FABCOT PTY LTD

REVIEW OF TRAFFIC EFFECTS OF PROPOSED PART 3A PROPOSAL FOR RETAIL DEVELOPMENT, THE LAKES WAY, FORSTER

MAY 2009

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1. INTRODUCTION

1.1. Colston Budd Hunt & Kafes Pty Ltd has been retained by Fabcot Pty Ltd to review the traffic effects of the proposed Part 3A proposal, for part of the land on the western side of The Lakes Way, Forster, to allow retail development. The site location is shown on Figure 1.

1.2. This is a preliminary review of the traffic effects. A more comprehensive traffic and parking assessment would be undertaken when an Environmental Assessment is submitted. The findings of our review are set out through the following sections in Chapter 2:

- existing conditions;
- proposed development;
- public transport;
- parking;
- access, internal circulation and servicing;
- traffic effects.

2. TRAFFIC REVIEW

Existing Conditions

2.1. The site is located on the western side of The Lakes Way, just to the south of intersection with Breese Parade. The site is occupied by some commercial development along The Lakes Way frontage (including a motel). The rear of the site (with water frontage) is vacant land. Surrounding land use is residential on the eastern side of The Lakes Way and a hotel to the north. Stockland shopping centre is located to the east of the site with access off The Lakes Way and Breese Parade.

2.2. The main roads in the area are The Lakes Way and Breese Parade. The Lakes Way is a classified main road and is the principle access road to Forster from the north and south. In the vicinity of the site, The Lakes Way varies from a two lane road with kerb side parking to a dual carriageway standard with two traffic lanes in each direction.

2.3. Breese Parade is located to the east of the site. It has a dual carriageway with two traffic lanes in each direction plus kerb side parking. Breese Parade provides access to development located to the east of The Lakes Way, including the Stockland shopping centre located to the north east of the subject site. The intersection of The Lakes Way and Breese Parade is controlled by a roundabout.

2.4 Surveys of existing peak hour traffic flows during the Friday afternoon and Saturday midday peak periods were undertaken at the roundabout controlled intersection of The Lakes Way and Breese Parade.

2.5 The surveys are summarised in Table 2.1 and displayed in Figures 2 and 3.

Table 2.1 : Existing Two Way Peak Hour Traffic Flows		
	Vehicles Per Hour (Two-Way)	
Location	**Friday**	**Saturday**
The Lakes Way – north of Breese Parade – south of Breese Parade	 1350 980	 1310 1040
Breese Parade – east of The Lakes Way	 890	 815

2.6 Examination of Table 2.1 reveals that:

- traffic flows along The Lakes Way were some 980 to 1,350 vehicles per hour (two way) in the Friday afternoon and Saturday peak periods; and

- traffic flows along Breese Parade were some 815 to 890 vehicles per hour (two way) in the Thursday afternoon and Saturday peak periods;

2.7 The surveyed intersections have been analysed using the SIDRA program. SIDRA is designed to analyse controlled intersections, roundabouts and priority intersections.

2.8 SIDRA produces a number of measures of intersection operations. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle.

2.9 Based on average delay per vehicle SIDRA estimates the following levels of service (LOS):-

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:-

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode.
>70	=	"F"	Unsatisfactory and requires additional capacity

- For Give Way and Stop Signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:-

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode.
>70	=	"F"	Unsatisfactory and requires other control mode

2.10 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.11 The SIDRA analysis found that the roundabout at the intersection of The Lakes Way and Breese Parade operates with average delays of less than 15 seconds per vehicle in the Friday afternoon and Saturday peak periods. This represents level of service A, a good level of intersection operation.

2.12 Forster is subject to seasonal fluctuations in traffic flows with summer holiday traffic flows some 33% higher that typical traffic conditions. An analysis of the roundabout at the intersection of The Lakes Way and Breese Parade with peak summer flows has been undertaken using SIDRA. The analysis found that the roundabout at the intersection of The Lakes Way and Breese Parade would operate with average delays of less than 20 seconds per vehicle in the Friday afternoon and Saturday peak periods. This represents level of service B, an acceptable level of intersection operation with spare capacity.

2.13 Copies of SIDRA movement summaries are attached to this report.

Proposed Development

2.14 The proposed development is for a retail development comprising the following elements:

- Retail – some 18,115m^2 GLA (comprising a supermarket – some 4,200m^2 GLA, DDS and mini majors – some 8,700m^2 GLA and specialty shops – some 5,215m^2 GLA); and
- Commercial – some 1,200m^2 GLA.

2.15 Access is proposed from The Lakes Way (at the southern end of the site with access limited to left in/left out) and via a fourth leg to the roundabout at the intersection of The Lakes Way and Breese Parade.

