

TECHNICAL NOTE

Transport Engineering



Project Code: N208800 **Project Name:** Waverley Streetscapes

Date: 14 April 2021 **Version No.** A

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SUBJECT: Glenayr Avenue / Curlewis Street Intersection – SIDRA Modelling

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Background

This technical note has been prepared by GTA, now Stantec, on behalf of Northrop Consulting Engineers, and presents the impact of the proposed changes to the Glenayr Avenue/ Curlewis Street intersection as part of the Waverley Streetscapes project.

The project proposes to consolidate the cycle lanes on either side of Curlewis Street into a separated bi-directional cycleway along the northern kerb. As a result, the existing eastbound and westbound approaches are reduced from dual lane approaches into single lane approaches, removing the opportunity for through vehicles to pass a vehicle waiting to turn right.

This technical note assesses the impact of the introduction of the cycleway and associated lane reduction against the existing intersection performance.

Traffic Volumes

Traffic movement counts at the study intersection were provided by Council. The counts were undertaken on Thursday 4 March 2021, between 7:00am and 10:00am and between 3:00pm and 6:00pm.

The AM and PM peak hours were found to occur from 7:30am to 8:30am and 5:00pm to 6:00pm respectively, with traffic volumes summarised in Figure 1 and Figure 2. Full survey results are contained in Attachment 1.

Figure 1: Existing AM peak hour traffic volumes

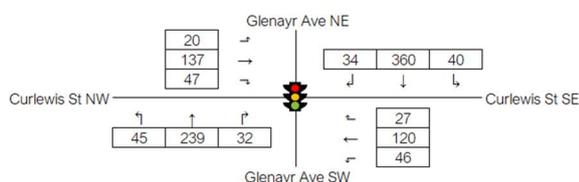
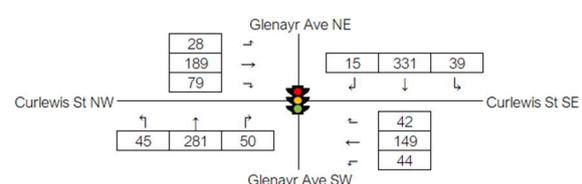


Figure 2: Existing PM peak hour traffic volumes



Existing Intersection Operation

The operation of the study intersection has been assessed using SIDRA INTERSECTION¹ (SIDRA), a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the TfNSW, is vehicle delay. SIDRA determines the average delay that vehicles encounter and provides a measure of the level of service. Intersections operating at level of service D or better are generally considered to have acceptable delays.

Table 1 shows the criteria that SIDRA adopts in assessing the level of service.

Table 1: SIDRA level of service criteria

Level of service (LOS)	Average delay per vehicle (secs/veh)	Traffic signals, roundabout	Give way & stop sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2 presents a summary of the existing intersection operation, with full results and calibration details presented in Attachment 2.

Table 2: Existing operating conditions

Intersection	Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
Glenayr Avenue/ Curlewis Road	AM	South-East	0.414	17.1	19.3	B
		North-East	0.714	15.6	54.8	B
		North-West	0.508	17.4	24.1	B
		South-West	0.526	13.7	34.2	A
		Overall	0.714	15.6	54.8	B
	PM	South-East	0.452	15.4	24.7	B
		North-East	0.729	17.2	49.0	B
		North-West	0.593	16.1	32.3	B
		South-West	0.746	18.0	48.5	B
		Overall	0.746	16.9	49.0	B

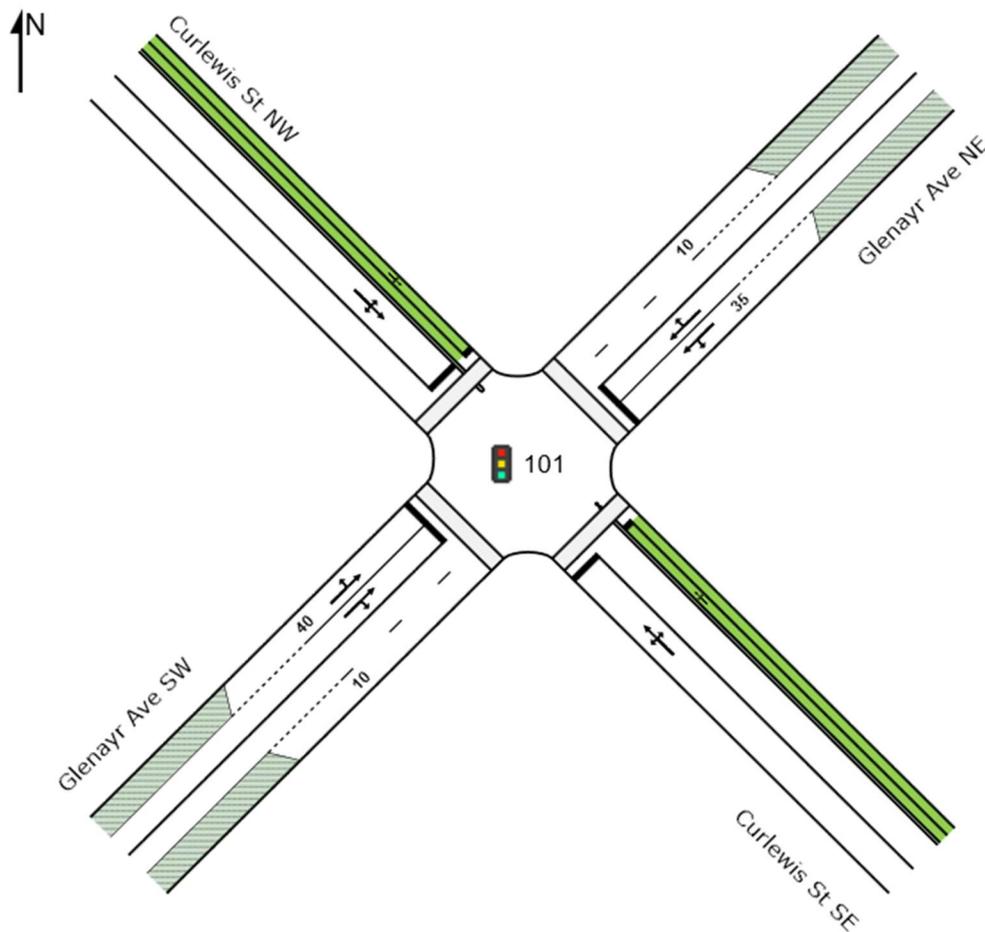
Based on the above assessment, the intersection of Glenayr Avenue/ Curlewis Road currently operates satisfactorily at LoS B, with minimal queues and delays on all approaches.

¹ Program used under license from Akcelik & Associates Pty Ltd.

Proposed Intersection Layout

The project seeks to remove the existing cycle lanes along Curlewis Street and provide a separated bi-directional cycleway along the northern kerb as shown in Figure 3.

Figure 3: Proposed Intersection Layout



Traffic Impact

To determine the traffic impact of the proposed intersection changes, two signal phasing options were tested as follows:

- Separate Cycle Phase
 - Cyclists in the proposed separated cycleway are given a dedicated signal phase allowing all movements from the cycleway.
 - The right turns are the only opposed movements against the through and left turn cyclists from the opposite direction.
- Cyclist Turning Bans
 - Cyclists in the proposed separated cycleway are banned from turning across traffic travelling along Curlewis Street. This includes the left turn for northbound cyclists and right turn for southbound cyclists to head west.
 - Banning these cyclist turning movements allows vehicles on Curlewis Street to be run in the same phase as cyclists, with vehicles turning across the cycleway being held until the cycle phase is completed.

Table 3 presents a summary of the existing operation of the intersection, with full results presented in Attachment 2.

Table 3: Future operating conditions

Intersection	Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
Glenayr Avenue/ Curlewis Road (Separate Cycle Phase)	AM	South-East	0.590	23.1	33.7	B
		North-East	0.773	20.9	73.5	B
		North-West	0.648	23.0	38.3	B
		South-West	0.623	19.3	46.8	B
		Overall	0.773	21.2	73.5	B
	PM	South-East	0.645	22.8	41.4	B
		North-East	0.701	19.7	59.5	B
		North-West	0.825	27.6	59.2	B
		South-West	0.817	24.8	65.4	B
		Overall	0.825	23.5	65.4	B
Glenayr Avenue/ Curlewis Road (Cyclist Turning Bans)	AM	South-East	0.388	17.7	28.6	B
		North-East	0.568	13.3	55.4	A
		North-West	0.426	16.9	31.7	B
		South-West	0.441	13.6	38.1	A
		Overall	0.568	14.8	55.4	B
	PM	South-East	0.430	17.2	34.6	B
		North-East	0.534	14.6	49.1	B
		North-West	0.532	16.3	43.1	B
		South-West	0.598	16.5	50.1	B
		Overall	0.598	16.0	50.1	B

Under both potential signal phasing options the intersection continues to operate at LoS B in both the AM and PM peak periods, with minimal queues and delays on all approaches.

Summary

Based on the analysis and information presented within this technical note, the following conclusions are made:

- The intersection of Glenayr Avenue/ Curlewis Road currently operates satisfactorily, with an overall LoS B in both the AM and PM peak periods.
- There are two available signal phasing options to incorporate the separated cycleway along Curlewis Street that require confirmation from Council and TfNSW on the preferred option. These are:
 - separate cycle phase
 - cyclist turning bans (to retain existing two-phase operation).
- Both signal phasing options result in satisfactory intersection operation, with an overall LoS B in both peak periods.

- The introduction of a separate cycle phase increases the degree of saturation, average delay and queue lengths compared to the existing. However, the provision of a separate cycle phase allows all existing movements to be retained.
- Banning cyclist turning movements from the separated cycleway results in similar average delays and queue lengths compared with existing intersection operation. The banning of these cyclist movements needs to be considered from a network perspective to understand the demand for these movements and the availability of alternative routes (or opportunities to exit the cycleway and join general traffic prior to the intersection).

It is recommended that a review of the design and intent of the overall cycleway is considered to determine if cyclist turning bans are acceptable at this location. Prior to further design and development of TCS plans, a decision on the preferred phasing at the intersection is required, considering intersection performance, safety and overall cycleway function.

