

WAVERLEY TRAFFIC COMMITTEE MEETING

A meeting of the WAVERLEY TRAFFIC COMMITTEE will be held at Waverley Council Chambers, Cnr Paul Street and Bondi Road, Bondi Junction at:

10.00 AM, THURSDAY 23 FEBRUARY 2023

Waverley Council PO Box 9 Bondi Junction NSW 1355 DX 12006 Bondi Junction Tel. 9083 8000

E-mail: info@waverley.nsw.gov.au

AGENDA

Apol	gies	
Decla	rations of Interest	
The r	ion of Previous Minutes by Council - 2 February 2023	legated
not e	PART 1 – MATTERS PROPOSING THAT COUNCIL EXERCISE ITS DELEGATED FUNG The matters listed under this part of the agenda propose that Council either does percise the traffic related functions delegated to it by TfNSW. The recommendations committee under this part of the agenda will be submitted to Council for adoption.	or does
TC/C	STATE ELECTORATE OF COOGEE	
TC/C	01/23.02 Resident Parking Scheme Area 11 - Extension (A02/0750)	16
cou	CIL OFFICER'S PROPOSAL:	
That	ouncil:	
1.	Installs '2P 8 am–10 pm, Permit Holders Excepted Area 11' parking restrictions in I Tamarama, as shown in Figure 1 of the report.	lawong Avenue,
2.	Excludes 20 Illawong Avenue from the Resident Parking Scheme and prohibits resiaddress from applying for permits in Area 11.	dents of this
•	02/23.02 Resident Parking Scheme Area 15 - Extension (A02/0750) CIL OFFICER'S PROPOSAL:	19
	ouncil:	
1.	Installs '2P 8 am–6 pm, All Days, Permit Holders Excepted Area 15' parking restrictio Street, Boonara Avenue, Farrellys Avenue, Imperial Avenue, Jackaman Street, Philip Tamarama Street and Tasman Street, as shown in Figure 1 of the report.	
2.	Retains existing parking restrictions in the rest of Area 15.	

			(()
TC/C.03/23.02	Park Parade, Bondi - S	peed Cushions Review	(A18/0579)23

COUNCIL OFFICER'S PROPOSAL:

That Council retains the rubber speed cushions outside 10 and 32 Park Parade, Bondi Junction, as a permanent traffic calming measure.

TC/V STATE ELECTORATE OF VAUCLUSE

TC/V.01/23.02 Curlewis Street, Bondi Beach - Streetscape Upgrades (A21/0381)......27

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Approves the installation of traffic devices, signs and linemarking in Curlewis Street, between Campbell Parade and Old South Head Road, Bondi Beach, as shown in Attachment 1 of the report (excluding traffic signals at Old South Head Road, Glenayr Avenue, and Campbell Parade).
- 2. Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should further amendments be required.
- 3. Notes that:
 - (a) The traffic signal designs will be submitted to Transport for NSW for approval, with any required design and signage changes being approved by Transport for NSW.
 - (b) Council has already undertaken two rounds of consultation on the concept designs and incorporated changes based on the feedback received.
 - (c) After signage and linemarking approval, the project's review of environmental factors (REF) will be emailed to Councillors for their feedback, five days prior to public exhibition, as per the Councillor Consultation Approval Process. Public exhibition of the REF will be subject to Councillor feedback, in line with the Councillor Consultation Approval Process.
 - (d) The General Manager, under delegation, will consider the REF outcomes and feedback from the public exhibition to determine whether the project will proceed.
 - (e) Council will proceed to tendering for construction services should the General Manager determine that the project proceed.

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Converts the angle parking on the northern side of Clyde Street, North Bondi, back to parallel parking.

2. Does not install passing bays in Clyde Street, east of Hardy Street.

TC/V.03/23.02 13-15 O'Brien Street, Bondi Beach - Loading Zone Modification (A04/0696) ... 182

COUNCIL OFFICER'S PROPOSAL:

That Council modifies the parking restrictions for the loading zone in front of 13–15 O'Brien Street, Bondi Beach, as shown in Figure 2 of the report.

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 9.2 metre 'No Stopping' zone on the southern side of Patterson Street, North Bondi, west of Plowman Street.
- 2. Installs a 10 metre 'No Stopping' zone on the western side of Plowman Street, south of Patterson Street.

TC/V.05/23.02 82 O'Brien Street, Bondi Beach - Construction Zone (A03/2514-04) 188

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 15 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone 5.4 metres west of the driveway to 75 Lamrock Avenue, Bondi Beach, as shown in Figure 2 of the report.
- 2. Notifies residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone, as necessary.

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 12 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 2 Princess Street, Rose Bay.

- 2. Notifies residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone, as necessary.

TC/V.07/23.02 20 Forest Knoll Avenue, Bondi Beach - Construction Zone (A03/2514-04) 196

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 10 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Saturday Council Authorised Vehicles Excepted' construction zone in front of 20 Forest Koll Avenue, Bondi Beach as shown in Figure 2.
- 2. Notifies residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone, as necessary.

TC/CV <u>ELECTORATES OF COOGEE AND VAUCLUSE</u>

Nil.

PART 2 – TRAFFIC ENGINEERING ADVICE

NOTE: The matters listed under this part of the agenda seek the advice of the WTC only and do not propose that Council exercise its delegated functions at this point in time (though they may or may not require it in the future).

TC/TEAC	STATE ELECTORATE OF COOGEE
Nil.	
TC/TEAV	STATE ELECTORATE OF VAUCLUSE
Nil.	
TC/TEACV	ELECTORATES OF COOGEE AND VAUCLUSE
Nil.	

MINUTES OF THE WAVERLEY TRAFFIC COMMITTEE MEETING HELD BY VIDEO CONFERENCE ON THURSDAY, 2 FEBRUARY 2023



Voting Members Present:

Cr T Kay Waverley Council – Deputy Chair

Sgt A Leeson NSW Police – Eastern Suburbs Police Area Command – Traffic Services

Mr P Pearce Representing Marjorie O'Neill, MP, Member for Coogee

Mr J Tukadra Transport for NSW – Network and Safety Officer

Ms J Zin Representing Gabrielle Upton, MP, Member for Vaucluse

Also Present:

Cst P Drinias NSW Police – Eastern Suburbs Police Area Command – Traffic Services

Mr B Gidies Transdev John Holland – Traffic and Events Manager

Ms K Lewis Transport for NSW – Manager, Communication and Stakeholder Engagement

Mr V Lee Transport for NSW – Network and Safety Services Manager

Cr L Fabiano Waverley Council – Deputy Chair

Mr N Zervos Waverley Council – Executive Manager, Infrastructure Services
Mr C Hutcheson Waverley Council – Service Manager, Traffic and Transport

Mr C O'Malley Waverley Council – Acting Manager, Events Mr M Almuhanna Waverley Council – Senior Traffic Engineer

Mr K Magistrado Waverley Council – Traffic Engineer

At the commencement of proceedings at 10.00 am, those present were as listed above.

At 10.08 am, Mr P Pearce left the meeting and did not return.

Apologies

Apologies were received from Cr P Masselos (Chair).

Declarations of Pecuniary and Non-Pecuniary Interests

The Deputy Chair called for declarations of interest and none were received.

Adoption of Previous Minutes by Council - 24 November 2022

The recommendations contained in Part 1 – Matters Proposing that Council Exercise its Delegated Functions – of the minutes of the Waverley Traffic Committee meeting held on 24 November 2022 were adopted by Council at its meeting on 13 December 2022.

ITEMS BY EXCEPTION

The following items on the agenda were dealt with together and the Council Officer's Proposal for each item was unanimously supported by the Committee:

TC/V.03/23.02	356-358 Military Road, Vaucluse – 'P Motor Bikes Only' Parking Zone.
TC/V.04/23.02	236 Campbell Parade, Bondi Beach – Mobility Parking Space.
TC/V.05/23.02	49 Blair Street, North Bondi – 'No Stopping' Zone Modification.
TC/V.07/23.02	91 O'Brien, Bondi Beach – Construction Zone.
TC/V.08/23.02	124 Hastings Parade, North Bondi – Construction Zone.

PART 1 – MATTERS PROPOSING THAT COUNCIL EXERCISE ITS DELEGATED FUNCTIONS

NOTE: The matters listed under this part of the agenda propose that Council either does or does not exercise the traffic related functions delegated to it by TfNSW. The recommendations made by the Committee under this part of the agenda will be submitted to Council for adoption.

TC/C STATE ELECTORATE OF COOGEE

TC/C.01/23.02 66 and 68 Queens Park Road, Queens Park - 'P Motor Bikes Only' Parking Zone (A21/0065)

COUNCIL OFFICER'S PROPOSAL:

That Council installs a 3.7 metre 'P Motor Bikes Only' parking zone in Arnold Street, Queens Park, between the driveways of 66 and 68 Queens Park Road.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: Representative of the Member for Coogee, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/C.02/23.02 Belgrave Street, Dickson Street and Blandford Avenue, Bronte - 'No Stopping' Zone (A14/0145)

COUNCIL OFFICER'S PROPOSAL:

That Council installs 10 metre 'No Stopping' zones at the following intersections:

- 1. The northern and southern sides of Dickson Street, west of Belgrave Street, Bronte
- 2. The southern side of Dickson Street, east of Blandford Avenue, Bronte

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted subject to being amended to read as follows:

That Council installs 10 metre 'No Stopping' zones at the following locations:

- 1. The eastern side of Dickson Street to the north and south of Belgrave Street, Bronte.
- 2. The western side of Dickson Street to the south of Blandford Avenue, Bronte.

Voting members present for this item: Representative of the Member for Coogee, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/C.03/23.02 194-214 Oxford Street and 2 Nelson Street - Construction Zone (A03/2514-04)

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 13 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 2 Nelson Street, Bondi Junction.
- 2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted subject to an amendment to clause 1 such that the recommendation now reads as follows:

That Council:

- 1. Installs an 11.5 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 2 Nelson Street, Bondi Junction, commencing generally from the Osmund Lane intersection.
- 2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

Voting members present for this item: Representative of the Member for Coogee, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/V STATE ELECTORATE OF VAUCLUSE

TC/V.01/23.02 Sydney WorldPride 2023 - Special Event (A19/0394)

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Approves the Traffic Guidance Scheme attached to the report for Sydney WorldPride 2023, subject to the event organisers:
 - (a) Submitting a Traffic Management Plan to Transport for NSW in accordance with the NSW Government's *Guide to Traffic and Transport Management for Special Events*.
 - (b) Obtaining NSW Police Force approval.
- 2. Delegates authority to the Executive Manager, Infrastructure Services, to approve any modification to the Traffic Management Plan in consultation with Transport for NSW and NSW Police.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: Representative of the Member for Vaucluse, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/V.02/23.02 79-103 Wellington Street, Bondi Beach - Temporary Road Closure for Crane Installation (A02/0617-07)

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Approves the temporary closure of Wellington Street, Bondi Beach, between O'Brien Street and Hall Street, from 7 am to 5 pm on Tuesday, 7 March 2023, in accordance with the Traffic Management Plan attached to the report, subject to the applicant:
 - (a) Notifying NSW Police, NSW Ambulance Service and NSW Fire and Rescue.
 - (b) Notifying local residents and businesses prior to the event.
 - (c) Providing Council with a pre- and post-dilapidation report of the condition of road pavements, kerb and adjacent assets along the truck access route.
 - (d) Covering all costs associated with closing the road, including traffic control.
- 2. Approves the occupation of 145 metres of resident parking along the site frontage and opposite from 4.00 pm the day prior.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to amend the planned closure date if needed.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted subject to amendments to clauses 1, 1(b), 2 and 3 and the addition of new clauses 1(e) and (f) such that the recommendation now reads as follows:

That Council:

- 1. Approves the temporary closure of Wellington Street, Bondi Beach, between O'Brien Street and Hall Street, and Rudolf Lane, between Simpson Street and Wellington Street, from 7 am to 5 pm on Tuesday, 7 March 2023, in accordance with the Traffic Management Plan attached to the report, subject to the applicant:
 - (a) Notifying NSW Police, NSW Ambulance Service and NSW Fire and Rescue.
 - (b) Notifying local residents and businesses prior to the event, subject to the notification letter also confirming the Rudolf Lane temporary road closure and that residential property vehicular access will be maintained during the works in Wellington Street and Rudolf Lane.
 - (c) Providing Council with a pre- and post-dilapidation report of the condition of road pavements, kerb and adjacent assets along the truck access route.
 - (d) Covering all costs associated with closing the road, including traffic control.
 - (e) Applying for a road occupancy licence from Transport for NSW.
 - (f) Ensuring that trucks not able to enter Wellington Street wait remote from the site in legal parking spaces and enter the street only when the area is clear for access.
- 2. Approves the removal of 145 metres of resident parking along the Wellington Street site frontage and opposite from 4.00 pm on Monday, 6 March 2023, to 5 pm Tuesday, 7 March 2023, to facilitate truck movements.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to amend the planned closure date and times if needed.

Voting members present for this item: Representative of the Member for Vaucluse, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/V.03/23.02 356-358 Military Road, Vaucluse - 'P Motor Bikes Only' Parking Zone (A21/0065)

COUNCIL OFFICER'S PROPOSAL:

That Council installs a 'P Motor Bikes Only' parking zone between the driveways of 356–358 Military Road, Vaucluse.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: Representative of the Member for Vaucluse, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/V.04/23.02 236 Campbell Parade, Bondi Beach - Mobility Parking Space (A20/0534)

COUNCIL OFFICER'S PROPOSAL:

That Council installs a 5.4 metre mobility parking space in Ramsgate Avenue, Bondi Beach, between 234 and 236 Campbell Parade.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: Representative of the Member for Vaucluse, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/V.05/23.02 49 Blair Street, North Bondi - 'No Stopping' Zone Modification (A14/0145)

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Reduces the length of the 'No Stopping' zone west of the pedestrian crossing in front of 47 Blair Street, North Bondi, from 6.7 metres to 2.9 metres.
- 2. Extends the 'No Stopping' zone east of the pedestrian crossing in front of 49 Blair Street from 7 metres to 11.2 metres.
- 3. Relocates the mobility parking space in front of 49 Blair Street 4.2 metres east of its existing position.
- 4. Relocates the 4 metre 'P Motor Bikes Only' parking zone to the west side of the pedestrian crossing kerb buildout.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: Representative of the Member for Vaucluse, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/V.06/23.02 6 Gilgandra Road, North Bondi - Construction Zone (A03/2514-04)

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 9.8 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 6 and 8 Gilgandra Road, North Bondi.
- 2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.

3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted subject to an amendment to clause 1 such that the recommendation now reads as follows:

That Council:

- 1. Installs a 9.8 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 6 and 8 Gilgandra Road, North Bondi, as shown in Figures 2 and 3 of the report.
- 2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

Voting members present for this item: Representative of the Member for Vaucluse, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/V.07/23.02 91 O'Brien Street, Bondi Beach - Construction Zone (A03/2514-04)

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 9 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 91 O'Brien Street, Bondi Beach.
- 2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
- 3. Temporarily relocates the mobility parking space in front of 91 O'Brien Street 5 metres east of its existing position.
- 4. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary, and to restore the mobility parking space back to its original location after the removal of the construction zone.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: Representative of the Member for Vaucluse, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/V.08/23.02 124 Hastings Parade, North Bondi - Construction Zone (A03/2514-04)

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 13 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 124 Hastings Parade, North Bondi.
- 2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: Representative of the Member for Vaucluse, NSW Police representative, TfNSW representative and Waverley Council representative (Deputy Chair).

TC/CV <u>ELECTORATES OF COOGEE AND VAUCLUSE</u>

Nil.

PART 2 – TRAFFIC ENGINEERING ADVICE

NOTE: The matters listed under this part of the agenda seek the advice of the WTC only and do not propose that Council exercise its delegated functions at this point in time (though they may or may not require it in the future).

TC/TEAC	STATE ELECTORATE OF COOGEE	
Nil.		
TC/TFAV	CTATE ELECTORATE OF VALIGHEE	
IC/ IEAV	STATE ELECTORATE OF VAUCLUSE	
Nil.		
TC/TEACV	ELECTORATES OF COOGEE AND VAUCLUSE	
Nil.		
THE MEETIN	ING CLOSED AT 10.35 AM.	
		ID CONFIRMED
	MAYOR 21 FEBRUA	RY 2023

REPORT TC/C.01/23.02

Subject: Resident Parking Scheme Area 11 - Extension

TRIM No: A02/0750

Author: Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs '2P 8 am–10 pm, Permit Holders Excepted Area 11' parking restrictions in Illawong Avenue, Tamarama, as shown in Figure 1 of the report.
- 2. Excludes 20 Illawong Avenue from the Resident Parking Scheme and prohibits residents of this address from applying for permits in Area 11.

1. Executive Summary

Council received a petition containing 43 signatures of residents of Illawong Avenue, Tamarama, requesting a resident parking scheme in Tamarama Street. The petition was considered at the Finance, Operations and Community Services Committee meeting held on 7 February 2023. Council resolved to refer the petition to the Executive Manager, Infrastructure Services, for consideration and for officers to prepare a report to the Traffic Committee on the consideration of the petition.

The petition has been signed by residents living in houses and apartments in Illawong Avenue. Residents at 20 Illawong Avenue were not included in the petition. 20 Illawong Avenue is a large apartment building at the end of the street that has ample parking for its residents.

The 43 signatures came from 29 dwellings, of which 15 were apartments and 14 were houses.

Excluding 20 Illawong Avenue and the Kindamindi Childcare Centre, there are 52 dwellings in Illawong Avenue. Signatures in favour of resident parking came from 56% of these dwellings.

It is recommended that '2P 8 am—10 pm, Permit Holders Excepted Area 11' parking restrictions are installed in Illawong Avenue from Farrellys Avenue to the end of the cul-de-sac except for the 15-minute pick up / drop off zone adjacent to 1 Illawong Avenue (Kindamindi childcare centre).

Council will need to exercise its delegated functions to implement the proposal.



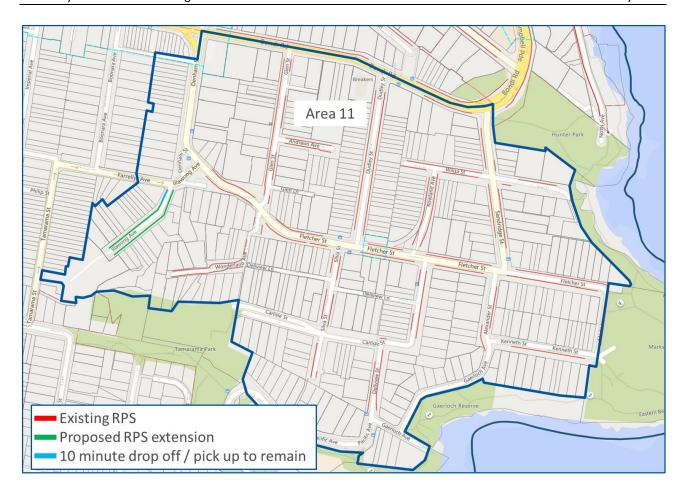


Figure 1. Proposed RPS extension in Illawong Avenue.

2. Introduction/Background

Council received a petition containing 43 signatures of residents of Illawong Avenue, Tamarama, requesting a resident parking scheme in the street. A majority of dwellings (excluding 20 Illawong Avenue) were represented.

3. Technical Analysis

Illawong Avenue is part of Resident Parking Scheme Area 11. It currently it does not have parking restrictions except for 15-minute pick-up/drop-off zone adjacent to 1 Illawong Avenue (Kindamindi childcare centre).

Residents living in the western part of resident parking Area 11 (including Silva, Carlisle, Fletcher, Denham, Illawong, Carlisle, Gaerloch, Alexander Streets) were surveyed regarding the extension of the existing Area 11 resident parking scheme in February 2022.

The results of the February 2022 survey were reported to the May 2022 traffic committee. Only two residents from Illawong Avenue responded to the survey, one in favour and one against the resident parking. It was determined not to extend resident parking into Illawong Avenue due to the low response. Restrictions were approved for Fletcher Street, between Illawong Avenue and Silva Street, and in Silva Street and Wonderland Avenue.

The petition reflects change in parking demands as some people who previously parked in Fletcher Street and Wonderland Avenue have now diverted to Illawong Avenue.

There are 131 dwellings in Illawong Avenue of which:

- 31 are in the apartment buildings at 6, 19, and 21 Illawong Avenue.
- 78 are in the apartment building at 20 Illawong Avenue (at the end of the cul-de-sac).
- 21 are houses.
- 1 is occupied by the Kindamindi childcare centre.

The petition with 43 signatures came from 29 dwellings of which:

- 15 are in the apartment buildings at 6, 19, and 21 Illawong Avenue.
- 14 are from residents of houses.

There are no signatures from 20 Illawong Avenue.

Excluding 20 Illawong Avenue and the Kindamindi childcare centre, the signatures from 29 dwellings represent 56% of the dwellings in the street. This majority in favour indicates that resident parking should be reconsidered for Illawong Avenue.

Given 20 Illawong Avenue has 78 apartments issuing of permits to residents of this address would impact the overall capacity of the Resident Parking Scheme Area 11. It is proposed that residents of this address do not qualify for permits and that as part of this report a recommendation to Council is to exclude the address.

4. Financial Information for Council's Consideration

Council will fund the cost of installing the signs from existing budgets.

5. Attachments

Nil.

REPORT TC/C.02/23.02

Subject: Resident Parking Scheme Area 15 - Extension

TRIM No: A02/0750

Author: Beryl Wang, Professional Engineer, Traffic and Development

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs '2P 8 am-6 pm, All Days, Permit Holders Excepted Area 15' parking restrictions in Avoca Street, Boonara Avenue, Farrellys Avenue, Imperial Avenue, Jackaman Street, Philip Street, Tamarama Street and Tasman Street, as shown in Figure 1 of the report.
- 2. Retains existing parking restrictions in the rest of Area 15.

1. Executive Summary

Council officers have conducted a survey of Resident Parking Scheme Area 15 and the surrounding area that currently does not have parking restrictions outside homes (Area D). The area surveyed is shown in Figure 1. The survey was undertaken to determine the level of support to installing restrictions in the streets.

Surveys were delivered to 415 properties in November 2022. 133 responses were received from 126 households (30 percent). Of these 126 households:

- 56 percent (71 responses) were in support of a resident parking scheme in their street.
- 44 percent (55 responses) were not in support of a resident parking scheme in their street.

Of the received responses:

- There was strong support from Avoca Street, Jackaman Street, Philip Street and Tasman Street.
- Support from Boonara Avenue and Farrellys Avenue and Tamarama Street was divided (50/50 or close to).
- Support from Birrell Street and Imperial Avenue was low.

It is recommended that resident parking scheme is installed in Avoca Street, Boonara Avenue, Farrellys Avenue, Imperial Avenue, Jackaman Street, Philip Street, Tamarama Street and Tasman Street as shown in Figure 1.

Parking restrictions have been recommended for Imperial Avenue despite the low support. This is because people parking in other streets are likely to transfer to Imperial Avenue from the other streets if they have parking restrictions whilst Imperial Avenue does not. This recently occurred when parking restrictions were implemented in Fletcher and Silva Streets but not Illawong Avenue.



Council will need to exercise its delegated functions to implement the proposal.

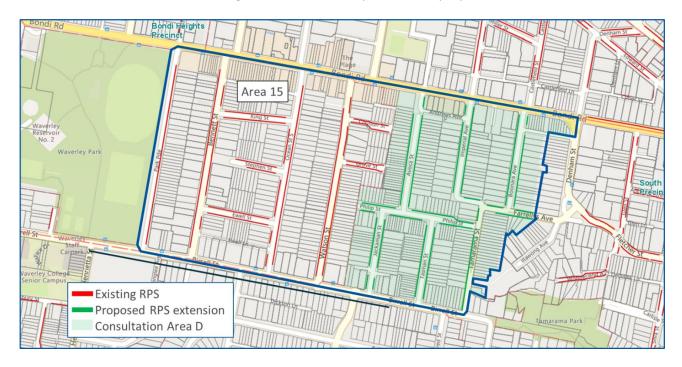


Figure 1. Proposed RPS extension on Area 15.

2. Introduction/Background

At its meeting on 23 September 2021, Council resolved to consult residents in the eastern part of Area 15 and other streets within the Waverley local government area regarding a potential extension of the existing resident parking scheme. This report presents the results of surveys of Area D.

Residents were provided with a fact sheet including resident parking permit eligibility criteria and associated costs. They were also given the option to choose a preferred restriction time and days if a resident parking scheme was to be implemented.

3. Technical Analysis

Resident survey results and analysis

A survey of 415 properties were conducted in November 2022. 133 responses were received from 126 households (30 percent). Of these 126 households:

- 56 percent (71 responses) were in support of a resident parking scheme in their street.
- 44 percent (55 responses) were not in support of a resident parking scheme in their street.

Figure 2 shows the responses by street.

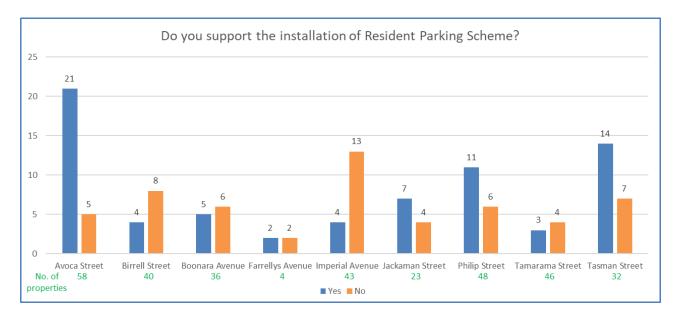


Figure 2. Resident feedback by street.

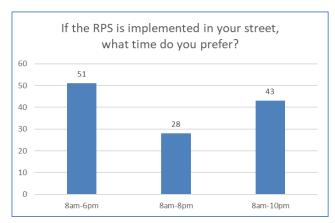
The breakdown reveals two streets that are not in support of the resident parking scheme. They are Birrell Street and Imperial Avenue. Three streets did not have a clear majority leading to deducing that the overall 'No' vote would have been higher if residents were concerned. The relevant streets were Farrellys Avenue, Boonara Avenue and Tamarama Street.

It is recommended that resident parking scheme is installed in all streets in Area D.

Timing of restrictions

The responses received show that residents of area D preferred a '2P, 8am-6pm, All days' restriction. Figures 3 and 4 show the responses for the preferred times and days of restrictions.

There was a mixed response to the times for the restrictions. There was strong support for the restrictions to be every day. It is recommended that the same times and days used for adjacent streets which already have resident parking are applied. This is 8am to 10pm, every day.



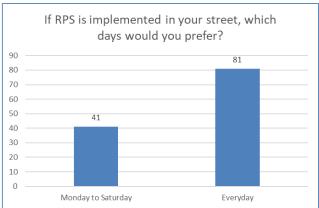


Figure 3. Resident feedback for preferred times and days of restriction.

Off-street parking

Access to off street parking was also investigated. Figure 4 presents the survey responders' access to offstreet parking filtered by street. Residents of most properties in Birrell Street and Imperial Avenue who

responded to the survey already have off street parking. This would have been a contributor to some residents in these streets opposing the resident parking.



Figure 4. Resident feedback for access to off-street parking.

4. Financial Information for Council's Consideration

Council will fund the cost of installing the signs from existing budgets if changes to signs are approved.

5. Attachments

Nil.

REPORT TC/C.03/23.02

Subject: Park Parade, Bondi - Speed Cushions Review

TRIM No: A18/0579

Author: Malik Almuhanna, Senior Traffic Engineer

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council retains the rubber speed cushions outside 10 and 32 Park Parade, Bondi Junction, as a permanent traffic calming measure.

1. Executive Summary

At its meeting in March 2021, Council resolved to install rubber speed cushions with a 12-month review after installation. The rubber speed cushions were installed in November 2021. They are located outside 10 and 32 Park Parade.

The speed humps were installed as part of the 40 km/h project for streets south of Bondi Road.

This report seeks approval of the existing rubber speed cushions in Park Parade as a permanent measure (see Figure 1).

Vehicular speed information was gathered from connected vehicle data to compare speeds along Park Parade 12 months before and after the installation of the rubber speed cushions. 85th percentile traffic speeds were:

- 51.9 km/h northbound before and 45.7 km/h after the installation of the humps.
- 52.0 km/h southbound before and 45.9 km/h after the installation of the humps.

The original 40 km/h project tube counts recorded 85th percentile speeds of around 51 km/h.

The reductions in speeds are significant. While the resultant speeds do not fall below the target of 40 km/h, they are a contributor.

Installation of 40 km/h signage is expected to occur by June 2023. This signage will assist in lowering the speeds further.

As the existing traffic calming devices are proving to be effective, it is recommended that they are retained as a permanent traffic calming measure.

Council will need to exercise its delegated functions to implement the proposal.





Figure 1. Park Parade.

2. Introduction/Background

Council at its March 2021 meeting resolved to install the rubber speed cushions with a 12-month review after installation. The rubber speed cushions were installed in November 2021.

Previous Traffic Committee recommendations and Council resolutions relating to Park Parade traffic calming devices are shown in Table 1 below.

Table 1. Relevant Council resolutions and Waverley Traffic Committee recommendations.

Meeting and date	Item No.	Resolution/recommendation	
Council 16 March 2021	CM/5.2.1/21.03	That Council:	
10 Ividicii 2021		 Approves the design of traffic calming devices consisting of 75 mm rubber cushions as shown in Attachment 1 (Option 3) of the report, including a 12-month trial of the rubber speed cushions outside 10 and 32 Park Parade. 	
		 Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should on-site circumstances warrant changes. 	
Traffic Committee 25 February 2021	TC/C.02/21.02	That Council:	
·		Approves the design of 75 mm rubber hump traffic control devices as shown in Attachment 1 (Option 3) of the report, including a 12-month trial of the rubber speed humps outside 10 and 32 Park Parade	
		Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should on-site circumstances warrant changes.	

Traffic Committee	TC/C.07/20.10	Coun	cil ado	lopted the recommendation below.	
22 October 2020		That (Counc	icil:	
		1.	Bond	dertakes consultation with residents of Park Parade, adi, on three options for the installation of traffic trol devices along Park Parade comprising:	,
			(a)	Line Markings between Bondi Road and Birrell Street, as follows.	
				(i) A line marked parking lane on the east side of Park Parade.	e
				(ii) A L5 enhanced unbroken lane centre line at the crest of the hill around 24 – 32 Park Parade for a length determined by Council officers, and S1 dividing (separation) centre line for the remainder of Park Parade, bot to have raised pavement markers.	I re
				(iii) A yellow 'No Stopping' edge line on the west side of Park Parade.	
			(b)	Line Markings (a) above plus a speed cushion at 19 Park Parade.	
			(c)	Line Markings (a) above plus speed cushions at 1 and 32 Park Parade.	.0
		2.	the o	cers prepare a report for Council consideration on outcomes of the community consultation, togethern a recommended design for implementation.	r

3. Technical Analysis

Traffic counts

Vehicular speed information was gathered from connected vehicle data technology to compare traffic speeds 12 months before and after the installation of the rubber speed cushions at Park Parade. The counts reveal:

- A reduction of 6.2km/h northbound from 51.9 km/h to 45.7 km/h, and
- A reduction of 6.1km/h southbound from 52.0 km/h to 45.9 km/h.

As the existing traffic calming devices are proving to be effective, it is recommended that they are retained as a permanent traffic calming measure.

Condition of existing traffic calming devices

A recent site inspection revealed that the linemarking and rubber speed cushions were in good condition 14 months post installation. Installation of a more permanent device is not required at this stage.



Figure 3. Existing traffic calming devices at Park Parade (February 2023).

Community feedback

Community feedback was initially divided after the installation of the rubber speed cushions with complaints being received in the first weeks after installation. Positive feedback was also received particularly in relation to the reduction of vehicle speeds and improved safety.

4. Financial Information for Council's Consideration

Traffic calming devices are existing. There are no associated costs.

5. Attachments

Nil.

REPORT TC/V.01/23.02

Subject: Curlewis Street, Bondi Beach - Streetscape Upgrades

TRIM No: A21/0381

Author: Arusha Bhowmik, Project Officer, Major Projects

Malik Almuhanna, Senior Traffic Engineer

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services



That Council:

- 1. Approves the installation of traffic devices, signs and linemarking in Curlewis Street, between Campbell Parade and Old South Head Road, Bondi Beach, as shown in Attachment 1 of the report (excluding traffic signals at Old South Head Road, Glenayr Avenue, and Campbell Parade).
- 2. Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should further amendments be required.

3. Notes that:

- (a) The traffic signal designs will be submitted to Transport for NSW for approval, with any required design and signage changes being approved by Transport for NSW.
- (b) Council has already undertaken two rounds of consultation on the concept designs and incorporated changes based on the feedback received.
- (c) After signage and linemarking approval, the project's review of environmental factors (REF) will be emailed to Councillors for their feedback, five days prior to public exhibition, as per the Councillor Consultation Approval Process. Public exhibition of the REF will be subject to Councillor feedback, in line with the Councillor Consultation Approval Process.
- (d) The General Manager, under delegation, will consider the REF outcomes and feedback from the public exhibition to determine whether the project will proceed.
- (e) Council will proceed to tendering for construction services should the General Manager determine that the project proceed.

1. Executive Summary

Council will be conducting streetscape upgrade works on Curlewis Street between Campbell Parade and Old South Head Road, Bondi Beach (see Figure 1). Part of the upgrade will involve installing new traffic control devices and upgrading of existing traffic control devices to support the new separated cycleway design.



This report seeks Council's approval for the traffic control devices associated with the project including replacement speed humps, pedestrian crossings, parking restrictions, and linemarking.

A separate report was presented to the Strategic Planning and Development Committee meeting on 2 August 2022 seeking approval to proceed to detailed design phase, while addressing key issues identified during the consultation.

Modifications to parts of the design considered in this report may arise as the project moves through external approvals process and/or enters the construction phase. It is proposed that the authorisation of modifications, if they arise, be delegated to Executive Manager, Infrastructure Services.

Attached to this report are:

- Attachment 1 The signs and linemarking plans and typical sections for Curlewis Street.
- Attachment 2 A review of the operation of the Curlewis Street/Wellington Street intersection.
- Attachment 3 A review of the operation of the Curlewis Street/Campbell Parade intersection.
- Attachment 4 A review of the operation of the Curlewis Street/Old South Head Road intersection.
- Attachment 5 A review of the operation of the Curlewis Street/Glenayr Avenue intersection.
- Attachment 6 The consultation report for the western end of Curlewis Street.

Council will need to exercise its delegated functions to implement the proposal.

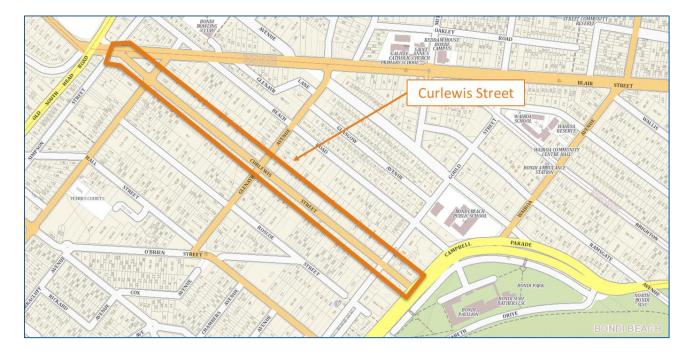


Figure 1. Curlewis Street.

2. Introduction/Background

Curlewis Street is a key road within the Waverley local government area, linking Bondi Beach to Old South Head Road. The street has a mixture of medium density residential and commercial buildings that support the daily needs of residents as well as providing amenities to people visiting the area.

Curlewis Street serves as a local commercial strip at Glenayr Avenue, Gould Street and at the western end as well as serving a major transport route for 'beach to bay' movements.

Project background

The public domain requires urgent road infrastructure upgrades to the road pavement, footpaths, stormwater drainage, and streetlighting. This project involves a streetscape upgrade for the entire street with the objective of renewing existing infrastructure, promoting active transport, improving safety, and updating material finishes to enhance the sense of belonging for all users.

A key element of the project is to formalise the existing link for active transportation by incorporating a separated bike path. This is identified in the 2013 Waverley Bike Plan. It was previously endorsed by Council as a pop-up cycleway as part of the COVID-19 response by Transport for NSW (TfNSW) to improve active transport.

