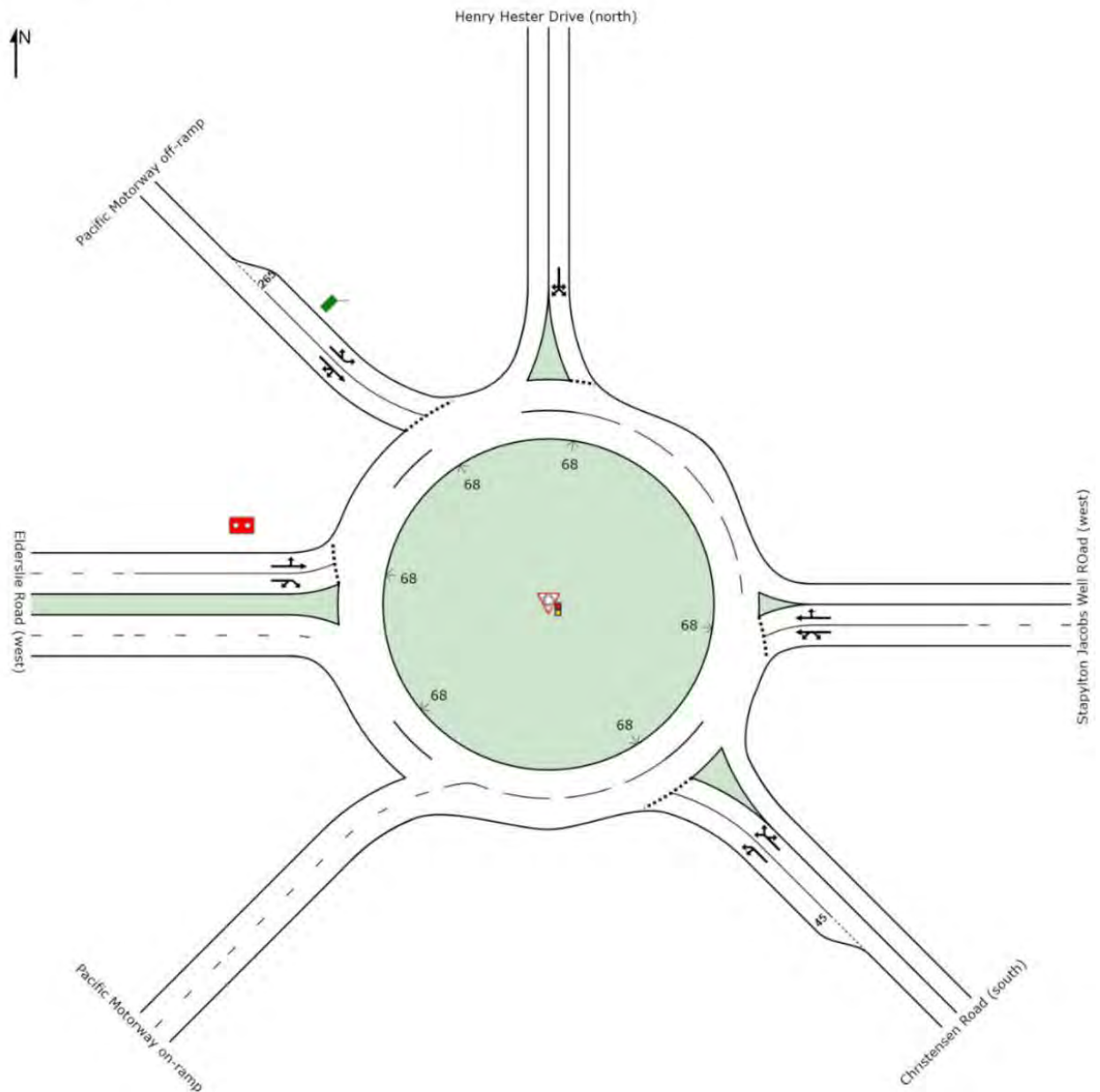
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

## UPGRADE B – EASTERN ROUNDABOUT

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering



## MOVEMENT SUMMARY

 **Site: Model 35 2020AM east Stage 2 UPGRADE B - SENSITIVITY**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|-----------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | 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 per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 21                                      | L2     | 38                 | 8.0        | 0.193         | 5.5               | LOS A            | 1.1                            | 8.1        | 0.76         | 0.59                        | 54.7               |
| 21a                                     | L1     | 182                | 8.0        | 0.193         | 5.7               | LOS A            | 1.1                            | 8.1        | 0.75         | 0.64                        | 56.0               |
| 23a                                     | R1     | 48                 | 8.0        | 0.193         | 12.4              | LOS B            | 0.9                            | 6.4        | 0.72         | 0.80                        | 55.4               |
| 23b                                     | R3     | 23                 | 8.0        | 0.193         | 15.3              | LOS B            | 0.9                            | 6.4        | 0.72         | 0.80                        | 58.3               |
| Approach                                |        | 291                | 8.0        | 0.193         | 7.5               | LOS A            | 1.1                            | 8.1        | 0.75         | 0.67                        | 55.9               |
| East: Stapylton Jacobs Well Road (west) |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4b                                      | L3     | 41                 | 8.0        | 0.751         | 15.9              | LOS B            | 4.8                            | 36.1       | 0.94         | 1.15                        | 47.9               |
| 4a                                      | L1     | 176                | 8.0        | 0.751         | 16.0              | LOS B            | 4.8                            | 36.1       | 0.94         | 1.15                        | 50.5               |
| 5                                       | T1     | 382                | 8.0        | 0.751         | 15.6              | LOS B            | 4.8                            | 36.1       | 0.94         | 1.12                        | 51.2               |
| 6                                       | R2     | 88                 | 8.0        | 0.751         | 22.1              | LOS C            | 3.0                            | 22.2       | 0.94         | 1.09                        | 52.3               |
| Approach                                |        | 687                | 8.0        | 0.751         | 16.5              | LOS B            | 4.8                            | 36.1       | 0.94         | 1.13                        | 51.0               |
| North: Henry Hester Drive (north)       |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 7                                       | L2     | 77                 | 8.0        | 0.628         | 9.0               | LOS A            | 3.2                            | 23.6       | 0.88         | 1.02                        | 51.1               |
| 7a                                      | L1     | 47                 | 8.0        | 0.628         | 9.1               | LOS A            | 3.2                            | 23.6       | 0.88         | 1.02                        | 52.8               |
| 9a                                      | R1     | 103                | 8.0        | 0.628         | 15.2              | LOS B            | 3.2                            | 23.6       | 0.88         | 1.02                        | 53.9               |
| 9                                       | R2     | 81                 | 8.0        | 0.628         | 16.6              | LOS B            | 3.2                            | 23.6       | 0.88         | 1.02                        | 55.2               |
| Approach                                |        | 308                | 8.0        | 0.628         | 13.0              | LOS B            | 3.2                            | 23.6       | 0.88         | 1.02                        | 53.3               |
| NorthWest: Pacific Motorway off-ramp    |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 27b                                     | L3     | 109                | 8.0        | 0.550         | 4.4               | LOS A            | 3.2                            | 24.1       | 0.70         | 0.47                        | 54.0               |
| 27a                                     | L1     | 395                | 8.0        | 0.550         | 4.0               | LOS A            | 3.2                            | 24.1       | 0.70         | 0.47                        | 57.2               |
| 28                                      | T1     | 251                | 8.0        | 0.684         | 4.8               | LOS A            | 5.8                            | 43.3       | 0.81         | 0.77                        | 54.3               |
| 29                                      | R2     | 1                  | 8.0        | 0.684         | 12.0              | LOS B            | 5.8                            | 43.3       | 0.81         | 0.77                        | 55.7               |
| 29b                                     | R3     | 552                | 8.0        | 0.684         | 13.4              | LOS B            | 5.8                            | 43.3       | 0.81         | 0.77                        | 57.1               |
| Approach                                |        | 1308               | 8.0        | 0.684         | 8.2               | LOS A            | 5.8                            | 43.3       | 0.77         | 0.65                        | 56.3               |
| West: Elderslie Road (west)             |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 10                                      | L2     | 72                 | 8.0        | 0.647         | 10.9              | LOS B            | 8.3                            | 62.2       | 0.90         | 0.90                        | 52.1               |
| 11                                      | T1     | 283                | 8.0        | 0.647         | 11.2              | LOS B            | 8.3                            | 62.2       | 0.90         | 0.90                        | 55.1               |
| 12a                                     | R1     | 251                | 8.0        | 0.507         | 15.4              | LOS B            | 7.4                            | 55.2       | 0.85         | 0.77                        | 51.8               |
| 12b                                     | R3     | 105                | 8.0        | 0.507         | 18.2              | LOS B            | 7.4                            | 55.2       | 0.85         | 0.77                        | 54.3               |
| Approach                                |        | 711                | 8.0        | 0.647         | 13.7              | LOS B            | 8.3                            | 62.2       | 0.87         | 0.84                        | 53.4               |
| All Vehicles                            |        | 3305               | 8.0        | 0.751         | 11.5              | LOS B            | 8.3                            | 62.2       | 0.84         | 0.83                        | 54.2               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 36 2020PM east Stage 2 UPGRADE B - SENSITIVITY

