



Suite 2.03, 789 Toorak Road
Hawthorn East Victoria 3123

T: +61 3 9804 3610
W: obrientraffic.com

21 May 2018

LAKE STREET SHARED TRAIL, MERIMBULA – TRAFFIC ENGINEERING ASSESSMENT OF OPTIONS

I refer to your request for a traffic and safety assessment of the Lake Street shared trail options to determine potential implications and identify remedial measures (if required).

OPTIONS FOR LAKE STREET

A total of four options are currently being considered (three developed by TBLD prior to public consultation and fourth conceptualised by Council during public consultation). The options are provided in Attachment A and described as follows:

- Option A: One-way road (southbound) and using the existing northbound traffic lane for a shared trail;
- Option B: Retaining the two-way road and providing a shared trail on a boardwalk (or similar);
- Option C: Two-way road north of the Bar Beach car park access and providing a shared trail on a boardwalk (or similar). One-way road (southbound) south of the Bar Beach car park access and using the northbound lane for a shared trail; and
- Option D (conceptualised by Council): One-way road (southbound) north of Wyeebo Street and south of the Beach Bar car park access and using the northbound lane for shared trail. Two-way road between Wyeebo Street and the Bar Beach car park access, and providing a shared trail on boardwalk (or similar)

EXISTING TRAFFIC CONDITIONS

In the course of undertaking this assessment, available weekday traffic counts and speed measurements in the study area were reviewed. The average weekday traffic volumes and 85th percentile speeds in the study area are shown in **Figure 1**.

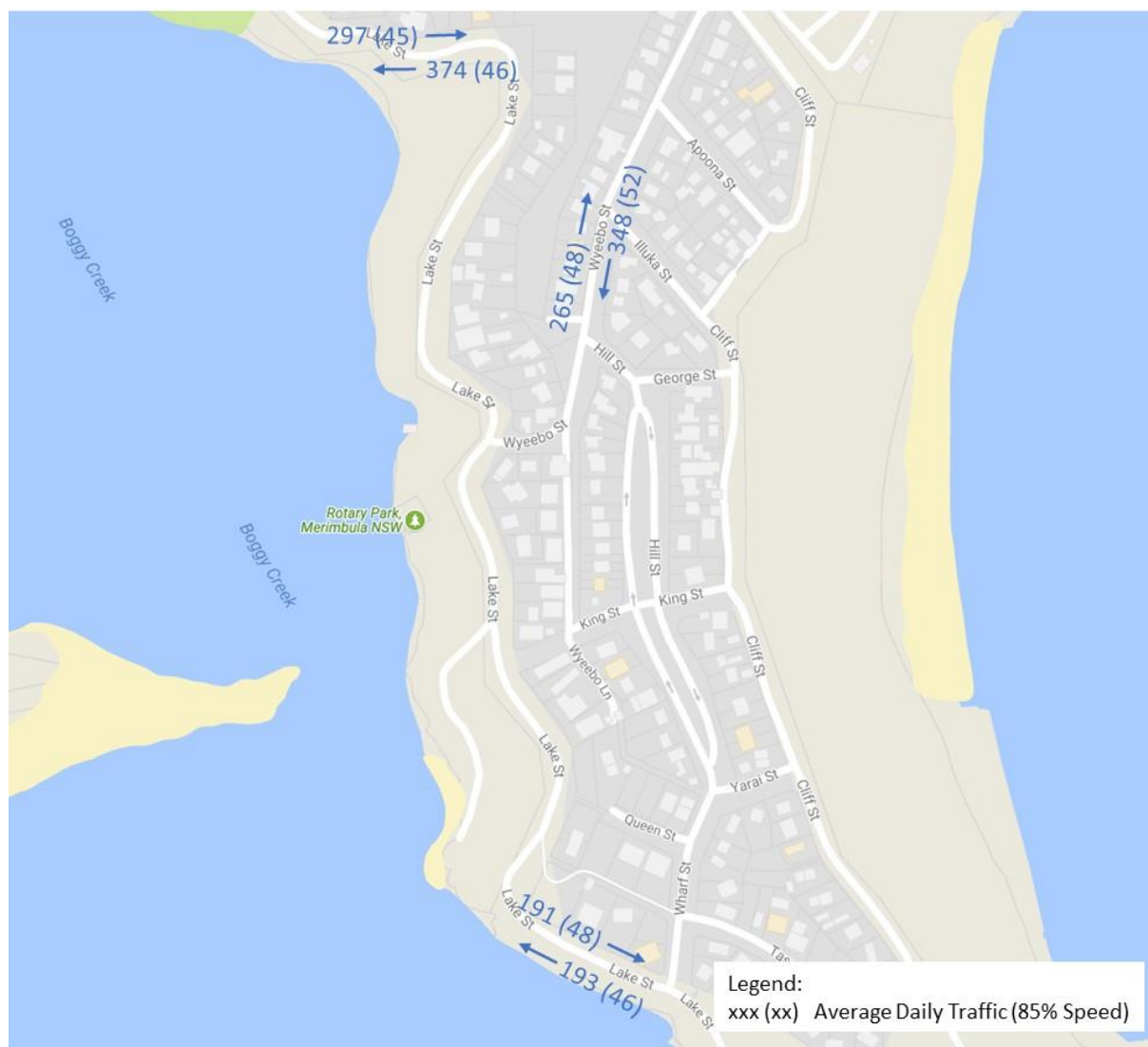


FIGURE 1: EXISTING (JULY 2017) TRAFFIC CONDITIONS

The assessment in this letter is based on the traffic data collected in July 2017. It is noted that traffic volumes would be expected to increase during the summer. Based on a review of historical traffic data in the vicinity of Lake Street, the weekday traffic volumes shown in **Figure 1** would be estimated to double during the peak summer conditions in the Long Point area.

