

## **Existing Cycle Infrastructure Review**

Prioritisation Process and Treatment of  
Existing Cycle Issues

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## 1 INTRODUCTION

### 1.1 Background

Auckland Transport is committed to making local roads safer for cyclists. This reflects the desire to encourage this as a viable alternative mode of travel, while also protecting the vulnerable users from other road users. Given the desire to grow cycling within Auckland this has become an increasingly important direction of many of the policies guiding the region. This means it is vital to ensure that the network cyclists' use is safe and encourages increased use.

Auckland Transport is currently investigating some 70 odd road corridor cycle safety related issues raised through recent requests for service. In addition, Cycle Action Auckland and other interested parties are undertaking cycle route audits to identify cycle issues on popular cycle corridors. This has identified a number of operational and maintenance type issues that are hazardous for cyclists and require further investigations. It has also identified some gaps where Auckland Transport's operational policies on cycling infrastructure may be lacking

To that end the following document identifies a prioritisation process for ranking the cycle related issues as they are identified. Given the number of issues already identified there is a need for these to be ranked in order of priority so as to understand which issues are more urgent than others

In addition, the following document also identifies operational policies for how particular cycle issues can be themed and dealt with in a consistent manner. Consistency is a critical outcome as it ensures that the network a cyclist is provided with is the same no matter where in the region they are.

The objectives of this document are to:

- ◆ Identify principles and operational policy regarding the use of cycle infrastructure and treatments
- ◆ To provide a consistent approach to the use of cycle infrastructure and treatments and how to address cycle safety issues on the existing corridors throughout the region
- ◆ Clarity of approach for stakeholders and advocates

### 1.2 Use of this Document

This document is by no means a "one-stop" shop for all the answers and solutions to the existing issues currently faced by cyclists on the Auckland road network. Instead this document provides guidance on some of the matters that can be considered when looking to remedy or mitigate existing cycle issues. There are many other design guidelines out there and any engineer/practitioner should reference these as necessary and be prepared to think outside the box as may be needed when trying to solve existing cycle issues

It is also worth noting that in some instances it may be not be possible or desirable to remove a cycle issue. One such example might be a highly used zebra crossing where the pedestrian movement is f greatest priority in the hierarchy of users. That does not mean that the cycle issue is ignored – but it

may mean any treatment is more subtle and may involve signage, markings, or changes to lower the speed environment of the road.

In looking to address existing cycle issues it is also paramount that the engineer/practitioner gives due consideration to other pertinent policies within Auckland Transport to avoid fixing one issue but creating another. This most certainly is not a desirable outcome for any improvement works. Due consideration should therefore be given to Auckland Transport's Code of Practice and other relevant strategies and policies.

### 1.3 Guiding Principles for Auckland

Auckland Transport has recently developed the document "Providing Bicycle Facilities as Part of Transport Projects – Guiding Principles for Auckland". This document establishes criteria for providing cycle facilities as part of transport projects, remedial work or maintenance. The goal of this document is to:

- ◆ Consider the needs for cyclists at an early stage of a transport project
- ◆ Improving the cycling environment as part of any remedial works or maintenance, regardless of the reason for the remedial works or maintenance

The guiding principles identify six criteria for assessing cycling in transport projects, remedial works or maintenance. These are:

1. All transport projects led by Auckland Transport must assess cycling opportunities in project scoping and design
2. Remedial work must assess opportunities for cycling
3. Maintenance projects must assess opportunities for cycling
4. The Auckland Cycle Network plan informs new projects, remedial work and maintenance work
5. Road safety risks to cycling inform remedial work
6. A points system determines whether cycling facilities are included in planning and remedial works now, later or likely never

With the Guiding Principles now adopted and in use by Auckland Transport it is expected that new infrastructure built on the road network will avoid new cycle issues being created without due consideration given to the cycle environment

### 1.4 Methodology

#### 1.4.1 Prioritisation Matrix

To appropriately assess each issue as it arises a prioritisation matrix has been developed to rank the issues with respect to their importance and priority. The prioritisation matrix uses a range of criteria to understand how an identified issue ranks against another issue. This is important as Auckland Transport need to be able to understand which issues are of greater importance for remedial works.

The prioritisation matrix ranks the issues as high, medium and low – with these also indicative of both the importance of an issue as well as an indication of the scale of remedial works that may be undertaken. That is a high priority issue is more likely to see a greater level of remedial works given the importance of the location and/or the severity of the safety issue. Likewise, a low priority issue is likely to see a lesser scale of remedial works, commiserate with the location and severity of the issue.

The latest prioritisation matrix is outlined in Table 1. An earlier version, being that which Table 1 has been refined from, is contained in Appendix A. The version in Appendix A has then been modified following the live example tests discussed in Appendix B and a review of the prioritisation process as discussed in Appendix C.

#### **1.4.2 Design Tool Box**

To provide a consistent approach to any cycle safety issues identified a design tool box is established to provide practitioners with key design prompts as to the measures available to remedy or mitigate an identified issue. The key design prompts have been grouped into themes, with the themes being issues that are similar in nature, and therefore able to be dealt with in a similar manner. The themes that have been identified are based on the 70 odd road corridor cycle safety related issues already known to Auckland Transport and represent the core eight issues that are typically being identified. These are discussed in greater detail in Section 3

Under each theme a generic set of remedial measures has been identified for issues ranked high, medium and low priority. The generic set of remedial measures is by no way a definitive list of measures – but has been developed to provide guidance as to what could be expected to be required.

To further populate a design tool box a number of identified issues have also been assessed, with these issues ranked and addressed by way of a concept design. This therefore takes real life issues, ranks them and then identifies how these can be addressed on site, conceptually, to ensure the safety issue is remedied or mitigated.

#### **1.4.3 Live Example Tests**

To understand the adequacy of the prioritisation matrix and the generic remedial measures identified in the design tool box 10 real life cycle issues have been assessed in order to identify how they rank in terms of priority and what physical changes can actually be made on site to remedy or mitigate the concern. The outcomes of this assessment are contained in Appendix A.

#### **1.4.4 Review Prioritisation Process**

The prioritisation process has been developed over a series of weeks, and has had a number of variations and edits made throughout the process. Some of the final iterations are outlined in Appendix B, illustrating how the final prioritisation process has been arrived at. .

## 2 PRIORITISATION PROCESS

AT is currently investigating some 70 odd road corridor cycle safety related issues raised through recent requests for service. In order to prioritise the issues raised, a prioritisation matrix has been developed in order to assess the merits of a particular site and rate this according to other sites. This then provides AT with a list, ranking each of the identified issues, enabling these to be then categorised as high priority, medium priority and low priority.

The following tables illustrate the prioritisation matrix (Table 1), background explanations as to the prioritisation matrix criteria (Table 2) and the rankings for high, medium and low priority issues (Table 3)

Table 1: Prioritisation Matrix

RANKING OF ISSUE				
<b>STRATEGIC ALIGNMENT</b>	The site is on the existing Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)	The site is on the future Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)	Not of the Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)- but potential to cater for a relative level of cyclists	No and unlikely to be a busy route for cycling
<b>SCORING</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>1</b>
<b>EXISTING FACILITIES - ON ROAD</b>	Cycle facilities are provided on or within 100m of the site via bus lane, cycle lane, shared path etc	No dedicated cycle facility, but sufficient road width on or within 100m of site to suggest cyclists can share with vehicles	No existing facilities providing on or near the site	
<b>SCORING</b>	<b>9</b>	<b>6</b>	<b>3</b>	
<b>ROUTE POPULARITY</b>	There are educational facilities within 300m of the site	There are educational facilities within 600m of the site	There are no educational facilities near the site	
	<b>5</b>	<b>3</b>	<b>0</b>	
	The site is located on a popular commuter route	The site is located on a potentially popular commuter route	The site is not located on a potentially popular commuter route	
	<b>4</b>	<b>2</b>	<b>0</b>	
	The site is located within 300m of a town centre or shopping centre	The site is located within 600m of a town centre or a shopping centre	The site is not located near a town or shopping centre	
<b>3</b>	<b>1</b>	<b>0</b>		
The site is located within 300m of a major bus or train station	The site is located within 600m of a major bus or train station	The site is not located near a major bus or train station		
<b>2</b>	<b>1</b>	<b>0</b>		
The site is located on a popular route for recreational cyclists	The site is located on a route that is potentially interesting for recreational cyclists	The site is not located on a route that is interesting for recreational cyclists		
<b>2</b>	<b>1</b>	<b>0</b>		
<b>TRAFFIC VOLUMES*</b>	Greater than 30,000 AADT	15,000 - 30,000 AADT	5000-15,000AADT	5000 AADT
<b>SCORING</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>HEAVY VEHICLE PERCENTAGE*</b>	Greater than 10%	6 – 10%	3-6	3% or less
<b>SCORING</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>85% VEHICLE OPERATING SPEED</b>	>70 km/h	60-70 km/h	50-60 km/h	Vehicle speeds are less than 50km/h
<b>SCORING</b>	<b>7</b>	<b>5</b>	<b>2</b>	<b>1</b>
<b>CYCLE CRASH HISTORY</b>	There is a known cycle crash history or safety issue at this location	There are a number of complaints regarding this cycle issue suggesting near misses	There is an existing cycle crash history within the vicinity of this location (200m)	There is no crash history evident nor any evidence of near misses (no other complaints)
<b>SCORING</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>1</b>
<b>CYCLE RISK MAP *</b>	The cycle issue is on a medium to high or high risk route identified as a black or red line	The cycle issue is on a medium risk route identified as an orange line	The cycle issue is on a low to medium or low risk route identified as a green or yellow line	The cycle issue is not located on an identified risk route
<b>SCORING</b>	<b>12</b>	<b>8</b>	<b>4</b>	<b>0</b>
<b>MINIMUM AVAILABLE WIDTH AT CYCLE ISSUE LOCATION</b>	3 m or less	Between 3 - 3.5	3.5 to 4.0 m	4.0 to 4.2 m
<b>SCORING</b>	<b>7</b>	<b>5</b>	<b>3</b>	<b>1</b>
<b>FORWARD VISIBILITY</b>	less than 40 m	40-65 m	65-90	greater than 90
<b>SCORING</b>	<b>7</b>	<b>5</b>	<b>3</b>	<b>1</b>
<b>TOPOGRAPHY</b>	The site accommodates uphill and downhill cyclists	The issue is likely to be met predominately by cyclists travelling uphill	The cycle issue is located on flat topography	The cycle issue is likely to be met predominately by cyclists travelling downhill
<b>SCORING</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>

\* Maps referred to above are provided in Appendix D of this report



**Table 2: Background Explanation to the Prioritisation Matrix**

CRITERIA DESCRIPTION	EXPLANATION
STRATEGIC ALIGNMENT	<p>At this stage reference is made to the Regional Cycle Network. Once the Auckland Cycle Network is finalised and adopted this should replace the Regional Cycle Network and the criteria changed accordingly</p> <p><a href="http://www.aucklandtransport.govt.nz/improving-transport/plans-proposals/ActiveTravel/Pages/Auckland-Regional-Cycle-Network.aspx">http://www.aucklandtransport.govt.nz/improving-transport/plans-proposals/ActiveTravel/Pages/Auckland-Regional-Cycle-Network.aspx</a></p>
EXISTING FACILITIES - ON ROAD	<p>Existing facilities include cycle lanes or bus lanes. Rationale behind this criteria is that these are the locations where we are encouraging cyclists, hence the need to provide the "safest" environment for the cyclist</p> <p><a href="http://www.aucklandtransport.govt.nz/moving-around/biking-cycleways/MapsAndMore/Pages/default.aspx">http://www.aucklandtransport.govt.nz/moving-around/biking-cycleways/MapsAndMore/Pages/default.aspx</a></p>
ROUTE POPULARITY	<p>Relies on a basic knowledge of key cycle corridors within the region. Can also look to refer to the Auckland Transport "Getting Around Auckland" cycle maps which indicate popular routes for cyclists.</p> <p><a href="http://www.aucklandtransport.govt.nz/moving-around/biking-cycleways/MapsAndMore/Pages/default.aspx">http://www.aucklandtransport.govt.nz/moving-around/biking-cycleways/MapsAndMore/Pages/default.aspx</a></p>
SURROUNDING LAND USES	<p>Key people attractors like schools, town centres, community facilities, office parks or PT Interchanges are land uses where access for cyclists needs to be safe to encourage this as a mode of travel. Consequently a cycle issue location in close proximity to such land uses should be investigated (eliminated or minimised)</p>
TRAFFIC VOLUMES	<p>Based on AADT Map prepared for Auckland City Council - contained in Appendix D</p>
85% VEHICLE OPERATING SPEED	<p>This relies on a basic knowledge of the route in question. Ideally a similar map to that used for the traffic volumes could be developed as tube count data regularly records speed data too. In the absence of any suitable data - assume the posted speed limit</p>
CYCLE CRASH HISTORY	<p>To be based on a CAS search, with the search focussed on the crash history 50 m either side of the cycle issue location. A review of the corridor as a whole (say 800m about the cycle issue) may also identify cycle safety concerns - indicating the presence of cyclists on this route</p>
CYCLE RISK MAP	<p>The cycle risk map is a map of the Auckland Region indicating which roads are particularly dangerous for cyclists. This map is attached in Appendix D</p>
AVAILABLE WIDTH AT CYCLE ISSUE LOCATION	<p>Measured as the narrowest point for the cyclist and vehicle to negotiate through at the specific issue site</p>

FORWARD VISIBILITY	Based on the Stopping Sight Distance - using absolute minimum values. Measurement to determine the visibility of a vehicle approaching the cycle issue location to determine whether they have adequate visibility of a cyclist.
TOPOGRAPHY	The approach to a cycle issue can affect the speed of the cyclist, and therefore also affect the differential in speed between the cyclist and the vehicle.
LANE SEPARATION	How are the opposing lanes separated as this may influence/affect how an approaching vehicle may overtake a cyclist

Each issue is then given a scoring, enabling it to be ranked and prioritised as below

**Table 3: Priority Category**

PRIORTIY CATEGORY	RATING SCORE	PRINCIPLE FOR EACH PRIORTIY CATEGORY
HIGH PRIORITY	70-100	A high priority cycle issue will be eliminated and must be addresses as soon as possible
MEDIUM PRIORITY	40-70	A medium priority cycle issue will be eliminated or the risk minimised. Works will be to a scale commiserate with the issue
LOW PRIORITY	0-40	A low priority cycle issue will be minimised with lesser intervention and cost. It may result in no action being taken if no discernible risk can be identified

### 3 THEMES

Through the issues raised in recent times AT has categorised these into a number of themes. Each theme typically identifies an issue that occurs in a number of locations across the regions road network. By identifying these themes it is then possible to also identify key design measures and changes that can be “generically” applied in order to remedy or mitigate the issue.

The identified themes are:

- ◆ Pinch points
- ◆ Markings and Signage
- ◆ Maintenance
- ◆ Lane Merging
- ◆ Lane Continuity

This report deals predominately with the pinch point theme, as well as addressing the lane merging and lane continuity issues as these also lead to a cyclist being “pinched” on their route. AT has a second work stream investigating the markings, signage and maintenance matters.

## 4 PINCH POINTS

The term pinch point is being used to categorise many of the cycling issues on the road network and as such can have quite a broad meaning as to what the actual is. AT have sought to address this by defining what a pinch point is, with this definition being:

*“A localised physical narrowing (constraint) of the road where a vehicle/cyclist is unable to safely manoeuvre”*

This, in essence, typically refers to kerb build outs or raised tables where it is not physically possible for a vehicle to safely manoeuvre around a cyclist. The definition also suggests that a vehicle that is able to change lanes (if there are two travel lanes in one direction) or has the ability to make use of a flush median does not constitute a pinch point.

