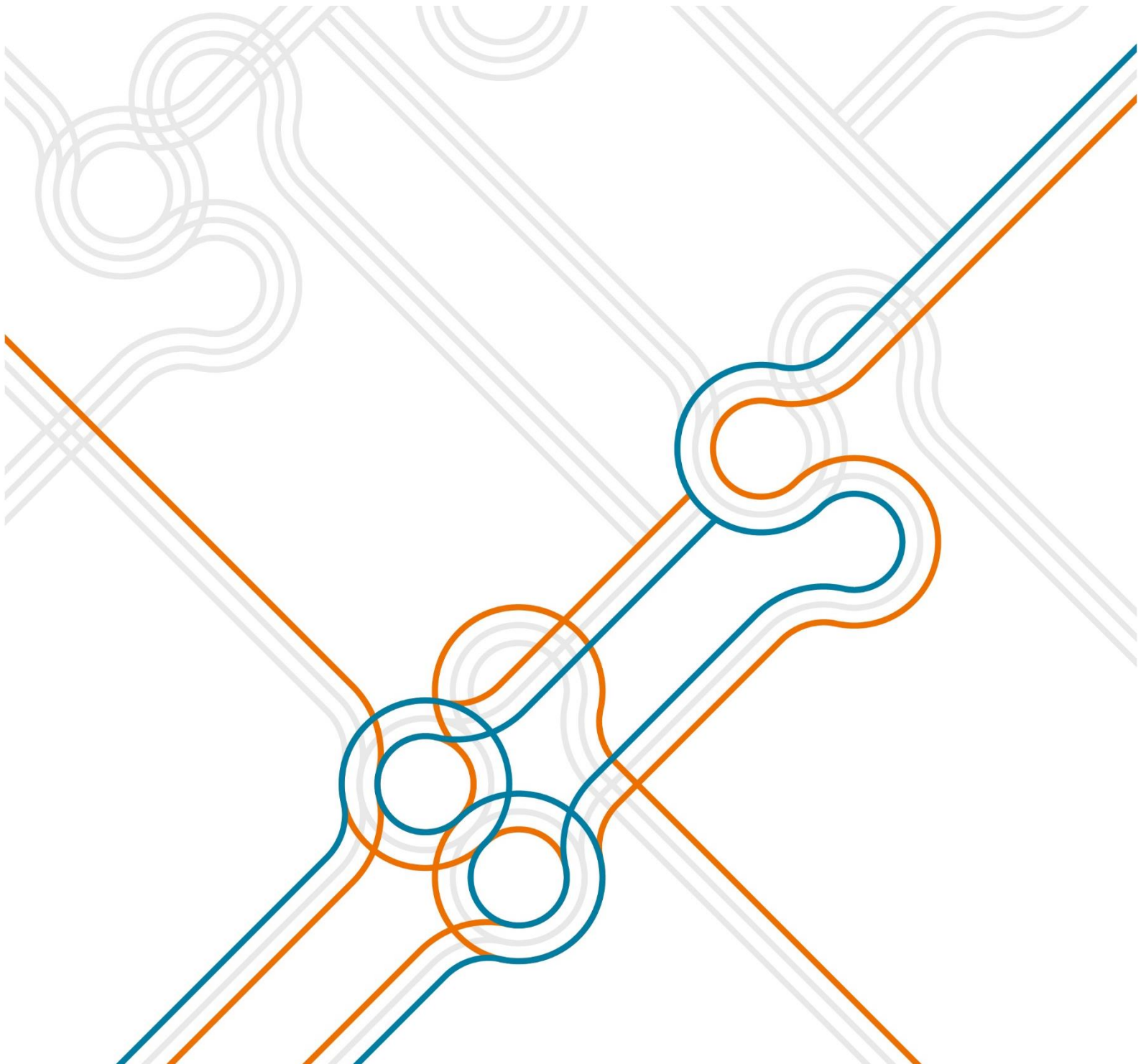

Cremorne Urban Design Framework

Transport Review

Prepared for: City of Yarra

Ref: 300304767 | Date: 17 August 2023



Revision

Revision	Date	Comment	Prepared By	Approved By
B	17 August 2023	Final	J Smith and N McCracken	N McCracken



Neale McCracken

For and on behalf of

Stantec Australia Pty Ltd

L25, 55 Collins Street, Melbourne VIC 3000

Acknowledgment of Country

In the spirit of reconciliation, Stantec acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

Limitations

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Executive Summary

Cremorne has been designated an "Enterprise Precinct" by state Government. The development of Cremorne will focus on fostering innovation, creativity, and technology. The precinct is anticipated to see significant growth over the next decade, with resident and worker populations expected to nearly double between 2021 and 2031.

This will put pressure on Cremorne's transport infrastructure, which is already facing challenges due to its compact street network, which is occupied by various transport modes, street activities, streetscape features, and on-street parking. The movement network is also constrained by limited connections in and out of the area, elevated railway lines, major roads, and the Yarra River.

The opportunities and local characteristics are encapsulated in the guiding vision for the precinct:

"Cremorne is a global innovation precinct with a vibrant village feel, new sustainable development, quality public spaces, active transport options, set within narrow streets and historic industrial buildings and workers cottages."

The **Cremorne Urban Design Framework** seeks to realise this vision and address the transport challenges by creating a connected and accessible precinct that promotes walking, cycling, and public transport.

Transport planning can help achieve the vision by setting out the steps that help to achieve a connected walking and cycling network, both internally and externally:



Stantec has reviewed the transport aspects of the draft Cremorne UDF. In consultation with the City of Yarra officers, we have determined a series of transport network interventions that are deliverable over short- to long-term timelines. These interventions reflect the transport mode hierarchy in Council's adopted Yarra's Transport Strategy 2022-2032, with increasing emphasis on walking and cycling priority over car-based travel over the roll-out period.

The interventions are listed in the Table below and are aimed at:

- Increasing walkability and cycling comfort in Cremorne by reducing vehicle through-traffic, removing car parking and reallocating road space to footpaths, cycling infrastructure and urban realm improvements.
- Leveraging a walkable network to connect Cremorne to the surrounding train, tram and bus network. Public transport will do the "heavy lifting", but a public transport trip is a walking trip between the doorstep and the station. An improved walking network is essential to the success of Cremorne.

The interventions should be supported by applying maximum car parking requirements for new developments, which form part of the package of measures included in the UDF.

Overall, we consider these interventions are an appropriate response to deliver the aspirations for Cremorne in view of the challenges presented by its street network.

Table ES1 – Proposed transport network interventions and timeframes

Intervention	Advantages and Trade-offs
Short-term Remove traffic and reduce speeds	
<ul style="list-style-type: none"> • Use traffic pinch points to reduce through-traffic volumes and reduce vehicle speeds on key vehicle access streets. 	<ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – Less traffic/less congestion and lower vehicle speeds – Creates crossing opportunities • Trade-offs <ul style="list-style-type: none"> – Some parking loss to kerb build-outs

Intervention	Advantages and Trade-offs
<ul style="list-style-type: none"> • Reduce speeds to 30km/h on traffic access streets. Enable still lower speeds on other roads through street design. 	<ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – Closes the speed gap between cars and people walking or cycling – Safer for everyone • Trade-offs <ul style="list-style-type: none"> – Could result in marginally slower travel driving times between intersections but will be balanced by fewer cars using those intersections.
<ul style="list-style-type: none"> • Trial pop-up versions of medium- and long-term measures. 	<ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – Low-cost measures – More coverage for the same cost of a smaller permanent scheme
Medium-term Relocate vehicle capacity and reorient road space around people walking and cycling	
<ul style="list-style-type: none"> • Relocate vehicle capacity from the Swan Street/Cremorne Street intersection by signalising the Kelso Street/Punt Road intersection. 	<ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – Reduces traffic volumes in key activity streets – Enables improvements at the Swan Street/Cremorne Street intersection – Creates bike lane and a crossing opportunity at Punt Road • Trade-offs <ul style="list-style-type: none"> – Relocates traffic from a commercial street to a residential street – Creates a need for DTP engagement on Punt Road shared user path (SUP) status and a crossing point at the CityLink off-ramp.
<ul style="list-style-type: none"> • Reallocate road space to people walking and cycling by removing parking on key streets 	<ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – Wider footways and protected bike lane opportunities – Car parking is replaced with opportunities to improve the public realm and transport network.
<ul style="list-style-type: none"> • Improve access to Richmond, East Richmond and South Yarra Stations. 	<ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – Connects Cremorne with key public transport hubs – Improvements such as the Green Street underpass and connection to South Yarra Station have wider connectivity benefits.
Long Term Build the aspirational walking and cycling network	
<ul style="list-style-type: none"> • Reallocate road space to walking and cycling on one side of the rail underpasses to create safe, attractive routes for active transport. 	<ul style="list-style-type: none"> • Advantages <ul style="list-style-type: none"> – Further reduces through-traffic opportunities. – Discourages rat-running through the precinct and encourages local streets for local trips. – Where appropriate, implement two-way bike ways on key roads for more efficient use of space. • Trade-offs <ul style="list-style-type: none"> – Some local trips will have altered routes. While routes will be less direct, a greater proportion of traffic will be local users rather than through traffic. – There will be a change in traffic volumes on some residential streets, such as Kelso Street, Dunn Street, Chapel Street and Chestnut Street. This will be balanced by fewer through-traffic routes and a lower speed limit.

Recommendations

The assessment and discussion in this review have led to the following recommendations:

- **UDF Structure and Staged Delivery**
 - Recommendation # 1 - Make minor structural changes to clarify and strengthen the UDF
 - Recommendation # 2 - Deliver streetscape improvements in stages to realise benefits early and maximise value for money
- **Short Term**
 - Recommendation # 3 - Reduce through-traffic by implementing a series of pinch points on key routes
 - Recommendation # 4 - Commit to establishing Cremorne as a low-speed traffic precinct.
 - Recommendation # 5 - Trial pop-up versions of medium- and long-term measures
- **Medium Term**
 - Recommendation # 6 - Deliver the street network using the recommended street cross-sections and hotspot improvements.
- **Long Term**
 - Recommendation # 7 - Reallocate road space to walking and cycling by closing rail underpasses to at least one direction of traffic.
- **Streets and Hotspots**
 - Recommendation # 8 - Make changes to street cross-sections to tie-in with the amended movement network changes.
 - Recommendation # 9 - Make changes to the hotspot concept plans to tie-in with the amended movement network changes.
- **Other Recommendations**
 - Recommendation # 10 - Car share spaces to be provided based on market demand
 - Recommendation # 11 - Update the Cremorne Enterprise Precinct – Parking Controls Review to give greater consideration to the parking needs of people with disabilities
 - Recommendation # 12 - Clear minimum bicycle parking and end-of-trip facilities for commercial premises and multi-unit residential buildings.

1. Introduction

Cremorne has been designated an "*Enterprise Precinct*" by the State Government. The development of Cremorne will focus on fostering innovation, creativity, and technology. The precinct is anticipated to see significant growth over the next decade, with the working and residential population expected to nearly double.

This will put pressure on Cremorne's transport infrastructure, which is already facing challenges due to its compact street network, which is occupied by various transport modes, street activities, streetscape features, and on-street parking. The movement network is also constrained by limited connections in and out of the area, elevated railway lines, major roads, and the Yarra River.

The **Cremorne Urban Design Framework** (UDF) seeks to address the transport challenges by creating a connected and accessible precinct that promotes walking, cycling, and public transport. Essential vehicle access for existing residents and businesses will be retained; however, measures will be put in place to reduce through-traffic.

Various actions are proposed to achieve the UDF objectives, such as:

- upgrading pedestrian and cycling access
- signalling the Punt Road/Kelso Street intersection
- improving the Swan Street/Cremorne Street intersection,
- advocating to State Government and its agencies for improved road and public transport connections, and
- reducing off-street car parking requirements to promote sustainable transport.

Stantec has been engaged by the City of Yarra to prepare a review of the current UDF documentation from a transport perspective in view of the City's wider policy objectives, identify gaps and make recommendations to meet those objectives.

The review includes a summary of the key drivers, statistics, growth, travel modes and constraints that drive the need for change in Cremorne. It identifies interventions that can be implemented in a staged roll-out to address issues through later stages of the project.

1.1 References

Reference has been made to the following in preparing this review:

- Consultation draft of the Cremorne Urban Design Framework, November 2022
- Draft Cremorne Urban Design Framework Consultation Findings Report
- Moving Forward: Yarra's Transport Strategy 2022-32
- Cremorne Issues and Opportunities Paper: Stage 1 Engagement Outcomes Summary Report
- Cremorne Place Implementation Plan
- Cremorne Streets and Movement Strategy
- Cremorne Enterprise Precinct – Parking Controls Review
- Yarra Planning Scheme
- Other documents as nominated.



2. Identifying the Issues

2.1 Background & Precinct Context

Cremorne is a growing suburb that is surrounded by state-level strategic transport links for all modes of travel. It is, however, poorly connected to those external networks and the internal streets are built for vehicles and parking.

The extent of the study area is shown in Figure 2.1.

Cremorne has significant barriers to external access, such as Punt Road, the Yarra River and CityLink. This has influenced the transport accessibility and development that has occurred within the precinct. The rail line, while a strategic movement link for Cremorne, also plays a significant severing role, limiting permeability between the eastern and western sides of the precinct.

Figure 2.1 – Cremorne Precinct Study Area



Source: Melway Publishing Pty Ltd

2.1.1 Land Uses

Cremorne has a mixture of light industrial, office space, medium-density housing and pockets of low-scale residential neighbourhoods. Industrial land uses are being changed into warehouse-style office uses and other purpose-built office developments. Larger-scale mixed-use development is occurring on the Nylex strategic site.

The fragmented nature of industrial, commercial and residential land uses within the precinct places a constraint on how road space is allocated; however, this is slowly changing.

The move towards more intensive office-based land uses along with pockets of denser residential development is likely to contribute to the peak congestion issues as the expected time of arrivals and departures would occur at similar times.



Figure 2.2 – Land Uses across the precinct



Source: Victorian Government Open Data, OpenStreetMap contributors, Stantec analysis

2.1.2 Walkability

Cremorne has excellent walkability potential. The opportunity lies in bringing the physical walking network up to a standard that matches the theoretical walkability measure of the precinct.

The walking network within the precinct is variable but mostly low-quality, with narrow footpaths that do not allow for two people to walk side-by-side. Footpaths are barely wide enough for a single person to walk comfortably in many cases. However, the low traffic volumes on many internal streets often allow pedestrians to walk on the road rather than the footpath. On many roads, people walking (and cycling) could share the road with people driving.

Walkscore provides a measure of the walkability of the precinct. Cremorne has a **Walk Score**¹ of 89 out of 100, which ranks 13th in Melbourne's most walkable suburbs, behind Southbank (91) and Richmond (90), and ahead of West Melbourne and St Kilda (both 89).

While this is a reasonably high score, it is noted that it is based on the information available to the Walk Score algorithm – which does not take footways widths, desire lines, location of crossing opportunities, vehicle volumes, street activation and general urban realm quality into account. However, Cremorne has reasonably small block sizes, which assists permeability. Walk Score includes block size, which is the #1 predictor of walkability². Cremorne has excellent walkability potential on this basis.

2.1.3 Public transport access

A walkable network is key to linking Cremorne to the excellent public transport availability surrounding the precinct. There are no services within the suburb, so all public transport trips are mostly walking trips between the doorstep and the station/tram stop.

Cremorne is well-served by public transport, with differing public transport options provided around the perimeter of the site. Mass transit routes accessed from Richmond and East Richmond Stations, as well as South Yarra Station further to the south, connect Cremorne to Melbourne's full metro train network. These stations provide strong metropolitan area connectivity with multiple lines being serviced, not requiring passengers to interchange.

Road-based public transport is provided on Swan Street and Church Street (tram) and also on Punt Road (SmartBus).

¹ Walk Score (www.walkscore.com) measures the walkability of any address using a patented system. For each address, Walk Score analyses hundreds of walking routes to nearby amenities. Points are awarded based on the distance to amenities. Amenities within a 5-minute walk (400m) are given maximum points. A decay function is used to give points to more distant amenities, with no points beyond a 30-minute walk. Walk Score also measures pedestrian friendliness by analysing population density and road metrics such as block length and intersection density.

² *Walkable City Rules: 101 Steps to Making Better Places*, Jeff Speck, 2018

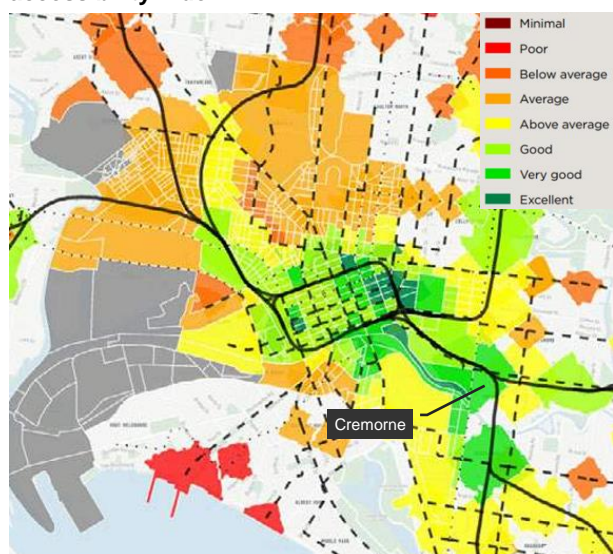
Cremorne has a **Transit Score**³ of approximately 87 out of 100⁴. This indicates "excellent transit" as "transit is convenient for most journeys", as measured by Walk Score.

This is further supported by a SNAMUTS⁵ public transport accessibility analysis that indicates Cremorne has a SNAMUTS index of "Very Good", as shown in Figure 2.3. It is the only area outside the Melbourne CBD that has such a high SNAMUTS index. Figure 2.4 then shows how the public transport network access is expected to change by 2036. Other inner city urban renewal precincts, such as Arden, Macaulay and Fishermans Bend, do not have the same level of public transport accessibility.

While a clear positive, there are barriers to the full use of public transport, such as permeability across the precinct due to the elevated rail line, as well as below-average pedestrian links to train stations with low/no DDA⁶ compliance:

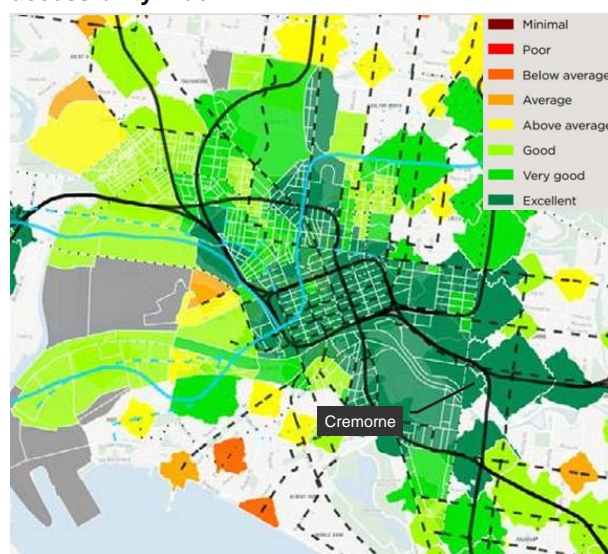
- **East Richmond station** - currently a narrow underpass
- **South Yarra station** - currently a narrow footbridge attached to the rail bridge over the Yarra River
- **Richmond station** – narrow pedestrian crossings at the intersection of Swan Street and Cremorne Street that are not on pedestrian desire lines.