Based on our review of the traffic volumes and inspection of the study area, the following assumptions are made in relation to determining future traffic flow patterns:

- The majority of the traffic on Lake Street is generated by Bar Beach or the Wharf;

- All of the traffic recorded at the south end of Lake Street would have been registered at the north end (i.e. if a vehicle has a destination in the south, Lake Street would be used);
- In July, approximately 25% residences along Lake Street are considered actively occupied. As such, out of the 23 residences that provide an access to Lake Street approximately 6 dwellings would consistently produce vehicle trips at an average rate of up to 10 movements per day. This equates to up to 60 movements (30 ingress and 30 egress) per day for the residences on Lake Street.

OPTION A: ONE-WAY (SOUTHBOUND) LAKE STREET

Traffic Distribution

The likely redistribution of traffic due to reconfiguration of Lake Street to a one-way road (southbound) was derived based on the existing traffic flow patterns, availability of alternate routes and our observations during the site inspection. Vehicles wishing to travel to the north will predominantly be diverted to Wharf Street / Hill Street / Wyeebo Street.

Figure 2 through **Figure 4** depicts the likely redistribution of traffic volumes in the surrounding street network. The resultant weekday traffic volumes following the Lake Street reconfiguration are shown in **Figure 5**.



FIGURE 2: OPTION A – TRAFFIC REDISTRIBUTION FROM BAR BEACH (JULY CONDITIONS)



FIGURE 3: OPTION A – TRAFFIC REDISTRIBUTION FROM WHARF (JULY CONDITIONS)



FIGURE 4: OPTION A – TRAFFIC REDISTRIBUTION FROM RESIDENCES (JULY CONDITIONS)

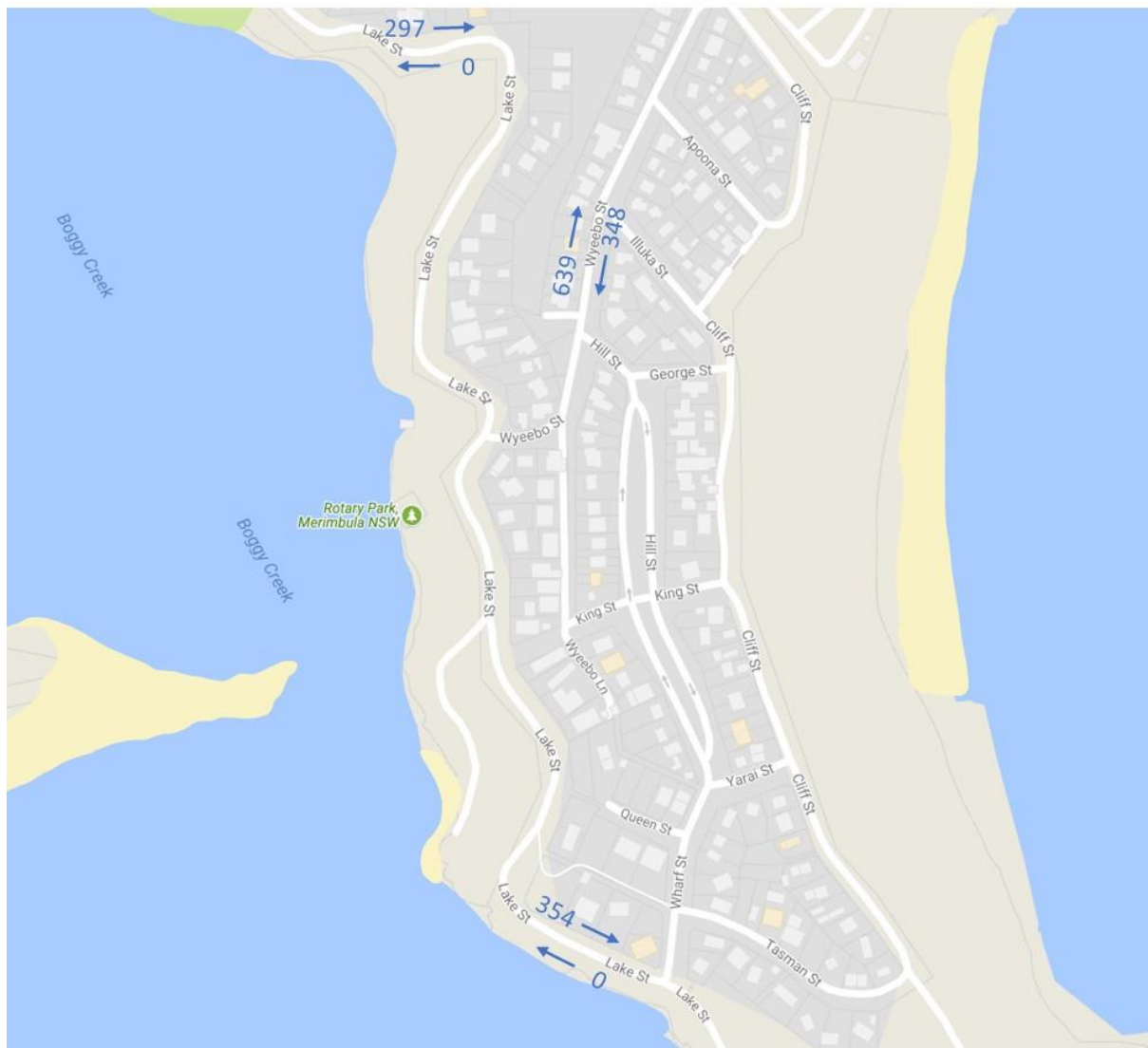


FIGURE 5: OPTION A – RESULTANT AVERAGE WEEKDAY TRAFFIC VOLUMES (JULY CONDITIONS)

As such, the reconfiguration of Lake Street would result in the following changes to average weekday traffic conditions in July:

- NBD Wyeebo Street (north of Hill Street): +374 vehicles per day;
- NBD Wyeebo Street (south of Hill Street): +18 vehicles per day;
- NBD Wharf Street/Hill Street: +356 vehicles per day;
- SBD Lake Street (north of Wharf Street): +163 vehicles per day; and
- NBD Lake Street (north end): -374 vehicles per day.

