



TRAFFIC IMPACT ASSESSMENT

PROPOSED INDUSTRIAL ESTATE (STAGE 2)

60 STAPYLTON – JACOBS WELL ROAD, STAPYLTON

(RESPONSE TO INFORMATION REQUESTED

DATED 24 DECEMBER 2020)

Prepared for

FRASERS PROPERTY

23 FEBRUARY 2021

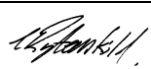
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60 Stapylton - Jacobs Well Road – STAGE 2

RTE Reference 20337

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1	20 November 2020	DA ISSUE	Luke Rytenskild Director RPEQ 6293	
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1.0 INTRODUCTION

1.1 Background

Rytenskild Traffic Engineering (RTE) has been engaged by Frasers Property to prepare a Transport Impact Assessment of its proposed industry development at Yatala.

This report forms part of a Development Application for an Industrial Estate for the second stage of the project.

It is noted that traffic impact of the overall estate has been carried out as part of a separate application. The results of the analysis indicate that the first stage of the development will require signalisation of the Stapylton – Jacobs Well Road intersection, with the following works proposed to be completed prior to the completion of stage two:

- Construction of the second approach lane on the northbound off ramp (western side of Exit 38 interchange);
- Construction of second departure lane on the Stapylton – Jacobs Well Road leg of the eastern roundabout at the Exit 38 interchange.

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

This is an amended version of the report submitted with the Development Application and addresses the following matters raised by Council in its Information Request:

Transport Assessment

3 New Road 01/Christensen Road Intersection

The applicant is requested to update the Rytenskild Traffic Engineering Traffic Impact Assessment (TIA) as follows:

- a. Address the relevant traffic requirements of condition 10 of the overarching approval (MIN/2019/762), specifically points a), c) and d). In addition to the site access intersection the applicant is required to upgrade Christensen Road and its intersection with Eastern Service Road.
- d. Provide the traffic survey data that was used to establish the background traffic volumes on Christensen Road.
- e. Undertake a sensitivity analysis adopting the following assumptions:
 - i. Undertake the analysis based on the proposed year of opening (2023) and the ten-year horizon (2033).
 - ii. Adopt a compound annual growth rate of 5% to estimate future year (i.e. 2023 and 2033) background traffic on Christensen Road.
 - iii. Distribute 50% of the total development traffic associated with stages 1 and 2 via Road 01/Christensen Road intersection instead of 20% to account for traffic accessing via the Eastern Service Road and Christensen Road and the future extension of Christensen Road to Burnside Road.
 - iv. Adopt 0.70 trips per 100m² Total Use Area (TUA) in the AM and 0.78 trips per 100m² TUA in the PM from RMS Technical Direction TDT 2013/04a instead of 0.42 trips per 100m² TUA.
 - v. Update the SIDRA intersection capacity analysis according to the above request items.

The following response is provided to the above items with additional information provided throughout the report.

Item 3a -

Condition 10 of the overarching approval states:

10 External Roadworks

Prior to the issue of any development approval associated with the relevant stage, functional road layout plans (including land dedications) must be submitted for the following:

- a the upgrade of Christensen Road and Christensen Road South;
- b the intersection of Christensen Road South and proposed new road;
- c the intersection of Christensen Road and proposed new road;
- d the intersection of Christensen Road and the Eastern Service Road;
- e the re-prioritisation of the intersection of Christensen Road and Christensen Road South.

The functional road layout plans must be supported by a Traffic Impact Assessment Report, and must be completed at no cost to Council and to the satisfaction of the Chief Executive Officer.

Advice Note: Any identified roadworks supported by Council will be conditioned for construction as part of future development applications.

- a. The proposed Stage 2 development will not have any impact upon the operation of the Christensen Road / Christensen Road South intersection, as the proposed new intersection is located to the north and Christensen Road does not connect across Sandy Creek. Requirements for this intersection should be carried out as part of future stages of the development and when Christensen Road has been connected to the south.
- b. The Christensen Road South / proposed new road is not proposed as part of this application.
- c. The geometrical requirements of the Christensen Road / proposed new road has been considered for current traffic volumes and a nominal future volume as discussed below.
- d. The geometrical requirements of the Eastern Service Road / Christensen Road intersection should be reviewed when Christensen Road is extended across Sandy Creek. It is considered that the traffic volumes expected to be generated by stages 1 and 2 do not warrant a re-prioritisation of movements at the Eastern Service Road intersection. From a road hierarchy perspective, the current arrangement is appropriate under the current road network layout. However this should be reviewed when Christensen Road is extended across Sandy Creek.
- e. Please refer to response to a.

Item 3d –

As shown in Figure 1A, Christensen Road currently only carries in the order of 3,000 vehicles per day near the proposed intersection location.

In the absence of any traffic forecast modelling available from Council, a nominal volume of 8,000 vehicles per day has been assumed. The intersection design should be based on current volumes with allowance for future possible upgrade requirements. The nominal estimate is considered to be appropriate for this purpose, however further review will be required as part of future development stages and when Christensen Road is extended across Sandy Creek.

Item 3e(i).

As discussed above, the analysis has already considered conservative estimates of future base traffic volumes. The existing volume of 3,000 vehicles per day has been increased to 8,000 vehicles per day

Item 3e(ii)

The future year analysis has assumed a nominal background volume on Christensen Road and does not relate to a timeframe (even though 2030 has been noted). Rather, it is indicative of volumes that may occur when Christensen Road is extended across Sandy Creek. Application of a 5% per annum growth rate to existing volumes of Christensen Road is not considered to be logical as background volumes on Christensen Road south of the Eastern Service Road will not change significantly until the road is extended across Sandy Creek. The application of the nominal forecast is significantly greater than 5% annual growth rate and provides a reasonable indication of future intersection requirements. These requirements will need to be refined when Christensen Road is extended across Sandy Creek.

Item 3e(iii)

A 50% distribution of traffic to Christensen Road is not considered to be realistic. The Stapylton-Jacobs Well Road access will provide a far more efficient route to and from the Pacific Motorway, whereas the route to Christensen Road will be relatively circuitous and a significantly longer distance. This will particularly be the case with the provision of traffic signals at the Stapylton-Jacobs Well Road access and other upgrade requirements towards and at the Motorway roundabout. Notwithstanding this, the actual distribution of development traffic can be surveyed as stage 2 progresses, and then the intersection analysis can be refined as part of a review of future stages.

Item 3e(iv)

The trip generation rates are based on similar developments in the local area. This is a preferred approach than adopting generic rates based on sites located in other states and areas, which have significantly different characteristics. This matter has been discussed further with Council's Mr Joel Burnett with further clarification provided regarding the original traffic generation surveys.

Item 3e(v)

Updated SIDRA modelling is not considered to be necessary based on the above information.

Responses to State codes 1 and 6 have been omitted from this version of the report.

Weekly Vehicle Counts

WeeklyVehicle-41

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	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	12 Mar	13 Mar	14 Mar	15 Mar	16 Mar	17 Mar	18 Mar	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	243	242	249	230	*	*	*	241.0	241.0
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	235	*	*	*	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	258	244	284	267	*	*	*	263.3	263.3
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
Totals									
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

FIGURE 1A – SURVEYED TRAFFIC VOLUMES ON CHRISTENSEN ROAD

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 forms the first stage of the planned estate on Lot 1 on RP6882 & Lot 240 on W31330.



FIGURE 1.1 – LOCATION OF SUBJECT SITE

2.0 PROPOSED DEVELOPMENT

The proposed plan of development is for the second stage of the estate and comprises of 6 individual lots, including a detention basin. Stage 2 has a total area of approximately 31.1 hectares.

An internal road network is proposed to be built which will provide access to the individual lots. The internal roadway will accommodate vehicles up to A-Double size. It is proposed that a priority controlled intersection will be constructed to provide direct access to stage two from Christensen Road. The access established during stage one of the estate, from Stapylton – Jacobs Well Road, will provide secondary access to stage two.

The proposed plan of development allows for road connections to the adjoining properties (Stage 1) to the west.

The proposed plan of development (Stage 2) is shown in Figure 2.1.

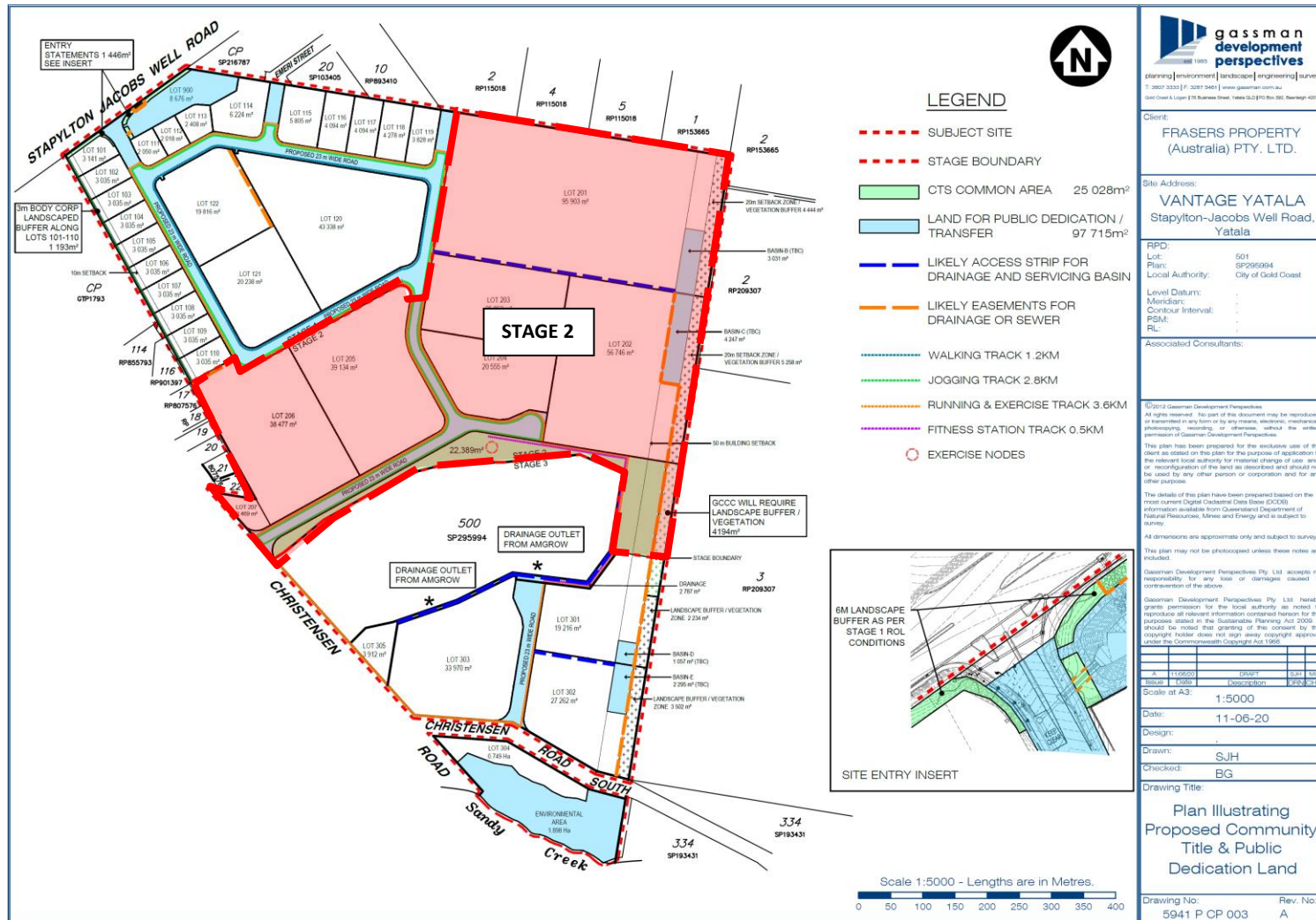


FIGURE 2.1 – PROPOSED STAGE 2 LAYOUT

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 D.



