



TRAFFIC AND PEDESTRIAN STRATEGY

THE ESPLANADE AND BELL STREET TRAFFIC AND PEDESTRIAN STRATEGY
THE ESPLANADE AND BELL STREET, TORQUAY
22 JUNE 2017

THE ESPLANADE AND BELL STREET TRAFFIC AND PEDESTRIAN STRATEGY

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CONTENTS

1	INTRODUCTION	1
2	STRATEGIC CONTEXT	2
3	EXISTING CONDITIONS	4
4	ROAD SAFETY AUDIT	8
5	TRAFFIC AND PEDESTRIAN STRATEGY	9
	APPENDIX A PEDESTRIAN SURVEY RESULTS	
	APPENDIX B ROAD SAFETY AUDIT	
	APPENDIX C CONCEPT PLANS	

1 INTRODUCTION

1.1 INTRODUCTION

O'Brien Traffic has been engaged by Surf Coast Shire to develop a Traffic and Pedestrian Strategy for The Esplanade (Bell Street to Zeally Bay Road) and Bell Street, Torquay.

In the course of developing the Strategy:

- The study area has been inspected;
- Background information and data has been reviewed;
- A Road Safety Audit of the study area has been undertaken;
- Traffic and parking issues and opportunities have been identified;
- Recommendations to improve pedestrian safety and accessibility, traffic flow and road safety have been developed;
- A strategic plan, incorporating an action plan, for the management of pedestrian, cyclist and traffic movements has been developed.

1.2 THE STUDY AREA

The Esplanade and Bell Street are popular visitor precincts in Torquay.

The Esplanade runs along the Foreshore Reserve in Torquay. It provides access to the foreshore and beach, as well as being host to shops, restaurants, and businesses. Pedestrian activity is high and car parking is at a premium during summer.

Bell Street provides a connection between the Surf Coast Highway and The Esplanade. It is also host to shops, restaurants, and businesses, as well as night time venues and summer markets, and provides access to the Torquay Foreshore Caravan Park.

The Esplanade and Bell Street also form part of the route of a number of annual cycling events, including the Cadel Evans Great Ocean Road Race.

The location of The Esplanade and Bell Street is shown in **Figure 1**. The study area is highlighted.



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FIGURE 1: LOCATION OF THE STUDY AREA

2 STRATEGIC CONTEXT

2.1 FUTURE GROWTH

Torquay-Jan Jun is the main urban growth centre of Surf Coast Shire and one of the fastest growing areas in Victoria, with a population of 25-30,000 expected by 2040. During holiday periods, the population increases substantially with holidaymakers and overnight visitors.

The *Sustainable Futures Plan Torquay-Jan Juc 2040* establishes that most of the growth will occur in Torquay North. Armstrong Creek is also being developed, with residential lots currently for sale. Potential for even further growth in Torquay and surrounds is as yet unplanned.

With the growing population, there will be a significant increase in the number of people accessing the Torquay town centre and beaches.

Unchecked growth in traffic within The Esplanade and Bell Street corridor is not sustainable. Cycling, walking and public transport will therefore become increasingly significant modes of transport.

Planning for the transport corridor must give due consideration to these sustainable modes of transport.

2.2 VICROADS ROAD SAFETY STRATEGY

Victoria's Road Safety Strategy 2013-2022 aims for a future free of deaths and serious injuries on our roads. It is based on the Safe System philosophy which has four key elements:

- Safe roads
- Safe speeds
- Safe vehicles
- Safe people

2.3 COUNCIL STRATEGIES

2.3.1 Road Safety Strategy 2016-2021

The Road Safety Strategy 2016-2021 aims to *reduce the number of people killed as a result of road crashes in Surf Coast to zero and reduce serious injuries by 30%*.

The Strategy included the following actions in relation to pedestrian safety:

7.2 Provide improved pedestrian crossing facilities at high risk locations

7.8 Develop a clear Council policy around DDA compliance for footpath infrastructure..

2.3.2 Torquay Town Centre Parking and Access Strategy 2016-2021

The Torquay Town Centre Parking and Access Strategy 2016-2021 provides an integrated framework for car parking provision, access and movement in the Town Centre.

Of particular relevance to this study is the following recommendation for The Esplanade:

Provide traffic signals at The Esplanade/Gilbert Street intersection, redirect the pedestrian paths in the Foreshore Reserve to facilitate crossing on the northern side of Gilbert Street. Investigate the introduction of flat top speed controls in consideration of cycling activities."

Consideration was also given to provision of a roundabout at The Esplanade/Zeally Bay Road intersection, although this was not supported.

2.3.3 Review of Torquay Town Centre Parking and Access Strategy (current)

A review of the 2016-2021 Strategy is currently being undertaken by Hansen Partnership Pty Ltd in conjunction with Martyn Group.

Discussions with the Martyn Group indicate that the following actions, relevant to the Study Area, are being considered:

- One-way traffic movement in Gilbert Street (eastbound). (Note that this was a recommendation of the 2011-2016 Torquay Town Centre Parking and Access Strategy but was not supported by the 2016-2021 Strategy);
- Widening the southern footpath along Gilbert Street; and
- Pedestrian connection between Coulson Lane and The Esplanade.

2.3.4 Pathways Strategy (2012)

The Surf Coast Shire Pathways Strategy 2012 Review identified pathways for funding in the 10 Year Surf Coast Shire Works Program (Year 1 being 2012/13). Paths recommended for funding that are relevant to this study are as follows:

- Bell Street south, from caravan park (eastern) boundary to Surf Beach Drive – upgrade path to a 1.8m-2m wide concrete/asphalt shared path;
- Zeally Bay Road, The Esplanade to Coulson Avenue – 1.5-1.8m wide concrete/asphalt footpath; and
- Pride Street east, Bell Street to end existing path near Price Street - 1.5-1.8m wide concrete/asphalt footpath (completed).

2.4 PLANNING POLICY

The *Torquay-Jan Juc Strategy* at Clause 21.08 in the Surf Coast Planning Scheme provides strategic directions and actions in relation to transport and infrastructure. The following are of particular relevance to this Strategy:

- *Provide a linked network of walking and cycling paths throughout Torquay-Jan Juc, enabling direct access to all activity centres and to and though all areas of public open space.*
- *Develop The Esplanade in a manner that acknowledges its important role and function of providing access to the foreshore and being the visual link between the town and the coast.*

3 EXISTING CONDITIONS

3.1 ROAD FUNCTION AND CROSS SECTION

3.1.1 The Esplanade

The Esplanade (Zeally Bay Road to Bell Street) is a Major Council Road. It provides one traffic lane and a bicycle lane in each direction plus kerbside parking. On the western side of the street, kerbside parking is parallel. On the eastern side of the street, angle parking is provided south of Anderson Street and parallel parking north of Anderson Street.

A footpath is provided along the western side of the street and within the Foreshore Reserve on the eastern side.

Facilities to assist pedestrians crossing the The Esplanade are limited, comprising:

- A zebra crossing with a refuge island on The Esplanade just north of Price Street;
- Refuge islands south of Gilbert Street and north of Zeally Bay Road.

A roundabout is provided at the intersection of The Esplanade and Bell Street.

Aerial views of The Esplanade are provided in **Figure 2**.



a) Between Bell St and Price St



b) Between Anderson St and Gilbert St

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FIGURE 2: AERIAL PHOTOS OF THE ESPLANADE

The speed limit on The Esplanade is 50 km/h.

3.1.2 Bell Street

Bell Street is also a Major Council Road. It provides one traffic lane and a bicycle lane in each direction plus kerbside parking. Kerbside parking is a mixture of angle parking and parallel parking.

Footpaths are provided along both sides of Bell Street. Zebra crossings are provided just west of Munday Street and mid-block between Munday Street and Davidson Drive.

Roundabouts are provided at the intersections of Bell Street/The Esplanade and Bell Street/Davidson Drive/Rudd Avenue.

Aerial views of Bell Street are provided in Figure 2.



a) Between Rudd St and Munday St



b) Between Munday St and Price St

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FIGURE 3: AERIAL PHOTO OF SUBJECT SITE

The speed limit on Bell Street is 50 km/h.

3.2 TRAFFIC DATA

Traffic data for The Esplanade and Bell Street was provided by Surf Coast Shire and is summarised in **Table 1**.

LOCATION	DATE/DAY	DAILY TRAFFIC VOLUME	PEAK HOURLY TRAFFIC VOLUME	85 TH PERCENTILE SPEED
The Esplanade				
Bell St to Price Street	10-12-2014 Saturday	4,618	652	47.9
Price St to Anderson St	13-1-2016* Sunday	9,266	1,031	41.0
	3-8-2016 Sunday	4,441	662	48.0
Anderson St to Gilbert St	3-8-2016 Sunday	4,665	679	46.4
	26-3-2008* Wednesday	8,369	N/a	45.4
Gilbert St to Zeally Bay Rd	20-5-15 Sunday	5,695	844	47.5
Bell Street				
Surf Coast Hwy to Rudd Ave	4-2-2010 Sunday	5,487	1,363	40.7
Rudd Ave to Munday Street	18-4-2015 Saturday	N/a	583	N/a

* Note School holidays

TABLE 1: TRAFFIC VOLUME AND SPEED DATA FOR THE ESPLANADE AND BELL STREET

Traffic volumes on The Esplanade are typically 4-5,000 vehicles per day (vpd) during the off-peak season, doubling to around 8-10,000 vpd during peak holiday times. Vehicle speeds (85th percentile speeds) are typically 46-48km/h

The current traffic volumes on Bell Street (Rudd Avenue to The Esplanade) are expected to be less than 6,000 vpd.

3.3 PEDESTRIAN COUNTS

O'Brien Traffic commissioned pedestrian counts on The Esplanade at Gilbert Street on Saturday 8th April 2017 (Easter Saturday) between 11am and 2pm.

All pedestrian movements across The Esplanade within approximately 20m (north and south) of the Gilbert Street intersection were recorded during the survey period. Bicycle movements were also recorded. The survey results are provided in **Appendix A** and the peak pedestrian movements shown in **Figure 4**.

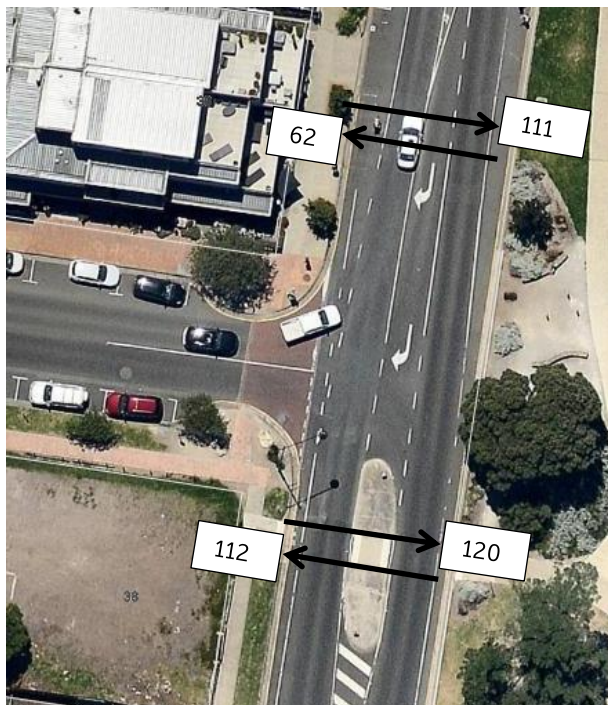


FIGURE 4: PEAK PEDESTRIAN MOVEMENTS ACROSS THE ESPLANADE AT GILBERT STREET, SATURDAY 15TH APRIL 2017 (EASTER SATURDAY), 1-2PM

3.4 CRASH DATA

Two crashes have been reported within the Study Area in the past five year period (up to October 2016). Both crashes occurred on Bell Street and resulted in 'other injury', as follows:

- Left turn side swipe crash on Bell Street, between Munday Street and Pride Street (2016); and
- U-turn crash on Bell Street at Munday Street (2012).