**Table 4: Pinch Point Definition**

TYPICAL PINCH POINT DEFINITION	WHAT DOES NOT FIT THE PINCH POINT DEFINITION
<p>Where a vehicle cannot safely manoeuvre about a cyclist. This typically refers to the following situations:</p> <ul style="list-style-type: none"> <li>- Where there is insufficient width for the cyclist and vehicle to safely share the lane as they travel through a pinch point, typically less than 4.2 m:</li> <li>- The ability for the vehicle to manoeuvre about the cyclist is hindered by                             <ul style="list-style-type: none"> <li>· Raised traffic islands that may be located to                                     <ul style="list-style-type: none"> <li>· Narrow the crossing distance for a pedestrian (zebra crossing,</li> <li>· Narrow the road cross section to slow traffic speeds</li> <li>· Create deflection within the road reserve to slow traffic speeds</li> <li>· Accommodate street furniture, negate turning movements etc</li> </ul> </li> </ul> </li> <li>- Lack of forward visibility making an overtaking manoeuvre unsafe</li> <li>- Lack of a flush median</li> </ul>	<p>Where a vehicle can safely manoeuvre about a cyclist. This typically refers to the following situations:</p> <ul style="list-style-type: none"> <li>- Where a vehicle can change lanes to manoeuvre about the cyclists – two or more traffic lanes</li> <li>- Where a vehicle can make use of a flush median over a short space to manoeuvre about the cyclist</li> <li>- Where there is sufficient width for the cyclist and vehicle to share the lane – typically 4.2 m or more</li> <li>- Where there is the ability for a vehicle to safely overtake a cyclist, requiring the vehicle to cross the centreline</li> </ul>

### 4.1 Other Pinch Points

Consultation with Cycle Action Auckland (CAA) has also identified pinch points created where on street parking occurs, or where a cycle lane or vehicle lane may suddenly narrow, thereby “pinching” the space available for a cyclist and increasing the possibility of the cyclist vs. vehicle side swipe type crash. These matters do not necessarily meet the AT definition, but are still of concern and require some form of intervention, depending on their prioritisation rating and severity. Consequently consideration has been given to measures to address the following matters:

- ◆ On street parking forcing a cyclist into a vehicle lane unexpectedly
- ◆ Lane merging
- ◆ Lane Continuity

Given the differences encountered as to how a pinch point should be defined or identified, the following sections provide design advice as to how a typical pinch point could be remedied or mitigated. This has been split into those pinch points that meet the AT definition and those pinch points that occur as a result of on street parking, lane merging and lane continuity (or lack of).

## 4.2 Summary of Pinch Points

To that end, the pinch points that have been identified and/or defined have been grouped further as follows:


- ◆ Permanent Pinch Points – these meet the AT definition and are therefore “physical” in nature as they generally involve raised islands of some form – hence this pinch point is permanently an issue
- ◆ Provisional Pinch Points – these are pinch points that occur either, temporarily (on street parking use), as a result of a discontinuous cycle facility, or at a location where there may be a high number of conflicts. These pinch points do not necessarily meet the AT definition as there may be the ability for a vehicle to safely change lanes to avoid the cyclist. However these are locations where a cyclist is exposed to a greater degree of risk given the road layout, meaning that these are also key areas to remedy or mitigate the issue.


## 5 PERMANENT PINCH POINTS DESIGN TOOL BOX


The following provides a consideration of the options available to deal with pinch points on the network. These have been divided into high priority, medium priority and low priority risk, indicating the severity of the issue and the intervention that may be needed to address the issue.

Following this, a generic cycle issue is identified as well as a number of “tool box” solutions to address the issue, with these issues categorised as high, medium and low priority with respect to the scale of works.

It is reiterated the following is by no ways a complete design guide as there will be a number of options available, and these will vary site to site. However this gives an indication of what the typical interventions could be.

<b>ZEBRA CROSSING PINCH POINT</b>		
<b>EXAMPLE: 265 PONSONBY ROAD</b>		
		
<b>HIGH PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Reconfigure carriageway (eg widen or reduce kerb build out or central median) and provide dedicated cycle by-pass or cycle lane through pinch point. Could be a “separated cycle lane” to maintain narrow vehicle lane.</li> <li>2. “Narrow” the pinch point even further (2.8 m width) to make it clear that a vehicle must yield. Will only suit lower speed/town centre environments. Signage, line markings likely. Need to consider bus, hcv, over dimension route requirements</li> <li>3. Signalise zebra crossing, change entire configuration to remove pinch point, but still provide priority for pedestrians.</li> <li>4. Speed reduction on main road to lessen speed differential between vehicle and cyclist. Measures to be located either side of pinch point.</li> </ol>	<p>If a high priority, likely to be part of RCN/ACN, or high crash risk. As such</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> <li>• must be addressed given high priority nature</li> </ul>
<b>MEDIUM PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Reconfigure zebra crossing to achieve 4.2-4.5m width (4.5m width suitable under The Design of the Pedestrian Network)</li> <li>2. Speed reduction on main road to lessen speed differential between vehicle and cyclist. Measures to be located either side of pinch point</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>
<b>LOW PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Speed reduction on main road to lessen speed differential between vehicle and cyclist. Measures to be located either side of pinch point</li> <li>2. line markings or signage to alert cyclist/motorist of issue and encourage cyclist to take the lane</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>

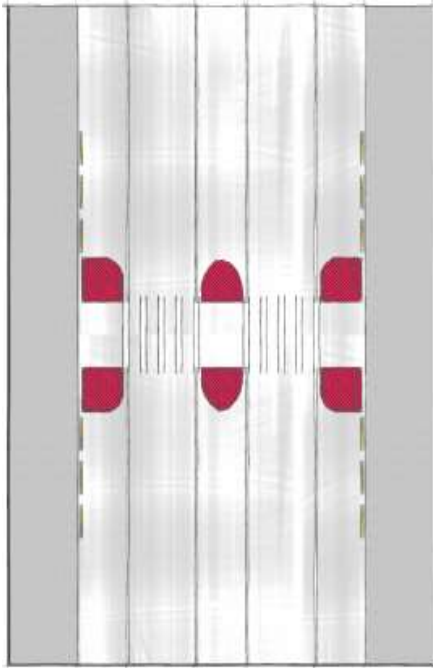
<b>PEDESTRAIN REFUGE PINCH POINT</b>		
<b>EXAMPLE: 21 MEOLA ROAD</b>		
		
<b>HIGH PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Reconfigure carriageway to achieve on road cycle lanes</li> <li>2. Reconfigure refuge island to achieve clearance required, may involve removing some on street parking about refuge island to maintain visibility of pedestrians etc. Or may involve localised widening</li> <li>3. Create a cycle by-pass, may mean taking cyclist onto shared path, off road over a short section</li> </ol>	<p>If a high priority, likely to be part of RCN/ACN, or high crash risk</p>
<b>MEDIUM PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Create a cycle by-pass, may mean taking cyclist onto shared path, off road over a short section</li> <li>2. Speed reduction on main road to lessen speed differential between vehicle and cyclist. Measures to be located either side of pinch point</li> <li>3. Sharrow markings or signage to alert cyclist/motorist of issue and encourage cyclist to take the lane</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>
<b>LOW PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Speed reduction on main road to lessen speed differential between vehicle and cyclist. Measures to be located either side of pinch point</li> <li>2. Sharrow markings or signage to alert cyclist/motorist of issue and encourage cyclist to take the lane</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>

<b>LATM TRAFFIC CALMING MEASURE</b>		
<b>EXAMPLE: POMPALLIER TERRACE</b>		
		
<b>HIGH PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Create a cycle by-pass through the measure, or via taking cyclist onto shared path, off road over a short section</li> <li>2. Speed reduction measure reconstructed to be more cycle friendly, but still achieve LATM desire</li> </ol>	<p>If a high priority, likely to be part of RCN/ACN, or high crash risk</p>
<b>MEDIUM PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Create a cycle by-pass through the measure, or via taking cyclist onto shared path, off road over a short section</li> <li>2. Line markings or signage to alert cyclist/motorist of issue and encourage cyclist to take the lane</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>
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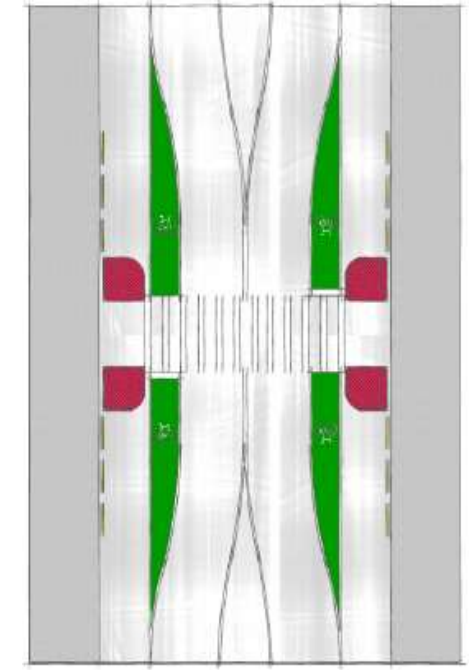
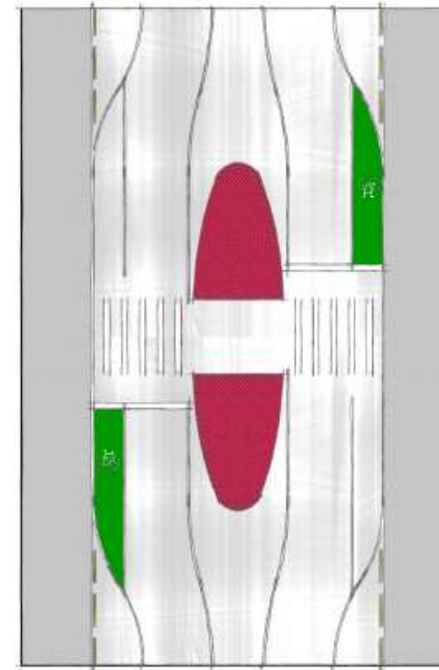
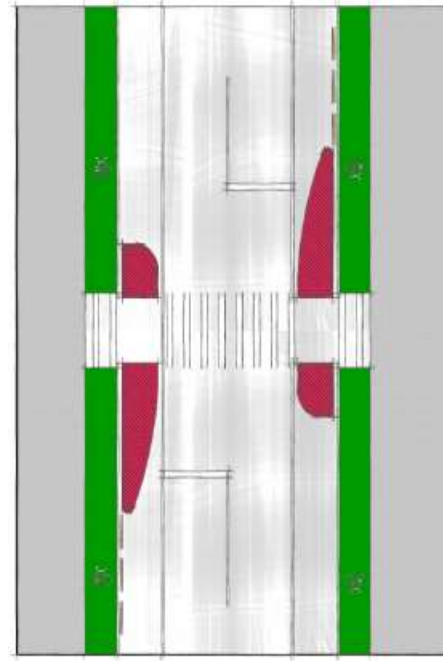
**DESIGN TOOL BOX: ZEBRA CROSSING - REFUGE ISLANDS ON THE EDGE AND IN THE MIDDLE**

**EXISTING ISSUE**

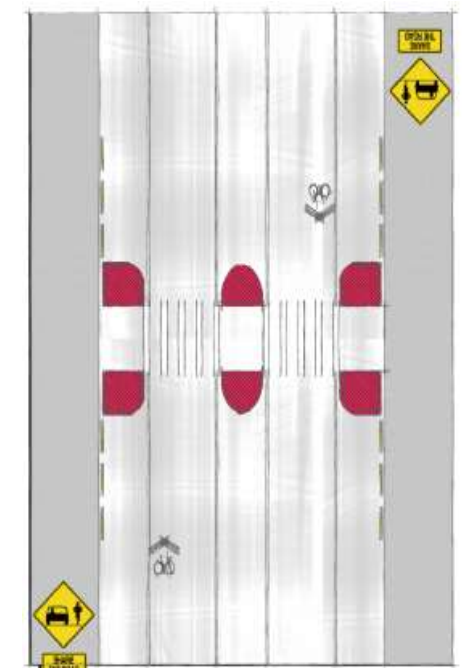
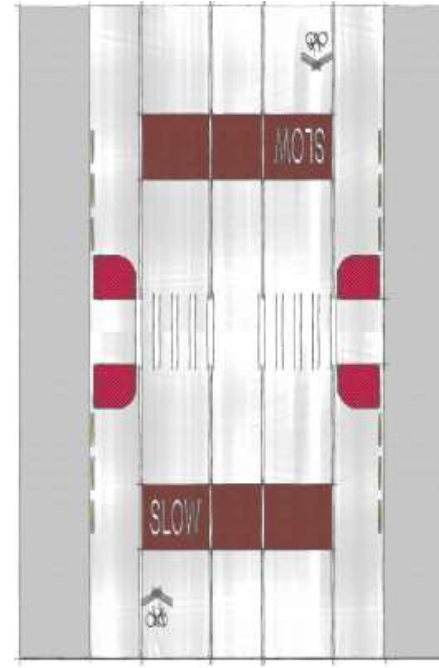
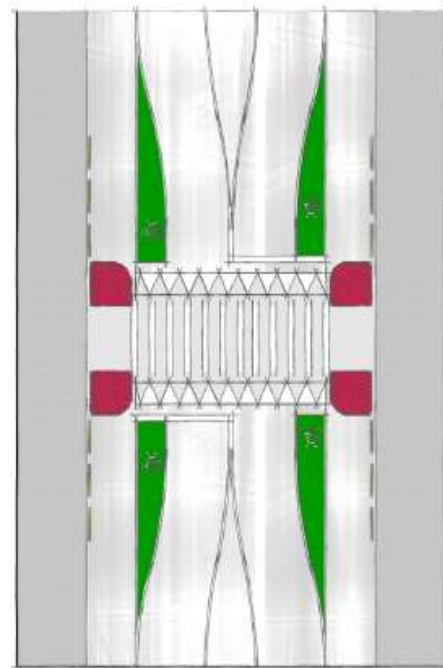


Pedestrian crossings are often equipped with side islands and a pedestrian refuge/centre island to reduce the crossing distance for pedestrians. These islands can result in pinch points for cyclists as it narrows the available road width for a cyclist and motorist to safely share.

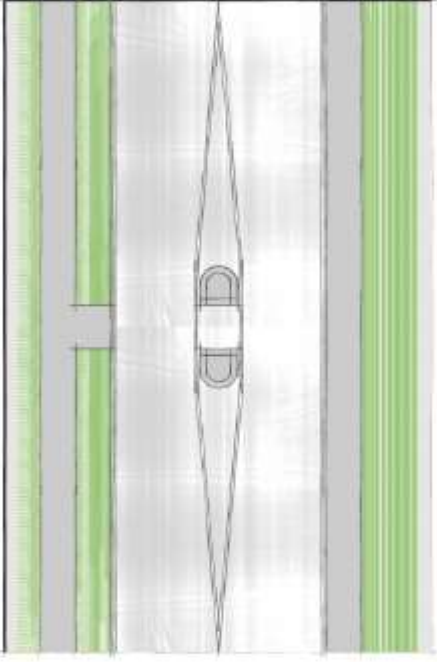
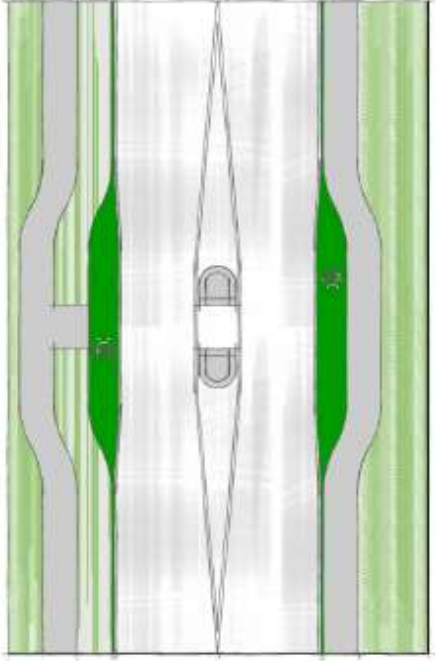
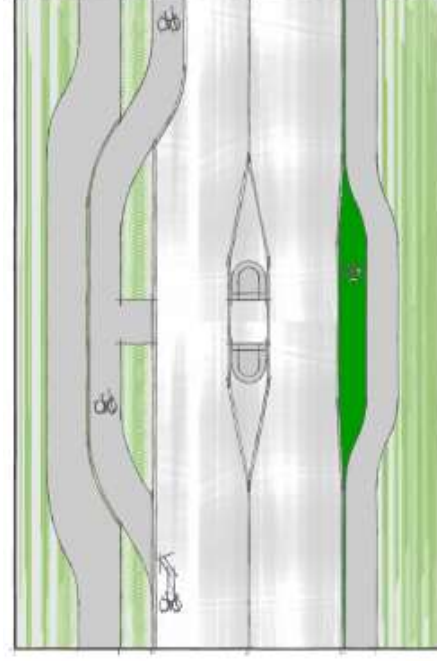
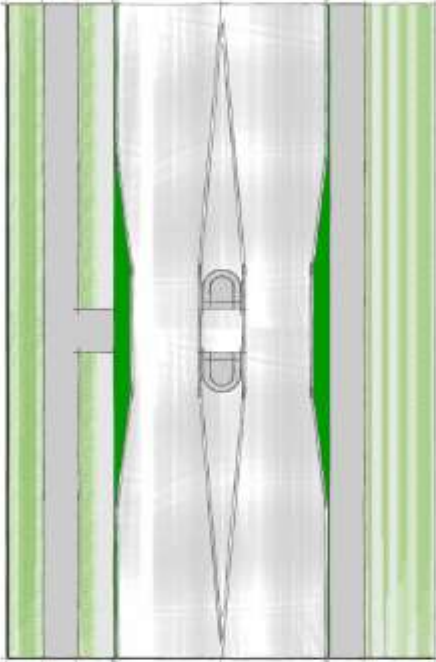
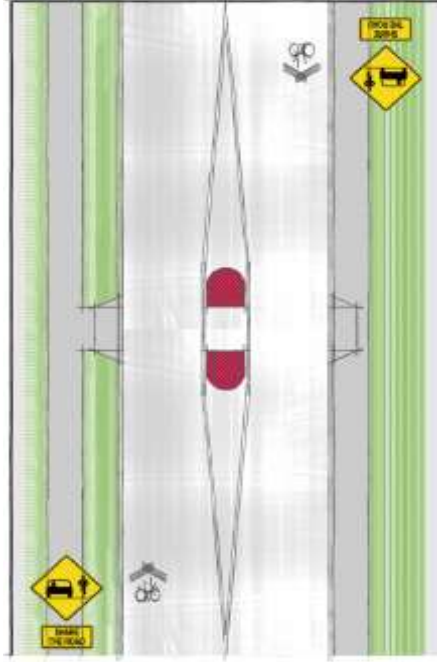
**HIGH PRIORITY POSSIBLE SOLUTIONS**



