

**To:** Northrop Consulting Engineers  
L11, 345 George Street  
Sydney NSW 2000

**From:** Stantec Australia Pty Ltd  
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**Project/File:** 301400272

**Date:** January 25, 2023

**Version** A

**Reference: Curlewis Street/ Wellington Street Intersection – SIDRA Modelling**

## Background

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

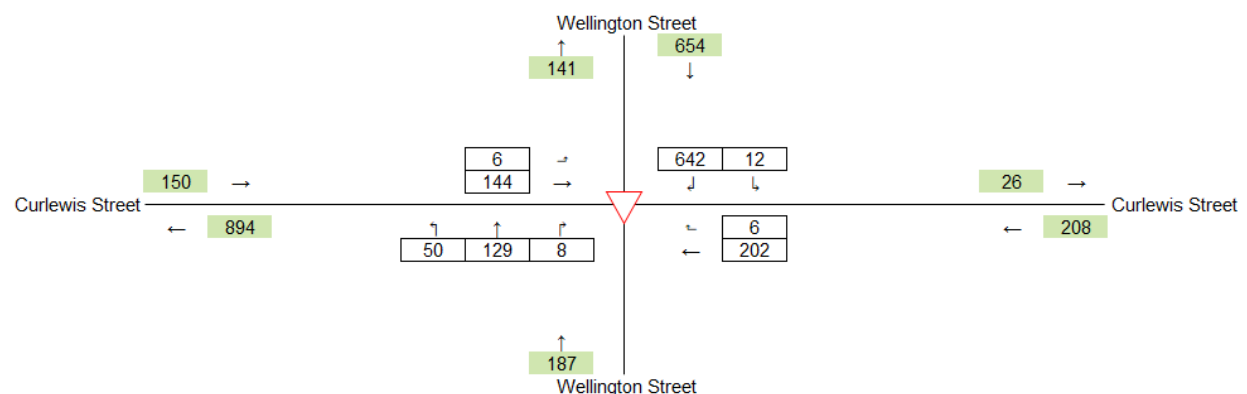
The project proposes a new cycle facility along Curlewis Street to enhance connectivity through the area. The project includes a new shared pedestrian and cyclist crossing at the Curlewis Street/ Wellington Street roundabout, with the crossing to be located on the north-eastern leg of Wellington Street. This technical note assesses the operational impact of the shared crossing.

## Traffic Volumes

Traffic movement counts at the study intersection were completed on Thursday 27 October 2022, between 7:30am and 9:30am and between 3:00pm and 6:00pm.

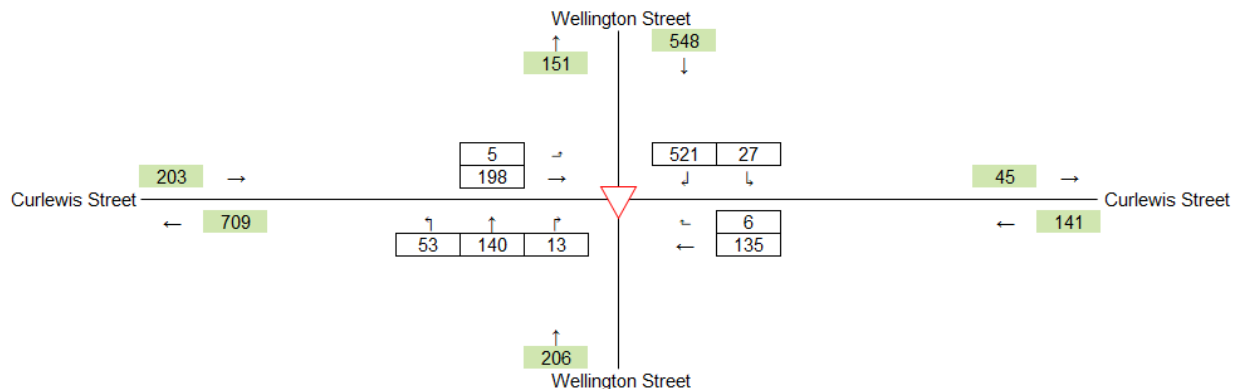
The AM and PM peak hours were found to occur from 7:30am to 8:30am and 3:15pm to 4:15pm respectively. Peak hour traffic volumes are summarised in Figure 1 and Figure 2, with full survey results contained in Attachment 1.

**Figure 1: Existing AM peak hour traffic volumes**



Reference: Curlewis Street/ Wellington Street Intersection – SIDRA Modelling

Figure 2: Existing PM peak hour traffic volumes



## Existing Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION (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 operation of the intersection, with full results presented in Attachment 2.

