SOUTHERN CROSS UNIVERSITY
COFFS HARBOUR ALLIED HEALTH BUILDING
TRAFFIC IMPACT ASSESSMENT

FOR

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1. INTRODUCTION

1.1 BACKGROUND

Bitzios Consulting has been commissioned by Southern Cross University (SCU) to prepare a response to Coffs Harbour City Council's (Council's) Request For Information (RFI) for the proposed SCU Coffs Harbour Allied Health Building. The subject site location is shown in Figure 1.1.

Figure 1.1: Subject Site Location

1.2 INFORMATION REQUEST

Council's RFI for the above development (dated 3rd July 2018) contains the following traffic related items:

Traffic

The submitted Traffic Impact Assessment demonstrated that by 2021 (i.e. within the 10-year planning horizon) the existing roundabout will be operating at an unacceptable level of service, impacted by the increased volume of students. This issue is required to be addressed as part of the development. The Traffic Impact Assessment proposes traffic control signals as a solution. If this is the proposed solution, Council will require the following information for further consideration:

- *More recent traffic count data (the TIA relies on traffic counts that are 10 years old);*
- *The assessment has not demonstrated that the site meets the required warrants for traffic signals (as outlined in RTA Traffic Signal Design, Section 2 – Warrants);*
- *Concept design details of the proposed intersection demonstrating the feasibility of the intersection in the context of site constraints, such as land availability to accommodate the intersection;*
- *Details of cumulative impacts on the road network, particularly Hogbin Drive and Stadium Drive during peak times resulting from signalisation;*
- *Details of incorporation of active transport modes such as walking and cycling in the intersection design as well as safe system principles such as speed calming and platforms.*

Parking

The parking assessment provided with the application is required to be reviewed, based on the following:

- *it is noted in the 2010 survey, McLaren Traffic Assessment found that 115 car spaces of the 858 on the site were available (86% utilised) during the morning peak (10am), and it is determined that the current development will generate a need for 155 spaces. An additional 26 spaces are proposed with this development which results in a shortfall of 14 spaces. However, the parking demand was based on survey results from a 2007 survey (by McLaren) which adopted 25% of students on-site at any one time. This assessment isn't considered sufficient to inform the current parking demand and a new multi-day parking utilisation survey should be undertaken and the parking demand reviewed accordingly.*

The proposed car parking layout does not accord with swept paths for waste collection vehicles having regard to spaces and kerbs/islands. The car park design will need to be modified to allow suitable collection of waste.

These items have been addressed herein this report.

1.3 PROPOSED DEVELOPMENT

The proposed development is for a new allied health building at the existing Coffs Harbour Education Campus (CHEC). The building will be accessed via existing internal roadways and will include the provision of an additional car park.

The building is expected to accommodate 155 enrolments across various health science discipline with a summary of the expected enrolments provided in Table 1.1.

Table 1.1: Proposed Development Expected Enrolments

Discipline	EFT Student Enrolments 2019
Nursing	35
Exercise Science	60
Occupational Therapy	20
Psychology	20
Paramedics	20
Total	**155**

The expected number of staff to be accommodated by the proposed development is considered to be 20% the number of EFT students (i.e. 31 staff in 2019).

1.4 SCOPE

The scope of this assessment included the following:

- revise traffic assessment based on 2018 traffic count data;
- revise existing SIDRA model for the Hogbin Drive / Stadium Drive / Doug Knight Drive intersection for year of opening and 10-year design horizon;
- perform sensitivity analysis on forecast background traffic volumes to establish maximum growth rate;
- review parking utilisation data to determine current parking demand;
- identify the location and extent of surplus for each existing car parking area; and
- undertake swept path assessment for waste collection vehicle and rural fire service (RFS) vehicle manoeuvring.

2. EXISTING CONDITIONS

2.1 SUBJECT SITE

The proposed development is located within the CHEC, which includes SCU Coffs Harbour, North Coast TAFE and Coffs Harbour Senior College.

2.2 ROAD NETWORK

Details of the surrounding road network are provided in Table 2.1.

Table 2.1: Surrounding Road Network

Road Name	Lanes	Speed Limit	Divided	Jurisdiction	Hierarchy	Details
Hogbin Drive	4	80 km/h	No	Council	Arterial	N-S road parallel to Pacific Highway which connects Coffs Harbour and Sawtell.
Stadium Drive	2	60 km/h	No		Collector	E-W road which connects Pacific Highway and Hogbin Drive.
Doug Knight Drive	2	40 km/h	No		Access	Access road for the CHEC campus.

2.3 BACKGROUND TRAFFIC VOLUMES

Background traffic volumes were obtained from traffic surveys undertaken by Traffic Data and Control (TDC) for the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout dated Wednesday 28th November 2012 and Thursday 29th November 2012, from 3:00PM to 6:00PM and 7:00AM to 10:00AM respectively. The results of these traffic surveys are provided in Figure 2.1.

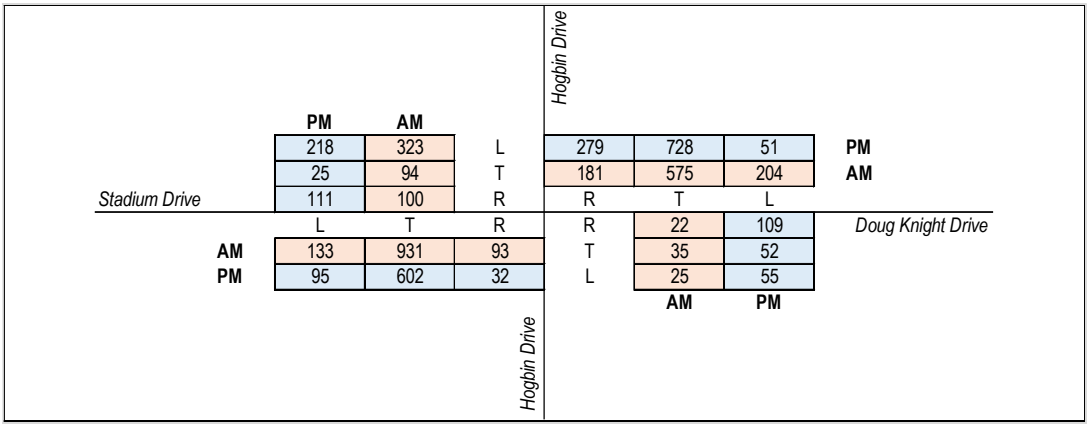


Figure 2.1: 2012 Peak-Hour Background Traffic Volumes

To address the traffic item in Council's RFI, recent background traffic volumes were obtained from traffic surveys undertaken by Traffic Data and Control (TDC) for the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout dated Thursday 2nd August, from 7:00AM to 9:00AM and 3:00PM to 6:00PM. The results of these traffic surveys are provided in Figure 2.2.

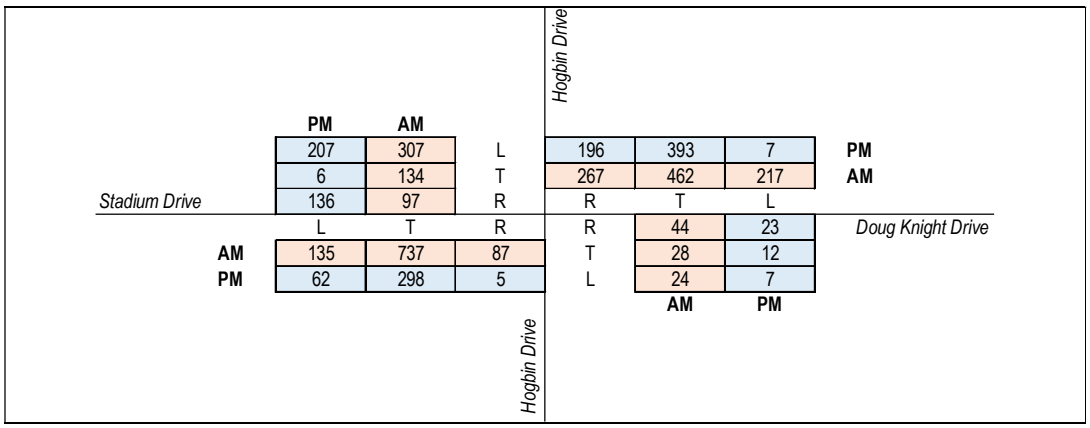


Figure 2.2: 2018 Peak-Hour Background Traffic Volumes

A summary of the TDC 2012 and 2018 traffic survey results are provided in Appendix B and Appendix C respectively.

2.4 MODE SHARE

A previous traffic impact assessment prepared by McLaren Traffic Engineering for a previous development application (DA 1127/07) at the CHEC campus, dated 9th August 2007, provided results for a travel mode survey undertaken 9th August 2007. The findings of this survey are shown in Table 2.2.

Table 2.2: CHEC Travel Mode Survey

Establishment	Participants	% Total	% Bus	% Driver	% Passenger	% Bicycle
SCU	235	37	9	76	12	3
TAFE	292	46	22	50	24	4
CHSC	106	17	53	13	28	6
Total	**633**	**100**	**22**	**53**	**20**	**5**

Additionally, the survey found the driver proportion of staff is 92%, and that of the students that drive all park on site at all times.

The McLaren traffic impact assessment is provided in Appendix D.

3. TRAFFIC ASSESSMENT

3.1 SEASONALITY

Given that the two (2) traffic surveys obtained by Bitzios Consulting were undertaken at different times of the year (i.e. November 2012 and August 2018), it is important to acknowledge seasonal changes in traffic.

The Roads and Maritime Services (RMS) Volume Viewer provides traffic data from 2011 for the Pacific Highway through Coffs Harbour. This data is considered unlikely to be representative of seasonal traffic changes on Hogbin Drive, noting the hierarchal and functional difference between the two roads. Additionally, seasonality data is not available on Council's website and was not considered in a previous intersection analysis report issued by Bitzios Consulting to Council, dated 20th December 2012. This previous report is provided in Appendix E.

In any case, while the 2012 surveys were undertaken during the warmer period of the year compared to the 2018 surveys, changes in traffic on Hogbin Drive due to seasonality are not expected, noting that the surveys were not conducted during peak holiday periods.

3.2 BACKGROUND TRAFFIC GROWTH

A previous intersection analysis report issued by Bitzios Consulting to Council, dated 20th December 2012, compared TDC traffic survey data for several Hogbin Drive intersections, undertaken November 2012, to tube count data of Hogbin Drive provided by Council, undertaken in 2008. This comparison resulted in compounding growth rates per annum of 3.4% in the AM and 2.5% in the PM.

Noting that Bitzios Consulting has obtained two (2) intersection traffic surveys of the subject roundabout (i.e. a survey in 2012 and a survey in 2018) the growth rate can be derived from the values shown in Figure 3.1.

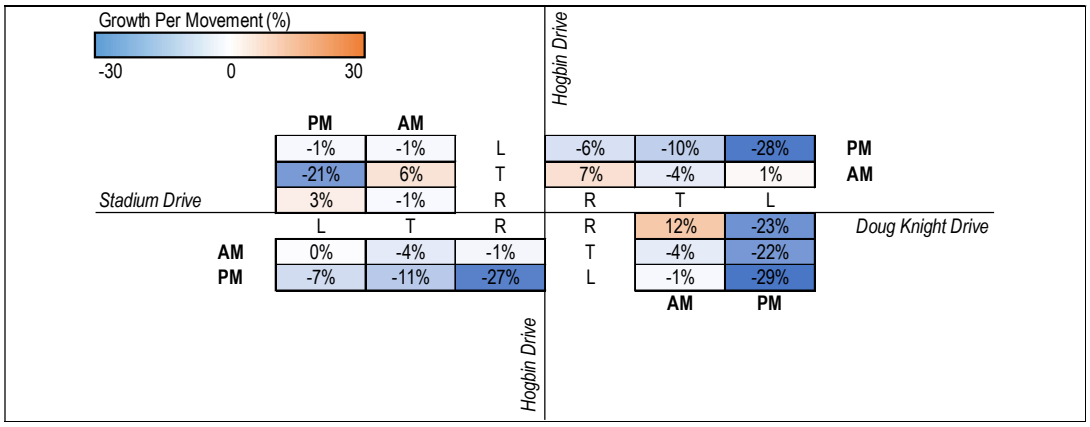
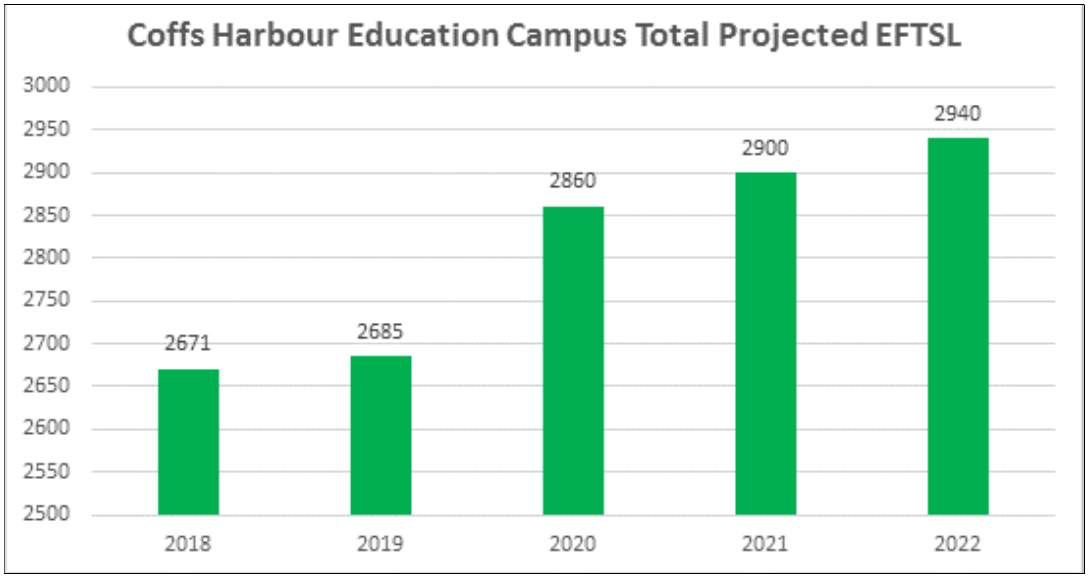


Figure 3.1: Peak-Hour Rate of Growth from 2012 to 2018

Figure 3.1 shows that traffic has mostly remained steady or decreased from 2012 to 2018, contrary to the traffic growth from 2008 to 2012. In the interest of providing a conservative assessment, a growth rate of 1% compounding per annum has been applied to all non-CHEC traffic movements (i.e. all movements not associated with Doug Knight Drive).

The projected equivalent full-time student load (EFTSL) for CHEC has been provided by the applicant as shown in Figure 3.2.



Source: Southern Cross University

Figure 3.2: Projected CHEC Growth

The projected EFTSL growth from 2022 to 2029 (ultimate year) is considered to be 40 EFT students /year, as per the constant growth from 2020 to 2022. The growth rate derived from the projected EFTSL has been applied to the traffic movements associated with Doug Knight Drive.

3.3 FORECAST BACKGROUND TRAFFIC VOLUMES

The year-of-opening (2019) and 10-year design horizon (2029) forecast background traffic volumes are provided in Figure 3.3 and Figure 3.4 respectively.

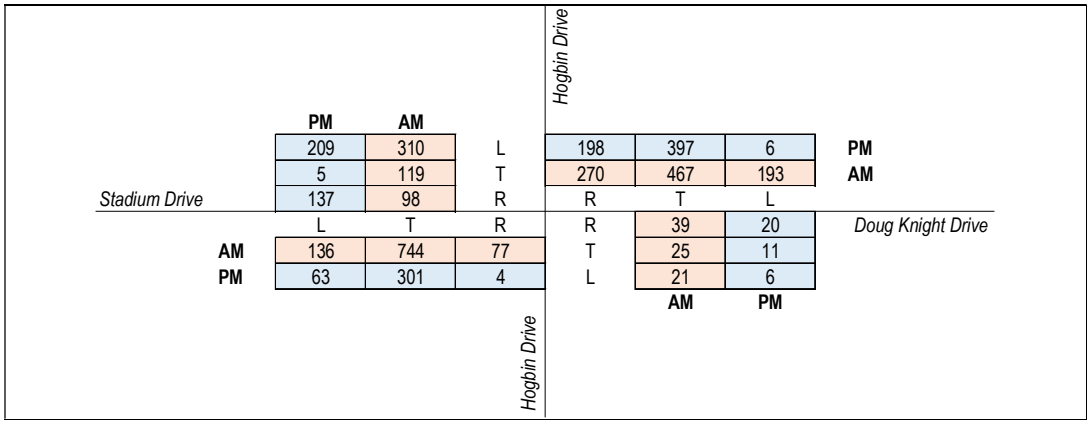


Figure 3.3: 2019 Forecast Background Traffic Volumes

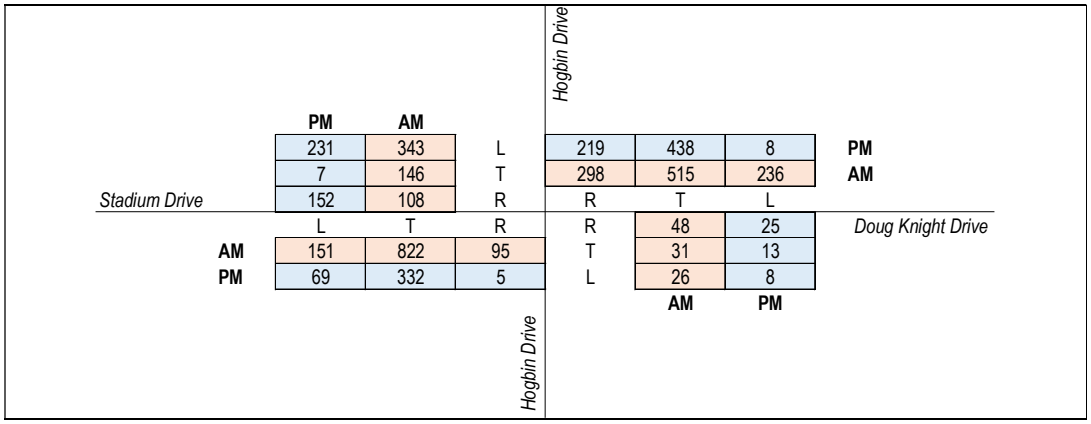


Figure 3.4: 2029 Forecast Background Traffic Volumes

3.4 TRAFFIC GENERATION

Traffic generation rates are not specified for tertiary education developments within RMS *To Traffic Generating Developments (2002)*, therefore a first-principles analysis has been undertaken.

The AM and PM trip rates have been derived from the 2018 traffic survey data on the basis of EFTSL, with rates for both 'in' and 'out' trips derived for both peaks. The derived trips rates are summarised in Table 3.1.

Table 3.1: Derived Trip Rates

Peak Period	Current EFTSL	Total Vehicle Trips		Derived Trip Rate (trips/EFTSL)	
		IN	OUT	IN	Out
AM	2,671	438	96	0.164	0.036
PM		18	42	0.007	0.016

The development traffic generation based on the derived trip rates and proposed development EFTSL is summarised in Table 3.2.

Table 3.2: Development Traffic Generation

Peak Period	Proposed Development EFTSL	Derived Trip Rate (trips/EFTSL)		Total Peak Hour Trips	
		IN	OUT	IN	Out
AM	155	0.164	96	25	6
PM		0.007	42	1	2

The proposed development will generate a total of 31 trips in the AM peak, and 3 trips in the PM peak.

3.5 TRAFFIC DISTRIBUTION

The future development traffic distribution is based on the existing CHEC distribution as observed in the 2018 traffic survey. The resultant distribution is provided in Figure 3.5.

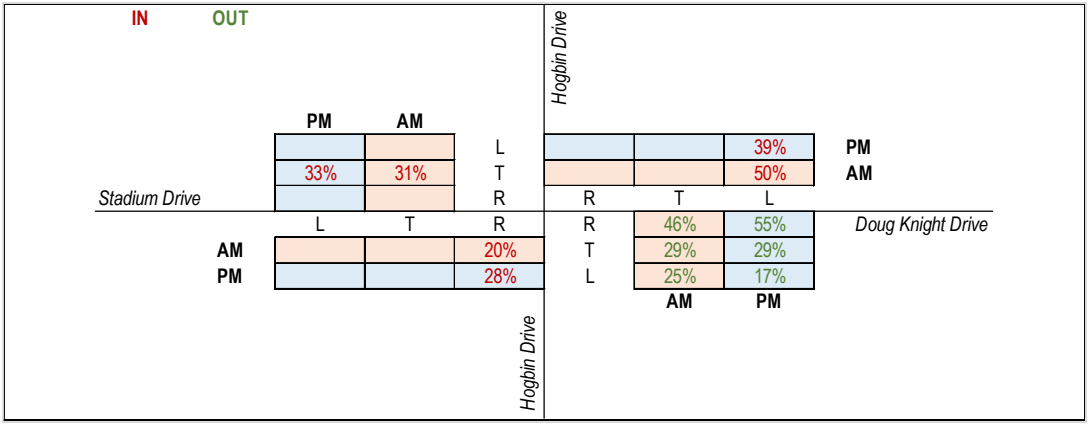


Figure 3.5: Development Traffic Distribution

The development traffic assignment has been estimated on the basis of the traffic distribution and is provided in Figure 3.6.

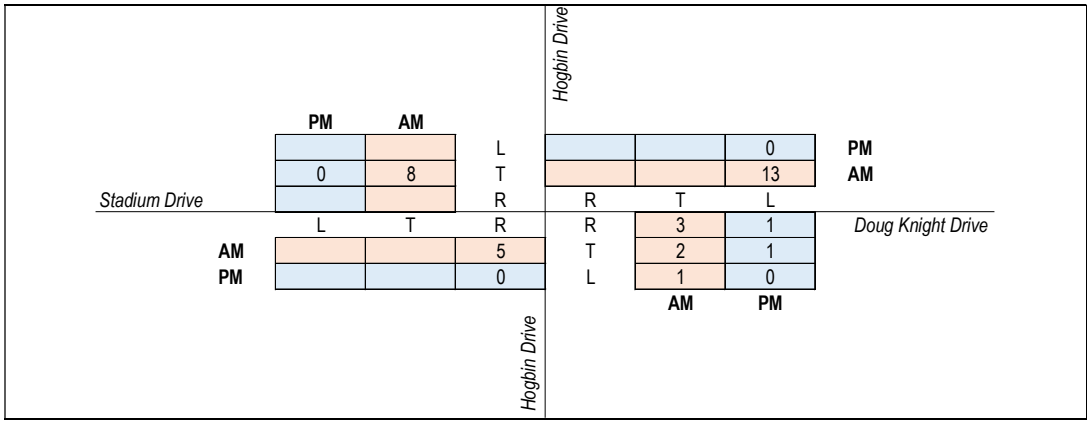


Figure 3.6: Development Traffic Assignment

3.6 DESIGN TRAFFIC VOLUMES

The 2019 and 2029 design traffic volumes (i.e. background traffic plus development traffic) are provided in Figure 3.7 and Figure 3.8 respectively.

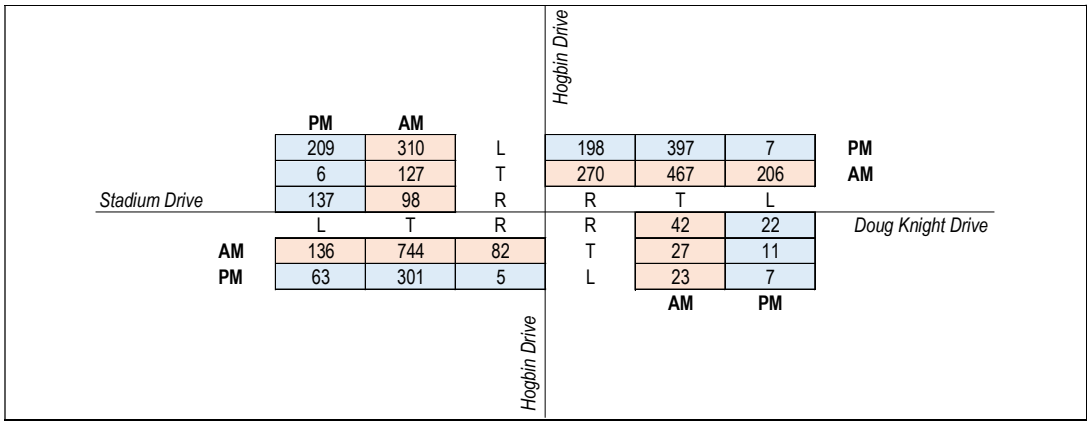


Figure 3.7: 2019 Design Traffic Volumes

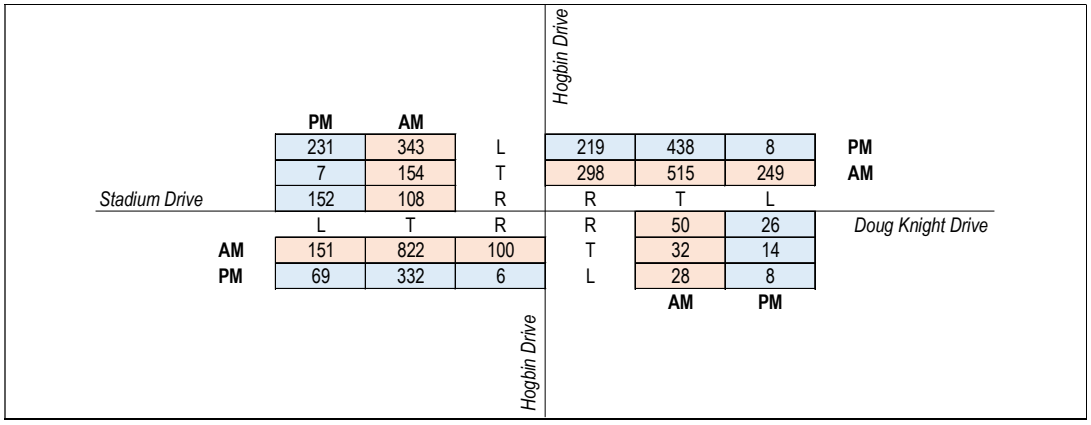


Figure 3.8: 2029 Design Traffic Volumes

4. INTERSECTION PERFORMANCE ASSESSMENT

4.1 METHODOLOGY

The operational performance of the Hogbin Drive / Stadium Drive / Doug Knight Drive intersection was analysed using SIDRA Intersection 7.0 to assess both the base and design scenarios for 2019 year-of-completion and 2029 10-year design horizon.

Key methodologies and assumptions included:

- peak hour profiles have been derived from survey data;
- posted speed limits were used in the 'Vehicle Movement Data' dialogue; and
- gap acceptance factors remain as SIDRA default values.

The existing configuration of the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout is illustrated in Figure 4.1.

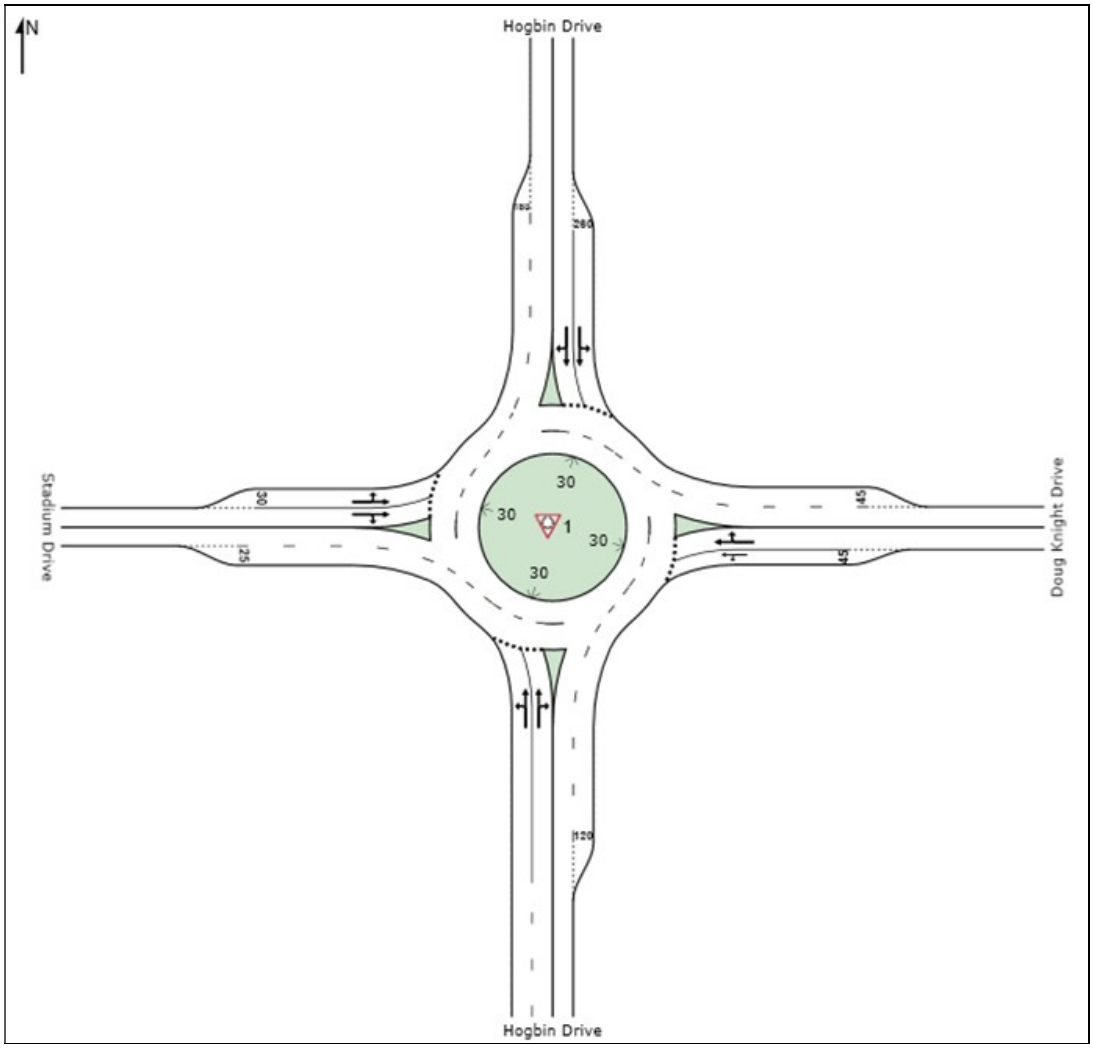


Figure 4.1: Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout Configuration

4.2 SIDRA OUTPUTS

The SIDRA results for the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout base and design scenarios for 2019 year-of-completion are provided in Table 4.1.

Table 4.1: 2019 Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout Summary

Approach	Movement	AM Peak Hour			PM Peak Hour		
		DOS (v/c)	Delay (s)	95%ile Queue (m)	DOS (v/c)	Delay (s)	95%ile Queue (m)
Base Scenario							
Hogbin Drive (S)	Left	0.474	6.0	25.3	0.162	4.6	6.1
	Through	0.474	5.7	25.3	0.162	4.6	6.1
	Right	0.474	11.8	23.9	0.162	11.1	6.0
Doug Knight Drive (E)	Left	0.052	7.4	2.1	0.016	7.5	0.6
	Through	0.090	3.7	3.7	0.036	2.8	1.2
	Right	0.090	8.6	3.7	0.036	7.5	1.2
Hogbin Drive (N)	Left	0.405	5.7	19.5	0.222	4.4	8.9
	Through	0.495	5.5	27.0	0.271	4.3	11.7
	Right	0.495	11.0	27.0	0.271	9.9	11.7
Stadium Drive (W)	Left	0.395	7.0	16.8	0.185	4.8	6.6
	Through	0.359	7.9	14.0	0.151	5.8	5.2
	Right	0.359	14.0	14.0	0.151	10.7	5.2
Design Scenario							
Hogbin Drive (S)	Left	0.479	6.1	25.7	0.162	4.6	6.1
	Through	0.479	5.8	25.7	0.162	4.6	6.1
	Right	0.479	11.8	24.3	0.162	11.1	6.0
Doug Knight Drive (E)	Left	0.057	7.5	2.3	0.018	7.6	0.7
	Through	0.098	3.8	4.1	0.038	2.9	1.3
	Right	0.098	8.6	4.1	0.038	7.5	1.3
Hogbin Drive (N)	Left	0.415	5.8	20.1	0.223	4.4	8.9
	Through	0.507	5.6	28.0	0.273	4.3	11.7
	Right	0.507	11.1	28.0	0.273	9.9	11.7
Stadium Drive (W)	Left	0.397	7.1	17.0	0.185	4.8	6.6
	Through	0.370	8.0	14.7	0.152	5.8	5.2
	Right	0.370	14.1	14.7	0.152	10.8	5.2

The results in Table 4.1 indicate the intersection is anticipated to operate within acceptable performance limits for a roundabout (i.e. DOS < 0.85) in 2019 year-of-opening for the base and design traffic scenarios. No upgrades are required upon completion of the proposed development in order to maintain the operability of the intersection.

The SIDRA results for the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout base scenarios for 2029 10-year design horizon are provided in Table 4.2.

Table 4.2: 2029 Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout Base Summary

Approach	Movement	AM Peak Hour			PM Peak Hour		
		DOS (v/c)	Delay (s)	95%ile Queue (m)	DOS (v/c)	Delay (s)	95%ile Queue (m)
Base Scenario							
Hogbin Drive (S)	Left	0.555	7.0	34.7	0.183	4.7	7.1
	Through	0.555	6.7	34.7	0.183	4.7	7.1
	Right	0.555	12.9	33.4	0.183	11.4	6.9
Doug Knight Drive (E)	Left	0.071	8.2	3.0	0.022	8.0	0.8
	Through	0.122	4.3	5.3	0.046	3.1	1.6
	Right	0.122	9.1	5.3	0.046	7.7	1.6
Hogbin Drive (N)	Left	0.482	6.3	25.0	0.247	4.5	10.1
	Through	0.589	6.4	38.6	0.301	4.4	13.4
	Right	0.589	12.2	38.6	0.301	10.0	13.4
Stadium Drive (W)	Left	0.478	8.2	22.8	0.209	4.9	7.6
	Through	0.464	9.5	20.4	0.174	6.1	6.1
	Right	0.464	15.6	20.4	0.174	10.9	6.1
Design Scenario							
Hogbin Drive (S)	Left	0.558	7.0	35.3	0.184	4.7	7.1
	Through	0.558	6.8	35.3	0.184	4.7	7.1
	Right	0.558	13.0	33.9	0.184	11.4	7.0
Doug Knight Drive (E)	Left	0.072	8.3	3.0	0.022	8.1	0.6
	Through	0.123	4.4	5.4	0.049	3.2	1.7
	Right	0.123	9.2	5.4	0.049	7.7	1.7
Hogbin Drive (N)	Left	0.495	6.6	26.4	0.251	4.5	10.3
	Through	0.604	6.8	41.2	0.306	4.4	13.7
	Right	0.604	12.5	41.2	0.306	10.0	13.7
Stadium Drive (W)	Left	0.480	8.2	23.0	0.210	4.9	7.6
	Through	0.479	9.6	21.4	0.174	6.1	6.1
	Right	0.479	15.8	21.4	0.174	10.9	6.1

The results in Table 4.2 indicate the intersection is anticipated to operate within acceptable performance limits for a roundabout (i.e. DOS < 0.85) in 2029 10-year design horizon for the base and design traffic scenarios. No upgrades are required in the ultimate year in order to maintain the operability of the intersection.

Detailed SIDRA summaries are provided in Appendix F.

4.3 SENSITIVITY ANALYSIS

While the comparison of the most recent traffic survey data (2012-2018) indicates that the background growth rate on Hogbin Drive has declined since 2012, a sensitivity analysis has been undertaken to establish if the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout can operate within the acceptable performance limits if the maximum growth rate derived prior to 2012 is applied to the 2019 and 2029 base scenarios. For the purpose of the sensitivity test, a 3.5% p.a. compounding growth rate has been applied to both the 2018 AM and PM peak hour traffic movements not associated with Doug Knight Drive.

The sensitivity analysis year-of-opening (2019) and 10-year design horizon (2029) forecast background traffic volumes are provided in Figure 4.2 and Figure 4.3 respectively.

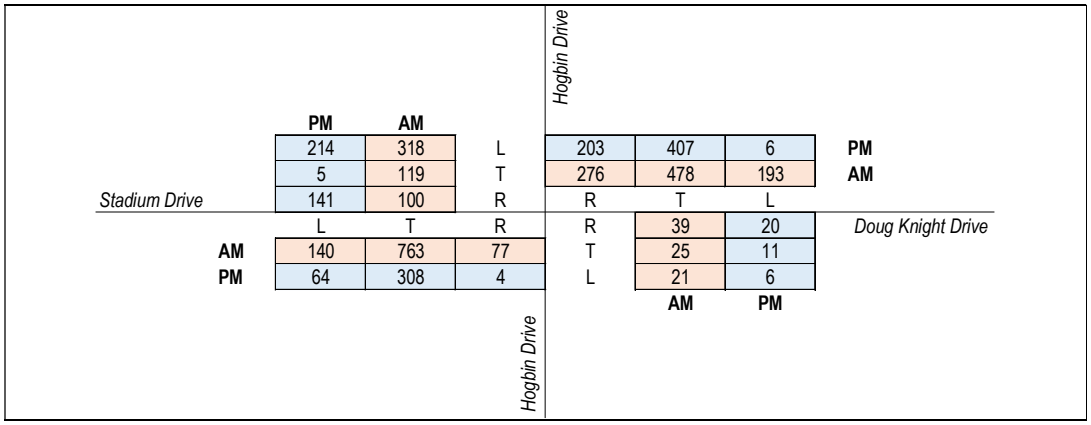


Figure 4.2: 2019 Sensitivity Analysis Forecast Background Traffic Volumes

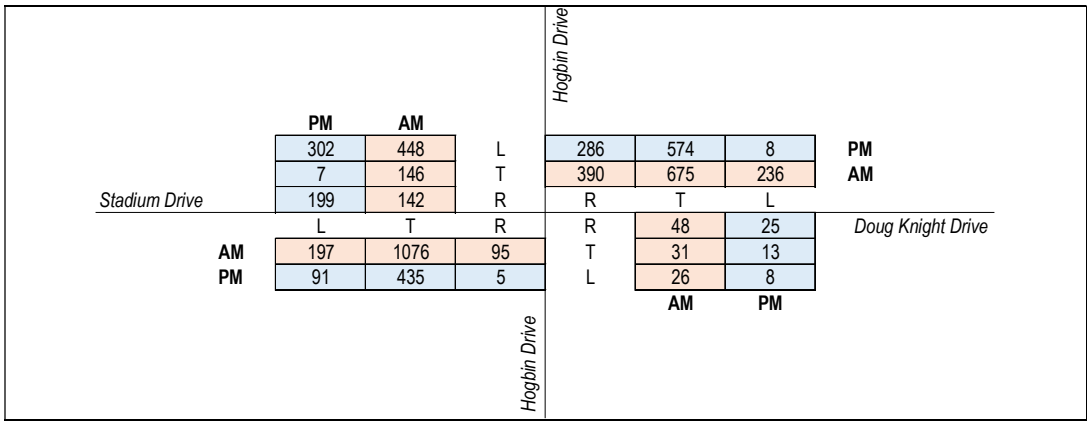


Figure 4.3: 2029 Sensitivity Analysis Forecast Background Traffic Volumes

The 2019 and 2029 design traffic volumes (i.e. background traffic plus development traffic) are provided in Figure 4.4 and Figure 4.5 respectively.

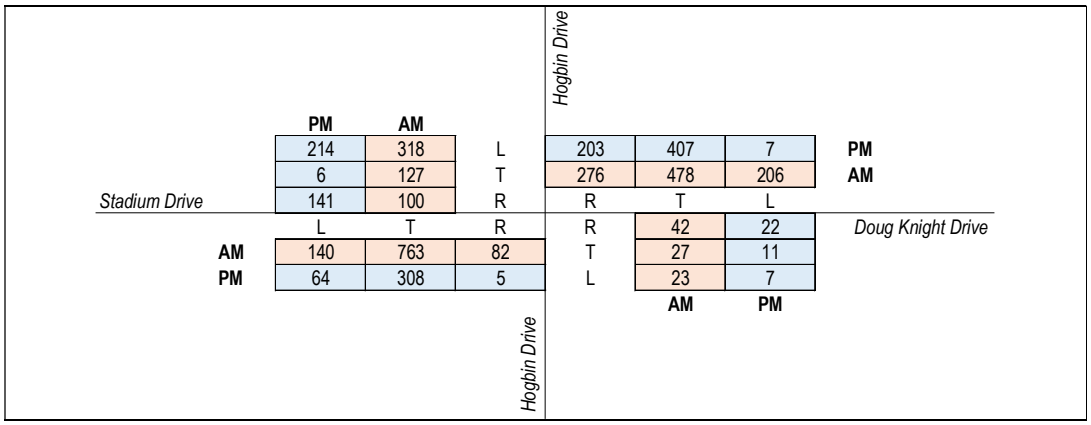


Figure 4.4: 2019 Sensitivity Analysis Design Traffic Volumes

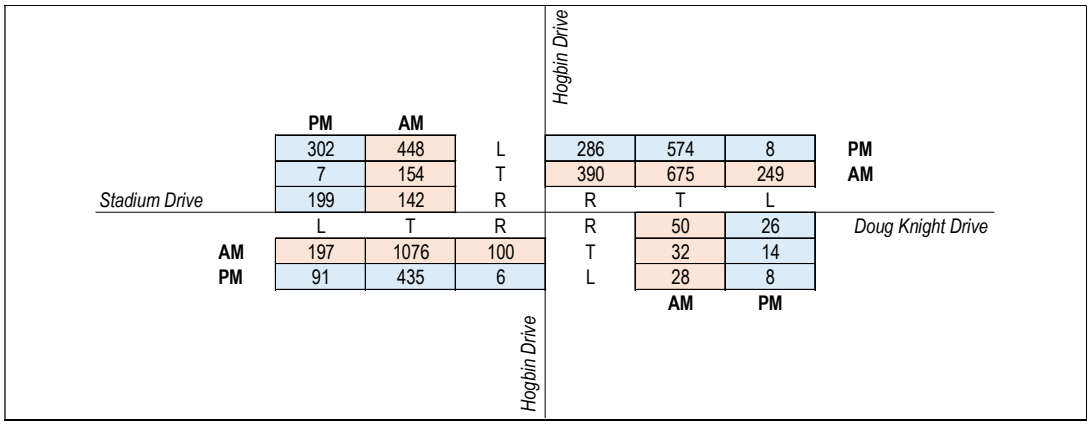


Figure 4.5: 2019 Sensitivity Analysis Design Traffic Volumes

The SIDRA results for the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout base scenarios for 2019 sensitivity analysis 10-year design horizon are provided in Table 4.3.

Table 4.3: 2019 Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout Sensitivity Analysis Summary

Approach	Movement	AM Peak Hour			PM Peak Hour		
		DOS (v/c)	Delay (s)	95%ile Queue (m)	DOS (v/c)	Delay (s)	95%ile Queue (m)
Base Scenario							
Hogbin Drive (S)	Left	0.488	6.1	26.5	0.166	4.6	6.3
	Through	0.448	5.8	26.5	0.166	4.6	6.3
	Right	0.448	11.9	25.0	0.166	11.2	6.2
Doug Knight Drive (E)	Left	0.053	7.6	2.1	0.016	7.7	0.6
	Through	0.091	3.8	3.8	0.037	2.9	1.2
	Right	0.091	8.7	3.8	0.037	7.5	1.2
Hogbin Drive (N)	Left	0.413	5.7	20.1	0.228	4.4	9.2
	Through	0.505	5.5	27.9	0.279	4.3	12.1
	Right	0.505	11.1	27.9	0.279	9.9	12.1
Stadium Drive (W)	Left	0.411	7.2	17.9	0.190	4.8	6.8
	Through	0.370	8.1	14.7	0.156	5.9	5.4
	Right	0.370	14.2	14.7	0.156	10.8	5.4
Design Scenario							
Hogbin Drive (S)	Left	0.493	6.2	26.9	0.254	5.1	10.8
	Through	0.493	5.8	26.9	0.254	5.2	10.8
	Right	0.493	11.9	25.4	0.254	12.0	10.5
Doug Knight Drive (E)	Left	0.058	7.6	2.4	0.025	9.6	1.0
	Through	0.099	3.9	4.2	0.054	4.1	2.0
	Right	0.099	8.7	4.2	0.054	8.6	2.0
Hogbin Drive (N)	Left	0.424	5.9	20.7	0.342	4.9	15.5
	Through	0.518	5.7	29.0	0.418	4.8	21.1
	Right	0.518	11.2	29.0	0.418	10.3	21.1
Stadium Drive (W)	Left	0.414	7.3	18.2	0.293	5.4	11.3
	Through	0.385	8.3	15.5	0.245	6.8	8.9
	Right	0.385	14.3	15.5	0.245	11.5	8.9

The results in Table 4.3 indicate the intersection is anticipated to operate within acceptable performance limits for a roundabout (i.e. DOS < 0.85) in 2019 year-of-opening for the base and design traffic scenarios.

The SIDRA results for the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout base scenarios for 2029 sensitivity analysis 10-year design horizon are provided in Table 4.4.

Table 4.4: 2029 Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout Sensitivity Analysis Summary

Approach	Movement	AM Peak Hour			PM Peak Hour		
		DOS (v/c)	Delay (s)	95%ile Queue (m)	DOS (v/c)	Delay (s)	95%ile Queue (m)
Base Scenario							
Hogbin Drive (S)	Left	0.797	13.2	89.8	0.254	5.1	10.8
	Through	0.797	13.1	89.8	0.254	5.2	10.8
	Right	0.797	19.8	83.5	0.254	12.0	10.5
Doug Knight Drive (E)	Left	0.096	10.5	4.2	0.025	9.6	1.0
	Through	0.164	6.0	7.7	0.054	4.1	2.0
	Right	0.164	10.8	7.7	0.054	8.6	2.0
Hogbin Drive (N)	Left	0.624	8.5	44.1	0.343	4.9	15.5
	Through	0.763	9.2	77.0	0.418	4.8	21.1
	Right	0.763	15.4	77.0	0.418	10.3	21.1
Stadium Drive (W)	Left	0.834	19.3	63.2	0.293	5.4	11.3
	Through	0.750	18.2	42.7	0.245	6.8	8.9
	Right	0.750	24.5	42.7	0.245	11.5	8.9
Design Scenario							
Hogbin Drive (S)	Left	0.802	13.4	91.9	0.255	5.1	10.8
	Through	0.802	13.4	91.9	0.255	5.2	10.8
	Right	0.802	20.0	85.4	0.255	12.0	10.5
Doug Knight Drive (E)	Left	0.097	10.6	4.2	0.025	9.6	1.0
	Through	0.166	6.1	7.9	0.054	4.1	2.0
	Right	0.166	10.8	7.9	0.054	8.6	2.0
Hogbin Drive (N)	Left	0.639	8.9	46.6	0.342	4.9	15.5
	Through	0.781	9.9	83.0	0.418	4.8	21.1
	Right	0.781	16.2	83.0	0.418	10.3	21.1
Stadium Drive (W)	Left	0.840	19.8	64.3	0.294	5.4	11.3
	Through	0.774	19.5	45.6	0.246	6.8	8.9
	Right	0.774	25.7	45.6	0.246	11.5	8.9

The results in Table 4.4 indicate the intersection is anticipated to operate within acceptable performance limits for a roundabout (i.e. DOS < 0.85) in 2029 10-year design horizon for the base and design traffic scenarios.

The results in Table 4.3 and Table 4.4 demonstrate the roundabout can support background traffic growth at a maximum rate of 3.5% p.a. compounding for 10 years post-opening, both with and without the inclusion of the proposed development, without the requirement for any intersection upgrade works.

Detailed SIDRA summaries are provided in Appendix F.

5. PARKING ASSESSMENT

5.1 EXISTING CAR PARKING PROVISION

A parking inventory created for the surveys identified a total of 921 car spaces are available on the CHEC. On-site parking has been separated into 28 zones, as shown in Figure 5.1. A summary of each of these parking zones is provided in Table 5.1. This zoning provides a basis for the parking surveys undertaken.

Figure 5.1: On-Site Parking Layout

Table 5.1: On-Site Parking Summary

Zone	Description	Parking Spaces
1	A Block/Head of Campus parking west side	5
2	A Block/Head of Campus parking east side	4
3	O Block carpark on Doug Knight Drive	5
4	Staff parking carpark	49
5	Large carpark next to Block N	75
6	Carpark in front of Block K	10
7	Roadside marked bays between Blocks S & I (west side)	13
8	Roadside marked bays between K Block & Innovation Centre entrance	23
9	Roadside marked bays from Innovation Centre entrance to carpark entrance	9
10	Innovation Centre carpark	21
11	Carpark in front of Block M	68
12	3 carparks opposite entrance to Innovation Centre carpark	3
13	Library / E Block undercover carpark	34
14	Cars in marked bays in front of Library undercover parking	7
15	Cars parked parallel to curb in marked bays	5
16	Undercover parking south of Block I	7
17	Undercover parking north of Block I	3
18	Large carpark on corner of Memorial Drive & Doug Knight Drive (Hogbin Drive side)	211
19	Carpark on corner of Memorial Drive & Doug Knight Drive (Campus side)	42
20	Large Carpark on Memorial Drive between T Block (Sports Centre) & L Block	180
21	Small carpark at L Block	23
22	Parked line of cars at right angle to L Block	7
23	Roadside angled parking between L Block & P Block	30
24	Cars parked beside P Block	4
25	Small carpark in front of P Block	15
26	Carpark at H Block	13
27	Roadside parking between P Block & H Block	49
28	Marked parking area north of Area 27	6
	Total	**921**

Zone 18 is the key parking area for the proposed development, noting that this parking area is the nearest in proximity to the subject site and has the largest parking capacity, accounting for 23% of the total on-site parking provision.

5.2 EXISTING CAR PARKING DEMAND

5.2.1 Parking Survey Results

To address the parking item of Council's RFI, the existing car parking demand of the CHEC was established by undertaking parking surveys. The surveys were undertaken on both Wednesday 1st August 2018 and Thursday 2nd August 2018. It should be noted that the CHEC hosted the Coffs Harbour Post-Secondary School Options Expo on Wednesday 1st August 2018. As such, the total number of persons present at the campus was higher than that experienced during typical daily operations (i.e. outside of event times). The campus operations on Thursday 2nd August 2018 were understood to be representative of typical daily operations. The complete parking survey results are provided in Appendix G.

Table 5.2: 2018 CHEC Parking Survey Summary

Time Starting	Wednesday 1st August 2018 (Event)		Thursday 2nd August 2018 (Typical)	
	Occupied Spaces (%)	Unoccupied Spaces (%)	Occupied Spaces (%)	Unoccupied Spaces (%)
7:00AM	55 (6%)	866 (94%)	63 (7%)	858 (93%)
8:00AM	202 (22%)	719 (78%)	187 (20%)	734 (80%)
9:00AM	695 (75%)	226 (25%)	465 (50%)	456 (50%)
10:00AM	851 (92%)	70 (8%)	**610 (66%)**	**311 (34%)**
11:00AM	**854 (93%)**	**67 (7%)**	598 (65%)	323 (35%)
12:00PM	847 (92%)	74 (8%)	358 (39%)	563 (39%)
1:00PM	729 (79%)	192 (21%)	172 (19%)	749 (19%)
2:00PM	700 (76%)	221 (24%)	118 (13%)	803 (13%)
3:00PM	570 (62%)	351 (38%)	105 (11%)	816 (11%)
4:00PM	366 (40%)	555 (60%)	91 (10%)	830 (10%)
5:00PM	198 (21%)	723 (79%)	72 (8%)	849 (8%)
6:00PM	135 (15%)	786 (85%)	67 (7%)	854 (7%)
Average	**517 (56%)**	**404 (44%)**	**242 (26%)**	**679 (74%)**

5.2.2 Event Parking Summary

On the event day, the peak-hour parking occupancy was measured to be 93% across the entire campus. This peak-hour was recorded at 11:00AM, noting that the event was held from 12:00PM to 3:00PM. A diagram of the event parking occupancy by zone is provided in Figure 5.2.