Pros / Cons

Potential pros/cons of Option A are described below:

- **Lake Street reconfiguration** – it is not uncommon to provide one-way circulation in the area where the majority of traffic movements are generated by visitors. With

appropriate signage and linemarking, one-way (southbound) Lake Street is unlikely to cause any confusion among motorists. A one-way road would allow for the provision of a separate path for cyclists and pedestrians and formal parking on Lake Street. The one-way road is expected to improve sight lines for the southbound traffic and would eliminate any potential for head-on crashes on Lake Street. Overall, this arrangement would improve safety for all modes on Lake Street when compared to the existing configuration.

- **Car parking** – among all four options considered, this option would provide more formal parking areas on Lake Street, potentially relieving pressure off the adjacent streets and making the existing on-street parking available for residents.
- **Traffic redistribution** – the northbound traffic volumes are expected to increase on Wharf Street, Hill Street and Wyeebo Street as noted above. It is noted that Wyeebo Street currently experiences higher southbound traffic volumes compared to Lake Street. On this basis, it can be assumed that vehicles wishing to travel to Bar Beach or the Wharf from Short Point Road utilise Wyeebo Street.
- **Road safety** – It is understood that Wyeebo Street provides pedestrian access between the Short Point camping grounds and Bar Beach/Wharf. It is noted that pedestrians would be required to walk on the naturestrip or the road. It is common for local streets within coastal towns such as Merimbula to accommodate pedestrians within the shared road space. Notwithstanding this, more pedestrians may choose to walk on the naturestrip once traffic volumes increase.

Traffic Impact

Although there is no precise “target volume” or “environmental capacity” for streets, various guidelines have been prepared over many years.

For example, the *Australian Model Code for Residential Development (AMCORD)* - 1990 refers to four key performance areas for new residential areas: noise, air pollution, crossing delay, and pedestrian safety. AMCORD does not provide any definitive rule-of-thumb figures (as each situation and local area should be considered on its individual merits), reference is often made to 2,000 vehicles/day for local access streets.

RTA's *Guide to Traffic Generating Developments* (2002), commonly used by traffic engineers, sets out a desirable maximum peak volume (the “environmental goal”) of 200 vehicles/hour and an absolute maximum of 300 vehicles/hour for local 40 km/h streets. This would typically correspond to daily traffic volumes of 2,000 – 3,000 vehicles per day. The RTA Guide suggests that there may be situations where alterations to these levels might be appropriate, e.g. if a street has a central median.

Clause 56.06 of the *Victorian Planning Scheme* (2010) assists in planning residential neighbourhood streets. Street types that relate to this project are listed with the following traffic volume and carriageway width characteristics:

Access Street – Level 1

- Traffic Volume: 1,000 – 2,000 vehicles per day
- Carriageway Width: 5.5m wide with hard standing parking area per 2 lots

Access Street – Level 2

- Traffic Volume: 2,000 – 3,000 vehicles per day
- Carriageway Width: 7 - 7.5m wide with parking on both sides of carriageway

The target traffic volumes listed in the various documents provide a similar theme. As the Victorian Planning Scheme provides the latest advice compared to AMCORD or RTA, this document has been used for this assessment.

Based on inspection of the area and noting existing carriageway widths (provided by Council), the following roads in the Long Point area would be classified as Access Street – Level 1:

- Wyeebo Street between Lake Street and Hill Street;
- Wharf Road between Lake Street and Yara Street.

The following roads would be classified as Access Street – Level 2:

- Hill Street
- Wyeebo Street between Hill Street and Cliff Street.

Noting that an Access Street- Level 1 can accommodate up to 2,000 vehicles per day and an Access Street-Level 2 can accommodate up to 3,000 vehicles per day, the surrounding street network is capable of absorbing additional traffic as the volumes are expected to be well below 2,000 vehicles per day. Even if traffic volumes in the summer months are double the July traffic volumes, local streets would still experience less than 2,000 vehicles per day.

The resultant traffic volumes would therefore not change the function of streets in the Long Point area.

OPTION B: TWO-WAY LAKE STREET (SHARED PATH ON SEPARATE BOARDWALK OR TRAIL)

No changes are expected in traffic volumes on Lake Street or surrounding street network. Therefore, this option would not impact existing traffic conditions, however the safety

benefits for traffic on Lake Street or parking improvements as identifies in Option A would not be realised.

OPTION C: TWO-WAY/ONE-WAY LAKE STREET

Traffic Distribution

The likely redistribution of traffic due to reconfiguration of Lake Street to two-way/one-way road was derived based on the existing traffic flow patterns, availability of alternate routes and our observations during the site inspection. Traffic movements to the north from the Bar Beach and the residences north of the Bar Beach car park access would be maintained as existing. Vehicles wishing to travel to the north from the south of the Bar Beach car park access (including the Wharf) will predominantly be diverted to Wharf Street / Hill Street / Wyeebo Street.

Figure 6 and **Figure 7** depicts the likely redistribution of traffic volumes in the surrounding street network. The resultant weekday traffic volumes following the Lake Street reconfiguration are shown in **Figure 8**.

