LETTER

Transport Engineering

REF: N133572

DATE: 3 April 2020

EG
Governor Phillip Tower
Level 21, 1 Farrer Place
SYDNEY NSW 2000

Attention: Grant Flannigan

Dear Grant

RE: DA2019/1346 – 4-10 INMAN ROAD, CROMER – RESPONSE TO TFNSW

This letter provides clarifications and the additional information requested by Transport for NSW (TfNSW) in the letter dated 1 April 2020 (TfNSW ref. SYD20/00225/02) for 4-10 Inman Road, Cromer (DA2019/1346). The comments have been reproduced below with responses provided after.

The SIDRA analysis identified that the Right Turn movement from Pittwater Road to South Creek Road goes from a Level of Service (LoS) D to E in the PM development scenario. In this regard, TfNSW provides the following comment to Council:

1. TfNSW does not support the LoS dropping below the existing LoS D. Any increase in traffic as a result of the development is to be mitigated, to ensure that no movements at the intersection of Pittwater Road/South Creek Road drop below the existing LoS. There is concern that with the increase in traffic in the PM peak, the right turn movement will likely queue into the westbound travel lane.

The acceptable intersection operation criteria of LoS D is typically applied to the overall intersection rather than every turning movement.

A fixed cycle time was used for the Pittwater Road/ South Creek Road intersection modelling, with SIDRA allowed to optimise intersection performance (as SCATS would do in practice). It is also noted that the right turn movement delay went from 56 to 62 seconds, representing a minor change, but crossing the LoS D threshold of 57 seconds. The additional traffic demand generated by the development proposal on South Creek Road meant that green time was increased for this approach (Phase C) by three seconds. Whilst the green time for the right turn phase from Pittwater Road (Phase B) also increased by two seconds, there was a corresponding reduction in green time for the through movements (Phase A). As a result, this affected the Level of Service (LoS) for the right turn movement (noting that the 95th percentile queue length only increased by six metres or one car).

Revised modelling has been completed using fixed phase times such that there are no alterations to existing traffic signal operation. The outputs discussed for Comment 5.

2. Lane lengths and lane geometry should accurately reflect the current road environment. For example the left/right lane length for South Creek Road is approximately 65 metres however the model shows 105 metres.

The kerbside lane length was an error in the model that was not picked up as part of our internal review process. This has been corrected in the revised modelling and does not impact the overall results, as vehicles turn right from both South Creek Road approach lanes. GTA has re-checked all other intersection geometry.

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3. The cycle time of 135 seconds is incorrect. This signalised intersection is part of a SCATS sub system. Therefore the cycle time for this intersection should be the same. The cycle time is to be modelled as a worst case scenario of 120 sec.

Sample cycle times recorded during GTA's site visit, as well as analysis of traffic survey video footage, were used to calibrate the existing models. The 135 second cycle time used in the original analysis was the longest cycle time observed and used for conservative assessment of turning movement delays and queues.

The revised modelling uses the requested 120 second cycle time, with the outputs discussed in response to Comment 5.

4. The traffic counts dated 16 October 2019 were undertaken in close proximity to the school holidays/long weekend and may not indicate normal traffic conditions. Ideally vehicle counts should be undertaken during a typical day, to include Thursday (or Wednesday), Friday and Saturday for the study (not near school/public holidays). This will provide the departments with an accurate understanding of the existing traffic conditions and the actual impact of this development application to the surrounding network.

In addition it is unclear if the counts provided a breakdown of light and heavy vehicles. It is important that counts provide a breakdown of light and heavy vehicles to accurately model the queue lengths.

It is recommended that new counts are undertaken at more appropriate dates and are to include a breakdown of light and heavy vehicles.

The school holidays were between 30 September and 11 October 2019, with the nearest public holiday (where non-school traffic is affected) being on Monday 7 October 2019. Northern Beaches Secondary College Cromer Campus returned to normal operation on Tuesday 15 October 2019 (following a pupil-free day on Monday 14 October 2019). The surveys were completed on Wednesday 16 October, with the data collected representing a typical weekday the first available typical day once schools were expected to be back to normal/ full operation. The single typical weekday traffic count is consistent with typical traffic assessment practice, with additional Friday and Saturday traffic counts only required for select land uses, such as retail. The warehouse and office components of the development proposal represent the majority of the traffic generation as summarised in Table 5.2 of the Transport Impact Assessment. These uses typically have consistent use on weekdays and low activity of weekends.

The surveys were classified by light vehicles, heavy vehicles and buses. The detailed survey results are included in Attachment 1 for reference.

On the basis of the above, there is no need to conduct additional traffic surveys, noting also that such surveys could not be completed for the foreseeable future.

5. The applicant is to provide updated modelling and any mitigation options (if required), which addresses the above.

The revised modelling for the Pittwater Road/ South Creek Road intersection has been summarised in Table 1, with the detailed outputs included in Attachment 2.

Table 1: Pittwater Road/ South Creek Road – Intersection Operation

Peak	Scenario	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
AM	Existing	East	0.82	13	319	A
		North	0.80	60	119	E
		West	0.70	18	228	B
		Overall	**0.82**	**21**	**319**	**B**
	Existing plus Development	East	0.85	16	342	B
		North	0.81	60	127	E
		West	0.74	19	245	B
		Overall	**0.85**	**23**	**342**	**B**
PM	Existing	East	0.55	11	100	A
		North	0.55	48	66	D
		West	0.78	14	203	A
		Overall	**0.78**	**16**	**203**	**B**
	Existing plus Development	East	0.61	11	100	A
		North	0.71	52	92	D
		West	0.78	14	203	A
		Overall	**0.78**	**17**	**203**	**B**

The results indicate that with a 120 second cycle time and fixed phase times in proportion with existing conditions, the additional traffic generated by the proposed development would not affect the existing LoS for any movement such that it drops below LoS D (note: South Creek Road is already LoS E in the AM peak under existing conditions).

The right turn movement from Pittwater Road into South Creek Road is expected to operate at LoS D in the PM peak, an improvement on the LoS E as part of the previous modelling, due to the reduced cycle time (120 seconds) and fixed phase times. The 95th percentile queuing in the right turn bay is expected to increase marginally from 59 to 66 metres (one vehicle) and is therefore at the limit of the right turn bay and taper. Given this is an infrequent occurrence (statistically less than twice in the PM peak hour), GTA does not consider that this warrants mitigation. It is also noted that the filtered right turn allows at least the first vehicle to store in front of the stop line during the phase. This marginal increase in queue length is also within the tolerance/ accuracy of the intersection modelling, traffic generation estimates and traffic distribution.

I trust the above provides the information you require. Should you have any questions or require any further information, please do not hesitate to contact me on (02) 8448 1800.

Yours sincerely

GTA CONSULTANTS

B.T. Maynard.

