



WAVERLEY TRAFFIC COMMITTEE MEETING

ADDITIONAL BUSINESS

10.00 AM, THURSDAY 25 AUGUST 2022

Waverley Council
PO Box 9
Bondi Junction NSW 1355
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Tel. 9083 8000
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ADDITIONAL BUSINESS

PART 1 – MATTERS PROPOSING THAT COUNCIL EXERCISE ITS DELEGATED FUNCTIONS

NOTE: *The matter 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/V STATE ELECTORATE OF VAUCLUSE

TC/V.07/22.08 Hall Street, Bondi Beach - Temporary One-Way Trial (A22/0171)..... 3

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Endorses the temporary one-way westbound conversion (Alternative Proposal) of Hall Street, Bondi Beach, between Gould Street and O'Brien Street, as shown in Figure 2 of the report.
2. Notes that the Alternative Proposal will not change the two-way configuration at the intersection of Hall Street, O'Brien Street and Glenayr Avenue.
3. Prepares and then submits a Traffic Management Plan of the proposed temporary one-way westbound conversion of Hall Street, Bondi Beach, between Gould Street and O'Brien Street to Transport for NSW for consideration and approval.
4. Prepares and then submits the detailed design plan to Transport for NSW and NSW Police for review and approval prior to construction.
5. Monitors traffic speeds and volumes to identify effects on surrounding streets during the trial period.
6. Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should on-site circumstances warrant changes.

REPORT
TC/V.07/22.08

Subject: Hall Street, Bondi Beach - Temporary One-Way Trial

TRIM No: A22/0171

Author: Malik Almuhanha, Senior Traffic Engineer
Calum Hutcheson, Service Manager, Traffic and Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

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5. Monitors traffic speeds and volumes to identify effects on surrounding streets during the trial period.
6. Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should on-site circumstances warrant changes.

1. Executive Summary

Council has been investigating ways to improve amenities including reduction of conflicts between pedestrians and vehicles along Hall Street, Bondi Beach. Council was successful in obtaining a \$500,000 grant through 'Streets as Shared Spaces' program towards a one-way trial along Hall Street between Gould Street and O'Brien Street.

A report on converting Hall Street to one-way northbound from north of Gould Street to south of Glenayr Avenue was submitted to the July Waverley Traffic Committee meeting. Council subsequently resolved for a report to be submitted to the August Waverley Traffic Committee meeting assessing an "Alternative Proposal" which allowed two-way access to O'Brien Street north-east of Hall Street.

The original and alternative proposals are presented in Figures 1 and 2. Traffic Management Plans for the proposals are contained in Attachments 1 and 2.

The original proposal provides greater benefits for the pedestrian community. The alternative proposal provides better access to carparking and loading facilities in O'Brien Street.

The changes in traffic flows for both proposals are 0 to 4 vehicles per minute in peak hours. They are much lower for most of the day.

Either proposal could proceed for the 6 month trial.

Another alternative was considered. This would involve making Hall Street one-way eastbound instead of westbound. This was not pursued as it may have impacted on police emergency call outs due to police in vehicles exiting Gould Street not being able to turn right into Hall Street.

Temporary kerb extensions at the pedestrian crossings immediately east of the Glenayr Avenue/O'Brien Street (west) intersection and the eastern section of O'Brien Street have been investigated. They could conflict with truck movements to and from the eastern section of O'Brien Street. They can be reconsidered after the trial period if Council determines to go with a permanent.

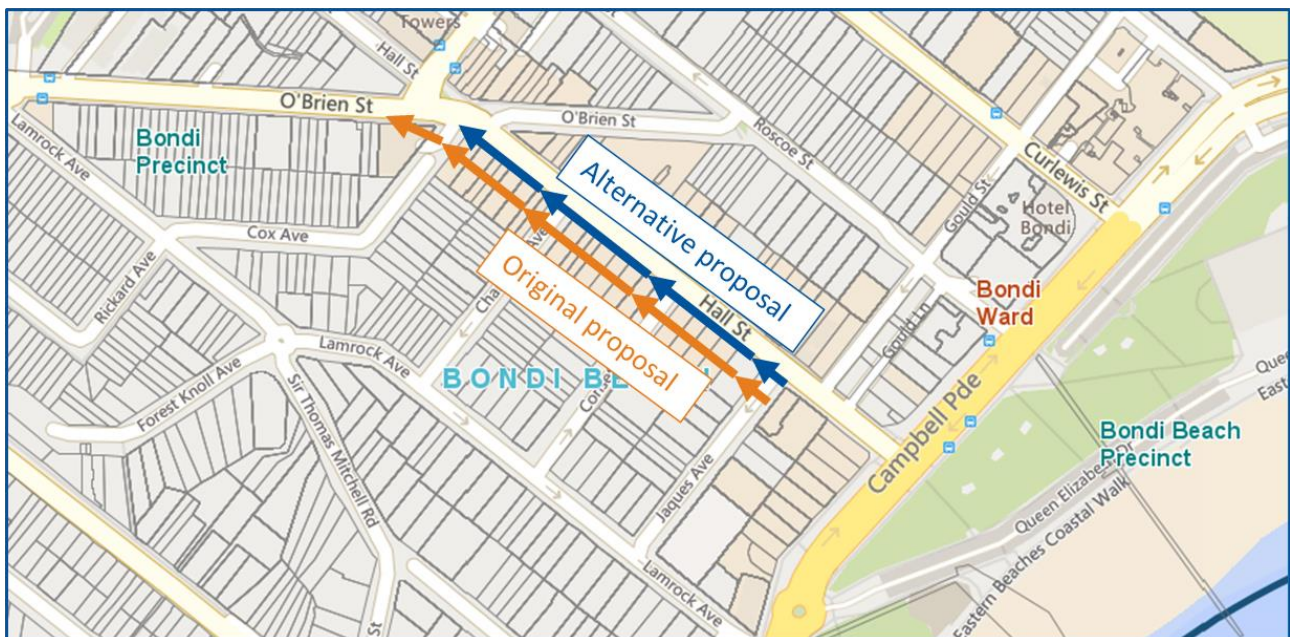


Figure 1. Original and alternative proposals for Hall Street.

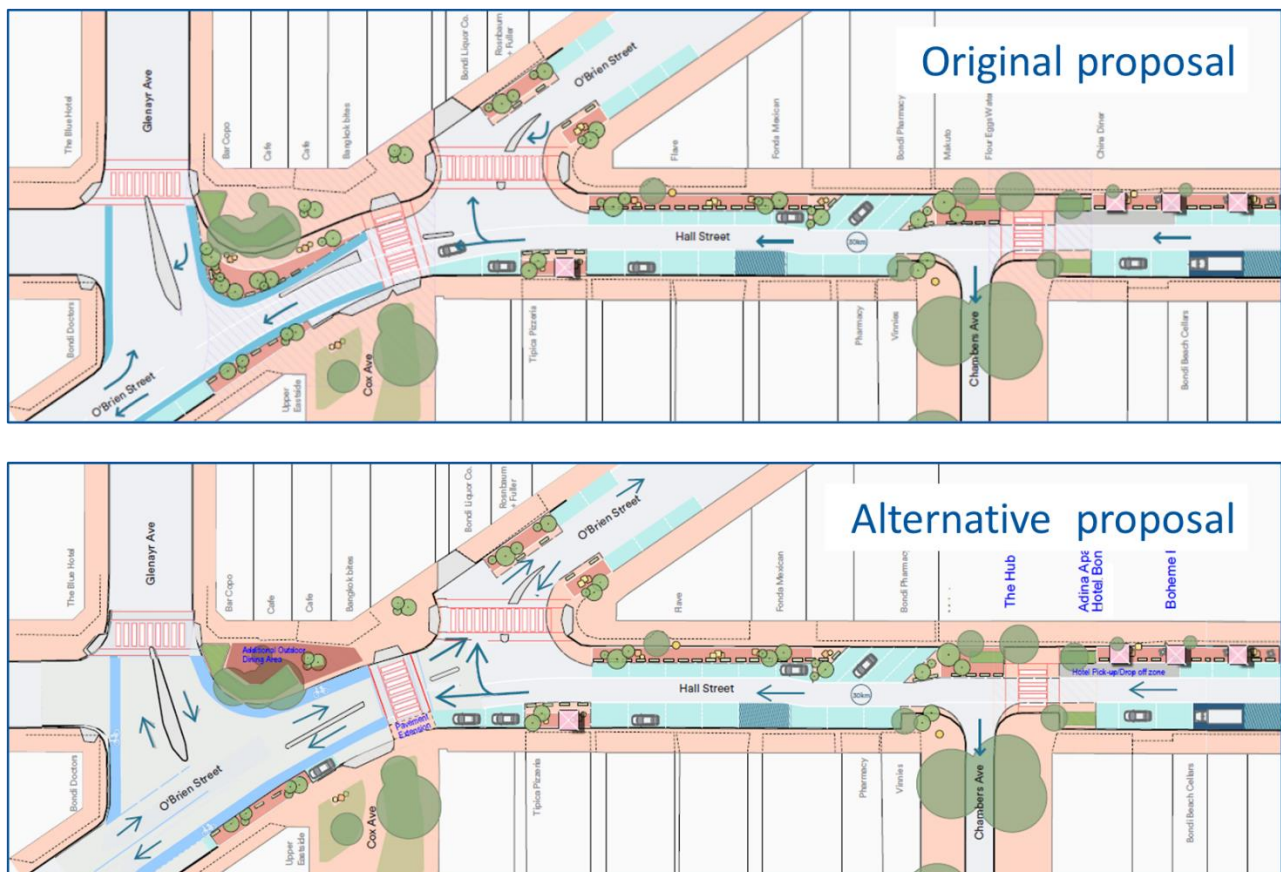


Figure 2. Original and alternative proposal details at the western end.

2. Introduction/Background

Council has investigated ways to improve amenities including reduction of conflicts between pedestrians and vehicles along Hall Street. A traffic consultant was engaged by Council to study the effects of the possible conversion on the surrounding streets when converting a section of Hall Street to one-way westbound.

This is funded as part of the NSW Government run 'Streets as Shared Spaces' program where Waverley Council secured a \$500,000 grant to conduct a one-way trial along Hall Street between Gould Street and O'Brien Street.

The one-way conversion supports Council's vision in making Hall Street 'an iconic destination for locals and international travelers'. It will also reduce conflicts between pedestrians and vehicles.

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

Meeting and date	Item No.	Resolution/recommendation
Council 16 August 2022	CM/7.9/22.08	That Council: <ol style="list-style-type: none"> Defers this item to the August 2022 Traffic Committee meeting for officers to present alternative options for the Glenayr, O'Brien and Hall Street intersection and Roscoe Street to allow better two-way access to the Hub Hall Street Retail Precinct car park and Roscoe Street from O'Brien Street.

		<ol style="list-style-type: none"> 2. Officers prepare a report to the September 2022 Finance, Operations and Community Services Committee on the alternative options. 3. Brings forward, as a matter of urgency, an expanded local area traffic study bounded by Warners Avenue, Campbell Parade, Francis Street and Old South Head Road, with officers to prepare a report to Council.
Traffic Committee 27 May 2021	TC/V.02/22.07	<p>That Council:</p> <ol style="list-style-type: none"> 1. Endorses the temporary one-way westbound conversion of Hall Street, Bondi Beach, between Gould Street and O'Brien Street/Glenayr Avenue, as shown in Attachment 1 of the report. 2. Prepares and then submits a Traffic Management Plan of the proposed temporary one-way westbound conversion of Hall Street, Bondi Beach, between Gould Street and O'Brien Street/Glenayr Avenue to Transport for NSW for consideration and approval. 3. Prepares and then submits the detailed design plan to Transport for NSW and NSW Police for review and approval prior to construction. 4. Notes that Hall Street's on-street parking provision during the trial will not be reduced. 5. Notes the improved efficiency to citybound vehicles, including buses, travelling south-west along Glenayr Avenue, due to the proposed 'Give Way' arrangement for Hall Street traffic at the Glenayr Avenue intersection. 6. Monitors traffic speeds and volumes to identify effects on surrounding streets during the trial period. 7. Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should onsite circumstances warrant changes, with any substantive changes being emailed to all Councillors.

3. Technical Analysis

Original and alternative options comparison

Table 2 presents existing and forecast peak hour traffic flows for a Saturday. Forecasts for a Sunday and Tuesday are contained in Attachment 3. Figure 3 shows the locations referred to in Table 2.

Table 2. Existing and forecast peak hour traffic flows.

Saturday 11am-12pm	Direction	Existing peak hour traffic flow	Change in peak hour traffic volume (Original proposal)		Change in peak hour traffic volume (Alternative proposal)	
		Vehicles per hour	Vehicles per hour	Percentage	Vehicles per hour	Percentage Change
Hall Street	westbound	381	166	44%	71	19%
Curlewis Street	eastbound	276	157	57%	141	51%
Consett Avenue	northbound	42	95	226%	32	76%
Chambers Avenue	southbound	90	17	19%	17	19%
Jaques Avenue	southbound	91	0	0%	0	0%
Glenayr Avenue	northbound	315	30	10%	30	10%
Glenayr Avenue	southbound	425	-127	-30%	-111	-26%
O'Brien Street	eastbound	463	-124	-27%	-124	-27%
O'Brien Street	westbound	566	21	4%	21	4%
Lamrock Avenue	eastbound	190	222	117%	162	85%

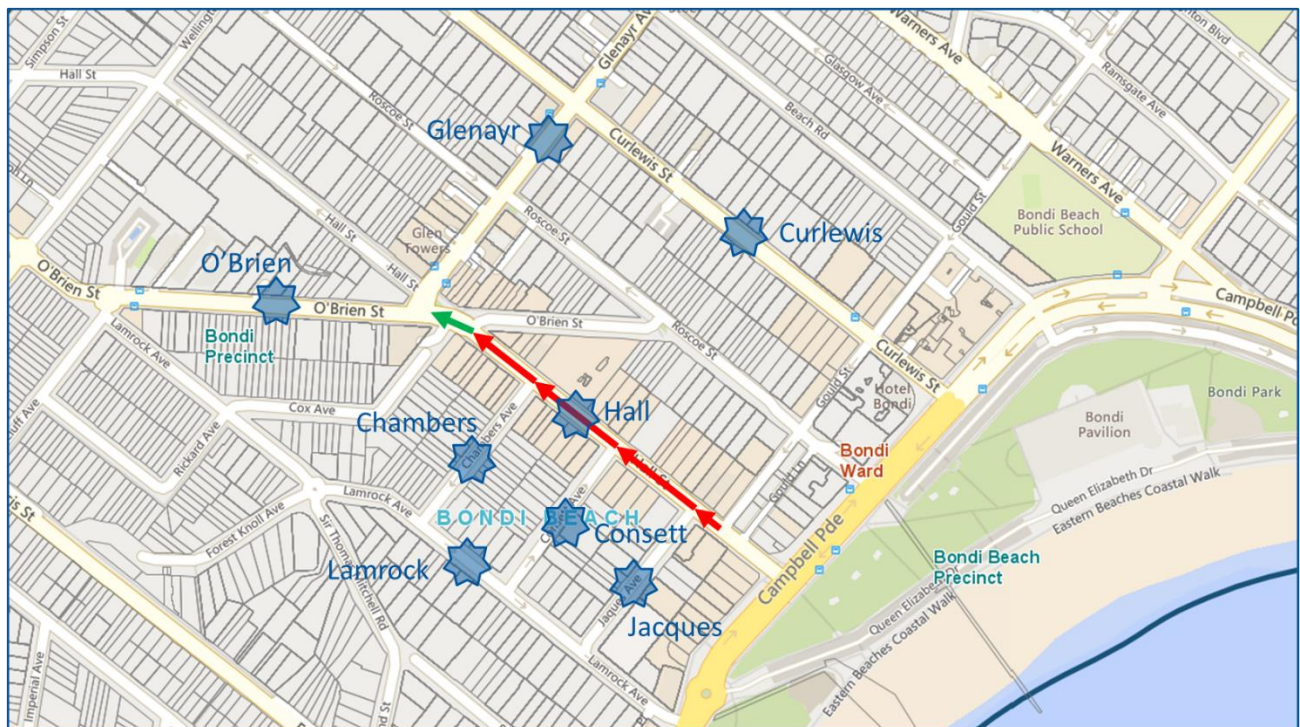


Figure 3. Existing and forecast peak hour traffic flows – Location of reported flows.

The most significant impacts are on Lamrock Avenue, Consett Avenue and Curlewis Street as expected. The alternative proposal lessens the impact somewhat but not by a great amount (48% increase in traffic on Lamrock Avenue with the alternative proposal compared to 54% with the original proposal).

The significance of the impact is best understood by the changes in traffic flows per minute as presented in Table 3.

Table 3. Existing and forecast peak hour traffic flows per minute.

Saturday 11am-12pm	Direction	Existing peak hour traffic flow	Change in peak hour traffic volume (Original proposal)		Change in peak hour traffic volume (Alternative proposal)	
		Vehicles per minute	Vehicles per minute	Percentage	Vehicles per minute	Percentage Change
Hall Street	westbound	6	2.8	44%	1.2	19%
Curlewis Street	eastbound	5	2.6	57%	2.4	51%
Consett Avenue	northbound	1	1.6	226%	0.5	76%
Chambers Avenue	southbound	2	0.3	19%	0.3	19%
Jaques Avenue	southbound	2	0.0	0%	0.0	0%
Glenayr Avenue	northbound	5	0.5	10%	0.5	10%
Glenayr Avenue	southbound	7	-2.1	-30%	-1.9	-26%
O'Brien Street	eastbound	8	-2.1	-27%	-2.1	-27%
O'Brien Street	westbound	9	0.4	4%	0.4	4%
Lamrock Avenue	eastbound	3	3.7	117%	2.7	85%

From Table 3 it can be seen that changes in traffic flows on individual roads are 0 to 4 vehicles per minute. This is during the peak hour only.