As such, the reconfiguration of Lake Street would result in the following changes to average weekday traffic conditions in July:

- NBD Wyeebo Street (north of Hill Street): +196 vehicles per day;
- NBD Wyeebo Street (south of Hill Street): 0 vehicles per day;
- NBD Hill Street/Wharf Street: +196 vehicles per day;
- SBD Lake Street (north of Wharf Street): +3 vehicles per day; and
- NBD Lake Street (north end): -196 vehicles per day.



FIGURE 6: OPTION C – TRAFFIC REDISTRIBUTION FROM WHARF (JULY)



FIGURE 7: OPTION C – TRAFFIC REDISTRIBUTION FROM RESIDENCES (JULY)

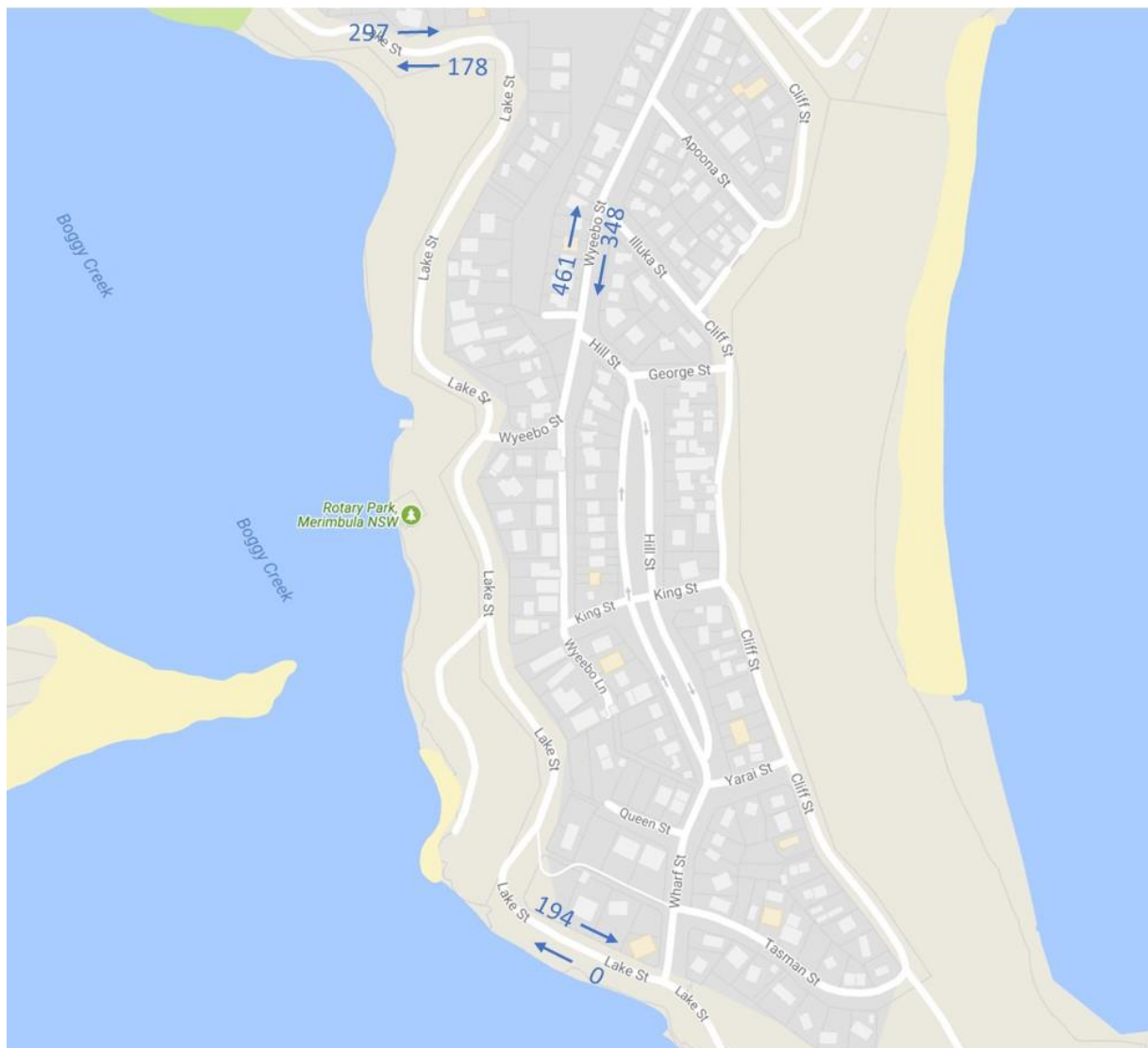


FIGURE 8: OPTION C – RESULTANT AVERAGE WEEKDAY TRAFFIC VOLUMES (JULY)

Pros / Cons

Potential pros/cons of Option C are described below:

- **Lake Street reconfiguration** – Given Lake Street has a single transition point between one-way road to two-way road, it is unlikely to cause any major confusion among motorists if appropriate signage and linemarking is installed. The one-way section south of the Bar Beach car park access would also eliminate any potential for head-on crashes. The proposed configuration under this option would generally enhance safety for all modes on Lake Street when compared to the existing configuration (although not as much as Option A).
- **Car Parking** – one-way road (southbound) south of the Bar Beach car park access would allow for formal parking spaces on Lake Street which would relieve the pressure off

adjacent streets particularly Wyeebo Street and Hill Street, making the existing on-street parking available for residents.

- **Traffic redistribution** – the northbound traffic volumes are expected to increase on Wharf Street, Hill Street and Wyeebo Street as noted above. These increases however would be less than Option A.
- **Road safety** – As noted in Option A, as traffic volumes increase, more pedestrians may choose to walk on the naturestrip in Wyeebo Street. It is however noted that the traffic volume increase would be lower relative to Option A and therefore this would reduce any potential or perceived impacts to pedestrian flows on Wyeebo Street.