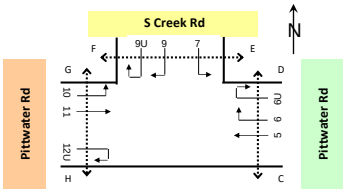
Brett Maynard
Director

ATTACHMENT 1

Detailed Traffic Survey Results

Job No.	: N5364
Client	: GTA
Suburb	: Cromer
Location	: 1. Pittwater Rd / S Creek Rd
Day/Date	: Wed, 16th October 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2	Class 3
Classifications	Lights	Heavies	Buses



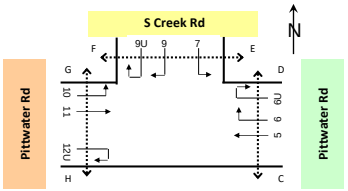
MATRIX Traffic and Transport Data

Approach				Pittwater Rd											
Direction				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period				Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00	to	7:15		325	7	17	**349**	32	3	0	**35**	0	0	0	**0**
7:15	to	7:30		379	10	14	**403**	22	2	0	**24**	0	0	0	**0**
7:30	to	7:45		353	11	15	**379**	15	0	0	**15**	0	0	0	**0**
7:45	to	8:00		451	10	10	**471**	21	0	2	**23**	0	0	0	**0**
8:00	to	8:15		401	11	14	**426**	43	1	0	**44**	0	0	0	**0**
8:15	to	8:30		440	4	9	**453**	26	7	1	**34**	0	0	0	**0**
8:30	to	8:45		400	8	8	**416**	22	1	0	**23**	0	0	0	**0**
8:45	to	9:00		335	8	7	**350**	23	0	1	**24**	0	0	0	**0**
9:00	to	9:15		364	13	10	**387**	33	1	2	**36**	0	0	0	**0**
9:15	to	9:30		311	9	7	**327**	32	2	0	**34**	0	0	0	**0**
9:30	to	9:45		295	15	7	**317**	16	3	0	**19**	0	0	0	**0**
9:45	to	10:00		299	16	3	**318**	18	1	1	**20**	0	0	0	**0**
AM Totals				**4,353**	**122**	**121**	4,596	**303**	**21**	**7**	**331**	**0**	**0**	**0**	**0**
14:00	to	14:15		257	10	8	**275**	15	0	0	**15**	0	0	0	**0**
14:15	to	14:30		262	8	6	**276**	34	2	0	**36**	0	0	0	**0**
14:30	to	14:45		249	9	6	**264**	19	5	0	**24**	0	0	0	**0**
14:45	to	15:00		292	8	7	**307**	27	4	1	**32**	0	0	0	**0**
15:00	to	15:15		284	9	10	**303**	35	3	2	**40**	1	0	0	**1**
15:15	to	15:30		321	4	13	**338**	31	1	0	**32**	0	0	0	**0**
15:30	to	15:45		285	12	5	**302**	31	3	0	**34**	0	0	0	**0**
15:45	to	16:00		263	2	10	**275**	30	3	3	**36**	0	0	0	**0**
16:00	to	16:15		295	12	6	**313**	37	0	3	**40**	0	0	0	**0**
16:15	to	16:30		315	1	10	**326**	42	2	2	**46**	0	0	0	**0**
16:30	to	16:45		260	3	11	**274**	32	0	2	**34**	0	0	0	**0**
16:45	to	17:00		265	2	11	**278**	48	1	3	**52**	0	0	0	**0**
17:00	to	17:15		280	5	5	**290**	25	2	1	**28**	0	0	0	**0**
17:15	to	17:30		298	5	8	**311**	44	0	0	**44**	0	0	0	**0**
17:30	to	17:45		325	4	7	**336**	33	0	0	**33**	0	0	0	**0**
17:45	to	18:00		273	2	6	**281**	33	0	0	**33**	0	0	0	**0**
PM Totals				**4,524**	**96**	**129**	4,749	**516**	**26**	**17**	**559**	**1**	**0**	**0**	**1**