Figure 2.3 – 2016 SNAMUTS public transport accessibility index



Source: SNAMUTS, City of Melbourne Transport Strategy 2030

Figure 2.4 – 2036 SNAMUTS public transport accessibility index



Source: SNAMUTS, City of Melbourne Transport Strategy 2030

2.1.4 Vehicle Travel

Cremorne is bordered by busy arterial roads, with limited connections to those roads. High traffic demands on the arterial road network contribute to a through-traffic problem within the precinct as drivers seek to miss the traffic lights and queues. Through-traffic detracts from the amenity of Cremorne. 30% of traffic on Balmain Street does not stop in the suburb⁷.

The existing precinct vehicle connections to the external road network are shown in Figure 2.5. There are several constraints which exist in accessing and leaving the precinct due to the nature of the surrounding arterial road network outlined on the previous page. These constraints exist primarily along Punt Road and Swan Street and within the north-western corner of the precinct. There are several entry and exit points that serve the eastern side of the precinct along Church Street, by contrast.

Cremorne Street and Balmain Street form the internal collector road network. These roads see the highest volumes due to the lack of permeability and availability of alternative routes (only two roads cross under the elevated rail line); see Figure 2.6. These roads are controlled by various traffic management devices due to this lack of permeability, such as speed bumps, pavement line markings, narrow lanes, and kerb outstands.

³ Transit Score is a Walk Score patented measure of how well a location is served by public transit. Transit Score is based on data released in a standard format by public transit agencies. To calculate a Transit Score, a "usefulness" value is assigned to nearby transit routes based on the frequency, type of route (rail, bus, etc.), and distance to the nearest stop on the route. The results are then normalized to generate a Transit Score from 0 to 100.

⁴ Measured at several locations around the suburb.

⁵ Spatial Network Analysis for Multimodal Urban Transport Systems www.snamuts.com/about-snamuts.html

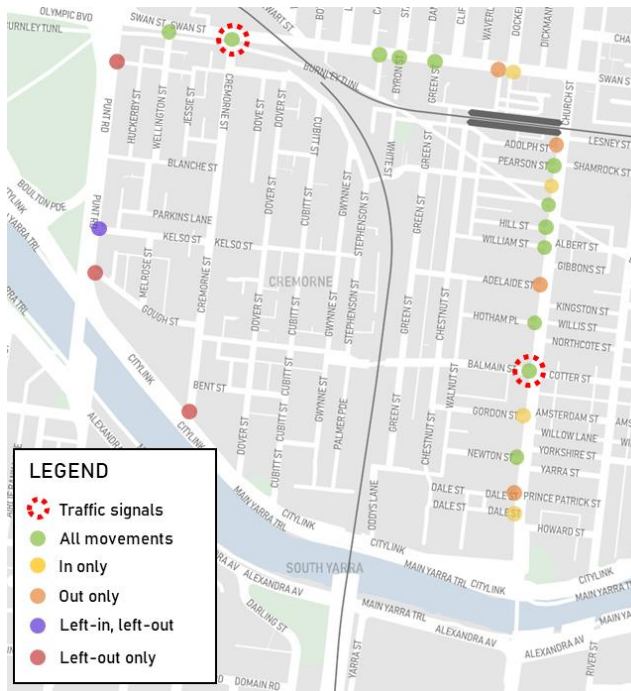
⁶ Disability Discrimination Act 1992 [\[Link\]](#)

⁷ Cremorne Streets and Movement Strategy, Martyn Group and Hansen Partnership – June 2020

Congestion on external arterial roads, as well as Cremorne Street and Balmain Street representing obvious shortcuts for some strategic traffic movements (including access to CityLink), has led to a through-traffic problem along these streets. Figure 2.8 to Figure 2.13 show the key through-traffic routes in the precinct. Up to 30% of all traffic on Balmain Street is through-traffic – which is approx. 1,000 of the 3,500 vehicle movements carried by the street each day. This is a further constraint on the internal street network.

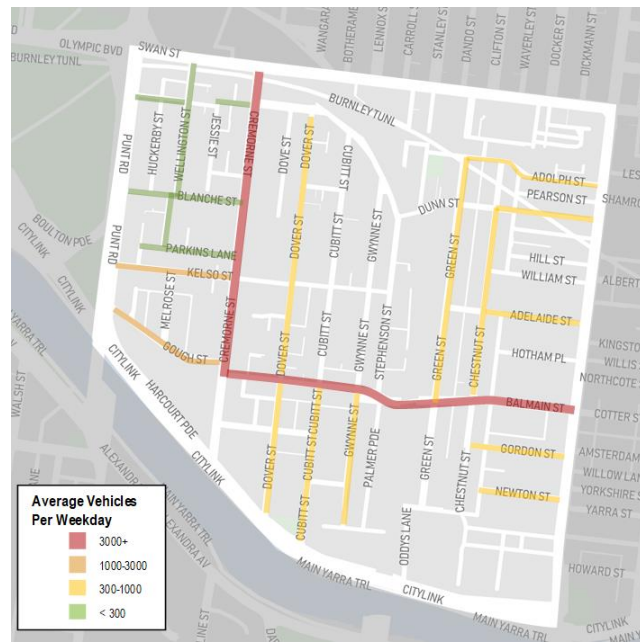
Figure 2.7 to Figure 2.10 show survey results of the most common movements that travel through Cremorne. This data was collected in 2019 but is still representative of current traffic flows and short cuts through the precinct.

Figure 2.5 – Existing access opportunities to the arterial road network



Source: OpenStreetMap contributors, Stantec analysis

Figure 2.6 – Existing daily average traffic volumes in 2019⁸



Source: OpenStreetMap contributors, Stantec analysis

Figure 2.7 – Church St to Swan St (via Balmain St and Cremorne St)



Source: OpenStreetMap contributors, Stantec analysis

Figure 2.8 – Church St to CityLink (via Balmain St and Cremorne St)



Source: OpenStreetMap contributors, Stantec analysis

⁸ A comparative analysis of SCATS signal detector volume data from 2019 and 2022 indicates that traffic volumes have remained broadly similar over this period.

Figure 2.9 – Church St to Punt Rd (via Balmain St and Gough St)



Source: OpenStreetMap contributors, Stantec analysis

Figure 2.10 – Swan St to CityLink (via Cremorne St)



Source: OpenStreetMap contributors, Stantec analysis

2.2 Cremorne Precinct Travel Characteristics

The journey-to-work data⁹ shows that while driving is the most popular method of travel, active and sustainable transport modes make up a significant portion of these trips. These figures are around the average for inner Melbourne suburbs.

Cremorne Residents' Mode of Travel to Work

45%

Car/Passenger

- 42% Driver
- 3% Passenger

33%

Public Transport

- 26% Train
- 6% Tram
- 1% Bus

22%

Active Travel

- 16% Walk
- 6% Bicycle

Source: ABS Census 2016 Journey to Work for the Cremorne Suburb (SA2). Stantec analysis.

Cremorne Workers' Mode of Travel to Work

58%

Car/Passenger

- 55% Driver
- 3% Passenger

32%

Public Transport

- 28% Train
- 4% Tram
- 1% Bus

10%

Active Travel

- 6% Walk
- 4% Bicycle

Source: ABS Census 2016 Journey to Work for the Census Place of Work Destination Zones that form Cremorne. Stantec analysis.

2.3 Changes to travel demands

2.3.1 Car Ownership Across Victoria is Trending Downward

Based on trends reported more broadly through numerous open-source data and research locations, car ownership trends reveal a diminishing or reduced level of ownership over recent decades (i.e. "peak car" was achieved in 2016, with a downward trend in licensing in Victoria recorded to 2021). This trend is shown in Figure 2.11 and is expected to continue over the long-term.

⁹ 2016 ABS Census Journey to Work data. 2016 data is used due to the atypical travel effects of the Covid-19 pandemic on 2021 travel activity, noting that the 2021 census was conducted during a time when Melbourne was under lockdown conditions.

2.3.2 The COVID-19 pandemic has changed the way people work

One of the positive outcomes of the COVID-19 pandemic is that it changed the way people work and, consequently, how much time they devote to travel to and from their place of work. The pandemic made businesses break down barriers to enable people to do their job from home. Many businesses have implemented a curtailed working week – or people voluntarily working fewer days – which has given people a greater work/life balance that will be difficult to relinquish.

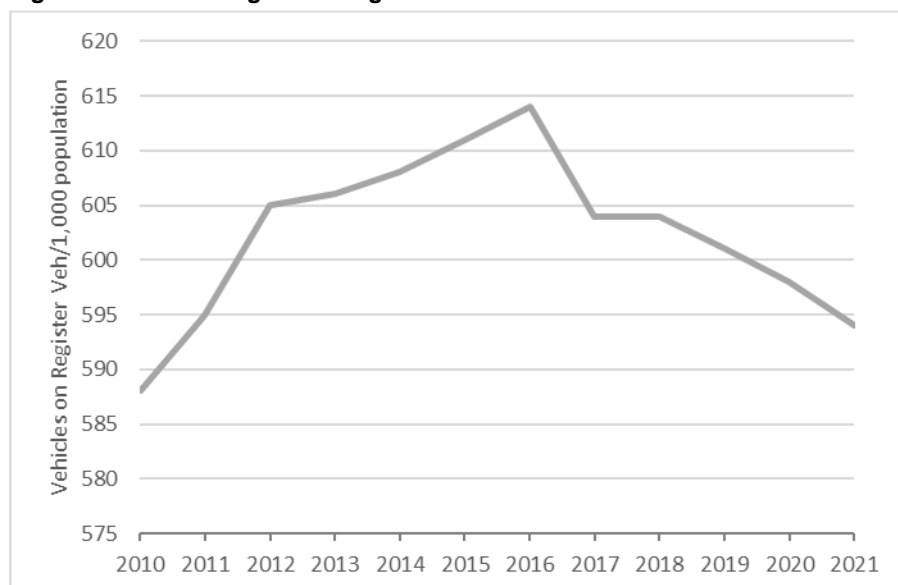
Increased working from home will mitigate some of the travel demands of increased working and resident populations.

- ABS employment data shows that 30% of workers work from home most of the time (April 2022 data)¹⁰ compared to approx. 5% historically¹¹.
- This trend is expected to continue as 74% of businesses expect working-from-home arrangements to either stay the same or increase in future¹⁰.

This means that while people may list Cremorne as their employer's address, it is unlikely that all those employees will travel there each day due to changed working practices. While employees have the option to work from home, it is becoming apparent that certain days of the week experience higher demand for movement than others. While the amount of people moving in and through Cremorne may have reduced on a per-person basis, the precinct is likely to experience movement levels that fluctuate significantly.

Cremorne's transport network will need to be designed to accommodate these higher demand times, noting that these demands are not expected to exceed pre-pandemic levels on a per-person basis and are likely to occur on 2-3 days per week rather than all 5 days, which was reflective of pre-pandemic activity.

Figure 2.11 – Passenger Car Registrations in Victoria from 2010 to 2021



Source: ABS Motor Vehicle Census, to 31 January 2021

2.3.3 Implications for Cremorne

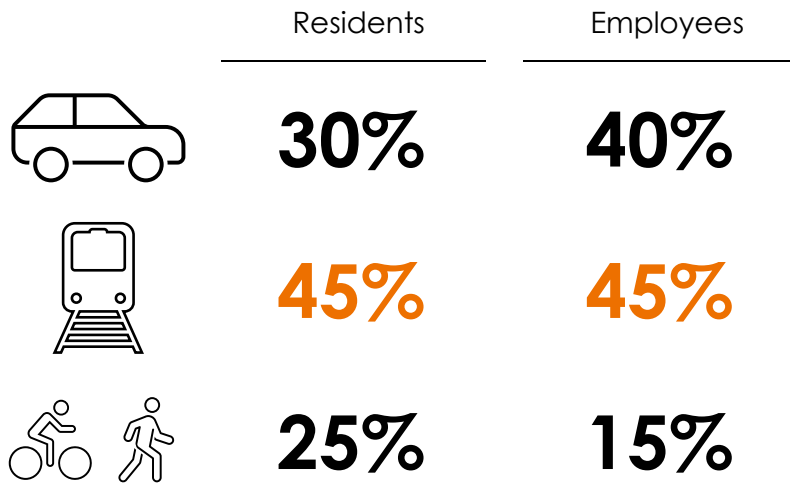
City of Yarra has supplied Stantec with existing and indicative future resident and employee populations. This has been used to compute the likely future year (2031) travel demands.

The basis for the analysis is that the road network could accommodate a minor increase in vehicle demands of the precinct, given current congestion, balanced with traffic management to remove through-traffic. However, the limitations of road network capacity will soon be reached, meaning that the “heavy lifting” in terms of the increase in travel demands will have to be carried by other modes.

¹⁰ Based on analysis of ABS Characteristics of Employment data by The Australian Industry Group (Ai Group) “*Deep dive – Working from where, and why?*” [\[Link\]](#). This measure is different from the measure of people who work from home from time-to-time, which currently sits at approx. 40-45%, compared to 25-30% pre-pandemic.

¹¹ According to Ai Group analysis, see footnote above – verified by ABS Census 2021 Journey to Work data (4.7%) [\[Link\]](#)

Figure 2.12 – Cremorne Precinct: Potential future 2031 travel modes shares



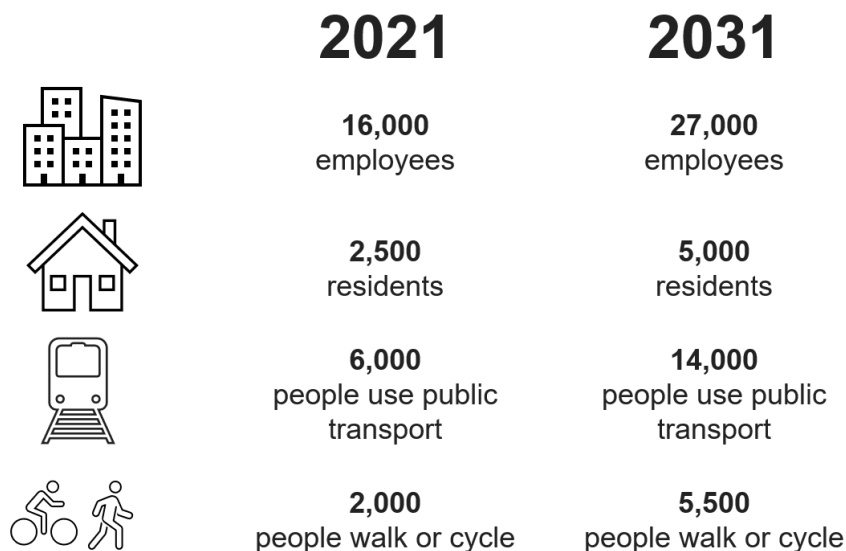
Source: ABS Census, Stantec Analysis

While these changes may seem significant, a target car trip mode share of 30-40% is a great deal higher than similar urban renewal precincts in Inner Melbourne, noting these precincts will not have the same level of public transport access in the future compared to what Cremorne has right now:

- **Arden 10%** car journeys
- **Macaulay 20%** car journeys
- **Fishermans Bend 20%** car journeys

The expected change in travel demand is shown in Figure 2.13. The biggest numerical change here is the increase in people using public transport. Practically all these public transport trips are going to translate to a walking trip between stations and individual buildings within the precinct. This will put significant additional strain on an already substandard walking network.

Figure 2.13 – Cremorne’s existing and estimated future travel demands



Data note: Stantec analysis using 2021 estimates based on 2016 Census travel to work data applied to 2021 Census residential and workplace populations.
 2031 resident population derived from Forecast id.
 Worker population figures are Council officer estimates and are indicative only.

2.3.4 Implications for Road Space Reallocation

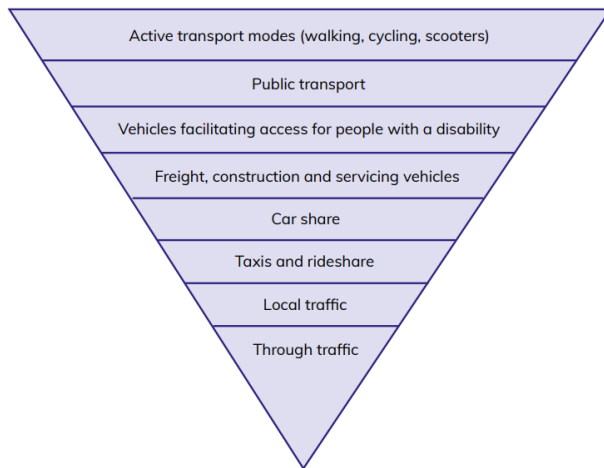
Public transport journeys in Cremorne all start and end at locations outside of the precinct. A walking trip connects people with public transport stations or stops and their destination within Cremorne.

- This means, in future, **walking trips will represent more than 50% of travel activity within Cremorne.**
- By contrast, bicycle trips represent approximately 6% of trips within the precinct.
- Remaining trip-making activity is expected to be car based.

Measures to improve the walkability of the precinct should have the greatest priority for the above reasons.

Improvements to cycling facilities are important; however, the delivery of cycling infrastructure should not hold up the priority delivery of improvements to precinct walkability. This is consistent with the Travel Mode Hierarchy in Yarra's Transport Strategy, see Figure 2.14.

Figure 2.14 – Yarra's Transport Strategy Travel Mode Hierarchy



Source: Moving Forward: Yarra's Transport Strategy 2022-32

2.4 What are the key transport issues for Cremorne?

Cremorne is a growing suburb that is surrounded by state-level strategic transport links for all modes of travel. It is, however, poorly connected to those external networks and the internal streets are built for vehicles and parking.

The background review indicates the following challenges and issues need to be addressed if the Cremorne Precinct is to grow successfully and fulfil its Enterprise Precinct vision:

- Travel demand will increase as Cremorne develops
- Walking and cycling will increase greatly
- Poor connections to surrounding transport networks
- Below-average internal walking and cycling network
- The street network is set up for cars and parking
- There is a through-traffic problem due to external congestion.





The key issue is that while the existing transport network is "just about managing", a substantial increase in walking and cycling trips will be difficult to accommodate without significant changes. This means reprioritising Cremorne's transport network to accommodate walking and cycling trips to connect it to the external transport network more effectively.

This level of change needs effective policy support that enables road space reallocation towards walking and cycling at a precinct network level, supported by individual development site-level policies that enable low car parking and bicycle end-of-trip facilities within buildings that match the necessary change in journey mode shares.

2.5 How can these issues be addressed?

There is a broad range of interventions to choose from depending on the street type and network operating parameters. The gap between existing conditions and future aspirations will determine future interventions.