As per Council's endorsed strategic asset management principles, the assets in Curlewis Street are considered condition 4 and require renewal within 12–24 months to meet the agreed service levels as defined in SAMP 6 with the Community. Moreover, the street has a high number of utility service trenches (communications, gas, water, and electricity), which has led to a patchwork of finishes throughout.

In consideration of the above, it is warranted to carry out a renewal of existing assets as well incorporate improvements/upgrades to the streetscape in line with Council plans and policies, including provision of a separate bike path.

Council endorsed proceeding to detailed design in August 2022.

Relevant Council resolutions

Meeting and date	Item No.	Resolution
Strategic Planning and Development	PD/5.4/22.08	That Council:
Committee 2 August 2022		Notes that 69% of respondents to the community consultation on the Curlewis Street Streetscape Upgrade were supportive of the overall proposal.
		2. Endorses Option 1, as set out in the report, at the eastern end of the project, for the bike path to be located on the northern side of Curlewis Street between Gould Steet and Campbell Parade.
		3. Endorses Option 1, as set out in the report, at the western end of the project, which includes the removal of the slip lane from Old South Head Road into Curlewis Street, subject to confirmation of the traffic impacts and support from Transport for NSW.
		Progresses to detailed design, noting the following will be addressed in development of the design:
		(a) Continue to review the design to minimise impacts to parking loss, and where possible include offset parking on nearby streets.
		(b) Review the design to minimise shared paths where possible.
		(c) Advocate for improved connectivity of the bike

			path (e.g. onto Birriga Road and O'Sullivan Road) with both Transport for NSW and Woollahra Council.
		((d) Review the number and extent of localised narrowings of the bike path surrounding retained trees.
		((e) Continue to update key stakeholders of design changes as the detailed design phase progresses.
		(1	f) Provide more information to the community about how and why Curlewis Street was selected for a two-way separated bike path.
		(1	g) Assesses the impact of the proposed Wellington Street pedestrian crossing on traffic movements and congestion in Wellington Street and Curlewis Street, especially at peak times.
		(1	h) Considers the entry to Curlewis Street at Old South Head Road to ensure vehicular safety.
		d T d	Notes that traffic-related design elements will be leveloped further and presented to the Waverley traffic Committee for review after completion of letailed design, with subsequent consideration by Council.
Council	CM/7.10/22.05	That Co	puncil:
17 May 2022		ι	Approves the Curlewis Street Streetscape and Cycleway Upgrade concept design attached to the report for 28 lays' public exhibition.
		c v a	Notes that the community consultation report will be irculated to Councillors following the exhibition period with an update on the revised concept design, in accordance with Step 5 of the Councillor Engagement Process for Capital Works Projects.
		р	Notes that traffic-related design elements will be bresented to the Waverley Traffic Committee for eview, with subsequent consideration by Council.
		\$	Notes that Transport for NSW has granted Council 165,000 in funding to develop the design and a further 835,000 for the construction of the cycleway.
		f	Notes that officers have applied to Transport for NSW or an additional \$2,000,000 grant funding for the onstruction of the cycleway.

Council	CM/5.2.1/20.09	Tha	at Council:
15 September 2020		1.	Approves the concept design for a temporary pop-up cycleway along Curlewis Street between Campbell Parade and Old South Head Road as documented in Attachment 1 (Curlewis Street Pop-up Cycleway for August TC), subject to detailed design.
		2.	Delegates authority to Executive Manager, Infrastructure Services, to modify the design following preparation of detailed plans by TfNSW with input from Council officers.
		3.	Notes that Transport for NSW:
			(a) Notified residents and businesses along Curlewis Street of the proposed pop-up cycleway on Saturday, 5 September 2020, and intends to consider any community feedback when developing the detailed design.
			(b) Intends to issue a follow up notification at least five days before construction works commence. Minutes of Council Meeting 15 September 2020 This is page 6 of the Minutes of the Ordinary Council Meeting held on 15 September 2020
			(c) Is estimating that construction will start in late October 2020.
		4.	Officers conduct broad community consultation from February 2021 on the pop-up cycleway and the possibility of the cycleway becoming permanent following the temporary pop-up scheme.
		5.	Requires that the detailed design process to be undertaken includes a road safety assessment for the following three options:
			(a) A safe north-south crossing of Curlewis Street at the pedestrian crossing on the western side of Gould Street.
			(b) A safe north-south crossing of Curlewis Street at the Glenayr Avenue signalised intersection.
			(c) No crossing of Curlewis Street with the cycleway to run along the northern side of Curlewis Street between Gould Street and Campbell Parade.
		6.	Requires that the detailed design includes an examination of potential conflict between traffic westbound on Curlewis Street turning right into Old South Head Road and cyclists crossing Old South Head Road. The assessment is to consider the potential need

		to introduce a right-turn arrow for the turn from Curlewis Street within the signal design.				
		7. Requires that the 40 km/h speed limit on the eastern end of Curlewis Street is extended to Old South Head Road upon opening of the cycleway.				
		8. Officers complete a detailed review of cyclist transition to and from the cycleway at Campbell Parade.				
		 Officers investigate the implications of the cycleway along Curlewis Street upon deliveries to and from commercial premises and loading/truck zones. 				
		10. Receives a briefing report at the Strategic Planning and Development Committee meeting on 3 November 2020, or as appropriate, which includes any changes to the current concept design along Curlewis Street, and an updated timetable for construction and operation of both the Waverley and Woollahra components of the Beach to Bay pop-up cycleway.				
Waverley Traffic	TC/V.07/20.05	Council adopted the recommendation below.				
Committee 28 May 2020		That Council:				
		Approves in-principle the concept design for a fully separated pop-up cycleway along Curlewis Street between Campbell Parade and Old South Head Road as documented in Attachment 1 (Curlewis Street Pop-up Cycleway), for the purpose of:				
		(a) Applying for funding.				
		(b) Undertaking site survey and commencing detail design.				
		Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should onsite circumstances warrant changes.				
		3. Following confirmation of funding:				
		(a) Requires detailed plans to be prepared showing modification to signs and line-markings and any changes to infrastructure to be submitted to Council's Traffic Committee for review.				
		(b) Requires Council Officers undertake community consultation as part of the detailed design process.				
Council	CM/8.1/20.05	That Council:				
19 May 2020		Note the recent announcement by Planning and Public				

	Spaces Minister Rob Stokes for grants for Council for immediate pilot projects for cycleway and pedestrian widening and longer-term projects.
	 Notes the unanimous decision in November 2017 that Council investigates building a separated bicycle path from Bondi Beach (to our local government area boundary) to Rose Bay Wharf as part of Waverley's People, Movement and Places study – Signature Project 11 (Cycling Superhighways).
	 Immediately apply for a grant for the Bondi Beach, Bondi (to Waverley's LGA boundary) to Rose Bay Wharf cycleway.
	4. Staff liaise with Woollahra Council to co-ordinate the development and implementation for the Old South Head Road to Rose Bay Wharf section of the cycleway.
	5. Investigates other projects, including opportunities (up to \$1 million) for longer term projects such as extra crossing points and trialling lower speed limits, which have also been considered by Waverley Council.
CM/8.6/17.11	That Council:
	 Investigates building a separated bicycle path route from Bondi Beach (to our LGA boundary) to Rose Bay wharf as part of the Waverley's People, Movement and Places study – Signature Project 11 (Cycling Superhighways).
	Notes that Woollahra Council has agreed to write to Mayor of Waverley Council seeking their support to deliver this route as a joint initiative.
	3. Requests staff to liaise with Woollahra Council as appropriate and prepare a report on the implementation of a separated route (including budget implications) for the Old South Head Road to Bondi Beach section of this route. The report to also consider any additional stormwater drainage that may be identified by the flood mitigation mapping project, and a joint Waverley Woollahra application for a funding grant from the RMS to prepare a feasibility study for the route.
	CM/8.6/17.11

3. Technical Analysis

Community consultation

Council held two rounds of community consultations in 2022.

The first round of community consultation was held from 18 May to 15 June 2022 on the proposed concept design for the Curlewis Street streetscape upgrades. Various engagement methods were used. The feedback was reported to the August 2022 Strategic Planning and Development Committee meeting.

The design at the western end of Curlewis Street was then updated to address bike path connectivity and traffic flow concerns raised during the first round of consultation. The second round of community consultation was held from 21 November to 16 December 2022. Various engagement methods were implemented. These have been detailed in the attached consultation report (Attachment 6).

The community was largely supportive of the updated designs, with 60% of respondents supportive of the updated design. Recommendations from the report were:

- Proceed with the updated design at the western end of Curlewis Street, noting the existing alternative routes to access to the petrol station and Barracluff Park.
- Provide information to convey how traffic congestion at the Wellington Street roundabout has been investigated following feedback received in the first round of consultation.
- Provide information to explain the benefits of the slip lane removal.
- Continue to advocate to Transport for NSW to improve safety and congestion at the Old South Head Road intersection.
- Traffic Team to review requests for loading zones and a pedestrian crossing on Blair Street (near Beach Road) separately.

Traffic congestion at the Wellington Street roundabout and the implications of removing the slip lane from Old South Head Road have been investigated. The effects of these changes as well as impacts on each of the intersections along the route are presented later in this report.

Traffic components of the upgrade

The traffic signage and linemarking changes are shown in Attachment 1 of this report. Key changes to the road network include:

- Simpson Street intersection at the northern side of Curlewis Street converted to an exit only/no entry and addition of a continuous footpath treatment.
- Addition of one car parking space at the northern side of Curlewis Street between Old South Head Road and Simpson Street as a result of the slip lane removal at the north-eastern side of Old South Head Road/Curlewis Street intersection.
- Addition of a pedestrian and bike crossing across Wellington Street north of Curlewis Street.
- Addition of a shared path along the northern side of Curlewis Street between Old South Head Road and Wellington Street.
- Addition of a separated cycleway along the northern side of Curlewis Street between Wellington Street and Campbell Parade.
- A net loss of 5 parking spaces on Curlewis Street to allow for compliant 'No Stopping' lengths at intersections, and vehicle swept paths.
- Addition of a continuous footpath treatment at Gould Street south of Curlewis Street.
- Removal of one PUDO parking space at the northern side of Curlewis Street west of Campbell Parade.
- Extension of existing motorbike parking at Gould Street west side south of Curlewis Street to accommodate an extra 3 to 4 motorbikes.
- Addition of 2 P15 spaces on the northern side of Curlewis Street to the east of Glenayr Avenue.
- Addition of 4 metres of parking on the southern side of Curlewis Street West of Campbell Parade.

Wellington Street crossing assessment

Existing traffic flows and estimated pedestrian and cyclist movements were assessed to determine the traffic impact of the proposed changes at the Curlewis Street/Wellington Street intersection including the installation of a shared pedestrian/cyclist crossing in Wellington Street north of Curlewis Street. A network model was created using SIDRA intersection analysis software to include a mid-block pedestrian crossing. The modelling indicated that:

- The intersection of Curlewis Street/Wellington Street currently operates satisfactorily at an overall level of service B during the morning peak and level of service A during the afternoon peak.
- The introduction of a shared pedestrian and cyclist crossing on the north-eastern leg of Wellington Street results in a 5 second delay approaching the roundabout.
- There will be no queuing beyond one car for vehicles on Wellington Street northbound at the pedestrian crossing (exiting the roundabout). This indicates that there will not be queuing from the shared pedestrian and cyclist crossing back into the roundabout.

Campbell Parade assessment

Existing traffic flows were assessed to determine the traffic impact of the proposed changes at the Curlewis Street/Campbell Parade intersection including the removal of the short right turn lane and the introduction of a bike phase to the signals. A model was created using SIDRA intersection analysis software. The modelling indicated that:

- The intersection of Curlewis Street/ Campbell Parade currently operates satisfactorily, with an overall level of service A in the weekday morning peak period and level of service B in the weekday afternoon and Saturday peak periods.
- The introduction of the bi-directional cycleway and associated bicycle only phase increases the intersection average delay by eight to nine seconds and queue lengths by approximately 30 metres.
- These increases in average delay and queue lengths result in a level of service B for the intersection. Guidelines indicate that level of service B is considered good with acceptable delays and spare capacity.

Old South Head Road assessment

Current traffic flows were assessed to determine the traffic impact of the proposed changes at the Curlewis Street/Old South Head Road intersection including the removal of the slip lane into Curlewis Street. A model was created using SIDRA intersection analysis software. The modelling indicated that:

- The intersection of Old South Head Road/Curlewis Street/O'Sullivan Road/Birriga Road currently operates beyond capacity at level of service F, with high delays and queues in both the morning and afternoon peak periods.
- The removal of the slip lane from Old South Head Road southbound into Curlewis Street will result in a
 relatively minor decrease in performance in the morning peak, which is satisfactory. The afternoon
 peak will result in a potential additional 16 second delay to the existing 72 second delay. This delay is
 justified as it results in prioritising pedestrians and cyclists over traffic. It is a net benefit for the local
 community.

Glenayr Avenue assessment

Current traffic flows were assessed to determine the traffic impact of the proposed changes at the Curlewis Street/Glenayr Avenue intersection. A model was created using SIDRA intersection analysis software. The modelling indicated that:

- The intersection of Glenayr Avenue/Curlewis Street currently operates satisfactorily, with an overall level of service B in both the morning and afternoon peak periods.
- There are two available signal phasing options to incorporate the separated cycleway along Curlewis Street that require confirmation from 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 level of service B in both peak periods.
- The introduction of a separate cycle phase increases the overall average delay by 5.6 seconds from 15.6 seconds in the morning and by 6.6 seconds from 16.9 seconds in the evening.
- Banning cyclist turning movements between Curlewis Street and Glenayr Avenue results in similar average delays and queue lengths compared with the existing intersection operation. The banning of these cyclist movements is not required.

Timeline

It is anticipated that detailed design development will take a further two months subsequent to Council approval. Pending approval, a review of environmental factors will be publicly exhibited for 28 days.

Construction commencement is targeted for the first quarter of the 2023-24 financial year.

4. Financial Information

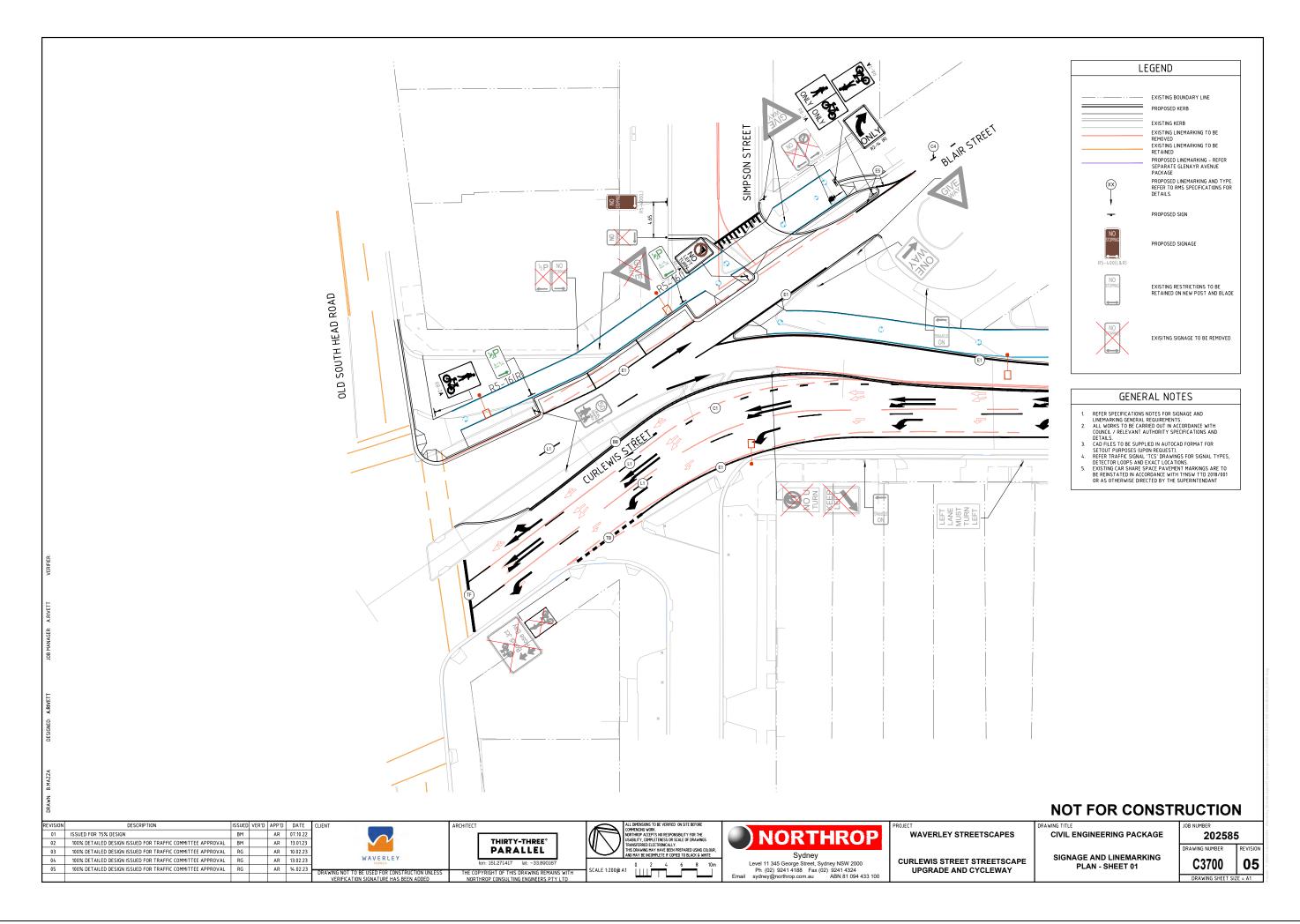
The Curlewis Street Streetscape Upgrades is being partially funded by TfNSW via the following:

- Active Transport Program \$1,000,000 (\$165,000 for design, \$835,000 for construction)
- Active Transport: Get NSW Active Program 2022-23 \$2,000,000 for construction.

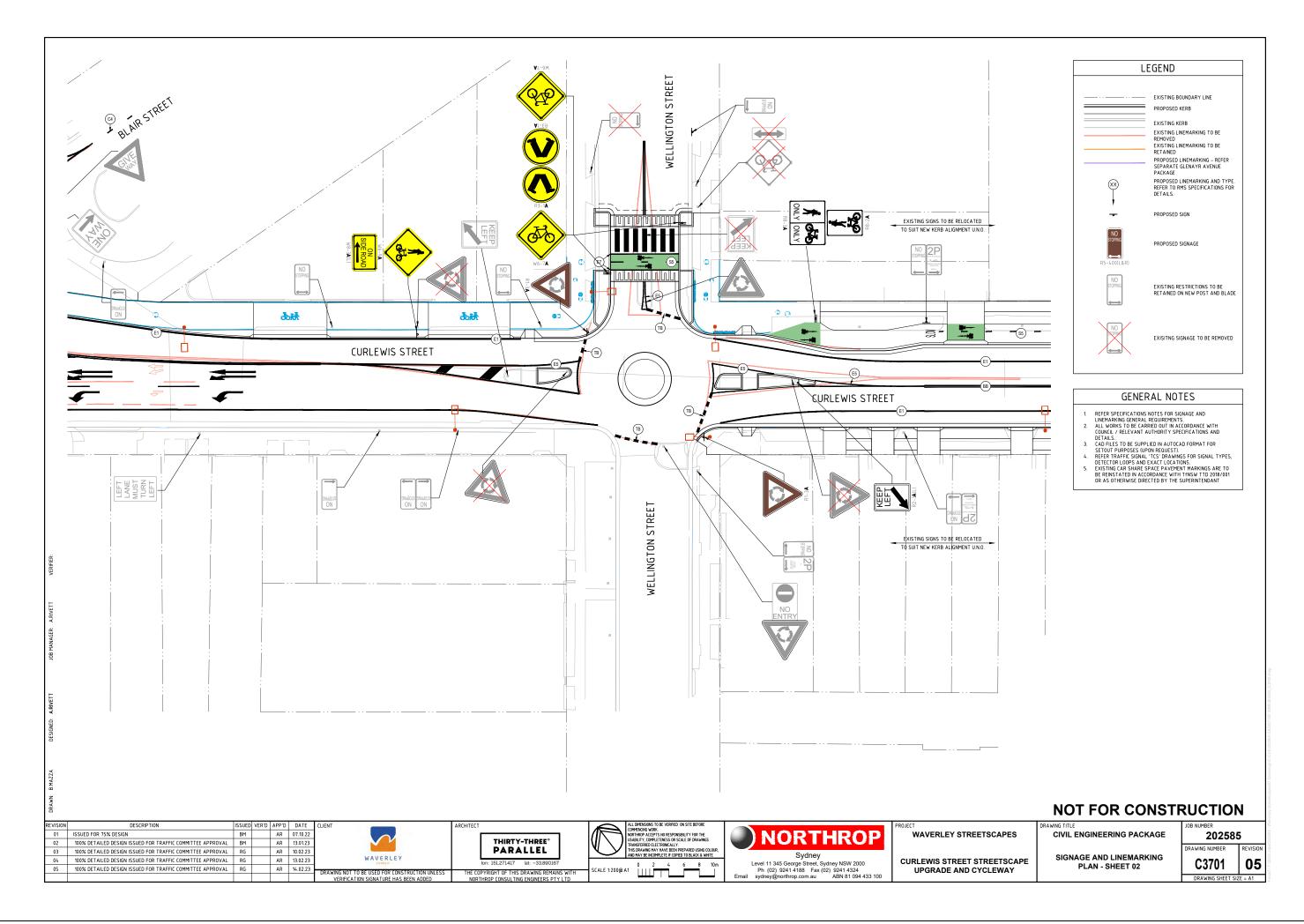
Council will be contributing \$1,500,000 from the SAMP Capital Works allocation towards the construction.

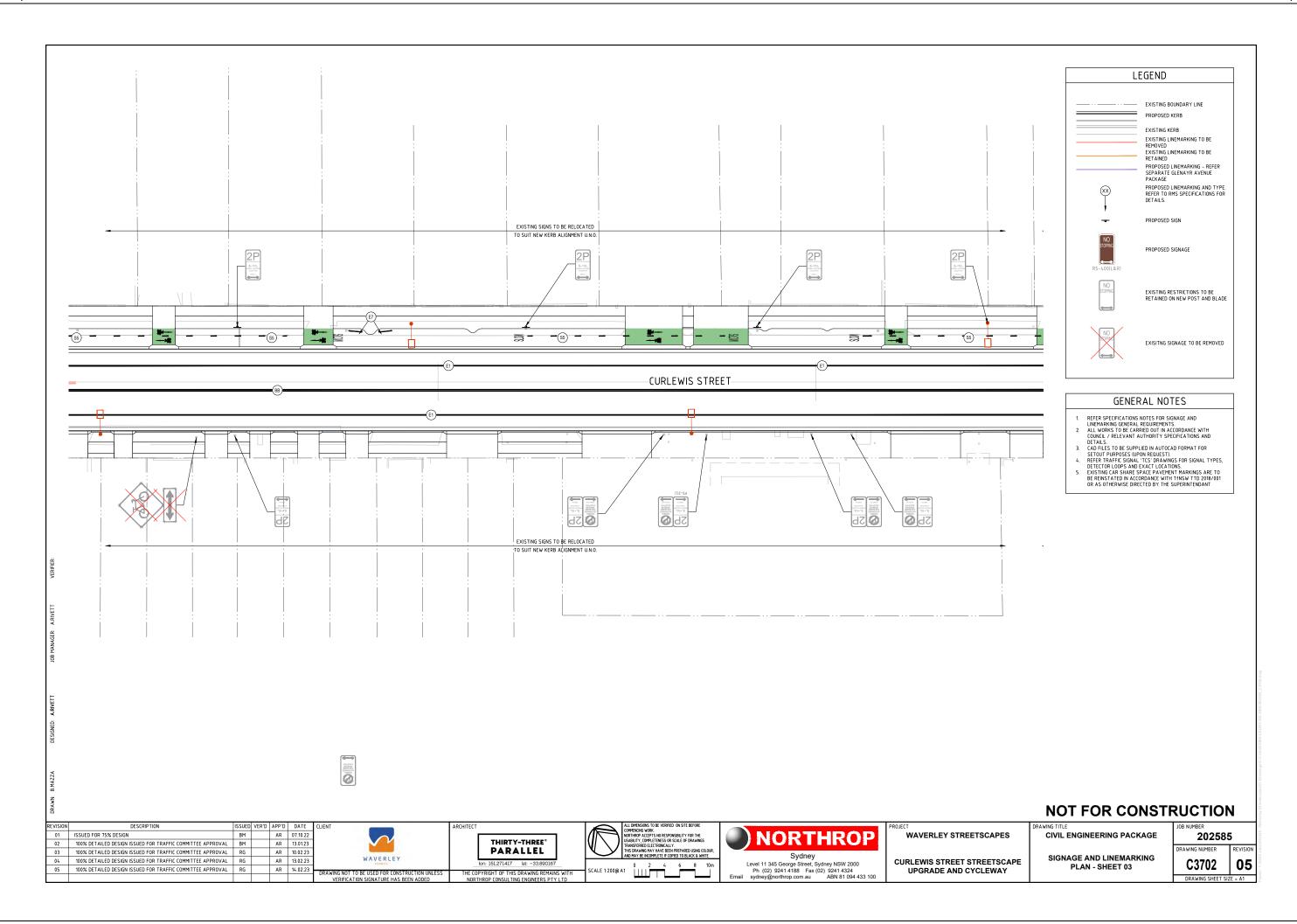
5. Attachments

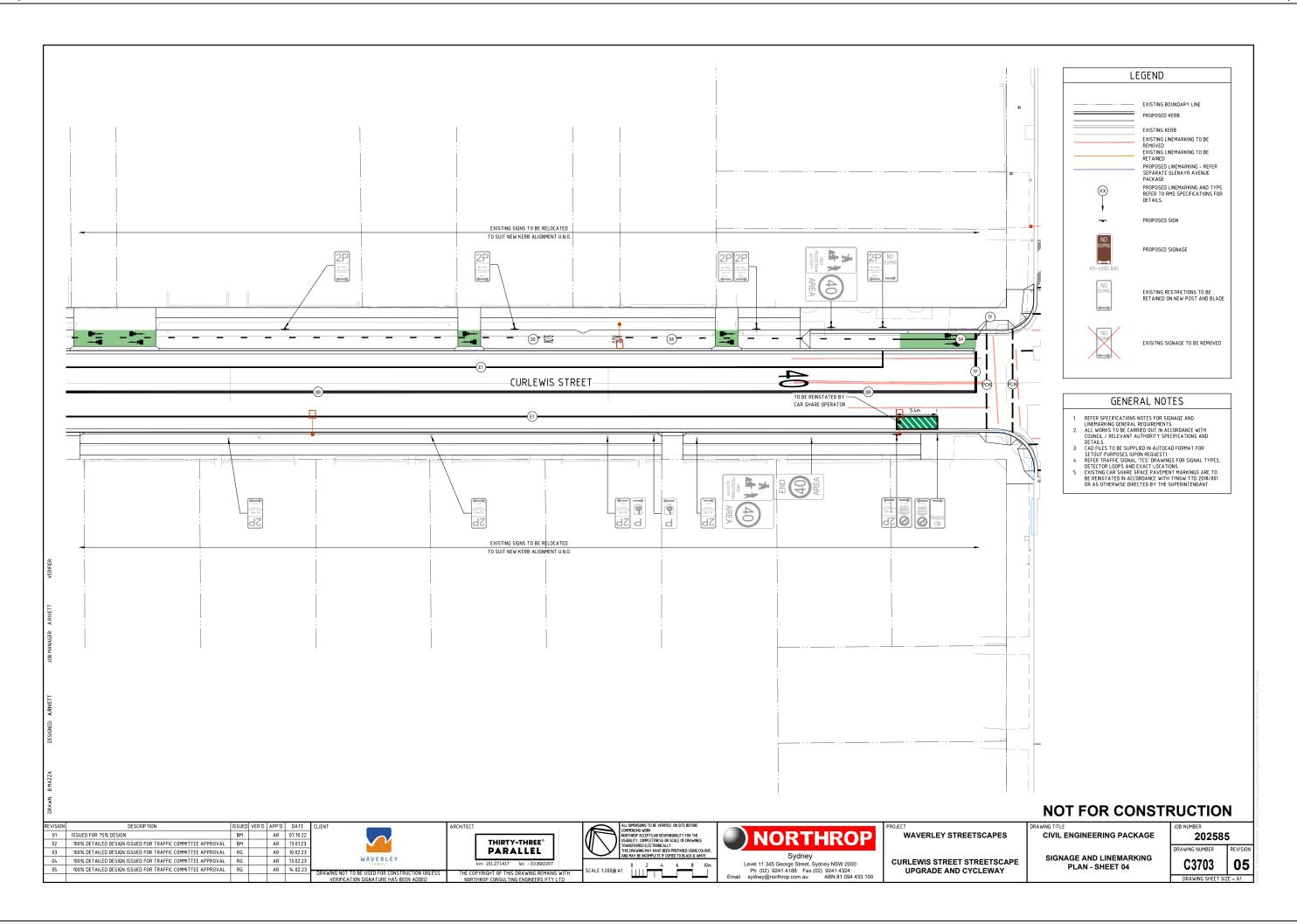
- 1. Curlewis Street Design Signs and lines <a>J
- 2. Wellington Street Assessment <a>J
- 3. Campbell Parade Assessment <u>J</u>
- 4. Old South Head Road Assessment <a>J
- 5. Glenayr Avenue Assessment <u>J</u>
- 6. Consultation Report Western end of Curlewis Street 😃

