ANALYSIS OF SMART BICYCLE LIGHT DATA FOR SAFE SYSTEM ALIGNED COUNTERMEASURES

TORQUAY

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ANALYSIS OF SMART BICYCLE LIGHT DATA FOR SAFE SYSTEM ALIGNED COUNTERMEASURES

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26965 report v2.0	28 July 2025	Final Draft	Jemima Macaulay Lisa Steinmetz Matthew Lam	Jemima Macaulay
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CONTENTS

1 INTRODUCTION

1.1 BACKGROUND

Surf Coast Shire developed the *Safer Cycling Strategy* in 2021 to inform Council policy and approach to improving safety and access for cyclists in Surf Coast Shire. The Strategy includes goals and targets to address key issues identified in the region and a targeted Action Plan to allow for future planning of the cycling network.

During development of the Strategy, several local roads in Torquay were identified by the community as priority for upgrade. These roads also display observable crash indicators. Hence Surf Coast Shire is seeking to implement short to medium term improvements to mitigate cyclist risk along these routes within the context of the existing infrastructure.

Recommendations for longer term, strategic network upgrades for cyclists can be found in the Safer Cycling Strategy *(www.surfcoast.vic.gov.au/files/assets/public/v/1/have-your-say/d22-47559-surf-coast-safer-cycling-strategy-final-august-2022.pdf)*.

1.2 PROJECT OBJECTIVES

The project objective was to develop short to medium term recommendations to improve cyclist safety along 8 key cycling routes in Torquay.

In collaboration with TAC, a cohort of cyclists was selected to participate in the Lit Light Smart Bicycle Lights campaign. These cyclists have been actively collecting data utilising a smart bicycle light which syncs with the See Sense online platform.

This project investigated the use of the smart bicycle light data to compliment traditional data sources to identify high risk cyclist locations and safety issues along 8 local cycling routes in Torquay with the aim of developing a low cost, safe system aligned countermeasure program. The 8 routes were selected as they were identified through the data review as having high cyclist volumes and cyclist crash patterns, and have not been considered or analysed in detail as part of other projects.

The project involved:

- Review of background information, including strategic context, road asset data, current/proposed projects, land use planning etc.
- Data analysis
  - See Sense smart bicycle light data
  - Casualty crash data, with a focus on crashes involving cyclists
  - Traffic volume and speed data
  - Community input data
- Inspection of routes
- Identification of safety issues for cyclists and potential treatments
- Workshop with a Steering Committee to discuss treatment options
- Prioritisation of treatment options.

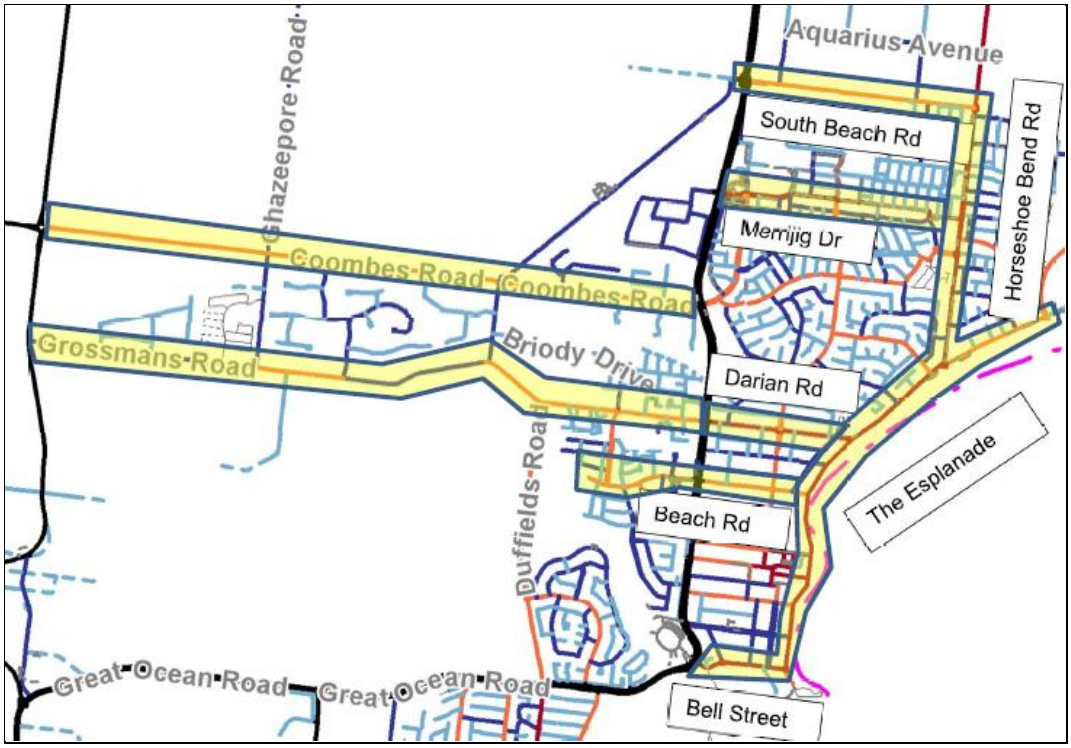
Concept plans were also prepared for the agreed treatments (provided separately).

1.3 STUDY AREA

The routes included in the study are as follows:

- South Beach Road
- Horseshoe Bend Road
- The Esplanade
- Bell Street
- Darian Rd / Grossmans Rd
- Combes Road
- Merrijig Drive
- Beach Road.

The study routes are shown in **Figure 1**.



SOURCE: SURF COAST SHIRE, PROJECT BRIEF

FIGURE 1: STUDY ROUTES

1.4 STRATEGIC CONTEXT

1.4.1 State strategies

Victorian road safety strategy

The Victorian Road Safety Strategy 2021-2030 aims to halve road deaths and reduce serious injuries by 2030. One of the strategy's strategic focus areas is vulnerable and unprotected road users, which includes cyclists. Levers of change include safer travel speeds (for vehicles), infrastructure improvements and education programs.

Victorian cycling strategy

Victoria's Cycling Strategy 2018-2028 aims to increase the number, frequency and diversity of Victorians cycling for transport by:

- Investing in safer, lower stress, better-connected network, prioritising strategic corridors
- Making cycling a more inclusive experience.

The Victorian Strategy prioritises strategic cycling corridors but recognises that neighbourhood cycling connections are essential to provide safe access to local destinations.

1.4.2 Council Policies and strategies

Surf Coast Road Safety Strategy

Council's Road Safety Strategy 2022-2027 is a five year plan to improve road safety and reflects the shire's growing, yet ageing population, as well as an increasing number of cyclists and tourist drivers. The Road Safety Strategy identifies vulnerable and unprotected road users as one of five strategic focus areas, with Goal 5 being to *Increase cyclist safety* and the related action being to incorporate the Safer Cycling Strategy in the Road Safety Strategy Action Plan.

Surf Coast Safer Cycling Strategy

The Safer Cycling Strategy and Action Plan 2022-2027 was developed to work towards the goal of establishing and maintaining a safe cycling network and reduce reliance on cars.

The strategy aims to:

- improve the safety and quality of the cycling experience
- reduce fatal and serious injury cyclist crashes by 30% by 2030
- increase participation in cycling.

The follow study routes are identified in the strategy as priority commuter/school cycling routes:

- *Local routes* - South Beach Road (west of Fischer Street), Darian Road (west of Fischer Street), Grossmans Road (east of Eton Road), Merrijig Drive, Beach Road (Eton Road to Fischer Street)
- *Regional routes* - Horseshoe Bend Road, The Esplanade, Bell Street.

The follow study routes are identified in the strategy as priority recreational/tourist cycling routes:

- *Local routes* - Beach Road (Eton Road to Surf Coast Highway),
- *Regional routes* - The Esplanade, Bell Street.

The Coombes Road and Horseshoe Bend Road routes are identified in the strategy as priority fitness routes.

The strategy includes an Action Plan to guide Council in delivering targeted, safer cycling initiatives. Of relevance to the study routes are the following actions:

- Leverage existing proposed capital works on high priority fitness/training cycling routes for provision of on-road cycling infrastructure – including Coombes Road (Surf Coast Highway to Ghazeepore Road).
- Provide wider shoulders in conjunction with upcoming renewal/upgrade/ rehabilitation works where possible on high priority fitness/training cycling routes – including Coombes Road (Ghazeepore Road to Anglesea Road)
- Seek funding to deliver a strategic low-stress cycling link to Armstrong Creek via a shared pathway or separated cycle lanes along Horseshoe Bend Road from The Esplanade.
- Provide a shared pathway or protected cycle lanes on Darian Road (Surf Coast Highway to Fischer Street) and Beach Road (Eton Road to Fischer Street).
- Provide bicycle 'sharrow' pavement symbols at roundabouts – including Bell Street, Horseshoe Bend Road, Grossmans Road/Eton Road (some of these have been implemented).
- Review 100 km/h speed limits on key fitness routes and seek a reduction to 80 km/h where appropriate - including Grossmans Road and Coombes Road (has been implemented).
- Seek funding through the Federal Blackspot Program or alternate funding source to implement the following along Horseshoe Bend Road:
    - Protected on-road cycle lanes between South Beach Road and Quay Boulevard
    - Raised threshold or wombat crossings on Merrijig Drive, Quay Boulevard and Pacific Drive approaches to Horseshoe Bend Road (implemented)
    - 50 km/h speed limit south of South Beach Road.

Pathway strategy

The Pathways Strategy, Connecting Communities, is a 10 year rolling strategy to guide a planned and integrated approach to footpaths within the municipality. The Works Tables and Township Plans identifies the following potential pathways:

- Grossmans Road – local bike route between Eton Road and Messmate Road
- Beach Road – shared path on the northern side east of Surf Coast Highway and on the southern side west of Surf Coast Highway
- Horseshoe Bend Road – shared path between South Beach Road and Pacific Drive
- South Beach Road - shared path on southern side (completed).

1.5 CURRENT WORKS AND PROPOSALS

Current works and proposals on the study routes are outlined below.

Current / funded works

Coombes Road – Road reconstruction is currently underway and includes 1.8m wide sealed shoulders between Ghazeepore Road and Messmate Road. It is also proposed to construct 1.5m wide shoulders between Messmate Road and Surf Coast Highway.

Horseshoe Bend Road – Funded project for the installation of wombat crossings on the northern and southern legs of the Quay Boulevard roundabout.

Grossmans Road - The Briody West Development Plan includes a shared path along the northern side of Grossmans Road between Messmate Road and Illawong Drive.

Blackspot applications

2024/25 blackspot applications for The Esplanade, Bell Street and Darian Road have been successful, and the funding approved. The treatments are described below.

The Esplanade – Completion of a painted buffer between the bike lanes and traffic lanes (where space permits), kerb separators in some locations, and sharrows and speed cushions at the Horseshoe Bend Road roundabout.

Bell Street – Provision of a painted buffer between the bike lanes and traffic lanes, wombat crossings, raised priority crossing at Surf Beach Drive, and speed cushions at The Esplanade.

Darian Road - Separate parking and bicycle lanes and raised platforms at several locations.

Current blackspot applications for Torquay West Urban Fringe as well as for Torquay Town Centre include treatments on Coombes Road, Grossmans Road and Beach Road.

Coombes Road – Provision of a painted buffer between the bike lanes and traffic lanes with green surface treatment at intersections and a speed limit gateway.

Grossmans Road – Provision of three raised platforms, delineation improvements, speed limit reduction (to 60 km/h between Ghazeepore Road and Messmate Road), and a speed limit gateway.

Beach Road – Provision of three raised platforms as well as 40 km/h speed limit signs and pavement marking.

Horseshoe Bend Road – Provision of cycle lanes with a painted buffer south of Blackgate Road (painted buffer to be provided between existing bike lanes and traffic lanes south of South Beach Road), shared use path north of Blackgate Road and speed limit reduction (60 km/h to 70 km/h between South Beach Road and Lower Dundeed Road).

Other proposals

Grossmans Road – A Safe System Assessment and concept development recommended the Briody West shared path connect to the existing path on the southern side of the road near Murnong Circuit and, in the longer term extend further west to Merino Drive

to connect to housing estates. This concept also proposed kerb and channel east of Ghazeepore Road and 500mm shoulder plus edgeline west of Ghazeepore Road.

Bell Street – A Safe System Assessment and concept development recommended relocating the bicycle lanes to the kerbside (i.e. in front of the parking).

Darian Road, Beach Road and Merrijig Drive – The Fischer Street Cycling Corridor proposal upgrades Dutch style roundabout treatments at the Darian Road/Fischer Street, Beach Road/Fischer Street and Merrijig Drive/Fischer Street roundabouts. The roundabout treatment at Darian Road/Fischer Street has been approved for funding through the Safer Local Roads Program and work commenced in October 2025.

2 ANALYSIS AND INVESTIGATION

2.1 CASUALTY CRASH HISTORY

Casualty crash data over the last 10 years of available data was reviewed[1]. Maps showing the crashes along each route is shown in **Appendix A.** For crashes involving cyclists, collision diagrams are provided.

2.2 SMART BICYCLE LIGHTS DATA

The See Sense platform was utilised to analyse the Smart Bicycle Lights data and gain insights into cyclist risk along the project routes.

The three key metrics of braking, road surface and swerving incidents were reviewed, along with hotspot maps, to identify higher risk locations along each route. Cyclist perception reports were also reviewed to provide context and insights into the issues and risks at specific locations.

For each route, higher risk locations were identified (see **Appendix B**).

2.3 ASSET DATA AND TRAFFIC DATA

Asset data and traffic data provided by Council was reviewed to understand infrastructure provision, traffic volumes and traffic composition (e.g. heavy vehicles) on each route and identify routes experiencing high vehicle speeds.

2.4 COMMUNITY INPUT

Community consultation undertaken during the development of the Safer Cycling Strategy was reviewed to identify community concerns relating to the study routes. Community concerns included the following:

- The Esplanade – conflicts with car parking manoeuvres
- Merrijig Drive – conflicts with vehicles at Fischer Street roundabout, vehicle speeds
- Coombes Road – lack of bike lane/sealed shoulder for cyclists, poor road surface condition, vehicle speeds
- Grossmans Road – insufficient width for on-road cycling
- Horseshoe Bend Road – lack of separation between bike lane and parked cars.

[1] Crash data source: Transport Victoria OpenData, Victoria Road Crash Data, period 1/6/2014 – 31/5/2024. Note that a time lag exists between crash occurrence and the publication of data in the database, to enable checking and validation.

2.5 ROUTE INSPECTIONS

Route inspections were undertaken on Friday 28 February 2025 with a focus on higher risk locations identified from the analysis of the smart bicycle lights data and casualty crash data. The inspections allowed more detailed investigation into the probable causes increasing cyclist risk and identification of potential treatments.

2.6 SUMMARY OF ANALYSES

A summary of the analyses for each route, along with potential treatment options is provided in **Appendix B**.

2.7 COMMUNITY FEEDBACK ON DRAFT RECOMMENDATIONS

The community were invited to provide feedback on the draft report and plans via an online survey on Surf Coast Shire's Your Say between 8 August and 5 September 2025. Nine contributions were received.

- Eight respondents agreed that the project routes address roads they 'commonly rode on in Torquay'
- Seven respondents agreed that the project recommendations address issues on roads that they ride frequently
- Six respondents 'feel confident that there will be improvements to' their riding experience if the report recommendations are implemented
- Eight respondents agree that 'the cycling network will be safer and more attractive to new cyclists' if the report recommendations are implemented.

Respondents identified Horseshoe Bend Road and The Esplanade as their most important cycling routes, followed by Coombes Road.

The following treatments were identified as the highest priority from respondents:

- South Beach Road: Kerb separator followed by green surface treatment
- Horseshoe Bend Road: Speed platforms, followed by indented parking, sharrows and the dutch-style roundabout
- The Esplanade: Removal of angled parking, followed by green surface treatment, wombat crossings and painted buffer
- Bell Street: Painted buffer followed by wombat crossings
- Grossmans Road: Narrow shoulders, followed by speed reduction (60km/h between Ghazeepore Road and Messmate Road) and separated shared path on north side
- Combes Road: Shoulder widening followed by green surface treatment and chevron buffer
- Merrijig Drive: Widening of the north-side path (suitable for shared use) and dutch-style roundabout followed by green surface treatment
- Darian Road: no treatments were voted for by respondents.

Treatments on The Esplanade, Horseshoe Bend Road and Combes Road received the highest overall number of votes.

2.8 FINALISATION OF TREATMENT RECOMMENDATIONS

Feedback from the community was considered, and the draft plan reviewed and finalised in collaboration with Council.

The recommendations, and associated concept plans, focus on short- to medium-term measures to improve cyclist safety along the eight key cycling routes in Torquay included in this study.

3 CYCLIST SAFETY RISK ASSESSMENT

Outcomes from the data analysis and route inspections were used to identify high-risk locations for cyclists along the routes and the contributing risk factors. An overview of each route including summary of key risks, high risk locations and a risk assessment is provided below.

The risk assessment is based on the Risk Assessment Matrix provided in the Austroads *Guide to Road Safety Part 6: Road Safety Audit* which is aligned to Safe System principles. Two risk parameters are considered:

- Likelihood - the likelihood of a crash involving a cyclist including consideration of exposure (i.e. likely volume of cyclists using route)
- Severity – the likely severity of the crash based on the type of crash and crash speed.

Further explanation of the risk assessment process is provided in Appendix C.

3.1 SOUTH BEACH ROAD

South Beach Road (west of Fischer Street) is identified in the *Safer Cycling Strategy* as a priority commuter/ school local cycling route. It is also frequently used by fitness cyclists.

A 2.5m wide signed shared path is provided along the southern side of the road. This path provides a good facility for school and other local commuting.

On-road cycling facilities (typically used by fitness cyclists and some commutes) comprise a bike lane in the westbound direction and a sealed shoulder in the eastbound direction. No separation is provided between vehicular traffic and cyclists.

The speed limit on South Beach Road is 60 km/h. A 40 km/h school speed zone applies near Lisieux Catholic School at school start/finish times.

Land use on the northern side is low density residential. Land on the southern side comprises residential development at the eastern end (although there is no direct vehicle

FIGURE 2: PHOTO OF SOUTH BEACH ROAD

access) and Lisieux Catholic School. Further development is planned at the western end including a community hospital. Fischer Street will be extended to intersect with South Beach Road in the future.

Most cyclist crashes occurred at the Horseshoe Bend Road roundabout however there have been no reported crashes since speed cushions were installed in late 2023.

Issues identified from the analyses and observations:

- Lack of separation between vehicles and on-road cyclists - braking incidents may indicate cyclist-vehicle interactions
- High vehicle speeds (85th %ile speeds of 70-80km/h west of Sagittarius Street) – likely due to long, straight road and low density/undeveloped land at western end
- Potential intersection conflicts, particularly at Legacy Drive (noting that turning movements will increase as development proceeds)
- History of cyclist crashes at Horseshoe Bend Road (but no crashes since speed cushions installed), one cyclist crash at Surf Coast Highway also
- Debris on shoulder/in bike lane (may result in swerving incidents) – this has a significant impact on the usability of road space for cyclists and will often force cyclists into the traffic lane
- Bins left on shoulder - may result in swerving incidents and force cyclists into the traffic lane
- Transition from shoulder to off-road path for eastbound cyclists opposite Lisieux Catholic School - some cyclists stay on-road
- Transition from smooth to coarse seal east of Scorpio Street (for eastbound cyclists) – this may be resulting in braking/swerving incidents
- Lack of bicycle pavement markings (i.e. to remind motorists of likely presence of cyclists).

A risk assessment for South Beach Road generally, and for identified higher risk locations, is provided in **Table 1**.

TABLE 1: SOUTH BEACH ROAD CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
General	No separation to vehicles, vehicle speeds	Rare	Serious	Medium
	Conflict points at intersections	Rare	Moderate	Low
	Lack of bicycle markings (drivers may not be aware of presence of cyclists)	Rare	Serious	Medium
	Debris on shoulder/bike lane	Rare	Serious	Medium

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
Northern side	Bins left on shoulder	Rare	Serious	Medium
East Scorpio Street	Surface changes, vehicle speeds, braking/swerving	Rare	Serious	Medium
Legacy Drive	Potential intersection conflicts (turning movements likely to increase as development proceeds)	Rare	Moderate	Low
Opposite Lisieux Catholic School	Shoulder terminates (not all cyclists move to path)	Rare	Serious	Medium
Horseshoe Bend Road	Intersection conflicts	Likely	Minor	Medium

3.2 HORSESHOE BEND ROAD

Horseshoe Bend Road is identified in the *Safer Cycling Strategy* as a priority commuter/school regional route and fitness route.

Cycling facilities on Horseshoe Bend Road comprise a bike lane in each direction, with no separation between vehicular traffic and cyclists. Parking is generally permitted in the bike lane, although indented parking, clear of the bike lane, is provided in some sections. A 2.5m wide path is provided north of Richards Road (approximately), generally appropriate for shared use.

The speed limit on Horseshoe Bend Road is 50 km/h. Adjacent land use is generally residential but also includes the VMCH Star of the Sea Retirement Village, Quay Reserve and Wetlands Reserve, and the linear reserve and shared path along Splitters Avenue.

Most cyclist crashes occurred at the roundabouts at South Beach Road and Quay Boulevard. However, no crashes have occurred at South Beach Road since speed cushions and increased annulus was installed in late 2023, and only one crash at Quay Boulevard since the raised crossing was installed on the western leg.

Issues identified from the analyses and observations:

- History of cyclist crashes at South Beach Road (but no crashes since speed cushions installed) and Quay Boulevard (one crash since wombat crossing installed on western leg)
- South Beach Road roundabout – vehicles driving in bike lane to avoid speed hump (separator not effective), vehicles failing to give way (although no crashes since installation of speed cushions and larger annulus)
- Quay Boulevard – cyclists reporting close passes on northbound approach/entry to roundabout

- Lack of separation between vehicles and cyclists - braking incidents may indicate cyclist-vehicle interactions
- Conflicts at side street intersections and driveways
- Cars parked in bike lane force cyclists into traffic lane (note particularly heavy parking demand opposite VMCH)
- The Esplanade roundabout – bike lanes end prior to roundabout with no sharrows (bikes mixing with vehicles), one cyclist crash.

A risk assessment for Horseshoe Bend Road generally, and for identified higher risk locations, is provided in **Table 2**.

TABLE 2: HORSESHOE BEND ROAD CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
General	No separation to vehicles, vehicle speeds, conflicts at intersections/driveways	Unlikely	Serious	High
South Beach Road	Intersection conflicts	Likely	Minor	Medium
Grinders Avenue to Merrijig Drive	Parking in bike lane	Rare	Serious	Medium
Quay Boulevard	Intersection conflicts	Possible	Moderate	High
Quay Boulevard to Island Drive	Parking in bike lane	Rare	Serious	Medium
The Esplanade	Mixing with vehicles, intersection conflicts	Possible	Moderate	High

3.3 THE ESPLANADE

The Esplanade is identified in the *Safer Cycling Strategy* as a priority commuter/school and recreational/tourist regional routes.

Cycling facilities on The Esplanade comprise a bike lane in each direction. A painted buffer between the bike lane and traffic lane is provided between Zeally Bay Road and Beach Road; while no separation is provided elsewhere. Parking is generally provided in a separate parking lane or indented, including angle parking on the eastern side of the road.

The speed limit on The Esplanade is 40 km/h south of Zeally Bay Road and 50km/h north of Zeally Bay Road.

Land use on the western side is a combination of residential and commercial, and also includes Taylors Park and the Torquay Bowls Club.

FIGURE 3: PHOTO OF THE ESPLANADE

Given the proximity to the foreshore, parking demand is often high and there is significant pedestrian activity.