FIGURE 3.1 – EXISTING YATALA NORTH INTERCHANGE (PHOTO AUGUST 2020)

4.0 DEVELOPMENT TRAFFIC ESTIMATES

4.1 Trip Generation Rate

In accordance with the original traffic impact assessment, the following trip generation rates have been adopted for the analysis.

0.42 trips / 100m² GFA / peak hour, and 4 trips / 100m² GFA / day.

This rate is considered to be reasonable for the proposal given the proposed mix of lot sizes and similar location. It was also adopted for other studies in the area including the Frasers Property estate off Pearson Road.

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. It is noted that the trip generation calculations are based on revised calculations of developable areas. Previous assessments were based on the overall stage area and resulted in a significant over-estimate of potential trip generation.

Table 4.1 - Estimated Peak Hour Development Traffic Generation (STAGES 1 & 2 ONLY)

Stage	Lot Area (m ²)	Est GFA (m ²)	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
STAGE 1	119833	53925	147	79	226	46	180	226
STAGE 2	276677	124505	340	183	523	105	427	523
TOTAL TRAFFIC			487	262	749	151	607	749

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 on Stapylton Jacobs Well Road and on Christensen Road as follows:

Stapylton – Jacobs Well Road

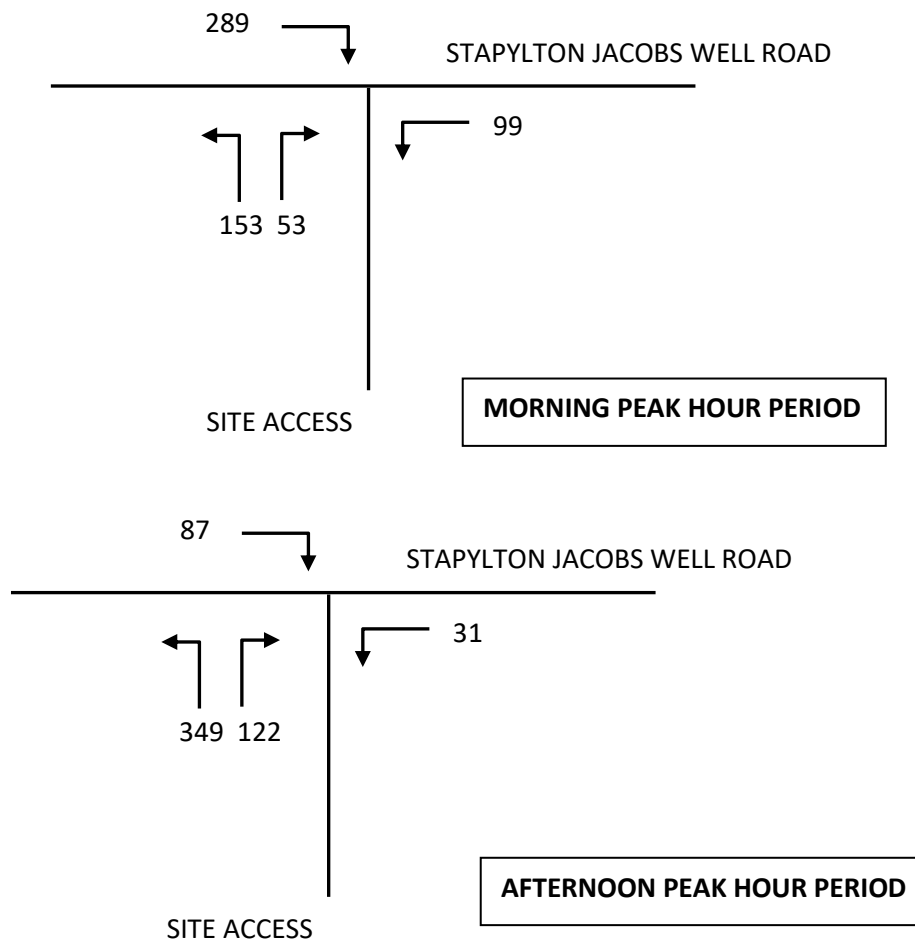
- 80% to and from the Pacific Motorway
- 20% to and from the east via the Stapylton – Jacob's Well Road.

Christensen Road

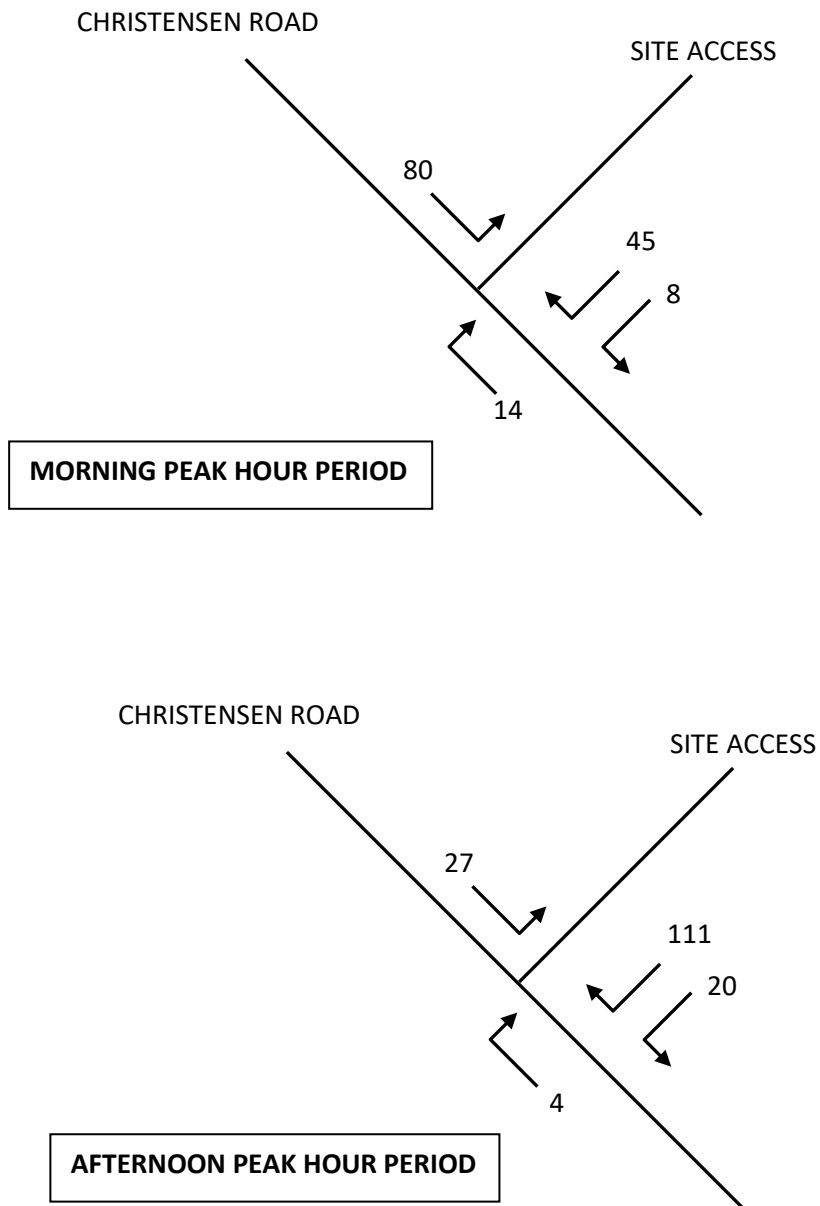
- 85% to and from the Pacific Motorway
- 15% to and from the east via the Stapylton – Jacob's Well Road.

It is noted that Council is planning to extend Christensen Road to connect with Burnside Road. This connection will significantly change the traffic patterns in the local area, and provide an overall increase in capacity. In particular local traffic will have more flexibility with regard to access to the Pacific Motorway, as it will provide a connection between the Exit 38 and Exit 41 interchanges. Forecast traffic volumes have been requested by Council, however it is understood that such are not currently available at this time.

The combined development traffic estimates (for Stages 1 and 2) at the site access intersections are shown in Figures 4.1 and 4.2.



**FIGURE 4.1 – STAGES 1 & 2 DEVELOPMENT TRAFFIC ESTIMATES
AT THE STAPYLTON – JACOBS WELL ROAD INTERSECTION**



**FIGURE 4.2 – STAGES 1 & 2 DEVELOPMENT TRAFFIC ESTIMATES
AT THE CHRISTENSEN ROAD INTERSECTION**

5.0 ROAD NETWORK IMPACT

5.1 General

Traffic modelling using SIDRA software has been carried out to determine the performance of the proposed Stapylton Jacobs Well Road / Site Access and Christensen Road / Site Access intersections under opening year (year 2023) and the projected project future (year 2030) conditions of the overall estate. 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 second stage of development would be completed by the year 2023, and the full development by the year 2030.

The estate access intersection with the Stapylton – Jacobs Well Road will be constructed to its ultimate layout (two through lanes in each direction plus turning lanes / traffic signal control) as part of the approved works for Stage 1. An additional access intersection of Christensen Road is proposed to be constructed to provide direct access to Stage 2.

It is noted that an assessment of impacts at the Exit 38 interchange has been carried out as part of the DA for a Preliminary Approval over the site.

5.2 Modelling of Overall Estate

Based on the analysis of the overall estate (prepared under a separate application) the signalised intersection with the Stapylton – Jacobs Well Road will improve the operation of the eastern roundabout at the Exit 38 interchange by bunching the traffic flow in the westbound direction. The operation of the Interchange is therefore expected to improve as a result of the first stage of development.

The traffic impact of the overall estate has been carried out as part of a separate application. The results of the analysis indicate that the following works are required upon the completion of Stage 2:

- Construction of new intersection with Christensen Road;
- Construction of the second approach lane on the northbound off ramp (western side of Exit 38 interchange);
- Construction of second departure lane on the Stapylton – Jacobs Well Road leg of the eastern roundabout at the Exit 38 interchange.

A concept design of the proposed Stage 2 works are in Shown in Figures 5.1 – 5.3.