**MEDIUM AND LOW PRIORITY POSSIBLE SOLUTIONS**

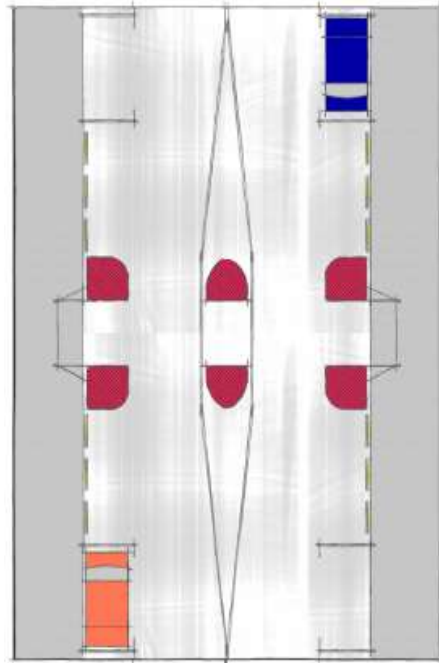




DESIGN TOOL BOX: PEDESTRIAN REFUGE ISLAND			
EXISTING ISSUE		HIGH PRIORITY POSSIBLE SOLUTIONS	
 <p>Centre islands provide a safer crossing for pedestrians, but can cause safety issues for cyclists. A cyclist approaching the centre island can be sideswiped by a car merging towards the left to avoid the islands. Particularly when the lane width at the location of the centre island is 4.2 m or less, the cyclist might get caught by a car encroaching on its space.</p>			
			MEDIUM AND LOW PRIORITY POSSIBLE SOLUTIONS
			

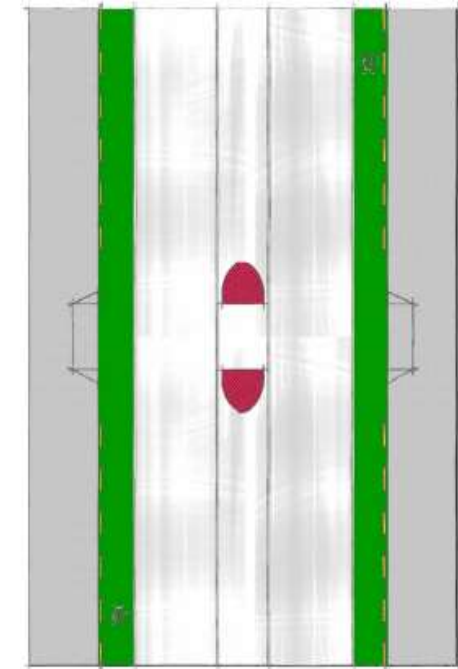
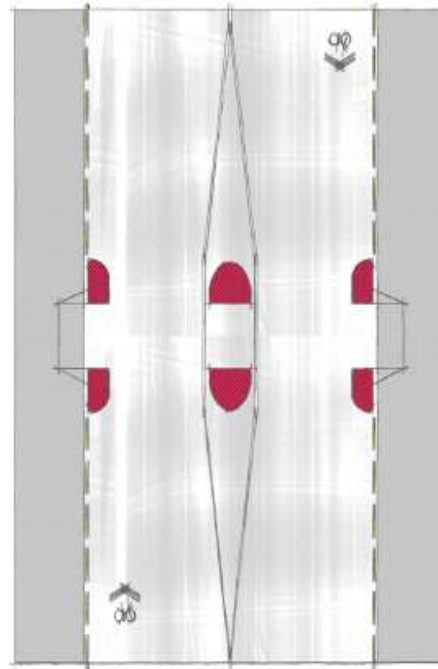
**DESIGN TOOL BOX: LATM TREATMENT – REFUGE AND PARKING**

**EXISTING ISSUE**



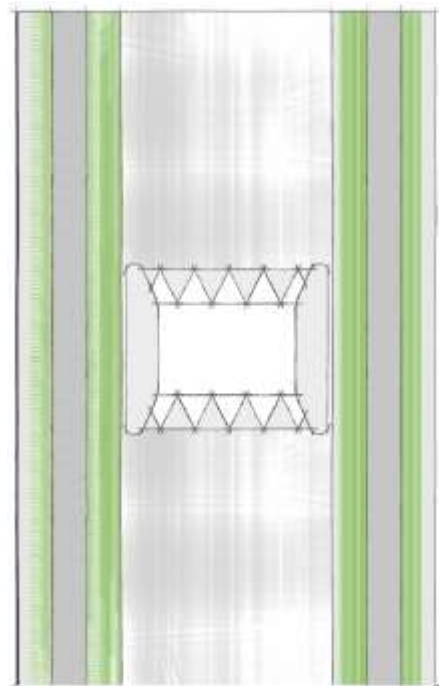
Centre islands are often implemented with side islands to help narrow the crossing distance, and provide greater visibility of a pedestrian if on street parking is also provide for.

**POSSIBLE SOLUTIONS**



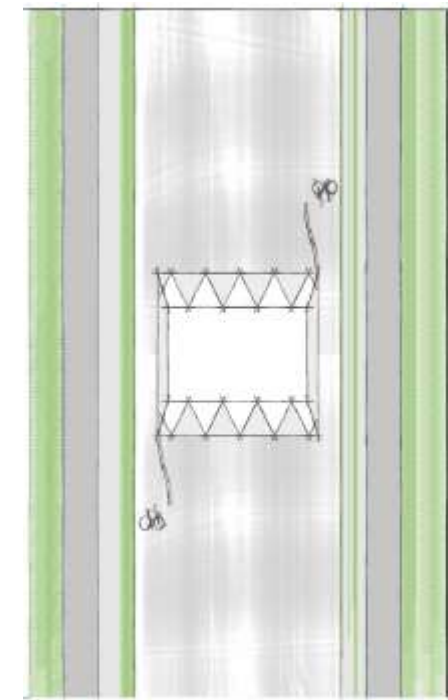
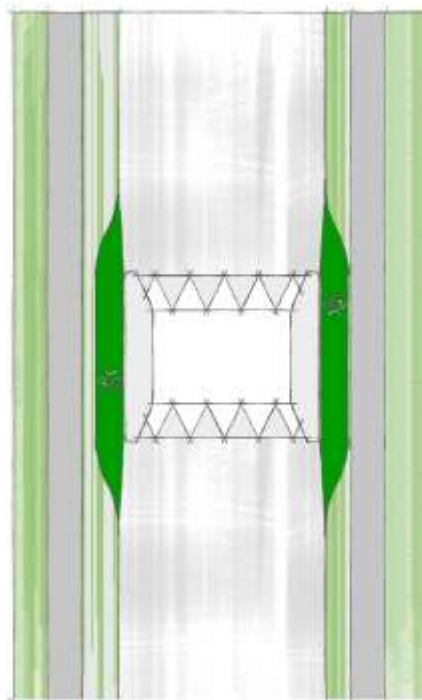
**DESIGN TOOL BOX: LATM TREATMENT – SPEED TABLE**

**EXISTING ISSUE**



Speed tables are used to lower traffic speeds in low volume streets. Speed tables introduce a hazard for cyclists because they are often narrower than the traffic lane before and after the speed table and they form an obstacle for cyclists, who have to slow down significantly.

**POSSIBLE SOLUTIONS**



## 6 PROVISIONAL PINCH POINTS TOOL BOX

### 6.1 Parking Pinch Points

As evident from much of the publicity regarding cycle pinch points, many of the matters being raised are with respect to on street parking and the resulting issue this causes in forcing a cyclist into a live vehicle lane. This has, to date, typically been identified on the downstream arm of an intersection, but could occur in a number of places about the street network.

The MOTSAM manual provides guidance as to the road markings recommended about parallel parking spaces where no cycle lane is present. This is replicated in Figure 1, and shows two important techniques. One being the edge line taper, which if installed at the start of the parking bay, can help to alert and direct a cyclist to the outside of the parking bay. This helps to lessen any “swerving” a cyclist may typically exhibit if the on street parking comes as a bit of a surprise to the cyclist. The second technique is the separation of the parking bay from the edge line. This separation gives a cyclist a “safe zone” for which to travel in, as well as providing the motorist with an edge line to their vehicle lane, helping to ensure they also stay within their lane. It is recognised that the 0.6 m minimum and 1.0 m desirable separation between the parked vehicle and the edge line does not constitute a cycle lane – but it does provide that additional room for a cyclist to manoeuvre.

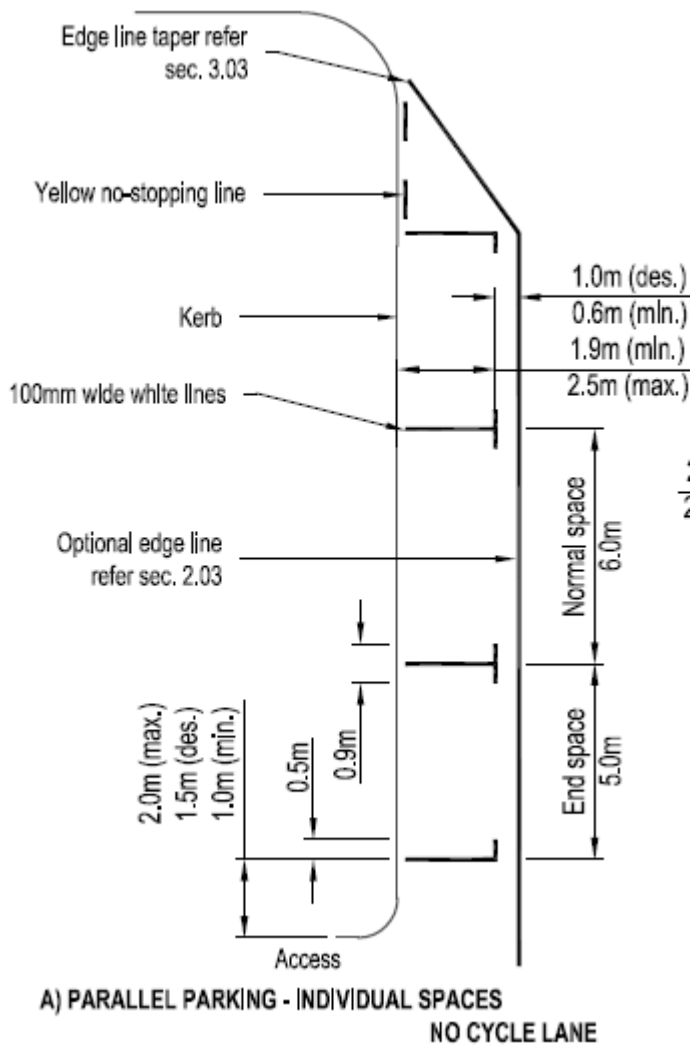
There are a number of other matters to consider with respect to parking given the varying nature of its use. These matters are touched on as follows

1. Is the parking “permanent” i.e. it is used every day and is not subject to clearway restriction? In this situation it is anticipated that line marking may be appropriate to guide and alert cyclists of the need to merge into the live vehicle lane. It may also be possible to implement markings similar to those identified in the MOTSAM manual (as replicated above), thereby providing greater guidance and separation between the motorist and cyclist.
2. Is the parking only used off peak – whereby a clear way operates during the peak times? This limits the ability to provide taper/continuity lines and may require consideration as to whether any on street parking needs to be removed or whether advanced warning can be given to the cyclist of the downstream
3. Does the parking begin in close proximity to merging lanes? This is typically a high conflict area as motorists are seeking to change lanes as well as contend with a cyclist who may move into the live vehicle lane in order to negotiate about a parked vehicle. In this situation consideration may need to be given to the removal of parking for a short length, or to adjusting the merge location, or to the ability to implement markings similar to those shown in .
4. As an ultimate, on road cycle lanes may, in the long term, be anticipated, therefore providing cyclists with dedicated road space to travel within.

For clearway parking the issue is not likely to be apparent during the peak period, as at this time there is no on street parking, Consequently the issues becomes an off peak matter where on street parking

occurs. Under clearway restrictions it is also difficult to implement continuity lines, as during peak periods vehicles will be given the “wrong” message through the use of any continuity/taper type line markings. Therefore careful consideration needs to be given as to how to address issues that the parking may be causing.

Figure 1: MOTSAM example of road markings about parallel parking



### 6.1.1 Addressing a Parking Pinch Point

Typical design features that can be used to address parking pinch points include:

- ◆ Removal or relocation of the on street parking to eliminate or mitigate the issue
- ◆ Continuity lines from the edge of seal to the rear of the car park should help to alert cyclists that their path of travel is shifting into the live vehicle lane. This would seem to be one of the more simple solutions – and is identified in MOTSAM as a typical marking for on street parking – see below. As shown, if width enables there may be the ability to implement an edge line around the whole on street parking.
- ◆ Symbol road markings, for example “sharrows”, could look to be marked on the road surface to alert the cyclist of the narrowing ahead – this could be way of an angled arrow to alert cyclists to

shift to the right. Care has to be taken with regards to the use of sharrow markings, they are more appropriate for lower speed environments. The use of sharrows is discussed further in Section 7.

- ◆ If the parking pinch point occurs in the vicinity of a lane merge – can the parking be removed. Motorists in this situation may be focussed on merging with the traffic stream and less focussed on the cyclist
- ◆ The ability to narrow traffic lanes or flush medians to provide additional space for cyclists. This could then be “safeguarded” with the use of an edge line – similar to Figure 2 – again from MOTSAM
- ◆ The ultimate solution and particularly if the issue occurs on the RCN/ACN, is for cycle lanes to be implemented, resulting in a full reconfiguration or widening of the existing carriageway.
- ◆ Signage may be of some use – but bear in mind a cyclist’s visibility is different to that of a motorists. Cyclists are regularly scanning the surface of the road, what is directly in front of them etc. Signage may be difficult to observe. Coupled with this is the regular “complaint” about signage clutter – so signage may prove less successful

The following provides a more detailed consideration of the options available to deal with parking pinch points on the network for high medium and low priority issues. Following this, a Design Tool Box is again provided, giving a generic cycle issue and two to three possible solutions to address the issue.

It is reiterated the following is by no ways a complete design guide as there will be a number of options available, and these will vary site to site. However this gives an indication of what the typical interventions could be.