Approach	S Creek Rd												Pittwater Rd												Crossing Pedestrians						
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12U (U Turn)										
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	D to C	C to D	F to E	E to F	H to G	G to H	Total
7:00 to 7:15	20	1	0	**21**	46	2	1	**49**	0	0	0	**0**	38	2	0	**40**	191	8	4	**203**	0	0	0	**0**	0	0	0	1	1	8	**10**
7:15 to 7:30	16	2	1	**19**	69	1	0	**70**	0	0	0	**0**	51	4	0	**55**	242	8	5	**255**	0	0	0	**0**	0	0	0	1	0	7	**8**
7:30 to 7:45	19	1	1	**21**	66	1	0	**67**	0	0	0	**0**	47	4	0	**51**	254	13	5	**272**	0	0	0	**0**	0	0	1	6	1	10	**18**
7:45 to 8:00	18	3	1	**22**	71	3	1	**75**	0	0	0	**0**	58	4	2	**64**	272	15	3	**290**	0	0	0	**0**	0	0	4	6	3	6	**19**
8:00 to 8:15	24	4	3	**31**	75	1	3	**79**	0	0	0	**0**	55	4	1	**60**	301	15	6	**322**	0	0	0	**0**	0	0	13	16	4	12	**45**
8:15 to 8:30	24	3	0	**27**	149	1	0	**150**	0	0	0	**0**	64	5	2	**71**	285	7	3	**295**	0	0	0	**0**	0	0	4	8	0	10	**22**
8:30 to 8:45	26	6	1	**33**	84	3	0	**87**	0	0	0	**0**	54	3	1	**58**	304	6	7	**317**	0	0	0	**0**	0	0	5	7	0	3	**15**
8:45 to 9:00	31	1	0	**32**	67	2	0	**69**	0	0	0	**0**	50	1	0	**51**	257	12	6	**275**	0	0	0	**0**	0	0	4	8	1	5	**18**
9:00 to 9:15	18	2	0	**20**	57	2	1	**60**	0	0	0	**0**	53	1	1	**55**	265	9	6	**280**	0	0	0	**0**	0	0	2	3	0	1	**6**
9:15 to 9:30	28	2	0	**30**	54	2	0	**56**	0	0	0	**0**	48	0	0	**48**	214	11	5	**230**	0	0	0	**0**	0	0	2	2	1	3	**8**
9:30 to 9:45	21	4	0	**25**	46	3	1	**50**	0	0	0	**0**	43	4	1	**48**	215	11	9	**235**	0	0	0	**0**	0	0	3	5	0	0	**8**
9:45 to 10:00	15	6	0	**21**	39	3	0	**42**	0	0	0	**0**	37	3	0	**40**	229	7	6	**242**	0	0	0	**0**	0	0	1	0	0	4	**5**
AM Totals	**260**	**35**	**7**	**302**	**823**	**24**	**7**	**854**	**0**	**0**	**0**	**0**	**598**	**35**	**8**	**641**	**3,029**	**122**	**65**	**3,216**	**0**	**0**	**0**	**0**	**0**	**0**	**39**	**63**	**11**	**69**	**182**
14:00 to 14:15	24	4	0	**28**	45	0	1	**46**	0	0	0	**0**	35	3	0	**38**	326	10	6	**342**	1	0	0	**1**	0	0	2	2	0	1	**5**
14:15 to 14:30	20	3	1	**24**	44	2	0	**46**	0	0	0	**0**	56	5	1	**62**	315	9	3	**327**	0	0	0	**0**	0	0	2	2	0	1	**5**
14:30 to 14:45	31	3	0	**34**	44	0	0	**44**	0	0	0	**0**	52	4	0	**56**	300	11	4	**315**	0	0	0	**0**	0	0	2	2	0	2	**6**
14:45 to 15:00	18	0	0	**18**	50	1	0	**51**	0	0	0	**0**	64	3	0	**67**	300	9	3	**312**	0	0	0	**0**	0	0	5	2	1	1	**9**
15:00 to 15:15	24	2	0	**26**	51	1	3	**55**	0	0	0	**0**	70	2	0	**72**	311	10	4	**325**	0	0	0	**0**	0	0	1	2	0	1	**4**
15:15 to 15:30	24	0	1	**25**	59	1	0	**60**	0	0	0	**0**	81	1	0	**82**	363	8	3	**374**	0	0	0	**0**	0	0	8	2	5	0	**15**
15:30 to 15:45	19	0	1	**20**	78	1	2	**81**	0	0	0	**0**	56	1	0	**57**	334	8	9	**351**	0	0	0	**0**	0	0	1	8	2	10	**21**
15:45 to 16:00	32	2	2	**36**	54	4	1	**59**	0	0	0	**0**	75	4	2	**81**	395	9	14	**418**	0	0	0	**0**	0	0	14	1	0	0	**15**
16:00 to 16:15	18	2	0	**20**	46	2	0	**48**	0	0	0	**0**	71	2	2	**75**	393	6	11	**410**	0	0	0	**0**	0	0	1	6	0	4	**11**
16:15 to 16:30	23	1	0	**24**	53	2	4	**59**	0	0	0	**0**	92	1	3	**96**	372	6	10	**388**	0	0	0	**0**	0	0	5	4	0	0	**9**
16:30 to 16:45	31	0	0	**31**	48	2	0	**50**	0	0	0	**0**	90	3	0	**93**	396	14	8	**418**	0	0	0	**0**	0	0	0	3	1	4	**8**
16:45 to 17:00	30	0	0	**30**	54	0	0	**54**	0	0	0	**0**	80	1	0	**81**	364	4	8	**376**	0	0	0	**0**	0	0	1	2	1	6	**10**
17:00 to 17:15	25	0	0	**25**	72	0	0	**72**	0	0	0	**0**	88	2	0	**90**	375	5	9	**389**	0	0	0	**0**	0	0	0	1	0	0	**1**
17:15 to 17:30	23	0	0	**23**	38	1	0	**39**	0	0	0	**0**	72	0	0	**72**	443	6	7	**456**	0	0	0	**0**	0	0	3	0	1	1	**5**
17:30 to 17:45	24	0	0	**24**	66	3	0	**69**	0	0	0	**0**	92	1	0	**93**	409	2	10	**421**	0	0	0	**0**	0	0	3	0	0	1	**4**
17:45 to 18:00	34	1	0	**35**	54	0	1	**55**	0	0	0	**0**	85	2	0	**87**	426	6	11	**443**	0	0	0	**0**	0	0	0	0	1	0	**1**
PM Totals	**400**	**18**	**5**	**423**	**856**	**20**	**12**	**888**	**0**	**0**	**0**	**0**	**1,159**	**35**	**8**	**1,202**	**5,822**	**123**	**120**	**6,065**	**1**	**0**	**0**	**1**	**0**	**0**	**48**	**37**	**12**	**32**	**129**

Job No. : N5364
Client : GTA
Suburb : Cromer
Location : 1. Pittwater Rd / S Creek Rd

Day/Date : Wed, 16th October 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



MATRIX Traffic and Transport Data

Approach		Pittwater Rd											
Direction		Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period		Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 8:00		1,508	38	56	**1,602**	90	5	2	**97**	0	0	0	**0**
7:15 to 8:15		1,584	42	53	**1,679**	101	3	2	**106**	0	0	0	**0**
7:30 to 8:30		1,645	36	48	**1,729**	105	8	3	**116**	0	0	0	**0**
7:45 to 8:45		1,692	33	41	**1,766**	112	9	3	**124**	0	0	0	**0**
8:00 to 9:00		1,576	31	38	**1,645**	114	9	2	**125**	0	0	0	**0**
8:15 to 9:15		1,539	33	34	**1,606**	104	9	4	**117**	0	0	0	**0**
8:30 to 9:30		1,410	38	32	**1,480**	110	4	3	**117**	0	0	0	**0**
8:45 to 9:45		1,305	45	31	**1,381**	104	6	3	**113**	0	0	0	**0**
9:00 to 10:00		1,269	53	27	**1,349**	99	7	3	**109**	0	0	0	**0**
AM Totals		**4,353**	**122**	**121**	4,596	**303**	**21**	**7**	**331**	**0**	**0**	**0**	**0**
14:00 to 15:00		1,060	35	27	**1,122**	95	11	1	**107**	0	0	0	**0**
14:15 to 15:15		1,087	34	29	**1,150**	115	14	3	**132**	1	0	0	**1**
14:30 to 15:30		1,146	30	36	**1,212**	112	13	3	**128**	1	0	0	**1**
14:45 to 15:45		1,182	33	35	**1,250**	124	11	3	**138**	1	0	0	**1**
15:00 to 16:00		1,153	27	38	**1,218**	127	10	5	**142**	1	0	0	**1**
15:15 to 16:15		1,164	30	34	**1,228**	129	7	6	**142**	0	0	0	**0**
15:30 to 16:30		1,158	27	31	**1,216**	140	8	8	**156**	0	0	0	**0**
15:45 to 16:45		1,133	18	37	**1,188**	141	5	10	**156**	0	0	0	**0**
16:00 to 17:00		1,135	18	38	**1,191**	159	3	10	**172**	0	0	0	**0**
16:15 to 17:15		1,120	11	37	**1,168**	147	5	8	**160**	0	0	0	**0**
16:30 to 17:30		1,103	15	35	**1,153**	149	3	6	**158**	0	0	0	**0**
16:45 to 17:45		1,168	16	31	**1,215**	150	3	4	**157**	0	0	0	**0**
17:00 to 18:00		1,176	16	26	**1,218**	135	2	1	**138**	0	0	0	**0**
PM Totals		**4,524**	**96**	**129**	4,749	**516**	**26**	**17**	**559**	**1**	**0**	**0**	**1**