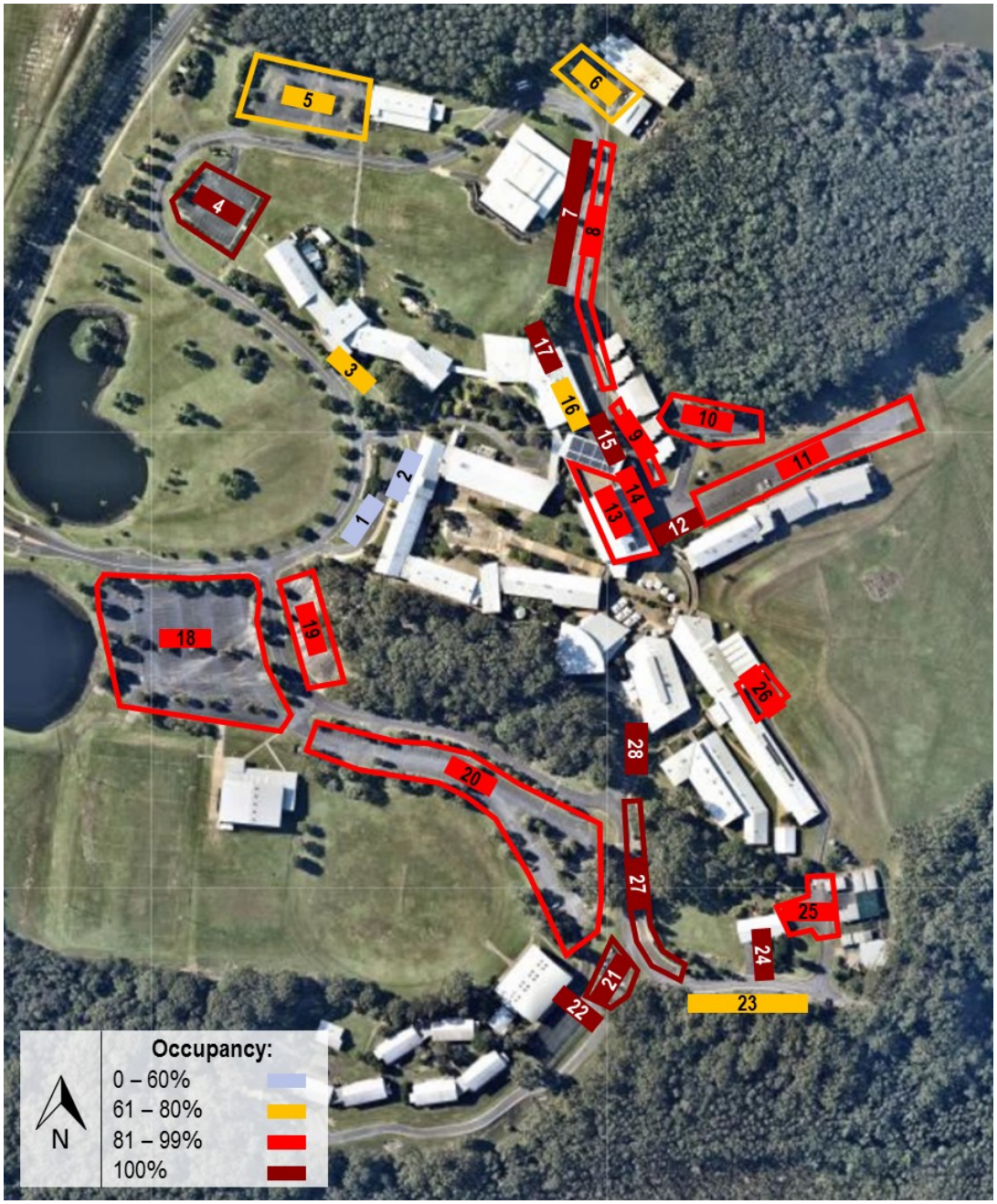


Figure 5.2: Event Peak-Hour Parking Occupancy

5.2.3 Typical Parking Summary

On the typical weekday, the peak hour parking occupancy was measured to be 66% across the entire campus, and was recorded at 10:00AM. Additionally, the parking occupancy of Zone 18 was measured at 32%, with 144 available parking spaces. As such, if the 26 parking spaces on the front door of the development were occupied, there is capacity in the next closest parking area for utilisation by staff, students or visitors. A diagram of the typical parking occupancy by zone is provided in Figure 5.3.

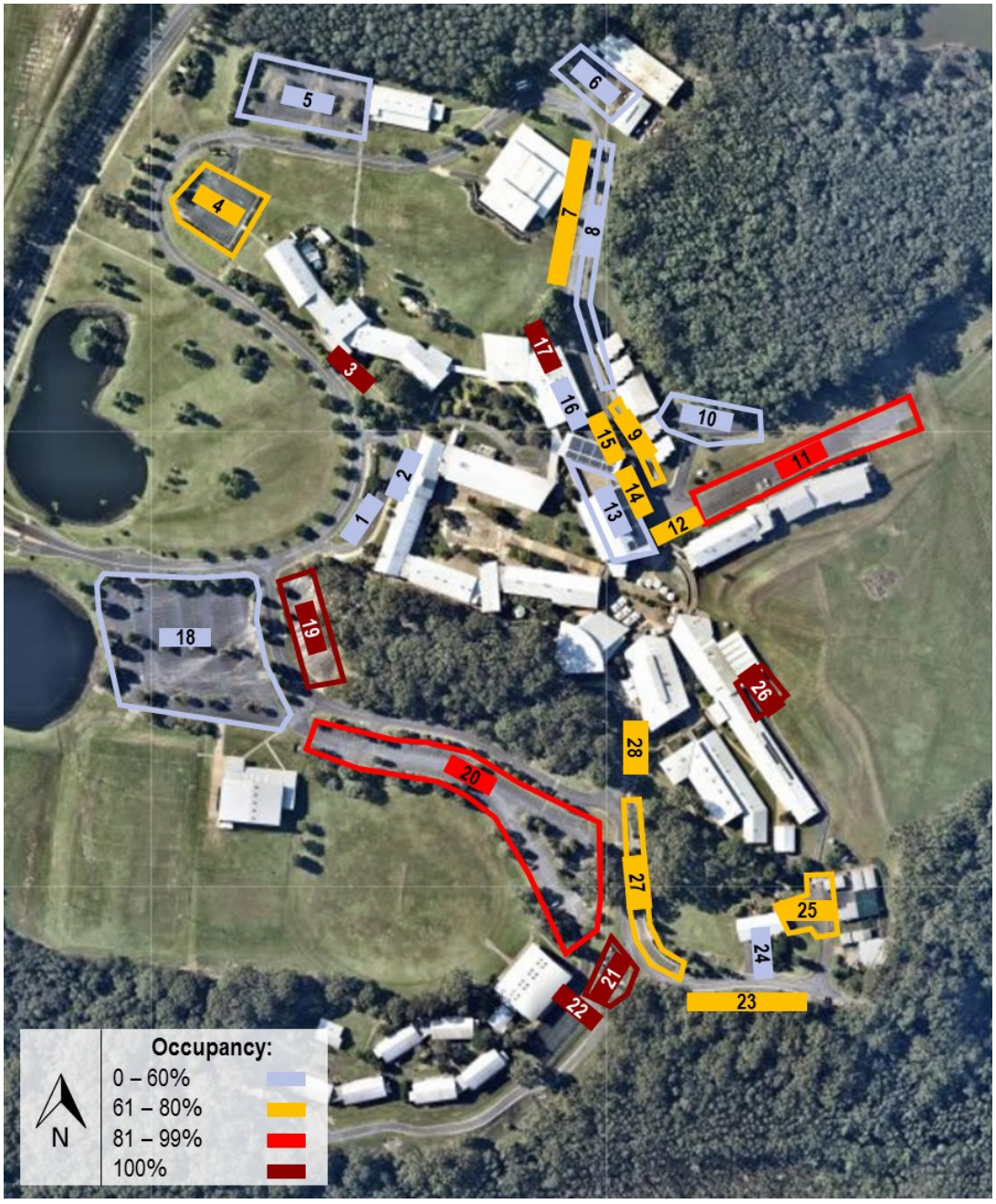


Figure 5.3: Typical Weekday Peak-Hour Parking Occupancy

5.3 PREVIOUS PARKING ASSESSMENT

The Coffs Harbour Development Control Plan (DCP) does not specify a particular parking rate for educational establishments, therefore the parking requirement for this development has been determined as detailed below. Given that on-site parking is unallocated to each particular land use, this assessment considers the CHEC campus as a whole.

The parking demand is dependent on the overall patronage to the CHEC campus as well as the travel modes of these patrons. The student and staff patronage for the TAFE and school, and the student patronage for the existing university campus and the proposed development, was obtained from SCU. The staff rate for the existing university campus and the proposed development was considered to be 20% of the number of students, as per the traffic assessment. The overall CHEC campus patronage is provided in Table 5.3.

Table 5.3: CHEC Campus Patronage

Establishment	Students EFT	Staff EFT
TAFE	1453	123
School	511	48
University	649	129.8
Proposed Development	155	31

According to the previous McLaren traffic impact assessment, peak time parking surveys of the CHEC campus indicated 25% of the total number of EFT students were on site at any one time typically. A rate of one (1) space / 10 Year 12 students and one (1) space / staff is proposed for the school land use in lieu of additional parking assessments of the school exclusive of the other land uses. The school demand considers 50% of students are attending Year 12, resulting in one (1) space / 20 students (i.e. 0.05 spaces / student). This school parking rate is consistent with the rate provided by other NSW councils. The parking demand for the TAFE and university has been calculated on a first-principles basis (i.e. number students EFT x proportion on site x proportion travel by car = demand).

Table 5.4: CHEC Campus Parking Demand

Patron	Establishment	Quantity (EFT)	On-Site Rate	Driver Mode Share	Parking Demand
Students	TAFE	1453	25%	50%	182
	School	511	1 space / 20 students		26
	University	649	25%	76%	124
	Development	155	25%	76%	30
Staff	TAFE	123	100%	92%	113
	School	48	1 space / staff		48
	University	129.8	100%	92%	119
	Development	31	100%	92%	29
				Total	**671**

In a previous letter prepared by McLaren Traffic Engineering for SCU, dated 2nd September 2010, parking survey results identified a total of 858 parking spaces on site. Based on a review of Google Streetview, which shows 2008 and 2015 imagery, and 2018 NearMap imagery, no additional car parks or parking areas appear to have been constructed since those proposed as a part of the 2010 McLaren letter. However, given the 2018 parking surveys indicated that 921 spaces presently exist at the CHEC, this number is adopted given it is has been confirmed in the field. With 26 spaces proposed as part of this development, there would be therefore, a surplus of 276 spaces upon completion. This letter is provided in Appendix H.

5.4 REVISED PARKING ASSESSMENT

The Coffs Harbour Development Control Plan (DCP) does not specify a particular parking rate for educational establishments, therefore the parking requirement for this development has been determined based on the results of the parking surveys, in particular the typical day survey.

The 2018 parking survey results indicate that the maximum car parking demand for the CHEC under typical daily operations is 669 spaces (610 existing and 59 development. This demonstrates that the car parking demand previously calculated (i.e. 671 spaces) based on the student/staff EFT numbers, mode share and other inferences, is overly-conservative of the demands of typical daily operations. As such, the existing car parking supply, with the addition of the 26 spaces to be provided as part of the proposed development, is sufficient to cater for the overall parking demand of the CHEC.

5.5 BICYCLE PARKING

The bicycle parking requirement and provision for the proposed development as per Austroads *Cycling Aspects of Austroads Guide* is shown in Table 5.5.

Table 5.5: Bicycle Parking Provision

Land Use	Required Rate	Quantity	Requirement	Provision
University	2 space / 100 students EFT	155 students EFT	4	10

Ten (10) bicycle spaces are proposed as part of this development, which exceeds Austroads requirements by six (6) spaces.

6. ACCESS AND SERVICING ASSESSMENT

6.1 PARKING LAYOUT

The parking access and layout has been assessed as per Council and AS2890.1 requirements, with comments as follows:

- general parking bay dimensions are provided at a minimum of 2.6m wide by 5.4m long with an aisle width of at least 5.8m as per AS2890.1 requirements for Class 3 users;
- PWD parking bay and shared area dimensions are provided at a minimum of 2.4m wide by 5.4m long as per AS2890.6 requirements; and
- the queueing area length is approximately 100m from the proposed car park to the existing south-west access point within the main car park, which exceeds AS2890.1 requirements.

Swept paths provided in Appendix I show the ability for a B99 vehicle to ingress, manoeuvre and egress the site.

6.2 SERVICING AND REFUSE COLLECTION

The largest service vehicle used on the CHEC is a Ford Ranger (i.e. a B99 design vehicle). The swept paths provided in Appendix I show the ability for a B99 vehicle to ingress, manoeuvre and egress the site.

A swept path assessment was undertaken to ensure that a 10.2m front-loading RCV can adequately manoeuvre the site. The swept paths provided in Appendix I show the ability for the RCV to ingress the site in forward gear, access the bin and egress the site in forward gear.

Additionally, a swept path assessment was undertaken to ensure that a firefighting appliance (i.e. Category 1 Tanker Medium Rigid Vehicle – equivalent of an 8.8m medium rigid vehicle (MRV)) can adequately manoeuvre the site. The swept paths provided in Appendix I show the ability for the firefighting appliance to ingress the site in forward gear, manoeuvre through the site and egress the site in forward gear. This is acknowledged as the larger RCV vehicle can perform the same manoeuvres. The car park layout provides a 'loop road' function' which allows for a fire fighting appliance to circulate in anti-clockwise direction.

7. CONCLUSION

The key findings of this traffic impact assessment for the proposed SCU Coffs Harbour Allied Health Building are as follows:

- the development is expected to generate 25 AM peak trips and three (3) PM peak trips;
- SIDRA results indicate no upgrades are required before the ultimate year (2029) in order to maintain the operability of the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout in both the background and design traffic scenarios;
- sensitivity analysis indicates the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout can support a maximum background traffic growth rate of 3.5% p.a. compounding for 10 years post-opening;
- parking surveys indicate that the existing car parking supply, with the addition of the 26 spaces to be provided as part of the proposed development, is sufficient to cater for the overall parking demand of the CHEC;
- a total of ten (10) bicycle spaces are proposed as part of this development, which exceeds Austroads requirements by six (6) spaces;
- the proposed car park layout meets Council and AS2890 requirements; and
- the swept paths demonstrate the ability for a 10.2m front-loading RCV to ingress the site in forward gear, access the bin and egress the site in forward gear; and
- the swept paths demonstrate the ability for the 8.8m firefighting appliance to ingress the site in forward gear, manoeuvre through the site and egress the site in forward gear.

Based on the above assessment we conclude that there are no significant traffic or transport impacts associated with the proposed development that would preclude its approval and relevant conditioning.

APPENDIX A

DETAILED DEVELOPMENT PLANS

EXISTING DAM

NEW RETAINING WALL

NEW RETAINING WALL

CULVERT UNDER ROAD

NEW FOOTPATH

PROPOSED ACCESS ROAD

SWALE

CULVERT UNDER ROAD

SEATING

BUILDING SIGN

15000 SETBACK

TPZ ZONE

HOSE TAP

NEW FOOTPATH

PROPERTY BOUNDARY

FIRE HYDRANT

BICYCLE RACKS

DROP OFF

HOSE TAP

LP

CARPARK
26 CARS

BINS

EXISTING SPORT FIELD
(SHOWN INDICATIVE ONLY)

BRIDGE 1

PROPOSED BUILDING

HOSE TAP

EXTERNAL LEARNING SPACE

BRIDGE 2

MAINTENANCE PATH

21000 APZ

FUTURE BUILDING

3000 SETBACK

SWALE

FIRE HYDRANT

HOSE TAP

EXISTING BOUNDARY LINE

EXISTING BOUNDARY LINE

EXISTING CARPARK

Notes

Verify all dimensions and levels on site and report any discrepancies to dwp for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents.

Use figured dimensions only. Do not scale from drawings. dwp cannot guarantee the accuracy of content and format for copies of drawings issued electronically. The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.

FOR TENDER
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	FOR TENDER	18.07.06	GH	LA

Architect/ Designer
dwp
www.dwp.com

Client
SOUTHERN CROSS UNIVERSITY

Project
ALLIED HEALTH BUILDING

Location
HOGBIN DR, COFFS HARBOUR NSW 2450

Project Number
AUBNE-16-0353

Drawing
SITE PLAN

Scale (A1) 1 : 200
Date Printed 13/07/18 11:11:12 AM

Drawing Number A102
Issue 1

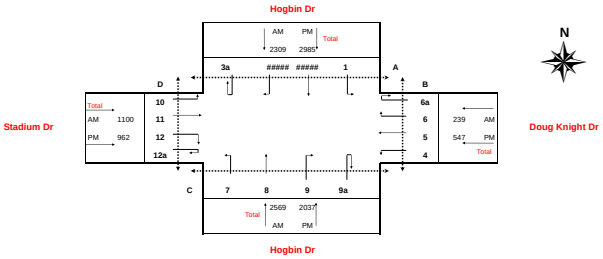
File Name: BIM 360://dwp_16-0353_SCU_CH Campus_Health Education Building/AUBNE-16-0353_SCUCHEB_R2017.rvt

APPENDIX B

TDC 2012 TRAFFIC SURVEY SUMMARY

TDC
Traffic Data & Control

Site ID: N/A
Location: Hogbin Dr & Stadium Dr
Weather: Fine
Suburb: Coffs Harbour
Duration: 7:00am to 10:00am (Thursday) & 3:00pm to 6:00pm (Wednesday)
Day/Date: Wednesday, 28 November 2012 & Thursday, 29 November 2012
AM Peak 09:00 (hour ending)
PM Peak 16:30 (hour ending)
Traffic Control: Roundabout
HOME



TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	3	0	0	0	69	3	1	0	28	0	0	1	0	0	0	0
2	7:30 AM	11	0	0	0	87	2	0	0	36	1	1	0	0	0	0	0
3	7:45 AM	12	0	1	0	95	4	0	0	49	3	1	1	0	0	0	0
4	8:00 AM	35	0	0	1	118	0	0	0	44	2	0	0	0	0	0	0
5	8:15 AM	33	0	1	0	120	5	1	0	55	3	0	0	0	0	0	0
6	8:30 AM	41	0	1	0	140	4	4	0	50	0	0	0	0	0	0	0
7	8:45 AM	57	2	4	0	171	1	6	0	31	4	0	0	0	0	0	0
8	9:00 AM	64	0	1	0	116	2	5	0	35	2	1	0	0	0	0	0
9	9:15 AM	38	0	1	0	106	4	1	0	31	1	0	0	0	0	0	0
10	9:30 AM	25	0	0	0	101	4	0	0	39	4	0	0	0	0	0	0
11	9:45 AM	24	0	1	0	114	1	0	0	35	3	0	0	0	0	0	0
12	10:00 AM	19	0	0	0	136	1	0	0	49	2	0	0	0	0	0	0
3HR Total		362	2	10	1	1373	31	18	0	482	25	3	2	0	0	0	0
Peak Hour Total		195	2	7	0	547	12	16	0	171	9	1	0	0	0	0	0

TIME		Doug Knight Dr (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2	7:30 AM	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
3	7:45 AM	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0
4	8:00 AM	1	0	0	0	6	0	0	0	2	0	1	0	0	0	0	0
5	8:15 AM	2	0	2	21	2	0	0	0	4	0	0	0	0	0	0	0
6	8:30 AM	4	0	1	5	7	0	0	0	7	0	1	0	0	0	0	0
7	8:45 AM	4	0	5	0	9	2	0	0	6	0	0	0	0	0	0	0
8	9:00 AM	6	1	0	3	12	0	3	0	4	0	0	0	0	0	0	0
9	9:15 AM	6	0	1	1	4	0	0	0	16	0	1	0	0	0	0	0
10	9:30 AM	2	0	0	1	3	0	1	0	8	0	3	0	0	0	0	0
11	9:45 AM	12	0	1	3	8	0	1	0	9	1	0	0	0	0	0	0
12	10:00 AM	5	0	0	4	10	0	0	2	6	0	1	0	0	0	0	0
3HR Total		45	1	11	38	61	2	5	2	66	1	7	0	0	0	0	0
Peak Hour Total		16	1	8	29	30	2	3	0	21	0	1	0	0	0	0	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	14	3	2	1	87	3	2	0	0	0	0	0	0	0	0	0
2	7:30 AM	12	0	1	0	107	6	1	0	1	0	0	0	0	0	0	0
3	7:45 AM	19	4	4	1	144	5	0	0	0	0	1	0	0	0	0	0
4	8:00 AM	25	0	0	0	170	4	0	1	8	0	0	0	0	0	0	0
5	8:15 AM	34	3	1	2	182	3	0	0	3	0	1	0	0	0	0	0
6	8:30 AM	29	0	2	0	240	6	3	0	13	0	1	0	0	0	2	0
7	8:45 AM	26	2	6	0	249	3	2	0	30	1	3	0	0	0	0	0
8	9:00 AM	22	1	7	0	240	3	0	0	38	0	3	0	0	0	0	0
9	9:15 AM	30	4	0	0	160	2	1	0	14	0	1	0	0	0	0	0
10	9:30 AM	24	1	0	0	149	1	1	0	11	0	0	0	0	0	0	0
11	9:45 AM	21	3	0	0	163	1	0	0	14	0	1	0	0	0	0	0
12	10:00 AM	22	5	2	1	141	2	1	0	6	0	0	0	0	0	0	0
3HR Total		278	26	25	5	2032	39	11	1	138	1	11	0	0	0	2	0
Peak Hour Total		111	6	16	2	911	15	5	0	84	1	8	0	0	0	2	0

TIME		Stadium Dr (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	7:15 AM	22	1	0	0	4	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	32	0	0	0	2	0	0	1	11	3	1	0	0	0	0	0	2	0	0	0
3	7:45 AM	50	0	0	0	6	0	0	1	16	4	2	0	0	0	0	0	0	0	0	0
4	8:00 AM	44	2	0	0	8	0	0	0	7	2	0	0	0	0	0	0	0	9	0	0
5	8:15 AM	63	1	1	0	16	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0
6	8:30 AM	91	1	1	1	17	0	0	2	27	2	4	0	0	0	0	0	0	0	0	0
7	8:45 AM	77	1	0	0	33	0	1	0	31	1	1	0	0	0	0	0	0	0	0	0
8	9:00 AM	86	1	0	0	27	0	0	0	16	1	0	0	0	0	0	0	0	0	0	0
9	9:15 AM	74	2	0	0	18	1	3	0	20	1	1	0	0	0	0	0	0	0	0	0
10	9:30 AM	58	2	0	0	10	0	0	0	19	2	3	0	0	0	0	0	0	0	0	0
11	9:45 AM	46	2	0	0	12	1	1	0	24	0	0	0	0	0	0	0	0	0	0	0
12	10:00 AM	27	3	1	0	2	0	1	0	21	1	0	0	0	0	0	0	0	0	0	0
3HR Total		670	16	3	1	155	2	6	4	211	20	12	0	0	0	0	0	2	9	0	0
Peak Hour Total		317	4	2	1	93	0	1	2	91	4	5	0	0	0	0	0	0	0	0	0

TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	10	0	1	0	149	5	2	0	56	4	0	0	0	0	0	0
2	3:30 PM	13	0	0	0	162	0	1	0	41	4	3	0	0	0	0	0
3	3:45 PM	13	0	2	0	187	2	0	0	64	2	3	0	0	0	0	0
4	4:00 PM	10	0	2	0	154	4	2	0	57	3	0	0	0	0	0	0
5	4:15 PM	8	0	2	0	161	5	1	0	57	1	0	0	0	0	0	0
6	4:30 PM	13	0	1	0	210	2	0	0	88	4	0	0	0	0	0	0
7	4:45 PM	6	0	0	0	196	2	0	0	49	2	1	0	0	0	0	0
8	5:00 PM	10	0	0	0	151	2	0	0	51	2	1	0	0	0	0	0
9	5:15 PM	8	0	0	0	188	3	3	0	65	1	0	0	0	0	0	0
10	5:30 PM	9	1	0	0	200	3	0	0	54	3	0	0	0	0	0	0
11	5:45 PM	18	0	0	0	172	1	2	0	48	1	0	0	0	0	0	0
12	6:00 PM	6	0	0	0	155	0	1	0	60	1	0	0	0	0	0	0
3HR Total		124	1	8	0	2085	29	12	0	690	28	8	0	0	0	0	0
Peak Hour Total		44	0	7	0	712	13	3	0	266	10	3	0	0	0	0	0

TIME		Doug Knight Dr (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	12	0	2	1	13	0	0	0	27	0	1	0	0	0	0	0
2	3:30 PM	14	0	0	0	12	0	0	0	22	0	3	0	0	0	0	0
3	3:45 PM	13	0	1	3	6	0	0	0	19	0	1	0	0	0	0	0
4	4:00 PM	3	0	0	3	10	0	0	0	22	0	0	0	0	0	0	0
5	4:15 PM	22	0	1	0	25	0	2	0	41	0	3	1	0	0	0	0
6	4:30 PM	13	0	2	0	9	0	0	1	22	0	1	0	0	0	0	0
7	4:45 PM	10	0	0	0	7	0	0	1	26	0	0	0	0	0	0	0
8	5:00 PM	8	0	0	0	6	0	1	0	15	0	0	0	0	0	0	0
9	5:15 PM	15	0	1	8	10	0	1	0	18	0	0	0	0	0	0	0
10	5:30 PM	9	0	0	2	15	0	0	0	14	0	0	0	0	0	0	0
11	5:45 PM	5	0	1	5	5	0	0	0	12	0	0	0	0	0	0	0
12	6:00 PM	4	0	0	4	9	0	0	0	4	0	0	0	0	0	0	0
3HR Total		128	0	8	26	127	0	4	2	242	0	9	1	0	0	0	0
Peak Hour Total		51	0	4	6	50	0	2	1	104	0	5	1	0	0	0	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	19	5	0	0	160	1	3	0	7	0	2	0	0	0	0	0
2	3:30 PM	55	2	7	1	131	2	5	0	20	0	4	0	0	0	0	0
3	3:45 PM	34	0	2	0	184	3	1	0	9	0	3	0	0	0	0	0
4	4:00 PM	18	0	2	0	149	4	2	0	6	0	0	0	0	0	0	0
5	4:15 PM	21	0	0	0	140	1	0	0	7	0	1	0	0	0	0	0
6	4:30 PM	17	0	1	0	116	2	0	0	6	0	0	0	0	0	0	0
7	4:45 PM	25	0	0	0	135	3	0	0	2	0	0	0	0	0	0	0
8	5:00 PM	12	0	0	1	113	1	0	0	8	0	1	0	0	0	0	0
9	5:15 PM	18	0	0	0	127	1	0	0	10	0	1	0	0	0	0	0
10	5:30 PM	13	0	0	0	139	1	0	0	5	0	0	0	0	0	0	0
11	5:45 PM	29	0	0	0	106	0	0	0	6	0	1	0	0	0	0	0
12	6:00 PM	23	0	0	1	96	0	0	0	6	0	0	0	0	0	0	0
3HR Total		284	7	12	3	1596	19	11	0	92	0	13	0	0	0	0	0
Peak Hour Total		90	0	5	0	589	10	3	0	28	0	4	0	0	0	0	0

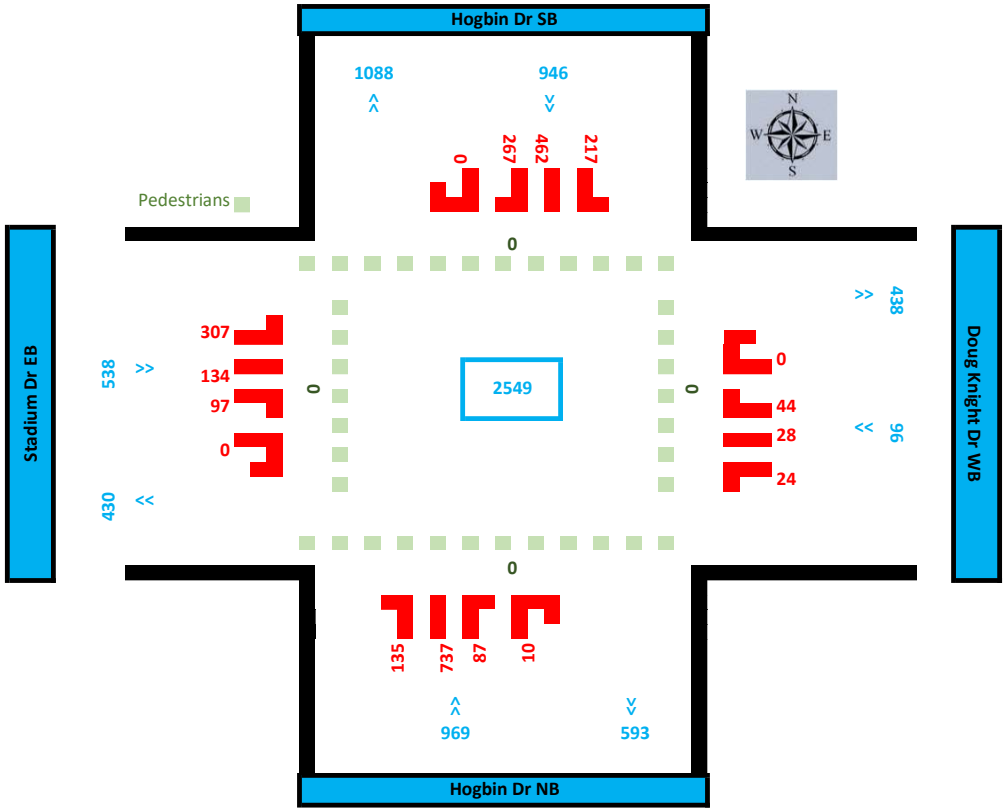
TIME		Stadium Dr (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	3:15 PM	41	2	1	0	1	0	1	0	31	0	5	0	0	0	0	0	0	0	0	0
2	3:30 PM	46	1	0	0	8	0	0	0	29	0	7	0	0	0	0	0	0	0	0	0
3	3:45 PM	49	4	0	1	4	0	0	0	33	2	1	0	0	0	0	0	0	0	0	0
4	4:00 PM	51	2	0	0	4	0	1	1	21	2	0	0	0	0	0	0	0	0	0	0
5	4:15 PM	54	1	0	0	8	0	1	0	19	1	0	0	0	0	0	0	0	0	0	0
6	4:30 PM	52	4	1	0	6	0	1	0	31	1	0	0	0	0	0	0	0	0	0	0
7	4:45 PM	54	2	0	0	1	0	0	0	33	0	1	1	0	0	0	0	0	0	0	0
8	5:00 PM	40	2	0	1	3	0	1	1	21	1	0	0	0	0	0	0	0	0	0	0
9	5:15 PM	60	2	0	0	1	0	0	5	32	1	1	0	0	0	0	0	0	0	0	0
10	5:30 PM	35	0	0	0	4	0	0	1	23	0	0	0	0	0	0	0	0	0	0	0
11	5:45 PM	29	1	0	0	5	0	1	0	13	0	1	0	0	0	0	0	0	1	0	0
12	6:00 PM	30	0	0	0	7	0	0	0	17	1	0	1	0	0	0	0	0	0	0	0
3HR Total		541	21	2	2	52	0	6	8	303	9	16	2	0	0	0	0	0	1	0	0
Peak Hour Total		206	11	1	1	22	0	3	1	104	6	1	0	0	0	0	0	0	0	0	0

APPENDIX C

TDC 2018 TRAFFIC SURVEY SUMMARY

Turning Movement Count Summary

Site ID:	1
Location:	Hogbin Dr & Stadium Dr, Coffs Harbour
Date:	2-May-2018
Surveyed Time:	7:00 AM to 9:00 AM
Weather:	Fine
Data for hour starting:	8:00 AM to 9:00 AM
Vehicle Class:	ALL VEHICLES



Site ID: 1

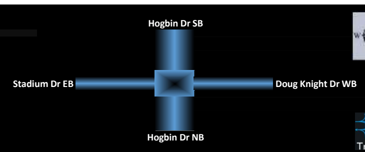
Location: Hogbin Dr & Stadium Dr, Coffs Harbour

Date: 2-May-2018

Period 1 Time: 7:00 AM to 9:00 AM

Weather: Fine

Period 1 Peak Hour: 8:00 AM to 9:00 AM



TOTALS AND PEAKS

Hogbin Dr SB

Time Starting	Left Light Vehicles	Left Trucks	Left Buses	Left Bicycles on Road	Through Light Vehicles	Through Trucks	Through Buses	Through Bicycles on Road	Right Light Vehicles	Right Trucks	Right Buses	Right Bicycles on Road	U-turn Light Vehicles	U-turn Trucks	U-turn Buses	U-turn Bicycles on Road	Cross 1 Pedestrians
Period 1 Total	265	1	9	1	778	15	12	0	537	10	3	0	0	0	0	0	0
Period 1 Peak Hr	207	1	9	0	440	10	12	0	259	6	2	0	0	0	0	0	0
07:00	4	0	0	0	58	2	0	0	34	1	0	0	0	0	0	0	0
07:15	12	0	0	0	74	1	0	0	53	1	0	0	0	0	0	0	0
07:30	12	0	0	1	94	0	0	0	92	0	1	0	0	0	0	0	0
07:45	30	0	0	0	112	2	0	0	99	2	0	0	0	0	0	0	0
08:00	27	0	1	0	128	2	3	0	86	1	1	0	0	0	0	0	0
08:15	49	0	6	0	107	3	3	0	67	3	0	0	0	0	0	0	0
08:30	72	0	2	0	97	4	6	0	68	2	1	0	0	0	0	0	0
08:45	59	1	0	0	108	1	0	0	38	0	0	0	0	0	0	0	0

Doug Knight Dr WB

Time Starting	Left Light Vehicles	Left Trucks	Left Buses	Left Bicycles on Road	Through Light Vehicles	Through Trucks	Through Buses	Through Bicycles on Road	Right Light Vehicles	Right Trucks	Right Buses	Right Bicycles on Road	U-turn Light Vehicles	U-turn Trucks	U-turn Buses	U-turn Bicycles on Road	Cross 1 Pedestrians
Period 1 Total	17	0	9	0	27	0	6	4	48	0	7	0	0	0	0	0	0
Period 1 Peak Hr	16	0	8	0	22	0	5	1	39	0	5	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
07:15	0	0	0	0	2	0	0	1	2	0	0	0	0	0	0	0	0
07:30	1	0	1	0	1	0	1	0	4	0	1	0	0	0	0	0	0
07:45	0	0	0	0	2	0	0	1	3	0	0	0	0	0	0	0	0
08:00	1	0	1	0	4	0	0	0	6	0	1	0	0	0	0	0	0
08:15	3	0	6	0	1	0	1	1	13	0	0	0	0	0	0	0	0
08:30	1	0	1	0	6	0	2	0	8	0	2	0	0	0	0	0	0
08:45	11	0	0	0	11	0	2	0	12	0	2	0	0	0	0	0	0

Hogbin Dr NB

Time Starting	Left Light Vehicles	Left Trucks	Left Buses	Left Bicycles on Road	Through Light Vehicles	Through Trucks	Through Buses	Through Bicycles on Road	Right Light Vehicles	Right Trucks	Right Buses	Right Bicycles on Road	U-turn Light Vehicles	U-turn Trucks	U-turn Buses	U-turn Bicycles on Road	Cross 1 Pedestrians
Period 1 Total	215	19	14	2	1250	28	6	0	105	0	11	0	10	0	2	0	0
Period 1 Peak Hr	108	13	13	1	720	11	6	0	79	0	8	0	8	0	2	0	0
07:00	24	0	0	0	85	4	0	0	0	0	1	0	0	0	0	0	0
07:15	11	1	0	1	110	4	0	0	2	0	0	0	0	0	0	0	0
07:30	31	2	0	0	175	4	0	0	11	0	2	0	2	0	0	0	0
07:45	41	3	1	0	160	5	0	0	13	0	0	0	0	0	0	0	0
08:00	36	3	2	0	185	1	3	0	7	0	1	0	0	0	0	0	0
08:15	27	4	6	1	204	1	2	0	15	0	2	0	1	0	2	0	0
08:30	21	2	5	0	199	5	1	0	20	0	3	0	4	0	0	0	0
08:45	24	4	0	0	132	4	0	0	37	0	2	0	3	0	0	0	0

Stadium Dr EB

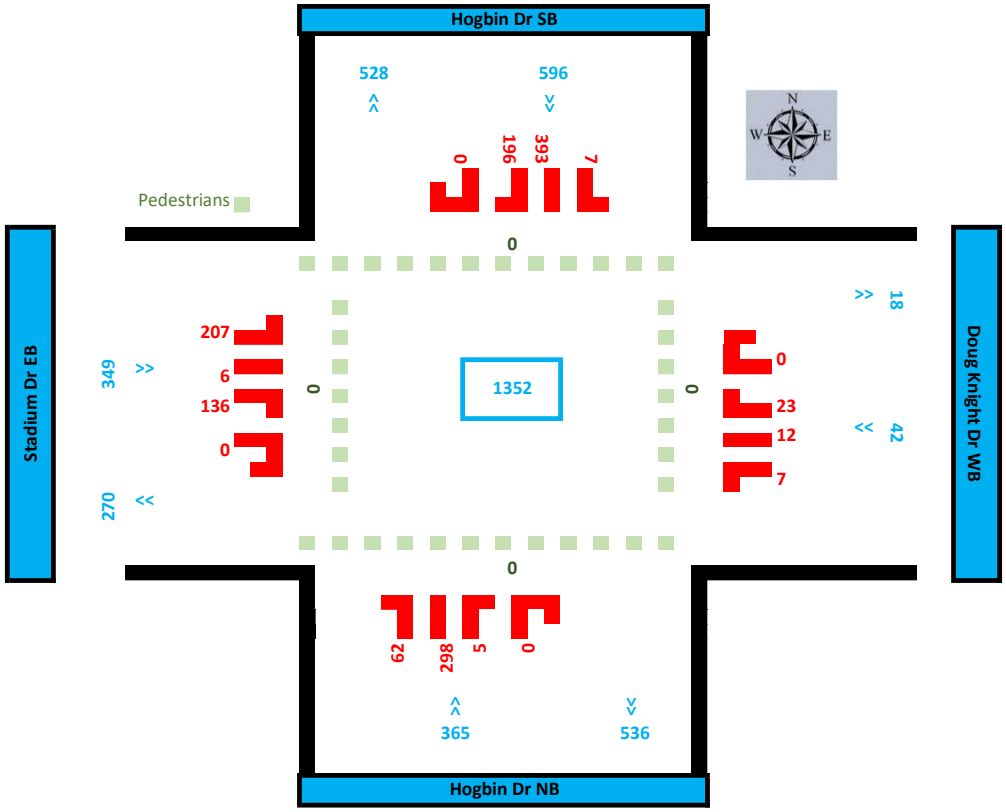
Time Starting	Left Light Vehicles	Left Trucks	Left Buses	Left Bicycles on Road	Through Light Vehicles	Through Trucks	Through Buses	Through Bicycles on Road	Right Light Vehicles	Right Trucks	Right Buses	Right Bicycles on Road	U-turn Light Vehicles	U-turn Trucks	U-turn Buses	U-turn Bicycles on Road	Cross 1 Pedestrians
Period 1 Total	416	14	3	1	168	1	1	1	138	19	3	0	0	0	0	0	0
Period 1 Peak Hr	299	6	2	0	132	1	1	0	88	7	2	0	0	0	0	0	0
07:00	8	0	1	0	1	0	0	1	4	0	0	0	0	0	0	0	0
07:15	24	2	0	0	5	0	0	0	12	4	0	0	0	0	0	0	0
07:30	31	1	0	1	8	0	0	0	12	3	0	0	0	0	0	0	0
07:45	54	5	0	0	22	0	0	0	22	5	1	0	0	0	0	0	0
08:00	75	0	0	0	14	0	0	0	26	0	0	0	0	0	0	0	0
08:15	90	3	2	0	24	0	1	0	21	2	2	0	0	0	0	0	0
08:30	72	2	0	0	43	0	0	0	26	1	0	0	0	0	0	0	0
08:45	62	1	0	0	51	1	0	0	15	4	0	0	0	0	0	0	0

Totals

Time Starting	GRAND TOTAL TOTALS	Hogbin Dr SB TOTAL All Classes	Doug Knight Dr WB TOTAL All Classes	Hogbin Dr NB TOTAL All Classes	Stadium Dr EB TOTAL All Classes
Period 1 Total	4176	1631	118	1662	765
Period 1 Peak Hr	2549	946	96	969	538
07:00	**230**	99	2	114	15
07:15	**322**	141	5	129	47
07:30	**492**	200	9	227	56
07:45	**583**	245	6	223	109
08:00	**615**	249	13	238	115
08:15	**673**	238	25	265	145
08:30	**676**	252	20	260	144
08:45	**585**	207	38	206	134

Turning Movement Count Summary

Site ID:	1
Location:	Hogbin Dr & Stadium Dr, Coffs Harbour
Date:	2-May-2018
Surveyed Time:	3:00 PM to 6:00 PM
Weather:	Fine
Data for hour starting:	4:30 PM to 5:30 PM
Vehicle Class:	ALL VEHICLES



Site ID: 1

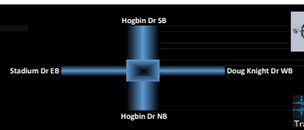
Location: Hogbin Dr & Stadium Dr, Coffs Harbour

Date: 2-May-2018

Period 2 Time: 3:00 PM to 6:00 PM

Weather: Fine

Period 2 Peak Hour: 4:30 PM to 5:30 PM



TDC Traffic Data & Control

TOTALS AND PEAKS

	Hogbin Dr SB								Doug Knight Dr WB								Hogbin Dr NB								Stadium Dr EB								GRAND TOTAL	Hogbin Dr SB	Doug Knight Dr WB	Hogbin Dr NB	Stadium Dr EB
	Left				Through				Right				U-turn				Cross 1				Left				Through				Right				U-turn				Cross 1					TOTAL	TOTAL	TOTAL	TOTAL
Time Starting	Light Vehicles	Trucks	Buses	Bicycles on Road	Light Vehicles	Trucks	Buses	Bicycles on Road	Light Vehicles	Trucks	Buses	Bicycles on Road	Light Vehicles	Trucks	Buses	Bicycles on Road	Pedestrians	Light Vehicles	Trucks	Buses	Bicycles on Road	Light Vehicles	Trucks	Buses	Bicycles on Road	Light Vehicles	Trucks	Buses	Bicycles on Road	Light Vehicles	Trucks	Buses	Bicycles on Road	Pedestrians	Light Vehicles	Trucks	Buses	Bicycles on Road	Pedestrians	TOTALS	All Classes	All Classes	All Classes	All Classes
Period 2 Total	37	0	7	0	1090	9	7	0	534	6	5	0	3	0	0	0	1	21	0	11	0	29	0	4	2	65	0	7	0	0	0	0	0	2	180	6	4	0	923	3	10	0	11	0	6	0	2	0	0	0	0	557	0	4	0	14	0	6	1	294	2	6	1	0	0	0	0	3867	1698	139	1145	885
Period 2 Peak Hr	7	0	0	0	386	3	4	0	195	0	1	0	0	0	0	0	0	4	0	3	0	9	0	2	1	23	0	0	0	0	0	0	0	0	60	2	0	0	295	1	2	0	3	0	2	0	0	0	0	0	0	206	0	1	0	3	0	2	1	134	1	0	1	0	0	0	0	1352	596	42	365	349
15:00	4	0	0	0	85	0	0	0	36	0	1	0	1	0	0	0	0	1	0	2	0	0	0	0	0	5	0	2	0	0	0	0	0	0	19	2	0	0	83	0	1	0	1	0	1	0	1	0	0	0	0	32	0	1	0	0	0	0	0	17	0	3	0	0	0	0	0	298	127	10	108	53
15:15	2	0	2	0	96	1	0	0	36	0	1	0	0	0	0	0	0	3	0	1	0	6	0	0	0	1	0	1	0	0	0	0	0	0	17	1	2	0	72	1	0	0	1	0	0	0	0	0	0	0	0	48	0	0	0	1	0	1	0	25	0	1	0	0	0	0	0	320	138	12	94	76
15:30	5	0	0	0	98	2	0	0	37	1	0	0	0	0	0	0	0	2	0	2	0	4	0	0	1	9	0	1	0	0	0	0	0	0	20	0	2	0	83	0	2	0	1	0	0	0	0	0	0	0	0	60	0	0	0	3	0	1	0	29	1	2	0	0	0	0	0	367	143	19	109	96
15:45	2	0	3	0	92	0	1	0	45	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	6	0	2	0	0	0	0	0	0	10	1	0	0	87	1	1	0	1	0	0	0	0	0	0	0	0	35	0	0	0	3	0	1	0	23	0	0	0	0	0	0	0	319	144	12	101	62
16:00	7	0	2	0	87	0	0	0	51	0	0	0	1	0	0	0	0	2	0	3	0	3	0	2	0	7	0	1	0	0	0	0	0	0	22	0	0	0	74	0	0	0	0	0	1	0	0	0	0	0	0	53	0	0	0	0	0	1	0	22	0	0	0	0	0	0	0	339	148	18	97	76
16:15	3	0	0	0	77	1	0	0	62	2	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	11	0	0	0	88	0	1	0	1	0	0	0	0	0	0	0	0	48	0	2	0	0	0	0	0	20	0	0	0	0	0	0	0	326	145	10	101	70
16:30	3	0	0	0	80	0	1	0	33	0	0	0	0	0	0	0	0	1	0	0	0	4	0	1	1	9	0	0	0	0	0	0	0	0	11	0	0	0	75	1	0	0	2	0	1	0	0	0	0	0	0	67	0	0	0	0	0	0	0	42	1	0	0	0	0	0	0	333	117	16	90	110
16:45	1	0	0	0	84	0	0	0	41	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	0	0	0	0	0	0	0	0	18	0	0	0	70	0	0	0	1	0	0	0	0	0	0	0	0	43	0	0	0	1	0	1	0	33	0	0	1	0	0	0	0	300	126	6	89	79
17:00	2	0	0	0	104	0	1	0	62	0	0	0	0	0	0	0	0	2	0	1	0	5	0	1	0	5	0	0	0	0	0	0	0	0	15	0	0	0	88	0	2	0	0	0	1	0	0	0	0	0	0	52	0	1	0	2	0	0	0	38	0	0	0	0	0	0	0	382	169	14	106	93
17:15	1	0	0	0	118	3	2	0	59	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	4	0	0	0	0	0	0	0	0	16	2	0	0	62	0	0	0	0	0	0	0	0	0	0	0	0	44	0	0	0	0	0	1	1	21	0	0	0	0	0	0	0	337	184	6	80	67
17:30	3	0	0	0	81	1	1	0	48	1	2	0	1	0	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	12	0	0	0	92	0	2	0	2	0	0	0	1	0	0	0	0	51	0	0	0	1	0	0	0	14	0	0	0	0	0	0	0	321	138	8	109	66
17:45	4	0	0	0	88	1	1	0	24	1	0	0	0	0	0	0	1	2	0	0	0	1	0	0	0	5	0	0	0	0	0	0	0	2	9	0	0	0	49	0	1	0	1	0	1	0	0	0	0	0	0	24	0	0	0	3	0	0	0	10	0	0	0	0	0	0	0	225	119	8	61	37

APPENDIX D

MCLAREN TRAFFIC ENGINEERING TRAFFIC IMPACT ASSESSMENT (DA1127/07)

NSW DEPARTMENT OF COMMERCE
SEPTEMBER 2007

TRAFFIC & PARKING STUDY
IN SUPPORT OF PROPOSED NEW EDUCATIONAL FACILITIES & ASSOCIATED WORKS INCLUDING ADDITIONAL PARKING COFFS HARBOUR EDUCATION CAMPUS AT HOGBIN DRIVE, COFFS HARBOUR
DA# 1127/07

M^{C}LAREN TRAFFIC ENGINEERING
5 JABIRU PLACE WORONORA HEIGHTS NSW 2233
PH (02) 9545-5161 FAX (02) 9545-1227

2007/60

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1. INTRODUCTION

M^CLaren Traffic Engineering was commissioned in June 2007 by the NSW Department of Commerce to undertake a traffic and parking study for the Coffs Harbour TAFE new educational facilities & associated works including additional parking.

This report addresses the following issue raised in Council's letter dated 21 May 2007 (received on 1st June 2007 by the Department of Education & Training) in relation to DA # 1127/07:

> *"Council's City Services Branch has raised an issue in relation to the potential impact of the proposed development on the existing intersection of Hogbin Drive and the entrance road. Given that the proposed development will result in an additional 171 new students a Traffic Study, which examines the impact of the proposed development on the subject intersection should be submitted to Council for consideration … Note, the application requires referral to a Regional Advisory Committee Traffic."*

During the conduct of the study, discussions were held with representatives from Coffs Harbour Council (traffic department), Coffs Harbour Education Campus and the NSW Department of Commerce. The co-operation and assistance given by these representatives is acknowledged.

2. SITE LOCATION AND SURROUNDING CONTEXT

Situated on the east coast, the Coffs Harbour Education Campus (CHEC) is located south of Coffs Harbour city centre. CHEC consists of a combined High School, University & TAFE teaching facilities. Location of the Site is shown in **Figures 1 & 2.**

The site is bound by dense bush land to the north, east and south with access off Hogbin Drive to the west. The site currently includes existing buildings and car parking as shown on the Campus Site map (**Figure 3**). There is a large dam to the south of the site. The campus buildings are generally clustered across a ridge on the site with a spine road and parking facilities that serve the various buildings on the site.

3. EXISTING TRANSPORT/TRAFFIC CONDITIONS

3.1 Road Hierarchy

Hogbin Drive is a Regional road, carrying moderately high traffic volumes, under the care and control of the Coffs Harbour City Council. Recent upgrades of Hogbin Drive are currently under construction north of High Street, with the assistance of funding from Federal, State and local Council.

Stadium Drive is a collector road under the care and control of Coffs Harbour City Council. Stadium Drive is planned to become a future Regional road, as depicted in **Figure 4**, obtained from the Roads & Traffic Authority.

3.2 Road Conditions

Hogbin Drive is constructed as a variable width traffic corridor. Its general operating segment design conditions are as follows:

- High Street to General Aviation access … 4 lane undivided (80km/h).
- General Aviation access to Airport … 3 lane undivided (2 south) (80km/h).
- CH Airport to CHEC … 2 lane undivided (80km/h).
- CHEC to Boambee Ck Bridge … 3 lane undivided (2 north) (100km/h).
- On Boambee Ck Bridge to Sawtell Road … 2 lane undivided (100km/h).

The above general speed limits reduce to 60km/h on the approaches to the roundabout controls located at the following Hogbin Drive intersections:

- High Street.
- CH Airport.
- CHEC / Stadium Drive. (A 40km/h school zone also applies)
- Sawtell Road.