Public Transport

2.16 The site is accessible by bus services that operate along The Lakes Way or Breese Parade. Thus the proposed development would increase development close to existing public transport services, supporting their efficient and viable operation. This is consistent with government policy of:

(a) improving accessibility to employment and services by walking, cycling, and public transport;
(b) improving the choice of transport and reducing dependence solely on cars for travel purposes;
(c) moderating growth in the demand for travel and the distances travelled, especially by car; and
(d) supporting the efficient and viable operation of public transport services.

2.17 Furthermore the subject site is located within an established commercial area along The Lakes Way and Breese Parade. The area includes the existing Stockland shopping centre located to the north east. The site has good access to the arterial road network being adjacent to The Lakes Way. Existing bus services operate along The Lakes Way past the site. By locating additional development within the area, the proposal increases opportunities to minimise traffic generation by allowing linked trips and for people to undertake trips by public transport.

2.18 The proposed development would include provision for taxis, coach and mini bus parking, further increasing accessibility by means other than private car.

Parking

2.19 Councils parking policy requires the following parking rates for the proposed development:

- Retail – 1 space per 20m^2 GLA for ground floor development + 1 space per 30m^2 GLA for upper floor development; and
- Commercial – 1 space per 20m^2 GLA for ground floor development + 1 space per 30m^2 GLA for upper floor development.

2.20 Assuming that the proposed retail and commercial development is all at ground level, the proposed development would require some 965 parking spaces.

2.21 By way of comparison RTA Guidelines (which are based on extensive surveys) suggest the following parking rates for shopping centres:

- 4.0 spaces per 100m^2 DDS and mini majors;
- 4.2 spaces per 100m^2 supermarkets; and
- 4.5 spaces per 100m2 specialty shops.

2.22 Applying these rates the proposed development would require some 820 parking spaces (760 retail and 60 commercial).

2.23 A minimum of 880 spaces would be provided which satisfies RTA guidelines. Appropriate disabled and bicycle parking (including change facilities) would be provided in accordance with Council requirements.

Access, Internal Circulation and Servicing

2.24 These aspects would be assessed in more detail when a DA is submitted. However the following principles would be followed:

- access is proposed from The Lakes Way (at the southern end of the site with access limited to left in/left out) and via a fourth leg to the roundabout at the intersection of The Lakes Way and Breese Parade. Access arrangements would be designed to comply with the requirements of AS2890.1-2004 and AS2890.2-2002. The proposed development would require construction of the fourth leg to the Breese Parade/The Lakes Way roundabout;

- parking layout (parking bay dimensions, aisle widths, ramp grades and circulating roads) would be designed to comply with the requirements of AS2890.1-2004; and

- service areas would generally be separated from customer parking areas. Service areas would be designed to allow trucks to enter and depart the development in a forward direction and to comply with the requirements of AS2890.2-2002.

Traffic Effects

2.25 Estimates of traffic generation of the proposed development have been based on RTA Guidelines for the retail and commercial components and surveys of bulky goods development. Based on RTA Guidelines, the retail development would generate some 1,070 to1, 290 vehicles per hour (two way) in the Friday afternoon and Saturday midday peak periods respectively. The commercial component

would generate some 25 vehicles per hour (two way) in the Friday afternoon peak period and little traffic on Saturday.

2.26 Thus the total traffic generation would be some 1,095 and 1,290 vehicles per hour (two way) in the Friday afternoon and Saturday midday peak periods respectively.

2.27 Some of this traffic will be passing trade, which are vehicles that are already driving past the site, regardless of their visit to the site, or visiting similar developments in the area. The RTA guide suggests that for retail developments this is in the order of 15% to 25%. Our analysis has been based on 20% passing trade. Thus the additional traffic generated by the proposed development would be some 875 and 1,030 vehicles per hour (two way) in the Friday afternoon and Saturday midday peak periods respectively.

2.28 The additional traffic has been assigned to the road network. The resulting flows are summarised in Table 2.2 and displayed in Figures 2 and 3.

Table 2.3 : Existing + Development Two Way Peak Hour Traffic Flows

	Vehicles Per Hour (Two-Way)			
Road	**Friday**		**Saturday**	
	Existing	With Dev	Existing	With Dev
The Lakes Way				
– north of Breese Parade	1350	+410	1310	+490
– south of Breese Parade	980	+315	1040	+350
Breese Parade				
– east of The Lakes Way	890	+210	815	+250

2.29 Examination of Table 2.2 reveals that:

- Traffic flows on The Lakes Way would increase by some 315 to 490 vehicles per hour (two way) during the peak periods; and

- Traffic flows on Breese Parade would increase by some 210 to 250 vehicles per hour (two way) during the peak periods.