Approach	S Creek Rd												Pittwater Rd												Crossing Pedestrians						
Direction	Direction 7 (Left Turn)					Direction 9 (Right Turn)					Direction 9U (U Turn)					Direction 10 (Left Turn)					Direction 11 (Through)					Direction 12U (U Turn)											
Time Period	Lights	Heavies	Buses	Total		Lights	Heavies	Buses	Total		Lights	Heavies	Buses	Total		Lights	Heavies	Buses	Total		Lights	Heavies	Buses	Total		Lights	Heavies	Buses	Total		D to C	C to D	F to E	E to F	H to G	G to H	Total
7:00 to 8:00	73	7	3	**83**		252	7	2	**261**		0	0	0	**0**		194	14	2	**210**		959	44	17	**1,020**		0	0	0	**0**		0	0	5	14	5	31	**55**
7:15 to 8:15	77	10	6	**93**		281	6	4	**291**		0	0	0	**0**		211	16	3	**230**		1,069	51	19	**1,139**		0	0	0	**0**		0	0	18	29	8	35	**90**
7:30 to 8:30	85	11	5	**101**		361	6	4	**371**		0	0	0	**0**		224	17	5	**246**		1,112	50	17	**1,179**		0	0	0	**0**		0	0	22	36	8	38	**104**
7:45 to 8:45	92	16	5	**113**		379	8	4	**391**		0	0	0	**0**		231	16	6	**253**		1,162	43	19	**1,224**		0	0	0	**0**		0	0	26	37	7	31	**101**
8:00 to 9:00	105	14	4	**123**		375	7	3	**385**		0	0	0	**0**		223	13	4	**240**		1,147	40	22	**1,209**		0	0	0	**0**		0	0	26	39	5	30	**100**
8:15 to 9:15	99	12	1	**112**		357	8	1	**366**		0	0	0	**0**		221	10	4	**235**		1,111	34	22	**1,167**		0	0	0	**0**		0	0	15	26	1	19	**61**
8:30 to 9:30	103	11	1	**115**		262	9	1	**272**		0	0	0	**0**		205	5	2	**212**		1,040	38	24	**1,102**		0	0	0	**0**		0	0	13	20	2	12	**47**
8:45 to 9:45	98	9	0	**107**		224	9	2	**235**		0	0	0	**0**		194	6	2	**202**		951	43	26	**1,020**		0	0	0	**0**		0	0	11	18	2	9	**40**
9:00 to 10:00	82	14	0	**96**		196	10	2	**208**		0	0	0	**0**		181	8	2	**191**		923	38	26	**987**		0	0	0	**0**		0	0	8	10	1	8	**27**
AM Totals	**260**	**35**	**7**	**302**		**823**	**24**	**7**	**854**		**0**	**0**	**0**	**0**		**598**	**35**	**8**	**641**		**3,029**	**122**	**65**	**3,216**		**0**	**0**	**0**	**0**		**0**	**0**	**39**	**63**	**11**	**69**	**182**
14:00 to 15:00	93	10	1	**104**		183	3	1	**187**		0	0	0	**0**		207	15	1	**223**		1,241	39	16	**1,296**		1	0	0	**1**		0	0	11	8	1	5	**25**
14:15 to 15:15	93	8	1	**102**		189	4	3	**196**		0	0	0	**0**		242	14	1	**257**		1,226	39	14	**1,279**		0	0	0	**0**		0	0	10	8	1	5	**24**
14:30 to 15:30	97	5	1	**103**		204	3	3	**210**		0	0	0	**0**		267	10	0	**277**		1,274	38	14	**1,326**		0	0	0	**0**		0	0	16	8	6	4	**34**
14:45 to 15:45	85	2	2	**89**		238	4	5	**247**		0	0	0	**0**		271	7	0	**278**		1,308	35	19	**1,362**		0	0	0	**0**		0	0	15	14	8	12	**49**
15:00 to 16:00	99	4	4	**107**		242	7	6	**255**		0	0	0	**0**		282	8	2	**292**		1,403	35	30	**1,468**		0	0	0	**0**		0	0	24	13	7	11	**55**
15:15 to 16:15	93	4	4	**101**		237	8	3	**248**		0	0	0	**0**		283	8	4	**295**		1,485	31	37	**1,553**		0	0	0	**0**		0	0	24	17	7	14	**62**
15:30 to 16:30	92	5	3	**100**		231	9	7	**247**		0	0	0	**0**		294	8	7	**309**		1,494	29	44	**1,567**		0	0	0	**0**		0	0	21	19	2	14	**56**
15:45 to 16:45	104	5	2	**111**		201	10	5	**216**		0	0	0	**0**		328	10	7	**345**		1,556	35	43	**1,634**		0	0	0	**0**		0	0	20	14	1	8	**43**
16:00 to 17:00	102	3	0	**105**		201	6	4	**211**		0	0	0	**0**		333	7	5	**345**		1,525	30	37	**1,592**		0	0	0	**0**		0	0	7	15	2	14	**38**
16:15 to 17:15	109	1	0	**110**		227	4	4	**235**		0	0	0	**0**		350	7	3	**360**		1,507	29	35	**1,571**		0	0	0	**0**		0	0	6	10	2	10	**28**
16:30 to 17:30	109	0	0	**109**		212	3	0	**215**		0	0	0	**0**		330	6	0	**336**		1,578	29	32	**1,639**		0	0	0	**0**		0	0	4	6	3	11	**24**
16:45 to 17:45	102	0	0	**102**		230	4	0	**234**		0	0	0	**0**		332	4	0	**336**		1,591	17	34	**1,642**		0	0	0	**0**		0	0	7	3	2	8	**20**
17:00 to 18:00	106	1	0	**107**		230	4	1	**235**		0	0	0	**0**		337	5	0	**342**		1,653	19	37	**1,709**		0	0	0	**0**		0	0	6	1	2	2	**11**
PM Totals	**400**	**18**	**5**	**423**		**856**	**20**	**12**	**888**		**0**	**0**	**0**	**0**		**1,159**	**35**	**8**	**1,202**		**5,822**	**123**	**120**	**6,065**		**1**	**0**	**0**	**1**		**0**	**0**	**48**	**37**	**12**	**32**	**129**