Campbell Parade / Curlewis Street Traffic Signals

Transport for NSW has advised that there may be a need for the right turn lane at the Curlewis Street/Campbell Parade traffic lights be extended. This would require removal of 3 parking spaces on the southern kerb line of Curlewis Street west of Campbell Parade as shown in Figure 4.

This is outside the scope of works for the trial project. Assessment of this proposal should occur separate to the trial and in parallel with the design of the Curlewis Street cycleway. We will monitor the conditions during the trial period and work with Transport for NSW if an extension of the right turn bay is required.

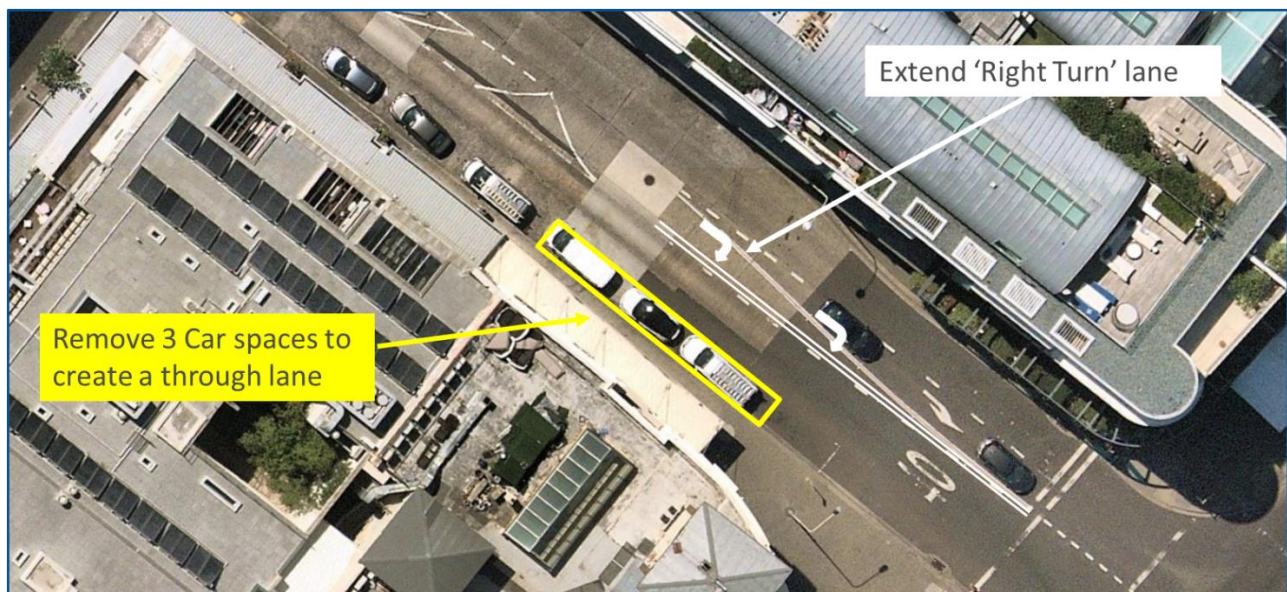


Figure 4. TfNSW proposal to remove parking in Curlewis Street.

4. Financial Information for Council's Consideration

The project is being funded via a \$500,000 grant from the NSW Government 'Streets as Shared Spaces' program.

5. Consultation

Given the significance of the proposal, consultation on the project has been undertaken. Council has received representation from across both businesses and residents. Further review of the consultation will

be presented in a separate report at the Finance, Operations and Community Services Committee meeting in September. In relation to traffic management, a key concern related to access to the carpark and loading docks on O'Brien Street has prompted the assessment of the alternative option within this report.

Based on the data presented in this report the Alternative Proposal has an overall lesser traffic impact on Lamrock Avenue, Consett Avenue and Curlewis Street if the intersection of O'Brien Street, Glenayr Avenue and Hall Street remains two ways. Therefore, it is Council officers' recommendation for the purpose of proceeding with program that the temporary one way on Hall Street be reduced to only include between Gould Street and O'Brien Street (eastern side) maintaining a two way flow at the Glenayr Avenue, O'Brien Street and Hall Street Intersection.

6. Attachments

1. TMP (Original proposal) [↓](#)
2. TMP (Alternative proposal) [↓](#)
3. Existing and forecast traffic flows [↓](#)



Ref: 0582r01v03

19/07/2022

Waverley Council
Level 6, 55 Grafton Street
Bondi Junction NSW 2022

Attention: Calum Hutcheson

**RE: TEMPORARY ONE-WAY CONVERSION OF HALL STREET, BONDI BEACH, BETWEEN O'BRIEN STREET AND GOULD STREET
TRAFFIC MANAGEMENT PLAN**

Dear Calum,

PDC Consultants has been commissioned by Waverley Council (Council) to prepare a Traffic Management Plan (TMP) documenting investigations and findings into the proposed temporary conversion of a section of Hall Street, Bondi Beach, to a one-way northbound road (the Proposal).

The Proposal will extend from just north of the intersection with Gould Street to just north of the intersection with O'Brien Street / Glenayr Avenue (the Study Area), as illustrated by **Figure 1**.

The aim of the Proposal is to reduce conflicts between pedestrians and vehicles in a highly pedestrianised part of the Bondi Beach suburb. Hall Street is activated on both sides by dozens of commercial and retail premises including cafes, restaurants and bars, fitness studios, post office, clothing stores, food stores and banks, with pedestrian footfall along both footpaths very high throughout the week, particularly during the summer months.

Two zebra crossings provide crossing opportunities for pedestrians within the Study Area which are supplemented by further zebra crossings to the north and signalised pedestrian crossings at the intersection with Campbell Parade to the south.

The Proposal will significantly reduce vehicular traffic along Hall Street, improving the street's 'place' function and public amenity, thereby contributing towards *Waverley's People, Movement and Places* Policy and the NSW Centre for Road Safety's Vision Zero strategy.

Given the Proposal implements the temporary prohibition of passage of traffic on a public road, Council does not have delegated authority to deliver the Proposal without approval from Transport for NSW (Transport), under *Delegation to Councils – Regulation of Traffic, RMS 2011*. As such, this TMP has been developed in accordance with *Procedures for Use in the Preparation of a Traffic Management Plan, RTA 2001* (TMP Procedures), with our findings discussed herein.

PDC Consultants

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+61 2 7900 6514 | Level 14, 100 William St, Woolloomooloo NSW 2011



Figure 1: Study Area

**A. Description or detailed plan of proposed measures.**

Is a detailed plan of the proposed measures necessary?

Yes / ~~No~~

A temporary conversion of a section of Hall Street, Bondi Beach, from a two-way road to a one-way northbound road is proposed. The one-way conversion will extend for approximately 270 metres along Hall Street between its intersections with Gould Street in the southeast and O'Brien Street in the northeast, as illustrated by **Figure 1**.

The Proposal aims to reduce conflict between pedestrians and vehicles by reducing traffic to one-way only. Further features of the Proposal include:

- Maintaining the existing 40 km/h high pedestrian activity area (HPAA).
- Bicycle parking.
- Pot plants and landscaping.
- Outdoor dining and entertainment facilities for retail premises along Hall Street.
- Parklets and outdoor seating not associated with retail premises.
- Jersey kerb and safety barriers, as required.
- Reconfiguring existing parallel on-street car parking to angled parking.
- A net increase in car parking spaces provided.
- Consolidation of Loading and Truck Zones.

Council has prepared concept plans of the proposed temporary arrangements which are provided as **Attachment 1**, for reference.

B. Identification and assessment of impact of proposed measures.

Is detailed assessment required?

Yes / ~~No~~

Traffic Surveys

To inform understanding of the impacts the Proposal would have on the Study Area and alternative routes, traffic counts were commissioned by Council for the intersections shown in **Figure 2**.



Figure 2: Survey Locations



These counts were undertaken in stages. Counts at the critical intersection of Hall Street / O'Brien Street / Glenayr Avenue / Cox Avenue were undertaken during AM and PM weekday peaks on Wednesday 02/02/2021, with further counts undertaken:

- Saturday 29/01/2022 (09:00-12:00).
- Sunday 30/01/2022 (09:00-12:00).
- Tuesday 01/02/2022 (09:00-16:00).

Counts at all other intersections were undertaken:

- Saturday 07/05/2022 (10:00-13:00).
- Sunday 08/05/2022 (10:00-13:00).
- Tuesday 10/05/2022 (10:00-13:00).

Given the different survey dates, discrepancies exist in entry and exit flows of adjacent intersections in the study area which have been managed through data processing.

An assessment of these traffic counts showed that the peak traffic volumes along the banned southbound travel direction within the Study Area occurs on Saturdays between the hours of 11:00am and 12:00pm. As such, to assess the critical traffic volumes that will be rerouted under the Proposal, data from the surveys conducted in this period were used. It is also noted that this vehicular peak coincides with a peak in pedestrian volumes at key crossing points within the study area.

Methodology

The Proposal prohibits traffic from travelling southbound on Hall Street within the Study Area. As such, all traffic currently accommodated by the southbound lane of this section of Hall Street will need to reroute elsewhere on the broader or local road network. It is anticipated that rerouting will predominantly occur via the following routes:

1. **Lamrock Avenue:** vehicles originating at the O'Brien Street / Barracluff Avenue intersection travelling south-eastbound would reroute to travel south-eastbound on Lamrock Avenue until its intersection with Consett Avenue or Campbell Parade.
2. **Curlewis Street:** vehicles originating at either the O'Brien Street / Barracluff Avenue intersection travelling south-eastbound or the Glenayr Avenue / Curlewis Street intersection travelling south-westbound would reroute to travel south-eastbound on Curlewis Street until its intersection with Gould Street or Campbell Parade.

These alternative routes are illustrated in **Figure 3**.

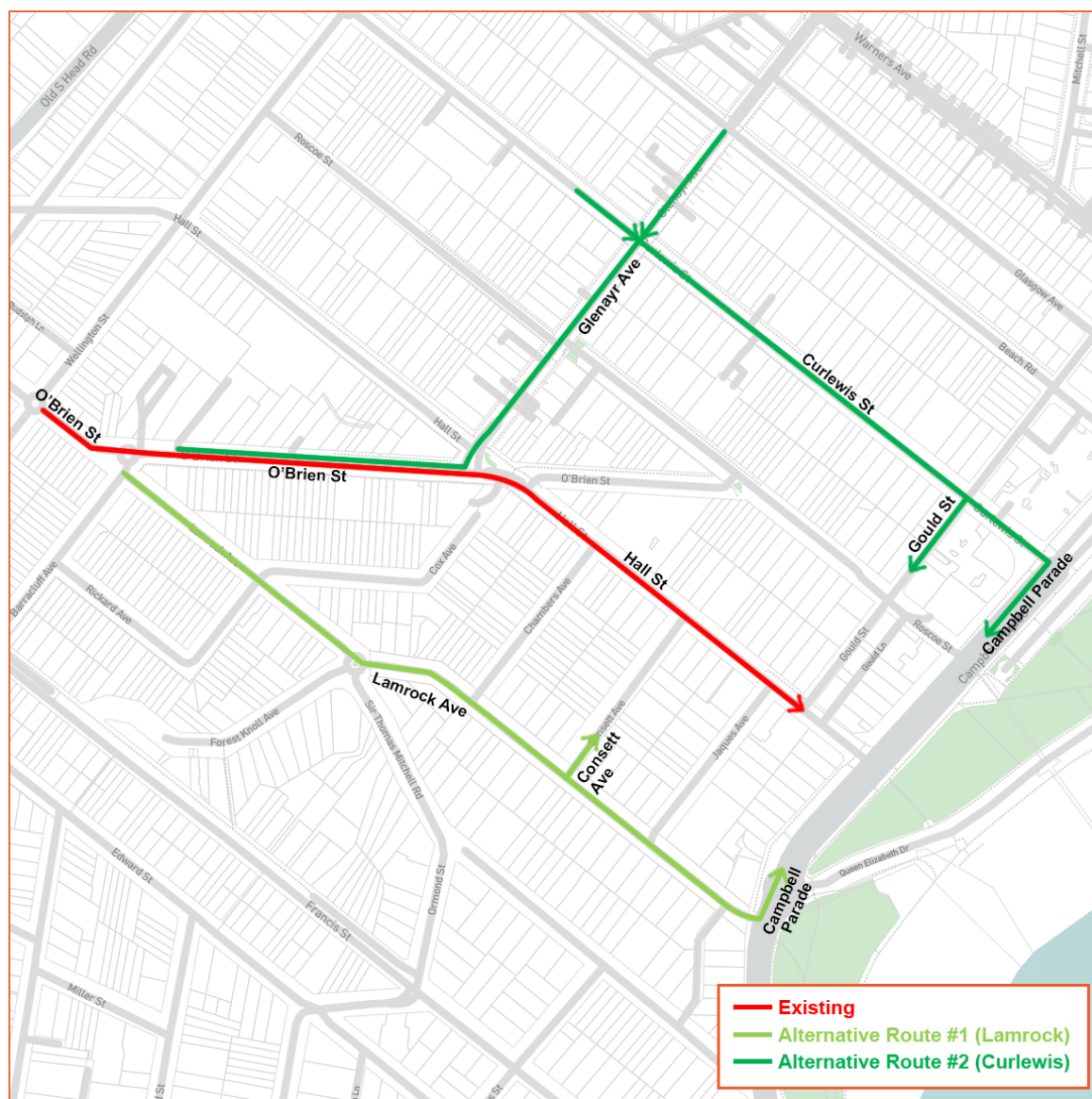


Figure 3: Alternative Routes

An Origin–Destination (OD) approach was taken using data collected from the traffic surveys during the peak period. Vehicles that would require rerouting under the Proposal were identified as having the following key origins:

- O'Brien Street at Barracluff Avenue (south-eastbound)
- Glenayr Avenue at Curlewis Street (south-westbound)
- O'Brien Street at Hall Street (north-westbound)
- Consett Avenue at Hall Street (north-eastbound).



Key destinations of the study are points at which the affected vehicles would have previously left the impacted section of Hall Street, being:

- Hall Street at Gould Street.
- Chambers Avenue.
- Jacques Avenue.

Intersection turn counts were used to estimate the number of vehicles originating from these four locations which would currently travel southbound along Hall Street through the Study Area. Once these volumes were established, each respective OD pair was assigned to one of the above identified alternative routes (**Figure 3**) based on travel distance and travel time. In most cases, a proportional split was applied, such that each alternative route was used by each OD pair, unless there was only one alternative route which could possibly be used to reach a given destination (such as using Lamrock Avenue to reach Consett Avenue).

Existing Traffic Conditions

Figure 4 - Figure 6 presents the existing midblock traffic volumes in vehicles per hour (vph), for all roads and travel directions which are expected to be affected by the Proposal for the Saturday (11:00–12:00), Sunday (11:00–12:00), and Tuesday (10:45–11:45) peak hours, of which Saturday is seen to be the day with the highest volumes and therefore the most critical day for consideration.

Figure 4 demonstrates that southbound traffic volumes are around 360 vph towards the north-western section of the Study Area. These volumes reduce to about 195 vph at the south-eastern section of the Study Area as traffic exits along the Chambers Avenue and Jacques Avenue side arms.

Elsewhere, one-way traffic volumes are generally consistent across the affected roads, within the 150 – 450 vph range, typical of local and collector streets which serve dual movement and place functions. The exception to this is Campbell Parade, in which two travel lanes are provided in both directions and traffic is higher in both directions as a result.