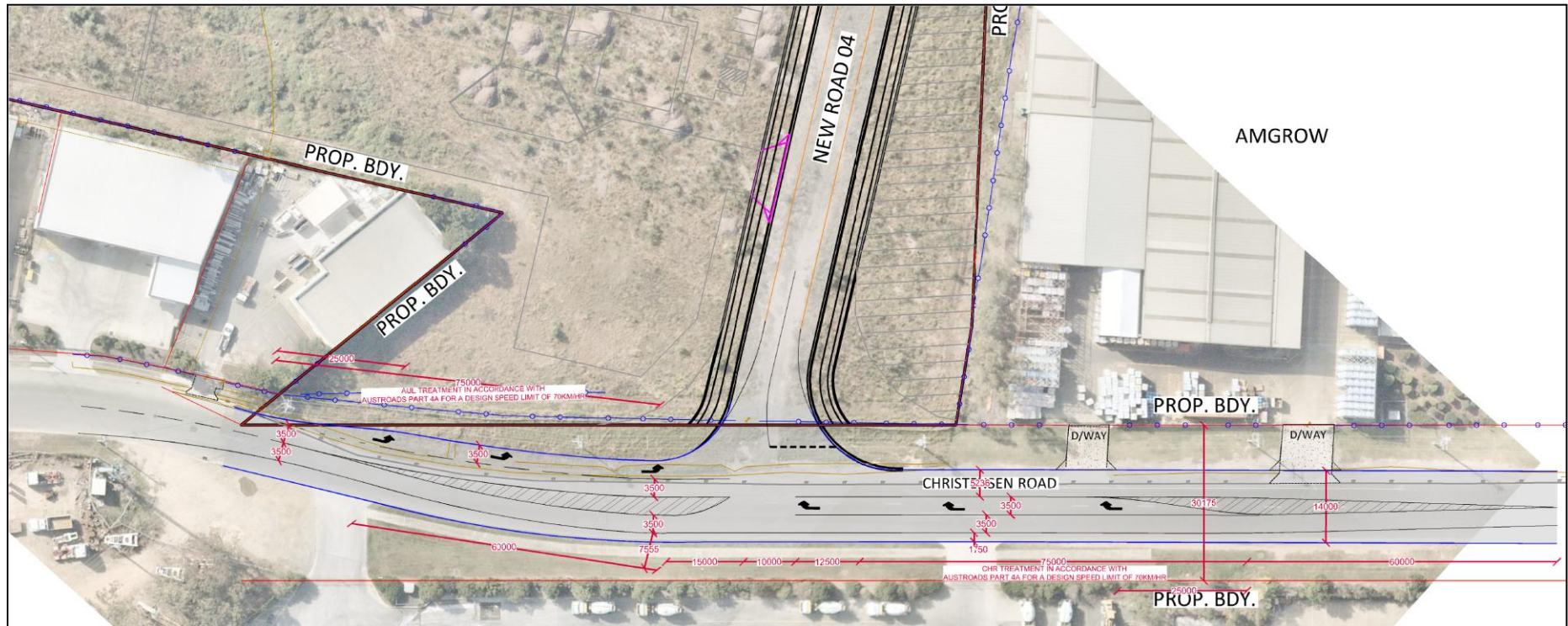


FIGURE 5.1 – CONCEPT DESIGN OF THE PROPOSED SITE ACCESS / CHRISTENSEN ROAD INTERSECTION

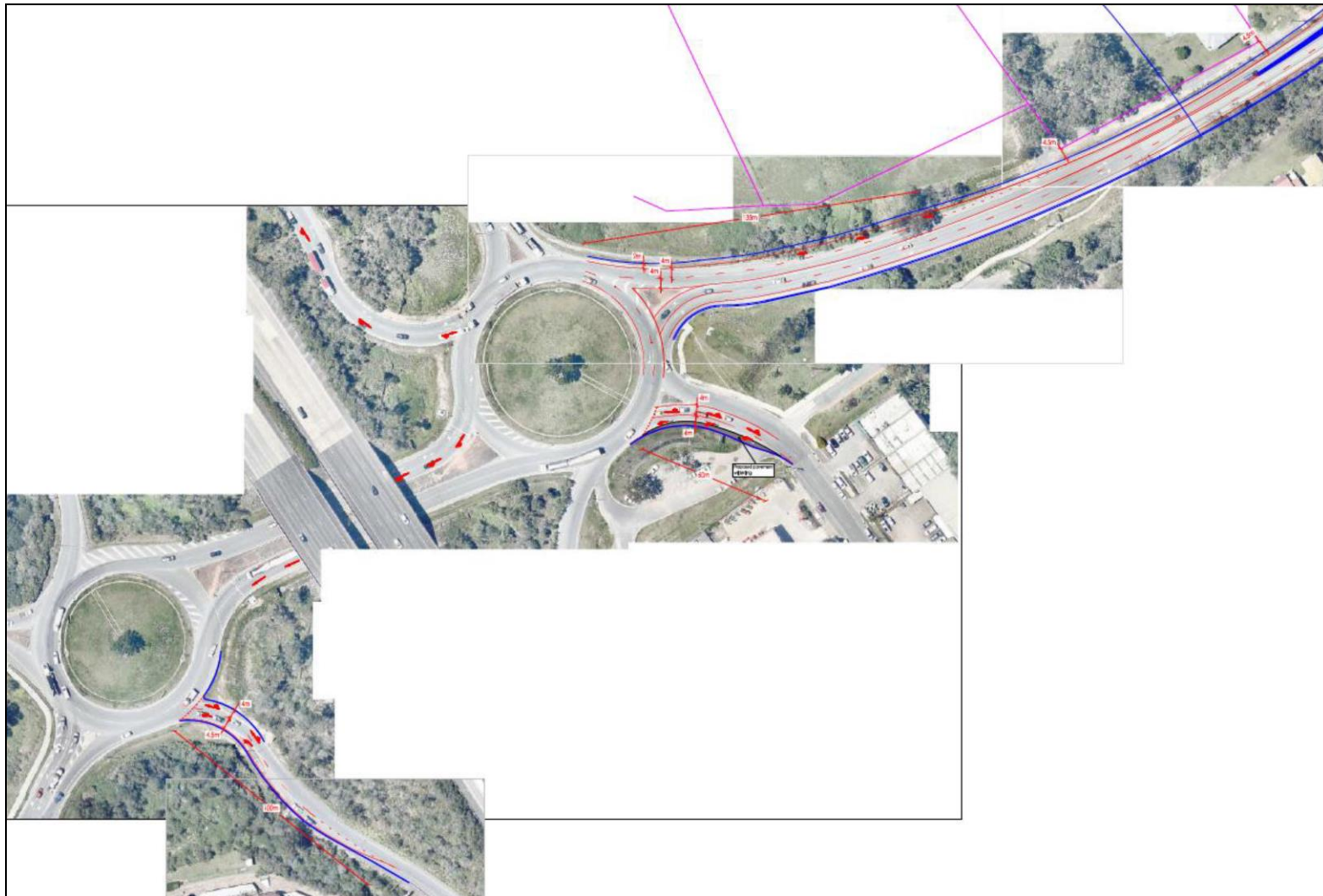


FIGURE 5.2 – CONCEPT DESIGN OF THE PROPOSED INTERCHANGE IMPROVEMENTS (OVERALL)



FIGURE 5.3 – CONCEPT DESIGN OF THE PROPOSED INTERCHANGE IMPROVEMENTS (DETAIL)

5.3 Development Impact

Traffic impacts upon the surrounding road network have been modelled using SIDRA. Criteria for evaluating the results of the SIDRA analysis are provided in Appendix E. Results of the SIDRA modelling of the Stapylton Jacobs Well Road / Site Access and Christensen Road / Site Access intersections are provided as Appendix F, and summarised in Tables 5.1 and 5.2 below.

As shown in Figure 1A, Christensen Road currently only carries in the order of 2,500 vehicles per day near the proposed intersection location. In order to consider the future extension of Christensen Road across Sandy Creek, a nominal volume of 8,000 vehicles per day has been assumed. It is noted that Council has not made available any traffic modelling for the extension.

Table 5.1 – Summarised SIDRA Results (Stapylton Jacobs Well Road / Site Access Intersection)

Scenario	Degree Of Saturation	Level Of Service	Total Average Delay (sec)	Queue Length (metres)	Cycle Time (sec)
2023 AM Peak – STAGES 1 & 2	0.815	B	14.8	50.2	40
2023 PM Peak – STAGES 1 & 2	0.578	B	11.9	64.3	40
2030 AM Peak – STAGES 1 & 2	0.729	B	13.8	63.2	50
2030 PM Peak – STAGES 1 & 2	0.714	B	13.0	90.3	50

Table 5.2 – Summarised SIDRA Results (Christensen Road / Site Access Intersection)

Scenario	Degree Of Saturation	Level Of Service	Total Average Delay (sec)	Queue Length (metres)
2023 AM Peak – STAGES 1 & 2	0.276	C	1.8	5.5
2023 PM Peak – STAGES 1 & 2	0.378	C	3.0	13.6
2030 AM Peak – STAGES 1 & 2	0.339	D	2.0	8.4
2030 PM Peak – STAGES 1 & 2	0.529	D	3.8	19.9

As shown in Table 5.1, the proposed access intersections will perform satisfactorily for a period of at least 10 years beyond completion of the final stage. Modelling carried out as part of the Preliminary Approval application indicates that the intersection will function satisfactorily with the overall estate completed.

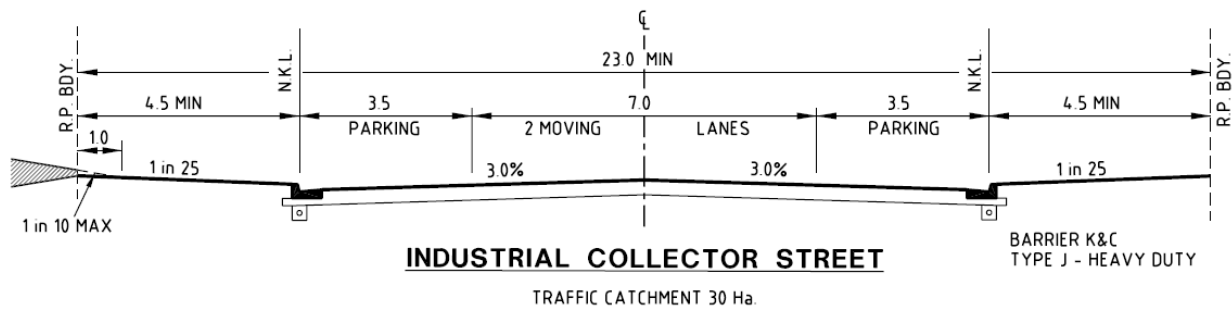
The above SIDRA results are consistent with the analysis of the preliminary approval and no additional mitigation works are considered to be necessary for the operation of the proposed development.

6.0 INTERNAL ROAD LAYOUT

The internal road profile has been designed in accordance with the Gold Coast City Council requirements for an Industrial Collector Street. As shown in Figure 6.1, the Industrial Collector Street provides a road reserve width of 23 metres with a 14 metre carriageway. Such is provided to accommodate the largest design vehicle expected to use the site (A-Double).

The layout of the intersections within the estate have been designed with a minimum radius of 17.0 metres. This is provided to allow the A-Double to navigate the intersections without having to encroach onto the opposite side of the road. Until the future staging is completed, it is proposed that the dead-end roads will be terminated using a cul-de-sac treatment.