**Reference: Curlewis Street/ Wellington Street Intersection – SIDRA Modelling**

**Table 2: Existing intersection operating conditions**

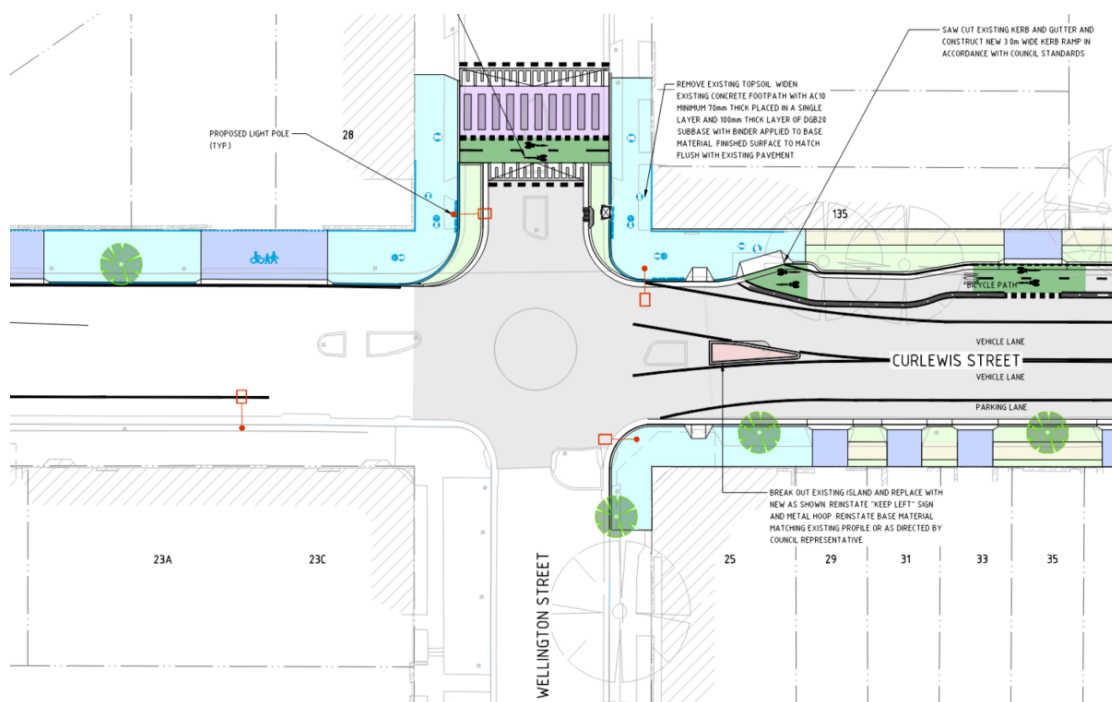
Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
AM	Curlewis St (SE)	0.48	15	27	B
	Wellington St (NE)	0.68	9	54	A
	Curlewis St (NW)	0.18	5	9	A
	Wellington St (SW)	0.48	17	25	B
	Overall	0.68	11	54	B
PM	Curlewis St (SE)	0.28	10	13	B
	Wellington St (NE)	0.64	11	50	B
	Curlewis St (NW)	0.24	6	12	A
	Wellington St (SW)	0.42	12	20	B
	Overall	0.64	10	50	A

Based on the above assessment, the Curlewis Street/ Wellington Street roundabout currently operates satisfactory at LOS B during the AM peak and LOS A during the PM peak, with minimal queues and delays on all approaches.

## Proposed Intersection Layout

The project seeks to add a new shared pedestrian and cyclist crossing on the north-east leg of Wellington Street, as shown in Figure 3. For the purposes of this assessment, the proposed crossing has been added as a network site to determine any impact on the roundabout operation.

**Figure 3: Proposed intersection layout**



Source: Northrop, drawing 202585 DAC7101, Revision WIP

Reference: Curlewis Street/ Wellington Street Intersection – SIDRA Modelling

## Traffic Impact

To determine the traffic impact of the proposed intersection layout changes, the existing traffic volumes were modelled. To reflect the proposed shared crossing on the north-east leg of Wellington Street, a network model was created to include a mid-block pedestrian crossing. Figure 4 shows the SIDRA network layout, noting that the distance (and configuration) between the roundabout and crossing point as shown does not represent the six-metre separation.

Figure 4: SIDRA network layout

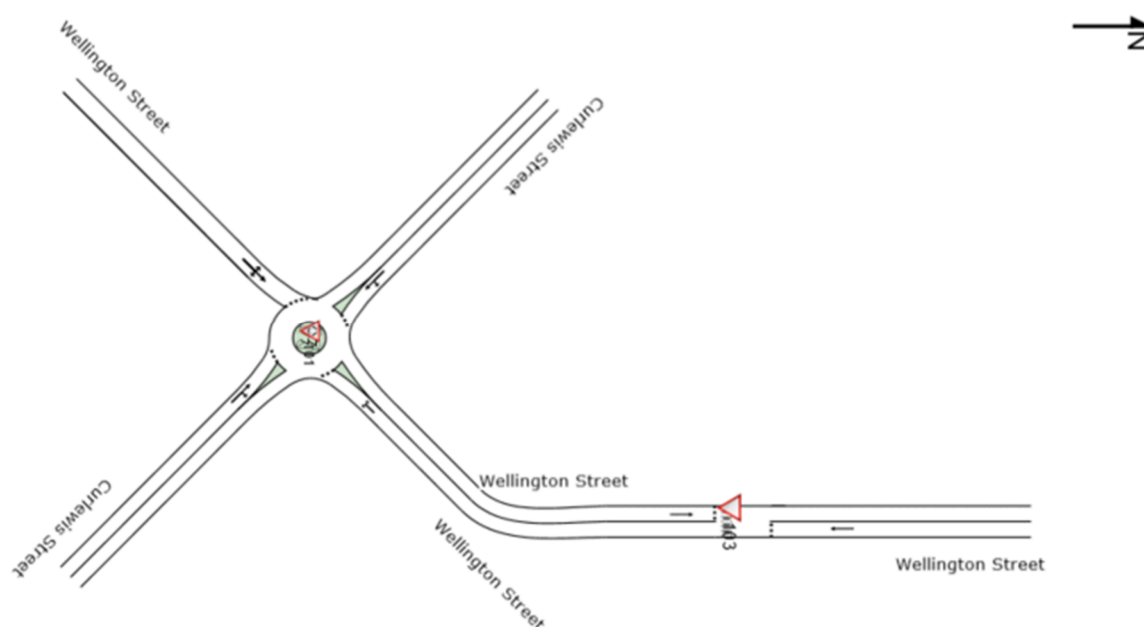


Table 3 and Table 4 present a summary of the future operation of the roundabout crossing point respectively, with full results presented in Attachment 2.