**PARKING AFFECTED BY CLEARWAY RESTRICTIONS**

EXAMPLE: NEW NORTH ROAD – MORNING-SIDE DRIVE



<p><b>HIGH PRIORITY</b></p>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Reconfigure carriageway to achieve on road cycle lanes</li> <li>2. Reconfigure carriageway to achieve greater separation between parked vehicle, cyclist and moving vehicle, but not necessarily to cycle lane standard</li> <li>3. Permanent removal of on street parking for 30 m from the limit line to provide adequate merge length.</li> <li>4. Ability to indent parking</li> </ol>	<p>If a high priority, likely to be part of RCN/ACN, or high crash risk</p>
<p><b>MEDIUM PRIORITY</b></p>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Removal of on street parking for 30 m from the limit line to provide adequate merge length.</li> <li>2. Line markings to alert motorists/cyclists of narrowing</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>
<p><b>LOW PRIORITY</b></p>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Line markings to alert motorists/cyclists of narrowing</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>

<b>PERMANENT ON STREET PARKING</b>		
<b>EXAMPLE: NEW NORTH ROAD - WEST OF CARRINGTON ROAD</b>		
		
<b>HIGH PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Reconfigure carriageway to achieve on road cycle lanes</li> <li>2. Reconfigure carriageway to achieve MOTSAM marking recommendation or similar</li> <li>3. Removal of on street parking for 30 m from the limit line to provide adequate merging distance for the cyclist to enter the live vehicle lane.</li> <li>4. Ability to indent parking. Does not need to be full indent – but enough to provide clear room for cyclists</li> </ol>	<p>If a high priority, likely to be part of RCN/ACN, or high crash risk</p>
<b>MEDIUM PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Continuity line markings to alert motorists/cyclists of narrowing</li> <li>2. Speed reduction on main road to lessen speed differential between vehicle and cyclist.</li> <li>3. Removal of on street parking for 30 m from the limit line to provide adequate merge length.</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>
<b>LOW PRIORITY</b>	<p>Options Available Include</p> <ol style="list-style-type: none"> <li>1. Continuity line markings to alert motorists/cyclists of narrowing</li> <li>2. Removal of on street parking for 30 m from the limit line to provide adequate merge length.</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>

<b>PARKING WHERE VEHICLE LANES MERGE</b>		
<b>EXAMPLE: NEW NORTH ROAD – IMMEDIATELY SOUTH OF MT EDEN ROAD</b>		
		
<b>HIGH PRIORITY</b>	Options Available Include <ol style="list-style-type: none"> <li>1. Reconfigure carriageway to achieve on road cycle lanes</li> <li>2. Reconfigure carriageway to achieve safety, adequate merge distances etc</li> <li>3. Reconfigure and/or remove parking to separate vehicle lane merge from cyclist merge area</li> </ol>	If a high priority, likely to be part of RCN/ACN, or high crash risk
<b>MEDIUM PRIORITY</b>	Options Available Include <ol style="list-style-type: none"> <li>1. Reconfigure and/or remove parking to separate vehicle lane merge from cyclist merge area</li> <li>2. Line markings to alert motorists/cyclists of narrowing</li> </ol>	Consider whether <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>
<b>LOW PRIORITY</b>	Options Available Include <ol style="list-style-type: none"> <li>1. Line markings to alert motorists/cyclists of narrowing</li> </ol>	Consider whether <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>

## 6.2 Lane Continuity

There have been a number of issues identified where an existing cycle lane (on or off road) or intersection lead in lanes, that do not consider the safety of the cyclist after the dedicated facility is discontinued. That is, where a cycle lane ends, consideration may not have been given as to how cyclists are reintroduced into a live vehicle lane. This can also be of concern where a cycle facility finishes on one side of an intersection and does not continue downstream.



**LANE CONTINUITY**

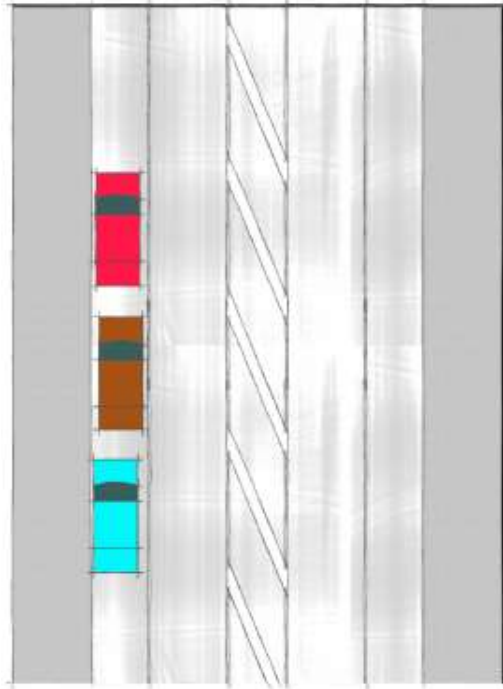
**EXAMPLE: NEW NORTH ROAD BY ASQUITH AVENUE**



<p><b>HIGH PRIORITY</b></p>	<ol style="list-style-type: none"> <li>1. Reconfigure carriageway to achieve on road cycle lanes</li> <li>2. Reconfigure carriageway to achieve safe merging distances for the cyclist to enter the live vehicle lane. This includes downstream of an intersection</li> </ol>	<p>If a high priority, likely to be part of RCN/ACN, or high crash risk</p>
<p><b>MEDIUM PRIORITY</b></p>	<ol style="list-style-type: none"> <li>1. Reconfigure carriageway to achieve safe merging distances for the cyclist to enter the live vehicle lane</li> <li>2. Line markings to alert motorists/cyclists of narrowing</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>
<p><b>LOW PRIORITY</b></p>	<ol style="list-style-type: none"> <li>1. Line markings and signage to alert motorists/cyclists of the end of a facility</li> </ol>	<p>Consider whether</p> <ul style="list-style-type: none"> <li>• on road cycle lanes may be a future desire for the corridor.</li> </ul>

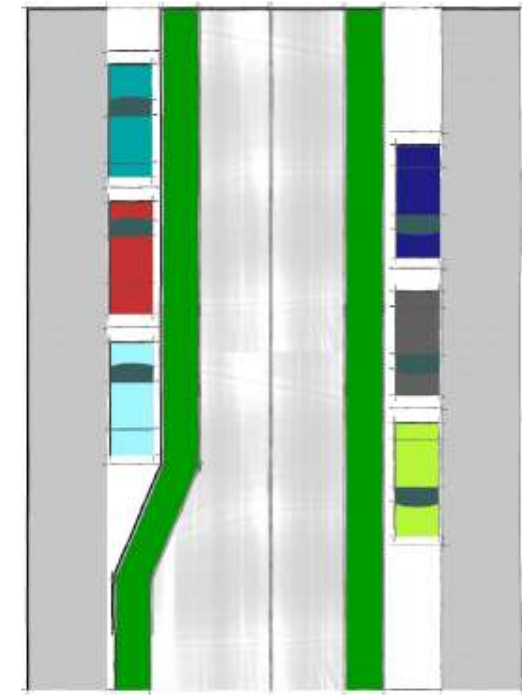
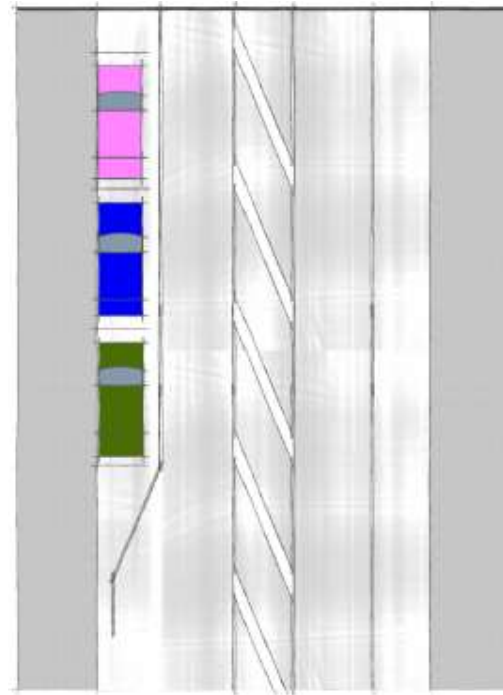
**DESIGN TOOL BOX: PARKING**

**EXISTING ISSUE**

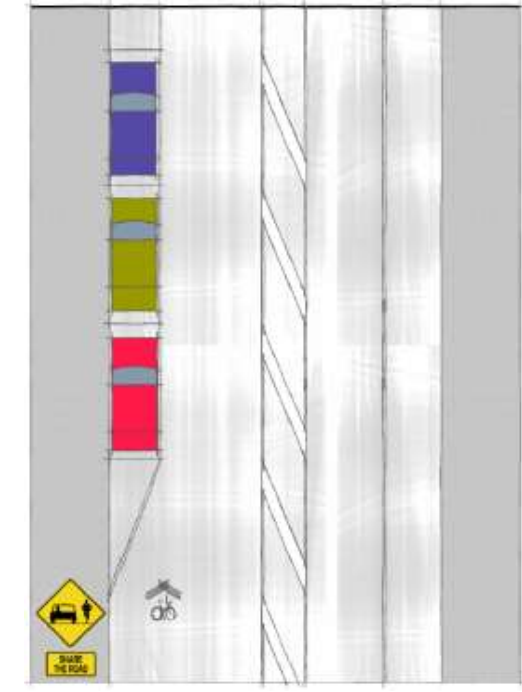
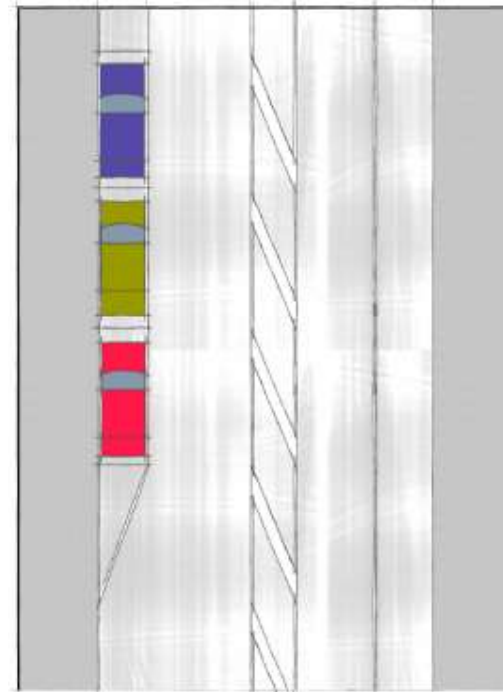


Parking can be a hazard for cyclists when they suddenly have to verge right to avoid collision with a parked car. This is often the case downstream from an intersection, where vehicles in the traffic lane are accelerating and cyclists have to merge suddenly.

**HIGH PRIORITY POSSIBLE SOLUTIONS**



**MEDIUM AND LOW PRIORITY POSSIBLE SOLUTIONS**



## 7 POSSIBLE LINE MARKING OR SIGNAGE MEASURES TO BE IMPLEMENTED

The following identifies a range of measures that could be implemented at low priority locations, by way of a short term solution, or where it is not possible for other changes to be reasonably made. This examines signage and road markings that could be applicable, also noting the use of these in NZ or otherwise.

### 7.1 Signage

A permanent warning sign, PW-35 can be erected prior to an area of concern to alert motorists of the presence of cyclists in locations where conflicts between motorists and cyclists are likely, and where there are no immediate opportunities to provide additional space for cyclists.

Figure 2: PW-35 Sign, MOTSAM



A supplementary sign could be added to the above, reminding a motorist to “Share the Road”. This is not a typical sign used currently in NZ, and will require consultation with NZTA as to its use. Similar signage is used in Canada and the USA, with these identified in the USA’s Manual for Traffic Sign. Examples of this are illustrated below.

**Figure 3: Example of a “Share the Road” signs**



This type of signage would require trialling and acceptance by NZTA if deemed as a possible solution, where it would need to be clearly stated as to its intended use, when it's use may be applicable and so forth. Typically this may include:

- ♦ where cycling conditions are poor (i.e. locations with high volumes of traffic, operating speeds greater than 50km/h, no shoulder space, or poor edge surface conditions
- ♦ in situations where there are poor sight distance;
- ♦ where a cyclist transitions from an off road facility onto the road, at the end of cycle lanes;
- ♦ where an obstacle prevents a cyclist from continuing on an otherwise rideable shoulder.

## 7.2 Markings

With respect to markings, Auckland Transport is currently considering the trial of “sharrows” as a mechanism to alert motorists as to the presence of cyclists on a route. Sharrows are popular in the USA and are typically used where cycling is frequent but it is not possible to provide a separate cycle lane due to width constraints.

**Figure 4: Example of a sharrow marking**



The use of this marking helps motorists and cyclists know where they have to share the same traffic lane on roads. Shared lane markings can also help direct cyclists away from parked vehicles, reducing the chance of being struck by an opening door. Sharrows can also be used through intersections and merge areas to support straight-line cycling and to increase the visibility of cyclist by ensuring they are well positioned on the road.

Sharrows are a useful tool in situations where the operating speed of vehicles is relatively low. In higher speed areas, not all cyclists will be able to confidently claim their space on the road. The effectiveness of sharrows in these environments will be lower and other measures and cycling facilities might be required to compliment the use of sharrows.

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# **APPENDIX A      Earlier version of the Prioritisation Matrix**

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Table 5: Prioritisation Matrix

RANKING OF ISSUE				
<b>STRATEGIC ALIGNMENT</b>	The site is on the existing Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)	The site is on the future Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)	Not on the Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)- but potential to cater for a relatively high number of cyclists	No and unlikely to be a busy route for cycling
<b>SCORING</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>0</b>
<b>EXISTING FACILITIES - ON ROAD</b>	Cycle facilities are provided on or within 100m of the site via wide bus lane, cycle lane, shared path etc	No dedicated cycle facility, but sufficient road width on or within 100m of site to suggest cyclists can share with vehicles	No existing facilities providing on or near the site	
<b>SCORING</b>	<b>5</b>	<b>4</b>	<b>1</b>	
<b>ROUTE POPULARITY</b>	There is strong evidence that this is a popular route for commuting, or by experienced cyclists	There is some evidence that this is a popular cycle route	There is the potential for this to be a popular cycle route	The route does not appear to have any potential to attract cyclists
<b>SCORING</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>1</b>
<b>TRAFFIC VOLUMES</b>	> 30,000 AADT	15,000 - 30,000 AADT	5000-15,000AADT	5000 AADT
<b>SCORING</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>85% VEHICLE OPERATING SPEED</b>	>70 km/h	60-70 km/h	50-60 km/h	Vehicle speeds are less than 50km/h
<b>SCORING</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>CYCLE CRASH HISTORY</b>	There is a known cycle crash history or safety issue at this location	There are a number of complaints regarding this issue, suggesting near misses	There is an existing cycle crash history within the vicinity of this location (200m)	There is no crash history evident nor any evidence of near misses (no other complaints)
<b>SCORING</b>	<b>10</b>	<b>5</b>	<b>3</b>	<b>0</b>
<b>CYCLE RISK MAP</b>	The location is on a high risk route identified as a black line	The location is on a medium to high risk route identified as a red line	The location is on a medium risk route identified as an orange line	The location is on a low to medium or low risk route identified as a green or yellow line
<b>SCORING</b>	<b>10</b>	<b>5</b>	<b>3</b>	<b>1</b>
<b>AVAILABLE WIDTH AT CYCLE ISSUE LOCATION</b>	3 m or less	Between 3 - 3.5	3.5 to 4.0 m	4.0 to 4.2 m
<b>SCORING</b>	<b>6</b>	<b>4</b>	<b>3</b>	<b>1</b>
<b>FORWARD VISIBILITY</b>	less than 40 m	40-65 m	65-90	greater than 90
<b>SCORING</b>	<b>6</b>	<b>4</b>	<b>3</b>	<b>1</b>
<b>TOPOGRAPHY</b>	Issue location accommodates uphill and downhill cyclists	Issue location likely to be met predominately by cyclists travelling uphill	Issue location located on flat topography	Issue location likely to be met predominately by cyclists travelling downhill
<b>SCORING</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>1</b>
<b>LANE SEPARATION</b>	Opposing traffic lanes physically separated by island or barrier	Opposing traffic lanes separated by "No Overtaking" markings	Opposing traffic lanes separated by typical centre line	Opposing traffic lanes separated by flush median
<b>SCORING</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>2</b>

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## **APPENDIX B**

## **Live Example Assessments**

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## LIVE EXAMPLE ASSESSMENTS

The following provides an assessment of a number of sites identified about the Auckland area and seeks to identify how each site ranks with respect to high, medium and low, as well as identify the typical measures that will remedy or mitigate the safety issue. Where a preferred option is identified a conceptual sketch has been developed to illustrate the remedial works. These sketches, whilst conceptual, are to scale and achievable.