Stadium Drive is generally constructed as a 2 lane undivided carriageway linking the Pacific Highway to Hogbin Drive.

3.3 Traffic Management

The prevailing traffic management conditions within the vicinity of the site include:

- Round-a-bout at the intersection of Hogbin Drive with the CHEC access and Stadium Drive.

- 40km/h school zone speed limit applying on the southern leg of the above listed intersection (on Hogbin Drive – south). The school zone speed limit applies from 8:00am to 9:30am and from 2:30pm to 4:00pm on school days.

- Other speed limits along Hogbin Drive as outlined above in Section 3.2 of this report.

The key intersection investigated is the intersection of Hogbin Drive / Stadium Drive / CHEC.

To this end, traffic flow counts were undertaken at the key intersections on Wednesday 8th & Thursday 9th August 2007 from 5:00pm to 6:00pm and from 7:30am to 10:00am, respectively.

The recorded peak hourly flows for these periods are presented in **Figure 5.**

The performance of the key intersections and driveways were analysed with the aid of the **aaSIDRA** computer program, which is used to evaluate the performances of intersections controlled by stop/give way signs, roundabouts or traffic signals. It provides a number of measures of performance including vehicle delay, degree of saturation and level of service.

The result of this analysis is shown in **Table 1** and in Annexure A.

TABLE 1: EXISTING INTERSECTION PERFORMANCE ("aaSIDRA V3.1")

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/vehicle)	95% Back of Queue (m)	Level of Service(3)
Hogbin Drive / Stadium Drive / CHEC	8:40 to 9:40 AM	0.53	5.9 (13.7 Right out CHEC)	35 (Hogbin South)	**A**
	5:00-6:00PM	0.50	7.9 (15.3 Right out CHEC)	32 (Hogbin North)	**A**

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

(2) Average delay is the delay experienced by the most disadvantaged movement under stop / give way or roundabout control modes and the total delay averaged for all movements under traffic signal control. (Maximum delay in brackets for most critical movement).

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst.

The criteria used to evaluate performance are shown in **Annexure B**.

Accordingly, it is evident from **Table 1** above that the performance of the key intersection currently operates at a GOOD level of service during the peak demand periods investigated.

The observations revealed that the following effects occur:

- AM peak - Northbound traffic volumes along Hogbin Drive on the approach to CHEC roundabout creates queues of 6 to 12 vehicles, particularly due to the effect of the 40km/h school speed zone.
- AM peak - Queue of vehicles entering CHEC within the eastern (CHEC) roadway BRIEFLY extend back to Hogbin Drive over relatively short period during the AM peak. The effect occurring between 8:50 to 8:55am.
- PM peak – no extended queuing observed.

3.4 Parking Demand

Currently there are a total of some 630 designated car parking spaces on the site.

Surveys of on-site parking demand were conducted on Thursday 9th August 2007 during both the day and evening periods. These surveys showed a peak parking accumulation of 653 vehicles, 26 bicycles, 1 route bus, 1 college bus and 1 truck at 10:00am. The buses and truck were parked in appropriate locations for that purpose. Thus the demand exceeds supply by some 23 cars.

During the evening, much less parking demand occurs, with an observed peak of 121 vehicles, no bicycles and 1 college bus at 7pm, represents 19% of capacity.

3.4.1 Existing Student / Staff Attendance

Estimates undertaken at the College on Thursday 9th August 2007, indicate that a peak of approximately 633 students and 105 staff (including service staff) were on campus at 10:00am. In the evening on the same day a peak of approximately 120 students and 30 were on the campus at around 6pm. Thus the peak parking demand period is during the day.

Surveys of the existing CHEC indicate that although there are 2,488 effective full time (EFT) students at the campus based upon the number of actual face-to-face teaching hours, many of these face-to-face teaching hours are for part time student positions, resulting in a smaller proportion of students on campus at any one time (due to the "floating" nature of students arriving / departing over any particular week and any particular day. Thus based upon the conducted survey on the peak day of the week, it is evident that 25% (i.e. 633 / 2488) of the EFT occurs, in terms of peak number of students on campus at any one time typically.

Hence for the additional 171 student places associated with the proposed development, this equates to 44 additional students on-site at any one time plus 8 extra staff.

3.4.2 Travel Mode Split

Based upon a questionnaire survey undertaken at CHEC on Thursday 9th August 2007, the following mode split characteristics for students were found:

Students travel habits surveyed at 10 am on 9 August 2007

	#Students	% Total	% Bus	% Driver	% Passenger	% Bike
SCU	235	37	9	76	12	3
TAFE	292	46	22	50	24	4
CHSC	106	17	53	13	28	6
TOTAL	**633**	**100**	**22**	**53**	**20**	**5**

Notes:

1. SCU – University students
2. TAFE – TAFE students
3. CHSC – High School students
4. 117 Y11 students were doing an exam and excluded from survey.
5. 35 students were on work placement.

Of the students that drive to this College all park within the CHEC grounds at all times. The staff car driver proportion is 92%.

Hence during the peak daytime period, the additional 44 students will give rise to an additional parking need of **22** spaces (i.e. 50% TAFE component x 44). The additional 8 staff will give rise to a need for a further **8** cars, thus an extra supply of **30** car spaces is needed for the subject development.

3.5 Existing Traffic Generation

It is evident from the traffic counts that the existing College generated a peak of 588 vehicles (498 inbound; 90 outbound) during the 8:40am to 9:40am period. The generation during the 5:00pm to 6:00pm period was 317 vehicles (109 inbound; 208 outbound). After 6pm the on-site parking demand and traffic generation noticeably declines.

These volumes include staff, students and visitor effects.

Hence, the recorded traffic generation per 100 students on-site at any one time equates to the rates shown in **Table 2** below, which includes total traffic demand (i.e. staff and students).

TABLE 2: TRAFFIC GENERATION RATES*
(VEHICLES PER 100 PEAK ON-SITE STUDENTS)

DIRECTION	AM PEAK (8:40 to 9:40)	PM PEAK (5:00-6:00)
INBOUND	79\100	17\100
OUTBOUND	14\100	33\100
TOTAL	**93/100 students**	**50/100 students**

* Includes staff and students effects. It reflects the mix of Uni, TAFE & High School students on campus

3.6 Public Transport Provision

The College is served by bus services that deliver and collect students from a dedicated on-site bus zone. These services link to suburbs north and south of the site via Hogbin Drive. The services peak during the morning and afternoon arrival / departure periods and are much less pronounced during the evenings.

4. PLANNED TRANSPORT INFRASTRUCTURE

Discussion with council officers revealed that no significant road network improvements are currently committed or planned for the general locality, other than the extension of Hogbin Drive north of High Street, which is nearing completion.

The Roads & Traffic Authority has no works planned in the immediate vicinity.

5. PROPOSED DEVELOPMENT

New proposed works comprise the following components:

- New automotive teaching facilities
- New nursing teaching facilities
- New car parking facilities for 62 spaces increasing the on-site supply to some 692 spaces.
- After completion of the project, the facilities at Coffs Harbour will provide a total of 2,659 effective full time (EFT) students, comprising of 2,488 existing and 171 new EFT. This equates to a 6.8% increase in students.

Although 171 new student EFT's are created, that does not translate to an additional 171 students on site at any one time. Refer to Section 3.4.1 for the analysis underpinning the projected 44 new students and 8 new staff on campus at any one time during the peak period, which in this case occurs during the day.

The layout of the proposed parking improvement works is presented in **Figure 3**.

5.1 Council Parking & Access Requirements

Coffs Harbour City Council does not specify a rate for parking for tertiary education establishments, but requires a parking study to justify needs.

The RTA has no specified rates for Colleges.

It is evident from parking demand surveys at the CHEC College that an additional **30** parking spaces (22 for students and 8 for staff) are needed.

5.2 Parking Supply

The proposed additional on-site parking supply of **62** spaces exceeds the forecast parking demand during the peak daytime by some 32 spaces. The extra parking supply however will improve current conditions by meeting the current undersupply of 23 in an operational sense. Thus operationally, the proposed 62 spaces will exceed operational peak parking demand needs by some 9 spaces.

As an alternative to supplying parking at the observed demand rate, the provision of improved bus services or indeed improved usage of prevailing bus services by students could be investigated to achieve a lower parking rate outcome.

At night the existing on-site parking supply is more than adequate.

6. TRAFFIC & PARKING IMPACT

6.1 Traffic Generation

The proposed additional student numbers of 44 at any one time as an expected maximum would yield the following traffic generation levels.

**TABLE 3: TRAFFIC GENERATION ESTIMATE*
(VEHICLES PER 100 ON-SITE STUDENTS)**

DIRECTION	AM PEAK (8 to 9)	PM PEAK (4:45-5:45)
INBOUND	79\100*44 = 35	17\100*44 = 7
OUTBOUND	14\100*44 = 6	33\100*44 = 15
TOTAL	41	22

* Includes staff and students effects.

The resulting traffic generation of 41 (35 in; 6 out) vehicle trips during the AM peak and 22 (7 in; 15 out) vehicle trips during the PM peak have been applied as a worst-case assessment. The assigned traffic is shown in **Figure 5**.

6.2 Traffic Impacts of Proposal

The effect of the increased traffic volumes on the performance of the key intersection of Hogbin Drive / CHEC access / Stadium Drive is shown in **Table 4**.

TABLE 4: FORECAST INTERSECTION PERFORMANCE ("aaSIDRA V3.1")

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/vehicle)	95% Back of Queue (m)	Level of Service(3)
Hogbin Drive / Stadium Drive / CHEC	8:40 to 9:40 AM	0.54	6.0 (13.7 Right out CHEC)	36 (Hogbin South)	**A**
	5:00-6:00PM	0.51	8.0 (15.4 Right out CHEC)	32 (Hogbin North)	**A**

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

(2) Average delay is the delay experienced by the most disadvantaged movement under stop / give way or roundabout control modes and the total delay averaged for all movements under traffic signal control. (Maximum delay in brackets for most critical movement).

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst.

It is evident from **Table 4** above that the key intersection of Hogbin Drive / CHEC access / Stadium Drive will continue to operate at its existing GOOD level of service during the peak demand periods investigated as a consequence of the proposed development.

We have undertaken a further test of the AM & PM peak hour performance of the intersection under a 10 year growth rate of both a 1%p.a rate (which has occurred over a 17 year period from 1990 to 2007) and a 3%p.a rate and found that the existing roundabout will continue to operate at Level of Service "A/B" during both peaks investigated.

6.3 Internal Impacts

Observations have been conducted in the field by an experienced traffic engineer / road safety auditor from *M^CLaren Traffic Engineering*. The observations revealed the following effects:

- AM peak - Northbound traffic volumes along Hogbin Drive on the approach to CHEC roundabout creates queues of 6 to 12 vehicles, particularly due to the effect of the 40km/h school speed zone.

- AM peak - Queue of vehicles entering CHEC within the eastern (CHEC) roadway BRIEFLY extend back to Hogbin Drive over relatively short period during the AM peak. The effect occurring between 8:50 to 8:55am.

- PM peak – no extended queuing observed.

In order to address the internal queue issue within the campus that BRIEFLY extends back to the roundabout during a peak 5 to 10 minute period before 9am, it is evident that the cause is the zebra crossing on the internal road that serves the main carparking area to the south of the entry roadway. To overcome this issue, it is recommended that the works depicted in **Figure 6**, which includes the relocation of the zebra crossing further to the south away from the "T" junction by some 15 to 20 metres.

6.4 Parking Provision

The proposed additional 62 on-site parking spaces will exceed the current shortfall as well as the additional demand generated by the proposed development by some 9 spaces.

7. CONCLUSIONS

The proposed development is supportable in terms of traffic and parking impacts, subject to the recommended works depicted in **Figure 6** to remove an existing hazard and to control the extent of queuing that briefly occurs over a relatively short period of 5 to 10 minutes before 9am.

The proposed additional on-site parking supply of **62** spaces exceeds the forecast parking demand during the peak daytime by some 32 spaces. The extra parking supply however will improve current conditions by meeting the current undersupply of 23 in an operational sense. Thus operationally, the proposed 62 spaces will exceed operational peak parking demand needs by some 9 spaces.

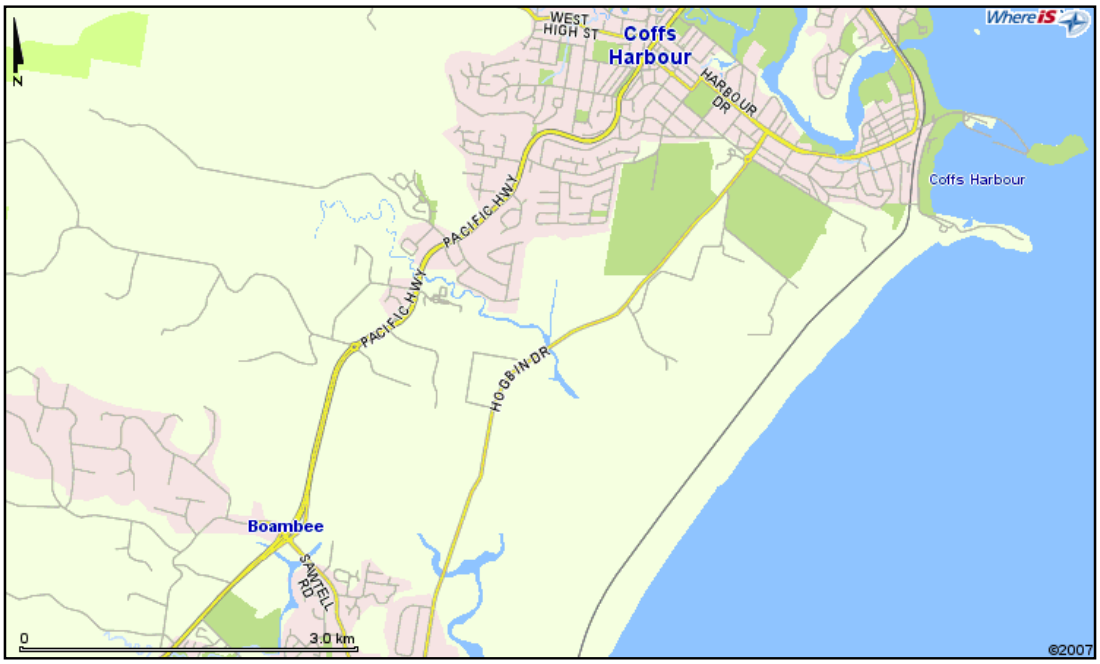
As an alternative to supplying parking at the observed demand rate, the provision of improved bus services or indeed improved usage of prevailing bus services by students could be investigated to achieve a lower parking rate outcome.

At night the existing on-site parking supply is more than adequate.

The key intersection of Hogbin Drive / CHEC access / Stadium Drive will continue to operate at its existing GOOD level of service during the peak demand periods investigated as a consequence of the proposed development.

No adverse residential amenity or road safety effects will result from the proposed development.

Finally as the proposed development does not exceed 500 new students or 250 new car parking spaces it does not require referral to the Regional Traffic Committee, however the excess of 50 parking spaces requires referral to the Local Traffic Committee under SEPP11.



KEY

SITE

COFFS HARBOUR EDUCATION CAMPUS

FIGURE 1
SITE LOCATION

PREPARED FOR: DEPT. OF COMMERCE

BY: M^CLAREN TRAFFIC ENGINEERING

COFFS HARBOUR EDUCATION CAMPUS

FIGURE 2
PART AERIAL MAP

PREPARED FOR: DEPT. OF COMMERCE

BY: M^CLAREN TRAFFIC ENGINEERING

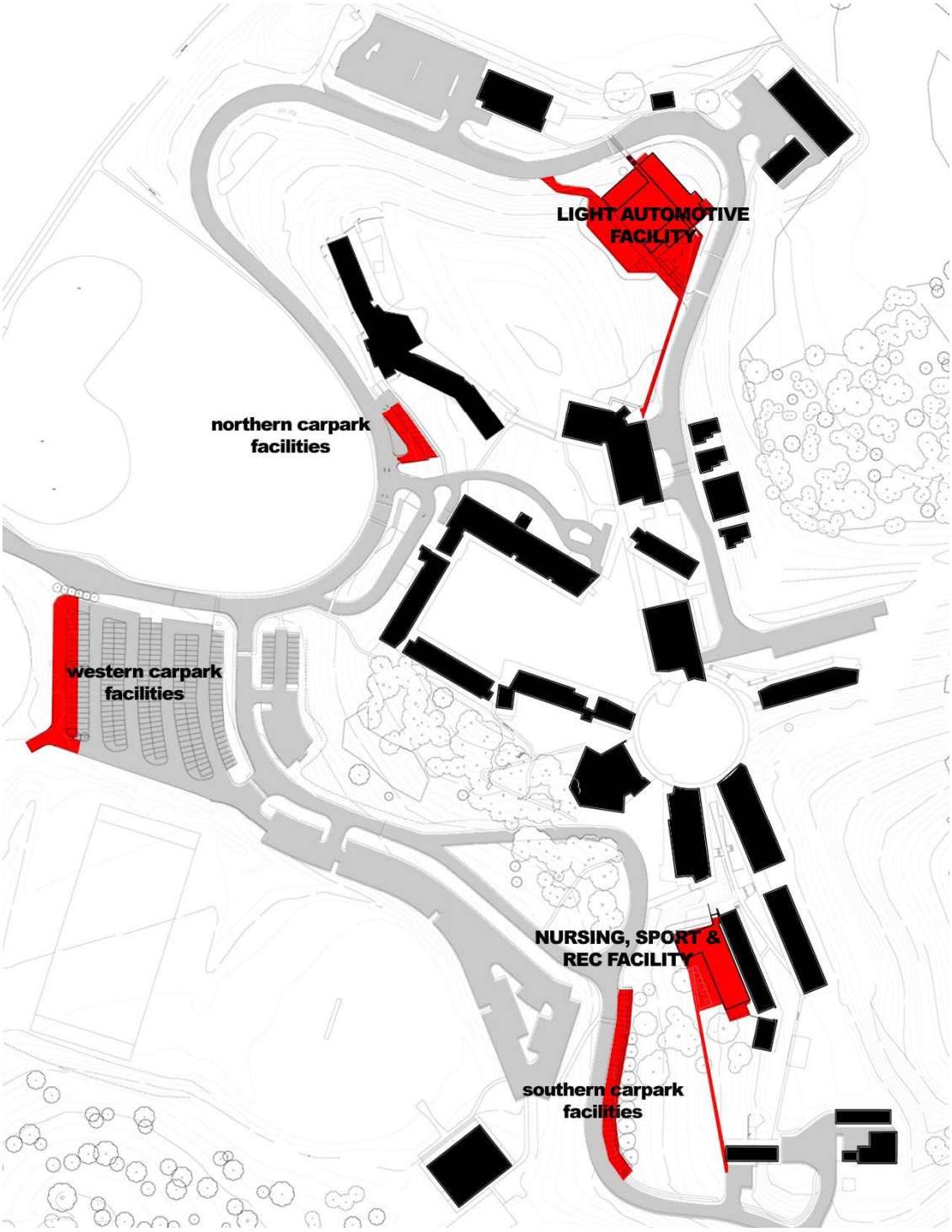


FIGURE 3: CAMPUS SITE PLAN
(Source: Suters Architects)

PREPARED FOR: DEPT. OF COMMERCE

BY: M^CLAREN TRAFFIC ENGINEERING

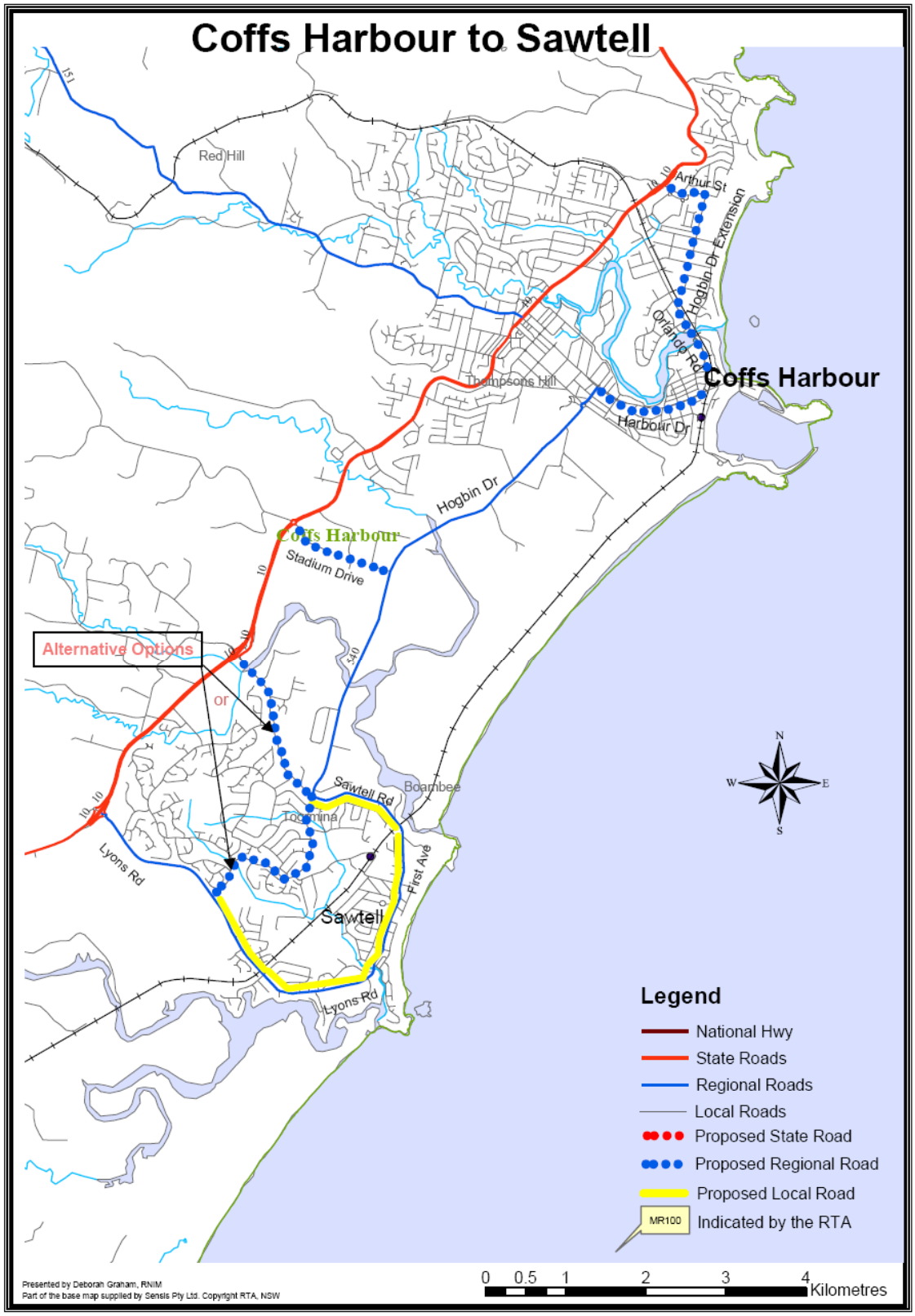
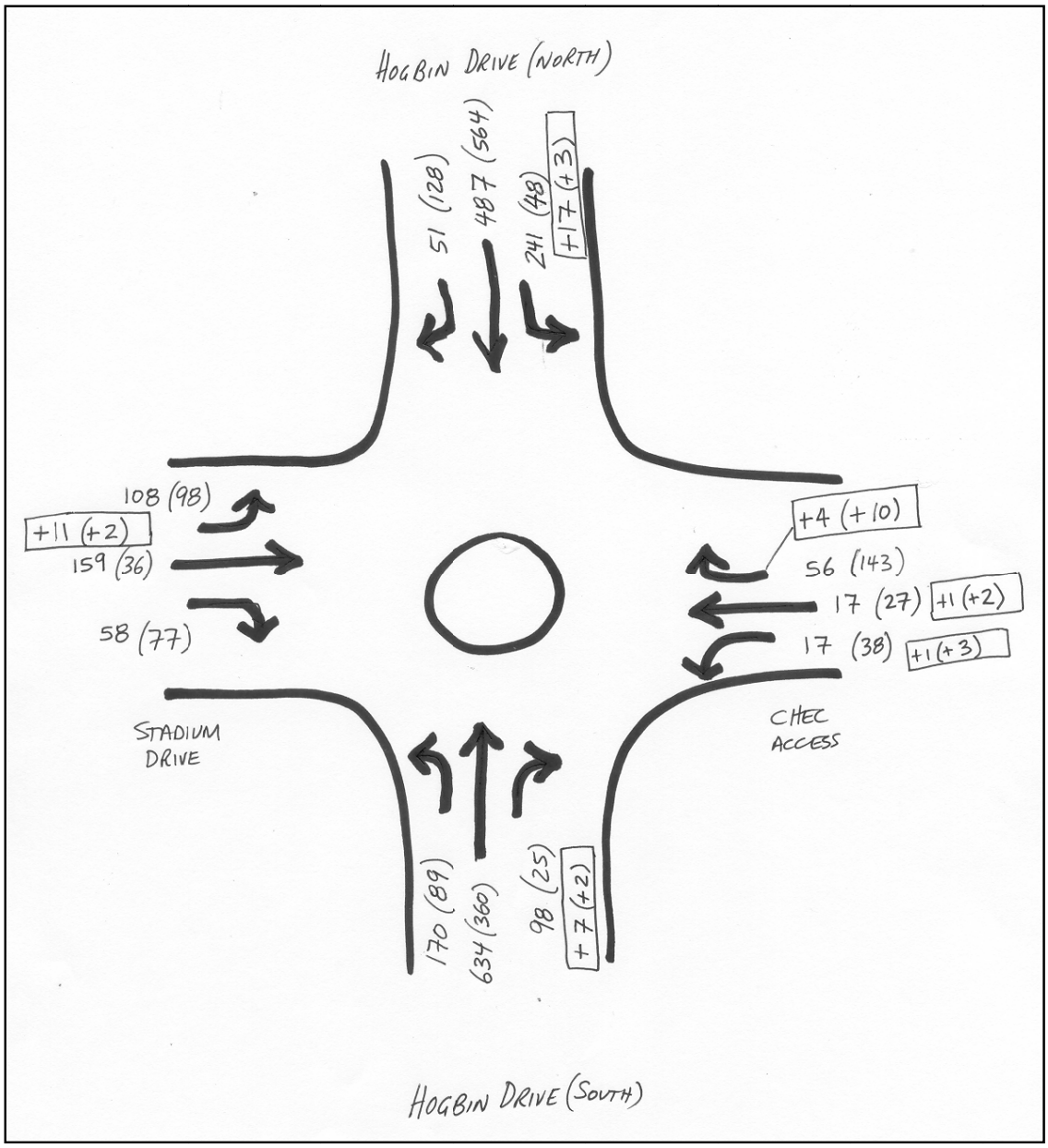


FIGURE 4: RTA ROAD HIERARCHY PLAN



COFFS HARBOUR EDUCATION CAMPUS

FIGURE 5
PEAK HOUR TRAFFIC FLOWS
AM PEAK (PM PEAK)

PREPARED FOR: DEPT. OF COMMERCE

BY: M^CLAREN TRAFFIC ENGINEERING

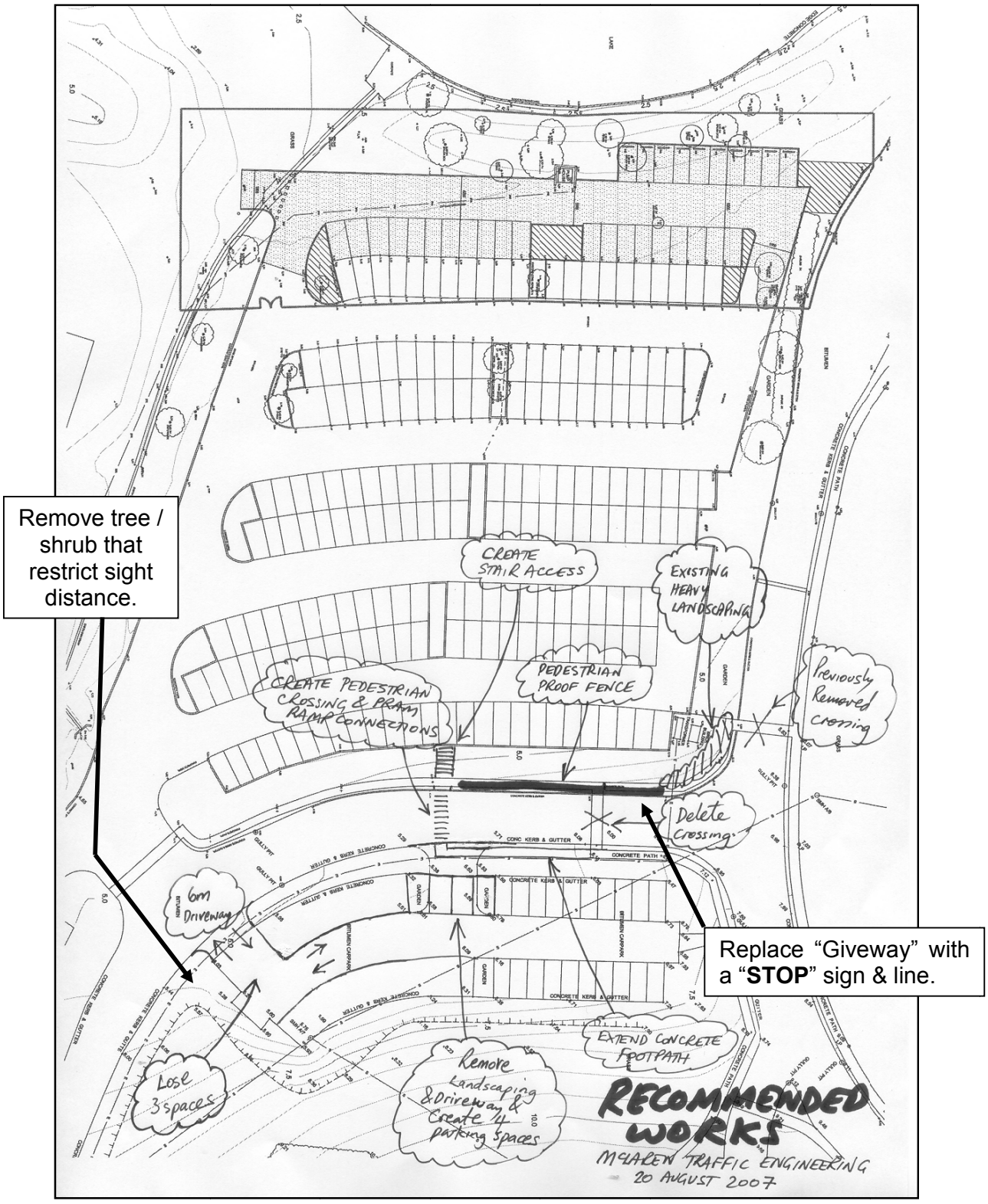
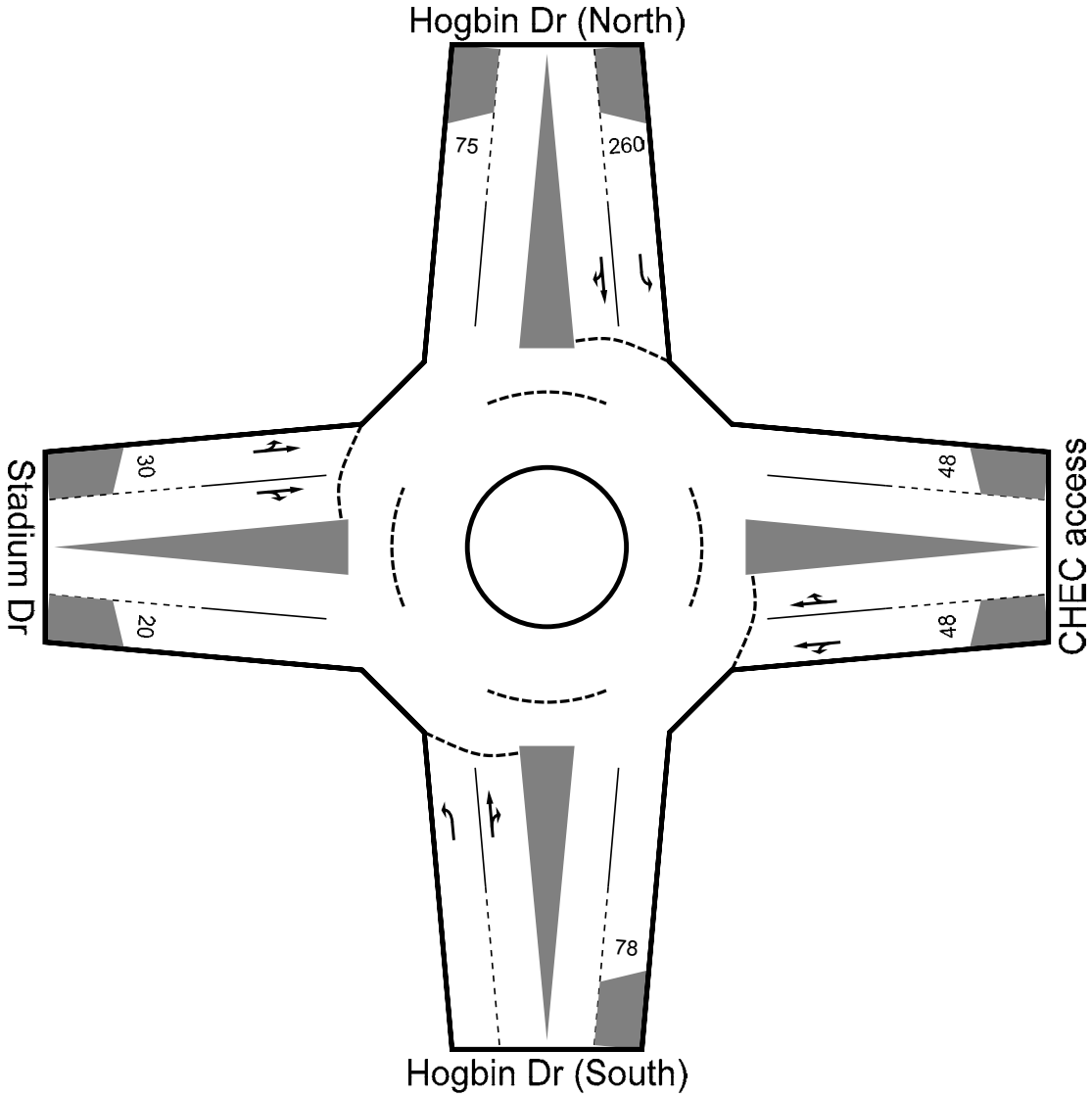


FIGURE 6: RECOMMENDED WORKS

ANNEXURE A – SIDRA RESULTS



Movement Summary
CHEC / HOGBIN / STADIUM - EXISTING AM PEAK
Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Hogbin Dr (South)										
1	L	179	5.0	0.203	4.3	LOS A	9	0.32	0.45	38.1
2	T	667	4.9	0.530	2.6	LOS A	35	0.38	0.30	38.8
3	R	103	4.9	0.531	9.4	LOS A	35	0.38	0.61	36.0
Approach		**949**	**5.0**	**0.530**	**3.7**	**LOS A**	**35**	**0.37**	**0.36**	**38.3**
CHEC access										
4	L	18	5.6	0.030	8.3	LOS A	1	0.61	0.64	47.6
5	T	18	0.0	0.080	6.9	LOS A	4	0.62	0.62	48.7
6	R	59	5.1	0.080	13.7	LOS A	4	0.62	0.73	44.1
Approach		**95**	**4.2**	**0.080**	**11.4**	**LOS A**	**4**	**0.62**	**0.69**	**45.4**
Hogbin Dr (North)										
7	L	254	3.1	0.271	7.4	LOS A	13	0.51	0.63	48.6
8	T	513	5.1	0.464	4.8	LOS A	28	0.57	0.48	49.0
9	R	54	3.7	0.466	12.8	LOS A	28	0.57	0.73	44.3
Approach		**821**	**4.4**	**0.464**	**6.1**	**LOS A**	**28**	**0.55**	**0.55**	**48.5**
Stadium Dr										
10	L	114	2.7	0.176	10.8	LOS A	9	0.73	0.80	46.4
11	T	167	3.0	0.270	8.8	LOS A	16	0.77	0.77	47.7
12	R	61	3.3	0.270	13.0	LOS A	16	0.77	0.83	42.4
Approach		**341**	**2.9**	**0.270**	**10.2**	**LOS A**	**16**	**0.76**	**0.79**	**46.3**
All Vehicles		**2206**	**4.4**	**0.531**	**5.9**	**LOS A**	**35**	**0.51**	**0.51**	**43.0**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

Site: CHEC / HOGBIN DR - EXISTING AM
Processed Sep 04, 2007 09:48:29AM

A0967, McLaren Traffic Engineering, Small Office
Produced by SIDRA Intersection 3.1.061208.34

Movement Summary
CHEC / HOGBIN / STADIUM
EXISTING PM PEAK
Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Hogbin Dr (South)										
1	L	94	5.3	0.126	8.1	LOS A	5	0.46	0.63	48.7
2	T	379	5.0	0.336	6.0	LOS A	18	0.49	0.53	49.6
3	R	26	3.8	0.338	12.7	LOS A	18	0.49	0.71	44.6
Approach		**499**	**5.0**	**0.336**	**6.7**	**LOS A**	**18**	**0.48**	**0.56**	**49.1**
CHEC access										
4	L	40	5.0	0.074	11.2	LOS A	3	0.69	0.75	46.1
5	T	28	0.0	0.209	8.6	LOS A	12	0.74	0.74	47.8
6	R	151	5.3	0.209	15.3	LOS B	12	0.74	0.82	43.3
Approach		**219**	**4.6**	**0.209**	**13.7**	**LOS A**	**12**	**0.73**	**0.80**	**44.3**
Hogbin Dr (North)										
7	L	51	3.9	0.057	6.5	LOS A	2	0.30	0.51	50.0
8	T	594	5.1	0.503	5.1	LOS A	32	0.39	0.46	50.5
9	R	135	3.0	0.502	12.0	LOS A	32	0.39	0.65	45.0
Approach		**780**	**4.6**	**0.503**	**6.4**	**LOS A**	**32**	**0.39**	**0.49**	**49.3**
Stadium Dr										
10	L	103	2.9	0.112	8.0	LOS A	5	0.56	0.65	48.3
11	T	38	2.6	0.112	6.5	LOS A	5	0.56	0.58	49.2
12	R	81	2.5	0.112	13.3	LOS A	5	0.56	0.73	44.4
Approach		**222**	**2.7**	**0.112**	**9.7**	**LOS A**	**5**	**0.56**	**0.67**	**46.8**
All Vehicles		**1720**	**4.5**	**0.503**	**7.9**	**LOS A**	**32**	**0.48**	**0.57**	**48.2**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

Site: CHEC / HOGBIN DR - EXISTING PM

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Movement Summary

CHEC / HOGBIN / STADIUM
EXISTING AM PEAK + DEVELOPMENT
Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Hogbin Dr (South)										
1	L	179	5.0	0.205	4.4	LOS A	9	0.33	0.45	38.1
2	T	667	4.9	0.538	2.6	LOS A	36	0.39	0.31	38.7
3	R	111	5.4	0.539	9.5	LOS A	36	0.39	0.61	36.0
Approach		**957**	**5.0**	**0.538**	**3.7**	**LOS A**	**36**	**0.38**	**0.37**	**38.2**
CHEC access										
4	L	19	5.3	0.032	8.3	LOS A	1	0.61	0.64	47.6
5	T	19	0.0	0.085	6.9	LOS A	4	0.62	0.62	48.6
6	R	63	4.8	0.085	13.7	LOS A	4	0.62	0.73	44.1
Approach		**101**	**4.0**	**0.085**	**11.4**	**LOS A**	**4**	**0.62**	**0.69**	**45.4**
Hogbin Dr (North)										
7	L	272	3.0	0.288	7.5	LOS A	14	0.53	0.65	48.5
8	T	513	5.1	0.471	4.9	LOS A	29	0.59	0.49	48.9
9	R	54	3.7	0.470	12.9	LOS A	29	0.59	0.74	44.2
Approach		**838**	**4.3**	**0.471**	**6.2**	**LOS A**	**29**	**0.57**	**0.56**	**48.4**
Stadium Dr										
10	L	114	2.7	0.180	11.0	LOS A	9	0.74	0.81	46.2
11	T	179	2.8	0.289	8.9	LOS A	17	0.78	0.79	47.6
12	R	61	3.3	0.289	13.2	LOS A	17	0.78	0.84	42.3
Approach		**353**	**2.8**	**0.289**	**10.3**	**LOS A**	**17**	**0.77**	**0.80**	**46.2**
All Vehicles		**2249**	**4.4**	**0.539**	**6.0**	**LOS A**	**36**	**0.52**	**0.52**	**43.0**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

Site: CHEC / HOGBIN DR - EXISTING AM + DEV

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Movement Summary
CHEC / HOGBIN / STADIUM

EXISTING PM PEAK + DEV
Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Hogbin Dr (South)										
1	L	94	5.3	0.127	8.2	LOS A	5	0.47	0.63	48.6
2	T	379	5.0	0.341	6.1	LOS A	18	0.50	0.54	49.5
3	R	28	3.6	0.341	12.7	LOS A	18	0.50	0.72	44.6
Approach		**501**	**5.0**	**0.341**	**6.8**	**LOS A**	**18**	**0.49**	**0.57**	**49.0**
CHEC access										
4	L	43	4.7	0.080	11.2	LOS A	4	0.69	0.76	46.1
5	T	31	0.0	0.225	8.6	LOS A	13	0.74	0.75	47.8
6	R	161	5.0	0.225	15.4	LOS B	13	0.74	0.82	43.3
Approach		**235**	**4.3**	**0.225**	**13.7**	**LOS A**	**13**	**0.73**	**0.80**	**44.2**
Hogbin Dr (North)										
7	L	54	3.7	0.061	6.5	LOS A	2	0.31	0.51	49.9
8	T	594	5.1	0.505	5.2	LOS A	32	0.40	0.46	50.4
9	R	135	3.0	0.506	12.0	LOS A	32	0.40	0.65	45.0
Approach		**783**	**4.6**	**0.505**	**6.4**	**LOS A**	**32**	**0.39**	**0.50**	**49.3**
Stadium Dr										
10	L	103	2.9	0.114	8.1	LOS A	5	0.57	0.66	48.2
11	T	40	2.5	0.115	6.5	LOS A	6	0.56	0.59	49.2
12	R	81	2.5	0.115	13.4	LOS A	6	0.56	0.73	44.3
Approach		**224**	**2.7**	**0.115**	**9.7**	**LOS A**	**6**	**0.57**	**0.67**	**46.8**
All Vehicles		**1743**	**4.4**	**0.506**	**8.0**	**LOS A**	**32**	**0.49**	**0.58**	**48.1**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

Site: CHEC / HOGBIN DR - EXISTING PM + DEV

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ANNEXURE B: aaSIDRA

Level of Service Criteria

Level of Service	Ave Delay per Vehicle (sec/veh)	Traffic Signals & Roundabouts	Give Way & Stop Signs
A	< 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, requires other control mode
F	over 70	Extra capacity required	Extreme delay, traffic signals or other major treatment required

Adapted from RTA Guide to Traffic Generating Developments, December 2002

APPENDIX E

COFFS HARBOUR TRAFFIC STUDY

COFFS HARBOUR TRAFFIC STUDY

INTERSECTION ANALYSIS REPORT FOR HOGBIN DRIVE CORRIDOR AND HARBOUR DRIVE / EARL STREET INTERSECTION

FOR

COFFS HARBOUR CITY COUNCIL

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Project No: P1158 Version No: 001 Issue date: 20th November 2012

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1. INTRODUCTION

1.1 BACKGROUND

Bitzios Consulting has been commissioned by Coffs Harbour City Council (CHCC) to analyse the major intersections on the Hogbin Drive corridor and the Harbour Drive / Earl Street intersection. Hogbin Drive is a major corridor that runs parallel with the Pacific Motorway and links both southern and northern residential areas of Coffs Harbour to the CBD via Harbour Drive. Hogbin Drive is used as an alternative route to the Pacific Highway during peak periods.

Harbour Drive provides important connections between the Pacific Highway and the CBD to eastern residential areas, beaches and the Coffs Harbour airport. Between the Pacific Highway and Earl Street, Harbour Drive has a "main street" environment, primarily servicing the retail and commercial core of Coffs Harbour. Through traffic typically bypasses this section of Harbour Drive via Park Avenue.

1.2 STUDY AREA INTERSECTION

Hogbin Drive is a north-south arterial road corridor using roundabouts to control key intersections. The grid structured road network in the CBD is also primarily comprised of roundabouts except for on the Pacific Highway where signals are typically used. It is noted however that Council is planning signalised intersection upgrades in the CBD such as at the Harbour Drive / Gordon Street intersection. Historically, roundabouts provide a safe and efficient form of traffic intersection control when traffic flows are balanced, but do not provide an efficient system when combined with high pedestrian flows.

CHCC has determined that the following roundabouts should be reviewed to determine the future operational performance and identify any upgrade requirements to meet future traffic demands and maintain an adequate level of service:

- Site 1 Hogbin Drive – Sawtell Road – Toormina Road;
- Site 2 Hogbin Drive – Stadium Drive – Doug Knight Drive;
- Site 3 Hogbin Drive – Howard Street – Albany Street – City Hill Drive;
- Site 4 Hogbin Drive – Harbour Drive;
- Site 5 Hogbin Drive – Orlando Street; and
- Site 6 Harbour Drive – Earl Street.

The above intersection locations are shown in Figure 1.1.

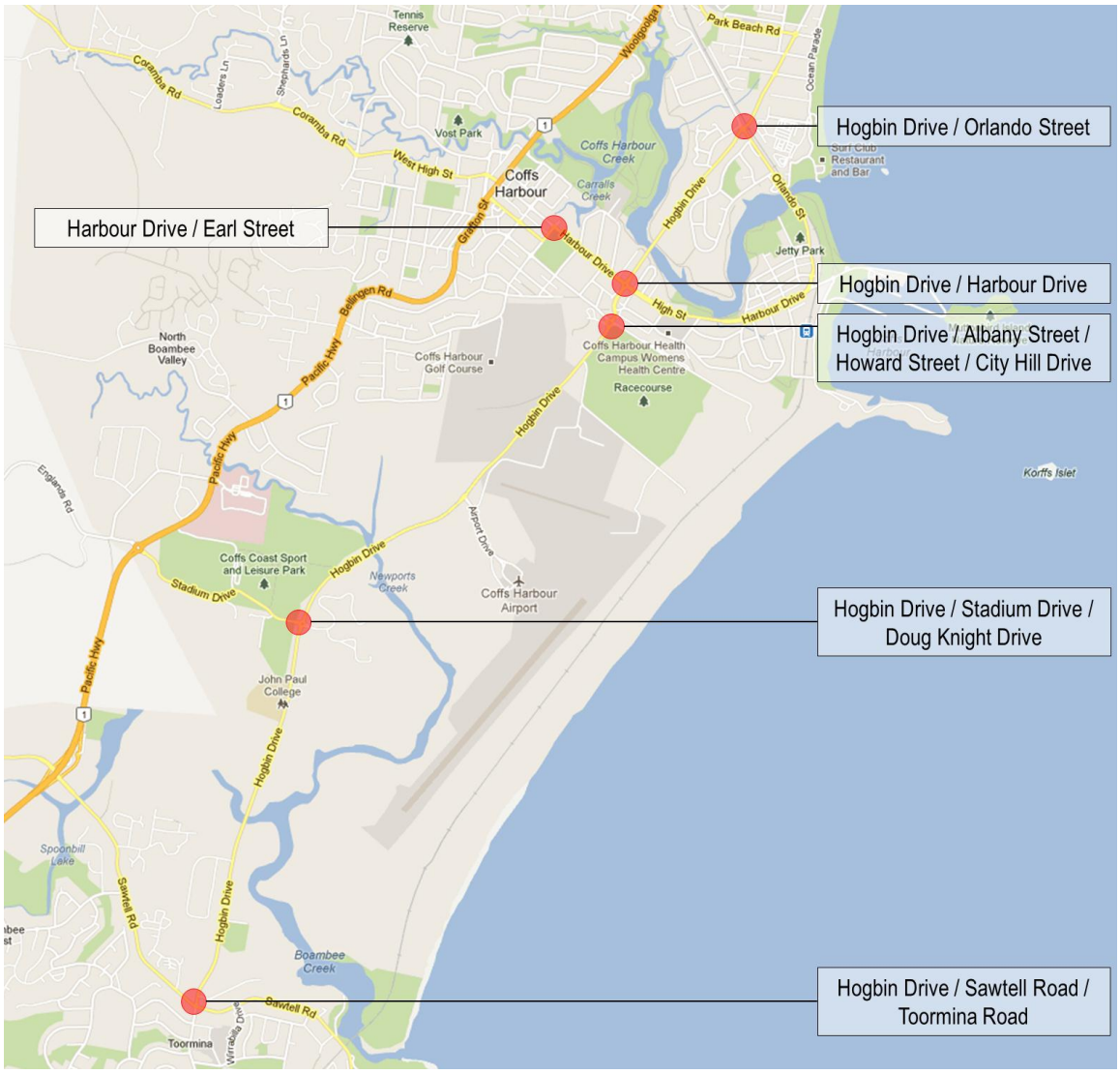


Figure 1.1: Study Area and Intersection Locations

1.3 SCOPE

The primary focus of this study is to assess the performance of key intersections along the Hogbin Drive corridor as well as the Harbour Drive / Earl Street intersection. The existing and future performances of the intersections are assessed to identify any future upgrades required as a result of traffic growth. The scope of work involved in this study included the following tasks:

- undertake intersection surveys and 'back-of-queue' observations during AM (7:00AM to 10:00AM) and PM (3:00PM to 6:00PM) peak periods on a standard weekday;
- develop SIDRA intersection models for the 2012 peak periods and confirm existing operations;
- review historical count data (as supplied by Council) to gauge expected traffic growth within the next 10 years;
- undertake future year (2022) SIDRA intersection assessments for the AM and PM peak periods; and
- identify required upgrades to each intersection to maintain a practical level of capacity to cater for future traffic volumes.

2. TRAFFIC DEMANDS

2.1 TRAFFIC SURVEYS

Traffic demands for each intersection are based on surveys undertaken by Traffic Data and Control (TDC) on Wednesday 28th and Thursday the 29th of November 2012. These surveys included the both light and heavy vehicle volumes for accurate input in to the SIDRA intersection traffic models. Further detail of the traffic surveys is provided in Appendix A.

2.2 BACKGROUND TRAFFIC GROWTH

Historical count data was also provided by Council for use in determining future growth rates. The best data identified for use to determine Hogbin Drive traffic growth was 2008 tube counts which were recorded shortly after the opening of the Hogbin Drive Bridge over Coffs Harbour Creek. The traffic growths are assumed to be compounding to establish conservative traffic volumes for the future 2022 assessment. Figure 2.1 shows the compounding traffic growth rates per annum based on the available 2008 and 2012 traffic volumes.