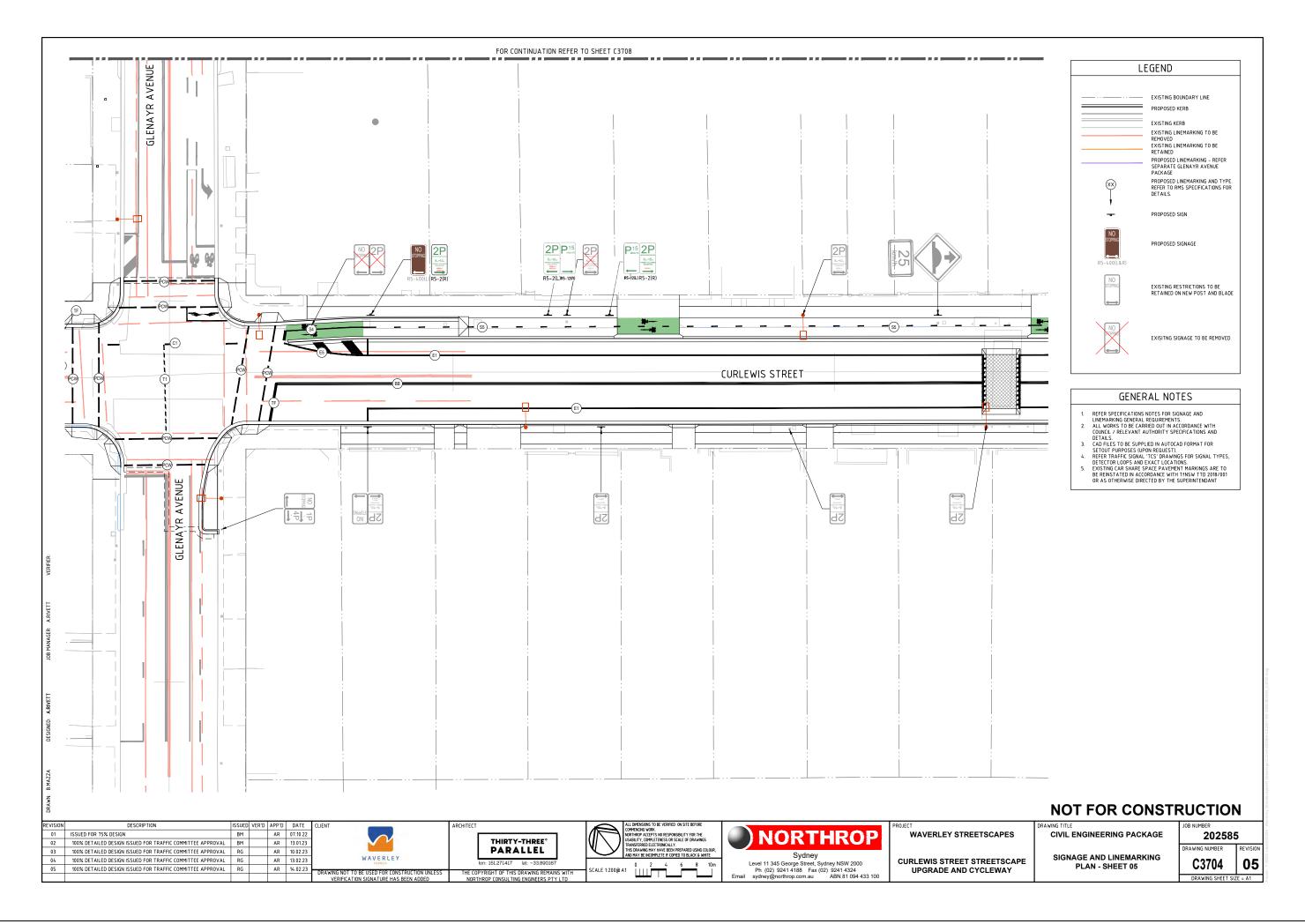


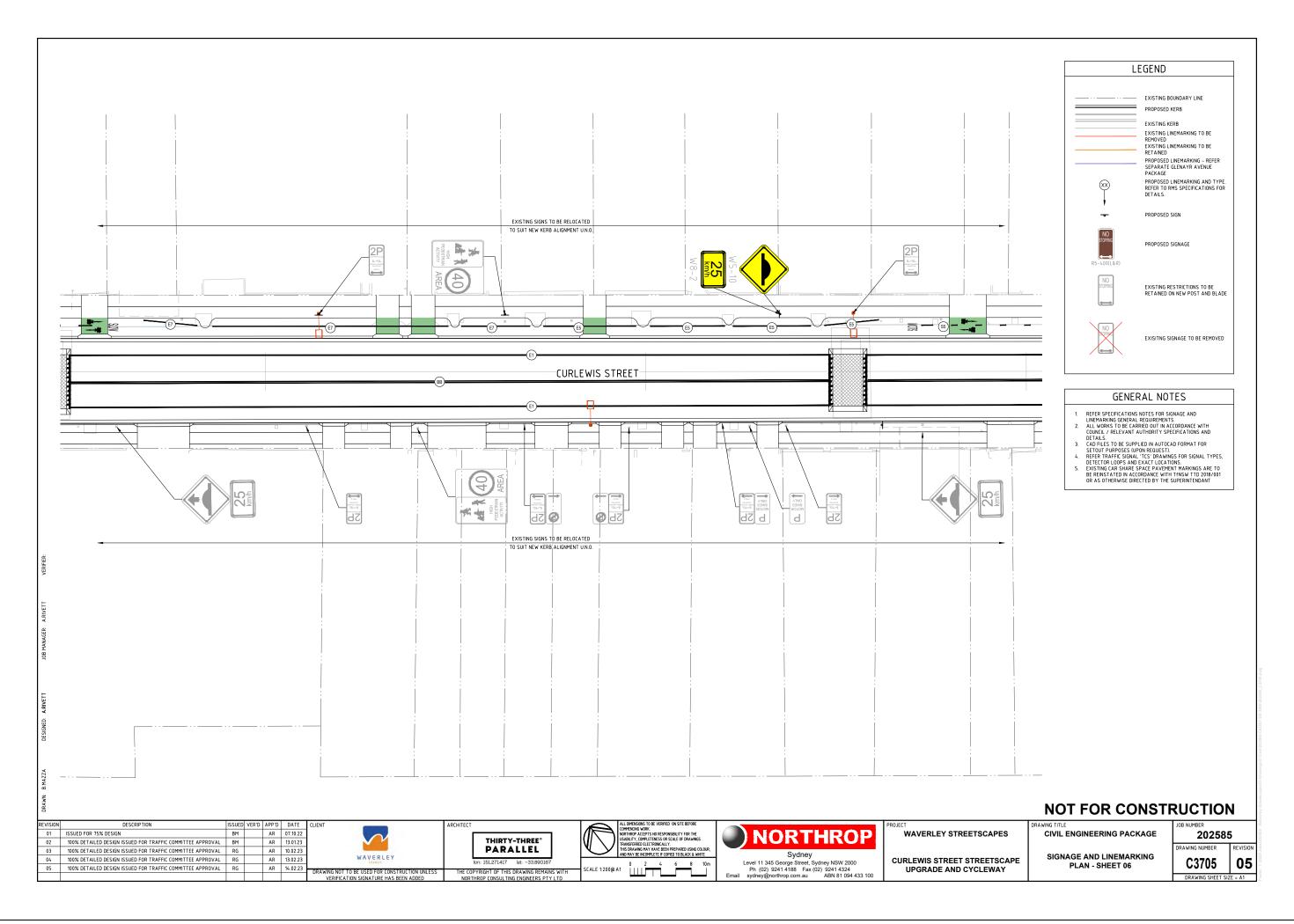
Waverley Traffic Committee



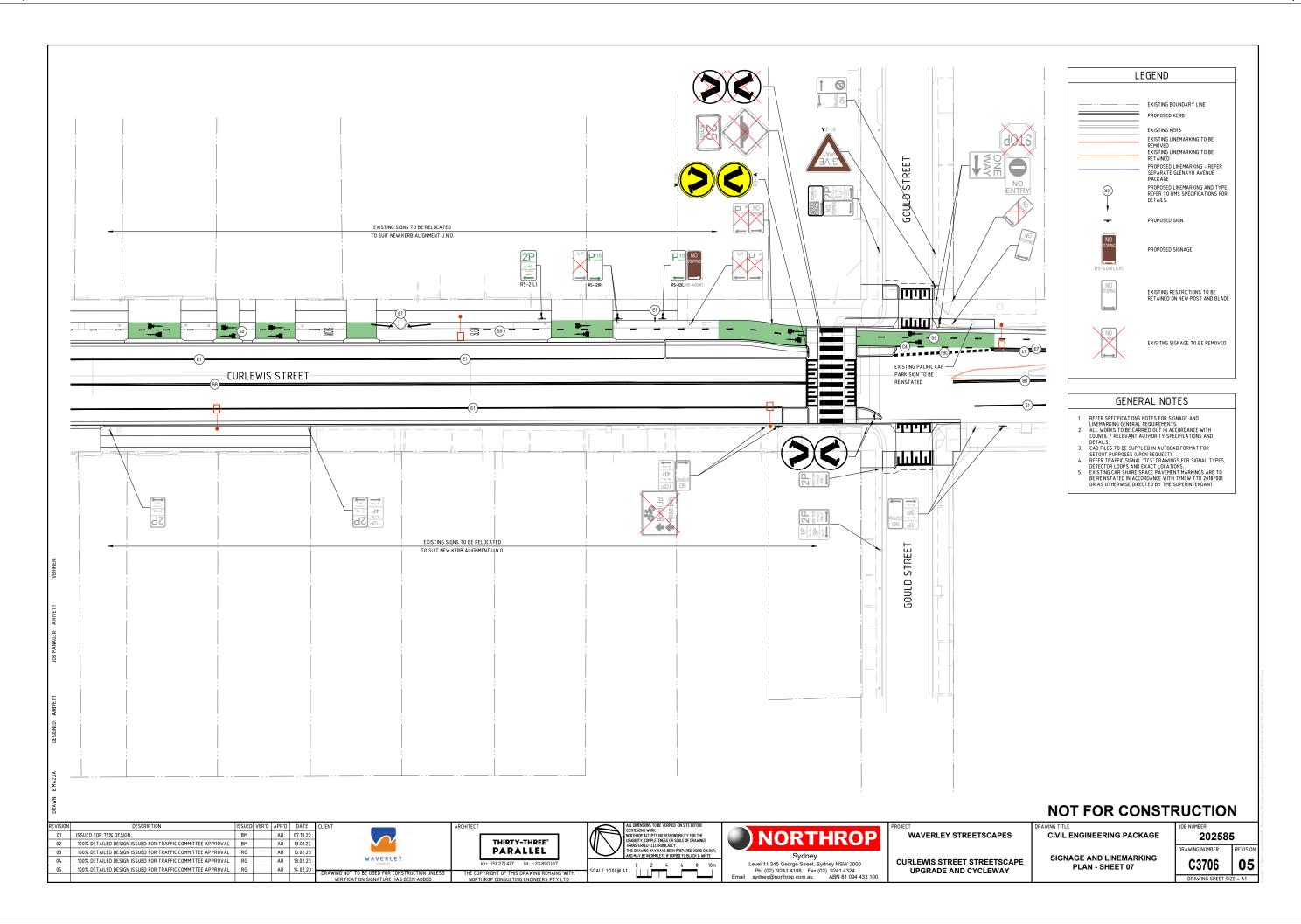


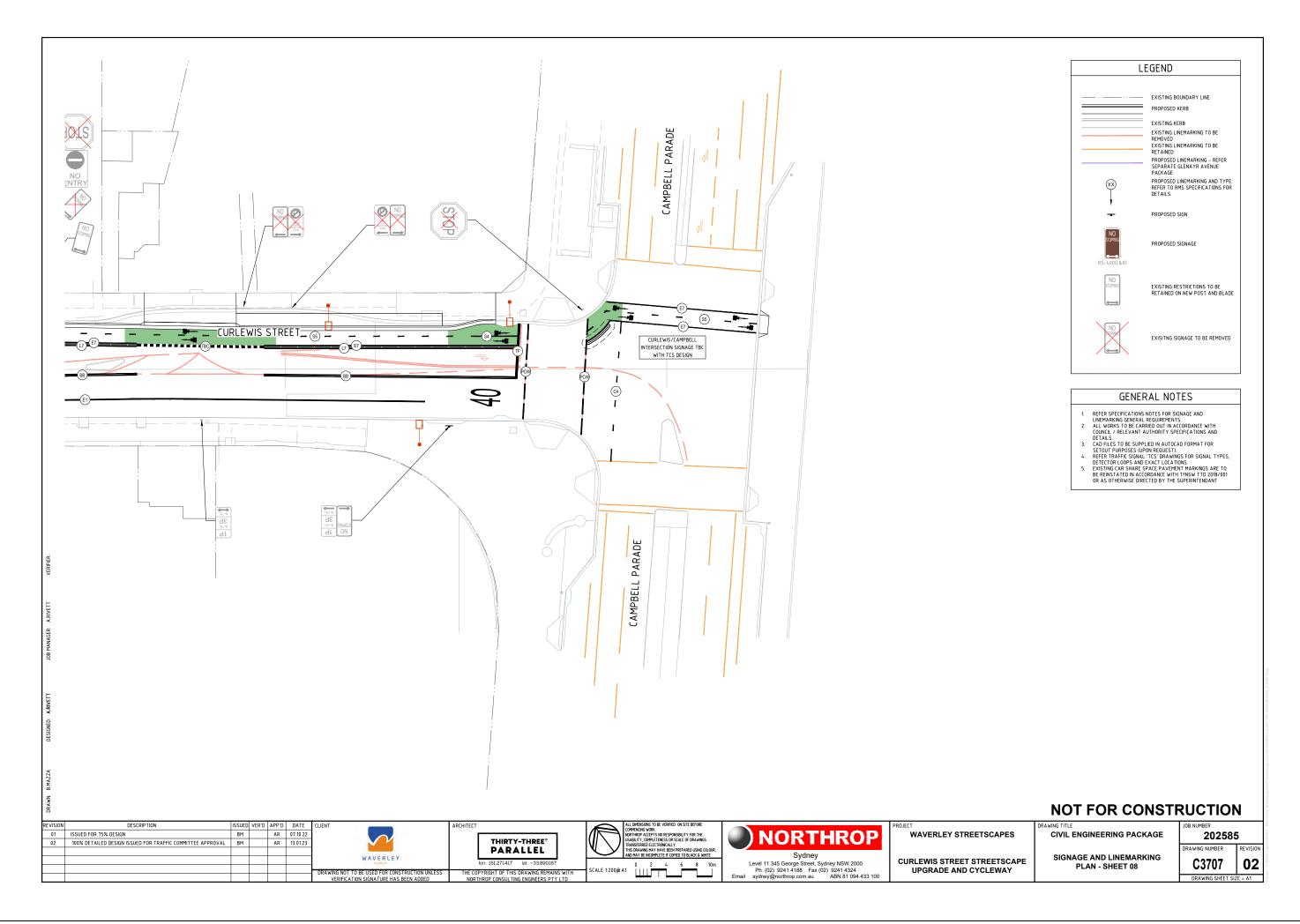




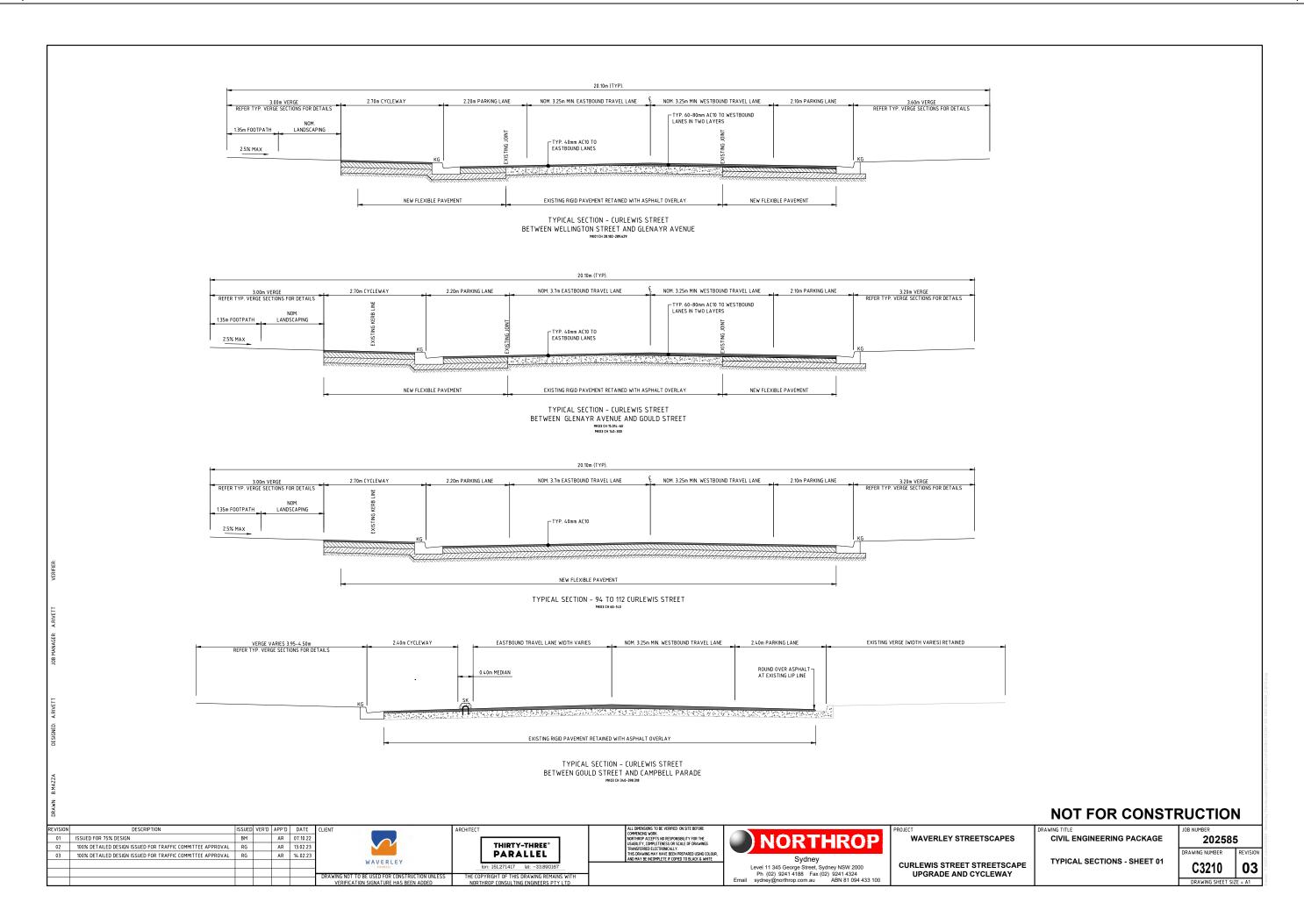


Waverley Traffic Committee





Waverley Traffic Committee





Technical Note

To: Northrop Consulting Engineers

L11, 345 George Street

Sydney NSW 2000

Project/File: 301400272

From: Stantec Australia Pty Ltd

Helen Aberra, Carla Bradley,

Rhys Hazell

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.

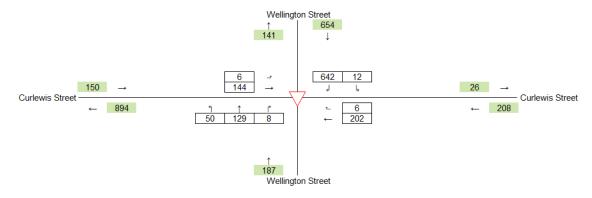
The project proposes a new cycle facility along Curlewis Street to enhance connectivity through the area. The project includes a new shared pedestrian and cyclist crossing at the Curlewis Street/ Wellington Street roundabout, with the crossing to be located on the north-eastern leg of Wellington Street.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



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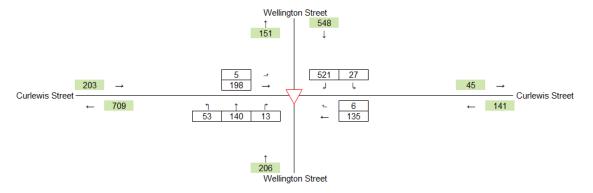
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REF: tnote_230125_0272_curlewis_wellington_modelling.docx

January 25, 2023 301400272 Page 2 of 6

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
А	Less than 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	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.

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REF: tnote_230125_0272_curlewis_wellington_modelling.docx

January 25, 2023 301400272 Page 3 of 6

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)
	Curlewis St (SE)	0.48	15	27	В
	Wellington St (NE)	0.68	9	54	A
AM	Curlewis St (NW)	0.18	5	9	A
	Wellington St (SW)	0.48	17	25	В
	Overall	0.68	11	54	В
	Curlewis St (SE)	0.28	10	13	В
	Wellington St (NE)	0.64	11	50	В
PM	Curlewis St (NW)	0.24	6	12	A
	Wellington St (SW)	0.42	12	20	В
	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



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 $REF: tnote_230125_0272_curlew is_wellington_modelling.docx$

January 25, 2023 301400272 Page 4 of 6

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

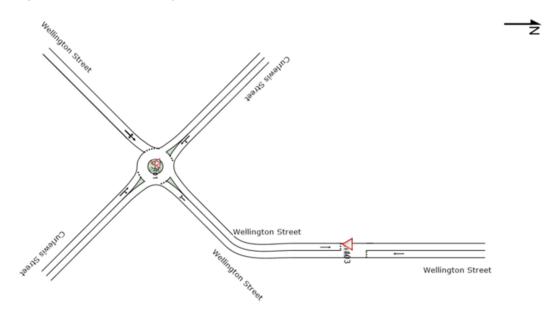


Table 3 and Table 4 present a summary of the future operation of the roundabout crossing point respectively, with full results presented in Attachment 2.

Table 3: Future operating conditions - roundabout

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

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 $REF: tnote_230125_0272_curlew is_wellington_modelling.docx$

January 25, 2023 301400272 Page 5 of 6

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)
	Wellington St (NE)	0.70	5	40	A
AM	Wellington St (SW)	0.08	1	0	A
	Overall	0.70	4	40	-
	Wellington St (NE)	0.59	5	35	A
PM	Wellington St (SW)	0.08	1	0	A
	Overall	0.59	4	35	-

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 95th 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 95th percentile queue lengths are 55 metres and 50 meres 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 95th 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.

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REF: tnote_230125_0272_curlewis_wellington_modelling.docx

January 25, 2023 301400272 Page 6 of 6

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 95th 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 95th 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

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REF: tnote_230125_0272_curlewis_wellington_modelling.docx

January 25, 2023 301400272

Reference: Curlewis Street/ Wellington Street Intersection - SIDRA Modelling

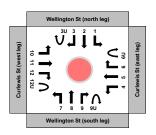
Attachment 1: Survey Results

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 $REF: tnote_230125_0272_curlew is_welling ton_modelling.docx$

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		Mover (Left				Mover (Thro					ment 3 t Turn)			Moven (U T	nent 3U 'um)			Mover (Left				Mover (Thre					ment 6 t Turn)			Moven (U 1		
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	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							Welli	ngton S	St (sout	h leg)													Cu	rlewis S	t (west	leg)										
Movement		Mover (Left					ment 8			Mover (Right	nent 9			Moven (U.)				Movem (Left				Mover (Thr	nent 11 nunh)				nent 12 t Turn)			Movem (U.T			А	LL MOV	/EMENT	rs
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	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	1,056
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

 Report Type:
 Pedestrian Data

 Geocounts Job ID:
 1652913908893

 Client Job Number:
 n/a

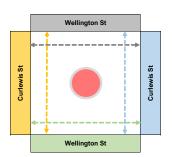
 Client Name:
 Stantec

 Location:
 Bondi

 Survey Site:
 IC02 (Curlewis St/Wellington St)

 Survey Date:
 Thursday, 27th October 2022

 Site Coordinates:
 -33.8856679, 151.2693062



	North	East	South	West	Total
Peds Crossing AM:	40	58	125	9	232
Cyclists Crossing AM:	0	1	0	0	1
Peds Crossing PM:	41	65	112	11	229
Cyclists Crossing PM:	0	0	0	0	0
Peak Hour Peds AM:		8:3	30 to 9:	30	
Peak Hour Cyclists AM:		7:	30 to 8:	30	
Peak Hour Peds PM:		15:	15 to 10	6:15	
Peak Hour Cyclists PM:		15:0	00 to 10	6:00	



15min Peds

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

60min Peds

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

15min Cyclists

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

60min Cyclists

	٠٠,	0010					
	Leg	1	North	East	South	West	Total
7:30	to	8:30	0	1	0	0	1
7:45	to	8:45	0	1	0	0	1
8:00	to	9:00	0	0	0	0	0
8:15	to	9:15	0	0	0	0	0
8:30	to	9:30	0	0	0	0	0
15:00	to	16:00	0	0	0	0	0
15:15	to	16:15	0	0	0	0	0
15:30	to	16:30	0	0	0	0	0
15:45	to	16:45	0	0	0	0	0
16:00	to	17:00	0	0	0	0	0
16:15	to	17:15	0	0	0	0	0
16:30	to	17:30	0	0	0	0	0
16:45	to	17:45	0	0	0	0	0
17:00	to	18:00	0	0	0	0	0
17:00	to	18:00	0	0	0	0	0

January 25, 2023 301400272

Reference: Curlewis Street/ Wellington Street Intersection - SIDRA Modelling

Attachment 2: SIDRA Outputs

Design with community in mind

 $REF: tnote_230125_0272_curlew is_welling ton_modelling.docx$

SITE LAYOUT

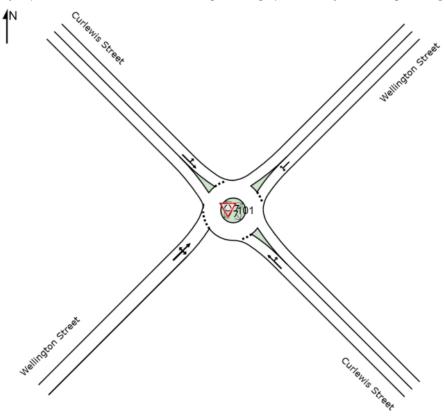
Site: 101 [Curlewis Street/ Wellington Street PM (Site Folder:

Existing)]

New Site

Site Category: (None) Roundabout

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



SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STANTEC NEW ZEALAND | Licence: NETWORK / Enterprise | Created: Tuesday, 17 January 2023 4:12:30 PM
Project: U:\301400272\technical\modelling\221130_Curlewis Street- Wellington Street.sip9

Site: 101 [Curlewis Street/ Wellington Street AM (Site Folder:

Existing)]

New Site

Site Category: (None)

Roundabout

Vehi	icle M	ovemen	t Perfo	rmance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM, FLO [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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
Appr	oach	208	3	219	1.4	0.476	14.6	LOS B	3.8	26.7	0.93	1.03	1.09	41.2
North	nEast: ˈ	Wellingto	n 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
Appr	oach	654	5	688	8.0	0.679	9.2	LOSA	7.8	54.4	0.78	0.67	0.78	43.7
North	nWest:	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
Appr	oach	150	11	158	7.3	0.182	5.4	LOSA	1.3	9.0	0.49	0.53	0.49	45.1
Sout	hWest:	Wellingt	on Stree	t										
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
Appr	oach	187	4	197	2.1	0.476	16.6	LOS B	3.5	25.2	0.92	1.04	1.12	40.4
All Vehic	cles	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.

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Project: U:\301400272\technical\modelling\221130_Curlewis Street- Wellington Street.sip9

Site: 101 [Curlewis Street/ Wellington Street PM (Site Folder:

Existing)]

New Site

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INP VOLU [Total		DEM. FLO [Total		Deg. Satn		Level of Service	95% B <i>A</i> QUI [Veh.	ACK OF EUE Dist]	Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	veh/h	veh/h	%	v/c	sec		veh	m			-,	km/h
SouthEast: Curlewis Street														
5	T1	135	2	142	1.5	0.275	9.9	LOSA	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
Appr	oach	141	2	148	1.4	0.275	10.0	LOS B	1.8	13.0	0.81	0.83	0.81	43.7
North	nEast: \	Wellingto	n Street											
7	L2	27	0	28	0.0	0.641	8.3	LOSA	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
Appr	oach	548	7	577	1.3	0.641	10.7	LOS B	7.1	50.2	0.81	0.76	0.86	43.2
North	nWest:	Curlewis	Street											
10	L2	5	0	5	0.0	0.239	5.9	LOSA	1.7	12.0	0.52	0.55	0.52	45.3
11	T1	198	1	208	0.5	0.239	5.6	LOSA	1.7	12.0	0.52	0.55	0.52	45.8
Appr	oach	203	1	214	0.5	0.239	5.6	LOSA	1.7	12.0	0.52	0.55	0.52	45.8
Sout	hWest:	Wellingt	on Stree	t										
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
Appr	oach	206	4	217	1.9	0.417	11.6	LOS B	2.9	20.1	0.85	0.96	0.92	42.6
All Vehic	cles	1098	14	1156	1.3	0.641	9.9	LOSA	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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Project: U:\301400272\technical\modelling\221130_Curlewis Street- Wellington Street.sip9

NETWORK LAYOUT

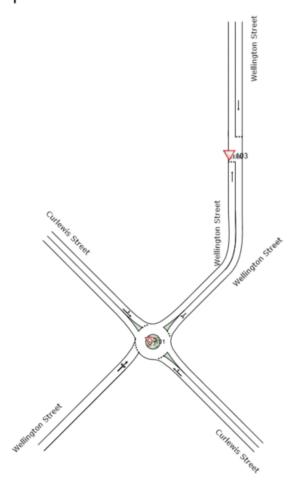
Network: N101 [PM - Proposed (Network Folder: Proposed)]

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

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Organisation: STANTEC NEW ZEALAND | Licence: NETWORK / Enterprise | Created: Tuesday, 17 January 2023 4:15:36 PM
Project: U:\301400272\technical\modelling\221130_Curlewis Street- Wellington Street.sip9

Site: 101 [Curlewis Street/ Wellington Street AM (Site Folder: Network: N101 [AM - Proposed)] Proposed (Network Folder: Proposed)]

New Site

Site Category: (None) Roundabout

Vehi	cle Mo	vement	Perfo	rmano	се									
Mov ID	Turn	DEMA FLOV [Total veh/h		ARRI FLO' [Total veh/h	WS HV]	Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. Que	EffectiveA Stop Rate	ver. No. Cycles	Aver. Speed km/h
Sout	hEast: 0	Curlewis S	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
Appr	oach	219	1.4	219	1.4	0.476	14.6	LOS B	3.8	26.7	0.93	1.03	1.09	41.1
North	nEast: V	Vellington	Street	t										
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
Appr	oach	688	8.0	688	8.0	0.679	6.2	LOS A	2.1	14.9	0.78	0.67	0.78	41.9
North	nWest: (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
Appr	oach	158	7.3	158	7.3	0.182	5.4	LOS A	1.3	9.0	0.49	0.53	0.49	45.1
Sout	hWest: \	Wellingto	n Stree	et										
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
Appr	oach	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 V	ehicles	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.

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

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

New Site

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

Vehi	cle Mo	vement	Perfo	rmano	e									
Mov ID	Turn	DEMA FLO\ [Total veh/h		ARRI FLO\ [Total veh/h	WS HV]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BA QUE [Veh. veh		Prop. Que	Effective A Stop Rate	ver. No. Cycles	Aver. Speed km/h
South	n: Wellir	ngton Str	eet											
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
Appro	oach	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	: Wellin	gton Stre	eet											
8	T1	688	8.0	688	8.0	0.699	5.0	LOS A	5.7	39.5	0.00	0.53	0.00	52.5
Appro	oach	688	8.0	688	8.0	0.699	5.0	LOSA	5.7	39.5	0.00	0.53	0.00	52.5
All Ve	hicles	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.

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

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

New Site

Site Category: (None) Roundabout

Vehi	cle Mo	vement	Perfo	rman	се									
Mov ID	Turn	DEMA FLOV [Total veh/h		ARRI FLO [Total veh/h	WS HV]	Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. Que	EffectiveA Stop Rate	ver. No. Cycles	Aver. Speed km/h
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
Appro	oach	148	1.4	148	1.4	0.275	10.0	LOS A	1.8	13.0	0.81	0.83	0.81	43.6
North	nEast: V	Vellington	Street	t										
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
Appro	oach	577	1.3	577	1.3	0.641	7.8	LOS A	2.1	14.9	0.81	0.76	0.86	40.7
North	nWest:	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
Appro	oach	214	0.5	214	0.5	0.239	5.6	LOS A	1.7	12.0	0.52	0.55	0.52	45.7
South	hWest:	Wellingto	n Stree	et										
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
Appro	oach	217	1.9	217	1.9	0.417	11.6	LOS A	2.9	20.1	0.85	0.96	0.92	39.8
	ehicles	1156	1.3	1156		0.641	8.4	LOSA	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.

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

Network: N101 [PM -Proposed (Network Folder: Proposed)1

New Site

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

Vehi	cle Mo	vement	Perfo	rmano	се									
Mov ID	Turn	DEMA FLO\ [Total veh/h		ARRI FLO' [Total veh/h	WS HV]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BA QUE [Veh. veh	ACK OF EUE Dist] m	Prop. Que	EffectiveA Stop Rate	ver. No. Cycles	Aver. Speed km/h
South	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
Appro	oach	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	: Wellir	gton Stre	eet											
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
Appro	oach	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 Ve	ehicles	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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Technical Note

To: Northrop Consulting Engineers

L11, 345 George Street

Sydney NSW 2000

Project/File: 301400272

From: Stantec Australia Pty Ltd

Carla Bradley, Helen Aberra, Brett

Maynard

Date: January 31, 2023

Version: A-Dr

Reference: Curlewis Street/ Campbell Parade - 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/ Campbell Parade intersection as part of the Waverley Streetscapes project.

The project proposes a new bicycle facility along Curlewis Street to enhance connectivity through the area. The proposed bi-directional cycleway runs along the northern kerb of Curlewis Street and ties into the Bondi Beach promenade at Campbell Parade. The right existing right turn bay out of Curlewis Street is removed, with the two-lane approach narrowed to one lane to accommodate the cycleway.

This technical note assesses the operational impact of the introduction of the cycleway and associated lane reduction against the existing intersection performance at the intersection of Curlewis Street/ Campbell Parade.

Traffic Volumes

Traffic counts at the study intersection were completed on the following days:

- Thursday 27 October 2022
 - o 7:30am to 9:30am
 - o 3:00pm to 6:00pm
- Saturday 29 October 2022
 - o 10:00am to 2:00pm

The weekday AM and PM peak hours were found to occur from 7:45am to 8:45am and 5:00pm to 6:00pm, respectively. The Saturday peak hour was observed to occur from 12:45pm to 1:45pm. Peak hour traffic volumes are summarised in Figure 1 to Figure 3, with full survey results contained in Attachment 1.



January 31, 2023 301400272 Page 2 of 6

Reference: Curlewis Street/ Campbell Parade Intersection - SIDRA Modelling

Campbell Parade

Figure 1: Existing AM peak hour traffic volumes

670

736 ↓
Campbell Parade

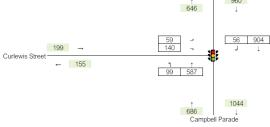
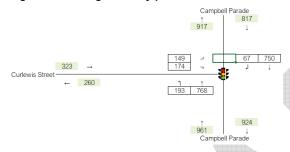


Figure 3: Existing Saturday peak hour traffic volumes



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
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	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

Design with community in mind

 $REF: tnote_230131_0272_curlew is_campbell_modelling_draft.docx$

January 31, 2023 301400272 Page 3 of 6

Reference: Curlewis Street/ Campbell Parade Intersection - SIDRA Modelling

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

Table 2: Existing operating conditions

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
	Campbell Parade (NE)	0.42	8	71	A
A 84	Curlewis Street (NW)	0.37	30	35	С
AM	Campbell Parade (SW)	0.37	12	61	A
	Overall	0.42	12	71	A
	Campbell Parade (NE)	0.27	11	47	A
PM	Curlewis Street (NW)	0.37	33	36	С
PIVI	Campbell Parade (SW)	0.36	12	66	A
	Overall	0.37	15	66	В
	Campbell Parade (NE)	0.37	10	66	A
Sat	Curlewis Street (NW)	0.54	33	47	С
Sat	Campbell Parade (SW)	0.53	17	109	В
	Overall	0.54	17	109	В

Based on the above assessment, the Curlewis Street/ Campbell Parade intersection currently operates satisfactorily at an overall level of service A during the AM peak and level of service B during the PM and Saturday peaks.

Proposed Intersection Layout

The project seeks to introduce a separated bi-directional cycleway along the northern kerb of Curlewis Street, with the existing right turn bay out of Curlewis Street to be removed. The proposed bi-directional cycleway will connect into the shared user path along Bondi Beach promenade.

Bicycle transition ramps will be provided along the Campbell Parade eastern kerb on the approach and departure to the intersection to connect with the existing southbound bicycle lane along Campbell Parade. The proposed ramps will allow southbound cyclists to access Curlewis Street westbound, and also cyclists travelling eastbound on Curlewis Street to access the southbound bicycle lane on Campbell Parade.

As per existing, the right turn from Campbell Parade northbound is not permitted. If required, a bicycle transition ramp could be added, with the existing seating area on the south-west corner to be removed.

The proposed layout is shown schematically in Figure 4.

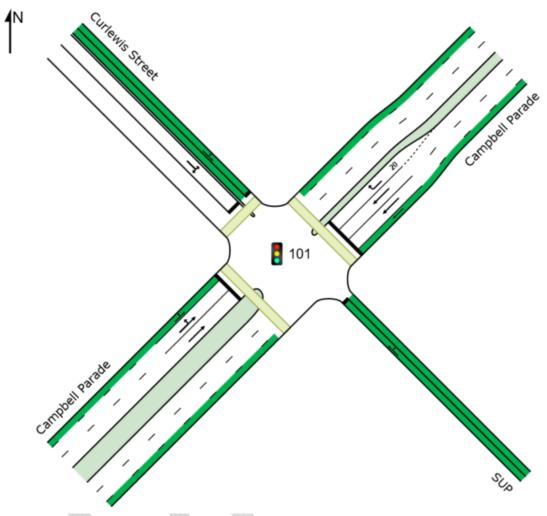
Design with community in mind

 $REF: tnote_230131_0272_curlew is_campbell_modelling_draft.docx$

January 31, 2023 301400272 Page 4 of 6

Reference: Curlewis Street/ Campbell Parade Intersection - SIDRA Modelling

Figure 4: Proposed intersection layout



The shared user path (SUP) is shown diagrammatically only, with the SUP running parallel to Campbell Parade in both directions. Bicycle transition ramps for the Campbell Parade southbound bicycle lane are not shown.

Traffic Impact

To determine the traffic impact of the introduction of the bi-directional cycleway a new bicycle only phase was introduced with the existing signal cycle length maintained.

It has been assumed that the proposed bi-directional cycleway will introduce additional cyclists into the area. As a result, the existing bicycle movements have been increased, with an additional 15 movements introduced on both Curlewis Street and the shared user path as follows:

- ten through movements from Curlewis Street to shared user path
- five left turn movements from Curlewis Street to Campbell Parade northbound
- ten through movements from the shared user path to Curlewis Street
- five right turn movements from the shared user path to Campbell Parade southbound.

Design with community in mind

 $REF: tnote_230131_0272_curlew is_campbell_modelling_draft.docx$

January 31, 2023 301400272 Page 5 of 6

Reference: Curlewis Street/ Campbell Parade Intersection - SIDRA Modelling

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

Table 3: Future operating conditions

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
	Shared User Path (SE)	0.06	38	2	С
	Campbell Parade (NE)	0.56	16	100	В
AM	Curlewis Street (NW)	0.47	32	52	С
	Campbell Parade (SW)	0.51	21	82	В
	Overall	0.56	20	100	В
	Shared User Path (SE)	0.06	44	2	D
	Campbell Parade (NE)	0.39	20	68	В
PM	Curlewis Street (NW)	0.48	34	63	С
	Campbell Parade (SW)	0.50	22	93	В
	Overall	0.50	23	93	В
	Shared User Path (SE)	0.08	44	2	D
	Campbell Parade (NE)	0.47	18	89	В
Sat	Curlewis Street (NW)	0.71	38	99	С
	Campbell Parade (SW)	0.73	28	144	В
	Overall	0.73	26	144	В

Under the proposed intersection changes the performance of the intersection in the AM peak period has reduced from level of service A to level of service B, with the PM and Saturday peaks continuing to operate at level of service B. The average delays have increased by eight to nine seconds, with queue lengths increased by approximately 30 metres.

These increases are considered acceptable with the overall intersection level of service continuing to be satisfactory, with spare capacity.

Notwithstanding the above, sensitivity testing was undertaken to understand the impact of increasing the signal cycle length to match the site and video observations¹. In all three peaks the degree of saturation for the intersection reduced with minor increases in average delay and queue lengths noted.

During the weekday PM peak and Saturday peak period, cyclists on the shared user path experience level of service D. This is largely related to cyclists being provided less than ten per cent of the total signal cycle time and being required to wait a full cycle. The average delays of approximately 40 seconds are less than the total cycle length indicating that all cyclists are able to proceed each phase. This is therefore satisfactory.

Design with community in mind

 $REF: tnote_230131_0272_curlew is_campbell_modelling_draft.docx$

¹ Refer to Attachment 2 SIDRA calibration notes for details.

January 31, 2023 301400272 Page 6 of 6

Reference: Curlewis Street/ Campbell Parade 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/ Campbell Parade currently operates satisfactorily, with an
 overall level of service A in the weekday AM peak period and level of service B in the weekday PM
 and Saturday peak periods.
- The introduction of the proposed bi-directional cycleway on Curlewis Street requires a new bicycle
 only signal phase and bicycle transition ramps on Campbell Parade eastern kerb to cater for
 connections to and from the proposed cycleway.
- The introduction of the bi-directional cycleway and associated bicycle only phase increases the
 intersection average delay by eight to nine seconds and queue lengths by approximately 30
 metres. These increases in average delay and queue lengths are considered acceptable, with no
 significant impact to overall intersection performance.
- In all three peak periods the proposed intersection layout is anticipated to operate at level of service B, representing a decrease in level of service for the weekday AM peak period only.