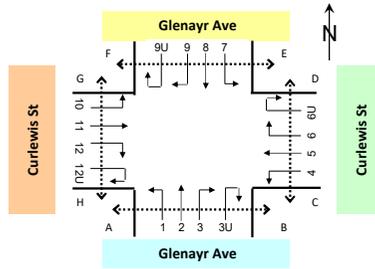
ATTACHMENT 1

TRAFFIC SURVEY RESULTS

DRAFT

Job No. : N6252
Client : Waverley Council
Suburb : Curlewis St
Location : 1. Curlewis St / Glenayr Ave

Day/Date : Thursday, 4th March 2021
Weather : Fine
Description : Classified Intersection Count
 : 15 mins Data



Classifications	Class 1	Class 2	Class 3	Class 4
	Lights	Heavies	Buses	Cyclists

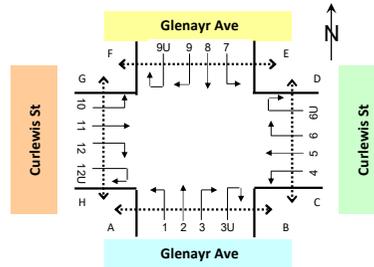
Approach	Glenayr Ave															Curlewis St																													
	Direction 1 (Left Turn)					Direction 2 (Through)					Direction 3 (Right Turn)					Direction 3U (U Turn)					Direction 4 (Left Turn)					Direction 5 (Through)					Direction 6 (Right Turn)					Direction 6U (U Turn)									
	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total					
7:00 to 7:15	6	0	0	0	6	26	0	2	2	30	9	0	0	0	9	0	0	0	0	0	9	0	0	0	9	32	1	0	0	33	3	0	0	0	3	4	0	0	0	4	0	0	0	0	0
7:15 to 7:30	7	0	0	0	7	32	0	2	0	34	10	0	1	0	11	0	0	0	0	0	7	0	0	1	8	20	1	0	3	24	12	1	0	0	13	0	0	0	0	0					
7:30 to 7:45	9	1	0	0	10	45	1	1	1	48	3	0	0	0	3	0	0	0	0	0	15	0	0	0	15	32	1	0	1	34	8	0	0	0	8	0	0	0	0	0					
7:45 to 8:00	10	0	0	0	10	50	1	5	3	59	8	1	0	0	9	0	0	0	0	0	9	1	0	0	10	34	0	0	4	38	4	0	0	0	4	0	0	0	0	0					
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AM Totals	134	4	0	2	140	525	8	29	14	576	99	3	2	0	104	0	0	0	0	0	106	4	0	2	112	329	7	4	12	352	72	3	0	1	76	0	0	0	0	0					
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PM Totals	140	0	1	5	146	707	4	33	15	759	148	1	0	0	149	0	0	0	0	0	122	1	1	7	131	365	3	18	11	397	82	1	1	3	87	0	0	0	0	0					

Approach	Glenayr Ave															Curlewis St																								
	Direction 7 (Left Turn)					Direction 8 (Through)					Direction 9 (Right Turn)					Direction 9U (U Turn)					Direction 10 (Left Turn)					Direction 11 (Through)					Direction 12 (Right Turn)					Direction 12U (U Turn)				
Time Period	Lights	Heavyies	Buses	Cyclists	Total	Lights	Heavyies	Buses	Cyclists	Total	Lights	Heavyies	Buses	Cyclists	Total	Lights	Heavyies	Buses	Cyclists	Total	Lights	Heavyies	Buses	Cyclists	Total	Lights	Heavyies	Buses	Cyclists	Total	Lights	Heavyies	Buses	Cyclists	Total	Lights	Heavyies	Buses	Cyclists	Total
7:00 to 7:15	7	0	0	0	7	47	0	3	3	53	4	1	0	0	5	0	0	0	0	0	1	0	0	0	1	18	1	0	4	23	12	1	0	1	14	0	0	0	0	0
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16:30 to 16:45	10	0	0	1	11	77	0	1	2	80	13	0	0	0	13	0	0	0	0	0	9	0	0	1	10	31	0	0	3	34	24	0	0	1	25	0	0	0	0	0
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17:15 to 17:30	7	0	0	0	7	84	0	2	1	87	3	0	0	0	3	0	0	0	0	0	6	0	0	1	7	45	0	0	2	47	22	0	0	1	23	0	0	0	0	0
17:30 to 17:45	8	0	0	0	8	76	1	2	2	81	4	0	0	0	4	0	0	0	0	0	6	0	0	0	6	51	0	0	0	51	19	0	0	0	19	0	0	0	0	0
17:45 to 18:00	11	0	0	0	11	63	1	2	3	69	2	0	0	0	2	0	0	0	0	0	5	0	0	0	5	47	0	0	3	50	21	0	0	1	22	0	0	0	0	0
PM Totals	109	2	0	3	114	924	14	25	17	980	64	2	0	1	67	0	0	0	0	0	63	0	0	3	66	478	3	3	16	500	215	2	0	4	221	0	0	0	0	0

Approach	Crossing Pedestrians																							
Direction	A			B			C			D			E			F			G			H		
Time Period	Peds	Cyclists	Total	Peds	Cyclists	Total	Peds	Cyclists	Total	Peds	Cyclists	Total	Peds	Cyclists	Total	Peds	Cyclists	Total	Peds	Cyclists	Total	Peds	Cyclists	Total
7:00 to 7:15	5	0	5	9	0	9	4	0	4	6	0	6	13	0	13	5	0	5	11	2	13	7	1	8
7:15 to 7:30	7	0	7	11	0	11	7	0	7	8	0	8	8	0	8	3	0	3	13	0	13	11	1	12
7:30 to 7:45	13	0	13	13	0	13	14	0	14	5	0	5	19	0	19	10	1	11	12	0	12	8	0	8
7:45 to 8:00	9	0	9	10	0	10	9	0	9	18	0	18	21	0	21	11	0	11	13	0	13	10	0	10
8:00 to 8:15	10	0	10	14	0	14	11	0	11	19	0	19	14	0	14	6	0	6	14	0	14	17	0	17
8:15 to 8:30	8	0	8	11	0	11	11	0	11	14	0	14	15	0	15	9	0	9	18	0	18	13	0	13
8:30 to 8:45	7	0	7	14	0	14	15	0	15	8	1	9	10	0	10	7	0	7	13	0	13	11	1	12
8:45 to 9:00	8	0	8	17	0	17	13	0	13	18	0	18	21	1	22	4	0	4	12	0	12	15	0	15
9:00 to 9:15	11	0	11	13	0	13	14	0	14	13	0	13	2	0	2	5	0	5	7	0	7	9	0	9
9:15 to 9:30	12	0	12	11	0	11	15	0	15	10	0	10	7	0	7	5	0	5	10	0	10	9	0	9
9:30 to 9:45	6	0	6	8	0	8	8	0	8	9	0	9	14	0	14	8	0	8	7	0	7	10	0	10
9:45 to 10:00	5	0	5	13	0	13	17	0	17	10	0	10	11	0	11	6	0	6	2	0	2	5	0	5
AM Totals	101	0	101	144	0	144	138	0	138	138	1	139	155	1	156	79	1	80	132	2	134	125	3	128
15:00 to 15:15	4	0	4	7	0	7	8	0	8	13	1	14	5	0	5	1	0	1	12	0	12	9	1	10
15:15 to 15:30	7	0	7	7	0	7	8	0	8	17	0	17	12	0	12	7	0	7	10	0	10	3	0	3
15:30 to 15:45	8	0	8	12	0	12	9	1	10	6	0	6	6	0	6	1	0	1	2	0	2	6	0	6
15:45 to 16:00	5	0	5	9	0	9	9	0	9	7	0	7	5	0	5	7	0	7	11	0	11	11	0	11
16:00 to 16:15	11	0	11	11	0	11	11	0	11	12	0	12	5	0	5	1	0	1	7	0	7	9	0	9
16:15 to 16:30	6	0	6	4	0	4	9	0	9	12	0	12	15	0	15	5	0	5	15	0	15	7	0	7
16:30 to 16:45	15	0	15	19	0	19	17	0	17	8	1	9	11	0	11	5	0	5	7	0	7	8	0	8
16:45 to 17:00	13	0	13	18	0	18	11	0	11	18	0	18	3	1	4	5	0	5	24	0	24	8	0	8
17:00 to 17:15	10	0	10	16	0	16	7	0	7	10	0	10	8	2	10	4	0	4	11	0	11	17	0	17
17:15 to 17:30	8	0	8	15	0	15	11	0	11	15	0	15	21	0	21	6	0	6	12	0	12	11	0	11
17:30 to 17:45	7	0	7	8	0	8	7	0	7	13	0	13	23	0	23	10	0	10	16	0	16	8	0	8
17:45 to 18:00	18	0	18	24	0	24	7	0	7	20	0	20	19	0	19	8	0	8	12	0	12	15	0	15
PM Totals	112	0	112	150	0	150	114	1	115	151	2	153	133	3	136	60	0	60	139	0	139	112	1	113

Job No. : N6252
Client : Waverley Council
Suburb : Curlewis St
Location : 1. Curlewis St / Glenayr Ave

Day/Date : Thursday, 4th March 2021
Weather : Fine
Description : Classified Intersection Count
 : Hourly Summary