Broadly, interventions can be categorised as:

	Fitter assets for the future Transport assets need to be fit for purpose now and resilient to future use and adaptations.
	More efficient/flexible use of space This is about making better use of the space within our transport network. For Cremorne, it is about improving the quality of places where people go to work, shop and play.
	Changing behaviour/managing demand Influencing travel demands by encouraging changes in individuals' and businesses' travel behaviour to help them make informed decisions.
	Substitute/improve/relocate capacity We can increase the capacity for movement and place-making through the building of new streets, infrastructure and public spaces. For Cremorne, this means relocating vehicle capacity to free-up space for walking and cycling.

Key changes to benefit walkability and cycling

Based on the background review, the precinct-specific issues to address are:

- Prioritising walking and cycling in and out of Cremorne
- Better connecting Cremorne to external public transport
- Creating areas of activity for people to gather (people-centric, not vehicle-centric)
- Urban greening and water-sensitive urban design
- Replacing parking and vehicle capacity with higher-value uses
- Designing streets with safe speeds

The following approach is recommended and is supported by specific recommendations in discrete locations.



There will be trade-offs

It is acknowledged that these changes will cause some issues for car drivers:

- local vehicle routes will be less direct
- traffic moving through the precinct will be discouraged
- less parking, meaning parking on commercial streets will need to be managed more efficiently
- lower speeds will be required for safer streets

Such matters can be addressed through effective community engagement.

2.6 There is community support for change

Acknowledging that different people have different views, there is community support for reprioritising Cremorne's street network for walking and cycling. This aligns with the Council's sustainability objectives and is vital to the success of the Cremorne Enterprise Precinct.

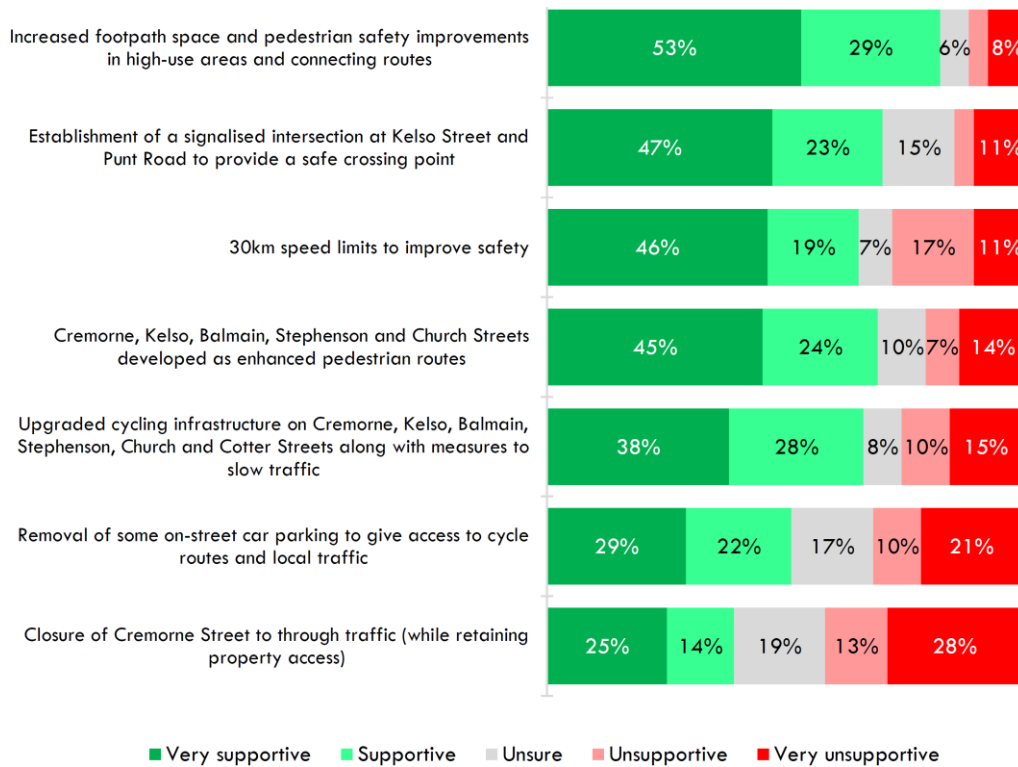
City of Yarra has consulted the community on the draft Cremorne UDF¹². The community was asked a series of questions on the proposed transport improvements, including more general concepts, such as increased walking space, 30km/h speed limit and car parking removal.

There is broad support for the high-level transport directions and concepts and greater sustainability. Even parking, which is a contentious and emotive topic, received support - noting some specific concepts, such as the proposed closure of Cremorne Street, were less-well supported.

¹² Draft Cremorne Urban Design Framework Consultation Findings Report, Chatterbox Projects, 8 March 2023

The feedback received is further supported by consultation undertaken for Yarra's Transport Strategy 2022-2032 (YTS). There was very strong support for active and sustainable transport at a strategic level. 86% of respondents in the YTS wanted to see "a lot more active and sustainable transport options" rather than "a lot more cars and parking spaces".

Figure 2.15 – Ratings of support for street network actions



Source: Draft Cremorne Urban Design Framework Consultation Findings Report, Chatterbox Projects, 8 March 2023

3. Cremorne Urban Design Framework

3.1 Overview

The transport aspects of Cremorne UDF build on a body of previous work, including:

- Cremorne Place Implementation Plan (2020), Victorian Planning Authority (VPA)
- Cremorne Streets and Movement Strategy (2020), Martyn Group & Hansen Partnership
- Cremorne Enterprise Precinct - Parking Controls Review (2020), Traffix Group

The UDF envisions a well-connected movement network that prioritises sustainable and active transport, discouraging through-traffic. The plan includes improvements to public transport services and access, with a focus on reliability and accessibility for all, including DDA-compliant infrastructure.

Theme 3 of the draft UDF addresses transport considerations and comprises four objectives. Stantec supports each of these objectives. A review of these objectives is set out below.

Table 3.1 – UDF Theme 3: *Connected and Accessible Cremorne* – Review and Recommendations

Theme 3 Objective	Review and recommendations
3.1 - Creating a highly accessible and well-connected movement network that prioritises sustainable and active transport and discourages through-traffic.	<ul style="list-style-type: none"> • Underpinned by: <ul style="list-style-type: none"> – Streets and Movement Framework – Streets Implementation Plan – Hotspot treatments – Street cross-sections • Stantec supports this methodology. • These elements are reviewed in the following sections. • Alternative solutions are offered in Section 0 of this report.
3.2 - Improving public transport services and access to public transport and to meet the needs of Cremorne’s workers, residents and visitors.	<ul style="list-style-type: none"> • Significant improvements are needed to the cross-river connection to South Yarra Station and enabled within the precinct itself (Green Street). This should be detailed as an action to improve public transport access. • Amend Action 3.2.2 to remove or amend the statement advocating to “increase train services at East Richmond Station”. <ul style="list-style-type: none"> – Increased services will require a business case to be produced to support increasing frequencies on the affected train line(s). It is unlikely to be given consideration on the basis of a single train station. – The statement should either apply to Cremorne more generally or be removed. • These improvements go hand in hand with walkability.
3.3 - Delivering a safe and attractive local cycling and pedestrian network which connects strategic corridors, major trails and key destinations.	<ul style="list-style-type: none"> • Reorder objectives – Renumber this objective to Objective 3.2. A good walking network enables good access to public transport. • Green Street connectivity as a parallel route to Church Street. • Enabled by a series of improvements, including wider footways, more crossing points, more bicycle facilities and upgrades to rail underpasses.
3.4 - Reducing off-street car parking requirements to promote more sustainable modes of transport.	<ul style="list-style-type: none"> • The Cremorne Enterprise Precinct – Parking Controls Review could be a separate planning scheme amendment now to get reduced car parking rates into the planning scheme. • Should be supported by bicycle parking and end of trip requirements within the same planning scheme ordinance, either as part of decision guidelines or through an incorporated document. Further detail on bicycle parking considerations is provided in Section C.6 of this report.

3.2 Network Plans and Cross-Sections

Various actions are proposed to achieve the objectives as part of the Streets and Movement Framework (UDF Figure 18) and the Streets Implementation Plan (UDF Figures 19 to 21).

Actions include:

- Implementing a 30km/h speed limit (at most) within the precinct
- Advocating state transport agencies for changes to the transport network, including increased public transport frequencies and changes to arterial road intersections

- Upgrading pedestrian and cycling access to the precinct, and reallocating road space within the precinct for these travel modes
- Reducing off-street car parking requirements to promote sustainable transport.

The network plans are supported by street cross-sections showing the potential road space allocation at key locations.

The plan is for wider footways and cycling facilities on key internal road links, supported by local streets. It is clear these changes will contribute to achieving the transport vision for the precinct. Table 3.2 sets out key recommendations.

Table 3.2 – High-level recommended changes to the UDF transport network plans and street-cross sections

UDF Aspect	Recommendation	Comment
Streets and Movement Framework	<ul style="list-style-type: none"> • Declutter the diagram 	<ul style="list-style-type: none"> • Remove green and blue lines that highlight the local east/west street network and walking and cycling links. These roads all have low enough traffic that they can all be mixed/shared streets. • Highlight Green Street as a key north-south walking and cycling link from Swan Street to the Yarra River (and onward to South Yarra Station).
Streets Implementation Plan	<ul style="list-style-type: none"> • Remove the modal filter (street closure) at the Cremorne Street/Kelso Street intersection. 	<ul style="list-style-type: none"> • This proposal saw the least community support. • It is not clear why this is necessary, and it potentially creates other unintended issues, see further discussion on the hotspots below.
	<ul style="list-style-type: none"> • Remove the "Option B" Alternative Streets Implementation Plan 	<ul style="list-style-type: none"> • While signalling Kelso Street and Punt Road needs DTP support, an alternate option is not necessary. Upgrades to the road network are not fully dependent on this hotspot. • If it is retained, be clear that the alternative is not equal to the preferred option as it does not provide traffic relief to Cremorne Street.
	<ul style="list-style-type: none"> • Show required cycling infrastructure on Punt Road 	<ul style="list-style-type: none"> • Show a shared user path (SUP) on the western side of Punt Road. • Show requirement for a priority crossing of the CityLink off-ramp to connect the path network along the west side of Punt Road.
	<ul style="list-style-type: none"> • Correct the errors in Figure 21 	<ul style="list-style-type: none"> • Signalised intersections are shown in the middle of the precinct, where none are proposed.
Cross-sections	<ul style="list-style-type: none"> • Show dimensions 	<ul style="list-style-type: none"> • While understandable that cross-sections are generic, the use of dimensions adds credibility to demonstrate the proposals are workable.

Source: Stantec



3.3 Hotspot Treatments

The UDF includes concept designs for five hotspots within Cremorne and at its edges. The proposed concept designs have been extracted from the UDF and are shown in Figure 3.1 to Figure 3.5. Our comments are noted below each. Further consideration of Hotspots, and recommended changes, is provided in Section 4.6.

Figure 3.1 – Hotspot 1 - Kelso Street and Punt Road intersection



Issues and opportunities

- Relocates traffic exiting the precinct away from the Swan Street/Cremorne Street intersection.
- Enables reprioritisation of road space elsewhere
- Elevates cycling to and from the precinct
- Creates greater walking and cycling connectivity
- Requires a shared user path along the western side of Punt Road
- Re priority crossing of the CityLink off-ramp (not shown)
- Needs modelling to gain DTP support

Figure 3.2 – Hotspot 2 - Cremorne Street and Kelso Street intersection



Issues and opportunities

- Move this to Hotspot 3 to draw a clearer link between the intersection Hotspot proposals at Punt Road and Swan Street.
- Possibly assists known west-to-east through-traffic route
- Not clear how Cremorne Street can operate as two-way up to the modal filter
- Parking is redundant on one side as there is nowhere to turnaround
- Consider alternatives to reduce through-traffic such as a local narrowing and "give-way to oncoming traffic" (also known as pinch points).
- It cuts off use of the proposed Kelso Street signals for a significant proportion of the precinct, undermining its purpose.
- Consider extending the raised table at this intersection to provide enough width for zebra crossing points.

3.3.1 Support for signalling the Punt Road/Kelso Street intersection¹³

The addition of traffic signals at Kelso Street could provide considerable additional exiting capacity for the Cremorne Precinct. The signals will add to exiting capacity for vehicles leaving the precinct, specifically those that currently turn left via Swan Street/Cremorne Street and then right onto Punt Road or onward to Olympic Boulevard.

As part of the referral of the Richmond Maltings site Stage 1A permit application, the VicRoads (now DTP) response letter included a stance of 'No Objection' (VicRoads/DTP reference 14209/15). The response, however, included the following comments in respect of the signalisation of Punt Road/Kelso Street:

"Mitigating options should include the installation of a new traffic signal at the intersection to provide safe operation at the site and manage the impact of the additional traffic generated by the development."

The signalisation of the Punt Road/Kelso Street intersection would clearly provide a benefit for the Cremorne precinct by increasing/relocating exiting vehicle capacity to enable road space reallocation at and around the Swan Street/Cremorne Street intersection. This can be combined with better bicycle and pedestrian crossings at Punt Road to deliver increased connectivity for people walking and cycling.

¹³ Adapted from the Transport Impact Evidence of expert witness John Kiriakidis for VCAT No. P1969/2015, Part of the Land at 2 Gough Street, Cremorne. Further context has been added in relation to traffic capacity relocation/reallocation and increased pedestrian and cycling connectivity proposed as part of the UDF.

Figure 3.3 – Hotspot 3 - Cremorne Street and Swan Street intersection



Issues and opportunities

- Move this to Hotspot 2 to draw a clearer link between this intersection and the Hotspot 1 proposals at Punt Road/Kelso Street.
- Evident there is an issue at this location with high pedestrian volumes between the station and Cremorne Street.
- DDA issues at the corner of the Precinct Hotel
- Footway level issues on both sides of the road east of Cremorne Street
- Requires DTP and Yarra Trams buy-in/support
- Needs modelling to gain DTP support.
- Need to avoid negatively impacting tram journey times.
- Consider widening existing cross-points
- The exit point at Kelso Street will reduce the left-turn demand at Swan Street. The left-turn onto Swan Street could be banned.

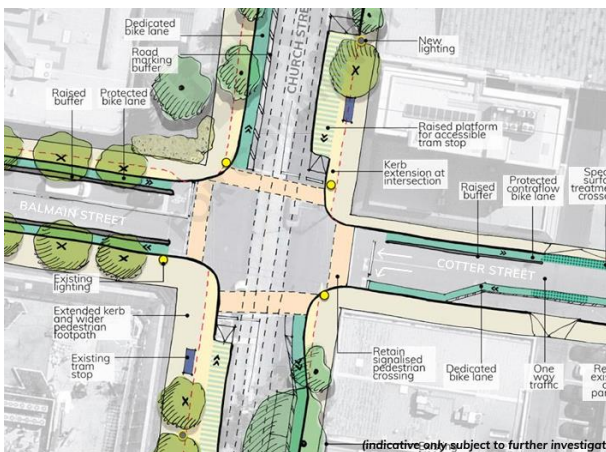
Figure 3.4 – Hotspot 4 - Balmain Street, west of the underpass



Issues and opportunities

- The underpass is unattractive, unsafe and discourages active travel movement.
- Traffic volumes and vehicle speeds are still high
- A fully shared space is not likely to be safe.
- Steps need to be taken to reduce traffic use and deal with the barrier effect caused by the underpass.

Figure 3.5 – Hotspot 5 - Balmain Street and Church Street intersection



Issues and opportunities

- Clear benefits for cyclists, pedestrians and tram users
- Parking removal is needed.
- Requires DTP and Yarra Trams buy-in/support.

3.4 Ways to clarify and strengthen the UDF

Recommendation # 1 - Make minor structural changes to clarify and strengthen the UDF

The transport aspects of the UDF could be strengthened in the following ways, based on the above review:

- Consider the sequential order of hotspot treatments and why they are needed
- Place the walkability objective (currently 3.3) above the public transport objective (currently 3.2)
- Provide a roll-out of measures (short, medium and long-term)
- Consider other minor recommendations made in this section of the review.



4. Options Development

4.1 Options Context

While the improved walkability of the precinct is the clear priority, suitable cycling facilities are also necessary to support the increased demand by people cycling.

It is noted in Section 2.3 that walking trips are expected to grow to more than 50% of travel activity within Cremorne by 2031. This is due to public transport trips being walking trips between stations and destinations within the precinct. Journeys that are part walking are anticipated to exceed 35,000 people trips daily (17,500 people entering and leaving)

By contrast, bicycle trips represent approximately 6% of trips within the precinct by 2031 compared to 4% in 2021. This equates to approximately 4,000 bicycle trips per day (2,000 people entering and leaving), an increase of approximately 2,400 bicycle trips per day¹⁴.

The development of recommendations is based on the following process (see Section 2.5 for further detail).



In consultation with City of Yarra officers, we have recommended a series of transport network interventions that are deliverable over time, with increasing emphasis on walking and cycling priority over car-based travel over the roll-out period.

Short, medium and long-term recommendations have been developed for flexibility of implementing options at different times, as funding becomes available (and not necessarily in the order set out in the UDF).

4.2 Best Practice Solutions

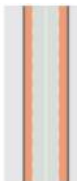
A review of best practice solutions relevant to the Cremorne precinct is provided in B.5. The following topics are included:

- Low-traffic neighbourhoods (Section C.1) – the principles have been adopted throughout this review.
- Managing parking supply and loading zones (Section C.2) – provided for information.
- Ride Hailing Services (Section C.3) - provided for information.
- Car Share (Section C.4) – see Section 5.1 for recommendations.
- Bicycle Facilities (Section C.5) – the principles have been adopted throughout this review.
- Bicycle Parking (Section C.6) – see Section 5.15.1 for recommendations.

¹⁴ Data note: Stantec analysis using 2021 estimates based on 2016 Census travel to work data applied to 2021 Census residential and workplace populations. 2031 resident population derived from Forecast id. Worker population figures are Council officer estimates and are indicative only.

4.3 Options Toolkit

Design treatments can be applied to the layout of local streets. These measures permit traffic but aim to reduce vehicle speed, reduce road space dedicated to car use and prioritise active travel.



Narrow Lanes

Narrow lanes reduce vehicle right of way and reprioritise road space for non-vehicle modes

- 3.0m maximum width for a single lane on local streets, less width where possible.



Tight Corner Radii

By tightening corner radii, we can reduce vehicle speeds, reduce pedestrian crossing distances and create compact intersections.

- 4.0m radius or less at intersections.
- Make intersections safer for pedestrians.



Buildings and Trees

Trees and continuous activated facades create the sense of an urban environment for people and not a highway for cars.

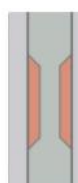
- Reduce vehicle crossovers
- Plant appropriate trees



Gateway Treatments

Alert drivers that they are entering a changed speed zone and should lower their speed.