Attachment:

Attachment 1: Survey Results Attachment 2: SIDRA Outputs

REF: tnote_230131_0272_curlewis_campbell_modelling_draft.docx

January 31, 2023 301400272

Reference: Curlewis Street/ Campbell Parade Intersection – SIDRA Modelling

Attachment 1: Survey Results



Design with community in mind

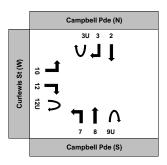
 $REF: tnote_230131_0272_curlew is_campbell_modelling_draft.docx$

Report Type: Classified Intersection Data - 60min
Geocounts Job ID: 1652913908893
n/a
Client Job Number: Stantec
Location: Bondi
Survey Site: ICO1 (Curlewis St/Campbell Pde)

Thursday, 27th October 2022

-33.889845, 151.2756523





AM Peak Hour:	7:45 to 8:45
PM Peak Hour:	17:00 to 18:00
AM Peak Hour Volume:	1,845
PM Peak Hour Volume:	1,556

Survey Date:

Site Coordinates:

Approach	Campbell Pde (N)						Campbell Pde (S)						Curlewis St (W)							1																				
Movement		Moven (Thro					ment 3 t Turn)				ment 3U Turn)				ement 7 ft Turn)			Move (Thr	ment 8 ough)				ment 9U Turn)			Mover (Left)			ment 12 it Turn)	2			nent 12U Furn)	l	A	LL MO	/EMENT	rs
Time Interval	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclis	s Total	Light	Heavy	Cyclist	S Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclist	Total	Light	Heavy	Cyclist	s Total	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total
7:30 to 8:30	867	39	19	925	44	2	4	50	0	0	0	0	98	2	0	100	487	35	10	532	0	0	0	0	48	7	3	58	141	10	4	155	0	0	0	0	1,685	95	40	1,820
7:45 to 8:45	847	40	17	904	53	2	1	56	0	0	0	0	98	1	0	99	534	38	15	587	0	0	0	0	49	7	3	59	128	10	2	140	0	0	0	0	1,709	98	38	1,845
8:00 to 9:00	787	36	17	840	54	2	0	56	0	0	0	0	113	2	0	115	561	35	14	610	0	0	0	0	58	2	2	62	122	10	1	133	0	0	0	0	1,695	87	34	1,816
8:15 to 9:15	730	34	14	778	54	3	0	57	0	0	0	0	113	2	1	116	578	35	12	625	0	0	0	0	70	2	1	73	124	7	1	132	0	0	0	0	1,669	83	29	1,781
8:30 to 9:30	670	30	6	706	58	2	0	60	0	0	0	0	129	2	1	132	548	36	11	595	0	0	0	0	81	1	1	83	120	7	1	128	0	0	0	0	1,606	78	20	1,704
15:00 to 16:00	553	43	5	601	50	3	0	53	0	0	0	0	133	4	3	140	465	27	1	493	1	0	0	1	66	4	0	70	141	4	1	146	0	0	0	0	1,409	85	10	1,504
15:15 to 16:15	562	45	6	613	48	2	0	50	0	0	0	0	118	2	3	123	469	32	3	504	1	0	0	1	73	4	0	77	132	3	1	136	0	0	0	0	1,403	88	13	1,504
15:30 to 16:30	539	43	4	586	56	1	0	57	1	0	0	1	113	2	1	116	491	32	3	526	1	0	0	1	71	2	0	73	133	3	1	137	0	0	0	0	1,405	83	9	1,497
15:45 to 16:45	513	37	4	554	56	1	0	57	1	0	0	1	109	1	1	111	486	30	4	520	1	0	0	1	69	0	0	69	125	2	2	129	0	0	0	0	1,360	71	11	1,442
16:00 to 17:00	496	36	3	535	41	1	0	42	1	0	0	1	96	0	0	96	485	24	7	516	1	0	0	1	72	0	0	72	115	0	1	116	0	0	0	0	1,307	61	11	1,379
16:15 to 17:15	484	31	4	519	49	2	0	51	1	0	0	1	103	1	0	104	505	18	8	531	1	0	0	1	81	0	0	81	115	0	1	116	0	0	0	0	1,339	52	13	1,404
16:30 to 17:30	492	33	5	530	41	3	0	44	0	0	0	0	113	1	0	114	515	22	8	545	0	0	0	0	92	0	0	92	124	0	1	125	0	0	0	0	1,377	59	14	1,450
16:45 to 17:45	502	31	6	539	35	7	0	42	1	0	0	1	121	1	0	122	549	22	8	579	0	0	0	0	92	0	0	92	133	0	0	133	0	0	0	0	1,433	61	14	1,508
17:00 to 18:00	499	29	8	536	45	7	0	52	1	0	0	1	124	1	0	125	576	23	12	611	1	0	0	1	96	0	0	96	133	0	1	134	0	0	0	0	1,475	60	21	1,556

Report Type: Pedestrian Data

Geocounts Job ID: 1652913908893

Client Job Number: n/a

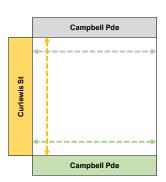
Client Name: Stantec

Location: Bondi

Survey Site: ICO1 (Curlewis St/Campbell Pde)

Survey Date: Thursday, 27th October 2022

Site Coordinates: -33.889845, 151.2756523



	North	South	West	Total				
Peds Crossing AM:	190	326	545	1,061				
Cyclists Crossing AM:	5	4	4	13				
Peds Crossing PM:	280	456	1,305	1,293				
Cyclists Crossing PM:	0	3	9	12				
Peak Hour Peds AM:	8:30 to 9:30							
Peak Hour Cyclists AM:	7:45 to 8:45							
Peak Hour Peds PM:	17:00 to 18:00							
Peak Hour Cyclists PM:	16:30 to 17:30							



15min Peds

	Leg		North	South	West	Total
7:30	to	7:45	31	49	38	118
7:45	to	8:00	27	38	45	110
8:00	to	8:15	36	40	51	127
8:15	to	8:30	21	47	74	142
8:30	to	8:45	22	39	80	141
8:45	to	9:00	23	46	75	144
9:00	to	9:15	17	28	89	134
9:15	to	9:30	13	39	93	145
15:00	to	15:15	9	28	104	141
15:15	to	15:30	21	29	117	167
15:30	to	15:45	33	16	114	163
15:45	to	16:00	15	43	101	159
16:00	to	16:15	16	59	104	179
16:15	to	16:30	25	29	105	159
16:30	to	16:45	17	34	110	161
16:45	to	17:00	26	22	116	164
17:00	to	17:15	30	39	106	175
17:15	to	17:30	27	50	110	187
17:30	to	17:45	39	49	125	213
17:45	to	18:00	22	58	93	173

60min Peds

	Leg	ı	North	South	West	Total
7:30	to	8:30	115	174	208	497
7:45	to	8:45	106	164	250	520
8:00	to	9:00	102	172	280	554
8:15	to	9:15	83	160	318	561
8:30	to	9:30	75	152	337	564
15:00	to	16:00	78	116	436	630
15:15	to	16:15	85	147	436	668
15:30	to	16:30	89	147	424	660
15:45	to	16:45	73	165	420	658
16:00	to	17:00	84	144	435	663
16:15	to	17:15	98	124	437	659
16:30	to	17:30	100	145	442	687
16:45	to	17:45	122	160	457	739
17:00	to	18:00	118	196	434	748

15min Cyclists

	Leg	ı	North	South	West	Total
7:30	to	7:45	1	0	0	1
7:45	to	8:00	2	1	1	4
8:00	to	8:15	0	3	0	3
8:15	to	8:30	1	0	1	2
8:30	to	8:45	1	0	2	3
8:45	to	9:00	0	0	0	0
9:00	to	9:15	0	0	0	0
9:15	to	9:30	0	0	0	0
15:00	to	15:15	0	0	1	1
15:15	to	15:30	0	0	2	2
15:30	to	15:45	0	0	0	0
15:45	to	16:00	0	0	2	2
16:00	to	16:15	0	0	1	1
16:15	to	16:30	0	2	1	3
16:30	to	16:45	0	0	1	1
16:45	to	17:00	0	0	0	0
17:00	to	17:15	0	0	1	1
17:15	to	17:30	0	1	0	1
17:30	to	17:45	0	0	0	0
17:45	to	18:00	0	0	0	0

60min Cyclists

	Leg		North	South	West	Total
7:30	to	8:30	4	4	2	10
7:45	to	8:45	4	4	4	12
8:00	to	9:00	2	3	3	8
8:15	to	9:15	2	0	3	5
8:30	to	9:30	1	0	2	3
15:00	to	16:00	0	0	5	5
15:15	to	16:15	0	0	5	5
15:30	to	16:30	0	2	4	6
15:45	to	16:45	0	2	5	7
16:00	to	17:00	0	2	3	5
16:15	to	17:15	0	2	3	5
16:30	to	17:30	0	1	2	3
16:45	to	17:45	0	1	1	2
17:00	to	18:00	0	1	1	2

1

Waverley Traffic Committee 23 February 2023

Report Type: Classified Intersection Data - 60min

Geocounts Job ID: 1652913908893

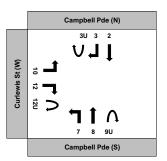
Client Job Number: n/a
Client Name: Stantec

 Survey Site:
 IC01 (Curlewis St/Campbell Pde)

 Survey Date:
 Saturday, 29th October 2022

 Site Coordinates:
 -33.889845, 151.2756523

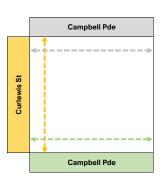




Peak Hour SAT:	12:45 to 13:45
Peak Hour Volume SAT:	2,103

Approach					C	Campbe	II Pde ((N)									(Campbe	ell Pde (S)									-	Curlew	is St (W)								
Movement			ment 2 ough)				ment 3 t Turn)			Movem (U T					ment 7 Turn)				ment 8 ough)				ment 9U Turn)			Mover (Left	nent 10 Turn)				nent 12 t Turn)				nent 12U Turn)	l	A	LL MO	/EMENT	rs
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	Light	Heavy	Cyclists	Total	Light	Heavy	Cyclists	Total
10:00 to 11:00	648	32	18	698	73	3	0	76	0	0	0	0	192	6	0	198	598	28	18	644	1	0	0	1	119	1	2	122	136	4	1	141	0	0	0	0	1,767	74	39	1,880
10:15 to 11:15	626	36	18	680	71	3	0	74	0	0	0	0	171	5	1	177	601	27	21	649	1	0	0	1	139	1	1	141	133	5	2	140	0	0	0	0	1,742	77	43	1,862
10:30 to 11:30	633	32	16	681	74	3	1	78	0	0	0	0	178	6	1	185	606	27	16	649	1	0	0	1	138	0	4	142	135	6	3	144	0	0	0	0	1,765	74	41	1,880
10:45 to 11:45	637	29	11	677	76	3	1	80	0	0	0	0	184	7	2	193	613	25	14	652	1	0	0	1	134	1	5	140	150	7	5	162	0	0	0	0	1,795	72	38	1,905
11:00 to 12:00	616	29	13	658	77	3	1	81	2	0	0	2	178	7	2	187	647	21	22	690	1	0	0	1	141	1	5	147	163	8	5	176	0	0	0	0	1,825	69	48	1,942
11:15 to 12:15	636	26	12	674	75	2	1	78	2	0	0	2	193	7	1	201	664	27	27	718	1	0	0	1	141	2	6	149	159	7	4	170	1	0	0	1	1,872	71	51	1,994
11:30 to 12:30	623	26	12	661	79	2	0	81	2	0	0	2	185	6	1	192	676	28	35	739	1	0	0	1	148	4	4	156	159	6	3	168	1	0	0	1	1,874	72	55	2,001
11:45 to 12:45	621	26	11	658	87	1	1	89	3	0	0	3	191	4	3	198	675	27	34	736	0	0	0	0	158	4	5	167	160	5	0	165	1	0	0	1	1,896	67	54	2,017
12:00 to 13:00	642	22	10	674	79	1	1	81	1	0	0	1	204	6	3	213	667	30	32	729	0	0	0	0	149	5	4	158	151	3	0	154	1	0	0	1	1,894	67	50	2,011
12:15 to 13:15	663	23	12	698	77	1	1	79	2	0	0	2	190	5	4	199	695	28	26	749	0	0	0	0	148	4	5	157	175	6	0	181	0	0	0	0	1,950	67	48	2,065
12:30 to 13:30	693	29	12	734	73	2	1	76	2	0	0	2	183	5	5	193	705	27	21	753	1	0	0	1	140	2	5	147	173	5	2	180	0	0	0	0	1,970	70	46	2,086
12:45 to 13:45	706	30	14	750	62	2	3	67	1	0	0	1	183	6	4	193	717	26	25	768	1	0	0	1	143	2	4	149	164	5	5	174	0	0	0	0	1,977	71	55	2,103
13:00 to 14:00	715	31	10	756	72	2	3	77	1	0	0	1	161	5	4	170	694	27	21	742	2	0	0	2	163	1	5	169	160	6	7	173	0	0	0	0	1,968	72	50	2,090

Report Type: Pedestrian Data Geocounts Job ID: 1652913908893 Client Job Number: Client Name: Stantec Bondi IC01 (Curlewis St/Campbell Pde) Saturday, 29th October 2022 Site Coordinates: -33.889845, 151.2756523





	North	South	West	Total
Peds Crossing SAT:	1,530	2,212	6,183	9,925
Cyclists Crossing SAT:	6	7	23	36
Peak Hour Peds SAT:		11:00 t	o 12:00	
Peak Hour Cyclists SAT:		12:00 t	o 13:00	

15min Peds

	Leg		North	South	West	Total
10:00	to	10:15	53	56	235	344
10:15	to	10:30	44	115	286	445
10:30	to	10:45	92	64	294	450
10:45	to	11:00	103	92	357	552
11:00	to	11:15	86	109	325	520
11:15	to	11:30	61	124	394	579
11:30	to	11:45	88	135	364	587
11:45	to	12:00	90	181	414	685
12:00	to	12:15	77	155	384	616
12:15	to	12:30	88	138	475	701
12:30	to	12:45	114	169	422	705
12:45	to	13:00	137	168	454	759
13:00	to	13:15	131	168	496	795
13:15	to	13:30	116	176	475	767
13:30	to	13:45	151	160	378	689
13:45	to	14:00	99	202	430	731

60m	iin F	Peds				
	Leg		North	South	West	Total
10:00	to	11:00	292	327	1,172	1,791
10:15	to	11:15	378	380	1,262	2,020
10:30	to	11:30	342	389	1,370	2,101
10:45	to	11:45	338	460	1,440	2,238
11:00	to	12:00	325	549	1,497	2,371
11:15	to	12:15	316	595	1,556	2,467
11:30	to	12:30	343	609	1,637	2,589
11:45	to	12:45	369	643	1,695	2,707
12:00	to	13:00	416	630	1,735	2,781
12:15	to	13:15	470	643	1,847	2,960
12:30	to	13:30	498	681	1,847	3,026
12:45	to	13:45	535	672	1,803	3,010
13:00	to	14:00	497	706	1,779	2,982

15min Cyclists

10111111	yclists				
Le	g	North	South	West	Total
10:00 to	10:15	0	0	2	2
10:15 to	10:30	0	1	0	1
10:30 to	10:45	0	0	0	0
10:45 to	11:00	0	0	1	1
11:00 to	11:15	0	1	4	5
11:15 to	11:30	2	0	2	4
11:30 to	11:45	0	0	1	1
11:45 to	12:00	0	0	2	2
12:00 to	12:15	0	1	3	4
12:15 to	12:30	1	1	0	2
12:30 to	12:45	1	1	3	5
12:45 to	13:00	0	1	2	3
13:00 to	13:15	2	0	0	2
13:15 to	13:30	0	0	2	2
13:30 to	13:45	0	1	0	1
13:45 to	14:00	0	0	1	1

60min Cyclists

	Leg		North	South	West	Total
10:00	to	11:00	0	1	3	4
10:15	to	11:15	0	2	5	7
10:30	to	11:30	2	1	7	10
10:45	to	11:45	2	1	8	11
11:00	to	12:00	2	1	9	12
11:15	to	12:15	2	1	8	11
11:30	to	12:30	1	2	6	9
11:45	to	12:45	2	3	8	13
12:00	to	13:00	2	4	8	14
12:15	to	13:15	4	3	5	12
12:30	to	13:30	3	2	7	12
12:45	to	13:45	2	2	4	8
13:00	to	14:00	2	1	3	6
						•

January 31, 2023 301400272

Reference: Curlewis Street/ Campbell Parade Intersection – SIDRA Modelling

Attachment 2: SIDRA Calibration and Outputs



Design with community in mind

 $REF: tnote_230131_0272_curlew is_campbell_modelling_draft.docx$

January 31, 2023 301400272

Reference: Curlewis Street/ Campbell Parade Intersection - SIDRA Modelling

Existing Models Calibration

A site inspection was undertaken during the PM peak on Thursday 27 October, with key observations on phase times, user behaviour and general operation used to inform the calibration of the existing SIDRA models. In addition to site observations, review of video footage and TfNSW Interpreted SCATS history files² were used to confirm signal phasing and operation.

The following observations were made and used in the calibration of the existing SIDRA models:

- Average phase cycle times were between 80 to 100 seconds, with A Phase (Campbell Parade) observed to be given 60-70 per cent of the cycle phase. The site and video observations indicate typically longer cycle times by around ten seconds, notwithstanding, the SCATS history file cycle times were adopted.
- B phase generally operated approximately 25 per cent of the time (i.e. once every four cycles) and accounted for less than five seconds of the average cycle length.
 - To incorporate this into the SIDRA model it was assumed B phase ran every cycle with the maximum and minimum green times, along with the yellow and all-red times reduced to reflect the average phase length. Additionally, the start loss for the right turn was reduced to reflect the shortened phase time.
 - For the PM peak period where B phase had an average length of one second a dummy movement was introduced with all movements stopped.
- The left turn from Campbell Parade into Curlewis Street had a red arrow at the start of C phase, with a low volume of vehicles observed to turn left in this phase.
 - Due to conflicts in SIDRA, this left turn movement was removed from C Phase.
- Vehicles turning into Campbell Parade were observed to turn evenly into the available lanes.
 - o The lane movement flow proportions were adjusted accordingly.

Design with community in mind

REF: tnote_230131_0272_curlewis_campbell_modelling_draft.docx

² Due to a system error SCATS data for the intersection count survey dates were unavailable, as such data files from 2 June 2022 and 4 June 2022 were used for calibration.

SITE LAYOUT

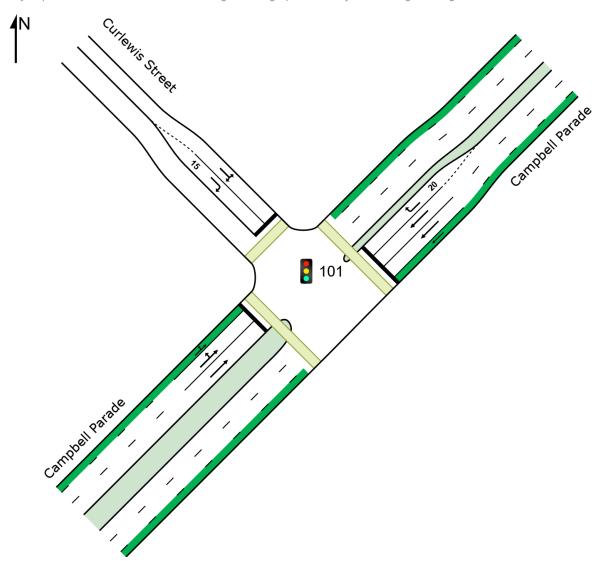
Site: 101 [Campbell Parade/ Curlewis Street AM (Site Folder:

Existing)]

New Site

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



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Project: \\Au2019-ppfss01\shared_projects\\301400272\technical\modelling\\230125_Campbell Parade-Curlewis Street.sip9

MOVEMENT SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street AM (Site Folder:

Existing)]

New Site

Site Category: (None)

Vehi	cle M	ovemen	t Perfor	mance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM. FLO [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. I Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
North	nEast:	Campbel			/0	V/C	<u> </u>		ven	- '''				KIII/II
8	T1	904	40	952	4.4	0.424	8.0	LOSA	9.8	71.0	0.54	0.47	0.54	36.7
9	R2	56	2	59	3.6	* 0.144	15.5	LOS B	1.3	9.2	0.61	0.66	0.61	34.2
Appr	oach	960	42	1011	4.4	0.424	8.4	LOSA	9.8	71.0	0.54	0.48	0.54	36.5
North	west:	Curlewis	Street											
10	L2	59	7	62	11.9	0.144	28.9	LOS C	2.0	14.5	0.81	0.71	0.81	30.1
12	R2	140	10	147	7.1	* 0.369	30.4	LOS C	4.7	35.3	0.86	0.76	0.86	30.1
Appr	oach	199	17	209	8.5	0.369	30.0	LOS C	4.7	35.3	0.85	0.75	0.85	30.1
South	nWest	Campbe	ell Parade	Э										
1	L2	99	1	104	1.0	* 0.365	16.0	LOS B	7.9	57.9	0.64	0.60	0.64	34.9
2	T1	587	38	618	6.5	0.365	11.8	LOSA	8.2	60.6	0.62	0.56	0.62	35.2
Appr	oach	686	39	722	5.7	0.365	12.4	LOSA	8.2	60.6	0.62	0.56	0.62	35.1
All Vehic	cles	1845	98	1942	5.3	0.424	12.2	LOSA	9.8	71.0	0.60	0.54	0.60	35.2

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.

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.

* Critical Movement (Signal Timing)

Ре	destrian N	/lovem	ent Perf	ormano	се							
Mo ID	v Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE QUE	UE	Prop. Et Que	fective Stop	Travel Time	Travel Dist. S	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m		Rate	sec	m	m/sec
Noi	rthEast: Ca	mpbell F	Parade									
P3	Full	106	112	34.4	LOS D	0.2	0.2	0.93	0.93	204.8	221.6	1.08
Noi	rthWest: Cu	ırlewis S	Street									
P4	Full	250	263	34.6	LOS D	0.6	0.6	0.94	0.94	198.1	212.6	1.07
Sou	uthWest: Ca	ampbell	Parade									
P1	Full	164	173	34.5	LOS D	0.4	0.4	0.93	0.93	205.1	221.8	1.08
All Ped	destrians	520	547	34.5	LOS D	0.6	0.6	0.93	0.93	201.7	217.3	1.08

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.

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Project: \\Au2019-ppfss01\shared_projects\\301400272\technical\modelling\\230125_Campbell Parade-Curlewis Street.sip9

PHASING SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street AM (Site Folder:

Existing)

New Site

Site Category: (None)

Timings based on settings in the Site Phasing & Timing dialog Phase Times determined by the program Phase Sequence: Leading Right Turn Reference Phase: Phase A

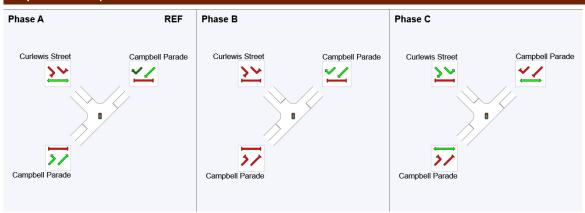
Input Phase Sequence: A, B, C Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	Α	В	С
Phase Change Time (sec)	0	49	56
Green Time (sec)	43	1	22
Phase Time (sec)	49	3	28
Phase Split	61%	4%	35%

See the Timing Analysis 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, Minor 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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Project: \\Au2019-ppfss01\shared_projects\\301400272\technical\modelling\\230125_Campbell Parade-Curlewis Street.sip9

MOVEMENT SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street PM (Site Folder:

Existing)]

New Site

Site Category: (None)

Vehi	cle M	ovemen	t Perfor	mance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM, FLO [Total veh/h		Deg. Satn v/c		Level of Service		ACK OF EUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
North	nEast:	Campbel	l Parade											
8	T1	536	29	564	5.4	0.274	10.0	LOSA	6.4	46.8	0.53	0.45	0.53	36.0
9 Appro	R2 oach	52 588	7 36	55 619	13.5 6.1	0.182 0.274	20.3	LOS B	1.5 6.4	11.7 46.8	0.64	0.67 0.47	0.64	32.9 35.7
North	nWest:	Curlewis	Street											
10	L2	96	0	101	0.0	0.216	32.1	LOS C	3.6	24.8	0.83	0.74	0.83	29.7
12	R2	134	0	141	0.0	* 0.373	33.8	LOS C	5.1	35.7	0.86	0.76	0.86	29.3
Appro	oach	230	0	242	0.0	0.373	33.1	LOS C	5.1	35.7	0.85	0.75	0.85	29.4
South	nWest	Campbe	II Parade	Э										
1	L2	125	1	132	8.0	* 0.360	15.3	LOS B	8.9	63.5	0.59	0.59	0.59	35.1
2	T1	611	23	643	3.8	0.360	11.1	LOSA	9.2	66.3	0.58	0.53	0.58	35.4
Appro	oach	736	24	775	3.3	0.360	11.8	LOSA	9.2	66.3	0.58	0.54	0.58	35.3
All Vehic	cles	1554	60	1636	3.9	0.373	14.6	LOS B	9.2	66.3	0.60	0.54	0.60	34.4

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.

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.

* Critical Movement (Signal Timing)

Ре	destrian N	/lovem	ent Perf	ormano	ce							
Mo ID	v Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE QUE	UE	Prop. Et Que	fective Stop	Travel Time	Travel Dist. S	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m		Rate	sec	m	m/sec
Noi	thEast: Ca	mpbell F	Parade									
P3	Full	118	124	39.4	LOS D	0.3	0.3	0.94	0.94	209.9	221.6	1.06
Noi	thWest: Cu	ırlewis S	Street									
P4	Full	434	457	40.0	LOS D	1.1	1.1	0.95	0.95	203.5	212.6	1.04
Sou	uthWest: Ca	ampbell	Parade									
P1	Full	196	206	39.5	LOS D	0.5	0.5	0.94	0.94	210.2	221.8	1.06
All Ped	destrians	748	787	39.8	LOS D	1.1	1.1	0.95	0.95	206.2	216.4	1.05

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.

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Project: \\Au2019-ppfss01\shared_projects\\301400272\technical\modelling\\230125_Campbell Parade-Curlewis Street.sip9

PHASING SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street PM (Site Folder:

Existing)]

New Site

Site Category: (None)

Timings based on settings in the Site Phasing & Timing dialog Phase Times determined by the program Phase Sequence: Leading Right Turn Reference Phase: Phase A

Input Phase Sequence: A, B, C Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	Α	В	С
Phase Change Time (sec)	0	58	64
Green Time (sec)	52	***	25
Phase Time (sec)	58	1	31
Phase Split	64%	1%	34%

See the Timing Analysis 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, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

*** No green time has been calculated for this phase because the next phase starts during its intergreen time. This occurs with overlap phasing where there is no single movement connecting this phase to the next, or where the only such movement is a dummy movement with zero minimum green time specified. If a green time is required for this phase, specify a dummy movement with a non-zero minimum green time.

Output Phase Sequence Phase A REF Curlewis Street Campbell Parade Curlewis Street Campbell Parade Campbell Parade Campbell Parade Campbell Parade Campbell Parade

REF: Reference Phase VAR: Variable Phase



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MOVEMENT SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street Sat (Site Folder:

Existing)]

New Site

Site Category: (None)

Vehi	cle M	ovemen	t Perfor	mance										
Mov ID	Turn	INP VOLU	IMES	DEM. FLO	WS	Deg. Satn		Level of Service	QUE	ACK OF EUE	Prop. Que	Effective Stop	Aver. No.	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m		Rate	Cycles	km/h
North	East:	Campbel	l Parade											
8	T1	750	30	789	4.0	0.367	9.1	LOSA	9.1	66.1	0.52	0.46	0.52	36.3
9	R2	67	2	71	3.0	* 0.218	23.4	LOS B	2.2	15.2	0.73	0.71	0.73	31.7
Appro	oach	817	32	860	3.9	0.367	10.3	LOSA	9.1	66.1	0.54	0.48	0.54	35.8
North	West:	Curlewis	Street											
10	L2	149	2	157	1.3	0.477	33.1	LOS C	5.9	40.1	0.86	0.76	0.86	29.2
12	R2	174	5	183	2.9	* 0.543	33.7	LOS C	6.6	47.1	0.87	0.77	0.87	29.3
Appro	oach	323	7	340	2.2	0.543	33.4	LOS C	6.6	47.1	0.87	0.77	0.87	29.3
South	nWest	Campbe	ell Parade	e										
1	L2	193	6	203	3.1	* 0.530	20.9	LOS B	14.3	102.6	0.75	0.70	0.75	33.1
2	T1	768	26	808	3.4	0.530	16.3	LOS B	15.1	109.0	0.72	0.65	0.72	33.6
Appro	oach	961	32	1012	3.3	0.530	17.2	LOS B	15.1	109.0	0.73	0.66	0.73	33.5
All Vehic	eles	2101	71	2212	3.4	0.543	17.0	LOS B	15.1	109.0	0.68	0.61	0.68	33.6

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.

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.

* Critical Movement (Signal Timing)

Mο\		Input	Dem.	Aver.	Level of	AVERAGE	BACK OF	Prop. Ef	fective	Travel	Travel	Aver.
ID	Crossing	Vol.	Flow	Delay	Service	QUE [Ped	:UE Dist]	Que	Stop Rate	Time	Dist. S	Speed
		ped/h	ped/h	sec		ped	m ¯			sec	m	m/sec
Nor	thEast: Ca	mpbell F	Parade									
РЗ	Full	535	563	40.1	LOS E	1.4	1.4	0.96	0.96	210.6	221.6	1.05
Nor	thWest: Cเ	ırlewis S	Street									
P4	Full	1803	1898	42.6	LOS E	4.9	4.9	1.01	1.01	206.1	212.6	1.03
Sou	ıthWest: C	ampbell	Parade									
P1	Full	672	707	40.4	LOS E	1.7	1.7	0.96	0.96	211.0	221.8	1.05
All Ped	lestrians	3010	3168	41.6	LOSE	4.9	4.9	0.99	0.99	208.0	216.3	1.04

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.

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Project: \\Au2019-ppfss01\shared_projects\\301400272\technical\modelling\\230125_Campbell Parade-Curlewis Street.sip9

PHASING SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street Sat (Site Folder:

Existing)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog Phase Times determined by the program Phase Sequence: Leading Right Turn Reference Phase: Phase A

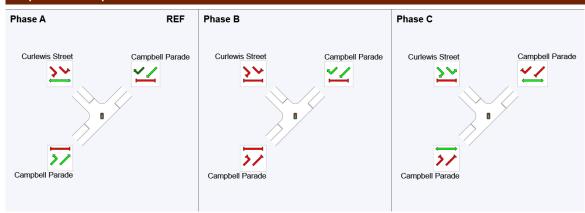
Input Phase Sequence: A, B, C Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	Α	В	С
Phase Change Time (sec)	0	52	61
Green Time (sec)	46	3	26
Phase Time (sec)	52	6	32
Phase Split	58%	7%	36%

See the Timing Analysis 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, Minor 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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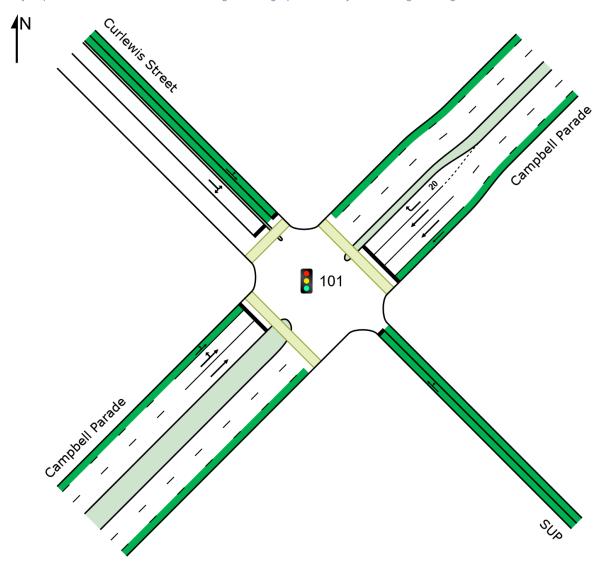
SITE LAYOUT

Site: 101 [Campbell Parade/ Curlewis Street AM (Site Folder:

New Site

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



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MOVEMENT SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street AM (Site Folder:

Future)]

New Site

Site Category: (None)

Vehi	cle M	ovemen	t Perfor	mance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM/ FLO [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh	ACK OF EUE Dist] m	Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Sout	hEast:	SUP												
22 23	T1 R2	11 5	0	12	0.0	* 0.060 0.060	37.6	LOS C	0.6	1.7	0.96 0.96	0.65 0.65	0.96 0.96	22.9
Appr		16	0	5 17	0.0	0.060	39.5 38.2	LOS C	0.6	1.7 1.7	0.96	0.65	0.96	23.1
North	nEast:	Campbel	l Parade											
8	T1 R2	904 55	40 2	952 58	4.4 3.6	0.556 * 0.195	15.8 26.5	LOS B LOS B	13.8 1.8	100.0 12.7	0.75 0.81	0.65 0.72	0.75 0.81	34.0 31.1
Appr		959	42	1009	4.4	0.556	16.4	LOS B	13.8	100.0	0.75	0.66	0.75	33.8
North	nWest:	Curlewis	Street											
10 28	L2 T1	64 12	7	67 13	10.9 0.0	0.472	32.5 36.8	LOS C	7.0 0.8	52.3 2.0	0.91	0.77 0.65	0.91	29.3 23.0
12 Appr	R2 oach	138 214	10 17	145 225	7.2 7.9	* 0.472 0.472	31.6 32.2	LOS C	7.0	52.3 52.3	0.90	0.79	0.90	29.9
South	hWest:	Campbe	ell Parade	;										
1 2	L2 T1	99 587	1 38	104 618	1.0 6.5	* 0.511 0.511	25.1 20.7	LOS B LOS B	10.4 11.1	75.7 82.4	0.83 0.82	0.74 0.71	0.83 0.82	32.1 32.4
Appr	oach	686	39	722	5.7	0.511	21.3	LOS B	11.1	82.4	0.82	0.71	0.82	32.3
All Vehic	cles	1875	98	1974	5.2	0.556	20.2	LOS B	13.8	100.0	0.80	0.69	0.80	32.6

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.

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.

* Critical Movement (Signal Timing)

Pe	destrian N	lovem	ent Perf	ormano	e							
Mo ID	v Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of a Service	AVERAGE QUE [Ped	BACK OF EUE Dist]	Prop. Ef Que	fective Stop Rate	Travel Time	Travel Dist. S	Aver. Speed
		ped/h	ped/h	sec		ped	m m		Trate	sec	m	m/sec
Noi	rthEast: Ca	mpbell l	Parade									
P3	Full	106	112	34.4	LOS D	0.2	0.2	0.93	0.93	204.8	221.6	1.08
Noi	rthWest: Cเ	ırlewis S	Street									
P4	Full	250	263	34.6	LOS D	0.6	0.6	0.94	0.94	198.3	212.8	1.07
Sou	uthWest: Ca	ampbell	Parade									
P1	Full	164	173	34.5	LOS D	0.4	0.4	0.93	0.93	205.1	221.8	1.08
All Ped	destrians	520	547	34.5	LOS D	0.6	0.6	0.93	0.93	201.8	217.4	1.08

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.

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PHASING SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street AM (Site Folder:

Future)]

New Site

Site Category: (None)

Timings based on settings in the Site Phasing & Timing dialog Phase Times determined by the program

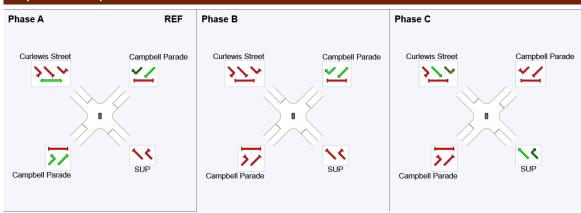
Phase Times determined by the progr Phase Sequence: Leading Right Turn Reference Phase: Phase A Input Phase Sequence: A, B, C, D Output Phase Sequence: A, B, C, D

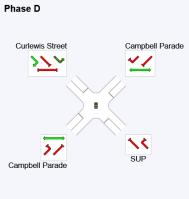
Phase Timing Summary

Phase	Α	В	С	D
Phase Change Time (sec)	0	37	44	52
Green Time (sec)	31	1	6	22
Phase Time (sec)	37	3	12	28
Phase Split	46%	4%	15%	35%

See the Timing Analysis 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, Minor 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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Project: \\Au2019-ppfss01\shared_projects\\301400272\technical\modelling\\230125_Campbell Parade-Curlewis Street.sip9

MOVEMENT SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street PM (Site Folder:

Future)]

New Site

Site Category: (None)

Vehi	cle M	ovemen	t Perfor	mance										
Mov ID	Turn	INP VOLU		DEM. FLO [Total		Deg. Satn		Level of Service	95% BA QUE [Veh.		Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	veh/h	veh/h	%	v/c	sec		veh	m m		rtate	Cycles	km/h
South	hEast:	SUP												
22	T1	10	0	11	0.0	* 0.064	43.1	LOS D	0.7	1.8	0.96	0.65	0.96	22.1
23	R2	5	0	5	0.0	0.064	45.0	LOS D	0.7	1.8	0.96	0.65	0.96	22.3
Appro	oach	15	0	16	0.0	0.064	43.7	LOS D	0.7	1.8	0.96	0.65	0.96	22.2
North	nEast:	Campbel	l Parade											
8	T1	536	29	564	5.4	0.389	19.0	LOS B	9.2	67.8	0.72	0.61	0.72	33.1
9	R2	52	7	55	13.5	0.276	34.0	LOS C	2.0	15.9	0.84	0.74	0.84	29.3
Appro	oach	588	36	619	6.1	0.389	20.3	LOS B	9.2	67.8	0.73	0.62	0.73	32.7
North	nWest:	Curlewis	Street											
10	L2	101	0	106	0.0	* 0.482	33.6	LOS C	9.0	62.7	0.89	0.79	0.89	29.2
28	T1	11	0	12	0.0	0.041	42.0	LOS C	0.7	1.9	0.96	0.64	0.96	22.3
12	R2	133	0	140	0.0	0.482	33.0	LOS C	9.0	62.7	0.88	0.79	0.88	29.5
Appro	oach	245	0	258	0.0	0.482	33.6	LOS C	9.0	62.7	0.89	0.78	0.89	29.0
South	hWest:	Campbe	II Parade)										
1	L2	125	1	132	0.8	* 0.498	25.3	LOS B	12.0	85.7	0.80	0.73	0.80	32.0
2	T1	611	23	643	3.8	0.498	20.9	LOS B	12.8	92.9	0.78	0.69	0.78	32.4
Appro	oach	736	24	775	3.3	0.498	21.6	LOS B	12.8	92.9	0.79	0.70	0.79	32.3
All Vehic	cles	1584	60	1667	3.8	0.498	23.2	LOS B	12.8	92.9	0.78	0.68	0.78	31.7

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.