Traffic Impact

Consistent with reasoning outlined for Option A, the surrounding street network is capable of absorbing additional traffic volumes noted above. In addition, the resultant traffic volumes under this option would not change the function of streets in the Long Point area.

OPTION D: ONE-WAY/TWO-WAY/ONE-WAY LAKE STREET

Traffic Distribution

The likely redistribution of traffic due to reconfiguration of Lake Street to one-way/two-way/one-way road was derived based on the existing traffic flow patterns, availability of alternate routes and our observations during the site inspection. Traffic movements from the Bar Beach and the residences north of the Bar Beach car park access to the north would be displaced to Wyeebo Street. Vehicles wishing to travel to the north from south of the Bar Beach car park access (including the Wharf) will predominantly be diverted to Wharf Street / Hill Street / Wyeebo Street.

Figure 9 through **Figure 11** depicts the likely redistribution of traffic volumes in the surrounding street network. The resultant weekday traffic volumes following the Lake Street reconfiguration are shown in **Figure 12**.

As such, the reconfiguration of Lake Street would result in the following changes to average weekday traffic conditions:

- NBD Wyeebo Street (north of Hill Street): +374 vehicles per day;
- NBD Wyeebo Street (south of Hill Street): +178 vehicles per day;
- NBD Hill Street/Wharf Street: +196 vehicles per day;
- SBD Lake Street (north of Wharf Street): +3 vehicles per day; and
- NBD Lake Street (north end): -374 vehicles per day.

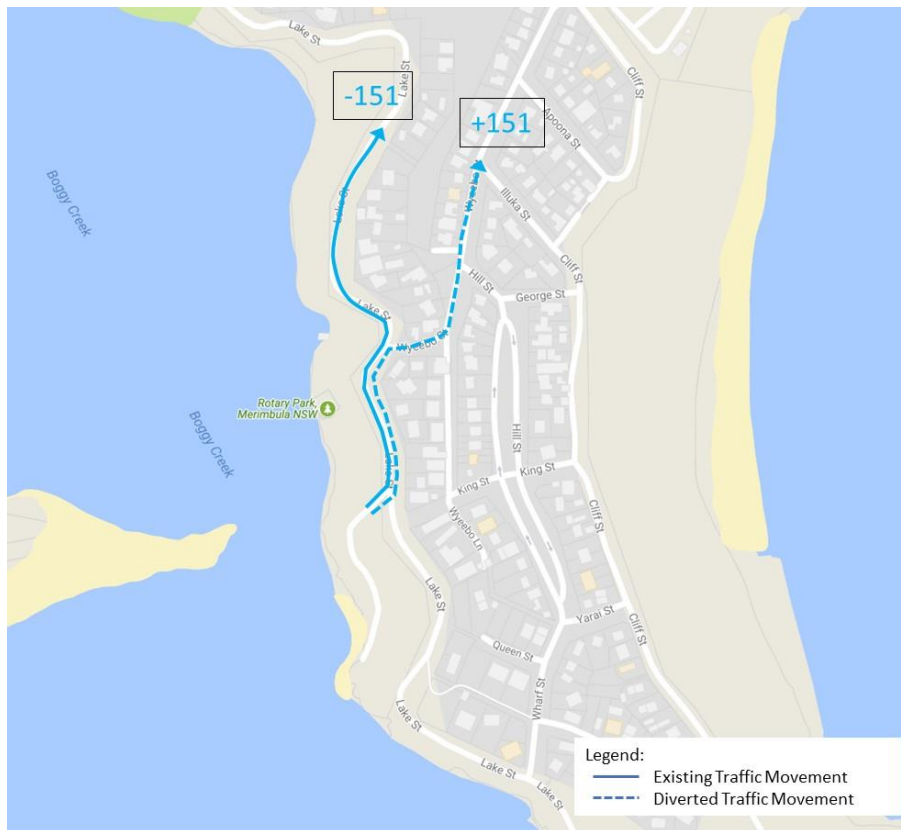


FIGURE 9: OPTION D – TRAFFIC REDISTRIBUTION FROM BAR BEACH (JULY)



FIGURE 10: OPTION D – TRAFFIC REDISTRIBUTION FROM WHARF (JULY)



FIGURE 11: OPTION D – TRAFFIC REDISTRIBUTION FROM RESIDENCES (JULY)