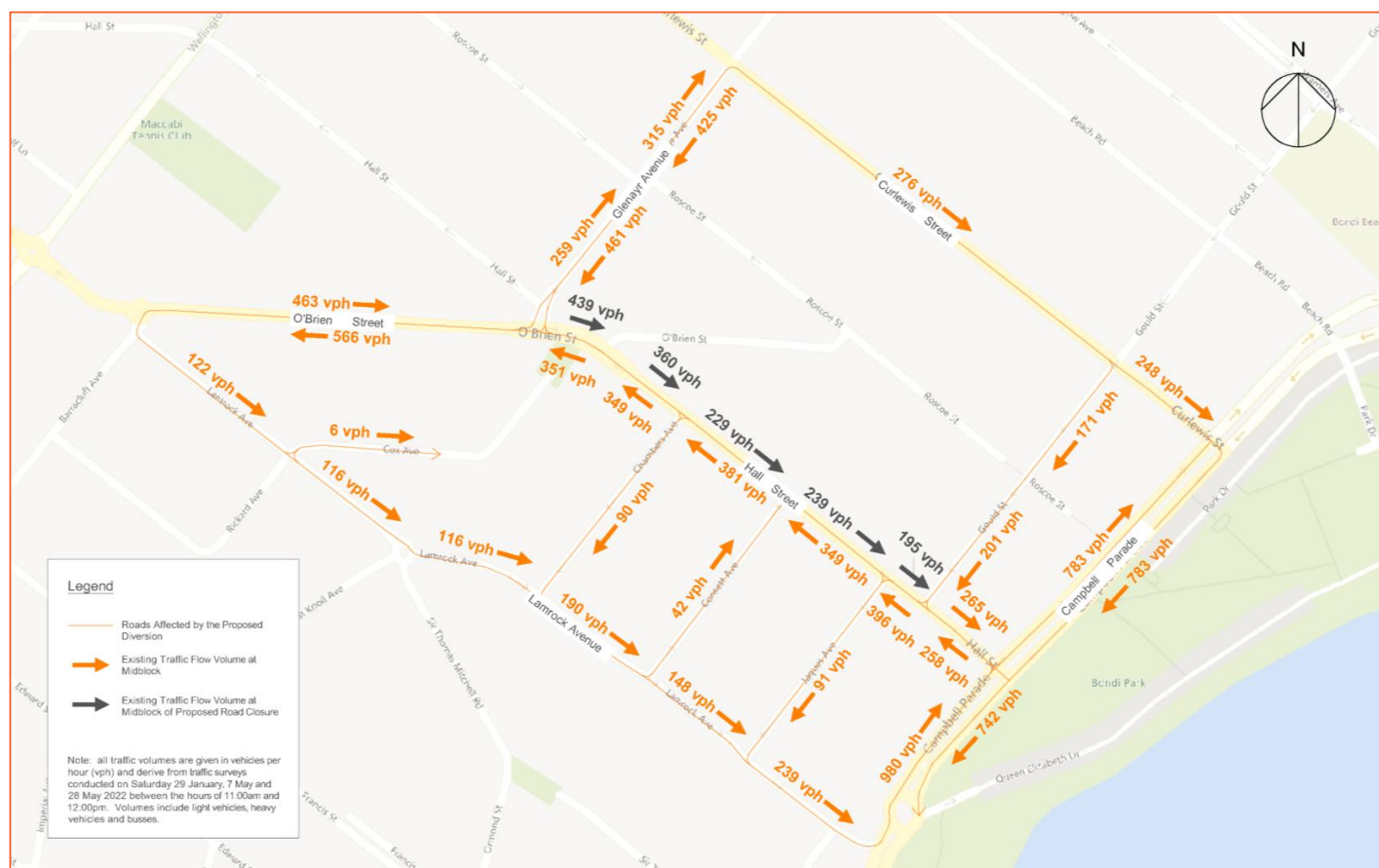


Figure 4: Existing Midblock Traffic Volumes (Saturday 11:00-12:00)

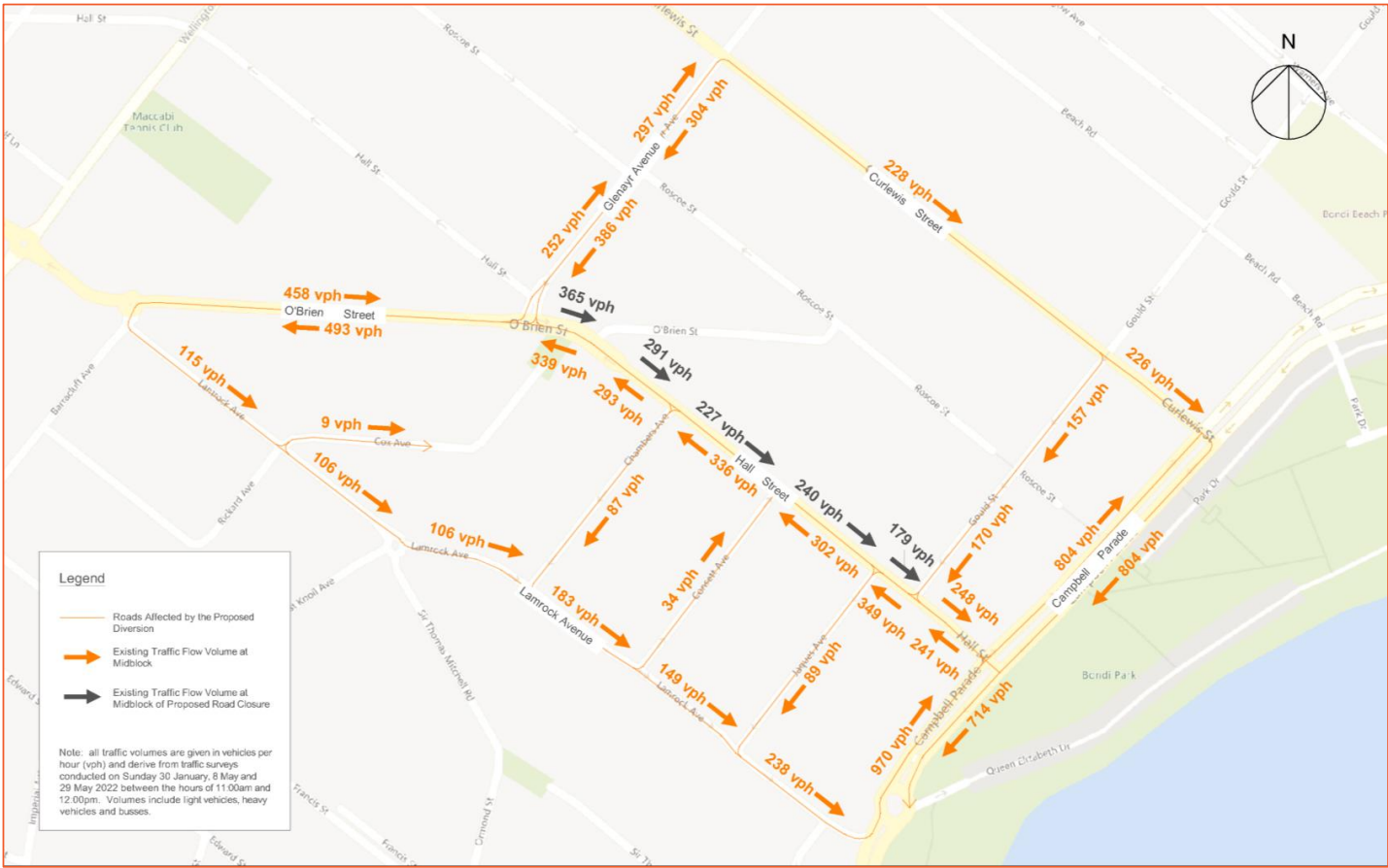


Figure 5: Existing Midblock Traffic Volumes (Sunday 11:00-12:00)

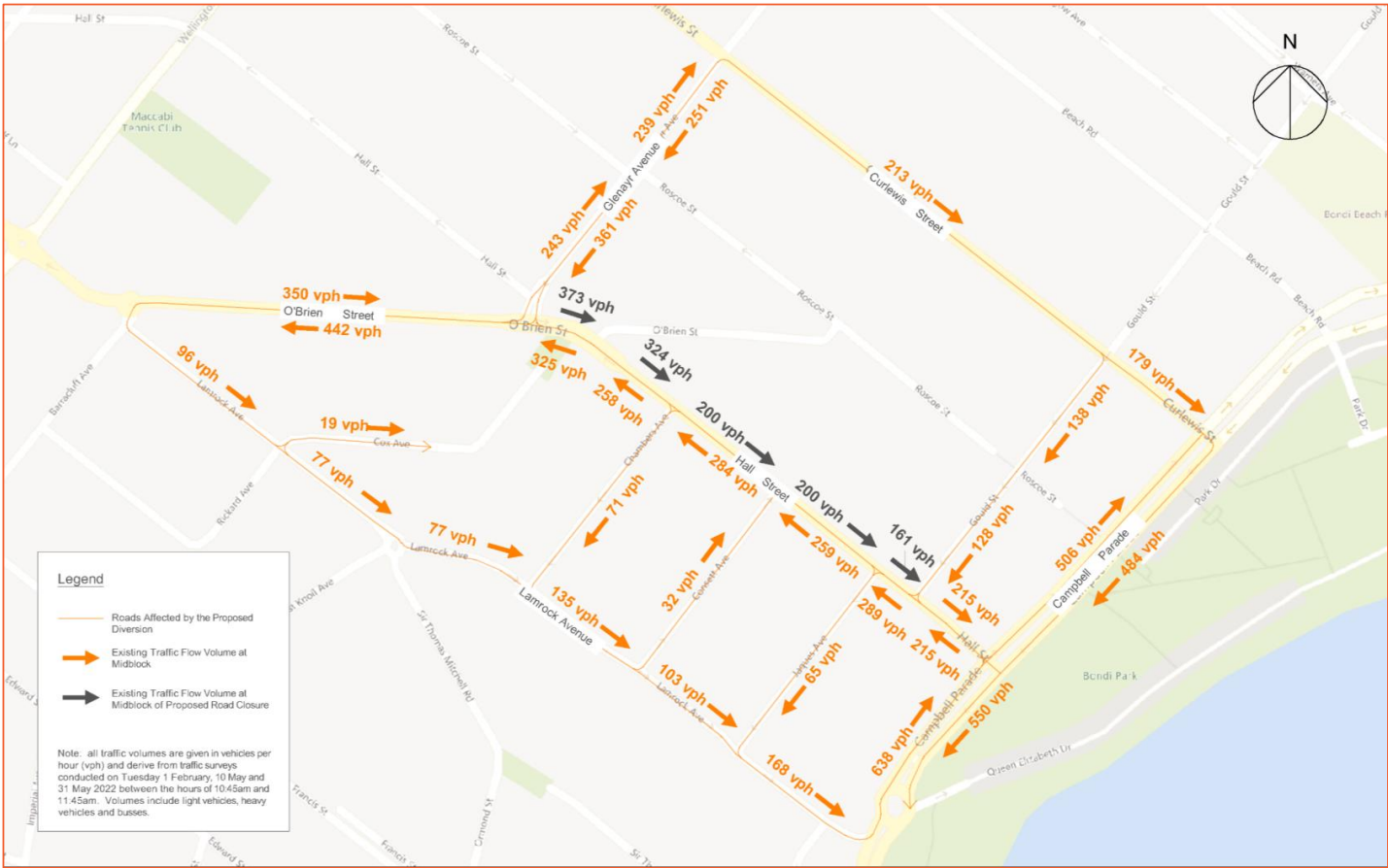


Figure 6: Existing Midblock Traffic Volumes (Tuesday 10:45-11:45)



Future Traffic Conditions

Figure 7 and **Figure 8** illustrate the estimated change in midblock traffic volumes and the resultant actual midblock traffic volumes following implementation of the Proposal for the Saturday 11:00-12:00 peak hour.

The respective figures for Sunday (11:00-12:00) and Tuesday (10:45-11:45) are provided as **Figure 9** – **Figure 12**.

Given Saturday is seen to be the day with the highest traffic volume, commentary below focuses on this day to allow for assessment of the worst-case. This is a conservative approach and it is noted that for all other times of the week, traffic impacts would be expected to be much lower.

Figure 7 illustrates the anticipated increase in traffic expected on the alternative routes during the Saturday peak hour, being approximately 130 – 220 vph along Lamrock Avenue, or two to four (2 – 4) additional vehicles per minute, and 30 – 160 vph along Glenayr Avenue and Curlewis Street, an increase of up to three (3) vehicles per minute.

It is reiterated that these are expected to be the maximum hourly impacts on the local streets in the suburb as they represent the peak Saturday hour (11:00-12:00) during which traffic volumes in the area are highest. At other times of the day and week, the increases in traffic along these streets are expected to be much lower.

For example, the total southbound traffic volume along Hall Street departing the Glenayr Avenue intersection during the Saturday peak hour (11:00-12:00) is seen from **Figure 4** to be 439 vph. The corresponding value at 09:00-10:00 is 26% lower at 327 vph.

On a Sunday, **Figure 5** shows the existing peak hour (11:00-12:00) volume southbound along Hall Street is 17% lower than that on a Saturday, being 365 vph. The peak hour volume on a Tuesday (10:45-11:45) is also around this level, at 373 vph.

It can be seen therefore that the estimated upper limit impacts along Lamrock Avenue (130 – 220 vph) and Curlewis Street (30 – 160 vph) are indeed upper limits, with traffic increases at other times of the day or week expected to be much lower.

Further, the approach adopted is considered highly conservative as the network shown by **Figure 4** – **Figure 8** is considered a closed system in which all rerouting occurs locally. In reality, there may be several consequences of the proposal, including:

- A mode shift to cycling or walking given improved facilities for active transport.
- Elimination of trip purposes altogether.
- Much broader networked rerouting, such as vehicles continuing along Old South Head Road to use Curlewis Street or Blair Street, or alternatively using Bondi Road and Campbell Parade to reach a destination.

As such, the estimated increases on these local streets may be lower still, should a more nuanced pattern of traffic redistribution and modal shift occur than that assumed in this TMP.

Redistributed traffic benefits from the networked nature of the Bondi Beach suburb, with most OD pairs having multiple alternative routes they could take to reach their destination without requiring the use of Hall Street southbound. The estimated increase in traffic volumes is manageable when spread across the network, and is unavoidable in delivering the significant public realm benefits to the local community along Hall Street.

Elsewhere, hourly traffic volumes are expected to increase by lesser amounts or reduce as a result of the Proposal.

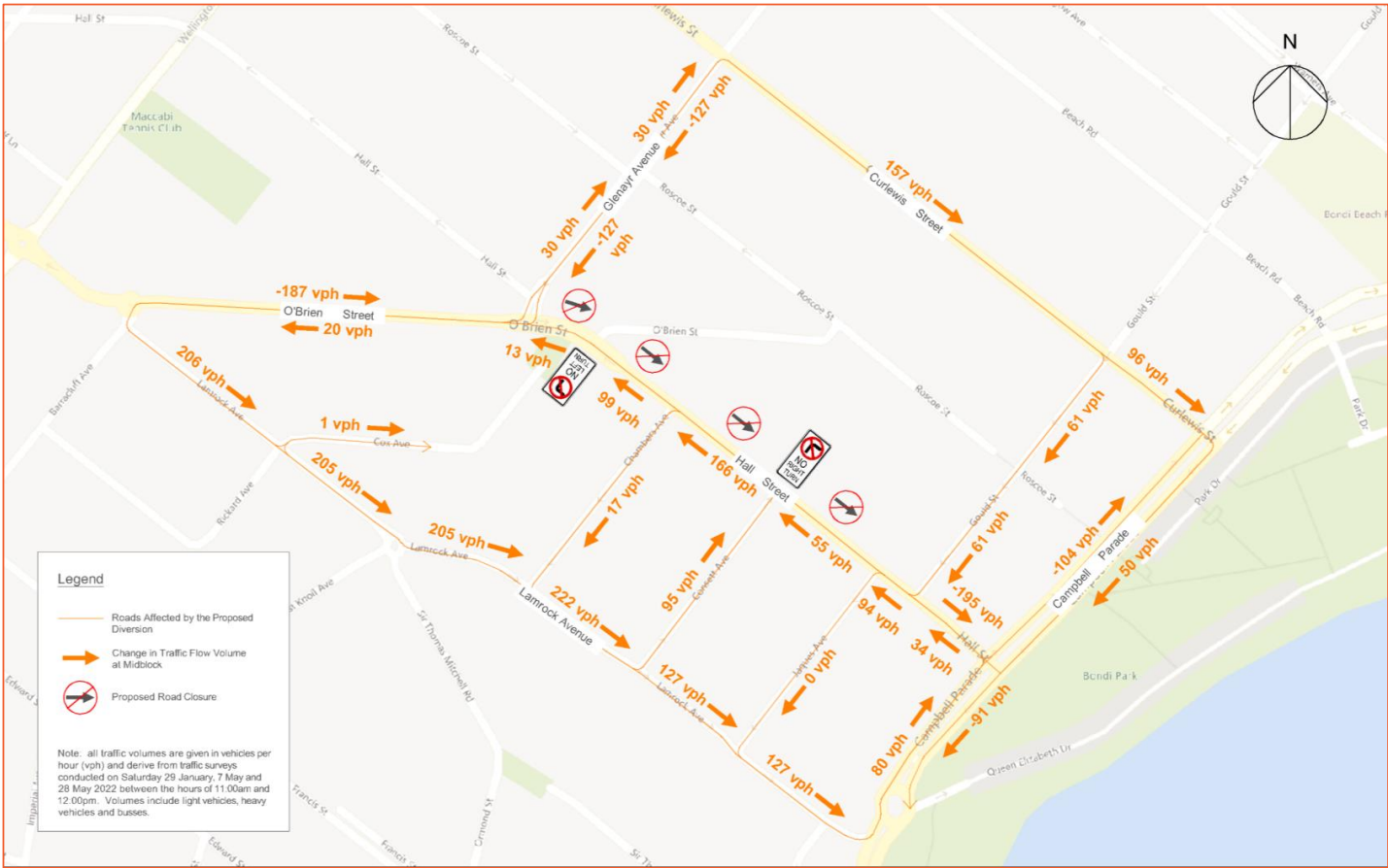


Figure 7: Anticipated Change in Midblock Traffic Volumes (Saturday 11:00-12:00)

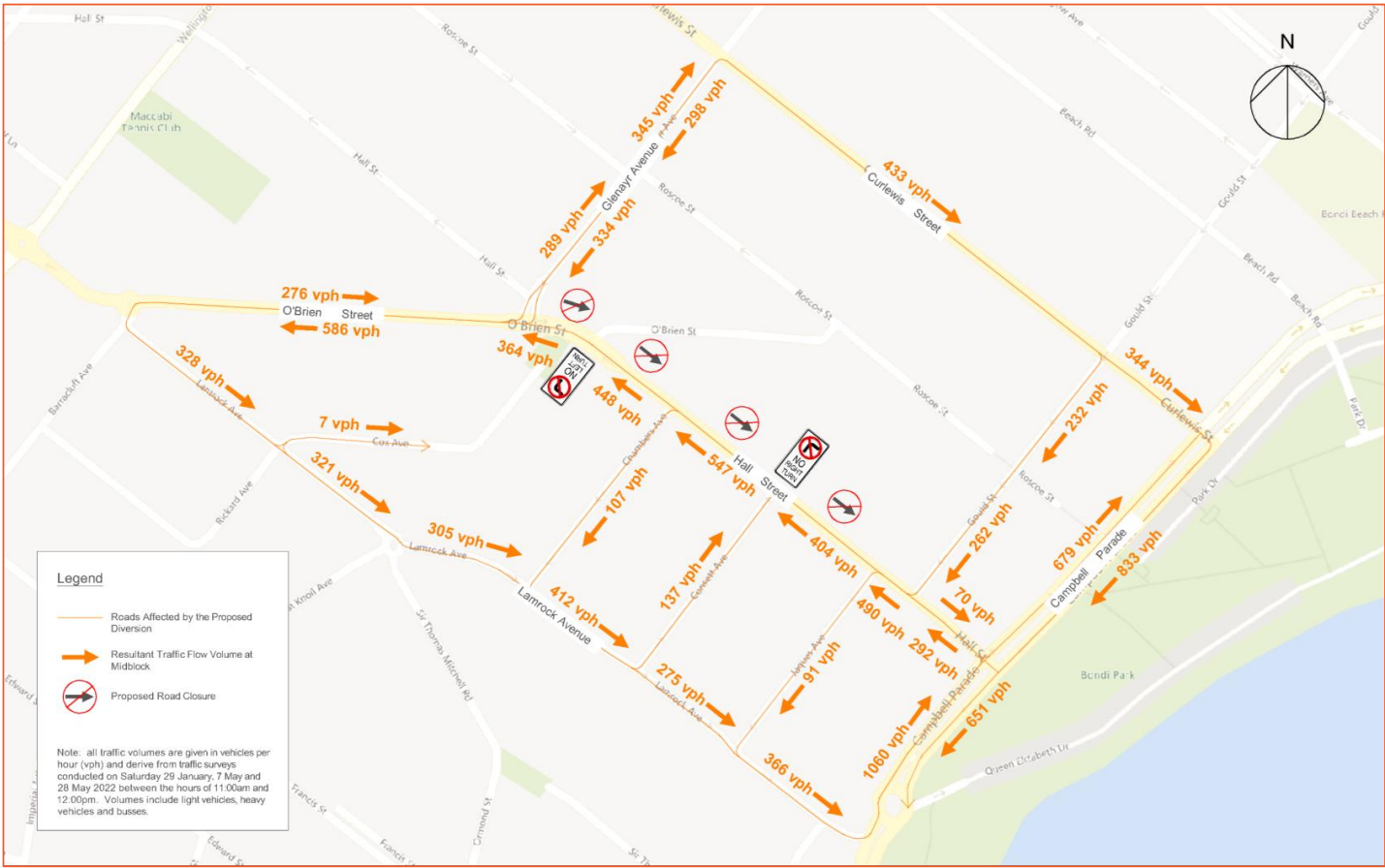


Figure 8: Estimated Resultant Midblock Traffic Volumes (Saturday 11:00-12:00)