Approach	Glenayr Ave															Curlewis St																													
	Direction 1 (Left Turn)					Direction 2 (Through)					Direction 3 (Right Turn)					Direction 3U (U Turn)					Direction 4 (Left Turn)					Direction 5 (Through)					Direction 6 (Right Turn)					Direction 6U (U Turn)									
Time Period	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total
7:00 to 8:00	32	1	0	0	33	153	2	10	6	171	30	1	1	0	32	0	0	0	0	0	40	1	0	1	42	118	3	0	8	129	27	1	0	1	29	0	0	0	0	0	0	0	0	0	0
7:15 to 8:15	43	1	0	0	44	193	2	12	5	212	31	2	1	0	34	0	0	0	0	0	37	1	0	1	39	107	3	0	8	118	29	1	0	0	30	0	0	0	0	0	0	0	0	0	0
7:30 to 8:30	43	1	0	1	45	216	4	12	7	239	30	2	0	0	32	0	0	0	0	0	44	1	0	1	46	112	2	0	6	120	26	1	0	0	27	0	0	0	0	0	0	0	0	0	0
7:45 to 8:45	46	1	0	1	48	219	3	14	7	243	32	2	1	0	35	0	0	0	0	0	35	1	0	1	37	99	1	0	6	106	24	2	0	0	26	0	0	0	0	0	0	0	0	0	0
8:00 to 9:00	49	1	0	1	51	216	2	13	5	236	32	1	1	0	34	0	0	0	0	0	35	0	0	1	36	96	3	2	2	103	32	2	0	0	34	0	0	0	0	0	0	0	0	0	0
8:15 to 9:15	45	1	0	1	47	204	2	11	5	222	30	0	1	0	31	0	0	0	0	0	41	2	0	1	44	112	2	4	2	120	29	2	0	0	31	0	0	0	0	0	0	0	0	0	0
8:30 to 9:30	51	1	0	0	52	191	0	10	3	204	36	1	1	0	38	0	0	0	0	0	36	2	0	0	38	117	2	4	2	125	26	1	0	0	27	0	0	0	0	0	0	0	0	0	0
8:45 to 9:45	54	0	0	0	54	176	1	8	2	187	36	1	0	0	37	0	0	0	0	0	33	3	0	0	36	117	3	4	2	126	21	0	0	0	21	0	0	0	0	0	0	0	0	0	0
9:00 to 10:00	53	2	0	1	56	156	4	6	3	169	37	1	0	0	38	0	0	0	0	0	31	3	0	0	34	115	1	2	2	120	13	0	0	0	13	0	0	0	0	0	0	0	0	0	0
AM Totals	134	4	0	2	140	525	8	29	14	576	99	3	2	0	104	0	0	0	0	0	106	4	0	2	112	329	7	4	12	352	72	3	0	1	76	0	0	0	0	0	0	0	0	0	0
15:00 to 16:00	53	0	0	2	55	225	2	11	2	240	48	1	0	0	49	0	0	0	0	0	44	0	0	3	47	103	2	5	2	112	19	1	0	1	21	0	0	0	0	0	0	0	0	0	0
15:15 to 16:15	53	0	0	1	54	235	2	12	1	250	44	1	0	0	45	0	0	0	0	0	39	0	0	3	42	95	0	4	1	100	21	1	0	1	23	0	0	0	0	0	0	0	0	0	0
15:30 to 16:30	56	0	1	1	58	246	2	13	2	263	46	1	0	0	47	0	0	0	0	0	36	0	0	3	39	102	1	3	2	108	18	1	1	1	21	0	0	0	0	0	0	0	0	0	0
15:45 to 16:45	52	0	1	1	54	238	1	12	5	256	47	0	0	0	47	0	0	0	0	0	35	0	0	0	35	113	1	5	2	121	21	1	1	1	24	0	0	0	0	0	0	0	0	0	0
16:00 to 17:00	45	0	1	0	46	219	1	10	8	238	50	0	0	0	50	0	0	0	0	0	39	0	1	0	40	128	1	5	2	136	22	0	1	1	24	0	0	0	0	0	0	0	0	0	0
16:15 to 17:15	47	0	1	0	48	223	1	11	10	245	54	0	0	0	54	0	0	0	0	0	43	0	1	0	44	135	1	5	6	147	28	0	1	0	29	0	0	0	0	0	0	0	0	0	0
16:30 to 17:30	39	0	0	3	42	234	1	10	9	254	51	0	0	0	51	0	0	0	0	0	45	0	1	1	47	145	0	5	8	158	34	0	0	0	34	0	0	0	0	0	0	0	0	0	0
16:45 to 17:45	35	0	0	3	38	262	2	12	7	283	51	0	0	0	51	0	0	0	0	0	41	1	1	3	46	137	0	8	8	153	40	0	0	0	40	0	0	0	0	0	0	0	0	0	0
17:00 to 18:00	42	0	0	3	45	263	1	12	5	281	50	0	0	0	50	0	0	0	0	0	39	1	0	4	44	134	0	8	7	149	41	0	0	1	42	0	0	0	0	0	0	0	0	0	0
PM Totals	140	0	1	5	146	707	4	33	15	759	148	1	0	0	149	0	0	0	0	0	122	1	1	7	131	365	3	18	11	397	82	1	1	3	87	0	0	0	0	0	0	0	0	0	0

Approach	Glenayr Ave															Curlewis St																								
	Direction 7 (Left Turn)					Direction 8 (Through)					Direction 9 (Right Turn)					Direction 9U (U Turn)					Direction 10 (Left Turn)					Direction 11 (Through)					Direction 12 (Right Turn)					Direction 12U (U Turn)				
Time Period	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total
7:00 to 8:00	27	2	0	1	30	285	2	21	14	322	24	3	0	0	27	0	0	0	0	0	15	1	0	0	16	91	8	6	4	109	32	2	0	3	37	0	0	0	0	0
7:15 to 8:15	32	3	0	1	36	312	3	25	12	352	30	2	0	0	32	0	0	0	0	0	19	1	0	0	20	107	7	6	1	121	32	2	0	2	36	0	0	0	0	0
7:30 to 8:30	36	4	0	0	40	321	5	23	11	360	30	3	0	1	34	0	0	0	0	0	19	1	0	0	20	128	6	2	1	137	45	1	0	1	47	0	0	0	0	0
7:45 to 8:45	36	6	0	0	42	309	6	18	13	346	30	3	0	1	34	0	0	0	0	0	20	0	0	0	20	140	2	1	1	144	54	1	0	2	57	0	0	0	0	0
8:00 to 9:00	44	5	0	0	49	292	6	17	11	326	30	2	0	1	33	0	0	0	0	0	21	0	0	0	21	139	0	1	1	141	57	1	0	2	60	0	0	0	0	0
8:15 to 9:15	40	4	0	0	44	286	5	13	11	315	31	2	0	1	34	0	0	0	0	0	24	1	0	0	25	145	0	3	1	149	62	0	0	3	65	0	0	0	0	0
8:30 to 9:30	41	4	0	1	46	281	8	12	10	311	33	1	0	0	34	0	0	0	0	0	27	1	0	0	28	135	3	3	1	142	59	0	0	2	61	0	0	0	0	0
8:45 to 9:45	36	2	0	1	39	248	8	13	7	276	33	0	0	0	33	0	0	0	0	0	32	1	0	0	33	122	4	2	1	129	64	0	0	1	65	0	0	0	0	0
9:00 to 10:00	27	1	0	1	29	234	8	11	5	258	30	0	0	0	30	0	0	0	0	0	31	2	0	0	33	122	4	3	1	130	64	0	0	1	65	0	0	0	0	0
AM Totals	98	8	0	2	108	811	16	49	30	906	84	5	0	1	90	0	0	0	0	0	67	3	0	0	70	352	12	10	6	380	153	3	0	6	162	0	0	0	0	0
15:00 to 16:00	39	1	0	2	42	296	9	11	4	320	20	2	0	0	22	0	0	0	0	0	19	0	0	1	20	149	3	2	4	158	73	1	0	1	75	0	0	0	0	0
15:15 to 16:15	35	0	0	2	37	297	6	12	4	319	20	2	0	0	22	0	0	0	0	0	14	0	0	0	14	156	3	2	4	165	72	1	0	1	74	0	0	0	0	0
15:30 to 16:30	35	0	0	1	36	319	5	11	4	339	21	2	0	1	24	0	0	0	0	0	13	0	0	0	13	173	3	2	3	181	66	1	0	1	68	0	0	0	0	0
15:45 to 16:45	35	0	0	1	36	298	2	8	5	313	30	0	0	1	31	0	0	0	0	0	20	0	0	1	21	168	2	0	4	174	72	1	0	1	74	0	0	0	0	0
16:00 to 17:00	32	0	0	1	33	317	1	6	5	329	29	0	0	1	30	0	0	0	0	0	17	0	0	1	18	147	0	1	5	153	65	1	0	1	67	0	0	0	0	0
16:15 to 17:15	38	1	0	1	40	328	2	6	7	343	31	0	0	1	32	0	0	0	0	0	23	0	0	1	24	152	0	1	7	160	66	1	0	1	68	0	0	0	0	0
16:30 to 17:30	39	1	0	1	41	325	2	7	6	340	29	0	0	0	29	0	0	0	0	0	26	0	0	2	28	155	0	1	9	165	76	0	0	2	78	0	0	0	0	0
16:45 to 17:45	37	1	0	0	38	324	3	8	6	341	20	0	0	0	20	0	0	0	0	0	23	0	0	1	24	175	0	1	6	182	71	0	0	1	72	0	0	0	0	0
17:00 to 18:00	38	1	0	0	39	311	4	8	8	331	15	0	0	0	15	0	0	0	0	0	27	0	0	1	28	182	0	0	7	189	77	0	0	2	79	0	0	0	0	0
PM Totals	109	2	0	3	114	924	14	25	17	980	64	2	0	1	67	0	0	0	0	0	63	0	0	3	66	478	3	3	16	500	215	2	0	4	221	0	0	0	0	0

Approach	Crossing Pedestrians																							
Direction	A			B			C			D			E			F			G			H		
Time Period	Ped	Cycl	Total	Ped	Cycl	Total	Ped	Cycl	Total	Ped	Cycl	Total	Ped	Cycl	Total	Ped	Cycl	Total	Ped	Cycl	Total	Ped	Cycl	Total
17:45 to 18:45	34	0	34	43	0	43	34	0	34	37	0	37	61	0	61	29	1	30	49	2	51	36	2	38
18:00 to 19:00	39	0	39	48	0	48	41	0	41	50	0	50	62	0	62	30	1	31	52	0	52	46	1	47
18:15 to 19:15	40	0	40	48	0	48	45	0	45	56	0	56	69	0	69	36	1	37	57	0	57	48	0	48
18:30 to 19:30	34	0	34	49	0	49	46	0	46	59	1	60	60	0	60	33	0	33	58	0	58	51	1	52
18:45 to 19:45	33	0	33	56	0	56	50	0	50	59	1	60	60	1	61	26	0	26	57	0	57	56	1	57
19:00 to 20:00	34	0	34	55	0	55	53	0	53	53	1	54	48	1	49	25	0	25	50	0	50	48	1	49
19:15 to 20:15	38	0	38	55	0	55	57	0	57	49	1	50	40	1	41	21	0	21	42	0	42	44	1	45
19:30 to 20:30	37	0	37	49	0	49	50	0	50	50	0	50	44	1	45	22	0	22	36	0	36	43	0	43
19:45 to 20:45	34	0	34	45	0	45	54	0	54	42	0	42	34	0	34	24	0	24	26	0	26	33	0	33
8:30	101	0	101	144	0	144	138	0	138	138	1	139	155	1	156	79	1	80	132	2	134	125	3	128
8:45 to 9:45	24	0	24	35	0	35	34	1	35	43	1	44	28	0	28	16	0	16	35	0	35	29	1	30
9:00 to 10:00	31	0	31	39	0	39	37	1	38	42	0	42	28	0	28	16	0	16	30	0	30	29	0	29
9:15 to 10:15	30	0	30	36	0	36	38	1	39	37	0	37	31	0	31	14	0	14	35	0	35	33	0	33
9:30 to 10:30	37	0	37	43	0	43	46	0	46	39	1	40	36	0	36	18	0	18	40	0	40	35	0	35
9:45 to 10:45	45	0	45	52	0	52	48	0	48	50	1	51	34	1	35	16	0	16	53	0	53	32	0	32
10:00 to 11:00	44	0	44	57	0	57	44	0	44	48	1	49	37	3	40	19	0	19	57	0	57	40	0	40
10:15 to 11:15	46	0	46	68	0	68	46	0	46	51	1	52	43	3	46	20	0	20	54	0	54	44	0	44
10:30 to 11:30	38	0	38	57	0	57	36	0	36	56	0	56	55	3	58	25	0	25	63	0	63	44	0	44
10:45 to 11:45	43	0	43	63	0	63	32	0	32	58	0	58	71	2	73	28	0	28	51	0	51	51	0	51
16:30	112	0	112	150	0	150	114	1	115	151	2	153	133	3	136	60	0	60	139	0	139	112	1	113

ATTACHMENT 2

SIDRA CALIBRATION & OUTPUTS

DRAFT

Existing Models Calibration

A site inspection was undertaken during the PM peak period on Friday 30 March 2021. The following observations were made and used in the calibration of the existing SIDRA models:

- Average phase cycle time was approximately 45 seconds, with Glenayr Avenue phase observed to be given 50-60% of the cycle phase.
- Intersection queue lengths were observed to be up to approximately ten cars, with the Glenayr Avenue approaches observed to have typically longer queue lengths than Curlewis.
- Due to the single roundel signal lanterns (i.e. absence of red arrow lanterns) when a pedestrian crossing is called all vehicle movements are held for four seconds while the pedestrian crossing begins.
 - To incorporate this into the SIDRA models the vehicle priorities for through vehicles were adjusted to consider the parallel pedestrian movements as opposing movements. This allowed the gap acceptance for all movements to have a four second start loss applied when the opposing pedestrian phase is called.
- The kerb side lanes for all approaches were typically underutilised, with their use generally limited to left turn vehicles and the occasional through vehicle passing a vehicle waiting at the intersection to turn right.
 - Lane movement flow proportions were adjusted to reflect turning vehicles entering exit lane 2 as opposed to turning into the kerb side lane and changing downstream. Additionally, cyclists were kept within the kerbside lanes where existing cycle lanes are provided adjacent to the parking.