Review of crash data for previous years (2009 onwards) reveals a further three 'other injury' crashes in the study area:

- Pedestrian crash at The Esplanade/Price Street (2009);
- Left off carriageway on The Esplanade between Gilbert Street and Zeally Bay Road (2009); and
- Cross traffic crash at The Esplanade/Bell Street intersection (2011).

The locations of crashes are shown in **Figure 5**.

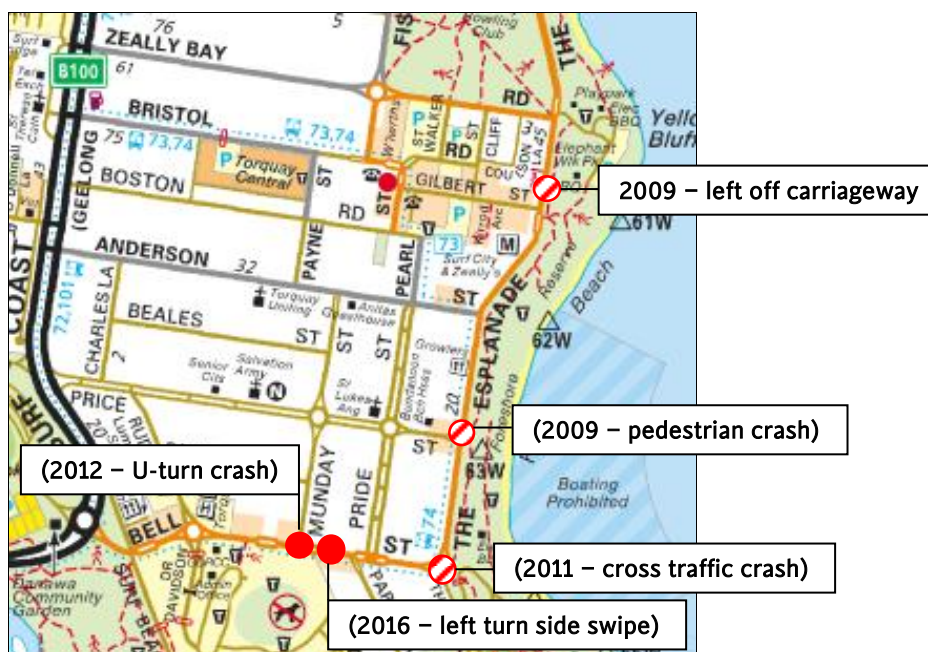


FIGURE 5: CRASH DATA FOR THE ESPLANADE AND BELL STREET

3.5 PUBLIC TRANSPORT

Bus routes 50 and 51 provide services between Geelong Station and Jan Juc. Both routes operate along Bell Street and The Esplanade south of Anderson Street.

A V-Line service between Geelong and Apollo Bay also stops in Torquay (but does not operate along Bell Street or The Esplanade).

3.6 CYCLING EVENTS

The Esplanade and Bell Street form part of the route of annual cycling events that begin and pass through Torquay.

The Cadel Evans Great Ocean Road Race includes elite men's and women's races plus a 'people's ride'. The elite races include a sprint section southbound on The Esplanade, finishing near Price Street.

The Great Ocean and Otway Classic starts and finishes at Elephant Walk Park and runs along The Esplanade, involving approximately 3,500 riders.

Discussions with Cycling Australia indicate that any additional road furniture within the road pavement on The Esplanade north of Price Street would have an impact on safety during the sprint section of the Cadel Evans Great Ocean Road Race.

4 ROAD SAFETY AUDIT

A Road Safety Audit of The Esplanade and Bell Street was undertaken and is provided in Appendix B.

The Road Safety Audit recommended numerous actions to improve safety for pedestrians, cyclists and vehicular traffic. The recommendations include:

- Provision of a pedestrian crossing facility on The Esplanade in the vicinity of Anderson Street;
- Improved pedestrian crossing facilities on Price Street (at The Esplanade), Pride Street (at Bell Street), The Esplanade/Bell Street intersection, and Bell Street/Surf Beach Drive;
- Improvements to bicycle facilities on The Esplanade and Bell Street;
- Numerous recommendations in relation to obstacles close to/within footpaths and damaged footpaths;
- A review of Tactile Ground Surface Indicators (TGSI's) in the Study Area;
- Numerous recommendations in relation to vegetation; and
- Recommendations in relation to road pavement surface condition and linemarking.

5 TRAFFIC AND PEDESTRIAN STRATEGY

5.1 APPROACH

The Traffic and Pedestrian Strategy aims to provide an environment where traffic movement is secondary to pedestrian accessibility and cycling.

Consistent with the VicRoads *SmartRoads* approach to managing the road network (including local roads), a Road Use Hierarchy gives priority based on mode of transport to help resolve competing demands for road space and priority of movement.

The proposed Road Use Hierarchy for The Esplanade and Bell Street is:

1. Pedestrians
2. Cyclists
3. Public Transport
4. Vehicles

The Strategy, based on the above Road Use Hierarchy, can be achieved through traffic calming measures, pedestrian priority treatments, and improved cycling infrastructure.

Over time, this approach would provide improved opportunities for walking and cycling and greater connection between the town centre and the foreshore.

To support the Strategy, road safety principles underpin an Action Plan, with consideration given to flexibility of road furniture to support cycling events.

5.2 KEY INITIATIVES

5.2.1 Gateway treatment at The Esplanade / Zeally Bay Road

Provision of a gateway treatment at the northern end of The Esplanade at Zeally Bay Road is desirable to mark the change in function of the road and transition to a lower speed environment (for southbound vehicles).

Two options for a gateway treatment have been considered as follows.

Roundabout

A roundabout could be provided at The Esplanade/Zeally Bay Road intersection which would physically slow vehicles on The Esplanade and provide a visual cue to the changed environment.

Provision of zebra crossings on the southern and western legs of the roundabout would improve the level of service and safety for pedestrians at this location. A zebra crossing is not proposed on the northern leg given the existing crossing facility approximately 15m north of Zeally Bay Road which would be maintained.

Bicycle movements would be catered for by the provision of bicycle sharrows on the northern and southern approach legs (see Section 5.2.4).

It is recommended that a roundabout at this location incorporate the entrance to the Torquay Play Park carpark and be designed to accommodate potential bus movements. It is noted that a roundabout would better facilitate right turn movements from Zeally Bay Road to The Esplanade.

While construction of a permanent roundabout would not be supported at this location by Cycling Australia, options for a removable roundabout could be considered. However, a removable roundabout would typically have a lifespan of only 3-5 years, therefore there would be ongoing cost implications. Options for removable roundabouts (and traffic islands) that can be installed/removed without impacting the road surface are available and could be further investigated.

Examples of removable rubber roundabouts are shown in **Figure 6**.



FIGURE 6: EXAMPLES OF A REMOVABLE RUBBER ROUNDABOUT

SIDRA intersection analysis has been undertaken to determine the likely traffic impact of a roundabout at this location, with zebra crossings on the southern and western legs. The results of the SIDRA analysis (based on peak traffic volumes and pedestrian counts provided by Council) are presented in **Table 2**. Note that the analysis has been undertaken with and without zebra crossings to demonstrate the impact of the zebra crossings on the roundabout.

OPTION	DEGREE OF SATURATION	AVERAGE DELAY (SEC)	95 TH PERCENTILE QUEUE LENGTH	
			VEHICLES	DISTANCE (M)
<i>Existing traffic volumes</i>				
Roundabout with zebra crossings on southern and western legs	0.50	5	4	26
Roundabout with no zebra crossings	0.45	5	4	26
<i>With future growth (10% growth)</i>				
Roundabout with zebra crossings on southern and western legs	0.58	5	5	31
Roundabout with no zebra crossings	0.51	5	5	31

TABLE 2: SIDRA ANALYSIS RESULTS FOR PROPOSED ROUNDABOUT AT THE ESPLANADE/ZEALLY BAY ROAD

The SIDRA results indicate that a roundabout with zebra crossings would operate satisfactorily, based on current (peak) traffic volumes and with 10% growth. While the provision of zebra crossings would reduce the capacity at the roundabout, they would have negligible impact on queue length and delay.

Linemarking Treatment

A linemarking treatment, similar to that provided along the main commercial street in Port Campbell, could be provided at the northern end of the study treatment (see **Figure 7**). While there would be no physical necessity for cars to reduce speed, the linemarking treatment would provide a visual cue that the road environment had changed.



FIGURE 7: LINE MARKING TREATMENT OF THE MAIN STREET THROUGH PORT CAMPBELL

The linemarking treatment could be provided over the section of road between Zeally Bay Road and the Coulson Lane pedestrian connection, a distance of approximately 80m.

Merits assessment of gateway treatment options

A merits based assessment of the gateway treatment options has been undertaken to determine which option would, on balance, provide a better outcome for the precinct.

A number of factors have been considered that are most relevant to this assessment as follows:

- Reduction in vehicle speeds;
- Impact on traffic flow (delays) along the Esplanade;
- Pedestrian connectivity (between the town centre and the foreshore);
- Impact on cyclists;
- Impact on public transport (bus movements);
- Visual impact (improved streetscape);
- Impact on cycling events;
- Maintenance;
- Road hierarchy – how each option supports the road hierarchy given in Section 5.1 (i.e. pedestrians first, cyclists second, public transport third, vehicles forth); and
- Safe systems assessment - the safe systems assessment is based on the Safe System approach to road safety. It considers each option based on the potential severity and likelihood of an incident occurring and recognising that people will make mistakes and have road crashes but the system should be forgiving and those road crashes should not result in death or injury.

For each factor, the options are ranked and a score provided with the highest value (3) for the best outcome and the lowest value (1) for the poorest outcome. The evaluation then considers the collective performance of each option.

Table 3 presents the merits assessment for the gateway treatment options.

ASSESSMENT CRITERIA	TREATMENT OPTION		
	ROUNDAABOUT	ROUNDAABOUT - REMOVEABLE	LINEMARKING TREATMENT
Reduction in vehicle speed	3	3	1
Impact on traffic flow	1	1	3
Pedestrian connectivity	3	3	1
Impact on cyclists	1	1	3
Impact on public transport	n/a	n/a	n/a
Visual impact	3	1	1
Impact on cycling events	1	3	3
Maintenance	3	1	2
Road Hierarchy	3	3	1
Safe system assessment	3	3	1
Total	21	19	16

TABLE 3: MERITS ASSESSMENT FOR GATEWAY TREATMENT OPTIONS ON THE ESPLANADE AT ZEALLY BAY ROAD

Based on the above assessment, a permanent roundabout is the preferred option for a gateway treatment on The Esplanade at Zeally Bay Road.

5.2.2 Pedestrian facility at The Esplanade / Gilbert Street

Pedestrian movement between the town centre and foreshore is highest around The Esplanade/Gilbert Street intersection. Desirably, provision for pedestrians would be improved at this location.

Development of any treatment needs to give consideration to the likely conversion of Gilbert Street to one way (eastbound) between The Esplanade and Pearl Street.