A shared path is provided along the foreshore and provides an off-road alternative to cycling along The Esplanade. The path is popular for recreational cycling, but also well used by pedestrians and dog walkers.

Most cyclist crashes occurred at the intersection with Beach Road. A raised pedestrian crossing (wombat crossing) was installed across the Beach Road approach to the intersection in late 2024.

Other recent works include a painted buffer between the bike lane and traffic lane between Zeally Bay Road and Beach Road and green surface treatments at intersections/ conflict points.

Issues identified from the analyses and observations:

- History of cyclist crashes along route, most occurred at Beach Road intersection (note wombat crossing installed on western leg in late 2024)
- Lack of separation between vehicles and cyclists along much of route (painted buffer implemented between Zeally Bay Road and Beach Road in 2024)
- Cars entering/exiting parking spaces, particularly cars reversing from angled spaces on eastern side of road
- Horseshoe Bend Road roundabout – bike lanes end prior to roundabout with no sharrows (bikes mixing with vehicles), one cyclist crash
- Debris in bike lanes
- Bell Street roundabout – bikes mixing with vehicles, faded and poorly placed sharrows
- Squeeze points for cyclists on bends (near Anderson Street and Gilbert Street)
- Several localised issues (see Appendix B for details).

A risk assessment for The Esplanade generally, and for identified higher risk locations, is provided in **Table 3**.

TABLE 3: THE ESPLANADE CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
General	No separation to vehicles (except Zeally Bay Road to Beach Road)	Unlikely	Serious	High
Horseshoe Bend Road	Mixing with vehicles, intersection conflicts	Possible	Moderate	High
Adjacent to angle parking	Cars reversing from angle spaces	Unlikely	Moderate	Medium
Bell Street	Mixing with vehicles, intersection conflicts	Possible	Moderate	High

3.4 BELL STREET

Bell Street is identified in the *Safer Cycling Strategy* as a priority commuter/school and recreational/tourist regional routes.

FIGURE 4: PHOTO OF BELL STREET

A path (approximately 3m wide) on the southern side of Bell Street, west of Munday Street is appropriate for shared use, although is not signed as a shared path. On-road cycling facilities comprise a bike lane in each direction with no separation between cyclists and vehicular traffic. Parking is provided in a separate parking lane or indented angled spaces.

The speed limit on Bell Street is 40 km/h. Land use is typically residential at the eastern end and commercial elsewhere. The Torquay Caravan Pak is located on the southern side of Bell Street.

Cyclist crashes occurred mid-block (associated with parking manoeuvres) and at the intersection with Surf Beach Drive.

Issues identified from the analyses and observations:

- Lack of separation between vehicles and on-road cyclists
- Cars entering/exiting parking spaces, particularly cars reversing from angle spaces
- Bikes mixing with vehicles and intersection conflicts at Rudd Avenue and Bell Street
- No transition from westbound bike lane to off-road path at Surf Beach Drive
- Debris in bike lanes
- Bell Street roundabout – sharrows are faded and poorly placed.

A risk assessment for Bell Street generally, and for identified higher risk locations, is provided in **Table 4**.

TABLE 4: BELL STREET CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
General	No separation to vehicles	Unlikely	Serious	High
	Conflict points at intersections (other than intersections listed below)	Rare	Moderate	Low
The Esplanade	Mixing with vehicles at roundabout, intersection conflicts	Possible	Moderate	High

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
Adjacent to angle parking	Cars reversing from angle spaces	Possible	Minor	Medium
Rudd Avenue	Mixing with vehicles at roundabout, intersection conflicts	Possible	Moderate	High
Surf Beach Drive	No transition from bike lanes to off-road path Potential conflict where path crosses Surf Beach Drive	Unlikely	Moderate	Medium

3.5 DARIAN ROAD

Darian Road (west of Fischer Street) is identified in the *Safer Cycling Strategy* as a priority commuter/school local route.

Cycling facilities on Darian Road comprise a shared bike and parking lane, although there are few bike signs. There is no separation between the shared bike-parking lane and the traffic lane.

FIGURE 5: PHOTO OF DARIAN ROAD

The urban default 50km/h speed limit applies to Darian Road. Darian Road east of Fischer Street is a bus route. Land use along Darian Road is typically residential.

One cyclist crash occurred at the Fischer Street roundabout in 2021. Improvement works were undertaken here in late 2024 (increased annulus and sharrows) which is expected to have improved cyclist safety.

Issues identified from the analyses and observations:

- Bike path not marked separately from parking lane – motorists' awareness of cyclists may be reduced
- Poor parking discipline may result in parked cars impinging on path of cyclists, forcing cyclists into the traffic lane
- Lack of bicycle pavement markings – may reduce motorists' awareness of cyclists
- Lack of separation between vehicles and cyclists - braking incidents may indicate cyclist-vehicle interactions
- Vehicles mixing with traffic at Fischer Street roundabout
- Vehicle speeds higher than 50 km/h speed limit (85th %ile speed approx. 55 km/h) – likely due to long, wide, straight road

- Interactions between cyclists, parked cars and buses at eastern end where there are bus stops and parking demand/turnover is higher
- No facility for cyclists near Surf Coast Highway or The Esplanade (parking-bike lanes end)
- Debris in parking-bike lane and poor surface in some locations (including uneven pit lids).

A risk assessment for Darian Road generally, and for identified higher risk locations, is provided in **Table 5**.

TABLE 5: DARIAN ROAD CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
General	Shared parking-bike lane, no separation to vehicles, vehicle speeds	Rare	Serious	Medium
	Conflict points at intersections (other than intersections listed below)	Rare	Moderate	Low
Approaching/at Surf Coast Highway	Mixing with vehicles, intersection conflicts	Rare	Moderate	Low
Fischer Street	Mixing with vehicles, intersection conflicts	Possible	Moderate	High
Eastern end - near bus stops and where parking demand higher	Conflicts with parked cars and buses	Rare	Serious	Medium
Approaching/at The Esplanade	Mixing with vehicles, intersection conflicts	Rare	Moderate	Low

3.6 GROSSMANS ROAD

Grossmans Road (east of Eton Road) is identified in the *Safer Cycling Strategy* as a priority commuter/school local route.

There are no dedicated cycling facilities on Grossmans Road; cyclists share the traffic lane with vehicles. Between Murnong Circuit and Eton Road, there is a 2.5m wide path on the southern side of the road that could function as a shared path.

Grossmans Road east of Eton Road is a bus route.

FIGURE 6: PHOTO OF GROSSMANS ROAD

The speed limit is 50km/h to the east of Murnong Circuit, 60 km/h between Murnong Circuit and Messmate Road, 70 km/h between Messmate Road and Ghazeepore Road and 80 km/h west of Ghazeepore Road.

Land use at the eastern end of Grossmans Road is a mix of residential, commercial and education (Torquay College). West of Murnong Circuit, land use is a mix of rural and residential.

The Briody West Development Plan applies to the land on the northern side of Grossmans Road, west of Messmate Road, to be developed for residential subdivision. It is noted that the Development Plan includes a shared path along the northern side of Grossmans Road between Messmate Road and Illawong Drive.

Three cyclist crashes occurred at/near the Eton Road roundabout. Improvement works were undertaken here in late 2024 (wombat crossing on east leg and sharrows).

Issues identified from the analyses and observations:

- Path on southern side of road, east of Eton Road, is not wide enough for shared use
- No dedicated road space or shoulder for cyclists to use - braking and swerving incidents may indicate cyclist-vehicle interactions
- Cyclists mixing with traffic at the Eton Road roundabout (crash risk has been reduced by installation on wombat crossing and sharrows)
- High vehicle speeds west of Murnong Circuit (noting speed limit)
- Condition of road edges is poor in numerous locations (including between Eton Road and Murnong Circuit)
- Debris along edge of road in some locations (potential for gravel to be dragged from driveways) and at intersections.
- Urban development will likely increase commuter and local cycling trips to/from Torquay – the Briody West shared path will cater for cyclists east of Messmate Road but should connect to the path on the southern side of Grossmans Road (which should be signed as a Shared Path).
- Fitness cyclists may not use an off-road path.

A risk assessment for Grossmans Road generally, and for identified higher risk locations, is provided in Table 6.

TABLE 6: GROSSMANS ROAD CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
General East of Eton Road	No dedicated road space for cyclists (can use parking lane)	Rare	Serious	Medium
General Eton Road to Messmate Road	No dedicated road space or shoulder for cyclists, poor road edges, debris/gravel on road, path on south side not signed as shared path	Rare	Serious	Medium

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
General West of Messmate Road	No dedicated road space or shoulder for cyclists, higher vehicle speeds, poor road edges, debris/gravel on road	Rare	Fatal	High
Eton Road	Mixing with vehicles, intersection conflicts	Rare	Minor	Low
Ghazeepore Road & Messmate Road intersections	Potential conflicts with turning vehicles	Rare	Moderate	Low
Near Anglesea Road	Island creates squeeze point for cyclists	Rare	Moderate	Low

3.7 COOMBES ROAD

Coombes Road is identified in the *Safer Cycling Strategy* as a priority fitness cycling route.

While there are no dedicated cycling facilities on Coombes Road, existing/ proposed shoulders provide some space for cyclists to ride clear of the traffic lane.

West of Ghazeepore Road, 1.0m wide shoulders provide limited space for cyclists to ride clear of the traffic lane (minimal clearance to traffic). Between Ghazeepore Road and Messmate Road, recently constructed 1.8m wide sealed shoulders allow cyclists space to ride with some clearance to the traffic lane. East of Messmate Road, there are currently no sealed shoulders, however construction of 1.5m wide shoulders is planned. A roundabout at the intersection of Coombes Road and Messmate Road is also planned for construction.

The speed limit is 60km/h east of Messmate Road, 7o km/h between Messmate Road and Ghazeepore Road, and 80 km/h west of Ghazeepore Road.

Land use adjacent to Coombes Road is a mix of rural and low density residential.

Three cyclist crashes have occurred on Coombes Road, including one at Surf Coast Highway.

Many of the issues identified from the analysis relate to poor condition of road edges and no space for cyclists to ride clear of the traffic lane. The proposed/under construction shoulders between Messmate Road and Surf Coast Highway should address these issues.

Other issues identified from the analyses and observations:

- Shoulder width west of Ghazeepore Road does not allow sufficient clearance between cyclists riding on the should and passing traffic, particularly given vehicle speeds (85th %ile speed of 89 km/h)

- Grass growing under the barriers (west of Ghazeepore Road) encroaching on the shoulder
- Debris in the shoulders
- Bikes mixing with vehicles at Anglesea Road; there is a squeeze point for eastbound cyclists near end of splitter island
- Cars potentially failing to give way at intersections

A risk assessment for Coombes Road is provided in Table 7. Note the risk assessment assumes completion of 1.5m shoulders east of Messmate Road.

TABLE 7: COOMBES ROAD CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
Surf Coast Highway to Messmate Road	No separation to traffic (Assumes 1.5 m shoulders)	Rare	Serious	Medium
Messmate Road intersection	Cars failing to give way (note a roundabout is planned at this intersection)	Unlikely	Moderate	Medium
Messmate Road to Ghazeepore Road	No separation to traffic, higher vehicle speeds (Assumes 1.8 m shoulders)	Rare	Fatal	High
Ghazeepore Road intersection	Cars failing to give way	Unlikely	Moderate	Medium
Ghazeepore Road to Anglesea Road	Narrow shoulders (1.0m), no separation to traffic, higher vehicle speeds	Rare	Fatal	High
Near Anglesea Road	Conflicts with vehicles	Rare	Moderate	Low
Other intersections	Potential conflicts with vehicles	Rare	Moderate	Low
General	No bicycle markings or signage	Rare	Serious	Medium

3.8 MERRIJIG DRIVE

Merrijig Drive is identified in the *Safer Cycling Strategy* as a priority commuter/school local route.

On-road cycling facilities on Merrijig Drive comprise a bike lane in each direction west of Fischer Street. A shared path is provided along the northern side of the road west of Yallock Circuit.

It is noted that a 2.0-2.5m path is provided on the northern side of the road, east of Yallock Circuit. The *Safer Cycling Strategy* nominates this path as a narrow shared path, although it is not signed as a shared path (clearances and sightlines may make it inappropriate for shared use).

The speed limit on Merrijig Drive is 50 km/h. It is a bus route west of Fischer Street.

Land use along Merrijig Drive is predominantly residential but also includes the Surf Coast Shire offices and Banyul-Warri Fields, as well as The Dunes Village Shopping Mall.

Cyclist crashes occurred at the intersections of Rosser Boulevard (roundabout) and Horseshoe Bend Road, and midblock adjacent to Banyul-Warri Fields (parking related). It is noted that a wombat crossing was installed on Merrijig Drive at Horseshoe Bend Road in 2023.

Issues identified from the analyses and observations:

- Lack of separation between vehicles and on-road cyclists (noting shared path is provided west of Yallock Circuit)
- Path between Yallock Circuit and Fischer Street is not wide enough for shared use (path not signed as a shared path)
- Path east of Fischer Street may have inadequate sightlines and clearances in some locations for shared use (path not signed as a shared path)
- Some cyclists stay on-road at Rosser Boulevard roundabout and mix with traffic (i.e. don't utilise off-road path)
- Interaction between on-road cyclists and parking manoeuvres adjacent to Banyul-Warri Fields, particularly cars reversing from angled spaces (an alternative off-road path is provided)
- On-road cyclists mix with vehicles at Fischer Street roundabout.

A risk assessment for Merrijig Drive generally, and for identified higher risk locations, is provided in Table 8.

TABLE 8: MERRIJIG DRIVE CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
Surf Coast Highway to Fischer Street	Lack of separation for on-road cyclists (shared path provided west of Yallock Circuit)	Rare	Moderate	Low
	Potential intersection conflicts	Rare	Moderate	Low
Rosser Boulevard to Yallock Circuit	No priority for crossing movements at raised platforms	Rare	Moderate	Low
Yallock Circuit to Fischer Street	2.0m path on northern side not wide enough for shared use (not signed a shared path)	Rare	Moderate	Low

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
East of Fischer Street	2.5m path may not have adequate sightlines and clearances in some locations (not signed a shared path)	Rare	Moderate	Low
Rosser Boulevard	Some cyclists stay on-road and mix with vehicles, intersection conflicts	Unlikely	Moderate	Medium
Adjacent to angle parking	Cars reversing from angle spaces	Unlikely	Moderate	Medium
Fischer Street	Mixing with vehicles, intersection conflicts	Possible	Moderate	High

3.9 BEACH ROAD

The *Safer Cycling Strategy* identifies Beach Road as a priority commuter/school local route between Eton Road and Fischer Street, and a recreational/tourist cyclist route between Eton Road and Surf Coast Highway.

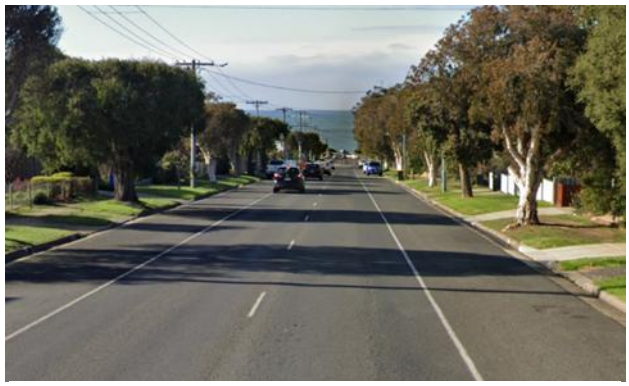


FIGURE 7: PHOTO OF BEACH ROAD

East of Surf Coast Highway, Beach Road has parking lanes which are signed as bike lanes in some locations (i.e. shared parking-bike lanes). There is no separation between the shared bike-parking lane and the traffic lane.

West of Surf Coast Highway, bike lanes are provided west of Kooringa Place. There are no dedicated bicycle facilities between Surf Coast Highway and Kooringa Place, however sharrows and a wombat crossing were provided in this section in 2024.

The urban default 50km/h speed limit applies to Beach Road.

Land use is typically residential along most of the route, with the exception of a section of mixed use (retail, child care etc.) west of Surf Coast Highway which generates higher traffic volumes and turning movements.

Four cyclist crashes occurred at The Esplanade intersection. A wombat crossing was installed on the approach to the intersection in late 2024.

Improvement works were also undertaken at the Fischer Street roundabout in late 2024 (increased annulus and sharrows) which is expected to have improved cyclist safety.

Issues identified from the analyses and observations:

East of Surf Coast Highway

- Bike path not marked separately from parking lane – motorists' awareness of cyclists may be reduced and parked cars may impinge on path of cyclists
- Lack of bicycle pavement markings and signage – may reduce motorists' awareness of cyclists
- Lack of separation between vehicles and cyclists - braking incidents may indicate cyclist-vehicle interactions
- Vehicles mixing with traffic at Fischer Street roundabout
- Vehicle speeds higher than 50 km/h speed limit east of Surf Coast Highway (85th %ile speed approx. 57 km/h) – likely due to long, wide, straight road.

West of Surf Coast Highway

- Interactions between cyclists and cars turning to/from McDonalds (north side) and car parking (south side)
- No bicycle pavement markings and signage between Kooringa Place and Alleyne Avenue – may reduce motorists' awareness of cyclists.

A risk assessment for Beach Road generally, and for identified higher risk locations, is provided in Table 9.

TABLE 9: BEACH ROAD CYCLIST RISK ASSESSMENT

LOCATION	KEY CYCLIST SAFETY ISSUES	CRASH LIKELIHOOD	CRASH SEVERITY	CRASH RISK
East of Surf Coast Highway	Shared parking-bike lane, no separation to vehicles, vehicle speeds	Unlikely	Serious	High
Fischer Street	Mixing with vehicles, intersection conflicts	Possible	Moderate	High
Surf Coast Highway to Kooringa Place	No dedicated bike facility, conflicts with turning movements of vehicles	Unlikely	Moderate	Medium
West of Kooringa Place	No separation to vehicles, lack of pavement markings/signage for bike lanes	Rare	Moderate	Low

4 RECOMMENDED TREATMENTS

Potential treatments have been identified for each route to address identified issues and improve safety for cyclists generally.

Consideration has been given to:

- Key risks identified during data analysis and site inspections
- Safe System principles and objectives
- Alignment with Council's strategic objectives
- Current and previous proposals
- Minimisation of treatment costs where possible
- Consistency with other cycling infrastructure across the Torquay network.

Treatment options are presented in the following sections for each route. For most routes, a holistic route treatment has been identified. For some routes, short-, medium- and long-term option were identified. Treatments are also proposed at higher risk locations to address specific cycling issues identified.

4.1.1 South Beach Road

The overall vision for South Beach Road is a physically separated on-road cycling facility, in addition to the existing shared path along the southern side of the road. This will cater for both on-road (fitness/commuting) and off-road (commuting/school) cycling (noting that some commuters prefer on-road cycling and others off-road cycling).

The proposed on-road cycling facility can be delivered in two stages; a painted buffer can be provided between the bike lane/ shoulder in the short term and physical separation (e.g. kerb) provided in the longer term. Speed management is also desirable, particularly at the western end where 85th percentile vehicle speeds currently exceed the speed limit.

With the extension of Fischer Street to South Beach Road, the desirable intersection treatment is a roundabout to control vehicle speeds and facilitate turning movements. The design of the roundabout should provide for safe cycling movements.

Proposed route treatments are outlined in **Table 10.**

Proposed treatments to address identified risks at locations along the route are outlined in **Table 11**.

TABLE 10: SOUTH BEACH ROUTE OVERALL ROUTE TREATMENTS

SOUTH BEACH ROAD	
ROUTE TREATMENT	BENEFIT
Short to medium-term	
Reduce traffic lane width to approx. 3.0m and provide a 500mm painted buffer between traffic lane and bike lane/shoulder	Assist in reducing vehicle speeds and increase separation between vehicles and cyclists
Provide green surface treatment at conflict points (e.g. side street intersections) and regular bicycle pavement markings	Increase driver awareness of potential presence of cyclists
Long term	
Physical separation between vehicles and cyclists, e.g. by provision of kerb separators between the traffic lane and cycle lane/shoulder (between driveways)	Reduce potential for conflicts between vehicles and cyclists

TABLE 11: SOUTH BEACH ROAD PROPOSED LOCALISED TREATMENTS

SOUTH BEACH ROAD		
LOCATION	TREATMENT	BENEFIT
Opposite Lisieux Catholic School	Mark bike symbol/arrow to direct cyclists onto off-road path where shoulder terminates and back onto shoulder where path terminates	More cyclists move onto path and avoid squeeze point where shoulder terminates, reducing risk of conflict with vehicles
Scorpio Street and Legacy Drive	Raised intersection	Reduce vehicle speeds where braking/swerving incidents are occurring and there are potential intersection conflicts
Gravel driveways on northern side	Seal driveways on northern side of road for first 5-6m (will require liaison with residents)	Will remove potential for gravel spill onto the road in the path of cyclists (forcing cyclists into traffic lane)
Properties on northern side	Provide a bin platform near edge of road	Bins no longer placed on shoulder in path of cyclists (forcing cyclists into traffic lane)
Horseshoe Bend Road	Monitor See Sense and crash data to evaluate whether 2023 upgrades are effective in reducing crash risk. Install full width speed humps if warranted. Consider marking bike lanes across approach lanes.	Full width speed humps will stop vehicles using bike lane to avoid speed cushions. Bike lanes markings through roundabout ill increase driver awareness of cyclists.

4.1.2 Horseshoe Bend Road

The Torquay to Geelong Safe Cycling Corridor project is currently preparing a long-term vision for cycling infrastructure along Horseshoe Bend. It is anticipated this will provide a greater level of safety or cyclists than the current unprotected bike lanes.

A current blackspot application for Horseshoe Bend Road seeks to provide improved safety for cyclists in line with the long-term vision.

Shorter term treatments have been identified to address higher risk locations for cyclists along the route. These are outlined in **Table 12**. It is noted that there is a funded project to install wombat crossings on the northern and southern legs of the Horseshoe Bend Road / Quay Boulevard roundabout. In addition, the successful 2024/25 blackspot application for The Esplanade includes speed cushions and sharrows at the Horseshoe Bend Road roundabout.

TABLE 12: HORSESHOE BEND ROAD PROPOSED LOCALISED TREATMENTS

HORSESHOE BEND ROAD		
LOCATION	**TREATMENT**	**BENEFIT**
South Beach Road	Monitor See Sense and crash data to evaluate whether 2023 upgrades are effective in reducing crash risk. Install full width speed humps if warranted. Consider marking bike lanes across approach lanes.	Full width speed humps will stop vehicles using bike lane to avoid speed cushions. Bike lanes markings through roundabout will increase driver awareness of cyclists.
Wagtail Avenue to Merrijig Drive (east side) Quay Boulevard to Island Drive (west side)	Investigate additional indented parking along route, particularly in sections with higher parking demand	Reduce the incidence of cars parking in the bike lane which forces cyclists to deviate into the traffic lane
Quay Boulevard	Mark bike lanes through roundabout (i.e. across approach lanes, potentially in conjunction with current project)	Increase driver awareness of cyclists
Quay Boulevard	Convert wombat crossing on western leg to shared path Provide a connection from the northbound on-road bike lane to the shared path south of Richards Street to enable cyclists to come off-road	Encourage northbound cyclists to move to off road path and provide cyclists priority across Quay Boulevard
The Esplanade	*Short term:* Provide sharrows and install speed cushions (as successful 2024/25 blackspot project application)	Reduce vehicle speeds entering roundabout, increase driver awareness of cyclists
	Long term: Investigate options to bring cyclists off road at the roundabout	Separation of cyclists at roundabout will reduce potential cyclist-vehicle conflicts

4.1.3 The Esplanade

The Esplanade is an important cycling route for commuting, recreation and tourism. However, road space is limited and there is high demand for parking. There is a shared path along the foreshore that provides an off-road cycling alternative to The Esplanade.