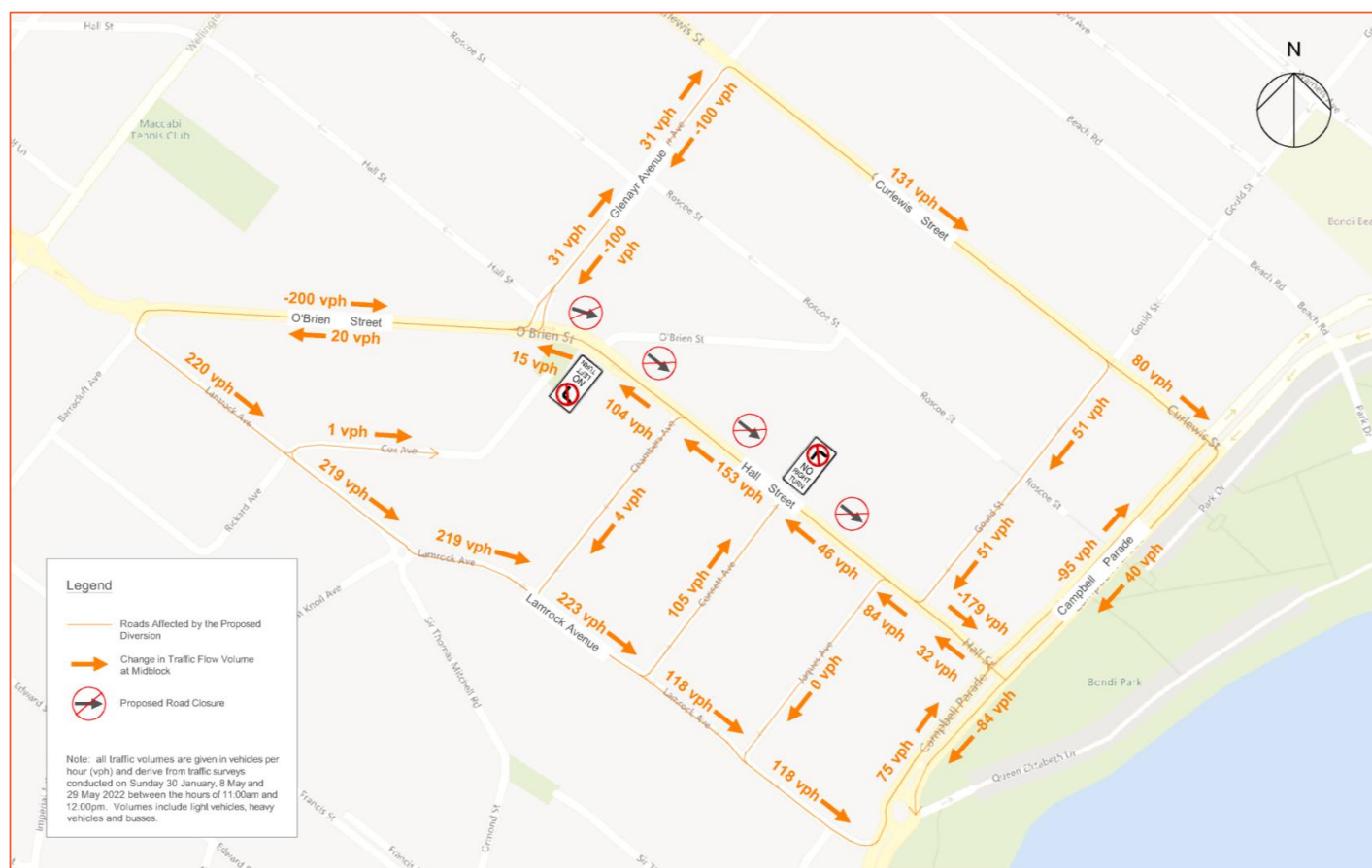


Figure 9: Anticipated Change in Midblock Traffic Volumes (Sunday 11:00-12:00)

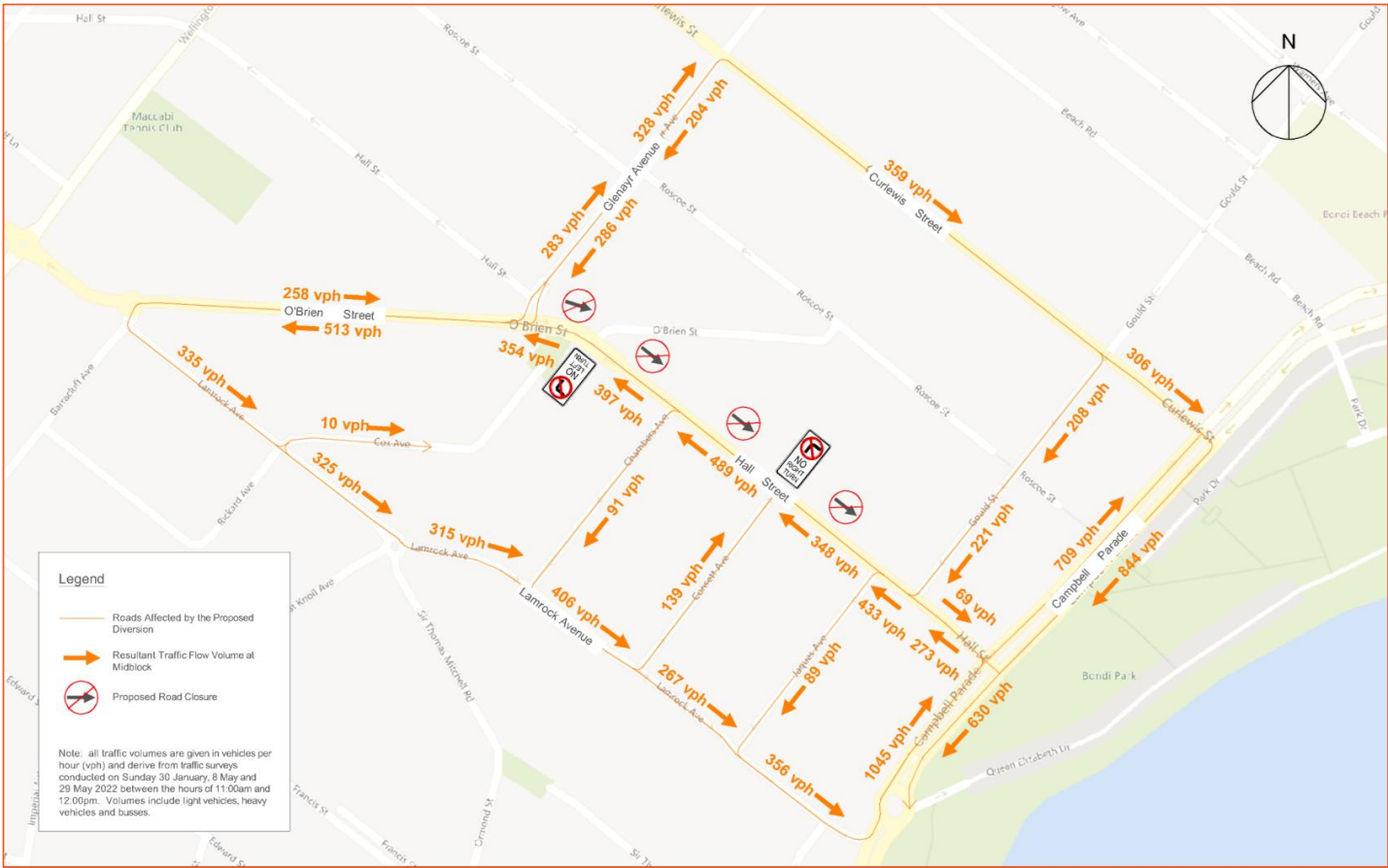


Figure 10: Estimated Resultant Midblock Traffic Volumes (Sunday 11:00-12:00)

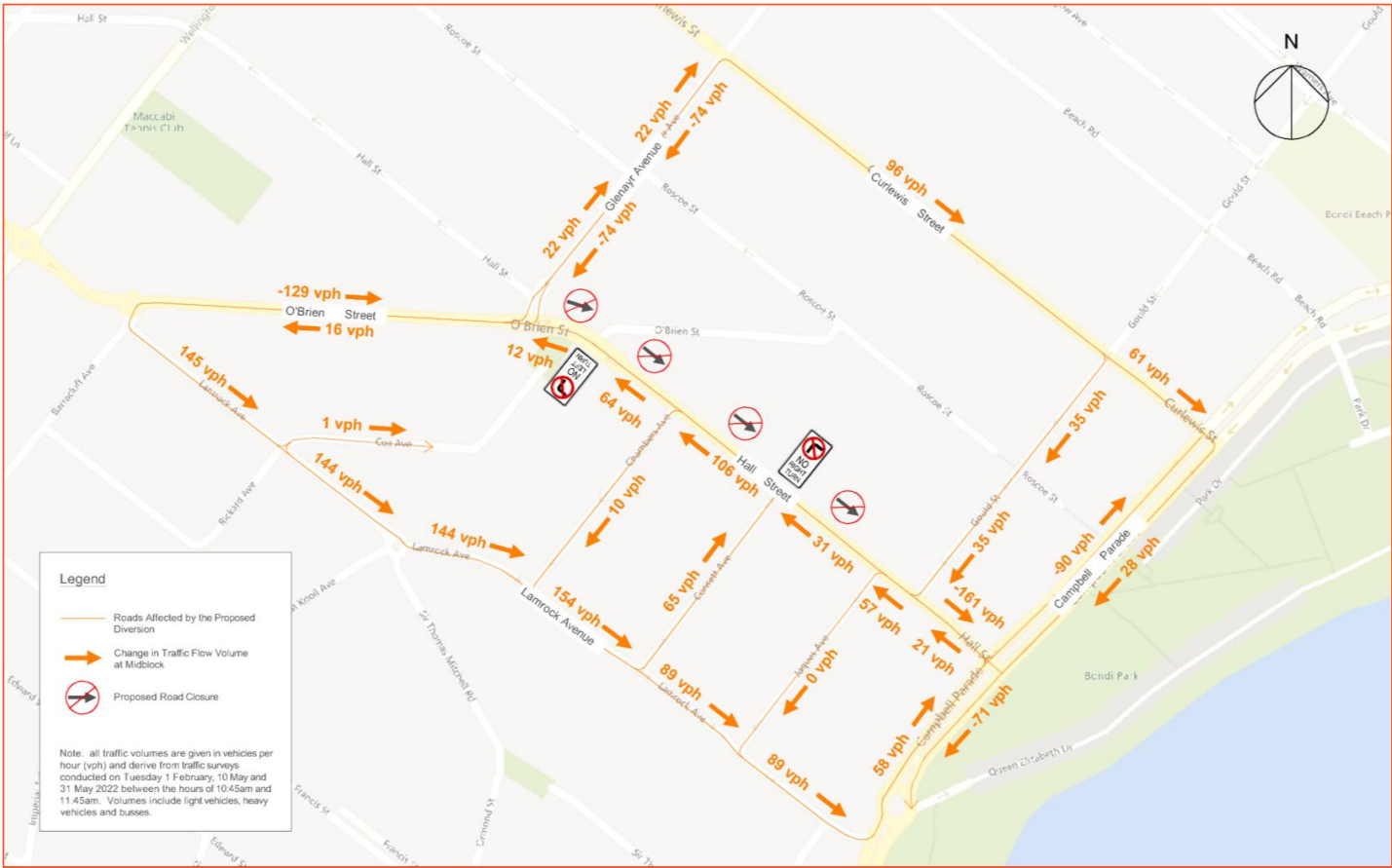


Figure 11: Anticipated Change in Midblock Traffic Volumes (Tuesday 10:45-11:45)

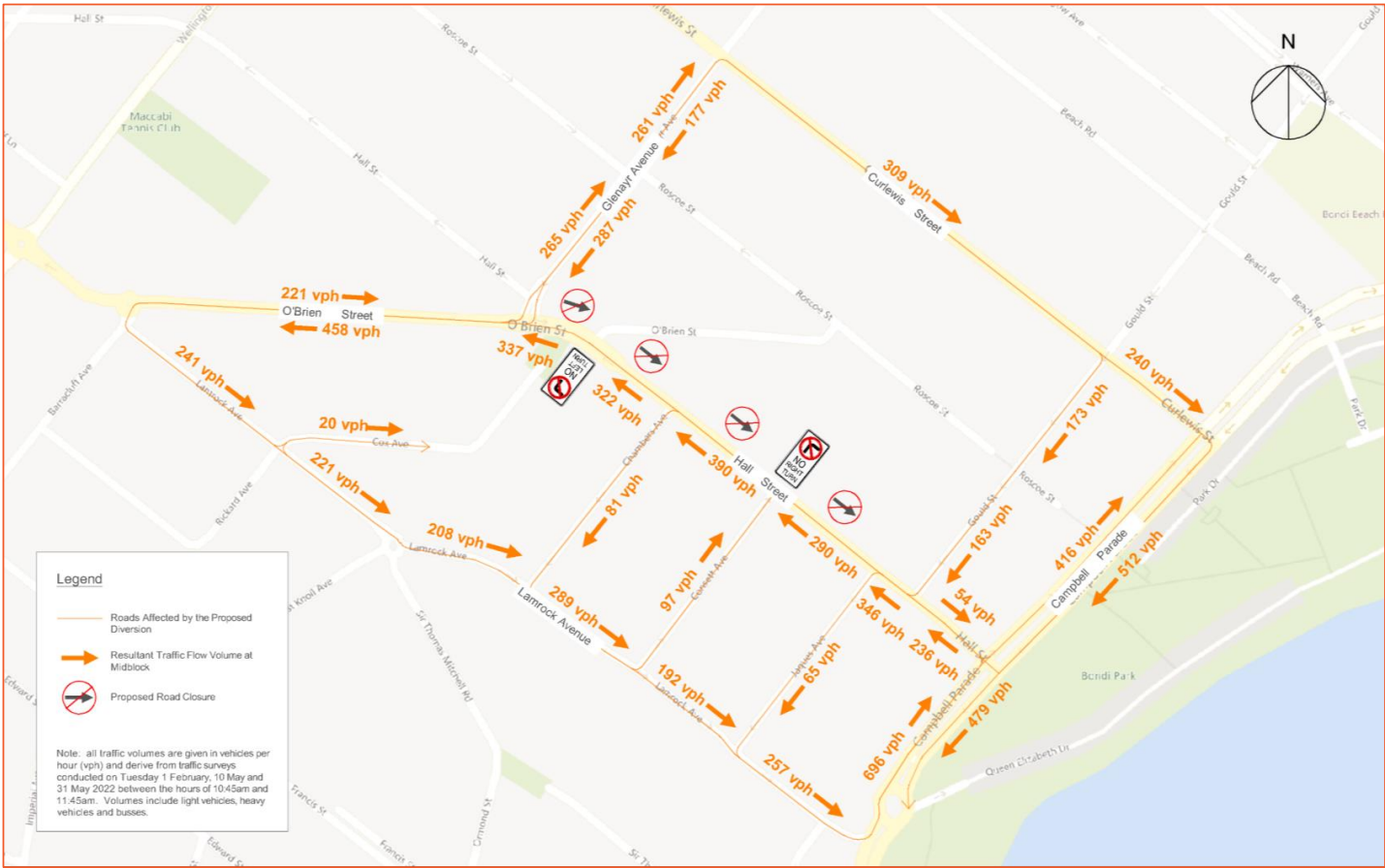


Figure 12: Estimated Resultant Midblock Traffic Volumes (Tuesday 10:45-11:45)



Crash Data

Crash data suggests there has not been a discernible crash trend, with a total of five crashes recorded along Hall Street in the five-year period of 2016 – 2020. Two of these crashes occurred near the Gould Street and Jacques Avenue intersections to the south of the Study Area involving vehicles only. The other three occurred near the Chambers Avenue intersection, one of which involved a pedestrian (type unknown), and the other two vehicles.