Traffic signals at The Esplanade/Gilbert Street intersection have previously been considered. While signals would improve safety and accessibility for pedestrians, they are not considered necessary for operation of the intersection (particularly if Gilbert Street becomes one-way). Pedestrian operated signals could be considered, desirably located on The Esplanade just north of Gilbert Street. However, it is understood that there is community concern regarding the visual impact of traffic signals along The Esplanade.

Alternatively, pedestrian safety and accessibility could be improved by provision of a

zebra crossing on The Esplanade. This could be provided immediately south of Gilbert Street at the existing refuge island.

If Gilbert Street is converted to one-way (eastbound), the existing right turn lane on The Esplanade would become redundant. The zebra crossing and refuge island could be relocated to north of Gilbert Street to better accommodate pedestrian movements (the pedestrian survey results indicate a high proportion of pedestrians currently cross The Esplanade north of Gilbert Street despite the refuge island being located on the south side of the intersection).

Given the width of The Esplanade, a zebra crossing should only be provided with a refuge island to increase pedestrian safety and minimise the impact on traffic flow (i.e. so that vehicles are required to give way to pedestrians on one traffic lane only). To minimise the impact of refuge islands on cycling events, consideration should be given to the provision of a removable island.

SIDRA intersection analysis has been undertaken to determine the likely traffic impact of the above options, that is pedestrian operated signals and a zebra crossing (north or south of Gilbert Street). The analysis is based on the peak traffic and pedestrian data given in Sections 3.2 and 3.3. The pedestrian volumes (counted over Easter) have been increased by a factor of 1.1 to represent the peak summer holiday period. The results are summarised in **Table 4**.

OPTION	DEGREE OF SATURATION	AVERAGE DELAY (SEC)	95 TH PERCENTILE QUEUE LENGTH	
			VEHICLES	DISTANCE (M)
<i>Existing traffic volumes</i>				
Pedestrian operated signals	0.67	11	10	68
Zebra crossing	0.56	8	5	31
<i>With future growth (10% growth)</i>				
Pedestrian operated signals	0.74	12	12	82
Zebra crossing	0.61	8	6	39

TABLE 4: SIDRA ANALYSIS RESULTS FOR PEDESTRIAN TREATMENT OPTIONS ON THE ESPLANADE AT GILBERT STREET

The SIDRA analysis indicates that the zebra crossing options would provide a better level of service to through traffic on The Esplanade than signals, with shorter delays and queue lengths.

Merits assessment of pedestrian facility options

A merits based assessment of the above options has been undertaken to determine which option would, on balance, provide a better outcome for the precinct.

A number of factors have been considered that are most relevant to this assessment as follows:

- Impact on traffic flow (delays) along the Esplanade;
- Pedestrian connectivity (between the town centre and the foreshore);
- Impact on cyclists;
- Impact on public transport (bus movements);
- Visual impact (improved streetscape);
- Impact on cycling events;
- Maintenance;
- Road hierarchy – how each option supports the road hierarchy given in Section 5.1 (i.e. pedestrians first, cyclists second, public transport third, vehicles forth); and
- Safe systems assessment - the safe systems assessment is based on the Safe System approach to road safety. It considers each option based on the potential severity and likelihood of an incident occurring and recognising that people will make mistakes and have road crashes but the system should be forgiving and those road crashes should not result in death or injury.

For each factor, the options are ranked and a score provided with the highest value (3) for the best outcome and the lowest value (1) for the poorest outcome. The evaluation then considers the collective performance of each option.

Table 5 presents the merits assessment for the pedestrian facility options.

ASSESSMENT CRITERIA	TREATMENT OPTION		
	PEDESTRIAN OPERATED SIGNALS	ZEBRA CROSSING (NORTH OR SOUTH OF GILBERT STREET)	
		PERMANENT ISLAND	REMOVABLE ISLAND
Impact on traffic flow	1	3	3
Pedestrian connectivity	1	3	3
Impact on cyclists	1	3	3
Impact on public transport	n/a	n/a	n/a
Visual impact	1	3	2
Impact on cycling events	3	1	3
Maintenance	1	3	2
Road Hierarchy	1	3	3
Safe system assessment	3	1	1
Total	12	20	20

TABLE 5: MERITS ASSESSMENT FOR GATEWAY TREATMENT OPTIONS ON THE ESPLANADE AT ZEALLY BAY ROAD

Based on the above assessment, a zebra crossing located either north or south of Gilbert Street (with a permanent or removable refuge island), is the preferred pedestrian facility for The Esplanade at Gilbert Street.

5.2.3 Other pedestrian facilities

The Esplanade

In addition to the proposed zebra crossings at Gilbert Street, zebra crossings are proposed at the following locations to improve accessibility between the town centre and the foreshore:

- South of Zeally Bay Road – on the southern leg of the proposed roundabout; and
- North of Anderson Street.

As discussed above, where zebra crossings are proposed, refuge islands should also be installed to increase pedestrian safety and minimise the impact on traffic flow.

To minimise the impact of the proposed pedestrian treatments on cycling events, consideration should be given to provision of removable refuge islands at the above locations.

Zebra crossings would also be provided on the side streets (Zeally Bay Road, Gilbert Street, Anderson Street, and Price Street) to give priority to pedestrians walking along The Esplanade.

South of Anderson Street, provision of kerb outstands with kerb ramps would assist pedestrians crossing midblock. Specifically, midblock kerb outstands are proposed at the following locations:

- between Anderson Street and Price Street; and
- between Price Street and Bell Street.

Provision of kerb outstands would result in the loss of 3 car spaces at each of the above locations.

In addition, future consideration should be given to the provision of kerb outstands on The Esplanade opposite the proposed Coulson Lane pedestrian link. While there is minimal pedestrian movement across The Esplanade at this location currently, pedestrian activity is likely to increase as the area is further developed.

Bell Street

The level of service and safety for pedestrians at the roundabouts on Bell Street at The Esplanade and Rudd Avenue/Davidson Drive could be improved by the provision of zebra crossings on each leg.

Pedestrians crossing Bell Street between Rudd Avenue and Munday Street are well catered for by the two existing zebra crossings with kerb outstands and refuge islands. However, no pedestrian crossing facilities are provided between Munday Street and The Esplanade.

Kerb ramps could be provided on Bell Street east of Park Lane and west of Pride Street to facilitate pedestrians crossing at this location. The kerb ramps should align with the

existing median island on Bell Street, where kerb ramps should also be provided to enable pedestrians to use the island as a refuge.

As identified in the Surf Coast Shire Pathways Strategy 2012 Review, the footpath on the southern side of Bell Street between the eastern boundary of the caravan park and Surf Beach Drive should be upgraded to a sealed path.

5.2.4 Bicycle facilities

Bicycle lanes are currently provided along both sides of Bell Street and The Esplanade within the study area. However much can be done to improve the facility for cyclists and increase conspicuity to other road users. The following actions are recommended:

- Provide well maintained bicycle lane lines, with two lane lines provided adjacent to parking spaces where possible;
- Provide bicycle logos within bicycle lanes at 200m intervals in accordance with AS 1742.9-2000;
- Provide bicycle lane signage in accordance with AS 1742.9-2000;
- Continue the bicycle lane on The Esplanade at the Price Street intersection;
- Provide coloured pavement treatment on bicycle lanes through intersections with side streets (see, for example **Figure 8**);
- Provide sharrows at the roundabouts on The Esplanade and Bell Street (including any new roundabout on The Esplanade at Zeally Bay Road). Sharrows can be used on the approach to roundabouts where a bicycle lane has terminated, and indicate that cyclists are to merge and share the lane with the vehicular traffic. An example of the use of sharrows is shown in **Figure 9**.



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FIGURE 8: EXAMPLE OF COLOURED PAVEMENT TREATMENT ON BICYCLE LANE AT INTERSECTION WITH A SIDE STREET



FIGURE 9: EXAMPLE OF BICYCLE TREATMENT AT A ROUNDABOUT – BICYCLE LANE TERMINATES ON THE APPROACH AND SHARROWS ARE PROVIDED IN THE TRAFFIC LANE TO INDICATE THAT CYCLISTS ARE TO MERGE AND SHARE THE TRAFFIC LANE

5.2.5 Seasonal speed limit

A reduced speed limit of 40km/h is proposed within the study area to reinforce the low speed environment.

5.2.6 Road Safety Audit recommendations

In addition to the above, the recommendations contained within the Road Safety Audit should be implemented as part of the Strategy.

5.2.7 Landscaping opportunities

The importance of The Esplanade as a tourist promenade should not be overlooked. Desirably landscape design elements would be introduced along The Esplanade and foreshore which would enhance amenity and contribute to creating a low speed, pedestrian friendly environment.

5.3 ACTION PLAN

An action plan has been developed to guide Council in implementing the Strategy. For each action, a cost estimate and priority (low, medium, high) is provided.

Concept plans have been developed and are provided in **Appendix C**.

ACTION	ESTIMATED CONSTRUCTION COST*	MAINTENANCE COST	PRIORITY
1. Install a roundabout at The Esplanade/Zeally Bay Road intersection, including lighting upgrade, with zebra crossings on the southern, western and eastern legs. The entrance to the Torquay Play Park car park would be incorporated into the eastern leg of the roundabout. Permanent islands Removable islands – central island and southern splitter island	\$650,000 \$630,000	Low High	Medium Medium
2. Implement a speed limit of 40km/h along The Esplanade (south of Zeally Bay Road) and Bell Street.	\$10,000	Low	High
3. Provide zebra crossings with refuge islands and lighting upgrade on The Esplanade at key locations as follows: 3.1 South of Gilbert Street at the existing refuge island, or North of Gilbert Street, if Gilbert Street is converted to one-way (eastbound) Removable refuge island Permanent refuge island 3.2 South of Anderson Street (minor road widening required) Removable refuge island Permanent refuge island	\$6,000 \$18,000 \$23,000 \$30,000 \$35,000	Low High Low High Low	High High High High High
4. Provide zebra crossings on each leg of the roundabouts, including lighting upgrades as necessary, at: 4.1 The Esplanade/Bell Street (including modification to kerb outstand on north-eastern corner) 4.2 Bell Street/Rudd Ave/Davidson Drive (including modification to kerb outstand on north-eastern corner)	\$20,000 \$20,000	Low Low	High High
5. Provide kerb outstands with kerb ramps at the following locations on The Esplanade: 5.1 Opposite the pedestrian link to Coulson Lane (for future consideration) 5.2 Mid-block between Price Street and Anderson Street 5.2 Mid-block between Anderson Street and Bell Street	\$20,000 \$20,000 \$20,000	Low Low Low	Low Low Low

6.	Provide zebra crossings, including lighting upgrades, on the following side streets:			
6.1	Zeally Bay Road at The Esplanade	\$6,000	Low	Medium
6.2	Gilbert Street at The Esplanade	\$6,000	Low	High
6.3	Anderson Street at The Esplanade, including refuge island	\$20,000	Low	Medium
6.4	Price Street at The Esplanade, including modifications to existing splitter island	\$15,000	Low	Medium
7.	Provide kerb ramps at the following locations:			
7.1	Bell Street (southern side) east of Park Lane, (northern side) west side of Munday Street, and on median island	\$5,000	Low	Low
7.2	Pride Street at Bell Street -east and west side and on splitter island.	\$3,000	Low	Medium
8.	Construct footpath on the southern side of Bell Street between the caravan park eastern boundary and Surf Beach Drive (approximately 300m).	\$66,000	Low	Medium
9.	Upgrade bicycle lanes along The Esplanade and Bell Street including lane lines, bicycle logos and signage in accordance with AS1742.9-2000. Provide coloured pavement treatment at intersections with side streets.	\$100,000	Medium	High
10.	Provide sharrows on each approach to the roundabouts at the following locations:			
10.1	The Esplanade/Bell Street	\$8,000	Low	High
10.2	Bell Street/Surf Beach Drive	\$8,000	Low	High
11.	Undertake a review of Tactile Ground Surface Indicators along The Esplanade and Bell Street	\$8,000	N/a	Medium
12.	Review provision of timber bollards in Bell Street, in particular:			
12.1	Remove timber bollards from median islands in Bell Street and provide reflectors on kerb	\$4,000	N/a	Medium
12.2	Remove timber bollards from departure side of Bell Street/Rudd Avenue/Davidson Drive roundabout	\$2,000	N/a	Medium
12.3	Review provision/ location of timber bollards at pedestrian crossing points along Bell Street	\$2,000	N/a	Medium
13.	Implement recommendations from the Road Safety Audit in relation to damaged footpaths, pavement condition, signage, hazards, linemarking, vegetation etc.	From annual maintenance budget	Low	Refer RSA
14.	Engage landscape architects to provide a concept design to enhance The Esplanade and foreshore area.	\$15,000	N/a	Low

