8.10. Design and Consultation Report for West Street Walking Cycling and Streetscape Upgrade - Stage 1 (4)

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ATTACHMENTS:
1. Attachment B: West Street Design Report Spackman Moss [**8.10.1** - 93 pages]
2. Attachment C: Community Engagement Strategy - West Street Walking Cycling and Streetscape Upgrades [**8.10.2** - 6 pages]
3. Attachment D: West Street Walking Cycling and Streetscape Upgrades Flyer FAQ [**8.10.3** - 3 pages]

PURPOSE:

This purpose of this report is to outline the proposed West Street Walking Cycling and Streetscape Upgrades – Stage 1 (West Street Stage 1).

EXECUTIVE SUMMARY:

The West Street Stage 1 upgrade is proposed to be constructed along West Street between the Pacific Highway and Ridge Street. The attached final concept design (Refer to Attachment A of this report) responds to the vision, principles, and actions outlined in the North Sydney Integrated Cycling Strategy ('Cycling Strategy'), the Community Strategic Plan: North Sydney Vision 2040 ('CSP') and the North Sydney Transport Strategy. These strategies collectively identify improved walking, cycling and public domain infrastructure projects that are critical to achieving the Community's vision for the future of North Sydney.

A West Street Design Report (Refer to Attachment B of this report) was prepared for the entire length of West Street in August 2019. The report assessed a variety of options for the walking, cycling and streetscape upgrades along West Street.

A final design has now been prepared for West Street Stage 1, between the Pacific Highway and Ridge Street. This design is considered to have the least impact on traffic and parking, whilst at the same time not compromising on amenity and safety of people who wish to walk or cycle in the area.

The West Street Stage 1 cycleway provides a direct connection into the Ridge Street Bi-Directional separated cycleway which was completed by Council in 2019 and also provides connectivity for cyclists who use Church Street in a shared-on road environment.

FINANCIAL IMPLICATIONS:

Funding for new pedestrian and cycling facilities is allocated in the adopted North Sydney Council Delivery Program 2022-2026. An application to the Get NSW Active grant was made in early 2022 and successful applications will be announced in four tranches. A decision regarding this application will be announced in late September and or late October 2022, depending on which tranche of the grant program is used.

RECOMMENDATION:

1.THAT the final concept design for West Street Stage 1 cycleway and associated streetscape works be placed on public exhibition for a period of 42 days from 4 October to 14 November 2022.

2.THAT at the end of the public exhibition period, a further report be prepared for Council detailing the outcomes of consultation and incorporating a preferred final design for Stage 1 of the West Street cycleway that considers the feedback received from the community consultation.

LINK TO COMMUNITY STRATEGIC PLAN

The relationship with the Community Strategic Plan is as follows:

2. Our Built Infrastructure
2.1 Infrastructure and assets meet diverse community needs
2.2 Vibrant public domains and villages
2.3 Prioritise sustainable and active transport
2.4 Efficient traffic mobility and parking

3. Our Innovative City
3.3 Distinctive sense of place and design excellence

COMMUNITY CONSULTATION

Council will undertake community consultation in accordance with the engagement strategy that has been developed for this project.

Refer to Attachment C of this report - West Street Walking Cycling and Streetscape Upgrades Community Engagement Strategy and Attachment D for consultation materials for further details.

In summary the community engagement strategy offers various opportunities for the community to understand the proposed changes and participate in providing feedback on West Street Walking Cycling and Streetscape Upgrades – Stage 1 (West Street Stage 1).

In summary the opportunities include:

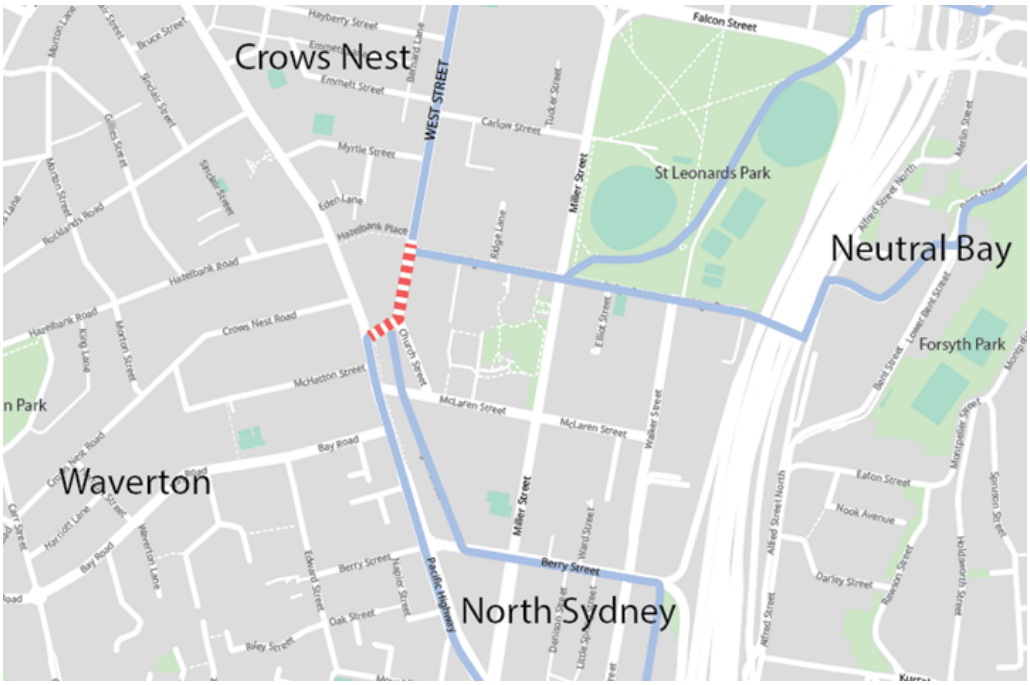
- Dedicated Your Say webpage
- Interactive map for feedback on specific sections of the design
- Email and written submissions
- Onsite walkthrough with interested community members
- Market stall at the Northside Markets
- Information webinar

BACKGROUND

The West Street Walking Cycling and Streetscape Upgrades (West Street Stage 1) forms part of priority Route 1 identified in Councils Integrated Cycling Strategy adopted in 2014. The route functions as the main north/south spine for cycle travel in the North Sydney LGA connecting major trip generating land uses and has favourable topography and amenity.

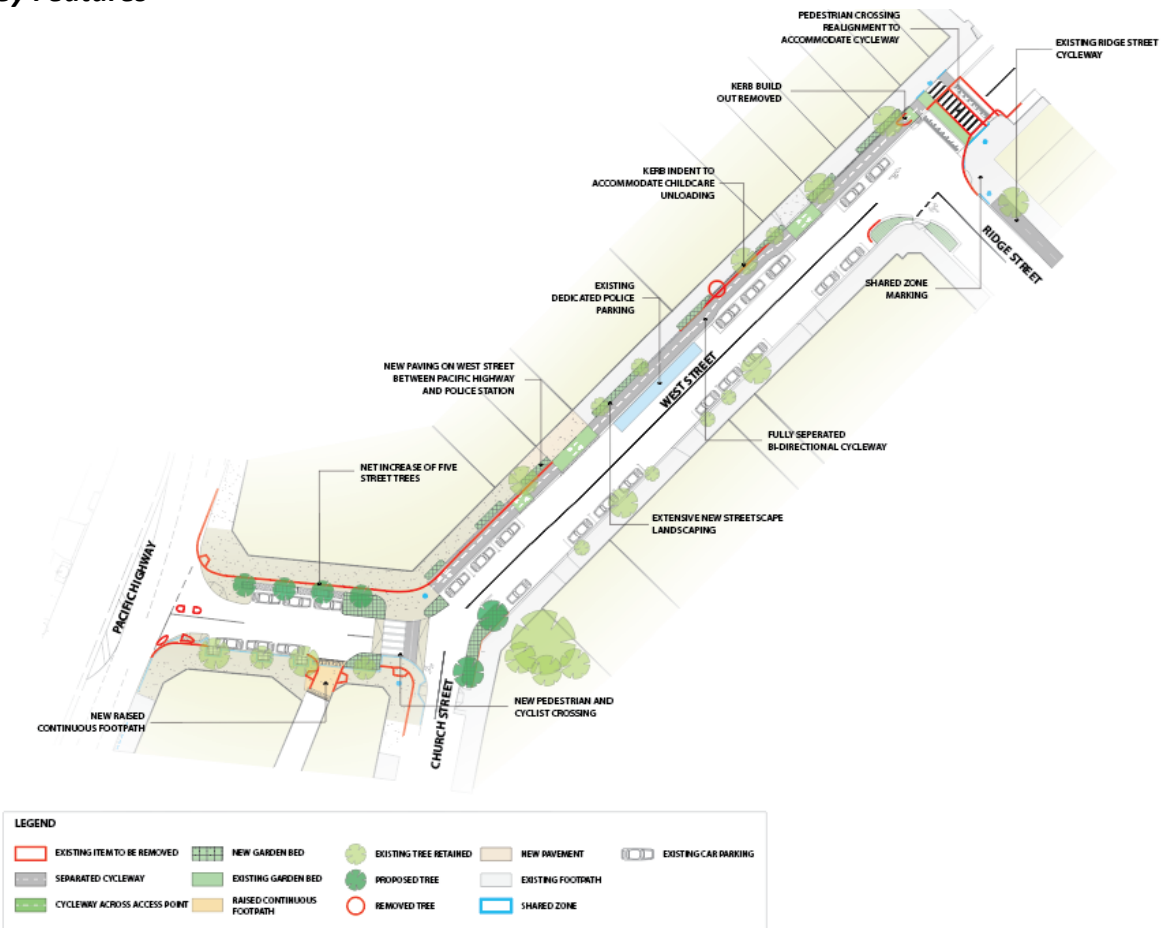
Transport for NSW has also identified this route (North Sydney to St Leonards) as a ‘priority route’ in the Eastern Harbour City Strategic Cycleway Corridors Strategy. West Street is a key section in this route.

The project area is located on West Street between Pacific Highway and Ridge Street.



Map 1. West Street Stage 1 site area in dotted red line. North Sydney Council priority routes identified in Council's Cycling Strategy are identified in light blue.

Key Features



Map 2. West Street Stage 1 site area

Project Scope

In summary the West Street Stage 1 upgrades and related outcomes includes:

- Cycling upgrades and outcomes:
    - Construction of 100m off-road – separated bi-directional cycleway between Pacific Highway and Ridge Steet Cycleway
    - a direct connection into the Ridge Street Bi-Directional separated cycleway
    - better connectivity for cyclists who use Church Street in a shared-on-road environment.
    - narrowing of road width to accommodate cycleway
- Walking upgrades and outcomes:
    - Improved pedestrian amenity and accessibility with new continuous footpath treatments at the intersection of Church Street / West Street,
    - Pedestrian and bicycle crossing at the intersection of Church Street and West Street
- Streetscape upgrades and outcomes
    - Enhancement of existing landscaped verges with the introduction of new garden beds including “Raingardens”.
    - upgraded signage and line marking
    - Removal of one (1) tree and the additional planting of six (6) extra street trees along West Street.

There will be no loss of parking associated with this project.

Councillor Briefing

A Councillor Briefing was held on 20 September 2022 to provide an overview of the project scope and detailing community engagement activities planned for the proposed consultation.

Proposed Delivery Program

The table below provides a recommended program for delivery.

CONSULTATION REQUIREMENTS

Design investigation commenced in 2018. A community design workshop was held on 22 February 2018 and gathered feedback from 35 community members to inform the West Street Stage 1 upgrades.

The final concept design was ready for consultation however, the project was put on hold while designs for major transport projects in North Sydney such as the Metro, Beaches Link, North Sydney Transport Masterplan were finalised. The project was also awaiting funding, which was allocated in the North Sydney Council Delivery Program 2022-2026, adopted 27 June 2022.

Photo 1. Community led design workshop for West Street Stage 1 upgrades

Council will offer various opportunities by which the community can understand the proposed changes and participate in providing feedback on West Street Stage 1 upgrades. These include:

- Dedicated Your Say webpage
- Interactive map for feedback on specific sections of the design
- Email and written submissions
- Onsite walkthrough with interested community members
- Market stall at the Northside Markets
- Information webinar

Council will promote consultation via social media, bus stop advertisement, enews letter, the precinct system, letterbox drop in vicinity of project, onsite signage and door knocking businesses along the route.

See Attachment C of this report - West Street Walking Cycling and Streetscape Upgrades Community Engagement Strategy and Attachment D for consultation materials. Community engagement will be carried out in accordance with Council's Community Engagement Protocol. Public exhibition of the proposed concept plans will be exhibited for 42 days from 4 October to 14 November 2022.

DETAIL

A West Street Design Report (Refer to Attachment B of this report) was prepared for the entire length of West Street in August 2018. The report assessed a variety of options for the walking, cycling and streetscape upgrades along West Street. These options included:

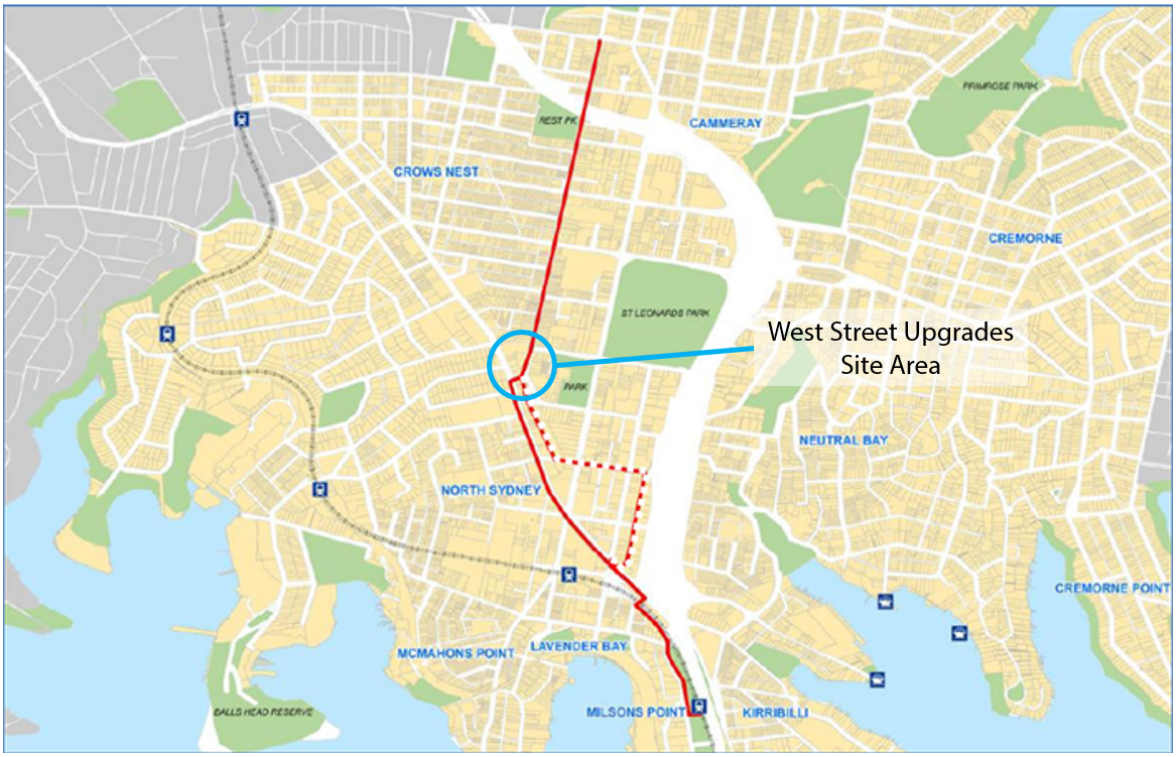
Option A: A bi-directional cycleway on the eastern side of West Street
Option B: A bi-directional cycleway on the western side of West Street
Option C: A bike boulevard with a mixed traffic cycle connection

From these options, a final design was proposed for the section of West Street, between Pacific Highway and Ridge Street, that had the least impact on traffic and parking, whilst not compromising on amenity and safety for walking and cycling. See West Street Design Report (Refer to attachment B of this report for further information).

Further studies and community consultation will be required for the remaining section of West Street, between Ridge Street and Amhurst Street. The designs outlined in the report for these sections do not reflect any current plans for this section.

Cycling Upgrades and Outcomes

The West Street Stage 1 upgrade will deliver an additional 100 metres off-road cycleway. This section forms part of the North Sydney Integrated Cycling Strategy (Cycling Strategy) 'High Priority' Route 1: Sydney Harbour Bridge to Cammeray via West Street. Transport for NSW also identify North Sydney to St Leonards as a 'priority route' in the Eastern Harbour City Strategic Cycleway Corridors.



Map 3. Route 1: Sydney Harbour Bridge to Cammeray via West Street in red. Image sourced from the North Sydney Integrated Cycling Strategy. Adopted by Council in 2014.

West Street, between Pacific Highway and Ridge Street, currently carries approximately 400 daily cycling journeys.

The cycleway on West Street will support delivery of the goals outlined in the Cycling Strategy including:

- Deliver an accessible, safe and connected cycle network by 2020
- Make cycling an attractive choice for short trips within the LGA
- Increase and diversify participation in cycling (people of all ages and abilities will view cycling as a safe, everyday transport option)

The proposed cycling upgrades will protect existing cyclists and off-road facilities will enable a broader range of the North Sydney community to engage in cycling, particularly younger people and older adults that would otherwise not feel safe on the road. The cycling upgrades will offer an alternative to driving for short trips, between 2km and 5km, which make it possible for a far broader cross section to choose cycling as a transport option.

Photo 2. Artist impression West Street Stage 1 looking north towards Ridge Street

Photo 3. Bi-directional separated cycle ways encourage people of all ages and abilities to take up cycling. Ridge Street Bi-directional separated cycleway completed 2019.

Photo 4. Ridge Street Bi-directional separated cycle ways completed in 2019.

Walking Upgrades and Outcomes

The North Sydney Transport Strategy (Transport Strategy) identifies walking as the highest priority in the transport Modal Hierarchy. The Transport Strategy aims to deliver inclusive streetscape design and slow speeds to 40km/hr on Local Roads.
West Street Stage 1 will meet these aims by:

- Improved pedestrian amenity with new crossing points, attractive pavers, and shared intersection treatments.
- Pavement extensions and pram ramp upgrades for improved access.
- Reducing street width to slow speeds

These upgrades will improve pedestrian access to village areas and public open space, slow traffic speeds and create an environment that invites walking.

Photo 5. Continuous footpaths treatments prioritise pedestrians and calm traffic

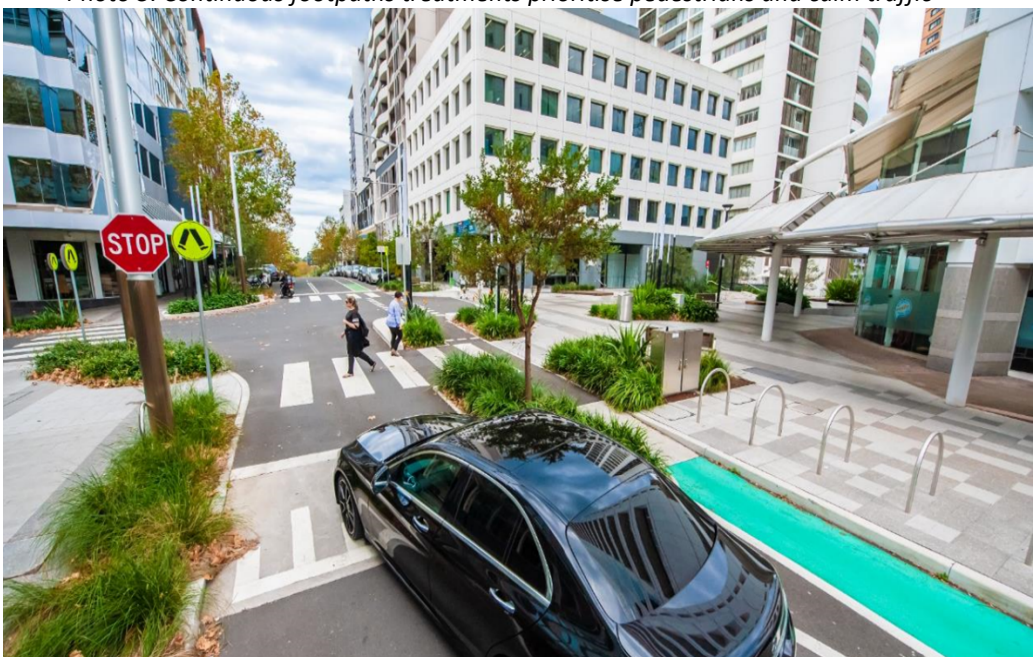


Photo 6. Pedestrian and bicycle crossings improve safety for all road users- Atchison Street – St Leonards cycleway works completed April 2020.