Table 3: Future operating conditions – roundabout

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
AM	Curlewis St (SE)	0.48	15	27	B
	Wellington St (NE)	0.68	6	15	A
	Curlewis St (NW)	0.18	5	9	A
	Wellington St (SW)	0.48	17	25	B
	<b>Overall</b>	<b>0.68</b>	<b>9</b>	<b>27</b>	<b>A</b>
PM	Curlewis St (SE)	0.28	10	13	B
	Wellington St (NE)	0.64	8	15	A
	Curlewis St (NW)	0.24	6	12	A
	Wellington St (SW)	0.42	12	20	B
	<b>Overall</b>	<b>0.64</b>	<b>8</b>	<b>20</b>	<b>A</b>

Reference: Curlewis Street/ Wellington Street Intersection – SIDRA Modelling

**Table 4: Future operating conditions – crossing**

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
AM	Wellington St (NE)	0.70	5	40	A
	Wellington St (SW)	0.08	1	0	A
	<b>Overall</b>	<b>0.70</b>	<b>4</b>	<b>40</b>	<b>-</b>
PM	Wellington St (NE)	0.59	5	35	A
	Wellington St (SW)	0.08	1	0	A
	<b>Overall</b>	<b>0.59</b>	<b>4</b>	<b>35</b>	<b>-</b>

When looking at the roundabout operation itself, Table 3 indicates the overall performance of the intersection improves. However, review of the detailed information indicates the Curlewis Street approaches and Wellington Street (SW) approach all operate as per existing conditions, with reductions in average delay and queue lengths observed on the Wellington Street (NE) approach only.

These reductions do not reflect an improved intersection performance, as consideration needs to be given to the delays and queue lengths occurring at the crossing point. The pedestrian crossing effectively creates a second point where vehicle delay on the north-east approach can occur and the delay is split between the roundabout and the crossing point.

To determine any reduction in performance the average delay and 95<sup>th</sup> percentile queue lengths at the roundabout and crossing point have been summed for the north-east approach. In the AM peak and PM peaks the total average delay on the north-east approach is 11 and 13 seconds, which is an increase of two seconds in both peak periods compared to existing conditions. The 95<sup>th</sup> percentile queue lengths are 55 metres and 50 metres in the AM and PM peak periods respectively, which is a one metre increase in the AM peak period only.

These minor increases in average delay and queue lengths are acceptable, with no significant impact to the overall roundabout operation.

There is a risk that the proposed crossing location may cause vehicles to queue back towards the roundabout and impede roundabout flows. As demonstrated in Table 4, the south-west approach to the proposed crossing has minimal delay and 95<sup>th</sup> percentile queue lengths of zero metres. Therefore, the proposed crossing is not anticipated to queue back and impact the roundabout operation. The plans prepared by Northrop indicate a six-metre area where vehicles exiting the roundabout could wait for pedestrians and cyclists using the crossing, without impeding the roundabout.

Notwithstanding the above, it is important to note that the aim of the project is to improve pedestrian and cyclist connectivity, safety and amenity in the area. Consideration to removing the proposed shared crossing to prioritise traffic would in-turn represent a poor outcome.

**Reference: Curlewis Street/ Wellington Street Intersection – SIDRA Modelling**

## Summary

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

- The intersection of Curlewis Street/ Wellington Street currently operates satisfactorily at an overall LOS B during the AM peak and LOS A during the PM peak.
- The introduction of a shared pedestrian and cyclist crossing on the north-eastern approach has been modelled as a SIDRA network layout. The crossing effectively introduces a second delay point on the north-east approach, resulting in the average delay and queue lengths being spread across two points.
- The future modelling indicates that the overall roundabout performance improves, however this is due to the average delay and queue length on the north-eastern approach being split between the roundabout and crossing point. The Curlewis Street approaches and Wellington Street south-west approach performance remain as per existing.
- Combining the roundabout and crossing point average delays and 95<sup>th</sup> percentile queue lengths for the north-east approach the total average delay on this approach is increased by two seconds in both peak periods, and the queue length is increased by one metre in the AM peak period only.
- These minor increases in average delay and queue lengths are considered acceptable, with no significant impact to overall roundabout operation.
- Analysis of the south-west approach to the proposed crossing indicates average delays of 1 second and 95<sup>th</sup> percentile queue lengths of zero metres. This indicates that vehicles exiting the roundabout will not be delayed at the proposed crossing, with vehicles not anticipated to queue back and impact the roundabout operation.
- Notwithstanding the above, it is important to note that the project's aim is to improve connectivity, safety and amenity for pedestrians and cyclists in the area. Removal of the proposed shared crossing would prioritise traffic over pedestrians and cyclists.

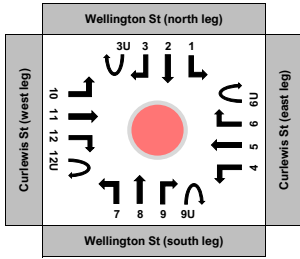
Attachment:

Attachment 1: Survey Results  
Attachment 2: SIDRA Outputs

**Reference:** Curlewis Street/ Wellington Street Intersection – SIDRA Modelling

## **Attachment 1: Survey Results**

Report Type:	Classified Intersection Data - 60min
Geocounts Job ID:	1652913908893
Client Job Number:	n/a
Client Name:	Stantec
Location:	Bondi
Survey Site:	IC02 (Curlewis St/Wellington St)
Survey Date:	Thursday, 27th October 2022
Site Coordinates:	-33.8856679, 151.2693062



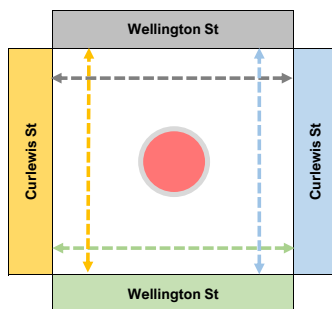
AM Peak Hour:	7:30 to 8:30
PM Peak Hour:	15:15 to 16:15
AM Peak Hour Volume:	1,206
PM Peak Hour Volume:	1,108