USER REPORT FOR SITE

Project: 210408sid_N208800 Glenayr and Curlewis

Template: Default Site User Report

Site: 101 [Glenayr Ave / Curlewis St - AM]

Glenayr Ave / Curlewis St - Existing

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

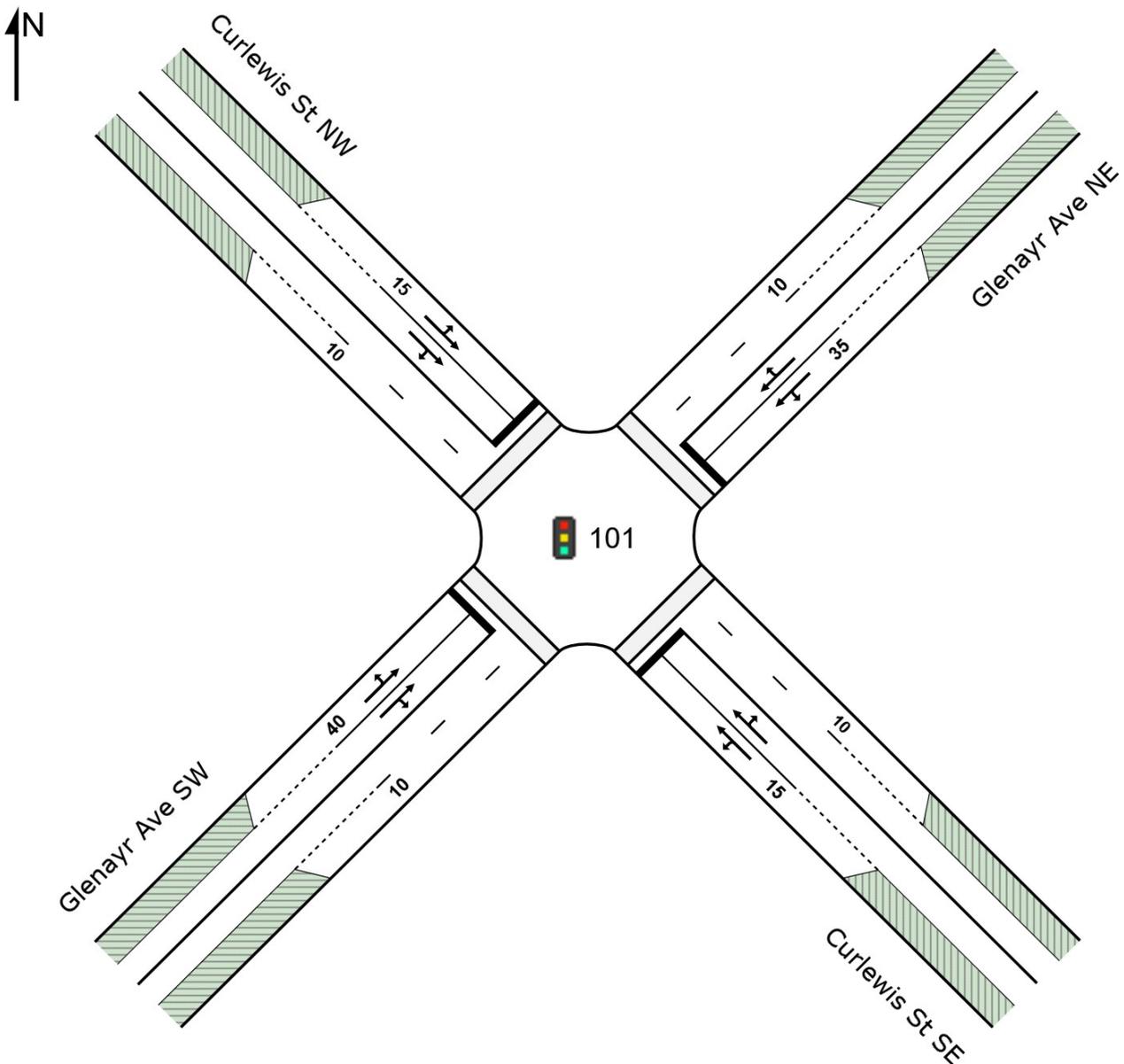
Phase Sequence: Two-Phase

Reference Phase: Phase A

Input Phase Sequence: A, B

Output Phase Sequence: A, B

Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Curlewis St SE												
4	L2	48	2.2	0.136	18.3	LOS B	0.9	6.0	0.85	0.70	0.85	30.0
5	T1	126	1.7	0.414	16.1	LOS B	2.7	19.3	0.91	0.73	0.91	31.6
6	R2	28	3.7	0.414	19.6	LOS B	2.7	19.3	0.91	0.74	0.91	31.3
Approach		203	2.1	0.414	17.1	LOS B	2.7	19.3	0.90	0.73	0.90	31.2
NorthEast: Glenayr Ave NE												
7	L2	42	10.0	0.143	14.9	LOS B	1.3	8.6	0.76	0.65	0.76	32.6
8	T1	379	7.8	0.714	15.3	LOS B	7.3	54.8	0.92	0.88	1.06	29.4
9	R2	36	8.8	0.714	19.2	LOS B	7.3	54.8	0.95	0.91	1.10	30.3
Approach		457	8.1	0.714	15.6	LOS B	7.3	54.8	0.91	0.86	1.04	29.8
NorthWest: Curlewis St NW												
10	L2	21	5.0	0.102	18.2	LOS B	0.6	4.5	0.85	0.66	0.85	30.0
11	T1	144	5.8	0.508	16.4	LOS B	3.3	24.1	0.93	0.75	0.93	31.4
12	R2	49	2.1	0.508	20.0	LOS B	3.3	24.1	0.94	0.76	0.94	29.3
Approach		215	4.9	0.508	17.4	LOS B	3.3	24.1	0.92	0.74	0.92	30.8
SouthWest: Glenayr Ave SW												
1	L2	47	2.2	0.105	14.6	LOS B	0.9	6.1	0.75	0.66	0.75	30.8
2	T1	252	6.7	0.526	13.1	LOS A	4.6	34.2	0.87	0.73	0.87	30.5
3	R2	34	6.2	0.526	16.7	LOS B	4.6	34.2	0.88	0.74	0.88	32.4
Approach		333	6.0	0.526	13.7	LOS A	4.6	34.2	0.85	0.72	0.85	30.8
All Vehicles		1207	5.9	0.714	15.6	LOS B	7.3	54.8	0.90	0.78	0.94	30.5

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P2	SouthEast Full Crossing	106	14.5	LOS B	0.1	0.1	0.85	0.85	
P3	NorthEast Full Crossing	112	14.5	LOS B	0.1	0.1	0.85	0.85	
P4	NorthWest Full Crossing	111	14.5	LOS B	0.1	0.1	0.85	0.85	
P1	SouthWest Full Crossing	93	14.5	LOS B	0.1	0.1	0.85	0.85	
All Pedestrians		421	14.5	LOS B			0.85	0.85	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

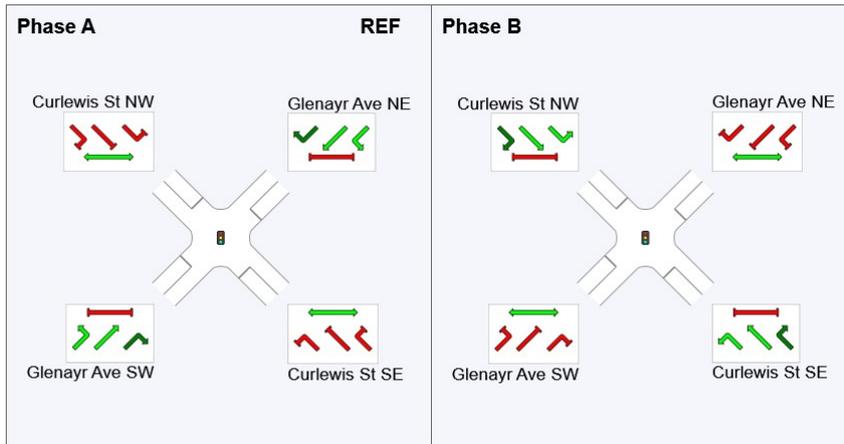
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	22
Green Time (sec)	16	12
Phase Time (sec)	22	18
Phase Split	55%	45%

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%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



USER REPORT FOR SITE

Project: 210408sid_N208800 Glenayr and Curlewis

Template: Default Site User Report

Site: 101 [Glenayr Ave / Curlewis St - AM - Proposed - Separate Phase]