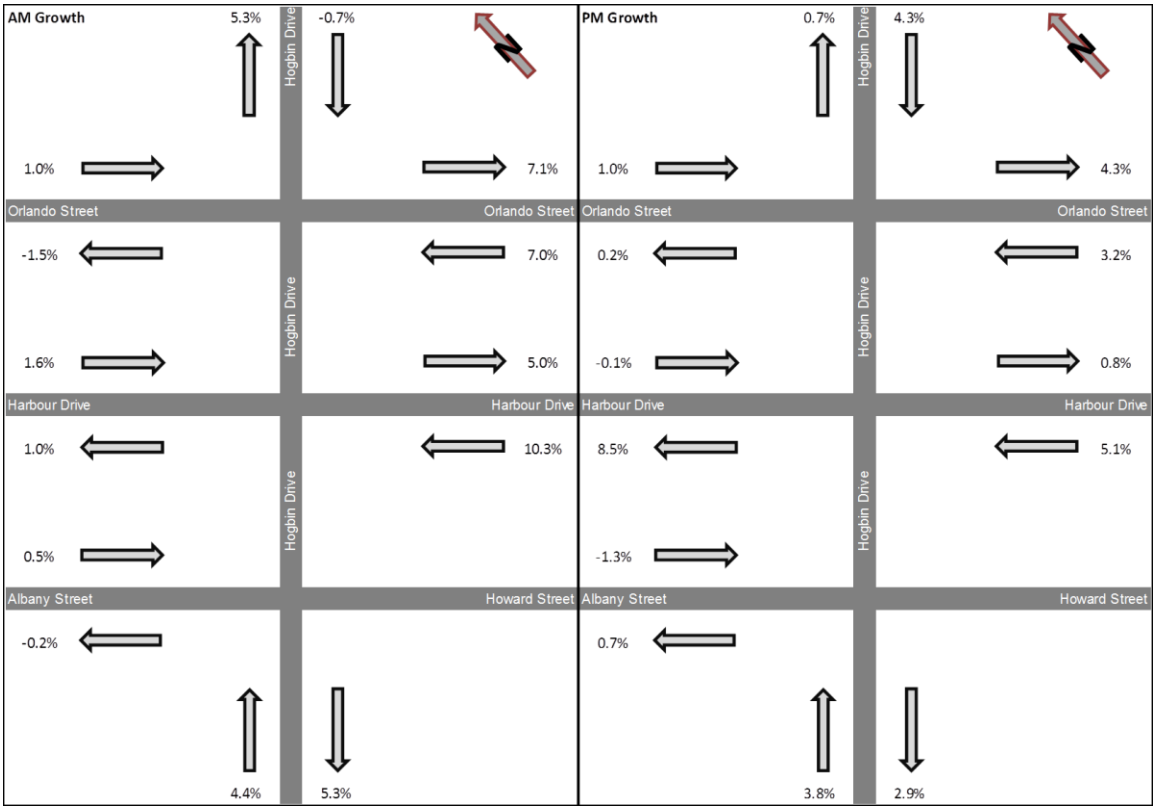


Figure 2.1: Traffic Growth (2008 to 2012 compounding per annum)

Due to the high variance in traffic growths on individual links and directions, an overall growth rate was determined for use at all locations within the study area. Table 2.1 below shows the traffic growth rates for all locations assumed for use in this study.

Table 2.1: Traffic Growth (2008 to 2012 compounding per annum)

Location	AM	PM
Hogbin Drive / Orlando Street	2.7%	2.0%
Hogbin Drive / Harbour Drive	4.4%	3.6%
Hogbin Drive / Albany Street / Howard Street	3.2%	2.2%
All Locations	**3.4%**	**2.5%**

3. TRAFFIC MODELLING

3.1 INTERSECTION ASSESSMENT CRITERIA

The Sidra "RTANSW" model configuration setting was adopted for this assessment. The Level of Service (LOS) outputs are solely based on 'Average Delay' which can misrepresent the true operating condition of the intersection.

To accurately define the performance output of the scenarios modelled the 'Degree of Saturation', 'Average Delay' and '95%ile Back of Queue' output data has been captured for each approach. This enables a true understanding of the likely operational performance of each of the intersection approaches for each of the scenarios tested.

Based on our experience the criteria shown in Table 3.1 have been used to determine intersections approaching failure and intersections that have failed and as a result require upgrades.

Table 3.1: Performance Criteria

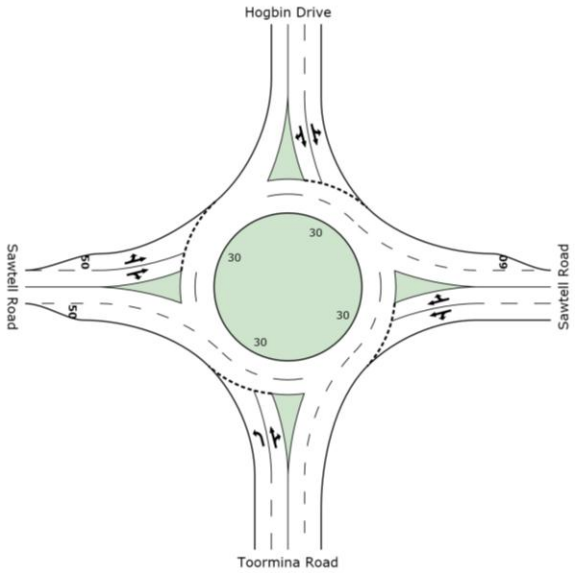
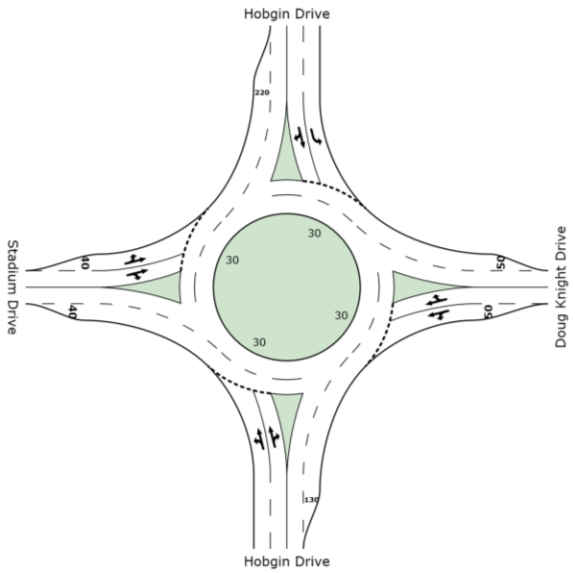
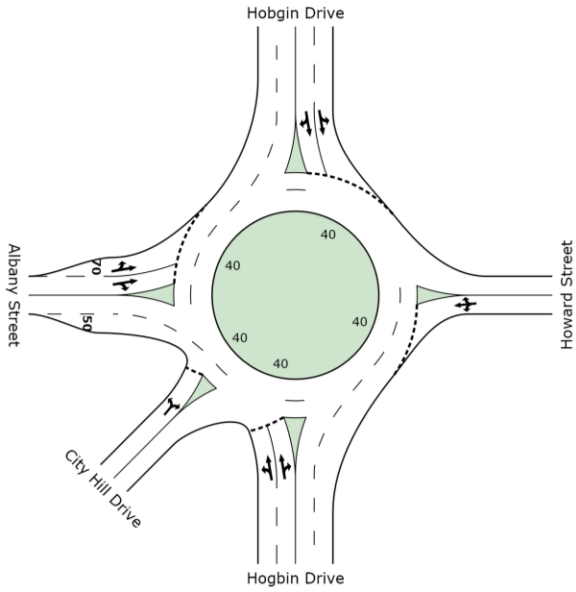
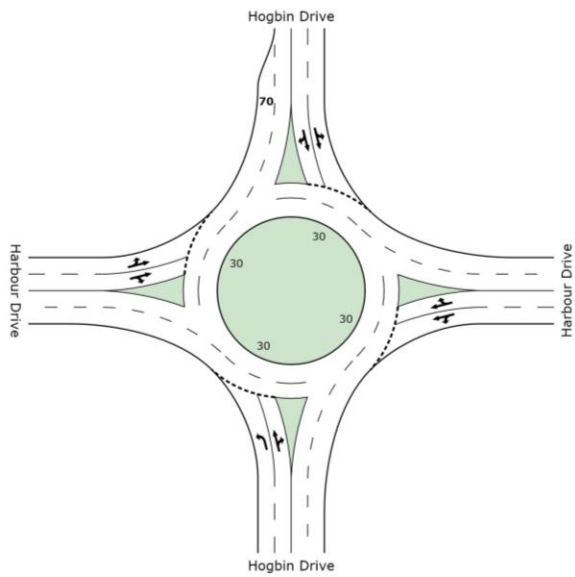
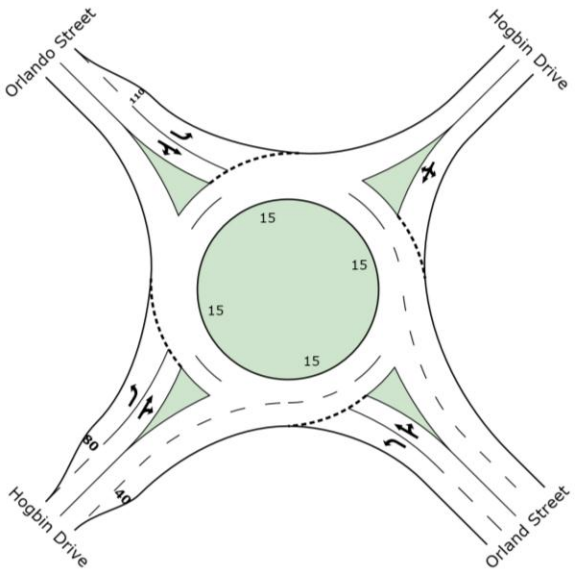
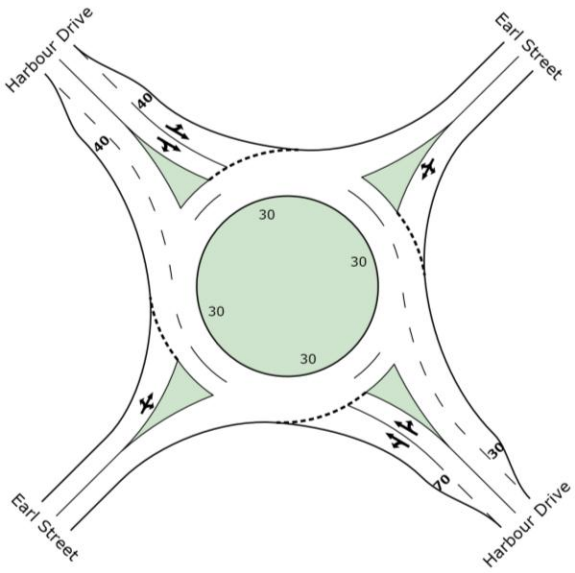
Performance Measure	Degree of Saturation (DOS)	Average Delay (s)	Level of Service	95%ile Queue (m)
Approaching Failure	0.8-0.9	40-60	D	100-200
Requires Upgrade	>0.9	>60	E, F	>200

It should be noted that the assessment is based on a future design horizon, where a certain level of peak spreading would be expected.

3.2 INTERSECTION CONFIGURATIONS

The existing intersection configurations for all sites are shown in Table 3.2.

Table 3.2: Intersection Configurations

Hogbin Drive / Sawtell Road / Toormina Road	Hogbin Drive / Stadium Drive / Doug Knight Drive
	
Hogbin Drive / Howard Street / Albany Street	**Hogbin Drive / Harbour Drive**
	
Hogbin Drive / Orlando Street	**Harbour Drive / Earl Street**
	

3.3 INTERSECTION PERFORMANCE

Tables 3.3 and 3.4 show a summary of the SIDRA intersection modelling results for both AM and PM peak hour periods in 2012 and 2022. The tables highlight the performance of the intersections based on the criteria specified in Table 3.1.

Table 3.3: AM SIDRA Intersection Modelling Outputs

Approach	2012 AM				2022 AM			
	DOS	Delay (s)	LOS	95%'ile Queue (m)	DOS	Delay (s)	LOS	95%'ile Queue (m)
Site 1 - Hogbin Drive / Sawtell Road / Toormina Road								
South (Toormina Road)	0.575	8.0	A	32.5	0.92	19.2	B	138.8
East (Sawtell Road)	0.353	10.9	B	13.5	0.535	12.2	B	27.0
North (Hogbin Drive)	0.251	7.1	A	10.8	0.354	7.3	A	16.7
West (Sawtell Road)	0.432	14.7	B	25.3	1.417	85.2	F	829.3
Site 2 - Hogbin Drive / Stadium Drive / Doug Knight Drive								
South (Hogbin Drive)	0.462	6.3	A	22.4	0.707	8.7	A	57.9
East (Doug Knight Drive)	0.078	12.0	B	3.7	0.213	18.7	B	12.8
North (Hogbin Drive)	0.580	7.6	A	32.3	0.886	14.1	B	130.3
West (Stadium Drive)	0.343	9.4	A	12.4	0.661	13.8	B	36.3
Site 3 - Hogbin Drive / Howard Street / Albany Street / City Hill Drive								
South (Hogbin Drive)	0.453	4.6	A	21.0	0.654	5.1	A	41.4
East (Howard Street)	0.072	11.0	B	2.4	0.135	13.3	B	5.1
North (Hogbin Drive)	0.299	5.7	A	13.3	0.466	6.5	A	24.8
West (Albany Street)	0.296	12.4	B	11.5	0.511	15.1	B	28.4
South-West (City Hill Drive)	0.009	10.9	B	0.3	0.016	14.2	B	0.6
Site 4 - Hogbin Drive / Harbour Drive								
South (Hogbin Drive)	0.442	9.8	A	19.2	0.802	15.8	B	60.1
East (Harbour Drive)	0.404	9.5	A	16.0	0.706	13.3	B	43.7
North (Hogbin Road)	0.405	7.9	A	16.9	0.693	12.2	B	47.0
West (Harbour Drive)	0.372	9.4	A	18.7	0.767	27.7	C	81.8
Site 5 - Hogbin Drive / Orlando Street								
South-East (Orland Street)	0.366	12.1	B	17.6	0.523	13.9	B	31.4
North-East (Hogbin Drive)	0.856	22.2	C	94.8	1.407	388.1	F	1215.0
North-West (Orlando Street)	0.613	14.3	B	41.8	1.193	195.1	F	697.2
South-West (Hogbin Drive)	0.462	8.7	AM	22.3	0.715	11.7	B	58.9
Site 6 - Harbour Drive / Earl Street								
South-East (Harbour Drive)	0.342	5.7	A	13.8	0.494	6	A	24.8
North-East (Earl Street)	0.091	10.2	B	3.2	0.163	12.3	B	6.6
North-West (Harbour Drive)	0.343	7.3	A	15.9	0.547	8.8	A	34.7
South-West (Earl Street)	0.609	13.5	B	37.5	1.036	81.1	F	332.2

Table 3.4: PM SIDRA Intersection Modelling Outputs

Approach	2012 PM				2022 PM			
	DOS	Delay (s)	LOS	95%'ile Queue (m)	DOS	Delay (s)	LOS	95%'ile Queue (m)
Site 1 - Hogbin Drive / Sawtell Road / Toormina Road								
South (Toormina Road)	0.373	7.8	A	16.7	0.541	9.5	A	32.7
East (Sawtell Road)	0.311	10.6	B	12.5	0.501	13	B	26.7
North (Hogbin Drive)	0.442	8.2	A	21.2	0.657	11.8	B	50.5
West (Sawtell Road)	0.359	10.6	B	16.6	0.554	13.5	B	36.5
Site 2 - Hogbin Drive / Stadium Drive / Doug Knight Drive								
South (Hogbin Drive)	0.334	6.8	A	14.2	0.494	8.3	A	27.6
East (Doug Knight Drive)	0.277	16.8	B	15.4	0.873	96.3	F	106.5
North (Hogbin Drive)	0.692	7.4	A	47.1	0.923	12.7	B	163.2
West (Stadium Drive)	0.21	9.4	A	7.3	0.311	10.1	B	12.3
Site 3 - Hogbin Drive / Howard Street / Albany Street / City Hill Drive								
South (Hogbin Drive)	0.361	4.4	A	15.2	0.472	4.6	A	23.2
East (Howard Street)	0.073	10.7	B	2.4	0.122	12.5	B	4.5
North (Hogbin Drive)	0.344	5.7	A	15.6	0.48	6.5	A	25.7
West (Albany Street)	0.309	11.8	B	11.2	0.438	12.9	B	19.3
South-West (City Hill Drive)	0.046	9.1	A	1.4	0.48	7	A	25.7
Site 4 - Hogbin Drive / Harbour Drive								
South (Hogbin Drive)	0.461	9.2	A	20.9	0.701	12.4	B	45.9
East (Harbour Drive)	0.374	9.3	A	14.1	0.569	11.4	B	28.6
North (Hogbin Road)	0.415	8.1	A	17.6	0.612	10.4	B	36.7
West (Harbour Drive)	0.376	9.1	A	18.9	0.701	12.5	B	50.3
Site 5 - Hogbin Drive / Orlando Street								
South-East (Orlando Street)	0.486	12.9	B	27.0	0.791	23.9	C	79.4
North-East (Hogbin Drive)	0.686	12.2	B	49.9	1.012	57.5	E	268.0
North-West (Orlando Street)	0.490	14.1	B	27.7	0.876	34.8	C	109.7
South-West (Hogbin Drive)	0.572	10	A	34.1	0.854	17.3	B	100.9
Site 6 - Harbour Drive / Earl Street								
South-East (Harbour Drive)	0.366	6.0	A	15.6	0.488	6.4	A	24.4
North-East (Earl Street)	0.212	11.1	B	7.9	0.358	14.1	B	15.8
North-West (Harbour Drive)	0.446	7.4	A	22.6	0.654	10.0	A	50.3
South-West (Earl Street)	0.651	14.8	B	44.2	0.985	53.8	D	226.9

3.4 INTERSECTION UPGRADES

The intersections that required upgrading due to unsatisfactory performance are shown in Table 3.5.

Table 3.5: Required Intersection Upgrades

Intersection	2012AM	2012PM	2022AM	2022PM
	Requires Upgrades (Yes / No)			
Site 1 - Hogbin Drive / Sawtell Road / Toormina Road	No	No	Yes	No
Site 2 - Hogbin Drive / Stadium Drive / Doug Knight Drive	No	No	No	Yes
Site 3 - Hogbin Drive / Howard Street / Albany Street	No	No	No	No
Site 4 - Hogbin Drive / Harbour Drive	No	No	No	No
Site 5 - Hogbin Drive / Orlando Street	No	No	Yes	Yes
Site 6 - Harbour Drive / Earl Street	No	No	Yes	Yes

Based on the above table, four of the six intersections require upgrades by 2022 to improve performance to satisfactory conditions. The following sections detail the intersection upgrades and there corresponding performance. It should be noted that significant change to travel patterns and volumes are likely to occur over the next 10 years and therefore upgrades will require further assessment closer to the time the required time of implementation.

3.4.1 Site 1 - Hogbin Drive / Sawtell Road / Toormina Road

The Hogbin Drive / Sawtell Road / Toormina Road roundabout has been upgraded to provide two through lanes from the southern Toormina Road approach. This requires the upgrade Hogbin Drive northbound to include an additional lane. Road widening will also need to take into account a short right turn pocket for access to Barcoo Court. Figure 3.1 shows the proposed upgrades to the Hogbin Drive / Sawtell Road / Toormina Road roundabout.

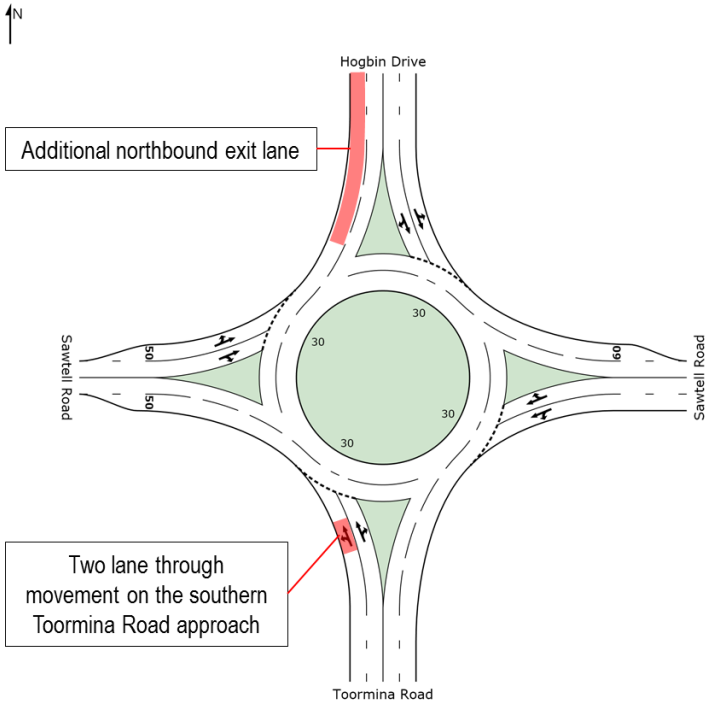


Figure 3.1: Site 1: Hogbin Drive / Sawtell Road / Toormina Road Upgraded Layout

Table 3.6 summarises the SIDRA intersection modelling results for both AM and PM peak hour periods in 2022 with the proposed upgrades. The results indicate that the intersection performs adequately in both AM and PM peak periods.

Table 3.6: 2022 Site 1 – Hogbin Drive / Sawtell Road / Toormina Road SIDRA Results

Approach	2022 AM				2022 PM			
	DOS	Delay (s)	LOS	95%'ile Queue (m)	DOS	Delay (s)	LOS	95%'ile Queue (m)
South (Hogbin Drive)	0.631	10.5	B	41.7	0.421	8.8	A	20.7
East (Doug Knight Drive)	0.567	13.0	B	31.1	0.497	12.9	B	26.2
North (Hogbin Drive)	0.396	8.1	A	20	0.642	11.5	B	47.3
West (Stadium Drive)	0.637	17.7	B	39.9	0.481	11	B	23

3.4.2 Site 2 - Hogbin Drive / Stadium Drive / Doug Knight Drive

The Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout has been upgraded to provide two through lanes from the northern Hogbin Drive Road approach. This is likely to require the extension of the two lane southbound section on Hogbin Drive to reduce the impact of vehicles merging back to a single southbound lane. Figure 3.2 shows the proposed upgrades to the Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout.

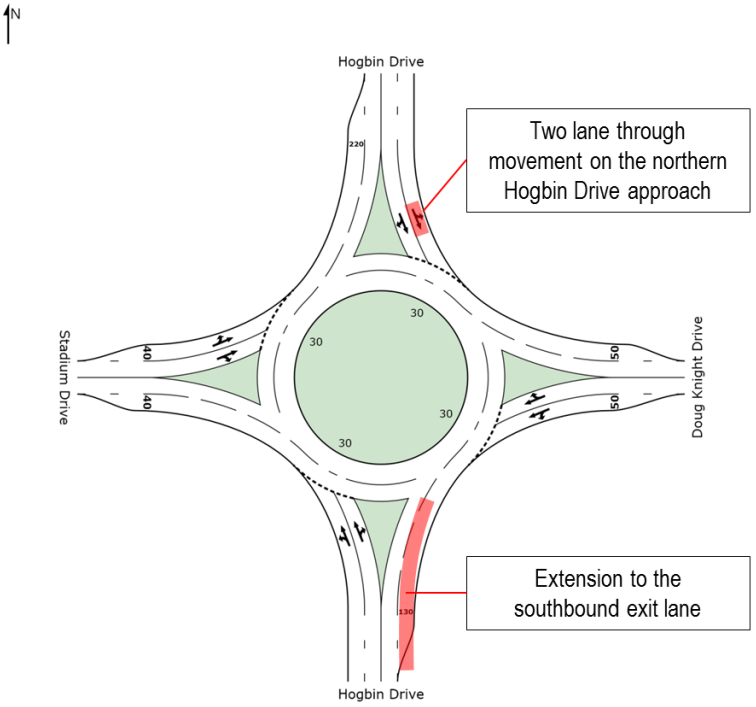


Figure 3.2: Site 2: Hogbin Drive / Stadium Drive / Doug Knight Drive Upgraded Layout

Table 3.7 summarises the SIDRA intersection modelling results for both AM and PM peak hour periods in 2022 with the proposed upgrades. The results indicate that the intersection performs adequately in both AM and PM peak periods.

Table 3.7: 2022 Site 2 – Hogbin Drive / Stadium Drive / Doug Knight Drive SIDRA Results

Approach	2022 AM				2022 PM			
	DOS	Delay (s)	LOS	95%'ile Queue (m)	DOS	Delay (s)	LOS	95%'ile Queue (m)
South (Toormina Road)	0.697	8.6	A	54.2	0.47	8.2	A	23.5
East (Sawtell Road)	0.117	11.8	B	4.9	0.278	12.8	B	11.3
North (Hogbin Drive)	0.654	9.3	A	47.5	0.567	7.5	A	31.8
West (Sawtell Road)	0.648	13.6	B	35.1	0.306	10.1	B	11.9

3.4.3 Site 5 - Hogbin Drive / Orlando Street

The Hogbin Drive / Orlando Street roundabout has been upgraded to provide an additional through lane movement south-eastbound on Orlando Drive. Many intersection upgrades and configurations were tested for the roundabout with minimal success in improving performance. The primary issue with the roundabout is the northern Hogbin Drive approach on the bridge over the rail line. This approach is restricted to a single lane which is required to provide all movements. The proposed upgrade does not significantly improve this approach and as a result still results in failure. Figure 3.3 shows the proposed upgrades to the Hogbin Drive / Orlando Street roundabout.

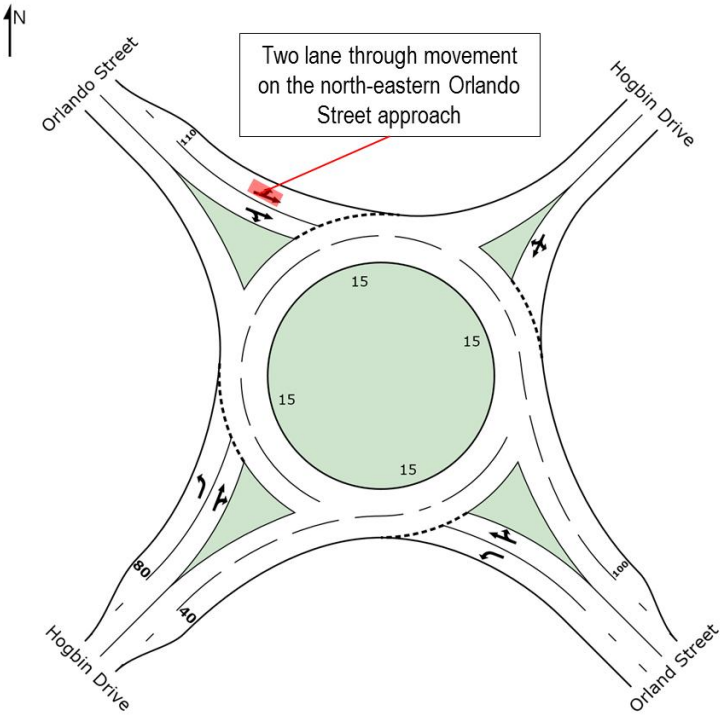


Figure 3.3: Site 5: Hogbin Drive / Orlando Street Upgraded Layout

Table 3.8 summarises the SIDRA intersection modelling results for both AM and PM peak hour periods in 2022 with the proposed upgrades. The results indicate that whilst intersection performance has improved from the existing configuration, the north-eastern Hogbin Drive approach is still over capacity most significantly in the AM peak period.

Table 3.8: 2022 Site 5 – Hogbin Drive / Orlando Street SIDRA Results

Approach	2022 AM				2022 PM			
	DOS	Delay (s)	LOS	95%'ile Queue (m)	DOS	Delay (s)	LOS	95%'ile Queue (m)
South-East (Orlando Street)	0.559	15.3	B	36.1	0.799	24.6	C	81.8
North-East (Hogbin Drive)	1.355	337.9	F	1085.8	0.962	31.9	C	165.7
North-West (Orlando Street)	0.876	29.9	C	114.1	0.774	25.4	C	72.9
South-West (Hogbin Drive)	0.720	11.8	B	60.1	0.855	17.4	B	101.2

The above results indicate that the north-eastern Hogbin Drive approach may require significant upgrades in the next 10 years which may only be improved by widening of the bridge. This high costs required for this may warrant further investigations into the use of other routes such as the Pacific Highway to reduce the demand on Hogbin Drive.

3.4.4 Site 6 - Harbour Drive / Earl Street

The Harbour Drive / Earl Street roundabout has been upgraded to provide a dedicated right turn lane from Earl Street to Harbour Drive. Figure 3.4 shows the proposed upgrades to the Harbour Drive / Earl Street roundabout.

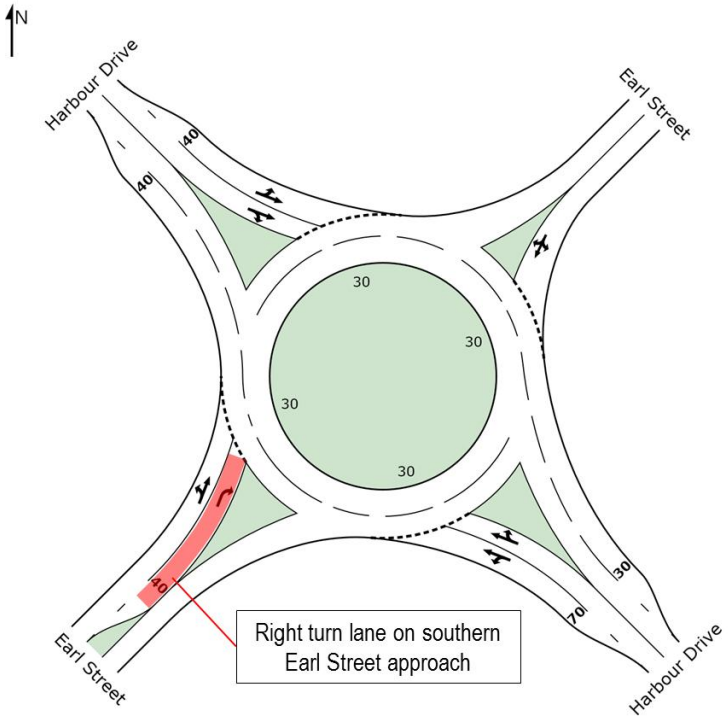


Figure 3.4: Site 6: Harbour Drive / Earl Street Upgraded Layout

Table 3.9 summarises the SIDRA intersection modelling results for both AM and PM peak hour periods in 2022 with the proposed upgrades. The results indicate that the intersection performs adequately in both AM and PM peak periods.

Table 3.9: 2022 Site 6 – Harbour Drive / Earl Street SIDRA Results

	2022 AM				2022 PM			
Approach	DOS	Delay (s)	LOS	95%'ile Queue (m)	DOS	Delay (s)	LOS	95%'ile Queue (m)
South-East (Harbour Drive)	0.493	6	A	24.3	0.488	6.4	A	24.4
North-East (Earl Street)	0.161	12.5	B	6.4	0.345	13.9	B	14.7
North-West (Harbour Drive)	0.514	8.1	A	26.6	0.597	8.4	A	35
South-West (Earl Street)	0.488	13.2	B	26.2	0.436	12.9	B	22.5

The pedestrian crossing over the south-eastern Harbour Drive leg of the roundabout was raised as a potential issue by Council due to the increased pedestrian activity from the recently constructed Coles development. The surveys indicated that less than 60 pedestrians used the crossing in any peak hour throughout the surveyed period. This volume of less than one pedestrian per minute on average is not expected to have a significant impact on the roundabout and does not warrant any further upgrades.

4. CONCLUSIONS

Bitzios Consulting was commissioned by Coffs Harbour City Council (CHCC) to analyse the major intersections on the Hogbin Drive corridor and the Harbour Drive / Earl Street intersection. CHCC has determined that the following roundabouts should be reviewed to determine the future operational performance and identify any upgrade requirements to meet future traffic demands and maintain an adequate level of service:

- Site 1 Hogbin Drive – Sawtell Road – Toormina Road;
- Site 2 Hogbin Drive – Stadium Drive – Doug Knight Drive;
- Site 3 Hogbin Drive – Howard Street – Albany Street – City Hill Drive;
- Site 4 Hogbin Drive – Harbour Drive;
- Site 5 Hogbin Drive – Orlando Street; and
- Site 6 Harbour Drive – Earl Street.

Traffic demands for each intersection were based on surveys undertaken by Traffic Data and Control (TDC) on Wednesday 28th and Thursday the 29th of November 2012. Future year (2022) intersection volumes were based on traffic growths determined from 2008 Council tube counts to 2012 intersection surveys volumes. The traffic growth rates were 3.4% compounding per annum in the AM peak period and 2.5% in the PM peak period.

SIDRA intersection modelling was used to assess intersection performance using failure criteria based on 'Degree of Saturation', 'Average Delay', 'Level of Service' and '95%ile Back of Queue' outputs.

The SIDRA intersection outputs indicated that in 2012 and 2022 the Hogbin Drive / Howard Street / Albany Street / City Hill Drive intersection and the Hogbin Drive / Harbour Drive intersection perfume satisfactorily.

The SIDRA intersection outputs also indicated that the remaining four intersections require upgrades by 2022 to improve performance. The following intersections upgrades are required for the intersections to perform satisfactorily in 2022:

- The Hogbin Drive / Sawtell Road / Toormina Road roundabout requires upgrades to provide two through lanes from the southern Toormina Road approach. This is achieved by upgrading Hogbin Drive northbound to include an additional lane on the exit of the roundabout.
- The Hogbin Drive / Stadium Drive / Doug Knight Drive roundabout requires upgrades to provide two through lanes from the northern Hogbin Drive Road approach. This may also require the extension of the two lane southbound section on Hogbin Drive to reduce the impact of vehicles merging back to a single southbound lane.
- The Harbour Drive / Earl Street roundabout requires upgrades to provide a dedicated right turn pocket from Earl Street to Harbour Drive.

The Hogbin Drive / Orlando Street roundabout was upgraded to provide an additional through lane movement south-eastbound on Orlando Drive. However, the proposed upgrade still results in failure in 2022. Many intersection upgrades and configurations were tested for the roundabout with minimal success in improving performance. The primary issue is the available capacity of the northern Hogbin Drive approach due to the single lane approach over the rail bridge which is required to provide for all movements. The results indicate that the north-eastern Hogbin Drive approach would require significant high cost upgrades for the intersection to perform satisfactorily. It is recommended to undertake further investigations into future traffic network planning of this area to assess options including alternate route upgrades.

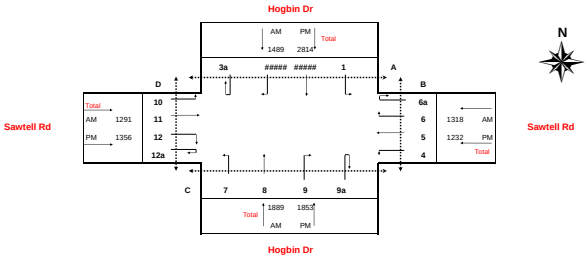
APPENDIX A

TDC TRAFFIC SURVEYS

Traffic Data & Control

Site ID: N/A
Location: Hogbin Dr & Sawtell Rd
Weather: Fine
Suburb: Coffs Harbour
Duration: 7:00am to 10:00am (Thursday) & 3:00pm to 6:00pm (Wednesday)
Day/Date: Wednesday, 28 November 2012 & Thursday, 29 November 2012
AM Peak 09:15 (hour ending)
PM Peak 16:30 (hour ending)
Traffic Control: Roundabout

HOME



TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	14	1	0	0	32	6	1	0	16	0	0	0	0	0	0	0
2	7:30 AM	16	2	0	0	40	2	0	3	8	3	0	0	0	0	0	0
3	7:45 AM	24	6	0	0	61	3	1	0	14	2	0	1	0	0	0	0
4	8:00 AM	33	0	0	0	68	1	0	0	18	1	2	0	0	0	0	0
5	8:15 AM	28	0	0	0	61	3	1	0	14	2	1	0	1	1	0	0
6	8:30 AM	23	0	0	0	73	1	2	0	8	0	0	0	4	0	1	0
7	8:45 AM	38	0	1	0	85	4	2	0	11	3	1	0	1	0	0	0
8	9:00 AM	48	0	0	1	80	2	6	0	22	1	0	1	4	1	0	0
9	9:15 AM	42	0	0	0	69	3	2	0	19	1	1	0	3	1	0	0
10	9:30 AM	36	1	0	0	63	6	1	0	23	1	0	1	0	0	0	0
11	9:45 AM	29	1	0	0	82	3	1	1	18	1	1	0	1	0	0	0
12	10:00 AM	55	1	0	0	76	5	0	1	23	2	0	0	0	0	0	0
3HR Total		386	12	1	1	790	39	17	5	194	17	6	3	14	3	1	0
Peak Hour Total		151	0	1	1	307	10	12	0	60	5	2	1	12	2	1	0

TIME		Sawtell Rd (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	8	0	1	0	27	1	0	0	34	2	0	0	0	0	0	0
2	7:30 AM	11	0	0	0	23	0	0	0	28	0	0	0	0	0	0	0
3	7:45 AM	12	1	0	0	16	0	0	1	58	0	0	0	0	0	0	0
4	8:00 AM	11	1	1	0	33	2	0	0	63	5	0	1	0	0	0	0
5	8:15 AM	13	2	3	0	34	2	0	0	73	0	0	0	0	0	0	0
6	8:30 AM	10	0	0	0	30	0	0	0	78	2	0	0	0	0	0	0
7	8:45 AM	12	1	1	0	30	1	1	0	87	1	0	2	0	0	0	0
8	9:00 AM	11	1	0	0	43	0	0	2	99	0	0	3	0	0	0	0
9	9:15 AM	33	2	1	2	25	1	0	0	42	3	0	0	0	0	0	0
10	9:30 AM	24	0	0	0	21	1	0	3	51	0	0	0	0	0	0	0
11	9:45 AM	27	2	0	0	24	2	0	0	50	1	0	0	0	0	0	0
12	10:00 AM	23	0	1	0	32	0	0	0	65	0	0	0	0	0	0	0
3HR Total		195	10	8	2	338	10	1	6	728	14	0	6	0	0	0	0
Peak Hour Total		66	4	2	2	128	2	1	2	306	6	0	5	0	0	0	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	15	0	0	0	40	4	2	2	4	0	0	0	0	0	0	0
2	7:30 AM	10	0	0	0	74	3	2	1	4	0	1	0	0	0	0	0
3	7:45 AM	21	2	2	0	80	2	1	1	7	0	0	0	0	1	0	0
4	8:00 AM	30	3	1	0	121	0	0	2	12	1	0	0	1	0	0	0
5	8:15 AM	27	1	0	0	114	2	1	0	7	1	2	0	0	0	0	0
6	8:30 AM	35	0	0	0	168	3	3	3	12	0	1	0	1	0	0	0
7	8:45 AM	40	0	1	0	170	6	2	3	13	0	0	0	0	0	0	0
8	9:00 AM	50	2	1	0	136	2	4	2	15	0	0	0	1	0	0	0
9	9:15 AM	29	1	1	0	105	0	2	1	9	0	0	0	1	0	0	0
10	9:30 AM	39	1	1	0	93	2	1	0	9	0	1	0	3	0	0	0
11	9:45 AM	38	1	0	0	110	1	1	2	18	1	0	1	1	0	0	0
12	10:00 AM	28	3	1	0	80	3	1	0	17	1	0	0	3	0	0	0
3HR Total		362	14	8	0	1291	28	20	17	127	4	5	1	11	1	0	0
Peak Hour Total		154	3	3	0	579	11	11	9	49	0	1	0	3	0	0	0

TIME		Sawtell Rd (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	7:15 AM	35	1	0	0	13	0	0	0	17	0	0	0	0	0	0	0	0	4	3	0
2	7:30 AM	30	1	2	2	8	2	0	0	12	0	0	0	0	0	0	0	0	3	2	0
3	7:45 AM	46	1	0	0	14	1	0	0	19	2	0	0	0	0	0	0	0	1	3	0
4	8:00 AM	51	1	0	1	17	1	0	0	25	1	1	1	1	0	0	0	0	4	3	0
5	8:15 AM	59	2	1	0	11	0	0	0	32	0	1	0	1	0	0	0	0	0	2	0
6	8:30 AM	65	1	3	0	17	1	0	1	35	0	1	1	0	0	0	0	0	0	0	0
7	8:45 AM	59	1	1	2	31	1	0	0	41	1	2	1	3	0	0	0	0	0	1	0
8	9:00 AM	59	1	0	2	36	2	0	0	58	2	2	0	1	0	0	0	0	0	3	0
9	9:15 AM	42	3	0	0	32	0	0	1	43	1	2	1	0	0	0	0	0	1	0	0
10	9:30 AM	45	0	0	0	20	0	0	0	41	1	1	0	0	0	0	0	0	2	3	0
11	9:45 AM	48	2	0	1	26	1	0	0	33	3	0	0	0	0	0	0	0	0	1	0
12	10:00 AM	26	1	1	1	22	1	0	0	42	3	1	0	2	0	0	0	0	0	0	0
3HR Total		565	15	8	9	247	10	0	2	398	14	11	4	8	0	0	0	0	15	21	0
Peak Hour Total		225	6	4	4	116	4	0	2	177	4	7	3	4	0	0	0	0	1	4	0

TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	47	0	0	2	92	0	3	1	30	1	1	1	1	0	0	0
2	3:30 PM	51	0	0	0	129	2	2	0	31	0	0	0	1	0	0	0
3	3:45 PM	61	0	0	0	142	1	3	2	50	1	0	0	1	0	0	0
4	4:00 PM	65	1	0	1	98	3	0	0	25	2	1	0	0	0	0	0
5	4:15 PM	59	2	0	1	108	3	2	0	48	0	0	0	0	0	0	0
6	4:30 PM	81	2	0	0	132	3	2	2	48	2	0	0	0	0	0	0
7	4:45 PM	82	2	0	0	129	2	0	2	63	0	0	0	1	0	0	0
8	5:00 PM	64	0	0	0	118	1	1	1	42	1	0	0	1	0	0	0
9	5:15 PM	63	0	0	1	125	2	5	1	52	1	0	0	0	0	0	0
10	5:30 PM	93	2	0	2	134	0	0	0	62	0	0	1	1	0	0	0
11	5:45 PM	60	1	0	1	122	1	3	2	35	0	0	0	0	0	0	0
12	6:00 PM	56	1	0	0	99	1	0	0	30	0	0	0	0	0	0	0
3HR Total		782	11	0	8	1428	19	21	11	516	8	2	2	6	0	0	0
Peak Hour Total		266	5	0	2	480	10	7	4	171	5	1	0	1	0	0	0

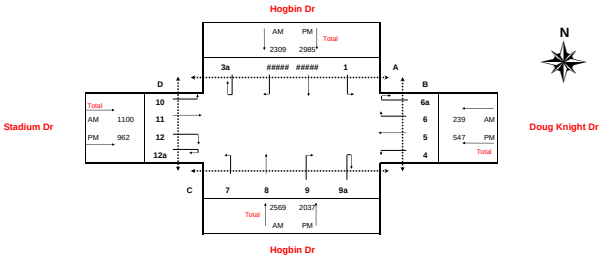
TIME		Sawtell Rd (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	32	1	2	0	21	2	0	0	45	4	2	2	0	0	0	0
2	3:30 PM	34	2	1	0	30	0	0	0	43	3	0	1	0	0	0	0
3	3:45 PM	28	1	1	0	31	1	0	1	41	1	1	0	1	0	0	0
4	4:00 PM	35	2	2	0	32	1	0	0	38	3	0	0	0	0	0	0
5	4:15 PM	34	0	2	1	26	0	0	1	51	1	0	0	0	0	0	0
6	4:30 PM	33	0	0	0	29	0	0	0	34	1	0	0	0	0	0	0
7	4:45 PM	30	0	1	0	23	0	0	0	41	1	0	0	0	0	0	0
8	5:00 PM	25	0	0	0	35	0	0	1	37	0	0	1	0	0	0	0
9	5:15 PM	16	0	0	0	24	0	0	0	51	0	0	0	1	0	0	0
10	5:30 PM	28	0	0	0	29	0	0	1	52	0	0	0	1	0	0	0
11	5:45 PM	25	0	1	0	32	0	0	0	39	0	0	0	0	0	0	0
12	6:00 PM	25	1	0	0	15	0	0	0	38	0	0	0	0	0	0	0
3HR Total		345	7	10	1	327	4	0	4	510	14	3	4	3	0	0	0
Peak Hour Total		130	3	5	1	118	2	0	2	164	6	1	0	1	0	0	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	39	1	1	0	97	1	5	1	25	0	1	1	3	0	0	0
2	3:30 PM	44	2	0	0	82	2	3	2	16	1	1	0	0	0	0	0
3	3:45 PM	53	0	1	1	98	3	2	1	28	1	0	0	0	0	0	0
4	4:00 PM	51	0	0	0	89	1	0	1	14	0	0	0	1	0	0	0
5	4:15 PM	40	0	1	0	71	0	1	3	14	0	0	0	0	0	0	0
6	4:30 PM	41	0	0	1	83	0	0	2	21	0	0	1	0	0	0	0
7	4:45 PM	49	0	0	1	90	4	1	0	24	0	1	0	2	0	0	0
8	5:00 PM	44	0	0	0	66	0	0	1	28	0	0	0	0	0	0	0
9	5:15 PM	31	1	1	1	85	2	1	1	13	0	0	0	0	0	0	0
10	5:30 PM	53	0	0	1	92	2	0	3	15	0	1	0	1	0	0	0
11	5:45 PM	41	0	1	0	77	0	1	0	7	0	0	0	1	0	0	1
12	6:00 PM	46	0	0	1	78	2	0	2	22	0	1	1	4	0	0	0
3HR Total		532	4	5	6	1008	17	14	17	227	2	5	3	12	0	0	1
Peak Hour Total		185	0	2	2	341	4	3	7	77	1	0	1	1	0	0	0

TIME		Sawtell Rd (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	3:15 PM	29	1	0	0	28	0	0	1	32	2	0	0	1	0	0	0	0	0	0	0
2	3:30 PM	27	1	1	0	40	1	0	0	45	1	0	1	1	0	0	0	0	0	0	0
3	3:45 PM	39	3	1	0	38	0	0	0	50	1	1	1	0	0	0	0	0	0	0	0
4	4:00 PM	32	1	0	0	42	0	0	0	62	2	1	1	0	0	0	0	0	1	2	0
5	4:15 PM	28	1	0	1	29	1	0	0	56	0	0	1	1	0	0	0	0	4	0	0
6	4:30 PM	31	0	0	0	37	0	0	0	53	0	0	0	0	0	0	0	0	2	0	0
7	4:45 PM	23	1	0	0	36	0	0	0	45	0	0	2	0	0	0	0	0	9	2	0
8	5:00 PM	29	0	0	0	41	1	0	0	54	1	0	0	1	0	0	0	0	4	0	0
9	5:15 PM	23	1	0	0	41	0	0	1	46	0	0	0	0	0	0	0	0	1	0	0
10	5:30 PM	25	0	0	0	35	1	0	0	40	0	0	0	0	0	0	0	0	0	0	0
11	5:45 PM	27	0	0	0	30	0	0	0	32	1	0	1	0	0	0	0	0	0	0	0
12	6:00 PM	27	0	0	1	33	0	0	0	30	0	0	1	0	0	0	0	0	0	0	0
3HR Total		340	9	2	2	430	4	0	2	545	8	2	8	4	0	0	0	0	21	4	0
Peak Hour Total		130	5	1	1	146	1	0	0	221	3	2	3	1	0	0	0	0	7	2	0

TDC
Traffic Data & Control

Site ID: N/A
Location: Hogbin Dr & Stadium Dr
Weather: Fine
Suburb: Coffs Harbour
Duration: 7:00am to 10:00am (Thursday) & 3:00pm to 6:00pm (Wednesday)
Day/Date: Wednesday, 28 November 2012 & Thursday, 29 November 2012
AM Peak 09:00 (hour ending)
PM Peak 16:30 (hour ending)
Traffic Control: Roundabout
HOME



TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	3	0	0	0	69	3	1	0	28	0	0	1	0	0	0	0
2	7:30 AM	11	0	0	0	87	2	0	0	36	1	1	0	0	0	0	0
3	7:45 AM	12	0	1	0	95	4	0	0	49	3	1	1	0	0	0	0
4	8:00 AM	35	0	0	1	118	0	0	0	44	2	0	0	0	0	0	0
5	8:15 AM	33	0	1	0	120	5	1	0	55	3	0	0	0	0	0	0
6	8:30 AM	41	0	1	0	140	4	4	0	50	0	0	0	0	0	0	0
7	8:45 AM	57	2	4	0	171	1	6	0	31	4	0	0	0	0	0	0
8	9:00 AM	64	0	1	0	116	2	5	0	35	2	1	0	0	0	0	0
9	9:15 AM	38	0	1	0	106	4	1	0	31	1	0	0	0	0	0	0
10	9:30 AM	25	0	0	0	101	4	0	0	39	4	0	0	0	0	0	0
11	9:45 AM	24	0	1	0	114	1	0	0	35	3	0	0	0	0	0	0
12	10:00 AM	19	0	0	0	136	1	0	0	49	2	0	0	0	0	0	0
3HR Total		362	2	10	1	1373	31	18	0	482	25	3	2	0	0	0	0
Peak Hour Total		195	2	7	0	547	12	16	0	171	9	1	0	0	0	0	0

TIME		Doug Knight Dr (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2	7:30 AM	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
3	7:45 AM	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0
4	8:00 AM	1	0	0	0	6	0	0	0	2	0	1	0	0	0	0	0
5	8:15 AM	2	0	2	21	2	0	0	0	4	0	0	0	0	0	0	0
6	8:30 AM	4	0	1	5	7	0	0	0	7	0	1	0	0	0	0	0
7	8:45 AM	4	0	5	0	9	2	0	0	6	0	0	0	0	0	0	0
8	9:00 AM	6	1	0	3	12	0	3	0	4	0	0	0	0	0	0	0
9	9:15 AM	6	0	1	1	4	0	0	0	16	0	1	0	0	0	0	0
10	9:30 AM	2	0	0	1	3	0	1	0	8	0	3	0	0	0	0	0
11	9:45 AM	12	0	1	3	8	0	1	0	9	1	0	0	0	0	0	0
12	10:00 AM	5	0	0	4	10	0	0	2	6	0	1	0	0	0	0	0
3HR Total		45	1	11	38	61	2	5	2	66	1	7	0	0	0	0	0
Peak Hour Total		16	1	8	29	30	2	3	0	21	0	1	0	0	0	0	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	14	3	2	1	87	3	2	0	0	0	0	0	0	0	0	0
2	7:30 AM	12	0	1	0	107	6	1	0	1	0	0	0	0	0	0	0
3	7:45 AM	19	4	4	1	144	5	0	0	0	0	1	0	0	0	0	0
4	8:00 AM	25	0	0	0	170	4	0	1	8	0	0	0	0	0	0	0
5	8:15 AM	34	3	1	2	182	3	0	0	3	0	1	0	0	0	0	0
6	8:30 AM	29	0	2	0	240	6	3	0	13	0	1	0	0	0	2	0
7	8:45 AM	26	2	6	0	249	3	2	0	30	1	3	0	0	0	0	0
8	9:00 AM	22	1	7	0	240	3	0	0	38	0	3	0	0	0	0	0
9	9:15 AM	30	4	0	0	160	2	1	0	14	0	1	0	0	0	0	0
10	9:30 AM	24	1	0	0	149	1	1	0	11	0	0	0	0	0	0	0
11	9:45 AM	21	3	0	0	163	1	0	0	14	0	1	0	0	0	0	0
12	10:00 AM	22	5	2	1	141	2	1	0	6	0	0	0	0	0	0	0
3HR Total		278	26	25	5	2032	39	11	1	138	1	11	0	0	0	2	0
Peak Hour Total		111	6	16	2	911	15	5	0	84	1	8	0	0	0	2	0