ATTACHMENT 2

Updated SIDRA Modelling Results

USER REPORT FOR SITE

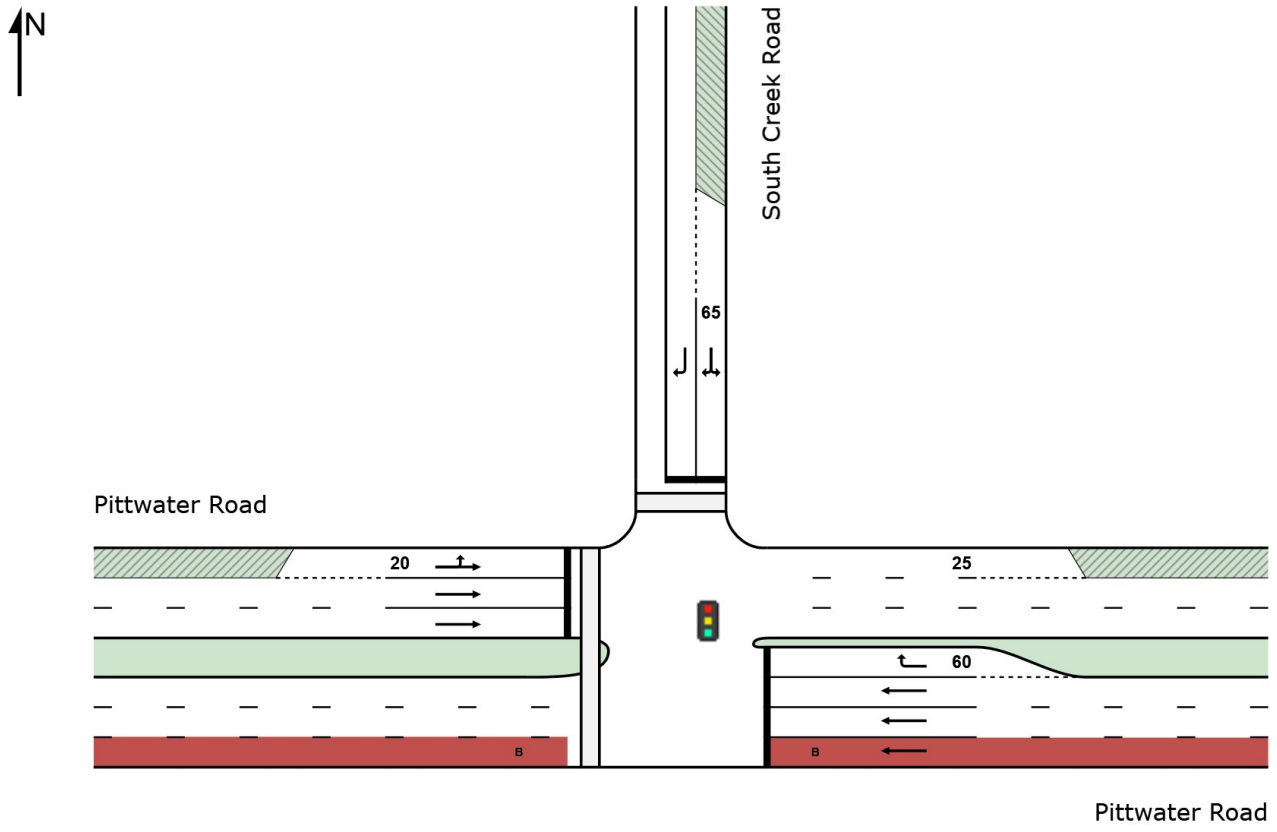
Project: 200403sip-N135572 100 South Creek Road, Cromer | **Template: Default Site User Report**

Site: [1 Pittwater Road/ South Creek Road - Ex AM]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

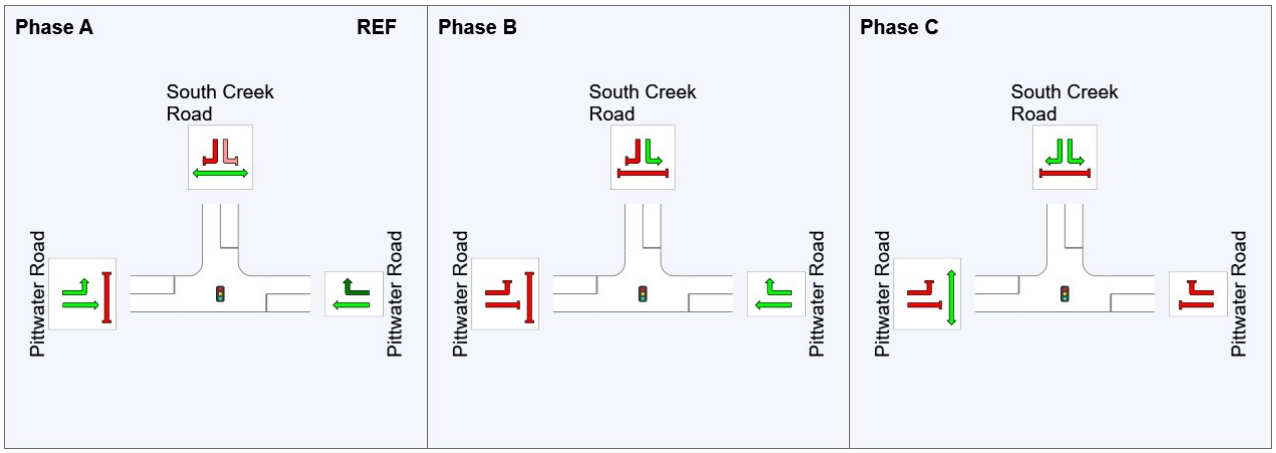
Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
East: Pittwater Road												
5	T1	1859	4.2	0.822	11.7	LOS A	44.8	319.1	0.63	0.60	0.65	49.8
6	R2	131	9.7	0.449	37.7	LOS C	6.0	45.8	0.81	0.83	0.87	34.8
Approach		1989	4.6	0.822	13.4	LOS A	44.8	319.1	0.64	0.61	0.66	48.3
North: South Creek Road												
7	L2	119	18.6	0.798	59.5	LOS E	15.7	119.3	1.00	0.99	1.47	28.4
9	R2	412	3.1	0.798	60.2	LOS E	15.7	119.3	1.00	0.94	1.27	27.4
Approach		531	6.5	0.798	60.0	LOS E	15.7	119.3	1.00	0.95	1.31	27.6
West: Pittwater Road												
10	L2	266	8.7	0.576	19.0	LOS B	8.6	68.0	0.56	0.68	0.56	41.5
11	T1	1288	5.1	0.703	18.4	LOS B	31.5	227.5	0.72	0.65	0.72	45.3
Approach		1555	5.7	0.703	18.4	LOS B	31.5	227.5	0.69	0.66	0.69	44.6
All Vehicles		4075	5.2	0.822	21.4	LOS B	44.8	319.1	0.71	0.67	0.76	42.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	74	93
Green Time (sec)	68	13	21
Phase Time (sec)	74	19	27
Phase Split	62%	16%	23%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