- A variety of measures can be used, such as those listed on this page.
- Use gateway intersection treatments where local streets meet external roads.



Pinch Points

Midblock road narrowing with priority to oncoming vehicles.

- Combine with a pedestrian crossing to shorten crossing distances.
- Alternate vehicle directional priority over successive locations.



Diverters and Modal Filters

Reduce overall traffic volume and cut speeds by eliminating through-traffic.

- Use modal filters to wholly prohibit all but essential vehicle movement through pedestrian priority areas.

Source: NACTO, Global Designing Cities Initiative

4.4 Network Level

Recommendation # 2 - Deliver streetscape improvements in stages to realise benefits early and maximise value for money

- Short Term | Remove traffic and reduce speeds
- Medium Term | Relocate vehicle capacity and reorient road space around people walking and cycling
- Long Term | Build the aspirational walking and cycling network

4.4.1 Short Term | Remove traffic and reduce speeds

Recommendation # 3 - Reduce through-traffic by implementing a series of pinch points on key routes

Reduce through-traffic by implementing a series of pinch points on key routes within the precinct that have been identified as problematic (see Section 2.1.4)

Locate pinch points at or close to the locations shown in Figure 4.1. Provide less priority to oncoming traffic in the east-west direction to deal with the predominant through-traffic routes.

This supports the use of shared car-bike streets in Cremorne by reducing traffic volumes, particularly through-traffic, which is known to travel at higher speeds than destination traffic. This has a magnifying effect on the safety and comfort outcomes for people walking and people cycling, in particular:

- Less traffic/less congestion and lower vehicle speeds
- Creates crossing opportunities
- Some parking loss to kerb build-outs.



Pinch points can be implemented in a temporary manner while allowing people on bicycles to pass, or even incorporating crossing opportunities, see Figure 4.2.

Figure 4.1 – Indicative pinch point locations on Balmain Street, Cremorne Street, Kelso Street, and Gough Street



Source: OpenStreetMap Contributors, edited by Stantec

Figure 4.2 – Pinch point layout options



Source: BikePortland [Link](#)

Source: Google - Redan Road, Caulfield North

Source: NACTO, Global Designing Cities Initiative

Recommendation # 4 - Commit to establishing Cremorne as a low-speed traffic precinct.

Reduce vehicle speeds to deal with residual interactions between people walking and cycling and people driving cars. Implement a 30km/h zone across Cremorne to support the effectiveness of other traffic management.

Low traffic speeds have the following benefits¹⁵:

- Reduce the speed gap between cars and people walking and cycling.
- Significantly reduces deaths and injuries.
- Less noise and air pollution.
- Enables **shared road space** between cars and people cycling, even **at higher traffic volumes**.
- Supports a shift to walking and cycling.
- Locals face less congestion when they travel by car as it discourages through-traffic.
- 65% of the community already supports this change in Cremorne¹².



Recommendation # 5 - Trial pop-up versions of medium- and long-term measures

Find out what works and what doesn't by conducting temporary trials, including:

- Temporary bollards and removable line paint to create treatments
- Use planter boxes to hold signs to increase regulatory compliance and add credibility/legitimacy
- Create pinch points, kerb build-outs, protected bike lanes and crossings

These are low-cost measures that can be implemented using semi-permanent materials that gain greater coverage for the same cost as a smaller permanent scheme.

Figure 4.3 – Modal filter trial with pole-mounted signage anchored in planter boxes



Source: Image by Jack Fifield, CC BY 2.0, [Link](#)

Figure 4.4 – Pinch point trial on a local street using sandbags to create the kerb build-out



Source: Image by MRSC [Link](#), edited by Stantec

4.4.2 Medium Term | Relocate vehicle capacity and reorient road space around people walking and cycling

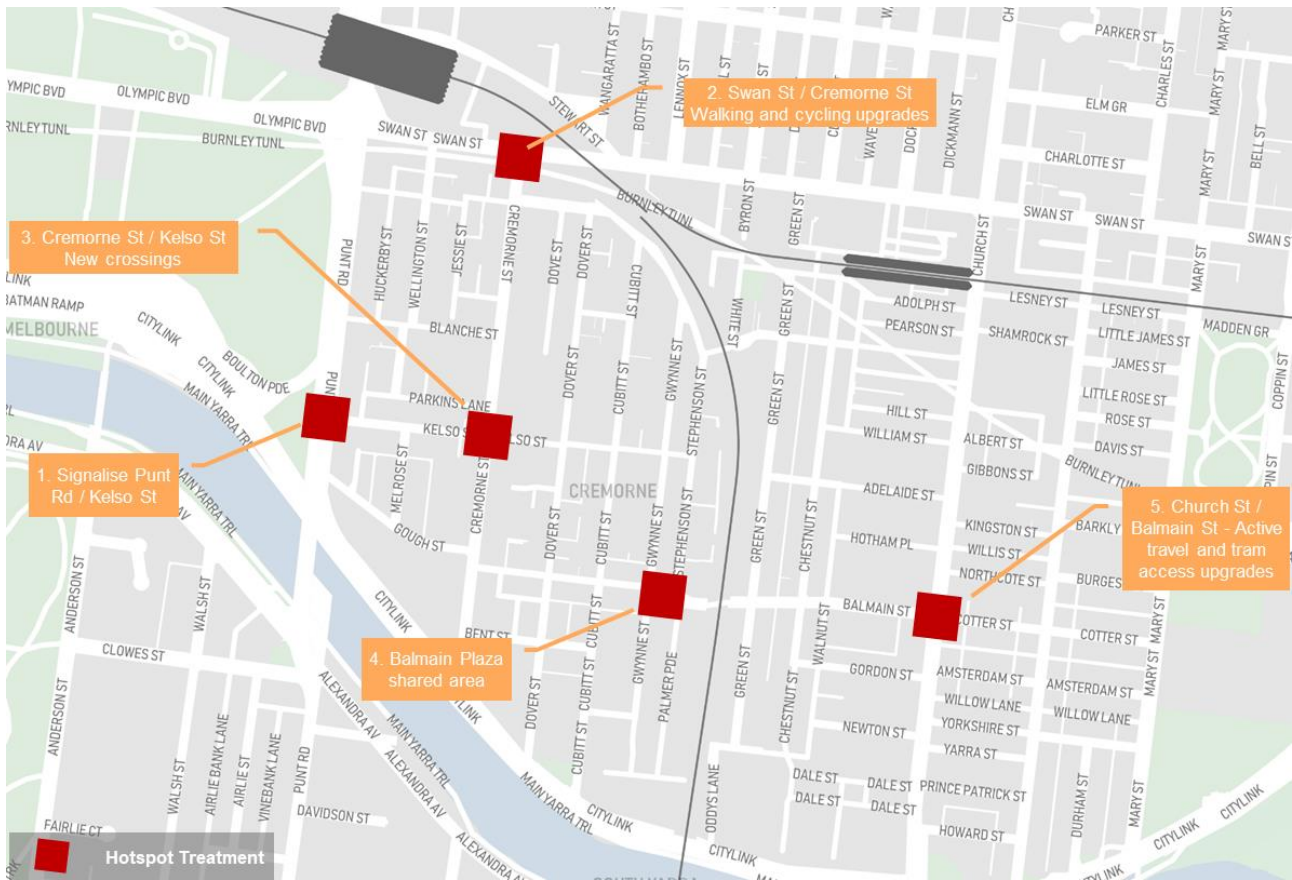
Recommendation # 6 - Deliver the street network using the recommended street cross-sections and hotspot improvements.

- Reorder hotspots for the reasons set out in Section 0 of this report.
- Relocate vehicle capacity by signalling the Kelso Street/Punt Road intersection.
- Reallocate road space to people walking and cycling by replacing parking on key streets using the recommended cross-sections – see Section 4.5.
- Implement Hotspot treatments as recommended in Section 4.6. The order of delivery can be based on funding availability.

¹⁵ More info at thanksfor30.com.au/why-30kmh

- Improve access to Richmond, Richmond East and South Yarra Stations to better connect Cremorne with key transport hubs. These improvements will have wider connectivity benefits for the Swan Street Precinct and cross-river access.

Figure 4.5 – Deliver the street network using the recommended cross-sections and hotspot improvements



Source: OpenStreetMap Contributors, edited by Stantec

4.4.3 Long Term | Build the aspirational walking and cycling network

Recommendation # 7 - Reallocate road space to walking and cycling by closing rail underpasses to at least one direction of traffic.

Build on work completed by Ratio¹⁶ to deliver two-way bikeways along Cremorne Street, Balmain Street and Kelso Street, which will be connected via low-traffic streets in the heart of Cremorne. These bikeways will connect to external arterial roads at Swan Street, Church Street, Punt Road and the strategic bike network.

- Reallocating one direction of traffic under the Balmain Street and Dunn Street rail underpasses to create spaces for people walking and cycling – removing two significant uncomfortable and unsafe barriers to these travel modes.
- Supported by implementing one-way sections of street and removal of parking, see Figure 4.8.
- Further reduces through-traffic convenience by making streets serve a local access function.
- Actively encourages cycling as a primary choice rather than simply being a secondary mode or "car alternative".
- Traffic movements will re-route or use other streets due to the closure of one direction of travel in the underpasses.
 - This will be balanced by fewer through-traffic routes, traffic calming works and a lower speed limit. So while an increase in traffic on some streets could occur, it is expected to be less than would be the case if existing traffic simply re-routed.
- Local vehicle routes may be less direct and some routes will change.
 - This will be balanced by less through-traffic and better local access for people walking and cycling.
 - Local streets for local people as the proportion of local road users will be greater as through-traffic is discouraged.

¹⁶ Cremorne Pop-up Bike Lanes & One Way Traffic Loop, Ratio Consultants [\[Link\]](#)

- Can combine with shared areas on minor streets within the precinct as traffic volumes are, by and large, quite low when away from the connector road network. These streets are often lined with parked cars on both sides. Parking would need to be removed from one side – swapping sides at certain locations is possible – to provide comfort for people walking and cycling in a shared environment with vehicles. This way, they have the option to step to the side to allow vehicles to pass, rather than being uncomfortably penned-in by parked cars.

Figure 4.6 – Existing Balmain Street Underpass



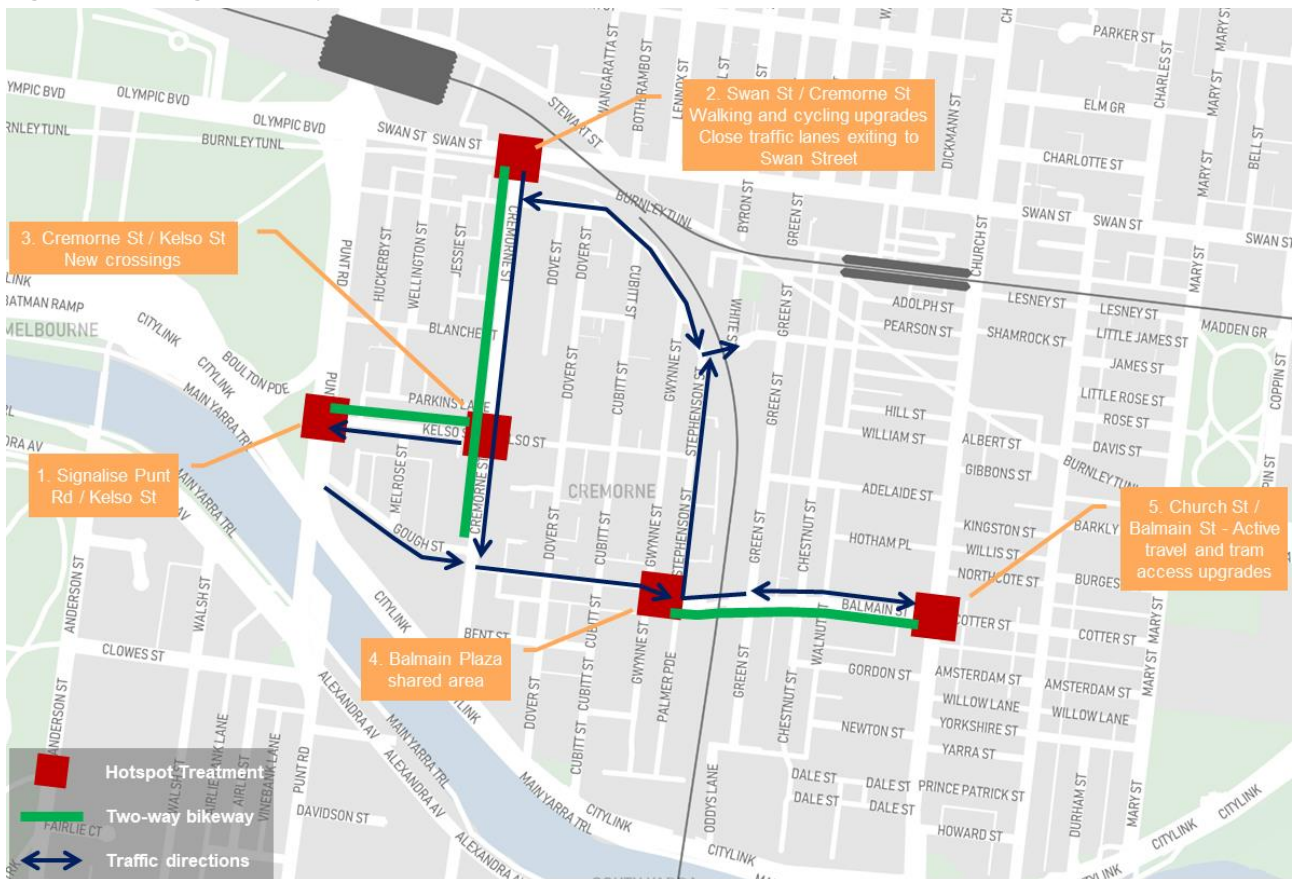
Source: Google Maps

Figure 4.7 – Example of partial underpass closure



Source: Belvedere Road, Southbank, London - Image by Google Maps

Figure 4.8 – Long-Term Bicycle Network, Street Direction and Hotspots



Source: OpenStreetMap Contributors, edited by Stantec

4.5 Cross-sections

Recommendation # 8 - Make changes to street cross-sections to tie-in with the amended movement network changes.

Street cross-sections have been considered and prepared for key locations within the precinct. Recommendations are set out in Appendix A, which includes:

- Cross-section locations (see Figure A.1).
- Pictorial diagrams showing road space reallocation in existing and proposed stages of change.

- An assessment of relative change in modal priority on a high/medium/low scale.
- Commentary on recommended changes and other interventions.

4.6 Hotspots

Recommendation # 9 - Make changes to the hotspot concept plans to tie-in with the amended movement network changes.

Proposed and potential alternative hotspot concepts and minor changes to current UDF concepts have been considered and prepared for key locations within the precinct – ensuring that the key changes are viable to support medium-term delivery. Further plans can be developed for the long-term potential of incorporating a two-way bikeway, where necessary, noting there are no apparent reasons that would prevent this from occurring based on current road layouts.

Recommendations are set out in Appendix B, a summary of which is set out below. The review includes:

- Concept plans showing road space reallocation in existing and proposed stages of change.
- An assessment of relative change in modal priority on a high/medium/low scale
- Commentary on recommended changes and other interventions.

Table 4.1 – Recommended Changes to UDF Concept Plans^[1]

Location	Current UDF Plans	Stantec Proposed Concept Plan
1 - Punt Road/Kelso Street	<ul style="list-style-type: none"> • Generally sufficient for long-term use. • Note this creates a need to get the Punt Road path designated as a shared user path (SUP). • A priority crossing of the CityLink off-ramp is required. 	<ul style="list-style-type: none"> • An alternative option is proposed that is suited to medium-term plans but also fits in with long-term delivery. • Also creates a requirement for a SUP designation on the west side of Punt Road and CityLink off-ramp priority crossing.
2 - Swan Street/Cremorne Street	<ul style="list-style-type: none"> • Changes are recommended per the proposed concept plan in Appendix B. 	<ul style="list-style-type: none"> • Introduce scramble crossing. Widen and realign pedestrian crossings along desire lines. • Provide better cycling facilities at the intersection • Leverage Punt Road/Kelso Street signals and reduce to one lane exiting Cremorne Street out onto Swan Street. • Further plans can be developed for the long-term potential of incorporating a two-way bikeway.
3 - Cremorne Street/Kelso Street	<ul style="list-style-type: none"> • Changes are recommended per the proposed concept plan in Appendix B. 	<ul style="list-style-type: none"> • Remove modal filter • Remove kerb build-outs into Cremorne Street (may be abortive if a 2-way bikeway is introduced in future).
4 – Balmain Plaza	<ul style="list-style-type: none"> • Changes are recommended per the proposed concept plan in Appendix B. 	<ul style="list-style-type: none"> • Minor changes: <ul style="list-style-type: none"> – Narrow roadway to 5.5m opposite Cherry Tree Hotel – Remove centreline • Long-term <ul style="list-style-type: none"> – Close one side of the underpass to eastbound traffic. Reallocate space to walking and cycling. • Enabling true shared space in the heart of the plaza by requiring all westbound traffic to turn into Stephenson Street.
5 – Church Street/Balmain Street/Cotter Street [2]	<ul style="list-style-type: none"> • Changes are recommended per the proposed concept plan in Appendix B. 	<ul style="list-style-type: none"> • Changes focused on delivering DDA-compliant tram stops and better bicycle facilities on all approach roads. • Further plans can be developed for the long-term potential of incorporating a two-way bikeway.

Source: Stantec

[1] Note the order of Hotspots has been changed to reflect earlier recommendations made in this review.

[2] Not formally considered in Appendix B due to overall suitability for the medium-term.



5. Other Considerations

5.1 Car share

A review of car share is provided in B.5 Section C.4. Demand for car share will likely evolve over time, including spatially (some locations will be more popular than others).

Car share companies are commercial operations. If the terms of the sale/lease of the parking space are attractive to both the car share company and the property owner, this creates a market for this type of parking. It would be wasteful to provide parking for a market that does not exist. Therefore, a specific rate of car share is not required.

Social car sharing may see more widespread adoption. This type of car share does not need any more parking than what is already provided. This creates a level of uncertainty as to the future prevalence of commercial car share.

Recommendation # 10 - Car share spaces to be provided based on market demand

Consideration of car share can be implemented in the *Parking Plan* (parking layout) clause of the Parking Overlay and its associated decision guidelines.

On-street car share provision should continue to be provided in accordance with the City of Yarra Car Share Policy.

5.2 Planning for people with disabilities

Around 1 in 6 people in Australia have a disability¹⁷. The streetscape should be designed to be wheelchair friendly, with pram ramps and tactile ground surface indicators provided at crossing points, together with convenient alternative routes in areas where adverse gradients cannot be directly mitigated.

These users are often unable to avoid the use of the private motor vehicle and have the need to park closer to their destination. The allocation of both on and off-street parking should be prioritised so these users have a sufficient amount of conveniently located car parking spaces.

In Victoria, approximately 320,000 people with disabilities need a parking permit. Given there are approximately 4,000,000 issued driver's licences in Victoria, the number of permits for people with disabilities is approximately 8% of all drivers.