Eight sites have been assessed as follows

**Table 6: Site Issues Assessed**

Site Number	Site	Theme of Issue
1	21 Meola Road	Pinch Point
2	120 New North Road	Pinch Point
3	899 New North Road	Parking
4	2 New North Road	Parking
5	37 Tamaki Drive	Pinch Point
6	265 Ponsonby Road	Pinch Point
7	Tamaki Drive (east of Solent St)	Parking
8	Tamaki Drive (east of The Parade)	Pinch Point

The following issues have been addressed in a similar fashion and ideally this layout could form a template used for other issues, again ensuring consistency when assessing a site.



## 21 MEOLA ROAD

This site has been identified as part of previous works regarding the preparation of this document. This issue meets the pinch point definition developed by Auckland Transport and is located on the future Regional Cycle Network

### SITE INFORMATION

Location	21 Meola Road, Westmere
Type of issue	Central pedestrian refuge island
Road width on site	8.8m (approx.)
Road reserve width	20.5m (approx.)

Figure 5: Aerial (Source: Auckland Council GIS)



Figure 6: Streetview Image (Source: Google Street View)



## PRIORITY SCORING

Issue	Score	Points
Strategic Alignment	The site is on the future Regional Cycle Network	5
Existing Facilities (on road)	No existing facilities providing on or near the site	1
Route Popularity	There is some evidence that this is a popular cycle route	4
Surrounding Land Uses	The site is within 800m to key destinations (eg schools, town centres, community facilities, employment, public transport, retail) and is likely to serve as a route for cycling to and from these locations	4
Traffic Volumes	15,00-30,000 ADT	3
85% Vehicle Operating Speed	60-70km/h	3
Cycle Crash History	There is no crash history evident nor any evidence of near misses (no other complaints)	0
Cycle Risk Map	The pinch point is not on a red or black line	0
Available Width at Pinch Point	Between 3-3.5m	4
Forward Visibility	Greater than 90m	1
Topography	Pinch point is located on flat topography	2
Lane Separation	Opposing traffic lanes physically separated by island or barrier	6
TOTAL SCORE		33 points

## CONSTRAINTS AND OPPORTUNITIES

Large trees on the southern side of the pedestrian refuge island are located in the grass verge. This limits the amount of space available for kerb realignment, particularly if the trees are to be maintained. This can be remedied by providing bicycle ramps onto a (widened) footpath. This does create two additional matters that will need to be addressed, being

- ◆ This will require the shared path to be widened into Jagers Bush about this location, therefore widening into open space
- ◆ It introduces a potential safety issue around the point where the cyclist re-joins the carriageway. Given the provided lane width at this point, a section of cycle lane could be provided to reduce the risk for cyclists. This could extend over a short period to help reintegrate cyclists with the main traffic stream

## OPTIONS TO ADDRESS THE ISSUE

The following identifies options that could address this issue. These options are all valid, and could be progressed with at a scheme design level. However an attempt has been made to identify an option that reflects this location being on the future RCN/ACN

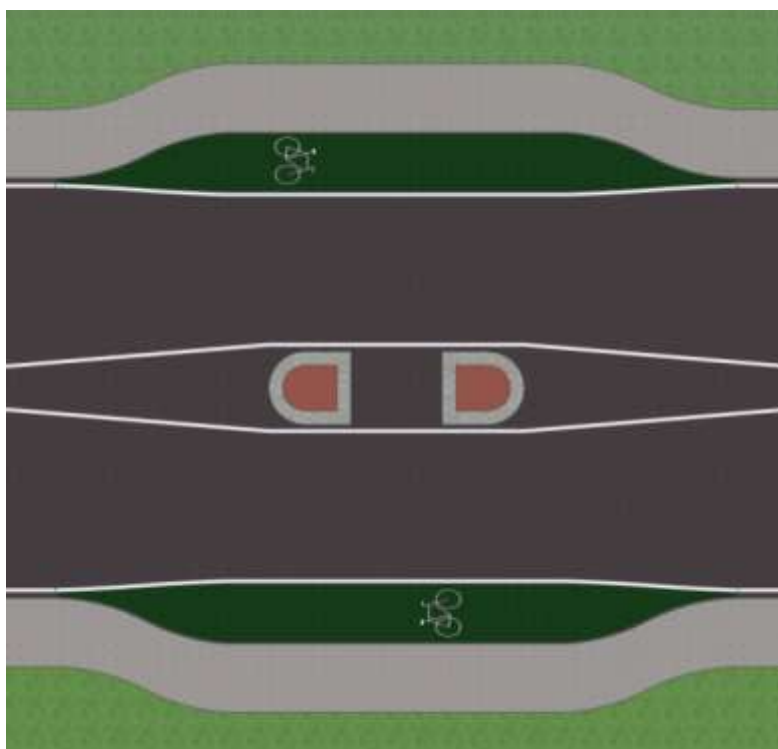
1. Remove central refuge island – although this may have a negative effect on the pedestrian environment
2. Implement cycle lane along Meola Road, consistent with its RCN/ACN status – this would require widening
3. Widen road immediately about the pedestrian refuge island by moving kerbs back and paint new road surface green (see Figure 7). This remains consistent with the RCN/ACN status of the route – but reduces the extent of works. Hence this option is recommended for further consideration
4. Remove centre island and put in side islands with cycle paths passing side islands on the outside
5. Provide ramps, widen footpath to serve as a shared foot/cycle path (see Figure 8). .

## SKETCH OF POSSIBLE SOLUTIONS

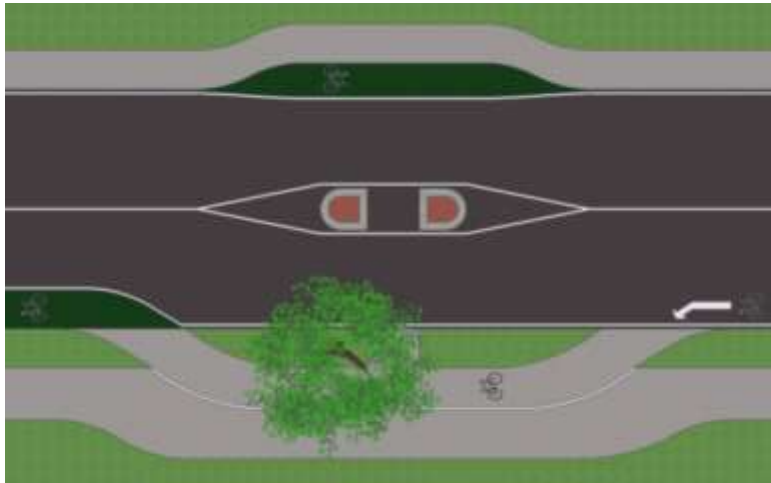
Long term, given this corridor is on the future RCN/ACN it could be expected that cycle lanes are to be implemented along this corridor.

The following identifies two short-medium term solutions, with these differing in response to the existing trees within the southern berm and the difficulty that may arise should an option seek the removal of these

**Figure 7: Possible Solution: Meola Road**



**Figure 8: Possible Solution: Meola Road**



## 120 NEW NORTH ROAD

This issue has been identified as part of a CAA cycle audit of the New North Road corridor (being Issue #14). Within the CAA documentation it was noted that the

*Kerbside lanes are narrowed down to 3.8m by kerb extensions - the width acknowledged in safety literature as wide enough to encourage motorists to overtake cyclists, but too narrow to do so safely.*

CAA recommended cutting back the kerb build outs or relocating the refuge islands further west.

### SITE INFORMATION

Location	120 New North Road, Eden Terrace
Type of issue	Side islands and pedestrian refuge island
Road width on site	17.7m (approx.)
Road reserve width	25.7m (approx.)

Figure 9: 120 New North Road Aerial (source: Auckland Council GIS)





**Figure 10: Streetview image of problem area (Source: Google Streetview)**



**PRIORITY SCORING**

Issue	Score	Points
Strategic Alignment	The site is on the future Regional Cycle Network	5
Existing Facilities (on road)	Cycle facilities are provided on or within 100m of the site via bus lane, cycle lane, shared path etc	5
Route Popularity	There is some evidence that this is a popular cycle route	4
Surrounding Land Uses	The site is within 800m to key destinations (eg schools, town centres, community facilities, employment, public transport, retail) and is likely to serve as a route for cycling to and from these locations	4
Traffic Volumes	15,00-30,000 ADT	3
85% Vehicle Operating Speed	50-60km/h	2
Cycle Crash History	There is no crash history evident nor any evidence of near misses (no other complaints)	0
Cycle Risk Map	The pinch point is not on a red or black line	0
Available Width at Pinch Point	Between 3.5-4.0m	3
Forward Visibility	Greater than 90m	1
Topography	Pinch point is located on flat topography	2
Lane Separation	Opposing traffic lanes physically separated by island or barrier	6
<b>TOTAL SCORE</b>		<b>35 points</b>

## CONSTRAINTS AND OPPORTUNITIES

At the location of this issue, there is road width that can be reallocated to create sufficient room for cyclists. The four lane road is approximately 17.7m wide, including a 2.5m wide flush median with central refuge islands. Footpaths on both sides of the road are also relatively wide.

Speeds at this section of road are potentially high, due to the close proximity of the Dominion Road interchange. There are also many vehicle crossings in the area, which limits the ability to relocate the refuge island..

## OPTIONS TO ADDRESS THE ISSUE

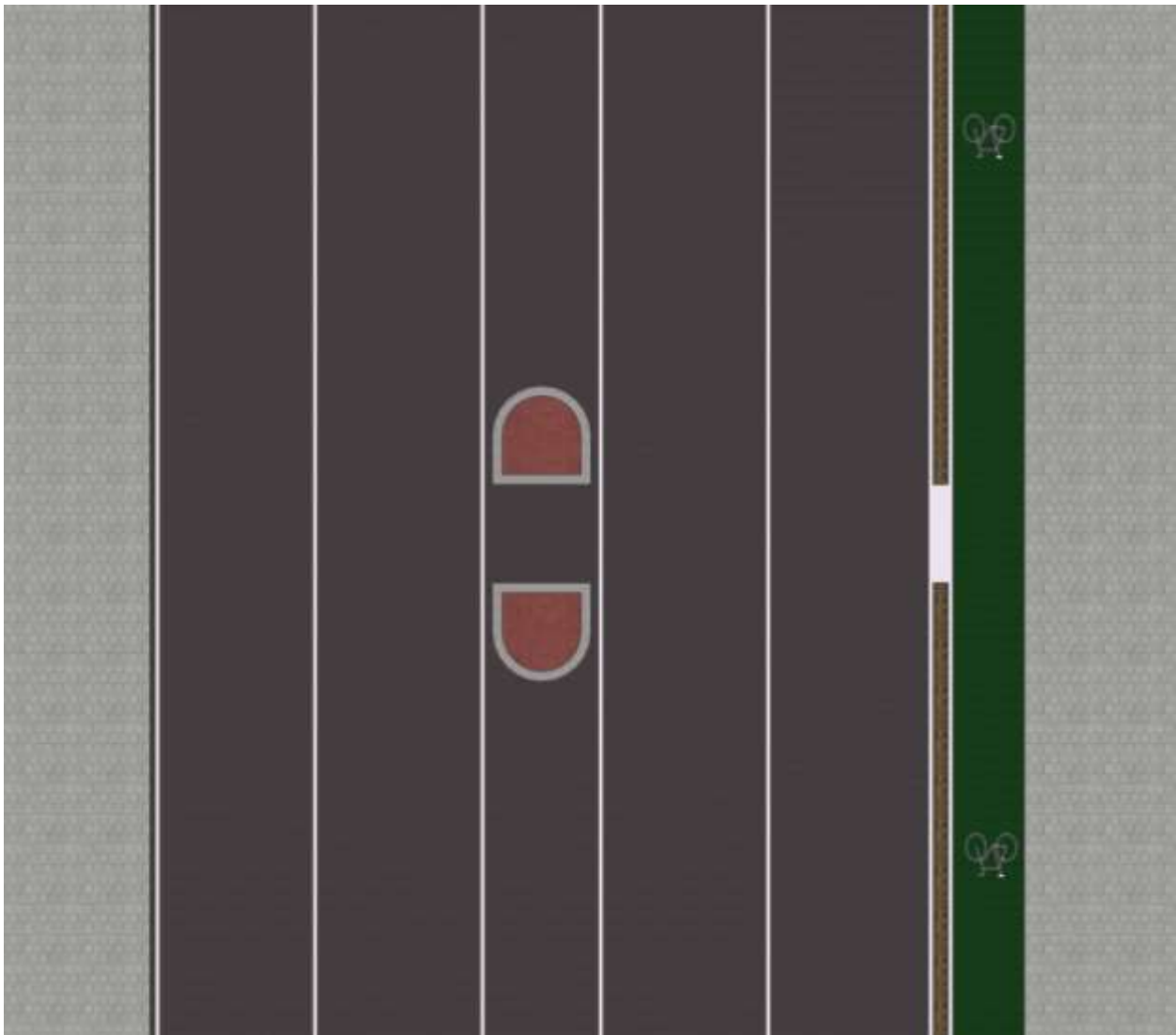
The following identifies options that could address this issue. These options are all valid, and could be progressed with at a scheme design level. However an attempt has been made to identify an option that reflects this location being on the future RCN/ACN

1. Remove central refuge island – although this may have a negative effect on the pedestrian environment
2. Remove side islands and implement cycle lane on New North Road consistent with its RCN/ACN status (see Figure 11)
3. Move side islands inwards, realign kerb line further back, construct cycle lane on outside of side islands (see Figure 12)
4. Narrow traffic lanes and side islands and provide cycle lane past obstacle

## SKETCH OF POSSIBLE SOLUTIONS

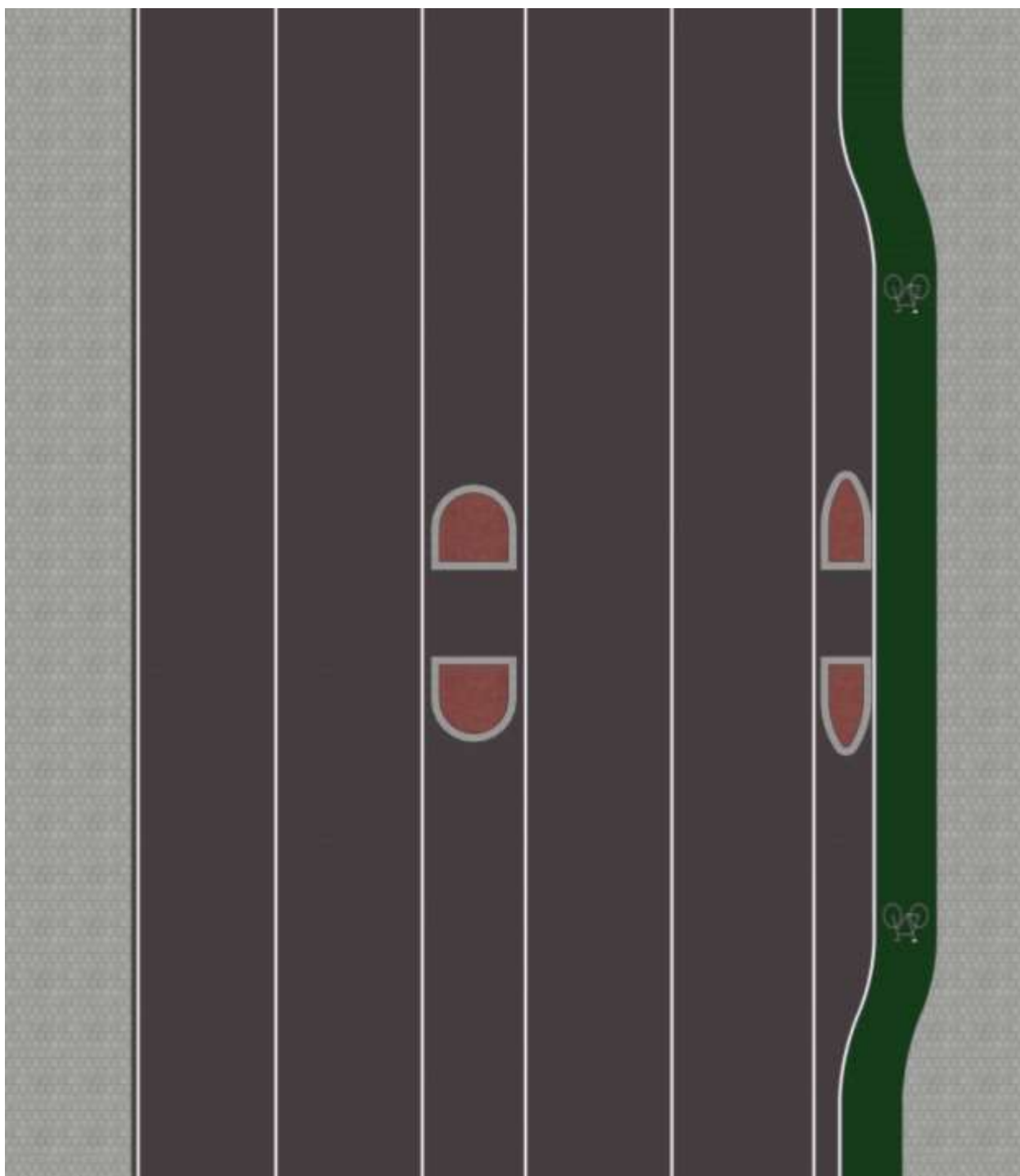
The following illustrate two possible solutions to this issue.