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|-----------------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                                  | OD Mov | 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 per veh | Average Speed km/h |
| SouthEast: Christensen Road (south)     |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 21                                      | L2     | 111                | 8.0        | 0.707         | 13.3              | LOS B            | 4.7                            | 35.4       | 0.93         | 1.10                        | 50.6               |
| 21a                                     | L1     | 379                | 8.0        | 0.707         | 12.8              | LOS B            | 4.7                            | 35.4       | 0.93         | 1.09                        | 52.0               |
| 23a                                     | R1     | 97                 | 8.0        | 0.707         | 17.6              | LOS B            | 2.9                            | 21.7       | 0.94         | 1.06                        | 52.4               |
| 23b                                     | R3     | 34                 | 8.0        | 0.707         | 20.4              | LOS C            | 2.9                            | 21.7       | 0.94         | 1.06                        | 55.0               |
| Approach                                |        | 621                | 8.0        | 0.707         | 14.0              | LOS B            | 4.7                            | 35.4       | 0.93         | 1.09                        | 52.0               |
| East: Stapylton Jacobs Well Road (west) |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4b                                      | L3     | 42                 | 8.0        | 0.898         | 33.6              | LOS C            | 16.7                           | 124.9      | 0.95         | 1.74                        | 38.6               |
| 4a                                      | L1     | 364                | 8.0        | 0.898         | 35.7              | LOS D            | 16.7                           | 124.9      | 0.95         | 1.74                        | 40.2               |
| 5                                       | T1     | 638                | 8.0        | 0.898         | 32.6              | LOS C            | 16.7                           | 124.9      | 0.96         | 1.60                        | 42.0               |
| 6                                       | R2     | 120                | 8.0        | 0.898         | 37.3              | LOS D            | 9.6                            | 71.9       | 0.96         | 1.49                        | 43.8               |
| Approach                                |        | 1164               | 8.0        | 0.898         | 34.1              | LOS C            | 16.7                           | 124.9      | 0.96         | 1.64                        | 41.5               |
| North: Henry Hester Drive (north)       |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 7                                       | L2     | 88                 | 8.0        | 0.577         | 8.2               | LOS A            | 3.1                            | 22.9       | 0.82         | 0.98                        | 51.5               |
| 7a                                      | L1     | 35                 | 8.0        | 0.577         | 8.3               | LOS A            | 3.1                            | 22.9       | 0.82         | 0.98                        | 53.2               |
| 9a                                      | R1     | 130                | 8.0        | 0.577         | 14.4              | LOS B            | 3.1                            | 22.9       | 0.82         | 0.98                        | 54.3               |
| 9                                       | R2     | 77                 | 8.0        | 0.577         | 15.8              | LOS B            | 3.1                            | 22.9       | 0.82         | 0.98                        | 55.7               |
| Approach                                |        | 330                | 8.0        | 0.577         | 12.4              | LOS B            | 3.1                            | 22.9       | 0.82         | 0.98                        | 53.7               |
| NorthWest: Pacific Motorway off-ramp    |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 27b                                     | L3     | 84                 | 8.0        | 0.411         | 4.6               | LOS A            | 2.2                            | 16.5       | 0.70         | 0.49                        | 54.0               |
| 27a                                     | L1     | 248                | 8.0        | 0.411         | 4.2               | LOS A            | 2.2                            | 16.5       | 0.70         | 0.49                        | 57.2               |
| 28                                      | T1     | 74                 | 8.0        | 0.471         | 4.6               | LOS A            | 3.3                            | 24.5       | 0.77         | 0.77                        | 53.4               |
| 29                                      | R2     | 4                  | 8.0        | 0.471         | 11.7              | LOS B            | 3.3                            | 24.5       | 0.77         | 0.77                        | 54.8               |
| 29b                                     | R3     | 412                | 8.0        | 0.471         | 13.2              | LOS B            | 3.3                            | 24.5       | 0.77         | 0.77                        | 56.1               |
| Approach                                |        | 822                | 8.0        | 0.471         | 8.8               | LOS A            | 3.3                            | 24.5       | 0.74         | 0.66                        | 55.9               |
| West: Elderslie Road (west)             |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 10                                      | L2     | 89                 | 8.0        | 0.526         | 9.5               | LOS A            | 6.3                            | 47.0       | 0.86         | 0.79                        | 53.1               |
| 11                                      | T1     | 202                | 8.0        | 0.526         | 9.8               | LOS A            | 6.3                            | 47.0       | 0.86         | 0.79                        | 56.2               |
| 12a                                     | R1     | 92                 | 8.0        | 0.710         | 17.7              | LOS B            | 12.6                           | 94.0       | 0.93         | 0.88                        | 49.7               |
| 12b                                     | R3     | 417                | 8.0        | 0.710         | 20.5              | LOS C            | 12.6                           | 94.0       | 0.93         | 0.88                        | 51.9               |
| Approach                                |        | 800                | 8.0        | 0.710         | 16.3              | LOS B            | 12.6                           | 94.0       | 0.91         | 0.85                        | 52.7               |
| All Vehicles                            |        | 3737               | 8.0        | 0.898         | 19.5              | LOS B            | 16.7                           | 124.9      | 0.88         | 1.10                        | 49.2               |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 23 2023AM east full dev UPGRADED V2 - SENS