Approach	Wellington St (north leg)																Curlewis St (east leg)															
Movement	Movement 1 (Left Turn)				Movement 2 (Through)				Movement 3 (Right Turn)				Movement 3U (U Turn)				Movement 4 (Left Turn)				Movement 5 (Through)				Movement 6 (Right Turn)				Movement 6U (U Turn)			
Time Interval	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total				
7:30 to 8:30	9	1	2	12	0	0	0	0	627	4	11	642	1	0	0	1	0	0	0	0	195	3	4	202	6	0	0	6	0	0	0	0
7:45 to 8:45	8	2	2	12	0	0	0	0	605	4	11	620	1	0	0	1	0	0	0	0	195	3	5	203	5	0	0	5	0	0	0	0
8:00 to 9:00	12	2	2	16	0	0	0	0	602	3	11	616	1	0	0	1	0	0	0	0	178	3	2	183	10	0	0	10	0	0	0	0
8:15 to 9:15	18	2	1	21	0	0	0	0	563	6	10	579	1	0	0	1	0	0	0	0	162	5	2	169	9	0	0	9	1	0	0	1
8:30 to 9:30	20	2	1	23	0	0	0	0	527	10	6	543	0	0	0	0	0	0	0	0	156	4	4	164	11	0	0	11	3	0	0	3
15:00 to 16:00	22	0	1	23	0	0	0	0	494	9	1	504	2	0	0	2	0	0	0	0	136	3	1	140	7	0	0	7	2	0	0	2
15:15 to 16:15	26	0	1	27	0	0	0	0	513	7	1	521	2	0	0	2	0	0	0	0	132	2	1	135	6	0	0	6	3	0	0	3
15:30 to 16:30	24	0	1	25	0	0	0	0	484	9	1	494	3	0	0	3	0	0	0	0	147	2	1	150	7	0	0	7	4	0	0	4
15:45 to 16:45	21	0	2	23	0	0	0	0	448	9	2	459	2	0	0	2	0	0	0	0	133	2	3	138	5	0	0	5	7	0	0	7
16:00 to 17:00	21	0	1	22	0	0	0	0	443	9	3	455	1	0	0	1	0	0	0	0	132	1	2	135	9	0	0	9	11	0	0	11
16:15 to 17:15	19	0	1	20	0	0	0	0	378	8	3	389	1	0	0	1	0	0	0	0	133	2	2	137	9	0	0	9	12	0	0	12
16:30 to 17:30	17	0	1	18	0	0	0	0	377	5	3	385	0	0	0	0	0	0	0	0	124	3	2	129	7	0	0	7	16	0	0	16
16:45 to 17:45	15	0	0	15	0	0	0	0	372	4	3	379	0	0	0	0	0	0	0	0	145	6	0	151	7	0	0	7	13	0	0	13
17:00 to 18:00	12	0	0	12	0	0	0	0	362	4	1	367	2	0	0	2	0	0	0	0	149	7	1	157	4	0	0	4	11	0	0	11

Approach	Wellington St (south leg)												Curlewis St (west leg)																							
Movement	Movement 7 (Left Turn)				Movement 8 (Through)				Movement 9 (Right Turn)				Movement 9U (U Turn)				Movement 10 (Left Turn)				Movement 11 (Through)				Movement 12 (Right Turn)				Movement 12U (U Turn)				ALL MOVEMENTS			
Time Interval	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total				
7:30 to 8:30	49	1	0	50	126	3	0	129	8	0	0	8	0	0	0	0	6	0	0	6	125	11	8	144	0	0	0	0	5	1	0	6	1,157	24	25	1,206
7:45 to 8:45	44	1	0	45	133	2	0	135	9	0	0	9	0	0	0	0	4	1	0	5	135	8	5	148	0	0	0	0	4	1	0	5	1,143	22	23	1,188
8:00 to 9:00	47	2	0	49	138	3	1	142	12	0	0	12	0	0	0	0	4	1	0	5	150	6	3	159	0	0	0	0	7	1	0	8	1,161	21	19	1,201
8:15 to 9:15	48	4	1	53	121	2	1	124	13	1	0	14	0	0	0	0	4	1	0	5	155	6	3	164	0	0	0	0	11	1	0	12	1,106	28	18	1,152
8:30 to 9:30	57	3	1	61	103	1	2	106	10	1	0	11	0	0	0	0	3	1	0	4	159	6	2	167	0	0	0	0	9	0	0	9	1,058	28	16	1,102
15:00 to 16:00	51	3	3	57	127	4	0	131	12	0	0	12	0	0	0	0	5	0	0	5	185	4	2	191	0	0	0	0	6	0	0	6	1,049	23	8	1,080
15:15 to 16:15	50	1	2	53	136	3	1	140	13	0	0	13	0	0	0	0	5	0	0	5	195	1	2	198	0	0	0	0	5	0	0	5	1,086	14	8	1,108
15:30 to 16:30	46	1	2	49	142	0	2	144	13	0	0	13	0	0	0	0	4	0	0	4	205	1	3	209	0	0	0	0	6	0	0	6	1,085	13	10	1,108
15:45 to 16:45	54	3	2	59	139	0	3	142	18	0	0	18	0	0	0	0	3	0	0	3	180	0	4	184	0	0	1	1	7	0	0	7	1,017	14	17	1,048
16:00 to 17:00	55	2	0	57	144	1	3	148	23	0	0	23	0	0	0	0	6	0	0	6	174	1	3	178	0	0	1	1	10	0	0	10	1,029	14	13	1,055
16:15 to 17:15	57	2	0	59	141	2	3	146	23	0	1	24	0	0	0	0	5	0	0	5	186	1	4	191	0	0	1	1	11	0	0	11	975	15	15	1,005
16:30 to 17:30	65	3	0	68	133	2	2	137	28	0	1	29	0	0	0	0	4	0	0	4	175	1	5	181	0	0	1	1	11	0	0	11	957	14	15	986
16:45 to 17:45	62	1	0	63	145	2	2	149	25	0	1	26	0	0	0	0	6	0	0	6	184	1	4	189	0	0	0	0	9	0	0	9	983	14	10	1,007
17:00 to 18:00	59	2	0	61	133	1	2	136	27	0	1	28	0	0	0	0	3	0	0	3	193	0	5	198	0	0	0	0	6	0	0	6	961	14	10	985