* NOTE DOES NOT INCLUDE DESIGN COST, PROJECT MANAGEMENT COST OR CONTINGENCY

APPENDIX A

PEDESTRIAN SURVEY RESULTS



FIGURE A1: LOCATION OF PEDESTRIAN SURVEY

Absolute Value		Pedestrian Movements							
TIME		P1		P2		P3		P4	
		Ped	Bike	Ped	Bike	Ped	Bike	Ped	Bike
11:00	11:15	7	2	1	0	24	2	42	2
11:15	11:30	13	0	6	2	46	1	35	1
11:30	11:45	13	0	9	0	31	0	30	5
11:45	12:00	20	0	11	0	28	0	73	4
12:00	12:15	0	2	5	0	23	4	40	3
12:15	12:30	14	0	13	1	38	0	27	4
12:30	12:45	9	0	4	1	19	5	23	3
12:45	13:00	10	1	26	0	22	1	36	5
13:00	13:15	31	3	24	1	34	4	24	0
13:15	13:30	23	5	17	0	40	0	27	0
13:30	13:45	29	0	6	3	21	2	14	5
13:45	14:00	28	0	15	0	25	0	47	1

Absolute Value		Pedestrian Movements							
TIME		P1		P2		P3		P4	
		Ped	Bike	Ped	Bike	Ped	Bike	Ped	Bike
11:00	11:15	7	2	1	0	24	2	42	2
11:15	11:30	20	2	7	2	70	3	77	3
11:30	11:45	33	2	16	2	101	3	107	8
11:45	12:00	53	2	27	2	129	3	180	12
12:00	12:15	53	4	32	2	152	7	220	15
12:15	12:30	67	4	45	3	190	7	247	19
12:30	12:45	76	4	49	4	209	12	270	22
12:45	13:00	86	5	75	4	231	13	306	27
13:00	13:15	117	8	99	5	265	17	330	27
13:15	13:30	140	13	116	5	305	17	357	27
13:30	13:45	169	13	122	8	326	19	371	32
13:45	14:00	197	13	137	8	351	19	418	33

TABLE A1: PEDESTRIAN SURVEY RESULTS, SATURDAY 8TH APRIL 2017

APPENDIX B

ROAD SAFETY AUDIT



ROAD SAFETY AUDIT

EXISTING CONDITIONS ROAD SAFETY AUDIT

THE ESPLANADE AND BELL STREET, TORQUAY

18 MAY 2017

THE ESPLANADE AND BELL STREET,
TORQUAY

CLIENT: Surf Coast Shire Council

OBT JOB NUMBER: 17439



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AUDITORS

Jemima Macaulay
Matt Harridge

CONTENTS

1	INTRODUCTION	1
2	FINDINGS, RECOMMENDATIONS & DECISION TRACKING	4
3	CONCLUSIONS	35
4	AUDIT STATEMENT	35

1 INTRODUCTION

1.1 SAFETY AUDIT DEFINITION & PURPOSE

Safety Audit is a formalised process to:

- Identify potential safety problems for road users and others affected by a road project; and
- Ensure that measures to eliminate or reduce the problems are fully considered.

It can be carried out at the following project stages:

- feasibility stage;
- preliminary design stage;
- detailed design stage; and
- pre-opening stage.

A road safety audit may also be conducted:

- for roadwork traffic management required during construction of significant projects; and
- on the existing road network.

This is an Existing Conditions Road Safety Audit.

1.2 THE AUDIT TEAM

The audit team comprised:

- Jemima Macaulay, Associate, O'Brien Traffic – Senior Road Safety Auditor; and
- Matt Harridge, Director, O'Brien Traffic – Senior Road Safety Auditor.

As part of this Road Safety Audit the site has been inspected Thursday 23rd February 2017.

Prior to this audit, the auditors have not had any involvement with the design or development of the audit area.

1.3 THE SITE AREA

The area for the audit is The Esplanade, between Zeally Bay Road and Bell Street, and Bell Street, between The Esplanade and Surf Beach Drive, as shown in **Figure 1**.



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FIGURE 1: LOCATION OF AUDIT AREA

1.4 REVIEW PROCESS & FORMAT

This audit has been carried out generally in accordance with Austroads Guide to Road Safety Part 6: Road Safety Audit (2009).

Section 4.8 C of the Guide (Pages 31 and 32) presents a useful indication of the level of risk and how to respond to it. An extract from this section of the Guide is included on the following page of this Audit Report.

The frequency of the risk (Table 4.1 of the Guide) and the severity of the risk (Table 4.2 of the Guide) can be used to select the risk category - Intolerable, High, Medium, Low (Table 4.3 of the Guide), and in turn this risk category can be used to suggest a treatment approach (Table 4.4 of the Guide).

Additionally we have included a 'Comment' risk category which is an issue of very low significance or an action that may be outside the scope of this road safety audit, but which may improve the overall design or be of wider significance.

The issues raised in the Audit are set out in tabular format in **Section 2**. Each issue raised is numbered for ease of reference. A recommendation for action follows the discussion of each issue.

Table 4.1: How often is the problem likely to lead to a crash?

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Table 4.2: What is the likely severity of the resulting crash type?

Severity	Description	Examples
Catastrophic	Likely multiple deaths	High-speed, multi-vehicle crash on a freeway. Car runs into crowded bus stop. Bus and petrol tanker collide. Collapse of a bridge or tunnel.
Serious	Likely death or serious injury	High or medium-speed vehicle/vehicle collision. High or medium-speed collision with a fixed roadside object. Pedestrian or cyclist struck by a car.
Minor	Likely minor injury	Some low-speed vehicle collisions. Cyclist falls from bicycle at low speed. Left-turn rear-end crash in a slip lane.
Limited	Likely trivial injury or property damage only	Some low-speed vehicle collisions. Pedestrian walks into object (no head injury). Car reverses into post.

Table 4.3: The resulting level of risk

	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

Table 4.4: Treatment approach

Risk	Suggested treatment approach
Intolerable	Must be corrected.
High	Should be corrected or the risk significantly reduced, even if the treatment costs is high.
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high.
Low	Should be corrected or the risk reduced, if the treatment cost is low.

1.5 DISCLAIMER

The findings and recommendations in this report are based on an examination of the road, and its environs, and the opinions of the audit team. However, it must be recognized that safety cannot be guaranteed since no road can be regarded as absolutely safe. Readers are urged to seek specific technical advice on matters raised and not rely solely on the report.

The auditors also point out that no guarantee is made that every deficiency has been identified. Further, if all the recommendations in this report were to be followed, this would not guarantee that the project is 'safe'; rather, adoption of the recommendations should improve the level of safety of the facility.

While every effort has been made to ensure the accuracy of the report, it is made available strictly on the basis that anyone relying on it does so at their own risk without any liability to members of the audit team or their respective organisations.

2 FINDINGS, RECOMMENDATIONS & DECISION TRACKING

The following table provides the:

- Review findings;
- Review recommendations; and
- Decision tracking form (for completion by the client/project manager).

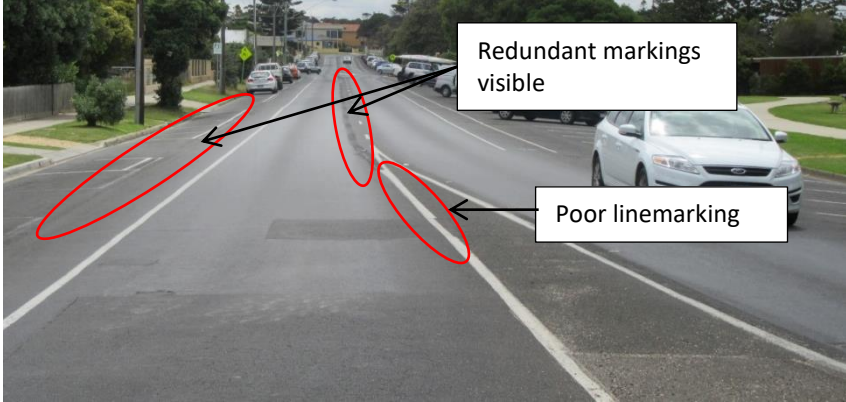

Photographs that help highlight the issues are included in the table.

FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Project title	The Esplanade (Zeally Bay Rd to Bell St) and Bell Street, Torquay	Review stage	Existing Conditions
Project manager	Aoife Corcoran	Designer	N/A
Road Safety Auditors	Jemima Macaulay, Associate, O'Brien Traffic Matt Harridge, Director, O'Brien Traffic		

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
1	<p>Poor provision for pedestrians crossing The Esplanade between Price Street and Gilbert Street</p> <p>The Esplanade has a wide carriageway (approximately 13-15m wide) which pedestrians must negotiate to cross the road. Refuge islands are provided at Price Street, Gilbert Street and Zeally Bay Road to assist pedestrians. However there are no crossing facilities between Price Street and Gilbert Street, a distance of over 400m. Given the high pedestrian demand (particularly in the summer months), an additional pedestrian crossing facility should be provided, desirably close to Anderson Street.</p> <p>Recommendation 1: Provide a pedestrian crossing facility on The Esplanade in the vicinity of Anderson Street.</p>	Medium		
2	<p>Line marking</p> <p>Line marking on sections of The Esplanade is faded and redundant markings are visible, including where lines have been blacked out (see Photos 1 and 2). This may be confusing for motorists, particularly in dark, wet conditions.</p>	Low		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 1. Line marking on The Esplanade</p>  <p>Photo 2. Line marking on The Esplanade</p>			



FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	<p>At the zebra crossing near Price Street, pavement repair work has been undertaken near the refuge island and the zebra crossing marking has not been re-marked (see Photo 3). This may reduce conspicuity of the crossing for motorists.</p>  <p>Photo 3. Zebra crossing on The Esplanade near Price Street Redundant lane lines are also visible on Bell Street (See Photo 4).</p>			

FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 4. Redundant lane markings on Bell Street</p> <p>Recommendation 2: Remove redundant line marking on The Esplanade and Bell Street.</p> <p>Recommendation 3: Re-mark faded line marking on The Esplanade.</p> <p>Recommendation 4: Re-mark missing marking at the zebra crossing on The Esplanade at Price Street.</p>			
3	<p>Bicycle lanes on The Esplanade</p> <p>Bicycle lanes are provided along both sides of The Esplanade however the bicycle logos are typically very faded or non-existent and no 'Bicycle Lane' signage is provided. This reduces the conspicuity of the bicycle lanes to motorists and other road users.</p> <p>Currently the bicycle lanes end approaching the Price Street and Bell Street intersections (although this is not indicated by signage or pavement markings) (see Photo 5). Consideration should be given to bicycle treatments at these intersections.</p>	Medium		

FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 5. End of bicycle lane on The Esplanade approaching Bell Street</p> <p>Desirably the bicycle lanes should continue through the Price Street intersection, although this may require relocation of the bus stops and changes to the kerb outstand. At the roundabout at Bell Street, sharrows could be provided on each approach to the roundabout to indicate to all road users that cyclists are to share the traffic lane.</p> <p>The bicycle lane lines on the western side of The Esplanade at Gilbert Street are confusing as the redundant lines have not been removed (see Photo 6).</p>  <p>Photo 6. Redundant bicycle lane markings on The Esplanade at Gilbert Street</p>			



FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	<p>Recommendation 5: Mark/remark bicycle logos on The Esplanade at 200m intervals in accordance with AS 1742.9-2000.</p> <p>Recommendation 7: Provide bicycle lane signage in accordance with AS 1742.9 – 2000, including End Bicycle Lane signage where bicycle lanes end.</p> <p>Recommendation 8: Continue bicycle lane on The Esplanade through the Price Street intersection.</p> <p>Recommendation 9: Provide sharrows on each approach to the roundabout at The Esplanade/Bell Street intersection.</p> <p>Recommendation 10: Remove redundant lines on the western side of The Esplanade, north of Gilbert Street.</p>			
4	<p>Bicycle lane widths on The Esplanade</p> <p>Where The Esplanade bends (at Anderson Street and south of Gilbert Street), the bicycle lane on the inside of the curves narrow to less than 1.5m, which is less than the desirable width for an on-road bicycle lane.</p> <p>Recommendation 11: Review lane lines on The Esplanade around the bends at Anderson Street and south of Gilbert Street and increase the width of the bicycle lanes to minimum 1.5m.</p>	Medium		
5	<p>Bicycle lanes on Bell Street</p> <p>Bicycle lanes are provided along both sides of Bell Street, however bicycle logos are typically very faded or non-existent and no 'Bicycle Lane' signage is provided. This reduces the conspicuity of the bicycle lanes to motorists and other road users.</p> <p>Desirably both lane lines for the bicycle lanes should be marked adjacent to the parallel kerbside parking – at the eastern end of Bell Street (both sides) and the western end of Bell Street (northern side). This provides guidance for cyclists to provide clearance to car doors (and potential dooring incidents) and improves conspicuity of the bicycle lanes.</p>	Medium		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	<p>Currently the bicycle lanes end prior to the roundabout at Rudd Avenue/Davidson Drive, although there are no signs to indicated the end of the bike lanes. Sharrows could be provided on each approach to the roundabout to indicate to all road users that cyclists are to share the traffic lane.</p> <p>Recommendation 12: Mark/remark bicycle logos on Bell Street at 200m intervals in accordance with AS 1742.9-2000.</p> <p>Recommendation 13: Provide bicycle lane signage in accordance with AS 1742.9 – 2000.</p> <p>Recommendation 14: Mark both lanes lines for bicycle lanes adjacent to parallel kerbside parking on the eastern end of Bell Street (both sides) and the western end of Bell Street (northern side).</p> <p>Recommendation 15: Provide sharrows on each approach to the roundabout at the Bell Street/Rudd Avenue/Davidson Drive intersection.</p>			
6	<p>Pavement condition on The Esplanade</p> <p>On the western side of The Esplanade, there is a crack in the road pavement near the kerb which provides a poor riding surface for cyclists. At several locations pits are also located in the road pavement within the bike lane (see Photos 7 and 8). The uneven surface also coincides with the pedestrian crossing point south of Gilbert Street.</p>	Low		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 7. Poor surface condition on the western side of The Esplanade south of Gilbert Street.</p>  <p>Photo 8. Poor surface condition on the western side of The Esplanade south of Zeally Bay Road.</p> <p>Recommendation 16: <i>Repair road pavement on the western side of the Esplanade to provide an even surface. Make surface flush around pits.</i></p>			


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
7	<p>Zebra Crossing on The Esplanade north of Price Street</p> <p>At the zebra crossing on The Esplanade north of Price Street, no pedestrian crossing signs are provided on the refuge island (see Photo 9). Provision of pedestrian crossing signs on the refuge island, facing each direction, would increase conspicuity of the crossing to approaching road users. There may be a benefit to traffic flow also, as motorists would only be required to give way to pedestrians on the crossing between the kerb and the refuge island (currently motorists must give way to pedestrians on the crossing on either side of the refuge island).</p>  <p>Photo 9. Zebra Crossing on The Esplanade north of Price Street</p> <p>Recommendation 17: Provide Pedestrian Crossing signs on the refuge island, facing each direction, at the zebra crossing on The Esplanade north of Price Street.</p>	Low		
8	<p>Splitter island in Price Street at The Esplanade</p> <p>The splitter island in Price Street at The Esplanade is set back from the intersection (presumably to accommodate vehicle turning movements) and does not provide a refuge</p>	Low		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	<p>for pedestrians crossing the street (see Photo 10). The kerb ramps on either side of Price Street direct pedestrians to walk around the front of the splitter island. Desirably the splitter island would include kerb ramps which align with the footpath along The Esplanade, and would provide a refuge for pedestrians crossing the street.</p>  <p>Photo 10. Splitter island on Price Street at The Esplanade</p> <p>Recommendation 18: Review design of the splitter island in Price Street at The Esplanade with a view to providing kerb ramps and a refuge for pedestrians crossing the street. Realign footpath kerb ramps on either side of Price Street to align with splitter/refuge island as necessary.</p>			
9	<p>Splitter island in Pride Street at Bell Street</p> <p>The splitter island in Pride Street at Bell Street has no kerb ramps making it difficult for mobility impaired pedestrians to cross (see Photo 11).</p>	Low		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 11. Splitter island on Pride Street at Bell Street</p> <p>Recommendation 19: Provide kerb ramps on splitter island in Pride Street at Bell Street. Align kerb ramps on the eastern and western side of Pride Street to align with kerb ramps on the splitter island.</p>			
10	<p>Provision for pedestrians crossing at The Esplanade/Bell Street roundabout</p> <p><i>Pedestrians Give Way</i> signs are provided on both sides of Bell Street at The Esplanade roundabout (see Photo 12). The signs are mounted above head height and are likely to be unnoticed by many pedestrians. It may be more effective to provide signage on a lower totem style pole or use pavement markings.</p> <p>Alternatively, consideration could be given to providing priority for pedestrians crossing at the intersection. Zebra crossings could be provided on each leg of the roundabout, set back approximately 6m from the circulating lane.</p>	Low		



FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 12. Pedestrians Give Way sign at The Esplanade/Bell Street roundabout</p> <p>Recommendation 20: Replace Pedestrians Give Way sign with signage on a totem style pole or pavement markings on Bell Street at The Esplanade.</p> <p>Recommendation 21: Consider provision of zebra crossings on each leg of The Esplanade/Bell Street roundabout.</p>			
11	<p>Walkway on the north-eastern corner of The Esplanade/Bell Street roundabout</p> <p>The timber walkway on the north-eastern corner of The Esplanade/Bell Street roundabout is damaged and could be a trip hazard (see Photo 13).</p>	Low		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 13. Damaged timber walkway on the northern side of The Esplanade at Bell Street Recommendation 22: Repair timber walkway on the north-eastern side of The Esplanade/ Bell Street roundabout.</p>			
12	<p>Obstacles on footpath along Bell Street</p> <p>At several locations along Bell Street, clothing racks and sign boards are placed on the footpath and are obstacles for pedestrians (see Photos 14 and 15).</p>	Low		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 14. Clothing rack on footpath, southern side of Bell Street</p>			
	 <p>Photo 15. A-frame sign board on footpath, southern side of Bell Street</p> <p>Recommendation 23: <i>Ensure goods/signs place on footpath are in accordance with Councils Local Laws.</i></p>			

FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
13	<p>Garden strip adjacent to caravan park on southern side of Bell Street,</p> <p>Adjacent to the caravan park, on the southern side of Bell Street, the timber garden edge juts in and out from the fence line and is a potential trip hazard for pedestrians on the footpath (see Photo 16).</p>  <p>Photo 16. Timber garden strip adjacent to caravan park juts in and out from the fenceline, southern side of Bell Street</p> <p>Recommendation 24: Redo timber garden edge adjacent to caravan park to provide a consistent edge parallel to the footpath, preferably within the fence line.</p>	Low		
14	<p>Step on footpath, northern side of Bell Street west of Munday Street</p> <p>On the northern side of Bell Street, west of Munday Street, a step is located outside the building on the footpath and is a potential trip hazard (see Photo 17). It is noted that the real estate agent places his advertising papers adjacent to the step during the day which may reduce the risk. Desirably the step would be removed, although this is unlikely to be feasible. Alternatively, pavement markings and/or reflective markings should be provided to increase conspicuity of the step.</p>	Medium		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 17. Step on footpath, northern side of Bell Street west of Munday Street <i>Recommendation 25: Provide pavement markings on each approach to the step and/or reflective markers on each edge of the step to increase its conspicuity.</i></p>			
15	<p>Footpath condition, southern side of Bell Street between Davidson Drive and Surf Beach Drive</p> <p>The gravel footpath along the southern side of Bell Street between Davidson Drive and Surf Beach Drive is rutted and has pit lids jutting out (see Photo 18), providing a poor surface for pedestrians. In addition a utility pole is located in near the middle of the path and may be difficult to see in poor light conditions.</p>	Low		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 18. Timber garden strip adjacent to caravan park juts in and out from the fenceline, southern side of Bell Street</p> <p>Recommendation 26: Seal footpath on the southern side of Bell street, between Davidson Drive and Surf Beach Drive.</p> <p>Recommendation 27: Provide reflective material on utility pole on southern side of Bell Street, between Davidson Drive and Surf Beach Drive to increase conspicuity in poor light conditions.</p>			
16	<p>Pedestrian crossing point on Bell Street east of Surf Beach Drive</p> <p>On the southern side of the pedestrian crossing point on Bell Street, east of Surf Beach Drive, a signpost is located on the path however the sign is missing (see Photo 19). The signpost is a potential hazard and should be removed. If the sign is replaced, it should be relocated closer to the plants.</p>	Low		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 19. Redundant sign post, southern side of Bell Street at Surf Beach Drive</p> <p>In addition, the kerb ramp on the northern side of the crossing does not align with the kerb ramps on the refuge island.</p> <p>Recommendation 28: Remove redundant signpost on south-eastern corner of Bell Street/ Surf Beach Drive, or replace sign and relocate closer to plants.</p> <p>Recommendation 29: Consider modifying kerb ramp on northern side of Bell Street, east of Surf Beach Drive, to align with kerb ramps on refuge island.</p>			
17	<p>Blind accesses, northern side of Bell Street</p> <p>Along the northern side of Bell Street, between Rudd Avenue and Munday Street, there are a couple of private properties with vehicular access to Bell Street that have no visibility to pedestrians approaching along the footpath (see Photo 20).</p>	Medium		



FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 20. Blind accesses along northern side of Bell Street</p> <p>Recommendation 30: Liaise with property owners to consider treatments to reduce potential for conflict between exiting vehicles and pedestrians, such as signage (eg. Look for Pedestrians) or speed humps in the driveway.</p>			
18	<p>Tactile Ground Surface Indicators (TGSIs)</p> <p>Where the footpath on the western side of The Esplanade crosses side streets, Tactile Ground Surface Indicators (TGSIs) are generally not provided. Similarly some crossing points along Bell Street don't have TGSIs. Where TGSIs are provided, there are often no directional indicators.</p> <p>At the bus stop on the western side of The Esplanade, north of Price Street, part of the directional indicator is missing (see Photo 21).</p>	Medium		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 21. Directional TGSIs partially missing at bus stop, western side of The Esplanade, north of Price Street</p> <p>Recommendation 31: Undertake a review of Tactile Ground Surface Indicators in the audit area and provide TGSIs as appropriate in accordance with Australian Standard AS1428.4.1:2009.</p>			
19	<p>Timber posts in median and at pedestrian crossing points in Bell Street</p> <p>At numerous locations along Bell Street, large timber bollards are located in median islands and at pedestrian crossing points (see, for example Photos 22 and 23). The timber bollards are a potential hazard if struck by an errant vehicle. The bollards in the median islands and on the departure side of the Bell Street/Davidson Street roundabout are particularly vulnerable to being struck.</p> <p>In addition, where the bollards are located at pedestrian crossing points, they can be a potential hazard to vision impaired pedestrians, particularly where they are located in the path of travel. See, for example, the bollard on the north eastern corner of Bell Street/Rudd Avenue intersection, as shown in Photo 22. (Note also, no TGSIs at this location).</p>	Medium		

FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 22. Timber posts in median islands along Bell Street</p>  <p>Photo 23. Timber posts at pedestrian crossing point, north eastern corner of Bell Street/Rudd Avenue</p> <p>Recommendation 32: Remove timber bollards from the Bell Street median islands and provide reflectors on kerb.</p> <p>Recommendation 33: Remove timber bollards from the departure side of the Bell</p>			



FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	<p><i>Street/Davidson Drive/Rudd Street roundabout.</i></p> <p>Recommendation 34: <i>Reconsider the provision/location of timber bollards at other pedestrian crossing points along Bell Street.</i></p>			
20	<p>Grasses adjacent to carriageway</p> <p>Where grasses are planted adjacent to the carriageway or in median islands, care should be given to ensure grasses don't compromise sight lines or reduce the conspicuity of pedestrian crossings. See, for example, on the south eastern corner of the Bell Street/Davidson Drive/Rudd Avenue roundabout (Photo 24) and at the zebra crossing on Bell Street west of Munday Street (Photo 25).</p>  <p>Photo 24. Grasses planted on the south eastern corner of the Bell Street/Davidson Drive/Rudd Avenue roundabout</p>	Low		



FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 25. Grasses planted in the median island at zebra crossing on Bell Street west of Munday Street</p> <p><i>Recommendation 35: Trim/maintain grasses adjacent to carriageway to ensure good sightlines and visibility of pedestrian crossings/signs/traffic islands.</i></p>			
21	<p>Cracked/damaged footpath</p> <p>At numerous locations, cracks/damage to the footpath and recessed/protruding pit lids were observed, which are potential tripping hazards (see, for example, Photos 26 to 28).</p>	Medium		


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 26. Cracked footpath on northern side of Bell Street, adjacent to No. 38-40</p>			
	 <p>Photo 27. Recessed pit lid on western side of The Esplanade, adjacent to No. 14A</p>			



FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 28. Broken footpath on western side of The Esplanade, adjacent to No. 24</p> <p>At other locations, potential trip hazards were observed adjacent to the footpath (see, for example Photos 29 and 30).</p>			
	 <p>Photo 29. Timber adjacent to the footpath is a potential trip hazard, western side of The Esplanade, adjacent to Zeally's Bar and Grill</p>			


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 30. Drop off adjacent to footpath and broken driveway at No 25 The Esplanade</p> <p>Recommendation 36: <i>Ensure the Shire’s footpath maintenance program continues to repair footpaths, including the above locations. Areas adjacent to footpaths should also be maintained to reduce potential trip hazards.</i></p>			
22	<p>The Esplanade footpath crossing at Gilbert Street</p> <p>Where the footpath on the western side of The Esplanade approaches Gilbert Street, from both north and south, the concrete path terminates at a brick paved path in a staggered T-layout (see Photos 31 and 32). There are several potential trip hazards in this area with differences in levels between the concrete path, brick paving, adjacent gravel area and pit lids. Rocks located close to the path are also potential trip hazards.</p>	Low		



FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 31. Footpath on the western side of The Esplanade approaching Gilbert Street, facing north</p>			
	 <p>Photo 32. Footpath on the western side of The Esplanade approaching Gilbert Street, facing south</p>			


FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	Recommendation 37: Provide smooth transition between concrete, brick and gravel surfaces. Ensure pit lids are even with surrounding surface. Remove rocks or relocate further from pedestrian path of travel.			
23	<p>Broken post and rail fence on the western side of The Esplanade south of Gilbert Street</p> <p>The post and rail fence on the western side of The Esplanade, south of Gilbert Street, is broken and potential hazardous (see Photo 33). The rail is lying on the ground, partially on the footpath, and the bolt on the post is exposed and sticking out.</p>  <p>Photo 33. Broken post and rail fence on the western side of The Esplanade, south of Gilbert Street</p> <p>Recommendation 38: Repair broken post and rail fence on the western side of The Esplanade south of Gilbert Street, or remove.</p>	Medium		
24	<p>Overgrown Vegetation</p> <p>There are a number of private properties with vegetation overhanging the footpath (see, for example, Photos 34 to 36 in Appendix A). Overhanging vegetation reduces the usable</p>	Low		

FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	<p>width of the footpath, can be potentially hazardous (particularly at eye height) and may reduce visibility for cars exiting from driveways (see, for example, Photos 29 to 31).</p>  <p>Photo 34. Overhanging vegetation, southern side of Bell Street, west of The Esplanade</p>  <p>Photo 35. Overhanging vegetation, southern side of Bell Street adjacent to caravan park</p>			

FINDINGS, RECOMMENDATIONS & DECISION TRACKING

Issue No.	Review Findings & Recommendations	Risk	CLIENT RESPONSE	
			Accept: Yes / No	Reasons / Comments
	 <p>Photo 36. Overhanging vegetation at 18 The Esplanade</p> <p>Recommendation 39: <i>Contact property owners to ensure that overhanging vegetation is trimmed or removed.</i></p>			

3 CONCLUSIONS

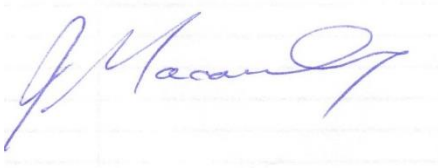
Safety concerns have been identified in this Existing Conditions road safety audit, and it is considered that actions should be implemented to improve likely safety outcomes.

The issues identified in the audit need to be reviewed and necessary actions/changes made. Where recommended actions are not taken, this should be reported in writing providing reasons for that decision.

4 AUDIT STATEMENT

We certify that we have examined the specified road and environs to identify features that could be changed, removed or modified in order to improve safety. The problems identified have been noted in this report, together with recommendations, which should be studied for implementation.

Auditors

A handwritten signature in blue ink on a white grid background, appearing to read 'J Macaulay'.

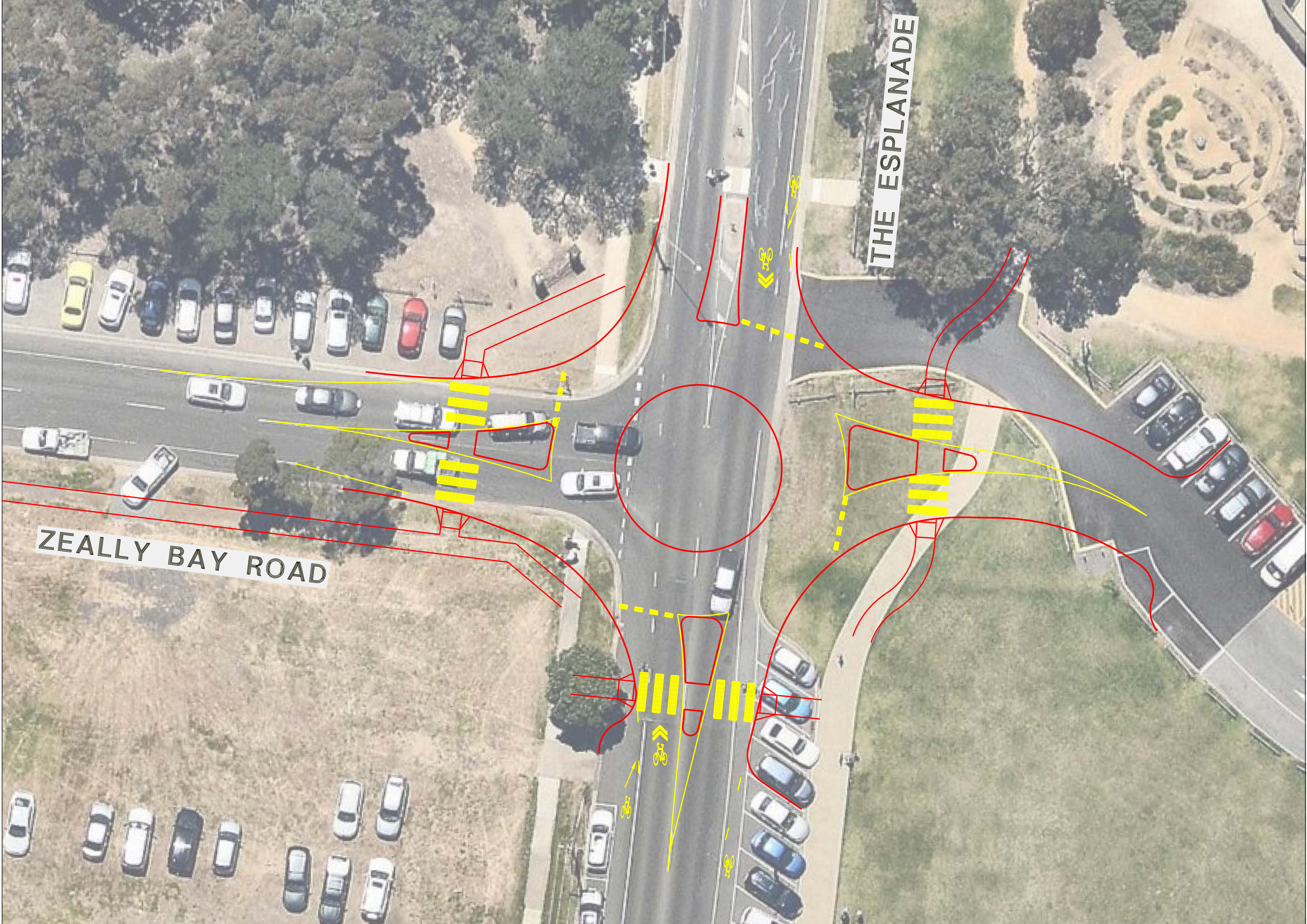
Jemima Macaulay
Associate
O'Brien Traffic

A handwritten signature in blue ink, appearing to read 'M Harridge'.