The overall vision for The Esplanade is separated bicycle lanes, with physical separation provided where feasible.

A successful 2024/25 blackspot application for The Esplanade includes extension of the 40 km/h speed limit to Horseshoe Bend Road, completion of a painted buffer between the bike lane and traffic lane (where feasible), physical separators (spike down kerbs) in some locations, and other treatments for cyclists (green surface treatments and line marking improvements). These treatments are supported to address risks to cyclists identified in the analysis.

Proposed route treatments (including current blackspot proposals) are outlined in **Table 13.** Proposed treatments to address identified risks at locations along the route are outlined in **Table 14**.

TABLE 13: THE ESPLANADE OVERALL ROUTE TREATMENTS

THE ESPLANADE	
ROUTE TREATMENT	BENEFIT
Short term	
Extension of 40 km/h speed limit to include section from Zeally Bay Road to Horseshoe Bend Road	Lower vehicle speeds reduces cyclist crash risk
Provision of painted buffer between traffic lane and bike lane (where feasible) with physical separation (spike down kerbs) in some locations.	Increase separation between vehicles and cyclists
Long term	
Investigate options to eliminate potential conflicts between cyclists and cars reversing from angle parking, such as: - replace angle parking with parallel parking - replace angle parking with off-street parking (i.e. within foreshore reserve) - provide aisle within foreshore reserve to access parking spaces from beach side (relocate shared path) - combination of above	Reduce potential for conflicts between cyclists and reversing vehicles

TABLE 14: THE ESPLANADE PROPOSED LOCALISED TREATMENTS

THE ESPLANADE		
LOCATION	**TREATMENT**	**BENEFIT**
Horseshoe Bend Road	*Short term:* Provide sharrows and install speed cushions (as per successful 2024/25 blackspot project application)	Reduce vehicle speeds entering roundabout, increase driver awareness of cyclists
	Long term: Investigate options to bring cyclists off-road at the roundabout	Separation of cyclists at roundabout will reduce potential cyclist-vehicle conflicts
North of Beach Road, west side	Add chevron markings between kerb and bike lane where no parking permitted, i.e. adjacent to yellow line	Provide clearer direction to motorists and cyclists and reinforce where parking is permitted
Parking opposite Taylor Park	Formalise parking in gravel area opposite Taylor Park (potentially parallel parking to reduce risk to cyclists)	Reduce dirt/gravel being dragged into bike lane
Bend south of Gilbert Street, west side	Green surface treatment on bend with bike symbol Cut back kerb to widen bike lane and provide Cyclesafe separator	Increase motorist awareness of cyclists/bike lane at pinch point Increase space for cyclists on bend and physical separation to traffic lane; reduce incidence of motorists cutting into bike lane
Bend at Anderson Street, east side	Cyclesafe separator along southbound bike lane around bend	Increase motorist awareness of cyclists/bike lane; reduce incidence of motorists cutting into bike lane
South of Anderson Street, west side	Re-mark parking lines to maintain bike lane width (i.e. remove pinch point).	Increase space for cyclists
South of Price Street, west side	Re-mark bike lane to maintain width (i.e. remove pinch point). Consider removal of end car space to provide more space for bikes	Increase space for cyclists
South of Price Street, west side	Investigate improving surface condition/level around grates	Improve surface for cyclists
Bell Street	*Short term:* Provide sharrows and install speed cushions (as per successful 2024/25 blackspot project application)	Reduce vehicle speeds entering roundabout, increase driver awareness of cyclists
	Long term: Investigate options to bring cyclists off-road at the roundabout (potentially utilise existing path on eastern side of roundabout)	Separation of cyclists at roundabout will reduce potential cyclist-vehicle conflicts

4.1.4 Bell Street

Bell Street is an important cycling route for commuting, recreation and tourism. However, road space is limited and there is high demand for parking. The path along the southern side of the road, west of Munday Street, provides an off-road option for cycling.

A successful 2024/25 blackspot application for Bell Street includes a painted buffer between the bike lane and traffic lane. East of Pride Street a painted buffer is also proposed between the bike lane and parking lane. Wombat crossings, a raised priority crossing across Surf Beach Drive, and speed cushions at The Esplanade are also proposed. These treatments are supported to address risks to cyclists identified in the analysis.

Previous work, including a Safe System Assessment, recommended relocating the bicycle lanes to the kerbside (i.e. in front of the parking) to eliminate conflict between parking manoeuvres and cyclists. This is supported as a long-term vision for the route.

Proposed route treatments (including successful 2024/25 and current blackspot application proposals) are outlined **Table 15.** Proposed treatments to address identified risks at locations along the route are outlined in **Table 16**.

TABLE 15: BELL STREET OVERALL ROUTE TREATMENTS

BELL STREET	
ROUTE TREATMENT	BENEFIT
Short term	
Provision of painted buffer between traffic lane and bike lane between Surf Beach Drive and The Esplanade; provision of painted buffer between parking lane and bike lane between ride Street and The Esplanade (as per blackspot proposal)	Increase separation between vehicles and cyclists
Provide green surface treatment at conflict points (e.g. side street intersections) (as per blackspot proposal)	Increase driver awareness of potential presence of cyclists
Long term	
Relocate bike lane to kerbside (i.e. in front of parking) east of Rudd Avenue/ Davidson Drive, upgrade/sign path on south side to shared path west of Davidson Drive, provide priority crossings on east and south legs of roundabout	Remove potential conflicts between parking manoeuvres and cyclists

TABLE 16: BELL STREET PROPOSED LOCALISED TREATMENTS

BELL STREET		
LOCATION	TREATMENT	BENEFIT
The Esplanade	*Short term:* Provide sharrows and install speed cushions at roundabout (as per blackspot proposal)	Reduce vehicle speeds entering roundabout, increase driver awareness of cyclists
	Long term: Investigate options to bring cyclists off-road at the roundabout (potentially utilise existing path on eastern side of roundabout)	Separation of cyclists at roundabout will reduce potential cyclist-vehicle conflicts
Rudd Avenue	Renew sharrows at roundabout (locate opposite splitter islands)	Increase driver awareness of potential presence of cyclists
Rudd Avenue	Provide wombat crossing on eastern leg (existing zebra crossing to be removed) (as per blackspot proposal)	Raised platform will reduce westbound vehicle speeds approaching roundabout
Surf Beach Drive	Provide transition from westbound on-road bike lane to off-road path at Surf Beach Drive.	Encourage westbound cyclists to move off road.
Surf Beach Drive	Wombat crossing east of Surf Beach Drive	Assist cyclists connect to eastbound bike lane. Reduce vehicle speeds at start of eastbound bike lane and for left turn movements into Surf Beach Drive.
Surf Beach Drive	Raised shared path priority crossing across Surf Beach Drive	Provide safe crossing of Surf Beach Drive

4.1.5 Darian Rd

A successful 2024/25 blackspot application for Darian Road includes separate parking and bicycle lanes and raised platforms at several locations along the road. These treatments are supported to address the cyclist risks identified in the analysis.

A long term vision for the route is protected bike lanes or a shared path to support the function of the route as a priority commuter/school route. However, this would inevitably require removal of parking and/or trees.

The Fischer Street Cycling Corridor upgrades include a Dutch Style roundabout at Darian Road. This is supported to reduce potential cyclist-vehicle conflicts.

Proposed route treatments (including above proposals) are outlined in **Table 17.** Proposed treatments to address identified risks at specific locations along the route are outlined in **Table 18**.

TABLE 17: DARIAN ROAD – OVERALL ROUTE TREATMENTS

DARIAN ROAD	
ROUTE TREATMENT	**BENEFIT**
Short term	
Mark separate parking and bicycle lanes (2.0m parking lane + 1.2m bike lane + 2.9m traffic lane) (as per blackspot proposal)	Provide clear space for cyclists, improve parking discipline
Provide green surface treatment along entire route given limited space for cyclists	Increase driver awareness of bike lane and potential presence of cyclists
Raised pavements at 7 locations along route	Reduce vehicle speeds
Long term	
Protected bike lanes or shared path	Safer facility for cyclists, supports function as priority commuter/school cycling route

TABLE 18: DARIAN ROAD PROPOSED LOCALISED TREATMENTS

DARIAN ROAD		
LOCATION	**TREATMENT**	**BENEFIT**
The Esplanade	Provide sharrows where bike lane ends	Increase driver awareness of potential presence of cyclists
The Esplanade	Provide right turn storage lane for cyclists at intersection 	Provide dedicated space for right turning cyclists, increase driver awareness of cyclists
Fischer Street	Dutch style roundabout	Separation of cyclists at roundabout will reduce potential cyclist-vehicle conflicts

No treatment is proposed at Surf Coast Highway. Desirably the bicycle facility would extend to the intersection, however this cannot be accommodated within the existing carriageway. It is noted that DTP has indicated that sharrows are not to be provided on the approach to arterial roads.

4.1.6 Grossmans Road

As noted above, residential development along Grossmans Road will likely increase commuter and local cycling trips to/from Torquay. The Briody West shared path will cater for cyclists east of Messmate Road if a safe crossing can be provided to connect to the path on the southern side of Grossmans Road. Desirably, the shared path would continue to Merino Drive to serve residential development further to the west.

A shared path is unlikely to be used by high-speed fitness cyclists who typically prefer to stay on-road. The cross section of Grossmans Road makes it difficult/costly to provide dedicated road space or shoulders for cyclists to reduce cycling risk.

Given the proximity of Coombes Road, it seems reasonable to invest in only one of these routes for on-road cycling. Existing infrastructure and current upgrades to Coombes Road make it the preferable route for on-road cycling.

A current blackspot application for Grossmans Road proposes an extension of the 60 km/h speed limit to Ghazeepore Road and a speed limit gateway, provision of three raised platforms and delineation improvements. It is noted that a previous project (including a Safe System Assessment) developed a concept for Grossmans Road which included kerb and channel east of Ghazeepore Road and 500mm shoulder west of Ghazeepore Road. These treatments are supported as they would provide a minor improvement for on-road cyclists choosing to use Grossmans Road.

Proposed route treatments are outlined **Table 19.** Additional treatments to address specific risks identified along the route are outlined in **Table 20**.

TABLE 19: GROSSMANS ROAD OVERALL ROUTE TREATMENTS

GROSSMANS ROAD	
ROUTE TREATMENT	**BENEFIT**
Short term	
Encourage on-road cyclists to use Coombes Road – through social media, cycling events etc.	Safer cycling conditions on Coombes Road reduces risk for cyclists
Extend 60 km/h speed limit to section from Messmate Road to Ghazeepore Road in conjunction with Gateway treatment at Ghazeepore Road	Lower vehicle speeds reduces crash risk for cyclists
Medium term	
Shared path east of Messmate Road - Construct shared path along northern side to Messmate Road as part of Briody West development - When Briody West shared path is constructed, provide a raised priority crossing to connect to the existing 2.5m wide path on southern side of Grossmans Road with new 50 km/h threshold provided prior to the crossing - Sign existing path on the southern side of Grossmans Road as a Shared Path	Provide a safe off-road path for local cycling, including a safer crossing point on Grossmans Road

GROSSMANS ROAD	
ROUTE TREATMENT	BENEFIT
Long term	
Potential future consideration: Extend shared path west to Merino Drive	Provide a safe off-road path for local cycling (caters for residential development to the west)
East of Ghazeepore Road - kerb & channel (as per previous concept)	Improve road edge conditions and reduce gravel spill from driveways
West of Ghazeepore Road - narrow shoulder (500mm) and edgeline (as per previous concept)	Will provide a buffer to road edge for cyclists
Maintenance	
Repair/maintain road edges	Reduce incidences of cyclists swerving away from road edges

TABLE 20: GROSSMANS ROAD PROPOSED LOCALISED TREATMENTS

GROSSMANS ROAD		
LOCATION	TREATMENT	BENEFIT
Daisy's Garden Supply	Consider sealing exit for first 10m	Reduce gravel spill onto road (may result in cyclists swerving)
Gravel driveways	Consider sealing driveways for first 5-6m	Reduce gravel spill onto road (may result in cyclists swerving)

4.1.7 Coombes Road

The overall vision for Coombes Road is a shoulder to accommodate cycling, with a painted chevron buffer in the western section where vehicle speeds are higher (west of Messmate Road) to provide separation between cyclists and the traffic lane. This would support the function of Coombes Road as a priority fitness cycling route.

Existing/ proposed shoulders provide some space for cyclists to ride clear of the traffic lane. A current blackspot application for Coombes Road proposes provision of a painted buffer between the bike lanes and traffic lanes with green surface treatment at intersections and a speed limit gateway.

It is proposed to provide a painted buffer between the shoulder and the traffic lane in the western section as follows:

- Anglessea Road to Ghazeepore Road: 1.0m shoulder + 0.5 buffer + 3.0m traffic lane
- Ghazeepore Road to Messmate Road: 1.5m shoulder + 0.3 buffer + 3.0m traffic lane

The overall route treatments are outlined in **Table 21**. Proposed treatments to address identified risks at specific locations along the route are outlined in **Table 22**.

TABLE 21: COOMBES ROAD OVERALL ROUTE TREATMENTS

COOMBES ROAD	
ROUTE TREATMENT	BENEFIT
Short term	
Provide a painted chevron buffer between the shoulder and traffic lane, west of Messmate Road, in accordance with the dimensions given above (to be implemented in conjunction with programmed linemarking renewal).	Provide separation between cyclists and vehicular traffic
Provide bike symbols on shoulders at regular intervals	Increase driver awareness of potential presence of cyclists
Provide RRPMs along edge of traffic lane	Improve visibility of edgeline and reduce vehicle encroachment of shoulder
Provide green surface treatment for cyclists across intersections	Increase driver awareness of potential presence of cyclists
Provide *Cyclists Share the Road* signage at each end of route	Increase driver awareness of potential presence of cyclists
Long term	
Increase width of shoulders west of Ghazeepore Road and west of Messmate Road to 1.5m (+ buffer)	Increased space for cyclists
Maintenance	
Maintain grass along road edge, particularly under barriers	Minimise encroachment of grass on shoulders

TABLE 22: COOMBES ROAD PROPOSED LOCALISED TREATMENTS

COOMBES ROAD		
LOCATION	TREATMENT	BENEFIT
Anglesea Road - westbound	Provide green surface treatment and bike symbols approaching roundabout	Increase driver awareness of potential presence of cyclists
Anglesea Road - eastbound	Shift barrier back from shoulder and localised widening of shoulder to provide consistent width opposite traffic island	Remove pinch point for cyclists opposite traffic island
Messmate Road	Monitor cyclist safety at intersection (following recent upgrade to roundabout).	If cyclist safety issues are identified in the future, consider upgrade to Dutch style roundabout to provide separation of cyclists to further reduce potential cyclist-vehicle conflicts.

4.1.8 Merrijig Drive

To cater for commuter and local cycling trips, a continuous off-road path is desirable for the full length of Merrijig Drive and would be a worthwhile long-term vision for the route.

In the short term, the existing bicycle lanes provide a connection between Fischer Street and Surf Coast Highway, although some improvements have been identified.

The Fischer Street Cycling Corridor upgrades include a Dutch Style roundabout at Merrijig Drive with priority crossings for pedestrians and cyclists across the eastern and western legs. This is supported to reduce potential cyclist-vehicle conflicts.

The overall route treatments are outlined in **Table 23**. Proposed treatments to address identified risks at specific locations along the route are outlined in **Table 24**.

TABLE 23: MERRIJIG DRIVE OVERALL ROUTE TREATMENTS

MERRIJIG DRIVE	
ROUTE TREATMENT	**BENEFIT**
Short term	
Provide green surface treatment for cyclists at intersections along route west of Fischer Street	Increase driver awareness of potential presence of cyclists
Long term	
Investigate upgrading/widening path on northern side between Yallock Circuit and Fischer Street suitable for shared use and sign as shared path	Off-road alternative for cyclists reduces potential cyclist-vehicle conflicts
Investigate upgrading path on northern side east of Fischer Street suitable for shared use and sign as shared path	Off-road alternative for cyclists reduces potential cyclist-vehicle conflicts

TABLE 24: MERRIJIG DRIVE PROPOSED LOCALISED TREATMENTS

MERRIJIG DRIVE		
LOCATION	**TREATMENT**	**BENEFIT**
Rosser Boulevard	Provide directional arrows for cyclists to transition from bike lanes to off-road path at roundabout	Encourage cyclists to move off-road to reduce potential cyclist-vehicle conflicts
McLean Street and Scott Avenue	Convert raised platforms to wombat crossings	Assists connection to shared path
Fischer Street	Dutch style roundabout (pedestrian and cyclist priority crossing for eastern and western legs)	Separation of cyclists at roundabout will reduce potential cyclist-vehicle conflicts

4.1.9 Beach Road

The overall vision for Beach Road, in the short term, is separated parking and bicycle lanes, along with raised platforms at several locations to reduce vehicle speeds along the road.

A long term vision for the route is a shared path to support the function of the route as a priority commuter/school route. Note the Pathways Strategy proposes a shared path on the northern side, east of Surf Coast Highway, and on the southern side west of Surf Coast Highway.

The Fischer Street Cycling Corridor upgrades include a Dutch Style roundabout at Beach Road and this is supported to reduce potential cyclist-vehicle conflicts. A current blackspot application for Beach Road proposes provision of three raised platforms as well as 40 km/h speed limit signs and pavement marking.

Proposed route treatments are outlined in Table 25. Proposed treatments to address identified risks at specific locations along the route are outlined in Table 26.

TABLE 25: BEACH ROAD – OVERALL ROUTE TREATMENTS

BEACH ROAD	
ROUTE TREATMENT	**BENEFIT**
Short term	
Implement 40 km/h speed limit	Lower vehicle speeds reduce cyclist crash risk
East of Surf Coast Highway	
Mark separate parking and bicycle lanes (2.0m parking lane + 1.2m bike lane + 2.9m traffic lane)	Provide clear space for cyclists, improve parking discipline
Provide green surface treatment along entire route given limited space for cyclists	Increase driver awareness of bike lane and potential presence of cyclists
Raised pavements at 4 locations along route	Reduce vehicle speeds
West of Surf Coast Highway	
Provide green surface treatment at conflict points and regular bicycle markings	Increase driver awareness of bike lane and potential presence of cyclists
Provide sharrows at Attunga Drive roundabout	Increase driver awareness of bike lane and potential presence of cyclists
Long term	
Shared path on north side (east and west of Surf Coast Highway)	Safer facility for cyclists, supports function as priority commuter/school cycling route

TABLE 26: BEACH ROAD PROPOSED LOCALISED TREATMENTS

BEACH ROAD		
LOCATION	TREATMENT	BENEFIT
The Esplanade	Provide sharrows where bike lane ends	Increase driver awareness of potential presence of cyclists
Fischer Street	*Short term:* Raised priority crossing on eastern leg *Long term:* Dutch style roundabout	Provides a safe crossing point for pedestrians and cyclists Separation of cyclists at roundabout will reduce potential cyclist-vehicle conflicts
Attunga Drive, Baines Crescent and Eton Road	*Medium term:* Raised intersections	Reduce vehicle speeds along route and where there are potential intersection conflicts
Eton Road	*Long term:* Intersection improvements (consider shared path crossing across western leg and connection to Eton Road bike lanes)	Shared path crossing: Provide a safe crossing point for pedestrians and cyclists (noting shared path to south) Provides safe connection between shared path and Eton Road bike lanes

No treatment is proposed at Surf Coast Highway. Desirably the bicycle facility would extend to the intersection, however this cannot be accommodated within the existing carriageway. It is noted that DTP has indicated that sharrows are not to be provided on the approach to arterial roads.

4.1.10 All routes - maintenance

Maintenance issues were commonly identified through the See Sense data and inspections, including debris on the road and poor surface condition (e.g. potholes), impacting the space where cyclists ride. These issues can significantly impact the riding experience for cyclists and is a potential safety issue, for example, a cyclist swerving to avoid debris may move into the path of a vehicle.

It is recommended that Council review road management practices with a view to increasing frequency of maintenance and road sweeping (including shoulders and bike lanes) on key cycling routes.