Glenayr Ave / Curlewis St - Existing

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

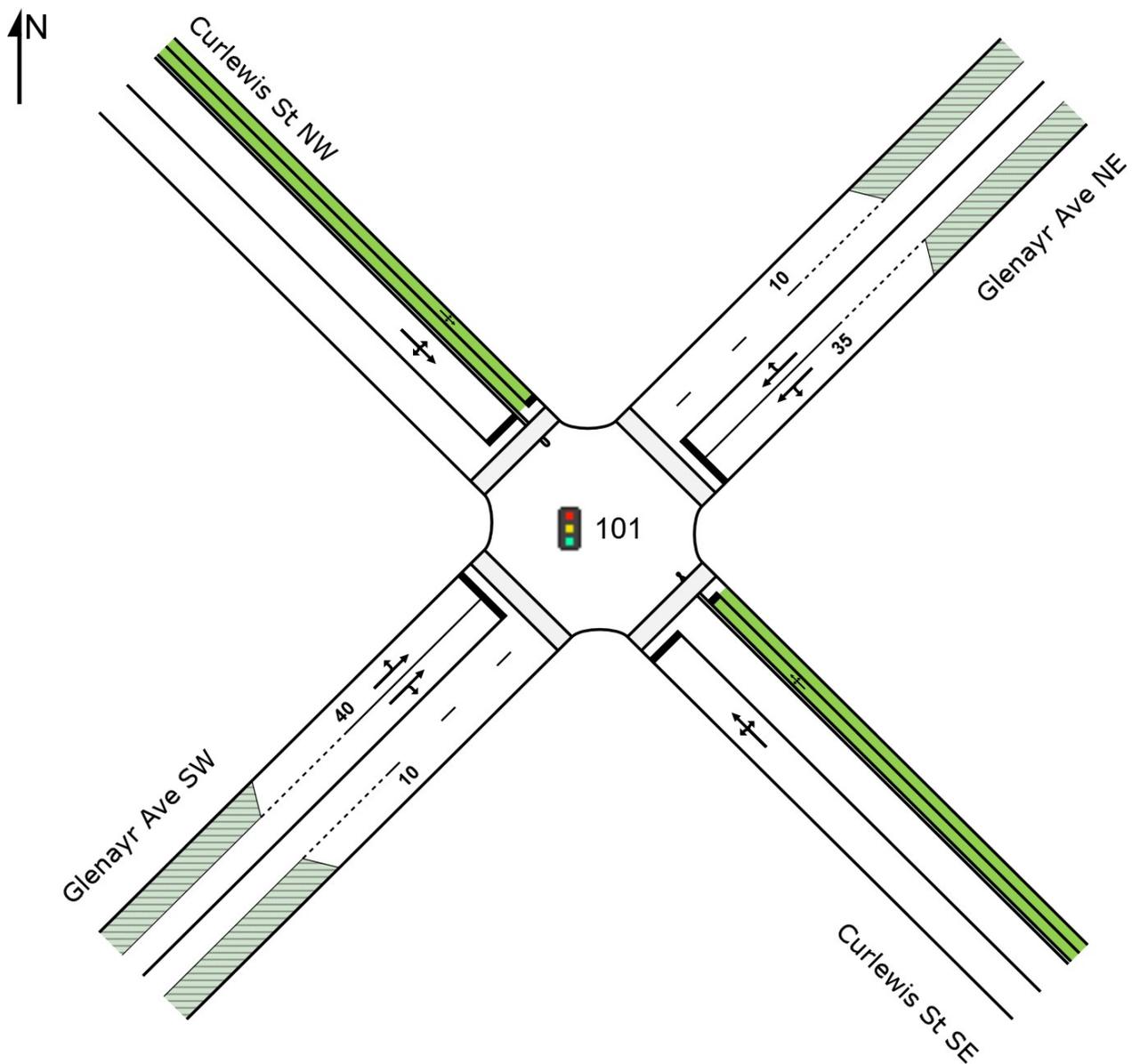
Phase Sequence: Two-Phase

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 Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Curlewis St SE												
4	L2	48	2.2	0.590	25.2	LOS B	4.7	33.7	0.96	0.81	1.00	26.7
5	T1	126	1.7	0.590	21.8	LOS B	4.7	33.7	0.96	0.80	1.00	26.5
6	R2	28	3.7	0.590	25.3	LOS B	4.7	33.7	0.97	0.81	1.01	28.9
Approach		203	2.1	0.590	23.1	LOS B	4.7	33.7	0.96	0.80	1.00	26.9
NorthEast: Glenayr Ave NE												
7	L2	42	10.0	0.155	19.3	LOS B	1.5	10.0	0.81	0.67	0.81	30.6
8	T1	379	7.8	0.773	20.7	LOS B	9.8	73.5	0.95	0.96	1.14	27.0
9	R2	36	8.8	0.773	24.6	LOS B	9.8	73.5	0.97	0.99	1.18	28.0
Approach		457	8.1	0.773	20.9	LOS B	9.8	73.5	0.94	0.93	1.12	27.5
NorthWest: Curlewis St NW												
10	L2	21	5.0	0.648	25.4	LOS B	5.2	38.3	0.97	0.86	1.07	27.5
11	T1	144	5.8	0.648	21.9	LOS B	5.2	38.3	0.97	0.86	1.07	29.3
12	R2	49	2.1	0.648	25.3	LOS B	5.2	38.3	0.97	0.86	1.07	27.0
Approach		215	4.9	0.648	23.0	LOS B	5.2	38.3	0.97	0.86	1.07	28.7
SouthWest: Glenayr Ave SW												
1	L2	47	2.2	0.125	19.9	LOS B	1.1	7.5	0.82	0.69	0.82	28.2
2	T1	252	6.7	0.623	18.8	LOS B	6.3	46.8	0.93	0.81	0.97	27.8
3	R2	34	6.2	0.623	22.3	LOS B	6.3	46.8	0.93	0.81	0.98	30.0
Approach		333	6.0	0.623	19.3	LOS B	6.3	46.8	0.91	0.79	0.95	28.1
All Vehicles		1207	5.9	0.773	21.2	LOS B	9.8	73.5	0.94	0.86	1.04	27.8

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P2	SouthEast Full Crossing	106	19.4	LOS B	0.1	0.1	0.88	0.88	
P3	NorthEast Full Crossing	112	19.5	LOS B	0.1	0.1	0.88	0.88	
P4	NorthWest Full Crossing	111	19.4	LOS B	0.1	0.1	0.88	0.88	
P1	SouthWest Full Crossing	93	19.4	LOS B	0.1	0.1	0.88	0.88	
All Pedestrians		421	19.4	LOS B			0.88	0.88	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

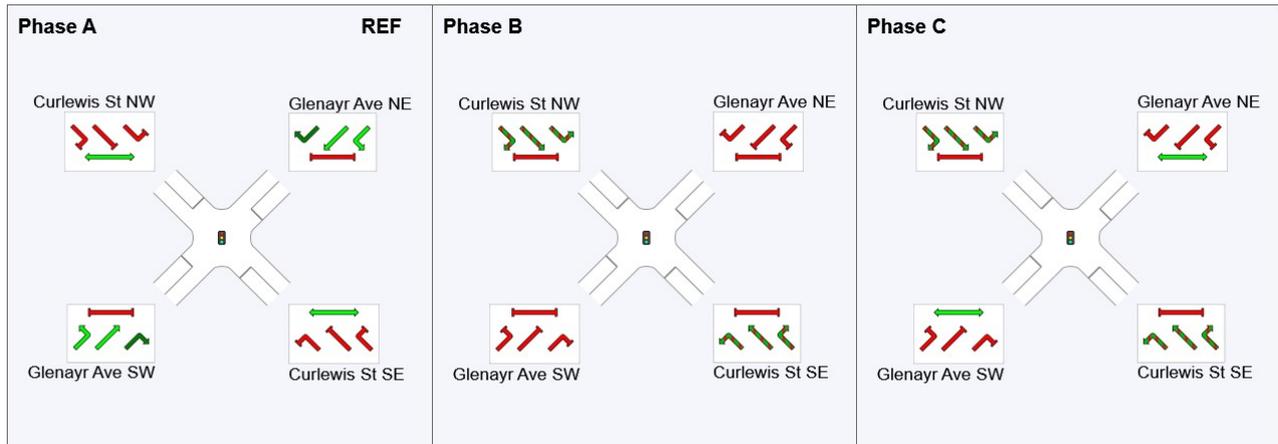
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	21	33
Green Time (sec)	15	6	11
Phase Time (sec)	21	12	17
Phase Split	42%	24%	34%

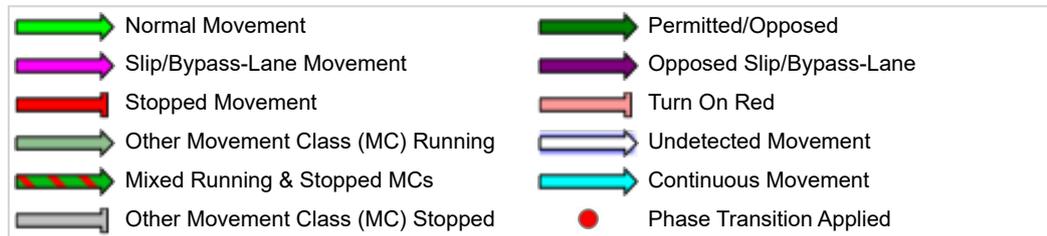
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



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Organisation: GTA CONSULTANTS | Created: Friday, 9 April 2021 2:48:29 PM

Project: P:\N20800-20899\N208800 Waverley Streetscapes\Modelling\210408sid_N208800 Glenayr and Curlewis.sip8

USER REPORT FOR SITE

Project: 210408sid_N208800 Glenayr and Curlewis

Template: Default Site User Report

Site: 101 [Glenayr Ave / Curlewis St - AM - Proposed - Turn Bans]