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                       |               |                  |                      |                  |                                      |                     |              |                                |                       |
|-----------------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------------|--------------|--------------------------------|-----------------------|
| Mov ID                                  | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Queue Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| SouthEast: Christensen Road (south)     |        |                       |               |                  |                      |                  |                                      |                     |              |                                |                       |
| 21                                      | L2     | 92                    | 8.0           | 0.282            | 6.3                  | LOS A            | 1.8                                  | 13.7                | 0.83         | 0.70                           | 54.5                  |
| 21a                                     | L1     | 239                   | 8.0           | 0.282            | 6.8                  | LOS A            | 1.8                                  | 13.7                | 0.82         | 0.76                           | 55.5                  |
| 23a                                     | R1     | 59                    | 8.0           | 0.282            | 13.9                 | LOS B            | 1.6                                  | 11.7                | 0.80         | 0.86                           | 54.9                  |
| 23b                                     | R3     | 31                    | 8.0           | 0.282            | 16.7                 | LOS B            | 1.6                                  | 11.7                | 0.80         | 0.86                           | 57.7                  |
| Approach                                |        | 421                   | 8.0           | 0.282            | 8.4                  | LOS A            | 1.8                                  | 13.7                | 0.82         | 0.77                           | 55.4                  |
| East: Stapylton Jacobs Well ROAD (west) |        |                       |               |                  |                      |                  |                                      |                     |              |                                |                       |
| 4b                                      | L3     | 44                    | 8.0           | 0.915            | 63.9                 | LOS E            | 17.2                                 | 128.4               | 0.98         | 1.75                           | 30.2                  |
| 4a                                      | L1     | 184                   | 8.0           | 0.915            | 63.4                 | LOS E            | 17.2                                 | 128.4               | 0.98         | 1.75                           | 31.2                  |
| 5                                       | T1     | 407                   | 8.0           | 0.915            | 65.0                 | LOS E            | 17.2                                 | 128.4               | 0.98         | 1.67                           | 31.2                  |
| 6                                       | R2     | 84                    | 8.0           | 0.915            | 72.3                 | LOS E            | 10.7                                 | 80.3                | 0.98         | 1.58                           | 31.4                  |
| Approach                                |        | 719                   | 8.0           | 0.915            | 65.4                 | LOS E            | 17.2                                 | 128.4               | 0.98         | 1.68                           | 31.2                  |
| North: Henry Hester Drive (north)       |        |                       |               |                  |                      |                  |                                      |                     |              |                                |                       |
| 7                                       | L2     | 83                    | 8.0           | 0.977            | 96.6                 | LOS F            | 19.1                                 | 142.9               | 0.99         | 2.20                           | 24.0                  |
| 7a                                      | L1     | 56                    | 8.0           | 0.977            | 95.7                 | LOS F            | 19.1                                 | 142.9               | 0.99         | 2.20                           | 24.3                  |
| 9a                                      | R1     | 112                   | 8.0           | 0.977            | 102.7                | LOS F            | 19.1                                 | 142.9               | 0.99         | 2.20                           | 24.6                  |
| 9                                       | R2     | 88                    | 8.0           | 0.977            | 104.2                | LOS F            | 19.1                                 | 142.9               | 0.99         | 2.20                           | 24.8                  |
| Approach                                |        | 339                   | 8.0           | 0.977            | 100.5                | LOS F            | 19.1                                 | 142.9               | 0.99         | 2.20                           | 24.5                  |
| NorthWest: Pacific Motorway off-ramp    |        |                       |               |                  |                      |                  |                                      |                     |              |                                |                       |
| 27b                                     | L3     | 119                   | 8.0           | 0.347            | 11.1                 | LOS B            | 2.7                                  | 20.4                | 0.75         | 0.64                           | 51.5                  |
| 27a                                     | L1     | 381                   | 8.0           | 1.005            | 74.4                 | LOS E            | 118.2                                | 884.3               | 0.90         | 2.25                           | 28.4                  |
| 28                                      | T1     | 310                   | 8.0           | 1.005            | 118.6                | LOS F            | 118.2                                | 884.3               | 1.00         | 3.35                           | 22.0                  |
| 29                                      | R2     | 1                     | 8.0           | 1.005            | 118.3                | LOS F            | 118.2                                | 884.3               | 1.00         | 3.35                           | 22.2                  |
| 29b                                     | R3     | 602                   | 8.0           | 1.005            | 127.2                | LOS F            | 118.2                                | 884.3               | 1.00         | 3.35                           | 22.4                  |
| Approach                                |        | 1413                  | 8.0           | 1.005            | 101.3                | LOS F            | 118.2                                | 884.3               | 0.95         | 2.82                           | 24.8                  |
| West: Elderslie Road (west)             |        |                       |               |                  |                      |                  |                                      |                     |              |                                |                       |
| 10                                      | L2     | 78                    | 8.0           | 1.040            | 211.0                | LOS F            | 144.3                                | 1079.6              | 0.98         | 4.14                           | 14.2                  |
| 11                                      | T1     | 477                   | 8.0           | 1.040            | 211.3                | LOS F            | 144.3                                | 1079.6              | 0.98         | 4.14                           | 14.4                  |
| 12a                                     | R1     | 290                   | 8.0           | 0.976            | 81.5                 | LOS F            | 36.9                                 | 276.1               | 1.00         | 1.42                           | 28.2                  |
| 12b                                     | R3     | 114                   | 8.0           | 0.976            | 84.3                 | LOS F            | 36.9                                 | 276.1               | 1.00         | 1.42                           | 28.9                  |
| Approach                                |        | 959                   | 8.0           | 1.040            | 156.9                | LOS F            | 144.3                                | 1079.6              | 0.99         | 2.99                           | 18.3                  |
| All Vehicles                            |        | 3851                  | 8.0           | 1.040            | 98.2                 | LOS F            | 144.3                                | 1079.6              | 0.96         | 2.37                           | 25.0                  |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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: Model 24 2023PM east full dev UPGRADED V2 - SENS**