2.30 The operation of the roundabout at the intersection of The Lakes Way and Breese Parade with development traffic in place was analysed using SIDRA. The analysis found that the roundabout would operate with average delays of less than 20 seconds per vehicle in the Friday afternoon and Saturday peak periods. This represents level of service B, an acceptable level of intersection operation with spare capacity.

2.31 Sensitivity testing was undertaken to assess the traffic effects under:

- summer traffic conditions; and
- with additional traffic from background traffic growth and additional development located on the northern side of the new road connecting to the roundabout added to summer plus development traffic flows.

2.32 With development traffic added to summer traffic flows the SIDRA analysis found that the roundabout would operate with average delays of less than 25 seconds per vehicle in the Friday afternoon and Saturday peak periods. This represents level of service B, an acceptable level of intersection operation with spare capacity.

2.33 To reflect background traffic growth, base traffic flows through the roundabout were increased by 10%. With respect to traffic from additional development located on the northern side of the new road connecting to the roundabout, an allowance of 200 vehicles per hour (two way) was made, with all access via the roundabout. With this additional traffic added to summer plus development traffic flows, the SIDRA analysis found that the roundabout would operate with average delays of less than 35 seconds per vehicle in the Friday afternoon and Saturday peak periods. This represents level of service C, a satisfactory level of intersection operation.

2.34 Thus in summary the traffic analysis found that:

- with development traffic added to existing traffic flows the roundabout would operate at an acceptable level of intersection operation with spare capacity in the peak periods;

- with development traffic added to summer traffic flows the roundabout would operate an acceptable level of intersection operation with spare capacity in the peak periods

- with a combination of background traffic growth, development traffic and traffic from other developments, the roundabout would operate at a satisfactory level of intersection operation in the peak periods.

Summary

2.35 In summary the traffic review has found that:

- The proposed development is for a mixed use development comprising retail, commercial and bulky goods;

- The site is accessible by public transport and the proposed development would increase development close to existing public transport services, supporting their efficient and viable operation;

- Parking would be provided in accordance with RTA requirements;

- Access, parking and servicing arrangements would be designed to comply with the requirements of AS2890.1-2004 and AS2890.2-2002;

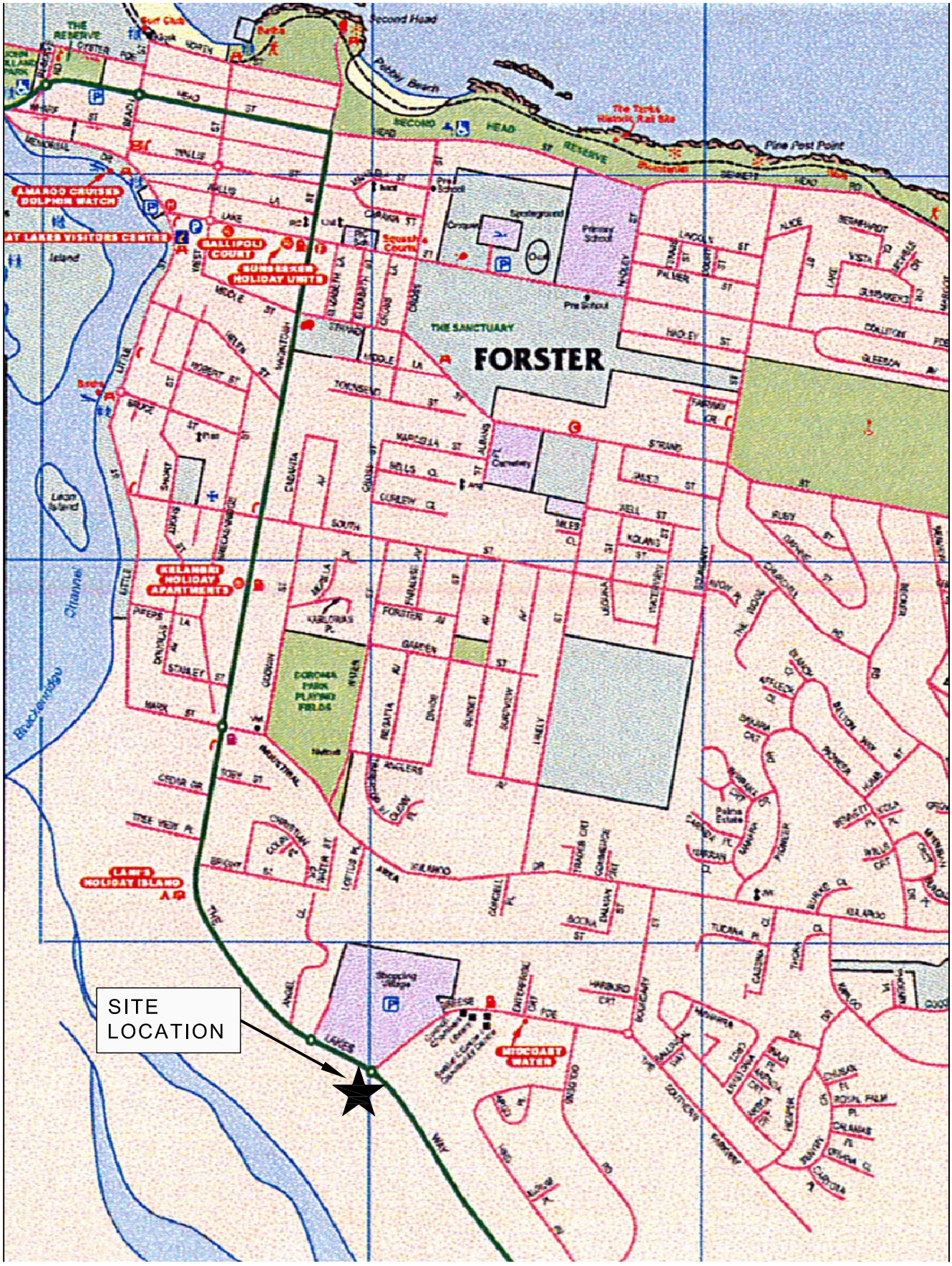
- The proposed development would require construction of the fourth leg to the Breese Parade/The Lakes Way roundabout;