Glenayr Ave / Curlewis St - Existing

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

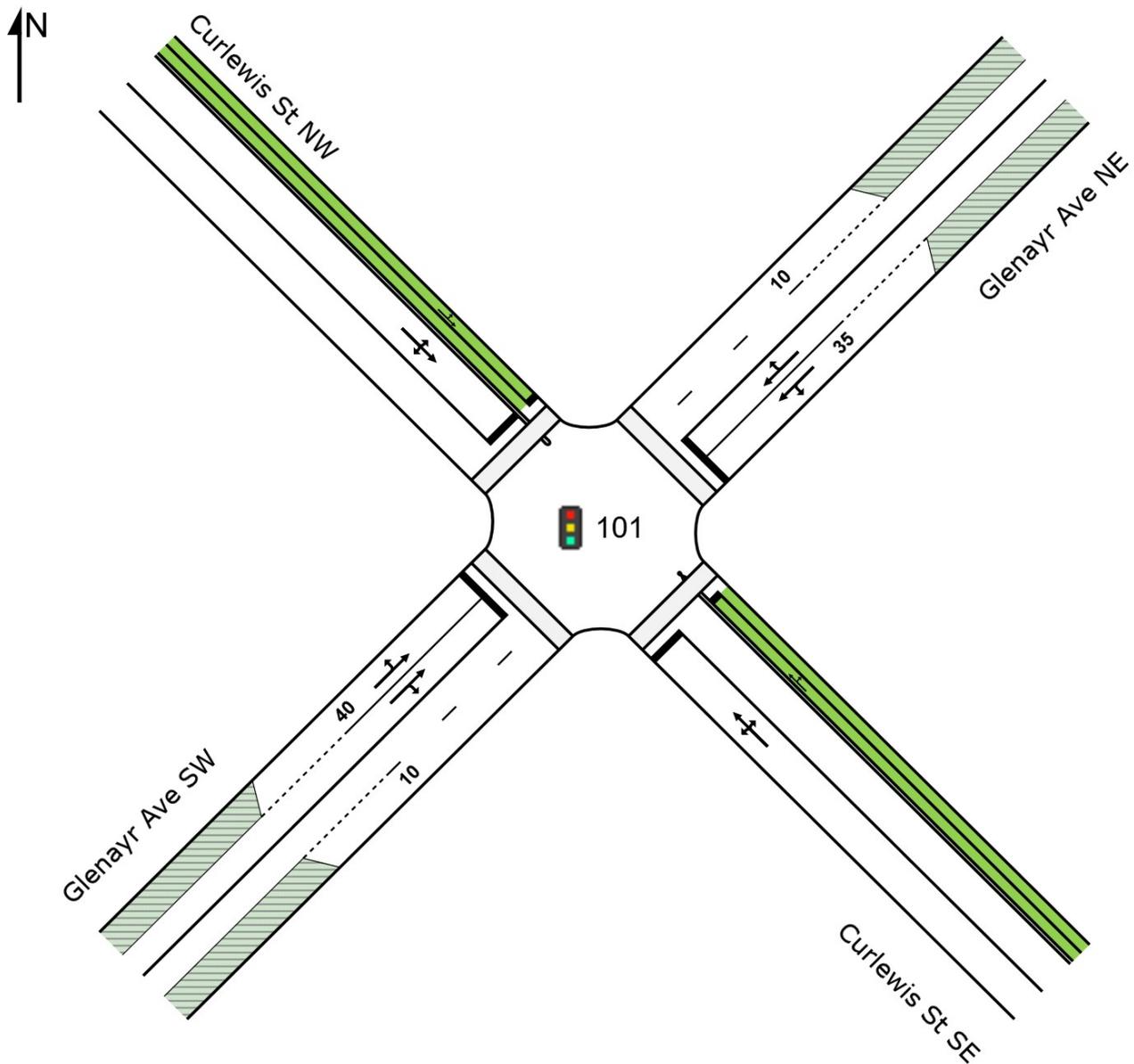
Phase Sequence: Two-Phase

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 Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Curlewis St SE												
4	L2	47	2.2	0.388	19.7	LOS B	4.0	28.6	0.85	0.72	0.85	30.8
5	T1	126	1.7	0.388	16.5	LOS B	4.0	28.6	0.85	0.72	0.85	28.1
6	R2	28	3.7	0.388	19.8	LOS B	4.0	28.6	0.85	0.72	0.85	31.0
Approach		202	2.1	0.388	17.7	LOS B	4.0	28.6	0.85	0.72	0.85	29.0
NorthEast: Glenayr Ave NE												
7	L2	42	10.0	0.114	15.1	LOS B	1.3	8.9	0.70	0.62	0.70	32.3
8	T1	379	7.8	0.568	12.8	LOS A	7.4	55.4	0.81	0.71	0.81	30.7
9	R2	36	8.8	0.568	16.4	LOS B	7.4	55.4	0.83	0.72	0.83	31.7
Approach		457	8.1	0.568	13.3	LOS A	7.4	55.4	0.80	0.70	0.80	31.0
NorthWest: Curlewis St NW												
10	L2	21	5.0	0.426	19.2	LOS B	4.3	31.7	0.85	0.72	0.85	30.0
11	T1	144	5.8	0.426	15.8	LOS B	4.3	31.7	0.85	0.72	0.85	31.6
12	R2	48	2.2	0.426	19.2	LOS B	4.3	31.7	0.85	0.72	0.85	29.7
Approach		214	4.9	0.426	16.9	LOS B	4.3	31.7	0.85	0.72	0.85	31.1
SouthWest: Glenayr Ave SW												
1	L2	47	2.2	0.088	15.7	LOS B	1.0	6.5	0.71	0.65	0.71	30.1
2	T1	252	6.7	0.441	12.8	LOS A	5.1	38.1	0.79	0.68	0.79	30.7
3	R2	34	6.3	0.441	16.3	LOS B	5.1	38.1	0.79	0.68	0.79	32.6
Approach		333	6.0	0.441	13.6	LOS A	5.1	38.1	0.78	0.67	0.78	30.8
All Vehicles		1205	5.9	0.568	14.8	LOS B	7.4	55.4	0.81	0.70	0.81	30.5

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	
P2	SouthEast Full Crossing	106	19.4	LOS B	0.1	0.1	0.88	0.88	
P3	NorthEast Full Crossing	112	19.5	LOS B	0.1	0.1	0.88	0.88	
P4	NorthWest Full Crossing	111	19.4	LOS B	0.1	0.1	0.88	0.88	
P1	SouthWest Full Crossing	93	19.4	LOS B	0.1	0.1	0.88	0.88	
All Pedestrians		421	19.4	LOS B			0.88	0.88	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

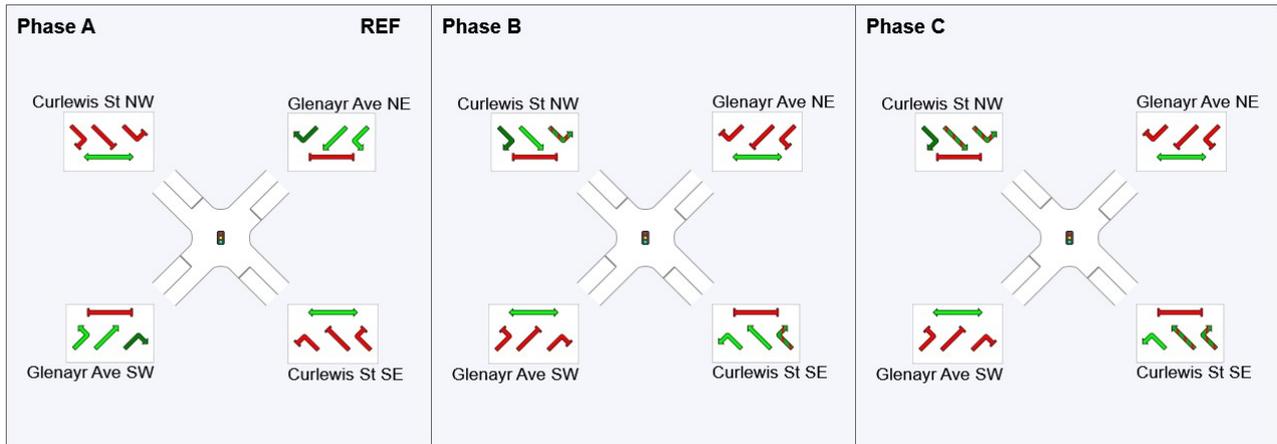
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	26	38
Green Time (sec)	20	6	6
Phase Time (sec)	26	12	12
Phase Split	52%	24%	24%

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%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



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Organisation: GTA CONSULTANTS | Created: Friday, 9 April 2021 2:49:22 PM

Project: P:\N20800-20899\N208800 Waverley Streetscapes\Modelling\210408sid_N208800 Glenayr and Curlewis.sip8

USER REPORT FOR SITE

Project: 210408sid_N208800 Glenayr and Curlewis

Template: Default Site User Report

Site: 101 [Glenayr Ave / Curlewis St - PM]