M1 Northbound, Yatala North - EXIT 38  
Roundabout Metering

| Movement Performance - Vehicles         |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
|-----------------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                                  | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| SouthEast: Christensen Road (south)     |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 21                                      | L2     | 136                   | 8.0           | 0.823            | 25.6                 | LOS C            | 8.3                                  | 62.0          | 0.99         | 1.35                           | 43.5                  |
| 21a                                     | L1     | 421                   | 8.0           | 0.823            | 24.5                 | LOS C            | 8.3                                  | 62.0          | 0.98         | 1.30                           | 44.9                  |
| 23a                                     | R1     | 106                   | 8.0           | 0.823            | 28.4                 | LOS C            | 5.0                                  | 37.5          | 0.96         | 1.21                           | 46.0                  |
| 23b                                     | R3     | 35                    | 8.0           | 0.823            | 31.2                 | LOS C            | 5.0                                  | 37.5          | 0.96         | 1.21                           | 47.9                  |
| Approach                                |        | 698                   | 8.0           | 0.823            | 25.6                 | LOS C            | 8.3                                  | 62.0          | 0.98         | 1.29                           | 44.9                  |
| East: Stapylton Jacobs Well Road (west) |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 4b                                      | L3     | 44                    | 8.0           | 1.127            | 271.6                | LOS F            | 121.6                                | 909.5         | 1.00         | 6.33                           | 11.5                  |
| 4a                                      | L1     | 381                   | 8.0           | 1.127            | 273.2                | LOS F            | 121.6                                | 909.5         | 1.00         | 6.33                           | 11.6                  |
| 5                                       | T1     | 677                   | 8.0           | 1.127            | 273.6                | LOS F            | 121.6                                | 909.5         | 1.00         | 5.82                           | 11.8                  |
| 6                                       | R2     | 127                   | 8.0           | 1.127            | 280.8                | LOS F            | 84.1                                 | 628.8         | 1.00         | 5.41                           | 11.9                  |
| Approach                                |        | 1229                  | 8.0           | 1.127            | 274.1                | LOS F            | 121.6                                | 909.5         | 1.00         | 5.95                           | 11.7                  |
| North: Henry Hester Drive (north)       |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 7                                       | L2     | 133                   | 8.0           | 0.839            | 20.5                 | LOS C            | 7.2                                  | 53.7          | 0.94         | 1.26                           | 44.5                  |
| 7a                                      | L1     | 40                    | 8.0           | 0.839            | 20.6                 | LOS C            | 7.2                                  | 53.7          | 0.94         | 1.26                           | 45.8                  |
| 9a                                      | R1     | 142                   | 8.0           | 0.839            | 26.7                 | LOS C            | 7.2                                  | 53.7          | 0.94         | 1.26                           | 46.6                  |
| 9                                       | R2     | 84                    | 8.0           | 0.839            | 28.1                 | LOS C            | 7.2                                  | 53.7          | 0.94         | 1.26                           | 47.7                  |
| Approach                                |        | 399                   | 8.0           | 0.839            | 24.3                 | LOS C            | 7.2                                  | 53.7          | 0.94         | 1.26                           | 46.0                  |
| NorthWest: Pacific Motorway off-ramp    |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 27b                                     | L3     | 92                    | 8.0           | 0.255            | 5.1                  | LOS A            | 1.5                                  | 11.5          | 0.74         | 0.60                           | 54.1                  |
| 27a                                     | L1     | 282                   | 8.0           | 0.738            | 7.6                  | LOS A            | 10.0                                 | 75.0          | 0.91         | 0.86                           | 53.4                  |
| 28                                      | T1     | 93                    | 8.0           | 0.738            | 9.6                  | LOS A            | 10.0                                 | 75.0          | 1.00         | 1.00                           | 52.6                  |
| 29                                      | R2     | 4                     | 8.0           | 0.738            | 16.7                 | LOS B            | 10.0                                 | 75.0          | 1.00         | 1.00                           | 53.9                  |
| 29b                                     | R3     | 450                   | 8.0           | 0.738            | 18.1                 | LOS B            | 10.0                                 | 75.0          | 1.00         | 1.00                           | 55.2                  |
| Approach                                |        | 921                   | 8.0           | 0.738            | 12.8                 | LOS B            | 10.0                                 | 75.0          | 0.95         | 0.92                           | 54.3                  |
| West: Elderslie Road (west)             |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 10                                      | L2     | 97                    | 8.0           | 0.555            | 10.8                 | LOS B            | 8.5                                  | 63.7          | 0.87         | 0.72                           | 52.2                  |
| 11                                      | T1     | 228                   | 8.0           | 0.555            | 11.1                 | LOS B            | 8.5                                  | 63.7          | 0.87         | 0.72                           | 55.2                  |
| 12a                                     | R1     | 105                   | 8.0           | 0.733            | 19.6                 | LOS B            | 17.1                                 | 127.6         | 0.94         | 0.80                           | 48.6                  |
| 12b                                     | R3     | 455                   | 8.0           | 0.733            | 22.4                 | LOS C            | 17.1                                 | 127.6         | 0.94         | 0.80                           | 50.7                  |
| Approach                                |        | 885                   | 8.0           | 0.733            | 17.9                 | LOS B            | 17.1                                 | 127.6         | 0.92         | 0.77                           | 51.6                  |
| All Vehicles                            |        | 4132                  | 8.0           | 1.127            | 94.9                 | LOS F            | 121.6                                | 909.5         | 0.96         | 2.48                           | 25.5                  |

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model 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 ACCESS / STAPYLTON JACOBS WELL ROAD INTERSECTION