The layout of the internal roadway is shown in Figure 6.2.



FIGURES 6.1 – PROPOSED ROAD CROSS SECTION

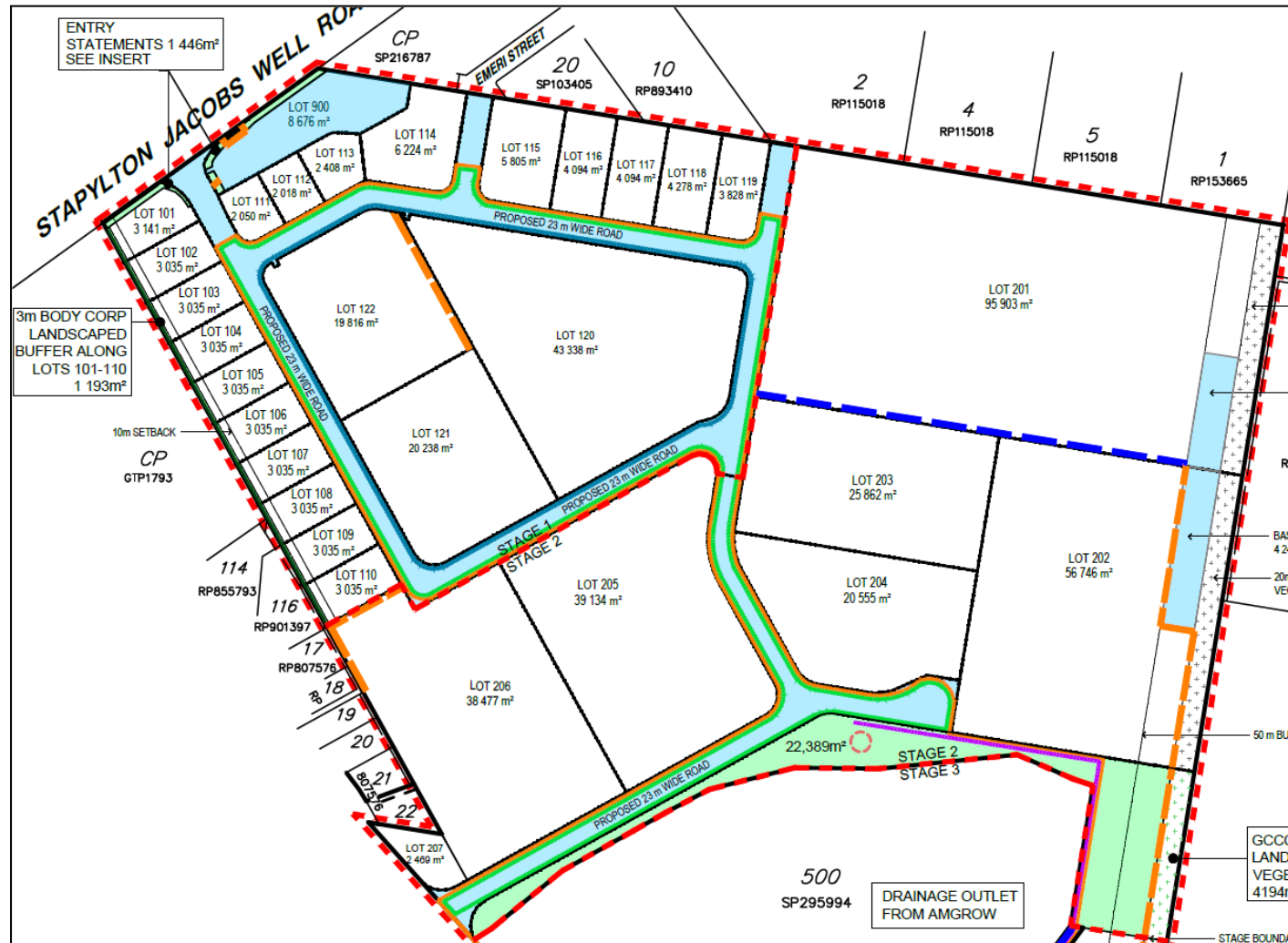


FIGURE 6.2 – PROPOSED ROAD LAYOUT

7.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

- The site is located on the southern side of Stapylton - Jacobs Well Road. The subject site forms the first stage of a planned estate on Lot 1 on RP6882 & Lot 240 on W31330.
- The stage two site has an area of approximately 31.1 hectares and will comprise of 6 individual lots, including a detention basin.
- It is proposed that a new intersection be constructed on Christensen Road, serving as the primary access point to stage two of the estate. An internal road connection will be provided between stages one and two allowing traffic to distribute between the two access points. Dedicated left and right turn treatments have been provided to accommodate ultimate traffic volumes.
- SIDRA modelling indicates that the proposed intersection will perform satisfactorily with the construction of the proposed development. Modelling of the intersection considering the full development of the estate was carried out as part of the Development Application for a Preliminary Approval over the site.
- The internal road profile has been designed in accordance with the City of Gold Coast requirements for an Industrial Collector Street and allows for A-Double vehicle access.

APPENDICES

APPENDIX A – RPEQ CERTIFICATION

APPENDIX B – TMR CONCEPT PLANNING FOR THE STAPYLTON JACOBS WELL ROAD

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

APPENDIX D – SURVEYED TRIP GENERATION (RTE / GRIFFITH UNIVERSITY)

APPENDIX E – CRITERIA FOR EVALUATING SIDRA RESULTS

APPENDIX F - DETAILED SIDRA OUTPUT

APPENDIX A – RPEQ CERTIFICATION

CERTIFICATION OF TRAFFIC IMPACT ASSESSMENT REPORT REGISTERED PROFESSIONAL ENGINEER QUEENSLAND for

Project title:	
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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:

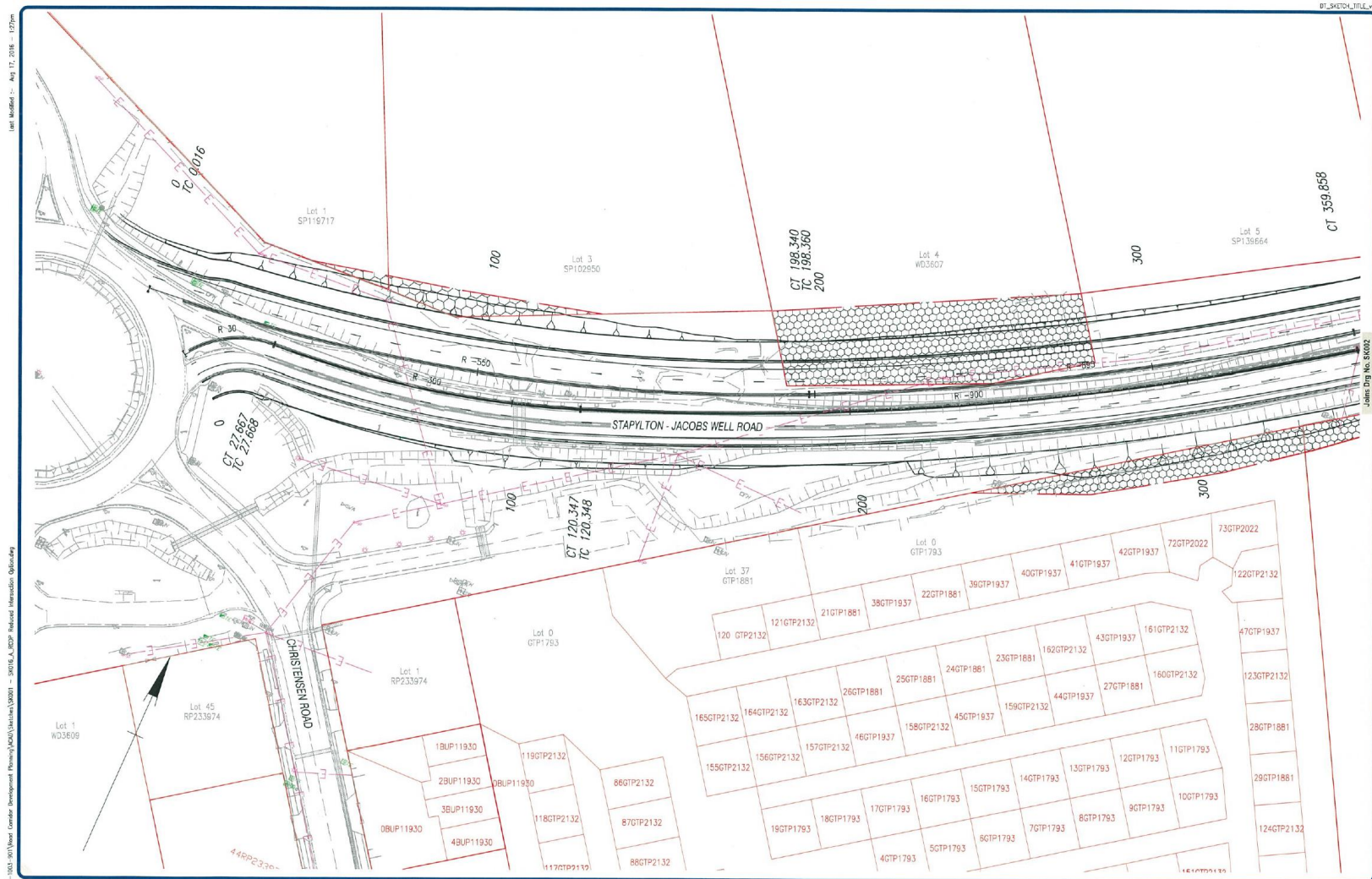
- the significant role of engineering as a profession, and that
- the community has a legitimate expectation that my certification affixed to this engineering work can be trusted, and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary 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:	20.11.20
Postal address:	Po Box 17 Surfers Paradise QLD 4217		
Email:	Luke@rytenskildtraffic.com		

APPENDIX B – TMR CONCEPT PLANNING FOR THE STAPYLTON JACOBS WELL ROAD



Comments:

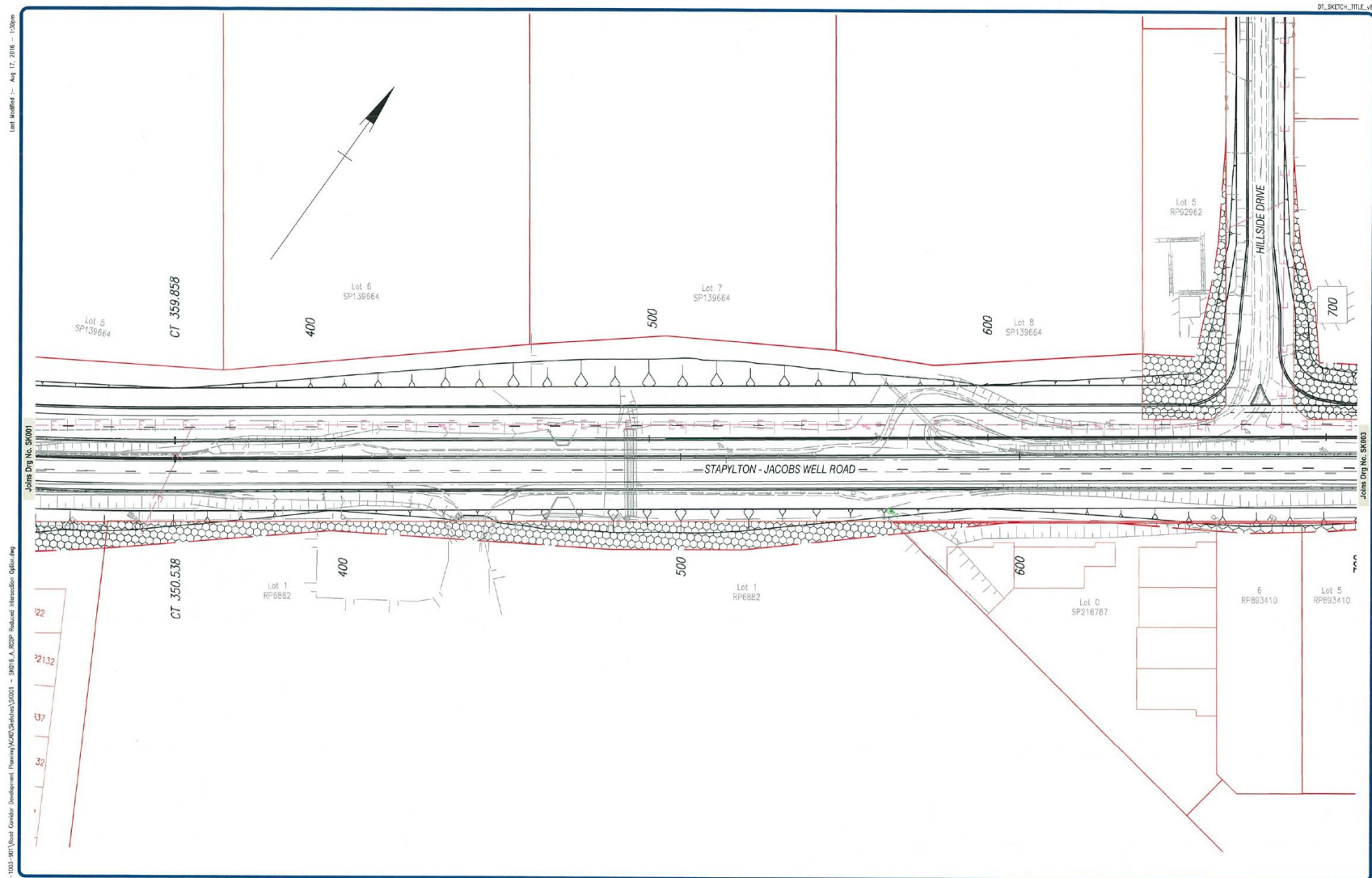
Stapylton - Jacobs Well Road Corridor Development Planning
Reduced Intersections Option
Sheet 1 of 16

0 10 20m
A

Drawing No. SK001 (A)
Drawn: S. READ
Design: S. READ
Engineer:



STAPYLTON - JACOBS WELL ROAD | 160 / 1003 / 901



Comments:

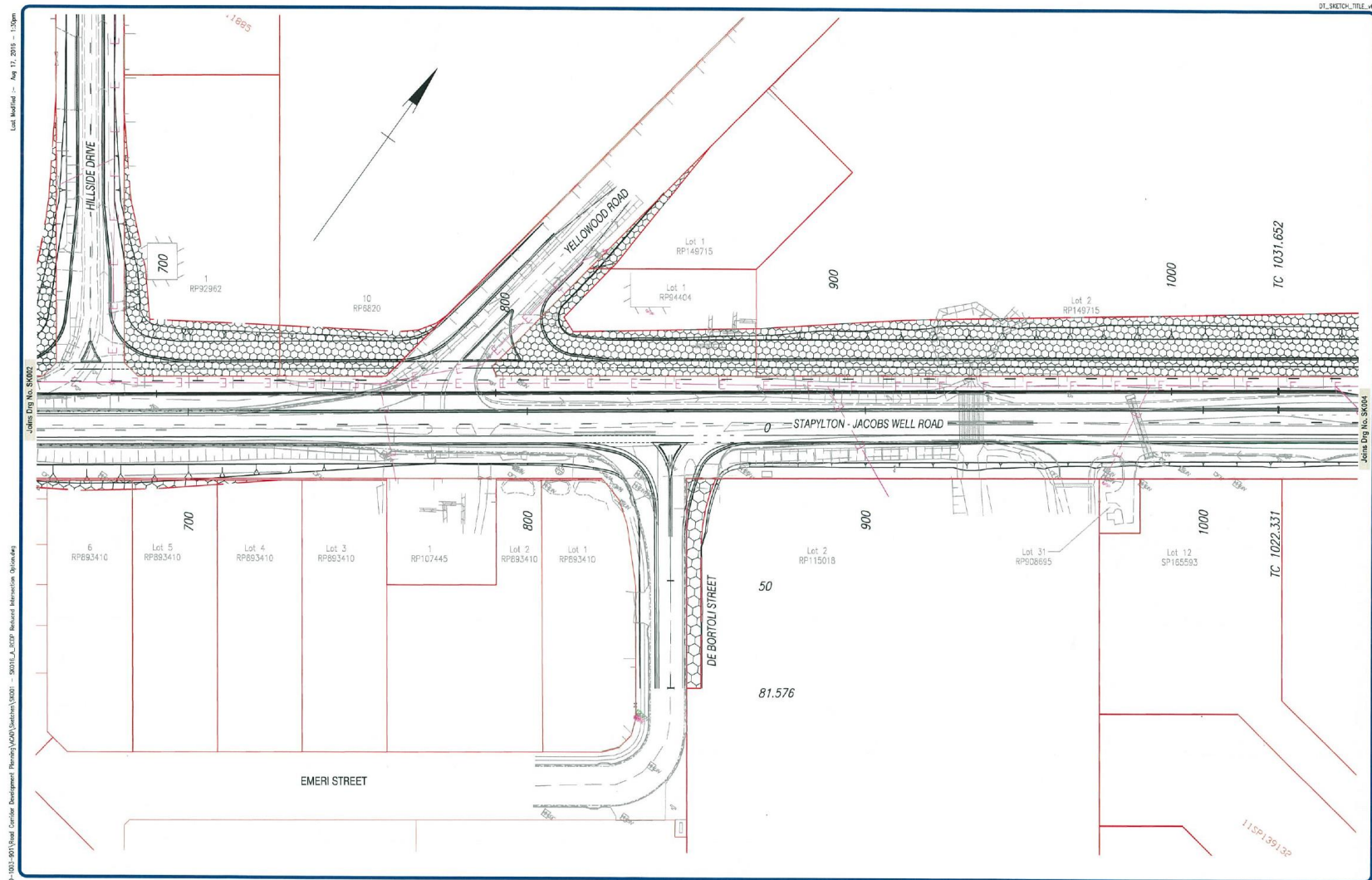
Stapylton - Jacobs Well Road Corridor Development Planning
Reduced Intersections Option
Sheet 2 of 16

0 10 20m
A

Drawing No. SK002 (A)
Drawn: S. READ
Design: S. READ
Engineer:



STAPYLTON - JACOBS WELL ROAD | 160 / 1003 / 901



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

AUSTRAFFIC VIDEO INTERSECTION COUNT

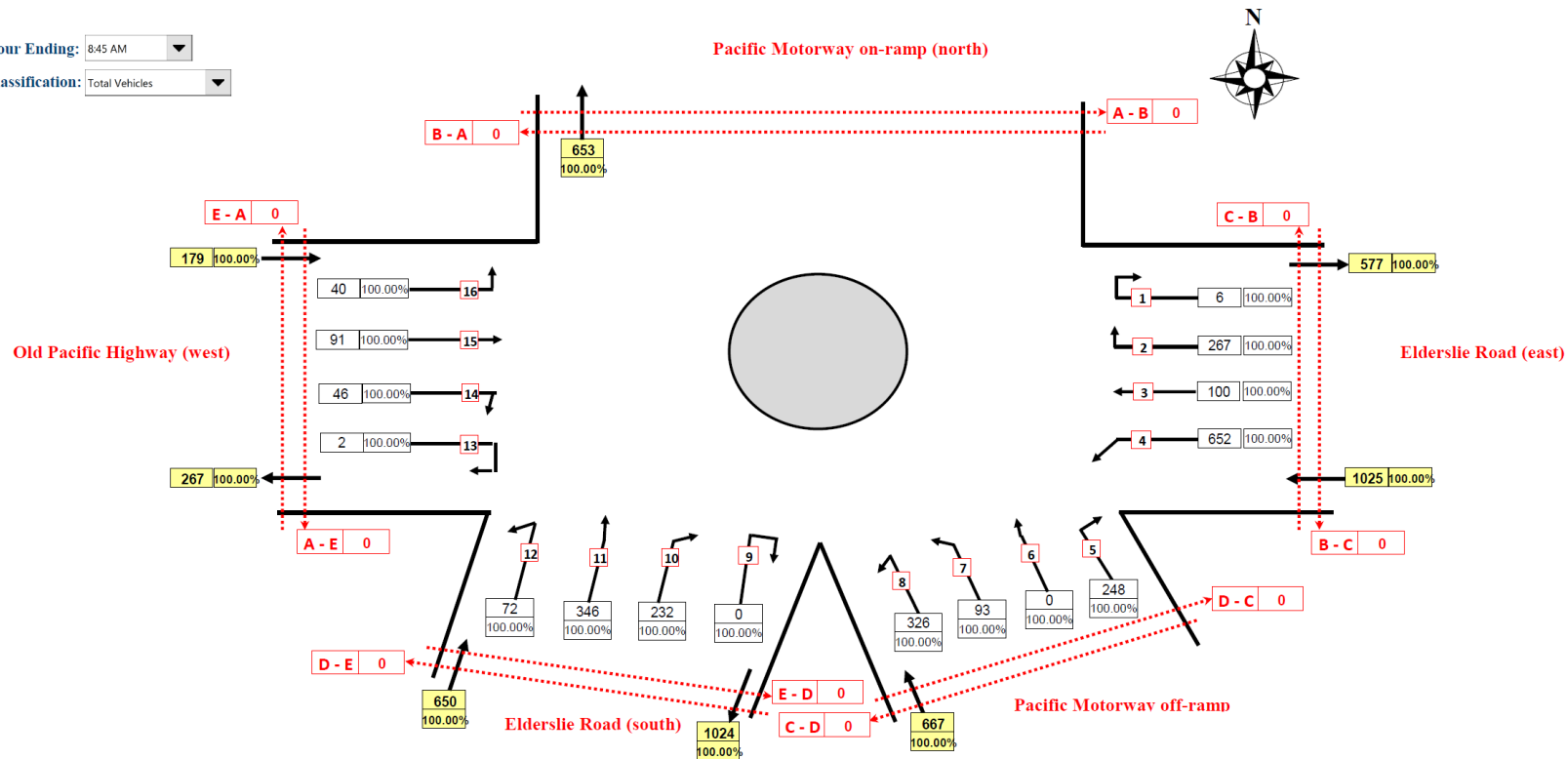
Site No.: 1 Weather: Fine
Location: Stapylton-Jacobs Well Road/Old Pacific Highway/Stanmore Road/M1 Ramps
Day/Date: Tuesday, 23 January 2018
Summary: AM Peak : Hour ending - 8:45 AM
PM Peak : Hour ending - 4:30 PM