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.

* Critical Movement (Signal Timing)

Mov	Input	Dem.	Aver.	Level of A	AVERAGE	BACK OF	Prop. Et	fective	Travel	Travel	Aver.
ID Crossing	Vol.	Flow	Delay	Service	QUE [Ped	:UE Dist]	Que	Stop Rate	Time	Dist. S	Speed
	ped/h	ped/h	sec		ped	m ¯			sec	m	m/sec
NorthEast: Ca	mpbell F	Parade									
P3 Full	118	124	39.4	LOS D	0.3	0.3	0.94	0.94	209.9	221.6	1.06
NorthWest: C	urlewis S	Street									
P4 Full	434	457	40.0	LOS D	1.1	1.1	0.95	0.95	203.7	212.8	1.04
SouthWest: C	ampbell	Parade									
P1 Full	196	206	39.5	LOS D	0.5	0.5	0.94	0.94	210.2	221.8	1.06
All Pedestrians	748	787	39.8	LOS D	1.1	1.1	0.95	0.95	206.3	216.5	1.05

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.

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Project: \\Au2019-ppfss01\shared_projects\\301400272\technical\modelling\\230125_Campbell Parade-Curlewis Street.sip9

PHASING SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street PM (Site Folder:

Future)]

New Site

Site Category: (None)

Timings based on settings in the Site Phasing & Timing dialog Phase Times determined by the program Phase Sequence: Leading Right Turn Reference Phase: Phase A B C D

Reference Phase: Phase A Input Phase Sequence: A, B, C, D Output Phase Sequence: A, B, C, D

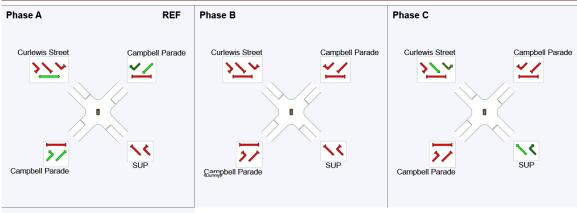
Phase Timing Summary

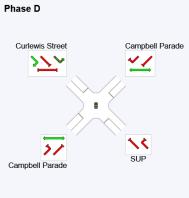
Phase	Α	В	С	D
Phase Change Time (sec)	0	44	50	57
Green Time (sec)	38	***	6	27
Phase Time (sec)	44	1	12	33
Phase Split	49%	1%	13%	37%

See the Timing Analysis 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, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

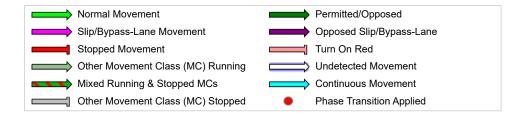
*** No green time has been calculated for this phase because the next phase starts during its intergreen time. This occurs with overlap phasing where there is no single movement connecting this phase to the next, or where the only such movement is a dummy movement with zero minimum green time specified. If a green time is required for this phase, specify a dummy movement with a non-zero minimum green time.

Output Phase Sequence





REF: Reference Phase VAR: Variable Phase



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Project: \\Au2019-ppfss01\shared_projects\\301400272\technical\modelling\\230125_Campbell Parade-Curlewis Street.sip9

MOVEMENT SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street Sat (Site Folder:

Future)]

New Site

Site Category: (None)

Vehi	icle M	ovemen	t Perfor	mance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM. FLO [Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [Veh. veh		Prop. E Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Sout	hEast:	SUP												
22	T1	13	0	14	0.0	* 0.075	43.1	LOS D	0.8	2.1	0.97	0.66	0.97	22.1
23	R2	5	0	5	0.0	0.075	45.0	LOS D	0.8	2.1	0.97	0.66	0.97	22.3
Appr	oach	18	0	19	0.0	0.075	43.6	LOS D	0.8	2.1	0.97	0.66	0.97	22.2
North	nEast:	Campbell	l Parade											
8	T1	750	30	789	4.0	0.468	16.6	LOS B	12.3	89.1	0.70	0.61	0.70	33.8
9	R2	64	2	67	3.1	* 0.276	36.9	LOS C	2.7	19.1	0.90	0.75	0.90	28.6
Appr	oach	814	32	857	3.9	0.468	18.2	LOS B	12.3	89.1	0.72	0.62	0.72	33.3
North	nWest:	Curlewis	Street											
10	L2	154	2	162	1.3	0.715	38.4	LOS C	13.8	98.6	0.97	0.86	1.01	28.1
28	T1	15	0	16	0.0	0.062	42.2	LOS C	1.0	2.8	0.96	0.66	0.96	22.2
12	R2	169	5	178	3.0	* 0.715	38.0	LOS C	13.8	98.6	0.97	0.87	1.02	28.4
Appr	oach	338	7	356	2.1	0.715	38.4	LOS C	13.8	98.6	0.97	0.85	1.01	27.9
Sout	hWest:	Campbe	II Parade	Э										
1	L2	193	6	203	3.1	* 0.725	31.9	LOS C	18.1	130.2	0.93	0.84	0.95	30.1
2	T1	768	26	808	3.4	0.725	26.8	LOS B	19.9	143.7	0.92	0.82	0.93	30.7
Appr	oach	961	32	1012	3.3	0.725	27.9	LOS B	19.9	143.7	0.92	0.82	0.93	30.6
All Vehic	cles	2131	71	2243	3.3	0.725	26.0	LOS B	19.9	143.7	0.85	0.75	0.86	31.0

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.

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.

* Critical Movement (Signal Timing)

Mov _	Input	Dem.	Aver.	Level of A	AVERAGE	BACK OF	Prop. Et	fective	Travel	Travel	Aver.
ID Crossing	Vol.	Flow	Delay	Service	QUE [Ped	UE Dist]	Que	Stop Rate	Time	Dist. S	Speed
	ped/h	ped/h	sec		ped	m ¯			sec	m	m/sec
NorthEast: C	ampbell f	Parade									
P3 Full	535	563	40.1	LOS E	1.4	1.4	0.96	0.96	210.6	221.6	1.05
NorthWest: C	urlewis S	Street									
P4 Full	1803	1898	42.6	LOS E	4.9	4.9	1.01	1.01	206.3	212.8	1.03
SouthWest: 0	Campbell	Parade									
P1 Full	672	707	40.4	LOS E	1.7	1.7	0.96	0.96	211.0	221.8	1.05
All Pedestrians	3010	3168	41.6	LOS E	4.9	4.9	0.99	0.99	208.1	216.4	1.04

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.

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PHASING SUMMARY

Site: 101 [Campbell Parade/ Curlewis Street Sat (Site Folder:

Future)]

New Site

Site Category: (None)

Timings based on settings in the Site Phasing & Timing dialog Phase Times determined by the program

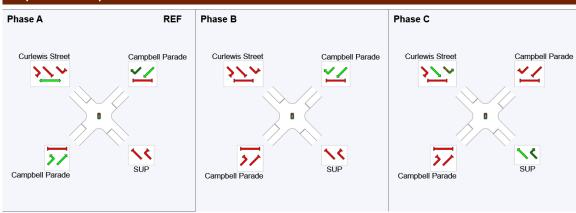
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

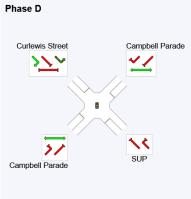
Phase Timing Summary

Phase	Α	В	С	D
Phase Change Time (sec)	0	40	49	58
Green Time (sec)	34	3	6	26
Phase Time (sec)	40	6	12	32
Phase Split	44%	7%	13%	36%

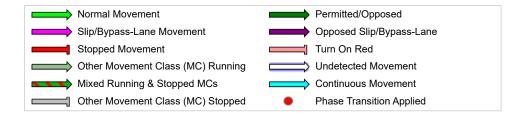
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified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

Output Phase Sequence





REF: Reference Phase VAR: Variable Phase



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TECHNICAL NOTE



now



Transport Engineering

Project Code: N208800 (301400272) Project Name: Waverley Streetscapes

Date: 31 August 2021 Version No. A-Dr

Author: Carla Bradley

Reviewer: Brett Maynard

SUBJECT: Old South Head Road/ Curlewis Street/ O'Sullivan Road/ Birriga Road Intersection - SIDRA Modelling

Page 1 of 5 plus attachments

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 Old South Head Road/ Curlewis Street/ O'Sullivan Road/ Birriga Road intersection as part of the Waverley Streetscapes project.

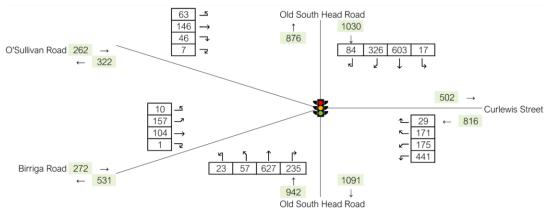
The project proposes to remove the existing left turn slip lane from Old South Head Road into Curlewis Street to enhance pedestrian and bicycle connectivity through the intersection. The reclaimed area is to be converted to a section of shared path to allow cyclists to connect into the shared path/ cycleway proposed on the northern side of Curlewis Street. This technical note assesses the operational impact of the slip lane removal.

Traffic Volumes

Traffic movement counts at the study intersection were completed on Tuesday 1 June 2021, between 7:30am and 9:30am and between 3:00pm and 6:00pm.

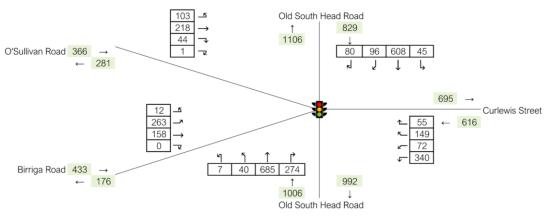
The AM and PM peak hours were found to occur from 7:30am to 8:30am and 4:45pm to 5:45pm, respectively. Peak hour traffic volumes are summarised in Figure 1 and Figure 2, with full survey results contained in Attachment 1.

Figure 1: Existing AM peak hour traffic volumes



VIC | NSW | QLD | SA | WA Level 16, 207 Kent Street SYDNEY NSW 2000 t// +612 8448 1800 ABN 51 137 610 452

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 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
А	Less than 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	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 included in Attachment 2.

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





Technical Note: Waverley Streetscapes Stantec ID: 210831tnote-N208800 OldSouthHead-Curlewis Intersection Modelling.docx

2

Table 2: Existing operating conditions

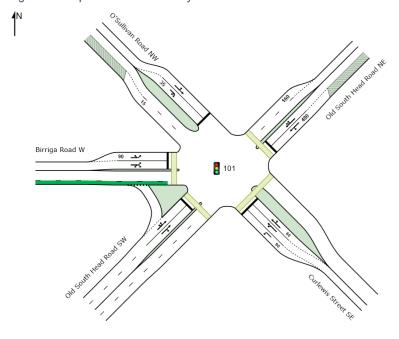
Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
	Curlewis St (SE)	0.940	39.1	92.7	С
	Old South Head Rd (NE)	0.998	94.6	311.6	F
AM	O'Sullivan Rd (NW)	0.897	58.2	71.8	Е
Alvi	Birriga Rd (W)	0.995	84.1	81.6	F
	Old South Head Rd (SW)	0.973	80.0	265.3	F
	Overall	0.998	72.9	311.6	F
	Curlewis St (SE)	0.977	40.3	98.6	С
	Old South Head Rd (NE)	0.879	56.8	200.2	Е
DM	O'Sullivan Rd (NW)	0.875	62.9	91.6	Е
PM	Birriga Rd (W)	0.990	90.9	133.6	F
	Old South Head Rd (SW)	0.999	100.6	315.2	F
	Overall	0.999	72.2	315.2	F

Based on the above assessment, the intersection of Old South Head Road/ Curlewis Street/ O'Sullivan Road/ Birriga Road currently operates beyond capacity at LoS F in both the AM and PM peak, with excessive delay on Old South Head Road and Birriga Road and significant queuing on Old South Head Road.

Proposed Intersection Layout

The project seeks to remove the existing left turn slip lane from Old South Head Road into Curlewis Street. In addition to the slip lane removal, the O'Sullivan Road approach lanes would be altered to create an exclusive right turn bay, resulting in a single through lane. The proposed layout is shown in Figure 3.

Figure 3: Proposed intersection layout





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3

Traffic Impact

To determine the traffic impact of the proposed intersection layout changes, the existing phasing and traffic volumes were modelled. Table 3 presents a summary of the future operation of the intersection, with full results presented in Attachment 2.

Table 3: Future operating conditions

Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
	Curlewis St (SE)	0.977	41.6	93.0	С
	Old South Head Rd (NE)	1.000	92.5	312.2	F
AM	O'Sullivan Rd (NW)	0.829	59.4	92.4	E
Alvi	Birriga Rd (W)	0.995	84.1	81.6	F
	Old South Head Rd (SW)	0.973	80.6	265.3	F
	Overall	1.000	73.2	312.2	F
	Curlewis St (SE)	0.997	41.1	102.1	С
	Old South Head Rd (NE)	0.884	54.9	203.5	D
DM	O'Sullivan Rd (NW)	1.180	210.5	300.7	F
PM	Birriga Rd (W)	0.990	90.9	133.6	F
	Old South Head Rd (SW)	0.999	101.9	315.2	F
	Overall	1.180	88.5	315.2	F

Under the proposed intersection layout changes the intersection continues to operate at capacity in the AM peak and exceeds capacity in the PM peak with excessive delays on O'Sullivan Road. However, it is noted that given the intersection currently operates at or above effective capacity, it is sensitive to any model changes and therefore the results are not necessarily reliable.

The removal of the slip lane and changes to lane arrangements on O'Sullivan Road is shown to have a relatively minor impact in the AM peak, with overall intersection average delays increasing by less than half a second.

In the PM peak the overall intersection average delays increase by approximately 16 seconds, with the greatest impact seen to vehicles on the O'Sullivan Road approach. This is a result of the exit lane on Curlewis Street no longer being able to cater for two through lanes and requiring the removal of the through movement from the median lane on O'Sullivan Road. The removal of this through movement results in all through vehicles on O'Sullivan Road using the kerbside lane.

Observations from traffic survey videos indicate a high proportion of through vehicles on O'Sullivan Road (approximately 90 per cent) currently use the kerbside lane to pass vehicles waiting to turn right. The intersection geometry, with approaches not aligned and set back pedestrian crossings, provides opportunities for through vehicles to manoeuvre around vehicles waiting in the intersection to turn. SIDRA is unable to cater for the unusual intersection geometry and assumes vehicles are impacted by turning vehicles.

Therefore, based on the lane utilisation observations and unusual intersection geometry, it is anticipated that the impact on O'Sullivan Road is unlikely to be as substantial as the modelling suggests.



now St

Technical Note: Waverley Streetscapes

ID: 210831tnote-N208800 OldSouthHead-Curlewis
Intersection Modelling.docx

4

Summary

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

- The intersection of Old South Head Road / Curlewis Street / O'Sullivan Road / Birriga Road currently operates beyond capacity at LoS F, with excessive delay and queues in both the AM and PM peak periods.
- Given the intersection currently operates at or above effective capacity, the model it is sensitive to any changes in geometry, lane arrangements and traffic volumes. Therefore, modelling results may not be
- Future modelling was conducted to determine the impact of removing the left-turn slip lane from Old South Head Road to Curlewis Street and associated lane arrangement changes on O'Sullivan Road. The modelling adopted the existing signal phase times to determine a like-for-like operation comparison.
- The SIDRA results indicate that in the AM peak, the intersection continues to operate at capacity, however the proposed layout changes result in a relatively minor decrease in performance.
- In the PM peak, the proposed layout changes result in an overall intersection increase in average delay of approximately 16 seconds, with the greatest impact to vehicles on the O'Sullivan Road approach where all through vehicles would be use the kerbside lane only.
- Observations from traffic survey videos indicate approximately 90 per cent of through vehicles on O'Sullivan Road currently use the kerbside lane to pass vehicles waiting to turn right. This combined with the unusual existing intersection geometry that allows through vehicles to manoeuvre around vehicles waiting in the intersection to turn indicates that the impact on O'Sullivan Road is unlikely to be as substantial as the modelling suggests.



Technical Note: Waverley Streetscapes Stantec ID: 210831tnote-N208800 OldSouthHead-Curlewis Intersection Modelling.docx

5

ATTACHMENT 1

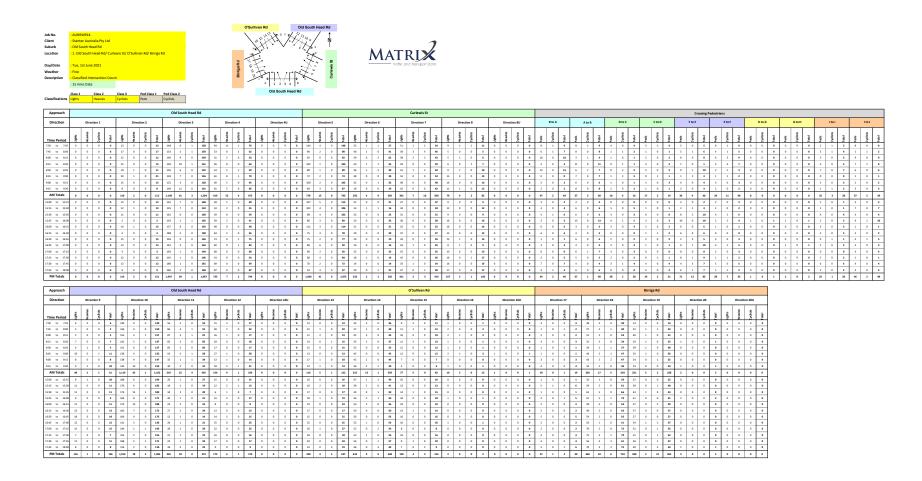
Traffic Survey Data





Technical Note: Waverley Streetscapes now Stantec ID: 210831tnote-N208800 OldSouthHead-Curlewis Intersection Modelling.docx

Waverley Traffic Committee 23 February 2023



Waverley Traffic Committee 23 February 2023

Job No. : AUNSW914

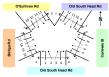
Client : Stantec Australia Pty Ltd

Suburb : Old South Head Rd

Location : 1. Old South Head Rd/ Curlewis St/ O'Sullivan Rd/ Birriga

Day/Date : Tue, 1st June 2021

Weather : Fine
Description : Classified Intersection Coun





Approach							Old South I	Head Ro	d																Curlew	vis St																				Cr	rossing P	edestria	ns													
Direction	Dir	ection 1	Τ	Directio	12	Т	Directio	ion 3			Direction	4		Dire	ction 4U			Direction		Т	Dire	ction 6			Directi	on 7		Die	rection 8			Direction	8U		B to			A to B		D	to C		C to	D		F to E			E to F			H to G			GtoH			J to I	П		l to J	
Time Period	lghts leavies	yclats	n spir	les vies	yclists otal	n sperie	lea vies	yelists	Na co	shts.	tea vies	Sellar South	sign as	tea vies	yelists	otal	lgh ts	tea vies	100	s (d)	tea vies	yclists	otal	s) (d)	tesa viera	yelists	le const	Agn ts	yellsts	100	lights.	tea vies	yclists	1 10	yclists	pro o	s de	yelists	pago.	40 2	yelists	E 60	yelkts	pin o	10 20	yclists	lotte o	sp.	yclists	JESO,	40.0	yclets	jeno.	40	yelists	otal	sp a	yclists	pa o	40	yelkts	pin o
7:30 to 8:30	0 0	0 0	57	0	0 57	591	22	3	627 2	104	29	2 22	5 0		0	0	434	7	44	167	1	- 5	176	157	6	8	171 :	S 2	2	29	0	0	0	0 28	2	20	30	2	22	6	2	8 10	1	11	19	1	20	21	9	20	0	٥	0	0	0	0	14	2	16	25	2	27
745 to 845	0 0	0 0	54	1	0 55	569	30	2	601 1	93 :	22	2 21			0	0	378	4	28	178	2	7	188	147	6	8	161 2	S 2	1	28	0	0	0	0 25	- 1	16	28	2	20	2	4	6 10		10	23	2	25	15	9	26	0	0	0	0	0	0	19	1	20	22	2	25
800 to 900	0 0	0 0	57	2	0 59	565	22	1	S98 2	101	22	2 22	6 0		0	0	354	4	25	176	2	7	185	161	2	4	168 3	25 2	1	28		0	0	0 29		29	27	2	29	2	s	7 9	- 1	90	19	2	22	12	9	21	0	0	0		0	0	16		16	23	1	24
R15 to 915	0 0	0 0	60	2	0 62	550	26	1	\$77 2	110	26	2 22	8 0		0	0	362	6	36	149	2	s	156	171	1			96 1	1	48	0	0	0	0 21	0	21	30	1	21	2	s	7 10	1	11	15	1	18	9	6	15	0	0	0	0	0	0	14	0	34	16	1	17
830 to 930	0 0	0 0	23	2	0 55	549	28	0	\$77 2	15	22	2 26	0 0		0	0	364	8	25	125	1	4	120	184	1	2	187 1	ii 2	0	23	0	0	0	0 29	0	19	27	1	28	4	4	g 7	1		17	3	20	8	2	10	0	0	0	0	0	0	11	1	12	12	0	12
AM Totals	0 0	0 0	110	2	0 112	1,140	61	2	1,204 4	119	52	4 47	5 0		0	0	778	15	29	292	4	9	305	341	7	10	258 7	N 4	2	92		0	0	0 47	2	49	57	2	60	10	6 :	16 17	2	29	16	4	40	29	11	40	0	0	0	0	0	0	25	2	28	27	2	29
15:00 to 16:00	0 0	0 0	37	1	0 28	601	21	1	623 1	90	s	0 19	s 0		0	0	393	16	40	81	1	1	83	132	0	0	132	96 O	0	46	0	0	0	0 13	1	14	29	0	29	12	1 :	13 4	0	4	22	2	25	20	- 4	14	1	0	1	1	0	1	â	0	8	23	1	24
15:15 to 16:15	0 0	0 0	29	2	0 41	597	22	1	620 1	99	4	0 20	9 0		0	0	297	14	41	81	1	1	83	120	0			ER 0	0	sa	0	0	0	0 17	- 1	18	28	0	28	15	1 1	16 6		6	26	2	29	9	4	13	1	0	1	1	0	1	10	0	10	21		22
15:30 to 16:30	0 0	0 0	31	1	0 22	650	17	1	668 2	109	4	0 21	2 0		0	0	370	13	22	87	0	0	87	123	0	0	123 1	ER 0	0	53	0	0	0	0 20	1	21	26	0	26	10	1 1	11 6	- 1	7	30	2	22	7	4	11	1	0	1	1	0	1	11	0	11	16		17
15:45 to 16:45	0 0	0 0	25	1	0 26	644	11	1	656 2	126	4	1 22	9 0		0	0	347	11	25	83	0	0	83	125	0		127 1	17 1	0	58	0	0	0	0 16	. 0	16	26	0	26	9	1 1	10 9	- 1	10	24	3	27	6	2		1	0	1	1	0	1	7	1	8	16	2	18
16:00 to 17:00	0 0	0 0	46	1	0 47	662	13		675 2	167	2	2 27	1 0		0	0	347	14	36	1 76	0	0	76	139	1			19 2	0	51		0	0	0 16		16	17	0	17	8	0	8 7	1		23	4	27	8	1	9	0	0	0	1	0	1	7	1	8	10	1	11
16:15 to 17:15	0 0	0 0	25	0	0 25	698	6	0	704 2	97	2	2 29	1 0		0	0	326	13	22	78	0	0	78	139	1			66 2	0	48	0	0	0	0 90	0	10	20	1	21	â	0	g 5	1	6	25	-4	29	20	1	11	0	0	0	1	0	1	4	1	s	13	1	54
16:30 to 17:30	0 0	0 0	43	0	0 43	655	s	0	660 2	78	0	2 29	0 0		0	0	331	14	24	76	1	0	77	147	1		150 1	10 2	1	23	0	0	0	9	0	9	21	1	22	10	0 :	10 4	1	5	27	s	22	11	2	12	0	0	0	1	0	1	-4	1	s	12	1	12
16/45 to 17/45	0 0	0 0	40	0	0 40	679	6		685 2	172	0	1 29	4 0		0	0	326	14	34	71	1	0	72	147	2	0	149 1	13 1	1	SS		0	0	0 15	0	15	19	1	20	11	1 1	12 5	1	6	29	2	24	13	2	15	0	0	0	1	0	1	10		20	12	0	12
17:00 to 18:00	0 0	0 0	36	0	0 26	684	s	0	689 2	78	0	0 27			0	0	294	11	20	75	1	1	77	140	1	1	142 (E2 0	1	a	0	0	0	0 15	- 1	16	21	1	22	8	1	9 2	1	9	26	s	21	20	2	12	0	0	0	0	0	0	10	0	10	13	0	13
PM Totals	0 0	0 0	119	2	0 121	1,947	29	1	1,987 7	25	7	2 76	4 0		0	٥	1,094	41	1,0	5 222	2	2	236	411	2	2	416 1	57 2	1	160	0	0	0	0 44	2	46	a	1	64	28	2 2	30 15	2	21	71	12	83	28	7	25	1	0	1	2	0	2	25	1	26	46	2	41
			_			_															_		_							_						_									_						_											_
Approach							Old South I	Head Ro	d																O'Sulliv	an Rd																Bi	irriga Rd																			
Direction	Dir	ection 9	Т	Direction	10	П	Directio	on 11		р	Direction	12		Dire	tion 12U			Direction	3	П	Dire	ction 14			Directio	in 15		Din	ection 16			Direction 1	160		Dire	ction 17			Direction	18		Dir	ection 19	,		Direct	tion 20			Directio	n 20U											
Time Period	Lights He avies	Cyclets	sudin	te avies	Cyclists	SAGE	te avies	Cyclists	Logal	nghts	te avies	Cyclesis	nghts	te avies	Cyclists	rotai	stylin	He awles	100	sugin	He avies	Cyclets	Fotal	nghts	te avies	Cyclists	Lotal	Ughts He awles	Cyclists	Total	sugin	te avies	Cyclists	sudin	He avies	Cyclists	rotal	Suppos	He avies	Cyclists	Logal	Ughts Ne avies	Cyclists	Lotal	stußin	He avies	Cyclists	rotai	Ughts	He avies	Cyclists	Fotal										
7:30 to 8:30	17 0	0 17	589	13	1 603	311	13	2	226	79	s	0 84			0	٥	59	1	- 6	137	9	0	146	41	s	0	46	6 1	0	7	0	0	0	9	0	1	10	147	9	1 1	157 1	00 3	1	104	1	0	0	1	0	0	0	0										
745 to 845	15 1	0 16		19	1 581		13	2	253 :	81	3	0 84	0			0		2		159		0	165	-66	2		47	6 1	0	.7	0	0		0 7	0	1		143	9	2 1	154 1	25 4	1	130	1	0	0	1	0	0	0	0										
800 to 900	23 1	1 25	543	10	1 563	306	12	2	220	79	2	0 90			0		53	2		177		0	192	45	2	0	47	6 2	0		1	0	0		0	0	7	160	9	2 1	171 1	20 4			1			- 1	0		0	0										

ATTACHMENT 2

SIDRA Calibration and Outputs





Technical Note: Waverley Streetscapes now Stantec ID: 210831tnote-N208800 OldSouthHead-Curlewis Intersection Modelling.docx

Page 105 TC/V.01/23.02- Attachment 4

Existing Models Calibration

No site visit was undertaken to observe intersection performance due to COVID-19 restrictions in place at the time of modelling. SCATS historic files and the traffic survey video files were relied upon to assist in the calibration of the existing SIDRA models. The following information was used in the calibration:

- Average phase cycle time was approximately 110 seconds and 120 seconds in the AM and PM peaks respectively.
- The exit lanes on O'Sullivan Road and Curlewis Street are not marked as two lanes, however are wide enough to accommodate two through vehicles for a short distance. Observations from videos indicate that eastbound through vehicles on O'Sullivan Road and Curlewis Street use either lane to travel through the intersection depending on whether their path is obstructed by left or right turning vehicles.
 - The model incorporates two exit lanes on O'Sullivan Road and Curlewis Street to reflect the above driver behaviour and allow SIDRA to model two through vehicles at the same time (noting this was observed to rarely occur and would typically only happen at the beginning of the phase).
- The median lanes for the O'Sullivan Road and Curlewis Street approaches were typically underutilised, with their use generally limited to right turn vehicles and the occasional through vehicle at the start of D Phase.
 - Lane utilisation was adjusted to reflect the high proportion of vehicles using the kerbside through lane despite the apparent downstream short lane effect identified in the model as a result of two exit lanes being modelled.
- Through movements from Old South Head Road (SW) and Birriga Road to Old South Head Road (NE) were typically evenly distributed between the approach lanes.
 - Lane utilisation for the kerbside lanes was adjusted to reflect the even distribution of vehicles in the approach lane despites the downstream short lane effect (160 metres) identified in the model.
- SCATS phasing data indicated pedestrian phases were not always running in each signal cycle, review of videos confirmed this. Additionally, it was noted that pedestrians (particularly on Birriga Road) crossed illegally and did not always wait for a green pedestrian signal.
 - Pedestrian phase actuation was adjusted to reflect the actuation observed in SCATS.
- Vehicles turning right into Old South Head Road (SW) from O'Sullivan Road were observed to turn at the same time as left turn vehicles from Curlewis Street, particularly at the end of the phase.
 - The conflicting priority for the right turn from O'Sullivan Road was therefore removed from Curlewis Street to allow these movements to occur simultaneously.
- Peak Flow Factors were adjusted based on movements where traffic volumes indicated the peak flow factor was above 95%. The following adjustments were made:
 - AM Peak Period
 - Old South Head Road (NE) Through Movement: 99%
 - Old South Head Road (SW) Through Movement: 99%
 - PM Peak Period
 - O'Sullivan Road (NW) Left Turn Movement: 99%
 - O'Sullivan Road (NW) Through Movement: 99%
 - Old South Head Road (SW) Through Movement: 100%
 - Old South Head Road (SW) All Other Movements (L3, L2 and R2): 96.5%





Technical Note: Waverley Streetscapes Stantec ID: 210831tnote-N208800 OldSouthHead-Curlewis Intersection Modelling.docx

USER REPORT FOR SITE

All Movement Classes

Project: 210824_N208800 - Old South Head-Curlewis Template: Default Site User Report

Site: 101 [AM - Old South Head / Curlewis / O'Sullivan / Birriga (Site Folder: Existing)]

Old South Head Road / Curlewis Street / O'Sullivan Road / Birriga Road Site Category: (None)

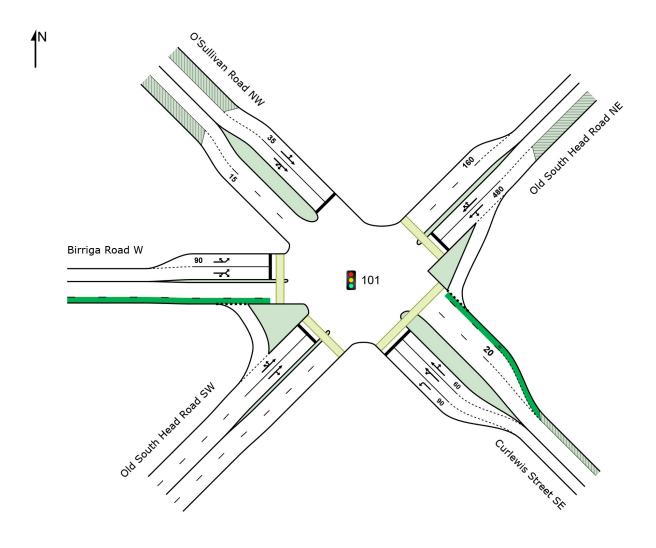
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog Phase Times determined by the program Phase Sequence: Leading Right Turn Reference Phase: Phase A Input Phase Sequence: A, B, C*, D Output Phase Sequence: A, B, C*, D (* Variable Phase)

Site Layout

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



Vehic	cle Mc	vemen	t Perfori	mance										
Mov ID	Turn	INPUT DEMAND VOLUMES FLOWS [Total HV] [Total HV]		Deg. Satn	Delay	Level of Service	QUI [Veh.	ACK OF EUE Dist]	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed		
South	nEast: 0	veh/h Curlewis	veh/h Street SE	veh/h	%	v/c	sec	_	veh	m	_	_	_	km/h
4	L2	441	7	464	1.6	0.514	17.7	LOS B	13.1	92.7	0.72	0.78	0.72	39.9
21a	L1	175	3	184	1.7	0.799	57.3	LOS E	12.7	87.3	1.00	0.94	1.17	28.0
5	T1	171	6	180	3.5	*0.940	69.1	LOS E	12.7	87.3	1.00	1.09	1.50	25.5
6	R2	29	2	31	6.9	0.940	78.0	LOS F	11.2	81.0	1.00	1.14	1.59	24.6
Appro	oach	816	18	859	2.2	0.940	39.1	LOS C	13.1	92.7	0.85	0.89	1.01	32.4
North	East: 0	Old South	Head R	oad NE										
7	L2	17	0	18	0.0	0.998	100.2	LOS F	43.8	311.6	1.00	1.38	1.60	21.8
8	T1	603	13	609	2.2	*0.998	95.0	LOS F	43.8	311.6	1.00	1.37	1.60	21.8
26a	R1	326	13	343	4.0	0.998	93.4	LOS F	41.7	301.2	1.00	1.29	1.61	22.2
9	R2	84	5	88	6.0	0.998	95.2	LOS F	41.7	301.2	1.00	1.29	1.61	22.0

Appro	ach	1030	31	1059	3.0	0.998	94.6	LOS F	43.8	311.6	1.00	1.34	1.61	21.9
North	West: 0	O'Sulliva	n Road N	1W										
10	L2	63	3	66	4.8	0.717	54.1	LOS D	9.8	71.8	0.99	0.87	1.08	29.3
11	T1	146	9	154	6.2	0.897	54.4	LOS D	9.8	71.8	0.99	0.91	1.19	28.4
12	R2	46	5	48	10.9	0.897	73.6	LOS F	5.7	43.4	1.00	1.03	1.57	25.1
29b	R3	7	1	7	14.3	0.897	74.4	LOS F	5.7	43.4	1.00	1.03	1.57	25.1
Appro	oach	262	18	276	6.9	0.897	58.2	LOS E	9.8	71.8	0.99	0.92	1.24	27.9
West	Birriga	a Road V	V											
10b	L3	10	0	11	0.0	0.895	71.7	LOS F	8.4	60.9	1.00	1.04	1.48	25.2
10a	L1	157	9	165	5.7	0.995	77.2	LOS F	11.3	81.6	1.00	1.09	1.57	24.4
12a	R1	104	3	109	2.9	0.995	95.6	LOS F	11.3	81.6	1.00	1.23	1.84	21.8
12b	R3	1	0	1	0.0	* 0.995	97.8	LOS F	11.3	81.6	1.00	1.23	1.84	21.6
Appro	oach	272	12	286	4.4	0.995	84.1	LOS F	11.3	81.6	1.00	1.14	1.67	23.3
South	West:	Old Sout	th Head F	Road SW										
30b	L3	23	0	24	0.0	0.948	82.9	LOS F	34.4	249.0	1.00	1.23	1.41	24.4
1	L2	57	0	60	0.0	0.948	81.9	LOS F	34.4	249.0	1.00	1.23	1.41	24.3
2	T1	627	33	633	5.3	* 0.973	78.5	LOS F	35.3	265.3	1.00	1.22	1.45	24.1
3	R2	235	29	247	12.3	0.973	83.2	LOS F	35.3	265.3	1.00	1.21	1.52	23.6
Appro	oach	942	62	965	6.6	0.973	80.0	LOS F	35.3	265.3	1.00	1.22	1.46	24.0
All Ve	hicles	3322	141	3445	4.3	0.998	72.9	LOS F	43.8	311.6	0.96	1.14	1.39	25.1

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.