TIME		Stadium Dr (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	7:15 AM	22	1	0	0	4	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	32	0	0	0	2	0	0	1	11	3	1	0	0	0	0	0	2	0	0	0
3	7:45 AM	50	0	0	0	6	0	0	1	16	4	2	0	0	0	0	0	0	0	0	0
4	8:00 AM	44	2	0	0	8	0	0	0	7	2	0	0	0	0	0	0	0	9	0	0
5	8:15 AM	63	1	1	0	16	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0
6	8:30 AM	91	1	1	1	17	0	0	2	27	2	4	0	0	0	0	0	0	0	0	0
7	8:45 AM	77	1	0	0	33	0	1	0	31	1	1	0	0	0	0	0	0	0	0	0
8	9:00 AM	86	1	0	0	27	0	0	0	16	1	0	0	0	0	0	0	0	0	0	0
9	9:15 AM	74	2	0	0	18	1	3	0	20	1	1	0	0	0	0	0	0	0	0	0
10	9:30 AM	58	2	0	0	10	0	0	0	19	2	3	0	0	0	0	0	0	0	0	0
11	9:45 AM	46	2	0	0	12	1	1	0	24	0	0	0	0	0	0	0	0	0	0	0
12	10:00 AM	27	3	1	0	2	0	1	0	21	1	0	0	0	0	0	0	0	0	0	0
3HR Total		670	16	3	1	155	2	6	4	211	20	12	0	0	0	0	0	2	9	0	0
Peak Hour Total		317	4	2	1	93	0	1	2	91	4	5	0	0	0	0	0	0	0	0	0

TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	10	0	1	0	149	5	2	0	56	4	0	0	0	0	0	0
2	3:30 PM	13	0	0	0	162	0	1	0	41	4	3	0	0	0	0	0
3	3:45 PM	13	0	2	0	187	2	0	0	64	2	3	0	0	0	0	0
4	4:00 PM	10	0	2	0	154	4	2	0	57	3	0	0	0	0	0	0
5	4:15 PM	8	0	2	0	161	5	1	0	57	1	0	0	0	0	0	0
6	4:30 PM	13	0	1	0	210	2	0	0	88	4	0	0	0	0	0	0
7	4:45 PM	6	0	0	0	196	2	0	0	49	2	1	0	0	0	0	0
8	5:00 PM	10	0	0	0	151	2	0	0	51	2	1	0	0	0	0	0
9	5:15 PM	8	0	0	0	188	3	3	0	65	1	0	0	0	0	0	0
10	5:30 PM	9	1	0	0	200	3	0	0	54	3	0	0	0	0	0	0
11	5:45 PM	18	0	0	0	172	1	2	0	48	1	0	0	0	0	0	0
12	6:00 PM	6	0	0	0	155	0	1	0	60	1	0	0	0	0	0	0
3HR Total		124	1	8	0	2085	29	12	0	690	28	8	0	0	0	0	0
Peak Hour Total		44	0	7	0	712	13	3	0	266	10	3	0	0	0	0	0

TIME		Doug Knight Dr (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	12	0	2	1	13	0	0	0	27	0	1	0	0	0	0	0
2	3:30 PM	14	0	0	0	12	0	0	0	22	0	3	0	0	0	0	0
3	3:45 PM	13	0	1	3	6	0	0	0	19	0	1	0	0	0	0	0
4	4:00 PM	3	0	0	3	10	0	0	0	22	0	0	0	0	0	0	0
5	4:15 PM	22	0	1	0	25	0	2	0	41	0	3	1	0	0	0	0
6	4:30 PM	13	0	2	0	9	0	0	1	22	0	1	0	0	0	0	0
7	4:45 PM	10	0	0	0	7	0	0	1	26	0	0	0	0	0	0	0
8	5:00 PM	8	0	0	0	6	0	1	0	15	0	0	0	0	0	0	0
9	5:15 PM	15	0	1	8	10	0	1	0	18	0	0	0	0	0	0	0
10	5:30 PM	9	0	0	2	15	0	0	0	14	0	0	0	0	0	0	0
11	5:45 PM	5	0	1	5	5	0	0	0	12	0	0	0	0	0	0	0
12	6:00 PM	4	0	0	4	9	0	0	0	4	0	0	0	0	0	0	0
3HR Total		128	0	8	26	127	0	4	2	242	0	9	1	0	0	0	0
Peak Hour Total		51	0	4	6	50	0	2	1	104	0	5	1	0	0	0	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	19	5	0	0	160	1	3	0	7	0	2	0	0	0	0	0
2	3:30 PM	55	2	7	1	131	2	5	0	20	0	4	0	0	0	0	0
3	3:45 PM	34	0	2	0	184	3	1	0	9	0	3	0	0	0	0	0
4	4:00 PM	18	0	2	0	149	4	2	0	6	0	0	0	0	0	0	0
5	4:15 PM	21	0	0	0	140	1	0	0	7	0	1	0	0	0	0	0
6	4:30 PM	17	0	1	0	116	2	0	0	6	0	0	0	0	0	0	0
7	4:45 PM	25	0	0	0	135	3	0	0	2	0	0	0	0	0	0	0
8	5:00 PM	12	0	0	1	113	1	0	0	8	0	1	0	0	0	0	0
9	5:15 PM	18	0	0	0	127	1	0	0	10	0	1	0	0	0	0	0
10	5:30 PM	13	0	0	0	139	1	0	0	5	0	0	0	0	0	0	0
11	5:45 PM	29	0	0	0	106	0	0	0	6	0	1	0	0	0	0	0
12	6:00 PM	23	0	0	1	96	0	0	0	6	0	0	0	0	0	0	0
3HR Total		284	7	12	3	1596	19	11	0	92	0	13	0	0	0	0	0
Peak Hour Total		90	0	5	0	589	10	3	0	28	0	4	0	0	0	0	0

TIME		Stadium Dr (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	3:15 PM	41	2	1	0	1	0	1	0	31	0	5	0	0	0	0	0	0	0	0	0
2	3:30 PM	46	1	0	0	8	0	0	0	29	0	7	0	0	0	0	0	0	0	0	0
3	3:45 PM	49	4	0	1	4	0	0	0	33	2	1	0	0	0	0	0	0	0	0	0
4	4:00 PM	51	2	0	0	4	0	1	1	21	2	0	0	0	0	0	0	0	0	0	0
5	4:15 PM	54	1	0	0	8	0	1	0	19	1	0	0	0	0	0	0	0	0	0	0
6	4:30 PM	52	4	1	0	6	0	1	0	31	1	0	0	0	0	0	0	0	0	0	0
7	4:45 PM	54	2	0	0	1	0	0	0	33	0	1	1	0	0	0	0	0	0	0	0
8	5:00 PM	40	2	0	1	3	0	1	1	21	1	0	0	0	0	0	0	0	0	0	0
9	5:15 PM	60	2	0	0	1	0	0	5	32	1	1	0	0	0	0	0	0	0	0	0
10	5:30 PM	35	0	0	0	4	0	0	1	23	0	0	0	0	0	0	0	0	0	0	0
11	5:45 PM	29	1	0	0	5	0	1	0	13	0	1	0	0	0	0	0	0	1	0	0
12	6:00 PM	30	0	0	0	7	0	0	0	17	1	0	1	0	0	0	0	0	0	0	0
3HR Total		541	21	2	2	52	0	6	8	303	9	16	2	0	0	0	0	0	1	0	0
Peak Hour Total		206	11	1	1	22	0	3	1	104	6	1	0	0	0	0	0	0	0	0	0

TDC
Traffic Data & Control

Site ID: N/A
Location: Hogbin Dr & Howard St
Weather: Fine
Suburb: Coffs Harbour
Duration: 7:00am to 10:00am (Thursday) & 3:00pm to 6:00pm (Wednesday)
Day/Date: Wednesday, 28 November 2012 & Thursday, 29 November 2012
AM Peak 09:15 (hour ending)
PM Peak 16:30 (hour ending)
Traffic Control: Roundabout
HOME

TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (Hard Right Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	5	1	0	0	67	2	1	1	0	0	0	0	14	0	0	0
2	7:30 AM	6	0	0	0	100	6	0	0	0	0	0	0	6	0	0	0
3	7:45 AM	2	1	0	1	114	7	3	0	0	0	0	0	15	2	0	0
4	8:00 AM	4	0	1	0	145	5	0	3	0	0	0	0	30	0	0	0
5	8:15 AM	6	2	0	0	140	5	1	0	0	0	0	0	29	0	0	0
6	8:30 AM	10	1	0	0	157	7	3	0	0	0	0	0	21	0	0	0
7	8:45 AM	2	0	0	0	155	6	7	0	0	0	0	0	20	0	2	0
8	9:00 AM	9	1	0	0	145	4	6	0	0	0	0	0	14	0	1	0
9	9:15 AM	3	0	0	0	121	2	2	1	0	0	0	0	14	0	0	0
10	9:30 AM	0	0	0	0	99	8	0	0	0	0	0	0	13	0	0	0
11	9:45 AM	3	1	0	0	125	3	1	0	0	0	0	0	15	0	0	0
12	10:00 AM	2	0	0	0	133	4	0	0	0	0	0	0	18	0	0	0
3HR Total		52	7	1	1	1501	59	24	5	0	0	0	0	209	2	3	0
Peak Hour Total		24	2	0	0	578	19	18	1	0	0	0	0	69	0	3	0

TIME		Howard St (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Bear Right Turn)				Movement 6a (RightTurn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	3	0	0	0	0	0	0	0	3	2	0	0	6	3	0	1
2	7:30 AM	3	0	1	0	0	0	0	0	2	1	0	0	4	2	0	0
3	7:45 AM	3	0	0	0	0	0	0	0	4	0	0	0	7	1	0	0
4	8:00 AM	4	0	0	0	0	0	0	0	4	0	0	0	6	0	1	0
5	8:15 AM	3	0	0	0	0	0	0	0	3	0	0	0	4	1	0	0
6	8:30 AM	6	0	0	0	0	0	0	0	4	1	0	0	7	1	1	0
7	8:45 AM	3	0	0	0	0	0	0	0	3	0	0	0	6	0	0	0
8	9:00 AM	3	0	0	0	0	0	0	0	3	0	0	0	5	1	1	0
9	9:15 AM	1	0	0	0	0	0	0	0	2	0	0	0	4	0	0	0
10	9:30 AM	9	0	0	0	0	0	0	0	3	0	0	0	4	1	0	0
11	9:45 AM	1	0	0	0	1	0	0	0	4	0	0	0	6	1	0	0
12	10:00 AM	4	0	0	0	0	0	0	0	5	0	0	0	9	1	0	0
3HR Total		43	0	1	0	1	0	0	0	40	4	0	0	68	12	3	1
Peak Hour Total		13	0	0	0	0	0	0	0	12	1	0	0	22	2	2	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Bear Left Turn)				Movement 9 (Through)				Movement 9a (Right Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	0	0	0	0	36	3	1	0	52	0	2	1	0	0	0	0
2	7:30 AM	0	0	0	0	36	2	0	2	96	3	3	0	3	0	0	0
3	7:45 AM	0	0	0	0	58	2	0	2	102	2	1	0	0	0	0	0
4	8:00 AM	1	0	0	0	105	1	0	0	129	3	2	0	0	0	0	0
5	8:15 AM	1	0	0	0	83	2	1	2	133	2	0	0	0	0	0	0
6	8:30 AM	0	0	0	0	152	1	1	0	186	2	7	0	1	0	1	0
7	8:45 AM	1	0	0	0	156	0	0	3	190	4	4	0	0	0	0	0
8	9:00 AM	1	0	0	0	149	0	2	1	182	1	3	0	3	0	0	0
9	9:15 AM	0	0	0	0	120	0	0	0	164	2	5	0	3	0	0	0
10	9:30 AM	0	0	0	0	76	1	1	0	133	3	6	0	2	0	0	0
11	9:45 AM	0	0	0	0	69	0	0	0	140	1	2	0	3	0	0	0
12	10:00 AM	1	0	0	0	82	3	0	0	134	2	1	0	0	0	0	0
3HR Total		5	0	0	0	1122	15	6	10	1641	25	36	1	15	0	1	0
Peak Hour Total		2	0	0	0	577	1	3	4	722	9	19	0	7	0	1	0

TIME		City Hill Dr (Eastbound)															
		Movement 10 (Hard Left Turn)				Movement 11 (Left Turn)				Movement 12 (Through)				Movement 12a (Right Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	8:00 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
5	8:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	8:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	8:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	9:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
9	9:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
10	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	10:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3HR Total		5	0	0	0	2	1	1	0	0	0	0	0	1	0	0	0
Peak Hour Total		2	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0

TIME		Albany St (South-Eastbound)															
		Movement 10 (Hard Left Turn)				Movement 11 (Bear Left Turn)				Movement 12 (Bear Right Turn)				Movement 12a (Hard Right Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	5	0	0	0	3	0	1	0	19	1	0	0	0	0	0	0
2	7:30 AM	11	1	0	0	3	0	0	3	35	0	0	2	0	0	0	0
3	7:45 AM	9	0	0	0	3	0	0	1	52	2	1	0	0	0	0	0
4	8:00 AM	8	0	0	0	2	0	0	0	54	1	0	0	0	0	0	0
5	8:15 AM	14	0	0	0	6	0	0	0	49	0	2	1	0	0	0	0
6	8:30 AM	12	0	0	0	2	0	0	0	85	1	2	0	0	0	0	0
7	8:45 AM	19	0	0	0	0	0	0	0	94	3	3	0	0	0	0	0
8	9:00 AM	18	1	0	0	6	0	0	0	69	0	1	2	0	0	0	0
9	9:15 AM	13	0	0	0	7	0	0	0	53	2	0	0	0	0	0	0
10	9:30 AM	14	0	0	0	1	0	0	2	58	1	0	0	0	0	0	0
11	9:45 AM	16	0	0	0	4	1	1	1	45	0	0	0	0	0	0	0
12	10:00 AM	15	0	0	0	6	0	0	1	61	0	0	0	0	0	0	0
3HR Total		154	2	0	0	43	1	2	8	674	11	9	5	0	0	0	0
Peak Hour Total		62	1	0	0	15	0	0	0	301	6	6	2	0	0	0	0

TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (Hard Right Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	5	0	0	0	149	4	1	0	0	0	0	0	36	1	1	0
2	3:30 PM	6	1	0	0	150	3	4	0	0	0	0	0	23	1	1	0
3	3:45 PM	4	0	0	0	181	4	3	1	0	0	0	0	23	0	1	0
4	4:00 PM	7	0	0	0	162	5	4	0	0	0	0	0	11	0	1	0
5	4:15 PM	3	0	0	0	149	5	1	0	0	0	0	0	14	0	0	0
6	4:30 PM	8	0	0	0	196	7	0	1	0	0	0	0	23	0	0	2
7	4:45 PM	3	0	0	0	158	6	2	0	0	0	0	0	25	0	0	0
8	5:00 PM	5	0	0	0	140	6	1	1	0	0	0	0	12	0	0	0
9	5:15 PM	6	0	0	0	180	3	2	0	0	0	0	0	19	0	0	0
10	5:30 PM	3	0	0	0	159	3	0	1	0	0	0	0	17	0	0	0
11	5:45 PM	5	0	0	0	145	2	1	1	0	0	0	0	15	0	0	0
12	6:00 PM	2	0	0	0	146	1	0	1	0	0	0	0	11	0	0	0
3HR Total		57	1	0	0	1915	49	19	6	0	0	0	0	229	2	4	2
Peak Hour Total		22	0	0	0	688	21	8	2	0	0	0	0	71	0	2	2

TIME		Howard St (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Bear Right Turn)				Movement 6a (RightTurn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	7	1	1	0	0	0	0	0	2	0	0	0	4	0	0	0
2	3:30 PM	5	0	0	0	0	0	0	0	2	0	0	0	4	0	0	0
3	3:45 PM	4	0	0	0	0	0	0	0	3	0	0	0	6	0	0	0
4	4:00 PM	3	1	0	0	0	0	0	0	5	0	0	0	7	0	0	0
5	4:15 PM	2	0	0	0	0	0	0	0	2	0	0	0	4	0	0	0
6	4:30 PM	7	0	0	0	0	0	0	0	3	0	0	0	6	0	0	0
7	4:45 PM	1	0	0	0	0	0	0	0	4	0	0	0	7	0	0	0
8	5:00 PM	6	0	0	0	0	0	0	0	5	0	0	0	9	0	0	0
9	5:15 PM	5	0	0	0	0	0	0	0	4	0	0	0	6	1	0	0
10	5:30 PM	4	0	0	0	0	0	0	0	3	0	0	0	5	0	0	0
11	5:45 PM	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0
12	6:00 PM	1	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0
3HR Total		47	2	1	0	0	0	0	0	37	0	0	0	63	1	0	0
Peak Hour Total		16	1	0	0	0	0	0	0	13	0	0	0	23	0	0	0

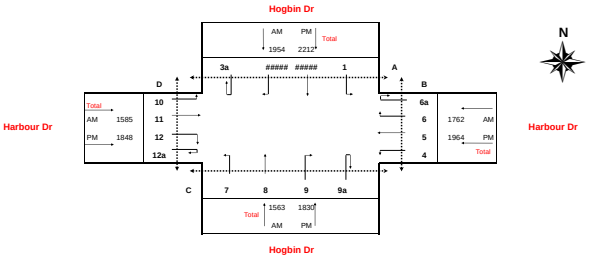
TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Bear Left Turn)				Movement 9 (Through)				Movement 9a (Right Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	0	0	0	0	64	0	2	0	139	3	5	0	0	0	0	0
2	3:30 PM	0	0	0	0	76	1	2	0	123	0	10	0	2	0	0	0
3	3:45 PM	0	0	0	0	91	1	0	0	174	6	9	0	1	0	0	0
4	4:00 PM	0	0	0	0	78	0	1	0	162	2	3	0	1	0	0	0
5	4:15 PM	0	0	0	0	92	1	1	0	194	1	3	0	1	0	0	0
6	4:30 PM	0	0	0	0	94	0	1	0	144	3	1	0	1	0	0	0
7	4:45 PM	0	0	0	0	82	0	0	0	130	5	2	0	2	0	0	0
8	5:00 PM	0	0	0	0	75	0	0	0	138	4	1	0	0	0	0	0
9	5:15 PM	0	0	0	0	75	0	0	0	150	2	2	0	1	0	0	0
10	5:30 PM	0	0	0	0	71	1	0	1	154	1	1	0	1	0	0	0
11	5:45 PM	0	0	0	0	43	0	0	0	109	1	1	0	3	0	0	0
12	6:00 PM	0	0	0	0	40	0	0	0	97	0	0	0	2	0	0	0
3HR Total		0	0	0	0	881	4	7	1	1714	28	38	0	15	0	0	0
Peak Hour Total		0	0	0	0	355	2	3	0	674	12	16	0	4	0	0	0

TIME		City Hill Dr (Eastbound)															
		Movement 10 (Hard Left Turn)				Movement 11 (Left Turn)				Movement 12 (Through)				Movement 12a (Right Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
3	3:45 PM	1	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0
4	4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
5	4:15 PM	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
6	4:30 PM	6	0	0	0	14	0	0	0	0	0	0	0	7	0	0	0
7	4:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0
8	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
9	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
11	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3HR Total		11	0	1	0	18	2	0	0	0	0	0	0	13	0	0	0
Peak Hour Total		9	0	1	0	17	1	0	0	0	0	0	0	8	0	0	0

TIME		Albany St (South-Eastbound)															
		Movement 10 (Hard Left Turn)				Movement 11 (Bear Left Turn)				Movement 12 (Bear Right Turn)				Movement 12a (Hard Right Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	37	1	0	0	3	0	0	0	88	1	1	0	0	0	0	0
2	3:30 PM	20	0	1	0	5	0	0	0	90	1	0	1	0	0	0	0
3	3:45 PM	26	0	0	0	6	0	0	0	84	2	3	1	0	0	0	0
4	4:00 PM	27	0	0	0	6	0	0	0	79	1	1	1	0	0	0	0
5	4:15 PM	14	1	0	0	6	0	0	0	88	2	1	0	0	0	0	0
6	4:30 PM	24	0	0	0	2	0	0	0	76	0	0	0	0	0	0	0
7	4:45 PM	17	0	0	0	2	0	0	0	87	0	0	0	0	0	0	0
8	5:00 PM	11	0	0	0	4	0	0	0	55	1	0	0	0	0	0	0
9	5:15 PM	26	0	0	0	7	0	0	0	126	2	0	0	0	0	0	0
10	5:30 PM	22	0	0	0	1	0	0	0	92	0	0	4	0	0	0	0
11	5:45 PM	19	0	0	0	4	0	0	0	66	1	0	0	0	0	0	0
12	6:00 PM	10	0	0	0	4	0	0	0	36	0	1	0	0	0	0	0
3HR Total		253	2	1	0	50	0	0	0	967	11	7	7	0	0	0	0
Peak Hour Total		91	1	0	0	20	0	0	0	327	5	5	2	0	0	0	0

TDC
Traffic Data & Control

Site ID: N/A
Location: Hogbin Dr & Harbour Dr
Weather: Fine
Suburb: Coffs Harbour
Duration: 7:00am to 10:00am (Thursday) & 3:00pm to 6:00pm (Wednesday)
Day/Date: Wednesday, 28 November 2012 & Thursday, 29 November 2012
AM Peak 09:00 (hour ending)
PM Peak 16:30 (hour ending)
Traffic Control: Roundabout
HOME



TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	5	0	1	0	43	2	1	3	12	2	1	0	0	0	0	0
2	7:30 AM	11	0	1	0	64	2	0	0	37	3	0	1	0	0	0	0
3	7:45 AM	9	1	0	0	64	3	0	0	40	3	1	0	0	0	0	0
4	8:00 AM	13	1	1	0	104	0	1	2	29	1	1	0	0	0	0	0
5	8:15 AM	22	0	0	0	118	2	0	1	22	3	0	1	0	0	0	0
6	8:30 AM	36	0	1	0	137	5	2	2	27	2	0	0	0	0	0	0
7	8:45 AM	34	0	1	0	127	5	3	1	30	1	1	0	0	0	0	0
8	9:00 AM	40	0	1	1	147	5	0	0	21	1	0	1	0	0	0	0
9	9:15 AM	30	1	0	1	113	3	1	1	51	0	2	1	0	0	0	0
10	9:30 AM	23	1	2	0	102	2	1	0	25	1	0	1	0	0	0	0
11	9:45 AM	29	0	0	0	95	8	0	1	26	0	0	0	0	0	0	0
12	10:00 AM	17	0	1	1	106	2	0	2	39	0	1	0	0	0	0	0
3HR Total		269	4	9	3	1220	39	9	13	359	17	7	5	0	0	0	0
Peak Hour Total		132	0	3	1	529	17	5	4	100	7	1	2	0	0	0	0

TIME		Harbour Dr (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	2	0	0	0	48	3	0	2	18	1	0	1	0	0	0	0
2	7:30 AM	7	0	0	0	52	3	0	1	40	2	0	2	0	0	0	0
3	7:45 AM	3	0	0	0	63	1	1	2	53	1	0	1	0	0	0	0
4	8:00 AM	2	0	0	0	75	4	0	0	58	1	0	2	0	0	0	0
5	8:15 AM	9	0	0	0	122	2	0	0	85	3	0	1	0	0	0	0
6	8:30 AM	4	0	0	0	109	3	0	0	74	4	0	0	0	0	0	0
7	8:45 AM	3	0	0	0	102	1	1	0	59	0	0	0	0	0	0	0
8	9:00 AM	5	0	0	0	101	2	3	0	78	1	1	1	0	0	0	0
9	9:15 AM	8	0	0	0	62	0	1	2	65	1	0	1	0	0	0	0
10	9:30 AM	9	0	0	0	63	4	0	0	49	1	0	0	0	0	0	0
11	9:45 AM	3	0	0	0	80	4	0	0	38	1	0	0	0	0	0	0
12	10:00 AM	7	1	0	0	70	0	0	1	67	0	0	1	0	0	0	0
3HR Total		62	1	0	0	947	27	6	8	684	16	1	10	0	0	0	0
Peak Hour Total		21	0	0	0	434	8	4	0	296	8	1	2	0	0	0	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	17	0	0	0	45	2	0	0	16	1	0	0	0	0	0	0
2	7:30 AM	20	2	0	2	51	2	2	0	14	1	0	1	0	0	0	0
3	7:45 AM	29	4	2	0	50	2	2	1	27	0	0	0	0	0	0	0
4	8:00 AM	49	0	0	1	50	5	0	0	42	0	0	2	0	0	0	0
5	8:15 AM	32	3	0	0	57	2	1	0	13	0	1	0	0	0	0	0
6	8:30 AM	29	1	1	0	69	1	1	0	38	0	3	0	0	0	0	0
7	8:45 AM	37	4	6	0	72	2	3	0	48	0	1	0	0	0	0	0
8	9:00 AM	34	2	0	0	47	3	1	0	66	0	0	0	0	0	0	0
9	9:15 AM	24	1	0	1	29	0	1	0	75	3	0	0	0	0	0	0
10	9:30 AM	24	1	0	1	32	2	0	0	53	0	1	1	0	0	0	0
11	9:45 AM	31	1	0	0	58	3	0	0	52	0	0	1	0	0	0	0
12	10:00 AM	34	2	0	1	45	1	1	0	63	0	0	1	0	0	0	0
3HR Total		360	21	9	6	605	25	12	1	507	5	6	6	0	0	0	0
Peak Hour Total		132	10	7	0	245	8	6	0	165	0	5	0	0	0	0	0

TIME		Harbour Dr (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	7:15 AM	18	0	0	0	50	1	0	0	9	1	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	21	2	0	0	63	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0
3	7:45 AM	29	6	2	0	77	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0
4	8:00 AM	44	1	0	0	85	2	0	4	5	2	0	1	0	1	0	0	0	0	0	0
5	8:15 AM	35	3	0	0	99	1	1	2	0	2	0	0	0	0	1	0	4	0	2	2
6	8:30 AM	29	3	0	0	106	2	1	0	0	0	4	1	0	0	0	0	1	0	4	4
7	8:45 AM	39	5	6	0	100	4	4	0	16	0	2	0	0	0	1	0	3	0	4	4
8	9:00 AM	31	2	1	0	87	2	2	2	18	0	1	0	0	0	0	0	3	0	1	1
9	9:15 AM	26	1	0	2	84	2	1	0	17	1	0	0	0	0	0	0	0	0	0	1
10	9:30 AM	22	1	0	1	77	0	0	0	8	0	1	0	0	0	0	0	0	0	0	0
11	9:45 AM	31	1	0	0	93	3	0	0	16	0	1	0	0	0	0	0	0	0	0	1
12	10:00 AM	35	2	0	1	97	1	0	1	9	2	0	0	0	0	0	0	0	0	0	0
3HR Total		360	27	9	4	1018	25	10	11	98	8	9	3	0	1	2	0	11	0	11	13
Peak Hour Total		134	13	7	0	392	9	8	4	34	2	7	1	0	0	2	0	11	0	11	11

TIME		Hogbin Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	22	0	0	0	116	7	4	2	26	0	0	0	0	0	0	0
2	3:30 PM	22	0	2	0	112	4	4	0	31	0	0	1	0	0	0	0
3	3:45 PM	29	0	3	0	126	5	4	4	39	3	1	0	0	0	0	0
4	4:00 PM	22	1	1	0	135	4	2	0	44	0	0	0	0	0	0	0
5	4:15 PM	24	0	0	1	136	4	1	0	45	0	0	0	0	0	0	0
6	4:30 PM	19	0	0	1	144	6	1	2	37	1	0	1	2	0	0	0
7	4:45 PM	17	0	0	0	124	2	0	0	31	3	0	0	0	0	0	0
8	5:00 PM	13	0	0	0	134	2	0	3	22	2	0	0	0	0	0	0
9	5:15 PM	9	0	0	0	144	3	0	3	29	2	0	1	0	0	0	0
10	5:30 PM	11	0	0	0	143	0	0	0	21	2	0	1	0	0	0	1
11	5:45 PM	18	0	0	0	122	1	0	1	20	1	0	0	0	0	0	0
12	6:00 PM	7	0	0	0	109	0	0	0	9	0	0	0	0	0	0	0
3HR Total		213	1	6	2	1545	38	16	15	354	14	1	4	2	0	0	1
Peak Hour Total		94	1	4	2	541	19	8	6	165	4	1	1	2	0	0	0

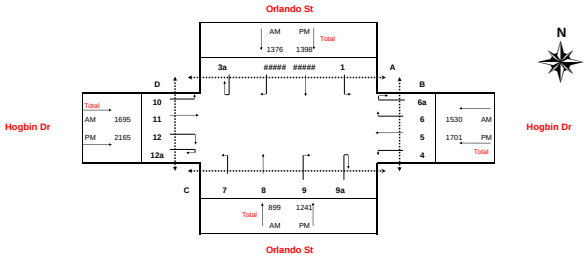
TIME		Harbour Dr (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	10	0	0	0	98	5	2	4	66	2	3	0	0	0	0	0
2	3:30 PM	5	1	0	0	88	2	0	1	36	1	1	1	0	0	0	0
3	3:45 PM	10	0	0	0	93	0	1	0	48	2	0	0	0	0	0	0
4	4:00 PM	9	0	0	0	92	3	2	0	60	0	0	0	0	0	0	0
5	4:15 PM	6	0	0	0	78	0	1	0	59	3	0	0	0	0	0	0
6	4:30 PM	4	0	0	0	128	5	0	0	85	2	0	2	3	0	0	0
7	4:45 PM	6	0	0	0	89	2	0	0	48	3	0	0	0	0	0	0
8	5:00 PM	3	0	0	0	89	1	2	2	50	3	0	0	0	0	0	0
9	5:15 PM	10	0	0	1	91	1	2	3	48	1	0	2	0	0	0	0
10	5:30 PM	5	0	0	0	112	0	0	3	39	1	0	2	0	0	0	0
11	5:45 PM	8	0	0	0	98	2	1	2	34	0	1	0	0	0	0	0
12	6:00 PM	7	0	0	0	111	1	0	1	56	1	0	0	0	0	0	0
3HR Total		83	1	0	1	1167	22	11	16	629	19	5	7	3	0	0	0
Peak Hour Total		29	0	0	0	391	8	4	0	252	7	0	2	3	0	0	0

TIME		Hogbin Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	44	1	0	0	62	2	0	2	59	0	0	0	0	0	0	0
2	3:30 PM	38	3	1	0	82	0	0	1	45	0	1	0	0	0	0	0
3	3:45 PM	59	2	4	0	85	2	4	0	39	0	4	0	0	0	0	0
4	4:00 PM	29	3	2	0	80	3	3	0	34	1	0	1	0	0	0	0
5	4:15 PM	47	0	3	0	68	1	0	0	32	0	1	3	0	0	0	0
6	4:30 PM	39	0	1	0	78	5	0	0	13	0	0	1	0	0	0	0
7	4:45 PM	48	0	4	0	76	1	0	0	27	0	1	0	0	0	0	0
8	5:00 PM	31	0	3	1	64	2	1	0	28	0	0	3	0	0	0	0
9	5:15 PM	56	2	0	0	78	0	2	1	19	0	0	0	0	0	0	0
10	5:30 PM	27	2	0	0	96	0	0	0	7	0	0	0	0	0	0	0
11	5:45 PM	38	0	0	2	78	2	1	1	19	0	0	0	0	0	0	0
12	6:00 PM	33	1	0	0	70	0	0	0	17	0	0	0	0	0	0	0
3HR Total		489	14	18	3	917	18	11	5	339	1	7	8	0	0	0	0
Peak Hour Total		174	5	10	0	311	11	7	0	118	1	5	5	0	0	0	0

TIME		Harbour Dr (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	3:15 PM	42	1	0	0	101	1	0	3	26	2	0	1	0	0	0	0	6	0	0	0
2	3:30 PM	39	3	1	0	108	0	0	0	18	0	2	1	0	0	0	0	2	0	0	0
3	3:45 PM	55	2	3	0	102	1	7	0	21	0	2	0	0	0	1	0	11	0	0	0
4	4:00 PM	29	3	1	0	101	1	3	0	9	1	1	1	0	0	0	0	4	0	0	0
5	4:15 PM	47	3	0	0	92	1	0	1	4	0	0	0	0	0	0	0	5	1	1	0
6	4:30 PM	35	2	0	0	99	8	0	1	0	0	0	0	0	0	0	0	2	0	1	0
7	4:45 PM	47	3	1	0	97	3	0	1	1	0	1	0	0	0	0	0	5	0	0	0
8	5:00 PM	33	3	0	0	81	2	0	0	11	0	0	0	0	0	0	1	11	0	0	0
9	5:15 PM	57	1	0	0	101	0	1	4	7	0	0	0	0	0	0	0	0	0	0	0
10	5:30 PM	27	2	0	0	107	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11	5:45 PM	39	0	0	2	83	0	1	1	14	1	0	0	0	0	0	0	0	0	0	0
12	6:00 PM	34	0	0	0	87	0	0	0	7	0	0	1	0	0	0	0	0	0	1	0
3HR Total		484	23	6	2	1159	17	12	11	118	4	6	4	0	0	1	1	46	1	4	0
Peak Hour Total		166	10	4	0	394	11	10	2	34	1	3	1	0	0	1	0	22	1	2	0

TDC
Traffic Data & Control

Site ID: N/A
Location: Hogbin Dr & Orlando St
Weather: Fine
Suburb: Coffs Harbour
Duration: 7:00am to 10:00am (Thursday) & 3:00pm to 6:00pm (Wednesday)
Day/Date: Wednesday, 28 November 2012 & Thursday, 29 November 2012
AM Peak 09:15 (hour ending)
PM Peak 16:45 (hour ending)
Traffic Control: Roundabout
HOME



TIME		Orlando St (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	6	0	0	0	19	3	0	0	32	1	0	1	0	0	0	0
2	7:30 AM	5	1	0	0	36	2	0	0	46	4	0	0	0	0	0	0
3	7:45 AM	6	3	0	0	30	4	2	0	49	0	0	0	0	0	0	0
4	8:00 AM	6	0	0	0	38	0	0	0	60	4	0	0	0	0	0	0
5	8:15 AM	2	1	0	1	47	3	0	0	65	4	0	0	0	0	0	0
6	8:30 AM	9	1	0	0	63	2	5	0	69	3	1	0	0	0	1	0
7	8:45 AM	4	3	0	0	67	2	4	0	59	0	1	0	0	0	0	0
8	9:00 AM	10	0	0	0	76	2	0	0	60	2	0	0	1	0	0	0
9	9:15 AM	10	0	0	0	70	2	0	2	46	1	1	1	0	0	0	0
10	9:30 AM	13	0	0	0	55	1	0	1	39	2	0	0	0	0	0	0
11	9:45 AM	13	2	0	0	44	1	0	0	45	3	0	0	1	1	0	0
12	10:00 AM	10	0	0	1	50	4	0	0	26	3	0	1	0	1	0	0
3HR Total		94	11	0	2	595	26	11	3	596	27	3	3	2	2	1	0
Peak Hour Total		33	4	0	0	276	8	9	2	234	6	3	1	1	0	1	0

TIME		Hogbin Dr (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	11	2	0	0	40	4	0	3	8	0	0	0	0	0	0	0
2	7:30 AM	22	1	1	0	54	3	0	2	7	2	0	0	0	0	0	0
3	7:45 AM	14	1	0	0	66	0	0	0	8	1	0	0	0	0	0	0
4	8:00 AM	24	1	1	0	69	3	0	3	12	0	0	1	0	0	0	0
5	8:15 AM	31	1	3	0	101	2	0	1	7	0	1	0	0	0	0	0
6	8:30 AM	49	2	1	2	101	1	0	0	14	0	0	1	0	0	0	0
7	8:45 AM	31	1	1	0	90	1	0	1	8	2	0	0	1	0	0	0
8	9:00 AM	45	3	1	0	93	1	0	1	9	2	0	0	0	0	0	0
9	9:15 AM	43	1	1	1	86	2	0	0	12	0	1	0	0	0	0	0
10	9:30 AM	32	0	0	0	70	5	0	0	21	2	0	1	0	0	0	0
11	9:45 AM	31	1	0	0	83	0	0	1	7	0	0	0	0	0	0	0
12	10:00 AM	51	0	1	0	89	1	0	0	12	2	0	0	0	0	0	0
3HR Total		384	14	10	3	942	23	0	12	125	11	2	3	1	0	0	0
Peak Hour Total		168	7	4	3	370	5	0	2	43	4	1	1	1	0	0	0

TIME		Orlando St (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	4	0	0	0	18	2	0	2	14	1	1	2	0	0	0	0
2	7:30 AM	4	0	0	0	20	2	0	0	18	0	0	0	0	0	0	0
3	7:45 AM	12	0	0	1	24	5	0	0	16	1	0	1	0	0	0	0
4	8:00 AM	9	0	0	1	33	2	1	2	13	2	1	0	0	0	0	0
5	8:15 AM	12	0	0	0	24	0	0	0	21	1	1	0	0	0	0	0
6	8:30 AM	8	1	2	0	33	3	1	0	20	1	0	0	0	0	0	0
7	8:45 AM	18	0	4	1	31	1	1	2	27	2	0	1	0	0	0	0
8	9:00 AM	9	0	0	0	44	1	0	0	40	1	0	0	0	0	0	0
9	9:15 AM	9	0	0	0	49	2	2	0	38	0	0	0	0	0	0	0
10	9:30 AM	10	0	0	0	41	1	1	0	29	1	1	0	0	0	0	0
11	9:45 AM	8	0	0	0	37	2	0	0	33	1	0	0	0	0	0	0
12	10:00 AM	9	2	0	0	47	2	0	1	48	0	1	1	0	0	0	0
3HR Total		112	3	6	3	401	23	6	7	317	11	5	5	0	0	0	0
Peak Hour Total		44	1	6	1	157	7	4	2	125	4	0	1	0	0	0	0

TIME		Hogbin Dr (Eastbound)															
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	18	4	1	0	33	1	0	2	4	0	0	0	0	0	0	0
2	7:30 AM	44	5	0	2	50	3	0	1	5	0	0	0	0	0	0	0
3	7:45 AM	37	2	1	0	65	1	0	1	8	0	0	0	1	0	0	0
4	8:00 AM	67	1	0	2	62	2	0	0	7	0	0	0	0	0	0	0
5	8:15 AM	35	3	0	0	70	0	0	0	8	0	0	0	0	0	0	0
6	8:30 AM	51	1	0	1	80	3	1	1	16	0	1	0	0	0	0	0
7	8:45 AM	49	2	2	1	106	2	0	0	13	0	2	0	0	0	0	0
8	9:00 AM	45	1	1	1	106	3	0	0	13	0	0	0	3	0	0	0
9	9:15 AM	36	1	0	0	142	3	0	0	10	1	0	0	0	0	0	0
10	9:30 AM	38	1	1	0	96	1	0	0	4	0	1	0	0	0	0	0
11	9:45 AM	31	1	0	0	100	0	0	0	12	1	0	0	1	0	0	0
12	10:00 AM	56	0	0	0	104	0	0	0	3	0	0	0	0	0	0	0
3HR Total		507	22	6	7	1014	19	1	5	103	2	4	0	5	0	0	0
Peak Hour Total		181	5	3	3	434	11	1	1	52	1	3	0	3	0	0	0

TIME		Pedestrians			
		A	B	C	D
15 MINUTE PERIOD ENDING		North	East	South	West
1	7:15 AM	1	1	0	0
2	7:30 AM	0	0	0	0
3	7:45 AM	0	2	0	0
4	8:00 AM	0	1	0	4
5	8:15 AM	0	1	4	4
6	8:30 AM	0	0	4	1
7	8:45 AM	0	0	2	0
8	9:00 AM	0	1	1	2
9	9:15 AM	2	2	0	2
10	9:30 AM	1	2	1	0
11	9:45 AM	1	2	1	0
12	10:00 AM	1	3	0	0
3HR Total		6	15	13	13
Peak Hour Total		2	3	7	5

TIME		Orlando St (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	11	0	0	0	39	4	0	0	52	4	1	0	0	0	0	0
2	3:30 PM	11	0	0	1	57	3	1	0	38	3	0	1	1	0	0	0
3	3:45 PM	15	1	0	0	38	0	3	1	50	2	1	0	1	0	1	0
4	4:00 PM	21	3	0	1	36	0	2	1	50	0	1	0	1	0	0	0
5	4:15 PM	34	0	0	1	41	0	0	0	53	1	0	0	1	0	0	0
6	4:30 PM	16	1	0	0	50	0	0	0	48	1	0	0	0	0	0	0
7	4:45 PM	35	2	0	0	36	0	0	0	54	4	1	0	2	0	0	0
8	5:00 PM	22	0	0	0	50	0	0	0	37	1	2	1	0	0	0	0
9	5:15 PM	21	0	0	0	39	1	0	0	66	2	0	3	0	0	0	0
10	5:30 PM	5	0	0	0	49	1	0	0	44	1	0	4	0	0	0	0
11	5:45 PM	14	0	0	0	53	0	0	0	40	1	0	1	1	0	0	0
12	6:00 PM	14	0	0	1	46	0	0	0	41	0	0	0	0	0	0	0
3HR Total		219	7	0	4	534	9	6	2	573	20	6	10	7	0	1	0
Peak Hour Total		106	6	0	2	163	0	2	1	205	6	2	0	4	0	0	0

TIME		Hogbin Dr (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	36	2	1	0	84	1	2	1	18	0	0	0	0	0	0	0
2	3:30 PM	35	0	1	1	85	0	0	1	10	0	0	0	1	0	0	0
3	3:45 PM	33	1	1	1	79	1	0	0	18	0	0	0	0	0	0	0
4	4:00 PM	27	0	1	0	98	3	1	0	13	0	0	0	0	0	0	0
5	4:15 PM	33	1	0	0	91	1	1	2	13	0	0	0	0	0	0	0
6	4:30 PM	28	0	1	0	109	2	0	0	12	1	0	0	0	0	0	0
7	4:45 PM	36	1	0	1	98	1	0	0	13	0	0	0	0	0	0	0
8	5:00 PM	29	0	1	0	81	0	1	2	15	0	0	1	0	0	0	0
9	5:15 PM	38	0	0	0	85	0	0	2	10	0	0	0	1	0	0	0
10	5:30 PM	33	1	0	1	92	4	2	1	10	0	0	0	0	0	0	0
11	5:45 PM	30	0	0	1	116	1	0	2	6	0	0	0	0	0	0	0
12	6:00 PM	33	0	0	0	89	2	0	0	8	1	0	1	0	0	0	0
3HR Total		391	6	6	5	1107	16	7	11	146	2	0	2	2	0	0	0
Peak Hour Total		124	2	2	1	396	7	2	2	51	1	0	0	0	0	0	0

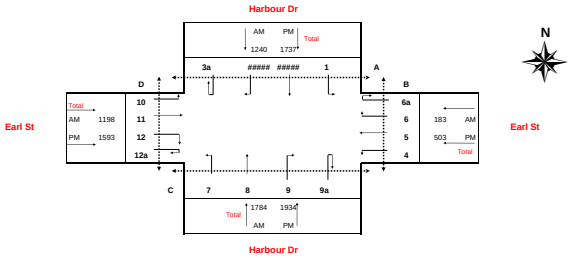
TIME		Orlando St (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	15	0	0	0	48	2	0	0	44	0	0	1	0	0	0	0
2	3:30 PM	14	0	0	0	35	2	0	0	45	0	2	0	0	0	0	0
3	3:45 PM	4	1	0	0	46	0	6	1	40	0	0	0	1	0	0	0
4	4:00 PM	12	0	0	0	57	4	0	0	46	1	2	0	0	0	0	0
5	4:15 PM	12	0	0	0	58	4	1	0	42	0	1	0	0	0	0	0
6	4:30 PM	10	3	0	0	53	0	0	0	33	1	2	0	0	0	0	0
7	4:45 PM	9	0	0	0	48	0	0	0	51	0	1	0	0	0	0	0
8	5:00 PM	4	0	0	0	51	0	0	0	34	0	1	1	0	0	0	0
9	5:15 PM	14	0	0	0	54	1	0	0	47	0	1	2	0	0	0	0
10	5:30 PM	9	0	0	0	49	0	0	0	34	0	1	1	0	0	0	0
11	5:45 PM	7	0	0	0	43	1	0	0	43	0	0	0	0	0	0	0
12	6:00 PM	9	0	0	0	39	3	0	0	33	1	0	0	0	0	0	0
3HR Total		119	4	0	0	581	17	7	1	492	3	11	5	1	0	0	0
Peak Hour Total		43	3	0	0	216	8	1	0	172	2	6	0	0	0	0	0

TIME		Hogbin Dr (Eastbound)															
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	34	1	1	0	109	2	0	0	13	1	1	0	0	0	0	0
2	3:30 PM	47	2	1	0	119	0	0	0	8	0	1	0	0	0	0	0
3	3:45 PM	79	4	1	1	103	0	0	2	11	0	0	0	1	0	0	0
4	4:00 PM	46	0	0	1	125	0	0	0	10	0	0	0	1	0	0	0
5	4:15 PM	62	0	0	3	142	1	0	0	17	0	0	0	0	0	0	0
6	4:30 PM	48	3	0	2	129	1	0	1	4	0	0	0	1	0	0	0
7	4:45 PM	51	4	0	1	117	3	0	2	16	0	0	0	1	0	0	0
8	5:00 PM	59	2	0	1	101	1	0	0	13	0	0	0	1	0	0	0
9	5:15 PM	56	0	0	2	113	3	0	1	8	0	0	0	0	0	0	0
10	5:30 PM	59	0	0	0	113	1	0	1	13	0	0	1	0	0	0	0
11	5:45 PM	44	0	0	0	103	1	0	2	8	0	0	0	0	0	0	0
12	6:00 PM	36	0	0	0	70	0	0	0	18	0	0	0	0	0	0	0
3HR Total		621	16	3	11	1344	13	0	9	139	1	2	1	5	0	0	0
Peak Hour Total		207	7	0	7	513	5	0	3	47	0	0	0	3	0	0	0

TIME		Pedestrians			
		A	B	C	D
15 MINUTE PERIOD ENDING		North	East	South	West
1	3:15 PM	0	0	5	0
2	3:30 PM	0	2	0	0
3	3:45 PM	0	4	0	0
4	4:00 PM	0	0	1	0
5	4:15 PM	0	0	0	1
6	4:30 PM	0	0	0	2
7	4:45 PM	0	1	0	2
8	5:00 PM	0	0	0	0
9	5:15 PM	0	0	1	2
10	5:30 PM	0	0	1	2
11	5:45 PM	9	0	6	1
12	6:00 PM	0	0	1	1
3HR Total		9	7	15	11
Peak Hour Total		0	1	1	5

TDC
Traffic Data & Control

Site ID: N/A
Location: Harbour Dr & Earl St
Weather: Fine
Suburb: Coffs Harbour
Duration: 7:00am to 10:00am (Thursday) & 3:00pm to 6:00pm (Wednesday)
Day/Date: Wednesday, 28 November 2012 & Thursday, 29 November 2012
AM Peak 09:15 (hour ending)
PM Peak 16:00 (hour ending)
Traffic Control: Roundabout
HOME



TIME		Harbour Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	3	0	0	0	38	1	0	2	8	1	0	0	0	0	0	0
2	7:30 AM	3	0	0	0	43	1	0	0	8	0	0	2	0	0	0	0
3	7:45 AM	4	0	0	0	44	2	1	1	17	0	0	0	1	0	0	0
4	8:00 AM	5	0	0	0	71	1	2	1	11	0	0	1	0	0	0	0
5	8:15 AM	10	0	0	0	74	1	2	0	15	1	0	0	0	0	0	0
6	8:30 AM	12	0	0	0	99	2	2	0	15	0	2	0	3	0	0	0
7	8:45 AM	15	1	0	0	86	2	4	1	20	0	1	0	2	0	0	0
8	9:00 AM	14	0	0	0	126	2	3	0	23	1	0	0	2	0	0	0
9	9:15 AM	20	0	0	2	36	0	1	0	13	0	0	0	5	0	0	0
10	9:30 AM	19	0	0	0	65	1	1	0	16	2	0	2	5	0	0	0
11	9:45 AM	12	0	0	0	73	2	2	1	13	0	0	0	10	0	0	0
12	10:00 AM	19	0	0	0	64	2	0	1	23	0	0	0	17	0	0	0
3HR Total		136	1	0	2	819	17	18	7	182	5	3	5	45	0	0	0
Peak Hour Total		61	1	0	2	347	6	10	1	71	1	3	0	12	0	0	0

TIME		Earl St (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
2	7:30 AM	0	0	0	0	3	0	0	0	2	1	0	0	0	0	0	0
3	7:45 AM	2	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0
4	8:00 AM	1	0	0	0	3	0	0	0	4	0	0	0	0	0	0	0
5	8:15 AM	2	0	0	0	2	0	1	0	1	0	0	0	0	0	0	0
6	8:30 AM	1	0	0	0	2	0	0	0	4	0	0	0	0	0	0	0
7	8:45 AM	5	0	0	0	8	0	0	0	8	1	0	0	0	0	0	0
8	9:00 AM	7	0	0	0	4	1	0	0	6	0	0	0	0	0	0	0
9	9:15 AM	10	0	0	0	9	0	0	0	6	1	0	0	0	0	0	0
10	9:30 AM	6	0	0	0	8	0	0	0	10	1	0	0	0	0	0	0
11	9:45 AM	5	1	0	0	3	0	0	0	16	0	0	1	0	0	0	0
12	10:00 AM	7	0	0	0	10	0	0	1	13	0	0	0	0	0	0	0
3HR Total		46	1	1	0	52	2	1	2	73	4	0	1	0	0	0	0
Peak Hour Total		23	0	0	0	23	1	0	0	24	2	0	0	0	0	0	0

TIME		Harbour Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	7:15 AM	27	1	0	0	47	0	0	1	1	0	0	0	0	0	0	0
2	7:30 AM	16	4	0	0	64	2	2	4	2	1	0	0	0	0	0	0
3	7:45 AM	39	2	0	0	60	0	1	0	2	1	0	0	1	0	0	0
4	8:00 AM	49	2	0	0	78	2	1	6	2	0	0	0	2	0	0	0
5	8:15 AM	39	1	0	0	62	2	1	1	5	0	0	0	2	0	0	0
6	8:30 AM	56	1	3	0	106	1	3	0	5	0	0	0	3	0	0	0
7	8:45 AM	47	2	5	0	107	0	1	1	11	0	0	0	2	0	1	0
8	9:00 AM	58	1	2	1	117	0	2	2	11	0	0	0	4	0	0	0
9	9:15 AM	39	2	1	1	130	2	0	0	13	0	0	0	4	0	0	0
10	9:30 AM	49	0	1	1	80	2	3	1	13	1	0	0	1	0	0	0
11	9:45 AM	45	2	0	1	111	2	0	0	7	0	0	0	1	0	0	0
12	10:00 AM	53	0	1	1	114	2	1	1	8	0	0	0	4	0	0	0
3HR Total		517	18	13	5	1076	15	15	17	80	3	0	0	24	0	1	0
Peak Hour Total		200	6	11	2	460	3	6	3	40	0	0	0	13	0	1	0