Elsewhere, no crashes were recorded along Lamrock Avenue, Chambers Avenue, Consett Street, or Jacques Avenue. Five crashes were recorded along Glenayr Avenue between O'Brien Street and Curlewis Street, and three on Curlewis Street between Glenayr Avenue and Gould Street.

The Proposal is likely to have a net improvement in safety performance along Hall Street, given the significant reduction in vehicular traffic in a highly pedestrianised area with an array of on-street parking and loading zones. No discernible crash trend is evident in the data along Glenayr Avenue and Curlewis Street which would be exacerbated by the increase in traffic resulting from the Proposal.

C. Measures to ameliorate the impact of re-assigned traffic

Is an assessment required?

~~Yes~~ / No

No ameliorative measures are proposed to mitigate the impact of re-assigned traffic.

The Proposal is a temporary measure expected to last for six (6) months and as such any impacts to the local community will also be temporary until such a time the existing conditions are reinstated. Any potential extension of the trial temporary arrangements should be reassessed by taking updated traffic counts to ascertain the impacts.

Discussion in response to Part B identifies that the increases in traffic on alternative routes is moderate, increasing by up to two to three (2 – 3) vehicles per minute on the roads most affected during the busiest time of the week.

Figure 8 demonstrates that the roads upon which the increase in traffic is highest, Lamrock Avenue and Curlewis Street, would still have hourly traffic volumes below 420 vph during peak periods, which is considered low and well within acceptable traffic volumes and level of service along local and collector streets.

It is anticipated that delay increases experienced by road users would be relatively minor and within the daily and seasonal variations which occur throughout the year. SCATS traffic signals at signalised intersections of Glenayr Avenue / Curlewis Street, Campbell Parade / Curlewis Street, and Campbell Parade / Hall Street, would each be able to adapt accordingly to changing traffic conditions to mitigate the impacts of any increase in traffic on given movements.

Council will monitor the performance of the local road network throughout implementation of the Proposal and be prepared to enact temporary, targeted amelioration or mitigation at certain locations as required on an ad hoc basis.

**D. Assessment of public transport services affected.**

Is an assessment required?

~~Yes~~ / No

No public transport services currently use Hall Street and thus all existing services will continue to operate as existing without disruption.

Any slight delay increases resulting from rerouted traffic conditions along roads buses do use, such as O'Brien Street, Glenayr Avenue, and Campbell Parade, would likely be minor and within daily and seasonal variations.

There would be increased efficiency at the Hall Street / O'Brien Street / Glenayr Avenue intersection, with 'give way' arrangements placed on Hall Street south-east of Glenayr Avenue to give priority to Glenayr Avenue citybound vehicles, including buses.

E. Details of provision made for emergency vehicles, heavy vehicles, cyclists and pedestrians.

Is an assessment required?

~~Yes~~ / No

Access to Hall Street is still retained in a northbound direction for emergency vehicles and servicing / loading vehicles, and as such all destinations along Hall Street which can currently be reached will continue to be available once the Proposal is implemented.

The Proposal deliberately terminates north of Gould Street to ensure that Bondi Beach Police Station, located on Gould Street, will have access north- and southbound along Hall Street when departing the Station. Gould Street is one-way south-westbound and so all vehicles returning to the Station are required to do so via the Curlewis Street intersection to the northeast, which remains unaffected by the proposals.

The existing loading arrangements along Hall Street will be consolidated but largely retained as existing, to ensure no significant disruption to local business or truck drivers.

Pedestrians and cyclists will retain access to all areas along Hall Street, with improved accessibility following the Proposal, and thus no adverse impacts are expected.

F. Assessment of effect on existing and future developments with transport implications in the vicinity of the proposed measures.

Is an assessment required?

~~Yes~~ / No

Developments of a small to moderate scale are committed and ongoing along Hall Street and across the Bondi Beach area; however, there are none which would be prejudiced by the Proposal, or which would have otherwise significantly increased demand for the south-eastbound Hall Street direction.



As such, the Proposal is expected to have little to no impact on existing and proposed traffic generating developments in the vicinity beyond those impacts discussed in response to earlier Parts.

G. Assessment of effect of proposed measures on traffic movements in adjoining Council areas.

Is an assessment required?

Yes / ~~No~~

The anticipated alternative routes vehicles would take following implementation of the Proposal are contained wholly within the Waverley local government area, and as such, there will be no impact on traffic movements in adjoining Council areas.

H. Public consultation process.

Is a public consultation process required?

Yes / ~~No~~

Community consultation will be driven by Council and undertaken in accordance with the indicative timeline illustrated by **Figure 13**. This timeline may be subject to change following the Councillor workshop scheduled for 12/07/2022.

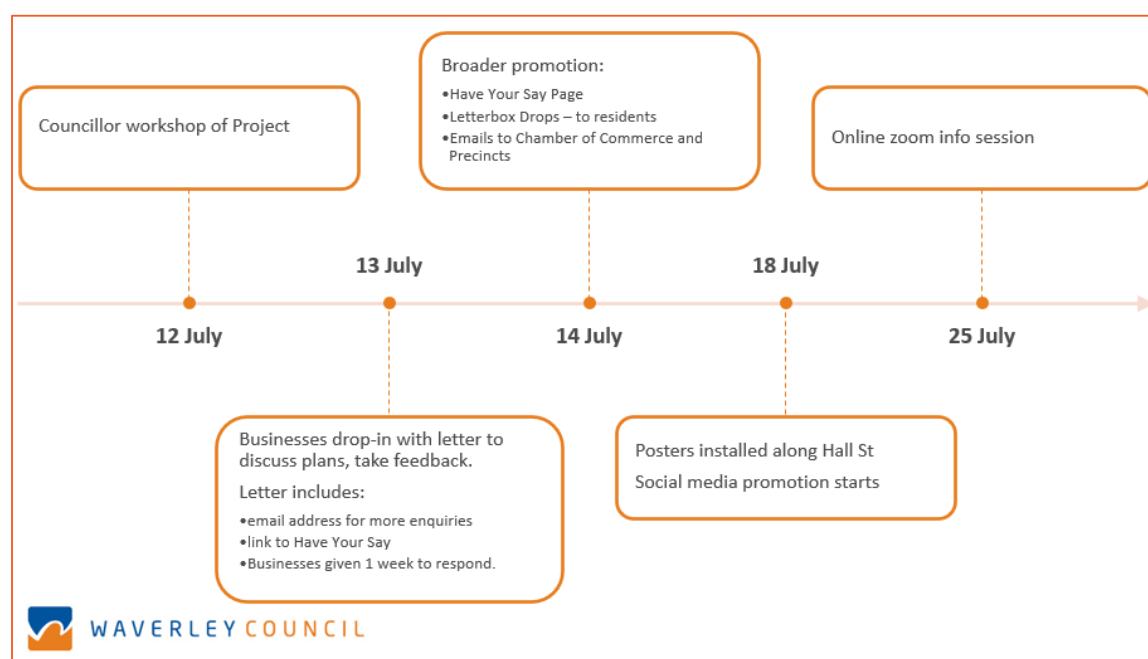


Figure 13: Community Consultation Timeline

Source: Waverley Council



The Proposal is therefore supportable on traffic planning grounds. Please contact the undersigned should you have any queries or require any further information.

Yours sincerely,

A handwritten signature in black ink that reads 'Ben Midgley'.

Ben Midgley

Principal Traffic Engineer, PDC Consultants

Email: bmidgley@pdcconsultants.com.au

Attachments:

1) *Concept Plans*



Ref: 0582r02v01

23/08/2022

Waverley Council
Level 6, 55 Grafton Street
Bondi Junction NSW 2022

Attention: Calum Hutcheson

RE: TEMPORARY ONE-WAY CONVERSION OF HALL STREET, BONDI BEACH, BETWEEN O'BRIEN STREET AND GOULD STREET ALTERNATIVE PROPOSAL TRAFFIC MANAGEMENT PLAN

Dear Calum,

PDC Consultants previously prepared a Traffic Management Plan (TMP) (ref: 0582r01v03) which considered the proposed temporary one-way conversion of Hall Street to extend from just north of the intersection with Gould Street to just north of the intersection with O'Brien Street / Glenayr Avenue.

PDC Consultants has since been instructed by Waverley Council to prepare a new TMP (this report) which considers an alternative proposal for the temporary one-way conversion of Hall Street extending from just north of the intersection with Gould Street to just south of the intersection of O'Brien Street (the Study Area), as illustrated in **Figure 1**. The main change is that the proposal would retain the existing two-way traffic movement along O'Brien Street between Glenayr Avenue and Hall Street.

The aim of the project is to reduce conflicts between pedestrians and vehicles in a highly pedestrianised part of the Bondi Beach suburb. Hall Street is activated on both sides by dozens of commercial and retail premises including cafes, restaurants and bars, fitness studios, post office, clothing stores, food stores and banks, with pedestrian footfall along both footpaths very high throughout the week, particularly during the summer months.

Two zebra crossings provide crossing opportunities for pedestrians within the Study Area which are supplemented by further zebra crossings to the north and signalised pedestrian crossings at the intersection with Campbell Parade to the south.

The project will significantly reduce vehicular traffic along Hall Street, improving the street's 'place' function and public amenity, thereby contributing towards Waverley's People, Movement and Places Policy and the NSW Centre for Road Safety's Vision Zero strategy.

This TMP considers the traffic impacts of the alternative proposal. Given this proposal implements the temporary prohibition of passage of traffic on a public road, Council does not have delegated authority to deliver the proposal without approval from Transport for NSW (Transport), under *Delegation to Councils - Regulation of Traffic, RMS 2011*. As such, this TMP has been developed in accordance with *Procedures for Use in the Preparation of a Traffic Management Plan, RTA 2001* (TMP Procedures), with our findings discussed herein.

PDC Consultants

ABN: 70 615 064 670

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+61 2 7900 6514 | Level 14, 100 William St, Woolloomooloo NSW 2011



Figure 1: Study Area

**A. Description or detailed plan of proposed measures.**

Is a detailed plan of the proposed measures necessary?

Yes / ~~No~~

A temporary conversion of a section of Hall Street, Bondi Beach, from a two-way road to a one-way northbound road is proposed. This TMP considers the proposal where the one-way conversion extends for approximately 280 metres along Hall Street between its intersections with Gould Street in the southeast and O'Brien Street in the northeast, as illustrated by **Figure 1**.

The project aims to reduce conflict between pedestrians and vehicles by reducing traffic to one-way only. Further features of the project include:

- Maintaining the existing 40 km/h high pedestrian activity area (HPAA).
- Bicycle parking.
- Pot plants and landscaping.
- Outdoor dining and entertainment facilities for retail premises along Hall Street.
- Parklets and outdoor seating not associated with retail premises.
- Jersey kerb and safety barriers, as required.
- Reconfiguring existing parallel on-street car parking to angled parking.
- A net increase in car parking spaces provided.
- Consolidation of Loading and Truck Zones.

B. Identification and assessment of impact of proposed measures.

Is detailed assessment required?

Yes / ~~No~~

[Traffic Surveys](#)

To inform understanding of the impacts the alternative proposal would have on the Study Area and alternative routes, traffic counts were commissioned by Council for the intersections shown in **Figure 2**.



Figure 2: Survey Locations



These counts were undertaken in stages. Counts at the critical intersection of Hall Street / O'Brien Street / Glenayr Avenue / Cox Avenue were undertaken during AM and PM weekday peaks on Wednesday 02/02/2021, with further counts undertaken:

- Saturday 29/01/2022 (09:00-12:00).
- Sunday 30/01/2022 (09:00-12:00).
- Tuesday 01/02/2022 (09:00-16:00).

Counts at all other intersections were undertaken:

- Saturday 07/05/2022 (10:00-13:00).
- Sunday 08/05/2022 (10:00-13:00).
- Tuesday 10/05/2022 (10:00-13:00).

Given the different survey dates, discrepancies exist in entry and exit flows of adjacent intersections in the study area which have been managed through data processing.

An assessment of these traffic counts showed that the peak traffic volumes along the banned southbound travel direction within the Study Area occurs on Saturdays between the hours of 11:00am and 12:00pm. As such, to assess the critical traffic volumes that will be rerouted under the alternative proposal, data from the surveys conducted in this period were used as well as data from the Sunday peak (occurring between the hours of 11:00am and 12:00pm) and the Tuesday peak (occurring between the hours of 10:45am and 11:45am). It is also noted that these vehicular peaks generally coincide with peaks in pedestrian volumes at key crossing points within the Study Area.

Methodology

The proposal prohibits traffic from travelling southbound on Hall Street within the Study Area. As such, all traffic currently accommodated by the southbound lane of this section of Hall Street will need to reroute elsewhere on the broader or local road network. It is anticipated that rerouting will predominantly occur via the following routes:

1. **Lamrock Avenue:** vehicles originating at the O'Brien Street / Barracluff Avenue intersection travelling south-eastbound would reroute to travel south-eastbound on Lamrock Avenue until its intersection with Consett Avenue or Campbell Parade.
2. **Curlewis Street:** vehicles originating at either the O'Brien Street / Barracluff Avenue intersection travelling south-eastbound or the Glenayr Avenue / Curlewis Street intersection travelling south-westbound would reroute to travel south-eastbound on Curlewis Street until its intersection with Gould Street or Campbell Parade.

These alternative routes are illustrated in **Figure 3**.

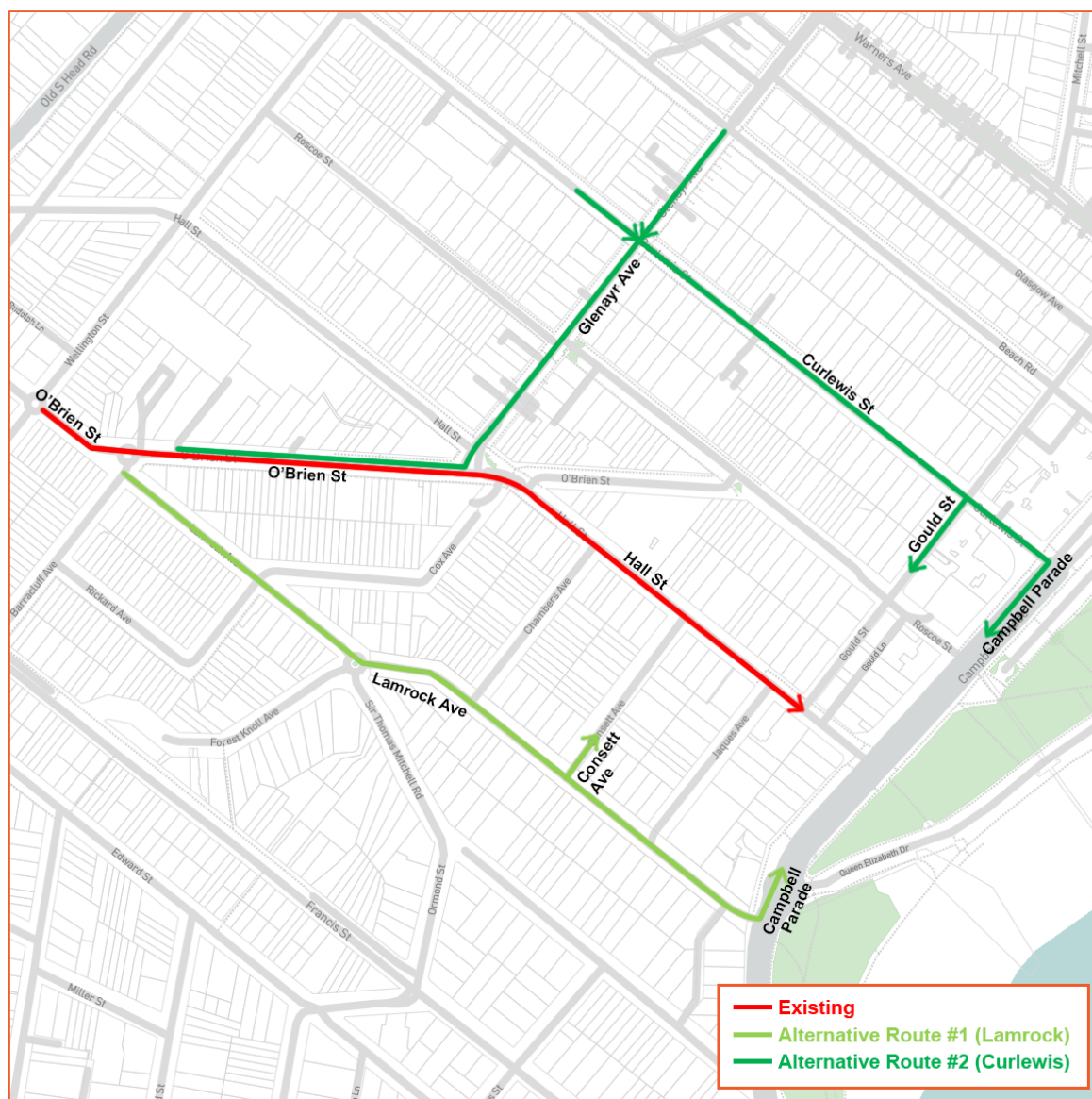


Figure 3: Alternative Routes

An Origin-Destination (OD) approach was taken using data collected from the traffic surveys during the peak period. Vehicles that would require rerouting under the proposal were identified as having the following key origins:

- O'Brien Street at Barracluff Avenue (south-eastbound).
- Glenayr Avenue at Curlewis Street (south-westbound).
- O'Brien Street at Hall Street (north-westbound).
- Consett Avenue at Hall Street (north-eastbound).



Key destinations of the study are points at which the affected vehicles would have previously left the impacted section of Hall Street, being:

- Hall Street at Gould Street.
- Chambers Avenue.
- Jacques Avenue.

Intersection turn counts were used to estimate the number of vehicles originating from these four locations which would currently travel southbound along Hall Street through the Study Area. Once these volumes were established, each respective OD pair was assigned to one of the above identified alternative routes (**Figure 3**) based on travel distance and travel time. In most cases, a proportional split was applied, such that each alternative route was used by each OD pair, unless there was only one alternative route which could possibly be used to reach a given destination (such as using Lamrock Avenue to reach Consett Avenue).