<b>Report Type:</b>	Pedestrian Data
<b>Geocounts Job ID:</b>	1652913908893
<b>Client Job Number:</b>	n/a
<b>Client Name:</b>	Stantec
<b>Location:</b>	Bondi
<b>Survey Site:</b>	IC02 (Curlewis St/Wellington St)
<b>Survey Date:</b>	Thursday, 27th October 2022
<b>Site Coordinates:</b>	-33.8856679, 151.2693062



	North	East	South	West	Total
<b>Peds Crossing AM:</b>	40	58	125	9	<b>232</b>
<b>Cyclists Crossing AM:</b>	0	1	0	0	<b>1</b>
<b>Peds Crossing PM:</b>	41	65	112	11	<b>229</b>
<b>Cyclists Crossing PM:</b>	0	0	0	0	<b>0</b>
<b>Peak Hour Peds AM:</b>	<b>8:30 to 9:30</b>				
<b>Peak Hour Cyclists AM:</b>	<b>7:30 to 8:30</b>				
<b>Peak Hour Peds PM:</b>	<b>15:15 to 16:15</b>				
<b>Peak Hour Cyclists PM:</b>	<b>15:00 to 16:00</b>				

15min Peds

Leg	North	East	South	West	Total
7:30 to 7:45	5	9	17	0	<b>31</b>
7:45 to 8:00	6	6	10	0	<b>22</b>
8:00 to 8:15	5	9	13	0	<b>27</b>
8:15 to 8:30	2	7	18	1	<b>28</b>
8:30 to 8:45	8	11	21	1	<b>41</b>
8:45 to 9:00	6	5	8	4	<b>23</b>
9:00 to 9:15	3	1	20	1	<b>25</b>
9:15 to 9:30	5	10	18	2	<b>35</b>
15:00 to 15:15	0	5	5	1	<b>11</b>
15:15 to 15:30	1	7	10	0	<b>18</b>
15:30 to 15:45	4	9	9	4	<b>26</b>
15:45 to 16:00	7	6	9	0	<b>22</b>
16:00 to 16:15	5	1	7	2	<b>15</b>
16:15 to 16:30	1	2	6	1	<b>10</b>
16:30 to 16:45	6	8	8	0	<b>22</b>
16:45 to 17:00	4	4	9	0	<b>17</b>
17:00 to 17:15	4	5	8	1	<b>18</b>
17:15 to 17:30	3	5	13	0	<b>21</b>
17:30 to 17:45	3	8	14	0	<b>25</b>
17:45 to 18:00	3	5	14	2	<b>24</b>

60min Peds

Leg	North	East	South	West	Total
7:30 to 8:30	18	31	58	1	<b>108</b>
7:45 to 8:45	21	33	62	2	<b>118</b>
8:00 to 9:00	21	32	60	6	<b>119</b>
8:15 to 9:15	19	24	67	7	<b>117</b>
8:30 to 9:30	22	27	67	8	<b>124</b>
15:00 to 16:00	12	27	33	5	<b>77</b>
15:15 to 16:15	17	23	35	6	<b>81</b>
15:30 to 16:30	17	18	31	7	<b>73</b>
15:45 to 16:45	19	17	30	3	<b>69</b>
16:00 to 17:00	16	15	30	3	<b>64</b>
16:15 to 17:15	15	19	31	2	<b>67</b>
16:30 to 17:30	17	22	38	1	<b>78</b>
16:45 to 17:45	14	22	44	1	<b>81</b>
17:00 to 18:00	13	23	49	3	<b>88</b>

15min Cyclists

Leg	North	East	South	West	Total
7:30 to 7:45	0	0	0	0	<b>0</b>
7:45 to 8:00	0	1	0	0	<b>1</b>
8:00 to 8:15	0	0	0	0	<b>0</b>
8:15 to 8:30	0	0	0	0	<b>0</b>
8:30 to 8:45	0	0	0	0	<b>0</b>
8:45 to 9:00	0	0	0	0	<b>0</b>
9:00 to 9:15	0	0	0	0	<b>0</b>
9:15 to 9:30	0	0	0	0	<b>0</b>
15:00 to 15:15	0	0	0	0	<b>0</b>
15:15 to 15:30	0	0	0	0	<b>0</b>
15:30 to 15:45	0	0	0	0	<b>0</b>
15:45 to 16:00	0	0	0	0	<b>0</b>
16:00 to 16:15	0	0	0	0	<b>0</b>
16:15 to 16:30	0	0	0	0	<b>0</b>
16:30 to 16:45	0	0	0	0	<b>0</b>
16:45 to 17:00	0	0	0	0	<b>0</b>
17:00 to 17:15	0	0	0	0	<b>0</b>
17:15 to 17:30	0	0	0	0	<b>0</b>
17:30 to 17:45	0	0	0	0	<b>0</b>
17:45 to 18:00	0	0	0	0	<b>0</b>