TIME		Earl St (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	7:15 AM	14	0	0	1	1	0	0	0	27	1	0	1	0	0	0	0	0	0	2	4
2	7:30 AM	19	0	0	0	3	0	1	0	31	2	0	1	0	0	0	0	0	0	4	3
3	7:45 AM	25	1	0	3	1	0	0	1	24	0	0	0	0	0	0	0	0	2	1	0
4	8:00 AM	34	0	0	0	3	0	0	0	45	0	0	0	3	0	0	0	0	4	2	2
5	8:15 AM	37	0	0	0	6	0	0	1	39	1	0	0	1	0	0	0	1	5	0	2
6	8:30 AM	55	0	0	0	7	0	0	0	51	1	3	0	0	0	0	0	0	9	8	1
7	8:45 AM	57	0	0	0	17	0	0	1	80	2	1	0	1	0	0	0	0	16	5	2
8	9:00 AM	61	1	0	1	23	1	0	0	73	1	0	1	0	0	0	0	0	14	9	4
9	9:15 AM	40	0	0	0	13	0	0	2	68	0	0	0	2	0	0	0	0	1	5	1
10	9:30 AM	29	0	0	0	7	1	0	0	41	1	0	0	0	0	0	0	0	12	2	0
11	9:45 AM	40	0	0	0	11	0	0	0	62	0	0	0	2	0	0	0	0	13	3	0
12	10:00 AM	67	0	0	0	4	0	0	0	42	0	0	0	1	0	0	0	0	14	4	0
3HR Total		478	2	0	5	96	2	1	5	583	9	4	3	10	0	0	0	1	90	45	19
Peak Hour Total		213	1	0	1	60	1	0	3	272	4	4	1	3	0	0	0	0	40	27	8

TIME		Harbour Dr (Southbound)															
		Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	19	0	0	0	103	3	1	0	11	0	0	0	1	0	0	0
2	3:30 PM	10	0	0	0	136	2	4	0	22	1	0	0	13	0	0	0
3	3:45 PM	16	0	0	0	131	0	1	0	23	0	0	0	16	0	0	0
4	4:00 PM	12	0	0	0	108	1	0	1	19	1	0	0	7	1	0	0
5	4:15 PM	13	0	0	0	115	2	1	0	0	0	0	0	0	0	0	0
6	4:30 PM	25	0	0	0	110	2	2	0	0	0	0	0	0	0	0	0
7	4:45 PM	15	0	0	1	119	1	0	4	0	0	0	0	0	0	0	0
8	5:00 PM	19	0	0	0	108	1	1	2	0	0	0	0	0	0	0	0
9	5:15 PM	21	0	0	0	120	1	1	0	18	1	0	0	3	0	0	0
10	5:30 PM	9	0	0	0	90	1	1	0	24	3	0	0	0	0	0	0
11	5:45 PM	10	0	0	0	104	0	0	0	15	0	0	0	0	0	0	0
12	6:00 PM	4	0	0	0	95	0	0	0	10	0	0	0	2	0	0	0
3HR Total		173	0	0	1	1339	14	12	7	142	6	0	0	42	1	0	0
Peak Hour Total		57	0	0	0	478	6	6	1	75	2	0	0	37	1	0	0

TIME		Earl St (Westbound)															
		Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	9	0	0	0	12	0	0	0	12	0	0	0	0	0	0	0
2	3:30 PM	15	0	0	0	12	0	0	0	13	0	0	0	0	0	0	0
3	3:45 PM	13	0	0	0	17	0	0	0	11	0	0	0	0	0	0	0
4	4:00 PM	7	0	0	0	14	0	0	0	17	0	0	0	0	0	0	0
5	4:15 PM	16	0	0	0	17	0	0	1	21	0	0	2	0	0	0	0
6	4:30 PM	10	0	0	0	13	0	0	0	15	0	0	1	0	0	0	0
7	4:45 PM	16	0	0	0	12	0	0	0	13	0	0	0	0	0	0	0
8	5:00 PM	9	0	0	0	13	0	0	0	13	0	0	0	0	0	0	0
9	5:15 PM	14	0	0	1	10	0	0	1	21	0	0	0	0	0	0	0
10	5:30 PM	14	0	0	0	18	0	0	1	13	0	0	0	0	0	0	0
11	5:45 PM	6	0	0	0	7	0	0	0	29	0	0	0	0	0	0	0
12	6:00 PM	8	0	0	0	20	0	0	0	16	0	0	0	0	0	0	0
3HR Total		137	0	0	1	165	0	0	3	194	0	0	3	0	0	0	0
Peak Hour Total		44	0	0	0	55	0	0	0	53	0	0	0	0	0	0	0

TIME		Harbour Dr (Northbound)															
		Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9a (U Turn)			
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists
1	3:15 PM	55	1	2	0	113	1	2	0	13	0	0	0	3	0	0	0
2	3:30 PM	50	1	3	0	121	0	1	0	13	0	0	0	5	0	0	0
3	3:45 PM	64	0	8	0	129	1	9	0	10	0	0	0	1	0	0	0
4	4:00 PM	52	0	3	0	95	1	1	0	6	0	0	0	6	0	1	0
5	4:15 PM	49	1	2	1	97	3	0	2	12	0	0	2	4	0	0	0
6	4:30 PM	44	1	0	0	84	0	0	3	10	0	0	0	3	0	0	0
7	4:45 PM	48	2	1	0	79	1	0	3	9	0	0	0	3	0	0	0
8	5:00 PM	46	1	0	2	74	0	0	1	12	0	0	0	2	0	0	0
9	5:15 PM	47	0	1	1	88	0	0	0	11	0	0	0	8	0	0	0
10	5:30 PM	43	0	0	0	66	0	0	1	6	0	0	0	4	0	0	0
11	5:45 PM	37	0	1	0	88	1	0	0	11	0	0	0	4	0	0	0
12	6:00 PM	49	0	0	0	74	0	0	0	9	0	0	0	11	0	0	0
3HR Total		584	7	21	4	1108	8	13	10	122	0	0	2	54	0	1	0
Peak Hour Total		221	2	16	0	458	3	13	0	42	0	0	0	15	0	1	0

TIME		Earl St (Eastbound)																Pedestrians			
		Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12a (U Turn)				A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Cyclists	North	East	South	West
1	3:15 PM	46	1	0	0	20	0	0	2	77	0	2	1	2	0	0	0	0	0	7	0
2	3:30 PM	39	0	0	0	13	0	0	2	65	2	2	1	1	0	0	0	0	0	1	0
3	3:45 PM	36	0	0	1	22	0	0	1	74	0	2	2	3	0	0	0	0	0	0	0
4	4:00 PM	63	0	0	0	21	0	0	0	88	0	0	0	2	0	0	0	0	0	3	1
5	4:15 PM	41	0	0	0	7	0	0	0	69	0	0	0	1	0	0	0	0	4	7	0
6	4:30 PM	40	0	0	0	13	0	0	0	58	1	0	0	0	0	0	0	0	2	9	0
7	4:45 PM	34	0	0	0	5	0	0	0	62	3	0	2	0	0	0	0	0	5	9	0
8	5:00 PM	35	0	0	0	15	0	0	0	91	0	0	0	3	0	0	0	0	11	6	0
9	5:15 PM	34	0	0	1	19	0	0	0	99	0	0	1	5	0	0	0	0	1	4	0
10	5:30 PM	24	0	0	1	25	0	0	0	99	0	0	0	8	0	0	0	0	9	5	0
11	5:45 PM	23	0	0	0	15	0	0	0	82	0	0	1	0	0	0	0	0	7	6	0
12	6:00 PM	18	0	0	0	7	0	0	0	58	0	0	1	1	0	0	0	0	6	10	0
3HR Total		433	1	0	3	182	0	0	5	922	6	6	9	26	0	0	0	0	45	67	1
Peak Hour Total		184	1	0	1	76	0	0	5	304	2	6	4	8	0	0	0	0	0	11	1

APPENDIX B

SIDRA INTERSECTION OUTPUTS

MOVEMENT SUMMARY

Site: AM Site 1 Sawtell Road

Hogbin Drive/Sawtell Road
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Toormina Road											
1	L	160	3.8	0.224	8.5	LOS A	1.0	7.5	0.58	0.73	48.2
2	T	601	3.7	0.575	7.3	LOS A	4.5	32.5	0.70	0.70	48.0
3	R	50	2.0	0.575	14.2	LOS B	4.5	32.5	0.70	0.94	45.5
Approach		811	3.6	0.575	8.0	LOS A	4.5	32.5	0.68	0.72	47.9
East: Sawtell Road											
4	L	72	8.3	0.163	8.5	LOS A	0.7	5.1	0.56	0.73	48.6
5	T	131	2.3	0.353	6.6	LOS A	1.9	13.5	0.58	0.60	48.1
6	R	312	1.9	0.353	13.2	LOS B	1.9	13.5	0.59	0.82	44.8
Approach		515	2.9	0.353	10.9	LOS B	1.9	13.5	0.58	0.75	46.1
North: Hogbin Drive											
7	L	152	0.7	0.251	6.9	LOS A	1.5	10.8	0.53	0.61	48.8
8	T	329	6.7	0.251	5.9	LOS A	1.5	10.8	0.53	0.53	49.0
9	R	67	10.4	0.251	13.0	LOS B	1.4	10.7	0.54	0.83	46.1
Approach		548	5.5	0.251	7.1	LOS A	1.5	10.8	0.53	0.59	48.6
West: Sawtell Road											
10	L	235	4.3	0.410	13.6	LOS B	2.9	21.3	0.89	0.97	43.7
11	T	120	3.3	0.432	11.3	LOS B	3.5	25.3	0.92	0.92	44.7
12	R	188	5.9	0.432	18.2	LOS B	3.5	25.3	0.92	0.96	41.7
Approach		543	4.6	0.432	14.7	LOS B	3.5	25.3	0.91	0.96	43.2
All Vehicles		2417	4.1	0.575	9.9	LOS A	4.5	32.5	0.68	0.75	46.5

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 used.

MOVEMENT SUMMARY

Site: PM Site 1 Sawtell Road

Hogbin Drive/Sawtell Road
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Toormina Road											
1	L	187	1.1	0.216	8.0	LOS A	1.1	7.8	0.56	0.68	48.3
2	T	348	2.0	0.373	6.4	LOS A	2.4	16.7	0.61	0.58	48.6
3	R	78	1.3	0.373	13.3	LOS B	2.4	16.7	0.61	0.86	46.0
Approach		613	1.6	0.373	7.8	LOS A	2.4	16.7	0.59	0.65	48.1
East: Sawtell Road											
4	L	138	5.8	0.200	9.3	LOS A	1.0	7.0	0.67	0.80	47.6
5	T	120	1.7	0.311	7.2	LOS A	1.7	12.5	0.70	0.65	47.1
6	R	171	4.1	0.311	14.1	LOS B	1.7	12.5	0.70	0.90	44.9
Approach		429	4.0	0.311	10.6	LOS B	1.7	12.5	0.69	0.80	46.3
North: Hogbin Drive											
7	L	271	1.8	0.442	7.6	LOS A	3.0	21.2	0.64	0.67	48.2
8	T	497	3.4	0.442	6.6	LOS A	3.0	21.2	0.64	0.60	48.0
9	R	177	3.4	0.442	13.6	LOS B	2.8	20.4	0.65	0.85	45.4
Approach		945	3.0	0.442	8.2	LOS A	3.0	21.2	0.64	0.67	47.5
West: Sawtell Road											
10	L	136	4.4	0.183	9.0	LOS A	0.9	6.9	0.63	0.73	47.9
11	T	147	0.7	0.359	7.1	LOS A	2.3	16.6	0.68	0.65	47.3
12	R	226	2.2	0.359	14.0	LOS B	2.3	16.6	0.68	0.84	44.9
Approach		509	2.4	0.359	10.6	LOS B	2.3	16.6	0.67	0.75	46.3
All Vehicles		2496	2.7	0.442	9.0	LOS A	3.0	21.2	0.64	0.70	47.2

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 used.

MOVEMENT SUMMARY

Site: AM Site 2 Stadium Drive/ Doug Knight Drive

Hogbin Drive/Doug Knight Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hobgin Drive											
1	L	133	16.5	0.462	7.1	LOS A	3.1	22.4	0.48	0.60	49.3
2	T	931	2.1	0.462	5.6	LOS A	3.1	22.4	0.49	0.51	49.5
3	R	93	9.7	0.462	12.7	LOS B	3.0	21.5	0.50	0.83	46.4
Approach		1157	4.4	0.462	6.3	LOS A	3.1	22.4	0.49	0.54	49.2
East: Doug Knight Drive											
4	L	25	36.0	0.063	13.5	LOS B	0.3	2.8	0.73	0.79	44.5
5	T	35	14.3	0.078	8.8	LOS A	0.5	3.7	0.76	0.70	47.0
6	R	22	4.5	0.078	15.5	LOS B	0.5	3.7	0.76	0.80	44.0
Approach		82	18.3	0.078	12.0	LOS B	0.5	3.7	0.75	0.76	45.4
North: Hobgin Drive											
7	L	204	4.4	0.243	7.5	LOS A	1.2	8.7	0.48	0.63	48.8
8	T	575	4.9	0.580	6.0	LOS A	4.4	32.3	0.60	0.54	48.6
9	R	181	5.5	0.580	12.9	LOS B	4.4	32.3	0.60	0.81	46.2
Approach		960	4.9	0.580	7.6	LOS A	4.4	32.3	0.57	0.61	48.1
West: Stadium Drive											
10	L	323	1.9	0.343	8.1	LOS A	1.7	12.4	0.69	0.71	47.5
11	T	94	1.1	0.281	7.8	LOS A	1.3	9.2	0.68	0.70	47.4
12	R	100	9.0	0.281	14.8	LOS B	1.3	9.2	0.68	0.94	44.4
Approach		517	3.1	0.343	9.4	LOS A	1.7	12.4	0.69	0.75	46.8
All Vehicles		2716	4.7	0.580	7.5	LOS A	4.4	32.3	0.56	0.61	48.2

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 used.

MOVEMENT SUMMARY

Site: PM Site 2 Stadium Drive/ Doug Knight Drive

Hogbin Drive/Doug Knight Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hobgin Drive											
1	L	95	5.3	0.334	7.5	LOS A	2.0	14.2	0.56	0.66	48.8
2	T	602	2.2	0.334	6.4	LOS A	2.0	14.2	0.57	0.58	49.0
3	R	32	12.5	0.334	13.6	LOS B	1.9	13.6	0.57	0.89	45.9
Approach		729	3.0	0.334	6.8	LOS A	2.0	14.2	0.57	0.60	48.8
East: Doug Knight Drive											
4	L	55	7.3	0.139	15.5	LOS B	0.8	6.3	0.87	0.89	42.2
5	T	52	3.8	0.277	12.6	LOS B	2.1	15.4	0.95	0.89	43.4
6	R	109	4.6	0.277	19.4	LOS B	2.1	15.4	0.95	0.92	40.8
Approach		216	5.1	0.277	16.8	LOS B	2.1	15.4	0.93	0.90	41.7
North: Hobgin Drive											
7	L	51	13.7	0.063	7.0	LOS A	0.3	2.0	0.34	0.52	49.7
8	T	728	2.2	0.692	5.5	LOS A	6.6	47.1	0.56	0.50	48.8
9	R	279	4.7	0.692	12.4	LOS B	6.6	47.1	0.56	0.75	46.2
Approach		1058	3.4	0.692	7.4	LOS A	6.6	47.1	0.55	0.57	48.1
West: Stadium Drive											
10	L	218	5.5	0.210	7.5	LOS A	1.0	7.3	0.58	0.65	48.2
11	T	25	12.0	0.170	7.0	LOS A	0.7	5.5	0.59	0.61	47.8
12	R	111	6.3	0.170	13.8	LOS B	0.7	5.5	0.59	0.85	44.8
Approach		354	6.2	0.210	9.4	LOS A	1.0	7.3	0.58	0.71	47.0
All Vehicles		2357	3.9	0.692	8.4	LOS A	6.6	47.1	0.59	0.63	47.4

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 used.

MOVEMENT SUMMARY

Site: AM Site 3 Howard Street/ Albany Street/City Hill Drive

Hogbin Drive/Howard Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	583	0.7	0.453	5.3	LOS A	3.0	20.9	0.31	0.47	50.7
2	T	750	3.7	0.453	4.0	LOS A	3.0	21.0	0.32	0.37	51.9
3	R	8	12.5	0.453	12.0	LOS B	2.9	21.0	0.33	0.90	47.2
Approach		1341	2.5	0.453	4.6	LOS A	3.0	21.0	0.32	0.42	51.3
East: Howard Street											
4	L	13	0.0	0.072	7.9	LOS A	0.3	2.4	0.63	0.70	48.1
5	T	13	7.7	0.072	6.8	LOS A	0.3	2.4	0.63	0.63	48.2
6	R	26	15.4	0.072	14.7	LOS B	0.3	2.4	0.63	0.86	44.8
Approach		52	9.6	0.072	11.0	LOS B	0.3	2.4	0.63	0.76	46.3
North: Hobgin Drive											
7	L	26	7.7	0.299	6.2	LOS A	1.8	13.3	0.50	0.55	50.0
8	T	615	6.0	0.299	4.8	LOS A	1.8	13.3	0.51	0.45	50.2
9	R	72	4.2	0.299	12.7	LOS B	1.7	12.7	0.51	0.85	46.7
Approach		713	5.9	0.299	5.7	LOS A	1.8	13.3	0.51	0.49	49.8
West: Albany Street											
10	L	63	1.6	0.086	8.0	LOS A	0.4	2.6	0.58	0.69	48.7
11	T	15	0.0	0.296	5.7	LOS A	1.6	11.5	0.63	0.56	47.6
12	R	313	3.8	0.296	13.6	LOS B	1.6	11.5	0.63	0.82	44.4
Approach		391	3.3	0.296	12.4	LOS B	1.6	11.5	0.62	0.79	45.1
South West: City Hill Drive											
30	L	4	25.0	0.009	9.4	LOS A	0.0	0.3	0.67	0.66	47.7
32	R	1	0.0	0.009	17.1	LOS B	0.0	0.3	0.67	0.81	43.3
Approach		5	20.0	0.009	10.9	LOS B	0.0	0.3	0.67	0.69	46.7
All Vehicles		2502	3.8	0.453	6.3	LOS A	3.0	21.0	0.43	0.50	49.6

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 used.

MOVEMENT SUMMARY

Site: PM Site 3 Howard Street/ Albany Street/City Hill Drive

Hogbin Drive/Howard Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	360	1.4	0.361	5.2	LOS A	2.1	15.2	0.27	0.47	51.0
2	T	702	4.0	0.361	3.9	LOS A	2.1	15.2	0.29	0.36	52.2
3	R	4	0.0	0.361	11.7	LOS B	2.1	15.1	0.29	0.91	47.2
Approach		1066	3.1	0.361	4.4	LOS A	2.1	15.2	0.28	0.40	51.8
East: Howard Street											
4	L	17	5.9	0.073	8.2	LOS A	0.3	2.4	0.67	0.73	47.9
5	T	13	0.0	0.073	6.9	LOS A	0.3	2.4	0.67	0.66	47.9
6	R	23	0.0	0.073	14.7	LOS B	0.3	2.4	0.67	0.87	44.7
Approach		53	1.9	0.073	10.7	LOS B	0.3	2.4	0.67	0.77	46.4
North: Hobgin Drive											
7	L	22	0.0	0.344	6.2	LOS A	2.2	15.6	0.54	0.56	49.8
8	T	717	4.0	0.344	5.0	LOS A	2.2	15.6	0.54	0.47	49.9
9	R	73	2.7	0.344	12.9	LOS B	2.1	14.9	0.55	0.87	46.6
Approach		812	3.8	0.344	5.7	LOS A	2.2	15.6	0.54	0.51	49.6
West: Albany Street											
10	L	92	1.1	0.120	7.7	LOS A	0.5	3.5	0.56	0.69	48.8
11	T	20	0.0	0.309	5.4	LOS A	1.6	11.2	0.59	0.53	48.0
12	R	337	3.0	0.309	13.3	LOS B	1.6	11.2	0.59	0.82	44.5
Approach		449	2.4	0.309	11.8	LOS B	1.6	11.2	0.59	0.78	45.4
South West: City Hill Drive											
30	L	28	7.1	0.046	7.3	LOS A	0.2	1.4	0.61	0.66	48.7
32	R	8	0.0	0.046	15.5	LOS B	0.2	1.4	0.61	0.90	44.5
Approach		36	5.6	0.046	9.1	LOS A	0.2	1.4	0.61	0.71	47.6
All Vehicles		2416	3.2	0.361	6.4	LOS A	2.2	15.6	0.44	0.52	49.5

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 used.

MOVEMENT SUMMARY

Site: AM Site 4 Harbour Drive

Hogbin Drive/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	149	11.4	0.242	9.4	LOS A	1.1	8.2	0.66	0.81	47.7
2	T	259	5.4	0.442	7.2	LOS A	2.6	19.2	0.71	0.67	47.4
3	R	170	2.9	0.442	14.0	LOS B	2.6	19.2	0.71	0.97	45.2
Approach		578	6.2	0.442	9.8	LOS A	2.6	19.2	0.70	0.80	46.7
East: Harbour Drive											
4	L	21	0.0	0.404	7.6	LOS A	2.2	16.0	0.65	0.67	48.5
5	T	446	2.7	0.404	6.5	LOS A	2.2	16.0	0.66	0.59	48.3
6	R	305	3.0	0.404	14.0	LOS B	2.2	15.5	0.67	0.90	44.3
Approach		772	2.7	0.404	9.5	LOS A	2.2	16.0	0.66	0.72	46.6
North: Hogbin Drive											
7	L	135	2.2	0.405	7.7	LOS A	2.3	16.9	0.65	0.67	48.3
8	T	551	4.0	0.405	6.7	LOS A	2.3	16.9	0.65	0.61	48.1
9	R	108	7.4	0.405	14.0	LOS B	2.3	16.4	0.66	0.94	45.3
Approach		794	4.2	0.405	7.9	LOS A	2.3	16.9	0.65	0.67	47.7
West: Harbour Drive											
10	L	154	13.0	0.372	9.7	LOS A	2.5	18.7	0.77	0.82	47.5
11	T	409	4.2	0.372	8.6	LOS A	2.5	18.7	0.77	0.78	47.4
12	R	43	20.9	0.372	16.1	LOS B	2.3	17.2	0.76	0.97	44.1
Approach		606	7.6	0.372	9.4	LOS A	2.5	18.7	0.77	0.80	47.2
All Vehicles		2750	4.9	0.442	9.1	LOS A	2.6	19.2	0.69	0.74	47.1

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 used.

MOVEMENT SUMMARY

Site: PM Site 4 Harbour Drive

Hogbin Drive/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	189	7.9	0.275	9.1	LOS A	1.3	9.5	0.66	0.78	47.7
2	T	329	5.5	0.461	7.4	LOS A	2.9	20.9	0.72	0.69	47.6
3	R	124	4.8	0.461	14.2	LOS B	2.9	20.9	0.72	0.98	45.2
Approach		642	6.1	0.461	9.2	LOS A	2.9	20.9	0.70	0.77	47.1
East: Harbour Drive											
4	L	29	0.0	0.374	7.6	LOS A	2.0	14.1	0.66	0.67	48.5
5	T	403	3.0	0.374	6.5	LOS A	2.0	14.1	0.66	0.59	48.3
6	R	259	2.7	0.374	14.0	LOS B	1.9	13.6	0.67	0.91	44.4
Approach		691	2.7	0.374	9.3	LOS A	2.0	14.1	0.66	0.71	46.7
North: Hogbin Drive											
7	L	99	5.1	0.415	7.6	LOS A	2.4	17.6	0.64	0.66	48.5
8	T	568	4.8	0.415	6.5	LOS A	2.4	17.6	0.64	0.59	48.2
9	R	170	2.9	0.415	13.7	LOS B	2.3	16.9	0.65	0.90	45.3
Approach		837	4.4	0.415	8.1	LOS A	2.4	17.6	0.64	0.66	47.6
West: Harbour Drive											
10	L	180	7.8	0.376	9.4	LOS A	2.6	18.9	0.76	0.80	47.5
11	T	415	5.1	0.376	8.4	LOS A	2.6	18.9	0.76	0.76	47.4
12	R	38	10.5	0.376	15.6	LOS B	2.4	17.5	0.76	0.95	44.4
Approach		633	6.2	0.376	9.1	LOS A	2.6	18.9	0.76	0.78	47.2
All Vehicles		2803	4.8	0.461	8.9	LOS A	2.9	20.9	0.69	0.73	47.2

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 used.

MOVEMENT SUMMARY

Site: AM Site 5 Orlando Street

Hogbin Drive/Orlando Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Orland Street											
21	L	51	13.7	0.119	13.3	LOS B	0.6	4.3	0.68	0.83	44.3
22	T	168	6.5	0.366	9.7	LOS A	2.4	17.6	0.76	0.81	46.3
23	R	129	3.1	0.366	14.7	LOS B	2.4	17.6	0.76	0.89	43.9
Approach		348	6.3	0.366	12.1	LOS B	2.4	17.6	0.75	0.84	45.0
North East: Hogbin Drive											
24	L	179	6.1	0.856	22.4	LOS C	13.2	94.8	1.00	1.30	37.4
25	T	375	1.3	0.856	21.5	LOS C	13.2	94.8	1.00	1.30	37.5
26	R	48	10.4	0.856	26.8	LOS C	13.2	94.8	1.00	1.29	36.0
Approach		602	3.5	0.856	22.2	LOS C	13.2	94.8	1.00	1.30	37.4
North West: Orlando Street											
27	L	37	10.8	0.078	12.4	LOS B	0.3	2.6	0.63	0.78	44.9
28	T	293	5.8	0.613	12.1	LOS B	5.7	41.8	0.84	0.96	44.5
29	R	243	3.7	0.613	17.2	LOS B	5.7	41.8	0.84	1.01	41.9
Approach		573	5.2	0.613	14.3	LOS B	5.7	41.8	0.83	0.97	43.4
South West: Hogbin Drive											
30	L	189	4.2	0.241	9.4	LOS A	1.2	8.9	0.53	0.71	47.4
31	T	446	2.7	0.462	7.8	LOS A	3.1	22.3	0.61	0.67	47.6
32	R	56	7.1	0.462	13.0	LOS B	3.1	22.3	0.61	0.84	45.6
Approach		691	3.5	0.462	8.7	LOS A	3.1	22.3	0.59	0.70	47.4
All Vehicles		2214	4.4	0.856	14.4	LOS B	13.2	94.8	0.79	0.95	42.9

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 used.

MOVEMENT SUMMARY

Site: PM Site 5 Orlando Street

Hogbin Drive/Orlando Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Orland Street											
21	L	46	6.5	0.096	12.4	LOS B	0.4	3.3	0.66	0.80	44.9
22	T	225	4.0	0.486	10.7	LOS B	3.7	27.0	0.81	0.88	45.9
23	R	180	4.4	0.486	15.8	LOS B	3.7	27.0	0.81	0.95	43.0
Approach		451	4.4	0.486	12.9	LOS B	3.7	27.0	0.79	0.90	44.6
North East: Hogbin Drive											
24	L	128	3.1	0.686	12.4	LOS B	7.0	49.9	0.83	0.94	45.1
25	T	405	2.2	0.686	11.6	LOS B	7.0	49.9	0.83	0.92	45.3
26	R	52	1.9	0.686	16.7	LOS B	7.0	49.9	0.83	0.99	42.5
Approach		585	2.4	0.686	12.2	LOS B	7.0	49.9	0.83	0.93	45.0
North West: Orlando Street											
27	L	112	5.4	0.228	13.0	LOS B	1.2	8.7	0.74	0.88	44.2
28	T	165	1.2	0.490	11.5	LOS B	3.9	27.7	0.85	0.92	44.9
29	R	213	3.8	0.490	16.6	LOS B	3.9	27.7	0.85	0.97	42.2
Approach		490	3.3	0.490	14.1	LOS B	3.9	27.7	0.82	0.93	43.5
South West: Hogbin Drive											
30	L	214	3.3	0.301	10.2	LOS B	1.6	11.8	0.63	0.78	46.9
31	T	518	1.0	0.572	9.4	LOS A	4.8	34.1	0.75	0.81	46.8
32	R	47	0.0	0.572	14.5	LOS B	4.8	34.1	0.75	0.91	44.4
Approach		779	1.5	0.572	10.0	LOS A	4.8	34.1	0.72	0.81	46.7
All Vehicles		2305	2.7	0.686	12.0	LOS B	7.0	49.9	0.78	0.88	45.1

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 used.

MOVEMENT SUMMARY

Site: AM Site 6 Earl Street/Harbour Drive

Earl Street/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Harbour Drive											
21	L	217	7.8	0.207	6.4	LOS A	0.9	6.9	0.29	0.51	50.1
22	T	469	1.9	0.342	4.8	LOS A	1.9	13.8	0.29	0.43	51.2
23	R	40	0.0	0.342	11.7	LOS B	1.9	13.8	0.29	0.85	46.7
Approach		726	3.6	0.342	5.7	LOS A	1.9	13.8	0.29	0.48	50.5
North East: Earl Street											
24	L	23	0.0	0.091	8.3	LOS A	0.4	3.2	0.60	0.68	48.1
25	T	24	4.2	0.091	7.4	LOS A	0.4	3.2	0.60	0.64	48.1
26	R	26	7.7	0.091	14.3	LOS B	0.4	3.2	0.60	0.83	44.7
Approach		73	4.1	0.091	10.2	LOS B	0.4	3.2	0.60	0.72	46.8
North West: Harbour Drive											
27	L	62	1.6	0.128	7.8	LOS A	0.6	4.3	0.52	0.65	48.8
28	T	363	4.4	0.343	6.0	LOS A	2.2	15.9	0.56	0.54	48.9
29	R	75	5.3	0.343	12.8	LOS B	2.2	15.9	0.57	0.84	46.3
Approach		500	4.2	0.343	7.3	LOS A	2.2	15.9	0.56	0.60	48.4
South West: Earl Street											
30	L	214	0.5	0.609	10.6	LOS B	5.3	37.5	0.77	0.88	46.0
31	T	61	1.6	0.609	9.6	LOS A	5.3	37.5	0.77	0.86	46.3
32	R	280	2.9	0.609	16.5	LOS B	5.3	37.5	0.77	0.96	42.8
Approach		555	1.8	0.609	13.5	LOS B	5.3	37.5	0.77	0.92	44.3
All Vehicles		1854	3.2	0.609	8.6	LOS A	5.3	37.5	0.52	0.65	47.8

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 used.

MOVEMENT SUMMARY

Site: PM Site 6 Earl Street/Harbour Drive

Earl Street/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Harbour Drive											
21	L	239	7.5	0.226	6.7	LOS A	1.1	8.2	0.36	0.54	49.6
22	T	474	3.4	0.366	5.1	LOS A	2.2	15.6	0.38	0.46	50.5
23	R	42	0.0	0.366	11.9	LOS B	2.2	15.6	0.38	0.84	46.7
Approach		755	4.5	0.366	6.0	LOS A	2.2	15.6	0.37	0.51	50.0
North East: Earl Street											
24	L	44	0.0	0.212	9.4	LOS A	1.1	7.9	0.71	0.80	47.4
25	T	55	0.0	0.212	8.5	LOS A	1.1	7.9	0.71	0.77	47.3
26	R	53	0.0	0.212	15.3	LOS B	1.1	7.9	0.71	0.91	43.9
Approach		152	0.0	0.212	11.1	LOS B	1.1	7.9	0.71	0.83	46.0
North West: Harbour Drive											
27	L	57	0.0	0.166	8.2	LOS A	0.8	5.8	0.57	0.69	48.6
28	T	490	2.4	0.446	6.4	LOS A	3.2	22.6	0.65	0.58	48.3
29	R	77	2.6	0.446	13.2	LOS B	3.2	22.6	0.66	0.85	46.1
Approach		624	2.2	0.446	7.4	LOS A	3.2	22.6	0.64	0.63	48.0
South West: Earl Street											
30	L	185	0.5	0.651	11.7	LOS B	6.2	44.2	0.82	0.95	44.9
31	T	76	0.0	0.651	10.7	LOS B	6.2	44.2	0.82	0.93	45.2
32	R	312	2.6	0.651	17.6	LOS B	6.2	44.2	0.82	1.01	42.0
Approach		573	1.6	0.651	14.8	LOS B	6.2	44.2	0.82	0.98	43.2
All Vehicles		2104	2.7	0.651	9.2	LOS A	6.2	44.2	0.60	0.69	47.1

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 used.

MOVEMENT SUMMARY

Site: AM Site 1 Sawtell Road

Hogbin Drive/Sawtell Road
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Toormina Road											
1	L	222	3.6	0.357	10.0	LOS A	1.9	13.6	0.71	0.86	47.2
2	T	837	3.7	0.920	21.0	LOS C	19.2	138.8	1.00	1.46	38.1
3	R	69	1.4	0.920	27.8	LOS C	19.2	138.8	1.00	1.46	36.4
Approach		1128	3.5	0.920	19.2	LOS B	19.2	138.8	0.94	1.34	39.5
East: Sawtell Road											
4	L	100	8.0	0.247	9.3	LOS A	1.1	8.3	0.64	0.80	48.1
5	T	182	2.2	0.535	7.9	LOS A	3.8	27.0	0.70	0.74	47.1
6	R	434	1.8	0.535	14.7	LOS B	3.8	27.0	0.73	0.95	44.0
Approach		716	2.8	0.535	12.2	LOS B	3.8	27.0	0.71	0.88	45.3
North: Hogbin Drive											
7	L	211	0.5	0.354	7.1	LOS A	2.3	16.7	0.58	0.63	48.5
8	T	458	6.8	0.354	6.2	LOS A	2.3	16.7	0.59	0.55	48.6
9	R	93	10.8	0.354	13.3	LOS B	2.2	16.4	0.59	0.84	46.0
Approach		762	5.5	0.354	7.3	LOS A	2.3	16.7	0.59	0.61	48.2
West: Sawtell Road											
10	L	248	4.3	0.937	108.2	LOS F	17.0	123.5	1.00	1.75	15.1
11	T	167	3.6	1.417	437.8	LOS F	113.8	829.3	1.00	4.45	4.6
12	R	261	5.7	1.417	444.7	LOS F	113.8	829.3	1.00	4.44	4.9
Approach		755	4.6	1.417	331.5	LOS F	113.8	829.3	1.00	3.45	6.3
All Vehicles		3361	4.1	1.417	85.2	LOS F	113.8	829.3	0.83	1.47	19.6

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 used.

MOVEMENT SUMMARY

Site: PM Site 1 Sawtell Road

Hogbin Drive/Sawtell Road
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Toormina Road											
1	L	240	1.3	0.315	9.1	LOS A	1.8	13.0	0.69	0.78	47.5
2	T	447	2.0	0.541	8.4	LOS A	4.6	32.7	0.79	0.80	47.2
3	R	100	1.0	0.541	15.2	LOS B	4.6	32.7	0.79	0.94	44.6
Approach		787	1.7	0.541	9.5	LOS A	4.6	32.7	0.76	0.81	46.9
East: Sawtell Road											
4	L	177	5.6	0.328	10.9	LOS B	1.8	13.1	0.81	0.91	46.3
5	T	154	1.9	0.501	9.9	LOS A	3.7	26.7	0.88	0.95	45.7
6	R	220	4.1	0.501	16.8	LOS B	3.7	26.7	0.88	1.03	42.8
Approach		551	4.0	0.501	13.0	LOS B	3.7	26.7	0.85	0.97	44.6
North: Hogbin Drive											
7	L	347	1.7	0.657	10.9	LOS B	7.1	50.5	0.88	0.94	46.7
8	T	638	3.4	0.657	10.2	LOS B	7.1	50.5	0.88	0.94	46.0
9	R	228	3.5	0.657	17.5	LOS B	6.7	48.0	0.88	1.02	42.5
Approach		1213	3.0	0.657	11.8	LOS B	7.1	50.5	0.88	0.96	45.5
West: Sawtell Road											
10	L	175	4.6	0.285	10.6	LOS B	1.7	12.3	0.77	0.85	46.5
11	T	188	0.5	0.554	10.4	LOS B	5.2	36.5	0.89	0.94	45.5
12	R	290	2.1	0.554	17.3	LOS B	5.2	36.5	0.89	0.99	42.3
Approach		653	2.3	0.554	13.5	LOS B	5.2	36.5	0.86	0.94	44.2
All Vehicles		3204	2.7	0.657	11.8	LOS B	7.1	50.5	0.84	0.92	45.4

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 used.

MOVEMENT SUMMARY

Site: AM Site 2 Stadium Drive/ Doug Knight Drive

Hogbin Drive/Doug Knight Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hobgin Drive											
1	L	185	16.8	0.707	9.2	LOS A	7.9	57.9	0.78	0.80	47.7
2	T	1296	2.2	0.707	8.0	LOS A	7.9	57.9	0.78	0.76	47.4
3	R	130	10.0	0.707	15.3	LOS B	7.8	56.2	0.79	0.91	44.7
Approach		1611	4.5	0.707	8.7	LOS A	7.9	57.9	0.78	0.78	47.1
East: Doug Knight Drive											
4	L	35	37.1	0.180	21.5	LOS C	1.0	9.5	0.92	0.96	38.2
5	T	49	14.3	0.213	14.8	LOS B	1.7	12.8	1.00	0.93	42.2
6	R	30	3.3	0.213	21.5	LOS C	1.7	12.8	1.00	0.91	39.8
Approach		114	18.4	0.213	18.7	LOS B	1.7	12.8	0.98	0.93	40.3
North: Hobgin Drive											
7	L	284	4.6	0.373	8.6	LOS A	2.1	15.2	0.62	0.73	47.9
8	T	800	4.9	0.886	13.9	LOS B	17.8	130.3	1.00	1.09	43.1
9	R	252	5.6	0.886	20.8	LOS C	17.8	130.3	1.00	1.09	40.6
Approach		1336	4.9	0.886	14.1	LOS B	17.8	130.3	0.92	1.01	43.5
West: Stadium Drive											
10	L	449	1.8	0.661	12.5	LOS B	5.1	36.3	0.92	1.07	44.7
11	T	130	0.8	0.571	12.3	LOS B	3.5	25.4	0.87	0.99	44.0
12	R	140	9.3	0.571	19.3	LOS B	3.5	25.4	0.87	1.05	41.1
Approach		719	3.1	0.661	13.8	LOS B	5.1	36.3	0.90	1.05	43.8
All Vehicles		3780	4.8	0.886	11.9	LOS B	17.8	130.3	0.86	0.92	44.9

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 used.

MOVEMENT SUMMARY

Site: PM Site 2 Stadium Drive/ Doug Knight Drive

Hogbin Drive/Doug Knight Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hobgin Drive											
1	L	122	4.9	0.494	8.8	LOS A	3.8	27.6	0.76	0.78	47.8
2	T	773	2.2	0.494	7.9	LOS A	3.8	27.6	0.76	0.74	47.6
3	R	41	12.2	0.494	15.3	LOS B	3.7	26.5	0.76	0.96	44.7
Approach		936	3.0	0.494	8.3	LOS A	3.8	27.6	0.76	0.76	47.5
East: Doug Knight Drive											
4	L	70	7.1	0.426	38.8	LOS D	3.3	24.2	1.00	1.06	29.1
5	T	67	4.5	0.873	111.1	LOS F	14.7	106.5	1.00	1.57	14.7
6	R	140	4.3	0.873	118.0	LOS F	14.7	106.5	1.00	1.57	15.1
Approach		277	5.1	0.873	96.3	LOS F	14.7	106.5	1.00	1.44	17.0
North: Hobgin Drive											
7	L	65	13.8	0.084	7.3	LOS A	0.4	2.8	0.39	0.56	49.4
8	T	935	2.2	0.923	11.0	LOS B	22.7	163.2	1.00	0.84	45.5
9	R	358	4.7	0.923	18.0	LOS B	22.7	163.2	1.00	0.85	42.6
Approach		1358	3.5	0.923	12.7	LOS B	22.7	163.2	0.97	0.83	44.8
West: Stadium Drive											
10	L	279	5.4	0.311	8.1	LOS A	1.7	12.3	0.71	0.70	47.4
11	T	32	12.5	0.260	7.8	LOS A	1.2	9.3	0.70	0.69	46.8
12	R	143	6.3	0.260	14.6	LOS B	1.2	9.3	0.70	0.92	44.1
Approach		454	6.2	0.311	10.1	LOS B	1.7	12.3	0.70	0.77	46.2
All Vehicles		3025	3.9	0.923	18.6	LOS B	22.7	163.2	0.87	0.85	39.6

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 used.

MOVEMENT SUMMARY

Site: AM Site 3 Howard Street/ Albany Street/City Hill Drive

Hogbin Drive/Howard Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	812	0.7	0.654	5.7	LOS A	5.8	41.2	0.49	0.52	49.5
2	T	1044	3.7	0.654	4.5	LOS A	5.8	41.4	0.52	0.43	50.2
3	R	11	9.1	0.654	12.5	LOS B	5.7	41.4	0.53	0.84	47.3
Approach		1867	2.5	0.654	5.1	LOS A	5.8	41.4	0.51	0.47	49.8
East: Howard Street											
4	L	18	0.0	0.135	10.1	LOS B	0.7	5.1	0.77	0.84	46.6
5	T	18	5.6	0.135	8.9	LOS A	0.7	5.1	0.77	0.82	46.9
6	R	37	16.2	0.135	16.9	LOS B	0.7	5.1	0.77	0.95	43.1
Approach		73	9.6	0.135	13.3	LOS B	0.7	5.1	0.77	0.89	44.7
North: Hobgin Drive											
7	L	36	8.3	0.466	6.9	LOS A	3.4	24.8	0.69	0.60	48.9
8	T	855	6.0	0.466	5.6	LOS A	3.4	24.8	0.69	0.53	48.7
9	R	100	4.0	0.466	13.7	LOS B	3.2	23.4	0.69	0.90	46.2
Approach		991	5.9	0.466	6.5	LOS A	3.4	24.8	0.69	0.57	48.4
West: Albany Street											
10	L	87	1.1	0.148	9.4	LOS A	0.7	5.1	0.72	0.82	47.7
11	T	21	0.0	0.511	8.6	LOS A	3.9	28.4	0.83	0.88	45.7
12	R	436	3.9	0.511	16.6	LOS B	3.9	28.4	0.85	1.02	42.7
Approach		544	3.3	0.511	15.1	LOS B	3.9	28.4	0.83	0.98	43.5
South West: City Hill Drive											
30	L	5	20.0	0.016	12.9	LOS B	0.1	0.6	0.81	0.77	44.3
32	R	1	0.0	0.016	20.5	LOS C	0.1	0.6	0.81	0.84	40.9
Approach		6	16.7	0.016	14.2	LOS B	0.1	0.6	0.81	0.78	43.6
All Vehicles		3481	3.7	0.654	7.3	LOS A	5.8	41.4	0.62	0.59	48.1

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 used.

MOVEMENT SUMMARY

Site: PM Site 3 Howard Street/ Albany Street/City Hill Drive

Hogbin Drive/Howard Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	461	1.1	0.472	5.4	LOS A	3.3	23.2	0.36	0.49	50.4
2	T	893	3.1	0.472	4.1	LOS A	3.3	23.2	0.38	0.39	51.3
3	R	5	0.0	0.472	11.9	LOS B	3.2	23.0	0.39	0.89	47.3
Approach		1359	2.4	0.472	4.6	LOS A	3.3	23.2	0.37	0.42	51.0
East: Howard Street											
4	L	22	4.5	0.122	10.0	LOS B	0.6	4.5	0.79	0.85	46.8
5	T	17	0.0	0.122	8.7	LOS A	0.6	4.5	0.79	0.82	46.9
6	R	30	0.0	0.122	16.5	LOS B	0.6	4.5	0.79	0.94	43.3
Approach		69	1.4	0.122	12.5	LOS B	0.6	4.5	0.79	0.88	45.2
North: Hobgin Drive											
7	L	28	0.0	0.480	6.9	LOS A	3.6	25.7	0.70	0.61	48.9
8	T	912	3.2	0.480	5.8	LOS A	3.6	25.7	0.70	0.55	48.7
9	R	93	2.2	0.480	13.9	LOS B	3.4	24.6	0.71	0.90	46.0
Approach		1033	3.0	0.480	6.5	LOS A	3.6	25.7	0.70	0.59	48.4
West: Albany Street											
10	L	118	0.8	0.168	8.4	LOS A	0.7	5.3	0.64	0.76	48.3
11	T	26	0.0	0.438	6.6	LOS A	2.7	19.3	0.72	0.67	46.7
12	R	430	2.3	0.438	14.5	LOS B	2.7	19.3	0.72	0.92	44.0
Approach		574	1.9	0.438	12.9	LOS B	2.7	19.3	0.71	0.87	44.9
South West: City Hill Drive											
30	L	36	5.6	0.070	8.4	LOS A	0.3	2.3	0.70	0.76	48.0
32	R	10	0.0	0.070	16.6	LOS B	0.3	2.3	0.70	0.94	43.7
Approach		46	4.3	0.070	10.2	LOS B	0.3	2.3	0.70	0.80	46.9
All Vehicles		3081	2.5	0.480	7.0	LOS A	3.6	25.7	0.56	0.58	48.6

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 used.

MOVEMENT SUMMARY

Site: AM Site 4 Harbour Drive

Hogbin Drive/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	208	11.5	0.442	12.2	LOS B	2.4	18.6	0.82	0.95	45.2
2	T	360	5.3	0.802	14.3	LOS B	8.3	60.1	0.97	1.19	42.5
3	R	237	3.0	0.802	21.1	LOS C	8.3	60.1	0.97	1.20	40.0
Approach		805	6.2	0.802	15.8	LOS B	8.3	60.1	0.93	1.13	42.3
East: Harbour Drive											
4	L	29	0.0	0.706	11.1	LOS B	6.1	43.7	0.89	1.06	47.0
5	T	621	2.7	0.706	10.0	LOS B	6.1	43.7	0.89	1.01	46.6
6	R	425	3.1	0.706	18.3	LOS B	5.6	40.0	0.89	1.08	41.2
Approach		1075	2.8	0.706	13.3	LOS B	6.1	43.7	0.89	1.04	44.2
North: Hogbin Drive											
7	L	188	2.1	0.693	11.6	LOS B	6.5	47.0	0.90	1.07	46.3
8	T	767	4.0	0.693	11.0	LOS B	6.5	47.0	0.89	1.05	45.7
9	R	150	7.3	0.693	18.8	LOS B	6.0	43.5	0.89	1.11	41.8
Approach		1105	4.2	0.693	12.2	LOS B	6.5	47.0	0.89	1.06	45.2
West: Harbour Drive											
10	L	214	13.1	0.767	27.2	LOS C	10.9	81.8	1.00	1.32	34.9
11	T	569	4.2	0.767	27.1	LOS C	10.9	81.8	1.00	1.32	34.3
12	R	60	21.7	0.767	35.4	LOS D	9.5	70.2	1.00	1.29	32.7
Approach		843	7.7	0.767	27.7	LOS C	10.9	81.8	1.00	1.31	34.3
All Vehicles		3828	5.0	0.802	16.7	LOS B	10.9	81.8	0.92	1.13	41.5

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 used.

MOVEMENT SUMMARY

Site: PM Site 4 Harbour Drive

Hogbin Drive/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	242	7.9	0.421	11.0	LOS B	2.3	17.4	0.78	0.92	46.2
2	T	422	5.5	0.701	11.2	LOS B	6.3	45.9	0.90	1.07	45.5
3	R	159	5.0	0.701	18.0	LOS B	6.3	45.9	0.90	1.12	42.4
Approach		823	6.1	0.701	12.4	LOS B	6.3	45.9	0.87	1.04	45.0
East: Harbour Drive											
4	L	37	0.0	0.569	9.4	LOS A	4.0	28.6	0.82	0.88	47.7
5	T	517	2.9	0.569	8.4	LOS A	4.0	28.6	0.82	0.82	47.1
6	R	332	2.7	0.569	16.3	LOS B	3.7	26.4	0.82	1.02	42.7
Approach		886	2.7	0.569	11.4	LOS B	4.0	28.6	0.82	0.89	45.3
North: Hogbin Drive											
7	L	127	4.7	0.612	9.7	LOS A	5.0	36.7	0.82	0.91	47.5
8	T	729	4.8	0.612	8.8	LOS A	5.0	36.7	0.82	0.86	46.9
9	R	218	2.8	0.612	16.3	LOS B	4.7	34.2	0.82	1.05	43.3
Approach		1074	4.4	0.612	10.4	LOS B	5.0	36.7	0.82	0.91	46.2
West: Harbour Drive											
10	L	231	7.8	0.628	16.3	LOS B	6.8	50.3	0.99	1.12	42.0
11	T	533	5.1	0.628	16.0	LOS B	6.8	50.3	0.98	1.12	41.5
12	R	49	10.2	0.628	23.6	LOS C	6.1	44.9	0.97	1.14	38.9
Approach		813	6.2	0.628	16.5	LOS B	6.8	50.3	0.98	1.12	41.5
All Vehicles		3596	4.8	0.701	12.5	LOS B	6.8	50.3	0.87	0.98	44.6

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 used.

MOVEMENT SUMMARY

Site: AM Site 5 Orlando Street

Hogbin Drive/Orlando Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Orland Street											
21	L	71	14.1	0.172	13.9	LOS B	0.8	6.4	0.71	0.88	43.7
22	T	233	6.4	0.523	11.7	LOS B	4.3	31.4	0.85	0.93	45.0
23	R	180	3.3	0.523	16.7	LOS B	4.3	31.4	0.85	0.98	42.3
Approach		484	6.4	0.523	13.9	LOS B	4.3	31.4	0.82	0.94	43.8
North East: Hogbin Drive											
24	L	249	6.0	1.407	388.3	LOS F	168.6	1215.0	1.00	6.18	5.1
25	T	522	1.3	1.407	387.4	LOS F	168.6	1215.0	1.00	6.20	5.2
26	R	67	10.4	1.407	392.7	LOS F	168.6	1215.0	1.00	6.11	5.3
Approach		838	3.5	1.407	388.1	LOS F	168.6	1215.0	1.00	6.19	5.2
North West: Orlando Street											
27	L	52	11.5	0.153	15.7	LOS B	0.8	6.0	0.78	0.91	42.1
28	T	408	5.9	1.193	205.3	LOS F	95.5	697.2	1.00	4.28	9.0
29	R	339	3.8	1.193	210.3	LOS F	95.5	697.2	1.00	4.29	9.2
Approach		799	5.4	1.193	195.1	LOS F	95.5	697.2	0.99	4.07	9.6
South West: Hogbin Drive											
30	L	263	4.2	0.377	10.5	LOS B	2.2	15.8	0.67	0.81	46.6
31	T	621	2.7	0.715	11.6	LOS B	8.2	58.9	0.87	0.94	45.4
32	R	78	7.7	0.715	16.8	LOS B	8.2	58.9	0.87	0.99	42.7
Approach		962	3.5	0.715	11.7	LOS B	8.2	58.9	0.82	0.91	45.5
All Vehicles		3083	4.4	1.407	161.9	LOS F	168.6	1215.0	0.91	3.17	11.1

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 used.