5 TREATMENT PRIORITISATION

A comparative analysis of treatments along each route has been undertaken to prioritise proposed treatments. The analysis has considered a range of factors as follows:

- Risk assessment
- Cyclist safety improvement
  -  treatment aligned with Safe System outcomes
  -  Safety improvement
- Feasibility & environment:
  - Feasibility to implement (Council managed roads vs. arterials, environmental, cultural, parking and infrastructure impacts)
  - Environmental impact (including loss of trees/vegetation).
- Cost: Low <$30,000 | Medium $30,000-$100,000 | High $100,000-$500,000 | Very High >$500,000
- Priority: High | Medium | Low
- Timeframe: Short-term | Medium-term | Long-term

The comparative analysis and treatment priorities for each route are provided in **Tables 28 to 36.**

TABLE 27: SOUTH BEACH ROAD PROPOSED TREATMENTS AND PRIORITISATION

SOUTH BEACH ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
General Lack of separation between vehicles and on-road cyclists - braking incidents may indicate cyclist-vehicle interactions	*Rare / Serious /* Medium	**Painted buffer along route** to assist in reducing vehicle speeds and increase separation between vehicles and cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Physical separation between vehicles and cyclists, e.g. by provision of kerb separators	Safe System aligned	Feasibility: Moderate (would require drainage works & infrastructure) Env. impact: Low	Very High	Low	Long-term
General Lack of bicycle markings	*Rare / Serious /* Medium	**Regular bicycle markings** to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term

SOUTH BEACH ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
General Conflict points - at intersections and start/end of bike lane	*Rare* / *Moderate* / Low	**Green surface treatment at conflict points** to increase driver awareness of potential presence of cyclists to reduce risk of conflicts	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Medium	Medium-term
Opposite Lisieux Catholic School Transition from shoulder to off-road path for eastbound cyclists opposite Lisieux Catholic School - some cyclists stay on-road	*Rare* / *Serious* / Medium	**Cyclist transition to off road path** opposite Lisieux Catholic School, including green surface treatment (to encourage cyclists to transition)	Safe System aligned	Feasibility: Good Env. impact: Low	Low	High	Short-term
Scorpio Street High vehicle speeds west of Sagittarius Street Surface changes near Scorpio Street	*Rare* / Serious / *Medium*	**Raised intersection at Scorpio Street** to reduce vehicle speeds where braking/ swerving incidents are occurring and there are potential intersection conflicts	Safe System aligned	Feasibility: Good Env. impact: Low	High	Medium	Long-term
Legacy Drive Potential conflicts with vehicles at Legacy Drive	*Rare* / Moderate / *Low*	**Raised intersection at Legacy Drive** to control vehicle speeds along the route and where there are potential intersection conflicts	Safe System aligned	Feasibility: Good Env. impact: Low	High	Low	Long-term

SOUTH BEACH ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Gravel driveways on northern side Debris on shoulder (may result in swerving incidents) – this has a significant impact on the usability of road space for cyclists and will often force cyclists into the traffic lane	*Rare / Serious /* Medium	**Seal 5-6m of gravel driveways (northern side)** to remove potential for gravel spill onto the road in the path of cyclists (and reduce likelihood of cyclists in traffic lane)	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Medium	Long-term
Properties on northern side Bins left on shoulder - may result in swerving incidents and force cyclists into the traffic lane	*Rare / Serious /* Medium	**Provide bin platforms (northern side)** to reduce potential for bins on road in the path of cyclists (and reduce likelihood of cyclists in traffic lane)	Safety improvement	Feasibility: Moderate (requires drainage works) Env. impact: Low	High	Medium	Long-term
Horseshoe Bend Road Conflicts with vehicles at Horseshoe Bend Road roundabout	*Likely / Minor /* Medium	**Full width speed hump** on South Beach Road leg of roundabout to stop vehicles using bike lanes to avoid speed cushions (if warranted)	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Medium* (* Note, See Sense data to be monitored to determine if treatment required)	Medium-term* (* Note, See Sense data to be monitored to determine if treatment required)

TABLE 28: HORSESHOE BEND ROAD PROPOSED TREATMENTS AND PRIORITISATION

HORSESHOE BEND ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
General Lack of separation between vehicles and on-road cyclists	*Unlikely* / *Serious* / High	**Refer to Torquay to Geelong Safe Cycling Corridor project**	-	-	-	-	-
South Beach Road Conflicts with vehicles at South Beach Road roundabout	*Likely* / *Minor* / Medium	**Full width speed hump** on southern approach lane to roundabout to stop vehicles using bike lanes to avoid speed cushions (if warranted) Consider **marking bike lanes** across approach lanes.	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Medium* (* Note, See Sense data to be monitored to determine if treatment required)	Medium-term (if warranted)
Wagtail Avenue to Merrijig Drive **Quay Boulevard to Island Drive** Parking in bike lane	*Rare* / *Serious* / Medium	**Consider additional indented parking along route** – investigate locations with higher parking demand (consider in context with the recommendations of Torquay to Geelong Safe Cycling Corridor project)	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Medium (if aligned with Torquay to Geelong Safe Cycling Corridor project)	Medium-term (if aligned with Torquay to Geelong Safe Cycling Corridor project)

HORSESHOE BEND ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Quay Boulevard Intersection conflicts at roundabout	*Possible / Moderate /* High	**Mark bike lanes through roundabout** to help increase driver awareness of cyclists Convert wombat crossing on Quay Boulevard to **priority shared path crossing**. **Improve connection and wayfinding** by providing a connection from the northbound on-road bike lane to the shared path south of Richards Road, sign as shared path	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
The Esplanade Intersection conflicts at roundabout	*Possible / Moderate /* High	**Provide sharrows and install speed cushions** to reduce vehicle speeds entering roundabout and increase driver awareness of cyclists (as per blackspot proposal)	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Investigate options to bring **cyclists off road** at the roundabout to reduce potential conflicts between cyclists and-vehicles	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Low	High – Very High	Low	Long-term

TABLE 29: THE ESPLANADE PROPOSED TREATMENTS AND PRIORITISATION

THE ESPLANADE							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
General Lack of separation between vehicles and on-road cyclists - braking incidents may indicate cyclist-vehicle interactions	*Unlikely / Serious /* High	**Painted buffer along route** (where feasible), to assist in reducing vehicle speeds and increase separation between vehicles and cyclists **Physical separation between vehicles and cyclists** in some locations using bolt down kerb separators	Safety improvement	Feasibility: Good Env. impact: Low	Medium	High	Short-term
		Extend 40 km/h speed limit to and Horseshoe Bend Road	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
General Conflict with cars entering/exiting parking spaces, particularly cars reversing from angled spaces on eastern side of road	*Unlikely / Minor /* Low	Investigate options to **remove angle parking** from carriageway (long term) to reduce potential for conflicts between cyclists and reversing vehicles	Safety improvement	Feasibility: Moderate (reduced parking spaces) Env. impact: Low	Low (linemarking changes only, higher cost for options to replace parking)	Low	Long-term

THE ESPLANADE							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
North of Beach Road (west side) Vehicles parking in this area and encroaching into bicycle lane	*Rare / Serious /* Medium	**Add chevron markings** where parking not allowed between kerb and bike lane to provide clearer direction to motorists and cyclists and reinforce where parking is permitted	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
Parking opposite Taylor Park Gravel/debris in bike lane (may result in swerving incidents) – this has a significant impact on the usability of road space for cyclists and may force cyclists into the traffic lane	*Rare / Serious /* Medium	**Formalise parking in gravel area** to reduce dirt/gravel being dragged into bike lane	Safety improvement	Feasibility: Moderate (infrastructure, reduced parking spaces) Env. impact: Low	Medium	Medium	Medium-term
Bend south of Gilbert St Squeeze point at bend increases risk of interactions between cyclists and motor vehicles, including vehicles encroaching into cycling lane, and cyclists riding in travel lane	*Rare / Serious /* Medium	**Green surface treatment and bike symbol on bend** to increase motorist awareness of cyclists/bike lane at pinch point	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Cut back kerb to **widen northbound bike lane and provide bolt down Cyclesafe separator** to increase space for cyclists on bend and reduce incidence of motorists cutting into bike lane	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term

THE ESPLANADE							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Bend at Anderson St Squeeze point at bend increases risk of interactions between cyclists and motor vehicles, including vehicles encroaching into cycling lane	*Rare / Serious /* Medium	**Provide Cyclesafe separator** along southbound bike lane around bend to reduce incidence of motorists cutting into bike lane	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
South of Anderson St Squeeze point at end of parking increases risk of interactions between cyclists and motor vehicles,	*Rare / Serious /* Medium	**Re-mark parking lines** to maintain bike lane width (i.e. remove pinch point).	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
South of Price St Narrow bike lane and alignment of traffic lane through this section increases risk of interactions between cyclists and motor vehicles, including vehicles encroaching into cycling lane, and cyclists riding in traffic lane	*Rare / Serious /* Medium	**Re-mark northbound bike lane** to maintain width (i.e. remove pinch point) and increase space for cyclists. Consider **removal of end car space** to provide more space for cyclists.	Safety improvement	Feasibility: Moderate (loss of one parking space) Env. impact: Low	Low	High	Short-term
South of Price St Surface changes (drainage grates) within southbound cycling lane	*Rare / Serious /* Medium	Investigate **improving surface condition/level** around grates in southbound bike lane	Safety improvement	Feasibility: Moderate (infrastructure) Env. impact: Low	TBD	Medium	Medium-term

THE ESPLANADE							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Bell Street intersection Intersection conflicts at roundabout	*Possible / Moderate /* High	**Provide sharrows and install speed cushions** to reduce vehicle speeds entering roundabout and increase driver awareness of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Investigate options to bring **cyclists off road** at the roundabout to reduce potential conflicts between cyclists and-vehicles (potentially utilise existing path on eastern side of roundabout)	Safe System aligned	Feasibility: Moderate (infrastructure Env. impact: Low	High – Very High	Low	Long-term

TABLE 30: BELL STREET PROPOSED TREATMENTS AND PRIORITISATION

BELL STREET							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
General Lack of separation between vehicles and on-road cyclists	*Unlikely* / *Serious* / High	**Painted buffer along route** to increase separation between vehicles and cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Relocate bike lane to kerbside (i.e. in front of parking) east of Rudd Avenue/ Davidson Drive to remove potential conflicts between parking manoeuvres and cyclists (includes concrete separator)	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Low	Very High	Low	Long-term
General Conflict points at intersections	*Rare* / *Moderate* / Low	**Green surface treatment** at conflict points	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Medium	Medium-term

BELL STREET							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
The Esplanade Intersection conflicts at roundabout	*Possible / Moderate /* High	**Provide sharrows and install speed cushions** to reduce vehicle speeds entering roundabout and increase driver awareness of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Investigate options to bring **cyclists off road** at the roundabout to reduce potential conflicts between cyclists and-vehicles (potentially utilise existing path on eastern side of roundabout)	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Low	High – Very High	Low	Long-term
Rudd Avenue Intersection conflicts at roundabout	*Possible / Moderate /* High	**Renew sharrows** (locate opposite splitter islands) to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Provide **wombat crossing** on eastern leg (existing zebra crossing to be removed) to reduce speeds of westbound vehicle on roundabout approach	Safe System aligned	Feasibility: Good Env. impact: Low	Medium	Medium	Short-term

BELL STREET							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Surf Beach Drive No transition from westbound bike lane to off-road path may lead to cyclists remaining on roadway	*Unlikely / Moderate /* Medium	Provide **transition from on-road bike lane to off road path** to encourage cyclists to move off road	Safe System aligned	Feasibility: Good Env. impact: Low	Low	High	Short-term
Surf Beach Drive Potential conflict between vehicles and cyclists at start of eastbound bike lane, and for pedestrians at start of busy mixed-use area	*Unlikely / Moderate /* Medium	Install **raised pedestrian priority (wombat) crossing** east of Surf Beach Drive to reduce vehicle speeds at start of eastbound bike lane and for left turn movements into Surf Beach Drive	Safe System aligned	Feasibility: Good Env. impact: Low	Medium	Medium	Medium-term
Surf Beach Drive Potential conflict where path crosses Surf Beach Drive	*Unlikely / Moderate /* Medium	Install **raised shared path priority crossing** across Surf Beach Drive to provide safe crossing of Surf Beach Drive	Safe System aligned	Feasibility: Good Env. impact: Low	Medium	Medium	Medium-term

TABLE 31: DARIAN ROAD PROPOSED TREATMENTS AND PRIORITISATION

DARIAN ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
General Shared parking-bike lane, lack of separation between vehicles and on-road cyclists, including conflicts with parked cars and buses	*Rare / Serious /* Medium	Mark **separate parking and bicycle lanes** (2.0m parking lane + 1.2m bike lane + 2.9m traffic lane) (as per blackspot proposal)	Safety improvement	Feasibility: Good Env. impact: Low	Medium-High	Medium	Medium-term
		Provide **green surface treatment** along entire route to increase driver awareness of bike lane and potential presence of cyclists along route and at intersections	Safety improvement	Feasibility: Good Env. impact: Low	Very High	Low	Medium-term
		Consider **protected bike lanes or shared path**	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Low to medium	Very High	Low	Long-term

DARIAN ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
General Risks associated with high vehicle speeds along route	*Rare / Serious /* Medium	**Raised pavements** at 7 locations along route to reduce vehicle speeds	Safety improvement	Feasibility: Good Env. impact: Low	High	Medium	Medium-term
The Esplanade Potential conflict between vehicles and cyclists at end of bike lane	*Rare / Moderate /* Low	Provide **sharrows** where bike lane ends approaching The Esplanade to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	Medium	Short-term
The Esplanade Potential conflict between vehicles and cyclists at intersection	*Rare / Moderate /* Low	Provide **right turn storage lane for cyclists** at intersection to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	Medium	Short-term
Fischer Street Potential conflict between vehicles and cyclists at intersection	*Possible / Moderate /* High	**Dutch style roundabout** treatment to increase separation of cyclists at roundabout and reduce potential conflicts between cyclists and-vehicles	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Low	Very High	Medium	Medium-term

TABLE 32: GROSSMANS ROAD PROPOSED TREATMENTS AND PRIORITISATION

GROSSMANS ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
East of Messmate Road Potential conflict where path crosses Grossmans Road	*Rare / Serious /* Medium	**Raised priority shared path crossing** (to connect Briody West shared path to shared path on southern side of road)	Safe System aligned	Feasibility: Moderate (would require lighting) Env. impact: Low	Medium	High* * To be delivered when Briody West shared path is constructed	Medium-term (to be delivered when Briody West shared path is constructed)
East of Messmate Road No dedicated road space or shoulder for cyclists, poor road edges, debris/gravel on road, path on south side not signed as shared path	*Rare / Serious /* Medium	**Sign existing path** on the southern side of Grossmans Road as a Shared Path	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Medium-term
		Shared path extended to Messmate Road to provide a safe off-road path for local cycling, as per Briody West Road Network Plan (caters for residential developments)	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Moderate (some tree removal)	Very High	High* * To be delivered as part of Briody West development	Medium-term (to be delivered as part of Briody West development)

GROSSMANS ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
West of Messmate Road No dedicated road space or shoulder for cyclists, higher vehicle speeds, poor road edges, debris/gravel on road	*Rare / Fatal /* High	Encourage cyclists to use Coombes Road (i.e. where there is a shoulder and buffer is proposed) – through social media, cycling events etc.	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Messmate Road to Ghazeepore Road: **Extend 60 km/h speed zone** to Ghazeepore Road and provide **gateway treatment** to reduce vehicle speeds and crash risk for cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		East of Ghazeepore Road: Provide **kerb & channel** (as per previous concept) to improve road edge conditions and reduce gravel spill from driveways	Safety improvement	Feasibility: Good Env. impact: Low	Very High	Low	Long-term
		West of Ghazeepore Road: Provide **narrow shoulder** (500mm) **and edgeline** (as per previous concept) to provide a buffer to road edge for cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Very High	Low	Long-term

GROSSMANS ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
West of Messmate Road (cont.)		Extend **shared path** west to Merino Drive to provide a safe off-road path for local cycling (caters for residential development to the west)	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Low	Very High	Low	Long-term
Daisy's Garden Supply	*Rare* / *Serious* / Medium	Consider **sealing exit** for first 10m to reduce gravel spill onto road (may result in cyclists swerving)	Safety improvement	Feasibility: Good Env. impact: Low	Low	Medium	Medium
Gravel driveways	*Rare* / *Serious* / Medium	Consider **sealing driveways** for first 5-6m to reduce gravel spill onto road (may result in cyclists swerving)	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Low	Long term

TABLE 33: COOMBES ROAD PROPOSED TREATMENTS AND PRIORITISATION

COOMBES ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Surf Coast Highway to Messmate Road No separation to traffic (Assumes 1.5 m shoulders)	*Rare* / *Serious* / Medium	Increase **width of shoulders** to 1.8m and mark a 300mm buffer to traffic lane to increase space for cyclists	Safety improvement	Feasibility: Good Env. impact: Low	High	Low	Long term
Messmate Road to Ghazeepore Road No separation to traffic, higher vehicle speeds (Assumes 1.8 m shoulders)	*Rare* / *Fatal* / High	Provide a 0.3m **painted chevron buffer** between within the shoulder to provide separation between cyclists and vehicular traffic	Safety improvement	Feasibility: Good Env. impact: Low	Low* * To be done in conjunction with line marking renewal	High	Medium-term (To be done with scheduled line marking renewal)
Ghazeepore Road to Anglesea Road Narrow shoulders (1.0m), no separation to traffic, higher vehicle speeds	*Rare* / *Fatal* / High	Narrow traffic lane to 3.0m and provide a 0.5m **painted chevron buffer** to the shoulder to provide separation between cyclists and vehicular traffic	Safety improvement	Feasibility: Good Env. impact: Low	Low* * To be done in conjunction with line marking renewal	High	Medium-term (To be done with scheduled line marking renewal)
		Increase **width of shoulders** to 1.5m (+ buffer) to increase space for cyclists	Safety improvement	Feasibility: Moderate (infrastructure) Env. impact: Low	High	Medium	Long-term

COOMBES ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Messmate Road intersection Cars failing to give way	*Unlikely / Moderate /* Medium	Note a roundabout is planned at this intersection	Safety improvement Note, Safe System aligned for motor vehicles	Feasibility: Good Env. impact: Low	Funded	High	As per planned schedule
Ghazeepore Road intersection Cars failing to give way	*Unlikely / Moderate /* Medium	Provide **green surface treatment** for cyclists across intersections to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
Anglesea Road Conflicts with vehicles	*Rare / Moderate /* Low	Provide **green surface treatment** and **bike symbols** approaching roundabout to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	Medium	Medium-term
		Shift barrier back from shoulder on northern side and **localised shoulder widening** to provide consistent width opposite traffic island and remove pinch point for cyclists opposite traffic island	Safety improvement	Feasibility: Moderate (infrastructure) Env. impact: Low	Low	Medium	Medium-term

COOMBES ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Other intersections Potential conflicts with vehicles at intersections	*Rare* / *Moderate* / Low	Provide **green surface treatment** for cyclists across intersections to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Low	Medium-term
General No bicycle markings or signage	*Rare* / *Serious* / Medium	Provide **bike symbols on shoulders** at regular intervals to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Provide ***Cyclists Share the Road*** **signage** at each end of route to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
General	*Rare* / *Serious* / Medium	Provide **RRPMs** along edge of traffic lane to improve visibility of edgeline and reduce vehicle encroachment on shoulder	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term

TABLE 34: MERRIJIG DRIVE PROPOSED TREATMENTS AND PRIORITISATION

MERRIJIG DRIVE							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Surf Coast Highway to Fischer Street Lack of separation for on-road cyclists (shared path provided west of Yallock Circuit)	*Rare / Moderate /* Low	Provide **off road option** for cycling (east of Yallock Circuit) – see below					
Yallock Circuit to Fischer Street 2.0m path on northern side not wide enough for shared use (not signed a shared path)	*Rare / Moderate /* Low	Investigate **upgrading/widening path** on northern side suitable for shared use and sign as shared path to provide off-road alternative for cyclists (reduces potential cyclist-vehicle conflicts)	Safety improvement	Feasibility: Moderate (infrastructure) Env. impact: Moderate (may require tree removal)	Medium to High	Low	Long-term
Surf Coast Highway to Fischer Street Potential intersection conflicts	*Rare / Moderate /* Low	Provide **green surface treatment** for cyclists across intersections to increase driver awareness of potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	Medium	Short-term

MERRIJIG DRIVE							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
Fischer Street to Horseshoe Bend Road 2.5m path may not have adequate sightlines and clearances in some locations (not signed a shared path)	*Rare / Moderate /* Low	Investigate **upgrading path** on northern side suitable for shared use and sign as shared path to provide off-road alternative for cyclists (reduces potential cyclist-vehicle conflicts)	Safety improvement	Feasibility: Moderate (infrastructure) Env. impact: Moderate (may require tree removal)	Medium to High	Low	Long-term
Rosser Boulevard Some cyclists stay on-road and mix with vehicles, intersection conflicts	*Unlikely / Moderate /* Medium	Provide **directional arrows** and **green surface treatment** for transition to off-road path to encourage cyclists to move off-road to reduce potential cyclist-vehicle conflicts	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short term
Rosser Boulevard to Yallock Circuit No priority for crossing movements at raised platforms	*Rare / Moderate /* Low	Convert raised platforms to **wombat crossings** near McLean Street and Scott Avenue to facilitate access to shared path	Safety improvement	Feasibility: Good Env. impact: Low	Low	Medium	Short term
Fischer Street Potential conflict between vehicles and cyclists at roundabout	*Possible / Moderate /* High	**Dutch style roundabout** treatment to increase separation of cyclists at roundabout and reduce potential conflicts between cyclists and-vehicles	Safe System aligned	Feasibility: Good Env. impact: Low	Funded	High	Short-term

TABLE 35: BEACH ROAD PROPOSED TREATMENTS AND PRIORITISATION

BEACH ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
General Lack of separation between vehicles and on-road cyclists	*Unlikely / Serious /* High	Implement **40 km/h speed limit** to reduce vehicle speeds and cyclist crash risk	Safe System aligned	Feasibility: Good Env. impact: Low	Low	High	Short-term
East of Surf Coast Highway Shared parking-bike lane, no separation to vehicles, vehicle speeds	*Unlikely / Serious /* High	Mark **separate parking and bicycle lanes** (2.0m parking lane + 1.2m bike lane + 2.9m traffic lane) to provide clear space for cyclists, improve parking discipline	Safety improvement	Feasibility: Good Env. impact: Low	Medium	High	Short-term
		Provide **green surface treatment** in bike lane for entire length to increase driver awareness of bike lane and potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	High	Low	Medium-term
		Raised pavements at 4 locations to reduce vehicle speeds	Safety improvement	Feasibility: Good Env. impact: Low	High	Medium	Short-term

BEACH ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
East of Surf Coast Highway (cont.)		Provide **shared path** (on north side) to provide a safer facility for cyclists, supports function as priority commuter/school cycling route	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Moderate (possible tree removal)	Very High	Low	Medium-long-term
The Esplanade Potential conflict between vehicles and cyclists at end of bike lane	*Rare / Moderate /* Low	Provide **sharrows** where bike lane ends approaching The Esplanade	Safety improvement	Feasibility: Good Env. impact: Low	Low	Medium	Short-term
Fischer Street Potential conflict between vehicles and cyclists at intersection	*Possible / Moderate /* High	Provide **priority crossing** for pedestrians and cyclists on eastern leg to provide safe crossing of Beach Road	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Low	Funded	High	Short term
		Dutch style roundabout treatment to increase separation of cyclists at roundabout and reduce potential conflicts between cyclists and-vehicles	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Low	Very high	Medium	Long-term

BEACH ROAD							
LOCATION / ISSUE	**RISK ASSESSMENT**	**RECOMMENDED TREATMENT**	**CYCLIST SAFETY TREATMENT**	**FEASIBILITY & ENVIRONMENT**	**COST**	**PRIORITY**	**TIMEFRAME**
West of Surf Coast Highway East of Kooringa Place: No dedicated bike facility, conflicts with turning movements of vehicles West of Kooringa Place: No separation to vehicles, lack of pavement markings/signage for bike lanes	*Unlikely / Moderate /* Medium *Rare / Moderate /* Low	Provide **shared path** (on north side) to provide a safer facility for cyclists, supports function as priority commuter/school cycling route	Safe System aligned	Feasibility: Moderate (infrastructure) Env. impact: Moderate (possible tree removal)	Very High	Low	Long-term
		Provide **green surface treatment** at conflict points and **regular bicycle markings** west of Kooringa Place to increase driver awareness of bike lane and potential presence of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Medium	Medium	Medium-term
		Provide sharrows at Attunga Drive roundabout to increase driver awareness of cyclists	Safety improvement	Feasibility: Good Env. impact: Low	Low	High	Short-term
		Raised intersections at 3 locations to reduce vehicle speeds	Safety improvement	Feasibility: Good Env. impact: Low	High	Low	Long-term

6 CONCLUSION

This project combined analysis of innovative smart bicycle light data with traditional data sources (crash data, traffic data, road asset data, community input and site inspections) to identify high risk cyclist locations and key safety issues for cyclists along eight local routes in Torquay.

The project developed recommendations and concept plans focusing on short- to medium-term measures to make cycling safer along these routes.

The smart light bicycle data and perception reports were found to add value to the project by:

- highlighting specific locations and safety issues that might otherwise have been missed when considering traditional data sources only - for example bins left on the shoulder on South Beach Road blocking cyclists' path
- indicating how often (comparatively) cyclists encounter certain safety issues.

From this analysis, a program of low-cost, Safe System-aligned countermeasures was developed, with additional long-term and/or higher-cost treatments also been recommended for some routes.