Car parking in Cremorne is expected to be provided at lower levels than historical norms. So if the amount of parking is decreasing, and the number of people with disabilities that need car access stays the same, the amount of DDA-compliant parking needs to go up in percentage terms.

Heightening awareness of the availability of parking permits for this user group will also lead to greater uptake and the need for further parking provision.

Recommendation # 11 - Update the Cremorne Enterprise Precinct – Parking Controls Review to give greater consideration to the parking needs of people with disabilities

This can be implemented in the *Parking Plan* (parking layout) clause of the Parking Overlay and its associated decision guidelines.

5.3 Other on-street parking management considerations

A review of the following on-street parking aspects is provided within the best practice solutions review in B.5.

- Managing parking supply and loading zones (Section C.2) – provided for information.
- Ride Hailing Services (Section C.3) - provided for information.

Further consideration of these needs could be addressed through a Parking Precinct Plan or Parking Management Plan. No specific recommendations on these aspects are made in this report.

¹⁷ People with disability in Australia, Australian Institute of Health & Welfare, Oct 2020 [\[Link\]](#)

5.4 Bicycle parking

Bicycle travel can be used to replace many short-distance car trips that are beyond a casual walking distance, i.e. beyond 1km. Bicycle storage is normally separately planned where space is at a premium and access can be problematic (apartment buildings); however, consideration should be given to how people can own different types of bicycles to suit different everyday needs.

A review of bicycle parking provision best practice is provided in B.5 Section C.6.

Recommendation # 12 - Clear minimum bicycle parking and end-of-trip facilities for commercial premises and multi-unit residential buildings

Bicycle Parking

Description	Long-Stay Bicycle Parking	Short-Stay Bicycle Parking
Dwelling ^[1]	1 space per 1 or 2-bedroom dwelling 2 spaces per 3-bedroom dwelling 1 space per bedroom for dwellings with no car parking	2 spaces per 5 dwellings
Office ^[2]	0.45 spaces per 100sqm GFA	0.05 spaces per 100sqm GFA
Retail Premises ^[2]	0.1 spaces per 100sqm NFA	0.4 spaces per 100sqm NFA

[1] This policy applies to multi-unit residential buildings (of 3+ dwellings), irrespective of the number of storeys.

[2] Rate based on mode share of 10% travel by bicycle as set out in Austroads, 2016³⁰ and BESS standards that are adopted by Council.

End-of-Trip Facilities

End-of-trip facilities are to be provided in accordance with Planning Scheme Clause 52.34 or as otherwise recommended by an ESD consultant. Such facilities should be provided at locations that are convenient and designed using CPTED principles. It is not necessary to set out additional rates of provision in this strategy.

The quantification of end-of-trip facilities should be based on the number of bicycle parking spaces being delivered and not a lesser amount, such as a statutory minimum requirement.

End-of-trip facilities are to be provided with a dedicated area to clean and repair bicycles, where practical to do so. This will encourage the continued use and maintenance of bicycles in a convenient location.

Implementation

This recommendation can be implemented using the following means:

- Planning condition that makes reference to the UDF
- A Schedule to the Parking Overlay (via decision guidelines referring to the UDF, rather than explicit requirements in the overlay itself, making this a secondary means of implementation).

6. Recommendations

6.1 Summary of Issues

Stantec has conducted a review of the Cremorne Urban Design Framework. This has included a review of existing transport conditions, anticipated future transport demands, and the proposed interventions in the UDF to accommodate those demands. The findings of this study are:

- Cremorne is a growing suburb that is surrounded by state-level strategic transport links for all modes of travel. It is, however, poorly connected to those networks, and the internal streets are narrow and built for cars and parking.
- Cremorne is bordered by busy arterial roads, with limited connections to those roads. High traffic demands on the arterial road network contribute to a through-traffic problem within the precinct. Through-traffic detracts from the success of Cremorne.
- Transport demands are expected to greatly increase, particularly for public transport, due to the anticipated increase in residential and worker populations in the precinct.
- Public transport trips translate to walking trips within the precinct. Walking trips are expected to account for more than half of all trips in Cremorne. Cremorne has excellent walkability potential. The opportunity lies in bringing the physical walking network up to a standard that matches the theoretical walkability measure of the precinct.

6.2 Recommendations

The following approach is recommended to address these issues and meet the evolving needs of Cremorne:



This has led to the following recommendations. Other minor recommendations are made throughout this report.

- **UDF Structure and Staged Delivery**
 - Recommendation # 1 - Make minor structural changes to clarify and strengthen the UDF.
 - Recommendation # 2 - Deliver streetscape improvements in stages to realise benefits early and maximise value for money
- **Short Term**
 - Recommendation # 3 - Reduce through-traffic by implementing a series of pinch points on key routes.
 - Recommendation # 4 - Commit to establishing Cremorne as a low-speed traffic precinct.
 - Recommendation # 5 - Trial pop-up versions of medium- and long-term measures.
- **Medium Term**
 - Recommendation # 6 - Deliver the street network using the recommended street cross-sections and hotspot improvements.
- **Long Term**
 - Recommendation # 7 - Reallocate road space to walking and cycling by closing rail underpasses to at least one direction of traffic.
- **Streets and Hotspots**
 - Recommendation # 8 - Make changes to street cross-sections to tie-in with the amended movement network changes.
 - Recommendation # 9 - Make changes to the hotspot concept plans to tie-in with the amended movement network changes.
- **Other Recommendations**
 - Recommendation # 10 - Car share spaces to be provided based on market demand.
 - Recommendation # 11 - Update the Cremorne Enterprise Precinct – Parking Controls Review to give greater consideration to the parking needs of people with disabilities.
 - Recommendation # 12 - Clear minimum bicycle parking and end-of-trip facilities for commercial premises and multi-unit residential buildings.



Appendix A. Cross-section Recommendations

A.1 Street Cross-sections

Figure A.1 – Cross-section Locations



Source: OpenStreetMap Contributors, edited by Stantec

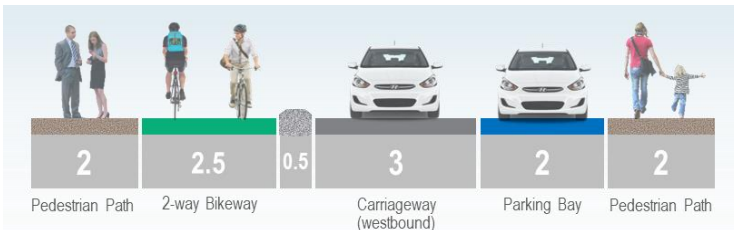
A.1.1 1 – Kelso Street (west)

1. Kelso Street (West): Existing (12m reserve) Relative Modal Priority



- Mixed-traffic two-way car-bike street
- No impediment to vehicle movement
- Priority can be better balanced using pinch points with bicycle passes

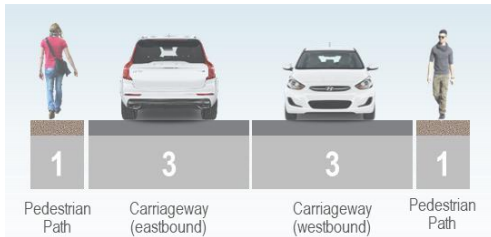
1. Kelso Street (West): Proposed (12m reserve) Relative Modal Priority



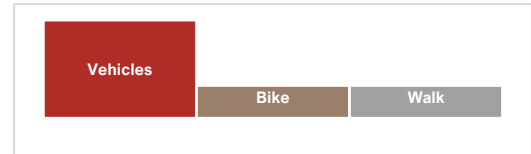
- Two-way separated bikeway, one-way cars.
- Parking retained

A.1.2 2 – Kelso Street (east)

2. Kelso Street (East): Existing (6.5-8m reserve)

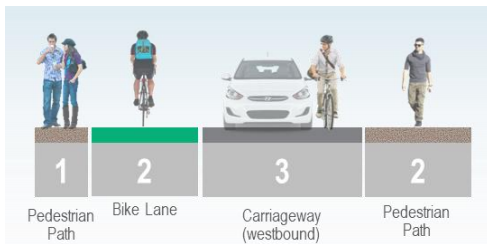


Relative Modal Priority

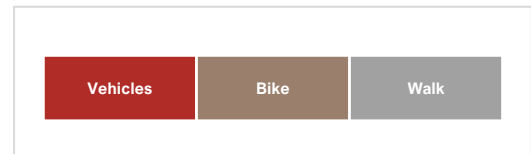


- Narrow footways
- Car dominant

2. Kelso Street (East): Proposed (6.5-8m reserve)



Relative Modal Priority



- Wider footway with a bike lane
- One-way traffic **westbound** to feed toward Kelso Street signals – shared car-bike lane.
- Could optionally be two-way traffic in a 5.5m wide shared car-bike carriageway where width permits

A.1.3 3 – Cremorne Street

3. Cremorne Street: Existing (14.5m reserve)

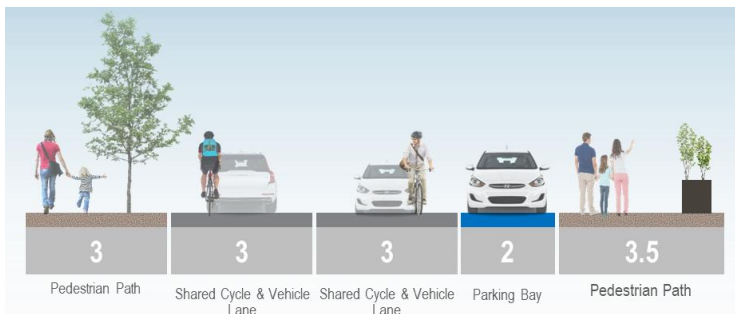


Relative Modal Priority



- Streetscape is dominated by cars and parking.

3. Cremorne Street: Proposed medium-term (14.5m reserve)

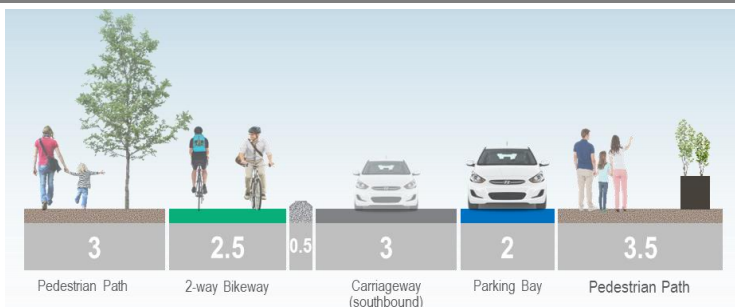


Relative Modal Priority



- Wider footways with greening/WSUDs opportunities
- Enabled by removing car parking on one side.
- Lower traffic volumes create safer space for shared car-bike activity.
- Remove the centre line better enable drivers to pass cyclists. The centre line can make drivers feel uncomfortable passing onto the opposite side of the road.

3. Cremorne Street: Proposed long-term (14.5m reserve)



Relative Modal Priority



- Two-way separated bikeway, one-way cars.
- Parking retained.
- One-way traffic **southbound** to feed toward Kelso Street signals.

A.1.4 4 – Balmain Street (west)

4. Balmain Street (west): Existing (9.6m reserve)



Relative Modal Priority



- Streetscape is dominated by cars and parking.

4. Balmain Street (west): Proposed medium-term (9.6m reserve)

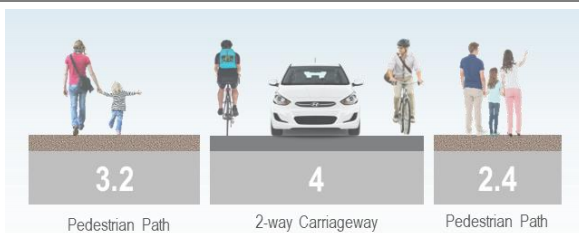


Relative Modal Priority



- Wider footway with greening/WSUDs opportunities
- Enabled by removing car parking on one side
- Lower traffic volumes create safer space for shared car-bike activity.

4. Balmain Street (west): Proposed long-term (9.6m reserve)



Relative Modal Priority



- Wider footways with greening/WSUDs opportunities
- Parking removed
- One-way traffic **eastbound** to support one-way traffic movement within the long-term plan

A.1.5 5 - Balmain Street (east)

5. Balmain Street (east): Existing (15m reserve)



Relative Modal Priority



- Reasonable footway width but balance very much favours cars and parking.
- Lower traffic volumes create safer space for shared car-bike activity.

5. Balmain Street (east): Optional medium-term (15m reserve)



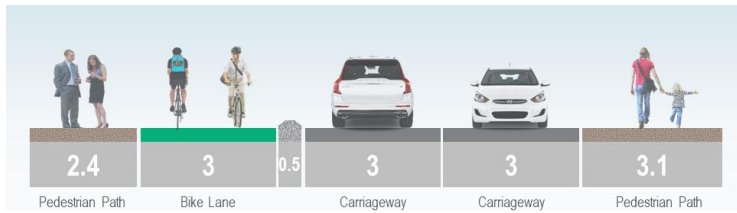
Relative Modal Priority



- Possible option to create separated bike facilities to replace shared car-bike lanes.
- Enabled by removing car parking on both sides.
- Walkability is improved by wider footways while retaining a form of separation from moving cars.
- Use pop-up treatments to create bike lanes that easily make way for long-term measures.

5. Balmain Street (east): Proposed long-term (15m reserve)

Relative Modal Priority



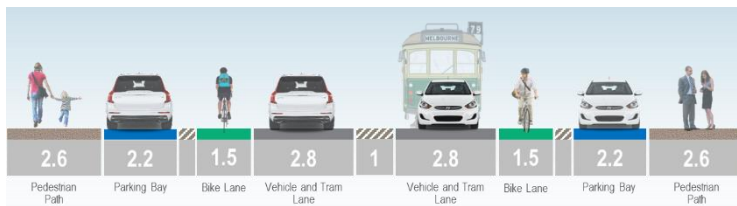
- Two-way bikeway enabled by the closure of Balmain Street rail underpass (provides a suitable endpoint for the bikeway – in a low traffic shared streetscape).

Source: Images by Stantec

A.1.6 6 – Church Street

6. Church Street: Existing (19.8m reserve)

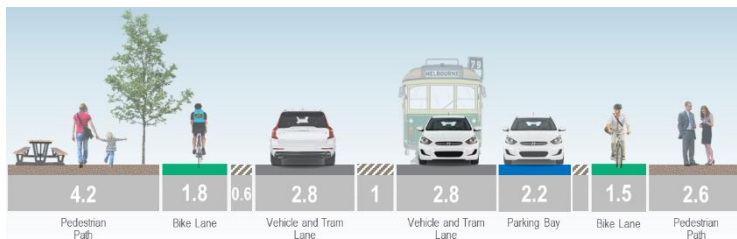
Relative Modal Priority



- Streetscape is dominated by cars and parking
- Bicycle lanes offer limited protection to car dooring.

6. Church Street: Proposed (19.8m reserve)

Relative Modal Priority



- Remove the northbound parking lane, widen the footway and provide a bike lane with a buffer to moving traffic.
- Protect people cycling by swapping the southbound parking and cycling lanes.

Appendix B. Hotspot Options Development

B.1 Punt Road/Kelso Street Intersection

B.1.1 Existing Conditions

Signalising Kelso Street at Punt Road has been historically seen as a solution to get traffic to Punt Road more directly. This option is linked to the Swan St/Cremorne St intersection as it can provide traffic capacity relief to enable urban realm improvement on Cremorne Street.



Source: Nearmap, edited by Stantec

Issues

1. 6-lane road with no crossing facilities on a 450m+ block length
2. Currently left-in/out with limited traffic utility, given other precinct gateways
3. Car parking/vehicle lanes all create expansive impermeable surfaces
4. Lack of designated shared paths
5. No crossing facility at CityLink off-ramp

Opportunities

1. Signalised pedestrian and cycling crossing and allow vehicles exiting to balance Cremorne St traffic use.
2. Advocate for a shared path on the western side of Punt Road linking to the sports precinct and Yarra Trail.
3. Widen pedestrian footpaths and provide Water Sensitive Urban Design (WSUD) beds.
4. Remove vehicle/parking lanes to reduce crossing distances and improve Disability Discrimination Act (DDA) compliance.
5. Priority crossing facility at CityLink off-ramp.
6. Consider 1-way traffic to balance current and future traffic volumes.



B.1.2 Medium Term Option

Signalising this intersection will enable greater connectivity to external walking and cycling links that can provide a key corridor to the adjacent sports precinct and onward to Melbourne CBD.



Source: Nearmap, edited by Stantec

Relative Modal Priority	Key Interventions
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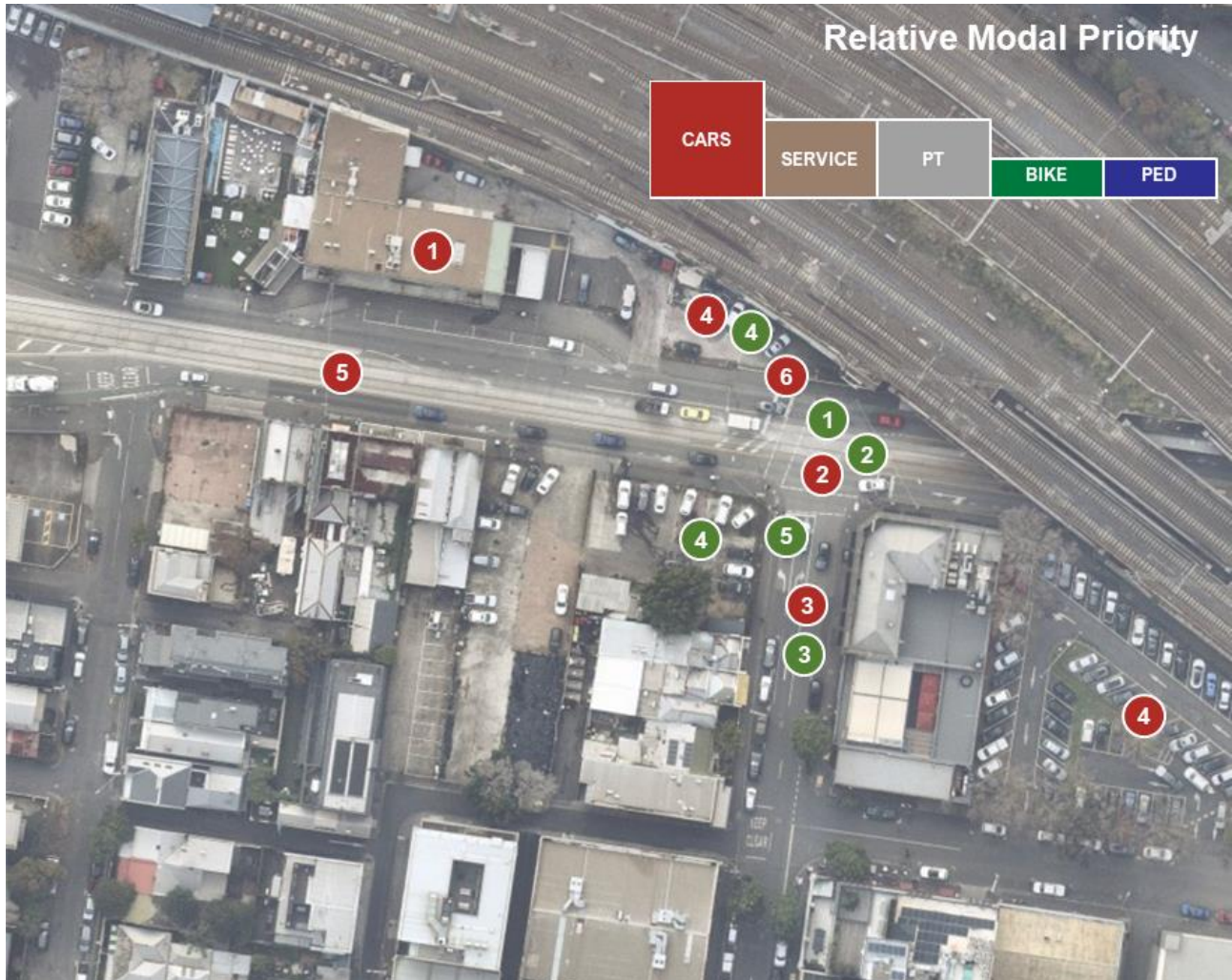
This intersection is key to balancing traffic use of Cremorne Street and enabling active travel improvements to take place elsewhere. Emphasis is on creating a convenient and safe active transport connection between Cremorne and the sports precinct and the wider shared path network.