**Figure 11: : Possible Solution: 120 New North Road**





**Figure 12: Possible Solution: 120 New North Road Issue**



## 899 NEW NORTH ROAD

This issue has been identified in the MWH Stage 4 Safety Audit of the New North Road/Symonds Street route and relates to the on street parking forcing a cyclist into the live vehicle lane.

Whilst the following focuses on the issue identified in the MWH report it is noted that the CAA audit also identified two line marking opportunities for east bound traffic on this arm of the intersection. These are #1 and #2 of the CAA audit and included:

- ◆ Relocating the limit lines to provide a continuous line clear of the advance stop boxes
- ◆ Lead in cycle lane created between the bus stop and vehicle lane

### SITE INFORMATION

Location	899 New North Road, Mt Albert
Type of issue	No merging lane
Road width on site	19.5m (approx.)
Road reserve width	41.0m (approx.)

Figure 13: Parked cars form obstacle for merging cyclists (source: Auckland Council GIS)



Figure 14: Streetview image of problem (Source: Google Streetview)



### PRIORITY SCORING

Issue	Score	Points
Strategic Alignment	Not of the Regional Cycle Network - but potential to cater for a relative level of cyclists	2
Existing Facilities (on road)	Cycle facilities are provided on or within 100m of the site via bus lane, cycle lane, shared path etc	5
Route Popularity	There is strong evidence that this is a popular route for commuting, or by experienced cyclists	5
Surrounding Land Uses	The site provides a direct link (within 200m) to key destinations (eg schools, town centres, community facilities, employment, public transport, retail) with this likely to attract cycle trips	5
Traffic Volumes	15,00-30,000 ADT	3
85% Vehicle Operating Speed	Vehicle speeds are less than 50km/h	1
Cycle Crash History	There is no crash history evident nor any evidence of near misses (no other complaints)	0
Cycle Risk Map	The pinch point is not on a red or black line	0
Available Width at Pinch Point	Between 3.5-4.0m	3
Forward Visibility	Greater than 90m	1
Topography	Pinch point is located on flat topography	2
Lane Separation	Opposing traffic lanes separated by typical centre line	4

Issue	Score	Points
TOTAL SCORE		31 points

## CONSTRAINTS AND OPPORTUNITIES

There is scope for significant changes to the eastern arm of this intersection as a result of the significantly large traffic island separating the left turn lane from the through lanes on the eastbound approach to this intersection. There is therefore potential space for cycle facilities to be incorporated into the road. To do so however requires significant works and streetscape changes to this area. This may be undertaken as part of any future revitalisation works for the Mt Albert town centre.

A short term option consisting of continuity paint markings is feasible and is illustrated above. The removal of one to two parking spaces at this site is also ideally required, but this may be problematic given the neighbouring shops are a dairy, a restaurant and a travel agent. Consultation will therefore be required. In addition to these works it would seem prudent to investigate the ability to incorporate the changes recommended by CAA, being:

- ◆ Relocating the limit lines to provide a continuous line clear of the advance stop boxes
- ◆ Lead in cycle lane created between the bus stop and vehicle lane

A complete redesign of this intersection would be desirable, but this is a significant project, probably more appropriate for the medium to long term.

## OPTIONS TO ADDRESS THE ISSUE

This issue is located within the Mt Albert town centre and as such there is a range tensions and space considerations that limit the ability to address this issue without significant alterations. The site is also located immediately downstream of the signalised intersection with Carrington Road and Mt Albert Road, also limiting the scope for changes.

The following matters could therefore be considered:

1. Remove two to three parking spaces, paint a tapered continuity line, see Figure 15
2. Hatch area behind the first parking spot to alert cyclists
3. Redesign entire intersection, including left turn slip lane from New North Road and bus stop island on the eastbound approach. This would yield room to accommodate cyclists through this section of New North Road. Such works could be anticipated as part of a streetscape type project within the town centre.
4. Continue line marking across intersection to guide vehicles and cyclists.

## SKETCH OF POSSIBLE SOLUTION

This illustrates Option 1 above, with two to three parking spaces removed and a tapered continuity line guiding cyclists into the vehicle lane. This is a relatively low cost solution, but is likely to require consultation with the affected business owners and this may prove challenging.

**Figure 15: Possible Solution: 899 New North Road**





## 2 NEW NORTH ROAD

This issue has been identified in the MWH safety audit and relates to the merging of the two westbound traffic lanes as on street parking also begins. This restricts the room available for cyclists, as well as the merge area being quite ambiguous in this location due to a lack of road markings.

### SITE INFORMATION

Location	2 New North Road, Mt Albert
Type of issue	Parking blocking merging traffic
Road width on site	14.7m (approx.)
Road reserve width	20.0m (approx.)

Figure 16: 2 New North Road Aerial (source: Auckland Council GIS)



Figure 17: Streetview Image (Source: Google Streetview)





## PRIORITY SCORING

Issue	Score	Points
Strategic Alignment	The site is on the future Regional Cycle Network	5
Existing Facilities (on road)	No dedicated cycle facility, but sufficient road width on or within 100m of site to suggest cyclists can share with vehicles	4
Route Popularity	There is the potential for this to be a popular cycle route	2
Surrounding Land Uses	The site provides a direct link (within 200m) to key destinations (eg schools, town centres, community facilities, employment, public transport, retail) with this likely to attract cycle trips	5
Traffic Volumes	15,000-30,000 ADT	3
85% Vehicle Operating Speed	Vehicle speeds are less than 50km/h	1
Cycle Crash History	There is no crash history evident nor any evidence of near misses (no other complaints)	0
Cycle Risk Map	The pinch point is not on a red or black line	0
Available Width at Pinch Point	3m or less	6
Forward Visibility	Greater than 90m	1
Topography	Pinch point is located on flat topography	2
Lane Separation	Opposing traffic lanes separated by typical centre line	4
TOTAL SCORE		33 points

## CONSTRAINTS AND OPPORTUNITIES

The current road layout is ambiguous, during clearway hours, the road width is approximately 7.5m, with two (unmarked) traffic lanes. When the clearway is not active, parking takes up around 2.5m of width on the side of the kerb, but there are still two traffic lanes across the intersection, leaving drivers unsure of their position on the road. New line markings could resolve this situation. There is also the possibility for a (narrow) cycle lane to be added. Additional parking could be removed further west of this location to ensure continuity of the cycle lane.

## OPTIONS TO ADDRESS THE ISSUE

Given the location of this, and the ambiguity faced by the motorists as well as the conflict faced by cyclist the options to be implemented at this location need to clearly demarcate the paths for vehicles as they travel through the intersection. The options identified are as follows

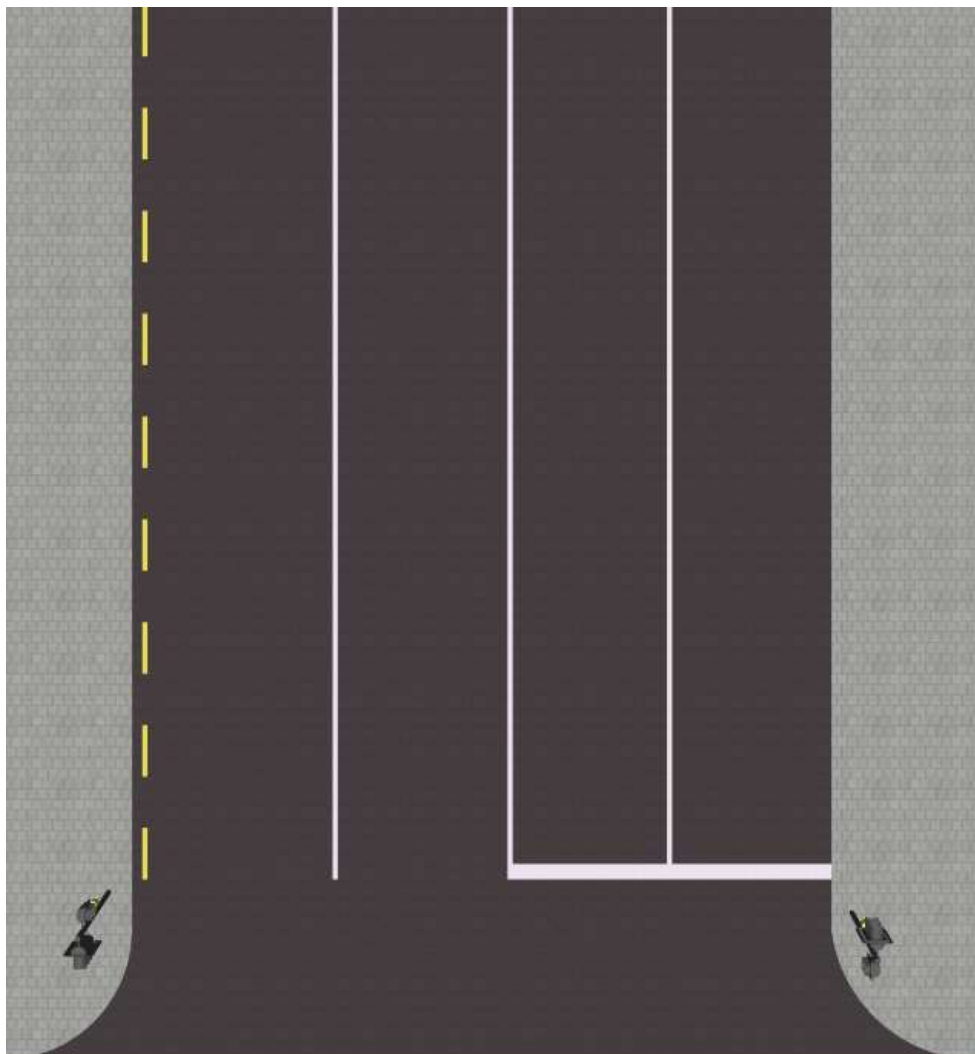
1. Remove one parking space, closest to the intersection, clearly mark lane lines and merging area,

2. Remove the three parking spaces that are closest to the intersection, clearly mark lane lines and merging area. The removal of three parking spaces provides greater merging area and greater separation for the cyclists away from the intersection (see Figure 18)
3. Change temporary clearway to permanent clearway and install cycle lane (see Figure 19)

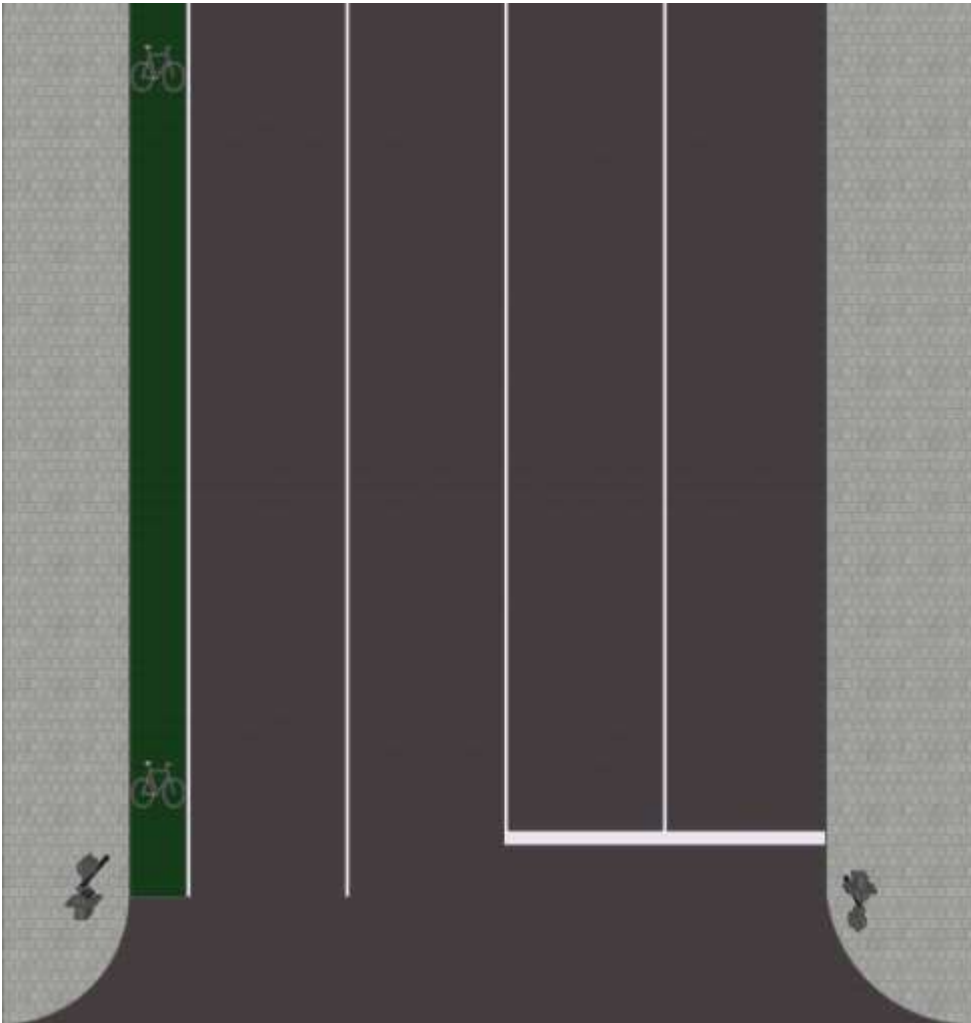
### SKETCH OF POSSIBLE SOLUTIONS

This illustrates Option 2 and 3 above, with two to three parking spaces removed and a two vehicle lanes exiting the stop line. This is a relatively low cost solution, but is likely to require consultation with the affected business owners as a result of the loss of parking. Figure 19 recognises this corridor as part of the RCN/ACN and consequently provides cycle lanes leading away from the intersection. Further investigations are required to understand the extent of cycle lane that could be provided through this section of New North Road. Consequently this option could be considered a medium term option.

**Figure 18: Short Term Possible Solution: 2 New North Road**



**Figure 19: Medium Term Possible Solution: 2 New North Road**



## 37 TAMAKI DRIVE

There has been considerable focus on the Tamaki Drive corridor and ensuring it provides a safe environment for cyclists. This is the most popular cycle route in Auckland and due to a recent fatality has come under scrutiny. The site is located at the western end of Mission Bay and represents a zebra crossing. This results in a pinch point for cyclists and hence has been investigated further.

### SITE INFORMATION

Location	37 Tamaki Drive, Mission Bay
Type of issue	Side islands and centre island
Road width on site	14.7m (approx.)
Road reserve width	20.2m (approx.)