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.

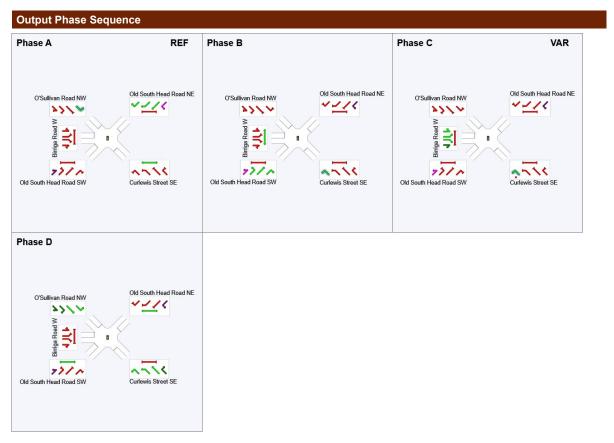
* Critical Movement (Signal Timing)

Ped	destrian N	loveme	nt Perfo	rmanc	е							
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE QUE [Ped		Prop. Et Que	fective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
Sou	ıthEast: Cu	rlewis St	reet SE									
P1	Full	19	20	49.2	LOS E	0.1	0.1	0.95	0.95	222.3	225.0	1.01
Nor	thEast: Old	South F	lead Roa	d NE								
P3	Full	50	53	49.3	LOS E	0.2	0.2	0.95	0.95	215.5	216.0	1.00
We	st: Birriga F	Road W										
P2	Full	43	45	49.3	LOS E	0.1	0.1	0.95	0.95	214.5	214.9	1.00
Sou	ıthWest: Ol	d South	Head Ro	ad SW								
P4	Full	62	65	49.3	LOS E	0.2	0.2	0.95	0.95	215.0	215.4	1.00
All Pec	lestrians	174	183	49.3	LOSE	0.2	0.2	0.95	0.95	215.8	216.5	1.00

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	Α	В	С	D
Phase Change Time (sec)	0	37	73	88
Green Time (sec)	31	30	9	16
Phase Time (sec)	37	36	15	22
Phase Split	34%	33%	14%	20%

See the Timing Analysis 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, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.



REF: Reference Phase VAR: Variable Phase



Site: 101 [PM - Old South Head / Curlewis / O'Sullivan / Birriga (Site Folder: Existing)]

Old South Head Road / Curlewis Street / O'Sullivan Road / Birriga Road Site Category: (None)

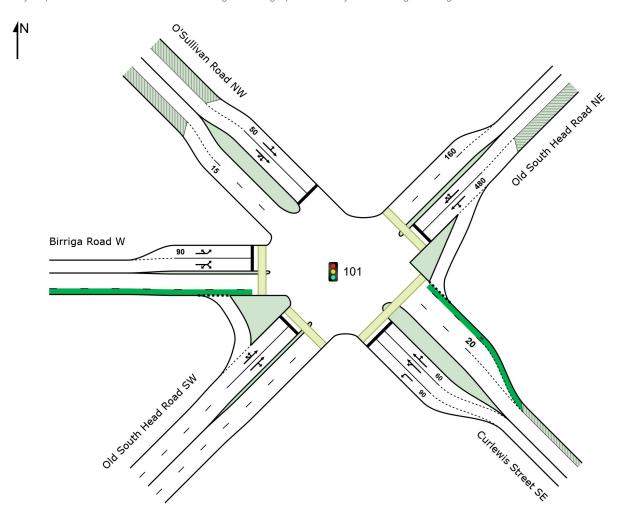
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time) Variable Sequence Analysis applied. The results are given for the selected output sequence.

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

(* Variable Phase)

Site Layout

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





ID			JMES	FLO'		Satn	Delay	Service	QUE		Que	Stop	No.	Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m		Rate	Cycles	km/h
South	East: 0		Street SE		,,,	V/0			7011					1(11)/11
4	L2	340	14	358	4.1	0.378	16.2	LOS B	9.5	69.1	0.62	0.74	0.62	40.6
21a	L1	72	1	76	1.4	0.830	64.1	LOSE	13.9	98.6	1.00	0.97	1.21	27.2
5	T1	149	2	157	1.3	* 0.977	63.1	LOS E	13.9	98.6	1.00	0.98	1.26	26.7
6	R2	55	1	58	1.8	0.977	95.6	LOS F	5.2	36.6	1.00	1.08	1.86	21.7
Appro	ach	616	18	648	2.9	0.977	40.3	LOS C	13.9	98.6	0.79	0.86	0.96	32.2
Northl	East: C	old South	n Head R	oad NE										
7	L2	45	0	47	0.0	0.835	60.2	LOS E	25.7	181.6	1.00	1.01	1.12	28.4
8	T1	608	10	640	1.6	* 0.879	55.8	LOS D	28.1	200.2	1.00	1.01	1.15	28.3
26a	R1	96	4	101	4.2	0.879	58.8	LOS E	28.1	200.2	1.00	1.02	1.20	28.3
9	R2	80	0	84	0.0	0.879	60.5	LOS E	28.1	200.2	1.00	1.02	1.20	27.9
Appro	ach	829	14	873	1.7	0.879	56.8	LOS E	28.1	200.2	1.00	1.01	1.16	28.2
North	West: 0	O'Sulliva	n Road N	1W										
10	L2	103	1	104	1.0	0.744	60.0	LOS E	13.1	91.6	1.00	0.89	1.09	27.9
11	T1	218	2	220	0.9	0.875	62.1	LOS E	13.1	91.6	1.00	0.95	1.22	26.9
12	R2	44	1	46	2.3	0.875	73.4	LOS F	9.9	70.0	1.00	1.02	1.38	25.4
29b	R3	1	0	1	0.0	0.875	74.1	LOS F	9.9	70.0	1.00	1.02	1.38	25.4
Appro	ach	366	4	372	1.1	0.875	62.9	LOS E	13.1	91.6	1.00	0.94	1.21	27.0
West:	Birriga	Road V	V											
10b	L3	12	0	13	0.0	0.941	82.9	LOS F	15.8	113.0	1.00	1.12	1.50	23.7
10a	L1	263	9	277	3.4	0.990	86.8	LOS F	19.1	133.6	1.00	1.15	1.55	23.0
12a	R1	158	1	166	0.6	*0.990	98.4	LOS F	19.1	133.6	1.00	1.26	1.68	21.3
12b	R3	1	0	1	0.0	0.990	100.7	LOS F	19.1	133.6	1.00	1.26	1.68	21.2
Appro	ach	434	10	457	2.3	0.990	90.9	LOS F	19.1	133.6	1.00	1.19	1.59	22.4
South	West:	Old Sou	th Head F	Road SW										
30b	L3	7	0	7	0.0	0.999	106.2	LOS F	44.7	315.2	1.00	1.34	1.57	21.2
1	L2	40	0	41	0.0	0.999	105.2	LOS F	44.7	315.2	1.00	1.34	1.57	21.1
2	T1	685	6	685	0.9	*0.999	100.4	LOS F	44.7	315.2	1.00	1.30	1.57	21.2
3	R2	274	0	284	0.0	0.999	100.3	LOS F	42.9	301.2	1.00	1.24	1.58	21.3
Appro	ach	1006	6	1018	0.6	0.999	100.6	LOS F	44.7	315.2	1.00	1.29	1.57	21.2
All Ve	hicles	3251	52	3367	1.6	0.999	72.2	LOS F	44.7	315.2	0.96	1.08	1.31	25.3

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.

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.

* Critical Movement (Signal Timing)

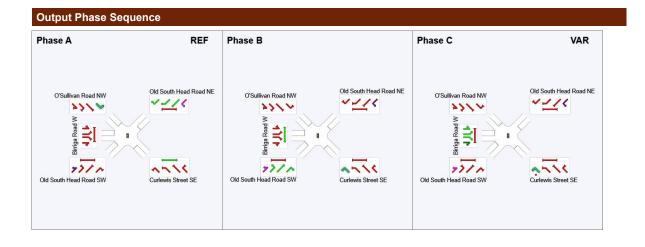
Pedestrian N	loveme	ent Perfo	ormanc	е							
Mov	Input	Dem.	Aver.	Level of	AVERAGE	BACK OF	Prop. E	ffective	Travel	Travel	Aver.
ID Crossing	Vol.	Flow	Delay	Service		EUE	Que	Stop	Time	Dist.	Speed
					[Ped	Dist]		Rate			
	ped/h	ped/h	sec		ped	m			sec	m	m/sec
SouthEast: Cu	rlewis S	treet SE									

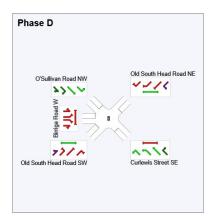
P1 Full	18	19	54.2	LOS E	0.1	0.1	0.95	0.95	227.3	225.0	0.99
NorthEast: Old	South H	ead Road	I NE								
P3 Full	49	52	54.3	LOS E	0.2	0.2	0.95	0.95	220.5	216.0	0.98
West: Birriga F	Road W										
P2 Full	22	23	54.2	LOS E	0.1	0.1	0.95	0.95	219.5	214.9	0.98
SouthWest: Ol	d South H	Head Roa	d SW								
P4 Full	35	37	54.2	LOS E	0.1	0.1	0.95	0.95	220.0	215.4	0.98
All Pedestrians	124	131	54.2	LOSE	0.2	0.2	0.95	0.95	221.1	217.0	0.98

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	Α	В	С	D
Phase Change Time (sec)	0	38	76	97
Green Time (sec)	32	32	15	17
Phase Time (sec)	38	38	21	23
Phase Split	32%	32%	18%	19%

See the Timing Analysis 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, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.





REF: Reference Phase VAR: Variable Phase



Site: 101 [AM - Old South Head / Curlewis / O'Sullivan / Birriga (Site Folder: Future - Slip Lane Removed)]

Old South Head Road / Curlewis Street / O'Sullivan Road / Birriga Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site User-Given Cycle Time)

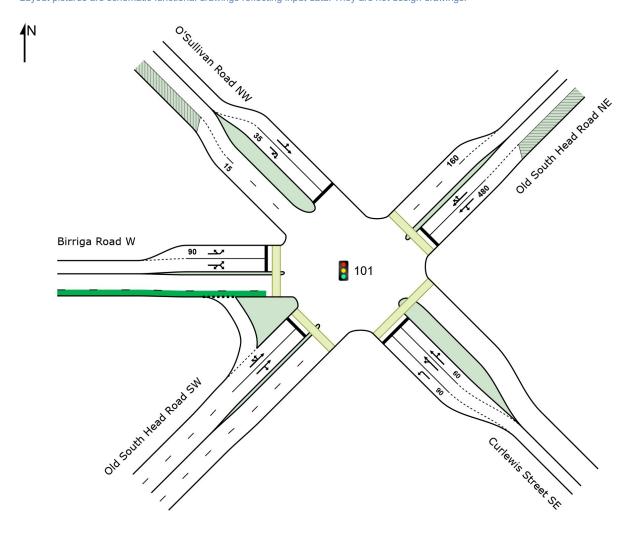
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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

(* Variable Phase)

Site Layout

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



Vehic	cle Mo	vement	Perforr	nance										
Mov ID	Turn	INP VOLL		DEM/ FLO		Deg. Satn		Level of Service	95% BA QUE		Prop. Que	Effective Stop	Aver. No.	Aver. Speed
		[Total	HV]	[Total	HV]				[Veh.	Dist]		Rate	Cycles	
Courth	Foot: C	veh/h	veh/h	veh/h	%	v/c	sec		veh	m				km/h
			Street SE											
4	L2	441	7	464	1.6	0.514	17.7	LOS B	13.1	92.7	0.72	0.78	0.72	39.9
21a	L1	175	3	184	1.7	0.831	59.1	LOS E	13.5	93.0	1.00	0.98	1.22	27.6
5	T1	171	6	180	3.5	* 0.977	77.1	LOS F	13.5	93.0	1.00	1.14	1.60	24.2
6	R2	29	2	31	6.9	0.977	89.7	LOS F	11.5	83.0	1.00	1.21	1.75	22.8
Appro	oach	816	18	859	2.2	0.977	41.6	LOS C	13.5	93.0	0.85	0.91	1.05	31.7
North	East: C	ld South	Head Ro	oad NE										
7	L2	17	0	18	0.0	1.000	95.3	LOS F	43.9	312.2	1.00	1.36	1.61	22.3
8	T1	603	13	609	2.2	* 1.000	90.8	LOS F	43.9	312.2	1.00	1.35	1.61	22.3
26a	R1	326	13	343	4.0	1.000	94.5	LOS F	42.0	303.6	1.00	1.30	1.62	22.1
9	R2	84	5	88	6.0	1.000	96.2	LOS F	42.0	303.6	1.00	1.30	1.62	21.8
Appro	oach	1030	31	1059	3.0	1.000	92.5	LOS F	43.9	312.2	1.00	1.33	1.62	22.2
North	West: 0	D'Sulliva	n Road N	W										
10	L2	63	3	66	4.8	0.829	60.1	LOS E	12.6	92.4	1.00	0.98	1.24	28.0
11	T1	146	9	154	6.2	0.829	55.2	LOS D	12.6	92.4	1.00	0.98	1.24	28.2
12	R2	46	5	48	10.9	0.819	70.2	LOS E	3.4	25.9	1.00	0.88	1.41	25.3
29b	R3	7	1	7	14.3	0.819	70.9	LOS F	3.4	25.9	1.00	0.88	1.41	25.3
Appro	oach	262	18	276	6.9	0.829	59.4	LOS E	12.6	92.4	1.00	0.96	1.27	27.6
West	: Birriga	Road W	I											
10b	L3	10	0	11	0.0	0.895	71.7	LOS F	8.4	60.9	1.00	1.04	1.48	25.2
10a	L1	157	9	165	5.7	0.995	77.2	LOS F	11.3	81.6	1.00	1.09	1.57	24.4
12a	R1	104	3	109	2.9	0.995	95.7	LOS F	11.3	81.6	1.00	1.23	1.84	21.7
12b	R3	1	0	1	0.0	* 0.995	97.8	LOS F	11.3	81.6	1.00	1.23	1.84	21.5
Appro	oach	272	12	286	4.4	0.995	84.1	LOS F	11.3	81.6	1.00	1.14	1.67	23.3
South	nWest: (Old Sout	h Head R	Road SW										
30b	L3	23	0	24	0.0	0.948	84.1	LOS F	34.4	249.0	1.00	1.23	1.41	24.2
1	L2	57	0	60	0.0	0.948	83.1	LOS F	34.4	249.0	1.00	1.23	1.41	24.1
2	T1	627	33	633	5.3	* 0.973	79.3	LOS F	35.3	265.3	1.00	1.23	1.45	24.0
3	R2	235	29	247	12.3	0.973	83.1	LOS F	35.3	265.3	1.00	1.21	1.52	23.7
Appro		942	62	965	6.6	0.973	80.6	LOS F	35.3	265.3	1.00	1.22	1.46	23.9
All Ve	hicles	3322	141	3445	4.3	1.000	73.2	LOS F	43.9	312.2	0.96	1.15	1.41	25.1

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.

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

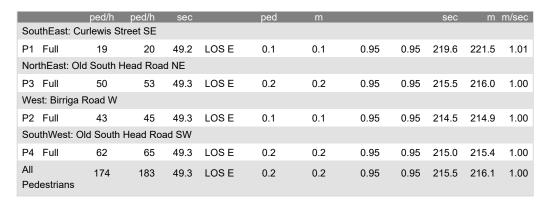
Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

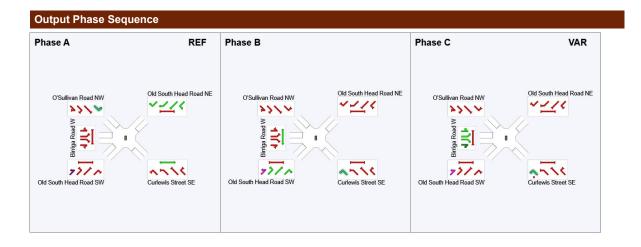
Pedestrian N	loveme	ent Perf	ormanc	е						
Mov ID Crossing	Input Vol.			Level of Service	AVERAGE BACK OF QUEUE	Prop. E Que	Effective Stop			Aver. Speed
3	VOI.	1 10 W	Delay	OCIVICC	[Ped Dist]	Que	Rate	TITLE	Dist.	Opecu

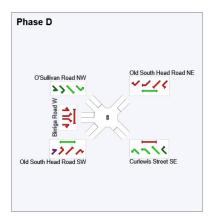


Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary				
Phase	Α	В	С	D
Phase Change Time (sec)	0	37	73	88
Green Time (sec)	31	30	9	16
Phase Time (sec)	37	36	15	22
Phase Split	34%	33%	14%	20%

See the Timing Analysis 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, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.





REF: Reference Phase VAR: Variable Phase



Site: 101 [PM - Old South Head / Curlewis / O'Sullivan / Birriga (Site Folder: Future - Slip Lane Removed)]

Old South Head Road / Curlewis Street / O'Sullivan Road / Birriga Road

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

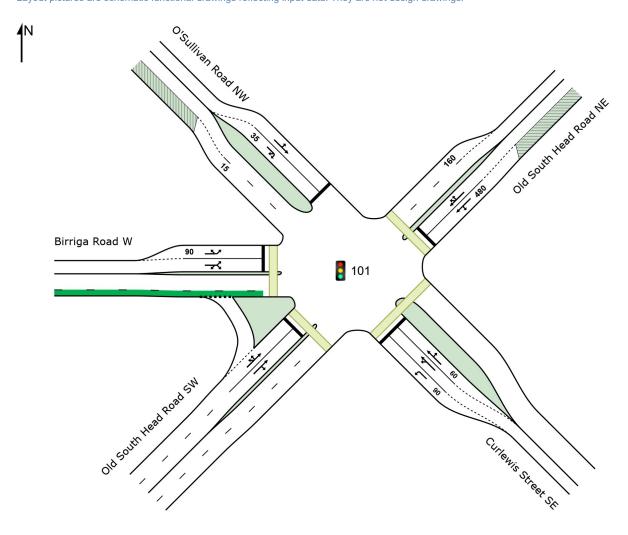
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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

(* Variable Phase)

Site Layout

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



Vehi	cle Mo	vemen	t Perforr	nance										
	Turn		PUT	DEM		Deg.		Level of	95% BA			Effective	Aver.	Aver.
ID		Total	JMES HV]	FLO	vvs HV]	Satn	Delay	Service	QUE [Veh.	Dist]	Que	Stop Rate	No. Cycles	Speed
		veh/h	veh/h	veh/h	% 1	v/c	sec		veh	m ¹			- /	km/h
South	nEast: C	Curlewis	Street SE											
4	L2	340	14	358	4.1	0.378	16.2	LOS B	9.5	69.1	0.62	0.74	0.62	40.6
21a	L1	72	1	76	1.4	0.847	65.4	LOS E	14.4	102.1	1.00	0.99	1.24	26.9
5	T1	149	2	157	1.3	0.997	63.7	LOS E	14.4	102.1	1.00	1.00	1.27	26.6
6	R2	55	1	58	1.8	0.997	101.8	LOS F	5.0	35.2	1.00	1.09	1.94	20.9
Appro	oach	616	18	648	2.9	0.997	41.1	LOS C	14.4	102.1	0.79	0.86	0.97	31.9
North	East: C	old South	n Head Ro	oad NE										
7	L2	45	0	47	0.0	0.840	55.5	LOS D	26.1	184.5	1.00	0.97	1.13	29.3
8	T1	608	10	640	1.6	0.884	53.3	LOS D	28.6	203.5	1.00	0.99	1.16	28.8
26a	R1	96	4	101	4.2	0.884	59.7	LOS E	28.6	203.5	1.00	1.03	1.21	28.1
9	R2	80	0	84	0.0	0.884	61.4	LOS E	28.6	203.5	1.00	1.03	1.21	27.8
Appro	oach	829	14	873	1.7	0.884	54.9	LOS D	28.6	203.5	1.00	1.00	1.17	28.6
North	West: 0	O'Sulliva	n Road N	W										
10	L2	103	1	104	1.0	* 1.180	233.8	LOS F	42.9	300.7	1.00	1.86	2.50	11.7
11	T1	218	2	220	0.9	1.180	228.8	LOS F	42.9	300.7	1.00	1.86	2.50	11.8
12	R2	44	1	46	2.3	0.728	74.2	LOS F	3.1	21.8	1.00	0.81	1.24	24.7
29b	R3	1	0	1	0.0	0.728	74.9	LOS F	3.1	21.8	1.00	0.81	1.24	24.7
Appro	oach	366	4	372	1.1	1.180	210.5	LOS F	42.9	300.7	1.00	1.73	2.34	12.6
West	: Birriga	Road V	V											
10b	L3	12	0	13	0.0	0.941	82.9	LOS F	15.8	113.0	1.00	1.12	1.50	23.7
10a	L1	263	9	277	3.4	0.990	86.7	LOS F	19.1	133.6	1.00	1.15	1.55	23.0
12a	R1	158	1	166	0.6	0.990	98.5	LOS F	19.1	133.6	1.00	1.24	1.68	21.3
12b	R3	1	0	1	0.0	* 0.990	100.6	LOS F	19.1	133.6	1.00	1.24	1.68	21.2
Appro	oach	434	10	457	2.3	0.990	90.9	LOS F	19.1	133.6	1.00	1.18	1.59	22.3
South	nWest:	Old Sout	th Head R	Road SW										
30b	L3	7	0	7	0.0	0.999	108.8	LOS F	44.7	315.2	1.00	1.34	1.57	20.9
1	L2	40	0	41	0.0	* 0.999	107.8	LOS F	44.7	315.2	1.00	1.34	1.57	20.8
2	T1	685	6	685	0.9	0.999	102.1	LOS F	44.7	315.2	1.00	1.31	1.57	21.0
3	R2	274	0	284	0.0	0.999	100.3	LOS F	42.9	301.2	1.00	1.24	1.58	21.4
Appro	oach	1006	6	1018	0.6	0.999	101.9	LOS F	44.7	315.2	1.00	1.29	1.57	21.1
All Ve	ehicles	3251	52	3367	1.6	1.180	88.5	LOS F	44.7	315.2	0.96	1.17	1.44	22.6

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.

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

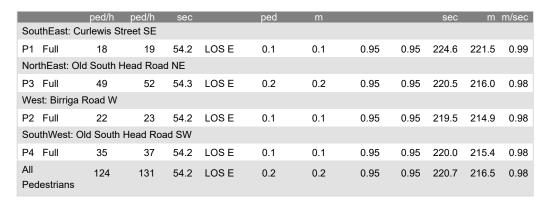
Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

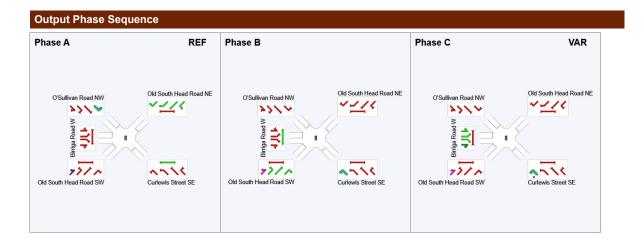
Pedestrian N	loveme	ent Perf	ormanc	е						
Mov ID Crossing	Input Vol.			Level of Service	AVERAGE BACK OF QUEUE	Prop. E Que	Effective Stop			Aver. Speed
3	VOI.	1 10 W	Delay	OCIVICC	[Ped Dist]	Que	Rate	TITLE	Dist.	Opecu

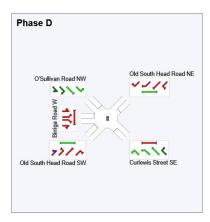


Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

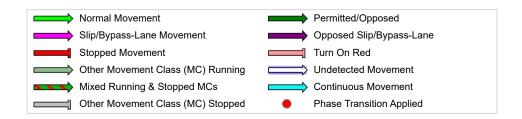
Phase Timing Summary	•			
Phase	Α	В	С	D
Phase Change Time (sec)	0	38	76	97
Green Time (sec)	32	32	15	17
Phase Time (sec)	38	38	21	23
Phase Split	32%	32%	18%	19%

See the Timing Analysis 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, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.





REF: Reference Phase VAR: Variable Phase



TECHNICAL NOTE



now



Transport Engineering

Project Code: N208800 Project Name: Waverley Streetscapes

Date: 14 April 2021 Version No. A

Author: Carla Bradley

Reviewer: Brett Maynard

SUBJECT: Glenayr Avenue / Curlewis Street Intersection – SIDRA Modelling

Page 1 of 5

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 bidirectional 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

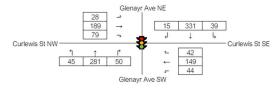
Traffic movement counts at the study intersection were provided by Council. The counts were undertaken on Thursday 4 March 2021, between 7:00am and 10:00am and between 3:00pm and 6:00pm.

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



VIC | NSW | QLD | SA | WA Level 16, 207 Kent Street SYDNEY NSW 2000 t// +612 8448 1800 ABN 51 137 610 452 www.gta.com.au

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
А	Less than 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	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)
		South-East	0.414	17.1	19.3	В
		North-East	0.714	15.6	54.8	В
	AM	North-West	0.508	17.4	24.1	В
		South-West	0.526	13.7	34.2	А
Glenayr		Overall	0.714	15.6	54.8	В
Avenue/ Curlewis Road		South-East	0.452	15.4	24.7	В
		North-East	0.729	17.2	49.0	В
	PM	North-West	0.593	16.1	32.3	В
		South-West	0.746	18.0	48.5	В
		Overall	0.746	16.9	49.0	В

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.



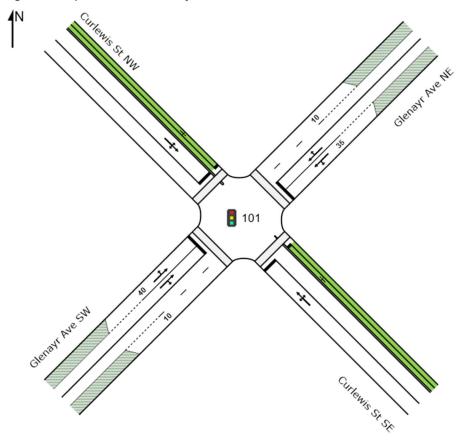


Technical Note: Waverley Streetscapes Stantec ID: 210413tnote-N208800 Glenayr-Curlewis Intersection Modelling.docx

Proposed Intersection Layout

The project seeks to remove the existing cycle lanes along Curlewis Street and provide a separated bidirectional 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.
 - o 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.



∞ **St**an

Technical Note: Waverley Streetscapes

ID: 210413tnote-N208800 Glenayr-Curlewis Intersection Modelling.docx

3

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)
		South-East	0.590	23.1	33.7	В
		North-East	0.773	20.9	73.5	В
	AM	North-West	0.648	23.0	38.3	В
Glenayr		South-West	0.623	19.3	46.8	В
Avenue/ Curlewis Road		Overall	0.773	21.2	73.5	В
(Separate		South-East	0.645	22.8	41.4	В
Cycle Phase)		North-East	0.701	19.7	59.5	В
	PM	North-West	0.825	27.6	59.2	В
		South-West	0.817	24.8	65.4	В
		Overall	0.825	23.5	65.4	В
		South-East	0.388	17.7	28.6	В
		North-East	0.568	13.3	55.4	А
	AM	North-West	0.426	16.9	31.7	В
Glenayr		South-West	0.441	13.6	38.1	А
Avenue/ Curlewis Road		Overall	0.568	14.8	55.4	В
(Cyclist		South-East	0.430	17.2	34.6	В
Turning Bans)		North-East	0.534	14.6	49.1	В
	PM	North-West	0.532	16.3	43.1	В
		South-West	0.598	16.5	50.1	В
		Overall	0.598	16.0	50.1	В

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.



Technical Note: Waverley Streetscapes Stantec ID: 210413tnote-N208800 Glenayr-Curlewis Intersection Modelling.docx

4

- 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.



Technical Note: Waverley Streetscapes now Stantec ID: 210413tnote-N208800 Glenayr-Curlewis Intersection Modelling.docx

5

ATTACHMENT 1

TRAFFIC SURVEY RESULTS



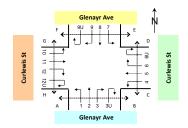
Technical Note: Waverley Streetscapes now Stantec ID: 210413tnote-N208800 Glenayr-Curlewis Intersection Modelling.docx

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

Class 1 Class 2 Class 3 Class 4

Classifications Lights





Approach										Glena	yr Ave																			Curle	wis St									
Direction			irection Left Turn					Direction (Through					irection Right Tur					irection (U Turn					Direction (Left Turi					Direction (Through					irection Right Turi					irection 6 (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 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	1	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
8:00 to 8:15	17	0	0	0	17	66	0	4	1	71	10	1	0	0	11	0	0	0	0	0	6	0	0	0	6	21	1	0	0	22	5	0	0	0	5	0	0	0	0	0
8:15 to 8:30	7	0	0	1	8	55	2	2	2	61	9	0	0	0	9	0	0	0	0	0	14	0	0	1	15	25	0	0	1	26	9	1	0	0	10	0	0	0	0	0
8:30 to 8:45	12	1	0	0	13	48	0	3	1	52	5	0	1	0	6	0	0	0	0	0	6	0	0	0	6	19	0	0	1	20	6	1	0	0	7	0	0	0	0	0
8:45 to 9:00	13	0	0	0	13	47	0	4	1	52	8	0	0	0	8	0	0	0	0	0	9	0	0	0	9	31	2	2	0	35	12	0	0	0	12	0	0	0	0	0
9:00 to 9:15	13	0	0	0	13	54	0	2	1	57	8	0	0	0	8	0	0	0	0	0	12	2	0	0	14	37	0	2	0	39	2	0	0	0	2	0	0	0	0	0
9:15 to 9:30	13	0	0	0	13	42	0	1	0	43	15	1	0	0	16	0	0	0	0	0	9	0	0	0	9	30	0	0	1	31	6	0	0	0	6	0	0	0	0	0
9:30 to 9:45	15	0	0	0	15	33	1	1	0	35	5	0	0	0	5	0	0	0	0	0	3	1	0	0	4	19	1	0	1	21	1	0	0	0	1	0	0	0	0	0
9:45 to 10:00	12	2	0	1	15	27	3	2	2	34	9	0	0	0	9	0	0	0	0	0	7	0	0	0	7	29	0	0	0	29	4	0	0	0	4	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
15:00 to 15:15	13	0	0	1	14	54	0	2	1	57	16	0	0	0	16	0	0	0	0	0	11	0	0	0	11	36	2	2	1	41	3	0	0	1	4	0	0	0	0	0
15:15 to 15:30	13	0	0	0	13	49	0	2	1	52	10	0	0	0	10	0	0	0	0	0	15	0	0	0	15	21	0	2	0	23	5	0	0	0	5	0	0	0	0	0
15:30 to 15:45	12	0	0	0	12	53	1	2	0	56	12	1	0	0	13	0	0	0	0	0	12	0	0	3	15	21	0	0	0	21	5	0	0	0	5	0	0	0	0	0
15:45 to 16:00	15	0	0	1	16	69	1	5	0	75	10	0	0	0	10	0	0	0	0	0	6	0	0	0	6	25	0	1	1	27	6	1	0	0	7	0	0	0	0	0
16:00 to 16:15	13	0	0	0	13	64	0	3	0	67	12	0	0	0	12	0	0	0	0	0	6	0	0	0	6	28	0	1	0	29	5	0	0	1	6	0	0	0	0	0
16:15 to 16:30	16	0	1	0	17	60	0	3	2	65	12	0	0	0	12	0	0	0	0	0	12	0	0	0	12	28	1	1	1	31	2	0	1	0	3	0	0	0	0	0
16:30 to 16:45	8	0	0	0	8	45	0	1	3	49	13	0	0	0	13	0	0	0	0	0	11	0	0	0	11	32	0	2	0	34	8	0	0	0	8	0	0	0	0	0
16:45 to 17:00	8	0	0	0	8	50	1	3	3	57	13	0	0	0	13	0	0	0	0	0	10	0	1	0	11	40	0	1	1	42	7	0	0	0	7	0	0	0	0	0
17:00 to 17:15	15	0	0	0	15	68	0	4	2	74	16	0	0	0	16	0	0	0	0	0	10	0	0	0	10	35	0	1	4	40	11	0	0	0	11	0	0	0	0	0
17:15 to 17:30	8	0	0	3	11	71	0	2	1	74	9	0	0	0	9	0	0	0	0	0	14	0	0	1	15	38	0	1	3	42	8	0	0	0	8	0	0	0	0	0
17:30 to 17:45	4	0	0	0	4	73	1	3	1	78	13	0	0	0	13	0	0	0	0	0	7	1	0	2	10	24	0	5	0	29	14	0	0	0	14	0	0	0	0	0
17:45 to 18:00	15	0	0	0	15	51	0	3	1	55	12	0	0	0	12	0	0	0	0	0	8	0	0	1	9	37	0	1	0	38	8	0	0	1	9	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

N8232 SITE1 - Curlewis SI & Glenayr Ave.xisx Page 1 of 6 Raw data & Hourly Summary

Approach										Glena	yr Ave										Curlewis St Direction 10 Direction 11 Direction 12																			
Direction			Direction (Left Turr					Direction (Through					Direction Right Tur					irection ((U Turn)					Direction (Left Turi					irection 1 (Through					rection 1 light Turi					ection 12 (U Turn)	2U	
Time Period	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	üghts	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	Lights	Heavies	Buses	Cyclists	Total	üghts	Heavies	Buses	Cyclists	Total	üghts	Heavies	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
7:15 to 7:30	5	0	0	1	6	66	0	5	4	75	8	0	0	0	8	0	0	0	0	0	3	0	0	0	3	21	1	4	0	26	2	1	0	2	5	0	0	0	0	0
7:30 to 7:45	9	0	0	0	9	91	1	7	2	101	4	1	0	0	5	0	0	0	0	0	5	1	0	0	6	20	4	2 0 26 7 0 0						0	7	0	0	0	0	0
7:45 to 8:00	6	2	0	0	8	81	1	6	5	93	8	1	0	0	9	0	0	0	0	0	6	0	0	0	6	32	2	0	0	34	11	0	0	0	11	0	0	0	0	0
8:00 to 8:15	12	1	0	0	13	74	1	7	1	83	10	0	0	0	10	0	0	0	0	0	5	0	0	0	5	34	0	0	1	35	12	1	0	0	13	0	0	0	0	0
8:15 to 8:30	9	1	0	0	10	75	2	3	3	83	8	1	0	1	10	0	0	0	0	0	3	0	0	0	3	42	0	0	0	42	15	0	0	1	16	0	0	0	0	0
8:30 to 8:45	9	2	0	0	11	79	2	2	4	87	4	1	0	0	5	0	0	0	0	0	6	0	0	0	6	32	0	1	0	33	16	0	0	1	17	0	0	0	0	0
8:45 to 9:00	14	1	0	0	15	64	1	5	3	73	8	0	0	0	8	0	0	0	0	0	7	0	0	0	7	31	0	0	0	31	14	0	0	0	14	0	0	0	0	0
9:00 to 9:15	8	0	0	0	8	68	0	3	1	72	11	0	0	0	11	0	0	0	0	0	8	1	0	0	9	40	0	2	1	43	17	0	0	1	18	0	0	0	0	0
9:15 to 9:30	10	1	0	1	12	70	5	2	2	79	10	0	0	0	10	0	0	0	0	0	6	0	0	0	6	32	3	0	0	35	12	0	0	0	12	0	0	0	0	0
9:30 to 9:45	4	0	0	0	4	46	2	3	1	52	4	0	0	0	4	0	0	0	0	0	11	0	0	0	11	19	1	0	0	20	21	0	0	0	21	0	0	0	0	0
9:45 to 10:00	5	0	0	0	5	50	1	3	1	55	5	0	0	0	5	0	0	0	0	0	6	1	0	0	7	31	0	1	0	32	14	0	0	0	14	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 15:15	10	1	0	0	11	76	4	1	0	81	4	0	0	0	4	0	0	0	0	0	9	0	0	1	10	27	0	0	0	27	15	0	0	0	15	0	0	0	0	0
15:15 to 15:30	6	0	0	1	7	65	1	2	2	70	4	0	0	0	4	0	0	0	0	0	4	0	0	0	4	25	0	0	1	26	18	1	0	0	19	0	0	0	0	0
15:30 to 15:45	10	0	0	1	11	98	3	4	1	106	4	2	0	0	6	0	0	0	0	0	2	0	0	0	2	36	1	2	2	41	18	0	0	1	19	0	0	0	0	0
15:45 to 16:00	13	0	0	0	13	57	1	4	1	63	8	0	0	0	8	0	0	0	0	0	4	0	0	0	4	61	2	0	1	64	22	0	0	0	22	0	0	0	0	0
16:00 to 16:15	6	0	0	0	6	77	1	2	0	80	4	0	0	0	4	0	0	0	0	0	4	0	0	0	4	34	0	0	0	34	14	0	0	0	14	0	0	0	0	0
16:15 to 16:30	6	0	0	0	6	87	0	1	2	90	5	0	0	1	6	0	0	0	0	0	3	0	0	0	3	42	0	0	0	42	12	1	0	0	13	0	0	0	0	0
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
16:45 to 17:00	10	0	0	0	10	76	0	2	1	79	7	0	0	0	7	0	0	0	0	0	1	0	0	0	1	40	0	1	2	43	15	0	0	0	15	0	0	0	0	0
17:00 to 17:15	12	1	0	0	13	88	2	2	2	94	6	0	0	0	6	0	0	0	0	0	10	0	0	0	10	39	0	0	2	41	15	0	0	0	15	0	0	0	0	0
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										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

N8232 SITE1 - Curlewis SI & Glenayr Ave.xisx Page 2 of 6 Raw data & Hourly Summary

Approach											Cr	ossing P	edestria	ns										
Direction		Α			В			С			D			E			F			G			н	
Time Period	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	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	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	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	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

N8232 SITE1 - Curlewis SI & Glenayr Ave.xisx Page 3 of 6 Raw data & Hourly Summary

Job No. : N6252
Client : Waverley Council
Suburb : Curlewis St

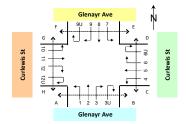
Location : 1. Curlewis St / Glenayr Ave

Day/Date : Thursday, 4th March 2021

Weather : Fine

Description : Classified Intersection Count

: Hourly Summary





Appr	oach										Glena	yr Ave																			Curle	wis St									
Direc	tion			irection Left Turn					Direction (Through					Direction Right Tur				-	irection (U Turn					Direction (Left Turr					Direction (Through					irection tight Turi					ection 6 [U Turn)	J	
Time F	eriod	üghts	Heavies	Buses	Cyclists	Total	lights	Heavies	Buses	Cyclists	Total	üghts	Heavies	Buses	Cyclists	Total	lights	Heavies	Buses	Cyclists	Total	lights	Heavies	Buses	Cyclists	Total	lights	Heavies	Buses	Cyclists	Total	üghts	Heavies	Buses	Cyclists	Total	lights	Heavies	Buses	Cyclists	Total
7:00 t	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
7:15 t	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
7:30 t	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
7:45 t	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
8:00 t	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
8:15 t	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
8:30 t	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
8:45 t	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
9:00 t	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
AM T	otals	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
15:00 t	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
15:15 t	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
15:30 t	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
15:45 t	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
16:00 t	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
16:15 t	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
16:30 t	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
16:45 t	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
17:00 t	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
PM T	otals	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

N8292 STET - Curtewis SI & Glenayr Ave.x/sx
Page 4 of 6
Raw data & Hourly Summary

Approach										Glena	yr Ave										Curlewis St Direction 10 Direction 11 Direction 12																			
Direction			Direction Left Turn					Direction (Through					Direction Right Tur					irection (U Turn					Direction (Left Turn					irection 1 Through					rection 1					ection 12 (U Turn)	2U	
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

N8232 SITE1 - Curlewis SI & Glenayr Ave.xisx Page 5 of 6 Raw data & Hourly Summary

Approach											Cr	ossing P	edestria	ns										
Direction		Α			В			С			D			E			F			G			Н	
Time Period	Ped	Cyd	Tota	Ped	Cyd	Tota	Ped	Cyd	Tota	Peds	Cyd	Tota	Ped	Cyd	Tota	Ped	Cyd	Tota	Ped	Cyd	Tota	Ped	Cyd	Tota
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

N8232 SITE1 - Curlewis SI & Glenayr Ave.xisx Page 6 of 6 Raw data & Hourly Summary

ATTACHMENT 2

SIDRA CALIBRATION & OUTPUTS





Technical Note: Waverley Streetscapes now Stantec ID: 210413tnote-N208800 Glenayr-Curlewis Intersection Modelling.docx

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.