- The traffic analysis found that:

  - with development traffic added to existing traffic flows the roundabout would operate at an acceptable level of intersection operation with spare capacity in the peak periods;

  - with development traffic added to summer traffic flows the roundabout would operate at an acceptable level of intersection operation with spare capacity in the peak periods; and

  - with a combination of background traffic growth, development traffic and traffic from other developments, the roundabout would operate at a satisfactory level of intersection operation in the peak periods.



Location Plan

Colston Budd Hunt & Kafes Pty Ltd

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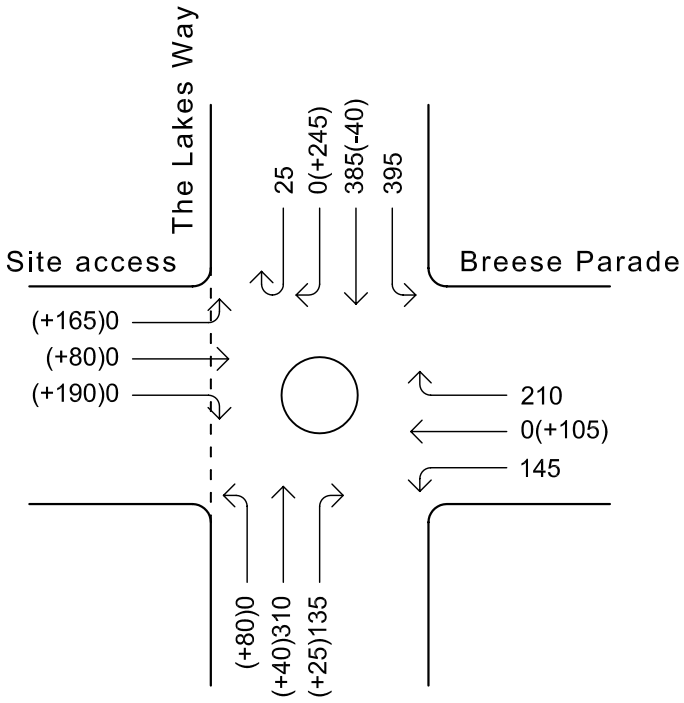
Figure 1