**Western Roundabout
Morning Peak Hour**

Hour Ending: 8:45 AM

Classification: Total Vehicles



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

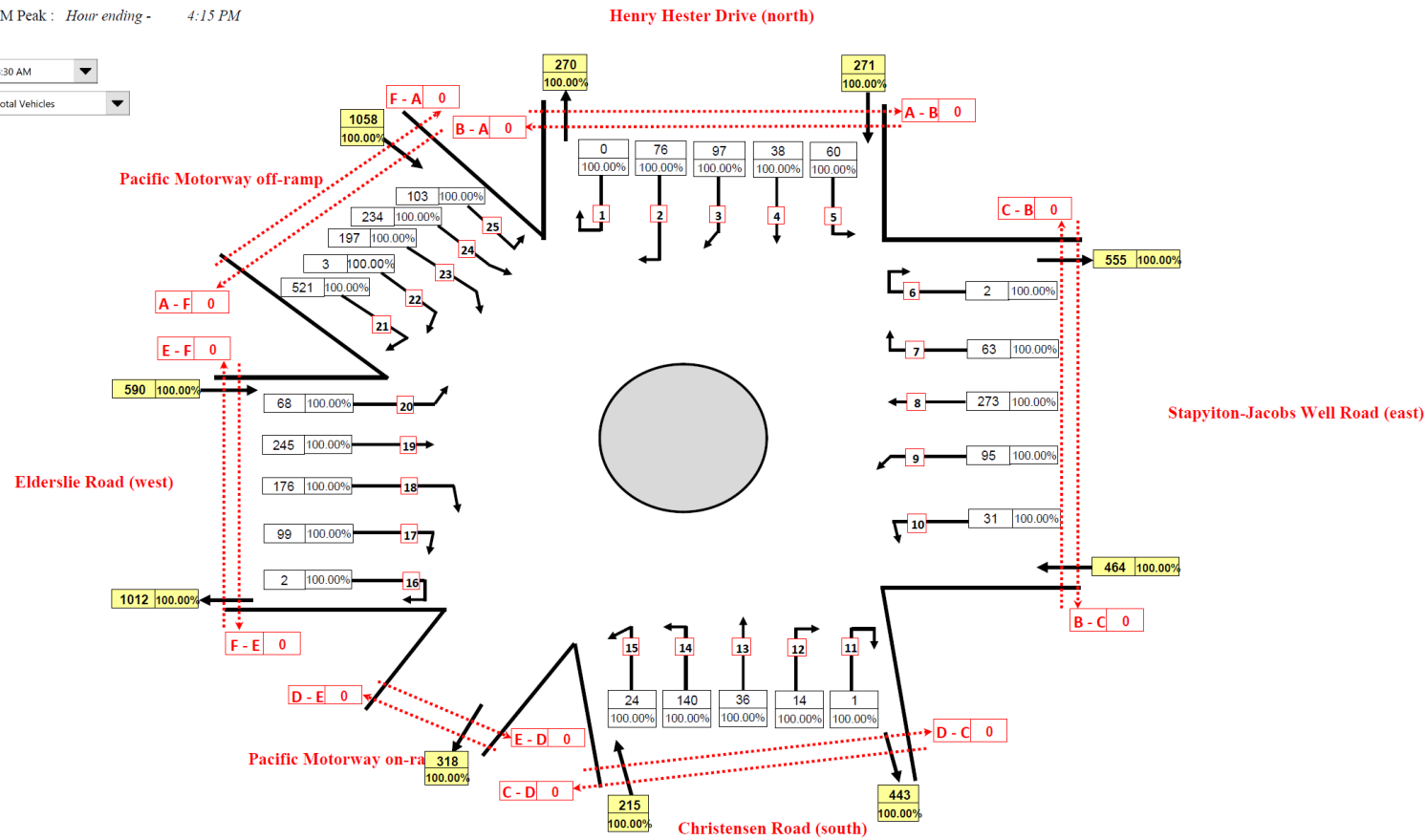
AUSTRAFFIC VIDEO INTERSECTION COUNT



**Eastern Roundabout
Morning Peak Hour**

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: 8:30 AM
Classification: Total Vehicles



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

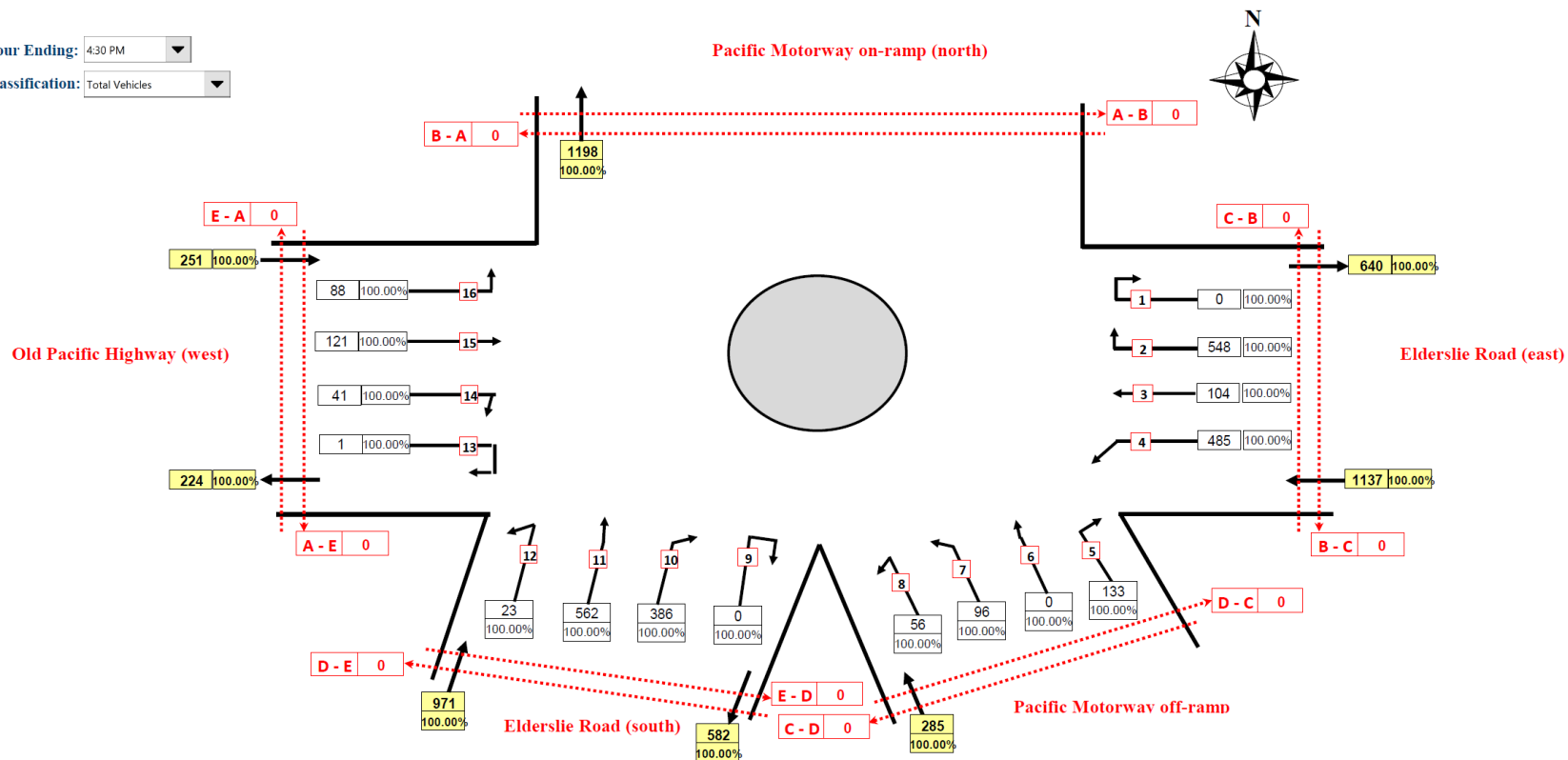
AUSTRAFFIC VIDEO INTERSECTION COUNT



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

**Western Roundabout
Afternoon Peak Hour**

Hour Ending: 4:30 PM
Classification: Total Vehicles



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

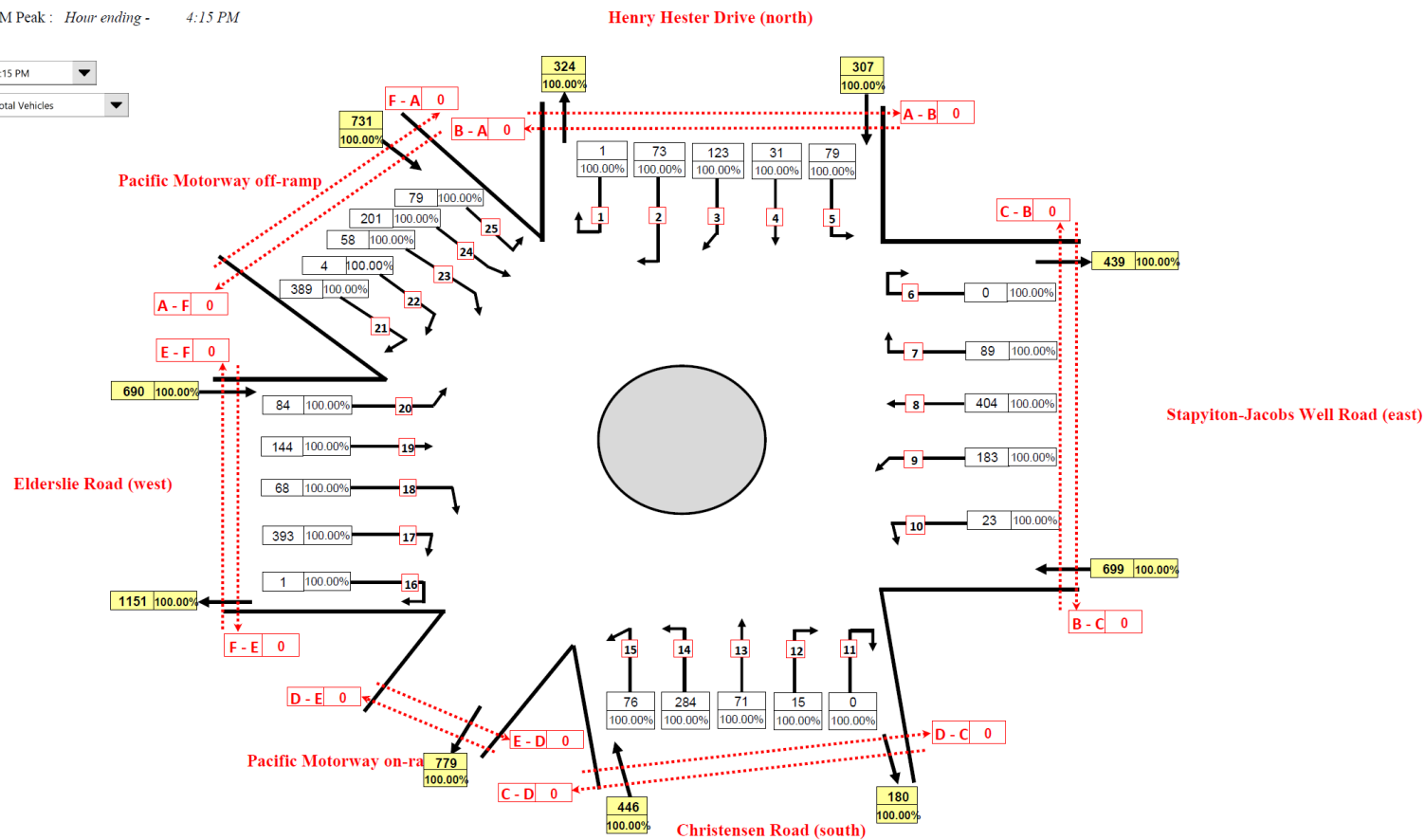
AUSTRAFFIC VIDEO INTERSECTION COUNT



**Eastern Roundabout
Afternoon Peak Hour**

Site No.: 2 Weather: Fine
Location: Stapyton-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