APPENDIX A

CRASH MAPS

South Beach Rd

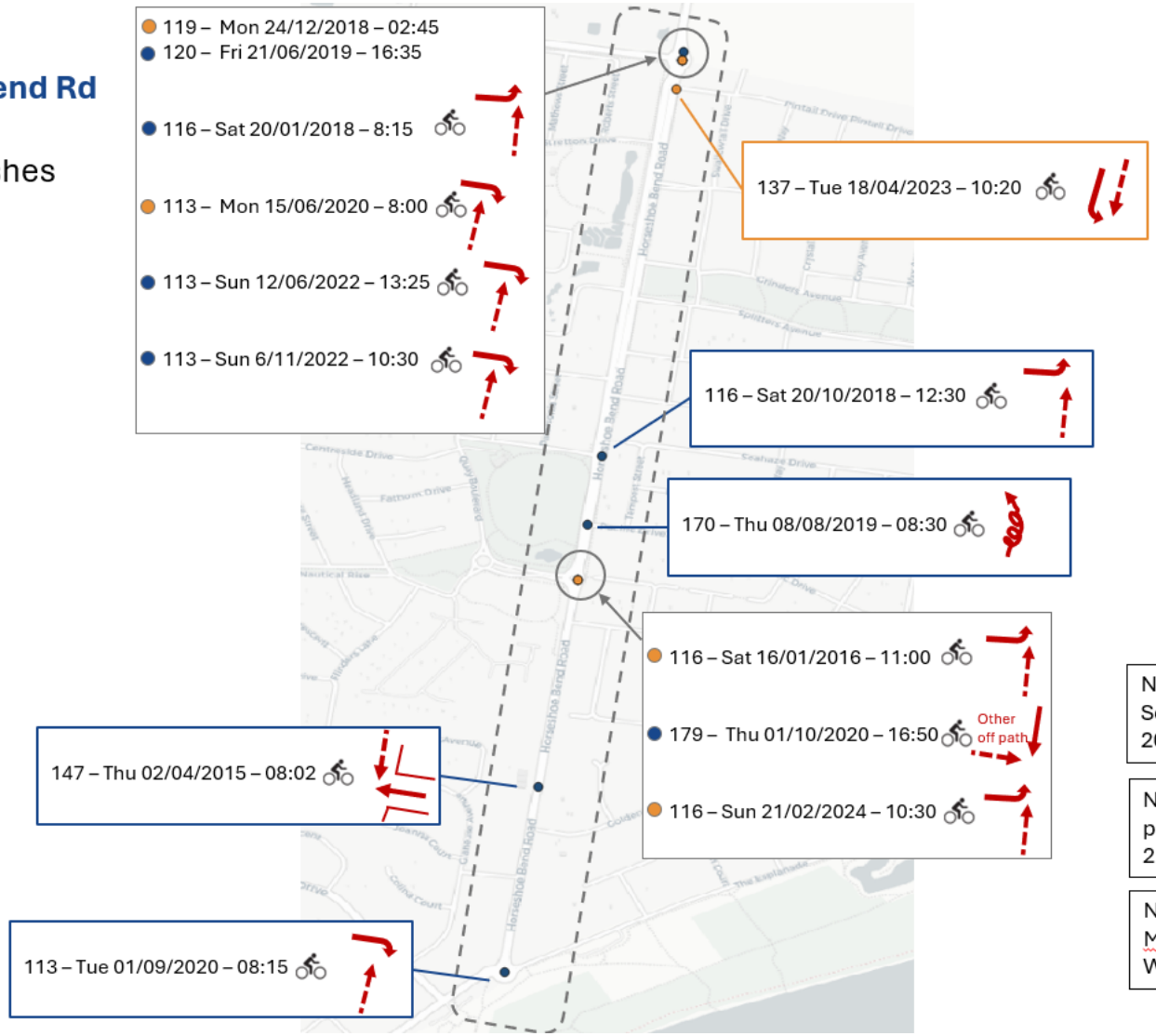
18 crashes

5 cyclist crashes

Horseshoe bend Rd

14 crashes

12 cyclist crashes



Note: speed cushions installed at South Beach Road roundabout in late 2023

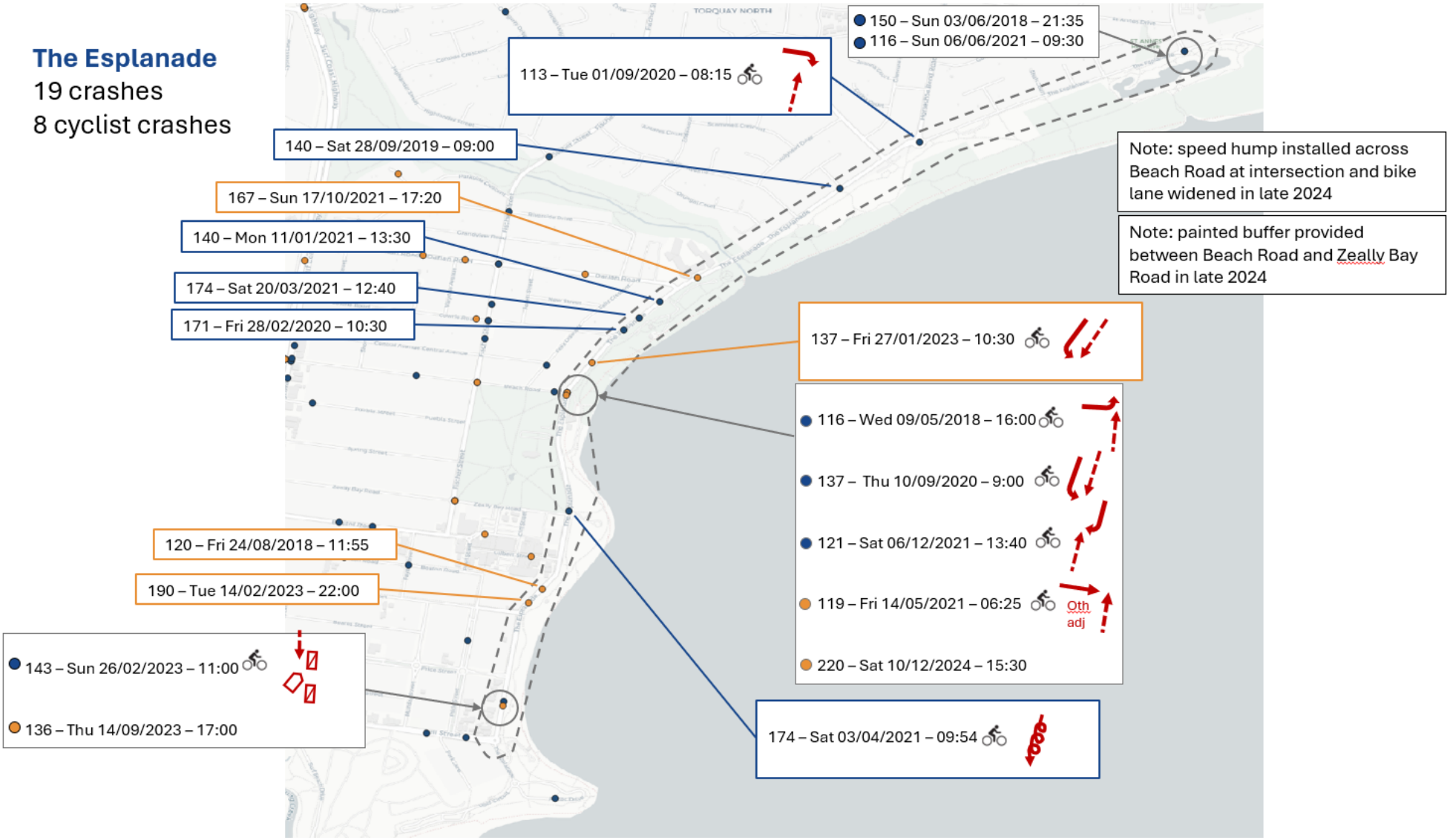
Note: green surface treatment provided across side streets in late 2023

Note: wombat crossings installed on Merriiig Drive, Quay Blvd and Pacific Way approaches to HSB Rd in 2023