USER REPORT FOR SITE

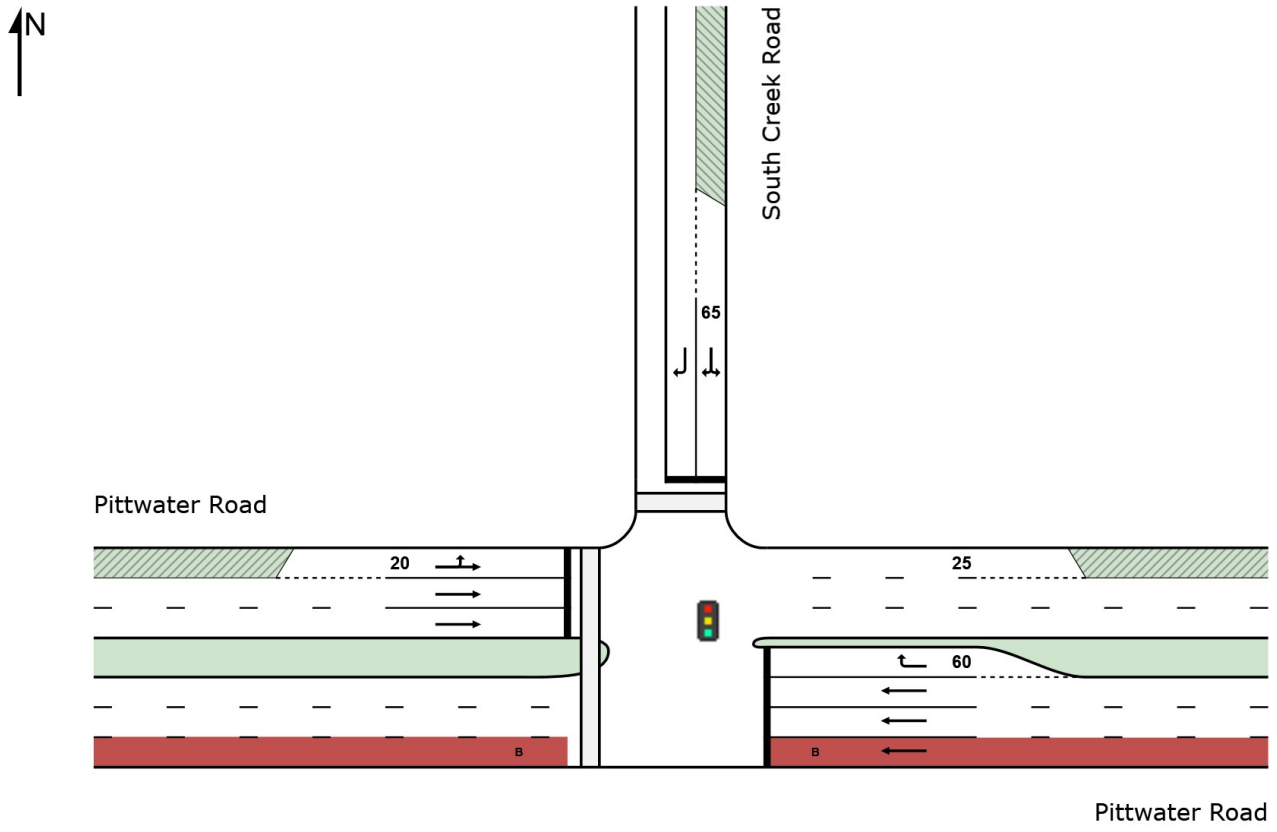
Project: 200403sip-N135572 100 South Creek Road, Cromer | **Template: Default Site User Report**

Site: [1 Pittwater Road/ South Creek Road - Dev AM - fixed Ex phase times]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

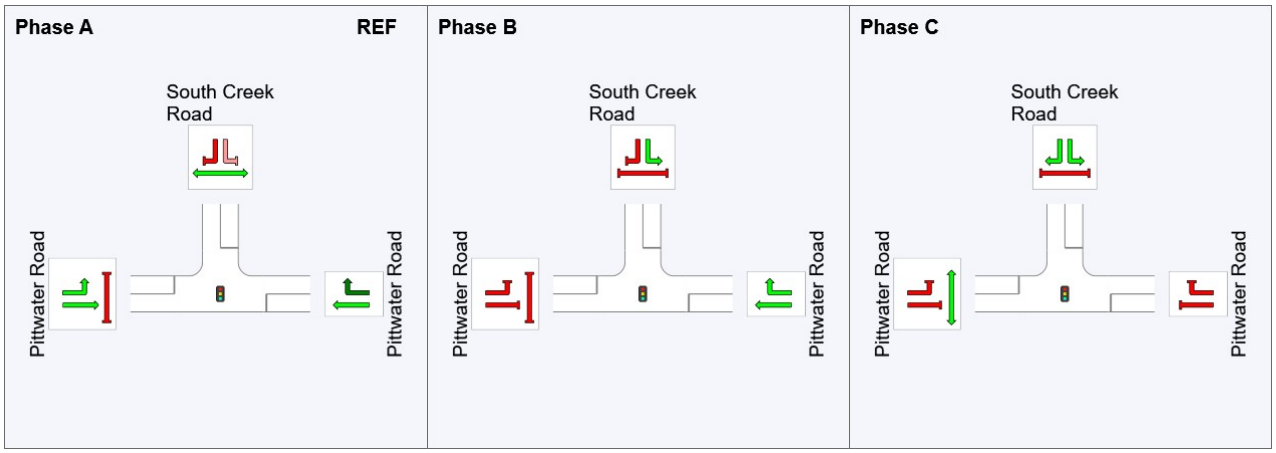
Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
East: Pittwater Road												
5	T1	1859	4.2	0.845	13.5	LOS A	48.1	342.3	0.65	0.63	0.68	48.5
6	R2	171	8.6	0.600	46.4	LOS D	8.4	63.2	0.88	0.93	1.16	32.2
Approach		2029	4.6	0.845	16.3	LOS B	48.1	342.3	0.67	0.66	0.72	46.4
North: South Creek Road												
7	L2	129	17.9	0.808	60.1	LOS E	16.8	127.6	1.00	1.00	1.50	28.2
9	R2	433	3.4	0.808	60.4	LOS E	16.8	127.6	1.00	0.95	1.28	27.3
Approach		562	6.7	0.808	60.3	LOS E	16.8	127.6	1.00	0.96	1.33	27.5
West: Pittwater Road												
10	L2	352	9.3	0.700	19.9	LOS B	11.9	93.4	0.60	0.71	0.60	40.9
11	T1	1288	5.1	0.735	18.7	LOS B	34.0	245.3	0.73	0.67	0.73	45.1
Approach		1640	6.0	0.735	18.9	LOS B	34.0	245.3	0.70	0.68	0.70	44.1
All Vehicles		4232	5.4	0.845	23.2	LOS B	48.1	342.3	0.73	0.70	0.80	41.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	73	92
Green Time (sec)	68	13	22
Phase Time (sec)	74	19	27
Phase Split	62%	16%	23%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