1. Signalised intersection to allow all movements exiting Kelso Street and allow pedestrians and cyclists to cross Punt Rd.
2. Shared on-road bike use leading to/from Punt Road crossing point
3. Formalise Punt Road as three lanes southbound.
4. WSUDs/greening opportunities
5. Widen Kelso Street footway to create a gateway feature. Narrow road to one lane, one-way.

B.2 Swan Street/Cremorne Street Intersection

B.2.1 Existing Conditions

This is a key gateway in and out of Cremorne for traffic heading to Punt Road to travel north and west. It attracts significant traffic use along Cremorne Street, which makes it difficult to reprioritise Cremorne Street for walking and cycling.



Source: Nearmap, edited by Stantec

Issues

1. Richmond Station creates sharp high-volume peaks in pedestrian activity, resulting in the unsafe crossing of Swan Street.
2. Lack of bicycle infrastructure and poor environment for people with disabilities
3. Wide cross-section (4 lanes) that prioritises vehicle movement and parking
4. Excessive allocation of public land to car parking creates expansive impermeable surfaces
5. Traffic queuing causes capacity issues for the left turn out of Cremorne St
6. Property accesses constrain crossing placement.

Opportunities

1. Widen existing crossings and place these close to desire lines
2. Dedicated facilities for bicycles to enter and exit Cremorne St
3. Long-term closure of traffic lanes exiting to Swan Street.
4. Remove vehicle/parking lanes to reduce crossing distances and improve DDA compliance.
5. Urban realm enhancements north and southwest of the intersection to create WSUDs beds and larger areas for pedestrians waiting to cross
6. Reduce the need to turn left out of Cremorne St by providing an alternative route at Kelso Street.



B.2.2 Proposed Changes

Creating an improved walking and cycling connection between the train station and Cremorne Street strengthens the link between Cremorne and key external movement networks.



Source: Nearmap, edited by Stantec

Relative Modal Priority



This intersection is constrained by private and state government property ownership on several sides. The emphasis is on creating a convenient and safe active transport connection between the train station and Cremorne Street.

Key Interventions

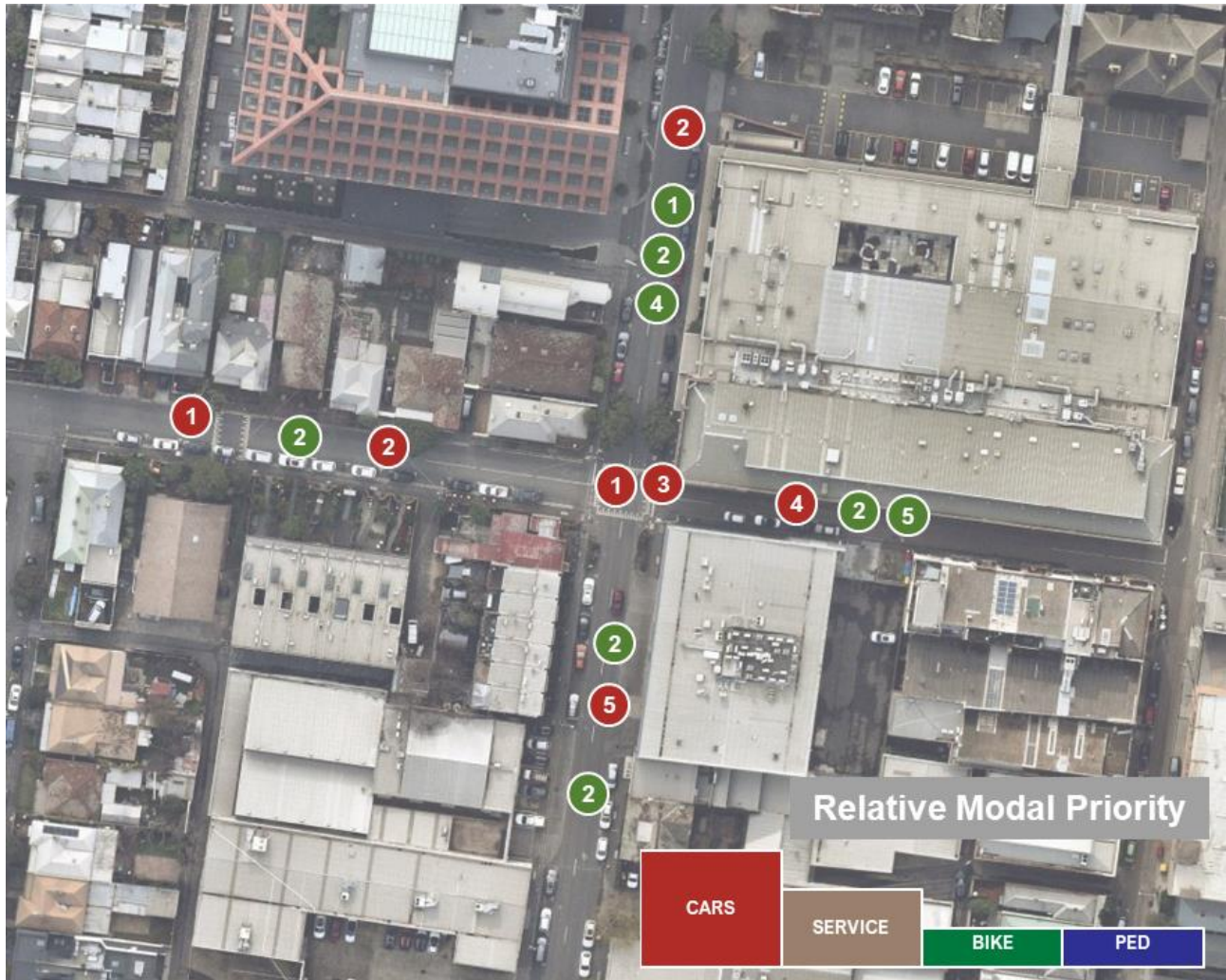
1. Introduce scramble crossing. Widen and realign pedestrian crossings along desire lines.
2. Narrow road width to reduce crossing distances and alleviate some DDA issues.
3. Reduce Cremorne St to one vehicle lane exiting to Swan St.
4. Contemporary bicycle lane layout alongside parking and at the intersection.
5. Investigate land acquisition or swap to reallocate land to enhance the public realm.
6. Seating/WSUDs/greening opportunities



B.3 Cremorne Street/Kelso Street Intersection

B.3.1 Existing Conditions

This intersection is a focal point for pedestrian and vehicle activity. The number of people walking greatly outweighs the number of people driving. LATM treatments are in place but should be refocused to increase walkability.



Source: Nearmap, edited by Stantec

Issues

1. Existing Local Area Traffic Management (LATM) treatments help deal with vehicle use but are not promoting active travel.
2. A wide straight road that promotes vehicle speed
3. Vehicle use will increase if Kelso Street is signalised.
4. Narrow footways and no cycling facilities
5. Few LATM measures along Cremorne Street

Opportunities

1. Remove medium to long-stay parking on Cremorne Street to provide more room for pedestrians and cyclists.
2. Allow bikes to share the road with cars.
3. Reduce vehicle speeds to close the speed difference between bikes and cars (not on page).
4. Use slow points and pinch points to reinforce low vehicle speeds and reduce through-traffic.
5. Increase footway width and provide street entry treatments for cyclists to travel on road.



B.3.2 Proposed Changes

Removing the modal filter that is currently proposed in the UDF will connect the northern part of the precinct to the proposed signals at Punt Road/Kelso Street. Through-traffic can be dealt with by area-wide solutions.



Source: Cremorne UDF, edited by Stantec

Relative Modal Priority	Key Interventions
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This is a key intersection for north-south movement within the precinct. Emphasis is on prioritising active modes while reducing through-traffic opportunities. Further consideration is needed to confirm what size of vehicles need to use this intersection and whether treatments other than a diagonal filter are workable.

1. Extend raised table to include crossing points.
2. Widen footway, remove car parking.
3. Contra-flow bike lane on Kelso Street eastbound, with traffic heading **westbound**.
4. Set aside the modal filter to allow greater flexibility for future bikeways. Pursue a route-based approach to deal with Cremorne's through-traffic problem.
5. WSUDs/greening opportunities on widened footways.

B.4 Balmain Plaza

B.4.1 Existing Conditions

This focal point for Cremorne is undermined by poor surrounding walking and cycling connections, together with relatively high vehicle volumes and speeds on Balmain Street. Low-traffic neighbourhood principles will provide solutions.



Source: Nearmap, edited by Stantec

Issues

1. Virtually unhindered through-traffic route
2. Value of plaza space is not maximised
3. Underpass is an intimidating environment for pedestrians and cyclists
4. Narrow footpaths and no real cycling facilities.

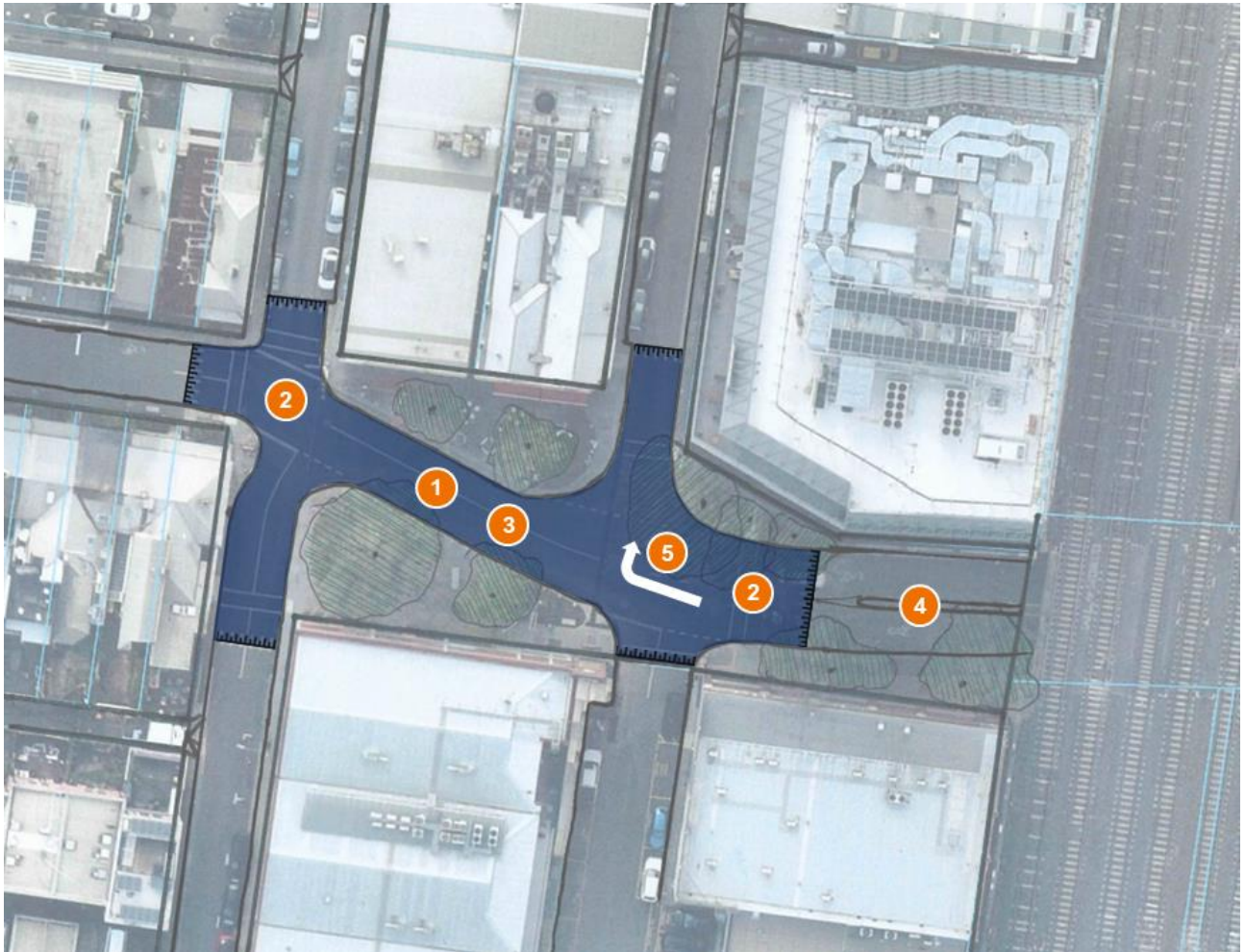
Opportunities

1. Shared space on side streets.
2. Reduce vehicle speeds to close the speed difference between bikes and cars (not on page).
3. Use slow points and pinch points to reinforce low vehicle speeds and reduce through-traffic.
4. Increase footpath width and provide street entry treatments for cyclists to travel on road.
5. Allow bikes to travel two-way on one-way traffic streets.
6. Potentially close one side of the underpass to traffic and reallocate the space to walking and cycling.



B.4.2 Proposed Changes

The focus of this intervention is to maximise the place value of the plaza area by removing the attractiveness of Balmain Street as a through-traffic route and removing the rail underpass as a barrier to active travel movement.



Source: Nearmap, edited by Stantec

Relative Modal Priority



A key part of removing through traffic from Balmain Street will be reducing vehicle speeds but also making it difficult for cars to pass straight through Cremorne.

Key Interventions

1. Narrow roadway to 5.5m.
2. Simplify the streetscape by removing the centreline and other painted lines on Balmain Street and other side streets.
3. Use a colour-differentiated surface or different surface material such as brick or bluestone to define the plaza streetscape and complement line marking removal.
4. Long-term option to dedicate one side of the underpass to walking and cycling by closing the eastbound direction to through-traffic.
5. Long-term option to require all westbound traffic to turn into Stephenson Street, greatly reducing traffic through the heart of the plaza, enabling true shared space.



B.5 Church Street/Balmain Street/Cotter Street Intersection

B.5.1 Existing Conditions

This is an important gateway for Cremorne. It provides connections to regional public transport system along the Church Street and Chapel Street activities centres as well as providing access to the precinct for people walking, cycling and driving.



Source: Nearmap, edited by Stantec

Issues

1. Car parking/vehicle lanes all create expansive impermeable surfaces.
2. No buffer between the bike lane and car doors opening in the parking lane.
3. Few existing bicycle facilities.
4. Narrow crossings and footways.
5. Unpaid parking creates high parking turnover next to Church Street meter parking.
6. Wide straight road encourages vehicle speed.
7. Tram stops are not DDA compliant and are on the approach side of the intersection.

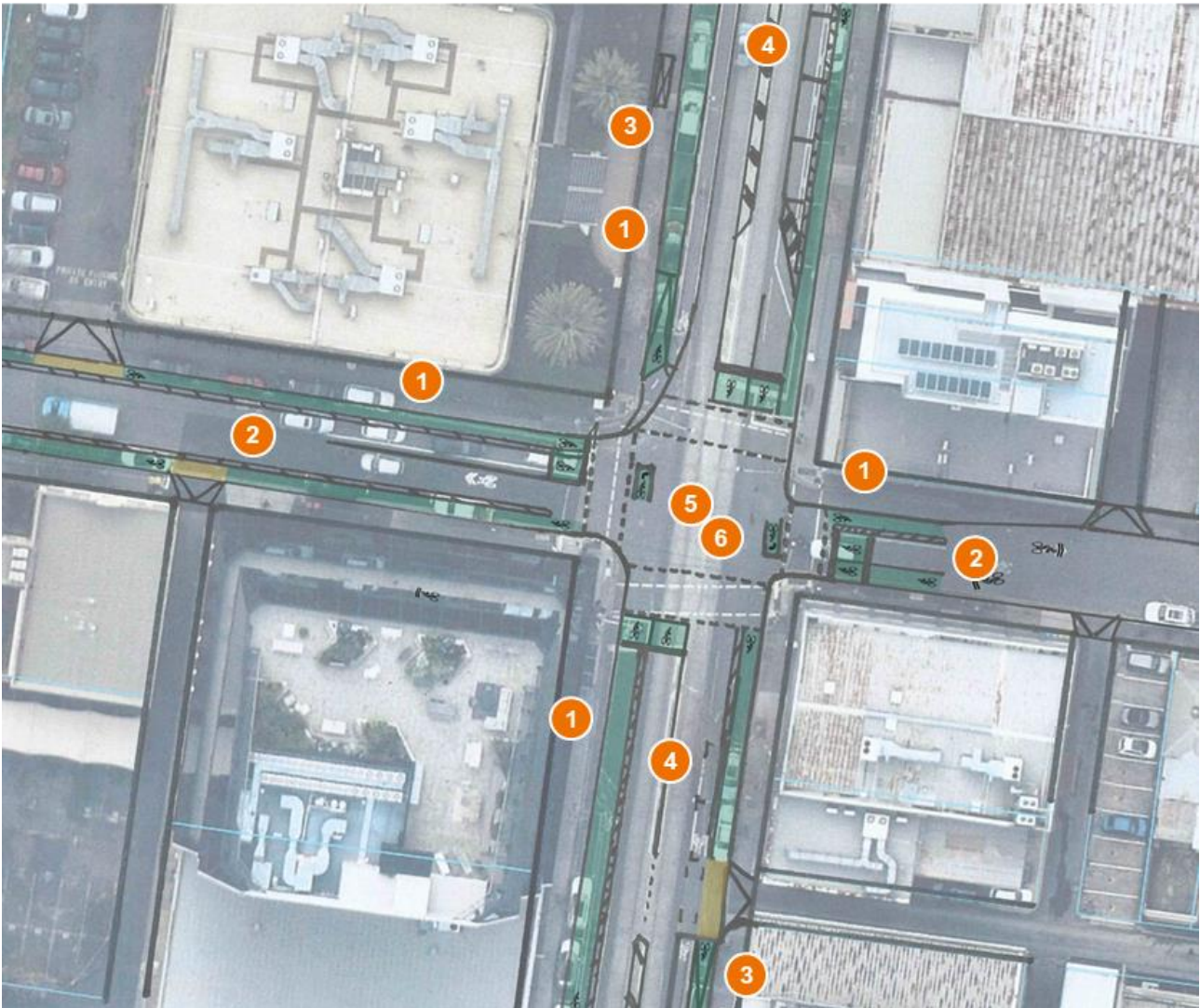
Opportunities

1. Reallocate car parking to provide more room for pedestrians and bicyclists.
2. Increase footway width and provide street entry treatments for cyclists to travel on-road.
3. Use slow points and pinch points to reinforce low vehicle speeds and reduce rat running.
4. Provide contemporary bicycle facilities (even if on-road).
5. Provide DDA-compliant tram stops on the departure side of the intersection.