2020AM PEAK – STAGE ONE

2020PM PEAK – STAGE ONE

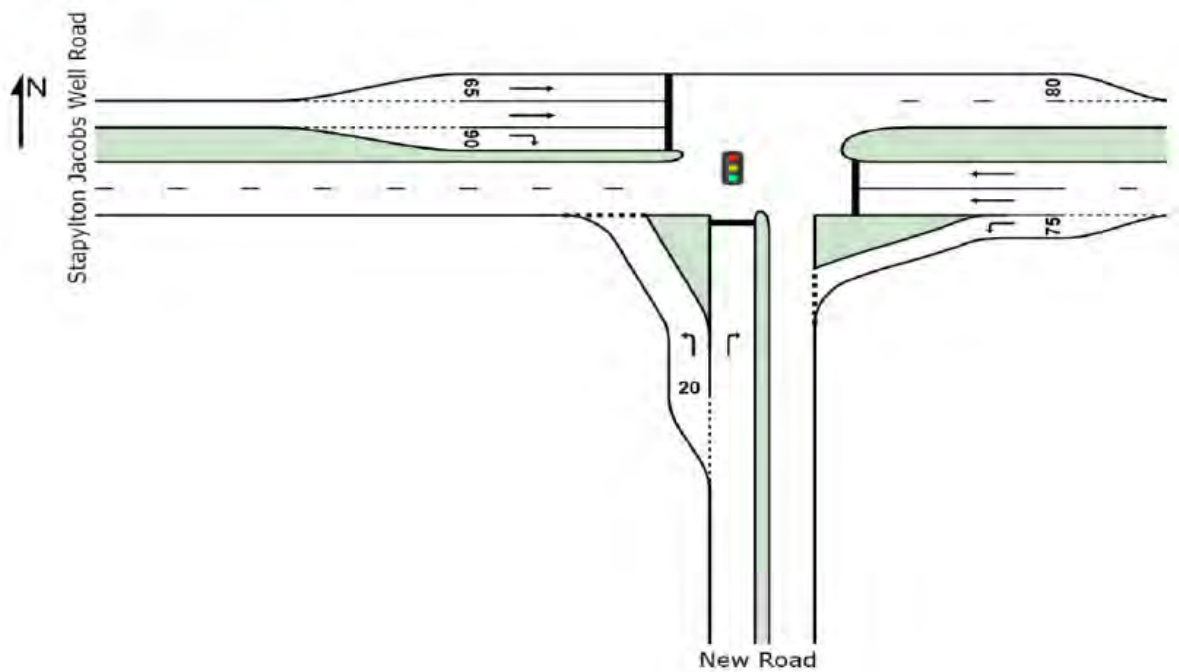
2023 AM PEAK – FULL DEVELOPMENT

2023 PM PEAK – FULL DEVELOPMENT

2033AM PEAK – FULL DEVELOPMENT

2033PM PEAK – FULL DEVELOPMENT

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated



## MOVEMENT SUMMARY

### Site: Model 31A 2020 AM Peak (SJW Rd - New Rd Int) - STAGE 1

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
 Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
|----------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                           | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: New Road                  |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 1                                | L2     | 61                 | 15.0       | 0.066         | 7.8               | LOS A            | 0.3                      | 2.5              | 0.43         | 0.64                        | 52.0               |
| 3                                | R2     | 15                 | 15.0       | 0.055         | 22.4              | LOS C            | 0.3                      | 2.1              | 0.88         | 0.67                        | 42.9               |
| Approach                         |        | 76                 | 15.0       | 0.066         | 10.6              | LOS B            | 0.3                      | 2.5              | 0.52         | 0.65                        | 50.0               |
| East: Stapylton Jacobs Well Road |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 4                                | L2     | 28                 | 15.0       | 0.027         | 7.2               | LOS A            | 0.1                      | 0.9              | 0.37         | 0.61                        | 52.4               |
| 5                                | T1     | 490                | 15.0       | 0.546         | 14.9              | LOS B            | 4.4                      | 35.0             | 0.92         | 0.76                        | 48.2               |
| Approach                         |        | 518                | 15.0       | 0.546         | 14.5              | LOS B            | 4.4                      | 35.0             | 0.89         | 0.75                        | 48.4               |
| West: Stapylton Jacobs Well Road |        |                    |            |               |                   |                  |                          |                  |              |                             |                    |
| 11                               | T1     | 590                | 15.0       | 0.408         | 5.5               | LOS A            | 4.7                      | 36.9             | 0.59         | 0.50                        | 55.0               |
| 12                               | R2     | 114                | 15.0       | 0.460         | 24.1              | LOS C            | 2.2                      | 17.7             | 0.95         | 0.77                        | 42.1               |
| Approach                         |        | 704                | 15.0       | 0.460         | 8.5               | LOS A            | 4.7                      | 36.9             | 0.65         | 0.55                        | 52.4               |
| All Vehicles                     |        | 1298               | 15.0       | 0.546         | 11.0              | LOS B            | 4.7                      | 36.9             | 0.74         | 0.63                        | 50.6               |

Level of Service (LOS) Method: Delay (HCM 2000).  
 Vehicle movement LOS values are based on average delay per movement  
 Intersection and Approach LOS values are based on average delay for all vehicle movements.  
 SIDRA Standard Delay Model 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.

## PHASING SUMMARY

 **Site: Model 31A 2020 AM Peak (SJW Rd - New Rd Int) - STAGE 1**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection

Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

Phase times determined by the program

Sequence: Variable Phasing

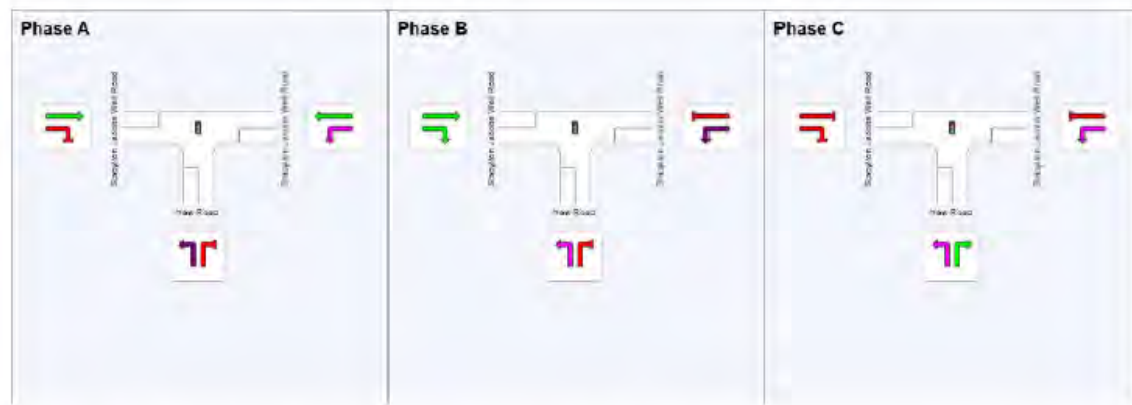
Movement Class: All Movement Classes

Input Sequence: A, B, C

Output Sequence: A, B, C

### Phase Timing Results

| Phase                   | A    | B    | C    |
|-------------------------|------|------|------|
| Reference Phase         | No   | Yes  | No   |
| Phase Change Time (sec) | 24   | 0    | 12   |
| Green Time (sec)        | 10   | 6    | 6    |
| Yellow Time (sec)       | 4    | 4    | 4    |
| All-Red Time (sec)      | 2    | 2    | 2    |
| Phase Time (sec)        | 16   | 12   | 12   |
| Phase Split             | 40 % | 30 % | 30 % |