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
○ - Roundabout

Existing Friday afternoon peak hour traffic flows plus development traffic

Colston Budd Hunt & Kafes Pty Ltd

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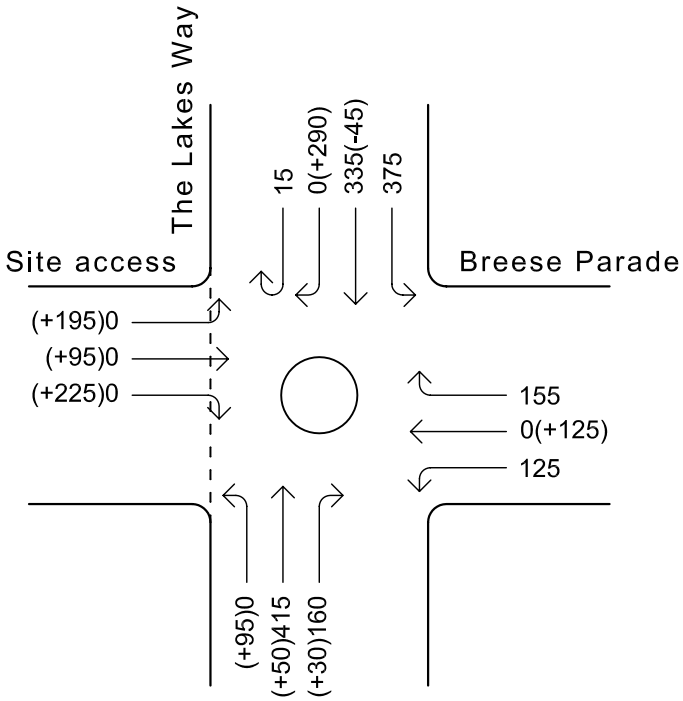
Figure 2



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
○ - Roundabout

Existing Saturday midday peak hour traffic flows plus development traffic

Colston Budd Hunt & Kafes Pty Ltd

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Figure 3

ATTACHMENT A

SIDRA MOVEMENT SUMMARIES

SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Existing Summer Friday PM

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)
Lakes Way (south)										
2	T	410	2.0	0.253	5.6	LOS A	13	0.46	0.50	49.9
3	R	180	2.2	0.253	12.6	LOS A	12	0.47	0.71	44.7
Approach		**590**	**2.0**	**0.253**	**7.7**	**LOS A**	**13**	**0.47**	**0.57**	**48.1**
Breese Street										
4	L	195	2.1	0.205	8.4	LOS A	12	0.65	0.69	47.7
6	R	280	2.1	0.225	13.4	LOS A	14	0.65	0.73	44.0
Approach		**475**	**2.1**	**0.225**	**11.3**	**LOS A**	**14**	**0.65**	**0.71**	**45.4**
Lakes Way (north)										
7	L	525	2.1	0.287	5.0	LOS B#	9#	0.00	0.44	52.8
8	T	510	2.0	0.399	5.4	LOS A	26	0.45	0.49	50.0
9	R	25	3.8	0.400	14.6	LOS B	26	0.45	0.68	43.4
Approach		**1062**	**2.1**	**0.399**	**5.4**	**LOS A**	**26**	**0.23**	**0.47**	**51.1**
All Vehicles		**2127**	**2.1**	**0.400**	**7.4**	**LOS A**	**26**	**0.39**	**0.55**	**48.9**

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

SIDRA SOLUTIONS

Site: Existing Summer Friday PM
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SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Existing + dev Friday PM

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)
Lakes Way (south)										
1	L	84	0.0	0.319	8.3	LOS A	18	0.68	0.73	47.6
2	T	350	2.0	0.320	7.3	LOS A	18	0.68	0.66	48.4
3	R	160	1.9	0.319	14.4	LOS A	17	0.68	0.82	43.9
Approach		**594**	**1.7**	**0.319**	**9.3**	**LOS A**	**18**	**0.68**	**0.71**	**46.9**
Breese Street										
4	L	150	2.0	0.223	10.9	LOS A	14	0.84	0.82	46.2
5	T	111	0.0	0.347	8.8	LOS A	26	0.90	0.80	46.8
6	R	210	1.9	0.347	15.7	LOS B	26	0.90	0.84	43.0
Approach		**471**	**1.5**	**0.347**	**12.5**	**LOS A**	**26**	**0.88**	**0.82**	**44.8**
Lakes Way (north)										
7	L	395	2.0	0.216	5.0	LOS A#	7#	0.00	0.44	52.8
8	T	345	2.0	0.589	8.4	LOS A	48	0.78	0.78	47.7
9	R	283	0.4	0.588	15.4	LOS B	48	0.78	0.85	43.2
Approach		**1023**	**1.6**	**0.588**	**9.0**	**LOS A**	**48**	**0.48**	**0.67**	**48.0**
New W leg										
10	L	174	0.0	0.249	7.7	LOS A	11	0.62	0.68	48.0
11	T	84	0.0	0.249	6.5	LOS A	11	0.62	0.60	48.8
12	R	200	0.0	0.248	13.8	LOS A	11	0.62	0.85	44.1
Approach		**458**	**0.0**	**0.248**	**10.2**	**LOS A**	**11**	**0.62**	**0.74**	**46.2**
All Vehicles		**2546**	**1.3**	**0.589**	**10.0**	**LOS A**	**48**	**0.62**	**0.72**	**46.8**

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

SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Existing Summer +dev Friday PM