B.5.2 Proposed Changes

The proposed changes are focussed on delivering more space for people walking and cycling along Balmain Street and Cotter Street. While tram tracks limit how road space can be allocated, removing parking on at least one side of Church Street would provide substantial walking and cycling benefits.



Source: Nearmap, edited by Stantec

Relative Modal Priority	Key Interventions
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Modal priorities can be better balanced at this location by reallocating the road space towards people walking and cycling. Church Street has one lane in each direction (no clearway), so dedicated tram stops are a significant opportunity.

1. Widened footways enable precinct gateways and WSUD opportunities.
2. Bicycle facilities that match bicycle demands and traffic speed/volume.
3. Dedicated DDA-compliant tram stops with passenger shelters and a bicycle bypass lane accessed from the roadway via a 1:12 ramp.
4. Reallocate road space in line with recommended cross-sections to deliver protected bicycle lanes.
5. Wider pedestrian crossings.
6. Better bicycle facilities at the intersection.

Appendix C. Best Practice Solutions

C.1 Low-traffic neighbourhoods

Low-traffic neighbourhood principles can be put in place to make it more difficult for travel to travel through Cremorne while maintaining access for businesses and residents.

C.1.1 Increase Active Travel by Restricting Vehicle Access

Limiting or removing vehicle access within a neighbourhood pushes vehicle priority down the modal hierarchy.

This can be achieved by straightforward and cost-effective means:

- Modal filters (restrict cars, permit everything else).
- One-way streets.
- Bus gates.
- Width restrictions to limit heavy vehicle access.
- School streets (to prevent parents from getting close for drop-off and pick-up).

A low-traffic neighbourhood can be supported by gateway treatments such as:

- Raised intersections (continuous footway).
- Parklets.
- Zebra crossings or pedestrian-operated signals.

Case Study – Streatham Hill Low-Traffic Neighbourhood (UK)

Streatham Hill Low traffic neighbourhood

- Access from A23
- Access from Roupell Rd
- Access from A205 via Hillside Rd Leigham Vale via Palace Rd
- Access from Leigham Ct Rd or Leigham Vale

@charmugadesigns
Lambeth

Considerations for Cremorne

- Limited access from surrounding major roads
- Vehicle access maintained but not wholly prohibited
- Access within the neighbourhood becomes more convenient by active travel

Benefits of Similar Schemes

- **Walking** +32 minutes per week
- **Cycling** +9 minutes per week
- **Life expectancy** +7 months
- **Economy** +30% retail, -17% vacancies
- **Vehicles** -56% residential, -38% overall
- **Community** +216% static street use

Source: London Borough of Lambeth

C.1.2 Managing loading and emergency vehicles

Examples from the UK indicate that emergency services¹⁸ are generally positive about such schemes. They are statutory consultees and typically see no change in response times, with the most common concerns raised being the placement

¹⁸ [Living Streets, Low Traffic Neighbourhoods, UK 2018.](#)

of lockable bollards for access during extended incidents and their GPS systems being updated appropriately. These issues can be managed with planning and coordination with local emergency services managers.

This similarly applies to loading vehicles.

C.2 Managing parking supply and loading zones

C.2.1 Rigid use of On-street Spaces

Across Australia, kerbside spaces are managed by fixed signage that requires updating each time a change is needed. The signage usually indicates the restrictions placed on the space, including the duration it applies to. Combining multiple conditions requires combining multiple pieces of information onto a small sign, representing a poor and confusing user experience for drivers.

These fixed conditions may also not be representative of the needs of the local community as this can change over the span of not only a day but also over the year (e.g. a local event may require more loading or delivery space than what the kerbside space is signposted for).

C.2.2 A modern approach for Cremorne as an Enterprise Precinct

The case study presented below demonstrates a new way of allocating and managing on-street parking provision for a range of needs. Benefits include:

- Efficient, dynamic use of road space that links with the precinct's innovation hub aspirations
- Links with last-km servicing and providing for vulnerable parking user groups, such as people with disabilities
- Reduces enforcement administrative burden.

Case Study – Grid Smarter Cities (UK)

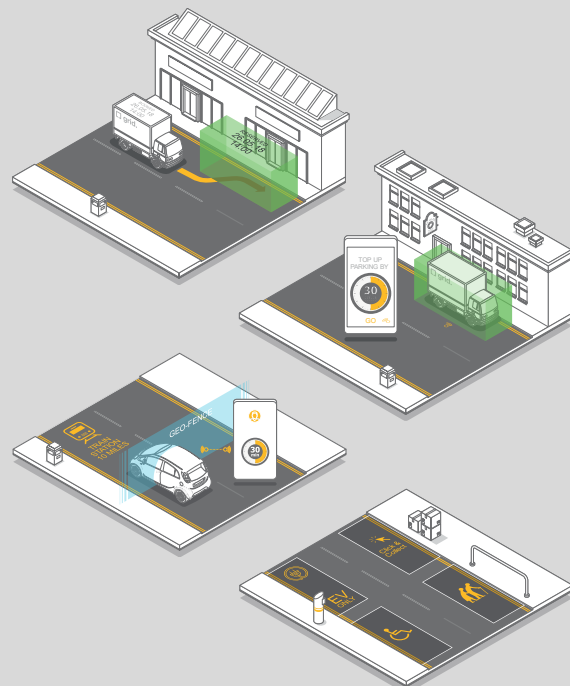
Grid Smarter Cities is a digital approach to managing kerbside spaces in urban areas. By combining geolocation technologies with dynamic resource allocation systems, it is possible to increase the flexibility and efficient usage of on-street space.

Typical on-street loading or parking spaces have a fixed use as indicated through signage or line marking. Grid Smarter Cities proposes to substitute these with geofenced locations that are updated and communicated in real-time through smartphone and desktop applications.

A key feature is the use of bookings to allocate resources across a defined range of spaces as well as to aid in wayfinding. By guaranteeing a specific parking/loading space to a user within a certain timeframe, congestion caused by users circling roads for a space is minimised.

At the same time, this system can also be used to reassign spaces as needed, both on-street and off-street, on a real-time basis. Additional parking and loading space can be created as needed if demand or a situation requires it by creating virtual parking or loading spaces demarcated by geofenced areas.

The system also minimises management overhead created by issuing permits and exemptions, as these can now be done in a unified system, all while providing accurate and detailed data to authorities.



Source: Grid Smarter Cities, 2020



C.3 Ride-Hailing Services

There is a temptation to try to accommodate these vehicles as a separate user group and provide parking for them. It is not necessary to do this, at least not to the extent that all demand for these vehicles would be served by providing enough parking for them.

A simple solution is offered by Jeff Speck in his book *Walkable City Rules*: designate the length of kerb between the last parking space on the block and the street corner as a ride-hailing zone.

Individual pick-ups/drop-offs take a short length of time, so the waiting car does not present an impediment to traffic flow for very long. This is unlikely to be a problem on low-traffic streets in Cremorne, and it saves having to provide dedicated parking spaces for these vehicles.

C.4 Car Share

Car share schemes allow limited space to be shared by multiple users and provide alternative access to car ownership where alternative transport options are unavailable.

C.4.1 Commercial Car Share Operators

Car share is well-established in Australia and in other countries, with companies promoting its benefits in terms of reducing the demand for parking spaces and travel demand. Publicised research supports the assertion that car share offsets the demand for car parking. Shaheen and Cohen (2013)¹⁹ undertook a review of studies that analysed these benefits and documented the following results based on case studies from different parts of the world:

- *"Each car share vehicle has been documented to reduce the number of private vehicles owned across car share members by 7 to 10 vehicles in Australia, 4 to 10 vehicles in Europe, and 9 to 13 vehicles in North America, with the related need for parking spaces reduced.*
- *A variety of European studies demonstrated a reduction in VKT per car share member of 28% to 45%, and in North America some studies demonstrated a vehicle kilometres travelled reduction of up to 80%.*
- *Car share also reduces the need to own a vehicle, reducing the overall number of cars in a city and reducing car ownership costs for an individual. European studies indicate that between 15.6% and 34% of participants sold a vehicle after joining a car sharing program, while between 11% and 29% of members did the same in the North American studies. Including the decision to forego the purchase of a car, this number rises to around 50% of members in the North American context."*

The studies reviewed by Shaheen and Cohen (2013) are consistent with the local Australian study undertaken by Phillip Boyle & Associates²⁰, which showed for every car share vehicle, ten fewer private vehicles are owned as a result, based on studies of municipalities in Melbourne and Sydney.

These findings align with other known documents, such as the Yarra City Council sustainable transport factsheet²¹ that identifies that a car share space removes 7 to 10 cars off the road.

As on-street car parking will continue to be provided in Cremorne, it would be preferred that a higher proportion of car share spaces are provided on-street where they are more visible, accessible and convenient for users. Providing car share spaces on-street also preserves the security of off-street spaces for residents and tenants (e.g. if no visitor parking is provided on-site). It is also more aligned with the intent of the ability to provide no on-site car parking. Where on-site car parking is proposed, the Schedule to the Parking Overlay should include a permit decision guideline that covers the extent to which the amount of proposed parking is to be allocated for car share.

C.4.2 Social Car Share

The future uptake of not only car share, but also of social car-sharing apps such as "**Uber Car Share**", can enable access to a vehicle from time to time from within the local area. Cars can be used on an hourly or daily basis, with a brief review of information available online indicating rates from \$6/hr and \$28/day can be found in the Council area currently.

¹⁹ Shaheen, S.A. & Cohen, A.P. (2013): Carsharing and Personal Vehicle Services: Worldwide Market Developments and Emerging Trends, *International Journal of Sustainable Transportation*, 7:1, 5-34.

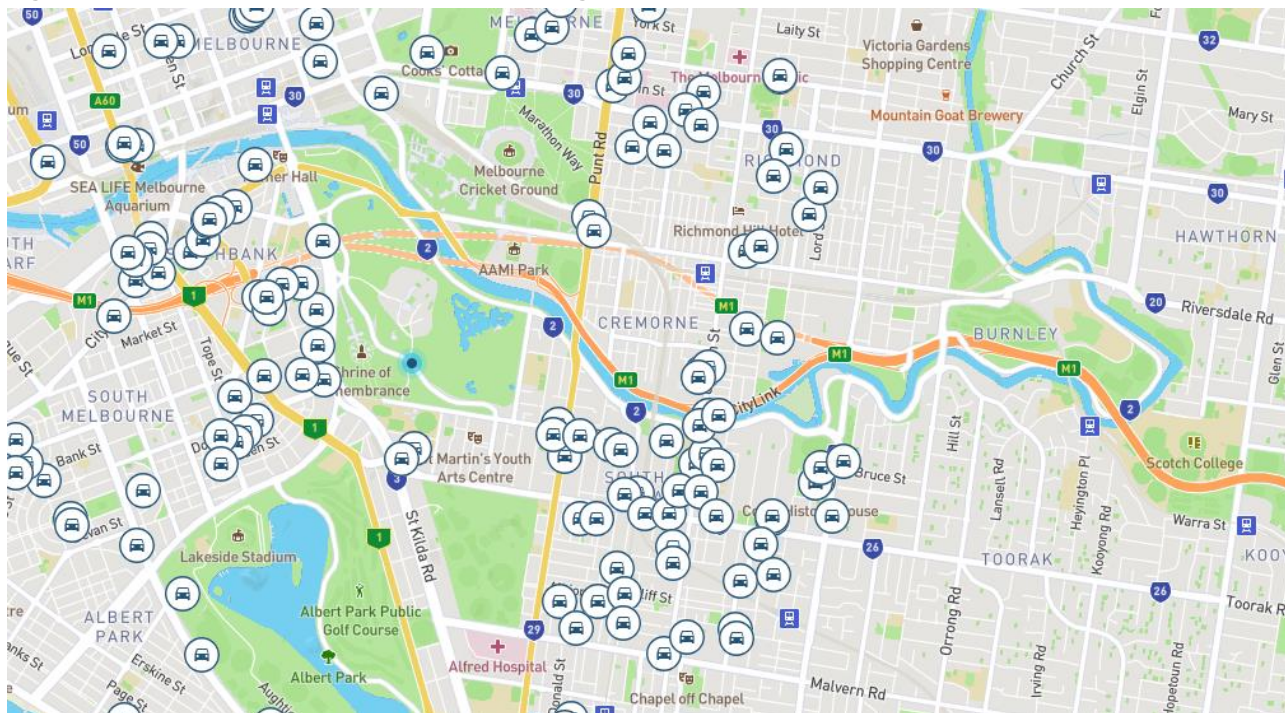
²⁰ Phillip Boyle & Associates (2016) *The Impact of Car Share Services in Australia*

²¹ Yarra City Council – Sustainable Design Assessment in the Planning Process, *Transport: Building Design for a Sustainable Future*.



It is expected that as social acceptance of these services goes beyond the "early adopter" phase, it will become more prevalent as a means of vehicle use.

Figure C.1 – Uber Car Share vehicles are becoming available in Cremorne



Source: Uber Car Share [\[Link\]](#) accessed by Stantec in July 2023

C.5 What is a suitable bicycle facility?

While the improved walkability of the precinct is the clear priority, suitable cycling facilities are also necessary to support the increased demand by people cycling.

C.5.1 What does design guidance say?

Transport planners consider the speed and volume of vehicle traffic when selecting a suitable bicycle facility. For example, in quiet streets, most people will be comfortable riding a bicycle in a mixed-traffic environment. This can be reinforced by signage both on the road and pole-mounted to reinforce the message (mainly for drivers) that streets are low-speed and people riding bicycles are welcome.

On busier and faster roads, most people will not be prepared to cycle on the carriageway, so they will not cycle at all, or some may unlawfully use the footpath. These are unwanted outcomes which necessitate increasing levels of separation between people on bicycles and moving/parked vehicles.

Low Traffic Volume Streets

The Yarra Transport Strategy 2022-2023 (YTS) sets out guidance for bicycle facilities in different road speed and traffic volume circumstances, see Figure C.2. **One of the key recommendations of the UDF, supported by our review, is that Cremorne should be subject to a 30km/h speed limit. The YTS does not contemplate situations where traffic volumes exceed 1,000 vehicles per day in low-speed environments.**

Further guidance for Cremorne has therefore been sought from other sources:

- **Cycling Aspects of Austroads Guides²²**
 - Identifies that "cycle-specific infrastructure can be considered but is not normally beneficial" for vehicle volumes up to around 600 vehicles per hour in a 30km/h speed zone – see Figure C.3.

²² Cycling Aspects of Austroads Guides (3rd Ed), Austroads, June 2017 [\[Link\]](#)

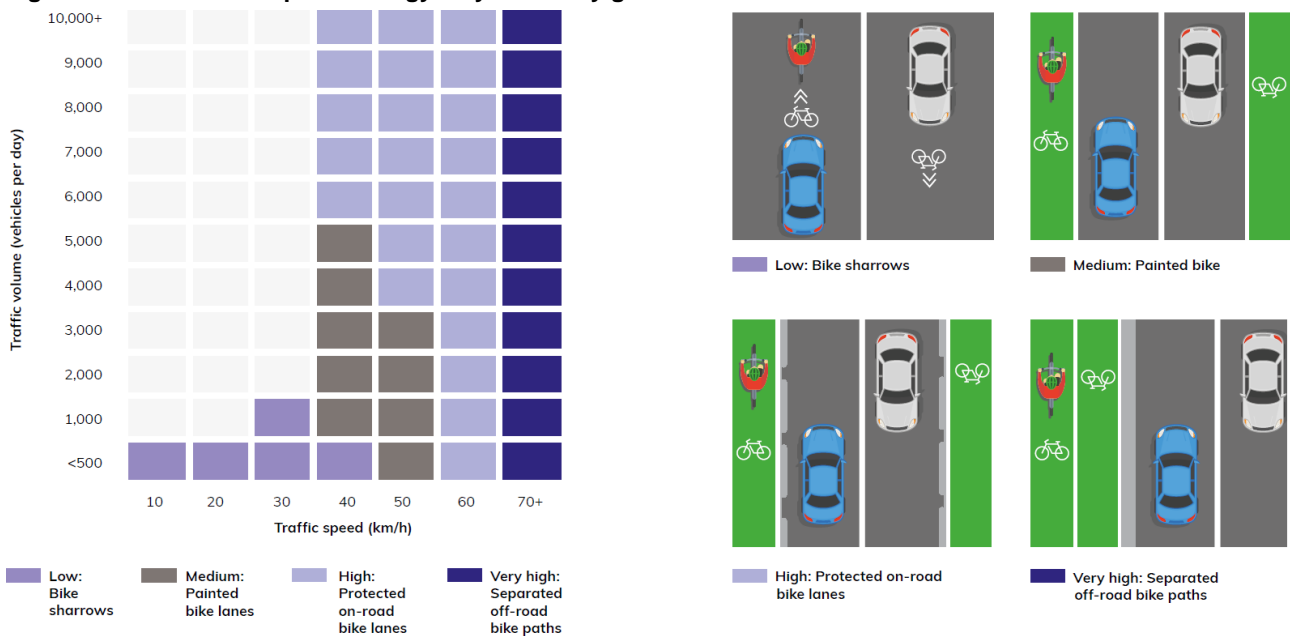
- **Cycling Infrastructure Design (UK)²³**
 - Brings together a range of international design guidance that identifies "most people" will be comfortable cycling in a mixed traffic environment for vehicle volumes up to around 2,000 vehicles per day in a 30km/h speed zone – see Figure C.4.
- **City of Melbourne Bike Lane Design Guidelines²⁴**
 - Indicates that a shared traffic-bike lane is suitable for roads carrying up to 2,000 vehicles per day or 180 vehicles per hour in a single direction. This indicates that two-way volumes of up to 4,000 vehicles per day or 360 vehicles per hour. Note this is for an 85th percentile operating speed of 25km/h which would correlate with a 30km/h speed limit – see Table C.1.