Figure 20: Aerial of Tamaki Drive area (Source: Auckland Council GIS)



**Figure 21: Tamaki Drive issue (Source: Google Streetview)**



### PRIORITY SCORING

Issue	Score	Points
Strategic Alignment	The site is on the existing Regional Cycle Network	6
Existing Facilities (on road)	Cycle facilities are provided on or within 100m of the site via bus lane, cycle lane, shared path etc.	5
Route Popularity	There is strong evidence that this is a popular route for commuting, or by experienced cyclists	5
Surrounding Land Uses	The site provides a direct link (within 200m) to key destinations (eg schools, town centres, community facilities, employment, public transport, retail) with this likely to attract cycle trips	5
Traffic Volumes	15,00-30,000 ADT	3
85% Vehicle Operating Speed	Vehicle speeds are less than 50km/h	1
Cycle Crash History	There is an existing cycle crash history within the vicinity of this location (200m)	3
Cycle Risk Map	The pinch point is on a route identified as a "black" line	10
Available Width at Pinch Point	3.5-4.0m	3
Forward Visibility	65-90m	3
Topography	Pinch point is located on flat topography	2
Lane Separation	Opposing traffic lanes physically separated by island or barrier	6

Issue	Score	Points
TOTAL SCORE		52 points

## CONSTRAINTS AND OPPORTUNITIES

At this location, there is sufficient road width to enable carriageway changes, but this is likely to come at the expense of on street parking. The flush median in this immediate location is not required since there are no, or very few, vehicle accesses in the area. However there is expected to be a need for the flush median immediately to the west to serve Atkin Avenue and the car park at the western end of Mission Bay. Given the site is closely located to the intersection with Atkin Avenue; this is expected to be a constraint to any proposed changes.

The other factor to consider is the high volume of cyclists using the corridor, typically in large bunches. This restricts the options in that sufficient room should be provided for cyclists to, ideally, travel two-a-breast

## OPTIONS TO ADDRESS THE ISSUE

- ◆ Remove refuge island, move side islands inwards, allow cycle lanes to pass on the kerbside, see Figure 22.
- ◆ Remove side islands, increase refuge island in size and construct cycle lanes on both sides, see Figure 23.
- ◆ Construct cycle ramps on northern side to allow cyclist to pass obstacle on the shared path (requires relocation of lamp posts)
- ◆ Construct speed table instead of centre island, allow space for cyclist to travel around speed table

## SKETCH OF POSSIBLE SOLUTIONS

Figure 22 may prove less desirable given the prominence of bunch cyclists along this corridor as this option would funnel them through a narrow area between the kerb and side island

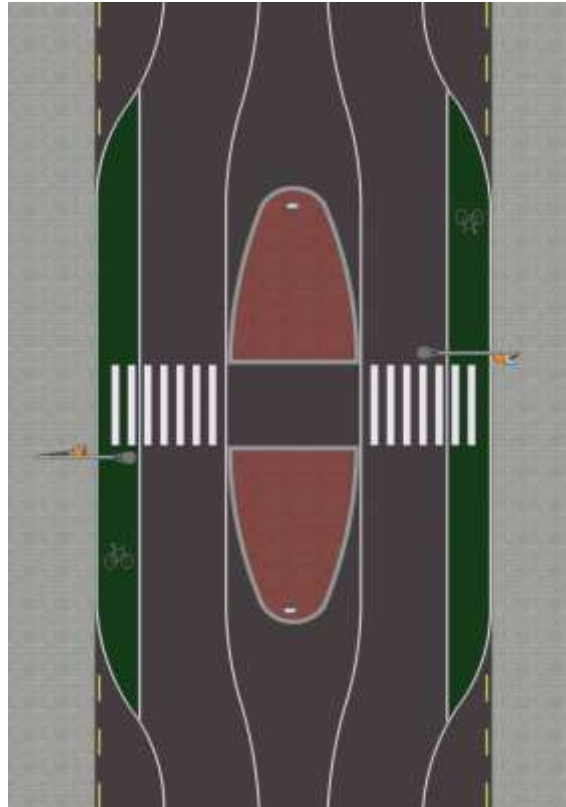
Figure 23 provides sufficient space for all users, whilst keeping the pedestrian crossing distance relatively short. This option will require the removal of on street parking, with the loss of four parking spaces likely (two from each side of the road).



Figure 22: Possible solution: 37 Tamaki Drive



Figure 23: Possible solution: 37 Tamaki Drive



## 265 PONSONBY ROAD

This site has been identified as part of previous works regarding the preparation of this document. This issue meets the pinch point definition developed by Auckland Transport and is located on the future Regional Cycle Network.

### SITE INFORMATION

Location	265 Ponsonby Road, Freemans Bay
Type of issue	Centre island and kerb build out
Road width on site	18.5m (approx.)
Road reserve width	27.5m (approx.)

Figure 24: Aerial Ponsonby Road (Source: Auckland Council GIS)



Figure 25: Kerb build out and centre island (Source: Google Streetview)



## PRIORITY SCORING

Issue	Score	Points
Strategic Alignment	The site is on the future Regional Cycle Network	5
Existing Facilities (on road)	No dedicated cycle facility, but sufficient road width on or within 100m of site to suggest cyclists can share with vehicles	4
Route Popularity	There is strong evidence that this is a popular route for commuting, or by experienced cyclists	5
Surrounding Land Uses	The site provides a direct link (within 200m) to key destinations (e.g. schools, town centres, community facilities, employment, public transport, retail) with this likely to attract cycle trips	5
Traffic Volumes	>30,000 ADT	4
85% Vehicle Operating Speed	Vehicle speeds are less than 50km/h	1
Cycle Crash History	There is an existing cycle crash history within the vicinity of this location (200m)	3
Cycle Risk Map	The pinch point is not on a black or red route	0
Available Width at Pinch Point	3.5-4.0m	3
Forward Visibility	>90m	1
Topography	Pinch point is located on flat topography	2
Lane Separation	Opposing traffic lanes physically separated by island or barrier	6
TOTAL SCORE		39 points

## CONSTRAINTS AND OPPORTUNITIES

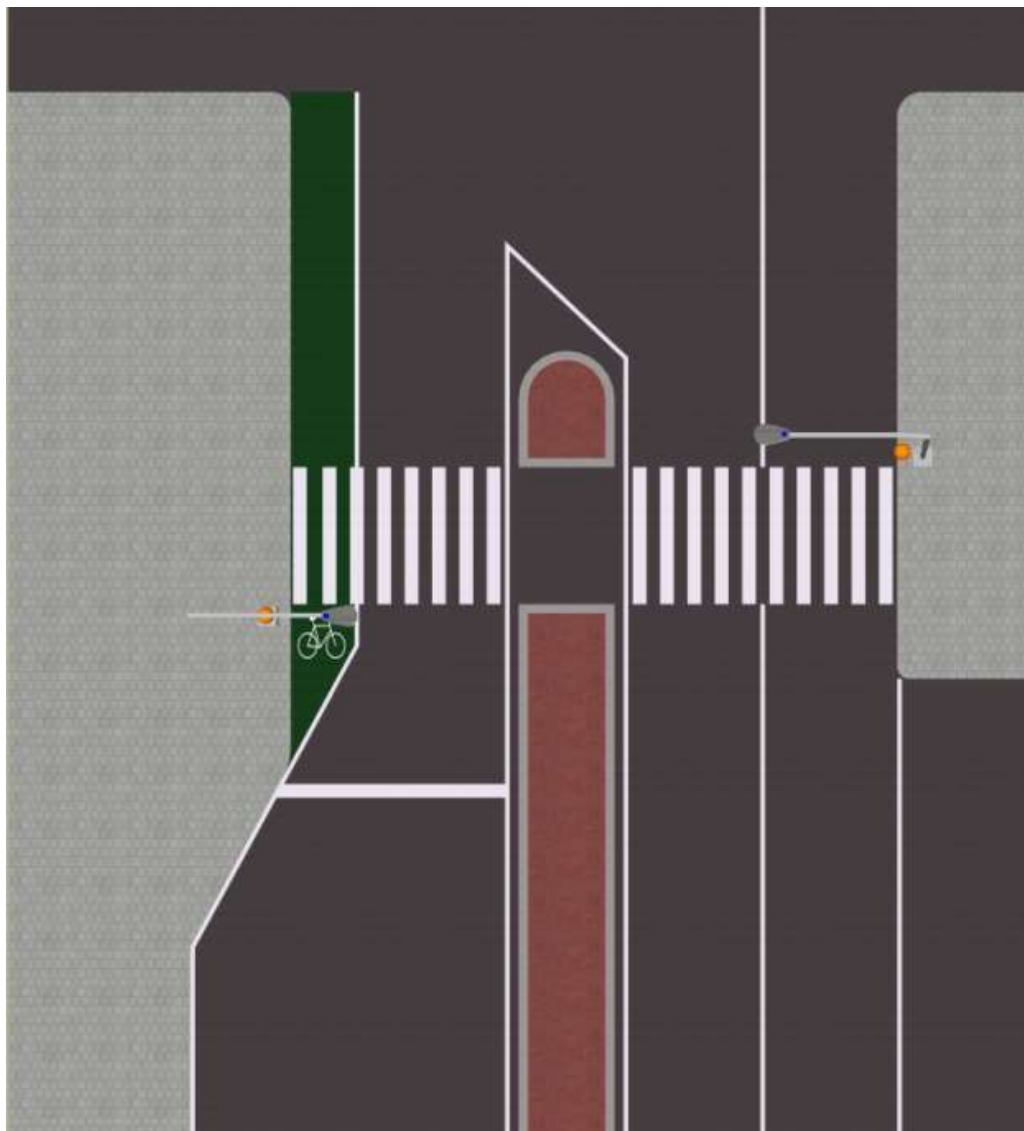
Space within the road width is constrained given the wide footpaths on either side of Ponsonby Road and this issue being within the Three Lamps local centre. As the pinch point is located on the southbound direction only, which consists of only one lane, it is possible to cut back the kerb build out without making the crossing distance for pedestrians much greater. Providing a short cycle lane at this location does not result in safety issues south of the intersection with Russell Street, due to the fact that Ponsonby Road widens from one lane to two lanes at this intersection, leaving enough space for cyclists to safely traverse the intersection and continue south on Ponsonby Road.

## OPTIONS TO ADDRESS THE ISSUE

- ♦ Cut back kerb build out to allow space for passing cyclists, see Figure 26. This will require the existing lamp post to be relocated

## SKETCH OF POSSIBLE SOLUTIONS

Figure 26: Possible Solution: 265 Ponsonby Road





## TAMAKI DRIVE (150 M EAST OF SOLENT ST)

This issue has been identified through the Tamaki Drive Road Safety Audit and arises as a result of a cyclist required to merge with the through traffic as it approached the on street parking.

### SITE INFORMATION

Location	Tamaki Drive, 150m east of Solent St
Type of issue	On street parking obstacle
Road width on site	14.8m (approx.)
Road reserve width	24.8m (approx.)

Figure 27: Tamaki Drive (Source: Auckland Council GIS)



Figure 28: Image of problem area (Source: Google Streetview)



## PRIORITY SCORING

Issue	Score	Points
Strategic Alignment	The site is on the existing Regional Cycle network	15
Existing Facilities (on road)	Cycle facilities are provided on or within 100m of the site via bus lane, cycle lane, shared path etc	9
Route Popularity	There is strong evidence that this is a popular route for commuting, or by experienced cyclists	9
Surrounding Land Uses	No land use facilities nearby that are likely to attract cycle trips	1
Traffic Volumes	>30,000 ADT	7
85% Vehicle Operating Speed	60-70 km/h	6
Cycle Crash History	There is a known cycle crash history or safety issue at this location	15
Cycle Risk Map	The pinch point is on a route identified as a "black" line	12
Available Width at Pinch Point	3.0-3.5m	5
Forward Visibility	>90m	1
Topography	Pinch point is located on flat topography	2
TOTAL SCORE		82 points

## CONSTRAINTS AND OPPORTUNITIES

The lane width is limited and provides two through lanes and a parking lane. This causes a hazard for cyclists who need to merge into the vehicle lane to avoid the parked cars. The removal of on street parking would obviously provide sufficient room to cater for cyclists. However this would require all parking to be removed, as the removal of one or two spaces will simply shift the merging issue

## OPTIONS TO ADDRESS THE ISSUE

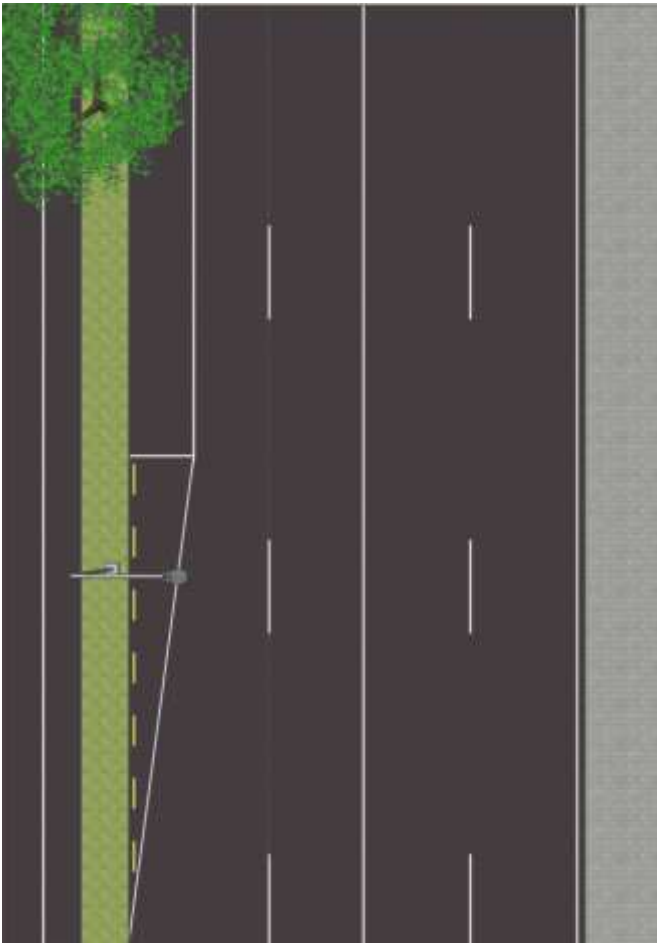
- ◆ Remove all parking along this section of Tamaki Drive and implement a cycle lane
- ◆ Provide tapered edge line to alert drivers and cyclists to the parked cars ahead (see Figure 29)
- ◆ Provide ramp for cyclist to enter shared path
- ◆ Paint green strip before parking lane to guide cyclists around parked cars

## SKETCH OF POSSIBLE SOLUTIONS

The following provides a short term solution until such time as on road cycle lanes are achieved. It is recommended that in this location cycle signage is also investigated given the high number of cycle numbers using this corridor.



**Figure 29: Possible Solution: Tamaki Drive east of Solent Street**



## TAMAKI DRIVE/THE PARADE

This issue has been identified through the Tamaki Drive Road Safety Audit and arises as a result of a pedestrian refuge island limiting the ability for a vehicle to overtake a cyclist. This can lead to the vehicle coming “uncomfortably” close to the cyclist.

### SITE INFORMATION

Location	Tamaki Drive, 25m east of The Parade, St Heliers
Type of issue	Centre refuge island
Road width on site	12m (approx.)
Road reserve width	18m (approx.)

Figure 30: Tamaki Drive/The Parade, St Heliers



Figure 31: Centre refuge island (Source: Google Streetview)



## PRIORITY SCORING

Issue	Score	Points
Strategic Alignment	The site is on the existing Regional Cycle network	15
Existing Facilities (on road)	Cycle facilities are provided on or within 100m of the site via bus lane, cycle lane, shared path etc	9
Route Popularity	There is some evidence that this is a popular cycle route	6
Surrounding Land Uses	No land use facilities nearby that are likely to attract cycle trips	1
Traffic Volumes	5000-15,000AADT	3
85% Vehicle Operating Speed	50-60 km/h	3
Cycle Crash History	There is an existing cycle crash history within the vicinity of this location (200m)	5
Cycle Risk Map	The pinch point is on a route identified as a "black" line	12
Available Width at Pinch Point	3.0-3.5m	5
Forward Visibility	>90m	1
Topography	Pinch point is located on flat topography	2
TOTAL SCORE		62 points

## CONSTRAINTS AND OPPORTUNITIES

The centre island at this location is very close to another refuge island approximately 80m further east, where a similar issue occurs. It may be feasible to remove one of the islands, although that is not the preferred option as it dis-benefits pedestrians. The on street parking on Tamaki Drive provides opportunities to implement cycle passing bays around the island while keeping within the existing kerb lines, but at the cost of losing parking spaces.