Existing Traffic Conditions

Figure 4 - Figure 6 presents the existing midblock traffic volumes in vehicles per hour (vph), for all roads and travel directions which are expected to be affected by the proposal for the Saturday (11:00-12:00), Sunday (11:00-12:00), and Tuesday (10:45-11:45) peak hours, of which Saturday is seen to be the day with the highest volumes and therefore the most critical day for consideration.

Figure 4 demonstrates that southbound traffic volumes are around 360 vph towards the north-western section of the Study Area. These volumes reduce to about 195 vph at the south-eastern section of the Study Area as traffic exits along the Chambers Avenue and Jacques Avenue side arms.

Elsewhere, one-way traffic volumes are generally consistent across the affected roads, within the 150 - 450 vph range, typical of local and collector streets which serve dual movement and place functions. The exception to this is Campbell Parade, in which two travel lanes are provided in both directions and traffic is higher in both directions as a result.

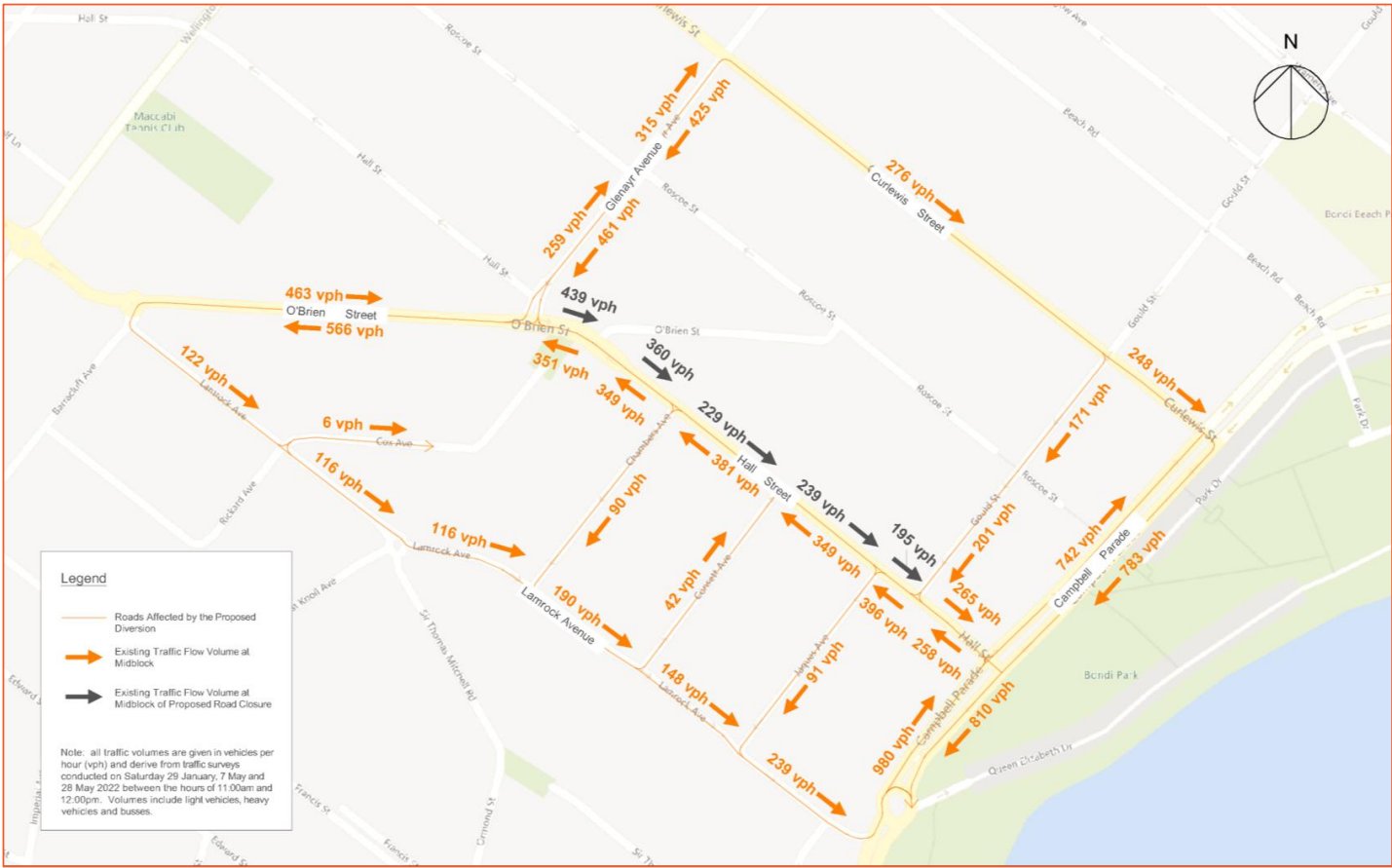


Figure 4: Existing Midblock Traffic Volumes (Saturday 11:00-12:00)

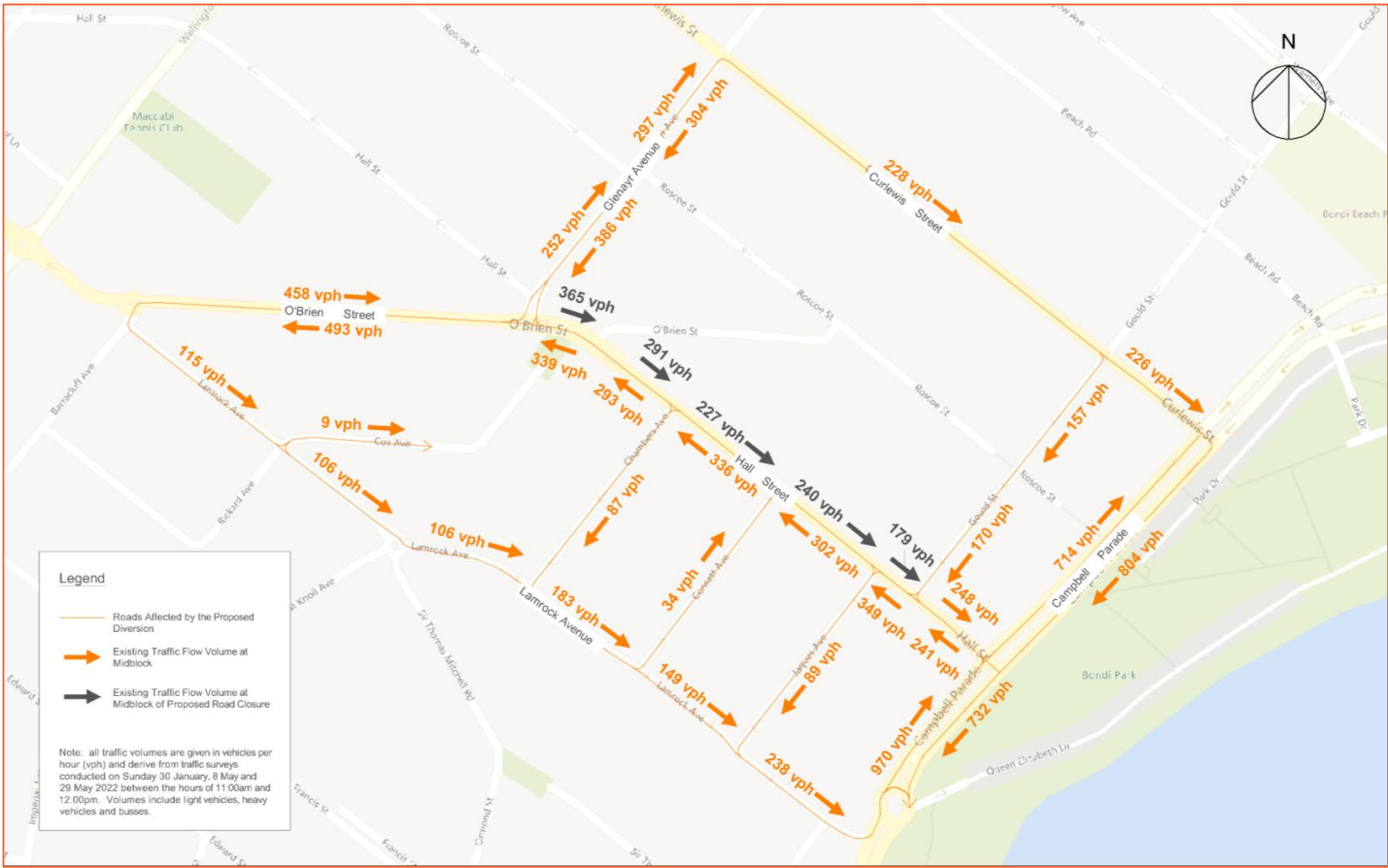


Figure 5: Existing Midblock Traffic Volumes (Sunday 11:00-12:00)

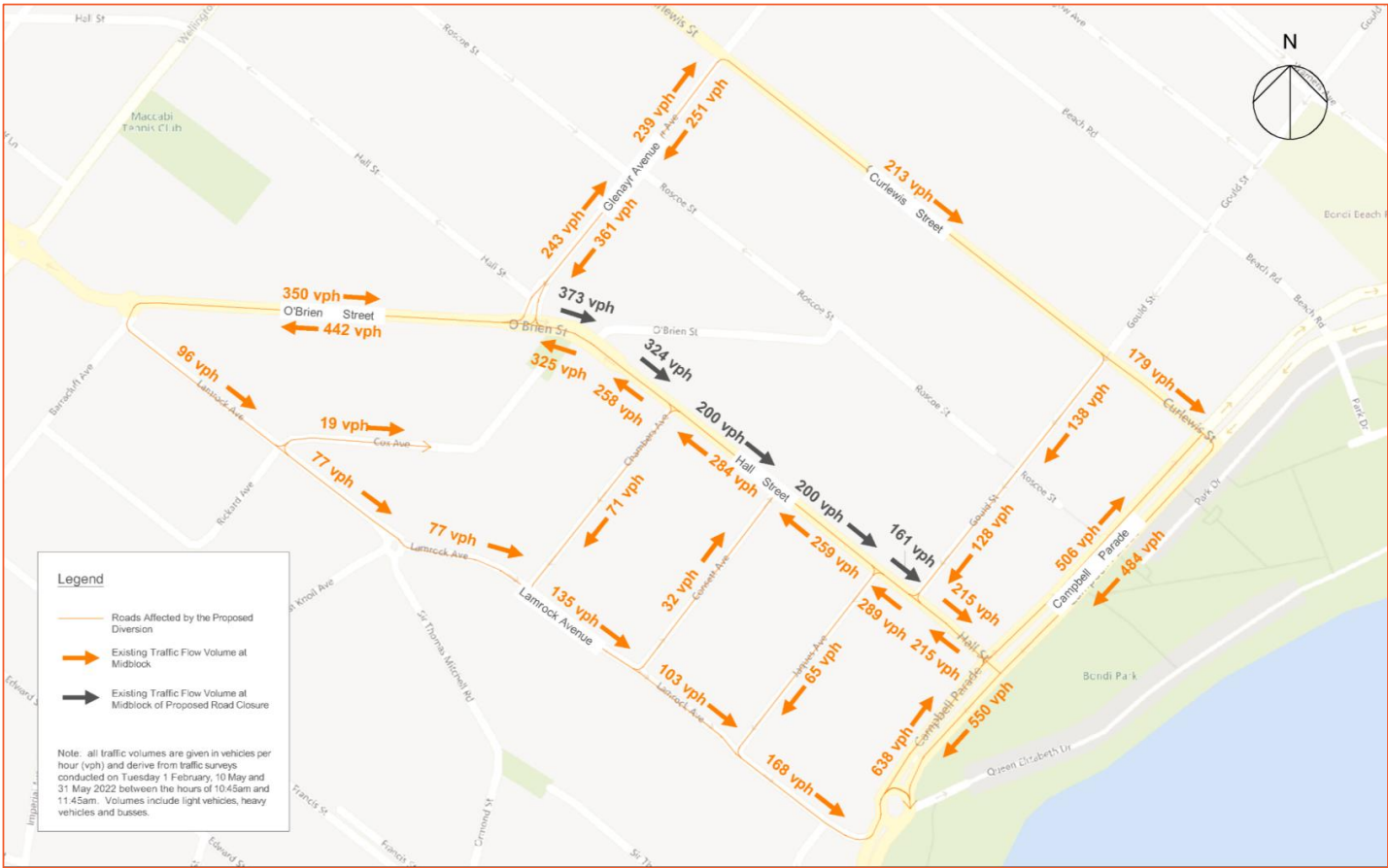


Figure 6: Existing Midblock Traffic Volumes (Tuesday 10:45-11:45)



Future Traffic Conditions

Figure 7 and **Figure 8** illustrate the estimated change in midblock traffic volumes and the resultant actual midblock traffic volumes following implementation of the proposal for the Saturday 11:00-12:00 peak hour.

The respective figures for Sunday (11:00-12:00) and Tuesday (10:45-11:45) are provided as **Figure 9** - **Figure 12**.

Given Saturday is seen to be the day with the highest traffic volume, commentary below focuses on this day to allow for assessment of the worst-case. This is a conservative approach and it is noted that for all other times of the week, traffic impacts would be expected to be much lower.

Figure 7 illustrates the anticipated increase in traffic expected on the alternative routes during the Saturday peak hour, being approximately 130 - 160 vph along Lamrock Avenue, or two to three (2 - 3) additional vehicles per minute; 30 vph along Glenayr Avenue, or one (1) additional vehicle per minute; and 110 - 140 vph along Curlewis Street, or two to three (2 - 3) additional vehicles per minute.

It is reiterated that these are expected to be the maximum hourly impacts on the local streets in the suburb as they represent the peak Saturday hour (11:00-12:00) during which traffic volumes in the area are highest. At other times of the day and week, the increases in traffic along these streets are expected to be much lower.

For example, the total southbound traffic volume along Hall Street departing the Glenayr Avenue intersection during the Saturday peak hour (11:00-12:00) is seen from **Figure 4** to be 439 vph. The corresponding value at 09:00-10:00 is 26% lower at 327 vph.

On a Sunday, **Figure 5** shows the existing peak hour (11:00-12:00) volume southbound along Hall Street is 17% lower than that on a Saturday, being 365 vph. The peak hour volume on a Tuesday (10:45-11:45) is also around this level, at 373 vph.

It can be seen therefore that the estimated upper limit impacts along Lamrock Avenue (130 - 160 vph), Glenayr Avenue (30 vph) and Curlewis Street (110 - 140 vph) are indeed upper limits, with traffic increases at other times of the day or week expected to be much lower.

Further, the approach adopted is considered highly conservative as the network shown by **Figure 4** - **Figure 8** is considered a closed system in which all rerouting occurs locally. In reality, there may be several consequences of the proposal, including:

- A mode shift to cycling or walking given improved facilities for active transport.
- Elimination of trip purposes altogether.
- Much broader networked rerouting, such as vehicles continuing along Old South Head Road to use Curlewis Street or Blair Street, or alternatively using Bondi Road and Campbell Parade to reach a destination.

As such, the estimated increases on these local streets may be lower still, should a more nuanced pattern of traffic redistribution and modal shift occur than that assumed in this TMP.

Redistributed traffic benefits from the networked nature of the Bondi Beach suburb, with most OD pairs having multiple alternative routes they could take to reach their destination without requiring the use of Hall Street southbound. The estimated increase in traffic volumes is manageable when spread across the network, and is unavoidable in delivering the significant public realm benefits to the local community along Hall Street.

Elsewhere, hourly traffic volumes are expected to increase by lesser amounts or reduce as a result of the proposal.