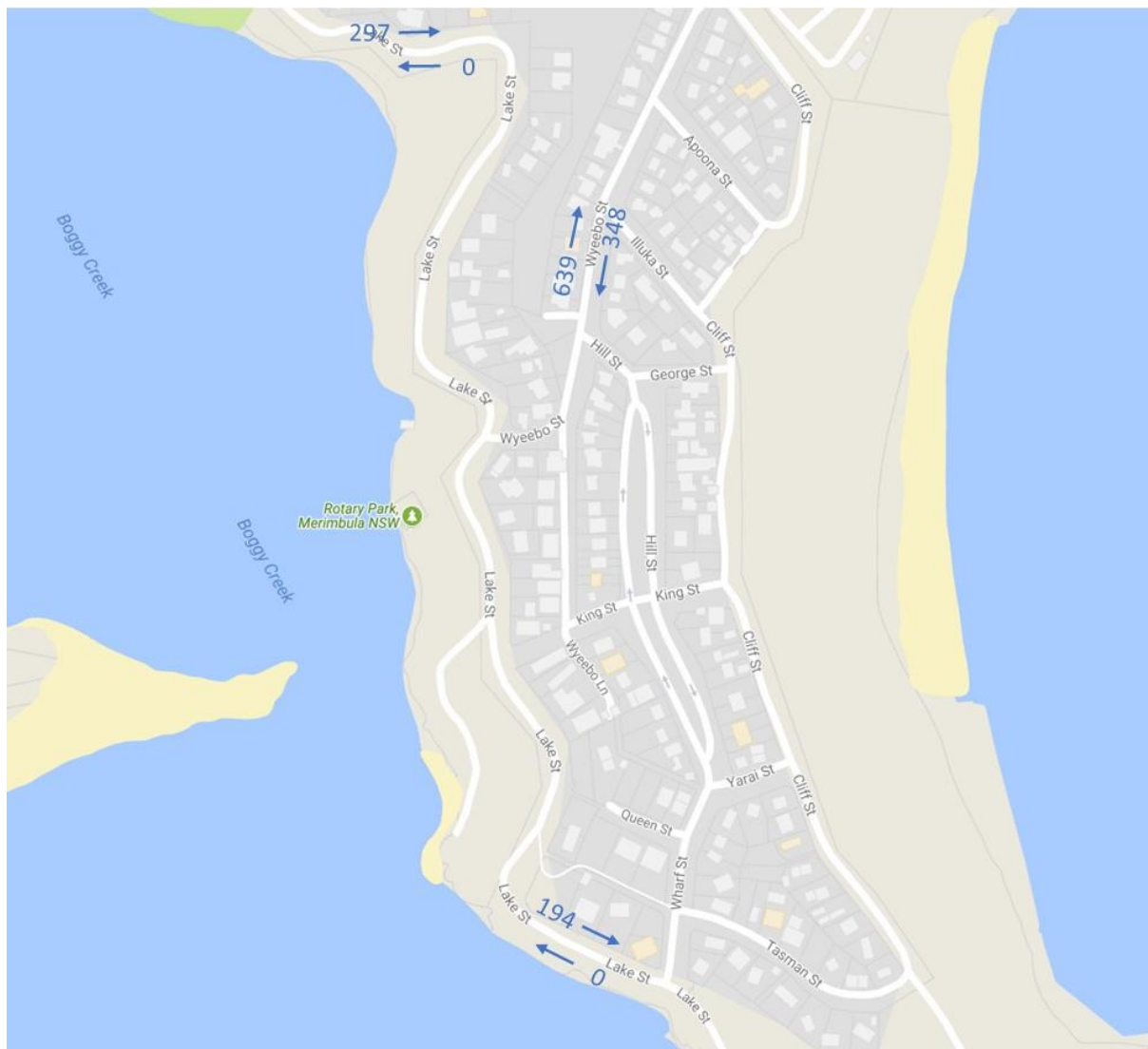


FIGURE 12: OPTION D – RESULTANT AVERAGE WEEKDAY TRAFFIC VOLUMES (JULY)

Pros / Cons

Potential pros/cons of Option D are described below:

- **Lake Street reconfiguration** – Given Lake Street has two transition points, one-way to two-way road, and two-way to one-way road, may cause some confusion amongst motorists (particularly for tourists) when compared to Option C. One-way sections would eliminate any potential for head-on crashes. The proposed configuration under this option would generally enhance safety for all modes on Lake Street compared to the existing configuration (although not as much as Option A).
- **Car Parking** – one-way road (southbound) north of Wyeebo Street and south of the Bar Beach car park access would allow for formal parking spaces on Lake Street. The provision of additional parking on Lake Street would relieve pressure off adjacent streets particularly Wyeebo Street and Hill Street, making the existing on-street

parking available for residents. Relative to Option C, this option would provide more formal parking area on Lake Street (although not as much as Option A).

- **Traffic redistribution** – the northbound traffic volumes are expected to increase on Wharf Street, Hill Street and Wyebo Street as noted above. Likely increase in traffic volumes on Wharf Street and Hill Street would be identical to Option C, but less when compared to Option A. This option would divert more traffic on Wyebo Street between Lake Street and Hill Street compared to Option C.
- **Road safety** – as noted in Option A, as traffic volumes increase, more pedestrians may choose to walk on the naturestrip in Wyebo Street.

Traffic Impact

Based on the reasoning outlined for Option A, the surrounding street network is capable of absorbing additional traffic volumes noted above. In addition, the resultant traffic volumes would not change the function of streets in the Long Point area.

POTENTIAL IMPROVEMENT OPTIONS

Based on the assessment presented above, the following considerations could be given to further minimise any potential or perceived impacts to the surrounding street network and road safety. Any of these recommendations could be implemented in isolation.

- Monitoring traffic conditions, especially volumes and speeds following the implementation of the shared trail;
- Reduction of the speed limit to 40km/hr on Wharf Street, Hill Street and Wyebo Street.
- Provision of traffic calming measures such as speed humps on Wharf Street, Hill Street and Wyebo Street, although It is anticipated that the existing width of streets would continue to promote lower speeds.
- Provision of wayfinding signs on Cliff Street to encourage southbound vehicles to use Lake Street rather than Wyebo Street.
- Provision of indented parking on Wyebo Street between Lake Street and Hill Street (particularly for Option D).
- Provision of a footpath on Wyebo Street.

Should you have any queries, please do not hesitate to contact me on 9804-3610.