## MOVEMENT SUMMARY

 **Site: Model 31B 2020 PM Peak (SJW Rd - New Rd Int) - STAGE 1**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
 Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
|----------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|-----------------------------|---------------------|--------------|--------------------------------|-----------------------|
| Mov ID                           | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Vehicles<br>veh | Queue Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: New Road                  |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 1                                | L2     | 140                   | 15.0          | 0.167            | 9.0                  | LOS A            | 1.0                         | 8.1                 | 0.55         | 0.69                           | 51.2                  |
| 3                                | R2     | 35                    | 15.0          | 0.128            | 22.7                 | LOS C            | 0.6                         | 5.0                 | 0.90         | 0.71                           | 42.7                  |
| Approach                         |        | 175                   | 15.0          | 0.167            | 11.7                 | LOS B            | 1.0                         | 8.1                 | 0.62         | 0.69                           | 49.2                  |
| East: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 4                                | L2     | 9                     | 15.0          | 0.008            | 6.8                  | LOS A            | 0.0                         | 0.2                 | 0.31         | 0.59                           | 52.6                  |
| 5                                | T1     | 740                   | 15.0          | 0.824            | 21.0                 | LOS C            | 8.5                         | 67.2                | 1.00         | 1.04                           | 44.7                  |
| Approach                         |        | 749                   | 15.0          | 0.824            | 20.8                 | LOS C            | 8.5                         | 67.2                | 0.99         | 1.04                           | 44.7                  |
| West: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 11                               | T1     | 496                   | 15.0          | 0.343            | 5.3                  | LOS A            | 3.8                         | 29.6                | 0.57         | 0.48                           | 55.2                  |
| 12                               | R2     | 35                    | 15.0          | 0.141            | 22.9                 | LOS C            | 0.6                         | 5.1                 | 0.90         | 0.71                           | 42.7                  |
| Approach                         |        | 531                   | 15.0          | 0.343            | 6.5                  | LOS A            | 3.8                         | 29.6                | 0.59         | 0.49                           | 54.2                  |
| All Vehicles                     |        | 1455                  | 15.0          | 0.824            | 14.5                 | LOS B            | 8.5                         | 67.2                | 0.80         | 0.80                           | 48.3                  |

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model 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.

## PHASING SUMMARY

 **Site: Model 31B 2020 PM Peak (SJW Rd - New Rd Int) - STAGE 1**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

Phase times determined by the program

Sequence: Variable Phasing

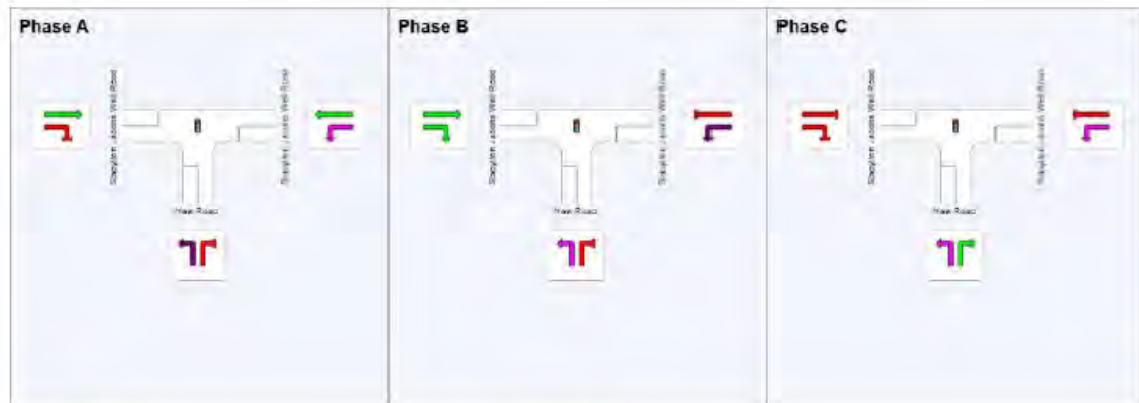
Movement Class: All Movement Classes

Input Sequence: A, B, C

Output Sequence: A, B, C

### Phase Timing Results

| Phase                   | A    | B    | C    |
|-------------------------|------|------|------|
| Reference Phase         | No   | Yes  | No   |
| Phase Change Time (sec) | 24   | 0    | 12   |
| Green Time (sec)        | 10   | 6    | 6    |
| Yellow Time (sec)       | 4    | 4    | 4    |
| All-Red Time (sec)      | 2    | 2    | 2    |
| Phase Time (sec)        | 16   | 12   | 12   |
| Phase Split             | 40 % | 30 % | 30 % |



## MOVEMENT SUMMARY

 **Site: Model 32A 2023 AM Peak (SJW Rd - New Rd Int) - ULTIMATE**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
|----------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                           | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: New Road                  |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 1                                | L2     | 153                   | 15.0          | 0.164            | 8.2                  | LOS A            | 0.9                                  | 7.5           | 0.49         | 0.67                           | 51.7                  |
| 3                                | R2     | 79                    | 15.0          | 0.288            | 23.4                 | LOS C            | 1.5                                  | 11.7          | 0.93         | 0.75                           | 42.4                  |
| Approach                         |        | 232                   | 15.0          | 0.288            | 13.4                 | LOS B            | 1.5                                  | 11.7          | 0.64         | 0.70                           | 48.1                  |
| East: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 4                                | L2     | 124                   | 15.0          | 0.140            | 8.5                  | LOS A            | 0.8                                  | 6.5           | 0.51         | 0.67                           | 51.5                  |
| 5                                | T1     | 512                   | 15.0          | 0.815            | 22.4                 | LOS C            | 5.9                                  | 46.5          | 1.00         | 1.01                           | 43.9                  |
| Approach                         |        | 636                   | 15.0          | 0.815            | 19.7                 | LOS B            | 5.9                                  | 46.5          | 0.90         | 0.95                           | 45.2                  |
| West: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 11                               | T1     | 657                   | 15.0          | 0.454            | 5.7                  | LOS A            | 5.4                                  | 42.6          | 0.61         | 0.52                           | 54.9                  |
| 12                               | R2     | 284                   | 15.0          | 0.764            | 25.3                 | LOS C            | 6.2                                  | 48.6          | 0.99         | 0.96                           | 41.6                  |
| Approach                         |        | 941                   | 15.0          | 0.764            | 11.6                 | LOS B            | 6.2                                  | 48.6          | 0.72         | 0.65                           | 50.1                  |
| All Vehicles                     |        | 1809                  | 15.0          | 0.815            | 14.7                 | LOS B            | 6.2                                  | 48.6          | 0.78         | 0.76                           | 48.0                  |

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model 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.