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)
Lakes Way (south)										
1	L	84	0.0	0.435	9.1	LOS A	28	0.79	0.81	46.9
2	T	450	2.0	0.434	8.2	LOS A	28	0.79	0.75	47.6
3	R	205	2.0	0.434	15.6	LOS B	27	0.78	0.90	43.1
Approach		**739**	**1.8**	**0.434**	**10.3**	**LOS A**	**28**	**0.79**	**0.80**	**46.1**
Breese Street										
4	L	195	2.1	0.359	12.9	LOS A	25	0.96	0.93	44.4
5	T	111	0.0	0.519	12.5	LOS A	48	1.00	0.97	44.8
6	R	280	2.1	0.519	19.4	LOS B	48	1.00	0.97	40.3
Approach		**586**	**1.7**	**0.518**	**15.9**	**LOS B**	**48**	**0.99**	**0.96**	**42.3**
Lakes Way (north)										
7	L	525	2.1	0.287	5.0	LOS B#	9#	0.00	0.44	52.8
8	T	470	1.9	0.731	11.6	LOS A	80	0.91	0.97	45.6
9	R	283	0.4	0.731	18.7	LOS B	80	0.91	1.00	40.8
Approach		**1279**	**1.6**	**0.731**	**10.5**	**LOS A**	**80**	**0.53**	**0.76**	**46.9**
New W leg										
10	L	174	0.0	0.290	8.4	LOS A	14	0.71	0.74	47.4
11	T	84	0.0	0.290	7.2	LOS A	14	0.71	0.66	48.1
12	R	200	0.0	0.289	14.7	LOS B	13	0.71	0.91	43.7
Approach		**458**	**0.0**	**0.289**	**10.9**	**LOS A**	**14**	**0.71**	**0.80**	**45.7**
All Vehicles		**3062**	**1.4**	**0.731**	**11.5**	**LOS A**	**80**	**0.71**	**0.81**	**45.6**

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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

SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Future Summer + dev Friday PM

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)
Lakes Way (south)										
1	L	111	0.0	0.539	11.6	LOS A	42	0.89	0.95	45.5
2	T	490	2.0	0.539	10.8	LOS A	42	0.88	0.95	46.5
3	R	225	2.2	0.539	18.4	LOS B	40	0.88	1.02	41.0
Approach		**827**	**1.8**	**0.539**	**12.9**	**LOS A**	**42**	**0.88**	**0.97**	**44.6**
Breese Street										
4	L	215	1.9	0.491	18.8	LOS B	39	1.00	1.07	39.6
5	T	132	0.0	0.721	25.7	LOS B	91	1.00	1.22	35.3
6	R	310	1.9	0.719	32.6	LOS C	91	1.00	1.22	32.9
Approach		**657**	**1.5**	**0.720**	**26.7**	**LOS B**	**91**	**1.00**	**1.17**	**35.2**
Lakes Way (north)										
7	L	580	2.1	0.317	5.0	LOS B#	10#	0.00	0.44	52.8
8	T	515	1.9	0.876	20.4	LOS B	147	1.00	1.30	38.6
9	R	330	0.3	0.876	27.4	LOS B	147	1.00	1.30	35.5
Approach		**1426**	**1.6**	**0.876**	**15.8**	**LOS B**	**147**	**0.59**	**0.95**	**42.2**
New W leg										
10	L	221	0.0	0.380	9.1	LOS A	20	0.79	0.81	46.9
11	T	105	0.0	0.380	8.0	LOS A	20	0.79	0.75	47.6
12	R	226	0.0	0.380	15.8	LOS B	19	0.78	0.95	42.9
Approach		**552**	**0.0**	**0.380**	**11.6**	**LOS A**	**20**	**0.78**	**0.85**	**45.2**
All Vehicles		**3462**	**1.4**	**0.876**	**16.5**	**LOS B**	**147**	**0.77**	**0.98**	**41.6**

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

SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Existing Saturday

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)
Lakes Way (south)										
2	T	415	1.9	0.219	5.0	LOS A	10	0.32	0.45	51.0
3	R	160	1.9	0.219	11.9	LOS A	10	0.33	0.66	45.3
Approach		**575**	**1.9**	**0.219**	**6.9**	**LOS A**	**10**	**0.32**	**0.51**	**49.2**
Breese Street										
4	L	125	1.6	0.110	7.1	LOS A	6	0.49	0.58	48.8
6	R	155	1.9	0.109	12.4	LOS A	6	0.47	0.66	44.7
Approach		**280**	**1.8**	**0.110**	**10.0**	**LOS A**	**6**	**0.48**	**0.62**	**46.4**
Lakes Way (north)										
7	L	375	1.9	0.205	5.0	LOS A#	6#	0.00	0.44	52.8
8	T	335	2.1	0.259	5.1	LOS A	14	0.37	0.46	50.7
9	R	15	6.2	0.258	14.4	LOS A	14	0.37	0.67	43.7
Approach		**726**	**2.1**	**0.259**	**5.3**	**LOS A**	**14**	**0.18**	**0.46**	**51.5**
All Vehicles		**1581**	**2.0**	**0.259**	**6.7**	**LOS A**	**14**	**0.28**	**0.50**	**49.7**