60min Cyclists

Leg	North	East	South	West	Total
7:30 to 8:30	0	1	0	0	<b>1</b>
7:45 to 8:45	0	1	0	0	<b>1</b>
8:00 to 9:00	0	0	0	0	<b>0</b>
8:15 to 9:15	0	0	0	0	<b>0</b>
8:30 to 9:30	0	0	0	0	<b>0</b>
15:00 to 16:00	0	0	0	0	<b>0</b>
15:15 to 16:15	0	0	0	0	<b>0</b>
15:30 to 16:30	0	0	0	0	<b>0</b>
15:45 to 16:45	0	0	0	0	<b>0</b>
16:00 to 17:00	0	0	0	0	<b>0</b>
16:15 to 17:15	0	0	0	0	<b>0</b>
16:30 to 17:30	0	0	0	0	<b>0</b>
16:45 to 17:45	0	0	0	0	<b>0</b>
17:00 to 18:00	0	0	0	0	<b>0</b>

**Reference:** Curlewis Street/ Wellington Street Intersection – SIDRA Modelling

## **Attachment 2: SIDRA Outputs**

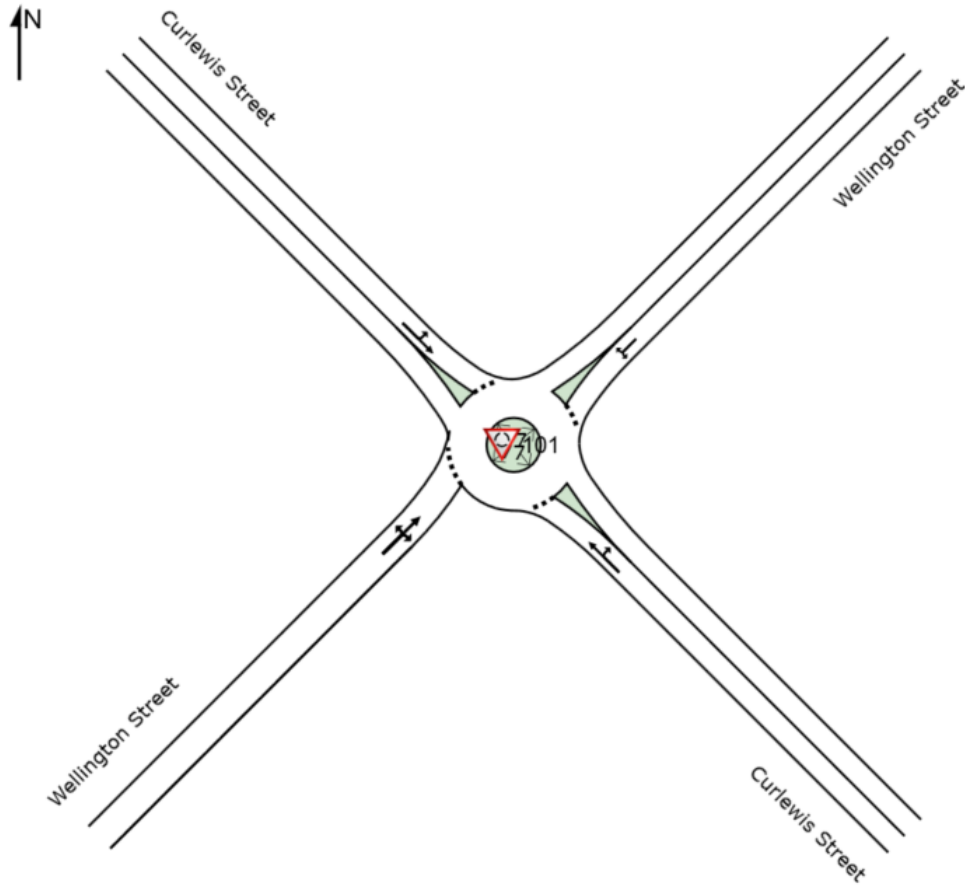
# SITE LAYOUT

**Site: 101 [Curlewis Street/ Wellington Street PM (Site Folder: Existing)]**

---

New Site  
Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

**Site: 101 [Curlewis Street/ Wellington Street AM (Site Folder: Existing)]**

New Site  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
SouthEast: Curlewis Street														
5	T1	202	3	213	1.5	0.476	14.6	LOS B	3.8	26.7	0.93	1.03	1.09	41.2
6	R2	6	0	6	0.0	0.476	17.2	LOS B	3.8	26.7	0.93	1.03	1.09	41.2
Approach		208	3	219	1.4	0.476	14.6	LOS B	3.8	26.7	0.93	1.03	1.09	41.2
NorthEast: Wellington Street														
7	L2	12	1	13	8.3	0.679	6.8	LOS A	7.8	54.4	0.78	0.67	0.78	42.4
9	R2	642	4	676	0.6	0.679	9.2	LOS A	7.8	54.4	0.78	0.67	0.78	43.8
Approach		654	5	688	0.8	0.679	9.2	LOS A	7.8	54.4	0.78	0.67	0.78	43.7
NorthWest: Curlewis Street														
10	L2	6	0	6	0.0	0.182	5.7	LOS A	1.3	9.0	0.49	0.53	0.49	45.1
11	T1	144	11	152	7.6	0.182	5.4	LOS A	1.3	9.0	0.49	0.53	0.49	45.1
Approach		150	11	158	7.3	0.182	5.4	LOS A	1.3	9.0	0.49	0.53	0.49	45.1
SouthWest: Wellington Street														
1	L2	50	1	53	2.0	0.476	16.8	LOS B	3.5	25.2	0.92	1.04	1.12	40.1
2	T1	129	3	136	2.3	0.476	16.4	LOS B	3.5	25.2	0.92	1.04	1.12	40.6
3	R2	8	0	8	0.0	0.476	18.9	LOS B	3.5	25.2	0.92	1.04	1.12	40.4
Approach		187	4	197	2.1	0.476	16.6	LOS B	3.5	25.2	0.92	1.04	1.12	40.4
All Vehicles		1199	23	1262	1.9	0.679	10.8	LOS B	7.8	54.4	0.79	0.78	0.85	42.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay per movement.  
 Intersection and Approach LOS values are based on average delay for all vehicle movements.  
 Roundabout Capacity Model: SIDRA Standard.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Queue Model: SIDRA Standard.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