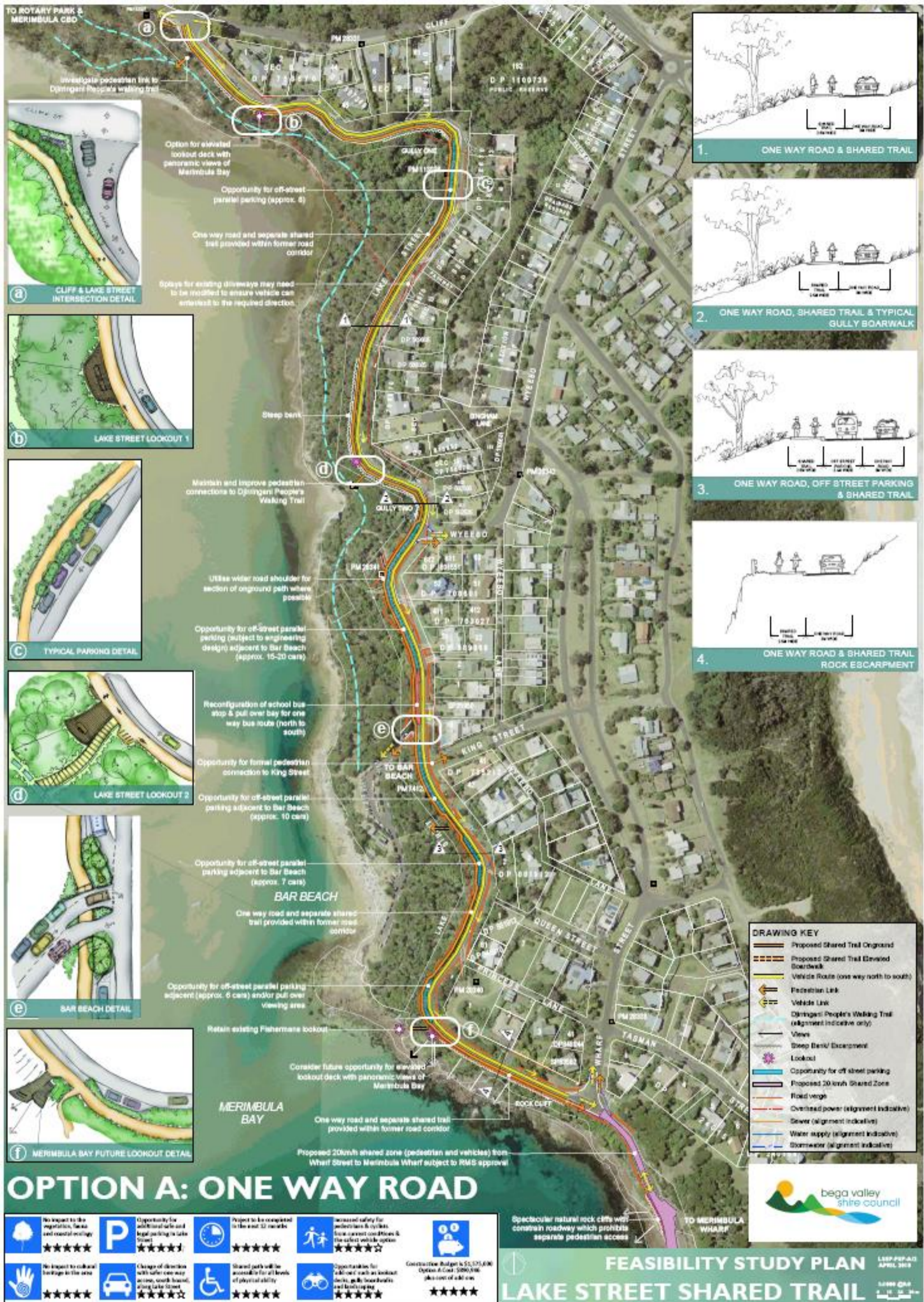
Yours sincerely

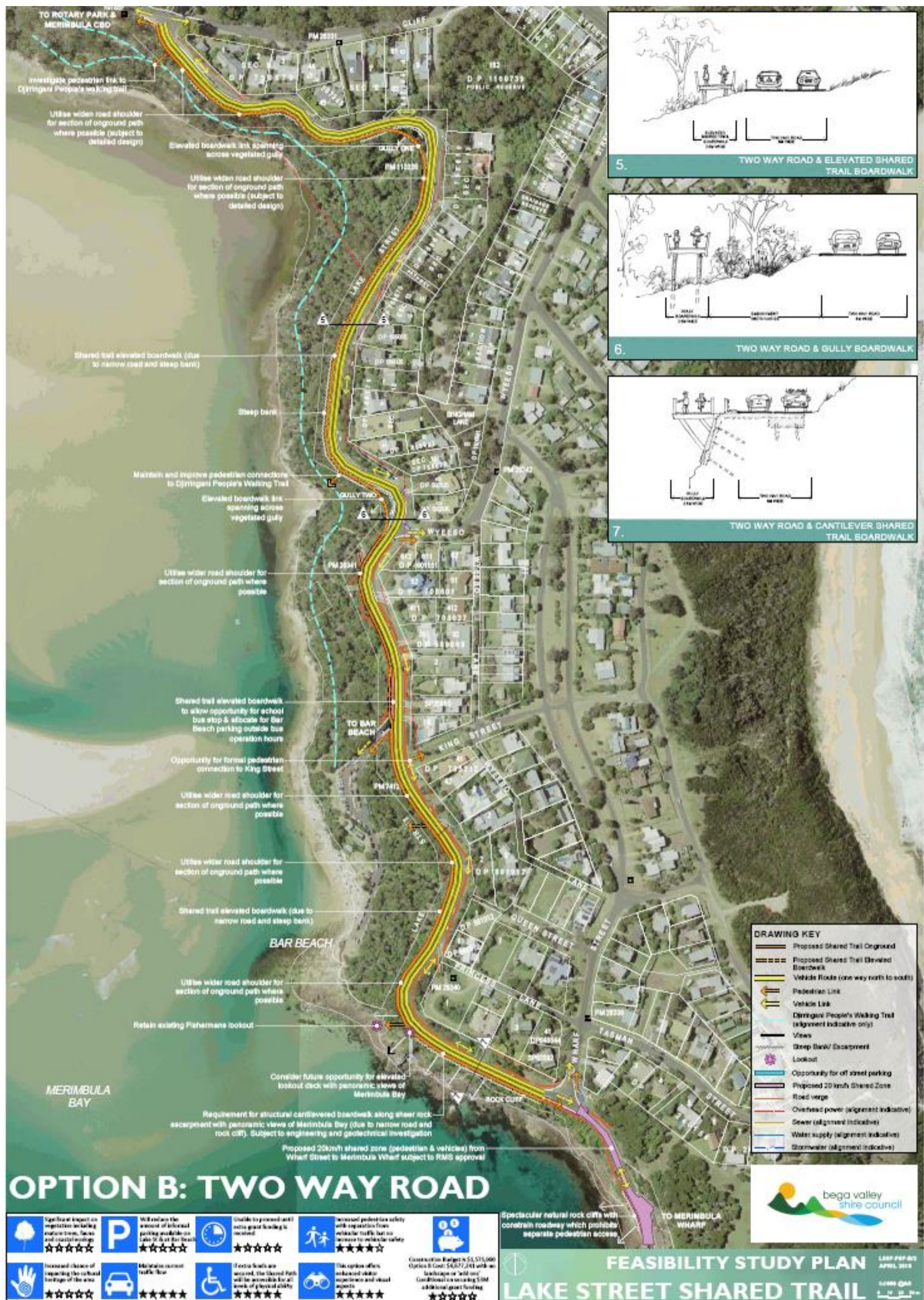
O'BRIEN TRAFFIC

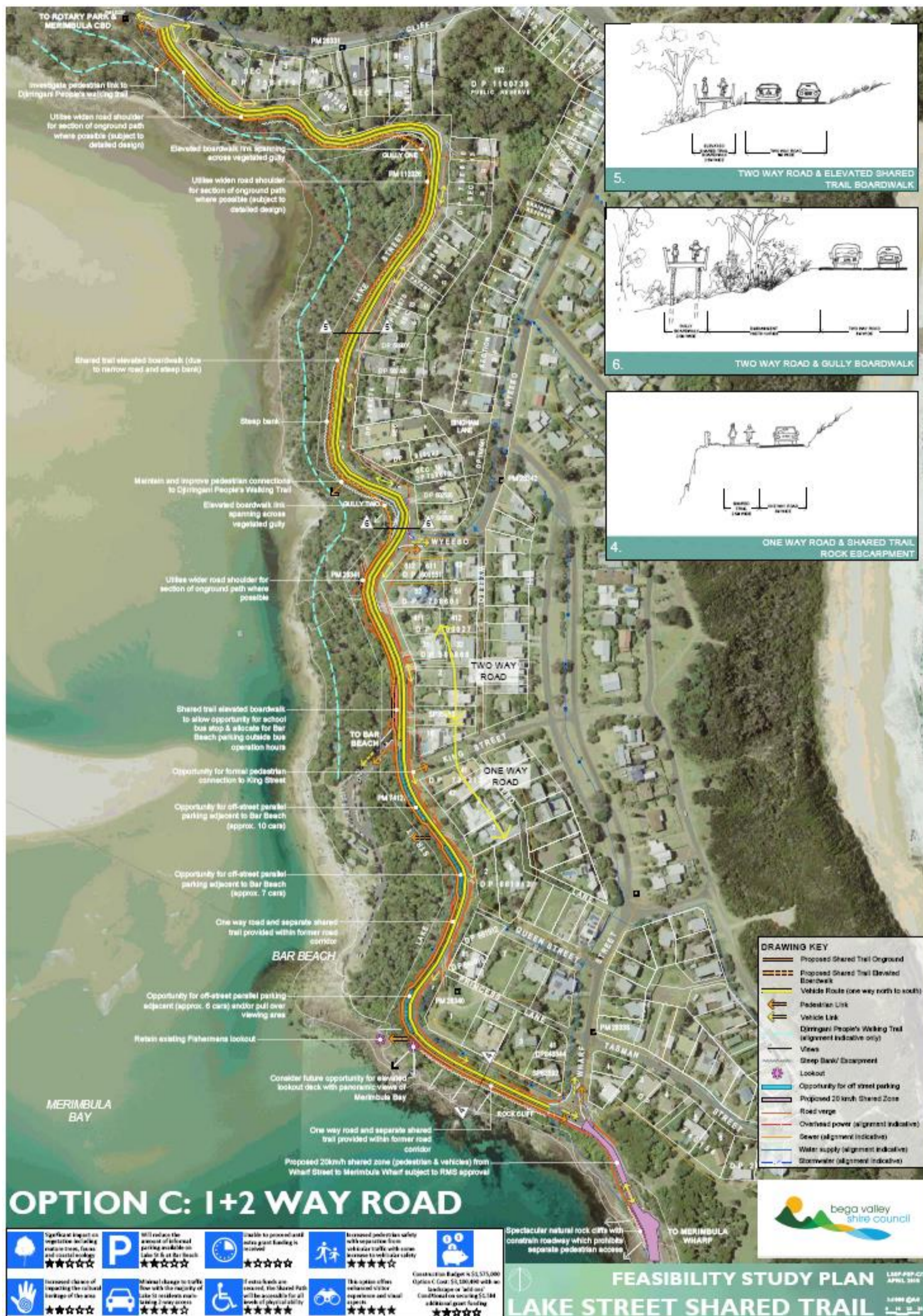
A handwritten signature in black ink, appearing to read 'MH' followed by a stylized flourish.

Matt Harridge
Director

LAKE STREET OPTIONS









OPTION D – 1 WAY + 2 WAY + 1 WAY