Glenayr Ave / Curlewis St - Existing

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

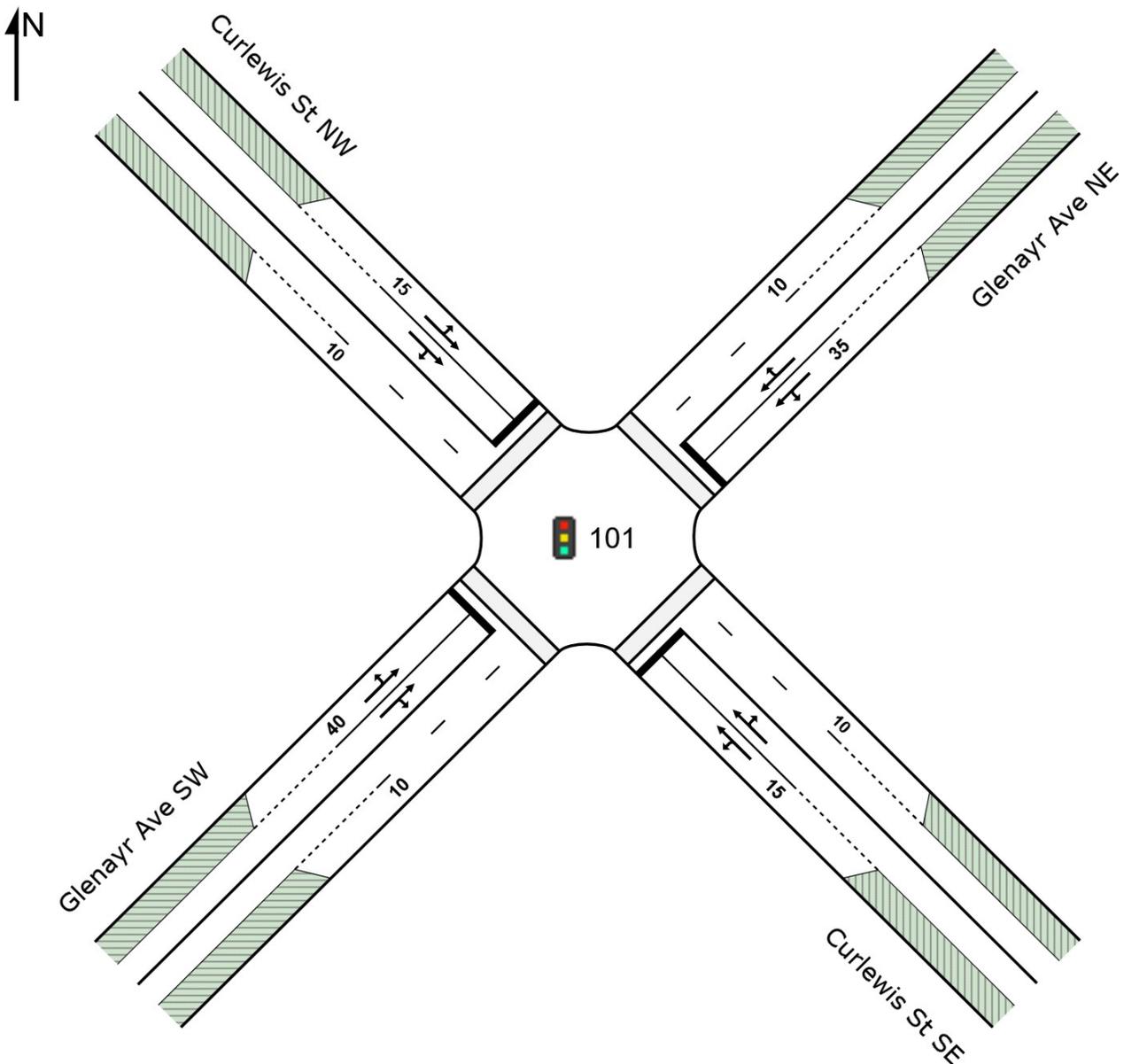
Phase Sequence: Two-Phase

Reference Phase: Phase A

Input Phase Sequence: A, B

Output Phase Sequence: A, B

Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Curlewis St SE												
4	L2	46	2.3	0.100	16.1	LOS B	0.8	5.2	0.80	0.68	0.80	30.4
5	T1	157	5.4	0.452	14.5	LOS A	3.4	24.7	0.89	0.73	0.89	32.1
6	R2	44	0.0	0.452	18.0	LOS B	3.4	24.7	0.89	0.74	0.89	31.9
Approach		247	3.8	0.452	15.4	LOS B	3.4	24.7	0.87	0.72	0.87	31.8
NorthEast: Glenayr Ave NE												
7	L2	41	2.6	0.146	16.5	LOS B	1.2	7.8	0.81	0.67	0.81	31.8
8	T1	348	3.6	0.729	17.1	LOS B	6.8	49.0	0.96	0.91	1.13	28.6
9	R2	16	0.0	0.729	21.0	LOS B	6.8	49.0	0.97	0.94	1.16	29.6
Approach		405	3.4	0.729	17.2	LOS B	6.8	49.0	0.94	0.89	1.10	29.1
NorthWest: Curlewis St NW												
10	L2	29	0.0	0.119	16.3	LOS B	1.0	6.2	0.80	0.65	0.80	30.6
11	T1	199	0.0	0.593	15.0	LOS B	4.6	32.3	0.91	0.78	0.94	31.8
12	R2	83	0.0	0.593	18.8	LOS B	4.6	32.3	0.93	0.80	0.97	29.8
Approach		312	0.0	0.593	16.1	LOS B	4.6	32.3	0.90	0.77	0.94	31.2
SouthWest: Glenayr Ave SW												
1	L2	47	0.0	0.149	16.4	LOS B	1.2	7.9	0.81	0.67	0.81	30.0
2	T1	296	4.6	0.746	17.6	LOS B	6.7	48.5	0.96	0.94	1.17	28.2
3	R2	53	0.0	0.746	21.5	LOS B	6.7	48.5	0.98	0.97	1.21	30.3
Approach		396	3.5	0.746	18.0	LOS B	6.7	48.5	0.94	0.91	1.13	28.8
All Vehicles		1360	2.7	0.746	16.9	LOS B	6.8	49.0	0.92	0.84	1.03	30.1

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P2	SouthEast Full Crossing	95	14.5	LOS B	0.1	0.1	0.85	0.85	
P3	NorthEast Full Crossing	106	14.5	LOS B	0.1	0.1	0.85	0.85	
P4	NorthWest Full Crossing	107	14.5	LOS B	0.1	0.1	0.85	0.85	
P1	SouthWest Full Crossing	112	14.5	LOS B	0.1	0.1	0.85	0.85	
All Pedestrians		420	14.5	LOS B			0.85	0.85	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

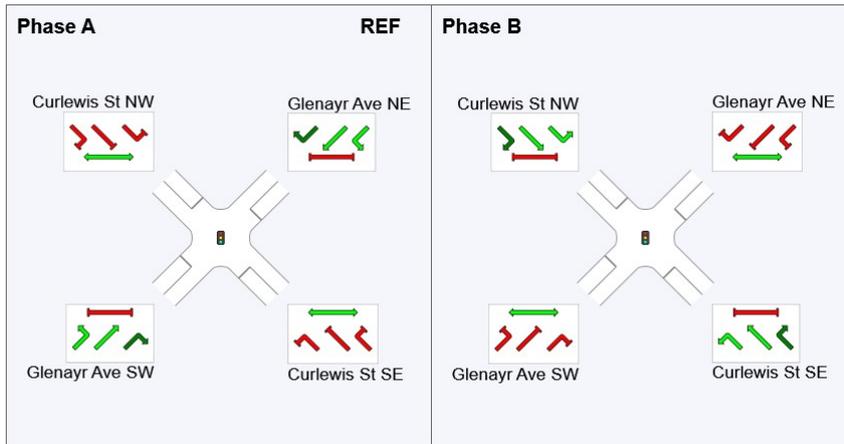
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	20
Green Time (sec)	14	14
Phase Time (sec)	20	20
Phase Split	50%	50%

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%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



USER REPORT FOR SITE

Project: 210408sid_N208800 Glenayr and Curlewis

Template: Default Site User Report

Site: 101 [Glenayr Ave / Curlewis St - PM - Proposed - Separate Phase]

Glenayr Ave / Curlewis St - Existing

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

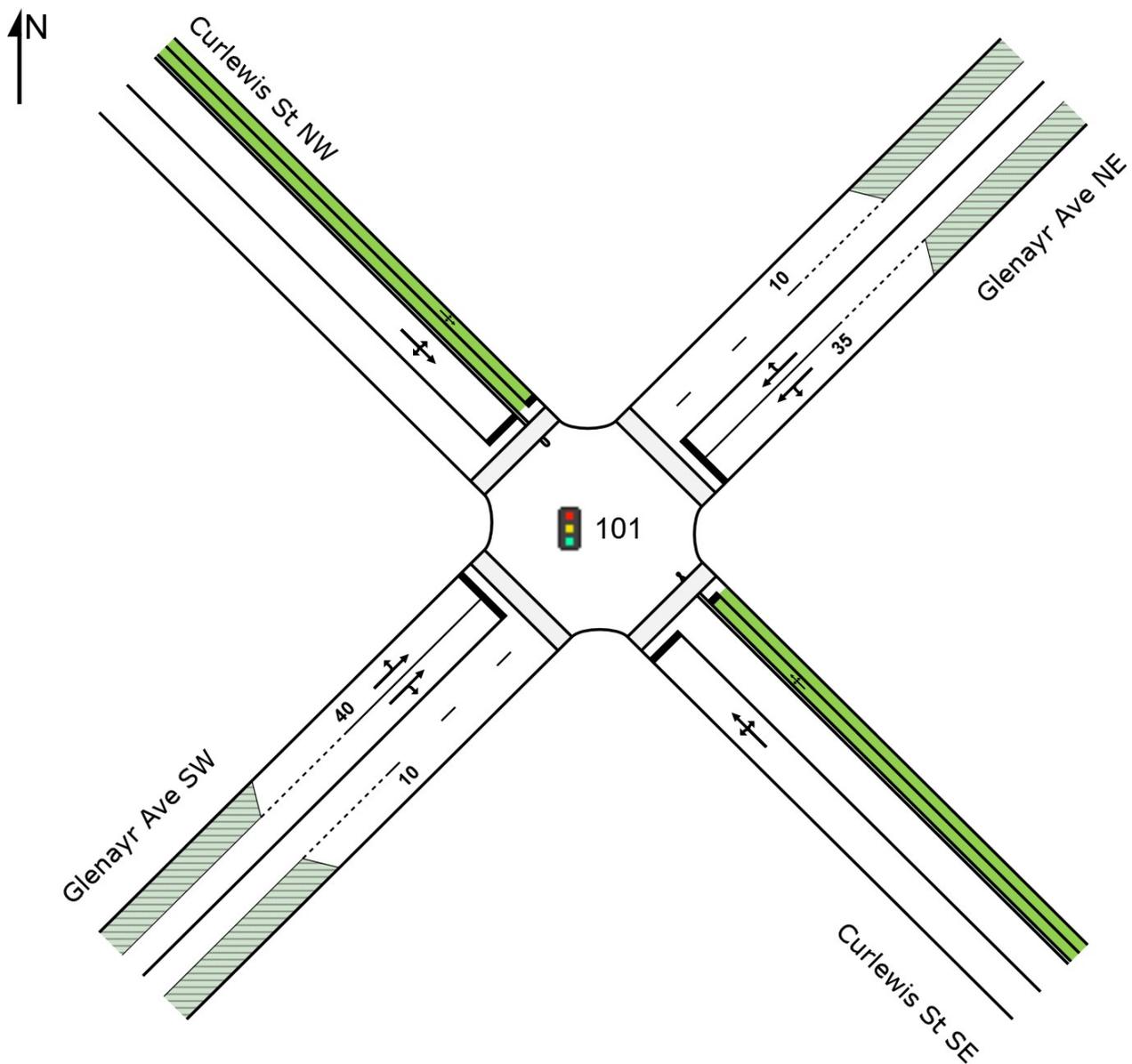
Phase Sequence: Two-Phase

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 Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Curlewis St SE												
4	L2	46	2.3	0.645	24.9	LOS B	5.7	41.4	0.96	0.83	1.04	26.6
5	T1	157	5.4	0.645	21.6	LOS B	5.7	41.4	0.97	0.84	1.04	26.6
6	R2	44	0.0	0.645	25.0	LOS B	5.7	41.4	0.97	0.85	1.05	26.8
Approach		247	3.8	0.645	22.8	LOS B	5.7	41.4	0.97	0.84	1.04	26.6
NorthEast: Glenayr Ave NE												
7	L2	41	2.6	0.140	20.9	LOS B	1.3	8.3	0.84	0.68	0.84	29.9
8	T1	348	3.6	0.701	19.4	LOS B	8.3	59.5	0.94	0.87	1.05	27.7
9	R2	16	0.0	0.701	22.9	LOS B	8.3	59.5	0.95	0.89	1.06	28.9
Approach		405	3.4	0.701	19.7	LOS B	8.3	59.5	0.93	0.86	1.03	28.0
NorthWest: Curlewis St NW												
10	L2	29	0.0	0.825	29.7	LOS C	8.5	59.2	1.00	1.06	1.36	25.8
11	T1	199	0.0	0.825	26.4	LOS B	8.5	59.2	1.00	1.05	1.36	27.8
12	R2	83	0.0	0.825	29.8	LOS C	8.5	59.2	1.00	1.06	1.36	25.4
Approach		312	0.0	0.825	27.6	LOS B	8.5	59.2	1.00	1.06	1.36	27.1
SouthWest: Glenayr Ave SW												
1	L2	47	0.0	0.163	20.9	LOS B	1.5	9.7	0.84	0.69	0.84	28.0
2	T1	296	4.6	0.817	24.7	LOS B	9.0	65.4	0.99	1.04	1.30	25.4
3	R2	53	0.0	0.817	28.8	LOS C	9.0	65.4	1.00	1.07	1.34	27.7
Approach		396	3.5	0.817	24.8	LOS B	9.0	65.4	0.97	1.00	1.25	26.0
All Vehicles		1360	2.7	0.825	23.5	LOS B	9.0	65.4	0.96	0.94	1.17	26.9

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	
P2	SouthEast Full Crossing	95	19.4	LOS B	0.1	0.1	0.88	0.88	
P3	NorthEast Full Crossing	106	19.4	LOS B	0.1	0.1	0.88	0.88	
P4	NorthWest Full Crossing	107	19.4	LOS B	0.1	0.1	0.88	0.88	
P1	SouthWest Full Crossing	112	19.5	LOS B	0.1	0.1	0.88	0.88	
All Pedestrians		420	19.4	LOS B			0.88	0.88	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