Matt Harridge
Director
O'Brien Traffic

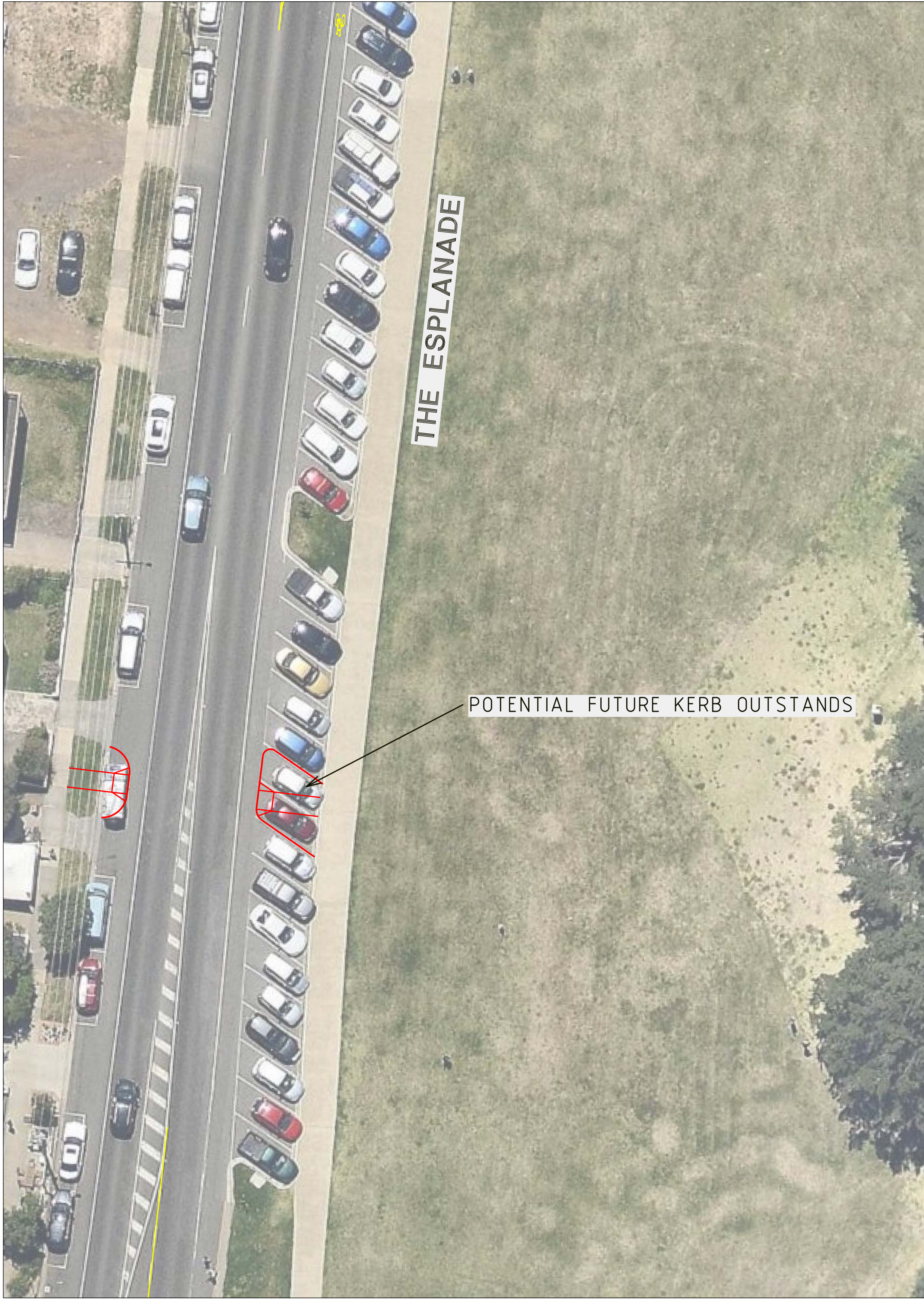
APPENDIX C

CONCEPT PLANS



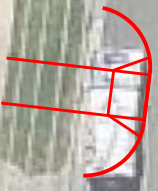
THE ESPLANADE

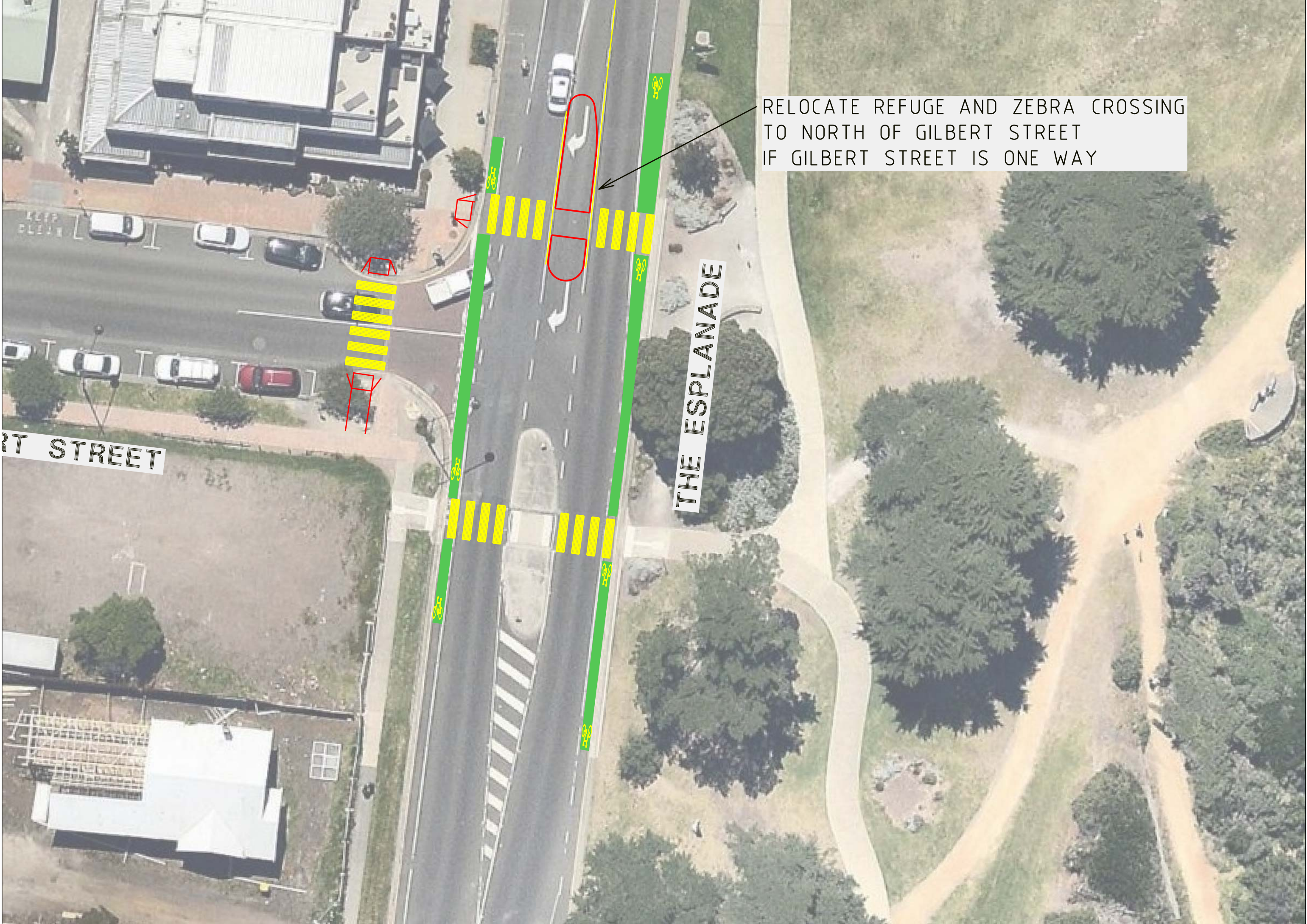
ZEALLY BAY ROAD



THE ESPLANADE

POTENTIAL FUTURE KERB OUTSTANDS





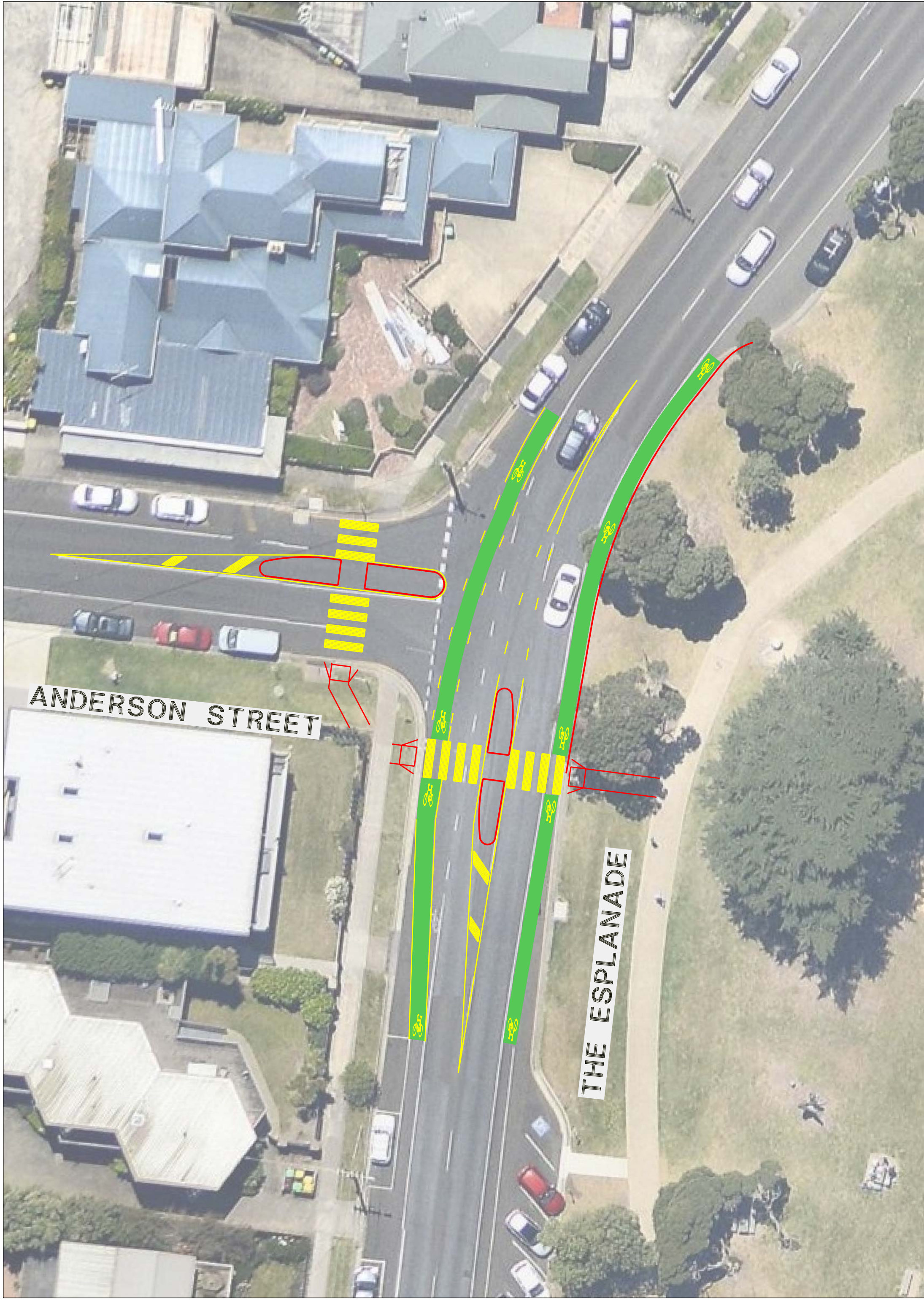
RELOCATE REFUGE AND ZEBRA CROSSING TO NORTH OF GILBERT STREET IF GILBERT STREET IS ONE WAY