MOVEMENT SUMMARY

Site: PM Site 5 Orlando Street

Hogbin Drive/Orlando Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Orland Street											
21	L	59	6.8	0.156	14.7	LOS B	0.8	5.9	0.77	0.90	42.9
22	T	289	4.2	0.791	22.7	LOS C	10.9	79.4	1.00	1.28	36.6
23	R	231	4.3	0.791	27.8	LOS C	10.9	79.4	1.00	1.28	35.2
Approach		579	4.5	0.791	23.9	LOS C	10.9	79.4	0.98	1.24	36.5
North East: Hogbin Drive											
24	L	164	3.0	1.012	57.7	LOS E	37.5	268.0	1.00	2.09	23.3
25	T	520	2.3	1.012	56.9	LOS E	37.5	268.0	1.00	2.09	23.4
26	R	66	1.5	1.012	62.0	LOS E	37.5	268.0	1.00	2.09	23.1
Approach		750	2.4	1.012	57.5	LOS E	37.5	268.0	1.00	2.09	23.3
North West: Orlando Street											
27	L	144	5.6	0.409	18.0	LOS B	2.6	19.2	0.89	1.00	40.2
28	T	212	1.4	0.876	36.9	LOS D	15.3	109.7	1.00	1.48	29.5
29	R	273	3.7	0.876	42.0	LOS D	15.3	109.7	1.00	1.48	28.7
Approach		629	3.3	0.876	34.8	LOS C	15.3	109.7	0.98	1.37	31.0
South West: Hogbin Drive											
30	L	275	3.3	0.454	12.3	LOS B	3.0	21.9	0.79	0.93	44.9
31	T	665	0.9	0.854	18.8	LOS B	14.3	100.9	1.00	1.23	39.5
32	R	60	0.0	0.854	23.9	LOS C	14.3	100.9	1.00	1.23	37.7
Approach		1000	1.5	0.854	17.3	LOS B	14.3	100.9	0.94	1.15	40.7
All Vehicles		2958	2.7	1.012	32.5	LOS C	37.5	268.0	0.97	1.45	31.8

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 used.

MOVEMENT SUMMARY

Site: AM Site 6 Earl Street/Harbour Drive

Earl Street/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Harbour Drive											
21	L	302	7.9	0.289	6.7	LOS A	1.5	11.4	0.38	0.55	49.4
22	T	653	2.0	0.494	5.2	LOS A	3.5	24.8	0.43	0.47	50.1
23	R	56	0.0	0.494	12.0	LOS B	3.5	24.8	0.43	0.82	46.6
Approach		1011	3.7	0.494	6.0	LOS A	3.5	24.8	0.41	0.51	49.7
North East: Earl Street											
24	L	32	0.0	0.163	10.5	LOS B	0.9	6.6	0.76	0.81	46.5
25	T	33	3.0	0.163	9.5	LOS A	0.9	6.6	0.76	0.79	46.8
26	R	36	8.3	0.163	16.5	LOS B	0.9	6.6	0.76	0.91	43.1
Approach		101	4.0	0.163	12.3	LOS B	0.9	6.6	0.76	0.84	45.3
North West: Harbour Drive											
27	L	86	1.2	0.203	8.8	LOS A	1.1	7.7	0.65	0.75	48.1
28	T	505	4.4	0.547	7.6	LOS A	4.8	34.7	0.78	0.71	47.3
29	R	105	5.7	0.547	14.5	LOS B	4.8	34.7	0.79	0.90	45.3
Approach		696	4.2	0.547	8.8	LOS A	4.8	34.7	0.77	0.75	47.0
South West: Earl Street											
30	L	297	0.3	1.036	78.2	LOS E	46.8	332.2	1.00	2.59	19.0
31	T	84	1.2	1.036	77.2	LOS E	46.8	332.2	1.00	2.59	19.1
32	R	389	2.8	1.036	84.1	LOS F	46.8	332.2	1.00	2.59	19.3
Approach		770	1.7	1.036	81.1	LOS F	46.8	332.2	1.00	2.59	19.2
All Vehicles		2578	3.2	1.036	29.4	LOS C	46.8	332.2	0.70	1.21	33.0

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 used.

MOVEMENT SUMMARY

Site: PM Site 6 Earl Street/Harbour Drive

Earl Street/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Harbour Drive											
21	L	307	7.5	0.303	7.0	LOS A	1.6	12.1	0.44	0.59	49.0
22	T	609	3.4	0.488	5.5	LOS A	3.4	24.4	0.49	0.50	49.6
23	R	54	0.0	0.488	12.3	LOS B	3.4	24.4	0.49	0.83	46.6
Approach		970	4.5	0.488	6.4	LOS A	3.4	24.4	0.48	0.54	49.2
North East: Earl Street											
24	L	56	0.0	0.358	12.4	LOS B	2.3	15.8	0.86	0.94	44.7
25	T	71	0.0	0.358	11.4	LOS B	2.3	15.8	0.86	0.92	44.9
26	R	68	0.0	0.358	18.3	LOS B	2.3	15.8	0.86	0.99	41.8
Approach		195	0.0	0.358	14.1	LOS B	2.3	15.8	0.86	0.95	43.6
North West: Harbour Drive											
27	L	73	0.0	0.243	9.1	LOS A	1.3	9.5	0.68	0.79	48.0
28	T	629	2.4	0.654	9.1	LOS A	7.0	50.3	0.86	0.88	46.8
29	R	99	3.0	0.654	16.2	LOS B	7.0	50.3	0.89	0.97	44.0
Approach		801	2.2	0.654	10.0	LOS A	7.0	50.3	0.85	0.89	46.5
South West: Earl Street											
30	L	237	0.4	0.985	50.7	LOS D	32.0	226.9	1.00	2.02	24.9
31	T	98	0.0	0.985	49.8	LOS D	32.0	226.9	1.00	2.02	25.0
32	R	400	2.5	0.985	56.7	LOS E	32.0	226.9	1.00	2.02	24.9
Approach		735	1.5	0.985	53.8	LOS D	32.0	226.9	1.00	2.02	24.9
All Vehicles		2701	2.7	0.985	20.9	LOS C	32.0	226.9	0.76	1.07	37.9

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 used.

MOVEMENT SUMMARY

Site: AM Site 1 Sawtell Road - Upgrade

Hogbin Drive/Sawtell Road
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Toormina Road											
1	L	222	3.6	0.631	10.6	LOS B	5.8	41.7	0.84	0.97	47.2
2	T	837	3.7	0.631	9.9	LOS A	5.8	41.7	0.84	0.96	46.7
3	R	69	1.4	0.631	17.2	LOS B	5.4	39.0	0.84	1.08	43.1
Approach		1128	3.5	0.631	10.5	LOS B	5.8	41.7	0.84	0.97	46.6
East: Sawtell Road											
4	L	100	8.0	0.262	9.7	LOS A	1.2	9.1	0.68	0.84	47.9
5	T	182	2.2	0.567	8.6	LOS A	4.4	31.1	0.75	0.82	46.7
6	R	434	1.8	0.567	15.6	LOS B	4.4	31.1	0.79	1.00	43.4
Approach		716	2.8	0.567	13.0	LOS B	4.4	31.1	0.76	0.93	44.7
North: Hogbin Drive											
7	L	211	0.5	0.396	7.8	LOS A	2.8	20.0	0.69	0.68	47.9
8	T	458	6.8	0.396	6.9	LOS A	2.8	20.0	0.70	0.63	47.8
9	R	93	10.8	0.396	14.1	LOS B	2.6	19.3	0.70	0.89	45.4
Approach		762	5.5	0.396	8.1	LOS A	2.8	20.0	0.70	0.67	47.5
West: Sawtell Road											
10	L	327	4.3	0.637	17.3	LOS B	4.9	35.4	0.92	1.09	40.7
11	T	167	3.6	0.629	13.7	LOS B	5.5	39.9	0.94	1.10	42.6
12	R	261	5.7	0.629	20.6	LOS C	5.5	39.9	0.94	1.12	40.1
Approach		755	4.6	0.637	17.7	LOS B	5.5	39.9	0.93	1.10	40.9
All Vehicles		3361	4.1	0.637	12.1	LOS B	5.8	41.7	0.81	0.92	44.9

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 used.

MOVEMENT SUMMARY

Site: PM Site 1 Sawtell Road - Upgrade

Hogbin Drive/Sawtell Road
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Toormina Road											
1	L	240	1.3	0.421	8.5	LOS A	2.9	20.7	0.73	0.74	47.6
2	T	447	2.0	0.421	7.6	LOS A	2.9	20.7	0.73	0.69	47.4
3	R	100	1.0	0.421	14.7	LOS B	2.8	19.6	0.73	0.91	44.8
Approach		787	1.7	0.421	8.8	LOS A	2.9	20.7	0.73	0.74	47.1
East: Sawtell Road											
4	L	177	5.6	0.325	10.9	LOS B	1.8	12.9	0.80	0.90	46.3
5	T	154	1.9	0.497	9.8	LOS A	3.6	26.2	0.87	0.94	45.8
6	R	220	4.1	0.497	16.7	LOS B	3.6	26.2	0.87	1.03	42.8
Approach		551	4.0	0.497	12.9	LOS B	3.6	26.2	0.85	0.97	44.7
North: Hogbin Drive											
7	L	347	1.7	0.642	10.7	LOS B	6.6	47.3	0.85	0.92	46.9
8	T	638	3.4	0.642	10.0	LOS A	6.6	47.3	0.85	0.92	46.3
9	R	228	3.5	0.642	17.3	LOS B	6.3	45.1	0.85	1.01	42.7
Approach		1213	3.0	0.642	11.5	LOS B	6.6	47.3	0.85	0.94	45.7
West: Sawtell Road											
10	L	175	4.6	0.249	9.0	LOS A	1.2	8.7	0.66	0.78	47.7
11	T	188	0.5	0.481	7.6	LOS A	3.2	23.0	0.74	0.72	46.8
12	R	290	2.1	0.481	14.5	LOS B	3.2	23.0	0.74	0.94	44.5
Approach		653	2.3	0.481	11.0	LOS B	3.2	23.0	0.72	0.84	45.9
All Vehicles		3204	2.7	0.642	11.0	LOS B	6.6	47.3	0.79	0.87	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 used.

MOVEMENT SUMMARY

Site: AM Site 2 Stadium Drive/ Doug Knight Drive - Upgrade

Hogbin Drive/Doug Knight Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hogbin Drive											
1	L	185	16.8	0.697	9.1	LOS A	7.4	54.2	0.74	0.79	47.9
2	T	1296	2.2	0.697	7.9	LOS A	7.4	54.2	0.75	0.75	47.6
3	R	130	10.0	0.697	15.2	LOS B	7.3	52.8	0.76	0.91	44.7
Approach		1611	4.5	0.697	8.6	LOS A	7.4	54.2	0.75	0.76	47.4
East: Doug Knight Drive											
4	L	35	37.1	0.102	13.7	LOS B	0.4	4.1	0.74	0.87	44.3
5	T	49	14.3	0.117	8.5	LOS A	0.6	4.9	0.77	0.75	47.0
6	R	30	3.3	0.117	15.1	LOS B	0.6	4.9	0.77	0.89	44.3
Approach		114	18.4	0.117	11.8	LOS B	0.6	4.9	0.76	0.82	45.4
North: Hogbin Drive											
7	L	284	4.6	0.571	8.9	LOS A	4.6	33.6	0.71	0.79	47.8
8	T	800	4.9	0.654	7.8	LOS A	6.5	47.5	0.74	0.75	47.4
9	R	252	5.6	0.654	14.7	LOS B	6.5	47.5	0.76	0.89	44.8
Approach		1336	4.9	0.654	9.3	LOS A	6.5	47.5	0.74	0.78	46.9
West: Stadium Drive											
10	L	449	1.8	0.648	12.3	LOS B	4.9	35.1	0.91	1.06	44.9
11	T	130	0.8	0.560	12.1	LOS B	3.4	24.6	0.86	0.99	44.2
12	R	140	9.3	0.560	19.1	LOS B	3.4	24.6	0.86	1.05	41.2
Approach		719	3.1	0.648	13.6	LOS B	4.9	35.1	0.89	1.05	43.9
All Vehicles		3780	4.8	0.697	9.9	LOS A	7.4	54.2	0.77	0.83	46.5

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 used.

MOVEMENT SUMMARY

Site: PM Site 2 Stadium Drive/ Doug Knight Drive - Upgrade

Hogbin Drive/Doug Knight Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hobgin Drive											
1	L	122	4.9	0.470	8.6	LOS A	3.3	23.5	0.70	0.76	48.1
2	T	773	2.2	0.470	7.7	LOS A	3.3	23.5	0.70	0.71	48.0
3	R	41	12.2	0.470	15.1	LOS B	3.2	22.9	0.71	0.95	44.8
Approach		936	3.0	0.470	8.2	LOS A	3.3	23.5	0.70	0.73	47.8
East: Doug Knight Drive											
4	L	70	7.1	0.139	11.3	LOS B	0.6	4.8	0.75	0.87	46.0
5	T	67	4.5	0.278	8.6	LOS A	1.6	11.3	0.80	0.78	46.2
6	R	140	4.3	0.278	15.5	LOS B	1.6	11.3	0.80	0.96	43.6
Approach		277	5.1	0.278	12.8	LOS B	1.6	11.3	0.79	0.89	44.8
North: Hobgin Drive											
7	L	65	13.8	0.495	7.2	LOS A	3.4	24.5	0.51	0.61	49.2
8	T	935	2.2	0.567	5.6	LOS A	4.4	31.8	0.52	0.51	49.1
9	R	358	4.7	0.567	12.4	LOS B	4.4	31.8	0.53	0.75	45.8
Approach		1358	3.5	0.567	7.5	LOS A	4.4	31.8	0.52	0.58	48.2
West: Stadium Drive											
10	L	279	5.4	0.306	8.1	LOS A	1.6	11.9	0.70	0.70	47.5
11	T	32	12.5	0.256	7.8	LOS A	1.2	9.0	0.69	0.69	46.9
12	R	143	6.3	0.256	14.6	LOS B	1.2	9.0	0.69	0.92	44.1
Approach		454	6.2	0.306	10.1	LOS B	1.6	11.9	0.69	0.77	46.3
All Vehicles		3025	3.9	0.567	8.6	LOS A	4.4	31.8	0.63	0.68	47.4

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 used.

MOVEMENT SUMMARY

Site: AM Site 5 Orlando Street - Upgrade

Hogbin Drive/Orlando Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Orland Street											
21	L	71	14.1	0.184	14.8	LOS B	0.9	6.9	0.73	0.89	42.9
22	T	233	6.4	0.559	13.2	LOS B	4.9	36.1	0.89	1.00	43.6
23	R	180	3.3	0.559	18.3	LOS B	4.9	36.1	0.89	1.04	41.2
Approach		484	6.4	0.559	15.3	LOS B	4.9	36.1	0.87	1.00	42.5
North East: Hogbin Drive											
24	L	249	6.0	1.355	338.1	LOS F	150.6	1085.8	1.00	6.35	5.8
25	T	522	1.3	1.355	337.2	LOS F	150.6	1085.8	1.00	6.37	5.9
26	R	67	10.4	1.355	342.5	LOS F	150.6	1085.8	1.00	6.27	6.0
Approach		838	3.5	1.355	337.9	LOS F	150.6	1085.8	1.00	6.35	5.9
North West: Orlando Street											
27	L	52	11.5	0.548	18.5	LOS B	4.3	31.7	0.92	1.06	40.6
28	T	408	5.9	0.876	25.0	LOS C	15.7	114.1	0.96	1.26	35.3
29	R	339	3.8	0.876	37.5	LOS D	15.7	114.1	1.00	1.47	30.4
Approach		799	5.4	0.876	29.9	LOS C	15.7	114.1	0.97	1.34	33.3
South West: Hogbin Drive											
30	L	263	4.2	0.379	10.5	LOS B	2.2	16.0	0.68	0.82	46.6
31	T	621	2.7	0.720	11.7	LOS B	8.4	60.1	0.88	0.94	45.3
32	R	78	7.7	0.720	16.9	LOS B	8.4	60.1	0.88	1.00	42.6
Approach		962	3.5	0.720	11.8	LOS B	8.4	60.1	0.83	0.91	45.4
All Vehicles		3083	4.4	1.355	105.7	LOS F	150.6	1085.8	0.92	2.51	15.5

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 used.

MOVEMENT SUMMARY

Site: PM Site 5 Orlando Street - Upgrade

Hogbin Drive/Orlando Street
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Orland Street											
21	L	59	6.8	0.157	14.8	LOS B	0.8	6.0	0.78	0.90	42.8
22	T	289	4.2	0.799	23.5	LOS C	11.3	81.8	1.00	1.29	36.1
23	R	231	4.3	0.799	28.6	LOS C	11.3	81.8	1.00	1.29	34.7
Approach		579	4.5	0.799	24.6	LOS C	11.3	81.8	0.98	1.25	36.1
North East: Hogbin Drive											
24	L	164	3.0	0.962	32.0	LOS C	23.2	165.7	1.00	1.60	32.1
25	T	520	2.3	0.962	31.3	LOS C	23.2	165.7	1.00	1.60	32.2
26	R	66	1.5	0.962	36.3	LOS D	23.2	165.7	1.00	1.60	31.2
Approach		750	2.4	0.962	31.9	LOS C	23.2	165.7	1.00	1.60	32.1
North West: Orlando Street											
27	L	144	5.6	0.484	18.2	LOS B	3.6	26.0	0.93	1.04	40.3
28	T	212	1.4	0.774	23.4	LOS C	10.2	72.9	0.98	1.21	36.0
29	R	273	3.7	0.774	30.9	LOS C	10.2	72.9	1.00	1.27	33.4
Approach		629	3.3	0.774	25.4	LOS C	10.2	72.9	0.98	1.20	35.6
South West: Hogbin Drive											
30	L	275	3.3	0.454	12.3	LOS B	3.0	21.9	0.79	0.93	44.8
31	T	665	0.9	0.855	18.9	LOS B	14.4	101.2	1.00	1.23	39.4
32	R	60	0.0	0.855	24.0	LOS C	14.4	101.2	1.00	1.23	37.7
Approach		1000	1.5	0.855	17.4	LOS B	14.4	101.2	0.94	1.15	40.7
All Vehicles		2958	2.7	0.962	24.2	LOS C	23.2	165.7	0.97	1.29	36.2

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 used.

MOVEMENT SUMMARY

Site: AM Site 6 Earl Street/Harbour Drive - Upgrade

Earl Street/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Harbour Drive											
21	L	302	7.9	0.288	6.7	LOS A	1.5	11.2	0.38	0.55	49.5
22	T	653	2.0	0.493	5.2	LOS A	3.4	24.3	0.42	0.47	50.1
23	R	56	0.0	0.493	12.0	LOS B	3.4	24.3	0.42	0.82	46.6
Approach		1011	3.7	0.493	6.0	LOS A	3.4	24.3	0.41	0.51	49.7
North East: Earl Street											
24	L	32	0.0	0.161	10.6	LOS B	0.9	6.4	0.75	0.81	46.3
25	T	33	3.0	0.161	9.7	LOS A	0.9	6.4	0.75	0.79	46.6
26	R	36	8.3	0.161	16.7	LOS B	0.9	6.4	0.75	0.91	43.0
Approach		101	4.0	0.161	12.5	LOS B	0.9	6.4	0.75	0.84	45.1
North West: Harbour Drive											
27	L	86	1.2	0.191	8.3	LOS A	0.9	6.3	0.58	0.74	48.4
28	T	505	4.4	0.514	6.8	LOS A	3.7	26.6	0.68	0.64	48.0
29	R	105	5.7	0.514	13.7	LOS B	3.7	26.6	0.69	0.92	45.8
Approach		696	4.2	0.514	8.1	LOS A	3.7	26.6	0.67	0.69	47.7
South West: Earl Street											
30	L	297	0.3	0.488	11.4	LOS B	3.7	26.2	0.82	0.92	45.9
31	T	84	1.2	0.488	10.2	LOS B	3.7	26.2	0.82	0.90	46.3
32	R	389	2.8	0.422	15.3	LOS B	3.0	21.5	0.79	0.86	43.3
Approach		770	1.7	0.488	13.2	LOS B	3.7	26.2	0.80	0.89	44.6
All Vehicles		2578	3.2	0.514	9.0	LOS A	3.7	26.6	0.61	0.69	47.3

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 used.

MOVEMENT SUMMARY

Site: PM Site 6 Earl Street/Harbour Drive - Upgrade

Earl Street/Harbour Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Harbour Drive											
21	L	307	7.5	0.303	7.0	LOS A	1.6	12.1	0.44	0.59	49.0
22	T	609	3.4	0.488	5.5	LOS A	3.4	24.4	0.49	0.50	49.6
23	R	54	0.0	0.488	12.3	LOS B	3.4	24.4	0.49	0.83	46.6
Approach		970	4.5	0.488	6.4	LOS A	3.4	24.4	0.48	0.54	49.2
North East: Earl Street											
24	L	56	0.0	0.345	12.2	LOS B	2.1	14.7	0.85	0.92	44.8
25	T	71	0.0	0.345	11.3	LOS B	2.1	14.7	0.85	0.91	45.0
26	R	68	0.0	0.345	18.1	LOS B	2.1	14.7	0.85	0.98	41.9
Approach		195	0.0	0.345	13.9	LOS B	2.1	14.7	0.85	0.94	43.8
North West: Harbour Drive											
27	L	73	0.0	0.222	8.5	LOS A	1.0	7.4	0.60	0.75	48.4
28	T	629	2.4	0.597	7.5	LOS A	4.9	35.0	0.73	0.72	47.7
29	R	99	3.0	0.597	14.4	LOS B	4.9	35.0	0.75	0.96	45.3
Approach		801	2.2	0.597	8.4	LOS A	4.9	35.0	0.72	0.75	47.4
South West: Earl Street											
30	L	237	0.4	0.436	10.5	LOS B	3.0	21.3	0.79	0.88	46.8
31	T	98	0.0	0.436	9.3	LOS A	3.0	21.3	0.79	0.85	46.9
32	R	400	2.5	0.433	15.2	LOS B	3.1	22.5	0.80	0.87	43.3
Approach		735	1.5	0.436	12.9	LOS B	3.1	22.5	0.79	0.87	44.8
All Vehicles		2701	2.7	0.597	9.3	LOS A	4.9	35.0	0.66	0.72	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 used.

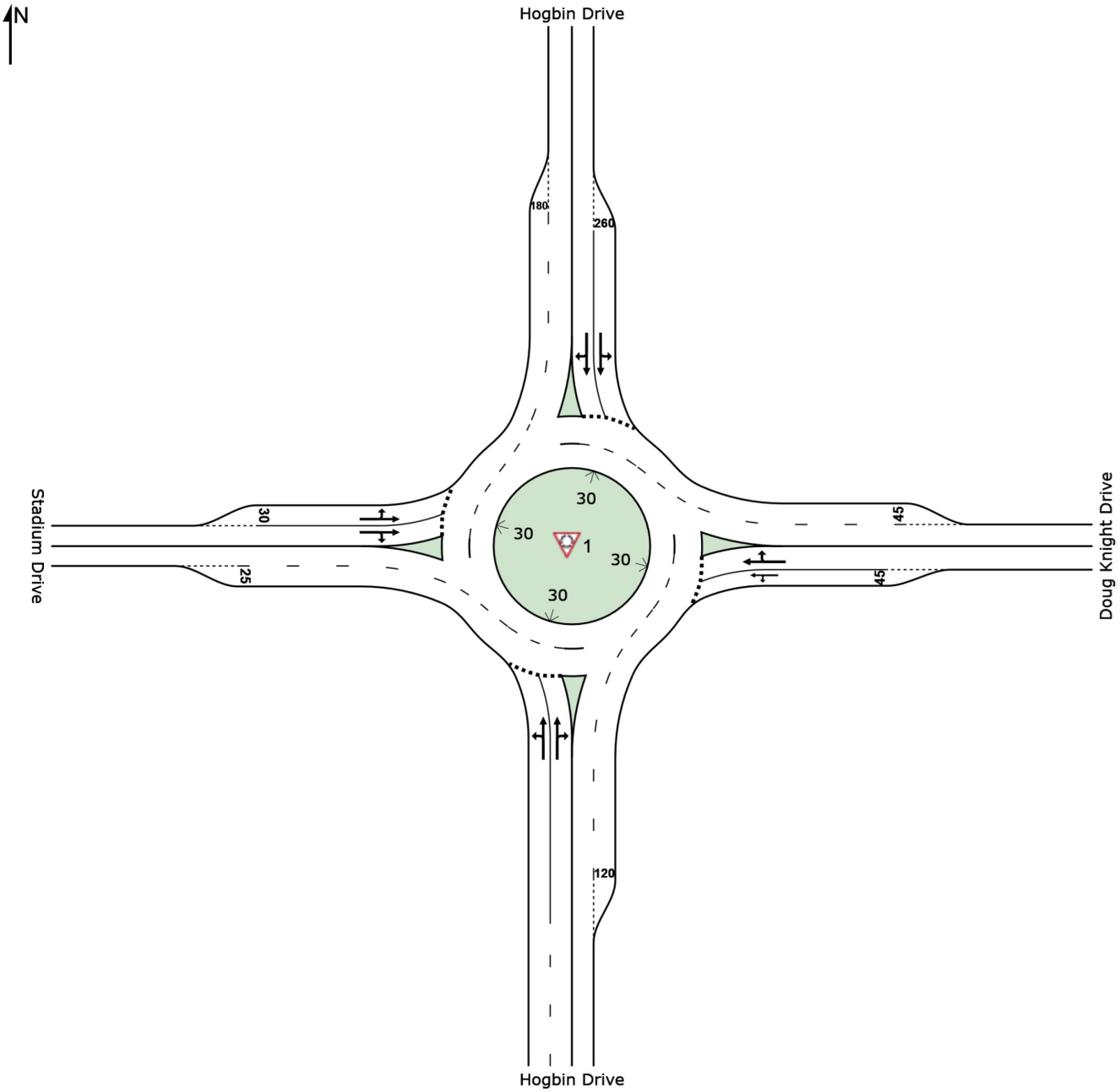
APPENDIX F

DETAILED SIDRA SUMMARIES

SITE LAYOUT

Site: 1 [2019 AM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Background Traffic Volumes
AM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 1 [2019 AM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Background Traffic Volumes
AM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	147	19.0	0.488	6.1	LOS A	3.6	26.5	0.66	0.59	52.9
2	T1	803	2.0	0.488	5.8	LOS A	3.6	26.5	0.66	0.61	54.7
3	R2	81	9.0	0.488	11.9	LOS B	3.5	25.0	0.67	0.62	51.1
Approach		1032	5.0	0.488	6.3	LOS A	3.6	26.5	0.66	0.61	54.2
East: Doug Knight Drive											
4	L2	22	33.0	0.053	7.6	LOS A	0.2	2.1	0.71	0.71	44.5
5	T1	26	18.0	0.091	3.8	LOS A	0.5	3.8	0.70	0.68	46.6
6	R2	41	11.0	0.091	8.7	LOS A	0.5	3.8	0.70	0.68	46.9
Approach		89	18.5	0.091	7.0	LOS A	0.5	3.8	0.71	0.69	46.2
North: Hogbin Drive											
7	L2	203	5.0	0.413	5.7	LOS A	2.7	20.1	0.61	0.60	48.0
8	T1	503	5.0	0.505	5.5	LOS A	3.9	27.9	0.62	0.62	54.3
9	R2	291	3.0	0.505	11.1	LOS B	3.9	27.9	0.64	0.64	53.9
Approach		997	4.4	0.505	7.2	LOS A	3.9	27.9	0.62	0.62	53.2
West: Stadium Drive											
10	L2	335	3.0	0.411	7.2	LOS A	2.5	17.9	0.77	0.89	53.5
11	T1	125	1.0	0.370	8.1	LOS A	2.0	14.7	0.77	0.89	47.3
12	R2	105	9.0	0.370	14.2	LOS B	2.0	14.7	0.77	0.89	52.7
Approach		565	3.7	0.411	8.7	LOS A	2.5	17.9	0.77	0.89	52.2
All Vehicles		2683	4.9	0.505	7.2	LOS A	3.9	27.9	0.67	0.67	53.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2019 AM DES]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Design Traffic Volumes
AM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	147	19.0	0.493	6.2	LOS A	3.6	26.9	0.67	0.59	52.9
2	T1	803	2.0	0.493	5.8	LOS A	3.6	26.9	0.67	0.61	54.6
3	R2	86	9.0	0.493	11.9	LOS B	3.5	25.4	0.68	0.63	51.0
Approach		1037	5.0	0.493	6.4	LOS A	3.6	26.9	0.67	0.61	54.1
East: Doug Knight Drive											
4	L2	24	33.0	0.058	7.6	LOS A	0.3	2.4	0.72	0.71	44.5
5	T1	28	18.0	0.099	3.9	LOS A	0.5	4.2	0.71	0.69	46.6
6	R2	44	11.0	0.099	8.7	LOS A	0.5	4.2	0.71	0.69	46.8
Approach		97	18.6	0.099	7.0	LOS A	0.5	4.2	0.71	0.70	46.2
North: Hogbin Drive											
7	L2	217	5.0	0.424	5.9	LOS A	2.8	20.7	0.62	0.62	48.0
8	T1	503	5.0	0.518	5.7	LOS A	4.0	29.0	0.64	0.63	54.2
9	R2	291	3.0	0.518	11.2	LOS B	4.0	29.0	0.66	0.65	53.9
Approach		1011	4.4	0.518	7.3	LOS A	4.0	29.0	0.64	0.63	53.1
West: Stadium Drive											
10	L2	335	3.0	0.414	7.3	LOS A	2.5	18.2	0.78	0.90	53.4
11	T1	134	1.0	0.385	8.3	LOS A	2.1	15.5	0.77	0.90	47.3
12	R2	105	9.0	0.385	14.3	LOS B	2.1	15.5	0.77	0.90	52.6
Approach		574	3.6	0.414	8.8	LOS A	2.5	18.2	0.78	0.90	52.1
All Vehicles		2718	5.0	0.518	7.3	LOS A	4.0	29.0	0.68	0.68	53.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2019 PM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Background Traffic Volumes
PM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	67	3.0	0.166	4.6	LOS A	0.9	6.3	0.40	0.47	54.6
2	T1	324	1.0	0.166	4.6	LOS A	0.9	6.3	0.41	0.47	56.3
3	R2	4	40.0	0.166	11.2	LOS B	0.9	6.2	0.41	0.47	53.2
Approach		396	1.8	0.166	4.7	LOS A	0.9	6.3	0.41	0.47	55.9
East: Doug Knight Drive											
4	L2	6	43.0	0.016	7.7	LOS A	0.1	0.6	0.65	0.60	44.2
5	T1	12	17.0	0.037	2.9	LOS A	0.2	1.2	0.59	0.58	47.2
6	R2	21	0.0	0.037	7.5	LOS A	0.2	1.2	0.59	0.58	47.9
Approach		39	12.0	0.037	6.2	LOS A	0.2	1.2	0.60	0.59	47.1
North: Hogbin Drive											
7	L2	6	0.0	0.228	4.4	LOS A	1.3	9.2	0.37	0.43	49.2
8	T1	428	2.0	0.279	4.3	LOS A	1.7	12.1	0.37	0.48	55.6
9	R2	214	1.0	0.279	9.9	LOS A	1.7	12.1	0.37	0.56	54.8
Approach		648	1.7	0.279	6.1	LOS A	1.7	12.1	0.37	0.50	55.3
West: Stadium Drive											
10	L2	225	0.0	0.190	4.8	LOS A	1.0	6.8	0.47	0.57	54.7
11	T1	5	33.0	0.156	5.9	LOS A	0.8	5.4	0.48	0.69	47.1
12	R2	148	1.0	0.156	10.8	LOS B	0.8	5.4	0.48	0.69	52.7
Approach		379	0.9	0.190	7.2	LOS A	1.0	6.8	0.47	0.62	53.8
All Vehicles		1462	1.7	0.279	6.0	LOS A	1.7	12.1	0.41	0.53	54.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2019 PM DES]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Design Traffic Volumes
PM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	67	3.0	0.167	4.6	LOS A	0.9	6.3	0.40	0.47	54.5
2	T1	324	1.0	0.167	4.6	LOS A	0.9	6.3	0.41	0.47	56.2
3	R2	5	40.0	0.167	11.2	LOS B	0.9	6.2	0.42	0.47	53.2
Approach		397	1.9	0.167	4.7	LOS A	0.9	6.3	0.41	0.47	55.9
East: Doug Knight Drive											
4	L2	7	43.0	0.019	7.7	LOS A	0.1	0.7	0.65	0.61	44.2
5	T1	12	17.0	0.039	2.9	LOS A	0.2	1.3	0.60	0.59	47.1
6	R2	23	0.0	0.039	7.5	LOS A	0.2	1.3	0.60	0.59	47.8
Approach		42	12.2	0.039	6.3	LOS A	0.2	1.3	0.61	0.59	47.0
North: Hogbin Drive											
7	L2	7	0.0	0.229	4.4	LOS A	1.3	9.3	0.37	0.43	49.2
8	T1	428	2.0	0.280	4.3	LOS A	1.7	12.2	0.37	0.48	55.6
9	R2	214	1.0	0.280	9.9	LOS A	1.7	12.2	0.37	0.56	54.8
Approach		649	1.6	0.280	6.2	LOS A	1.7	12.2	0.37	0.51	55.3
West: Stadium Drive											
10	L2	225	0.0	0.191	4.8	LOS A	1.0	6.8	0.47	0.57	54.7
11	T1	6	33.0	0.157	5.9	LOS A	0.8	5.4	0.48	0.70	47.1
12	R2	148	1.0	0.157	10.8	LOS B	0.8	5.4	0.48	0.70	52.7
Approach		380	0.9	0.191	7.2	LOS A	1.0	6.8	0.47	0.62	53.8
All Vehicles		1468	1.8	0.280	6.0	LOS A	1.7	12.2	0.41	0.53	54.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2029 AM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2029 Forecast Background Traffic Volumes
AM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	207	19.0	0.797	13.2	LOS B	12.1	89.8	0.99	1.09	49.4
2	T1	1133	2.0	0.797	13.1	LOS B	12.1	89.8	1.00	1.11	50.6
3	R2	100	9.0	0.797	19.8	LOS B	11.6	83.5	1.00	1.13	45.7
Approach		1440	4.9	0.797	13.6	LOS B	12.1	89.8	1.00	1.11	50.2
East: Doug Knight Drive											
4	L2	27	33.0	0.096	10.5	LOS B	0.5	4.2	0.82	0.85	42.3
5	T1	33	18.0	0.164	6.0	LOS A	1.0	7.7	0.86	0.88	45.2
6	R2	51	11.0	0.164	10.8	LOS B	1.0	7.7	0.86	0.88	45.5
Approach		111	18.5	0.164	9.3	LOS A	1.0	7.7	0.85	0.88	44.6
North: Hogbin Drive											
7	L2	248	5.0	0.624	8.5	LOS A	6.0	44.1	0.82	0.85	46.5
8	T1	711	5.0	0.763	9.2	LOS A	10.6	77.0	0.88	0.90	52.5
9	R2	411	3.0	0.763	15.4	LOS B	10.6	77.0	0.92	0.94	51.6
Approach		1369	4.4	0.763	11.0	LOS B	10.6	77.0	0.88	0.90	51.4
West: Stadium Drive											
10	L2	472	3.0	0.834	19.3	LOS B	8.8	63.2	1.00	1.25	45.5
11	T1	154	1.0	0.750	18.2	LOS B	5.9	42.7	0.95	1.15	39.9
12	R2	149	9.0	0.750	24.5	LOS C	5.9	42.7	0.95	1.15	46.1
Approach		775	3.8	0.834	20.1	LOS C	8.8	63.2	0.98	1.21	44.7
All Vehicles		3695	4.9	0.834	13.9	LOS B	12.1	89.8	0.95	1.05	49.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2029 AM DES]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2029 Forecast Design Traffic Volumes
AM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	207	19.0	0.802	13.4	LOS B	12.4	91.9	1.00	1.10	49.3
2	T1	1133	2.0	0.802	13.4	LOS B	12.4	91.9	1.00	1.12	50.4
3	R2	105	9.0	0.802	20.0	LOS C	11.9	85.4	1.00	1.13	45.4
Approach		1445	4.9	0.802	13.9	LOS B	12.4	91.9	1.00	1.11	50.0
East: Doug Knight Drive											
4	L2	27	33.0	0.097	10.6	LOS B	0.5	4.2	0.83	0.86	42.2
5	T1	33	18.0	0.166	6.1	LOS A	1.0	7.9	0.87	0.89	45.2
6	R2	51	11.0	0.166	10.8	LOS B	1.0	7.9	0.87	0.89	45.4
Approach		111	18.5	0.166	9.4	LOS A	1.0	7.9	0.86	0.88	44.6
North: Hogbin Drive											
7	L2	262	5.0	0.639	8.9	LOS A	6.4	46.6	0.83	0.88	46.3
8	T1	711	5.0	0.781	9.9	LOS A	11.5	83.0	0.90	0.94	52.0
9	R2	411	3.0	0.781	16.2	LOS B	11.5	83.0	0.94	0.98	51.2
Approach		1383	4.4	0.781	11.6	LOS B	11.5	83.0	0.90	0.94	50.9
West: Stadium Drive											
10	L2	472	3.0	0.840	19.8	LOS B	9.0	64.3	1.00	1.26	45.2
11	T1	162	1.0	0.774	19.5	LOS B	6.2	45.6	0.96	1.17	39.2
12	R2	149	9.0	0.774	25.7	LOS C	6.2	45.6	0.96	1.17	45.5
Approach		783	3.7	0.840	20.9	LOS C	9.0	64.3	0.98	1.22	44.2
All Vehicles		3722	4.9	0.840	14.3	LOS B	12.4	91.9	0.96	1.06	48.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2029 PM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2029 Forecast Background Traffic Volumes
PM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	96	3.0	0.254	5.1	LOS A	1.5	10.8	0.52	0.53	54.0
2	T1	458	1.0	0.254	5.2	LOS A	1.5	10.8	0.53	0.53	55.6
3	R2	5	40.0	0.254	12.0	LOS B	1.5	10.5	0.53	0.53	52.4
Approach		559	1.7	0.254	5.2	LOS A	1.5	10.8	0.52	0.53	55.3
East: Doug Knight Drive											
4	L2	8	43.0	0.025	9.6	LOS A	0.1	1.0	0.72	0.71	42.8
5	T1	14	17.0	0.054	4.1	LOS A	0.3	2.0	0.71	0.69	46.3
6	R2	26	0.0	0.054	8.6	LOS A	0.3	2.0	0.71	0.69	47.0
Approach		48	12.3	0.054	7.5	LOS A	0.3	2.0	0.71	0.70	46.0
North: Hogbin Drive											
7	L2	8	0.0	0.342	4.9	LOS A	2.2	15.5	0.49	0.48	48.4
8	T1	604	2.0	0.418	4.8	LOS A	3.0	21.1	0.49	0.52	55.0
9	R2	301	1.0	0.418	10.3	LOS B	3.0	21.1	0.50	0.59	54.3
Approach		914	1.7	0.418	6.6	LOS A	3.0	21.1	0.50	0.55	54.7
West: Stadium Drive											
10	L2	318	0.0	0.293	5.4	LOS A	1.6	11.3	0.58	0.65	54.3
11	T1	7	33.0	0.245	6.8	LOS A	1.2	8.9	0.58	0.77	46.7
12	R2	209	1.0	0.245	11.5	LOS B	1.2	8.9	0.58	0.77	52.3
Approach		535	0.8	0.293	7.8	LOS A	1.6	11.3	0.58	0.70	53.4
All Vehicles		2056	1.7	0.418	6.6	LOS A	3.0	21.1	0.53	0.58	54.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2029 PM DES]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2029 Forecast Design Traffic Volumes
PM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	96	3.0	0.255	5.1	LOS A	1.5	10.8	0.52	0.53	54.0
2	T1	458	1.0	0.255	5.2	LOS A	1.5	10.8	0.53	0.53	55.6
3	R2	6	40.0	0.255	12.0	LOS B	1.5	10.5	0.53	0.53	52.4
Approach		560	1.8	0.255	5.3	LOS A	1.5	10.8	0.53	0.53	55.3
East: Doug Knight Drive											
4	L2	8	43.0	0.025	9.6	LOS A	0.1	1.0	0.72	0.71	42.8
5	T1	14	17.0	0.054	4.1	LOS A	0.3	2.0	0.71	0.69	46.3
6	R2	26	0.0	0.054	8.6	LOS A	0.3	2.0	0.71	0.69	47.0
Approach		48	12.3	0.054	7.5	LOS A	0.3	2.0	0.71	0.70	46.0
North: Hogbin Drive											
7	L2	8	0.0	0.342	4.9	LOS A	2.2	15.5	0.49	0.48	48.4
8	T1	604	2.0	0.418	4.8	LOS A	3.0	21.1	0.50	0.52	55.0
9	R2	301	1.0	0.418	10.3	LOS B	3.0	21.1	0.50	0.59	54.3
Approach		914	1.7	0.418	6.6	LOS A	3.0	21.1	0.50	0.55	54.7
West: Stadium Drive											
10	L2	318	0.0	0.294	5.4	LOS A	1.6	11.3	0.58	0.65	54.3
11	T1	7	33.0	0.246	6.8	LOS A	1.3	8.9	0.59	0.77	46.7
12	R2	209	1.0	0.246	11.5	LOS B	1.3	8.9	0.59	0.77	52.3
Approach		535	0.8	0.294	7.8	LOS A	1.6	11.3	0.58	0.70	53.4
All Vehicles		2057	1.7	0.418	6.6	LOS A	3.0	21.1	0.53	0.58	54.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2019 AM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Background Traffic Volumes
AM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	147	19.0	0.488	6.1	LOS A	3.6	26.5	0.66	0.59	52.9
2	T1	803	2.0	0.488	5.8	LOS A	3.6	26.5	0.66	0.61	54.7
3	R2	81	9.0	0.488	11.9	LOS B	3.5	25.0	0.67	0.62	51.1
Approach		1032	5.0	0.488	6.3	LOS A	3.6	26.5	0.66	0.61	54.2
East: Doug Knight Drive											
4	L2	22	33.0	0.053	7.6	LOS A	0.2	2.1	0.71	0.71	44.5
5	T1	26	18.0	0.091	3.8	LOS A	0.5	3.8	0.70	0.68	46.6
6	R2	41	11.0	0.091	8.7	LOS A	0.5	3.8	0.70	0.68	46.9
Approach		89	18.5	0.091	7.0	LOS A	0.5	3.8	0.71	0.69	46.2
North: Hogbin Drive											
7	L2	203	5.0	0.413	5.7	LOS A	2.7	20.1	0.61	0.60	48.0
8	T1	503	5.0	0.505	5.5	LOS A	3.9	27.9	0.62	0.62	54.3
9	R2	291	3.0	0.505	11.1	LOS B	3.9	27.9	0.64	0.64	53.9
Approach		997	4.4	0.505	7.2	LOS A	3.9	27.9	0.62	0.62	53.2
West: Stadium Drive											
10	L2	335	3.0	0.411	7.2	LOS A	2.5	17.9	0.77	0.89	53.5
11	T1	125	1.0	0.370	8.1	LOS A	2.0	14.7	0.77	0.89	47.3
12	R2	105	9.0	0.370	14.2	LOS B	2.0	14.7	0.77	0.89	52.7
Approach		565	3.7	0.411	8.7	LOS A	2.5	17.9	0.77	0.89	52.2
All Vehicles		2683	4.9	0.505	7.2	LOS A	3.9	27.9	0.67	0.67	53.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2019 AM DES]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Design Traffic Volumes
AM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	147	19.0	0.493	6.2	LOS A	3.6	26.9	0.67	0.59	52.9
2	T1	803	2.0	0.493	5.8	LOS A	3.6	26.9	0.67	0.61	54.6
3	R2	86	9.0	0.493	11.9	LOS B	3.5	25.4	0.68	0.63	51.0
Approach		1037	5.0	0.493	6.4	LOS A	3.6	26.9	0.67	0.61	54.1
East: Doug Knight Drive											
4	L2	24	33.0	0.058	7.6	LOS A	0.3	2.4	0.72	0.71	44.5
5	T1	28	18.0	0.099	3.9	LOS A	0.5	4.2	0.71	0.69	46.6
6	R2	44	11.0	0.099	8.7	LOS A	0.5	4.2	0.71	0.69	46.8
Approach		97	18.6	0.099	7.0	LOS A	0.5	4.2	0.71	0.70	46.2
North: Hogbin Drive											
7	L2	217	5.0	0.424	5.9	LOS A	2.8	20.7	0.62	0.62	48.0
8	T1	503	5.0	0.518	5.7	LOS A	4.0	29.0	0.64	0.63	54.2
9	R2	291	3.0	0.518	11.2	LOS B	4.0	29.0	0.66	0.65	53.9
Approach		1011	4.4	0.518	7.3	LOS A	4.0	29.0	0.64	0.63	53.1
West: Stadium Drive											
10	L2	335	3.0	0.414	7.3	LOS A	2.5	18.2	0.78	0.90	53.4
11	T1	134	1.0	0.385	8.3	LOS A	2.1	15.5	0.77	0.90	47.3
12	R2	105	9.0	0.385	14.3	LOS B	2.1	15.5	0.77	0.90	52.6
Approach		574	3.6	0.414	8.8	LOS A	2.5	18.2	0.78	0.90	52.1
All Vehicles		2718	5.0	0.518	7.3	LOS A	4.0	29.0	0.68	0.68	53.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2019 PM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Background Traffic Volumes
PM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	67	3.0	0.166	4.6	LOS A	0.9	6.3	0.40	0.47	54.6
2	T1	324	1.0	0.166	4.6	LOS A	0.9	6.3	0.41	0.47	56.3
3	R2	4	40.0	0.166	11.2	LOS B	0.9	6.2	0.41	0.47	53.2
Approach		396	1.8	0.166	4.7	LOS A	0.9	6.3	0.41	0.47	55.9
East: Doug Knight Drive											
4	L2	6	43.0	0.016	7.7	LOS A	0.1	0.6	0.65	0.60	44.2
5	T1	12	17.0	0.037	2.9	LOS A	0.2	1.2	0.59	0.58	47.2
6	R2	21	0.0	0.037	7.5	LOS A	0.2	1.2	0.59	0.58	47.9
Approach		39	12.0	0.037	6.2	LOS A	0.2	1.2	0.60	0.59	47.1
North: Hogbin Drive											
7	L2	6	0.0	0.228	4.4	LOS A	1.3	9.2	0.37	0.43	49.2
8	T1	428	2.0	0.279	4.3	LOS A	1.7	12.1	0.37	0.48	55.6
9	R2	214	1.0	0.279	9.9	LOS A	1.7	12.1	0.37	0.56	54.8
Approach		648	1.7	0.279	6.1	LOS A	1.7	12.1	0.37	0.50	55.3
West: Stadium Drive											
10	L2	225	0.0	0.190	4.8	LOS A	1.0	6.8	0.47	0.57	54.7
11	T1	5	33.0	0.156	5.9	LOS A	0.8	5.4	0.48	0.69	47.1
12	R2	148	1.0	0.156	10.8	LOS B	0.8	5.4	0.48	0.69	52.7
Approach		379	0.9	0.190	7.2	LOS A	1.0	6.8	0.47	0.62	53.8
All Vehicles		1462	1.7	0.279	6.0	LOS A	1.7	12.1	0.41	0.53	54.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2019 PM DES]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2019 Forecast Design Traffic Volumes
PM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	67	3.0	0.167	4.6	LOS A	0.9	6.3	0.40	0.47	54.5
2	T1	324	1.0	0.167	4.6	LOS A	0.9	6.3	0.41	0.47	56.2
3	R2	5	40.0	0.167	11.2	LOS B	0.9	6.2	0.42	0.47	53.2
Approach		397	1.9	0.167	4.7	LOS A	0.9	6.3	0.41	0.47	55.9
East: Doug Knight Drive											
4	L2	7	43.0	0.019	7.7	LOS A	0.1	0.7	0.65	0.61	44.2
5	T1	12	17.0	0.039	2.9	LOS A	0.2	1.3	0.60	0.59	47.1
6	R2	23	0.0	0.039	7.5	LOS A	0.2	1.3	0.60	0.59	47.8
Approach		42	12.2	0.039	6.3	LOS A	0.2	1.3	0.61	0.59	47.0
North: Hogbin Drive											
7	L2	7	0.0	0.229	4.4	LOS A	1.3	9.3	0.37	0.43	49.2
8	T1	428	2.0	0.280	4.3	LOS A	1.7	12.2	0.37	0.48	55.6
9	R2	214	1.0	0.280	9.9	LOS A	1.7	12.2	0.37	0.56	54.8
Approach		649	1.6	0.280	6.2	LOS A	1.7	12.2	0.37	0.51	55.3
West: Stadium Drive											
10	L2	225	0.0	0.191	4.8	LOS A	1.0	6.8	0.47	0.57	54.7
11	T1	6	33.0	0.157	5.9	LOS A	0.8	5.4	0.48	0.70	47.1
12	R2	148	1.0	0.157	10.8	LOS B	0.8	5.4	0.48	0.70	52.7
Approach		380	0.9	0.191	7.2	LOS A	1.0	6.8	0.47	0.62	53.8
All Vehicles		1468	1.8	0.280	6.0	LOS A	1.7	12.2	0.41	0.53	54.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2029 AM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2029 Forecast Background Traffic Volumes
AM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	207	19.0	0.797	13.2	LOS B	12.1	89.8	0.99	1.09	49.4
2	T1	1133	2.0	0.797	13.1	LOS B	12.1	89.8	1.00	1.11	50.6
3	R2	100	9.0	0.797	19.8	LOS B	11.6	83.5	1.00	1.13	45.7
Approach		1440	4.9	0.797	13.6	LOS B	12.1	89.8	1.00	1.11	50.2
East: Doug Knight Drive											
4	L2	27	33.0	0.096	10.5	LOS B	0.5	4.2	0.82	0.85	42.3
5	T1	33	18.0	0.164	6.0	LOS A	1.0	7.7	0.86	0.88	45.2
6	R2	51	11.0	0.164	10.8	LOS B	1.0	7.7	0.86	0.88	45.5
Approach		111	18.5	0.164	9.3	LOS A	1.0	7.7	0.85	0.88	44.6
North: Hogbin Drive											
7	L2	248	5.0	0.624	8.5	LOS A	6.0	44.1	0.82	0.85	46.5
8	T1	711	5.0	0.763	9.2	LOS A	10.6	77.0	0.88	0.90	52.5
9	R2	411	3.0	0.763	15.4	LOS B	10.6	77.0	0.92	0.94	51.6
Approach		1369	4.4	0.763	11.0	LOS B	10.6	77.0	0.88	0.90	51.4
West: Stadium Drive											
10	L2	472	3.0	0.834	19.3	LOS B	8.8	63.2	1.00	1.25	45.5
11	T1	154	1.0	0.750	18.2	LOS B	5.9	42.7	0.95	1.15	39.9
12	R2	149	9.0	0.750	24.5	LOS C	5.9	42.7	0.95	1.15	46.1
Approach		775	3.8	0.834	20.1	LOS C	8.8	63.2	0.98	1.21	44.7
All Vehicles		3695	4.9	0.834	13.9	LOS B	12.1	89.8	0.95	1.05	49.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2029 AM DES]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2029 Forecast Design Traffic Volumes
AM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	207	19.0	0.802	13.4	LOS B	12.4	91.9	1.00	1.10	49.3
2	T1	1133	2.0	0.802	13.4	LOS B	12.4	91.9	1.00	1.12	50.4
3	R2	105	9.0	0.802	20.0	LOS C	11.9	85.4	1.00	1.13	45.4
Approach		1445	4.9	0.802	13.9	LOS B	12.4	91.9	1.00	1.11	50.0
East: Doug Knight Drive											
4	L2	27	33.0	0.097	10.6	LOS B	0.5	4.2	0.83	0.86	42.2
5	T1	33	18.0	0.166	6.1	LOS A	1.0	7.9	0.87	0.89	45.2
6	R2	51	11.0	0.166	10.8	LOS B	1.0	7.9	0.87	0.89	45.4
Approach		111	18.5	0.166	9.4	LOS A	1.0	7.9	0.86	0.88	44.6
North: Hogbin Drive											
7	L2	262	5.0	0.639	8.9	LOS A	6.4	46.6	0.83	0.88	46.3
8	T1	711	5.0	0.781	9.9	LOS A	11.5	83.0	0.90	0.94	52.0
9	R2	411	3.0	0.781	16.2	LOS B	11.5	83.0	0.94	0.98	51.2
Approach		1383	4.4	0.781	11.6	LOS B	11.5	83.0	0.90	0.94	50.9
West: Stadium Drive											
10	L2	472	3.0	0.840	19.8	LOS B	9.0	64.3	1.00	1.26	45.2
11	T1	162	1.0	0.774	19.5	LOS B	6.2	45.6	0.96	1.17	39.2
12	R2	149	9.0	0.774	25.7	LOS C	6.2	45.6	0.96	1.17	45.5
Approach		783	3.7	0.840	20.9	LOS C	9.0	64.3	0.98	1.22	44.2
All Vehicles		3722	4.9	0.840	14.3	LOS B	12.4	91.9	0.96	1.06	48.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2029 PM BG]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2029 Forecast Background Traffic Volumes
PM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	96	3.0	0.254	5.1	LOS A	1.5	10.8	0.52	0.53	54.0
2	T1	458	1.0	0.254	5.2	LOS A	1.5	10.8	0.53	0.53	55.6
3	R2	5	40.0	0.254	12.0	LOS B	1.5	10.5	0.53	0.53	52.4
Approach		559	1.7	0.254	5.2	LOS A	1.5	10.8	0.52	0.53	55.3
East: Doug Knight Drive											
4	L2	8	43.0	0.025	9.6	LOS A	0.1	1.0	0.72	0.71	42.8
5	T1	14	17.0	0.054	4.1	LOS A	0.3	2.0	0.71	0.69	46.3
6	R2	26	0.0	0.054	8.6	LOS A	0.3	2.0	0.71	0.69	47.0
Approach		48	12.3	0.054	7.5	LOS A	0.3	2.0	0.71	0.70	46.0
North: Hogbin Drive											
7	L2	8	0.0	0.342	4.9	LOS A	2.2	15.5	0.49	0.48	48.4
8	T1	604	2.0	0.418	4.8	LOS A	3.0	21.1	0.49	0.52	55.0
9	R2	301	1.0	0.418	10.3	LOS B	3.0	21.1	0.50	0.59	54.3
Approach		914	1.7	0.418	6.6	LOS A	3.0	21.1	0.50	0.55	54.7
West: Stadium Drive											
10	L2	318	0.0	0.293	5.4	LOS A	1.6	11.3	0.58	0.65	54.3
11	T1	7	33.0	0.245	6.8	LOS A	1.2	8.9	0.58	0.77	46.7
12	R2	209	1.0	0.245	11.5	LOS B	1.2	8.9	0.58	0.77	52.3
Approach		535	0.8	0.293	7.8	LOS A	1.6	11.3	0.58	0.70	53.4
All Vehicles		2056	1.7	0.418	6.6	LOS A	3.0	21.1	0.53	0.58	54.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 1 [2029 PM DES]