Streetscape Upgrades and Outcomes

The *West Street Stage 1* upgrade will support Council in delivering positive environmental outcomes through streetscape improvements.

The North Sydney Council Street Tree Strategy (Tree Strategy) aims to deliver 1460 trees over 5 years and the West Street Stage 1 upgrades will deliver an increase of five (5) new trees.

Photo 7. Tree canopies shade the black bitumen road reducing heat and create a buffer between roadway and residential dwellings.

The North Sydney Council Local Strategic Planning Statement (LSPS) encourages Water Sensitive Urban Design WSUD principles to improve water quality by reduce pollutants entering stormwater. This has positive environmental outcomes for our waterways and foreshore.

The West Street Stage 1 would deliver a range of rain gardens increasing the amount of soft soil and minimising rain runoff directly into stormwater drains.

Photo 8. Rain gardens provide soft soil to absorb rain before it enters our waterways and foreshore.

Impact on Car Traffic and Parking

The West Street Stage 1 upgrade will cause minimal impacts on local traffic flows and no change to existing parking arrangements. Due to the addition of a cycleway, the width of West Street will be slightly narrower which will contribute to slowing and calming traffic.

It also proposed in a future project to change West Street to a 40km road environment as outlined in the North Sydney 40km/h & 10km/h Shared Zone Masterplan & Action Plan (p.18) - adopted by Council in March 2020. West Street is currently a 50km speed dedicated road.

Summary

The proposed West Street Stage 1 upgrades will significantly improve the quality of the built environment throughout the study area and make substantial improvements in the safety and connectivity of existing and proposed walking and cycling routes that are identified in Council's strategies.

Pedestrian improvements will strengthen connections to village areas and new landscaping and paving treatments will create an improved walking environment.

The Cycling network improvements will also provide better connectivity for cyclists into the Ridge Street bi- directional separated cycleway as well as improving the safety of the Church Street shared on road environment.

Beyond transport and pedestrian access improvements, the upgrades will also result in significant benefit for the community through the delivery of a high-quality public domain that will contribute significantly to improving the aesthetics of this section of West Street.

It is recommended that the concept be placed on public exhibition for 42 days and then a further report be prepared for Council and the North Sydney Traffic Committee detailing the outcomes of consultation and incorporating a final design for the West Street Stage 1 upgrades that considers the feedback received from the community consultation.

Amendments will then be made to the final design so that detail design documentation, for tender and construction can commence by the end of this calendar year followed by construction commencing in April 2023.

Prepared by
Spackman Mossop Michaels

Prepared for
North Sydney Council

Quotation Number 17070
09 of August 2018

West Street
Design Report

Investigations and Concept Design

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1. INTRODUCTION

1.1 Purpose

The following Design Report has been prepared by Spackman Mossop Michaels (SMM) (Project Team) for North Sydney Council (Client). In the preparation of the Design Report, SMM has worked in conjunction with North Sydney Council, Roads and Maritime Services, road network planners and designers, Traffic engineers and technical staff from The Transport Planning Partnership and the local community.

The purpose of the Design Report is to document the urban design and engineering outcomes for the proposed upgrade on West Street. Integration of the findings aims to refine the concept design which provides an opportunity to minimise or avoid potential impacts where possible.

West Street has been identified by the North Sydney Integrated Cycle Strategy (North Sydney Council, 2104) and Sydney's Cycling Future (TfNSW, 2013) as a priority connection and as part of the North Shore Cycleway. Studies found that West Street is the most appropriate north-south route through the LGA as it carries relatively low traffic volumes, has favourable topography, travels through an area of predominantly low-density residential land uses and provides links to key destinations points. The final cycle facility will connect to existing on road bike paths and the Ridge Street bi-directional cycleway currently under construction.

The North Sydney Local Government Area (LGA) is located in Sydney's inner northern suburbs, about 3km from the Sydney GPO and covers ten square kilometres. The LGA is made up of two Central Business Districts (CBDs), smaller suburban centres, residential areas and parks and open spaces.

The local government area includes the suburbs of Cammeray, Cremorne, Cremorne Point, Crows Nest, Kirribilli, Kurraba Point, Lavender Bay, McMahons Point, Milsons Point, Neutral Bay, North Sydney, St Leonards (part), Waverton and Wollstonecraft. The neighbouring Local Government Areas (LGA's) include Willoughby to the north, the Mosman local government area to the east, Port Jackson in the south and the Lane Cove local government area to the west.

SMM and Local Council acknowledge the Guringai Tribe and Cammeraygal Clan as the traditional custodians of this area. It is essential to recognise the Aboriginal spiritual, social and cultural connections to North Sydney's land and waters.

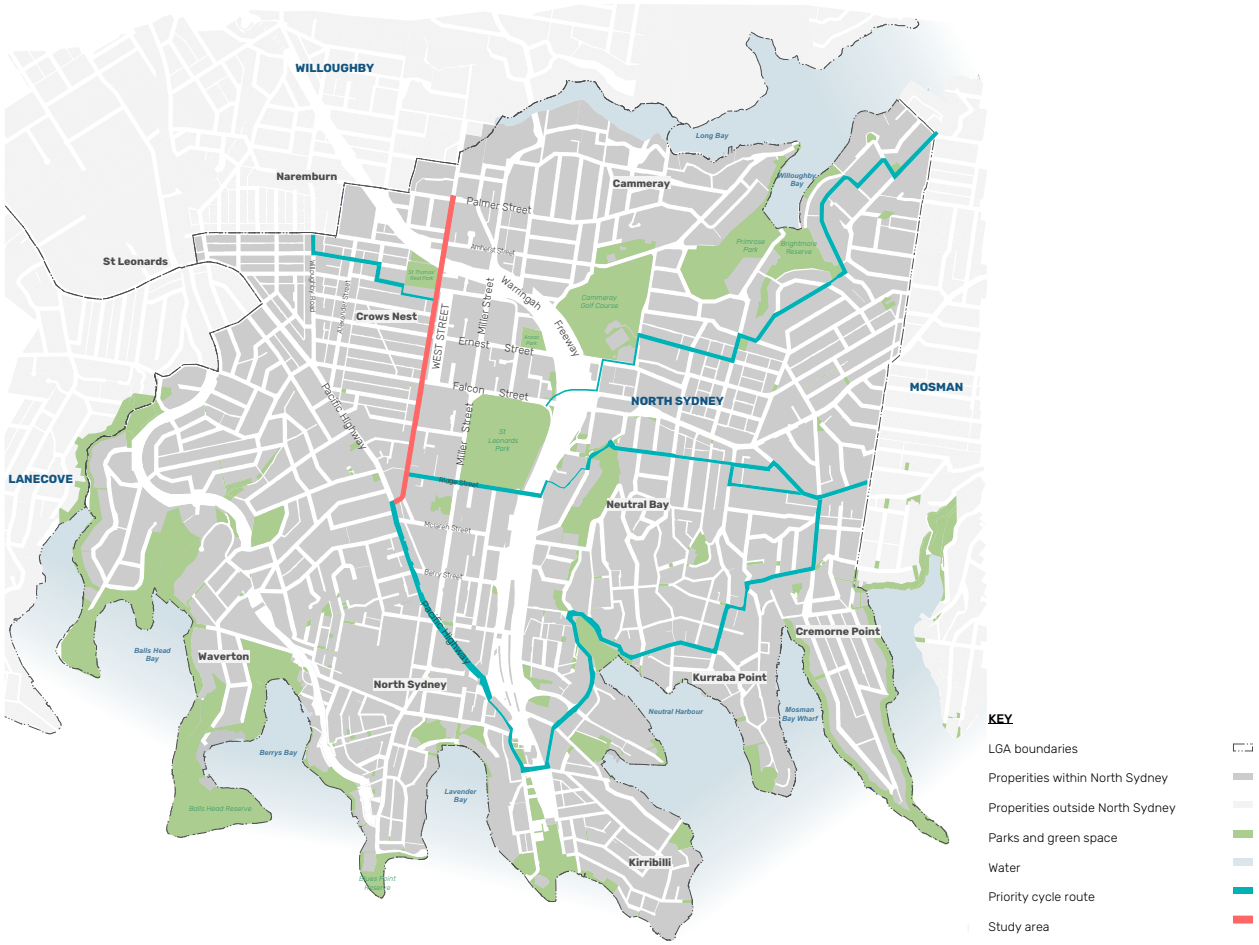


Figure 1-1: Existing Priority Routes and Study Area

1.2 Structure of the Study

To determine the feasibility of a cycleway, the study team undertook a thorough inventory and analysis of existing site features and operations including:

- a survey of the existing site context at a local and regional scale
- an analysis of existing traffic patterns, restricted use zones, surrounding open space, site adjacencies
- the identification and documentation of site issues and potential design concerns.

Following initial site reconnaissance, the study team commenced an iterative design process to ascertain a preferred route option. This included:

- an exploration of potential cycleway typologies and route alignments;
- thorough consideration of potential design options;
- an assessment of the potential design options; and,
- the identification of a preferred option.

As part of this conceptual design phase, the study team produced a report entitled "West Street Traffic Modelling: Traffic Modelling Report". This report, produced by TTPP, documents the traffic impacts resulting from the implementation of a dedicated cycleway between Pacific Highway and Amherst Street. The scope of this report examines existing traffic flows along the two proposed routes, and compares their relative impacts and viability.

1.3 Key feasibility considerations

Key feasibility considerations for this project include:

- the optimal alignment of the cycleway with regard to cycling journey times and the maintenance of traffic functions
- the comparative feasibility of a reduction in travel lane widths, a reduction in footpath widths to accommodate the cycle facility
- the comparative feasibility of a reduction in number of travel lanes to accommodate the cycle facility
- the comparative feasibility of loss of parking zones or pedestrian environments where travel lane reductions are not feasible
- the impact on loadings, bus operations, and other essential services arising from the proposals
- the feasibility of accommodating exit and entry movements for cyclists between the cycleway and general traffic lanes at intersections, as well was the capacity to provide leading/trailing bicycle phases
- appropriate cycle and general traffic lane widths and resultant kerb realignments determined
- appropriate widths configuration of the separation device in light of side conditions (vehicle speeding, adjacent parking, driveway locations, etc.)
- identification of major underground or overhead services that constrain the proposals
- resolution of safe vehicular crossings at major car parks and minor lanes
- resolution of safe pedestrian crossings across the road and cycleway.

1.4 Stakeholders

A number of public/private stakeholders and community representatives have been in liaison with SMM and coordination with authorities on matters of design were undertaken as required throughout the project, including;

- Roads and Maritime Services
- Sydney Buses
- Transport for New South Wales.

Liaison, consultation, and coordination with key community stakeholders on matters of design has been undertaken, and will continue as required throughout the project, including;

- Bicycle user groups
- Walking groups
- Local schools and educational facilities.

2. PLANNING CONTEXT, DESIGN VISION, OBJECTIVES, AND PRINCIPLES

2.1 Planning context

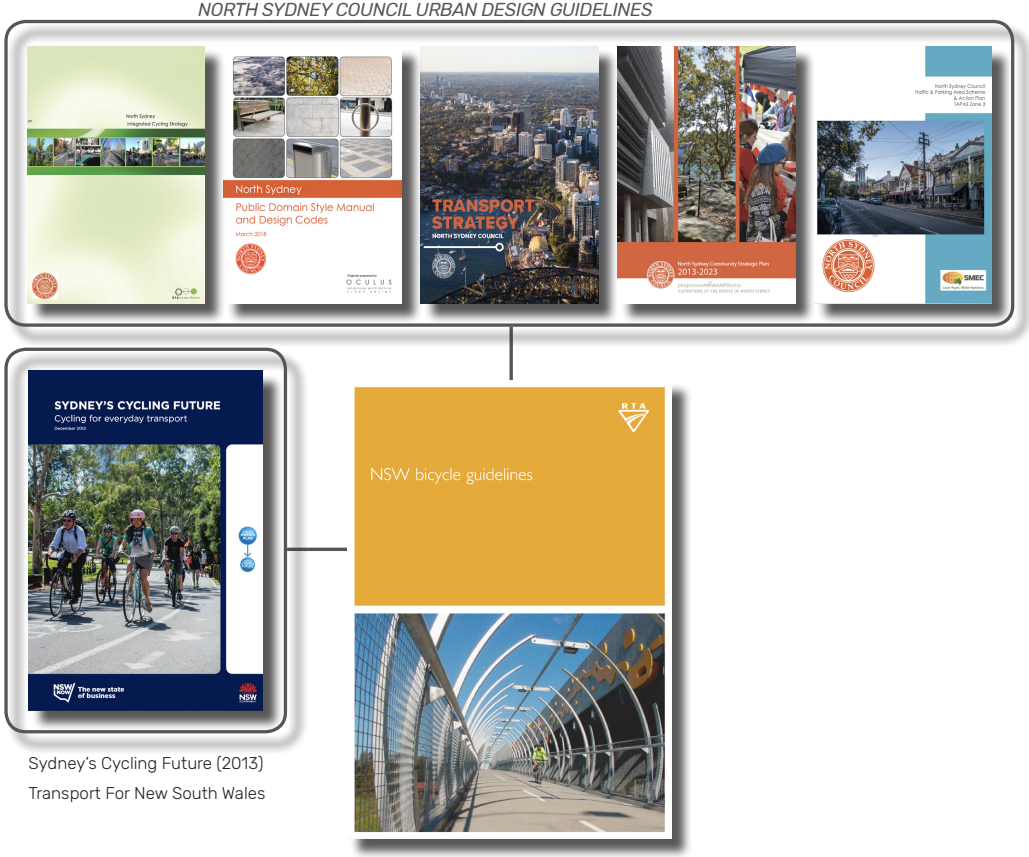
There are several overarching planning and design guidelines that influence the design of West Street. The guidelines have been produced by North Sydney Council, Transport for New South Wales and Roads and Maritime Services aimed at achieving successful urban design outcomes. The listed documents are listed below:

- *NSW Bicycle Guidelines* (RMS)
- *Guides to Road* (Austroads)
- *Sydney's Cycling Future* (TfNSW)
- *Community Strategic Plan* (North Sydney Council)
- *Integrated Cycling Strategies* (North Sydney Council)
- *Walking Action Plan* (North Sydney Council)
- *Public Domain Style Manual and Design Codes* (North Sydney Council)
- *Parking and Traffic Scheme* (North Sydney Council).

The overall aim of the guidelines listed is to develop cycling infrastructure that will make it possible for a diverse range of people to choose cycling as a transport option for both short and long trips, while also maintaining a practical setting for the higher speed regional cycle commuting that occurs along this route.

By implementing the aims set out in Sydney's Cycling Future and the North Sydney Integrated Cycling Strategy, the route will need to provide a level of access that will improve transport choice for the community by making cycling accessible to people of all ages and cycling abilities.

NORTH SYDNEY COUNCIL URBAN DESIGN GUIDELINES



Sydney's Cycling Future (2013)

Transport For New South Wales

NSW Bicycle Guidelines

Roads and Maritime Services (Formally RTA)

2.2 Active transport facilities and treatments

As part of the design brief the Project Team was required to consider at a minimum the following three (3) different options for the

route:

- Bi-directional separated cycle path on one side of the road
- Separated cycle paths on either side of the road
- 'Bicycle Boulevard' style treatments.

The design decisions will be shaped from public consultation and workshops with existing riders, members of the local community, and cycling advocacy groups.

In addition to facilitating cycling access, the project gives equal consideration to:

- the impact that the cycling infrastructure has on other transport modes, with emphasis
- given to improving and prioritising walking, and pedestrian access to public transport interchanges.
- the contributions that the cycling infrastructure and associated works makes to public domain quality and 'sense of place' with a focus on delivering urban spaces that
- improve walking/cycling/public domain amenity to both support participation in active travel modes, and enhance the potential for community use of public areas. This should include strategies to expand and improve the pedestrian environment.

2.3 Vision

The Vision, informing this design approach seeks to:

- Create a high quality environment that is safe and enjoyable for people walking and riding;
- build cycleway connections along key regional as identified by Transport for NSW Sydney's Cycling Future (TfNSW, 2013) & A Plan for Growing Sydney (NSW Government, 2017);
- provide a key route in North Sydney Integrated Cycleway Strategy;
- develop a design that incorporates the North Sydney Transport Strategy (NSTS) for the delivery of transport planning and management.
- reinforce the North Sydney's Community Strategic Plan 2013-2023 and Ecologically Sustainable Development Best Practice Project 2014 (ESD);and
- develop a design that maximises quality outcomes and minimises risk.

The goal of the Project is to design *"West Street as an accessible, safe and connected cycle link between the Sydney Harbour Bridge Cycleway and Epping Road Cycleway (which enters North Sydney at the intersection between West Street an Amherst Street). The link will improve transport choice for the community by making cycling an attractive and convenient option for both regional and local transport. It will be accessible to people of all ages and abilities and provide for riders at a variety of skill levels. The design will also consider how environmental/public domain quality impacts on the uptake and participation in Active Transport and incorporate appropriate public domain treatments to support and promote Active Transport."*

2.4 Approach

SMM understand that the West Street Cycleway is part of the regional North Shore Cycle Link identified as a priority cycle project within the NSW State Governments Sydney's Cycling Future report. The project is part of the realisation of the Governments vision to plan and investment in cycle infrastructure to increase the number of people riding.

When complete, the North Shore Cycle Link will connect the existing cycle facility on Sydney Harbour Bridge with the Naremburn Cycleway and beyond. The North Shore Cycle Link will be the significant north-south cycle connection linking suburbs on the north and south side of Sydney Harbour. Thousands of cyclists currently ride through the study area daily despite the existing environment having poor conditions through North Sydney CBD and onto the Sydney Harbour Bridge.

The purpose of the West Street Cycleway project is to provide a safe, high-quality cycle connection along West Street from the Pacific Highway in North Sydney's CBD to Amherst Street, Cammeray. The objective is to create a comfortable, bicycle-friendly environment that encourages more residents, visitors and workers to cycle every day.

The project realisation is to make walking and cycling an attractive choice of transport that is safe and connected with a high-quality streetscape that contributes to the public domain.

2.5 Objectives

The primary objective of the design is a functional and safe cycleway that prioritises the safety of people walking and riding. The design of the cycleway ensures functionality of daily riders. Intersection designs critically ensure riders will be able to enter and exit the cycleway safely whilst maintaining traffic capacity. Our approach to the project seeks to;

1. Develop a response that incorporates the principles for sustainability and the environment outlined in the North Sydney Community Strategic Plan 2013-2023.
2. Reinforces the aims and objectives of the North Sydney Integrated Cycling Strategy.
3. Create a high quality environment that is safe and enjoyable for cyclists.
4. Explores the potential for interpretation, social and economic benefits and local history.
5. Implement an approach that limits risks for North Sydney Council and maximises quality outcomes.

2.6 Design Principals

Key design principles to encourage well-patronised cycleways include:

- routes that are as direct as possible linking key destinations;
- routes connecting to wider network of cycleways and public transport hubs;
- routes that are safe, clear, wide, smooth, and obstacle-free;
- cycle links that are enjoyable, interesting and attractive; and
- the cycle link must integrate with existing footpaths and road operations.