THE ESPLANADE

GILBERT STREET

KEEP CLEAR





ANDERSON STREET

THE ESPLANADE

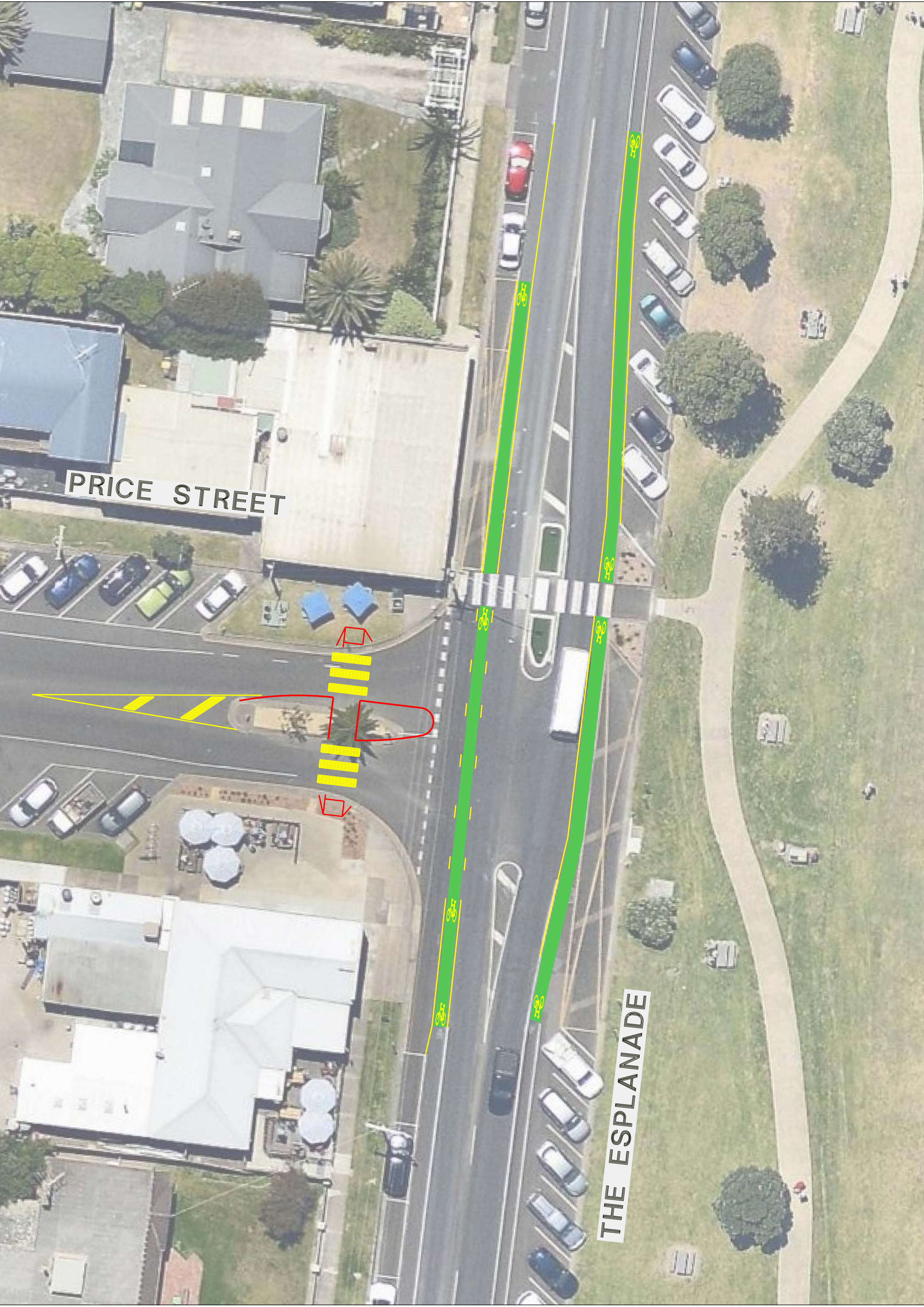


THE ESPLANADE

Starbucks

PRICE STREET

THE ESPLANADE





THE ESPLANADE

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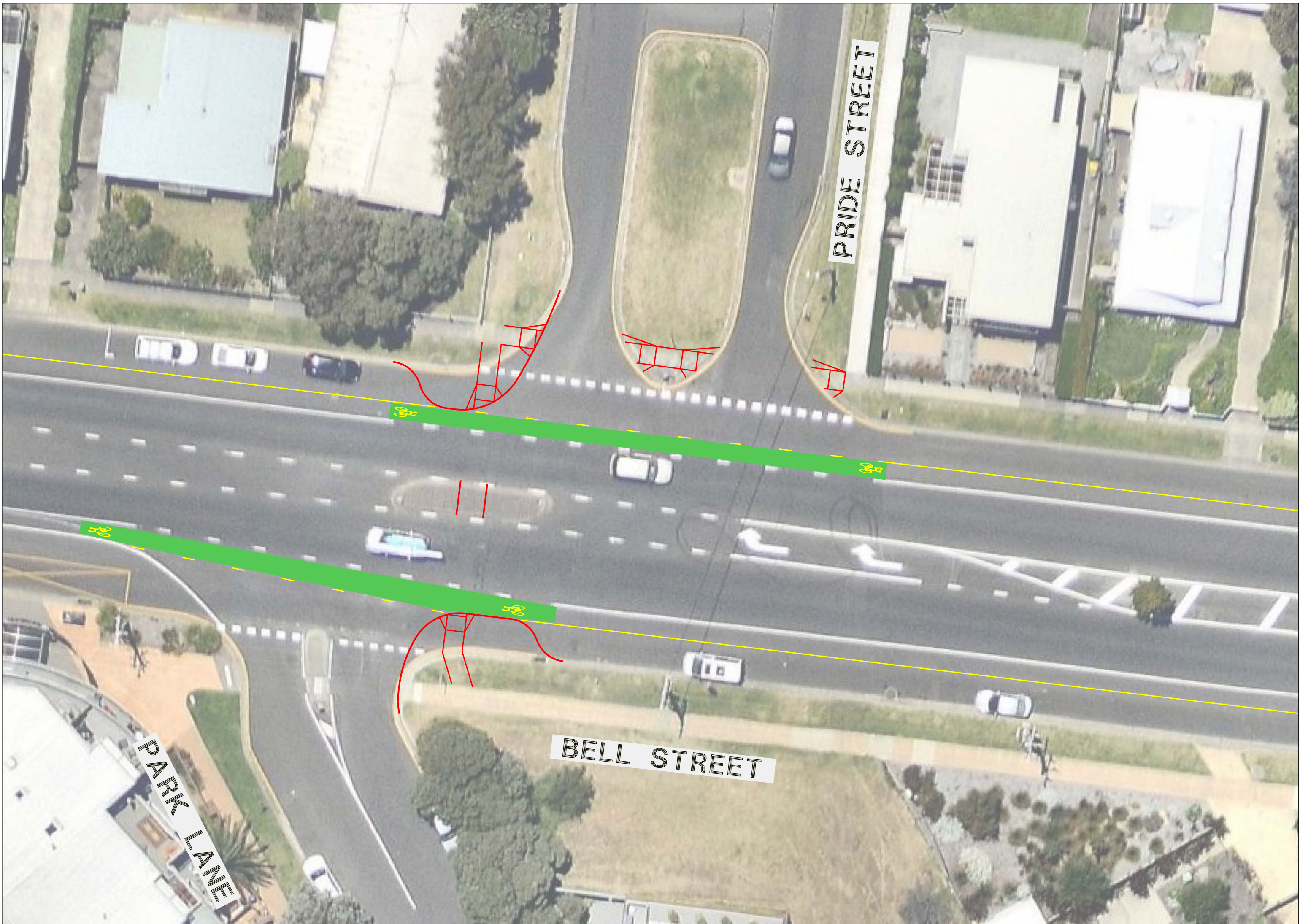
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THE ESPLANADE



BELL STREET





PRIDE STREET

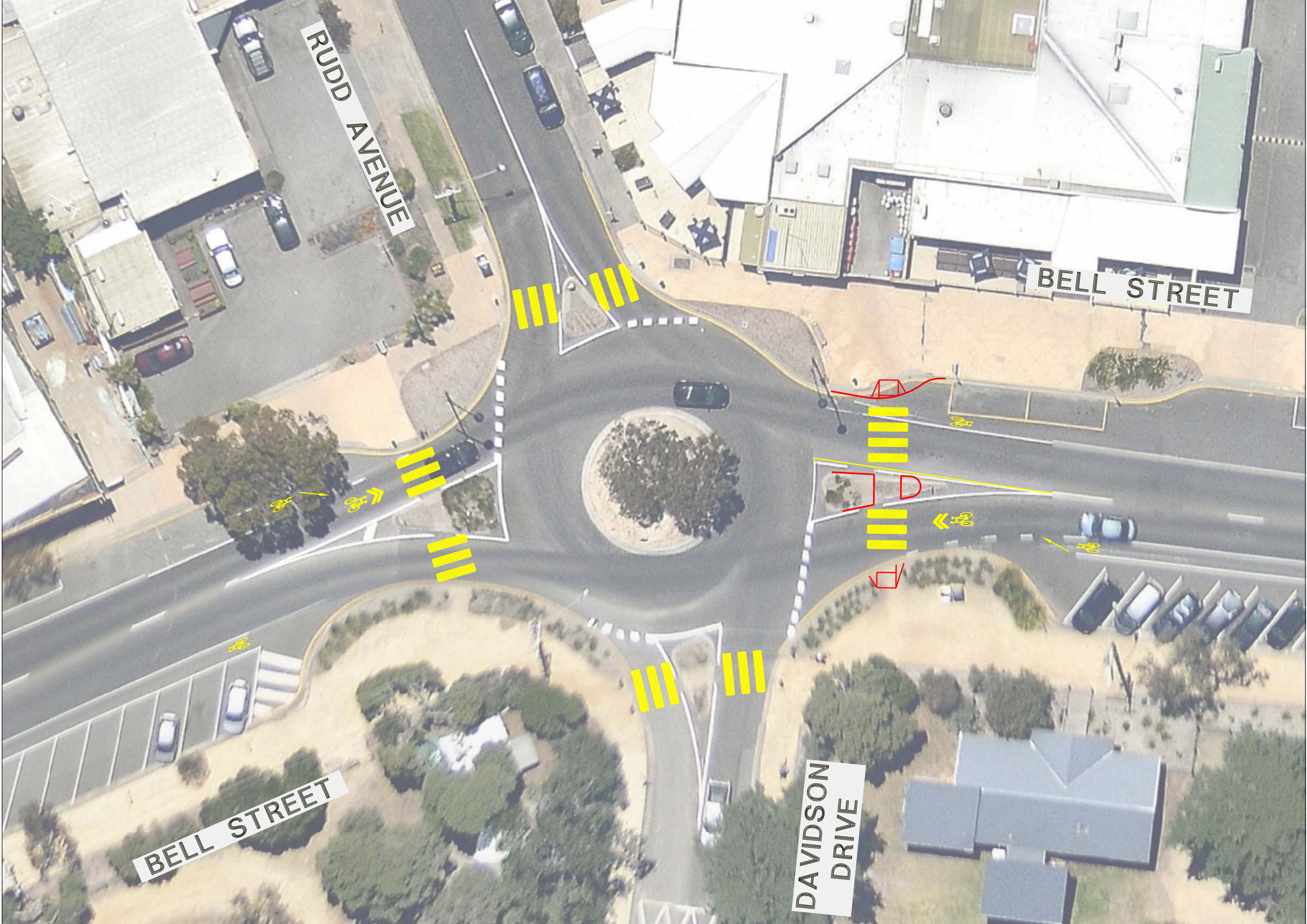
BELL STREET

PARK LANE

MUNDAY STREET

BELL STREET





RUDD AVENUE

BELL STREET

BELL STREET

DAVIDSON DRIVE