Technical Note: Waverley Streetscapes now () Stantec ID: 210413tnote-N208800 Glenayr-Curlewis Intersection Modelling.docx

USER REPORT FOR SITE

Project: 210408sid_N208800 Glenayr and Curlewis

Template: Default Site User

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 Curlenis St. Nu Genay Ave WE 101 Glenay Ave Sul

Move	ement P	erforman	ce - Vel	nicles								
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
South	East: Cu	rlewis St Sl	E									
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
Appro	oach	203	2.1	0.414	17.1	LOS B	2.7	19.3	0.90	0.73	0.90	31.2
North	East: Gle	enayr Ave N	ΙE									
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
Appro	ach	457	8.1	0.714	15.6	LOS B	7.3	54.8	0.91	0.86	1.04	29.8
North	West: Cเ	ırlewis St N	W									
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
Appro	ach	215	4.9	0.508	17.4	LOS B	3.3	24.1	0.92	0.74	0.92	30.8
South	West: Gl	enayr Ave S	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
Appro	ach	333	6.0	0.526	13.7	LOS A	4.6	34.2	0.85	0.72	0.85	30.8
All Ve	hicles	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.

Mov ID	Description	Demand Flow	Average Delay	Level of Ave Service Pe		of Queue Distance	Prop. Queued	Effective Stop Rate
		ped/h	sec	2011100 1	ped	m	Quouou	Otop Hato
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 Pe	destrians	421	14.5	LOS B			0.85	0.85

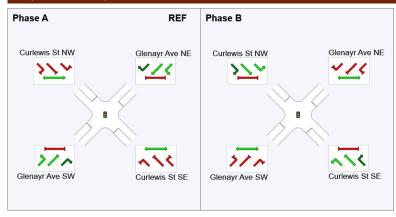
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay) Pedestrian movement LOS values are based on average delay per pedestrian movement. Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary

Phase	Α	В
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



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Organisation: GTA CONSULTANTS | Created: Friday, 9 April 2021 2:46:37 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 - Separate Phase]

Glenayr Ave / Curlewis St - Existing

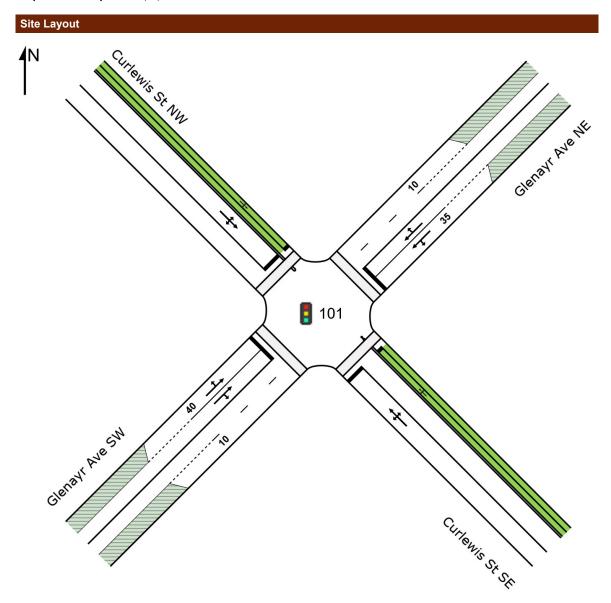
Site Category: (None)

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



Mov	ement P	erforman	ce - Vel	hicles	_	_		_		_		
Mov	Turn	Demand		Deg.	Average	Level of	95% Back		Prop.		Aver. No.	
ID		Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance m	Queued	Stop Rate	Cycles	Speed km/h
South	nEast: Cι	ırlewis St S		.,,								101711
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
Appro	oach	203	2.1	0.590	23.1	LOS B	4.7	33.7	0.96	0.80	1.00	26.9
North	East: Gle	enayr Ave N	ΙE									
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
Appro	oach	457	8.1	0.773	20.9	LOS B	9.8	73.5	0.94	0.93	1.12	27.5
North	West: Cı	urlewis St N	W									
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
Appro	oach	215	4.9	0.648	23.0	LOS B	5.2	38.3	0.97	0.86	1.07	28.7
South	West: G	lenayr 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
Appro	oach	333	6.0	0.623	19.3	LOS B	6.3	46.8	0.91	0.79	0.95	28.1
All Ve	hicles	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).

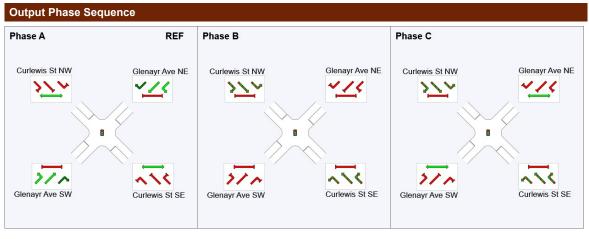
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Move	Movement Performance - Pedestrians										
Mov ID	Description	Demand Flow ped/h	Average Delay sec		Average Back Pedestrian ped	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 21 33 Green Time (sec) 15 6 11									
Phase	Α	В	С						
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%.



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

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 Glenay Ave NE 101 Glenay Ave Sty Curlenis St St

Move	ement P	erforman	ce - Vel	nicles								
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
South	nEast: Cι	ırlewis St S		.,,								
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
Appro	oach	202	2.1	0.388	17.7	LOS B	4.0	28.6	0.85	0.72	0.85	29.0
North	East: Gle	enayr Ave N	ΙE									
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
Appro	oach	457	8.1	0.568	13.3	LOS A	7.4	55.4	0.80	0.70	0.80	31.0
North	West: Cu	ırlewis St N	IW									
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
Appro	oach	214	4.9	0.426	16.9	LOS B	4.3	31.7	0.85	0.72	0.85	31.1
South	West: G	lenayr 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
Appro	oach	333	6.0	0.441	13.6	LOS A	5.1	38.1	0.78	0.67	0.78	30.8
All Ve	hicles	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).

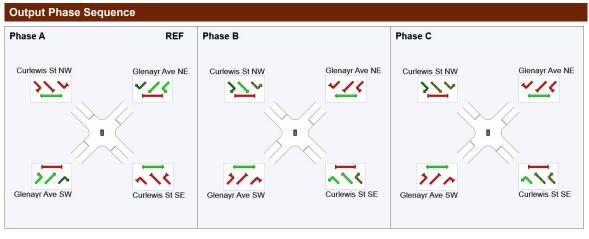
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians										
Mov ID	Description	Demand Flow	Average Delay		\verage Back Pedestrian	Distance		Effective Stop Rate		
		ped/h	sec		ped	m				
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	Α	В	С					
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%.



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

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 Curlenis St. Nu Genay Ave WE 101 Glenay Ave Sul

Move	Movement Performance - Vehicles											
Mov ID	Turn	Demand F 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
South	East: Cu	rlewis 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
Appro	ach	247	3.8	0.452	15.4	LOS B	3.4	24.7	0.87	0.72	0.87	31.8
North	East: Gle	nayr Ave NE	Ē									
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
Appro	ach	405	3.4	0.729	17.2	LOS B	6.8	49.0	0.94	0.89	1.10	29.1
North'	West: Cu	rlewis St NV	٧									
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
Appro	ach	312	0.0	0.593	16.1	LOS B	4.6	32.3	0.90	0.77	0.94	31.2
South	West: GI	enayr Ave S	W									
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
Appro	ach	396	3.5	0.746	18.0	LOS B	6.7	48.5	0.94	0.91	1.13	28.8
All Ve	hicles	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.

Mov ID	Description	Demand Flow	Average Delav	Level of Ave Service Pe		of Queue Distance	Prop. Queued	Effective Stop Rate
10		ped/h	sec	361 1100 1 0	ped	m	Q acucu	otop itato
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 Pe	destrians	420	14.5	LOS B			0.85	0.85

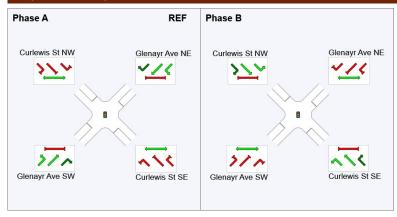
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay) Pedestrian movement LOS values are based on average delay per pedestrian movement. Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Phase Timing Summary

Phase	Α	В
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



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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 - 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 Glenay Ave NE 101 Glenay Ave Su Curlenis St St

Move	Movement Performance - Vehicles											
Mov ID	Turn	Demand F Total veh/h	lows 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
South	East: Cu	rlewis 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
Appro	ach	247	3.8	0.645	22.8	LOS B	5.7	41.4	0.97	0.84	1.04	26.6
North	East: Gle	nayr 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
Appro	ach	405	3.4	0.701	19.7	LOS B	8.3	59.5	0.93	0.86	1.03	28.0
North	West: Cเ	ırlewis St NV	V									
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
Appro	ach	312	0.0	0.825	27.6	LOS B	8.5	59.2	1.00	1.06	1.36	27.1
South	West: G	enayr Ave S	W									
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
Appro	ach	396	3.5	0.817	24.8	LOS B	9.0	65.4	0.97	1.00	1.25	26.0
All Ve	hicles	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).

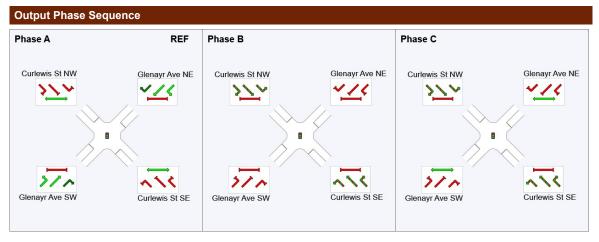
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Move	Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec		Average Back Pedestrian ped	of Queue Distance m	Prop. Queued S	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 Pe	destrians	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	Α	В	С					
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%.



REF: Reference Phase VAR: Variable Phase



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Organisation: GTA CONSULTANTS | Created: Friday, 9 April 2021 2:51:04 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 - 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 Glenay Ave NE 101 Glenay Ave 5th

Move	Movement Performance - Vehicles											
Mov ID	Turn	Demand F Total veh/h	lows 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
South	East: Cu	ırlewis 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
Appro	ach	243	3.9	0.430	17.2	LOS B	4.8	34.6	0.85	0.72	0.85	28.7
North	East: Gle	enayr Ave NE	Ē									
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
Appro	ach	405	3.4	0.534	14.6	LOS B	6.8	49.1	0.83	0.71	0.83	30.3
North'	West: Cเ	ırlewis St NV	٧									
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
Appro	ach	309	0.0	0.532	16.3	LOS B	6.2	43.1	0.86	0.74	0.86	31.2
South	West: G	lenayr Ave S	W									
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
Appro	ach	396	3.5	0.598	16.5	LOS B	6.9	50.1	0.87	0.75	0.87	29.4
All Ve	hicles	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).

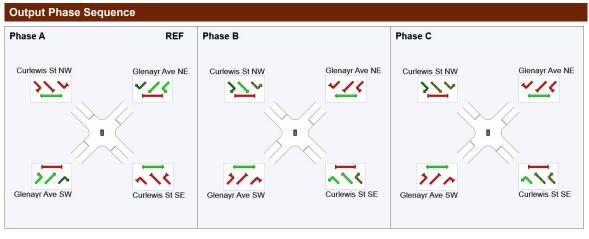
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Mov ID	Description	Demand Flow	Average Delay	Level of Av		of Queue Distance	Prop. Effective Queued Stop Rate		
טו		ped/h	sec	Service F	ped	m	Queueu	Stop Nate	
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 Pe	destrians	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 Summa	iry		
Phase	Α	В	С
Phase Change Time (sec) 0	24	36
Green Time (sec)	18	6	8
Phase Time (sec)	24	12	14
Phase Split	48%	24%	28%

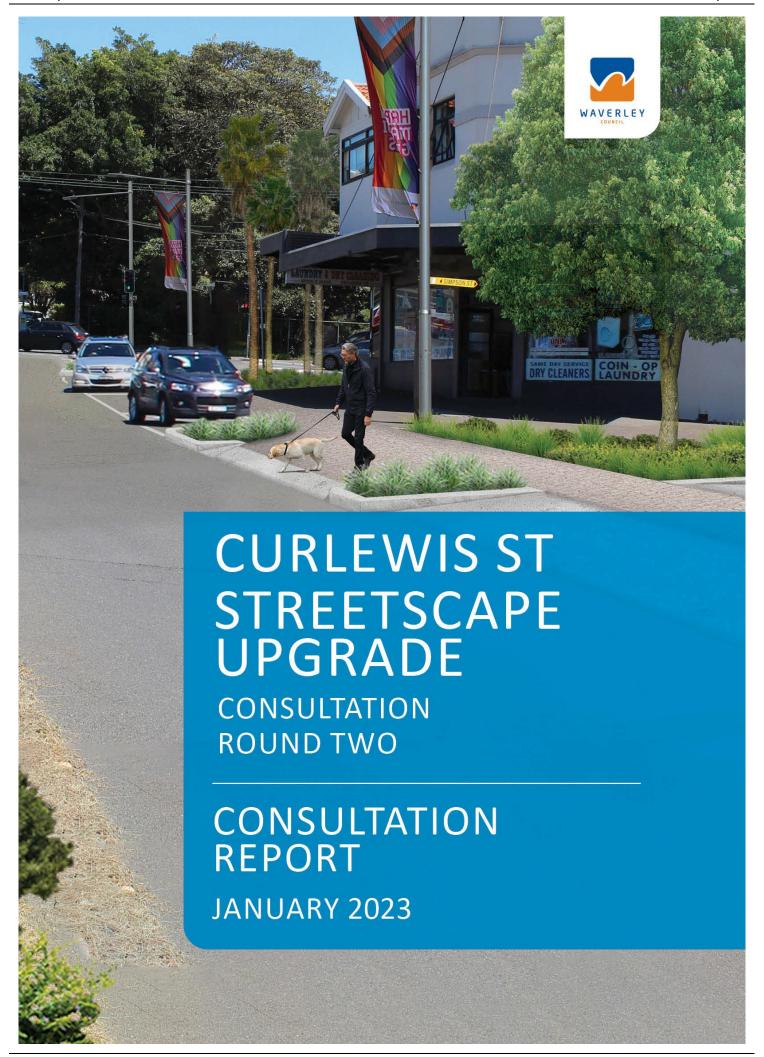
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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



REF: Reference Phase VAR: Variable Phase



SIDRA INTERSECTION 8.0 | Copyright © 2000-2019 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: GTA CONSULTANTS | Created: Friday, 9 April 2021 2:51:27 PM
Project: P:\N20800-20899\N208800 Waverley Streetscapes\Modelling\210408sid_N208800 Glenayr and Curlewis.sip8



Waverley Council acknowledges the Bidjigal, Birrabirragal and Gadigal people, who traditionally occupied the Sydney Coast, and we pay respect to all Aboriginal and Torres Strait Islander Elders both past and present.

Contents

Executive summary	2
Background	3
Approach	4
Engagement methodology	4
Detailed results – Survey	6
Detailed results – Doorknock	g
Detailed results – Have Your Say day	10
Detailed results – Email	10
Detailed results – Stakeholder submissions	11
Conclusion	11
Appendix A – Survey questions	12
Appendix B – Notification letter	14
Appendix C – Letter distribution maps	16
Appendix D – Social media posts	17
Appendix E – Enewsletters	19
Appendix F – Email submissions	20

Executive summary

Waverley Council is proposing to upgrade Curlewis Street in Bondi Beach to make it safer for pedestrians and bike riders. The proposed streetscape upgrade includes 700m of separated two-way bike path and beautifying the street to provide a welcoming and vibrant space for the whole community to enjoy.

Earlier this year we shared draft concept designs for the upgrade and asked for community feedback. The design at the western end of Curlewis Street was then updated to address feedback received in relation to connectivity of the bike path and traffic flow. From 21 November – 16 December 2022 we sought community feedback on the updated design and this report summaries feedback received.

A number of engagement methods were implemented to enable community members to submit feedback in a way that was easy and convenient, including:

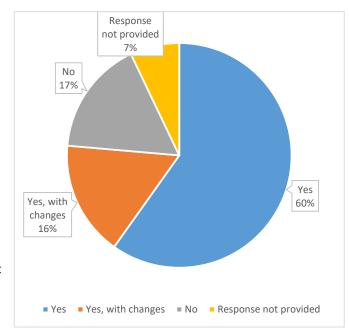
- Dedicated page on the Have Your Say website
- Online survey
- Letterbox drop to approx. 5,900 properties in the Waverley area, 900 properties in the Woollahra area and 100 nearby businesses
- One Have Your Say day held at Bondi Markets for community members to talk to Council officers about the project
- Social media
- Stakeholder outreach

Overview of feedback

A total of 128 submissions were received during the consultation period, with 60% supporting the updated design.

Of respondents who do not support the updated design, the main reasons noted were that a bike lane is not needed on Curlewis Street and that the proposed changes, including removal of the slip lane, won't address traffic congestion (note: this feedback was outside the scope of this consultation, which focused on changes to the bike path and traffic changes at the corner of Simpson St and Blair St).

A few changes to the design were suggested, including increasing connectivity of the bike path across Old South Head Road, improving road safety at this intersection, and constructing a pedestrian crossing further up Blair Street (near Beach Road).



The consultation revealed the left hand turn into
Simpson Street isn't heavily used, with the main reasons for use being to access the petrol station and Barracluff Park.

Curlewis St Streetscape Upgrade – Consultation Report

Page **2** of **22**

Recommendations:

- Proceed with the updated design at the western end of Curlewis St, noting the existing alternative routes to access to the petrol station and Barracluff Park.
- Provide information to the community to convey how traffic congestion at the Wellington St roundabout has been investigated following feedback received in the first round of consultation.
- Provide information to the community to explain the benefits of slip lane removal.
- Continue to advocate to Transport for NSW to improve safety and congestion at the Old South Head Road intersection.
- Traffic Team to review requests for loading zones and a pedestrian crossing on Blair St (near Beach Rd) separately.

Background

This project proposes to upgrade 850m of Curlewis Street from Campbell Parade to Old South Head Road, including 700m of separated two-way bike path.

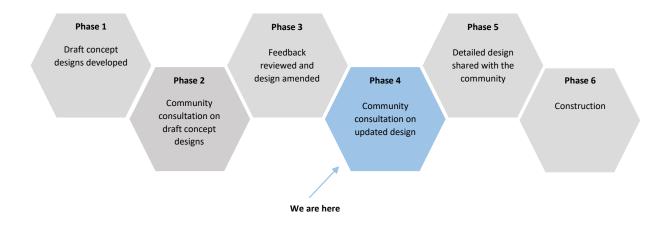
From 18 May – 15 June 2022 we collected feedback on a draft concept design for this upgrade. The design at the western end of Curlewis Street was then updated to address feedback received during the initial consultation with regards to connectivity of the bike path and traffic flow.

The second round of consultation sought feedback specifically on the updated design at the western end of Curlewis St, which:

- Removes the left hand turn into Simpson St (vehicles will still be able to turn left out of Simpson St)
- Improves connectivity of the shared path as bikes and pedestrians will have a more direct route along Curlewis St
- Allows room for two lanes of traffic travelling east from Old South Head Rd (one lane will continue onto Blair St and the other will continue onto Curlewis St)

There will be no net loss of parking on Simpson Street and no other vehicular movements will be impacted.

Community feedback has been used to inform the final design.



Curlewis St Streetscape Upgrade – Consultation Report

Page **3** of **22**

Approach

This consultation sought community feedback on an updated concept design at the western end of Curlewis Street, at the intersection with Old South Head Road. To do this, a mix of online and face-to-face engagement methods were employed.

The consultation objectives were:

- 1. To inform the community about the proposed streetscape upgrade
- 2. To obtain community feedback on the updated design at the western end of Curlewis Street

Engagement methodology

A range of engagement methods were used to maximise the opportunity for community participation. The methods used align with the IAP2 model for community engagement which has been adopted by Waverley Council.

Method	Overview	Date	Response
Have Your Say website	Updated Have Your Say page. URL: haveyoursay.waverley.nsw.gov.au/curlewisstreetscape	21 November 2022 – present	1,178 page views 774 unique visitors 34 project followers
Media release	Published on the <u>Waverley Council website</u> .	23 November 2022	N/A
Online survey	Survey hosted on <u>Have Your Say</u> to get feedback on the key elements of the proposed upgrade. See appendix A for survey questions.	21 November - 16 December 2022	98 submissions
Letterbox drop	Letter issued to approx. 5,900 nearby properties to notify of the consultation and encourage feedback. 900 letters were also delivered to adjacent properties in the Woollahra area. See appendix B and C for more information.	Late November 2022	24 QR code scans
Doorknock	Council officers doorknocked 49 residences and businesses on Beach Road, Simpson Street and Old South Head Road who are most likely to be impacted by the proposed removal of the left hand turn. Where there was no answer, a letter was left with more information.	24 November 2022	16 submissions 3 QR code scans
Social media posts	Facebook (two posts) See appendix D.	24 November 8 December 2022	24 November 1,709 reach 308 engagements (comments, shares, reactions) 8 December 2,101 reach 322 engagements

Curlewis St Streetscape Upgrade – Consultation Report

Page **4** of **22**

			(comments, shares, reactions)
	Instagram (two posts) See appendix D.	28 November 8 December 2022	28 November 2,291 reach 53 engagements (comments, shares, reactions)
			8 December 1,452 reach 16 engagements (comments, shares, reactions)
Stakeholder outreach	Emailed key stakeholders to advise of the consultation and encourage feedback, including: Precincts Councillors Bicycle NSW BIKEast Bondi and Districts Chamber of Commerce Bondi Mizrachi Synagogue Participants from the first round of consultation	Late November 2022	2 formal submissions
Waverley Weekly enewsletter	Story in Council's weekly enewsletter. See appendix E.	24 November and 8 December 2022	24 November 6,889 recipients 48.5% open rate 88 link clicks 8 December 6,902 recipients 48.7% open rate 77 link clicks
HYS engagement enewsletter	Story in Council's monthly enewsletter. See appendix E.	9 December 2022	9,487 recipients 52.2% open rate
HYS emails	Email sent to participants from the first round of consultation to encourage feedback on the updated design.	22 November 2022	N/A
Have Your Say day pop-up	Council officers held one face-to-face session at Bondi Markets to talk to residents about the proposed streetscape upgrade and collect feedback.	26 November 2022	22 surveys completed

Detailed results - Survey

The survey received a total of 98 submissions, including 22 hard copy surveys completed at the Have Your Say day pop-up. Hard copy surveys were input into the online form and a summary of results is below.

Respondent demographics

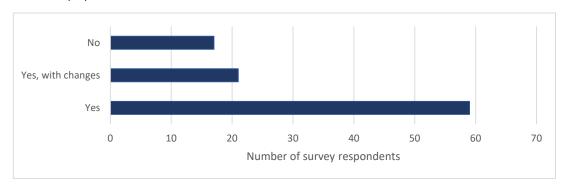
- 5% live on Beach Rd or Simpson St (north of Blair St)
- 14% live on Curlewis St
- 45% live in the Bondi area
- 13% live in the Waverley Council area

Support for the updated design

• Yes: 61% (59)

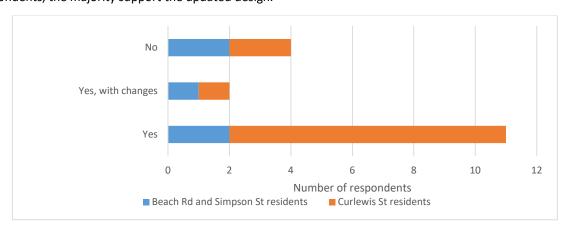
• Yes, with changes: 22% (21)

No: 17% (18)



Support from nearby residents

14% of respondents live on Curlewis St and 5% live on Beach Rd or Simpson St (north of Blair St). Of these respondents, the majority support the updated design.



The main concerns of the four respondents who do not support the updated design are:

- Bike lane is not needed (3)
- Removal of the left hand turn into Simpson St will cause traffic to build up on surrounding streets (1)

Curlewis St Streetscape Upgrade – Consultation Report

Page **6** of **22**

Suggested changes to the design

Respondents were asked to provide extra detail about the design changes they would like to see. 21 respondents answered this question, however one response has been excluded as it was not relevant to this consultation.

The most common ideas are listed below, with the number of times each idea was put forward shown in brackets.

- Keep the left hand turn into Simpson St (4)
- Construct a pedestrian crossing on Blair St near Beach Rd (3)
- Add a right hand turn lane from Old South Head Rd into Curlewis St (2)
- Improve connectivity of the bike path across Old South Head Rd (2)
- Separate bikes and pedestrians (2)

Other ideas:

- Remove the three parking spots on the corner
- Keep the slip lane
- Reduce parking loss (note: this comment was based on the understanding that parking was going to be removed along the entire length of Curlewis St)
- Make the shared path one way heading west
- More traffic signage to direct vehicles
- Reduce the speed limit to 40km/hr
- Concrete footpath will provide better grip than pavers
- · Upgrade the bike path on Blair St to make it safer

Reasons the updated design was not supported

Respondents were asked to provide extra detail to help us understand why they don't support the updated design. 17 respondents answered this question.

Feedback is summarised in the word cloud below, with the size of each phrase representing the number of times the idea was mentioned. Feedback is then listed below, with the number of times each idea was put forward shown in brackets.



Feedback and number of mentions:

- Bike lane not needed (5). One respondent noted it's not a useful bike route.
- Keep the slip lane (4)
- Loss of parking (4) note: the updated design will not result in a net loss of parking spaces
- Won't improve traffic congestion (4). One respondent noted the traffic signals at the Old South Head Road intersection need to be changed to address traffic flow issues.
- Improve bike path connectivity (2)
 - o One respondent noted bikes need an easier transition onto the separated bike lane
 - o One noted bikes will be funnelled down Blair St
- Keep the left hand turn in to Simpson St (1)

Curlewis St Streetscape Upgrade – Consultation Report

Page **7** of **22**

Businesses on the corner of Old South Head Rd and Blair St need a loading zone (1)

Usage of left hand turn into Simpson Street

56% of respondents (55) answered this question, of which:

- 17% (9) use the left hand turn into Simpson St
- 84% (46) do not

Reasons for using the turn and number of mentions:

- Access the petrol station on Old South Head Rd (4)
- Access Barracluff Park (2)
- Access kids' activities on Old South Head Rd (1)
- Parking (1)
- Visit the mechanic on Simpson St (1)
- Alternate route (1) context not given

Additional feedback

Respondents were given the option to provide any additional feedback and 46 comments were submitted. 6 comments were unrelated to the project and have not been included in this report.

Feedback is summarised in the word cloud below, with the size of each phrase representing the number of times the idea was mentioned. Feedback is then grouped by theme in the table.

Improve bike path connectivity

Make OSH Rd intersection safer

More greenery Bike path not needed Minimise shared paths Pedestrian crossing on Blair St Congestion at Wellington St roundabout

Add speed hump Improve Blair St bike path

Theme	No. of mentions	
Positive feedback about project	20	
Traffic congestion		
Address congestion at the Wellington St roundabout	3	
Bike path		
Bike path is not needed/won't be used	5	
Improve connectivity	2	
Improve Blair St bike path	1	
Paint all bike paths green to improve safety	1	
Pedestrian safety		
Construct a speed hump to slow down cars turning into Blair St/Curlewis St	2	
Construct a pedestrian crossing across Blair St (near Beach Rd)	1	
Minimise shared paths as they are not best practice	1	
Paint a centre line on the shared path to distinguish direction of travel	1	
Vehicular safety		
Address safety concerns at the Old South Head Rd intersection	5	

Curlewis St Streetscape Upgrade - Consultation Report

Page **8** of **22**

Remove the three parking spaces at the corner of Old South Head Rd and	1	
Blair St		
Other feedback		
More greenery	2	
More traffic signage	1	
Add bike racks	1	
Make Beach Rd one way	1	

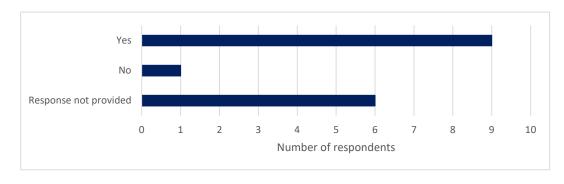
Detailed results - Doorknock

Council officers doorknocked 49 residences and businesses on Beach Road, Simpson Street and Old South Head Road most likely to be impacted by the proposed removal of the left hand turn. 16 submissions were recorded and are summarised below.

Support for updated design

Yes: 56% (9)No: 6% (1)

• Response not provided: 38% (6)



Reasons the updated design was supported

The number of times each piece of feedback was mentioned is shown in brackets.

- Proposed changes will improve pedestrian safety (3). Three respondents noted that intersection is dangerous as cars currently turn right into Simpson Street.
- Support for increased greenery (2)
- Bike path will be great (2)
- Proposed changes will improve traffic flow (1)

Reasons the updated design was not supported

One resident noted they use the left hand turn into Simpson Street regularly to access their property.

Additional comments

The number of times each piece of feedback was mentioned is shown in brackets.

- Three (3) businesses noted the proposed removal of the left hand turn into Simpson Street wouldn't impact them. One (1) business was not sure.
- Maintenance of garden beds needs to be improved (2)
- Google maps will need to be updated if the removal of the left hand turn goes ahead (1)
- Preference for native plants (1)

Curlewis St Streetscape Upgrade – Consultation Report

Page **9** of **22**

- Traffic gets congested at Wellington Street roundabout (1)
- A pedestrian crossing is needed across Blair Street, near Beach Road (1)
- If slip lane is removed, a loading zone is needed for businesses on the corner of Old South Head Road and Blair Street (1) Note: this respondent submitted the same feedback through the online survey.

Detailed results - Have Your Say day

One Have Your Say day was held during the consultation period at which community members were given the opportunity to talk through the plans with Council officers prior to submitting feedback. 22 survey submissions were recorded on the day, which were all input into the online form and analysed in the 'detailed results – survey' section of this report on pages 7-10.

Of the 22 surveys completed at these face-to-face sessions, 18 support the updated design, two do not support the updated design, two support the updated design with some changes.

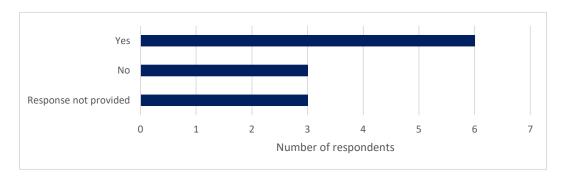
Detailed results - Email

12 pieces of feedback were received via email and are summarised below.

Support for updated design

Yes: 50% (6)No: 25% (3)

• Response not provided: 25% (3)



Concerns raised

- Parking loss (1)
- Need to enforce usage of dedicated bike lanes (1)
- Three parking spaces at the corner of Old South Head Rd and Blair St will cause traffic congestion (1)
- Proposed bike path doesn't provide a safe connection for cyclists on Birriga Rd (1)

Suggested changes

- Experienced cyclists won't use the shared path (1). Suggestion to add a kerb ramp further along the shared path for cyclists to join on Curlewis St. See appendix F figure 1.
- Construct a speed hump to slow down cars turning into Blair St/Curlewis St (1)
- Install traffic lights at intersection of Curlewis St and Gould St (1)
- Improve route for cyclists to transition from shared path to Blair St and construct a dedicated bike lane crossing across Old South Head Road with half height buttons (1). See appendix F figure 2.