3. PUBLIC CONSULTATION AND PUBLIC DESIGN WORKSHOP

3.1 Public Consultation

During the investigation stages and the development of the concept design, a substantial public consultation programme engaged private and public stakeholders that incorporated Transport for NSW, Roads and Maritime Services, State Transit Authority and bicycle groups, the local community and private businesses with an interest in West Street.

This consultation was documented over two stages; stage 1 was in October 2017 during the North Sydney Ride to Work Day. This was held at Sydney Harbour Bowling Green and involved bicycle commuters, bicycle user groups and residents of West Street outlining negatives and positives about their daily commute. This holistic approach allowed the Project Team to engage with communities and the local community regarding West Street and the other cycle alignments which connect to West Street. The interactions provided a clear insight on some of the impediments for riders in North Sydney. An overview of the public consultation is highlighted below:

- Amherst St/Freeway very dangerous.
- West Street needs bike boxes at traffic lights.
- Miller St dangerous for cyclists and close contact with cars.
- Poor storage space and surfaces for cyclists within the park.
- Very dangerous bus lane on Miller Street for cyclists.
- Pacific Highway roundabout very dangerous blackspot.
- Getting onto West Street is impossible.
- West Street is very dangerous for car doorings.
- Left turn lane on West Street has poor signage and conflicts with cars.

Please refer to the full public consultation feedback in **Appendix A1**.

Figure 3-1: Public consultation at the North Sydney Ride to Work Day

3.2 Public design workshop

Stage 2 was a public workshop held in February 2018 that sought feedback on ways to improve and expand pedestrian areas, provide cycling paths that cater for people of all ages and cycling abilities, reduce vehicle speeds, and provide new areas of landscaping, seating and street trees.

Council sought community input into the design and is holding a community and stakeholder design. The workshop involved a series of activities, including design exercises where participants produce their own designs for walking, cycling and landscaping along West Street. An overview of general comments is highlighted below:

- Increase pedestrian crossings.
- Retain on street car parking space.
- Increase vegetation and amenity provision.
- No right turn and no 3 tonnes trucks for West Street/Flacon Street is not enforced.
- Cycle facilities should be increased and located in popular areas.
- West Street is congested with traffic during peak traffic times.
- Parking retained and increased where possible.

The community feedback materials produced during the workshop will inform the development of the design concepts for West Street. Please see the entire workshop feedback in Appendix A2.

Figure 3-2: Community workshop presentation

Figure 3-3: Community workshop banner for West Street residents input

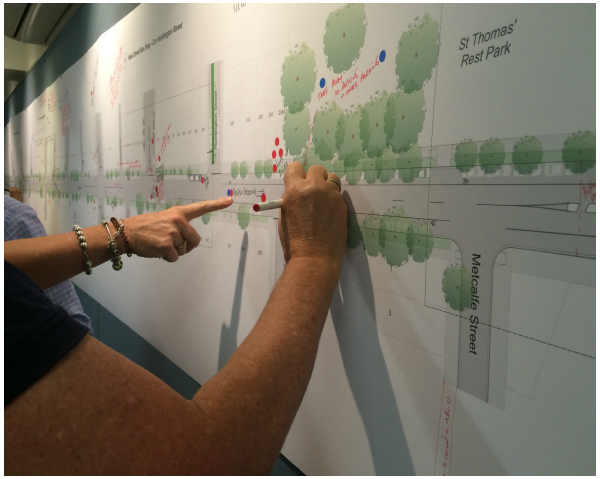


Figure 3-4: Resident's having their say on the consultation banner

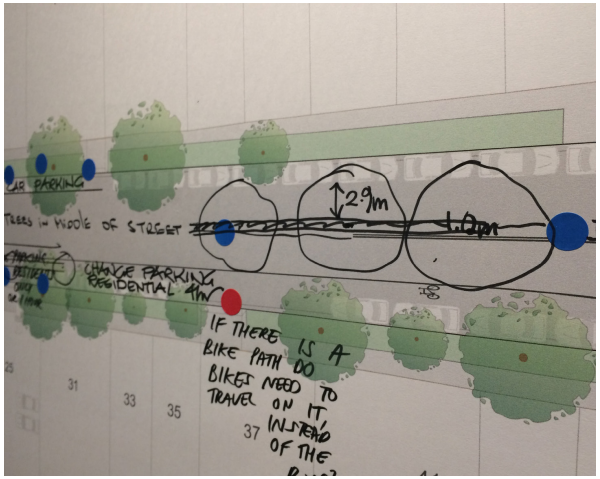


Figure 3-5: Comments from residents regarding issues on West Street

4. METHOD

4.1 Study process

This report has been prepared by Spackman Mossop Michaels Landscape Architects in collaboration with The Transport Planning Partnership (TTPP) Traffic Transport Engineers. This report has been produced in order to provide a transparent record of procedures, techniques and processes in that were employed in the bid to identify the most suitable Active Transport treatment(s) for West Street.

In order to reach a sound conclusion, a strategic analysis of the layered make up within the study area was necessary, giving the intricate qualities and character that is present on West Street.

The complexities and scale of the study area make for a lengthy analytical process, this report and the preparation of this Investigation & Design Report included the following:

- site inspections of the project corridor and adjacent spaces
- analysis of existing context including road geometry, traffic conditions, parking arrangements, pedestrian access, driveways, street trees, and other key features
- preparation of concept plans, sections, and diagrams describing the proposed cycleway and various route options
- preparation of a traffic modelling base (SIDRA) of existing and proposed conditions
- assessment of the proposals and their impact on the study site
- preparation of this Feasibility Study to present the findings and to nominate a preferred option.

Figure 4-1: Amherst Street/West Street looking south towards West Street

5. SITE ANALYSIS

Figure 5-1: Amherst Street/West Street looking south towards West Street

5.1 Overview

The site analysis component of this report has been developed through a combination of site visits, internal desktop reviews of background documentation, and "in progress" studies with the North Sydney Project Team and various stakeholders. The first part of this section describes the site context at a district and local level. The second part of this section analyses the existing traffic patterns, transport networks, land uses, and open spaces within and surrounding the study area.

5.2 Study area

The District Context Plan (Figure 5.1) shows the strategic location of the study area. West Street currently functions as one of the key spines of north-south bicycle traffic in northern Sydney.

For a cyclist, West Street is a link that connects North Sydney to the rest of the North Sydney LGA. This bicycle route attracts more traffic than any other in the area and provides a key connection between the North Sydney and Sydney CBDs and suburbs to the north and north-west (North Sydney, 2013). This route is used daily by cyclists who currently cycle with the traffic and thus, may be broadly classified as confident on-road cyclists. To provide an equitable facility, the cycle scheme will need to promote directness; otherwise these cyclists will tend to remain on-road. The route links to the following connections:

Sydney Harbour Bridge/Sydney CBD: The southern-most terminus of the study area lies at the junction of Pacific Highway, Church Street, and Church Lane, and represents a key entry point - popular with pedestrians and cyclists alike. At this southern terminus - there have been two routes explored to connect Sydney Harbour Bridge to Cammeray via West Street. Option 1a Pacific Highway (preferred route) and Option 1b – Alternative Route via Berry Street and Little Walker Street.

Naremburn/Cammeray: At the Northern-most end, Amherst Street intersection is a decision point whereby a left turn provides access to the west towards Naremburn, via the Warringah Freeway shared path. Access to the east provides a connection to Cremorne and Cammeray via the Amherst Street shoulder lanes.

North Sydney/ Neutral Bay: The route between North Sydney and Mosman via Ridge Street and Yeo Street is an established route, however it currently includes missing links. A suite of upgrades are proposed to transform this route into a safe and accessible connection. The east/west access of Falcon Street and Ernest Street also provide for commuters to the North Sydney CBD and the Sydney Harbour Bridge cycleway.

Crows Nest: Holtermann Street provides a connection between the West Street and the Crows Nest retail precinct and has been earmarked for a cycle facility upgrade in the future, as part of the North Sydney Integrated Strategy (2014).

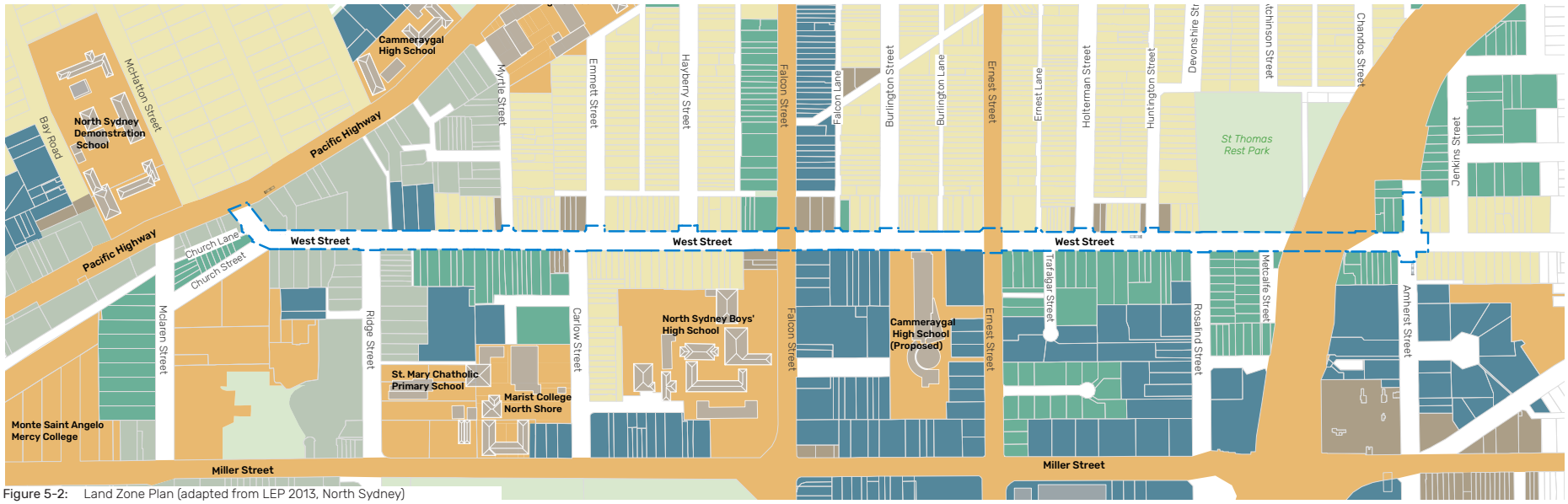


Figure 5-2: Land Zone Plan (adapted from LEP 2013, North Sydney)

5.3 Land use

The local land use plan (Figure 5.2), adopted from the North Sydney LEP 2013, shows the variety of land uses within and surrounding the study area.

The study area is predominantly a residential zone, characterised by a mixture of mainly medium to low density with a small scattering of high-density residential dwellings.

The southern portion of West Street at Pacific Highway traverses a mixed-use and commercial zone between Church Street and Hazelbank Lane. This portion of West Street is found in the North Sydney Centre.

North of Ridge Street, West Street can be defined as a local/residential area, typified by neighbourhood centres made up of shops and cafes on the corner of the bisecting roads.

Further north the from Ernest Street onwards West Street two-way local road characterised by wide, generous lanes widths and low to medium density residential infill.

Building heights, generally are higher in the commercial zone with a typical height of 13m and north of this within the residential zones, the building heights on West Street are typically 8.5m in height.

St. Thomas Rest Park and St. Leonards Park serve the area as regional parks with high user demand.

The close proximity to a large number of schools and educational facilities (8 within a 900m radius) will attract social cyclists together with families and younger cyclists. These are less confident cyclists and will look for a cycle scheme which provides greater safety and comfort. The option assessment should therefore strive for a design that balances the different needs of both these cycling groups.

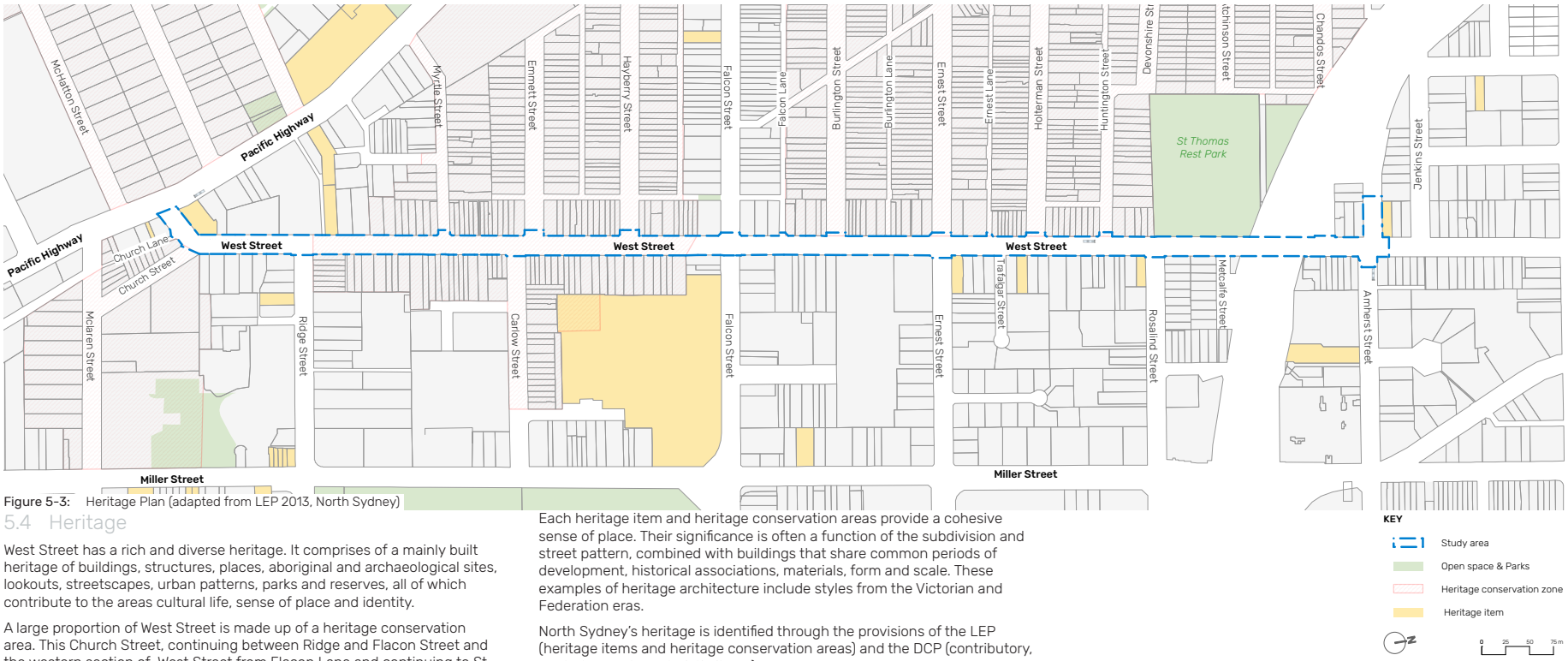


Figure 5-3: Heritage Plan (adapted from LEP 2013, North Sydney)

5.4 Heritage

West Street has a rich and diverse heritage. It comprises of a mainly built heritage of buildings, structures, places, aboriginal and archaeological sites, lookouts, streetscapes, urban patterns, parks and reserves, all of which contribute to the areas cultural life, sense of place and identity.

A large proportion of West Street is made up of a heritage conservation area. This Church Street, continuing between Ridge and Flacon Street and the western section of West Street from Flacon Lane and continuing to St Thomas Rest Park.

St. Thomas Church, south of West Street is associated with the development of European colonies in Australia. St. Thomas Rest Park to the north, has a social and historical significance as the site of the first European cemetery on the North Shore. The park also houses Sexton's cottage a simple vernacular style, one-storey house of rendered brick with a verandah and an iron roof over timber shingles. It is used by North Sydney Council as a house museum.

Each heritage item and heritage conservation areas provide a cohesive sense of place. Their significance is often a function of the subdivision and street pattern, combined with buildings that share common periods of development, historical associations, materials, form and scale. These examples of heritage architecture include styles from the Victorian and Federation eras.

North Sydney's heritage is identified through the provisions of the LEP (heritage items and heritage conservation areas) and the DCP (contributory, neutral or uncharacteristic items).

In urban environments, similar to West Street the infrastructure has a highly modified and is a harsh built environment. The project should ensure development does not adversely impact upon the significance of heritage items in the public domain.

Figure 5-4: Street Tree and Public Open Space Plan

5.5 Street trees and Public open space

The Existing Open Space Catchments (Open Space Provision Strategy, North Sydney 2009) indicated that a proportion of West Street sits within an area that is 250 - 400 metres from a park or reserve. Residence between Pacific Highway north and Ernest Street have There is a relatively low per capita provision to open space.

Residence closest open space amenity is St. Leonards Park and St. Thomas Rest Park. St. Thomas Rest Park is a district park and the largest park in the densely populated Crows Nest area.

West Street has a mixture of semi-mature and young native trees. The equidistant spacing between these trees is planted within grass verges. From the south, the trees range from *Platanus × acerifolia* (London Plane) with a small number of individual *Jacaranda mimosifolia* (Jacaranda).

From Ernest Street the placement of the tree-lined street becomes less concentrated with the irregular placing of *Lophostemon confertus* (Brush box) and *Callistemon citrinus* (Bottle brush) lining the northern portion of West Street.

The portions of West Street that is lined with trees provide canopy cover and shade that contributee to aspects of aesthetics and environmental purification are supported by many other, more subtle, functions of trees such as habitat, traffic calming, privacy, and recreation.

Private gardens along West Street also contribute to the visual experience and overall character of the street.

Under the North Sydney Street Tree Strategy (2006) the objective for West Street will be to "*create an unique 'Sense of Place', with a wide diversity of species used throughout, selected and located carefully to maximise public amenity and minimise any adverse affects on adjacent individuals or structures. Where the species chosen, in addition to being appropriate to the land capability, is also considerate to existing urban fauna*".

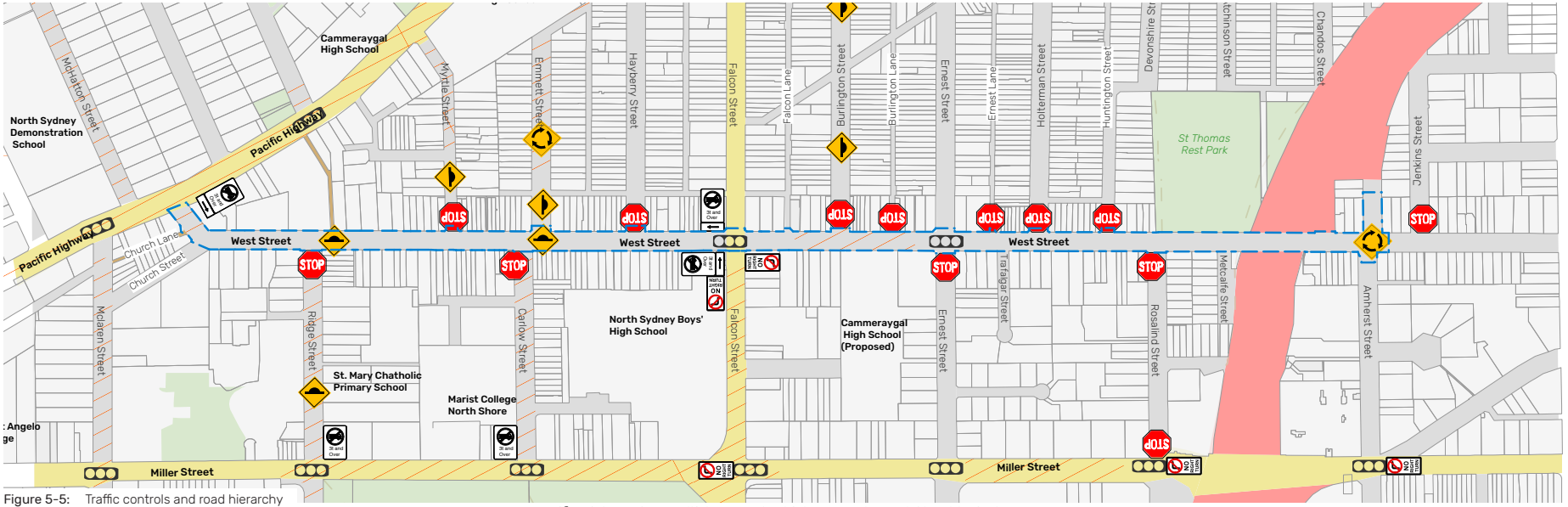


Figure 5-5: Traffic controls and road hierarchy

5.6 Traffic controls and road hierarchy

West Street is a single lane two-way local road, which extends between Pacific Highway in the south and Palmer Street in the North. The speed limit along West Street is 50km/h. It forms part of the local corridor between the northern suburbs and the Sydney CBD. Traffic flows along West Street fluctuate as users join and exit along the several streets.