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

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



Surveyed site at Motorway Circuit, Ormeau

Location:	Motorway Circuit, Ormeau
Use:	Warehouse / manufacturing
GFA:	Approx 45,000m ² GFA
Surveyed trip generation:	AM peak - 170 vehicles per hour PM peak - 190 vehicles per hour
Surveyed trip rate:	AM peak hour - 0.38 trips per 100m ² GFA PM peak hour - 0.42 trips per 100m ² 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 23 Mar	Tue 24 Mar	Wed 25 Mar	Thu 26 Mar	Fri 27 Mar	Sat 28 Mar	Sun 29 Mar	Averages 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 164	0700 143	1000 159	0900 170	0900 166	1100 0	1100 0		
PM Peak	1400 192	1400 190	1400 186	1400 197	1400 185	2300 0	* *		

* - No data.

APPENDIX E – CRITERIA FOR EVALUATING SIDRA RESULTS

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'		Good operation.
'B'	Good operation. 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. 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**¹ 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.

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

APPENDIX F – SIDRA RESULTS

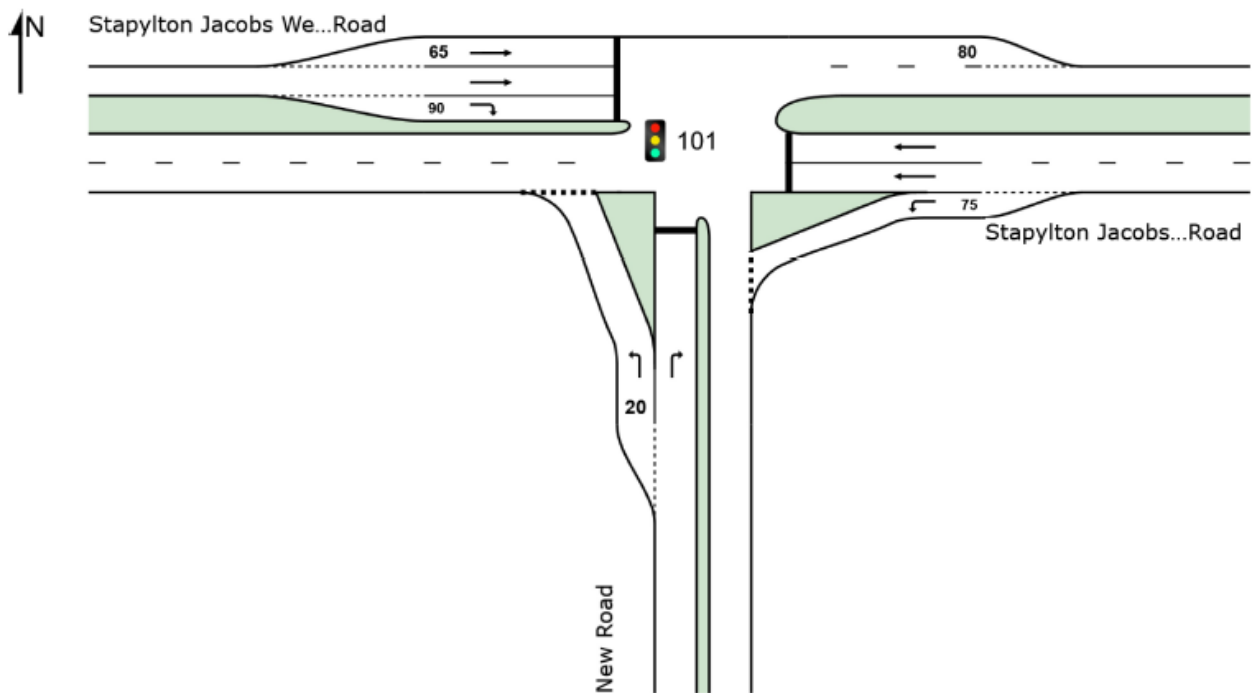
STAPYLTON JACOBS WELL ROAD / SITE ACCESS INTERSECTION

2023AM PEAK – STAGES 1 & 2

2023PM PEAK – STAGES 1 & 2

2030 AM PEAK – STAGES 1 & 2

2030 PM PEAK – STAGES 1 & 2



MOVEMENT SUMMARY

**Site: 101 [2023 AM Peak (SJW Rd - New Rd Int) - STAGES 1 & 2
(Site Folder: General)]**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: New Road														
1	L2	153	15.0	153	15.0	0.164	8.2	LOS A	0.9	7.5	0.49	0.67	0.49	51.7
3	R2	53	15.0	53	15.0	* 0.193	23.0	LOS C	1.0	7.7	0.91	0.73	0.91	42.6
Approach		206	15.0	206	15.0	0.193	12.0	LOS B	1.0	7.7	0.60	0.69	0.60	49.0
East: Stapylton Jacobs Well Road														
4	L2	99	15.0	99	15.0	0.112	8.5	LOS A	0.6	5.1	0.50	0.67	0.50	51.5
5	T1	512	15.0	512	15.0	* 0.815	22.4	LOS C	5.9	46.5	1.00	1.01	1.47	43.9
Approach		611	15.0	611	15.0	0.815	20.1	LOS C	5.9	46.5	0.92	0.96	1.31	45.0
West: Stapylton Jacobs Well Road														
11	T1	657	15.0	657	15.0	0.454	6.1	LOS A	5.4	42.6	0.61	0.52	0.61	54.9
12	R2	289	15.0	289	15.0	* 0.778	25.7	LOS C	6.4	50.2	0.99	0.98	1.33	41.4
Approach		946	15.0	946	15.0	0.778	12.1	LOS B	6.4	50.2	0.73	0.66	0.83	49.9
All Vehicles		1763	15.0	1763	15.0	0.815	14.8	LOS B	6.4	50.2	0.78	0.77	0.97	48.0

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

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

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

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

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

**Site: 101 [2023 PM Peak (SJW Rd - New Rd Int) - STAGES 1 & 2
(Site Folder: General)]**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
South: New Road														
1	L2	349	15.0	349	15.0	0.448	9.8	LOS A	3.7	29.5	0.60	0.74	0.60	50.6
3	R2	122	15.0	122	15.0	* 0.557	30.3	LOS C	3.1	24.4	0.99	0.80	1.04	39.3
Approach		471	15.0	471	15.0	0.557	15.1	LOS B	3.7	29.5	0.70	0.75	0.72	47.1
East: Stapylton Jacobs Well Road														
4	L2	31	15.0	31	15.0	0.026	6.9	LOS A	0.1	1.0	0.30	0.60	0.30	52.7
5	T1	830	15.0	830	15.0	* 0.578	13.0	LOS B	8.1	64.3	0.83	0.72	0.83	49.5
Approach		861	15.0	861	15.0	0.578	12.8	LOS B	8.1	64.3	0.81	0.71	0.81	49.6
West: Stapylton Jacobs Well Road														
11	T1	525	15.0	525	15.0	0.312	4.6	LOS A	4.0	31.3	0.46	0.39	0.46	56.1
12	R2	87	15.0	87	15.0	* 0.439	29.9	LOS C	2.2	17.1	0.97	0.76	0.97	39.5
Approach		612	15.0	612	15.0	0.439	8.2	LOS A	4.0	31.3	0.53	0.45	0.53	53.0
All Vehicles		1944	15.0	1944	15.0	0.578	11.9	LOS B	8.1	64.3	0.70	0.64	0.70	49.9

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

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

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

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

Queue Model: SIDRA Standard.

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

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

MOVEMENT SUMMARY

Site: 101 [2030 AM Peak (SJW Rd - New Rd Int) - STAGES 1 & 2
(Site Folder: General)]

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: New Road														
1	L2	153	15.0	153	15.0	0.172	8.7	LOS A	1.2	9.5	0.47	0.67	0.47	51.4
3	R2	53	15.0	53	15.0	* 0.242	28.9	LOS C	1.3	10.0	0.94	0.73	0.94	39.9
Approach		206	15.0	206	15.0	0.242	13.9	LOS B	1.3	10.0	0.59	0.69	0.59	47.9
East: Stapylton Jacobs Well Road														
4	L2	99	15.0	99	15.0	0.102	8.5	LOS A	0.7	5.9	0.45	0.65	0.45	51.5
5	T1	681	15.0	681	15.0	* 0.677	18.9	LOS B	8.0	63.2	0.94	0.84	1.02	45.8
Approach		780	15.0	780	15.0	0.677	17.6	LOS B	8.0	63.2	0.88	0.82	0.95	46.5
West: Stapylton Jacobs Well Road														
11	T1	815	15.0	815	15.0	0.484	5.3	LOS A	7.2	56.6	0.52	0.46	0.52	55.6
12	R2	289	15.0	289	15.0	* 0.729	27.7	LOS C	7.3	58.0	0.98	0.91	1.15	40.5
Approach		1104	15.0	1104	15.0	0.729	11.2	LOS B	7.3	58.0	0.64	0.58	0.69	50.7
All Vehicles		2090	15.0	2090	15.0	0.729	13.8	LOS B	8.0	63.2	0.73	0.68	0.78	48.7

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

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

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

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

Queue Model: SIDRA Standard.