## PHASING SUMMARY

 **Site: Model 32A 2023 AM Peak (SJW Rd - New Rd Int) - ULTIMATE**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection

Signals - Fixed Time Isolated Cycle Time = 40 seconds (Practical Cycle Time)

Phase times determined by the program

Sequence: Variable Phasing

Movement Class: All Movement Classes

Input Sequence: A, B, C

Output Sequence: A, B, C

### Phase Timing Results

| Phase                   | A    | B    | C    |
|-------------------------|------|------|------|
| Reference Phase         | No   | Yes  | No   |
| Phase Change Time (sec) | 27   | 0    | 15   |
| Green Time (sec)        | 7    | 9    | 6    |
| Yellow Time (sec)       | 4    | 4    | 4    |
| All-Red Time (sec)      | 2    | 2    | 2    |
| Phase Time (sec)        | 13   | 15   | 12   |
| Phase Split             | 33 % | 38 % | 30 % |



## MOVEMENT SUMMARY

 **Site: Model 32B 2023 PM Peak (SJW Rd - New Rd Int) - ULTIMATE**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
 Signals - Fixed Time Isolated Cycle Time = 50 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
|----------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|------------------------|--------------|--------------------------------|-----------------------|
| Mov ID                           | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Queue<br>Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: New Road                  |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
| 1                                | L2     | 349                   | 15.0          | 0.448            | 9.8                  | LOS A            | 3.7                                  | 29.5                   | 0.60         | 0.74                           | 50.6                  |
| 3                                | R2     | 131                   | 15.0          | 0.598            | 30.6                 | LOS C            | 3.4                                  | 26.5                   | 0.99         | 0.82                           | 39.1                  |
| Approach                         |        | 480                   | 15.0          | 0.598            | 15.5                 | LOS B            | 3.7                                  | 29.5                   | 0.71         | 0.76                           | 46.8                  |
| East: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
| 4                                | L2     | 39                    | 15.0          | 0.033            | 6.9                  | LOS A            | 0.2                                  | 1.3                    | 0.30         | 0.60                           | 52.7                  |
| 5                                | T1     | 830                   | 15.0          | 0.578            | 13.0                 | LOS B            | 8.1                                  | 64.3                   | 0.83         | 0.72                           | 49.5                  |
| Approach                         |        | 869                   | 15.0          | 0.578            | 12.7                 | LOS B            | 8.1                                  | 64.3                   | 0.81         | 0.71                           | 49.6                  |
| West: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                                      |                        |              |                                |                       |
| 11                               | T1     | 525                   | 15.0          | 0.312            | 4.2                  | LOS A            | 4.0                                  | 31.3                   | 0.46         | 0.39                           | 56.1                  |
| 12                               | R2     | 87                    | 15.0          | 0.439            | 29.9                 | LOS C            | 2.2                                  | 17.1                   | 0.97         | 0.76                           | 39.5                  |
| Approach                         |        | 612                   | 15.0          | 0.439            | 7.9                  | LOS A            | 4.0                                  | 31.3                   | 0.53         | 0.45                           | 53.0                  |
| All Vehicles                     |        | 1961                  | 15.0          | 0.598            | 11.9                 | LOS B            | 8.1                                  | 64.3                   | 0.70         | 0.64                           | 49.9                  |

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model 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.

## PHASING SUMMARY

 **Site: Model 32B 2023 PM Peak (SJW Rd - New Rd Int) - ULTIMATE**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Practical Cycle Time)

Phase times determined by the program

Sequence: Variable Phasing

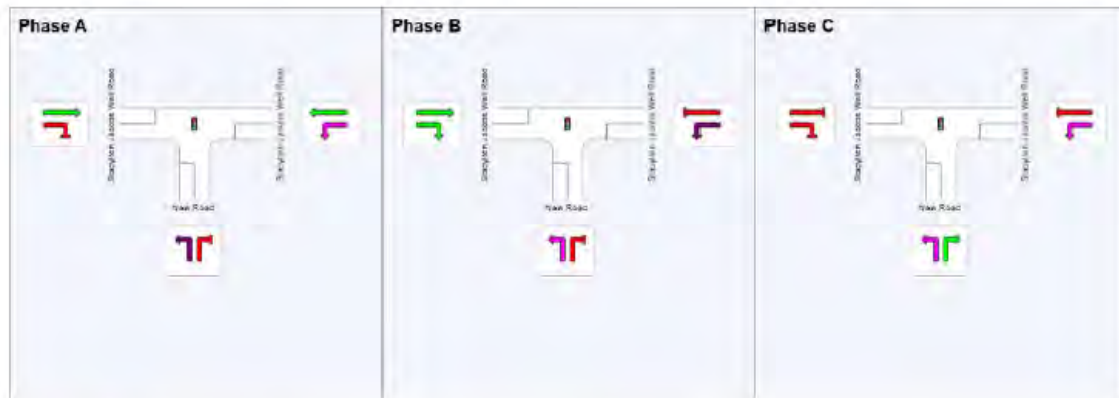
Movement Class: All Movement Classes

Input Sequence: A, B, C

Output Sequence: A, B, C

### Phase Timing Results

| Phase                   | A    | B    | C    |
|-------------------------|------|------|------|
| Reference Phase         | No   | Yes  | No   |
| Phase Change Time (sec) | 24   | 0    | 12   |
| Green Time (sec)        | 20   | 6    | 6    |
| Yellow Time (sec)       | 4    | 4    | 4    |
| All-Red Time (sec)      | 2    | 2    | 2    |
| Phase Time (sec)        | 26   | 12   | 12   |
| Phase Split             | 52 % | 24 % | 24 % |



|                                                                                     |                                          |                                                                                     |                              |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|------------------------------|
|  | Normal Movement                          |  | Permitted/Opposed            |
|  | Slip/Bypass-Lane Movement                |  | Opposed Slip/Bypass-Lane     |
|  | Stopped Movement                         |  | Turn On Red                  |
|  | Other Movement Class Running             |  | Other Movement Class Stopped |
|  | Mixed Running & Stopped Movement Classes |  | Phase Transition Applied     |
|  | Undetected Movement                      |                                                                                     |                              |