Hogbin Drive / Stadium Drive / Doug Knight Drive Roundabout
2029 Forecast Design Traffic Volumes
PM Peak Hour
Roundabout

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
South: Hogbin Drive											
1	L2	96	3.0	0.255	5.1	LOS A	1.5	10.8	0.52	0.53	54.0
2	T1	458	1.0	0.255	5.2	LOS A	1.5	10.8	0.53	0.53	55.6
3	R2	6	40.0	0.255	12.0	LOS B	1.5	10.5	0.53	0.53	52.4
Approach		560	1.8	0.255	5.3	LOS A	1.5	10.8	0.53	0.53	55.3
East: Doug Knight Drive											
4	L2	8	43.0	0.025	9.6	LOS A	0.1	1.0	0.72	0.71	42.8
5	T1	14	17.0	0.054	4.1	LOS A	0.3	2.0	0.71	0.69	46.3
6	R2	26	0.0	0.054	8.6	LOS A	0.3	2.0	0.71	0.69	47.0
Approach		48	12.3	0.054	7.5	LOS A	0.3	2.0	0.71	0.70	46.0
North: Hogbin Drive											
7	L2	8	0.0	0.342	4.9	LOS A	2.2	15.5	0.49	0.48	48.4
8	T1	604	2.0	0.418	4.8	LOS A	3.0	21.1	0.50	0.52	55.0
9	R2	301	1.0	0.418	10.3	LOS B	3.0	21.1	0.50	0.59	54.3
Approach		914	1.7	0.418	6.6	LOS A	3.0	21.1	0.50	0.55	54.7
West: Stadium Drive											
10	L2	318	0.0	0.294	5.4	LOS A	1.6	11.3	0.58	0.65	54.3
11	T1	7	33.0	0.246	6.8	LOS A	1.3	8.9	0.59	0.77	46.7
12	R2	209	1.0	0.246	11.5	LOS B	1.3	8.9	0.59	0.77	52.3
Approach		535	0.8	0.294	7.8	LOS A	1.6	11.3	0.58	0.70	53.4
All Vehicles		2057	1.7	0.418	6.6	LOS A	3.0	21.1	0.53	0.58	54.4

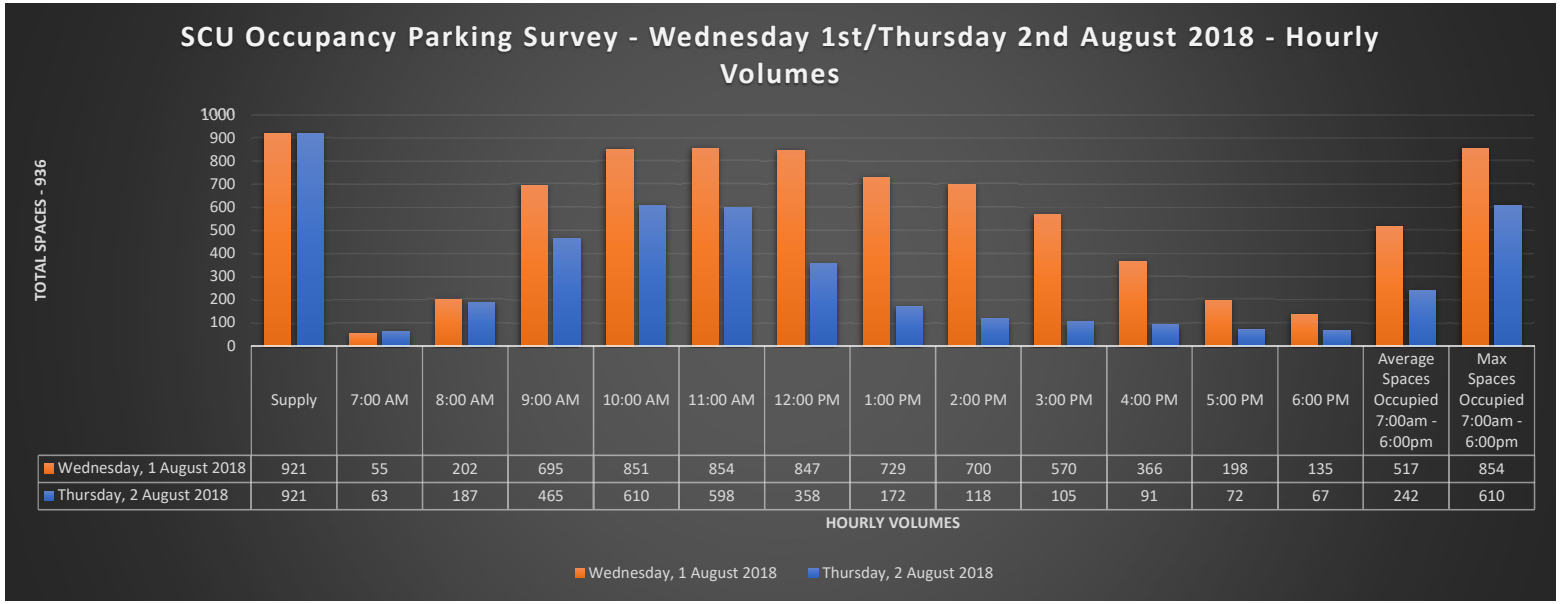
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay 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.

APPENDIX G

TDC PARKING SURVEY DATA

TDC
Traffic Data & Control

Day/Date	Supply	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	Average Spaces Occupied 7:00am - 6:00pm	Max Spaces Occupied 7:00am - 6:00pm
Wednesday, 1 August 2018	921	55	202	695	851	854	847	729	700	570	366	198	135	517	854
Thursday, 2 August 2018	921	63	187	465	610	598	358	172	118	105	91	72	67	242	610
2 Day Average		59	195	580	731	726	603	451	409	338	229	135	101	380	



Street Section ID	Thursday 2nd August 2018		7:00 AM		8:00 AM		9:00 AM		10:00 AM		11:00 AM		12:00 PM		1:00 PM		2:00 PM		3:00 PM		4:00 PM		5:00 PM		6:00 PM		Average Spaces Occupied 7:00am - 6:00pm	Max Spaces Occupied 7:00am - 6:00pm
	Description	**Supply**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**	**Occ**	**%**		
1	A Block/Head of Campus Parking west side	5	0	0%	0	0%	1	20%	2	40%	2	40%	3	60%	2	40%	1	20%	0	0%	1	20%	1	20%	0	0%	1	3
2	A Block/Head of Campus Parking east side	4	0	0%	0	0%	0	0%	0	0%	3	75%	4	100%	2	50%	0	0%	0	0%	3	75%	2	50%	1	25%	1	4
3	O Block carpark on Doug Knight Dr	5	2	40%	3	60%	5	100%	5	100%	5	100%	5	100%	3	60%	3	60%	1	20%	1	20%	0	0%	4	80%	3	5
4	Staff Parking Carpark	49	0	0%	9	18%	39	80%	41	84%	41	84%	25	51%	6	12%	3	6%	2	4%	2	4%	0	0%	1	2%	14	41
5	Large Carpark next to Block N	75	0	0%	23	31%	40	53%	43	57%	39	52%	10	13%	0	0%	0	0%	0	0%	0	0%	0	0%	1	1%	13	43
6	Carpark in front of Block K	10	1	10%	5	50%	5	50%	5	50%	5	50%	5	50%	4	40%	1	10%	1	10%	1	10%	1	10%	1	10%	3	5
7	Roadside marked bays btw Blocks S & I (west side)	13	2	15%	7	54%	10	77%	10	77%	10	77%	6	46%	3	23%	3	23%	2	15%	2	15%	0	0%	2	15%	5	10
8	Roadside Marked Bays btw K Block & Innovation Centre entrance	23	1	4%	5	22%	8	35%	7	30%	8	35%	7	30%	5	22%	2	9%	3	13%	3	13%	1	4%	2	9%	4	8
9	Roadside marked bays from Innov. Centre entrance to carpark entrance	9	0	0%	4	44%	7	78%	7	78%	7	78%	4	44%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	2	7
10	Innovation Centre Carpark	21	0	0%	2	10%	7	33%	12	57%	11	52%	6	29%	2	10%	2	10%	2	10%	1	5%	0	0%	0	0%	4	12
11	Carpark in front of Block M	68	0	0%	25	37%	45	66%	60	88%	67	99%	46	68%	36	53%	24	35%	22	32%	12	18%	7	10%	2	3%	29	67
12	3 Carparks opposite entrance to Innovation Centre Carpark	3	0	0%	0	0%	2	67%	2	67%	2	67%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	2
13	Library / E Block Undercover Carpark	34	9	26%	11	32%	17	50%	19	56%	20	59%	12	35%	8	24%	8	24%	8	24%	9	26%	10	29%	9	26%	12	20
14	Cars in marked bays in front of Library Undercover parking	7	1	14%	2	29%	5	71%	5	71%	4	57%	3	43%	1	14%	1	14%	1	14%	1	14%	1	14%	1	14%	2	5
15	Cars parked parallel to curb in marked bays	5	0	0%	0	0%	3	60%	4	80%	4	80%	1	20%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	4
16	Undercover Parking under LHS of Block I	7	1	14%	3	43%	4	57%	4	57%	4	57%	4	57%	1	14%	1	14%	1	14%	0	0%	0	0%	0	0%	2	4
17	Undercover parking under RHS of Block I	3	1	33%	2	67%	3	100%	3	100%	3	100%	1	33%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	3
18	Large Carpark on corner of Memorial Dr & Doug Knight Dr (Hogbin Dr side)	211	5	2%	5	2%	43	20%	67	32%	64	30%	37	18%	10	5%	5	2%	6	3%	5	2%	1	0%	2	1%	21	67
19	Carpark on corner of Memorial Dr & Doug Knight Dr (Campus side)	42	0	0%	8	19%	42	100%	42	100%	41	98%	28	67%	7	17%	5	12%	5	12%	4	10%	4	10%	2	5%	16	42
20	Large Carpark on Memorial Dr btw T Block (Sports Centre) & L Block	180	12	7%	24	13%	97	54%	157	87%	149	83%	87	48%	37	21%	23	13%	19	11%	12	7%	11	6%	9	5%	53	157
21	Small carpark at L Block	23	22	96%	22	96%	22	96%	23	100%	23	100%	23	100%	22	96%	19	83%	19	83%	18	78%	18	78%	18	78%	21	23
22	Parked line of cars at right angle to L Block	7	5	71%	5	71%	5	71%	7	100%	7	100%	7	100%	5	71%	6	86%	5	71%	5	71%	6	86%	5	71%	6	7
23	Roadside angled parking btw L Block & P Block	30	0	0%	3	10%	14	47%	23	77%	20	67%	6	20%	0	0%	0	0%	0	0%	2	7%	2	7%	2	7%	6	23
24	Cars parked beside P Block	4	1	25%	1	25%	2	50%	2	50%	1	25%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	2
25	Small carpark in front of P Block	15	0	0%	7	47%	10	67%	11	73%	10	67%	4	27%	1	7%	1	7%	1	7%	4	27%	4	27%	4	27%	5	11
26	Carpark at H Block	13	0	0%	3	23%	6	46%	13	100%	13	100%	9	69%	6	46%	3	23%	2	15%	0	0%	0	0%	0	0%	5	13
27	Roadside Parking btw P Block & H Block	49	0	0%	8	16%	21	43%	32	65%	30	61%	12	24%	9	18%	7	14%	5	10%	5	10%	3	6%	1	2%	11	32
28	Marked Parking area Nth of Area 27 (above)	6	0	0%	0	0%	2	33%	4	67%	5	83%	3	50%	2	33%	0	0%	0	0%	0	0%	0	0%	0	0%	1	5
	Grand Total	921	63	7%	187	20%	465	50%	610	66%	598	65%	358	39%	172	19%	118	13%	105	11%	91	10%	72	8%	67	7%	242	610

Street Section ID	Wednesday 1st August 2018		7:00 AM		8:00 AM		9:00 AM		10:00 AM		11:00 AM		12:00 PM		1:00 PM		2:00 PM		3:00 PM		4:00 PM		5:00 PM		6:00 PM		Average Spaces Occupied 7:00am - 6:00pm	Max Spaces Occupied 7:00am - 6:00pm
	Description	Supply	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%	Occ	%		
1	A Block/Head of Campus Parking west side	5	0	0%	0	0%	0	0%	2	40%	1	20%	1	20%	2	40%	1	20%	0	0%	3	60%	3	60%	3	60%	1	3
2	A Block/Head of Campus Parking east side	4	0	0%	1	25%	1	25%	0	0%	1	25%	1	25%	1	25%	2	50%	3	75%	3	75%	3	75%	3	75%	2	3
3	O Block carpark on Doug Knight Dr	5	2	40%	3	60%	4	80%	5	100%	4	80%	4	80%	5	100%	4	80%	2	40%	4	80%	2	40%	0	0%	3	5
4	Staff Parking Carpark	49	0	0%	4	8%	42	86%	49	100%	49	100%	49	100%	47	96%	46	94%	39	80%	30	61%	12	24%	1	2%	31	49
5	Large Carpark next to Block N	75	0	0%	9	12%	33	44%	51	68%	53	71%	53	71%	54	72%	55	73%	38	51%	34	45%	9	12%	1	1%	33	55
6	Carpark in front of Block K	10	1	10%	5	50%	4	40%	5	50%	6	60%	6	60%	5	50%	6	60%	4	40%	6	60%	2	20%	1	10%	4	6
7	Roadside marked bays btw Blocks S & I (west side)	13	0	0%	3	23%	9	69%	13	100%	13	100%	13	100%	13	100%	13	100%	7	54%	3	23%	4	31%	4	31%	8	13
8	Roadside Marked Bays btw K Block & Innovation Centre entrance	23	1	4%	4	17%	18	78%	20	87%	21	91%	21	91%	20	87%	17	74%	7	30%	5	22%	3	13%	6	26%	12	21
9	Roadside marked bays from Innov. Centre entrance to carpark entrance	9	0	0%	3	33%	9	100%	9	100%	8	89%	8	89%	9	100%	7	78%	7	78%	6	67%	3	33%	1	11%	6	9
10	Innovation Centre Carpark	21	0	0%	2	10%	7	33%	18	86%	18	86%	18	86%	18	86%	20	95%	15	71%	9	43%	4	19%	1	5%	11	20
11	Carpark in front of Block M	68	1	1%	20	29%	57	84%	68	100%	66	97%	66	97%	61	90%	66	97%	53	78%	28	41%	18	26%	4	6%	42	68
12	3 Carparks opposite entrance to Innovation Centre Carpark	3	0	0%	0	0%	2	67%	2	67%	3	100%	3	100%	2	67%	3	100%	3	100%	2	67%	1	33%	1	33%	2	3
13	Library / E Block Undercover Carpark	34	8	24%	12	35%	23	68%	27	79%	31	91%	31	91%	33	97%	34	100%	29	85%	19	56%	16	47%	15	44%	23	34
14	Cars in marked bays in front of Library Undercover parking	7	1	14%	1	14%	5	71%	5	71%	6	86%	6	86%	5	71%	5	71%	5	71%	4	57%	3	43%	2	29%	4	6
15	Cars parked parallel to curb in marked bays	5	0	0%	2	40%	5	100%	5	100%	5	100%	5	100%	4	80%	4	80%	4	80%	3	60%	0	0%	0	0%	3	5
16	Undercover Parking under LHS of Block I	7	1	14%	1	14%	3	43%	5	71%	5	71%	5	71%	5	71%	4	57%	4	57%	1	14%	1	14%	1	14%	3	5
17	Undercover parking under RHS of Block I	3	2	67%	2	67%	3	100%	3	100%	3	100%	3	100%	3	100%	3	100%	3	100%	3	100%	1	33%	0	0%	2	3
18	Large Carpark on corner of Memorial Dr & Doug Knight Dr (Hogbin Dr side)	211	3	1%	14	7%	131	62%	211	100%	207	98%	203	96%	147	70%	129	61%	101	48%	65	31%	41	19%	42	20%	108	211
19	Carpark on corner of Memorial Dr & Doug Knight Dr (Campus side)	42	0	0%	10	24%	40	95%	42	100%	40	95%	42	100%	40	95%	39	93%	41	98%	32	76%	7	17%	2	5%	28	42
20	Large Carpark on Memorial Dr btw T Block (Sports Centre) & L Block	180	9	5%	52	29%	180	100%	176	98%	177	98%	174	97%	144	80%	142	79%	111	62%	51	28%	26	14%	24	13%	106	180
21	Small carpark at L Block	23	14	61%	18	78%	22	96%	22	96%	23	100%	22	96%	20	87%	14	61%	20	87%	16	70%	6	26%	16	70%	18	23
22	Parked line of cars at right angle to L Block	7	5	71%	7	100%	7	100%	7	100%	7	100%	7	100%	5	71%	6	86%	6	86%	6	86%	3	43%	6	86%	6	7
23	Roadside angled parking btw L Block & P Block	30	3	10%	8	27%	22	73%	22	73%	23	77%	23	77%	21	70%	30	100%	19	63%	6	20%	3	10%	0	0%	15	30
24	Cars parked beside P Block	4	1	25%	1	25%	3	75%	3	75%	4	100%	4	100%	3	75%	2	50%	2	50%	2	50%	1	25%	0	0%	2	4
25	Small carpark in front of P Block	15	0	0%	5	33%	14	93%	15	100%	14	93%	14	93%	13	87%	13	87%	11	73%	5	33%	1	7%	0	0%	9	15
26	Carpark at H Block	13	0	0%	3	23%	8	62%	11	85%	11	85%	11	85%	13	100%	12	92%	10	77%	6	46%	6	46%	0	0%	8	13
27	Roadside Parking btw P Block & H Block	49	2	4%	11	22%	38	78%	49	100%	49	100%	48	98%	31	63%	21	43%	21	43%	11	22%	16	33%	1	2%	25	49
28	Marked Parking area Nth of Area 27 (above)	6	1	17%	1	17%	5	83%	6	100%	6	100%	6	100%	5	83%	2	33%	5	83%	3	50%	3	50%	0	0%	4	6
Grand Total		921	55	6%	202	22%	695	75%	851	92%	854	93%	847	92%	729	79%	700	76%	570	62%	366	40%	198	21%	135	15%	517	854

APPENDIX H

MCLAREN TRAFFIC ENGINEERING TRAFFIC LETTER

M^CLAREN TRAFFIC ENGINEERING
Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness
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MIRANDA NSW 2228
Ph 61-2-8543-3811
Fax 61-2-8543-3849

Accounts Office:
5 Jabiru Place
Woronora Heights
NSW 2233
Ph 61-2-9545-5161
Fax 61-2-9545-1227

2 September 2010 2010/108.L01 CM/sm

Facilities Management and Services
Southern Cross University
C/- NSW Public Works
359 Harbour Drive
COFFS HARBOUR NSW 2450

Attention: Mr. John Timmers

Dear John,

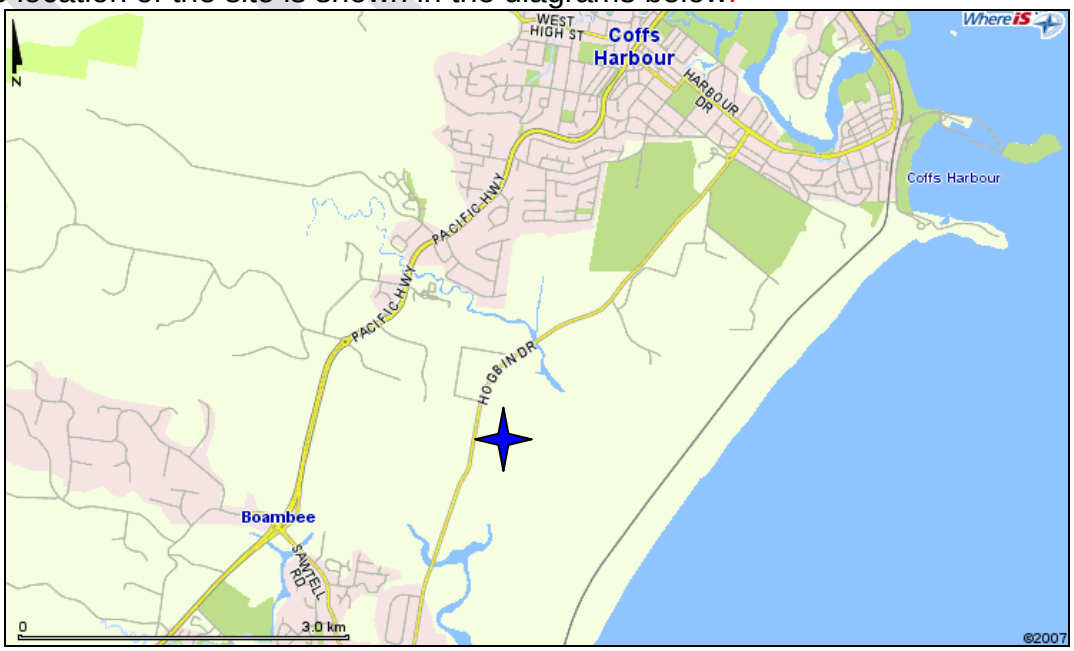
TRAFFIC & PARKING IMPACT ASSESSMENT OF PROPOSED ADDITIONS TO BLOCKS H & M WITHIN THE EDUCATIONAL CAMPUS, COFFS HARBOUR

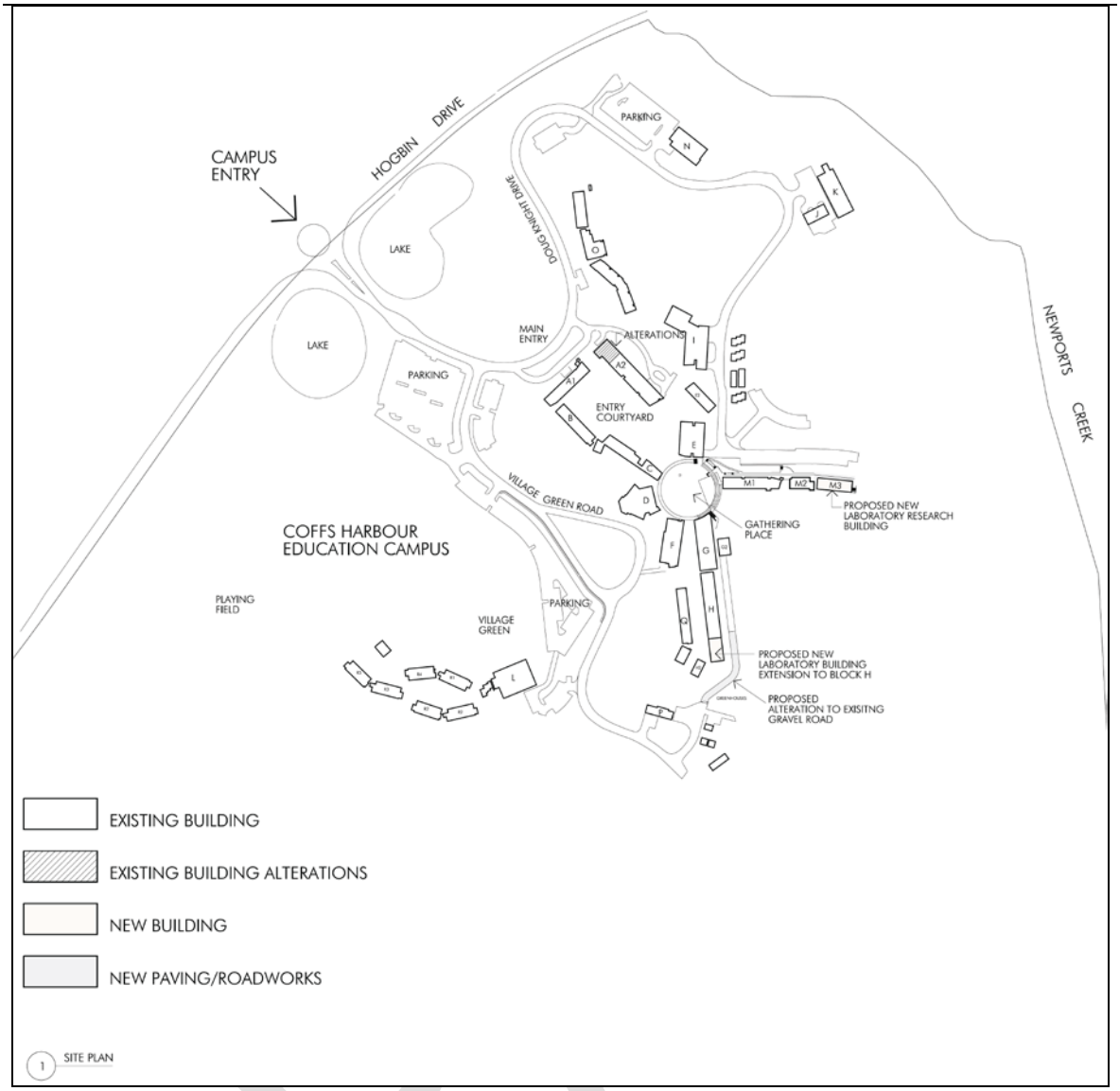
Reference is made to your request to provide a report on the impact of the proposed expanded areas of Blocks H & M within the Coffs Harbour Educational Campus at Hogbin Drive, Coffs Harbour to accommodate an extra 15 students and 5 staff.

The approximate expanded areas include the following:

- Internal space for block M = 850 m^2
- Internal space for block H = 150 m^2
- Internal space for block A = no change

The location of the site is shown in the diagrams below.





1. SITE LOCATION AND SURROUNDING CONTEXT

Situated on the east coast, the Coffs Harbour Education Campus (CHEC) is located south of Coffs Harbour city centre. CHEC consists of a combined High School, University & TAFE teaching facilities.

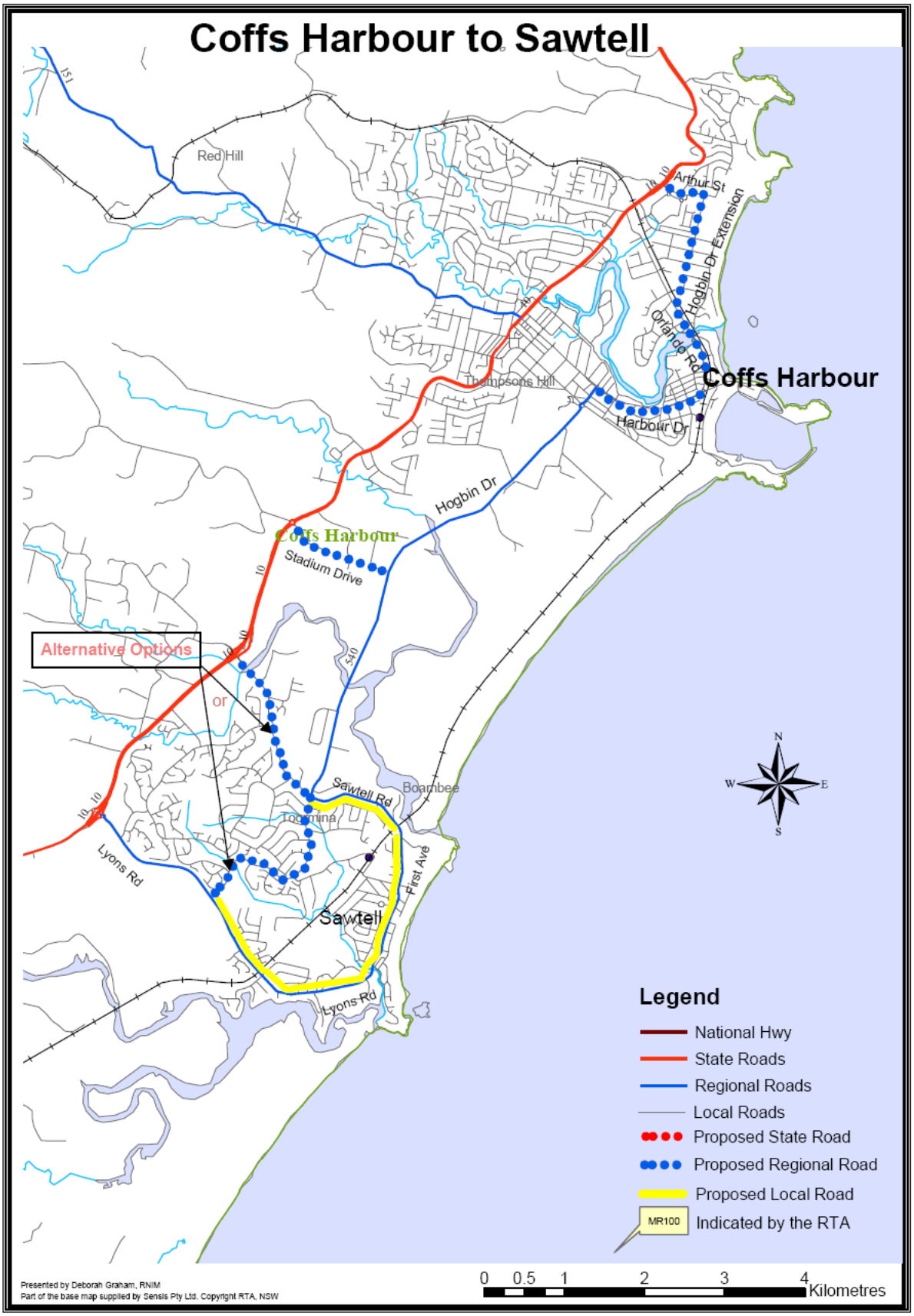
The site is bound by dense bush land to the north, east and south with access off Hogbin Drive to the west. The site currently includes existing buildings and car parking as shown on the Campus Site map (see above). There is a large dam to the south of the site. The campus buildings are generally clustered across a ridge on the site with a spine road and parking facilities that serve the various buildings on the site.

2. EXISTING TRANSPORT/TRAFFIC CONDITIONS

Road Hierarchy

Hogbin Drive is a REGIONAL road, carrying moderately high traffic volumes, under the care and control of the Coffs Harbour City Council. Recent upgrades of Hogbin Drive are currently under construction north of High Street, with the assistance of funding from Federal, State and local Council.

Stadium Drive is a collector road under the care and control of Coffs Harbour City Council. Stadium Drive is planned to become a future Regional road, as depicted in the diagram below, obtained from the Roads & Traffic Authority.



RTA ROAD HIERARCHY PLAN

3. ROAD CONDITIONS

Hogbin Drive is constructed as a variable width traffic corridor. Its general operating segment design conditions are as follows:

- High Street to General Aviation access … 4 lane undivided (80km/h).
- General Aviation access to Airport … 3 lane undivided (2 south) (80km/h).
- CH Airport to CHEC … 2 lane undivided (80km/h).
- CHEC to Boambee Ck Bridge … 3 lane undivided (2 north) (100km/h).
- On Boambee Ck Bridge to Sawtell Road … 2 lane undivided (100km/h).

The above general speed limits reduce to 60km/h on the approaches to the roundabout controls located at the following Hogbin Drive intersections:

- High Street.
- CH Airport.
- CHEC / Stadium Drive. (A 40km/h school zone also applies)
- Sawtell Road.

Stadium Drive is generally constructed as a 2 lane undivided carriageway linking the Pacific Highway to Hogbin Drive.

4. TRAFFIC MANAGEMENT

The prevailing traffic management conditions within the vicinity of the site include:

- Round-a-bout at the intersection of Hogbin Drive with the CHEC access and Stadium Drive.

- 40km/h school zone speed limit applying on the southern leg of the above listed intersection (on Hogbin Drive – south). The school zone speed limit applies from 8:00am to 9:30am and from 2:30pm to 4:00pm on school days.

- Other speed limits along Hogbin Drive as outlined above in Section 3.2 of this report.

5. PARKING DEMAND

Currently there are a total of some 858 designated car parking spaces on the site, including 16 disabled spaces.

Recent surveys of on-site parking demand showed a peak parking accumulation of 743 (i.e. 86.5%) vehicles at 10:00am. Thus the supply exceeds demand by some 115 cars.

During the evening, much less parking demand occurs, with an observed peak of 75 vehicles, no bicycles and 1 college bus at 7pm, representing 9% of capacity.

6. EXISTING STUDENT / STAFF ATTENDANCE

Previous inspections undertaken at the College indicate that peak student and staff numbers occur on campus at 10:00am. In the evening much less student and staff levels occur, unless there is a special event / function. Thus the peak parking demand period is during the day.

Past surveys of the existing CHEC (as well as other Colleges) indicate that the typical maximum number of students on-site is equivalent to 25% of the effective full time (EFT) students at the campus. EFT is based upon the number of actual face-to-face teaching hours, many of these face-to-face teaching hours are for part time student positions, resulting in a smaller proportion of students on campus at any one time (due to the "floating" nature of students arriving / departing over any particular week and any particular day).

Hence for the additional 15 student places associated with the proposed development, this equates to 4 additional students on-site at any one time plus 1 extra staff. It should be noted that the peak use of the expanded accommodation areas will occur during the evening by PHD research students and staff undertaking research. Much less use of the proposed areas will be used by new students during the day.

7. TRAVEL MODE SPLIT

Based upon a previous questionnaire survey undertaken at CHEC, the following mode split characteristics for students were found:

Students travel habits surveyed at 10 am

	#Students	% Total	% Bus	% Driver	% Passenger	% Bike
SCU	235	37	9	76	12	3
TAFE	292	46	22	50	24	4
CHSC	106	17	53	13	28	6
TOTAL	**633**	**100**	**22**	**53**	**20**	**5**

Notes:

1. SCU – University students
2. TAFE – TAFE students
3. CHSC – High School students

Of the students that drive to this College all park within the CHEC grounds at all times. The staff car driver proportion is 92%.

Hence during the peak daytime period, the additional 4 students will give rise to an additional parking need of **3** spaces (i.e. 76% SCU component x 4). The additional 1 staff will give rise to a need for a further **1** car, thus an extra demand of **4** car spaces is needed for the subject development.

8. PLANNED TRANSPORT INFRASTRUCTURE

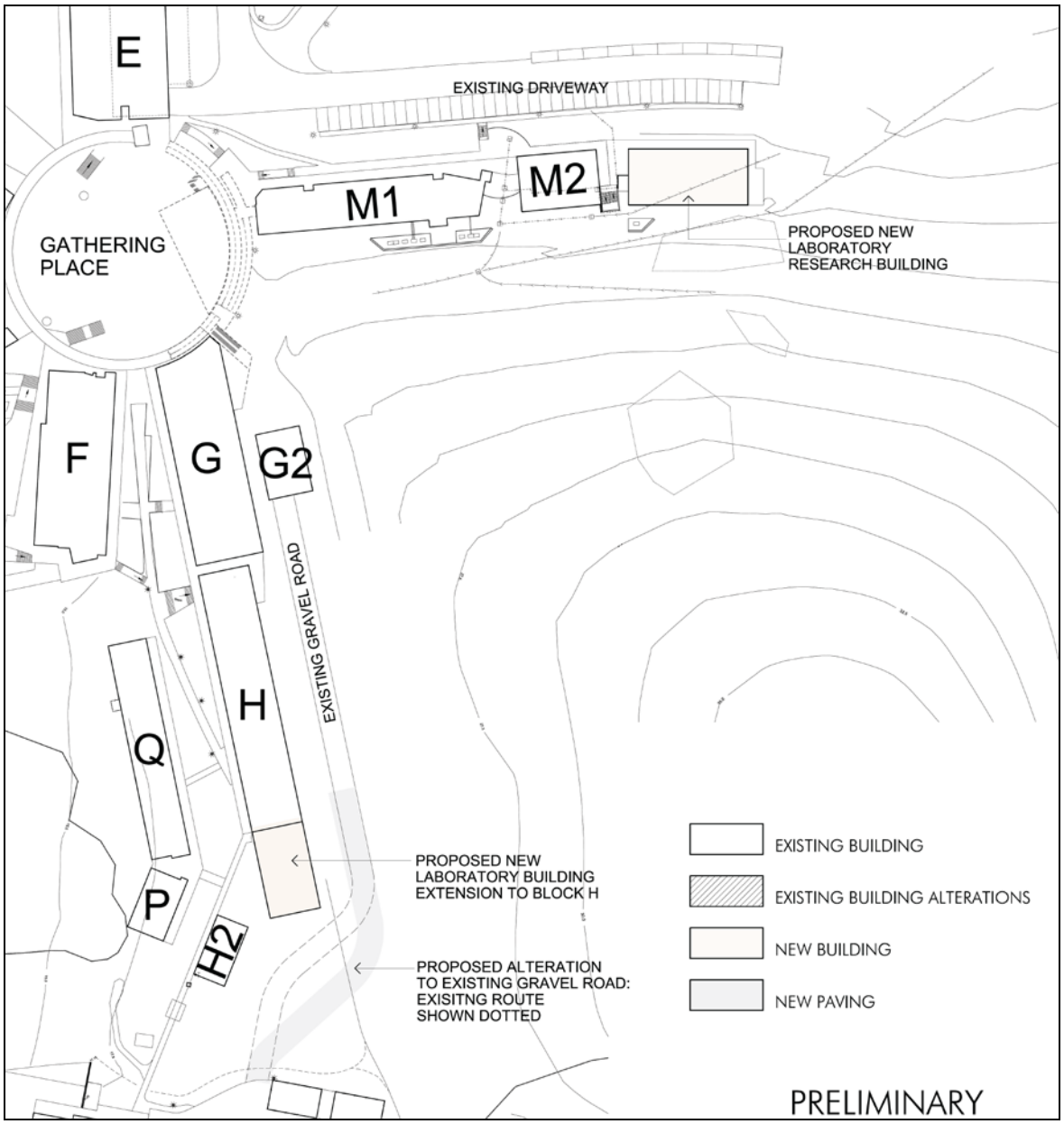
No significant road network improvements are currently committed or planned for the general locality. The Roads & Traffic Authority has no works planned in the immediate vicinity.

9. PROPOSED DEVELOPMENT

The proposed expansion to Blocks M & H that will accommodate an extra 15 students and 5 staff comprises the following:

- Internal space for block M = 850 m^2
- Internal space for block H = 150 m^2
- Internal space for block A = no change

The plans of the proposed development are shown below with greater detail submitted to Council under separate cover.



10. COUNCIL PARKING & ACCESS REQUIREMENTS

Coffs Harbour City Council does not specify a rate for parking for tertiary education establishments, but requires a parking study to justify needs.

The RTA has no specified rates for Colleges.

It is evident from parking demand discussion in Sections 5, 6 & 7 of this report for the CHEC College that extra on-site parking is not necessary as spare capacity exists on-site in excess of the additional demand of **4** parking spaces (3 for students and 1 for staff) associated with the proposed development.

11. PARKING ASSESSMENT

The existing on-site parking supply exceeds the operational peak parking demand needs of the combined effects of the existing CHEC College and proposed development.

At night the existing on-site parking supply is more than adequate.

12. TRAFFIC IMPACT

The proposed additional student vehicle numbers of **3** or even **12** [i.e. 15 x 76% by car] (as a worst case) plus 1 to **5** staff cars at any one time as an expected maximum would yield very low to low additional traffic levels. The additional arrival rate of 1 car per 15 minutes (i.e. 4 cars in an hour) or 1 car per 3 to 4 minutes (i.e. 4 cars in an hour) during the on-street commuter peak hour would not result in any change to the current level of service of the adjacent road network.

13. CONCLUSIONS

The proposed development is supportable in terms of traffic and parking impacts.

The existing on-site parking supply exceeds the operational peak parking demand needs of the combined effects of the existing CHEC College and proposed development. At night the existing on-site parking supply is more than adequate.

No adverse traffic flow efficiency, residential amenity or road safety effects will result from the proposed development. Finally as the proposed development does not exceed 500 new students or 250 new car parking spaces it does not require referral to the Regional Traffic Committee.

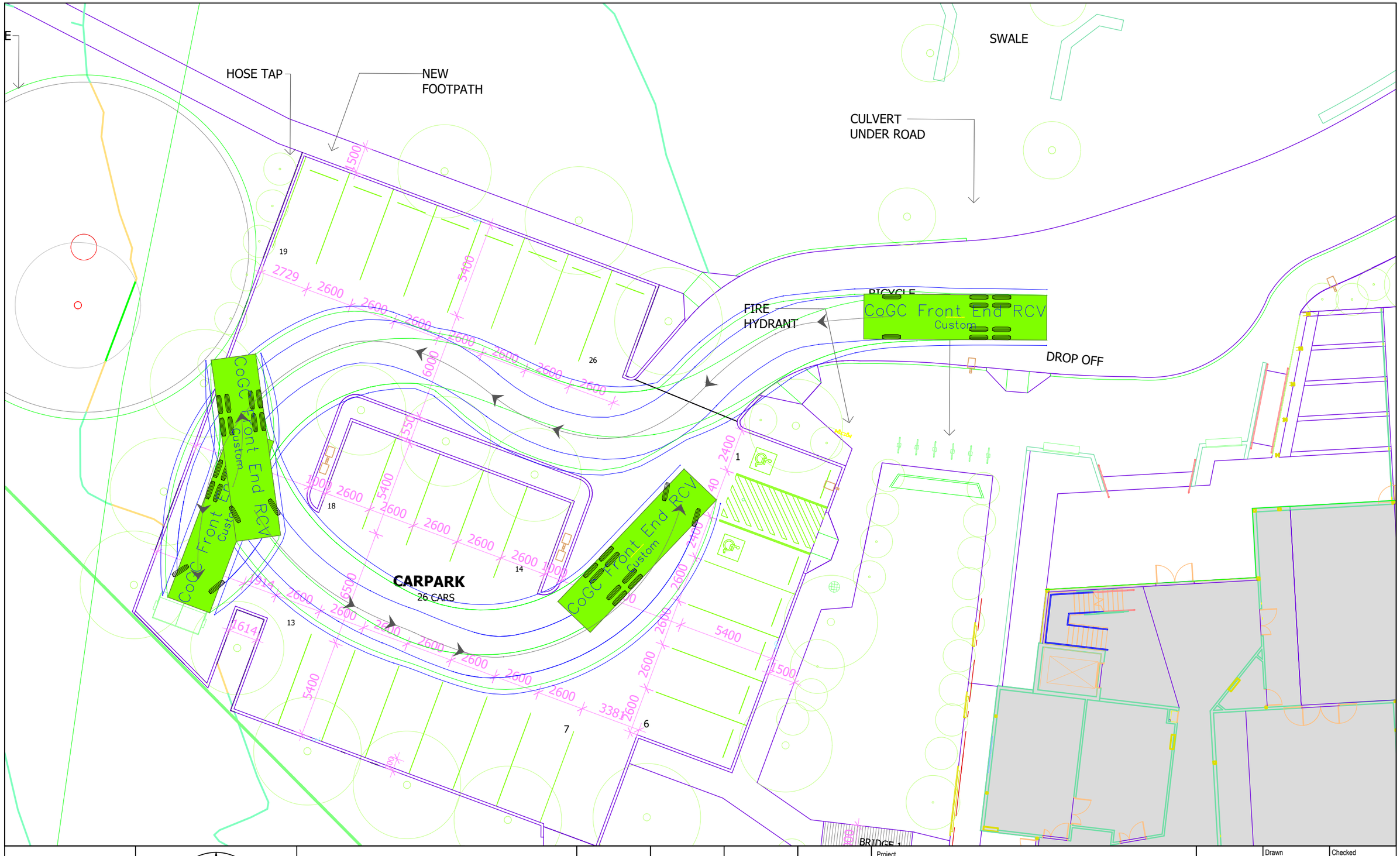
Please contact the undersigned should you require further information or assistance.

Yours faithfully
M^CLAREN TRAFFIC ENGINEERING

Craig M^CLaren
Director
BE Civil. Graduate Diploma (Transport Eng) MAITPM MITE
RTA Accredited Level 3 Road Safety Auditor
Traffic Control Plans (Red Card)

APPENDIX I

SWEPT PATHS



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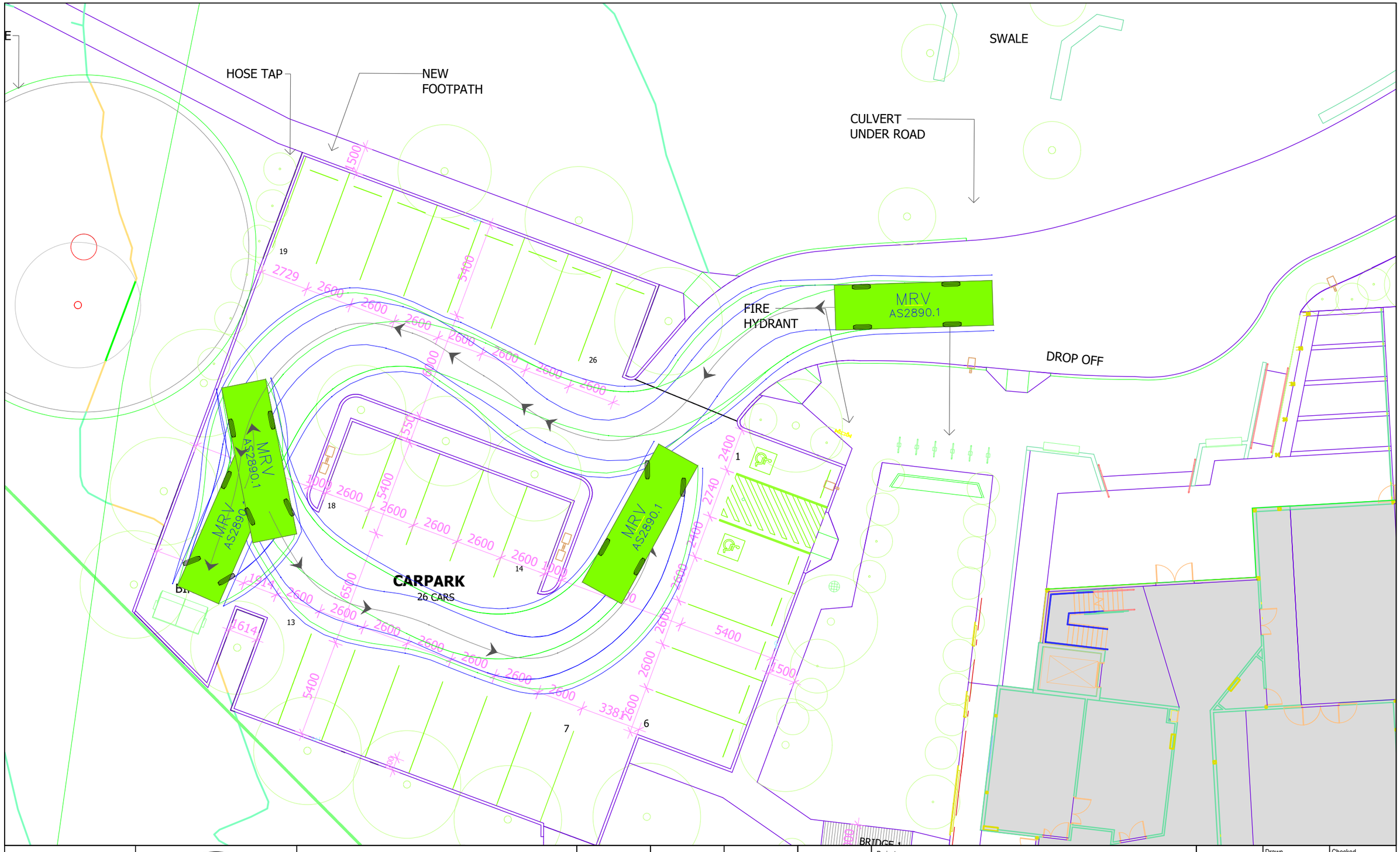
						Title: 10.2m Front-Loading RCV Swept Path	FOR INFORMATION ONLY / Date: 17/07/2018
							Project Number: P3480 / Issue: 009 / Sheet Number: 1



BITZIOS consulting

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Project	Southern Cross University Coffs Harbour Traffic Impact Assessment		
Title	8.8m MRV (Fire Truck) Swept Path		
		Drawn: S.K	Checked: A.B
	FOR INFORMATION ONLY	Date: 17/07/2018	
Project Number: P3480	Issue: 009	Sheet Number: 2	