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

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

MOVEMENT SUMMARY

**Site: 101 [2030 PM Peak (SJW Rd - New Rd Int) - STAGES 1 & 2
(Site Folder: General)]**

17450 - Stapylton Jacobs Well Road / New Road Signalised Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: New Road														
1	L2	349	15.0	349	15.0	0.482	11.4	LOS B	4.4	35.1	0.69	0.76	0.69	49.5
3	R2	122	15.0	122	15.0	* 0.557	30.3	LOS C	3.1	24.4	0.99	0.80	1.04	39.3
Approach		471	15.0	471	15.0	0.557	16.3	LOS B	4.4	35.1	0.76	0.77	0.78	46.4
East: Stapylton Jacobs Well Road														
4	L2	31	15.0	31	15.0	0.026	6.9	LOS A	0.1	1.0	0.30	0.60	0.30	52.7
5	T1	1026	15.0	1026	15.0	* 0.714	15.3	LOS B	11.4	90.3	0.90	0.83	0.97	48.0
Approach		1057	15.0	1057	15.0	0.714	15.0	LOS B	11.4	90.3	0.88	0.82	0.95	48.1
West: Stapylton Jacobs Well Road														
11	T1	644	15.0	644	15.0	0.382	4.9	LOS A	5.2	40.8	0.48	0.42	0.48	55.9
12	R2	87	15.0	87	15.0	* 0.439	29.9	LOS C	2.2	17.1	0.97	0.76	0.97	39.5
Approach		731	15.0	731	15.0	0.439	7.9	LOS A	5.2	40.8	0.54	0.46	0.54	53.3
All Vehicles		2259	15.0	2259	15.0	0.714	13.0	LOS B	11.4	90.3	0.75	0.70	0.78	49.3

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

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

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

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

Queue Model: SIDRA Standard.

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

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

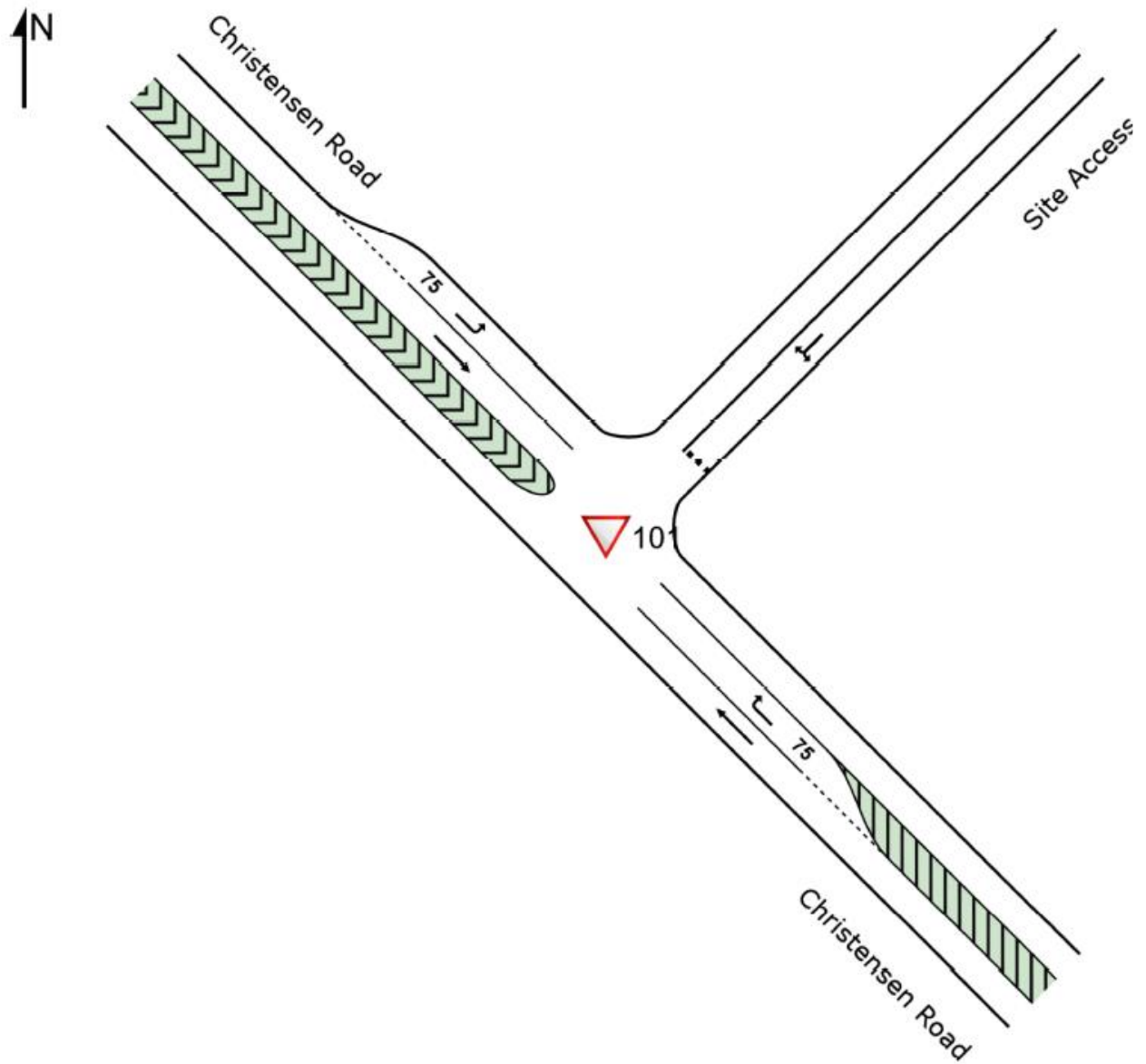
CHRISTENSEN ROAD / SITE ACCESS INTERSECTION

2023AM PEAK – STAGES 1 & 2

2023PM PEAK – STAGES 1 & 2

2030 AM PEAK – STAGES 1 & 2

2030 PM PEAK – STAGES 1 & 2



MOVEMENT SUMMARY

Site: 101 [2023 AM Peak (Christensen Rd - New Rd Int) - STAGES 1 & 2 (Site Folder: General)]

20337 - Christensen Road / Site Access Intersection

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
SouthEast: Christensen Road														
5	T1	294	15.0	294	15.0	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	14	15.0	14	15.0	0.022	9.4	LOS A	0.1	0.6	0.55	0.72	0.55	49.7
Approach		308	15.0	308	15.0	0.165	0.5	NA	0.1	0.6	0.03	0.03	0.03	59.4
NorthEast: Site Access														
7	L2	8	15.0	8	15.0	0.200	9.4	LOS A	0.7	5.5	0.77	0.91	0.80	44.4
9	R2	45	15.0	45	15.0	0.200	20.7	LOS C	0.7	5.5	0.77	0.91	0.80	44.2
Approach		53	15.0	53	15.0	0.200	19.0	LOS C	0.7	5.5	0.77	0.91	0.80	44.3
NorthWest: Christensen Road														
10	L2	80	15.0	80	15.0	0.048	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	53.0
11	T1	490	15.0	490	15.0	0.276	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		570	15.0	570	15.0	0.276	0.9	NA	0.0	0.0	0.00	0.08	0.00	58.8
All Vehicles		931	15.0	931	15.0	0.276	1.8	NA	0.7	5.5	0.05	0.11	0.05	57.9

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

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

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

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

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

Queue Model: SIDRA Standard.

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

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

MOVEMENT SUMMARY

▼ Site: 101 [2023 PM Peak (Christensen Rd - New Rd Int) - STAGES 1 & 2 (Site Folder: General)]

20337 - Christensen Road / Site Access Intersection

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
SouthEast: Christensen Road														
5	T1	488	15.0	488	15.0	0.275	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
6	R2	4	15.0	4	15.0	0.004	6.7	LOS A	0.0	0.1	0.34	0.56	0.34	51.6
Approach		492	15.0	492	15.0	0.275	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.8
NorthEast: Site Access														
7	L2	20	15.0	20	15.0	0.378	8.8	LOS A	1.7	13.6	0.70	0.92	0.92	45.0
9	R2	111	15.0	111	15.0	0.378	19.5	LOS C	1.7	13.6	0.70	0.92	0.92	44.9
Approach		131	15.0	131	15.0	0.378	17.9	LOS C	1.7	13.6	0.70	0.92	0.92	44.9
NorthWest: Christensen Road														
10	L2	27	15.0	27	15.0	0.016	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	53.0
11	T1	197	15.0	197	15.0	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		224	15.0	224	15.0	0.111	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.0
All Vehicles		847	15.0	847	15.0	0.378	3.0	NA	1.7	13.6	0.11	0.16	0.14	56.7

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

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

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

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

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

Queue Model: SIDRA Standard.

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

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

MOVEMENT SUMMARY

Site: 101 [2030 AM Peak (Christensen Rd - New Rd Int) - STAGES 1 & 2 - 3% growth (Site Folder: General)]

20337 - Christensen Road / Site Access Intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
SouthEast: Christensen Road														
5	T1	362	15.0	362	15.0	0.204	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	14	15.0	14	15.0	0.027	10.9	LOS B	0.1	0.7	0.62	0.78	0.62	48.8
Approach		376	15.0	376	15.0	0.204	0.5	NA	0.1	0.7	0.02	0.03	0.02	59.4
NorthEast: Site Access														
7	L2	8	15.0	8	15.0	0.300	13.2	LOS B	1.1	8.4	0.87	0.98	1.01	39.5
9	R2	45	15.0	45	15.0	0.300	32.0	LOS D	1.1	8.4	0.87	0.98	1.01	39.4
Approach		53	15.0	53	15.0	0.300	29.2	LOS D	1.1	8.4	0.87	0.98	1.01	39.4
NorthWest: Christensen Road														
10	L2	80	15.0	80	15.0	0.048	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	53.0
11	T1	602	15.0	602	15.0	0.339	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		682	15.0	682	15.0	0.339	0.8	NA	0.0	0.0	0.00	0.07	0.00	58.9
All Vehicles		1111	15.0	1111	15.0	0.339	2.0	NA	1.1	8.4	0.05	0.10	0.06	57.7

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

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

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

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

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

Queue Model: SIDRA Standard.

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

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

MOVEMENT SUMMARY

▼ Site: 101 [2030 PM Peak (Christensen Rd - New Rd Int) - STAGES 1 & 2 - 3% growth (Site Folder: General)]

20337 - Christensen Road / Site Access Intersection

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
SouthEast: Christensen Road														
5	T1	600	15.0	600	15.0	0.338	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
6	R2	4	15.0	4	15.0	0.004	6.9	LOS A	0.0	0.1	0.37	0.57	0.37	51.5
Approach		604	15.0	604	15.0	0.338	0.2	NA	0.0	0.1	0.00	0.00	0.00	59.7
NorthEast: Site Access														
7	L2	20	15.0	20	15.0	0.529	13.2	LOS B	2.5	19.9	0.82	1.04	1.27	40.3
9	R2	111	15.0	111	15.0	0.529	30.0	LOS D	2.5	19.9	0.82	1.04	1.27	40.1
Approach		131	15.0	131	15.0	0.529	27.5	LOS D	2.5	19.9	0.82	1.04	1.27	40.1
NorthWest: Christensen Road														
10	L2	27	15.0	27	15.0	0.016	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	53.0
11	T1	242	15.0	242	15.0	0.136	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		269	15.0	269	15.0	0.136	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.1
All Vehicles		1004	15.0	1004	15.0	0.529	3.8	NA	2.5	19.9	0.11	0.15	0.17	56.0

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

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

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

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

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

Queue Model: SIDRA Standard.

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

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