During the morning peak, there is a peak of approximately 350 trips in the morning AM. There also significant bike traffic along parallel routes (i.e. Miller Street), which further demonstrates the level of demand along the north/ south corridor through the LGA.

West Street has a typical road width of 12.8m and footpath width on either side of 3.6m. It is connected to the south by Pacific Highway by a left-turn-only signpost.

Pacific Highway is a multi-lane road, which connects West Street to Sydney Harbour Bridge. It is a Regional road with a speed limit of 60km/h.

To the north of the study area, West Street connects to Amherst Street through a roundabout intersection which feeds vehicles existing Warringah Freeway. During peak hours this intersection is often congested with traffic and dangerous for the cyclist to travel.

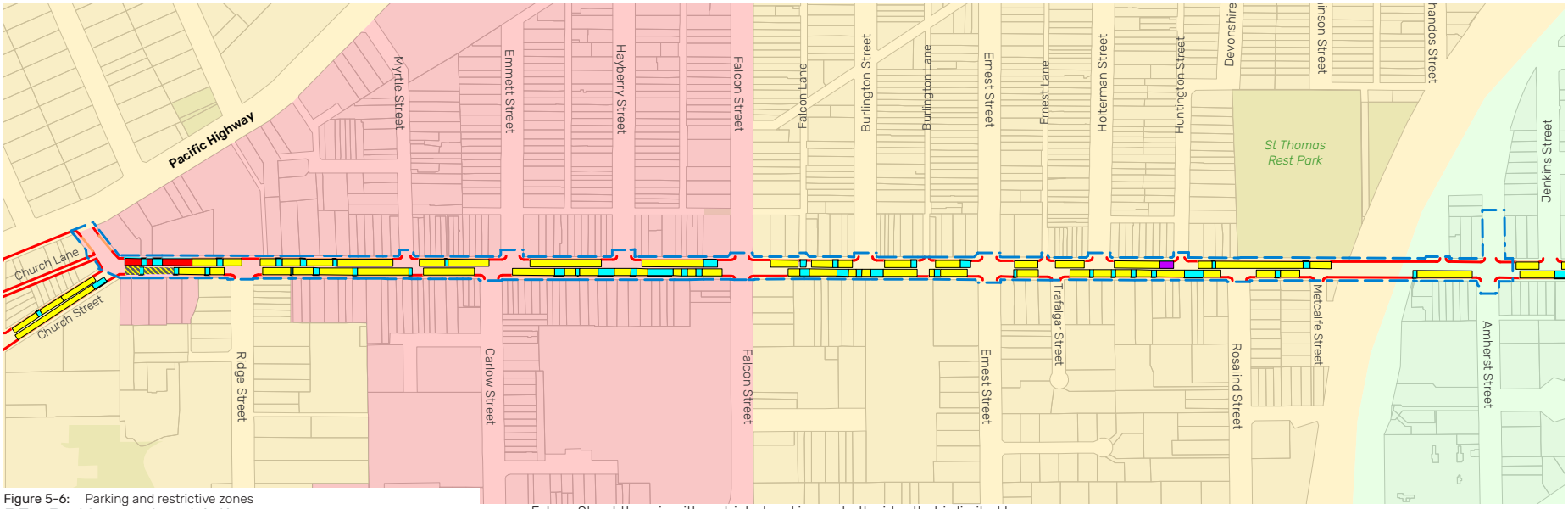


Figure 5-6: Parking and restrictive zones

5.7 Parking and restrictive zones

North Sydney Council has developed the Integrated Traffic and Parking Strategy to holistically manage traffic and parking across the North Sydney Local Government Area (LGA). An important component of the Strategy is the delivery of appropriate Traffic and Parking Area Scheme (TAPAS) Action Plans. West Street is divided within a High and a Medium Demand Parking Zone (ITPS, North Sydney). The High Demand Parking extends from Pacific Highway North to Falcon Street, with the Medium Demand Parking continuing from Falcon to Warringah Freeway, with a Low Demand Parking continuing to Amherst Street.

The high and Medium Demand Parking relate to the demand for on-street parking is greater than the supply of on-street parking. West Street contains a mixture of parking facilities along the eastern and western kerbsides between Pacific Highway and Amherst Street.

Within the High Demand Parking zone there is a mixture of parking related to business and commercial activity to the south, from Ridge Street to Falcon Street there is with restricted parking on both sides that is limited to 1/2 H, and 1H 8AM-6PM. There is some unrestricted parking on the east of West Street, north of Ridge Street.

The Medium Demand Parking zone from Falcon Street to Warringah Freeway, the parking is a mixture of unrestricted and restricted kerbside parking on both sides that is limited to 2 H, 9AM-6PM. North of Warringah Freeway, the Low Demand Parking, is restricted kerbside parking on both sides that is limited to 2 H, 9AM-6PM.

Along the length of West Street driveways, there are some existing driveways that facilitate the parking of off-street vehicles entering and existing residences and businesses. The western portion of West Street has a total of 17 driveways, with the eastern side having almost double with 32 driveways.

The location and design of these driveways, together with parking and bicycle facilities, generate sight distance challenges that impact both pedestrian and riders.

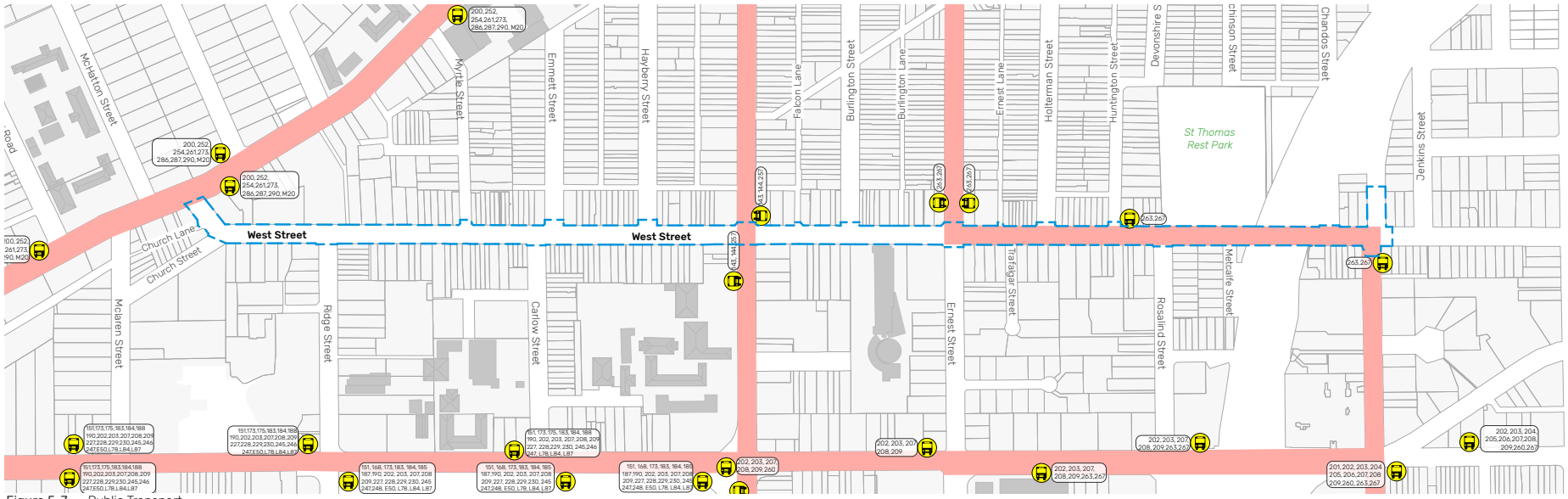


Figure 5-7: Public Transport

5.8 Public transportation and schools

There is one bus stop along West Street within the study area. This bus stop services two routes, the 263 and 267.
- 263 Crows Nest to Sydney CBD.
- 267 Chatswood to Crows Nest.

Also, there are private bus charter services that serve the educational facilities surrounding the study area.

The nearest rail stations nearby to the study area are Milsons Point Station, North Sydney Station and Waverton Station. These stations are part of the T1 North Shore, Northern and Western line and have frequent services particularly during peak periods. Ferry stations in the study area are located at Milsons Point Wharf, McMahons Point, Greenwich Point Wharf and Greenwich.

5.9 Future development

North Sydney is continuing to undergoing some major urban renewal transformations. are via the pedestrian plaza opening to Miller, Denison and Berry streets, and via the proposed northern services building on McLaren Street. Crows Nest Station access and entry points are via the corner of Clarke Street and Hume Street, and the corner of Pacific Highway and Oxley Street. The Metro service will connect Western Sydney (Bankstown) with Northwest Sydney (Rouse Hill).

On West Street the development of Cammeraygal Senior Campus will accommodate 600 students. The proposed development will potentially generate a total of 114 vehicle trips (60 in, 54 out) during the 8:00-9:00am peak hour and 38 vehicle trips (15 in, 23 out) during the 3:00-4:00pm peak hour if travel modes are maintained as documented in the Traffic Impact Assessment (Traffix, 2017). This is in addition to the recently opened Anzac Park Public School that is designed to accommodate 1,000 students.

The development of 139-147 to 50 new residential apartments with 69 internal parking spaces will generate additional vehicle movements distributed to the north and south along West Street.

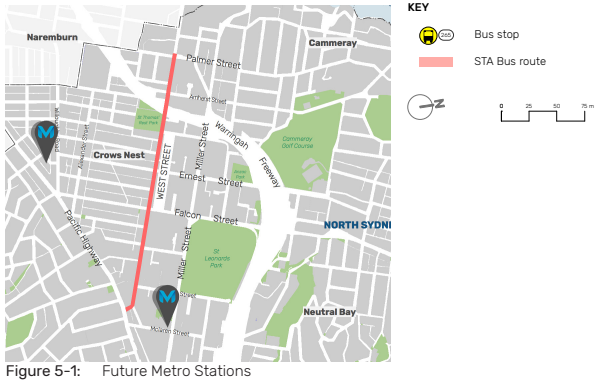


Figure 5-1: Future Metro Stations

6. SITE INVENTORY & ISSUES

6.1 Overveiw

The following site inventory provides a detailed analysis of the study areas and identifies the major issues facing the implementation of the cycle facility. This has been generated through a combination of existing site surveys and base material, site visits, and desktop reviews. The information is communicated in the form of plans, sections, photographs, and descriptive text.

The site is divided into six areas of examination:

1. West Street from Pacific Highway to Hazelbank Lane
2. Hazelbank Lane to Emmett Street
3. Emmett Street to Falcon Street.
4. Falcon Street to Ernest Street.
5. Ernest Street to Metcalfe Street
6. Metcalfe Street to Amherst Street.

Each area is assessed with respect to the following existing conditions:

- awnings
- bus lanes
- bus stops
- buildings lines
- cross streets
- driveways
- kerbs and kerb ramps
- loading zones
- parking
- pedestrian crossings
- services
- street furniture
- street trees
- taxi ranks
- traffic conditions (number of lanes)
- traffic controls (directional arrows).

Figure 6-1: West Street looking north

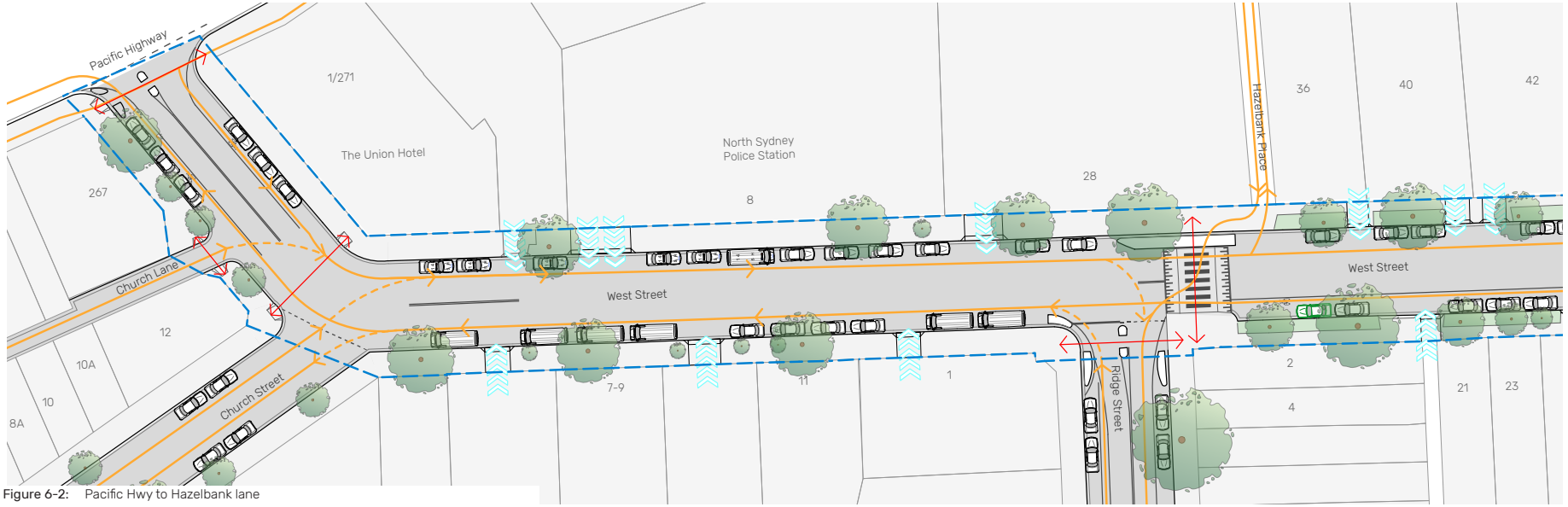


Figure 6-2: Pacific Hwy to Hazelbank lane

6.2 West Street - Pacific Highway to Hazelbank Lane

Pacific Highway is the main collector road for West Street. There is no right turn off Pacific Highway vehicles/cyclist enter West Street on Church Street or Ridge Street. West Street two way 50km/h street with generous lane widths (3.9 metres) and with parking bays on both sides (2.5 metres) of the road carriageway. Parking is a mixture of commercial loading zones, police parking and restricted parking. There is a pedestrian crossing on the corner of Ridge Street that serves pedestrian east/west movement. There is also a restriction on 3T vehicles in this zone.

On this section of West Street, there is no provision for cyclists and riders must travel on the road with vehicles. Riders, access West Street through Church Street and the narrow Church Lane. In many scenarios, the inexperienced rider will ride to the left to avoid causing traffic congestion and can result in 'car dooring'.

Hazelbank Place collects cyclists and pedestrians in the northwest to West Street from Pacific Highway.

The 3.9 wide footpath either side of West Street provides sufficient space for some pedestrian groups. However, there are long distances to cross the road and the often there is limited provision for crossing West Street. These crossing points are limited, and child and elderly pedestrians may have more difficulty judging speed and safe gaps at uncontrolled crossing points.

The street frontage on either side of West Street is predominately made up of commercial buildings with no street setback characterised by glass facades and large entry points. During rubbish collection days, though bins are placed on verges, the narrow footpaths may become cluttered, causing pinch points.

Vegetation within this zone is made up of a mixture of young and semi-mature street trees and vegetation from private gardens spilling onto the footpath. The mosaic of street trees include species such as *Platanus × acerifolia* (London Plane), *lophostemon confertus* (Brushbox) and *Jacaranda mimosifolia* that align either side of West Street.

Issues

- No right turn into West Street from Pacific Highway
- Riders choose to ride up Church Street/ Lane
- Riders take shared paths on Pacific Highway
- Lengthy crossing distances for pedestrians up to 15m
- Bins can often impede pedestrians.

Figure 6-1: Bins cluttering footpath

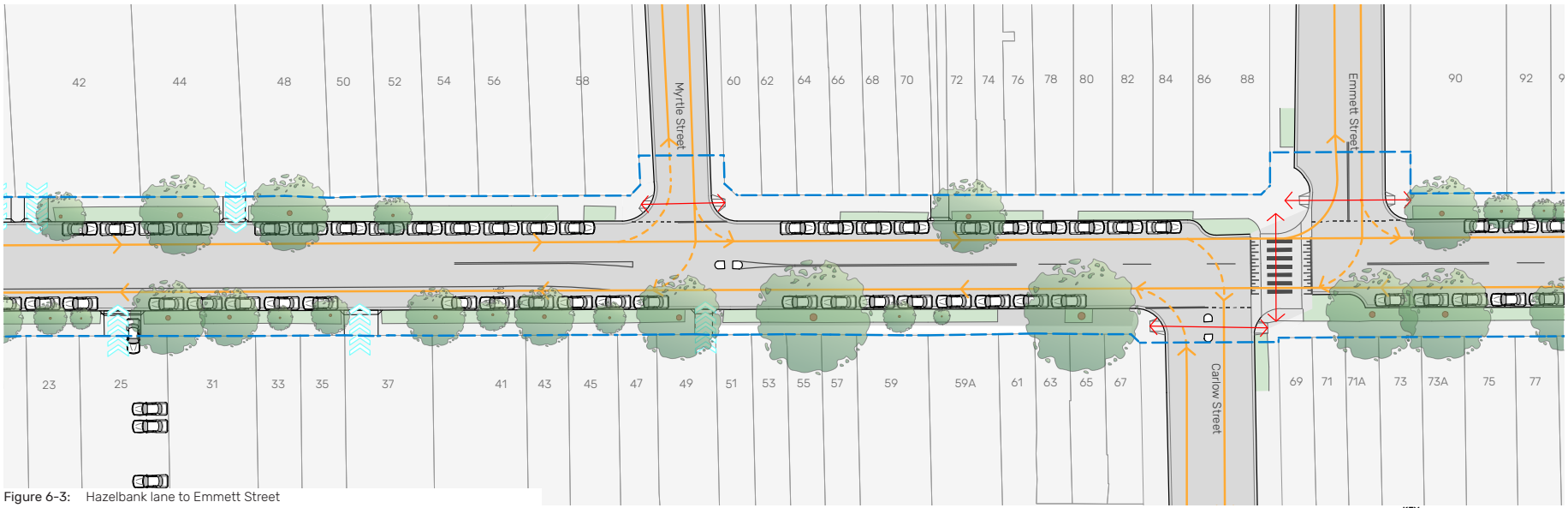


Figure 6-3: Hazelbank lane to Emmett Street

6.3 West Street - Hazelbank Lane to Emmett Street

The north- and southbound lanes each form an approximately 6.8m carriageway. In each direction, there is a single traffic lane roughly 2.9m wide, and 2.3m of kerbside parking. Parking on both sides is limited to 1H, 8AM-10PM. There is also a restriction on 3T vehicles in this zone. There is a pedestrian crossing on the corner of Ridge Street that serves pedestrian east/west movement. There are school zones located east and west of West Street with traffic flow effected on West Street during AM peak hours.

There is no provision for riders within the road carriageway and riders must travel with vehicles. Riders potentially find it difficult to cross at busy connecting safely and comfortably. Driveways and poor sight lines along the thoroughfare also create locations that may create conflicts between different road users.

The footpath on either side of the road is nominally 1.7m wide and widens to approximately 3.6m at restaurant/cafe spill out zones. Grass verges on either street limit pedestrian and cyclist storage capacity. The area is mainly residential with small pockets of retail. The architectural language relates to Victorian and Edwardian era terraced houses found in inner-city areas of Sydney.

Well maintained grass verges, restaurant seating and landscaping create areas for people to stay and enjoy. The Tree-lined streets consist of the semi-mature *Platanus × acerifolia* (London Plane) with a small number of individual *Jacaranda mimosifolia* (Jacaranda). Private gardens also contribute to the visual experience and street appeal.