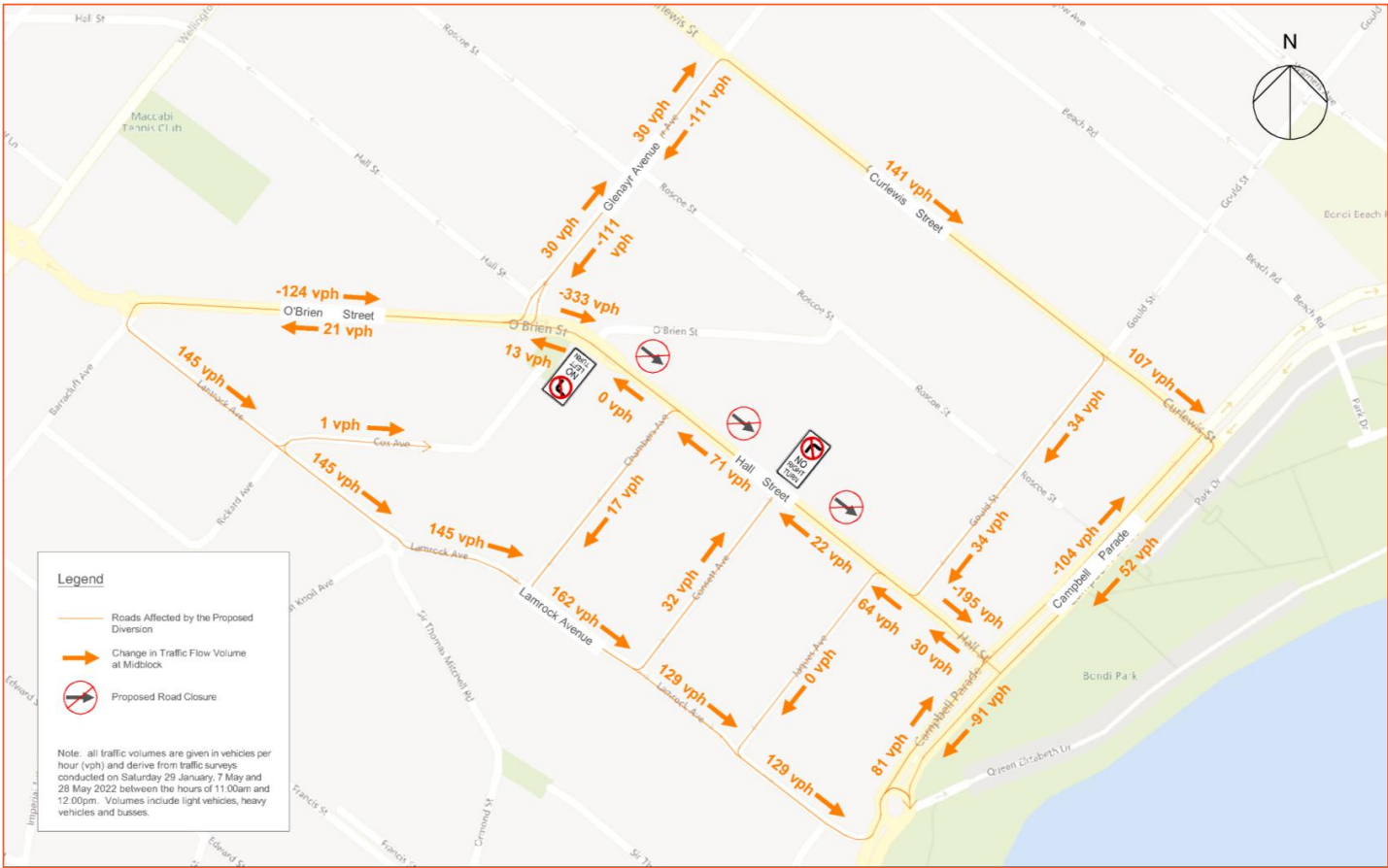


Figure 7: Anticipated Change in Midblock Traffic Volumes (Saturday 11:00-12:00)

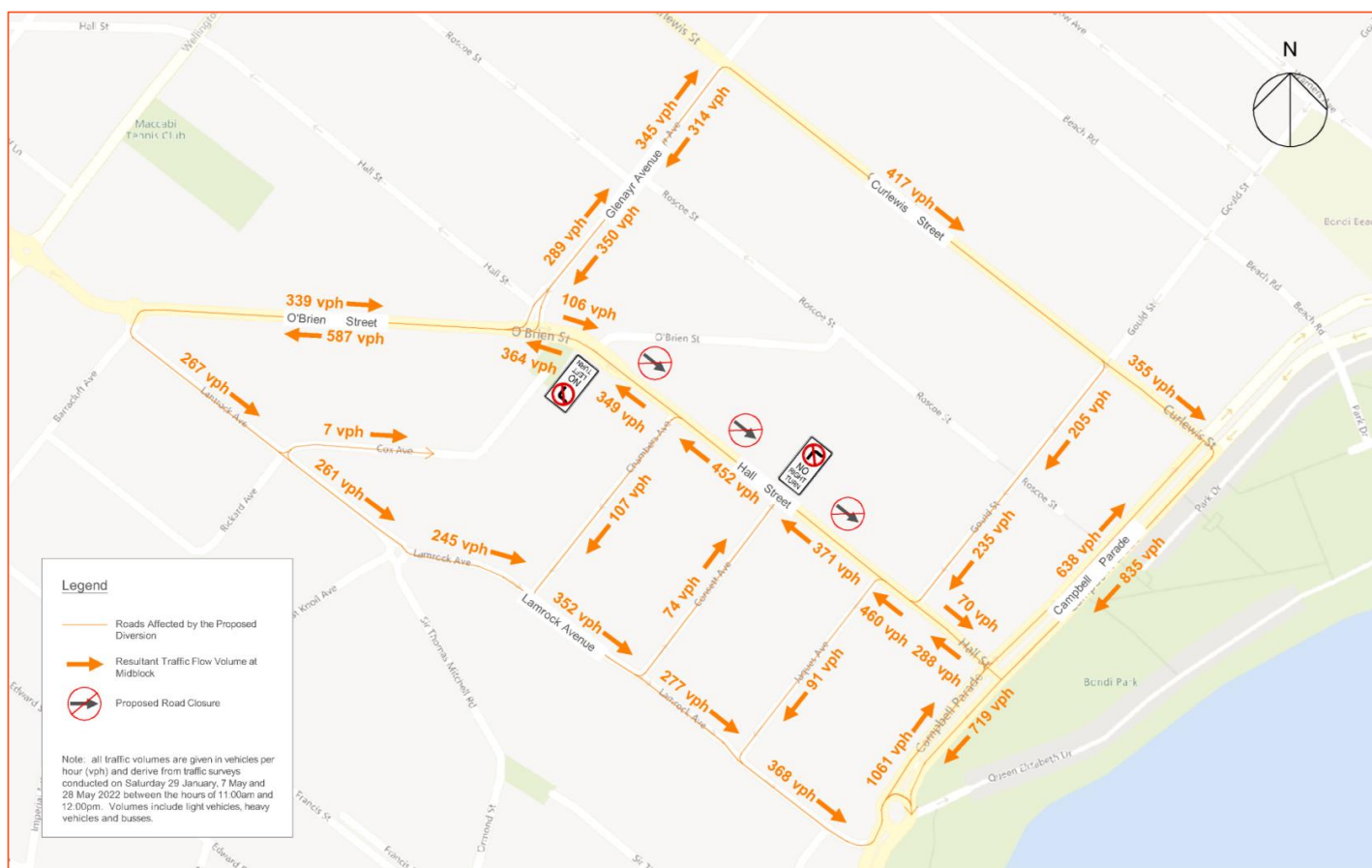


Figure 8: Estimated Resultant Midblock Traffic Volumes (Saturday 11:00-12:00)

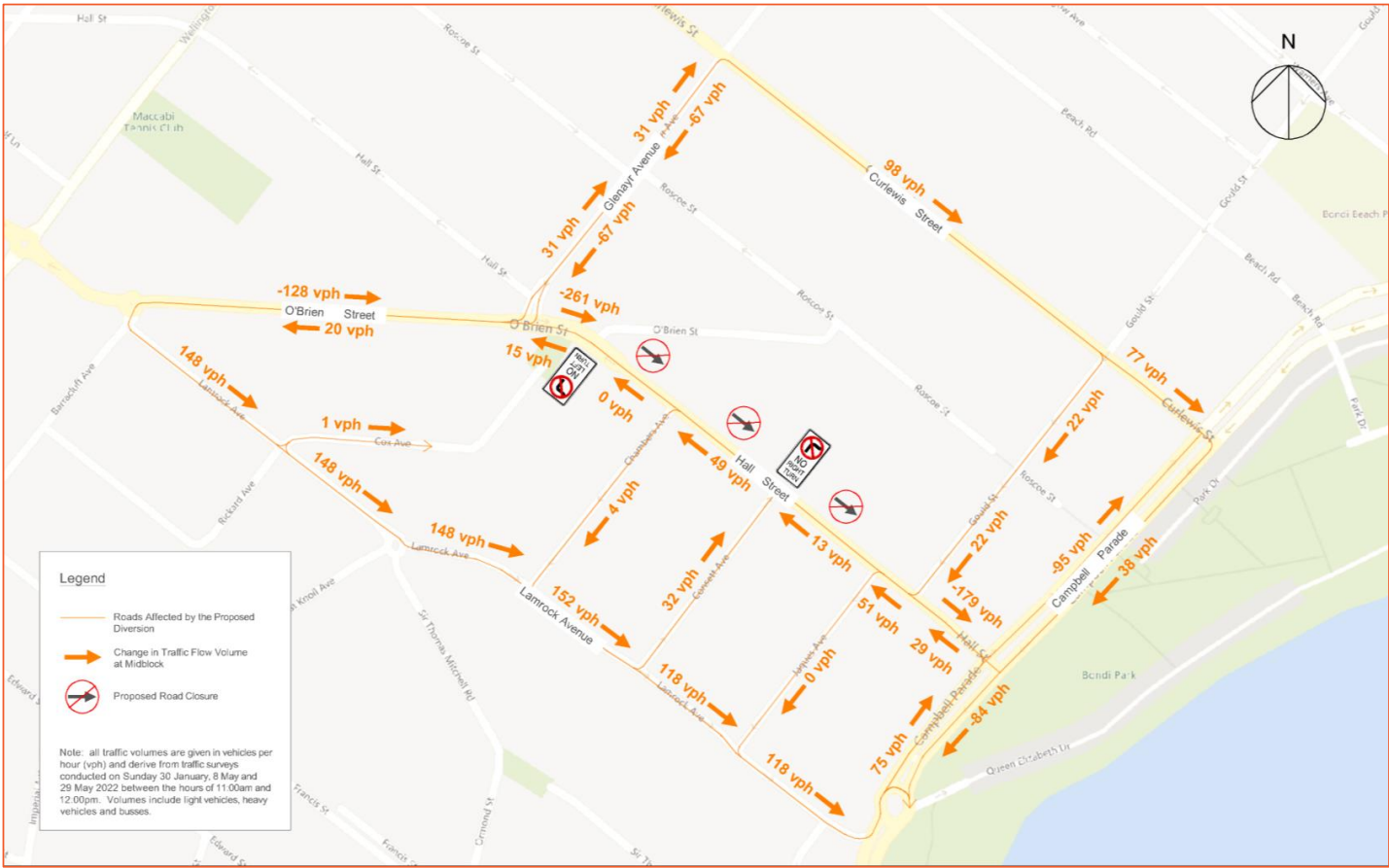


Figure 9: Anticipated Change in Midblock Traffic Volumes (Sunday 11:00-12:00)

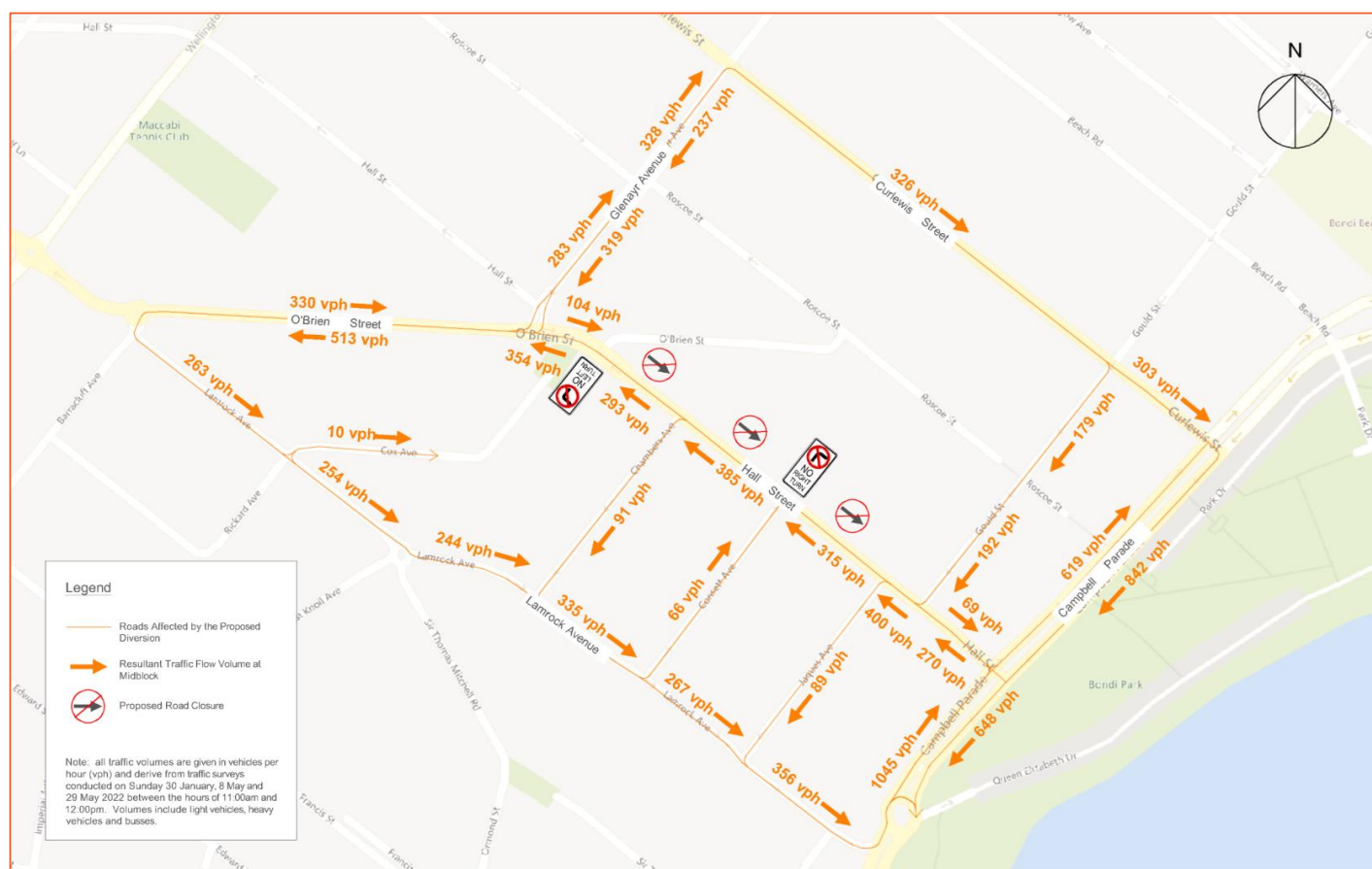


Figure 10: Estimated Resultant Midblock Traffic Volumes (Sunday 11:00-12:00)

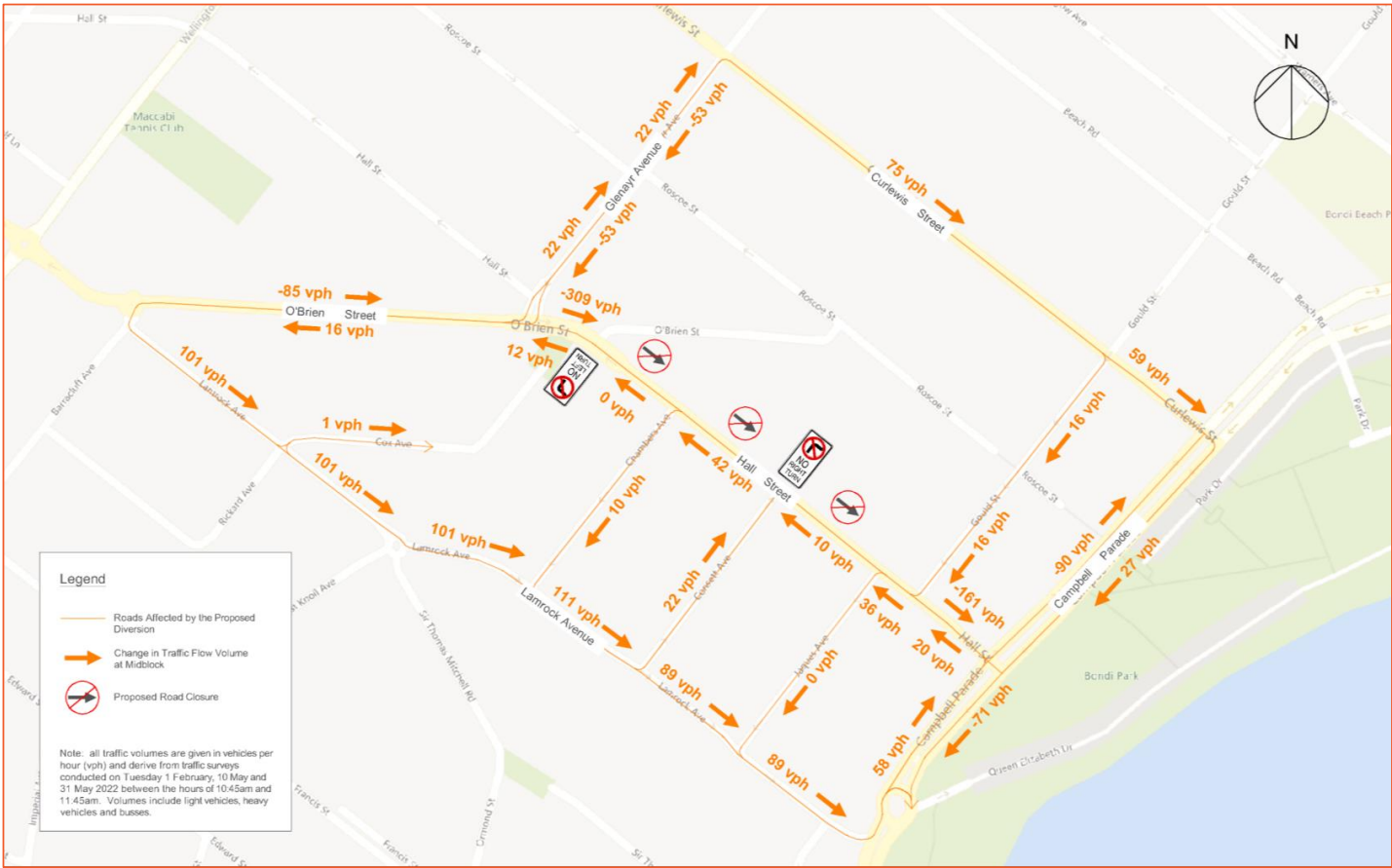


Figure 11: Anticipated Change in Midblock Traffic Volumes (Tuesday 10:45-11:45)