USER REPORT FOR SITE

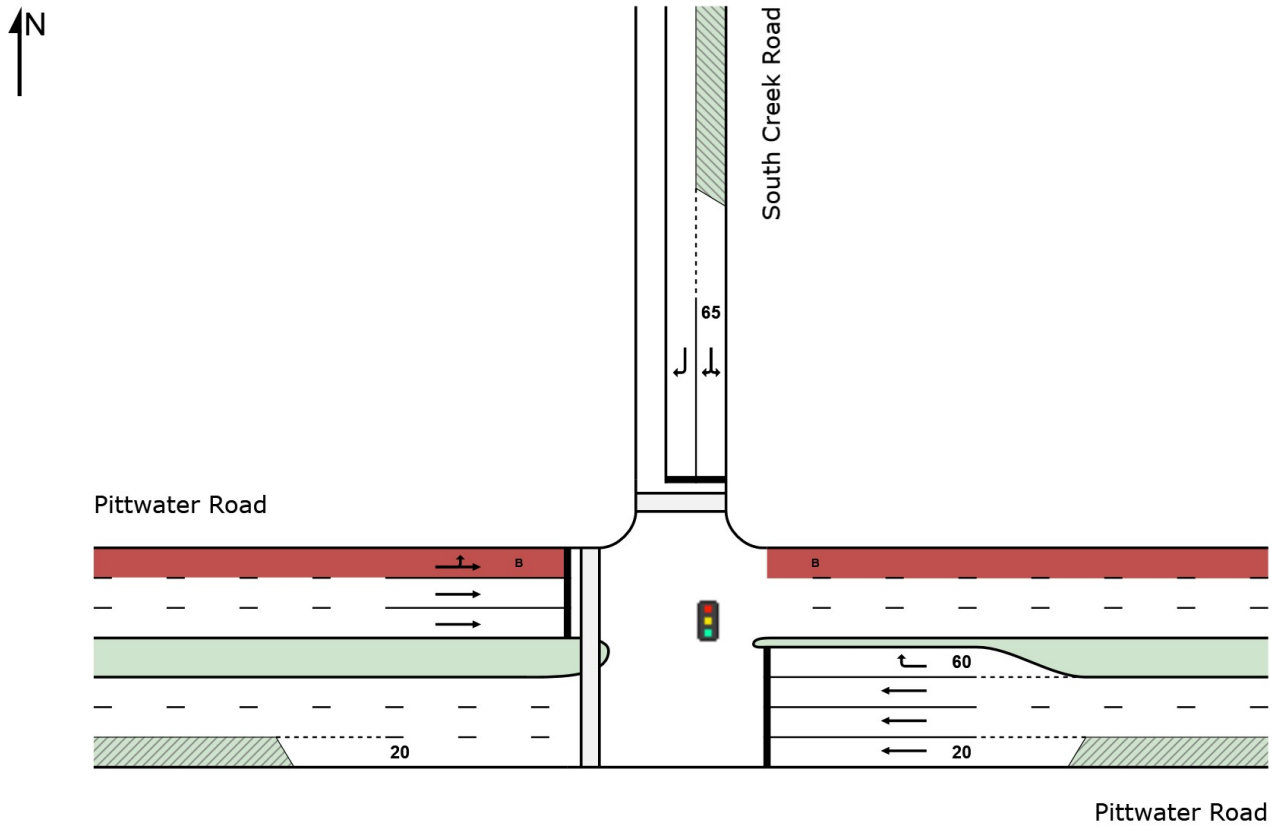
Project: 200403sip-N135572 100 South Creek Road, Cromer | **Template: Default Site User Report**

Site: [1 Pittwater Road/ South Creek Road - Ex PM]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

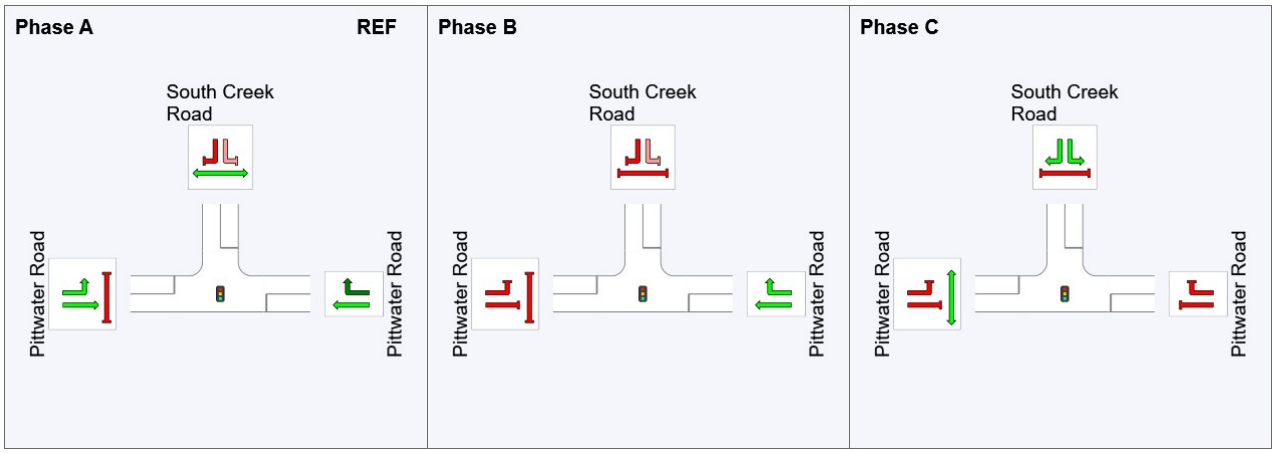
Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
East: Pittwater Road												
5	T1	1282	3.4	0.440	6.3	LOS A	14.1	99.6	0.40	0.36	0.40	54.0
6	R2	145	2.2	0.547	47.5	LOS D	8.2	58.8	0.99	0.95	1.27	31.9
Approach		1427	3.3	0.547	10.5	LOS A	14.1	99.6	0.46	0.42	0.49	50.2
North: South Creek Road												
7	L2	113	0.9	0.551	41.7	LOS C	7.9	55.8	0.96	0.86	1.12	35.0
9	R2	247	2.1	0.551	51.4	LOS D	9.2	65.7	0.96	0.83	1.02	31.1
Approach		360	1.8	0.551	48.3	LOS D	9.2	65.7	0.96	0.84	1.05	32.3
West: Pittwater Road												
10	L2	360	1.5	0.392	19.3	LOS B	11.9	91.4	0.56	0.70	0.56	44.1
11	T1	1799	3.3	0.779	12.5	LOS A	28.7	202.5	0.61	0.57	0.61	49.2
Approach		2159	3.0	0.779	13.5	LOS A	28.7	202.5	0.60	0.59	0.60	48.2
All Vehicles		3946	3.0	0.779	15.7	LOS B	28.7	202.5	0.59	0.55	0.60	46.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	76	94
Green Time (sec)	70	12	20
Phase Time (sec)	76	18	26
Phase Split	63%	15%	22%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