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Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: Existing Saturday
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SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Existing Summer Saturday

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)
Lakes Way (south)										
2	T	555	2.0	0.306	5.3	LOS A	16	0.41	0.48	50.3
3	R	215	1.9	0.306	12.2	LOS A	15	0.42	0.68	44.9
Approach		**770**	**1.9**	**0.306**	**7.2**	**LOS A**	**16**	**0.41**	**0.53**	**48.6**
Breese Street										
4	L	165	1.8	0.162	7.8	LOS A	9	0.59	0.64	48.1
6	R	205	2.0	0.157	12.9	LOS A	9	0.58	0.70	44.3
Approach		**370**	**1.9**	**0.162**	**10.6**	**LOS A**	**9**	**0.58**	**0.67**	**45.8**
Lakes Way (north)										
7	L	500	2.0	0.273	5.0	LOS B#	8#	0.00	0.44	52.8
8	T	445	2.0	0.361	5.5	LOS A	22	0.47	0.50	49.9
9	R	20	4.8	0.362	14.8	LOS B	22	0.47	0.69	43.3
Approach		**966**	**2.1**	**0.361**	**5.5**	**LOS A**	**22**	**0.23**	**0.47**	**51.1**
All Vehicles		**2106**	**2.0**	**0.362**	**7.0**	**LOS A**	**22**	**0.36**	**0.53**	**49.2**

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SIDRA SOLUTIONS

Site: Existing Summer Saturday
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SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Existing + dev Saturday

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)
Lakes Way (south)										
1	L	100	0.0	0.388	8.5	LOS A	23	0.70	0.75	47.4
2	T	465	1.9	0.387	7.5	LOS A	23	0.70	0.68	48.2
3	R	160	1.9	0.387	14.6	LOS B	21	0.70	0.84	43.8
Approach		**725**	**1.7**	**0.388**	**9.2**	**LOS A**	**23**	**0.70**	**0.72**	**47.0**
Breese Street										
4	L	125	1.6	0.189	11.0	LOS A	12	0.84	0.81	46.2
5	T	132	0.0	0.315	8.8	LOS A	24	0.90	0.80	46.9
6	R	155	1.9	0.315	15.7	LOS B	24	0.90	0.83	43.0
Approach		**412**	**1.2**	**0.315**	**12.1**	**LOS A**	**24**	**0.88**	**0.82**	**45.1**
Lakes Way (north)										
7	L	375	1.9	0.205	5.0	LOS A#	6#	0.00	0.44	52.8
8	T	285	2.1	0.599	9.2	LOS A	50	0.82	0.84	47.4
9	R	320	0.3	0.599	16.1	LOS B	50	0.82	0.89	42.7
Approach		**981**	**1.4**	**0.598**	**9.9**	**LOS A**	**50**	**0.50**	**0.71**	**47.4**
New W leg										
10	L	205	0.0	0.305	7.8	LOS A	14	0.65	0.68	47.7
11	T	100	0.0	0.305	6.6	LOS A	14	0.65	0.60	48.5
12	R	237	0.0	0.305	14.0	LOS A	13	0.66	0.87	43.9
Approach		**542**	**0.0**	**0.305**	**10.3**	**LOS A**	**14**	**0.66**	**0.75**	**46.1**
All Vehicles		**2660**	**1.2**	**0.599**	**10.1**	**LOS A**	**50**	**0.65**	**0.74**	**46.6**

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Following Queue
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SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Existing Summer + dev Saturday