Curlewis St Streetscape Upgrade – Consultation Report

Page **10** of **22**

- Improve the bicycle onramp on O'Sullivan Road and remove signage restricting bike access. Move the crossing further south to improve visibility for pedestrians and OF pedestrians (to cars). See appendix F figure 2.
- Add a loading zone for businesses on Curlewis St, between Glenayr Ave and Gould St (1)
- Address footpath damage on Curlewis St due to flooding (1)

Detailed results - Stakeholder submissions

Identified stakeholder groups were contacted via email and encouraged to provide feedback on the project. Two submissions were received, from BIKEast and Bicycle NSW.

Both submissions express support for the updated design as it improves connectivity for bike riders and request Council work with Woollahra Council and Transport for NSW to implement safer crossings for riders to connect Curlewis St to Birriga Rd and O'Sullivan Rd.

Additional comments

- Construct a raised pedestrian and bike crossing where the shared path crosses Blair St. If this is not feasible, narrow the travel lane as much as possible to reduce speed of cars.
- Negotiate with Transport for NSW to upgrade the intersection of Old South Head Rd, O'Sullivan Rd, Curlewis St and Blair St to make it safer for all road users, including a separated bike path to connect riders from Curlewis St to Birriga Rd and O'Sullivan Rd

Conclusion

The community is largely supportive of the updated design at the western end of Curlewis Street, although some respondents believe a separated bike path is not needed along Curlewis Street. The left hand turn into Simpson Street isn't heavily used, however it is used by some respondents to access the petrol station and Barracluff Park.

Safety and traffic congestion are the main priorities for the community; there were requests for the Old South Head Road intersection to be improved for the benefit of all road users and for bike path connections across this intersection to be enhanced.

Some respondents noted congestion is an issue at the Wellington Street roundabout and others asked for a pedestrian crossing to be constructed further up Blair Street (near Beach Road).

Recommendations:

- Proceed with the updated design at the western end of Curlewis St, noting the existing alternative routes to access to the petrol station and Barracluff Park.
- Provide information to the community to convey how traffic congestion at the Wellington St roundabout has been investigated following feedback received in the first round of consultation.
- Provide information to the community to explain the benefits of slip lane removal.
- Continue to advocate to Transport for NSW to improve safety and congestion at the Old South Head Road intersection.
- Traffic Team to review requests for loading zones and a pedestrian crossing on Blair St (near Beach Rd) separately.

Curlewis St Streetscape Upgrade – Consultation Report

Page **11** of **22**

Appendix A – Survey questions

1.	Do you support the updated design at the intersection of Curlewis St and Simpson St?
	o Yes
	 Yes, with some changes
	o No
	If "yes, with some changes" – please let us know what changes you would like to see made.
	If "no" - please let us know why you don't support the updated design.
2.	Do you currently use the left hand turn into Simpson St? O Yes
	YesNo
	If "yes", please let us know why you use the left hand turn into Simpson St.

Curlewis St Streetscape Upgrade – Consultation Report

Page **12** of **22**

3.	Any additional comments/feedback?

- **4.** What is your relationship to Curlewis St? Select the response that best applies.
 - o I live on Beach Rd and Simpson St, north of Blair St
 - o I live on Curlewis St
 - o I live in Bondi
 - o I live in the Waverley Council area
 - o I don't live in the area
 - o I own a business on Curlewis St
 - o Other:
- 5. How did you hear about this project? Select all that apply.
 - o Letter in my mailbox
 - o Council officers knocked on my door
 - o Email
 - Council website
 - o Social media
 - o Spoke to Council officers at Bondi Markets
 - o Other:

 ${\it Curlewis St Streets cape Upgrade-Consultation Report}$

Page **13** of **22**

Appendix B – Notification letter



Waverley Council PO Box 9, Bondi Junction NSW 1355 DX 12006, Bondi Junction Customer Service Centre 55 Spring Street, Bondi Junction NSW 2021 ABN: 12 302 383 608

Our ref: A21/0381

16 December 2022

[Title Firstname Surname]
[Position]
[Address]
[SUBURB] NSW [Post Code]

Re: Curlewis St Streetscape Upgrade - Have your say on the updated design by 16 December

Dear Resident/Business Owner

Earlier this year we asked for your feedback on a draft concept design for the proposed upgrade of Curlewis Street, Bondi Beach. This project aims to make the area safer for pedestrians and bike riders and create a more inviting and vibrant space for the community to enjoy.

Feedback has been reviewed and the concept design has been updated at the western end of Curlewis Street, at the intersection with Old South Head Road. The design has been updated to address key points raised during the initial consultation in relation to connectivity of the bike path and traffic flow.

A map of the updated design can be found overleaf. The updated design:

- Removes the left hand turn into Simpson Street (vehicles will still be able to turn left out of Simpson Street)
- Improves connectivity of the shared path as bikes and pedestrians will have a more direct route along Curlewis Street
- Allows room for two lanes of traffic travelling from Old South Head Road, one continuing onto Blair Street and the other continuing onto Curlewis Street

Other features of the streetscape upgrade were consulted on earlier this year. For more information, scan the QR code or visit https://haveyoursay.waverley.nsw.gov.au/curlewisstreetscape

We are now seeking feedback on the updated design at the western end of Curlewis Street. Please share your feedback via the methods outlined below by Friday 16 December 2022.



How to have your say

- Complete a short survey at https://haveyoursay.waverley.nsw.gov.au/curlewisstreetscape/survey
- Come and talk to us at a Have Your Say day:
 - Bondi Farmers Market (Bondi Beach Public School),
 Saturday 26 November from 9am-12pm
- Email <u>majorprojects@waverley.nsw.gov.au</u>

Kind regards

Rodhan Haughton Senior Project Manager, Waverley Council

> Contact us 9083 8000 info@waverley.nsw.gov.au waverley.nsw.gov.au

Connect with us

f whatsonwaverley
waverleycouncil

Curlewis St Streetscape Upgrade – Consultation Report

Page **14** of **22**



Map of updated design

Waverley Council PO Box 9, Bondi Junction NSW 1355 DX 12006, Bondi Junction Customer Service Centre 55 Spring Street, Bondi Junction NSW 2022 ABN: 12 502 583 608

SHARED FATH SIMPSON ST REMOVAL OF LEFT HAND TURN INTO SIMPSON ST NEW RAISED SHARED PATH **CURLEWIS ST**

LEGEND





info@waverley.nsw.gov.au waverley.nsw.gov.au

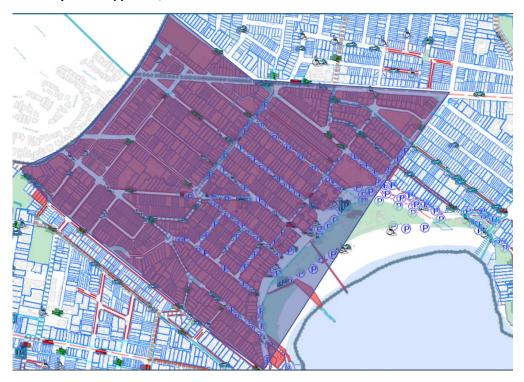
Connect with us f whatsonwaverley @ waverleycouncil

Curlewis St Streetscape Upgrade – Consultation Report

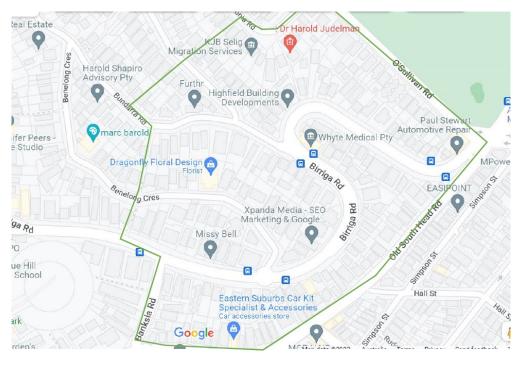
Page **15** of **22**

Appendix C – Letter distribution maps

Waverley area - approx. 5,900 residences



Woollahra area - approx. 900 residences



Curlewis St Streetscape Upgrade – Consultation Report

Page **16** of **22**

Appendix D - Social media posts

Facebook

24 November 2022



Earlier this year we asked for your feedback on a draft concept design for the upgrade of Curlewis Street, Bondi Beach. The design at the western end of the street (near Old South Head Road) has been updated we want to hear from you again.

Share your feedback and help us make Curlewis Street a safer and more welcoming space! Feedback closes Friday 16 December. Learn more: https://haveyoursay.waverley.nsw.gov.au/curlewisstreetscape

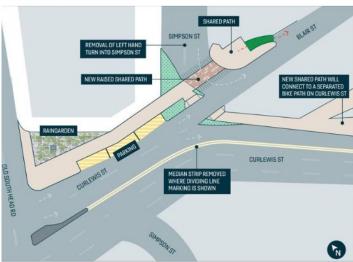


8 December 2022



Do you travel along Curlewis Street, Bondi Beach? We want your feedback on a proposed design to upgrade the street and make it safer for people walking and riding bikes. Learn more and share your thoughts at https://haveyoursay.waverley.nsw.gov.au/curlewisstreetscape

Feedback closes Friday 16 December.



Curlewis St Streetscape Upgrade – Consultation Report

Page **17** of **22**

Instagram

28 November 2022



8 December 2022



 ${\it Curlewis St Streets cape Upgrade-Consultation Report}$

Page **18** of **22**

Appendix E – Enewsletters

Waverley Weekly - 24 November 2022



Have your say on the Curlewis Street upgrade

The design for the proposed upgrade of Curlewis Street has been updated to address feedback received earlier this year. Have your say on the updated design before 16 December.

MORE

Waverley Weekly - 8 December 2022



Curlewis St Streetcape Upgrade

We're proposing to upgrade Curlewis Street in Bondi Beach. Have your say on the updated design before feedback closes on Friday 16 December.

MORE

Curlewis St Streetscape Upgrade – Consultation Report

Page **19** of **22**

HYS enews - 9 December 2022

Provide feedback on the Curlewis St Streetscape Upgrade, Bondi Local Traffic Study, Flickerfest 2023 and more

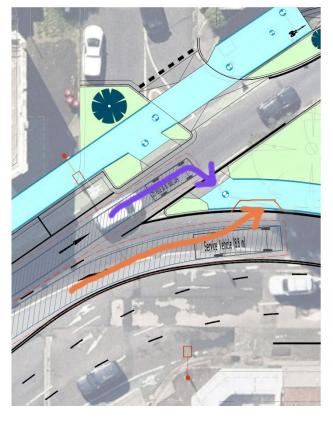


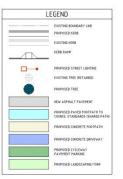
Projects open for community input

Last chance to have your say on an updated design for the <u>Curlewis St</u>
 <u>Streetscape Upgrade</u>. Feedback closes Friday 16 December.

Appendix F - Email submissions

Figure 1





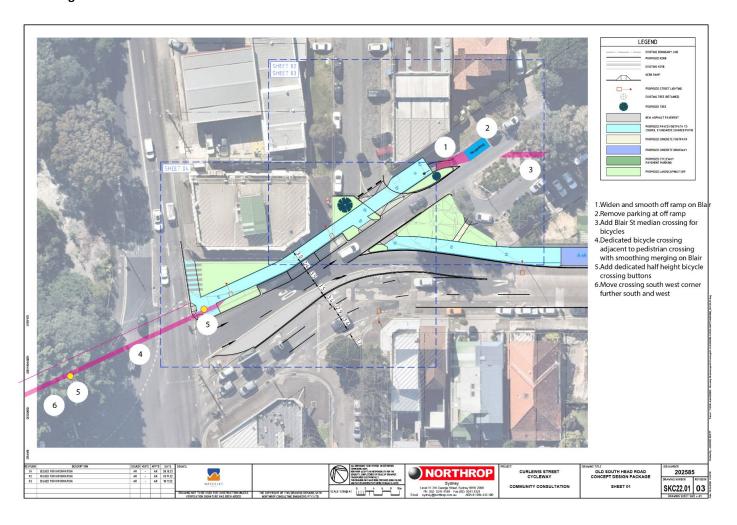
problem: cyclist turning from old south head into curlewis has to slow to negotiate kerb ramp, causing conflict problem for following motorist >yes, this will happen!

solution: add kerb ramp on curlewis enables cyclists to exit roadway onto shared path without inconveniencing motorists on blair >everyone is happy!

Curlewis St Streetscape Upgrade – Consultation Report

Page **20** of **22**

Figure 2



 ${\it Curlewis St Streets cape Upgrade-Consultation Report}$

Page **21** of **22**

WAVERLEY

REPORT TC/V.02/23.02

Subject: 140 Clyde Street, North Bondi - Angle Parking and Passing

Bays - Survey Results

TRIM No: DA-314/2021

Author: Beryl Wang, Professional Engineer, Traffic and Development

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Converts the angle parking on the northern side of Clyde Street, North Bondi, back to parallel parking.

2. Does not install passing bays in Clyde Street, east of Hardy Street.

1. Executive Summary

Council considered a petition from residents of Clyde Street, North Bondi, to remove angle parking restrictions at the Council meeting held on 18 October 2022. The restrictions were installed in August 2022. A report was submitted to the Traffic Committee meeting on 27 October 2022 recommending that Council:

- Undertakes a survey of residents in Clyde Street (east of Hardy Street) and Oakes Place, North Bondi, for their views on the angle parking that has recently been installed and provision of passing bays in the narrow section of Clyde Street.
- Reports the outcomes of the survey with any recommendations to the Waverley Traffic Committee for consideration.

At the following Council meeting, Council adopted the recommendation and added that Council 'monitors compliance of existing angle parking spaces concerning the length of vehicles parked in those spaces.'

This report presents the survey results received following the above recommendations. Figure 1 shows the consultation area.

93 properties were surveyed in November 2022. 38 responses were received from 37 households. Of these 37 households:

- 5 responses supported retaining the angle parking.
- 32 responses supported returning to parallel parking.
- 8 responses supported the installation of passing bays in Clyde Street.
- 30 responses did not support the installation of passing bays.

It is recommended that the angle parking at the east end of Clyde Street is removed and returned to parallel parking. It is also recommended that Council does not install passing bays in Clyde Street, east of Hardy Street.

Council will need to exercise its delegated functions to implement the proposal.



Figure 1. Consultation area (red).

2. Introduction/Background

Council considered a petition from residents of Clyde Street, North Bondi to remove angle parking restrictions at the Council meeting held on 18 October 2022. The restrictions were installed in August 2022. A report was submitted to the 27 October 2022 Traffic Committee recommending that Council:

- Undertakes a survey of residents in Clyde Street (east of Hardy Street) and Oakes Place, North
 Bondi, for their views on the angle parking that has recently been installed and provision of passing
 bays in the narrow section of Clyde Street.
- Reports the outcomes of the survey with any recommendations to the Waverley Traffic Committee for consideration.

Figure 2 shows the location of the angle parking in Clyde Street. Figure 3 shows the location of the proposed passing bays.

At the following Council meeting, Council adopted the recommendation and added that Council 'monitors compliance of existing angle parking spaces concerning the length of vehicles parked in those spaces.'

A survey was distributed in November 2022 to the 93 properties in Clyde Street, east of Hardy Street, and Oakes Place, North Bondi. The survey included the following questions:

- Do you support keeping the angle parking?
- Do you support the linemarking of bays if the angle parking is retained?
- Do you support the introduction of timed parking of four spaces outside the childcare centre?
- Do you support the introduction of passing bays in Clyde Street?



Figure 2. Location of existing angle parking in Clyde Street and potential timed parking outside childcare centre at 140 Clyde Street.



Figure 3. Location of proposed passing zones in Clyde Street.

3. Technical Analysis

93 properties were surveyed in November 2022. 38 responses were received from 37 households. Of these 37 households:

- 5 responses supported retaining the angle parking, 32 responses prefer to return to parallel parking (see Figure 4).
- 8 responses supported the installation of passing bays in Clyde Street, and 30 responses were not in support of the installation of passing bays (see Figure 5).
- 11 responses supported the linemarking of the existing angle parking, and 24 responses were not in support of the linemarking (see Figure 6).
- 2 responses supported the installation of timed parking spaces outside the childcare centre at 140 Clyde Street, and 34 responses were not in support the timed spaces (see Figure 7).

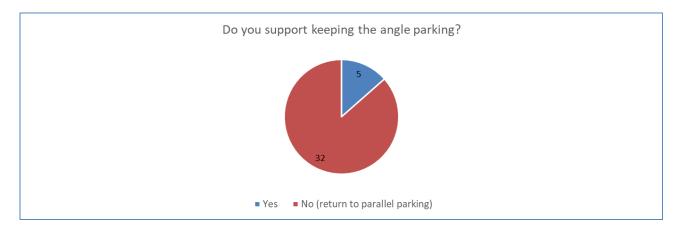


Figure 4. Survey results for keeping the angle parking.

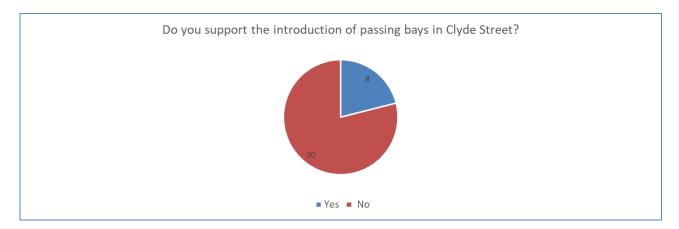


Figure 5. Survey results for the proposed passing bays.

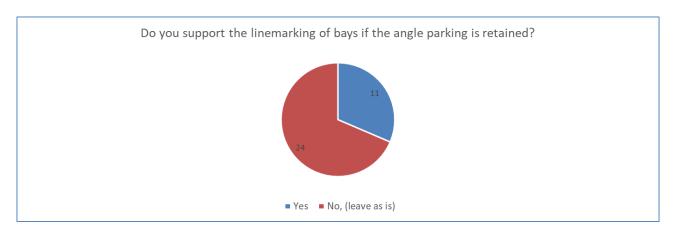


Figure 6. Survey results for linemarking of the angle parking bays.

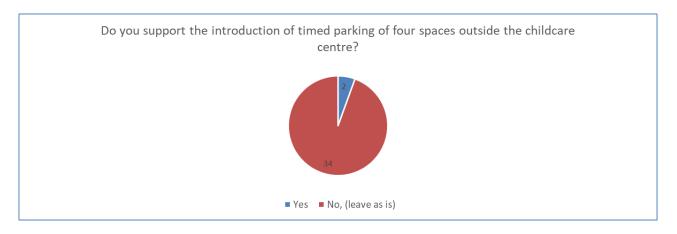


Figure 7. Survey results for timed parking outside the childcare centre at 140 Clyde Street.

It is recommended that the existing angle parking in Clyde Street is converted back to parallel parking and that Council does not install passing bays in Clyde Street east of Hardy Street.

4. Financial Information for Council's Consideration

Council will fund the costs from existing budgets.

5. Attachments

Nil.

REPORT TC/V.03/23.02

Subject: 13-15 O'Brien Street, Bondi Beach - Loading Zone

Modification

TRIM No: A04/0696

Author: Malik Almuhanna, Senior Traffic Engineer

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services



That Council modifies the parking restrictions for the loading zone in front of 13–15 O'Brien Street, Bondi Beach, as shown in Figure 2 of the report.

1. Executive Summary

Council has investigated weekend use of the 6.5 metre loading zone outside 13-15 O'Brien Street, Bondi Beach (see Figure 1). Use of the loading zone has been reported to be low on weekends.

The space is currently signposted as 'Loading Zone, 8 am–4 pm' and '1P 4 pm–6 pm, 4P 6 pm–10 pm' seven days a week. 1P and 4P metered parking restrictions apply from 4 pm to 10 pm.

Five businesses were consulted regarding their use of the loading zone and whether they require the zone on weekends to facilitate their deliveries. Out of the five businesses:

- 2 needed the loading zone for deliveries on Saturday mornings.
- 1 preferred the loading zone to be between Monday and Friday only.
- 2 rarely use the loading zone.

It is recommended that the loading zone operate from 8 am to 4 pm on weekdays and from 8 am to 12 noon on Saturday instead of the currently operation from 8 am to 4 pm, 7 days a week.

Figure 2 shows the existing and proposed signage.

Council will need to exercise its delegated functions to implement the proposal.



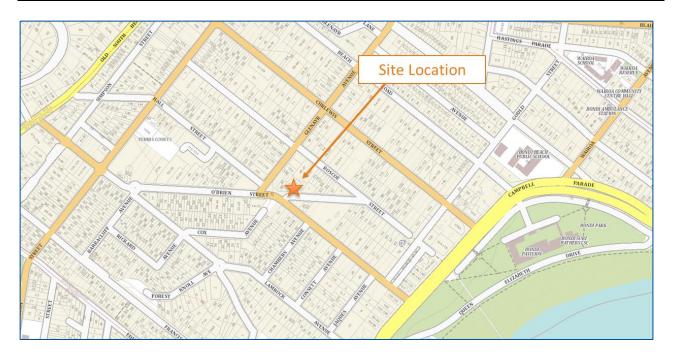


Figure 1. Site location.

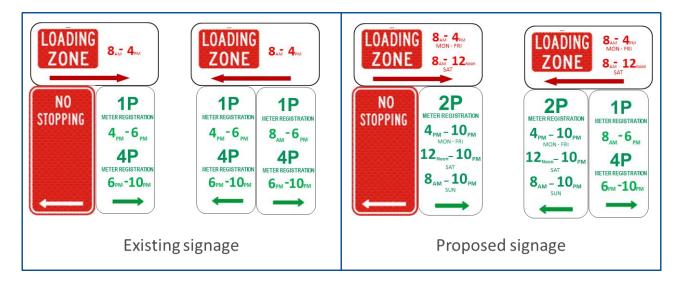


Figure 2. Proposed signage changes.

The loading zone outside 13-15 O'Brien Street is underutilised on Saturdays and Sundays. It is proposed that the loading zone times are reduced to 8 am to 12 noon on Saturday and removed on Sunday.

3. Technical Analysis

Consultation

Five businesses were consulted regarding their use of the loading zone and whether they require the zone on weekends to facilitate their deliveries. Out of the five businesses:

- 2 prefer to keep the loading zone on Saturday morning.
- 1 prefers the zone to be between Monday and Friday only.
- 2 rarely rely on the loading zone and do not mind either option.

Nearby loading zones

Hall Street has six loading zones between O'Brien Street and Campbell Parade. The nearest two loading zones are outside 68 Hall Street (40 metres away) and outside 23 O'Brien Street (90 metres away). The changes proposed for the loading zone outside 13-15 O'Brien Street will not affect the operation of those zones.

4. Financial Information for Council's Consideration

Council will use existing budgets to fund the installation of signs.

5. Attachments

Nil.

REPORT TC/V.04/23.02

Subject: Patterson Street and Plowman Street, North Bondi - 'No

Stopping' Zones

TRIM No: A14/0145

Author: Beryl Wang, Professional Engineer, Traffic and Development

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 9.2 metre 'No Stopping' zone on the southern side of Patterson Street, North Bondi, west of Plowman Street.

2. Installs a 10 metre 'No Stopping' zone on the western side of Plowman Street, south of Patterson Street.

1. Executive Summary

Council has received a request to review parking controls at the intersection of Patterson Street and Plowman Street, North Bondi. Figure 1 shows the location of the intersection.

The current restrictions are shown in Figure 2. They are:

- 10.5 metre 'No Stopping' zone on the northern side of Patterson Street, west of Plowman Street.
- 11.6 metre 'No Stopping' zone on the western side of Plowman Street, north of Patterson Street.

Council's waste services team are having difficulties turning waste vehicles right from Patterson Street onto Plowman Street. Residents have also reported safety concerns due to cars being parked close to the intersection obscuring sight lines for drivers.

It is recommended that Council:

- Installs a 9.2 metre 'No Stopping' zone on the southern side of Patterson Street, west of Plowman Street.
- Installs a 10 metre 'No Stopping' zone on the western side of Plowman Street, south of Patterson Street.

Figure 3 shows the proposed 'No Stopping' zones.

Council will need to exercise its delegated functions to implement the proposal.





Figure 1. Location of intersection.



Figure 2. Existing parking restrictions.



Figure 3. Proposed 'No Stopping' zones.

Council has received a request to review the parking controls at the intersection of Patterson and Plowman Street, North Bondi.

The existing parking restrictions are shown in Figure 2. The statutory 10 metres of 'No Stopping' is not currently signposted on the southern side of Patterson Street west of Plowman Street and on the western side of Plowman Street south of Patterson Street.

3. Technical Analysis

Council waste vehicles are around 10 metres long (9 metres for the truck itself, plus 1 metre for the scoop added to the rear). These long vehicles require more room to manoeuvre at local road intersections than general traffic.

The swept path of a waste truck turning right from Patterson Street onto Plowman Street at a turning speed of 0–5 km/h is shown in Figure 4. The swept path diagram is from Austroads for 8.8 metre medium rigid vehicles. It is similar to the swept path of a Council waste vehicle.

The swept paths show that 'No Stopping' zones are required on the southern side of Patterson Street west of Plowman Street and on the western side of Plowman Street south of Patterson Street.

It is recommended that Council installs a 9.2 metre 'No Stopping' zone on the southern side of Patterson Street, west of Plowman Street. This will be just east to the driveway of 23 Patterson Street. It is also recommended that Council installs a statutory 10 metre 'No Stopping' zone on the western side of Plowman Street, south of Patterson Street. Figure 3 shows the proposed parking restrictions.



Figure 4. Swept path analysis diagram.

4. Financial Information for Council's Consideration

Council will fund the costs of sign installation from existing budgets.

5. Attachments

Nil.

REPORT TC/V.05/23.02

Subject: 82 O'Brien Street, Bondi Beach - Construction Zone

TRIM No: A03/2514-04

Author: Karl Magistrado, Traffic Engineer

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services



COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 15 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone 5.4 metres west of the driveway to 75 Lamrock Avenue, Bondi Beach, as shown in Figure 2 of the report.
- 2. Notifies residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone, as necessary.

1. Executive Summary

Council has received an application for the installation of a construction zone in Lamrock Avenue at the rear of 82 O'Brien Street, Bondi Beach.

Council officers propose the installation of a 15 metre construction zone as shown in Figure 2.

Council will need to exercise its delegated functions to implement the proposal.



Figure 1. Site location.



Figure 2. Location to install construction zone signs.

In accordance with standard practice at Council, it is proposed that the construction zone is signposted 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' for the approved construction hours under the development consent. Council will then supply the applicant with transferable permits to be used on the applicant's construction vehicles. The Traffic Committee and Council's requirements for permit approvals are a minimum length of 9 metres along the site frontage with a minimum period of 13 weeks.

3. Technical Analysis

The subject site has a frontage of 5.4 metres on Lamrock Avenue. There is no driveway to the property from Lamrock Avenue. The applicant has requested a 15 metre construction zone along the frontage on Lamrock Avenue. Council officers propose to install 15 metre construction zone. The existing and recommended parking allocation is shown in Figures 3.

The construction zone location leaves two parking spaces available between the zone and a driveway to the west and one parking space between the zone and a driveway to the east.



Figure 3. Parking controls.

Table 1. Application details.

Applicant	Stothard Projects			
Development application	DA-55/2022			
Works	Alterations and additions to an existing semi-detached dwelling,			
	including first floor and hardstand car space to the rear of Lamrock			
	Avenue			
Approved hours of construction	7 am-5 pm Monday-Friday; 8 am-3 pm Saturday			
Frontage length	5.4 metres			
Road	Lamrock Avenue			
Existing parking	2P 8am-10pm Permit Holders Excepted Area 4			
Length requested by applicant	15 metres			
Length to be signposted	15 metres			
Effective construction zone - Total	15 metres			
length available for construction				
Duration	26 weeks			
Fee area	Medium Density Residential			

Signage

The proposed signage is shown below.



Figure 4. Proposed signage.

Notification

Residents in the vicinity of the construction zone will be notified prior to it being installed.

Figure 5 shows the properties to be notified about the Lamrock Avenue construction zone.



Figure 5. Notification area (hatched).

4. Financial Information for Council's Consideration

The cost to the applicant for the 15 metres made available for construction vehicles is estimated to be \$1,080 per week. The estimated weekly fees are shown in Table 2.

Table 2. Calculation of estimated fees.

Category	Unit	Number/ Dimensions	Rate (GST Exempt)	Fee
Fee (Areas zoned low, medium, or high density residential)				
- Parallel parking	per metre	15	\$72.00	\$1,080.00
- Angle parking	perweek	0	\$145.00	\$0.00
Fee (Areas zoned neighbourhood centre, commercial core, or mixed use)	per metre			
- Parallel parking	per week	0	\$100.00	\$0.00
- Angle parking		0	\$195.00	\$0.00
Occupation of metered parking spaces (in addition to the above fees) - 9 metres at 5.5 metres per unmarked parallel space	per space per week	0.0	\$400.00	\$0.00
		_	Weekly Fee	\$1,080.00

5. Attachments

Nil.

WAVERLEY

REPORT TC/V.06/23.02

Subject: 2 Princess Street, Rose Bay - Construction Zone

TRIM No: A03/2514-04

Author: Karl Magistrado, Traffic Engineer

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 12 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 2 Princess Street, Rose Bay.
- 2. Notifies residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone, as necessary.

1. Executive Summary

Council has received an application for the installation of a construction zone along the frontage of 2 Princess Street, Rose Bay. The site location is shown in Figure 1.

Council officers propose the installation of a 12 metre construction zone as shown in Figure 2.

Council will need to exercise its delegated functions to implement the proposal.



Figure 1. Site location.



Figure 2. Location to install construction zone signs.

In accordance with standard practice at Council, it is proposed that the construction zone is signposted 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' for the approved construction hours under the development consent. Council will then supply the applicant with transferable permits to be used on the applicant's construction vehicles. The Traffic Committee and Council's requirements for permit approvals are a minimum length of 9 metres along the site frontage with a minimum period of 13 weeks.

3. Technical Analysis

The subject site has a frontage of 12.3 metres on Princess Street. The applicant has requested a 12 metre construction zone along the frontage on Princess Street. Council officers propose to install 12 metre construction zone. The existing and recommended parking allocation is shown in Figure 3 below.

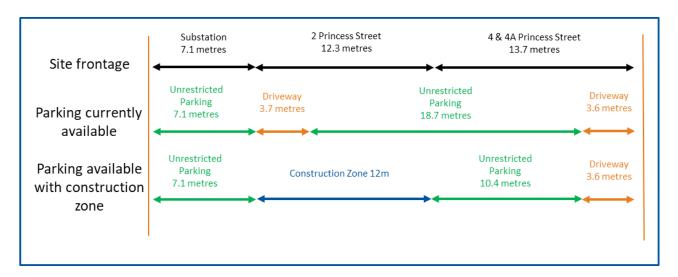


Figure 3. Parking controls.

Table 1. Application details.

Applicant	Matthew English			
Development application	DA-7/2021/A			
Works	Demolition of the existing dwelling, garage laundry, and the			
	construction of 2 x 3 storey and 1x2 storey townhouses with			
	basement parking and storage			
Approved hours of construction	7 am–5 pm Monday–Friday; 8 am–3 pm Saturday			
Frontage length	12.3 metres			
Road	Princess Street			
Existing parking	Unrestricted Parking			
Length requested by applicant	12 metres			
Length to be signposted	12 metres			
Effective construction zone - Total	12 metres			
length available for construction				
Duration	30 weeks			
Fee area	Medium Density Residential			

Signage

The proposed signage is shown below.



Figure 4. Proposed signage.

Notification

Residents in the vicinity of the construction zone will be notified prior to it being installed.

Figure 5 shows the properties to be notified about the Princess Street construction zone.



Figure 5. Notification area (hatched).

4. Financial Information for Council's Consideration

The cost to the applicant for the 12 metres made available for construction vehicles will be \$864 per week. The estimated weekly fees are shown in Table 1.

Table 1. Calculation of estimated fees.

Category	Unit	Number/ Dimensions	Rate (GST Exempt)	Fee
Fee (Areas zoned low, medium, or high density residential)				
- Parallel parking	per metre	12	\$72.00	\$864.00
- Angle parking	per week	0	\$145.00	\$0.00
Fee (Areas zoned neighbourhood centre, commercial core, or mixed use)	per metre			
- Parallel parking	per week	0	\$100.00	\$0.00
- Angle parking		0	\$195.00	\$0.00
Occupation of metered parking spaces (in addition to the above fees)	per space	0.0	\$400.00	\$0.00
- 9 metres at 5.5 metres per unmarked parallel space	per week			
	_		Weekly Fee	\$864.00

5. Attachments

Nil.

WAVERLEY

REPORT TC/V.07/23.02

Subject: 20 Forest Knoll Avenue, Bondi Beach - Construction Zone

TRIM No: A03/2514-04

Author: Beryl Wang, Professional Engineer, Traffic and Development

Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 10 metre 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 20 Forest Knoll Avenue, Bondi Beach as shown in Figure 2.
- 2. Notifies residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone, as necessary.

1. Executive Summary

Council has received an application for the installation of a construction zone in Forest Knoll Avenue, Bondi Beach west of the driveway to 18 Forest Knoll Avenue, Bondi Beach.

Council officers propose the installation of a 10 metre construction zone as shown in Figure 2.

Council will need to exercise its delegated functions to implement the proposal.



Figure 1. Site location.



Figure 2. Location to install construction zone signs.

In accordance with standard practice at Council, it is proposed that the construction zone is signposted 'No Parking 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' for the approved construction hours under the development consent. Council will then supply the applicant with transferable permits to be used on the applicant's construction vehicles. The Traffic Committee and Council's requirements for permit approvals are a minimum length of 9 metres along the site frontage with a minimum period of 13 weeks.

3. Technical Analysis

The subject site has a frontage of 12.5 metres in Forest Knoll Avenue. There is no driveway to the property from Forest Knoll Avenue. The applicant has requested a 10 metre construction zone along the frontage in Forest Knoll Avenue.

Council officers propose to install 10 metre construction zone. The existing and recommended parking allocation is shown in Figures 3.

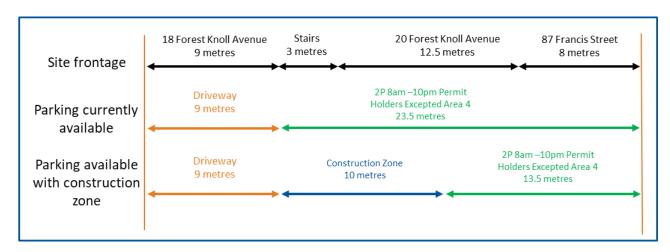


Figure 3. Parking Controls.

Table 1. Application details.

Applicant	Richard Gadd				
Development application	DA-313/2021				
Works	Demolition of dwelling and construction of two new part 2 and 3				
	storey dwellings with integrated basement parking				
Approved hours of construction	7 am-5 pm Monday-Friday; 8 am-3 pm Saturday				
Frontage length	12.5 metres				
Road	Forest Knoll Avenue				
Existing parking	2P 8 am-10 pm Permit Holders Excepted Area 4				
Length requested by applicant	10 metres				
Length to be signposted	10 metres				
Effective construction zone - Total	10 metres				
length available for construction					
Duration	14 Weeks				
Fee area	Low Density Residential				

Signage

The proposed signage is shown below.



Figure 4. Proposed signage.

Notification

Residents in the vicinity of the construction zone will be notified prior to it being installed.

Figure 5 shows the properties to be notified about the Forest Knoll Avenue construction zone.



Figure 5. Notification area (hatched).

4. Financial Information for Council's Consideration

The cost to the applicant for the 15 metres made available for construction vehicles is estimated to be \$720 per week. The estimated weekly fees are shown in Table 1.

Table 1. Calculation of estimated fees.

Category	Unit	Number/ Dimensions	Rate (GST Exempt)	Fee
Fee (Areas zoned low, medium, or high density residential) - Parallel parking - Angle parking	per metre per week	10	\$72.00 \$145.00	\$720.00 \$0.00
Fee (Areas zoned neighbourhood centre, commercial core, or mixed use)	per metre	0	\$143.00	3 0.00
- Parallel parking - Angle parking	per week	0	\$100.00 \$195.00	\$0.00 \$0.00
Occupation of metered parking spaces (in addition to the above fees) - 9 metres at 5.5 metres per unmarked parallel space	per space per week	0.0	\$400.00	\$0.00
	-	-	Weekly Fee	\$720.00

5. Attachments

Nil.