## OPTIONS TO ADDRESS THE ISSUE

- ◆ Remove the centre island, creating more space for cyclists and motorists to share the lane

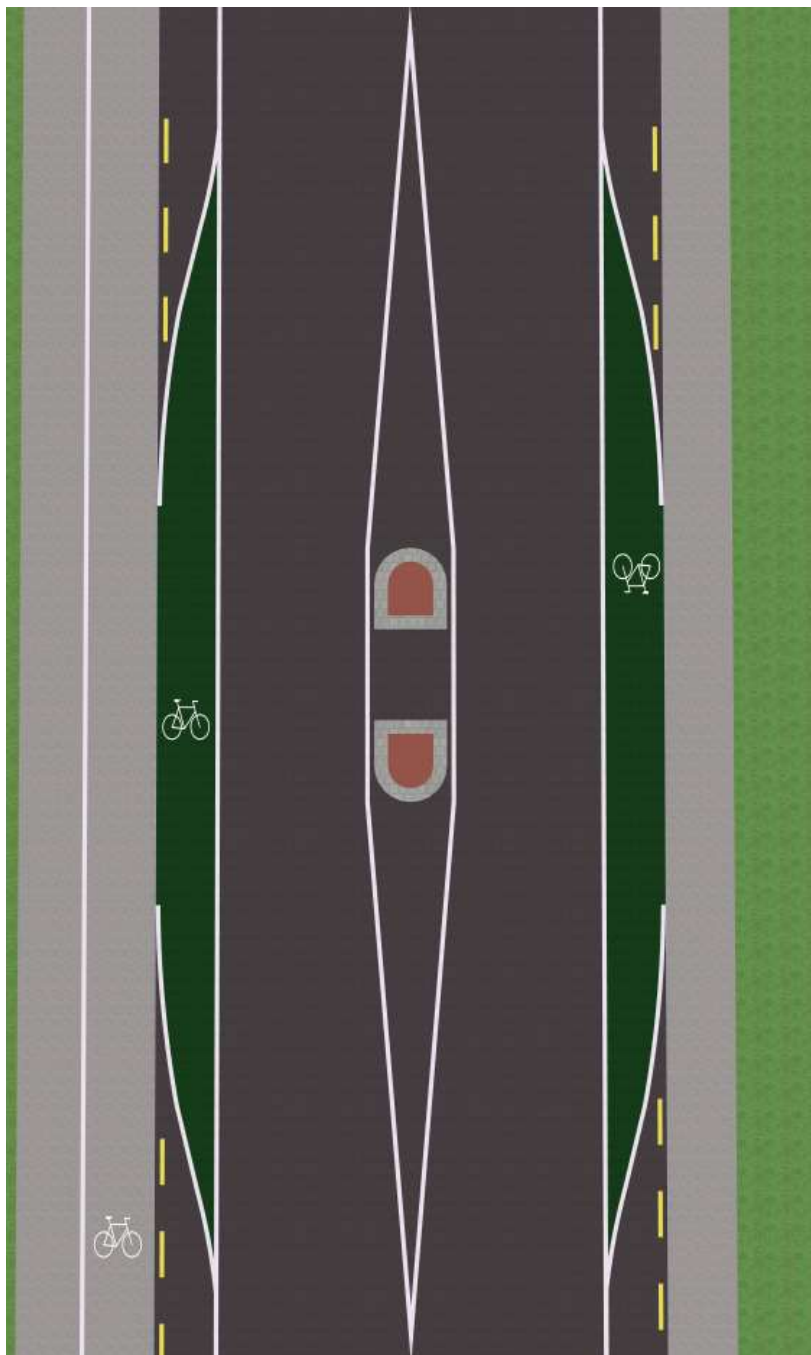
Implement cycle lane in parking lane to allow cyclists to circumvent the centre island, see

- ◆ Figure 32.
- ◆ Remove centre island and flush median and provide cycle lane on both sides
- ◆ Construct ramps to allow cyclists to use shared path on the side of the road
- ◆ Remove more parking on both sides of the centre refuge island without providing dedicated cycle lanes

## SKETCH OF POSSIBLE SOLUTIONS

This will require the loss of approximately 3 parking spaces on the northern side of Tamaki Drive. A cycle lane on the southern side can also be created without the loss of any on street parking given the existing no stopping lines through this area

Figure 32: Possible Solution: Tamaki Drive/The Parade



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## APPENDIX C

## Review of Priority Matrix

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## REVIEW OF PRIORITY MATRIX

The issues addressed in Section 6 are existing issues on the road network, and achievable options have been identified as to how these issues can be remedied or mitigated. However, the overall prioritisation process is still in development, and the above assessment of each site has enabled refinements to be made to the prioritisation matrix.

Table 7 summarises six of the sites assessed above and illustrated how they rank in terms of priority

**Table 7: Summary of Prioritisation**

Site Number	Site	Score	High/Medium/Low
1	21 Meola Road	33	Medium
2	120 New North Road	38	Medium
3	899 New North Road	36	Medium
4	2 New North Road	38	Medium
5	37 Tamaki Drive	52	Medium
6	265 Ponsonby Road	39	Medium

A review of the priority scoring for the above mentioned sites shows that all sites score medium on the priority scale and five of the sites are within six points from each other. Site 5, Tamaki Drive, shows a higher score, particularly due to the fact that it is on a route that is classified as a black route for cyclists. This scoring bandwidth is quite narrow and does not leave enough room for a prioritisation.

To allow for more differentiation between the sites, it is recommended that the total maximum score is raised to 100 points. This also allows for easier weighting of the different factors. In addition it is proposed to give greater differentiation to the surrounding land use, giving greater weighting to a site that might be close to a school and a town centre versus a site that may be a popular commuter route.

The proposed new prioritisation matrix is as follows:



Table 8: Updated Prioritisation Matrix

RANKING OF ISSUE				
<b>STRATEGIC ALIGNMENT</b>	The site is on the existing Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)	The site is on the future Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)	Not of the Regional Cycle Network (RCN) /Auckland Cycle Network (ACN)- but potential to cater for a relative level of cyclists	No and unlikely to be a busy route for cycling
<b>SCORING</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>1</b>
<b>EXISTING FACILITIES - ON ROAD</b>	Cycle facilities are provided on or within 100m of the site via bus lane, cycle lane, shared path etc	No dedicated cycle facility, but sufficient road width on or within 100m of site to suggest cyclists can share with vehicles	No existing facilities providing on or near the site	
<b>SCORING</b>	<b>9</b>	<b>6</b>	<b>3</b>	
<b>ROUTE POPULARITY</b>	There are educational facilities within 300m of the site	There are educational facilities within 600m of the site	There are no educational facilities near the site	
	<b>5</b>	<b>3</b>	<b>0</b>	
	The site is located on a popular commuter route	The site is located on a potentially popular commuter route	The site is not located on a potentially popular commuter route	
	<b>4</b>	<b>2</b>	<b>0</b>	
	The site is located within 300m of a town centre or shopping centre	The site is located within 600m of a town centre or a shopping centre	The site is not located near a town or shopping centre	
	<b>3</b>	<b>1</b>	<b>0</b>	
	The site is located within 300m of a major bus or train station	The site is located within 600m of a major bus or train station	The site is not located near a major bus or train station	
	<b>2</b>	<b>1</b>	<b>0</b>	
	The site is located on a popular route for recreational cyclists	The site is located on a route that is potentially interesting for recreational cyclists	The site is not located on a route that is interesting for recreational cyclists	
	<b>2</b>	<b>1</b>	<b>0</b>	
<b>TRAFFIC VOLUMES</b>	> 30,000 AADT	15,000 - 30,000 AADT	5000-15,000AADT	5000 AADT
<b>SCORING</b>	<b>7</b>	<b>5</b>	<b>3</b>	<b>2</b>
<b>85% VEHICLE OPERATING SPEED</b>	>70 km/h	60-70 km/h	50-60 km/h	Vehicle speeds are less than 50km/h
<b>SCORING</b>	<b>9</b>	<b>6</b>	<b>3</b>	<b>1</b>
<b>CYCLE CRASH HISTORY</b>	There is a known cycle crash history or safety issue at this location	There are a number of complaints regarding this pinch point, suggesting near misses	There is an existing cycle crash history within the vicinity of this location (200m)	There is no crash history evident nor any evidence of near misses (no other complaints)
<b>SCORING</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>1</b>
<b>CYCLE RISK MAP</b>	The pinch point is on a high risk route identified as a "black" line	The pinch point is on a medium to high risk route identified as a red line	The pinch point is on a medium risk route identified as an orange line	The pinch point is on a low to medium or low risk route identified as a green or yellow line
<b>SCORING</b>	<b>12</b>	<b>8</b>	<b>4</b>	<b>1</b>
<b>AVAILABLE WIDTH AT PINCH POINT</b>	3 m or less	Between 3 - 3.5	3.5 to 4.0 m	4.0 to 4.2 m
<b>SCORING</b>	<b>7</b>	<b>5</b>	<b>3</b>	<b>1</b>
<b>FORWARD VISIBILITY</b>	less than 40 m	40-65 m	65-90	greater than 90
<b>SCORING</b>	<b>7</b>	<b>5</b>	<b>3</b>	<b>1</b>
<b>TOPOGRAPHY</b>	Pinch Point accommodates uphill and downhill cyclists	Pinch point likely to be met predominately by cyclists travelling uphill	Pinch point located on flat topography	Pinch point likely to be met predominately by cyclists travelling downhill
<b>SCORING</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>

In the revised prioritisation matrix, the maximum scores add up to 100 points. The weights have been altered according to the following table:

**Table 9: Old and new maximum scores**

Factor	Previous maximum score	New maximum score
Strategic alignment	6	15
Existing facilities	5	9
Route popularity	5	+ 5 if close to school + 4 if located on commuter route + 3 if close to town centre or shopping centre + 2 if close to major public transport hub + 2 if popular recreation route
Surrounding land uses	5	7
Traffic volumes	4	7
85% operating speed	4	9
Cycle crash history	10	15
Cycle risk map	10	12
Available width at pinch point	6	7
Forward visibility	6	7
Topography	5	3
Lane separation	6	0
Total maximum score	72	100

The new scoring gives more weight to the importance of providing good cycling facilities on the current or future regional cycling network. It also gives more weight to sites with existing facilities or a high number of cyclists. The route popularity has also been split into various categories to differentiate between sites, particularly if the sites are along the same corridor. The weight for safety issues has remained the same, while the weight of uphill or downhill sites has been reduced. Lane separation has been removed from the priority matrix largely due to the fact that this is included in the available width factor, which should indicate whether there is room for vehicles to manoeuvre around cyclists.

Given the change in the individual scores for each category the bands separating the high, medium and low priority projects also needs to be altered.

**Table 10: Priority Category**

PRIORTIY CATEGORY	RATING SCORE	PRINCIPLE FOR EACH PRIORTIY CATEGORY
HIGH PRIORITY	70-100	A high priority pinch point will be eliminated and must be addresses as soon as possible
MEDIUM PRIORITY	40-70	A medium priority pinch point will be eliminated or the risk minimised. Works will be to a scale commiserate with the issue
LOW PRIORITY	0-40	A low priority pinch point will be minimised with lesser intervention and cost. It may result in no action being taken if no discernible risk can be identified

The new prioritisation matrix has been tested for the above mentioned six sites, with four additional sites included in order to further test the adequacy of the ranking process. The following table provides a comparison in scoring for the sites.

**Table 11: Score comparison**

Site Number	Ranking	Site	Old score	New score	High/Medium/Low
1	9	21 Meola Road	33	41	Medium
2	7=	120 New North Road	38	44	Medium
3	5	899 New North Road	36	47	Medium
4	4	2 New North Road	38	49	Medium
5	2	37 Tamaki Drive	52	73	High
6	7=	265 Ponsonby Road	39	44	Medium
7	6	1384 Dominion Road		46	Medium
8	10	66 Main Highway		38	Low
9	1	Tamaki Drive (east of Solent St)		78	High
10	3	Tamaki Drive (east of The Parade)		64	Medium

While the new scoring does not change a lot in the priority order, it does increase the scores of each individual site, leaving more room for differentiation. It also illustrates that two of the sites that have been addressed are now considered high priority, with one site falling into the low priority category

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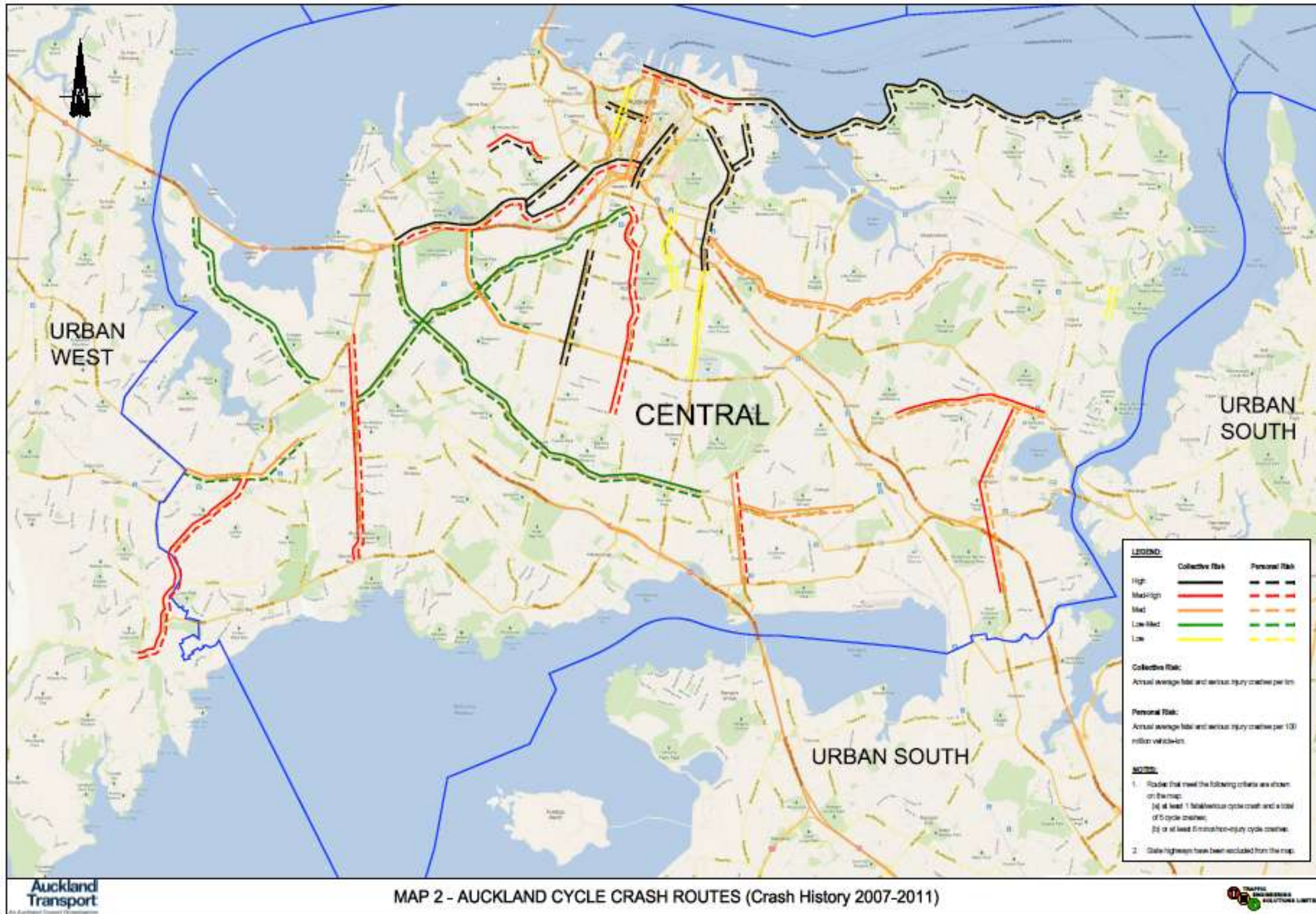
## APPENDIX D

## Maps used in Priority Matrix

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## CYCLE CRASH RISK - AUCKLAND





### AADT AND HCV PERCENTAGES MAP