The Esplanade

19 crashes

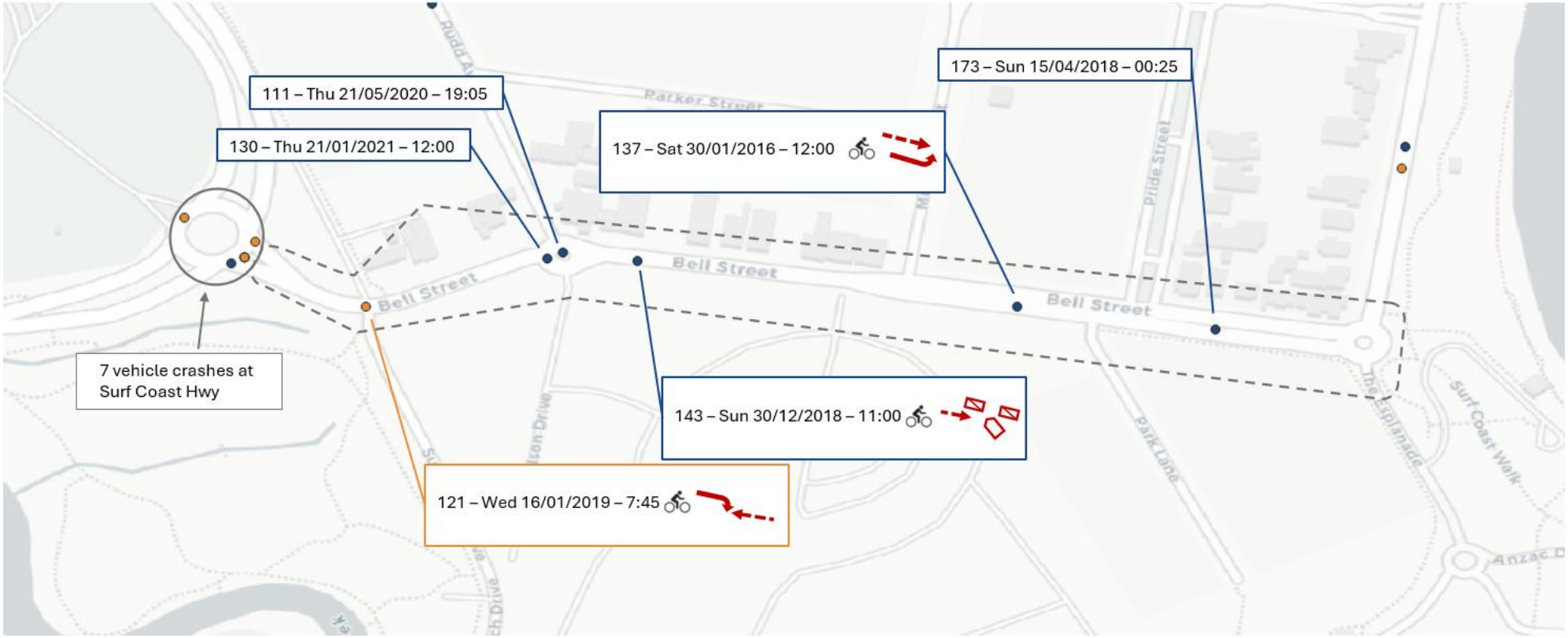
8 cyclist crashes



Bell St

6 crashes

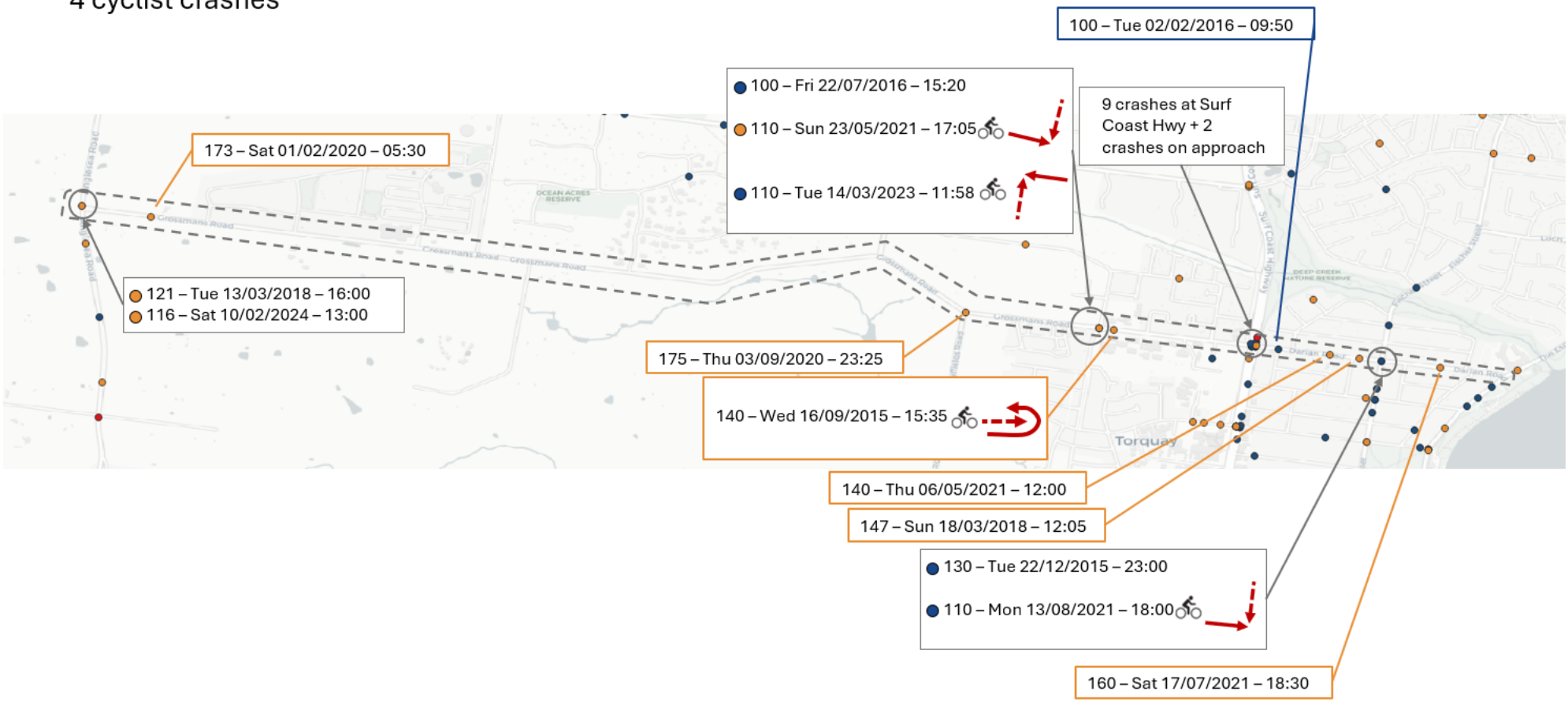
3 cyclist crashes



Grossmans Rd / Darian Rd

23 crashes

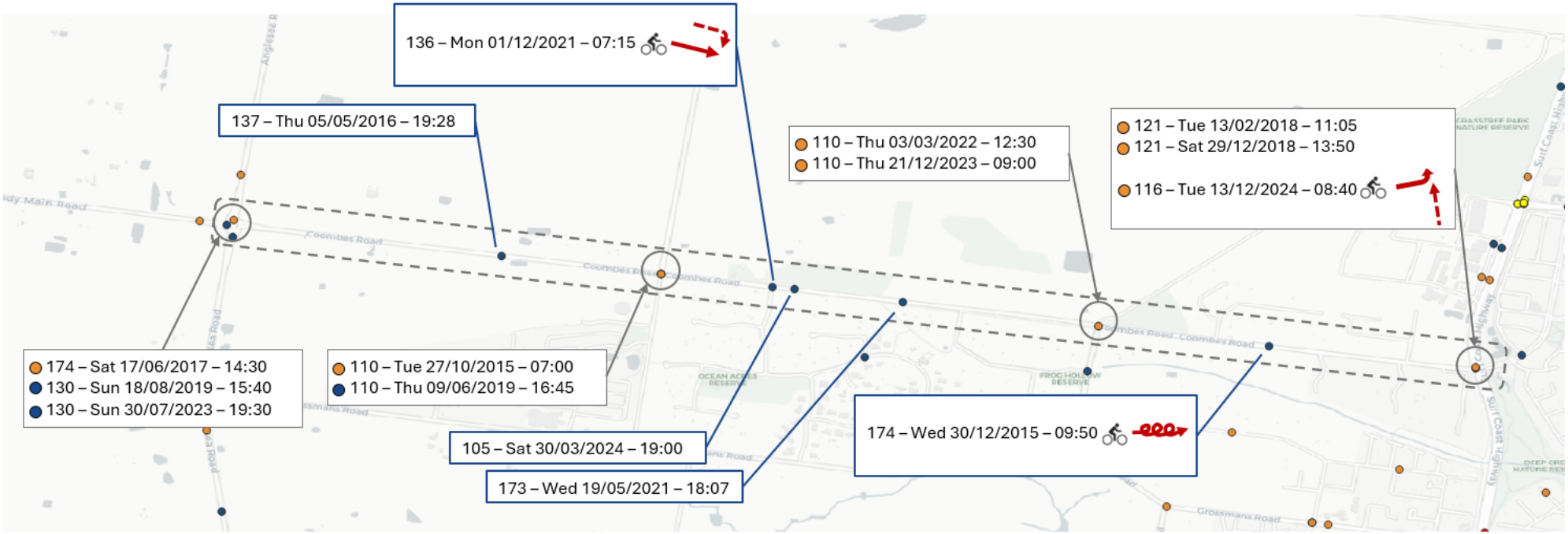
4 cyclist crashes



Coombes Rd

18 crashes

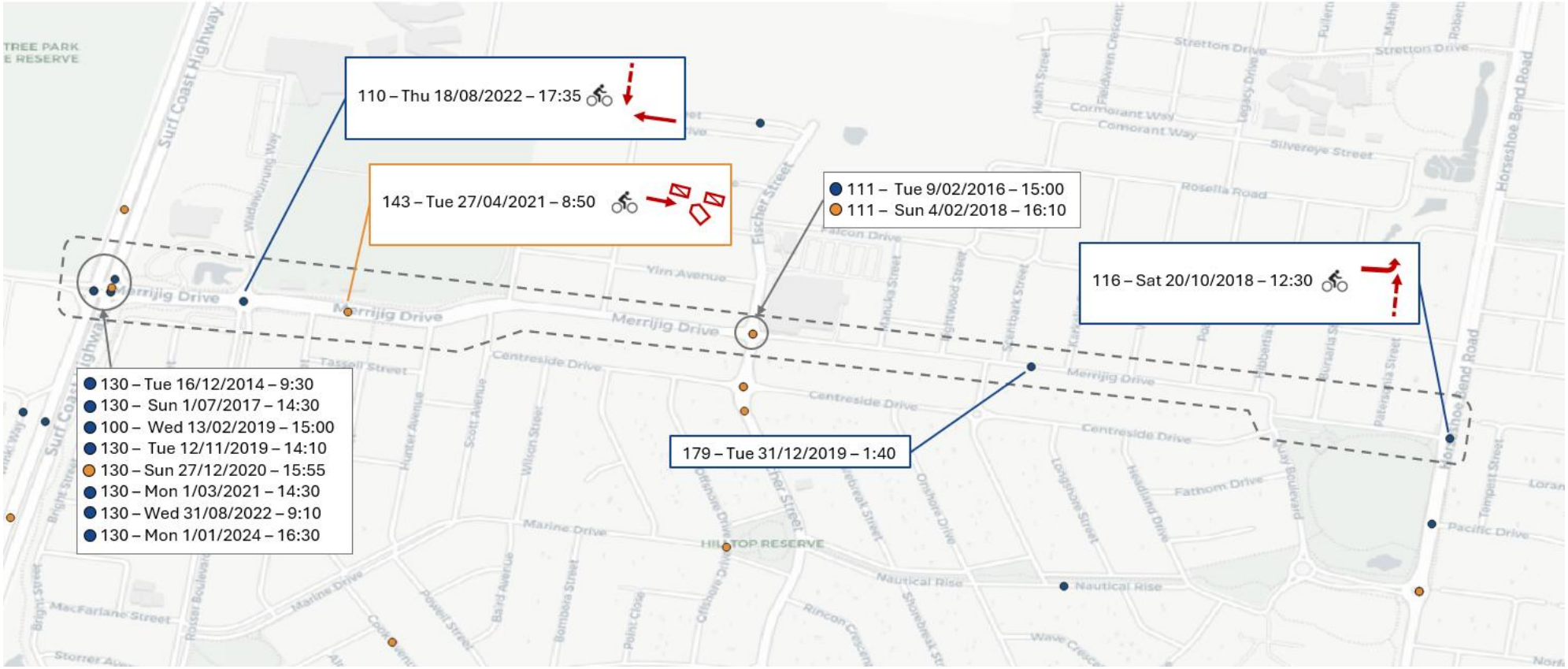
3 cyclist crashes



Merrijig Dr

14 crashes

3 cyclist crashes

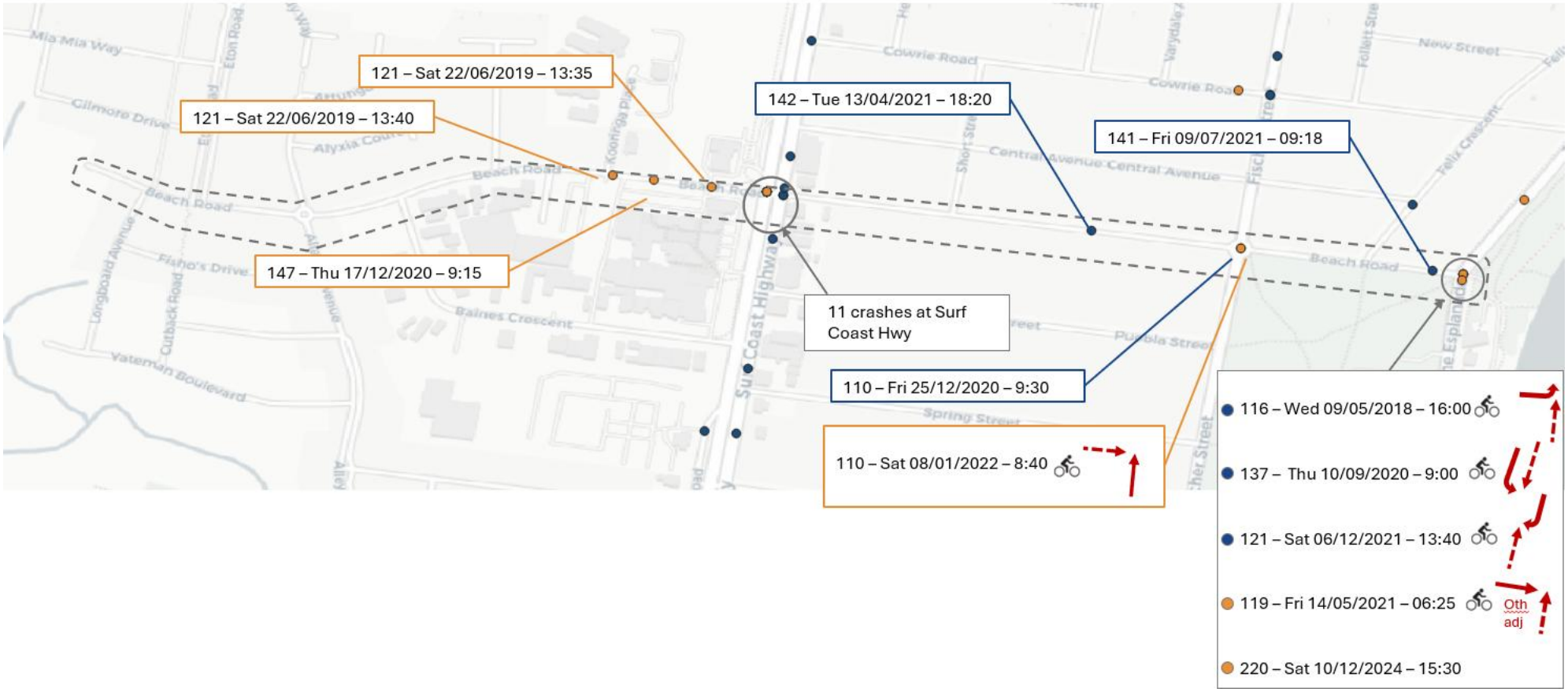


Beach Rd

25 crashes

5 cyclist crashes

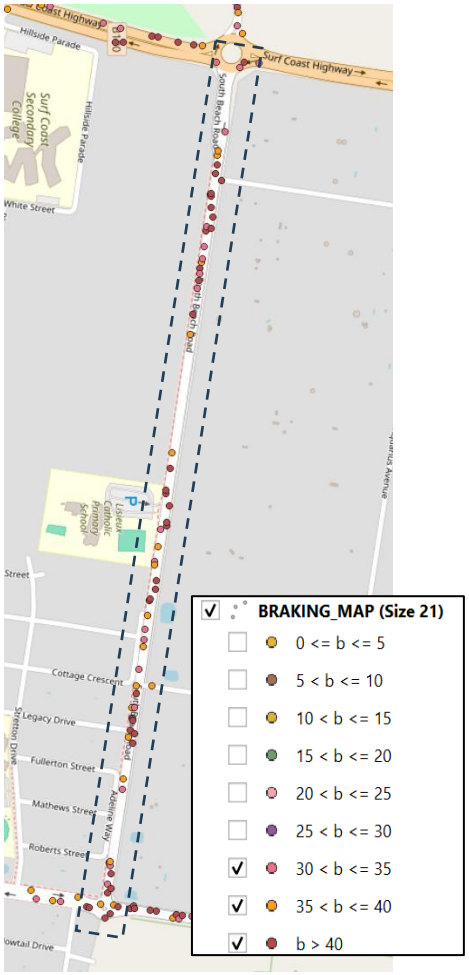
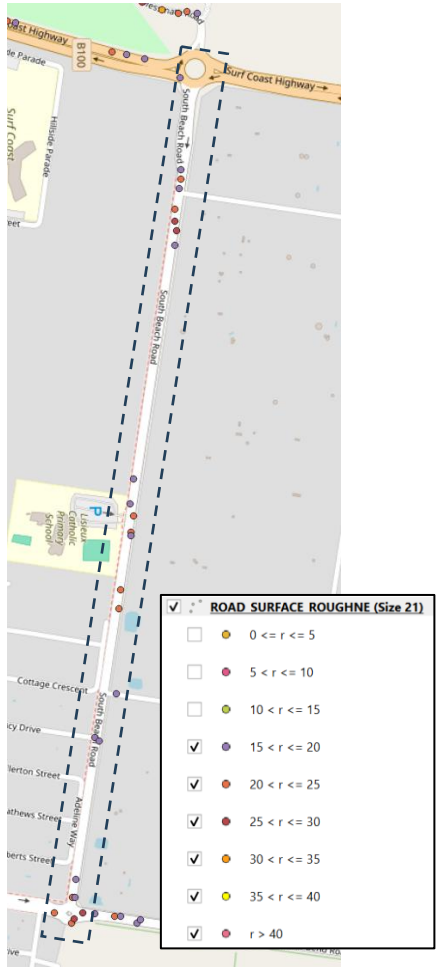
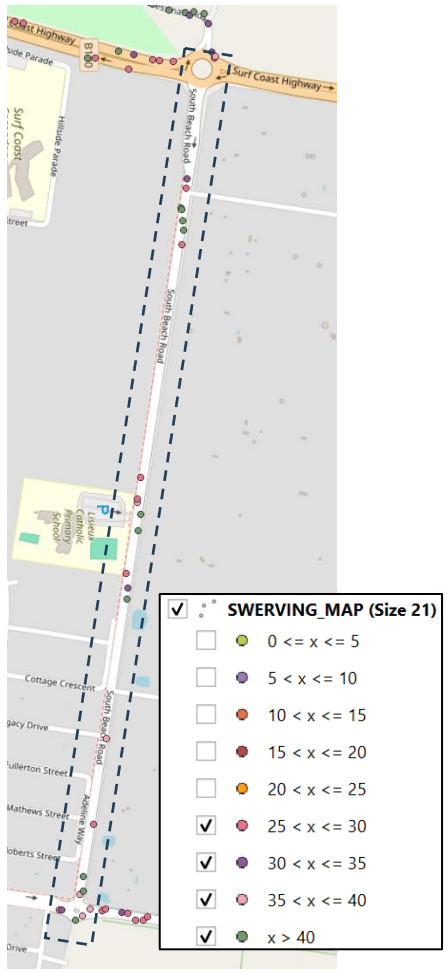
Note: speed hump installed across Beach Road approach to Surf Coast Hwy

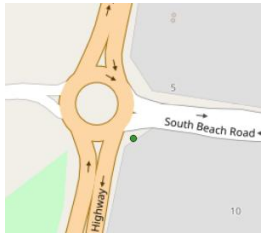
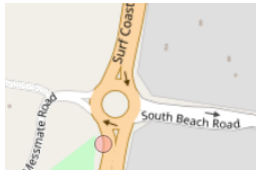
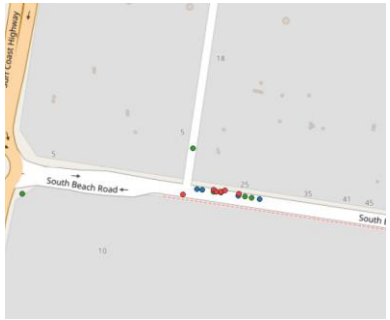


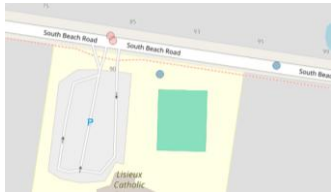
APPENDIX B

SUMMARY OF DATA ANALYSES

SOUTH BEACH ROAD

BRAKING MAP (SIZE 21)	ROAD SURFACE MAP (SIZE 21)	SWERVE MAP (SIZE 21)
		

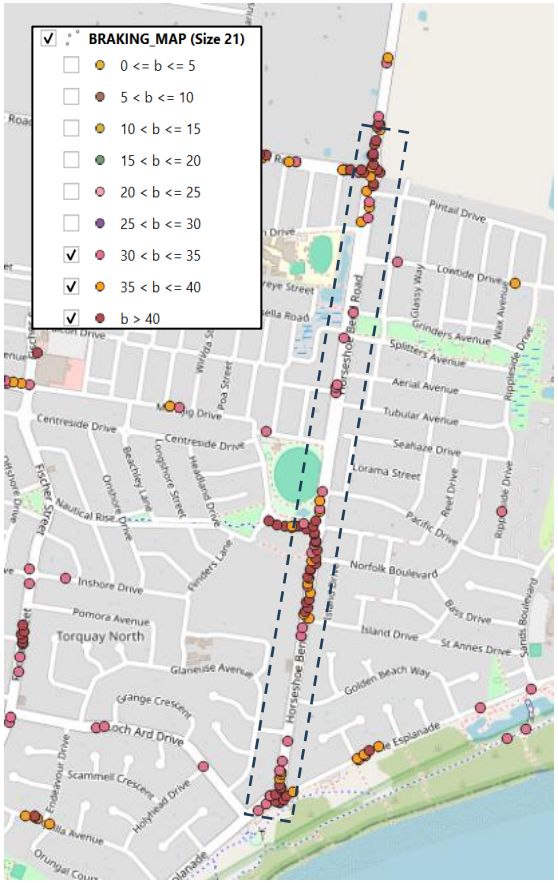
SOUTH BEACH ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Intersection of Surf Coast Highway and South Beach Road 	1 perception report: Obstruction x 1  *Comments summary:* Debris in bike lanes on Surf Coast highway, particularly in the dedicated lanes at the South Beach Road roundabout,	- Swerve (in roundabout) - Debris in bike lanes (Surf Coast Highway) - 1 bike crash (not on South Beach Road approach)	- Sweep bike lanes on Surf Coast Highway approaches to the roundabout and through the roundabout - Mark bike lanes in roundabout across entry lanes - Provide kerb separators on departure and opposite splitter islands *Long term: Raised platforms on Surf Coast Highway approaches to roundabout to reduce vehicle speeds*
East of Scorpio Street 	2 perception reports: Close Pass x 1, Obstruction x 1  *Comments summary:* - Bins left in bike lane - Multiple close passes by trucks/large utes	- Braking, surface and swerving (mostly north side) - Road surface changes from smooth seal to coarse asphalt (eastbound) - Braking at Scorpio Street - Bins left in bike lane - Close passes - No bike crashes - High 85th %ile vehicle speed (79 km/h) - Debris on shoulder	- Widen driveways to create level area for bin placement (liaise with residents and contractors) - Mark buffer between bike lane/shoulder and traffic lane (whole route) - Provide bike symbols on shoulder (north side, whole route) - Green surface treatment on shoulder across Scorpio Street and Sagittarius Street - Raised platform west of Scorpio Street to reduce vehicle speeds before potential conflict area - Increase frequency of road/shoulder sweeping

SOUTH BEACH ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Near Lisieux Catholic Primary School 	4 Perception Reports: Close Pass x 2, Obstruction x 2  *Comments summary:* - Bike lane disappears opposite the school on South Beach Road. - Close passes where there is no bike lane. - Bins block the entire bicycle lane, dangerous on downhill section.	- Braking and swerving north side - Surface south side (west of school) - Bins left in bike lane - Bike lane terminates opposite the school and an off road path option is provided, no pavement markings to direct bikes off road - Close passes - No bike crashes - Gravel/dirt on shoulder - 85th %ile speed of 71 km/h 	- Mark off-road path as a bike path and mark transition from shoulder to path for bikes. - Widen driveways to create level area for bin placement (liaise with residents and contractors) - Green surface treatment across school entry/exit - Seal first 5-6m of driveways (northern side) to prevent gravel/dirt being dragged onto shoulder (whole route) - More frequent sweeping of bike lane - Could consider raised platform / intersection near school
Sagittarius Street to Legacy Drive 	2 Perception Reports: Pothole x 1, Obstruction x 1  *Comments summary:* - Bins left in bike lane on South Beach Road	- Braking and surface mid-block - Braking and swerving at Legacy Drive - Bins left in bike lane (see photo below) - Debris in bike lane - Gravel/dirt spread from driveways (north side) - No crashes	- Consult with residents about placement of - Widen driveways to create level area for bin placement (liaise with residents and contractors) - Seal first 5-6m of driveways (northern side) to prevent gravel/dirt being dragged onto shoulder (whole route) - More frequent sweeping of bike lane - Green surface treatment of bike lane across Legacy Drive

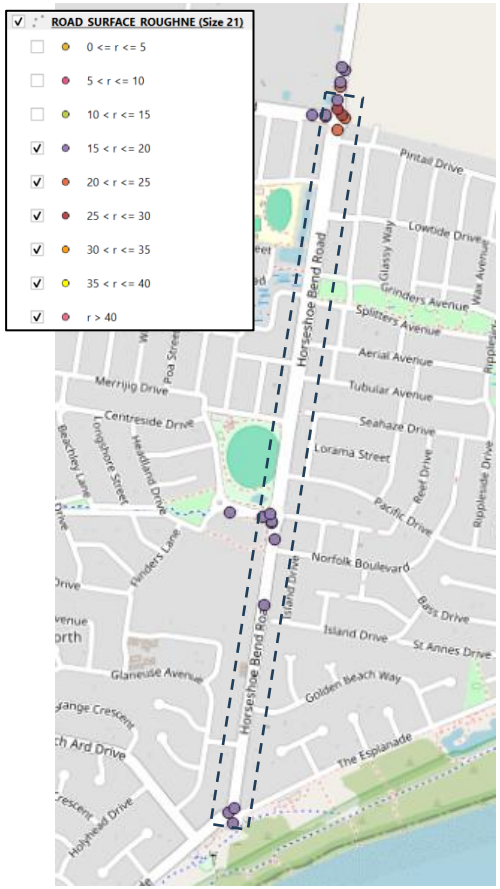
SOUTH BEACH ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
			- Could consider raised platform / intersection (although 85th %ile speeds close to 60)
Horseshoe Bend Road / South Beach Road 	See Horsheshoe Bend Road		

HORSESHOE BEND ROAD

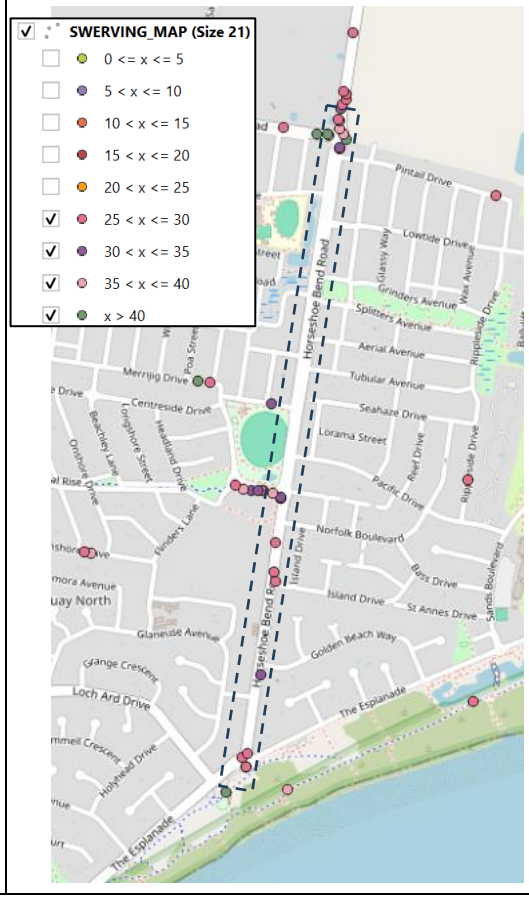
BRAKING MAP (SIZE 21)

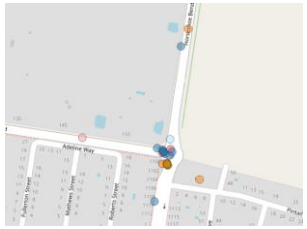
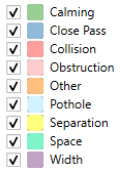


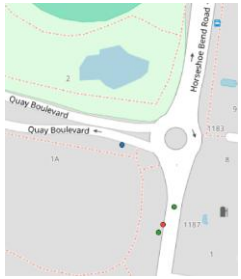
ROAD SURFACE MAP (SIZE 21)

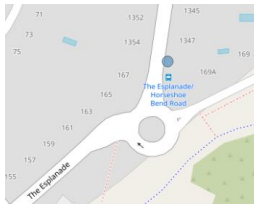


SWERVE MAP (SIZE 21)

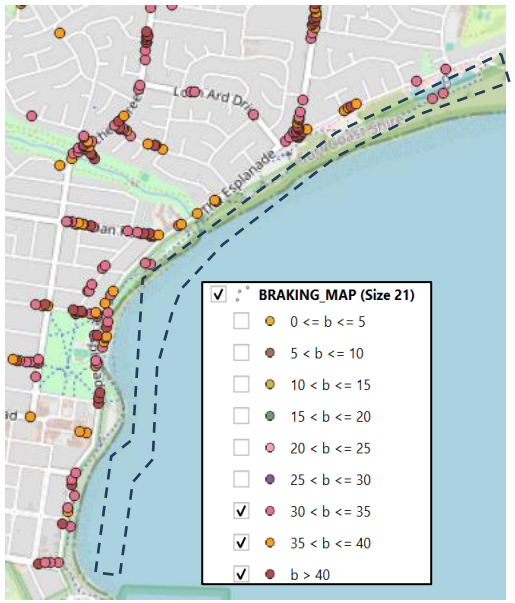
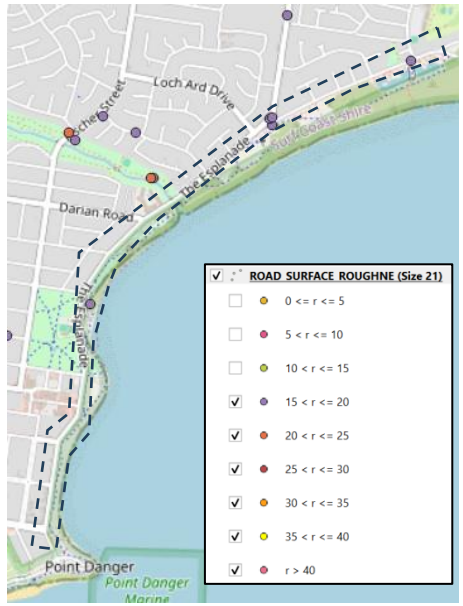
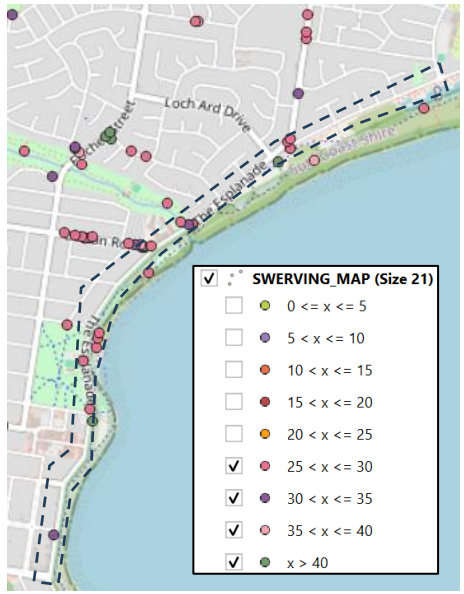


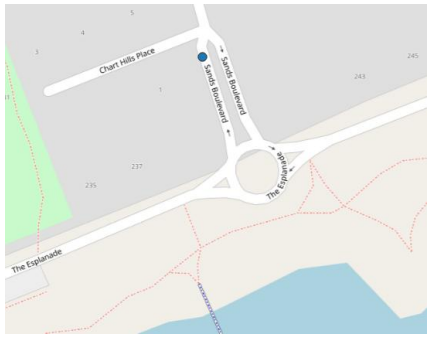
HORSESHOE BEND ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Horseshoe Bend Road / South Beach Road  	23 perception reports: Pothole x 1, Close Pass x 10, Collision x 2, Other x 9, Calming x 1   *Comments summary:* - Road surface is rough, potholes, debris and rubbish in bike lane - Dangerous intersection, vehicles purposely drive in the bike lane to avoid speed hump and slowing down. Speed hump does not make it safer. - Speed hump should extend into the bike lane for it to be effective. - Car failed to give way at roundabout	- Braking, surface and swerving - Vehicles drive in bike lane to avoid the speed hump, separator installed but not effective (see phot below) - Cars fail to give way at roundabout - Rough surface, rubbish and debris in bike lane - 4 bike crashes (all involved vehicles entering from South Beach Road colliding with northbound cyclist) (but no crashes since installation of speed cushions) 	- Mark bike lanes through roundabout - Monitor See Sense and crash data to evaluate if recent changes to roundabout are effective in reducing cyclist crash risk. - If warranted, replace speed cushions with full width raised platform - More frequent sweeping of bike lane
Grinders Avenue to Merrijig Drive 	3 perception reports: Obstruction x 3  *Comments summary:*	- Braking (mostly southbound) (potentially cyclists moving to right turn lane) - Cars park in the bike lane - No bike crashes	Consider indented parking bays, particularly between Wagtail Ave and Merrijig Drive (west side) *Long term vision (from bike strategy)* - Protected bike lanes between South Beach Road and Quay Blvd

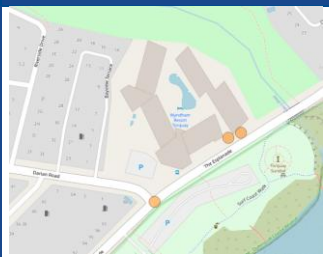
	- Cars parked in the bicycle lane		
HORSESHOE BEND ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Quay Boulevard intersection  	2 perception reports: Close pass x 2  	- Braking and swerving on northbound approach to roundabout - Close passes on northbound approach/entry - 3 bike crashes (2 involved northbound cyclists)	- Mark bike lanes through roundabout/across approach lanes - Convert wombat crossing on west leg to shared path crossing and sign this section of path as shared path. i.e. where path is 2.5m wide. Provide connection for cyclists to come off road south of Richards Road - Wombat crossings being installed on northern and southern legs (funded project)
Quay Boulevard to Island Drive  	Nil	- Braking, swerving and surface - Cars parked in bike lane on east side (opposite VMCH) (see photo below)  - No bike crashes	Investigate whether parking in bike lane on east side is regular occurrence. If so, consider indented parking opportunities.

HORSESHOE BEND ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Penola Street to The Esplanade 	1 perception report: Close pass x 1  *Comments summary:* - Near miss by traffic control utility - Bin in the bike lane near The Esplanade	- Surface and swerving - High parking demand on west side during 2023 due to construction works may have contributed to friction - Bike lane ends on approach to roundabout - No bike crashes	- Indented parking bays - Sharrows at end bike lane - Speed hump/cushions on approaches to roundabout
Horseshoe Bend Road / The Esplanade 	Nil	- Swerving, surface and braking - Bike lanes end approaching roundabout - 1 bike crash (bike travelling NE on The Esplanade struck by car exiting Horseshoe Bend Road)  	-Sharrows and speed cushions on approaches to roundabout (as per blackspot application) - Long term: Dutch style roundabout (similar to Fischer Street / Inshore Avenue)

THE ESPLANADE

BRAKING MAP (SIZE 21)	ROAD SURFACE MAP (SIZE 21)	SWERVE MAP (SIZE 21)
		

THE ESPLANADE			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Near Sands Boulevard 	2 perception reports: Other x 2  *Comments summary:* Driver attempted to overtake approaching roundabout then abusive	- No specific issues - No bike crashes	Long term: Dutch style roundabout could be considered (although traffic volumes are lower in this section)
Horseshoe Bend Road / The Esplanade 	See Horseshoe Bend Road	See Horseshoe Bend Road	- Sharrows and speed cushions on approaches to roundabout (as per blackspot application) Long term: Dutch style roundabout (similar to Fischer Street / Inshore Avenue)
Near Wyndham Resort Torquay	3 perception reports: Other x 3	- Braking and swerving - Glass in bike lane	- More frequent sweeping of bike lane - Narrow traffic lanes and provide buffer to bike lane as per blackspot application

THE ESPLANADE			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
	 *Comments summary:* - Glass in bike lane near the Wyndham - Near miss, truck failed to give way at intersection		
North of Beach Road 	2 perception reports: Obstruction x 1, Other x 1  *Comments summary:* - New lines painted on road very confusing as to where the bicycle lane is (for cyclists and drivers) - Cars parked on yellow line create bottlenecks.	- Swerving, braking and surface - Cars parked in No Stopping - Potential conflicts with cars reversing from angled parking and southbound bikes - 1 bike crash (left turn side swipe, southbound)	- Add chevron markings between kerb and bike lane where no parking permitted, i.e. where yellow line is  - Narrow traffic lanes and provide buffer to bike lane as per blackspot application

THE ESPLANADE			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
			Long term: investigate options to improve safety of parking such as - replace angle parking with parallel parking - replace angle parking with off-street parking (i.e. within foreshore reserve) - provide aisle to access parking spaces from beach side (relocate shared path) - combination of above
Beach Road to Zeally Bay Road 	9 perception reports: Close Pass x 4, Obstruction x 4, Calming x 1  *Comments summary:* - Cars turning right out of Fisho's car park (illegally) almost hit us - Cars parked in bicycle lane (east side)	- Braking, surface and swerving - Interactions with vehicles parking/unparking (cars reversing from angled spaces) - Cars parked in bicycle lane (see aerial below)  - 5 bike crashes at Beach Road (intersection upgrade in 2024 may have addressed crashes)	- Formalise parking in gravel area (east side) - Speed hump at exit from Fisho's carpark Note 2024 works included painted buffer to bike lane, wombat crossing across Beach Road at intersection and green surface treatments at intersections/ conflict points Long term: replace angle parking with parallel parking (could replace with angle parking on southern side of Beach Road)