West Street and Myrtle been identified within the North Sydney LGA Flood Study as an area for flood concern. In the 1% AEP flood event, the capacity of the pipes at this location is exceeded, causing flooding due to local overland flow on West Street and Cassin's Lane. Flood waters in the 1% AEP event are carried east along Myrtle Street, meeting West Street at a small dip near the intersection. Exacerbating the flood problem, the eastern side of West Street then acts as an obstruction to the natural flow path, causing water to pool, up to depths of approximate 0.2 m (North Sydney, 2016; p 66).

Issues

- Popular brunch spot, high pedestrian area
- No traffic controls exiting Emmett Street
- Beginning of School Zone
- Pluvial flooding on West Street

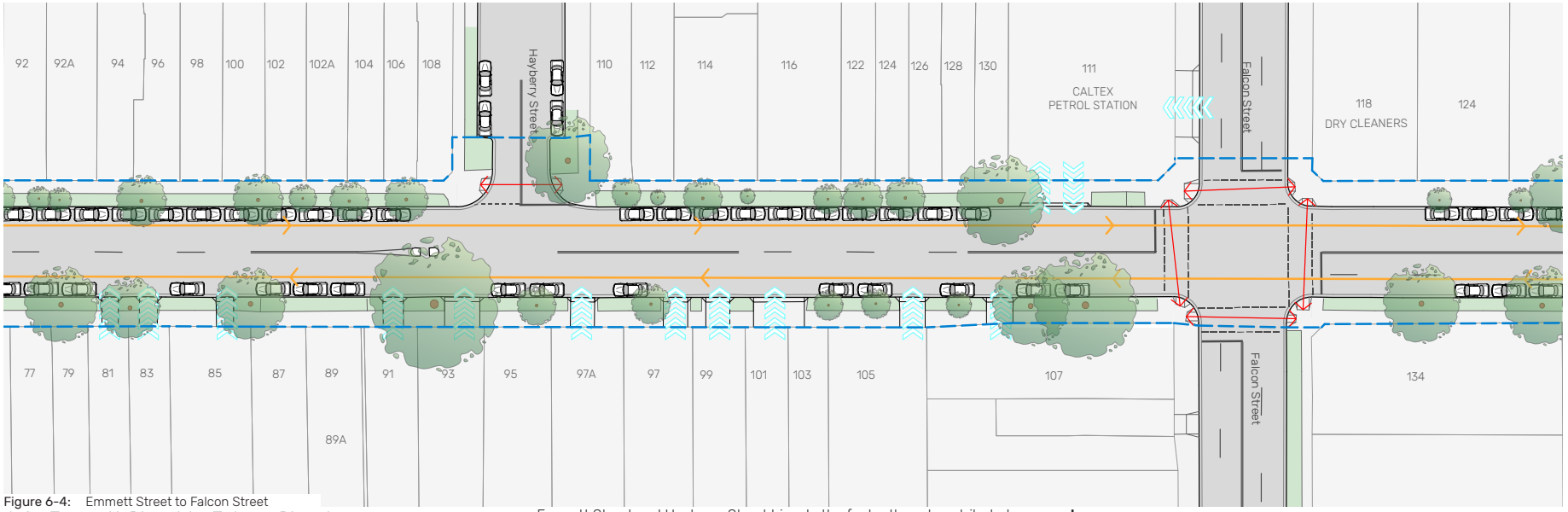


Figure 6-4: Emmett Street to Falcon Street

6.4 Emmett Street to Falcon Street

The north- and southbound single traffic lanes typically form a 6.9m carriageway, with the traffic lanes increasing to a four-lane carriageway in each direction with a ban on right turns for vehicles travelling in a northerly and easterly direction at the Falcon Street signalised intersection.

The intersection has high traffic volumes during peak AM and PM hours. A 3T restriction on vehicles begins at the junction of Flacon and West Street to Pacific Highway. South of Falcon Street kerbside parking is 2.4m wide with unrestricted parking.

Travelling north the road carriageway merges to back to a single lane where parking and vehicles exiting/entering businesses on Falcon Lane.

At the West Street and Falcon Street, riders must traverse potential conflict points and at the intersection, unmarked driveways and traffic congestion.

The footpath on either side of the road is nominally 1.9m wide, with grass verges and widens to approximately 3.6m at intersections. On the eastern side of West Street, there is the majority of driveways. On the western side, Emmett Street and Hayberry Street bisects the footpath and contribute to the perceived motor vehicle dominance.

Long waiting times and limited holding space on footpaths at Falcon Street create pedestrian pedestrians queuing on the road at peak AM and PM hours.

Well maintained grass verges, restaurant seating and landscaping create areas for people to stay and enjoy. The Tree lined streets consist of the semi-mature *Platanus × acerifolia* (London Plane) with a small number of individual *Jacaranda mimosifolia* (Jacaranda). Private gardens also contribute to the visual experience and street appeal.

Issues

- Large intersection with 4 lanes in each direction
- Long waits for pedestrians crossing Falcon Street and West Street
- Busy petrol station with dual entrances/exists
- Restaurants on south east corner

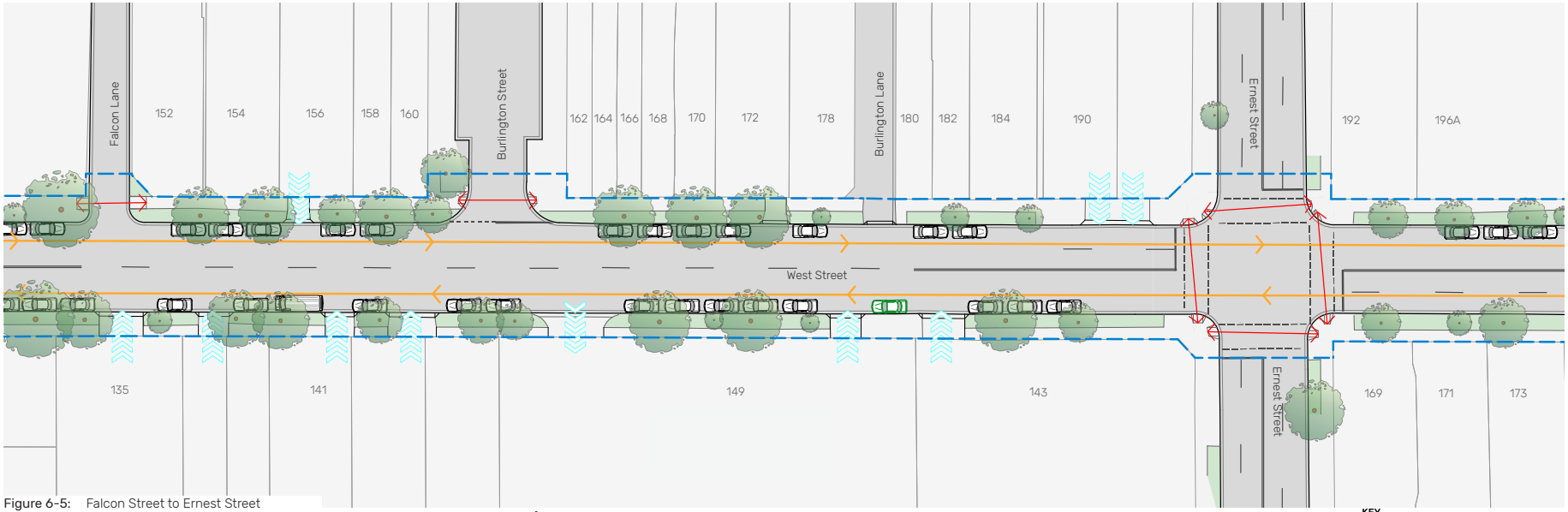


Figure 6-5: Falcon Street to Ernest Street

6.5 Falcon Street to Ernest Street

West Street is a two-way street with a School Zone from Falcon St to Ernest St with speed limit of 40km/h in both directions. The road corridor is typically 3.2m wide with an on-road cycle lane 1m wide on both sides. Parking on both sides is limited to 2H, 8AM-6PM at 2.2m wide. On the eastern section, a large two-way driveway serves as an entry/exit point into Cammeraygal High School. At Ernest Street, the road widens into a four-lane intersection in each direction.

The ridgeline that runs in an east-west direction creates an incline for riders travelling northerly along West Street. There is no provision or on-road facilities for riders.

The footpath on either side of this portion of West Street is nominally 1.4m wide, with grass verges. On the eastern side of West Street, there is the majority of driveways.

Long waiting times and limited holding space on footpaths at Ernest Street create pedestrians queuing at peak AM and PM hours.

Issues

- Two way driveway into Cammeraygal High School
- Burlington Street connection to Crows Nest.
- No pedestrian crossing provision across West Street to High School

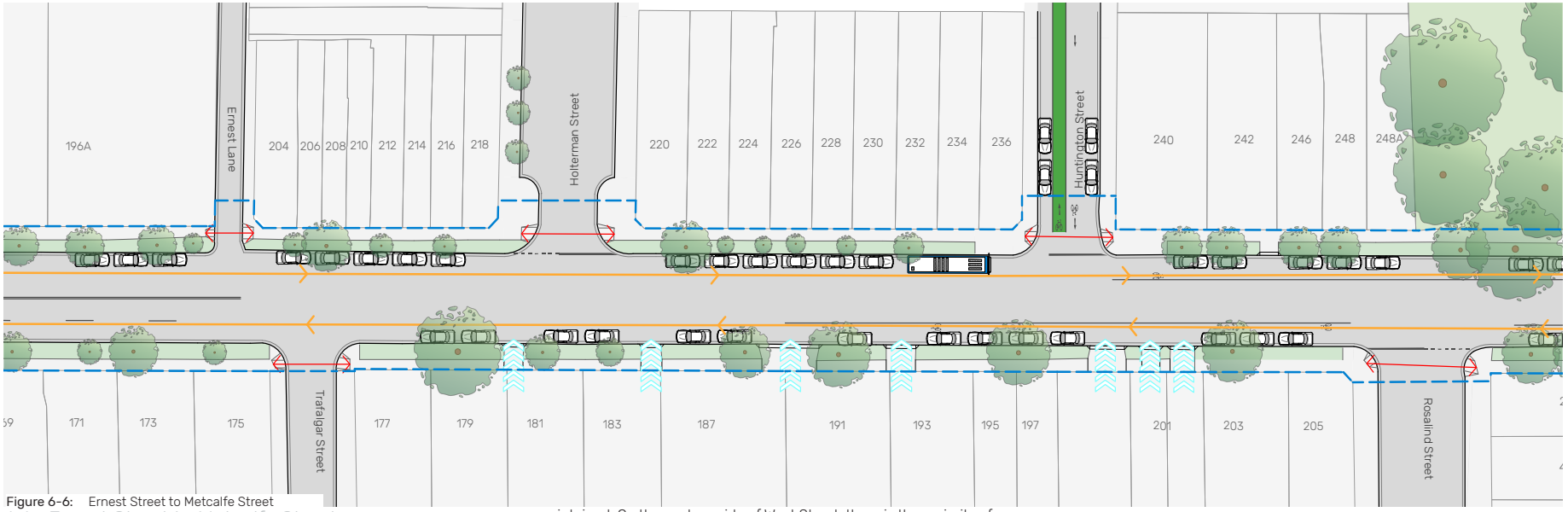


Figure 6-6: Ernest Street to Metcalfe Street

6.6 Ernest Street to Metcalfe Street

West Street is a two-way street typically 12.8m wide with a posted speed limit of 50km/h in both directions. The road corridor is typically 3.2m wide with an on-road cycle lane 1m wide on both sides. Parking on both sides is limited to 2H, 8AM-6PM at 2.2m wide.

The only bus stop within the study area is located on the corner of West Street and Huntington Street. The bus stop serves the 263 and 269, which both end in Sydney CBD.

To the north of Ernest Street, West Street has a dedicated cycle lane along its eastern and western kerbs located between the parking lane and traffic lanes. These cycle lanes continue until the intersection of Amherst Street and West Street. The one way Huntington Street also serves as a collector route for cyclists travelling east/west taking cyclists from Narremburn to North Sydney and back.

The provision of footpaths and pedestrian facilities is well served within this section of West Street with footpath widths, and grass verges well maintained. On the eastern side of West Street, there is the majority of driveways. However, the lengthy and limited provision for traversing West Street makes it difficult for pedestrians to cross the road.

The street trees provide good canopy cover for pedestrians along this portion of West Street and are made up of *lophostemon confertus* (Brush box).

Issues

; Driveways.

; Long distances for pedestrians crossing West Street.

; Potential conflict with parked cars and riders on the cycle lane.

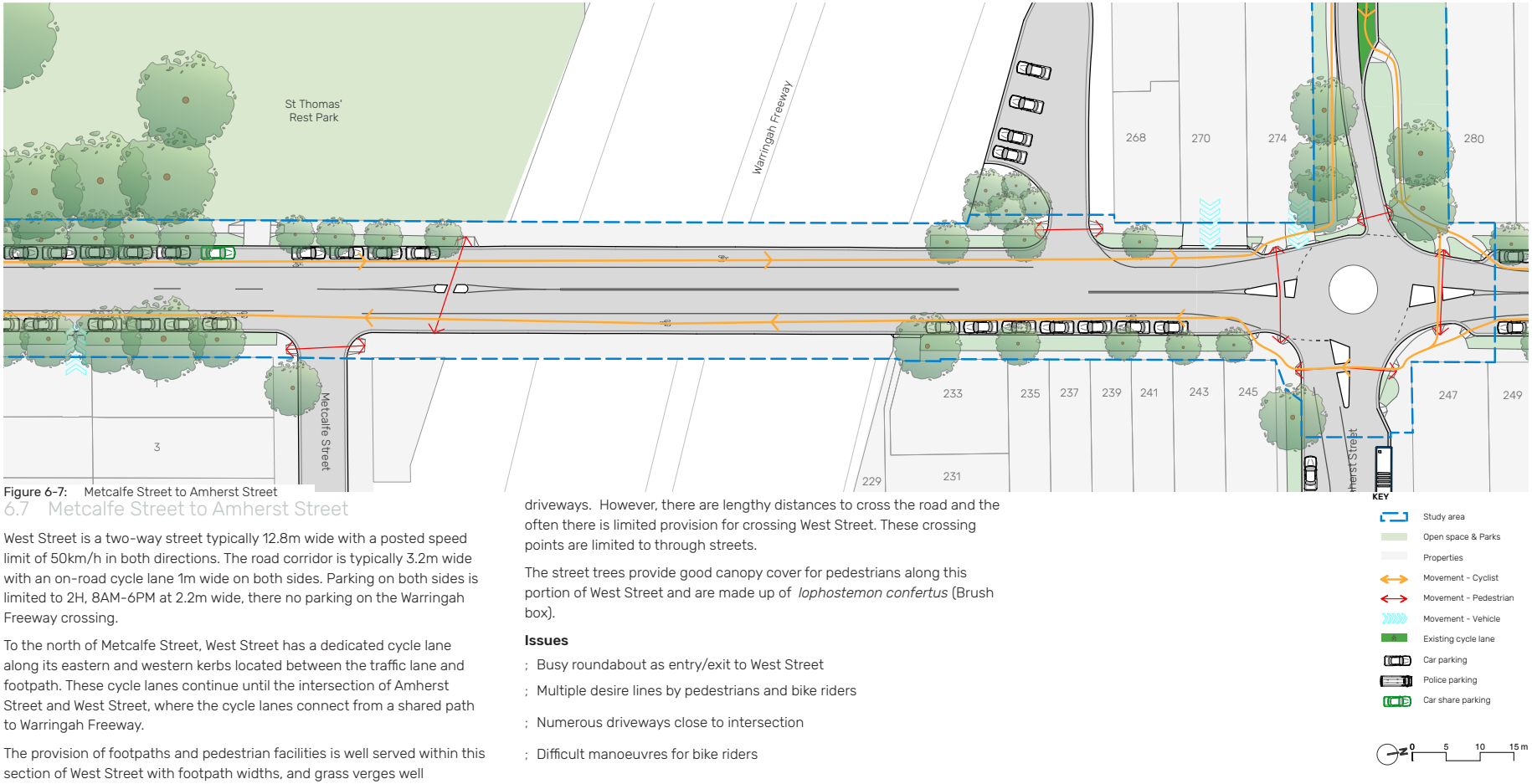


Figure 6-7: Metcalfe Street to Amherst Street

6.7 Metcalfe Street to Amherst Street

West Street is a two-way street typically 12.8m wide with a posted speed limit of 50km/h in both directions. The road corridor is typically 3.2m wide with an on-road cycle lane 1m wide on both sides. Parking on both sides is limited to 2H, 8AM-6PM at 2.2m wide, there no parking on the Warringah Freeway crossing.

To the north of Metcalfe Street, West Street has a dedicated cycle lane along its eastern and western kerbs located between the traffic lane and footpath. These cycle lanes continue until the intersection of Amherst Street and West Street, where the cycle lanes connect from a shared path to Warringah Freeway.

The provision of footpaths and pedestrian facilities is well served within this section of West Street with footpath widths, and grass verges well maintained. On the eastern side of West Street, there is the majority of driveways. However, there are lengthy distances to cross the road and the often there is limited provision for crossing West Street. These crossing points are limited to through streets.

The street trees provide good canopy cover for pedestrians along this portion of West Street and are made up of *Iophostemon confertus* (Brush box).

Issues

- Busy roundabout as entry/exit to West Street
- Multiple desire lines by pedestrians and bike riders
- Numerous driveways close to intersection
- Difficult manoeuvres for bike riders

7. PLACEMAKING



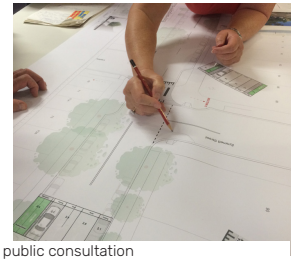



Figure 7-1: Existing site conditions and public consultation

7.1 Street character

Residents that attended the public consultation (Section 3.1 & 3.2) raised the issue of improving West Street's streetscape and amenity. Residents were concerned with the lack of east-west pedestrian connectivity and interested in opportunities for trees and planting, lighting upgrades and rest zones along the street.

West Street is a predominately residential with pockets of commercial and retail activity. Placemaking on West Street should be integrated with the cycleway to create a route that is not only more attractive but is also distinctive and legible for all users.

West Street has a distinct character with a mixture of Australian modern and traditional architecture frontages that border the street. The character of West Street could be enhanced by combining paving materials with planting, street furniture, lighting and possibly art, to enhance an attractive place.

There are many schools within close proximity to West Street and many pupils and parents routinely travel along the route. Placemaking can be incorporated via informal learning activities for parents and children that can create a unique identity for West Street. The number of popular cafes create points of interest for locals and visitors of West Street.

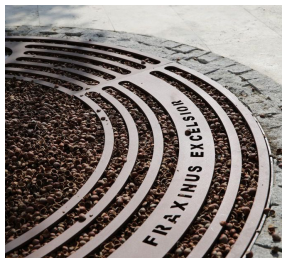



Figure 7-2: Placemaking

7.2 Community

Community spaces with seating are points for congregation that provide an extra element of comfort to a route and encourages the community to make the place their own, which is fundamental to help users feel safe. In some positions, they can be associated with tables or play equipment for children.

Providing seating can offer an opportunity to make the most of a particularly beautiful view or sunny spot, and:

- can be traditional or informal (low bulky bollards, tree trunks)
- can maximise local activity, allowing people to socialise and to linger

7.3 Education

West Street operates as a route for pupils travelling to and from many of the schools in the area. This user group allows for opportunity to incorporate formal and informal spaces for education along the street. Traffic calming and wide footpaths create uncluttered spaces that can create a more liveable streetscape with sufficient space for children to congregate and interact. Customized street furniture may also be designed as an element of education with plant names and poems from local artists to celebrate West Streets distinct character.


Figure 7-3: Community groups taking ownership of public space

7.4 Planting

Portions of West Street are 'poorly served' in terms of proximity to existing high-quality open space and recreation areas as outlined in open space Strategy (2009) planting and street trees have a crucial role to play on improving the attractiveness and environmental factors on West Street.