## MOVEMENT SUMMARY

 **Site: Model 33A 2033 AM Peak (SJW Rd - New Rd Int) - ULTIMATE**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
|----------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|-----------------------------|---------------------|--------------|--------------------------------|-----------------------|
| Mov ID                           | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Vehicles<br>veh | Queue Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: New Road                  |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 1                                | L2     | 153                   | 15.0          | 0.170            | 8.7                  | LOS A            | 1.2                         | 9.5                 | 0.47         | 0.67                           | 51.4                  |
| 3                                | R2     | 79                    | 15.0          | 0.361            | 29.4                 | LOS C            | 1.9                         | 15.2                | 0.96         | 0.75                           | 39.7                  |
| Approach                         |        | 232                   | 15.0          | 0.361            | 15.7                 | LOS B            | 1.9                         | 15.2                | 0.64         | 0.70                           | 46.7                  |
| East: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 4                                | L2     | 124                   | 15.0          | 0.128            | 8.3                  | LOS A            | 0.9                         | 7.0                 | 0.43         | 0.66                           | 51.7                  |
| 5                                | T1     | 665                   | 15.0          | 0.712            | 20.5                 | LOS C            | 8.2                         | 64.5                | 0.96         | 0.88                           | 44.9                  |
| Approach                         |        | 789                   | 15.0          | 0.712            | 18.6                 | LOS B            | 8.2                         | 64.5                | 0.88         | 0.85                           | 45.9                  |
| West: Stapylton Jacobs Well Road |        |                       |               |                  |                      |                  |                             |                     |              |                                |                       |
| 11                               | T1     | 854                   | 15.0          | 0.507            | 4.9                  | LOS A            | 7.7                         | 60.6                | 0.53         | 0.47                           | 55.6                  |
| 12                               | R2     | 284                   | 15.0          | 0.661            | 25.4                 | LOS C            | 6.7                         | 53.3                | 0.95         | 0.86                           | 41.5                  |
| Approach                         |        | 1138                  | 15.0          | 0.661            | 10.0                 | LOS A            | 7.7                         | 60.6                | 0.64         | 0.57                           | 51.2                  |
| All Vehicles                     |        | 2159                  | 15.0          | 0.712            | 13.7                 | LOS B            | 8.2                         | 64.5                | 0.73         | 0.68                           | 48.7                  |

Level of Service (LOS) Method: Delay (HCM 2000).  
Vehicle movement LOS values are based on average delay per movement  
Intersection and Approach LOS values are based on average delay for all vehicle movements.  
SIDRA Standard Delay Model 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.

## PHASING SUMMARY

 **Site: Model 33A 2033 AM Peak (SJW Rd - New Rd Int) - ULTIMATE**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection

Signals - Fixed Time Isolated Cycle Time = 50 seconds (Practical Cycle Time)

Phase times determined by the program

Sequence: Variable Phasing

Movement Class: All Movement Classes

Input Sequence: A, B, C

Output Sequence: A, B, C

### Phase Timing Results

| Phase                   | A    | B    | C    |
|-------------------------|------|------|------|
| Reference Phase         | No   | Yes  | No   |
| Phase Change Time (sec) | 31   | 0    | 19   |
| Green Time (sec)        | 13   | 13   | 6    |
| Yellow Time (sec)       | 4    | 4    | 4    |
| All-Red Time (sec)      | 2    | 2    | 2    |
| Phase Time (sec)        | 19   | 19   | 12   |
| Phase Split             | 38 % | 38 % | 24 % |



## MOVEMENT SUMMARY

 **Site: Model 33B 2033 PM Peak (SJW Rd - New Rd Int) - ULTIMATE**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Practical Cycle Time)

| Movement Performance - Vehicles  |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
|----------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID                           | OD Mov | 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 per veh | Average Speed km/h |
| South: New Road                  |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 1                                | L2     | 349                | 15.0       | 0.491         | 11.4              | LOS B            | 4.5                            | 35.5             | 0.69         | 0.76                        | 49.5               |
| 3                                | R2     | 131                | 15.0       | 0.598         | 30.6              | LOS C            | 3.4                            | 26.5             | 0.99         | 0.82                        | 39.1               |
| Approach                         |        | 480                | 15.0       | 0.598         | 16.7              | LOS B            | 4.5                            | 35.5             | 0.77         | 0.78                        | 46.2               |
| East: Stapylton Jacobs Well Road |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 4                                | L2     | 39                 | 15.0       | 0.033         | 6.9               | LOS A            | 0.2                            | 1.3              | 0.30         | 0.60                        | 52.7               |
| 5                                | T1     | 1079               | 15.0       | 0.751         | 16.5              | LOS B            | 12.7                           | 100.1            | 0.92         | 0.88                        | 47.2               |
| Approach                         |        | 1118               | 15.0       | 0.751         | 16.2              | LOS B            | 12.7                           | 100.1            | 0.90         | 0.87                        | 47.4               |
| West: Stapylton Jacobs Well Road |        |                    |            |               |                   |                  |                                |                  |              |                             |                    |
| 11                               | T1     | 683                | 15.0       | 0.406         | 4.5               | LOS A            | 5.6                            | 44.1             | 0.49         | 0.43                        | 55.9               |
| 12                               | R2     | 87                 | 15.0       | 0.439         | 29.9              | LOS C            | 2.2                            | 17.1             | 0.97         | 0.76                        | 39.5               |
| Approach                         |        | 770                | 15.0       | 0.439         | 7.4               | LOS A            | 5.6                            | 44.1             | 0.55         | 0.47                        | 53.4               |
| All Vehicles                     |        | 2368               | 15.0       | 0.751         | 13.4              | LOS B            | 12.7                           | 100.1            | 0.76         | 0.72                        | 48.9               |

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model 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.

## PHASING SUMMARY

 **Site: Model 33B 2033 PM Peak (SJW Rd - New Rd Int) - ULTIMATE**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection  
 Signals - Fixed Time Isolated Cycle Time = 50 seconds (Practical Cycle Time)

Phase times determined by the program

Sequence: Variable Phasing

Movement Class: All Movement Classes

Input Sequence: A, B, C

Output Sequence: A, B, C

### Phase Timing Results

| Phase                   | A    | B    | C    |
|-------------------------|------|------|------|
| Reference Phase         | No   | Yes  | No   |
| Phase Change Time (sec) | 24   | 0    | 12   |
| Green Time (sec)        | 20   | 6    | 6    |
| Yellow Time (sec)       | 4    | 4    | 4    |
| All-Red Time (sec)      | 2    | 2    | 2    |
| Phase Time (sec)        | 26   | 12   | 12   |
| Phase Split             | 52 % | 24 % | 24 % |