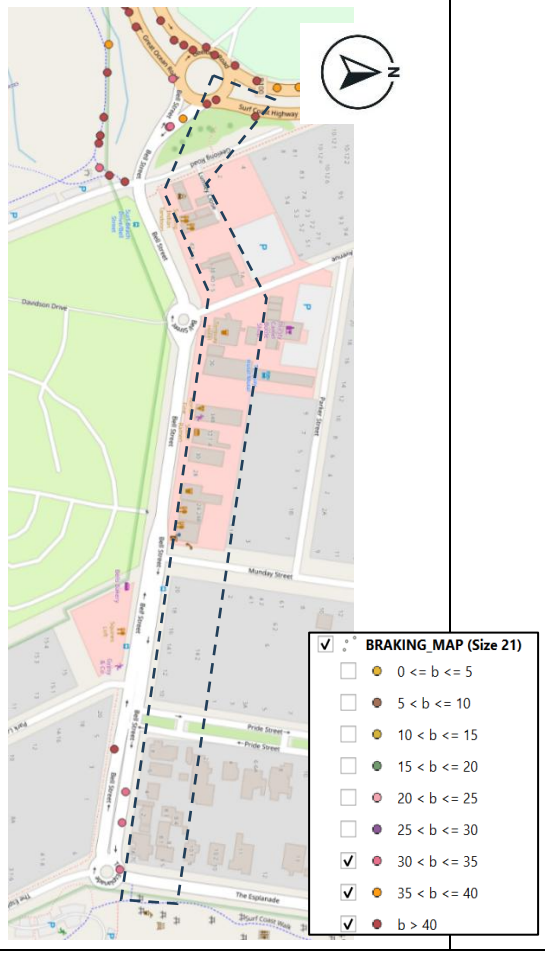
THE ESPLANADE			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
		- 1 bike crash at Zeally Bay Road (out of control)	
Near Gilbert Street 	4 perception reports: Close Pass x 2, Obstruction x 2  *Comments summary:* - Near dooring incident - Vehicle cut the corner - Cars parked on yellow line create bottlenecks. - Car reversing into bike lane not giving way	- Braking, surface and swerving - Interactions with vehicles parking/unparking - Potential dooring - Narrow bike lane around bend, cars cut across bike lane  - No bike crashes	- Buffer between bike lane and traffic lane (as per blackspot application) - Green surface treatment on bend with bike symbol (as per blackspot application); cut back kerb to widen bike lane and provide Cyclesafe separator
Near Anderson Street 	Nil	- Swerving (mostly northbound), surface and braking - Cars cut corner(southbound) - No bike crashes	- Buffer between bike lane and traffic lane north of Anderson Street (as per blackspot application) - Bike symbol prior to intersection (northbound) - Bike symbol and Cyclesafe separator at start of bend (southbound)

THE ESPLANADE			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
			
Near Price Street 	Nil	- Swerving northbound approach to Price Street (bike lane narrow slightly where traffic land deviates)  - Grates in southbound bike lane	- Re-mark bike lane approaching Price Street to maintain width. Consider removing end parking space to provide more space for bike lane before traffic lane deviates - Investigate improving surface conditions/level around grates

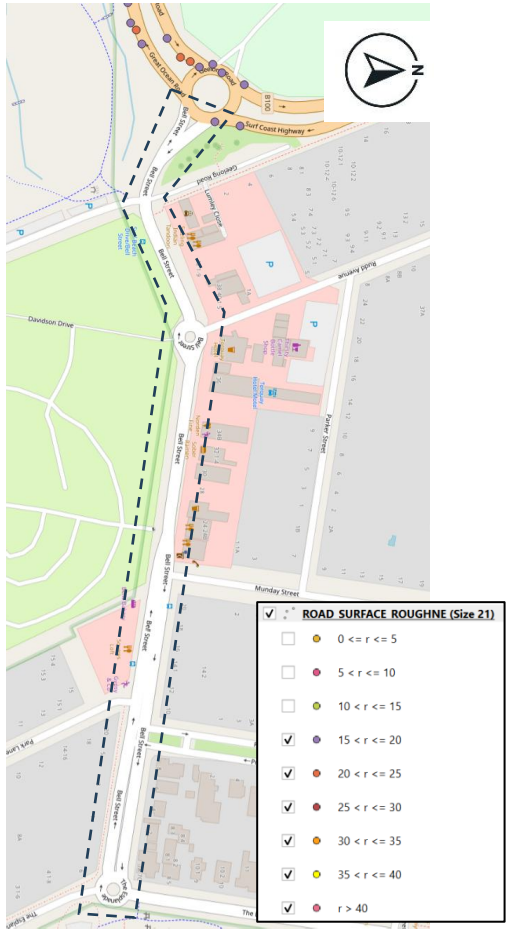
THE ESPLANADE			
LOCATION / SEE SENSE HOTSPOT MAP	SEE SENSE PERCEPTION REPORTS	KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)	POTENTIAL TREATMENTS
			
Bell Street 	Nil	- Swerving, bikes mixing with vehicles - Sharrows faded, not well placed	- Renew sharrows at Bell Street roundabout (locate sharrows opposite splitter islands) Long term: Dutch style roundabout (similar to Fischer Street / Inshore Avenue)

BELL STREET

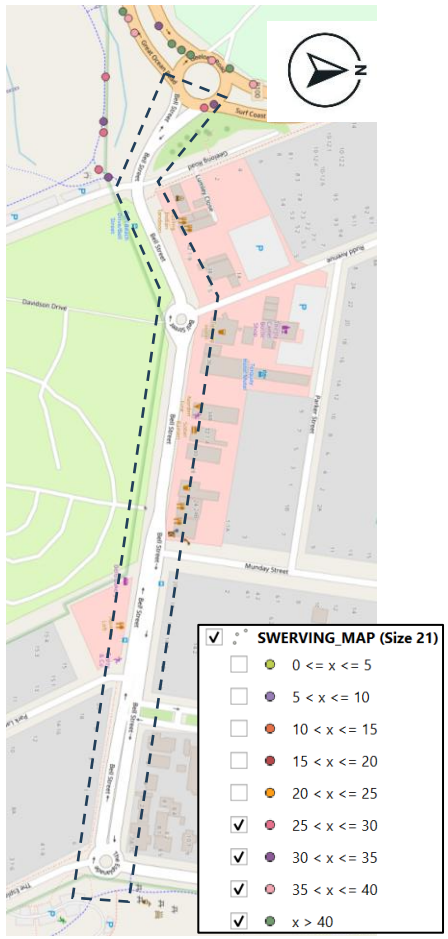
BRAKING MAP (SIZE 21)



ROAD SURFACE MAP (SIZE 21)

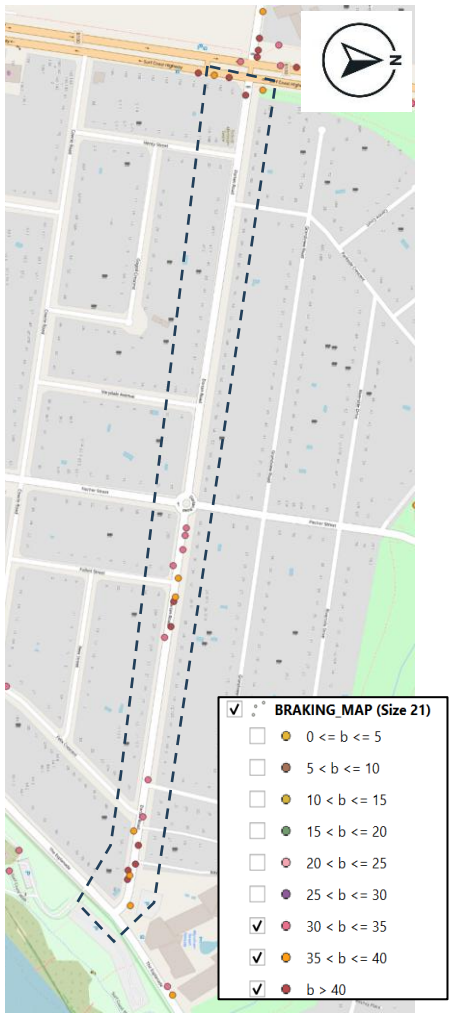
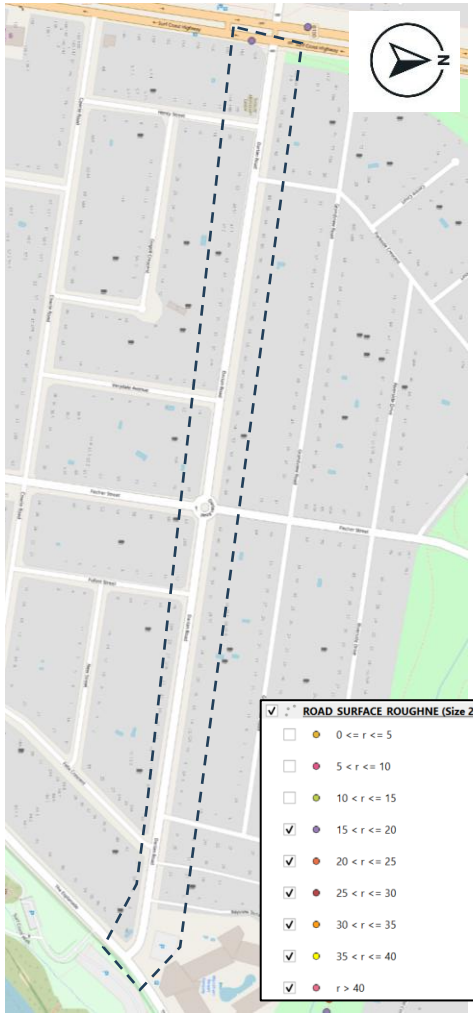
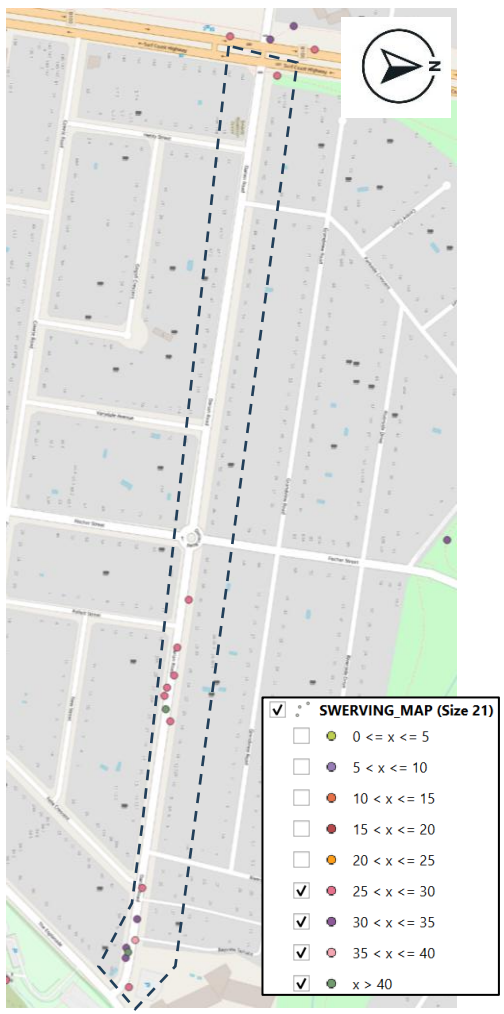


SWERVE MAP (SIZE 21)

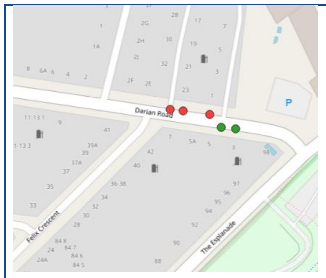


BELL STREET			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Great Ocean Road to The Esplanade 	4 perception reports: Close Pass x 3, Other x 1  *Comments summary:* Poor bike lane width on approach corners to Rudd Street roundabout and Surf Beach Drive, masses of traffic (bike lanes end at these locations) Glass in bike lane	- Lack of separation between bikes and vehicles Conflicts with vehicles parking/unparking - Bikes mixing with vehicles at The Esplanade and Rudd Avenue roundabouts (note swerving at The Esplanade) - Sharrows at The Esplanade and Rudd Avenue faded - Glass in bike lane - 3 bike crashes (2 midblock)	- Provide a painted buffer between bike lanes and traffic lanes (as per blackspot proposal) - Renew sharrows at The Esplanade and Rudd Avenue roundabouts (locate sharrows opposite splitter islands) - Green surface treatment at start of bike lane at western end of Bell Street and across side street intersections - Provide a transition from bike lane to off-road path west of Surf Beach Drive via a raised priority crossing at Surf Beach Drive (as per blackspot proposal) - Install wombat crossings east of Surf Beach Drive and Rudd Avenue and speed cushions on Bell Street at The Esplanade roundabout to reduce vehicle speeds in the vicinity of these intersections (as per blackspot proposal) - More frequent sweeping of bike lanes Long term: East of Davidson Drive/Rudd Avenue, relocate bike lanes to the kerbside and provide physical separator between bike lane and parking. West of Davidson Drive, sign path on south side as a shared user path and provide raised priority crossings at Davidson Drive. This is as per proposed treatment from the SSA project.

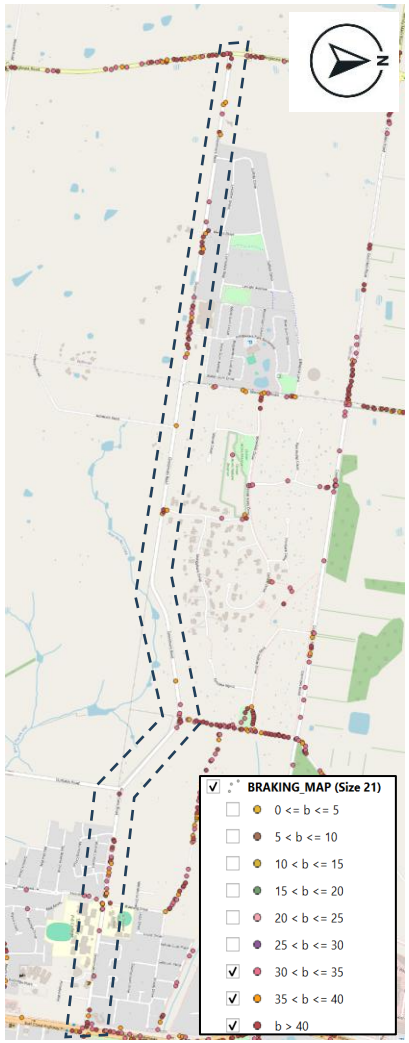
DARIAN ROAD

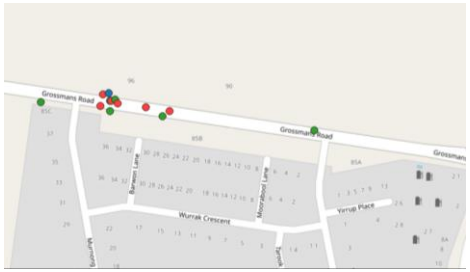
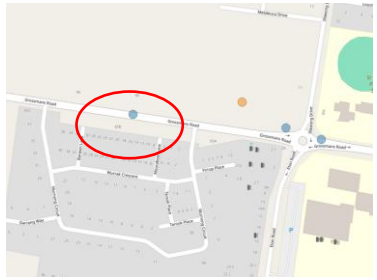
BRAKING MAP (SIZE 21)	ROAD SURFACE MAP (SIZE 21)	SWERVE MAP (SIZE 21)
		

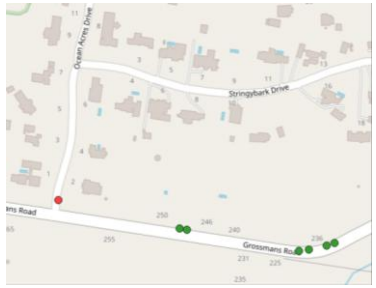
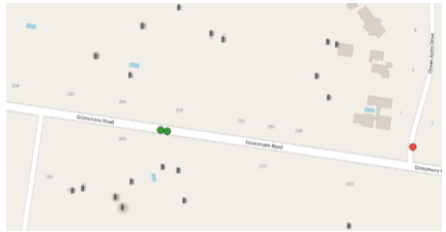
DARIAN ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
General		- 85th percentile speed of 55 km/h (exceed speed limit) - Cyclist conflicts with parking manoeuvres	- Separate bike and parking lane (entire length of road) as per blackspot application - Raised platforms as per blackspot application (to reduce vehicle speeds)
Fischer Street roundabout 	Nil	- Swerving (eastbound approach) - Debris - 1 bike crash	- More frequent sweeping Note roundabout improvements works were undertaken in 2024 *Long term:* - Dutch style bike lanes at roundabout (from Fischer Street corridor proposal)
East of Fischer Street 	Nil	- Surface - Numerous pits, road patching in eastbound (downhill) bike lane 	- Separate bike and parking lane (entire length of road) as per blackspot application - Raised platforms as per blackspot application (to reduce vehicle speeds) - When road re-sealing occurs, ensure smooth transition with pit lids
Felix Crescent to The Esplanade	Nil	- Braking (eastbound) and swerving (westbound) - Potential conflicts with parking and buses (bus stops and higher parking turnover in this section)	- Separate bike and parking lanes (entire length of road), as per blackspot application. Extend bike lane towards The Esplanade intersection. - Provide sharrows where bike lane ends - Provide bike lane symbols, green surface treatment at start of bike lane and through high conflict areas

			- Provide a right turn lane for bikes to store at The Esplanade intersection

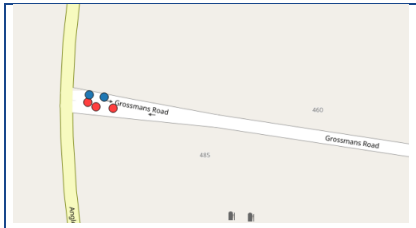
GROSSMANS ROAD

BRAKING MAP (SIZE 21)	ROAD SURFACE MAP (SIZE 21)	SWERVE MAP (SIZE 21)
		

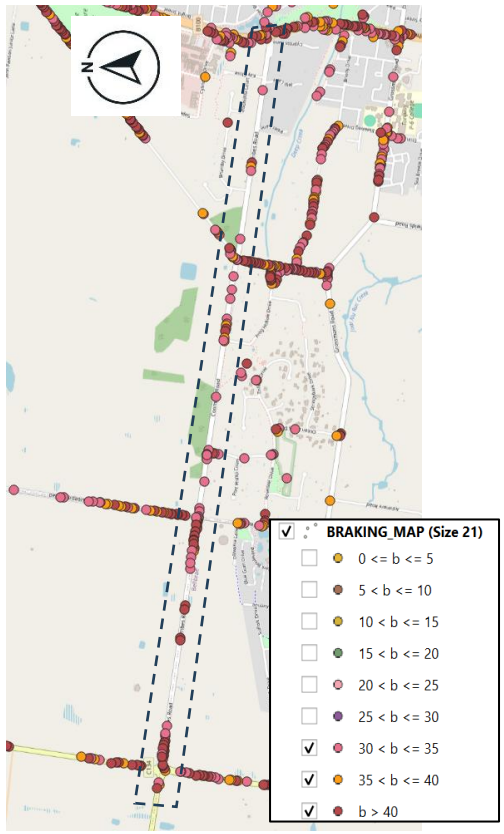
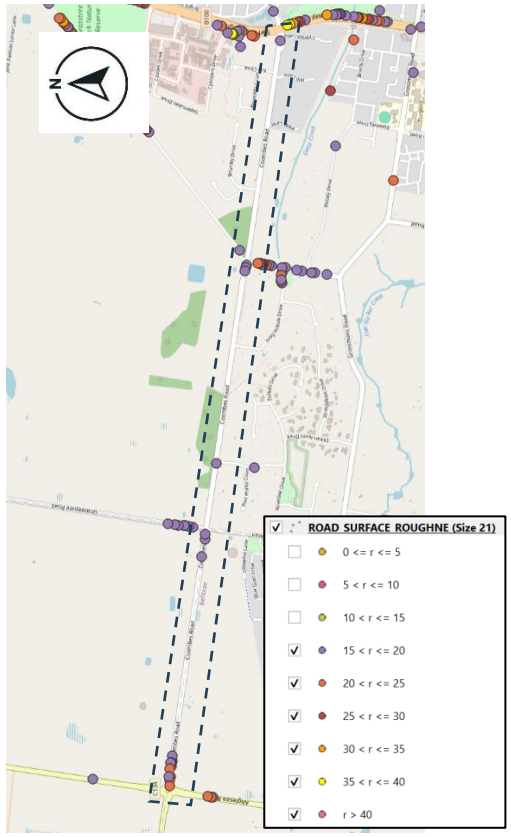
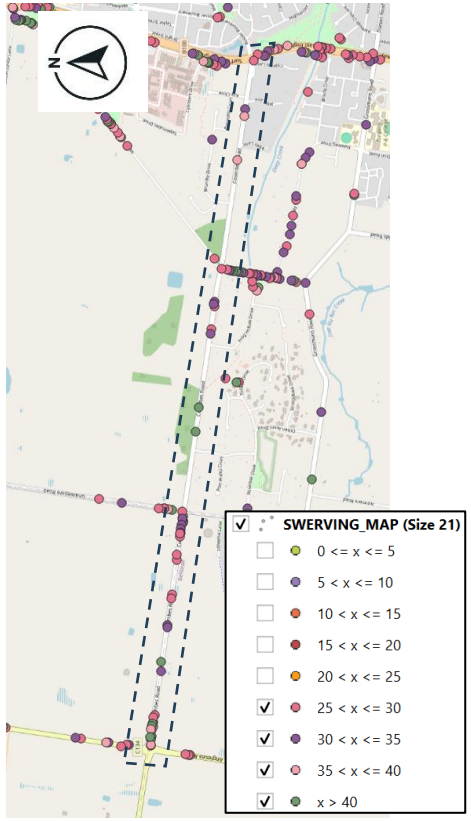
GROSSMANS ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Surf Coast Highway to Eton Road No hotspots along this length	Nil	- Interactions with vehicles and parking manoeuvres	No change as do not want to encourage school children to ride on road in this section
Illawong Drive / Eton Road intersection 	3 perception reports: Close Pass x 2, Other x 1  *Comments summary:* Poor shoulder, traffic unaware Road surface is very rough Car not giving way at the roundabout	- Braking, failure to give way - Rough surface on westbound approach - 2 bike crashes at roundabout (cross traffic) - 1 bike crash east of roundabout with U turning vehicle	No recommendations noting recent works undertaken (sharrows, wombat crossing on east leg and raised platforms on south and west legs in late 2024/early 2025).
Eton Road to Duffields Road 	1 perception report: Close Pass x 1  *Comments summary:* Cars passing closely forced onto soft gravel edge, caused a crash.	- Braking, surface and swerving - Poor road edges (both sides) Eton Road to Murnong Circuit - Potential gravel spill from driveways or interactions with vehicles turning into driveways	- Road edge repairs, particularly Eton Road to Murnong Circuit *Longer term:* - Kerb and channel east of Ghazeepore Road (as per previous concept) will address edge conditions and gravel spill from driveway

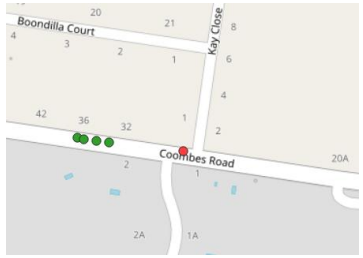
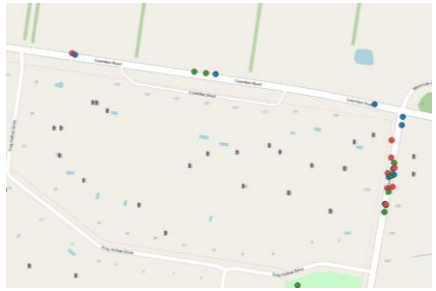
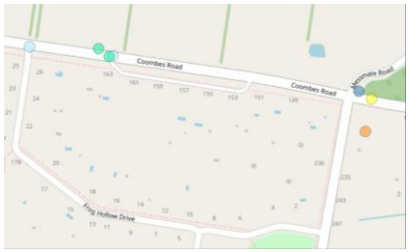
GROSSMANS ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
General	1 perception report: Other x 1 *Comments summary:* Shoulder on Grossmans Rd from Anglesea Road to Torquay is abysmal. Slight rises and bends make it difficult for drivers to overtake but some come very close when they do overtake.	- Lack of shoulder - Passing opportunities limited in some sections - Interactions with vehicles turning into properties - Potential for gravel spill from driveways (mostly ok during site inspection) - Debris at intersections	- Direct cyclists to use Coombes Road where shoulders (currently under construction) will provide space for cycling - Sweep intersections - Edge maintenance
East of Ocean Acres Drive (to bend) 	1 perception report Pothole x 1 	- Swerving, particularly on bend	- Maintenance of edges *Longer term:* - Kerb and channel east of Ghazeepore Road (as per previous concept) will address edge conditions
Ocean Acres Drive to Ghazeepore Road 	3 perception reports: Other x 1, Pothole x 1 and close pass x 1 	- Swerving - Potholes - Driver awareness -Debris at Ghazeepore Road intersection	- Maintenance of edges - Sweep intersection *Longer term:* - Kerb and channel east of Ghazeepore Road (as per previous concept) will address edge conditions