Local initiatives for roadside community gardens, such as Sustainable Chippendale, as shown above, is an organisation run by community members with the goal of sharing plants, provide education, local food, and conversations with strangers and neighbours around food and the organic beauty and improve safety and housing prices.

Planting that responds to local to the local context should also be encouraged. For example, the planting palette surrounding cafes and restaurants may be edible with sensory planting that enhances the local cafes and encourages ownership over the space. This may also be appropriate at the Cammerygal High School to encourage students to interact with planting.

Figure 7-4: Indigenous art

7.5 Public Art

Art is essential to placemaking, it provides a unique identity, enhances its existing character and attracts interest. Routes exhibiting public art create legibility within the landscape; it can provide intrigue and create a memorable journey for cyclists and walkers who have informal interactions with it.

West Street can utilise a variety of local historic themes (Indigenous/Anglo), colour, pavement patterns, art, and vertical elements to make a route legible and recognisable. Improved legibility can reduce the need for cluttered street signage and assist in wayfinding. Recurrent themes can define its identity and can assure the user that they are on course to their destination.

Figure 7-5: Active transport promotion

7.6 Active Transport Promotion

Public awareness and promotion along the new route should be investigated in future to encourage residents and visitors to take up cycling while also educating and informing the public about the benefits of the proposed active transport.

8. DESIGN OPTIONS

8.1 Options Analysis

Informed by the site analysis presented in Chapter 6 and in consideration of the design brief and principles discussed in Chapter 1, a number of cycleway alignments and typologies were tested: bi-directional separated cycleways, one way separated cycleways and mixed traffic / bicycle boulevard.

Each typology was considered in the context of the traffic and pedestrian conditions and the overall functionality and safety of the street. A description of the facility types and the key design criteria for each are outlined below:

OPTION 1

Figure 8-1: B-Directional Separated bike path

Bi-Directional Separated Bike Path

A two way bike path located on one side of the street and typically consisting of:

A 2.4m wide cycleway.

A 0.4m wide median.

A 2.1m wide parking lane, on both sides of the street.

A 2.9-3.2m wide travel lane, in each direction.

Raised intersections and pedestrian crossings.

Flat top speed humps.

OPTION 2

Figure 8-2: One Way Separated bike path

One Way Separated Bike Path

A one way bike path located on both sides of the street and typically consisting of:

A 1.2 - 1.5m wide cycleway, on both sides of the street.

A 1.0m wide median, on both sides of the street.

A 2.1m wide parking lane, on both sides of the street.

A 2.9-3.2m wide travel lane, in each direction.

Raised intersections and pedestrian crossings.

Flat top speed humps.

OPTION 3

Figure 8-3: Mixed Traffic / Bicycle boulevard

Mixed Traffic / Bicycle Boulevard

A slow speed, traffic calmed street with low traffic volumes, typically consisting of:

Low speed limits and restrictions on heavy vehicles.

Raised intersections and pedestrian crossings.

Slow points / road narrowing via garden beds.

Flat top speed humps.

Parking bays.

Shared travel lanes.

8.2 OPTION 1A: Bi-Directional Separated Cycleway

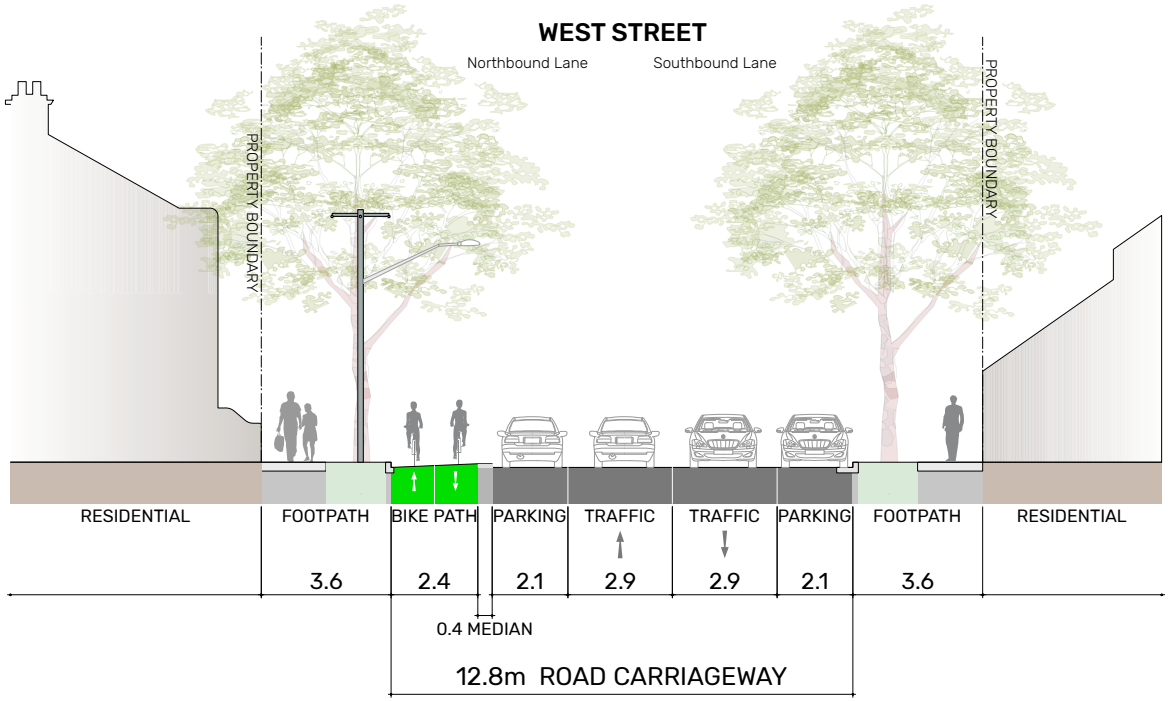
Key Features:

- Two way bike path provided on the western side.
- Traffic lanes reduced from 3.5m to 2.9m wide.
- Car parking lane reduced from 2.9m to 2.1m wide.
- No adjustment to kerb alignments.
- Footpath widths retained.
- Verge widths retained.
- Street trees, street lighting & power poles retained.

Assessment

A summary has been prepared for the following bi-directional separated cycleway that sets out simply and concisely how existing conditions will be affected by the implementation of the facility.

; Number of driveways	High use residential:	5
	Low res residential:	6
	Commercial:	4
	Special Use:	1
	Total	**16**
; Cross streets	Regional:	2
	Local:	5
	Laneway:	5
	Total	**12**
; Stormwater inlets:		8
; Cycleway linkage to priority route network: (Route 4 - Burlington St & Huntington St)		2
; Bus stop:		1



8.3 OPTION 1B: Bi-Directional Separated Cycleway

Key Features:

- Two way bike path provided on the eastern side.
- Traffic lanes reduced from 3.5m to 2.9m wide.
- Car parking lane reduced from 2.9m to 2.1m wide.
- No adjustment to kerb alignments.
- Footpath widths retained.
- Verge widths retained.
- Street trees, street lighting & power poles retained.

Assessment

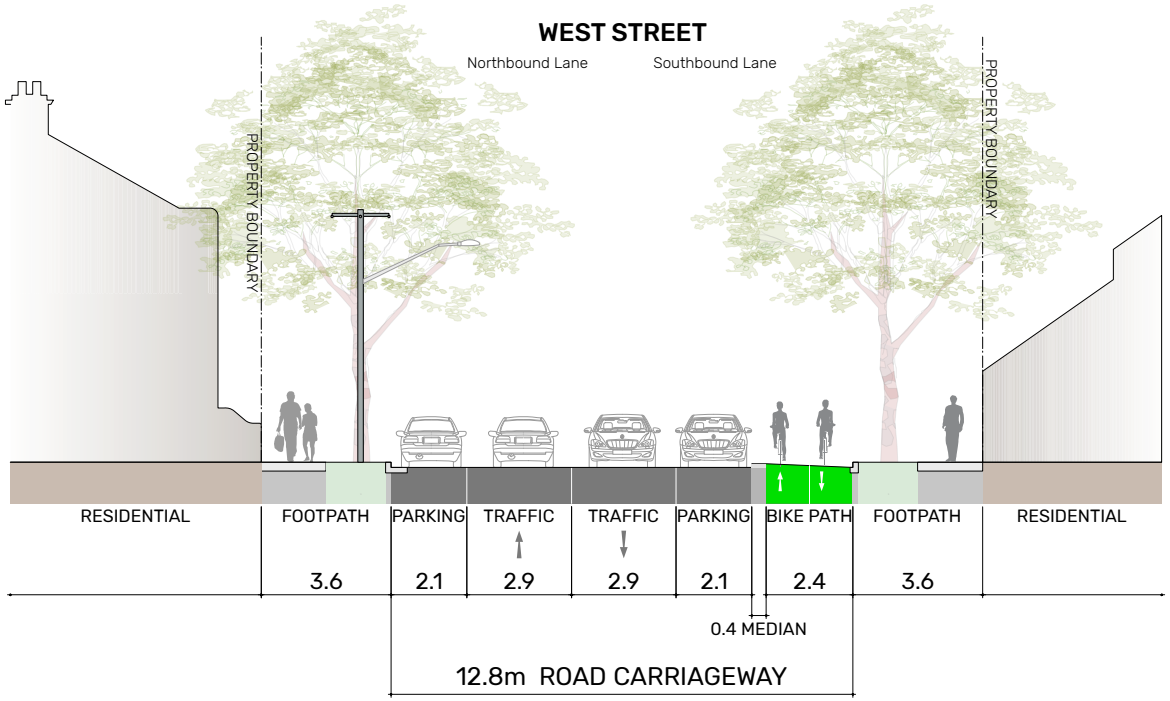
A summary has been prepared for the following bi-directional separated cycleway that sets out simply and concisely how existing conditions will be affected by the implementation of the facility.

; Number of driveways	High res:	5
	Low res:	16
	Commercial:	6
	Educational:	4
	Not in Use:	1
	Total	**32**
; Cross streets	Regional:	2
	Local:	5
	Single Lane:	2
	Total	**9**

; Stormwater inlets: 13

; Cycleway linkage to priority route network: 1 (Route 5 - Ridge St)

; Parking loss: 0



8.4 OPTION 2A: One Way Separated Bike Paths

Key Features:

- One way bike path provided on the eastern and western side.
- Traffic lanes reduced from 3.5m to 2.9m wide.
- One parking lane removed, parking to alternate between east & west side.
- One parking lane reduced from 2.9m to 2.1m wide.
- No adjustment to kerb alignments.
- Footpath widths retained.
- Verge widths retained.
- Street trees, street lighting & power poles retained.

Assessment

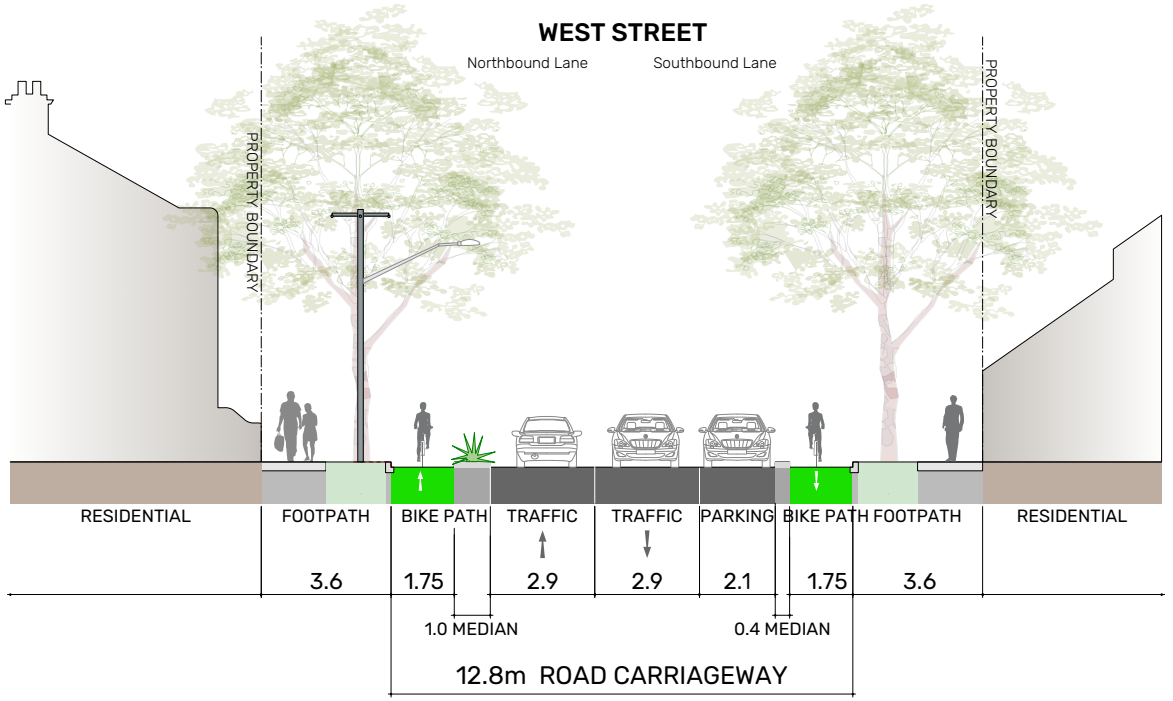
A summary is prepared for the option 1 A, as below:

; Parking loss* High demand: 47
Medium demand: 37
Special use parking: 5
Total **89**

; Planted medium**: 762.6 l/m x 1.4m= 1017m2

**For the purpose of comparison, parking spaces have been calculated on the basis of 6m = 1 space. Part spaces are generally not included. As parking bays are not marked, actual numbers of cars able to park within each block will vary based on the size of parked vehicles and the distance between them.*

***Assuming that 30% of median is planted.*



8.5 OPTION 2B: One Way Separated Bike Paths

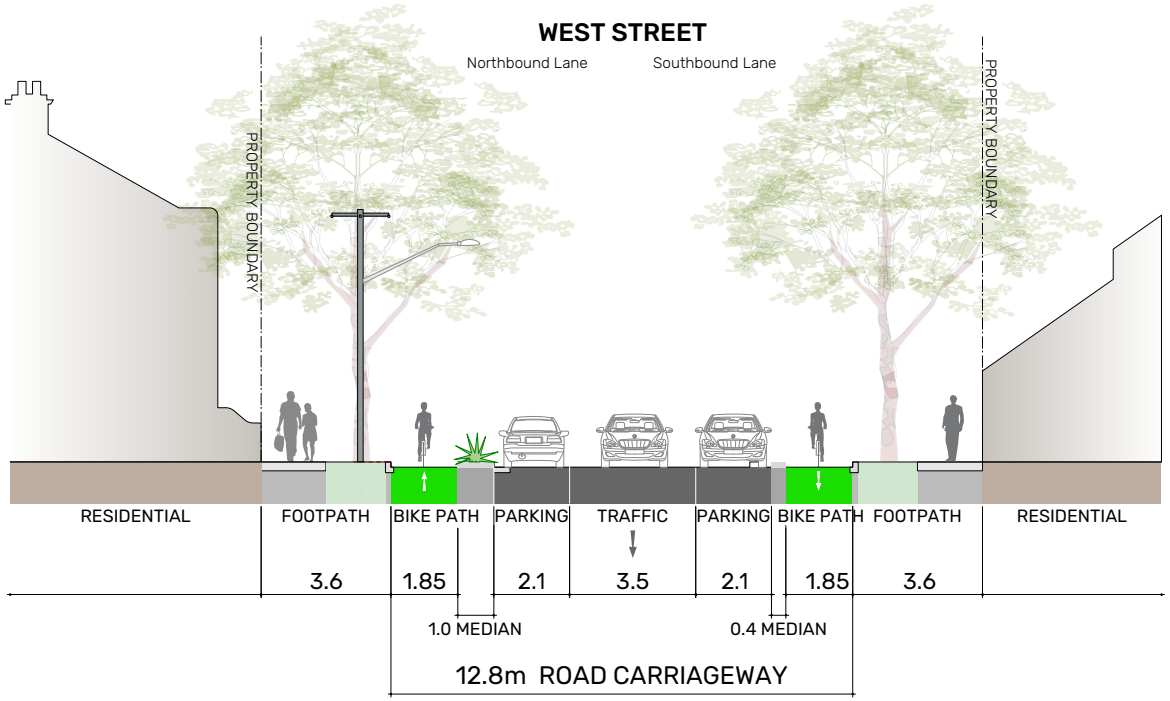
Key Features:

- One way bike path provided on the eastern and western side.
- One traffic lane removed, traffic becomes one way north or south bound.
- One traffic lane reduced from 3.5m to 2.9m wide.
- Parking lanes reduced from 2.9m to 2.1m wide.
- No adjustment to kerb alignments.
- Footpath widths retained.
- Verge widths retained.

Assessment

; Would reduce capacity of West St as a traffic route with only one lane of traffic.

; Two-way flow on one travel lane is unlikely to be supported by RMS with such high existing traffic volumes (800vph).



8.6 OPTION 2C: One Way Separated Bike Paths

Key Features:

- One way bike path provided on the eastern and western side.
- Traffic lanes reduced from 3.5m to 2.9m wide.
- Parking lanes reduced from 2.9m to 2.1m wide.
- Kerb alignments adjusted by 1.1m on both sides.
- Footpath & verge reduced from 3.6 to 2.5m wide on both sides.
- Street trees, street lighting & power poles removed.
- New street trees planted in medians.

Assessment

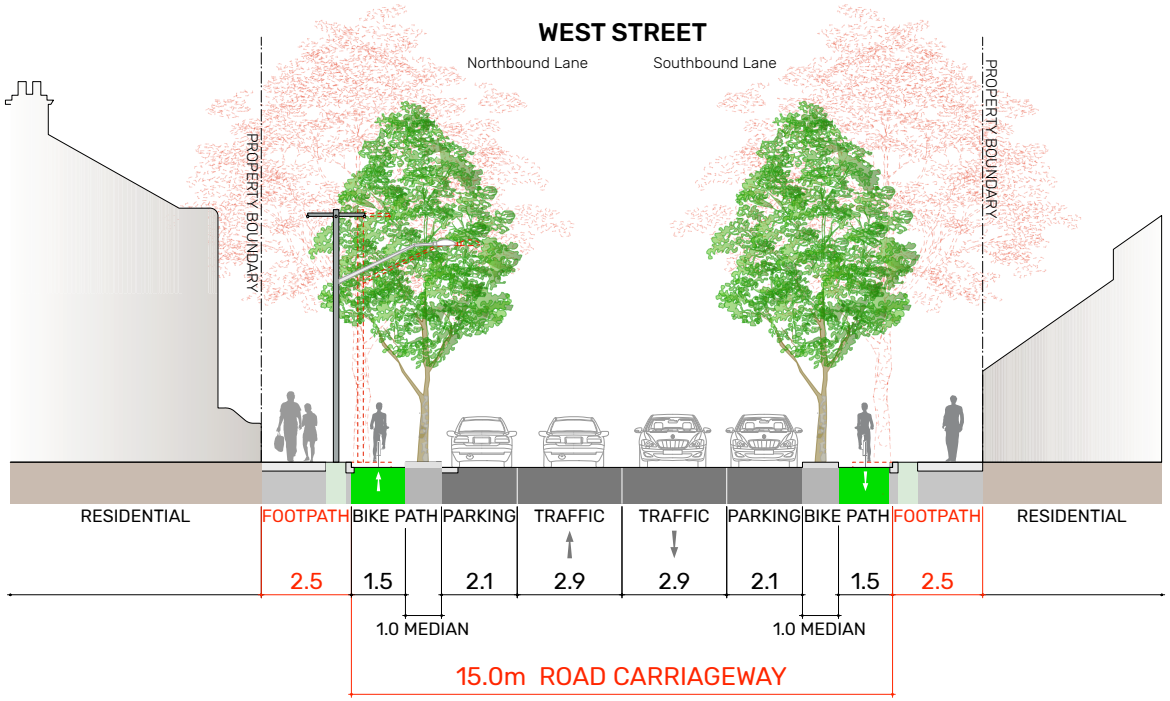
A summary is prepared for the option 1 C, as below:

; Kerb realignment	East:	1174l/m
	West:	1169 l/m
	Total	**2343 l/m**
; Lighting/pole	East	16
	West	38
	Total	**54**
; Tree loss:	West	79
	East	79
	Total	**-158**
; Tree gain*:	East:	39
	West:	39
	Total	**78**
	Overall	***-80***

; Planted medium**: 762.6 l/m x 0.7= 533m2

*Trees planted at 30m spacing intervals, similar to existing tree spacing.