For Cremorne, we must be mindful of the limitations presented by the existing street network. In this regard, the Cycling Infrastructure Design (UK)²³ provides the following guidance:

"Reducing the volume and speed of motor traffic can create acceptable conditions for on-carriageway cycling in mixed traffic and should always be considered as it delivers other safety and environmental benefits to streets. This is often the only feasible approach on narrow roads lined by buildings."

It is clear that Cremorne faces the challenges outlined in this statement and that street width should not be a barrier to cycling use if mitigating conditions – such as reduced vehicle speed – can be put in place to reduce the effects of adverse outcomes.

Figure C.2 – Yarra Transport Strategy bicycle facility guidelines

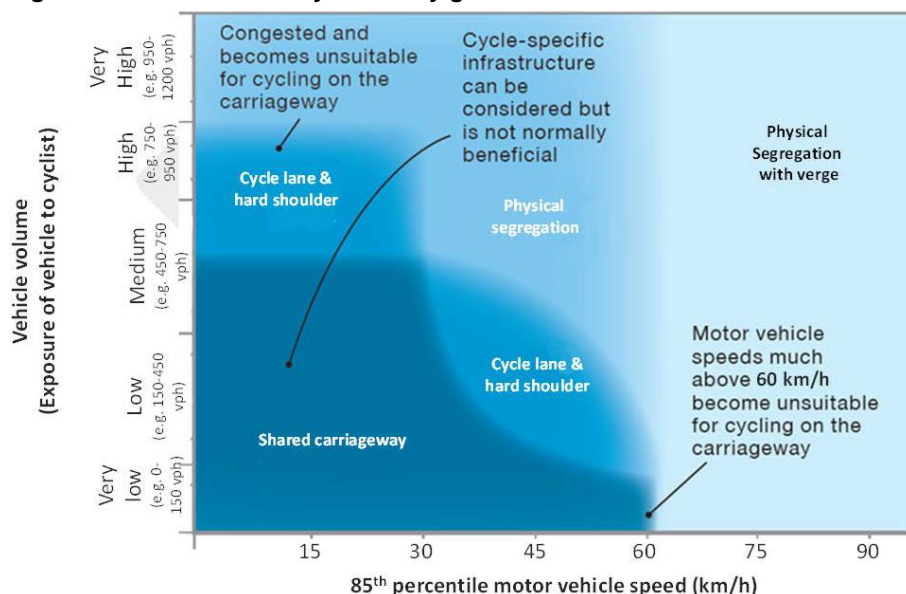


Source: Moving Forward – Yarra's Transport Strategy 2022-32, Figures 13 and 14

²³ Cycling Infrastructure Design, Local Transport Note 1/20, UK Department of Transport July 2020 [\[Link\]](#)

²⁴ Bike Lane Design Guidelines, City of Melbourne, June 2019 [\[Link\]](#)

Figure C.3 – Austroads bicycle facility guidelines



Source: Figure 2.2 of Cycling Aspects of Austroads Guides²², based on *Sustrans Design Manual: Handbook For Cycle-Friendly Design*, Sustrans 2014

Figure C.4 – UK Department of Transport bicycle facility guidelines (20mph shown, i.e. 30km/h)

Speed Limit ¹	Motor Traffic Flow (pcu/24 hour) ²	Protected Space for Cycling			Cycle Lane (mandatory/ advisory)	Mixed Traffic
		Fully Kerbed Cycle Track	Stepped Cycle Track	Light Segregation		
20 mph ³	0	Green	Green	Green	Green	Green
	2000	Green	Green	Green	Green	Green
	4000	Green	Green	Green	Yellow	Yellow
	6000+	Green	Green	Green	Yellow	Pink

- Provision suitable for most people
- Provision not suitable for all people and will exclude some potential users and/or have safety concerns
- Provision suitable for few people and will exclude most potential users and/or have safety concerns

- Notes:
1. If the 85th percentile speed is more than 10% above the speed limit the next highest speed limit should be applied
 2. The recommended provision assumes that the peak hour motor traffic flow is no more than 10% of the 24 hour flow
 3. In rural areas achieving speeds of 20mph may be difficult, and so shared routes with speeds of up to 30mph will be generally acceptable with motor vehicle flows of up to 1,000 pcu per day

Source: Figure 4.1 of Cycling Infrastructure Design, Local Transport Note 1/20²³, edited by Stantec to focus on the 30km/h speed limit.

Table C.1 – City of Melbourne bicycle facility guidelines

Bike Facility Option	Actual motor vehicle operating speed 85th percentile km/h	Road width in a single direction	Maximum traffic volume in a single direction
Preferred Bike Facilities			
Kerbside Physically Separated (The first treatment to be considered)	Preferred treatment for all streets that have greater than 25 km/h	Minimum 4.9 metres (no parking) Minimum 7.8 metres (with parking)	More than 5,000 vehicles per day More than 500 vehicles per hour
Double Chevron	Best suited for streets below 50 km/h	Minimum 7.4 metres	5,000 vehicles per day or 400-500 vehicles per hour
Shared Traffic-Bike Lane	Preferred treatment for streets with speeds below 25 km/h, low volumes and queues	Generally, less than 7.4 metres (with parking) & suitable low-traffic conditions	2,000 vehicles per day or 180 vehicles per hour
Less Desirable Bike Facilities: Should only be considered in situations where insufficient road width or traffic speeds/volumes prevents installation of above treatments			
Single Chevron on Parking Side of Bike Lane	Best suited for streets below 40 km/h	Minimum 7 metres	3,000 vehicles per day or 180-300 vehicles per hour

Bike Facility Option	Actual motor vehicle operating speed 85th percentile km/h	Road width in a single direction	Maximum traffic volume in a single direction
Single Chevron on Traffic Side of Bike Lane	Best suited for streets below 40 km/h	Minimum 6.8 metres	4,000 vehicles per day or 300-400 vehicles per hour
Simple Bike Lane	For consideration only up to 30 km/h	Minimum 6.4 metres (with parking)	2,500 vehicles per day or 180-240 vehicles per hour

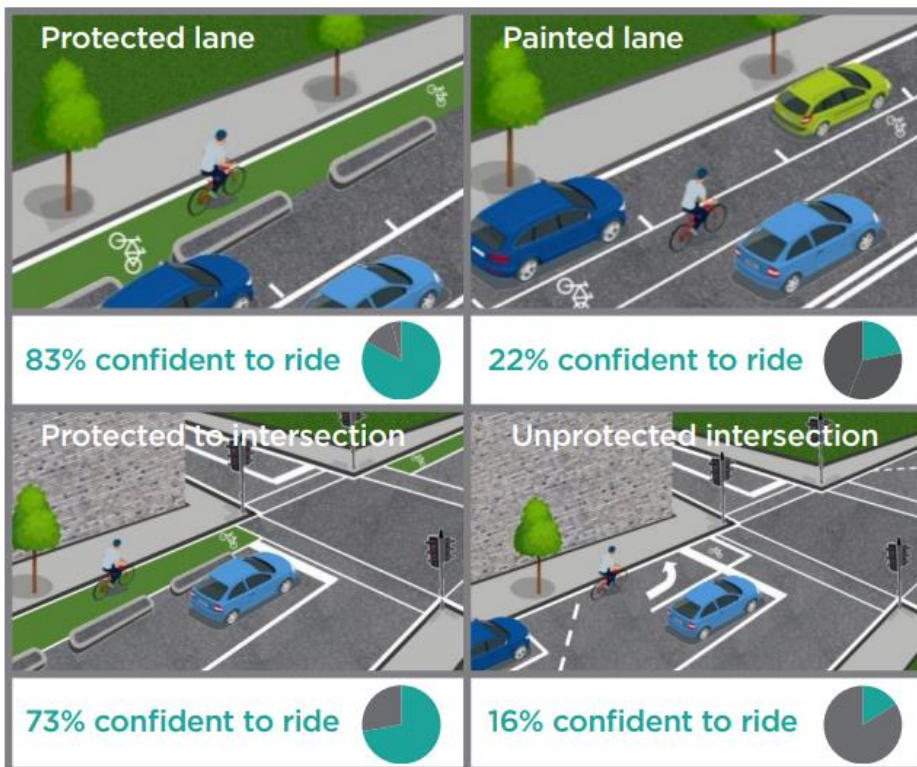
Source: Bike Lane Design Guidelines, City of Melbourne, June 2019²⁴

Higher Traffic Volume Streets

Suitable separation and protection should be provided (such as physical or marked buffers) between traffic and parked cars and on-road cycling lanes on streets with higher traffic volumes. These have the additional benefit of providing protection from vehicle intrusion in crowded or popular pedestrian areas.

According to research conducted by the City of Melbourne, shown in Figure C.5, 83% of people feel confident riding in a protected lane, compared to just 22% in a painted lane.²⁵

Figure C.5 – Proportion of people confident to ride with various levels of protection



Source: City of Melbourne Transport Strategy 2030²⁵

C.5.2 Who are we designing for?

The suitability of facilities also depends on the people being designed for. Professional judgement should be used to guide decision-making in view of the information available. These the above guides are general to all street types and user needs. They set out how to accommodate "most people" in all settings, including residential neighbourhoods, high streets, city centres, and traffic movement environments such as arterial roads and freeways.

The Cycling Infrastructure Design (UK)²³ provides guidance on what constitutes "most people"²⁶:

"Where motor traffic flows are light and speeds are low, cyclists are likely to be able to cycle on-carriageway in mixed traffic... Most people, especially with younger children, will not feel comfortable on-carriageways with more than 2,500 vehicles per day and speeds of more than 20 mph [30km/h]. These values should be regarded as desirable upper limits for inclusive cycling within the carriageway."

²⁵ City of Melbourne Transport Strategy 2030 [\[Link\]](#)

²⁶ Section 7.1 of Local Transport Note (LTN) 1/20. UK Dept of Transport. [\[Link\]](#)

The land uses in Cremorne lead to approximately 80% of bicycle trips being for employment purposes, with the remaining 20% associated with people living there – currently and in future. Census data²⁷ indicates that approx. 5.5% are of retirement age, while approx. 8% of people living in Cremorne are under 15 years of age, which is around 25 people of this age cycling in 2031, based on data in Section 2.3 of this report.

With this data and the above quote in mind, we can take the view that "most people" cycling in Cremorne are working-age adults.

C.5.3 Recommendation

The above discussion and analysis provide compelling evidence that mixed-traffic environments would be suitable for roads that have vehicle volumes of 400 vehicles per hour (200 in one direction) or approximately 4,000 vehicles per day. **This will apply to practically all streets in Cremorne.**

Separated bicycle lanes should be provided if traffic volumes or vehicle speeds exceed anticipated levels or if there are other overriding concerns, such as safety or a need to provide additional comfort for people cycling. That said, the expected increase in the amount of people cycling is minor in percentage terms, increasing from 4% currently to 6% in 2031. This leaves a lot of headroom for cycling uptake to increase. Additional bicycle infrastructure should be planned to encourage bicycle use, particularly if external connection issues can be solved, which could release latent demand – such as through the Swan Street Activity Centre.

C.6 Bicycle Parking

C.6.1 Current Bicycle Parking Requirements

Current statutory rates for bicycle parking are set out in Clause 52.34 of the Council Planning Scheme. These rates apply to all municipalities across Victoria.

Example rates that could apply to the proposed land uses are:

- 1 space to each 5 dwellings for residents in developments of four or more storeys
- 1 space to each 10 dwellings for visitors to developments of four or more storeys
- 1 space per 300sqm for office employees
- 1 space per 1,000sqm for office visitors
- 1 space per 600sqm for shop employees
- 1 space per 500sqm to shop customers

The rates in Clause 52.34 of the Planning Scheme are considered low by contemporary standards, as will be set out in the following review.

C.6.2 Benchmarking Bicycle Use and Needs

The Austroads National Cycling Participation Survey (2019) identified that approximately 60% of Victorian households own a bicycle.

Of these, in Victoria:

- 23.5% of households own 3+ bicycles
- 17.5% of households own 2 bicycles
- 20% of households own 1 bicycle
- These rates imply a state-wide average of 1.26 bicycles per household. It is noted that this average rate includes:
 - areas ranging from poor to excellent cycling connectivity
 - all dwelling types
 - all household occupancy levels

²⁷ ABS 2021 Census All persons QuickStats for Cremorne (Vic.), Area code SAL20670 [\[Link\]](#)

In a multi-unit residential setting, the dwelling sizes and occupancies are less than the Victorian average, meaning there are fewer people with a need to own a bike. However, higher-density dwellings are typically found in the most accessible areas, which implies a greater ability to use a bike for everyday needs.

To assist with determining a suitable set of bicycle parking rates, other types of bicycle parking policy requirements that have been recently published are set out in Table C.2 below.

Table C.2 – Recently Published Bicycle Park Rates in Other Jurisdictions

Ordinance	Resident	Residential Visitors	Retail and Office Employees	Retail and Office Visitors/Customers
Melbourne - draft amendment C376 ²⁸	1 per dwelling	2 per dwelling	1 per 100sqm	4 minimum + 1 per each additional 100sqm
Melbourne – Arden Precinct Structure Plan	1 per bedroom	2 per dwelling	1 per 100sqm	4 minimum + 1 per each additional 100sqm
ACT End-of-Trip Facilities General Code	1 space per one- or two-bedroom dwelling; 2 spaces per three or more-bedroom dwelling with a car parking space; AND 1 space per bedroom for dwellings not allocated a car parking space	0.1 per dwelling	1 per 200sqm for office 1 per 250sqm for Shop	1 per 400sqm for office 1 per 100sqm for Shop

Source: As noted

While the **Melbourne draft amendment C376** and the **Arden Precinct** bicycle parking rates are the same for residential visitors and commercial, the higher resident rate for Arden is due to the very low level of car parking being planned for (zero by default, together with preferred maximum car parking rates that average at 0.3 car spaces per dwelling).

The C376 and Arden retail and office rates do not have regard for the fact that employee and visitor/customer proportions greatly differ depending on whether the development is employment-led or retail-led. This is important for determining how many of each type to provide.

The **ACT End-of-Trip Facilities General Code** applies to all multi-unit dwellings across the ACT, meaning it applies to sites of all circumstances, making it applicable to similar types of development elsewhere. It provides a balance between the parking rates in Melbourne amendment C376 and those adopted for Arden, together with a clearly identifiable reasoning for doing so (dwelling size and access to car parking). Adopting these types of bicycle parking rates would result in a rate of parking provision that is at least 5 times higher than that required by Planning Scheme Clause 52.34. This meets the principle that sustainable travel should be prioritised by removing barriers to its use.

Further, the ACT code provides a wide range of bicycle parking rates for various other uses, as does Clause 52.34 of the Planning Scheme. While progressive for some land uses, it is not possible that a prescriptive level of bicycle parking can get it right for so many types of development in different circumstances. See Section C.6.5 for guidance on this matter.

C.6.3 Determining a suitable set of bicycle parking rates

Residential bicycle parking

Residents

On average, the demand for bicycle parking is 1.26 bicycles per dwelling for all dwelling types across the state²⁹. The adoption of a range of parking rates, per the **ACT End-of-Trip Facilities General Code**, would result in an average level of provision being above 1 per dwelling.

As noted, this will result in a level of provision that is at least 5 times greater than Clause 52.34 rates - it is also equivalent to current minimum car parking rates set out in Clause 52.06. For a parking plan seeking to prioritise sustainable travel choices over car use, there is a logical symmetry in replacing bicycle parking rates - that are low by contemporary requirements - with the same rates used to provide historically too much car parking.

²⁸ Melbourne Planning Scheme Amendment C376: Sustainable Building Design, 15 September 2020 [\[Link\]](#)

²⁹ Austroads National Cycling Participation Survey (2019)

Some households will not own bicycles. Shared facilities allow people to own different types of bicycles for different needs (cargo, racing, commuting, electric, pedal power, children's bicycles, etc).

Residential Visitors

As a measure of demand, we can continue to draw an equivalence between historic car parking provision and potential bicycle parking as a proxy for the average number of dwellings receiving visitors (1 in 5 dwellings in Clause 52.06).

A "car occupancy" factor would need to be considered to convert a single car into an equivalent number of bicycles. Car occupancies for personal business and leisure typically range from 1.5 to 2.0 per vehicle. This suggests the 2 bicycles are equivalent to 1 car, indicating a visitor bicycle parking rate of 2 spaces per 5 dwellings.

Non-residential bicycle parking

Contemporary planning for bicycle parking provision for non-residential developments is increasingly being based on determining building occupancies and applying target mode shares. This approach is exemplified by the Green Star Buildings *Movement and Place* credit methodology (Green Building Council of Australia, December 2021) and the Austroads guidance document *Bicycle Parking Facilities*³⁰.

The methodology set out in the Austroads guide is particularly applicable in this case as the employment land use population is based on City of Melbourne Census of Land Use and Employment (CLUE) data, and the other parking rates, such as retail, are based on Victoria Planning Provision (Clause 52.34). The bicycle parking rates specified in the Austroads guide are based on a target mode share of 10%, which can be factored based on the adopted mode share target. Parking rates are provided for both long-stay and short-stay parking. Example population densities and bicycle rates are set out in Table C.3 below.

Table C.3 – Example Employment and Retail Population Densities and Bicycle Parking Rates

Land Use	Population Density	Employee Bicycle Parking	Customer/Visitor Bicycle Parking
Office	20sqm GFA per person	0.45 spaces per 100sqm GFA	0.05 spaces per 100sqm GFA
Retail	20sqm NLA per person	0.1 spaces per 100sqm NFA	0.4 spaces per 100sqm NFA

Source: Austroads, 2016

Notes: Rates are based on a mode share of 10% travel by bicycle per the Austroads study. This aligns with BESS standards that are adopted by Council.

C.6.4 End-of-Trip Facilities

Current Statutory Requirements

Current statutory rates for the provision of end-of-trip facilities are set out in Clause 52.34 of the Planning Scheme:

- If 5 or more employee bicycle spaces are required, 1 shower for the first 5 employee bicycle spaces, plus 1 to each 10 employee bicycle spaces thereafter.
- 1 change room or direct access to a communal change room to each shower. The change room may be a combined shower and change room.

There is currently no requirement to provide an area within the end-of-trip facility to clean or repair bikes.

Quantifying End-of-Trip Facilities

Clause 52.34 is not clear on what the statutory requirement for showers should be based on:

- The number of statutorily required bicycle spaces; or
- The number of bicycle parking spaces proposed to be provided.

The implementation mechanism for any new bicycle facilities should be unambiguous: the quantification of associated facilities should be based on the number of bicycle parking spaces being provided.

³⁰ Austroads Report AP-R528-16 *Bicycle Parking Facilities: Updating the Austroads Guide to Traffic Management* (Austroads, 2016) <https://austroads.com.au/publications/active-travel/ap-r528-16>

C.6.5 Right-sizing Bicycle Requirements

There will be cases, particularly for large developments, when the statutory bicycle requirements for individual land uses would collectively result in too many bicycle parking spaces or end of trip facilities than would ever be needed.

A mechanism exists under Clause 52.34-4 to reduce bicycle requirements in specific circumstances. These provisions are considered adequate and will continue to apply to the Cremorne Urban Design Framework.





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