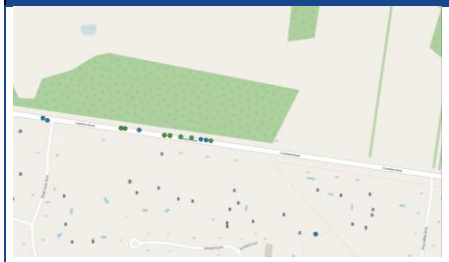
	Comments summary: Several potholes along Grossmans Road. Poor shoulder, traffic unaware		
Ghazeepore Road to Suffolk Drive 	2 perception reports: Pothole x 2  *Comments summary:* Several potholes along Grossmans Road	- Braking, surface and swerve - Poor edges (particularly north side) Suffolk Drive to Kithbrooke Park Blvd - Gravel spill from driveways @ no.400 and Daisy's and at Kithbrooke Park Blvd - Gravel spill from 2 driveways on south side	- Maintenance of edges - Road sweeping - Seal exit from Daisy's Garden Supplies *Longer term:* - Small shoulder (500mm, as per previous concept) will provide a buffer to the edge of seal for cyclists.
Anglesea Road to Suffolk Drive 	Nil	- Swerving (westbound) - Poor road edges and/or put holes may be contributing factors (south side)	- Maintenance of edges *Longer term:* - Narrow shoulder (500mm, as per previous concept) will provide a buffer to the edge of seal for cyclists.
Near Anglesea Road	Nil	- Braking and surface - Island creates squeeze point for westbound cyclists	- Nil

 Grossmans Road 460 Grossmans Road 485			

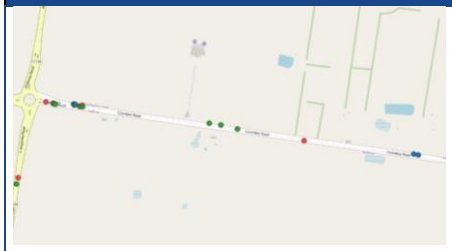
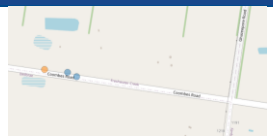
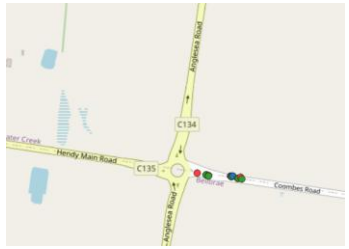
COOMBES ROAD

BRAKING MAP (SIZE 21)	ROAD SURFACE MAP (SIZE 21)	SWERVE MAP (SIZE 21)
		

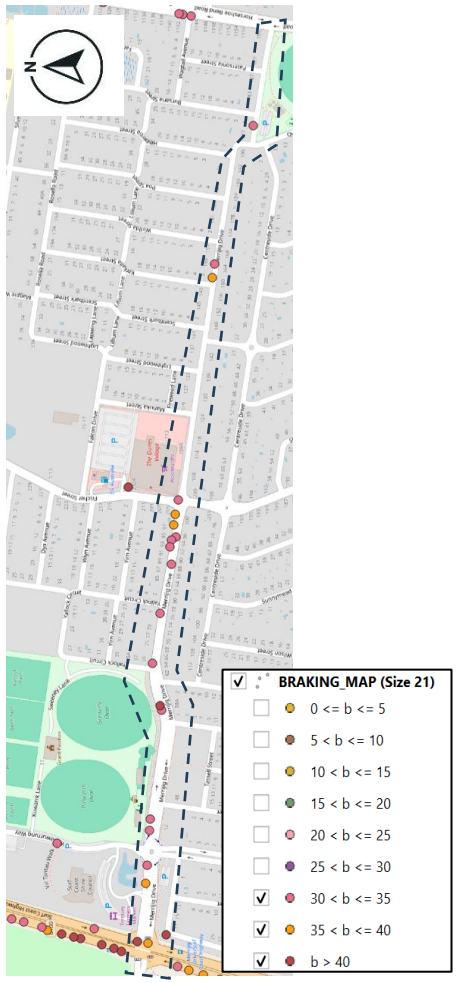
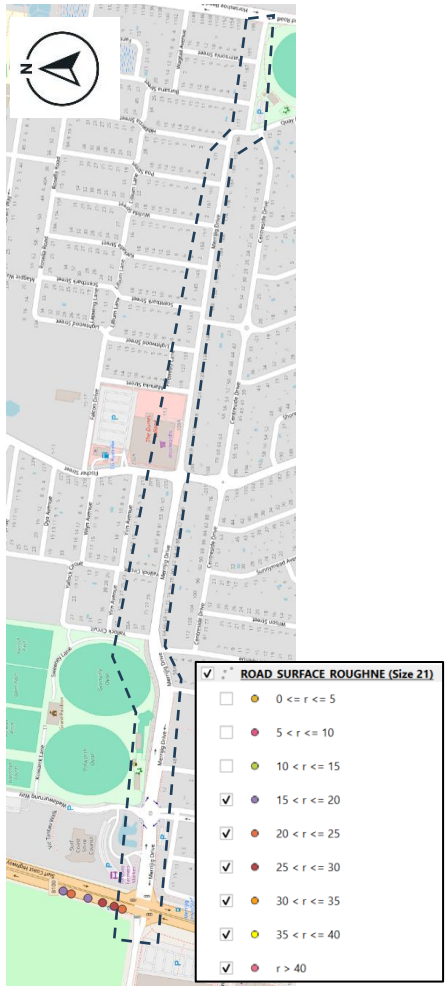
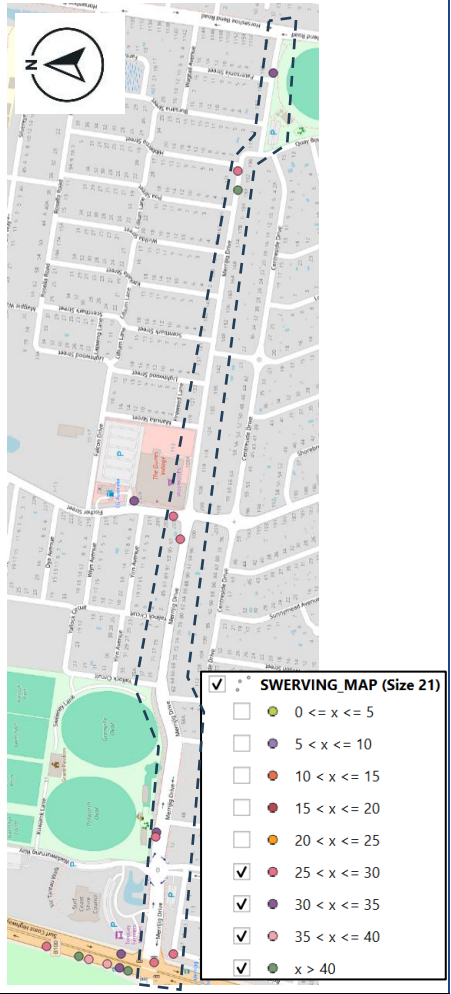
COOMBES ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Near Kay Close 	Nil	- Braking near Kay Close - Swerving issue appears to be resolved (no swerving incidents reported in SeeSense data since 2023)	- Construct shoulders as per current proposal (sealed shoulder provides additional space for cyclists) - Provide bike symbols on shoulder (whole route) - Provide green surface treatment (non-slippery) for cyclists across intersections to increase driver awareness of likely presence of cyclists (whole route)
Messmate Road to Frog Hollow Drive 	7 perception reports: Close Pass x 1, Pothole x 2, Separation x 1, Other x 1, Space x 2  *Comments summary:* Car fails to give way at give way sign No sealed shoulders on new section of Coombes Road. Dangerous surface, no bike lane in high traffic area, main cycle route out of Torquay other than Great Ocean Road Skinny, rough surface lose gravel	- Braking, surface and swerve	- Road reconstruction occurring Feb 2025 (sealed shoulder provides additional space for cyclists) - Provide bike symbols on shoulder (whole route) - Add RRPM's along edge of traffic lane to improve delineation at sunrise/sunset when cyclists are likely to be using shoulder (whole route). -Provide green surface treatment (non-slippery) for cyclists across intersections to increase driver awareness of likely presence of cyclists (whole route)
Frog Hollow Drive to Ocean Acres Drive	6 perception reports:	- Swerving and surface	- Road reconstruction occurring Feb 2025

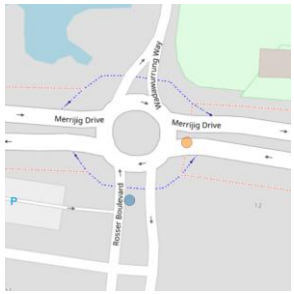
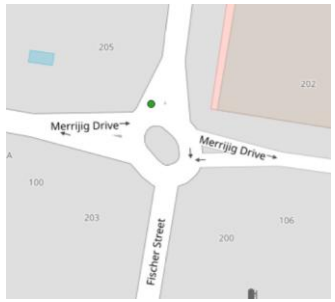
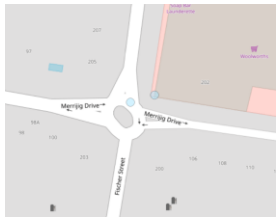
COOMBES ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
	Close Pass x 2, Pothole x 1, Other x 3  *Comments summary:* Driver behaviour - impatient driver tried to overtake and nearly caused a head on crash. Abuse from drivers Road not wide enough, edges are disintegrating, cracks and potholes, lots of traffic. Unsafe and unpleasant but a key road for many of the loop rides even getting to many of the trail rides we go on.	- 1 bike crash at Ocean Acres Drive intersection (right turn side swipe)	- Provide bike symbols on shoulder (whole route)
Near Ghazeepore Road 	Nil	- Braking, swerving and surface - 1.0m should does not provide sufficient clearance to traffic lane for cyclists riding on the shoulder	- Reduce traffic lanes to 3.0m and provide chevron buffer between traffic lane and shoulder (will provide clearance between cyclists and traffic lane). - Add RRPM's along edge of traffic lane to improve delineation at sunrise/sunset when cyclists are likely to be using shoulder (whole route). *Longer term:* Increase width of shoulders to 1.5m west of Ghazeepore Road
Ghazeepore Road to Anglesea Road	3 perception reports: Close Pass x 2, Other x 1	- Braking and surface (near barriers) - Swerving - Grass growing under barrier, encroaching on shoulder	- Cyclists Share the Road signage - Maintenance of grass edges, particularly under barriers

COOMBES ROAD

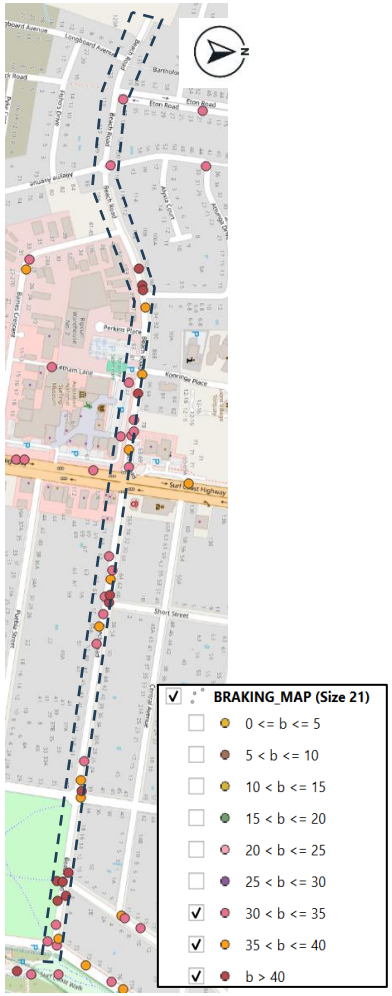
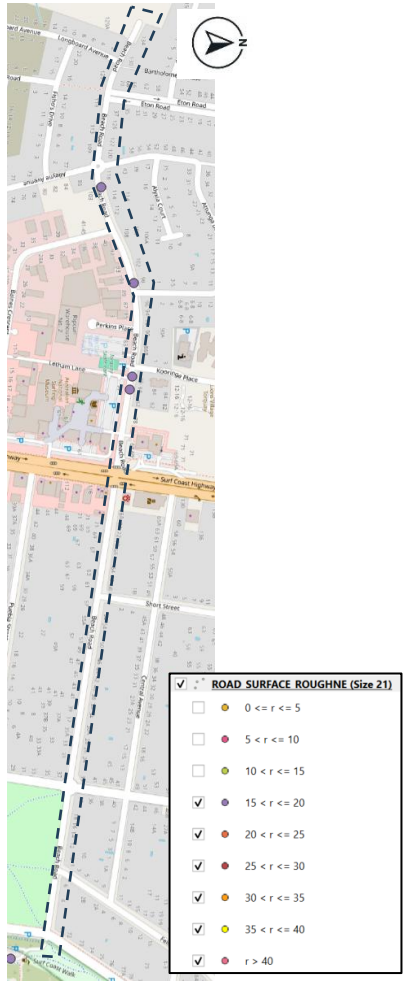
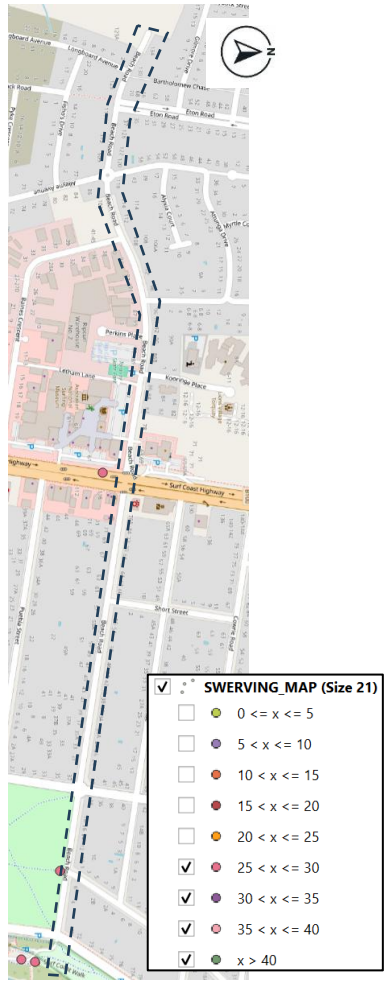
LOCATION / SEE SENSE HOTSPOT MAP	SEE SENSE PERCEPTION REPORTS	KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)	POTENTIAL TREATMENTS
	 *Comments summary:* Aggressive road worker Dangerously close overtake by truck		- Provide bike symbols on shoulder (whole route) *Longer term:* Increase width of shoulders to 1.5m west of Ghazeepore Road
Anglesea Road intersection 	3 perception reports: Other x 3  (Comments not related to Coombes Road)	- Braking and swerving on westbound approach to roundabout - Braking, swerving and surface eastbound - Pinch point for eastbound cyclists near end of island, shoulder is narrower through this section 	- Green surface treatment at start/end bike lane - Investigate widening shoulder past barrier through to power pole (desirably barrier would be set back further also) 

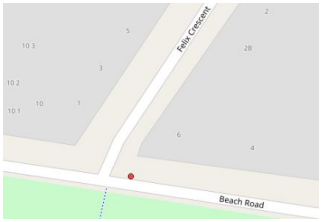
MERRIJIG DRIVE

BRAKING MAP (SIZE 21)	ROAD SURFACE MAP (SIZE 21)	SWERVE MAP (SIZE 21)
		

MERRIJIG ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
Wadawurrung Way/Rosser Boulevard roundabout 	2 perception reports: Other x 1, Close pass x 1  *Comments summary:* Car travelling west along Merrijig Drive drove straight through roundabout, failed to give way.	- Braking - Failure to give way - 1 bike crash (adjacent directions) - Off road path provided but some cyclists choose to stay on-road through roundabout	- Provide directional arrows for cyclists where bike lanes transition off-road
Wadawurrung Way to Fischer Street	Nil	- Interactions with vehicles parking/unparking (mostly north side)	- Green surface treatments after side streets to highlight possible presence of cyclists
Fischer Street roundabout 	2 perception reports: Pothole x 2 	- Swerving - Potholes rectified	*Long term vision:* - Dutch style bike lanes at roundabout (from Fischer Street corridor proposal)

BEACH ROAD

BRAKING MAP (SIZE 21)	ROAD SURFACE MAP (SIZE 21)	SWERVE MAP (SIZE 21)
		

BEACH ROAD			
LOCATION / SEE SENSE HOTSPOT MAP	**SEE SENSE PERCEPTION REPORTS**	**KEY ISSUES (FROM SEE SENSE, CRASH DATA, TRAFFIC DATA & INSPECTIONS)**	**POTENTIAL TREATMENTS**
General		- 85th percentile speed of 57 km/h (exceeds speed limit)	- Speed reduction devices along route
Near Felix Crescent 	Nil	- Braking - Parking lane very wide, no bike lane marked	- Mark separate bike and parking lanes (entire length of road east of Surf Coast Hwy) (this would be similar to Darian Road proposal) - Raised platforms at/near Short Street and Felix Street to control vehicle speeds
Near Fischer Street roundabout 	Nil	- Braking	Roundabout improvement works undertaken in late 2024 (annulus and sharrows) *Long term vision:* - Dutch style bike lanes at roundabout (from Fischer Street corridor proposal)
West of Surf Coast Highway  	Nil	- Braking, surface and swerving - Turning movement to McDonalds (north side) and car park (south side) - Sharrows and wombat crossing provided in 2024 - Bike lanes provided between Kooringa Place and Alleyne Avenue but no signs/symbols	- Install bike lane signs/symbols between Kooringa Place and Alleyne Avenue - Provide sharrow at end of bike lane at Alleyne Avenue *Long term vision:* - Widen path on northern side to provide shared path

APPENDIX C

RISK ASSESSMENT APPROACH

RISK ASSESSMENT APPROACH

The likelihood (**Table C1**) and severity (**Table C2**) for the crash type/s associated with each risk or hazard are identified. This can then be used to determine a 'priority' for risk mitigation (**Table C3**). The priorities for different levels of risk can be used to suggest a treatment approach (**Table C4**).

The Austroads Guide to Road Safety Part 6: Road Safety Audits presents a severity guidance sheet to assist consideration of crash severity outcomes associated with different crash types and speeds (**Figure C1**).

LIKELIHOOD	DESCRIPTION
Almost certain	Occurrence once per quarter
Likely	Occurrence once per quarter to once per year
Possible	Occurrence once per year to once every three years
Unlikely	Occurrence once every three years to once every seven years
Rare	Occurrence less than once every seven years

SOURCE: AUSTROADS GUIDE TO ROAD SAFETY PART 6: ROAD SAFETY AUDIT – LIKELIHOOD PARAMETERS

TABLE C1: CRASH LIKELIHOOD

SEVERITY	DESCRIPTION
Insignificant	Property damage
Minor	Minor first aid
Moderate	Major first aid and/or presents to hospital (not admitted)
Serious	Admitted to hospital
Fatal	At scene or within 30 days of the crash

SOURCE: AUSTROADS GUIDE TO ROAD SAFETY PART 6: ROAD SAFETY AUDIT – SEVERITY PARAMETERS

TABLEC2: CRASH SEVERITY

		SEVERITY				
		INSIGNIFICANT	MINOR	MODERATE	SERIOUS	FATAL
LIKELIHOOD	ALMOST CERTAIN	Medium	High	High	Extreme (FSI)	Extreme (FSI)
	LIKELY	Medium	Medium	High	Extreme (FSI)	Extreme (FSI)
	POSSIBLE	Low	Medium	High	High (FSI)	Extreme (FSI)
	UNLIKELY	Negligible	Low	Medium	High (FSI)	Extreme (FSI)
	RARE	Negligible	Negligible	Low	Medium (FSI)	High (FSI)

Safe System crash outcome threshold

Note, refer to the crash severity guidance (Figure C1)

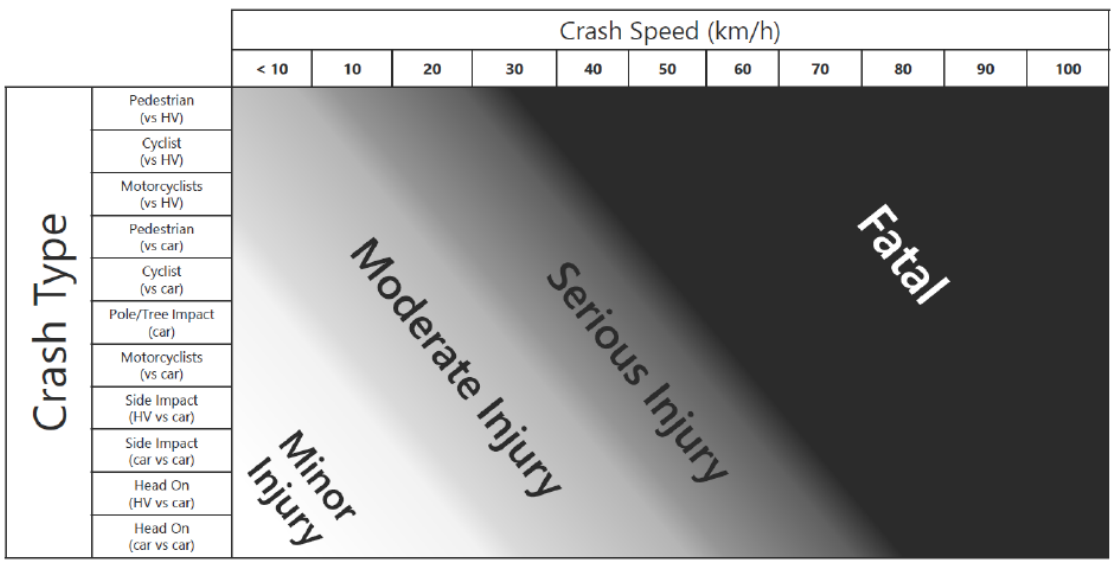
SOURCE: AUSTROADS GUIDE TO ROAD SAFETY PART 6: ROAD SAFETY AUDIT – FIGURE 10.2

TABLE C3: AUSTROADS RSA RISK MATRIX

RISK	PRIORITIES FOR MITIGATION
Negligible	No action required
Low	Should be corrected or the risk reduced if the treatment cost is low
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high
High	Should be corrected or the risk significantly reduced, even if the treatment cost is high
Extreme	Must be corrected regardless of cost

SOURCE: AUSTROADS GUIDE TO ROAD SAFETY PART 6: ROAD SAFETY AUDIT – PRIORITIES FOR MITIGATION

TABLE C4: PRIORITIES FOR MITIGATION



SOURCE: AUSTROADS GUIDE TO ROAD SAFETY PART 6: ROAD SAFETY AUDIT – FIGURE 10.3

FIGURE C1: CRASH SEVERITY GUIDANCE