USER REPORT FOR SITE

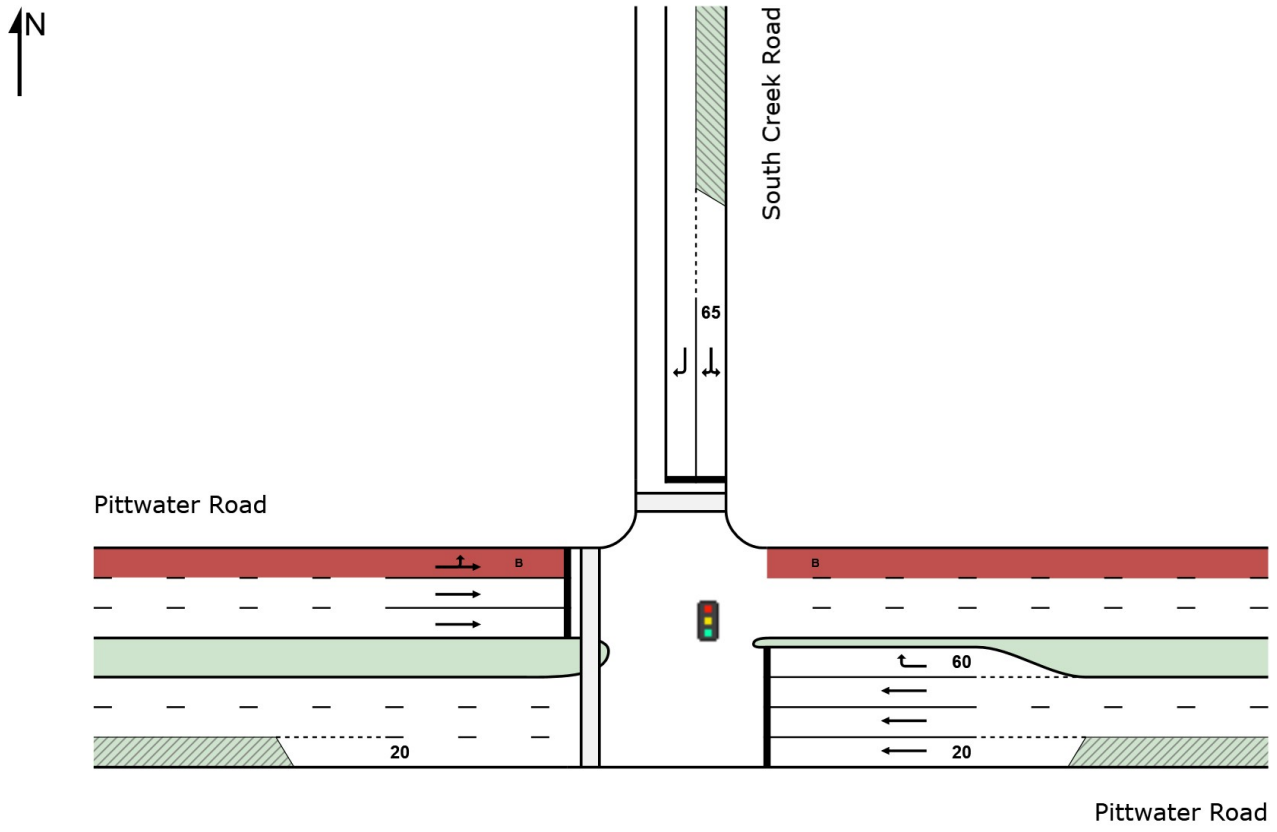
Project: 200403sip-N135572 100 South Creek Road, Cromer **Template: Default Site User Report**

Site: [1 Pittwater Road/ South Creek Road - Dev PM - fixed Ex phase times]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

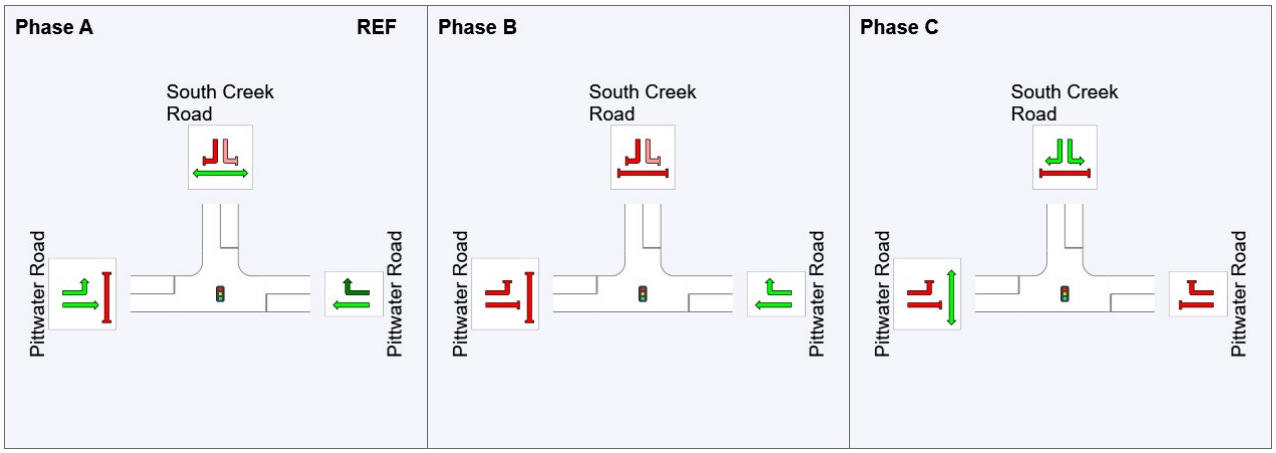
Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
East: Pittwater Road												
5	T1	1282	3.4	0.440	6.3	LOS A	14.1	99.6	0.40	0.36	0.40	54.0
6	R2	161	2.6	0.610	50.1	LOS D	9.2	65.7	1.00	0.98	1.34	31.2
Approach		1443	3.4	0.610	11.2	LOS A	14.1	99.6	0.47	0.43	0.51	49.7
North: South Creek Road												
7	L2	151	2.1	0.705	47.0	LOS D	11.9	85.3	0.99	0.91	1.24	33.3
9	R2	326	4.2	0.705	54.4	LOS D	12.7	92.2	0.99	0.87	1.11	30.2
Approach		477	3.5	0.705	52.1	LOS D	12.7	92.2	0.99	0.88	1.15	31.2
West: Pittwater Road												
10	L2	395	2.4	0.427	19.8	LOS B	13.4	102.6	0.58	0.72	0.58	43.9
11	T1	1799	3.3	0.779	12.5	LOS A	28.7	202.5	0.61	0.57	0.61	49.1
Approach		2194	3.1	0.779	13.7	LOS A	28.7	202.5	0.61	0.60	0.61	48.1
All Vehicles		4114	3.2	0.779	17.3	LOS B	28.7	202.5	0.60	0.57	0.63	45.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	75	93
Green Time (sec)	70	12	21
Phase Time (sec)	76	18	26
Phase Split	63%	15%	22%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.