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)
Lakes Way (south)										
1	L	100	0.0	0.510	9.8	LOS A	36	0.80	0.86	46.8
2	T	605	2.0	0.509	9.0	LOS A	36	0.80	0.84	47.5
3	R	190	2.1	0.509	16.4	LOS B	35	0.80	0.94	42.5
Approach		**895**	**1.8**	**0.509**	**10.6**	**LOS A**	**36**	**0.80**	**0.87**	**46.2**
Breese Street										
4	L	165	1.8	0.301	12.7	LOS A	20	0.94	0.91	44.6
5	T	132	0.0	0.441	10.6	LOS A	37	1.00	0.90	46.2
6	R	205	2.0	0.442	17.5	LOS B	37	1.00	0.90	41.6
Approach		**502**	**1.4**	**0.442**	**14.1**	**LOS A**	**37**	**0.98**	**0.90**	**43.6**
Lakes Way (north)										
7	L	500	2.0	0.273	5.0	LOS B#	8#	0.00	0.44	52.8
8	T	395	2.0	0.726	12.2	LOS A	80	0.93	1.00	45.1
9	R	320	0.3	0.726	19.1	LOS B	80	0.93	1.02	40.5
Approach		**1216**	**1.6**	**0.727**	**11.1**	**LOS A**	**80**	**0.55**	**0.78**	**46.3**
New W leg										
10	L	205	0.0	0.357	8.4	LOS A	18	0.75	0.74	47.1
11	T	100	0.0	0.357	7.3	LOS A	18	0.75	0.66	47.9
12	R	237	0.0	0.356	15.0	LOS B	17	0.75	0.93	43.5
Approach		**542**	**0.0**	**0.357**	**11.1**	**LOS A**	**18**	**0.75**	**0.81**	**45.5**
All Vehicles		**3155**	**1.3**	**0.726**	**11.4**	**LOS A**	**80**	**0.72**	**0.83**	**45.7**

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- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Existing Friday PM

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)
Lakes Way (south)										
2	T	310	1.9	0.180	5.2	LOS A	8	0.37	0.47	50.6
3	R	135	2.2	0.180	12.2	LOS A	8	0.38	0.67	45.1
Approach		**445**	**2.0**	**0.180**	**7.3**	**LOS A**	**8**	**0.37**	**0.53**	**48.7**
Breese Street										
4	L	147	2.0	0.137	7.5	LOS A	7	0.54	0.61	48.4
6	R	210	1.9	0.153	12.7	LOS A	9	0.52	0.68	44.5
Approach		**357**	**2.0**	**0.153**	**10.5**	**LOS A**	**9**	**0.53**	**0.65**	**46.0**
Lakes Way (north)										
7	L	395	2.0	0.216	5.0	LOS A#	7#	0.00	0.44	52.8
8	T	385	2.1	0.294	5.0	LOS A	17	0.35	0.45	50.8
9	R	25	3.8	0.295	14.3	LOS A	17	0.35	0.67	43.8
Approach		**806**	**2.1**	**0.294**	**5.3**	**LOS A**	**17**	**0.18**	**0.45**	**51.5**
All Vehicles		**1608**	**2.1**	**0.295**	**7.0**	**LOS A**	**17**	**0.31**	**0.52**	**49.3**

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SIDRA SOLUTIONS

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SIDRA INTERSECTION

Movement Summary

Breese Street - Lakes Way

Future Summer + dev Saturday

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)
Lakes Way (south)										
1	L	137	0.0	0.628	12.9	LOS A	56	0.91	1.01	44.3
2	T	665	2.0	0.629	12.1	LOS A	56	0.91	1.02	45.1
3	R	210	1.9	0.629	19.7	LOS B	52	0.90	1.08	40.1
Approach		**1012**	**1.7**	**0.629**	**13.8**	**LOS A**	**56**	**0.90**	**1.03**	**43.8**
Breese Street										
4	L	180	2.2	0.403	16.0	LOS B	30	1.00	1.00	41.7
5	T	153	0.0	0.605	19.0	LOS B	65	1.00	1.09	39.6
6	R	225	2.2	0.606	25.9	LOS B	65	1.00	1.09	36.3
Approach		**559**	**1.6**	**0.606**	**20.8**	**LOS B**	**65**	**1.00**	**1.06**	**38.7**
Lakes Way (north)										
7	L	550	2.0	0.300	5.0	LOS B#	9#	0.00	0.44	52.8
8	T	435	2.1	0.884	22.9	LOS B	151	1.00	1.37	37.0
9	R	368	0.3	0.885	29.8	LOS C	151	1.00	1.37	34.3
Approach		**1353**	**1.6**	**0.884**	**17.5**	**LOS B**	**151**	**0.59**	**0.99**	**40.9**
New W leg										
10	L	253	0.0	0.472	9.8	LOS A	27	0.83	0.90	46.7
11	T	121	0.0	0.473	8.6	LOS A	27	0.83	0.83	47.3
12	R	274	0.0	0.472	16.6	LOS B	25	0.82	0.99	42.2
Approach		**648**	**0.0**	**0.472**	**12.4**	**LOS A**	**27**	**0.83**	**0.92**	**44.7**
All Vehicles		**3572**	**1.3**	**0.885**	**16.0**	**LOS B**	**151**	**0.79**	**1.00**	**42.0**

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