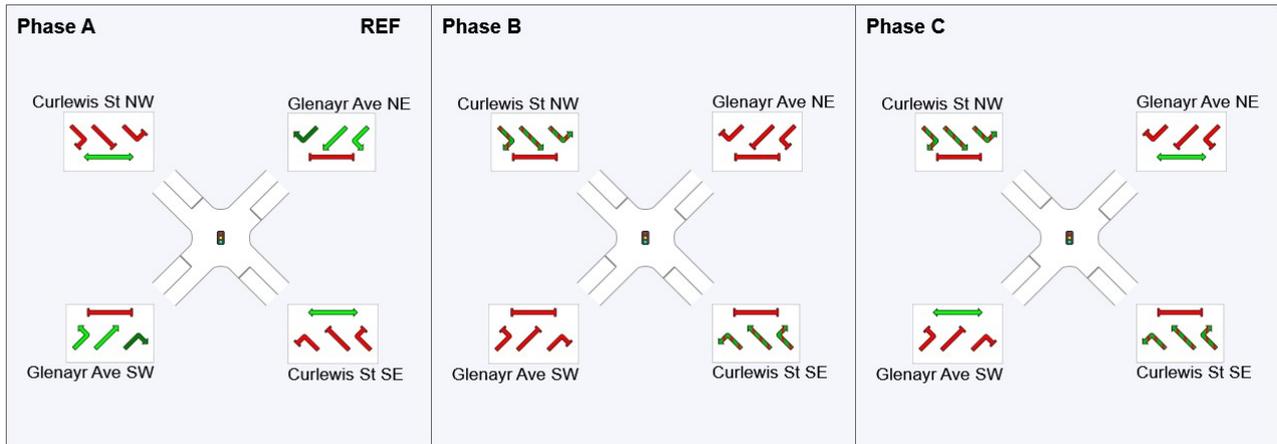
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	20	32
Green Time (sec)	14	6	12
Phase Time (sec)	20	12	18
Phase Split	40%	24%	36%

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%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



USER REPORT FOR SITE

Project: 210408sid_N208800 Glenayr and Curlewis

Template: Default Site User Report

Site: 101 [Glenayr Ave / Curlewis St - PM - Proposed - Turn Bans]

Glenayr Ave / Curlewis St - Existing

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

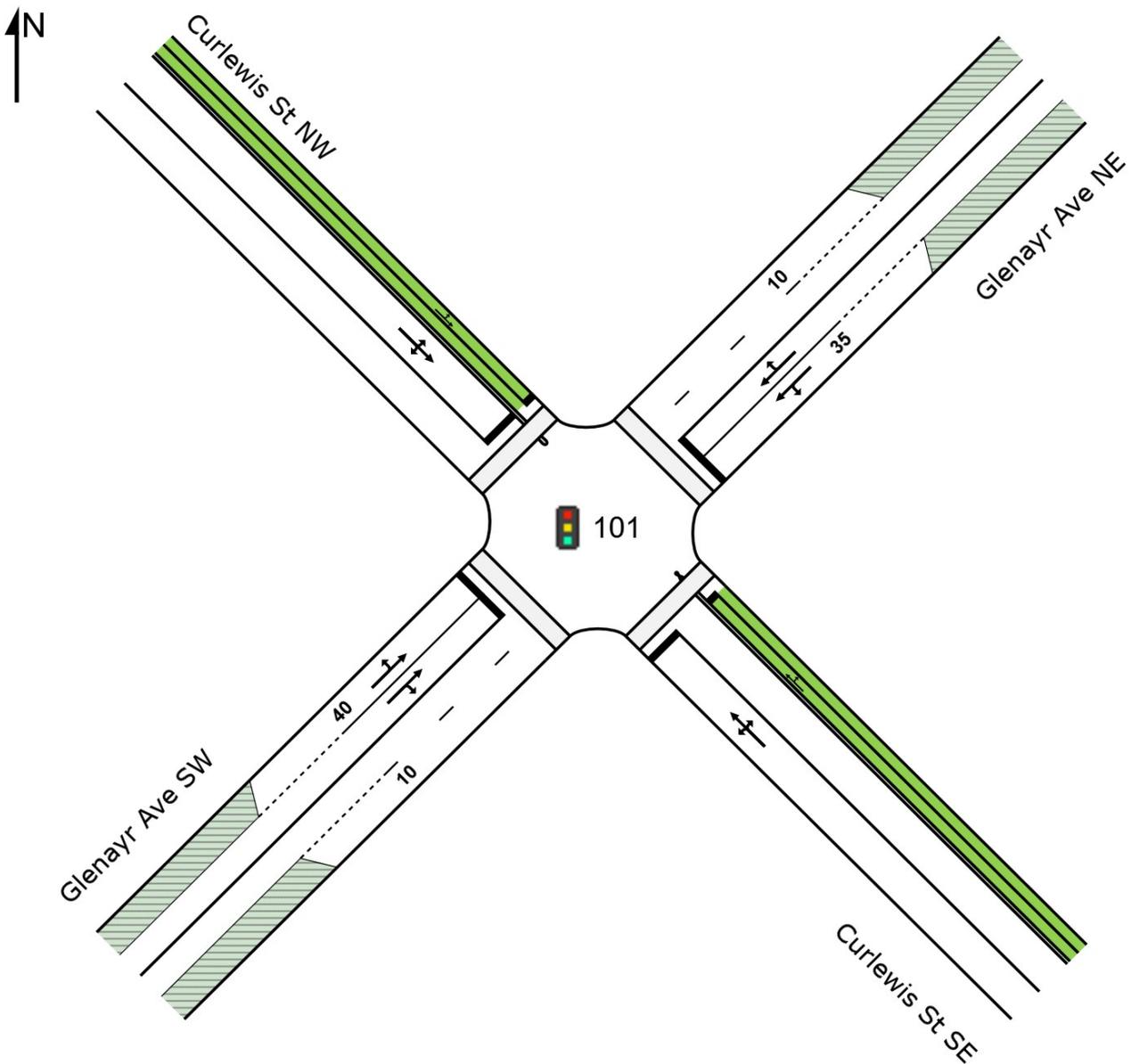
Phase Sequence: Two-Phase

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 Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Curlewis St SE												
4	L2	42	2.5	0.430	19.1	LOS B	4.8	34.6	0.85	0.73	0.85	31.0
5	T1	157	5.4	0.430	16.0	LOS B	4.8	34.6	0.85	0.72	0.85	28.3
6	R2	44	0.0	0.430	19.3	LOS B	4.8	34.6	0.85	0.73	0.85	28.7
Approach		243	3.9	0.430	17.2	LOS B	4.8	34.6	0.85	0.72	0.85	28.7
NorthEast: Glenayr Ave NE												
7	L2	41	2.6	0.107	17.3	LOS B	1.2	7.7	0.75	0.65	0.75	31.3
8	T1	348	3.6	0.534	14.1	LOS A	6.8	49.1	0.84	0.72	0.84	30.1
9	R2	16	0.0	0.534	17.5	LOS B	6.8	49.1	0.84	0.72	0.84	31.3
Approach		405	3.4	0.534	14.6	LOS B	6.8	49.1	0.83	0.71	0.83	30.3
NorthWest: Curlewis St NW												
10	L2	29	0.0	0.532	18.5	LOS B	6.2	43.1	0.86	0.74	0.86	30.2
11	T1	199	0.0	0.532	15.2	LOS B	6.2	43.1	0.86	0.74	0.86	31.7
12	R2	81	0.0	0.532	18.3	LOS B	6.2	43.1	0.86	0.75	0.86	30.1
Approach		309	0.0	0.532	16.3	LOS B	6.2	43.1	0.86	0.74	0.86	31.2
SouthWest: Glenayr Ave SW												
1	L2	47	0.0	0.120	17.3	LOS B	1.3	8.6	0.76	0.66	0.76	29.6
2	T1	296	4.6	0.598	15.9	LOS B	6.9	50.1	0.88	0.76	0.88	29.0
3	R2	53	0.0	0.598	19.5	LOS B	6.9	50.1	0.89	0.77	0.89	31.1
Approach		396	3.5	0.598	16.5	LOS B	6.9	50.1	0.87	0.75	0.87	29.4
All Vehicles		1354	2.7	0.598	16.0	LOS B	6.9	50.1	0.85	0.73	0.85	29.9

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P2	SouthEast Full Crossing	95	19.4	LOS B	0.1	0.1	0.88	0.88	
P3	NorthEast Full Crossing	106	19.4	LOS B	0.1	0.1	0.88	0.88	
P4	NorthWest Full Crossing	107	19.4	LOS B	0.1	0.1	0.88	0.88	
P1	SouthWest Full Crossing	112	19.5	LOS B	0.1	0.1	0.88	0.88	
All Pedestrians		420	19.4	LOS B			0.88	0.88	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

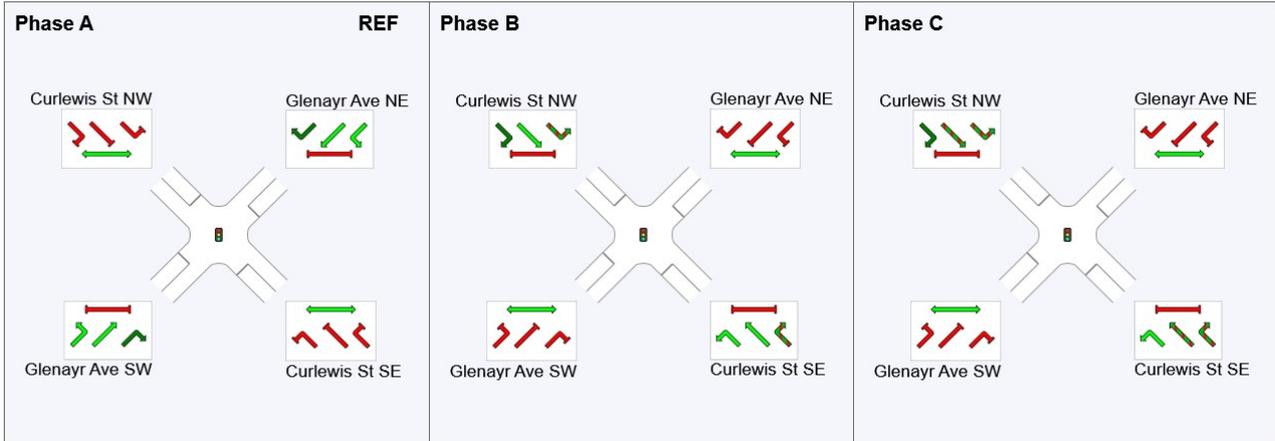
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	24	36
Green Time (sec)	18	6	8
Phase Time (sec)	24	12	14
Phase Split	48%	24%	28%

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%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