***Assuming that 30% of median is planted.*



8.7 OPTION 3A: Mixed traffic / Bike Boulevard

Key Features:

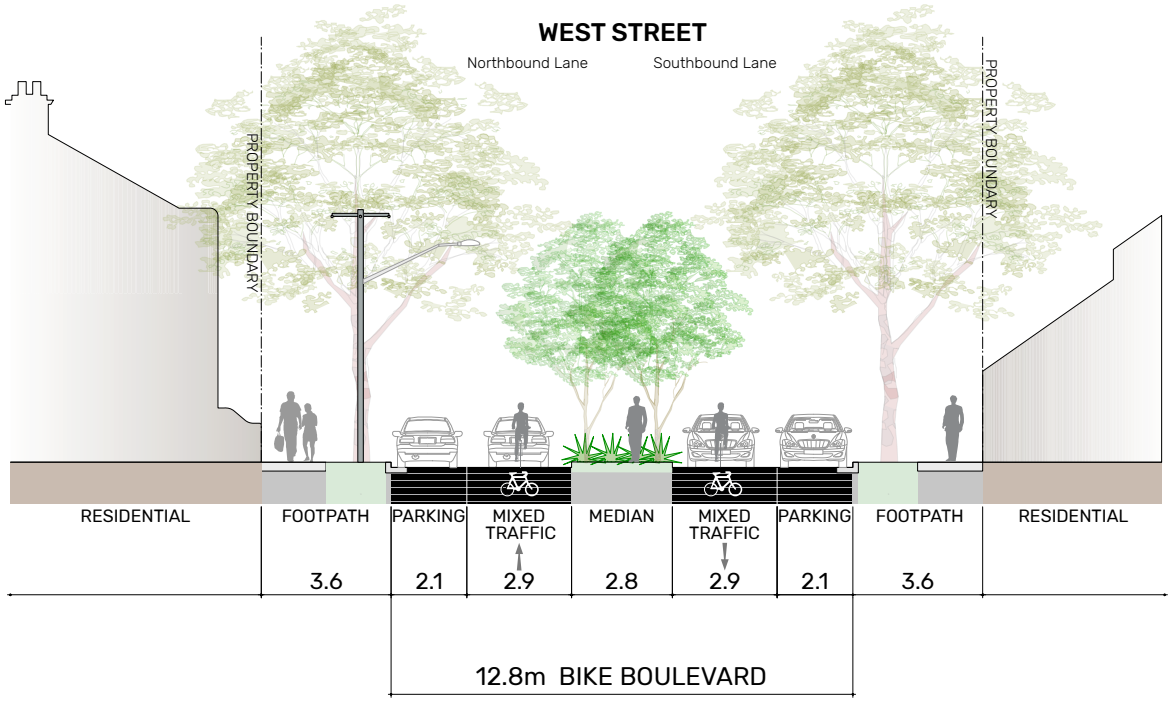
- Speed limited to 40km/hr or less.
- Traffic & parking lanes widths reduced.
- Raised pavements, central median & other traffic calming treatments provided.
- Additional street trees and garden beds.
- No adjustment to kerb alignments.
- Footpath widths retained.
- Verge widths retained.
- Street trees, street lighting & power poles retained.

Assessment

A summary table is prepared for the option 3 A, as below:

; Street trees increase: 78

; Increase in garden bed*: 2135m2 x 2.5m= 5337m2



**Assuming that 30% of median is planted l/m x 2.8m with a 150mm kerb.*

8.8 OPTION 3B: Mixed traffic / Bike Boulevard

Key Features:

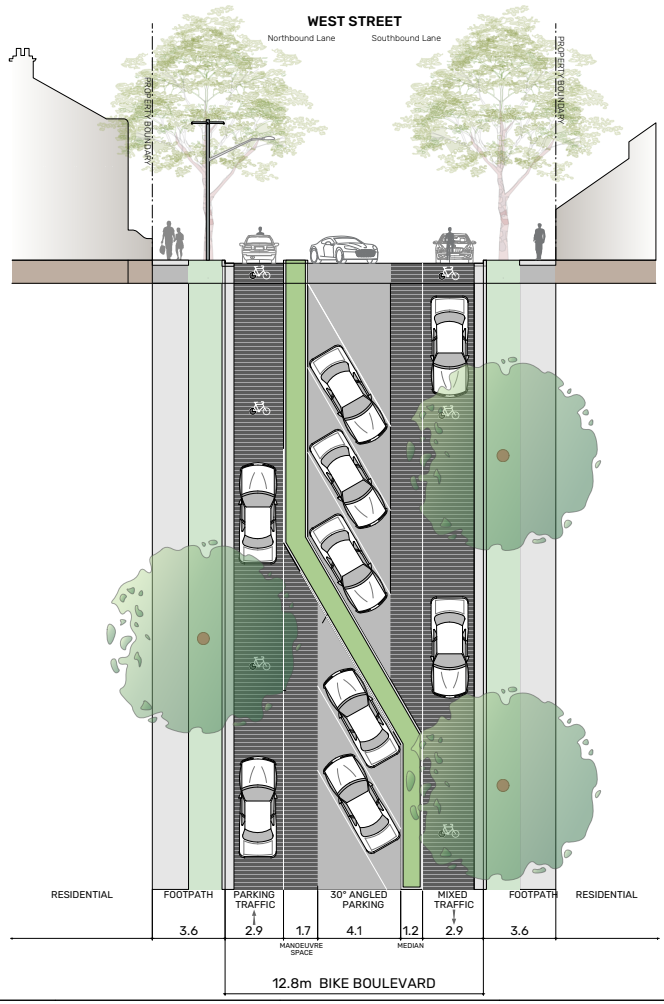
- 30° Angled Parking centrally located.
- Speed limited to 40km/hr or less.
- Traffic & parking lanes widths reduced.
- Raised pavements, central median & other traffic calming treatments provided.
- Additional street trees and garden beds.
- No adjustment to kerb alignments.
- Footpath widths retained.
- Verge widths retained.
- Street trees, street lighting & power poles retained.

Assessment

A summary table is prepared for the option 3 A, as below:

; Increase in garden bed*: 2135m2 x .8m= 1708m2

**Assuming that 30% of median is planted l/m x 2.8m with a 150mm kerb.*



8.9 SUB-OPTION ASSESSMENT

An analysis of the key features of the facility treatment has been undertaken to inform the feasibility assessment. The analysis is based on key design principles and criteria in order to select the safest facility type. The results of the analysis are presented in the tables right.

Table 8.1 Sub-option assessment

1A - Bi-Directional Separated Cycleway (West)	
Impacts	**Comment**
Street Trees	Typically no loss
Parking	Typically no loss
Street Lighting	Typically no impact
Safety Issues	**Comment**
Cross movements	
Driveways:	16
Bus stops:	1
Intersections	
Signalised crossing	2
Side streets	10

1B - Bi-Directional Separated Cycleway (East)	
Impacts	**Comment**
Street Trees	Typically no loss
Parking	Typically no loss
Street Lighting	Typically no impact
Safety Issues	**Comment**
Cross movements	
Driveways	32
Bus stops	0
Intersections	
Signalised crossing	2
Side streets	7

2A: One Way Separated Bike Paths	
Impacts	**Comment**
Street Trees	Typically no loss
Parking	89
Street Lighting	Typically no impact
Safety Issues	**Comment**
Cross movements	
Driveways	48
Bus stops	1
Intersections	
Signalised crossing	2
Side streets	19

2B: One Way Separated Bike Paths	
Impacts	**Comment**
Street Trees	Typically no loss
Parking	Typically no loss
Street Lighting	Typically no impact
Safety Issues	**Comment**
Cross movements	
Driveways	48
Bus stops	1
Intersections	
Signalised crossing	2
Side streets	19

2C: One Way Separated Bike Paths	
Impacts	**Comment**
Street Trees	-158
Parking	Typically no loss
Street Lighting	54 relocated
Safety Issues	**Comment**
Cross movements	
Driveways	48
Bus stops	1
Intersections	
Signalised crossing	2
Side streets	19

3A: Mixed traffic / Bike Boulevard	
Impacts	**Comment**
Street Trees	+78
Parking	Typically no loss
Street Lighting	Typically no impact
Safety Issues	**Comment**
Cross movements	
Driveways	Typically no impact
Bus stops	Typically no impact
Intersections	
Signalised crossing	Typically no impact
Side streets	Typically no impact

3B: Mixed traffic / Bike Boulevard	
Impacts	**Comment**
Street Trees	Typically no loss
Parking	1 space of every four
Street Lighting	Typically no impact
Safety Issues	**Comment**
Cross movements	
Driveways	Typically no impact
Bus stops	Typically no impact
Intersections	
Signalised crossing	Typically no impact
Side streets	Typically no impact

8.10 SUB-OPTION RECOMMENDATION

Following the site investigation and facility, assessment has been carried out to find the safest cycle facility that has the least impact, regarding parking, lighting and street tree loss to West Street.

Impact considers the implementation of the facility type and the general impact that facility type will have regarding relocation or loss of street trees/ parking/ lighting.

Safety Issues considered the potential for conflict among users regarding cross movements and intersections. Cross movements from existing driveways have a higher point for conflict to occur, as irregular use and the number of individual users.

Discussed below is the outcome of the sub-option assessment in Section 7.9:

Bi-directional cycleway

An option on the eastern and western portion of West Street has been considered for the bi-directional cycleway. Typically the impacts were minimal for street trees, parking and lighting with both options.

Option 1A has a higher number of intersections 3 with Option 1B having a greater number of driveways +16. Therefore, Option 1A would be the most favourable treatment facility in terms of safety for the rider. Whilst there are an additional 3 side streets on the western side, the risk associated with these side streets and vehicular movements are easier to mitigate than the additional 16 driveways on the eastern side.

One way separated bike paths

Three options have been considered for the one-way separated bike path facility. Safety issues are comparable for all of the one-way separated options, as adjoining cross movements and intersections are the same. Option 2C has the greatest impact with a loss of -158 street trees, kerb relocation, and relocation of existing street lights. Option 2B has the least impact with typically no loss to street trees, lighting or parking. Option 2A has the greatest loss to street parking. Therefore, Option 2B is considered the option with the least amount of impact on street trees and parking and has been considered for concept design.

Mixed traffic/bike boulevard

Two mixed traffic/bike boulevard design options have been considered as part of the sub-option assessment. Both facilities are comparable regarding safety with typically no impact on cross movements or intersections, at this early stage. However, Option 3A has typically no loss of parking or street lighting with the increase of an approximate number of street tree gain by +78, and is therefore the recommended facility treatment.

Listed below are the three chosen sub-option facility types, which are recommended as the safest and will cause the least impact on West Street.

- Bi-directional cycleway - Option 1A
- One way separated bike paths - Option 2A
- Mixed traffic/bike boulevard - Option 3A

8.11 NEXT STEPS

The design team shall prepare three (3) concept design options based on the route assessment outcomes for cycling treatments along West Street.

9. CONCEPT DESIGN OPTIONS

9.1 INTRODUCTION

Informed by the overall design principals, site analysis and the sub-option assessment presented in Chapter 8, three cycle facilities have been considered for devlopment to concept design stage.

The designs must integrate with other transport modes and give equal consideration to improving pedestrian accessibility and amenity, improving general road safety, and the quality of public/community space. The designs must also be:

- Consistent with State Government Transport Strategy documents and all relevant Council documents and plans;
- Consistent with all relevant standards including but not limited to NSW
- Bicycle Guidelines, Austroads guidelines, Australian Standards, BCA and access (DDA) standards, and Sydney Buses requirements including the State
- Transit Bus Infrastructure Guide (some roads identified accommodate bus routes);
- Balance the needs and expectations of a variety of rider types/needs (i.e. young people, older people, commuters, inexperienced cyclists, recreational cyclists);
- Be practical within the current funding availability;
- Designed to improve safety, connectivity and amenity and reduce conflicts between pedestrians, cyclists and vehicle users. This includes measures to manage appropriate vehicle speeds; address safety hazards such as sight lines or surface hazards; ensure pedestrian safety and amenity is maintained and enhanced;
- Ensure that cycling improvements are balanced against the needs of other road users and community members who are not likely to use the cycle network (e.g. designs should demonstrate compliance with turning templates and pedestrian access standards);
- Have minimal impact on car parking or include innovative strategies to compensate for any parking loss;
- Contribute to high-quality streetscapes and public spaces that encourage walking and cycling for transport, and facilitate greater community use of public space.

The concept designs will include a mix of:

- A combination of new separated cycle lanes, line marked cycle lanes, other line markings, and traffic management changes.
- Strategies/infrastructure to improve difficult crossings and make crossing over busy roads safe and comfortable for riders of all ages and abilities.
- Specific treatments/infrastructure to improve intersection safety and function.
- Footpath widening, improvements to pedestrian facilities and expansion of pedestrian environment.
- Landscaping and other public domain upgrades, including water sensitive urban design where possible.
- Any other supporting infrastructure required.

9.2 IMPACT ASSESSMENT

In order to select the most preferable option of the three concept designs for West Street the report will assess the concept designs based on a comparison of impact in three parts:

Firstly, a brief summary of the options major impacts on the existing street infrastructure through an option Assessment;

Secondly, a The Transport Planning Partnership's (TTPP) review of Concept Design Option A, Option B and Option C of the proposed West Street cycleway provides a review of compliance with guidelines, including pedestrian crossings, intersection treatments and road widths.

Thirdly, the Transport Planning and Management Decision Matrix will deliver a score for each option that addresses North Sydney's transport vision and priorities.

Each design option will be assessed against one another in order to considered in the context of the traffic and pedestrian conditions and the overall functionality and safety of the cycleway. The reasons for each option's dismissal are outlined in the following chapter.

9.3 Option A: Bi-Directional Separated Cycleway

The proposed separated two way cycleway (Option A) commences on the eastern side of West Street, east Church Street. The separated cycleway then travels north along West Street and connects to Ridge Street cycleway. The cycleway then transitions to the west side of West Street via a pedestrian crossing and cycleway crossing. The cycleway is bound by existing kerbside along West Street until it reaches Amherst Street shared path that connects to a proposed separated cycleway at Warringah Freeway. Option A provides a cycle facility that accommodates an easy to use route for all types of riders. The reduction of existing traffic lanes from 3.25m to 2.9m and narrowing of parking lanes have provided sufficient space for a 2.4m separated cycleway along the length of West Street. From Church Street the existing western kerb has been relocated to maintain the 2.6m loading bays with a reduction in the existing footpath. The key impact of the proposed concept design is the impact to the signal operation at the intersection of Falcon Street-West Street and Ernest Street-West Street with the introduction of a cycle phase. Consequently, an assessment of the intersection operation at both intersections has been undertaken.

The option includes a combination of the treatments identified above and is summarised below a, along with photomontages. Inset plans are provided as part of the main plans showing additional detail of the key features and locations.

Along the length of the route the following is recommended:

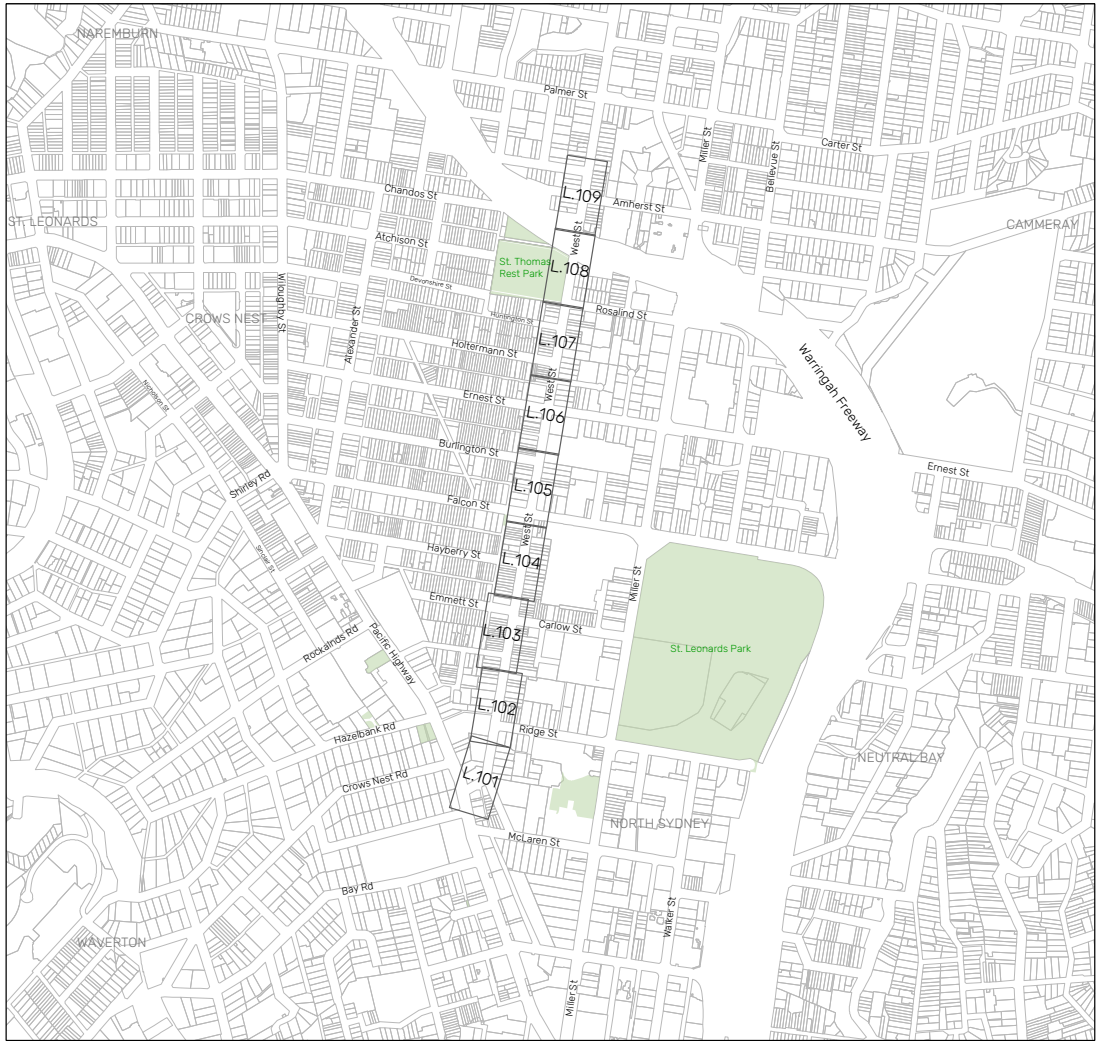
- Removal of the existing centre line, bicycle lane and car parking lane line markings;
- Introduction of a separated cycleway and median along West Street;
- Introduction of bend-in/out on side roads where traffic volumes and space permits, and;
- Distinctive shared intersection environment on side road entry to West Street, which could include the use of pavers or imprinted bitumen or concrete.
- Proposed road closure at Emmett Street for a new 'Pocket Parking' and water sensitive urban design provision.
- The existing traffic arrangements at the intersection of Amherst Street and West Street is proposed to be changed to a T-intersection, with all unrestricted traffic movements.

As part of improving the amenity of West Street for residents, local users and commuters, a number of opportunities have been taken to enhance the landscape. Around the proposed intersections, landscaped build outs have been incorporated within the areas adjacent to the intersection where parking is not permitted. These are proposed to be planted with low level vegetation to maintain appropriate sight distances.