**Site: 101 [Curlewis Street/ Wellington Street PM (Site Folder: Existing)]**

New Site  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
SouthEast: Curlewis Street														
5	T1	135	2	142	1.5	0.275	9.9	LOS A	1.8	13.0	0.81	0.83	0.81	43.7
6	R2	6	0	6	0.0	0.275	12.6	LOS B	1.8	13.0	0.81	0.83	0.81	43.5
Approach		141	2	148	1.4	0.275	10.0	LOS B	1.8	13.0	0.81	0.83	0.81	43.7
NorthEast: Wellington Street														
7	L2	27	0	28	0.0	0.641	8.3	LOS A	7.1	50.2	0.81	0.76	0.86	42.8
9	R2	521	7	548	1.3	0.641	10.8	LOS B	7.1	50.2	0.81	0.76	0.86	43.2
Approach		548	7	577	1.3	0.641	10.7	LOS B	7.1	50.2	0.81	0.76	0.86	43.2
NorthWest: Curlewis Street														
10	L2	5	0	5	0.0	0.239	5.9	LOS A	1.7	12.0	0.52	0.55	0.52	45.3
11	T1	198	1	208	0.5	0.239	5.6	LOS A	1.7	12.0	0.52	0.55	0.52	45.8
Approach		203	1	214	0.5	0.239	5.6	LOS A	1.7	12.0	0.52	0.55	0.52	45.8
SouthWest: Wellington Street														
1	L2	53	1	56	1.9	0.417	11.8	LOS B	2.9	20.1	0.85	0.96	0.92	42.1
2	T1	140	3	147	2.1	0.417	11.4	LOS B	2.9	20.1	0.85	0.96	0.92	42.8
3	R2	13	0	14	0.0	0.417	14.0	LOS B	2.9	20.1	0.85	0.96	0.92	42.6
Approach		206	4	217	1.9	0.417	11.6	LOS B	2.9	20.1	0.85	0.96	0.92	42.6
All Vehicles		1098	14	1156	1.3	0.641	9.9	LOS A	7.1	50.2	0.76	0.77	0.80	43.6

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

Roundabout LOS Method: SIDRA Roundabout LOS.

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

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

Roundabout Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA Standard.

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

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

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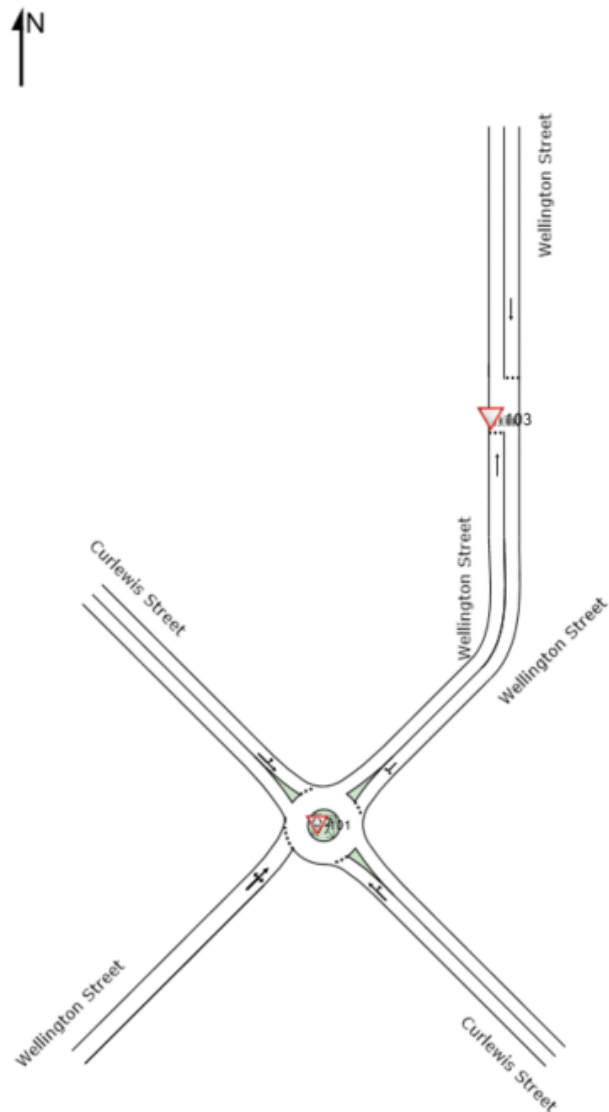
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# NETWORK LAYOUT

Network: N101 [PM - Proposed (Network Folder: Proposed)]

New Network  
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	CCG ID	Site Name
101	NA	Curlewis Street/ Wellington Street PM
103	NA	Wellington Street - PM

# MOVEMENT SUMMARY

Site: 101 [Curlewis Street/ Wellington Street AM (Site Folder: Proposed)]

Network: N101 [AM - Proposed (Network Folder: Proposed)]