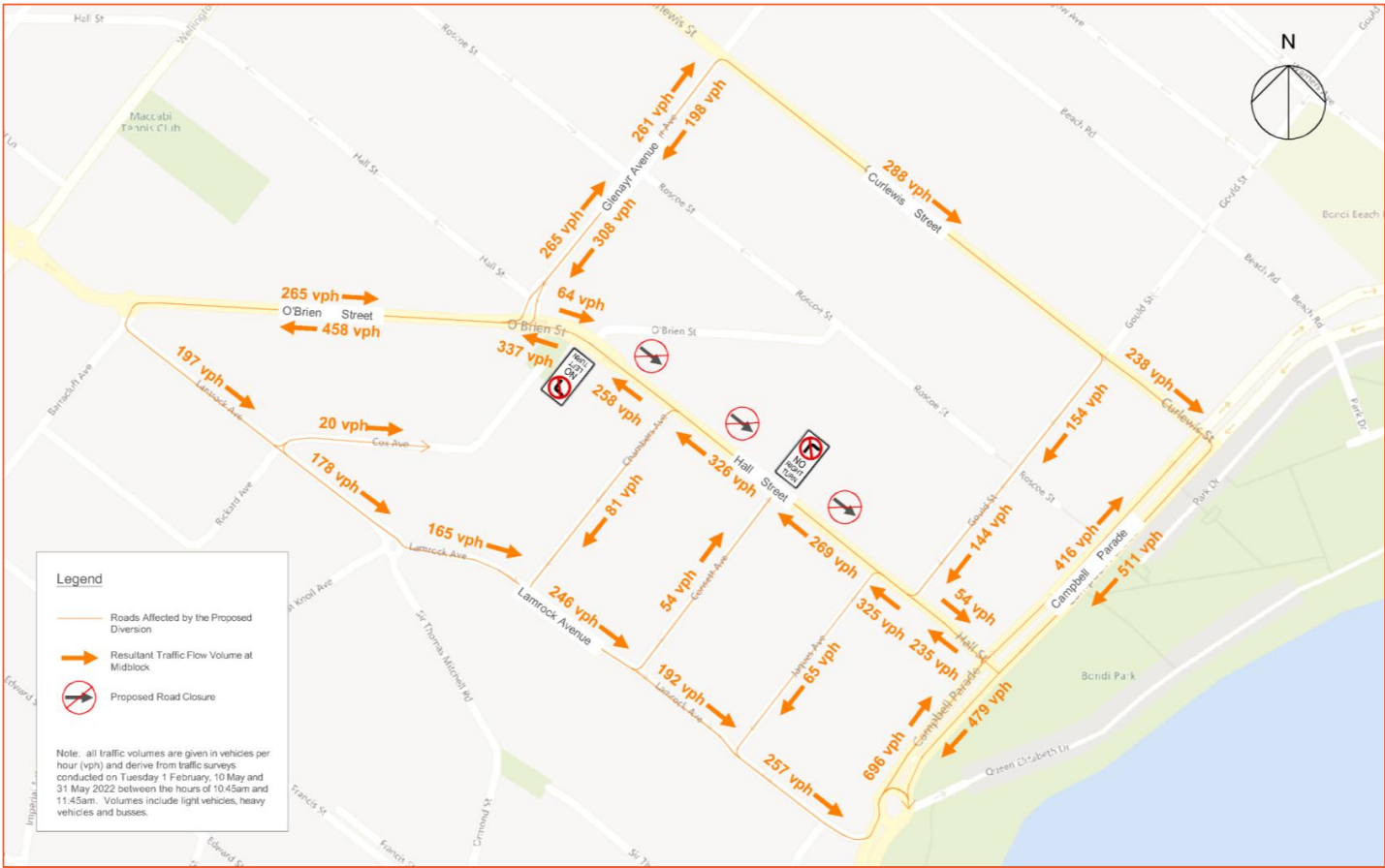


Figure 12: Estimated Resultant Midblock Traffic Volumes (Tuesday 10:45-11:45)



Crash Data

Crash data suggests there has not been a discernible crash trend, with a total of five crashes recorded along Hall Street in the five-year period of 2016 - 2020. Two of these crashes occurred near the Gould Street and Jacques Avenue intersections to the south of the Study Area involving vehicles only. The other three occurred near the Chambers Avenue intersection, one of which involved a pedestrian (type unknown), and the other two vehicles.

Elsewhere, no crashes were recorded along Lamrock Avenue, Chambers Avenue, Consett Street, or Jacques Avenue. Five crashes were recorded along Glenayr Avenue between O'Brien Street and Curlewis Street, and three on Curlewis Street between Glenayr Avenue and Gould Street.

The proposal is likely to have a net improvement in safety performance along Hall Street, given the significant reduction in vehicular traffic in a highly pedestrianised area with an array of on-street parking and loading zones. No discernible crash trend is evident in the data along Glenayr Avenue and Curlewis Street which would be exacerbated by the increase in traffic resulting from the proposal.

C. Measures to ameliorate the impact of re-assigned traffic

Is an assessment required?

~~Yes~~ / No

No ameliorative measures are proposed to mitigate the impact of re-assigned traffic.

The proposal is a temporary measure expected to last for six (6) months and as such any impacts to the local community will also be temporary until such a time the existing conditions are reinstated. Any potential extension of the trial temporary arrangements should be reassessed by taking updated traffic counts to ascertain the impacts.

Discussion in response to Part B identifies that the increases in traffic on alternative routes is moderate, increasing by up to two to three (2 - 3) vehicles per minute on the roads most affected during the busiest time of the week.

Figure 8 demonstrates that the roads upon which the increase in traffic is highest, Lamrock Avenue and Curlewis Street, would still have hourly traffic volumes below 420 vph during peak periods, which is considered low and well within acceptable traffic volumes and level of service along local and collector streets.

It is anticipated that delay increases experienced by road users would be relatively minor and within the daily and seasonal variations which occur throughout the year. SCATS traffic signals at signalised intersections of Glenayr Avenue / Curlewis Street, Campbell Parade / Curlewis Street, and Campbell Parade / Hall Street, would each be able to adapt accordingly to changing traffic conditions to mitigate the impacts of any increase in traffic on given movements.

Council will monitor the performance of the local road network throughout implementation of the proposal and be prepared to enact temporary, targeted amelioration or mitigation at certain locations as required on an ad hoc basis.

**D. Assessment of public transport services affected.**

Is an assessment required?

~~Yes~~ / No

No public transport services currently use Hall Street and thus all existing services will continue to operate as existing without disruption.

Any slight delay increases resulting from rerouted traffic conditions along roads buses do use, such as O'Brien Street, Glenayr Avenue, and Campbell Parade, would likely be minor and within daily and seasonal variations.

E. Details of provision made for emergency vehicles, heavy vehicles, cyclists and pedestrians.

Is an assessment required?

~~Yes~~ / No

Access to Hall Street is still retained in a northbound direction for emergency vehicles and servicing / loading vehicles, and as such all destinations along Hall Street which can currently be reached will continue to be available once the proposal is implemented.

The proposal deliberately terminates just north of Gould Street to ensure that Bondi Beach Police Station, located on Gould Street, will have access north- and southbound along Hall Street when departing the Station. Gould Street is one-way south-westbound and so all vehicles returning to the Station are required to do so via the Curlew Street intersection to the northeast, which remains unaffected by the proposal.

The existing loading arrangements along Hall Street will be consolidated but largely retained as existing, to ensure no significant disruption to local business or truck drivers.

Pedestrians and cyclists will retain access to all areas along Hall Street, with improved accessibility following the proposal, and thus no adverse impacts are expected.

F. Assessment of effect on existing and future developments with transport implications in the vicinity of the proposed measures.

Is an assessment required?

~~Yes~~ / No

Developments of a small to moderate scale are committed and ongoing along Hall Street and across the Bondi Beach area; however, there are none which would be prejudiced by the alternative proposal, or which would have otherwise significantly increased demand for the south-eastbound Hall Street direction.

A development that is worthy of consideration with respect to the proposal is The Boheme Bondi precinct, located at 69-73 Hall Street, Bondi Beach, which comprises:

- Adina Apartment Hotel Bondi Beach consisting of 111 serviced apartments ('Adina Hotel').



- 8 retail tenancies ('Hub Retail').
- 45 residential apartments ('Boheme Residential').
- 207 car spaces in total over three basement levels allocated between the Adina Hotel, Hub Retail and Boheme Residential components, accessed off O'Brien Street between its intersections with Hall Street and Roscoe Street.
- Loading Dock serving the entire development accessed off O'Brien Street between its intersections with Hall Street and Roscoe Street.

Traffic surveys conducted at the O'Brien Street / Hall Street intersection show that up to:

- 110 vehicles per hour currently turn left from western leg of O'Brien Street into the eastern leg of O'Brien Street.
- 30 vehicles per hour currently turn right from Hall Street into the eastern leg of O'Brien Street.
- 25 vehicles per hour currently turn left from eastern leg of O'Brien Street into Hall Street.
- 60 vehicles per hour currently turn right from eastern leg of O'Brien Street into the western leg of O'Brien Street.

A considerable proportion of the above vehicles are expected to be associated with The Boheme Bondi precinct development. All of the above movements would be retained under the alternative proposal apart from the turn left from eastern leg of O'Brien Street into Hall Street, which equates to only a small proportion of the overall turn volumes at the O'Brien Street / Hall Street intersection.

The required rerouting of traffic travelling to / from The Boheme Bondi precinct development would therefore be limited.

As such, the proposal is expected to have little impact on existing and proposed traffic generating developments in the vicinity beyond those impacts discussed above and in response to earlier Parts.

G. Assessment of effect of proposed measures on traffic movements in adjoining Council areas.

Is an assessment required?

Yes / ~~No~~

The anticipated alternative routes vehicles would take following implementation of the proposal are contained wholly within the Waverley local government area, and as such, there will be no impact on traffic movements in adjoining Council areas.

H. Public consultation process.

Is a public consultation process required?

Yes / ~~No~~

Community consultation has already been undertaken by Council in accordance with the indicative timeline illustrated by **Figure 13**.

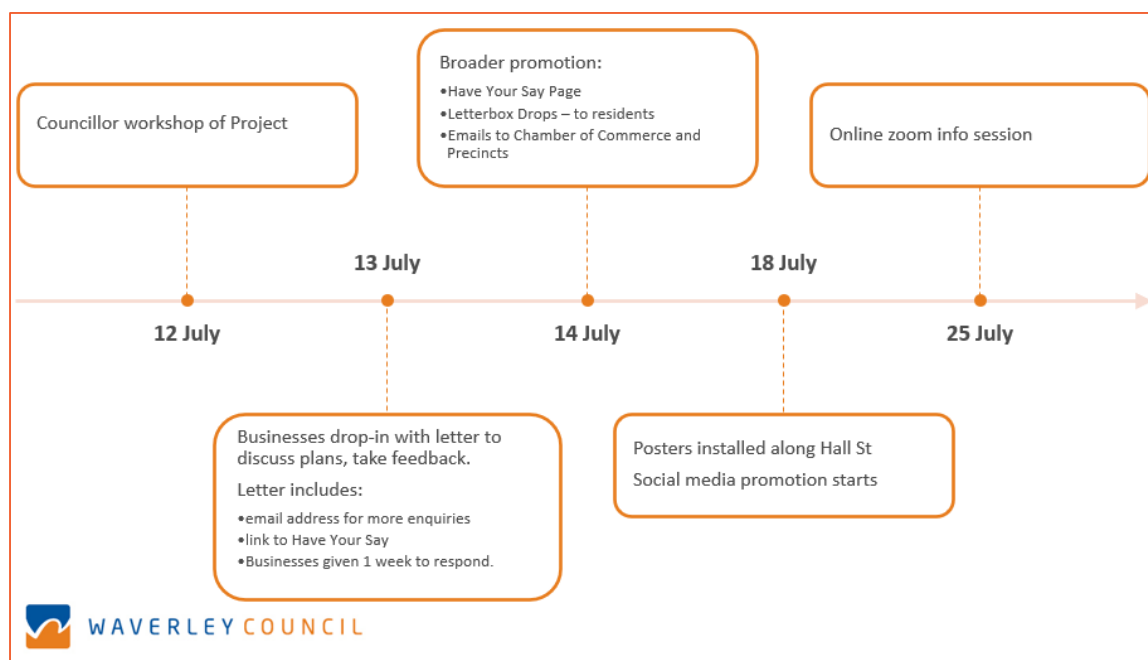


Figure 13: Community Consultation Timeline

Source: Waverley Council

The proposal is therefore supportable on traffic planning grounds. Please contact the undersigned should you have any queries or require any further information.

Yours sincerely,

Paul Corbett
Director, PDC Consultants

Email: pcorbett@pdconsultants.com.au



Existing and forecast peak hour traffic flows

Hall Street, Bondi Beach - Temporary One-Way Trial

Saturday 11am-12pm	Direction	Existing peak hour traffic flow	Change in peak hour traffic volume (Original proposal)		Change in peak hour traffic volume (Alternative proposal)	
		Vehicles per hour	Vehicles per hour	Percentage	Vehicles per hour	Percentage Change
Hall Street	westbound	381	166	44%	71	19%
Curlewis Street	eastbound	276	157	57%	141	51%
Consett Avenue	northbound	42	95	226%	32	76%
Chambers Avenue	southbound	90	17	19%	17	19%
Jaques Avenue	southbound	91	0	0%	0	0%
Glenayr Avenue	northbound	315	30	10%	30	10%
Glenayr Avenue	southbound	425	-127	-30%	-111	-26%
O'Brien Street	eastbound	463	-124	-27%	-124	-27%
O'Brien Street	westbound	566	21	4%	21	4%
Lamrock Avenue	eastbound	190	222	117%	162	85%

Sunday 11am-12pm	Direction	Existing peak hour traffic flow	Change in peak hour traffic volume (Original proposal)		Change in peak hour traffic volume (Alternative proposal)	
		Vehicles per hour	Vehicles per hour	Percentage	Vehicles per hour	Percentage Change
Hall Street	westbound	336	153	46%	49	15%
Curlewis Street	eastbound	228	131	57%	98	43%
Consett Avenue	northbound	34	105	309%	32	94%
Chambers Avenue	southbound	87	4	5%	4	5%
Jaques Avenue	southbound	89	0	0%	0	0%
Glenayr Avenue	northbound	297	31	10%	31	10%
Glenayr Avenue	southbound	304	-100	-33%	-67	-22%
O'Brien Street	eastbound	458	-200	-44%	-128	-28%
O'Brien Street	westbound	493	20	4%	20	4%
Lamrock Avenue	eastbound	183	223	122%	152	83%

Tuesday 10:45am-11:45am	Direction	Existing peak hour traffic flow	Change in peak hour traffic volume (Original proposal)		Change in peak hour traffic volume (Alternative proposal)	
		Vehicles per hour	Vehicles per hour	Percentage	Vehicles per hour	Percentage Change
Hall Street	westbound	284	106	37%	42	15%
Curlewis Street	eastbound	213	96	45%	75	35%
Consett Avenue	northbound	32	65	203%	22	69%
Chambers Avenue	southbound	71	10	14%	10	14%
Jaques Avenue	southbound	65	0	0%	0	0%
Glenayr Avenue	northbound	239	22	9%	22	9%
Glenayr Avenue	southbound	251	-74	-29%	-53	-21%
O'Brien Street	eastbound	350	-129	-37%	-85	-24%
O'Brien Street	westbound	442	16	4%	16	4%
Lamrock Avenue	eastbound	135	156	116%	111	82%

Existing and forecast peak traffic flows per minute

Hall Street, Bondi Beach - Temporary One-Way Trial

Saturday 11am-12pm	Direction	Existing peak hour traffic flow	Change in peak hour traffic volume (Original proposal)		Change in peak hour traffic volume (Alternative proposal)	
		Vehicles per minute	Vehicles per minute	Percentage	Vehicles per minute	Percentage Change
Hall Street	westbound	6	2.8	44%	1.2	19%
Curlewis Street	eastbound	5	2.6	57%	2.4	51%
Consett Avenue	northbound	1	1.6	226%	0.5	76%
Chambers Avenue	southbound	2	0.3	19%	0.3	19%
Jaques Avenue	southbound	2	0.0	0%	0.0	0%
Glenayr Avenue	northbound	5	0.5	10%	0.5	10%
Glenayr Avenue	southbound	7	-2.1	-30%	-1.9	-26%
O'Brien Street	eastbound	8	-2.1	-27%	-2.1	-27%
O'Brien Street	westbound	9	0.4	4%	0.4	4%
Lamrock Avenue	eastbound	3	3.7	117%	2.7	85%

Sunday 11am-12pm	Direction	Existing peak hour traffic flow	Change in peak hour traffic volume (Original proposal)		Change in peak hour traffic volume (Alternative proposal)	
		Vehicles per hour	Vehicles per hour	Percentage	Vehicles per hour	Percentage Change
Hall Street	westbound	6	2.6	46%	0.8	15%
Curlewis Street	eastbound	4	2.2	57%	1.6	43%
Consett Avenue	northbound	1	1.8	309%	0.5	94%
Chambers Avenue	southbound	1	0.1	5%	0.1	5%
Jaques Avenue	southbound	1	0.0	0%	0.0	0%
Glenayr Avenue	northbound	5	0.5	10%	0.5	10%
Glenayr Avenue	southbound	5	-1.7	-33%	-1.1	-22%
O'Brien Street	eastbound	8	-3.3	-44%	-2.1	-28%
O'Brien Street	westbound	8	0.3	4%	0.3	4%
Lamrock Avenue	eastbound	3	3.7	122%	2.5	83%

Tuesday 10:45am-11:45am	Direction	Existing peak hour traffic flow	Change in peak hour traffic volume (Original proposal)		Change in peak hour traffic volume (Alternative proposal)	
		Vehicles per hour	Vehicles per hour	Percentage	Vehicles per hour	Percentage Change
Hall Street	westbound	5	1.8	37%	0.7	15%
Curlewis Street	eastbound	4	1.6	45%	1.3	35%
Consett Avenue	northbound	1	1.1	203%	0.4	69%
Chambers Avenue	southbound	1	0.2	14%	0.2	14%
Jaques Avenue	southbound	1	0.0	0%	0.0	0%
Glenayr Avenue	northbound	4	0.4	9%	0.4	9%
Glenayr Avenue	southbound	4	-1.2	-29%	-0.9	-21%
O'Brien Street	eastbound	6	-2.2	-37%	-1.4	-24%
O'Brien Street	westbound	7	0.3	4%	0.3	4%
Lamrock Avenue	eastbound	2	2.6	116%	1.9	82%