New Site  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Curlewis Street														
5	T1	213	1.5	213	1.5	0.476	14.6	LOS B	3.8	26.7	0.93	1.03	1.09	41.2
6	R2	6	0.0	6	0.0	0.476	17.2	LOS B	3.8	26.7	0.93	1.03	1.09	35.7
Approach		219	1.4	219	1.4	0.476	14.6	LOS B	3.8	26.7	0.93	1.03	1.09	41.1
NorthEast: Wellington Street														
7	L2	13	8.3	13	8.3	0.679	4.3	LOS A	2.1	14.9	0.78	0.67	0.78	39.6
9	R2	676	0.6	676	0.6	0.679	6.3	LOS A	2.1	14.9	0.78	0.67	0.78	42.0
Approach		688	0.8	688	0.8	0.679	6.2	LOS A	2.1	14.9	0.78	0.67	0.78	41.9
NorthWest: Curlewis Street														
10	L2	6	0.0	6	0.0	0.182	5.7	LOS A	1.3	9.0	0.49	0.53	0.49	42.4
11	T1	152	7.6	152	7.6	0.182	5.4	LOS A	1.3	9.0	0.49	0.53	0.49	45.1
Approach		158	7.3	158	7.3	0.182	5.4	LOS A	1.3	9.0	0.49	0.53	0.49	45.1
SouthWest: Wellington Street														
1	L2	53	2.0	53	2.0	0.476	16.8	LOS B	3.5	25.2	0.92	1.04	1.12	40.1
2	T1	136	2.3	136	2.3	0.476	16.4	LOS B	3.5	25.2	0.92	1.04	1.12	34.5
3	R2	8	0.0	8	0.0	0.476	18.9	LOS B	3.5	25.2	0.92	1.04	1.12	40.4
Approach		197	2.1	197	2.1	0.476	16.6	LOS B	3.5	25.2	0.92	1.04	1.12	37.0
All Vehicles		1262	1.9	1262	1.9	0.679	9.2	LOS A	3.8	26.7	0.79	0.77	0.85	41.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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.  
Roundabout Capacity Model: SIDRA Standard.  
Delay Model: SIDRA Standard (Geometric Delay is included).  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 103 [Wellington Street - AM (Site Folder: Proposed)]

Network: N101 [AM - Proposed (Network Folder: Proposed)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Wellington Street														
2	T1	148	2.1	148	2.1	0.077	1.1	LOS A	0.0	0.0	0.00	0.41	0.00	55.3
Approach		148	2.1	148	2.1	0.077	1.1	LOS A	0.0	0.0	0.00	0.41	0.00	55.3
North: Wellington Street														
8	T1	688	0.8	688	0.8	0.699	5.0	LOS A	5.7	39.5	0.00	0.53	0.00	52.5
Approach		688	0.8	688	0.8	0.699	5.0	LOS A	5.7	39.5	0.00	0.53	0.00	52.5
All Vehicles		837	1.0	837	1.0	0.699	4.3	NA	5.7	39.5	0.00	0.51	0.00	53.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).  
Vehicle movement LOS values are based on average delay per movement.  
Minor Road Approach LOS values are based on average delay for all vehicle movements.  
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
Delay Model: SIDRA Standard (Geometric Delay is included).  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

Site: 101 [Curlewis Street/ Wellington Street PM (Site Folder: Proposed)]

Network: N101 [PM - Proposed (Network Folder: Proposed)]

New Site  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Curlewis Street														
5	T1	142	1.5	142	1.5	0.275	9.9	LOS A	1.8	13.0	0.81	0.83	0.81	43.7
6	R2	6	0.0	6	0.0	0.275	12.6	LOS A	1.8	13.0	0.81	0.83	0.81	39.3
Approach		148	1.4	148	1.4	0.275	10.0	LOS A	1.8	13.0	0.81	0.83	0.81	43.6
NorthEast: Wellington Street														
7	L2	28	0.0	28	0.0	0.641	5.7	LOS A	2.1	14.9	0.81	0.76	0.86	40.0
9	R2	548	1.3	548	1.3	0.641	7.9	LOS A	2.1	14.9	0.81	0.76	0.86	40.7
Approach		577	1.3	577	1.3	0.641	7.8	LOS A	2.1	14.9	0.81	0.76	0.86	40.7
NorthWest: Curlewis Street														
10	L2	5	0.0	5	0.0	0.239	5.9	LOS A	1.7	12.0	0.52	0.55	0.52	42.8
11	T1	208	0.5	208	0.5	0.239	5.6	LOS A	1.7	12.0	0.52	0.55	0.52	45.8
Approach		214	0.5	214	0.5	0.239	5.6	LOS A	1.7	12.0	0.52	0.55	0.52	45.7
SouthWest: Wellington Street														
1	L2	56	1.9	56	1.9	0.417	11.8	LOS A	2.9	20.1	0.85	0.96	0.92	42.1
2	T1	147	2.1	147	2.1	0.417	11.4	LOS A	2.9	20.1	0.85	0.96	0.92	37.9
3	R2	14	0.0	14	0.0	0.417	14.0	LOS A	2.9	20.1	0.85	0.96	0.92	42.6
Approach		217	1.9	217	1.9	0.417	11.6	LOS A	2.9	20.1	0.85	0.96	0.92	39.8
All Vehicles		1156	1.3	1156	1.3	0.641	8.4	LOS A	2.9	20.1	0.76	0.77	0.80	42.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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.  
Roundabout Capacity Model: SIDRA Standard.  
Delay Model: SIDRA Standard (Geometric Delay is included).  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 103 [Wellington Street - PM (Site Folder: Proposed)]

Network: N101 [PM -  
Proposed (Network Folder:  
Proposed)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Wellington Street														
2	T1	147	2.1	147	2.1	0.076	1.1	LOS A	0.0	0.0	0.00	0.41	0.00	55.1
Approach		147	2.1	147	2.1	0.076	1.1	LOS A	0.0	0.0	0.00	0.41	0.00	55.1
North: Wellington Street														
8	T1	577	1.3	577	1.3	0.594	4.7	LOS A	5.0	35.3	0.00	0.53	0.00	52.8
Approach		577	1.3	577	1.3	0.594	4.7	LOS A	5.0	35.3	0.00	0.53	0.00	52.8
All Vehicles		724	1.5	724	1.5	0.594	4.0	NA	5.0	35.3	0.00	0.50	0.00	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

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

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

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

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

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

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

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