Figure 9-1: Proposed B-Directional Separated Cycleway

West Street - Concept Design A - Bi-Directional Separated Cycleway (West)

Pacific Highway to Amherst Street



1 Sheet Layout
1 : 10,000

DRAWING REGISTER

PAGE	DRAWING TITLE	SCALE	ISSUE
Drawings (000)			
L.001	COVER PAGE	1:10,000 @ A3	D
Concept Design (100)			
L.101	CONCEPT DESIGN 1 OF 9	1:400 @ A3	D
L.102	CONCEPT DESIGN 2 OF 9	1:400 @ A3	D
L.103	CONCEPT DESIGN 3 OF 9	1:400 @ A3	D
L.104	CONCEPT DESIGN 4 OF 9	1:400 @ A3	D
L.105	CONCEPT DESIGN 5 OF 9	1:400 @ A3	D
L.106	CONCEPT DESIGN 6 OF 9	1:400 @ A3	D
L.107	CONCEPT DESIGN 7 OF 9	1:400 @ A3	D
L.108	CONCEPT DESIGN 8 OF 9	1:400 @ A3	D
L.109	CONCEPT DESIGN 9 OF 9	1:400 @ A3	D

REV	AMENDMENT DESCRIPTION	DSGND	DRAWN	APRVD	DATE
D	Draft Final Concept Design	FM / MD	FM / MD	MS	25/07/18
C	80% Concept Design	FM / MD	FM / MD	MS	09/07/18
B	50% Concept Design	FM / MD	FM / MD	MS	04/06/18
A	DRAFT FOR DISCUSSION	FM / MD	FM / MD	MS	29/05/18

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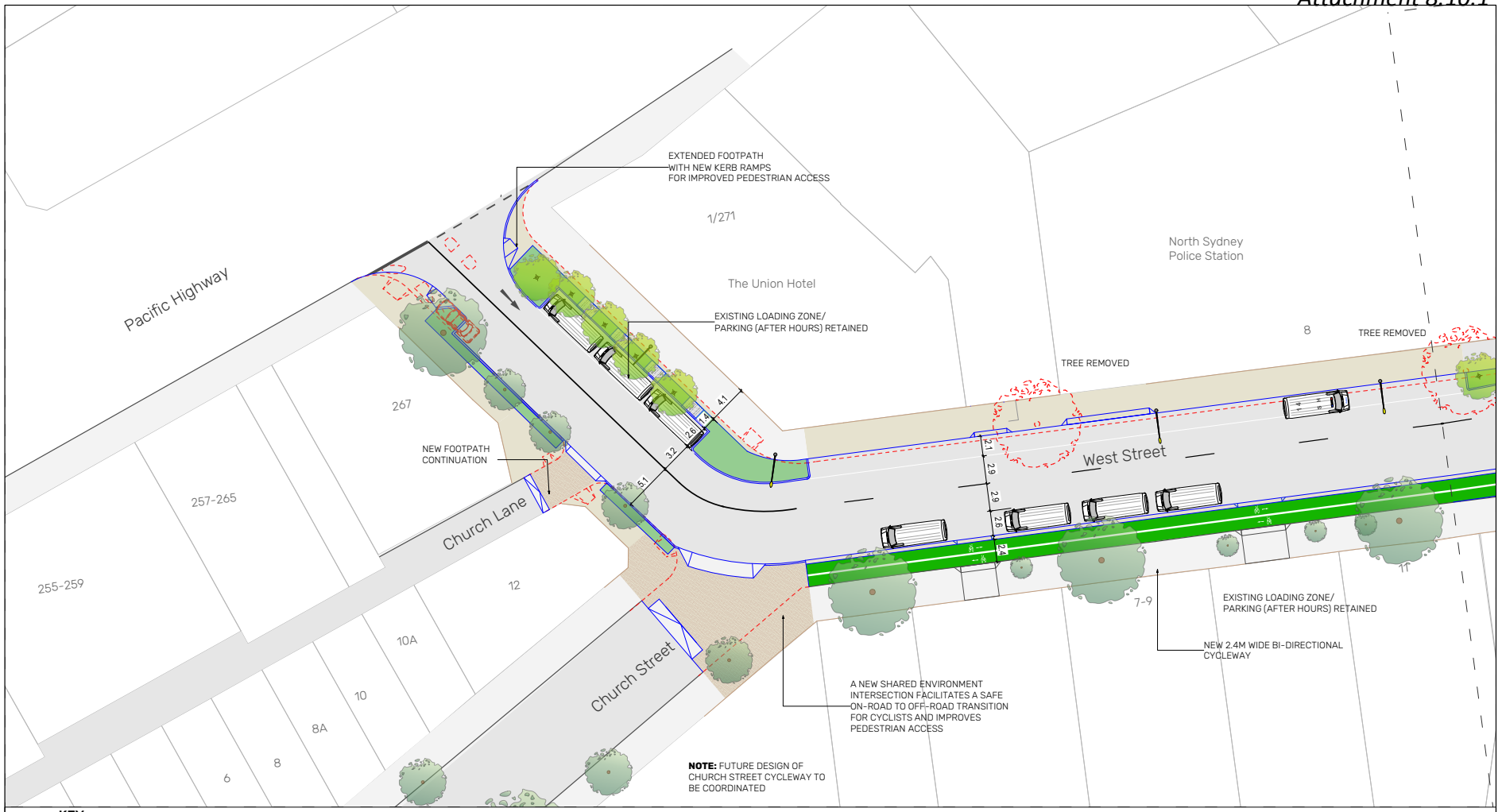
PROJECT West Street Cycleway

SHEET 000

DRAWING Concept Design Option A - Bidirectional Cycleway

REVISION D



KEY

- Existing item
- Existing item removed
- Existing light pole
- Existing tree
- Existing traffic signal
- Existing parking
- Bus stop
- Loading bay
- Emergency Service parking
- Car share parking
- Existing pavement
- Existing bike lane
- New or proposed item
- New cycleway
- New garden bed
- New pavement
- New parking
- New lighting
- New intersection treatment
- New Shared Environment
- New Tree
- Biofiltration Swale
- Outdoor furniture

REV	AMENDMENT DESCRIPTION	DSGND	DRAWN	APRVD	DATE
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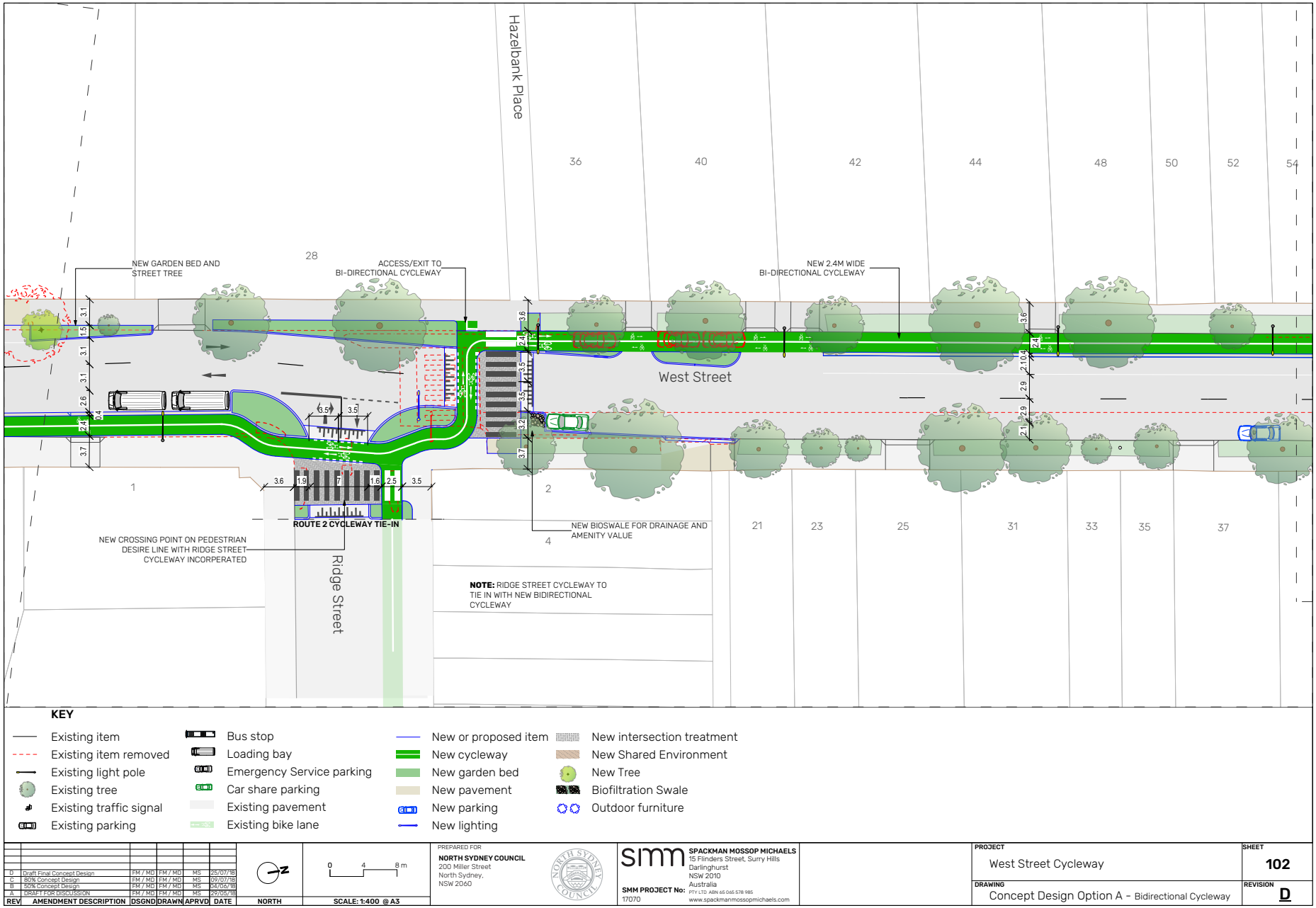
PROJECT: West Street Cycleway
SHEET: 101
DRAWING: Concept Design Option A - Bidirectional Cycleway
REVISION: D


Hazelbank Place
West Street
Ridge Street
NEW GARDEN BED AND STREET TREE
ACCESS/EXIT TO BI-DIRECTIONAL CYCLEWAY
NEW 2.4M WIDE BI-DIRECTIONAL CYCLEWAY
ROUTE 2 CYCLEWAY TIE-IN
NEW CROSSING POINT ON PEDESTRIAN DESIRE LINE WITH RIDGE STREET CYCLEWAY INCORPERATED
NEW BIOSWALE FOR DRAINAGE AND AMENITY VALUE
NOTE: RIDGE STREET CYCLEWAY TO TIE IN WITH NEW BIDIRECTIONAL CYCLEWAY
KEY
Existing item
Existing item removed
Existing light pole
Existing tree
Existing traffic signal
Existing parking
Bus stop
Loading bay
Emergency Service parking
Car share parking
Existing pavement
Existing bike lane
New or proposed item
New cycleway
New garden bed
New pavement
New parking
New lighting
New intersection treatment
New Shared Environment
New Tree
Biofiltration Swale
Outdoor furniture
REV AMENDMENT DESCRIPTION DSGND DRAWN APRVD DATE
D Draft Final Concept Design FM / MD FM / MD MS 25/07/18
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Darlinghurst
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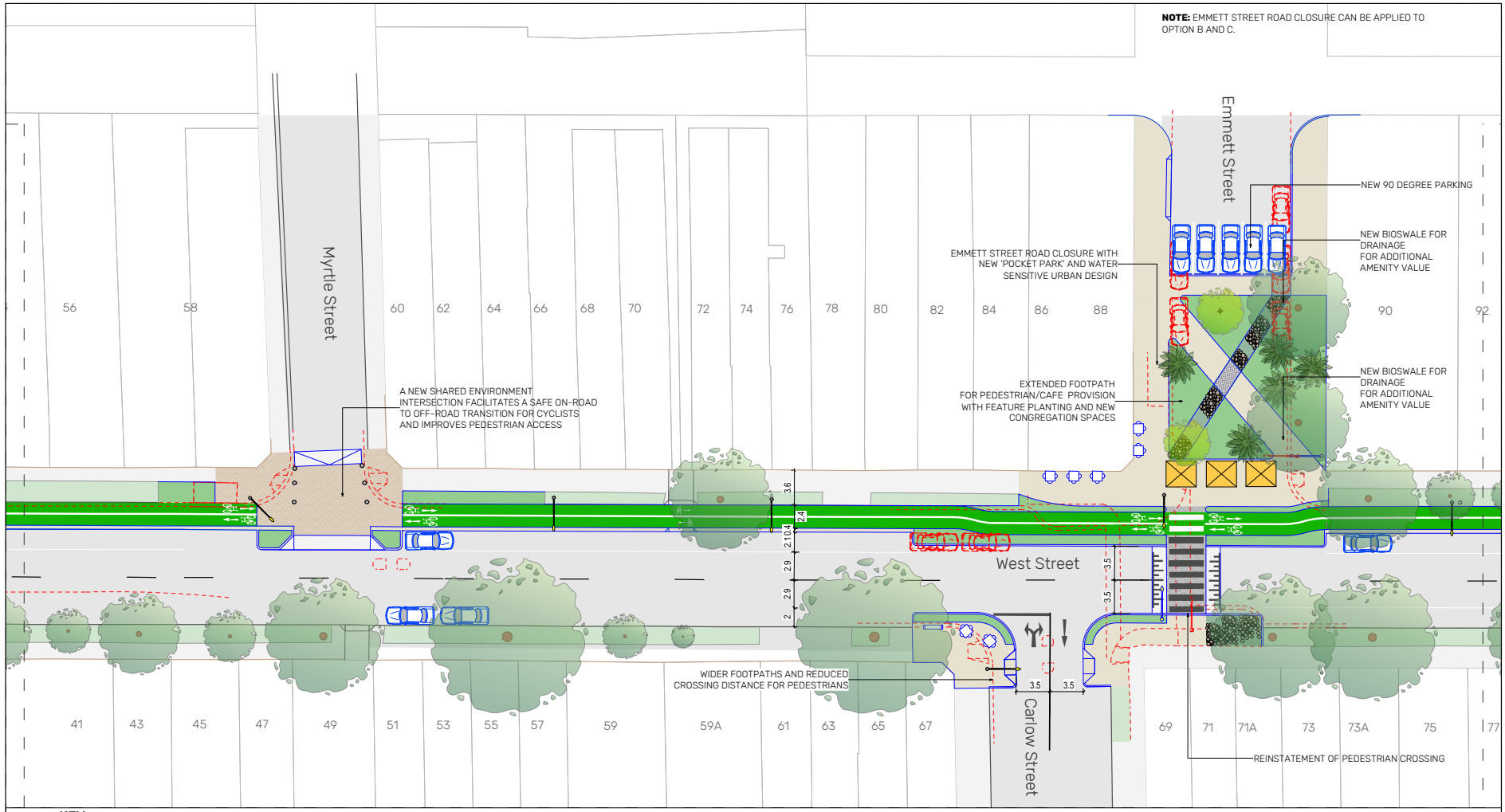
Australia
SMM PROJECT No: 17070
PROJECT
West Street Cycleway
SHEET
102
DRAWING
Concept Design Option A – Bidirectional Cycleway
REVISION
D



KEY

Existing item	Bus stop	New or proposed item	New intersection treatment
Existing item removed	Loading bay	New cycleway	New Shared Environment
Existing light pole	Emergency Service parking	New garden bed	New Tree
Existing tree	Car share parking	New pavement	Biofiltration Swale
Existing traffic signal	Existing pavement	New parking	Outdoor furniture
Existing parking	Existing bike lane	New lighting	

REV	AMENDMENT DESCRIPTION	DSGND	DRAWN	APRVD	DATE
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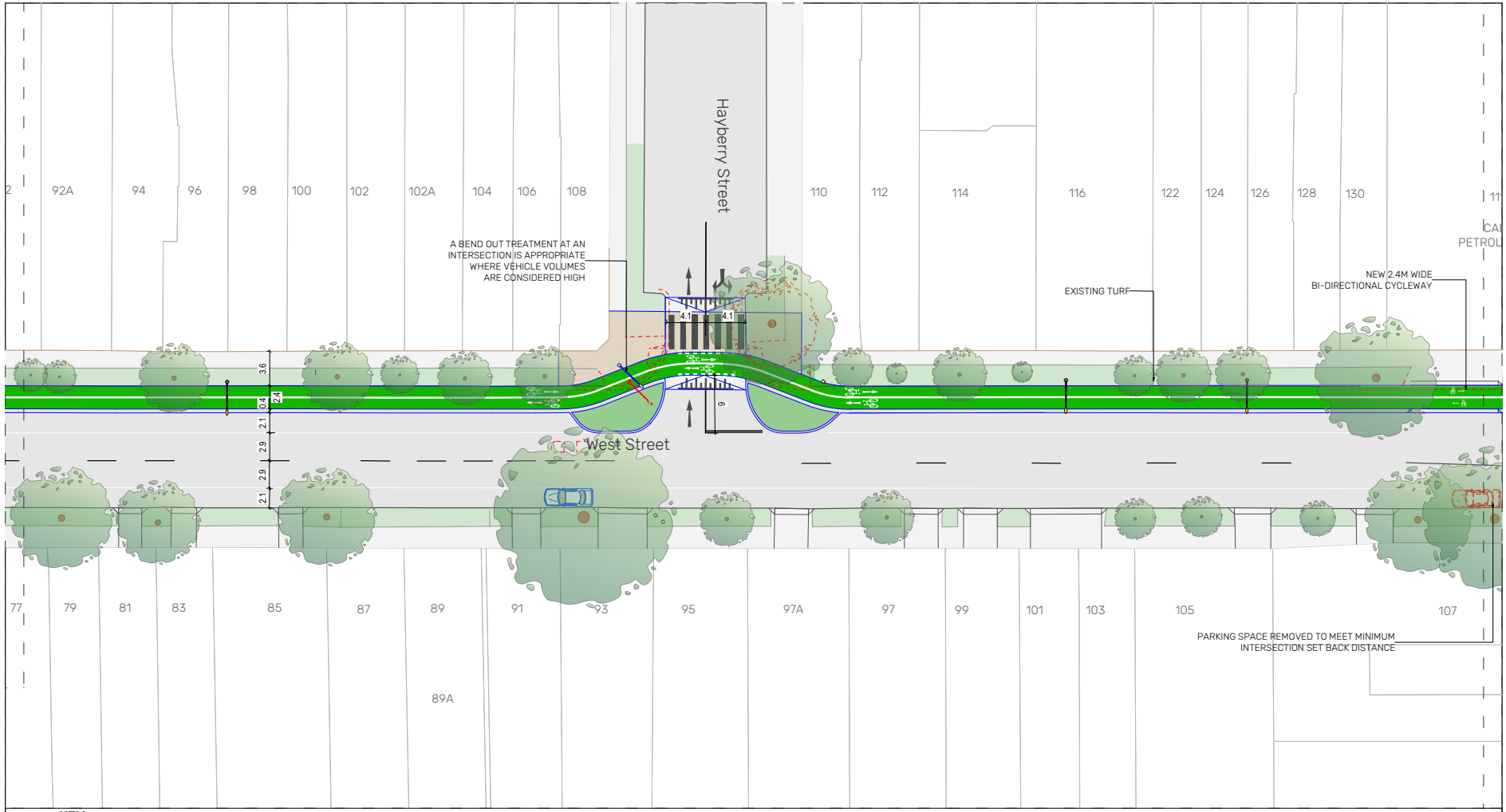
PROJECT: West Street Cycleway
SHEET: 103
DRAWING: Concept Design Option A - Bidirectional Cycleway
REVISION: D



KEY

Existing item	Bus stop	New or proposed item	New intersection treatment
Existing item removed	Loading bay	New cycleway	New Shared Environment
Existing light pole	Emergency Service parking	New garden bed	New Tree
Existing tree	Car share parking	New pavement	Biofiltration Swale
Existing traffic signal	Existing pavement	New parking	Outdoor furniture
Existing parking	Existing bike lane	New lighting	

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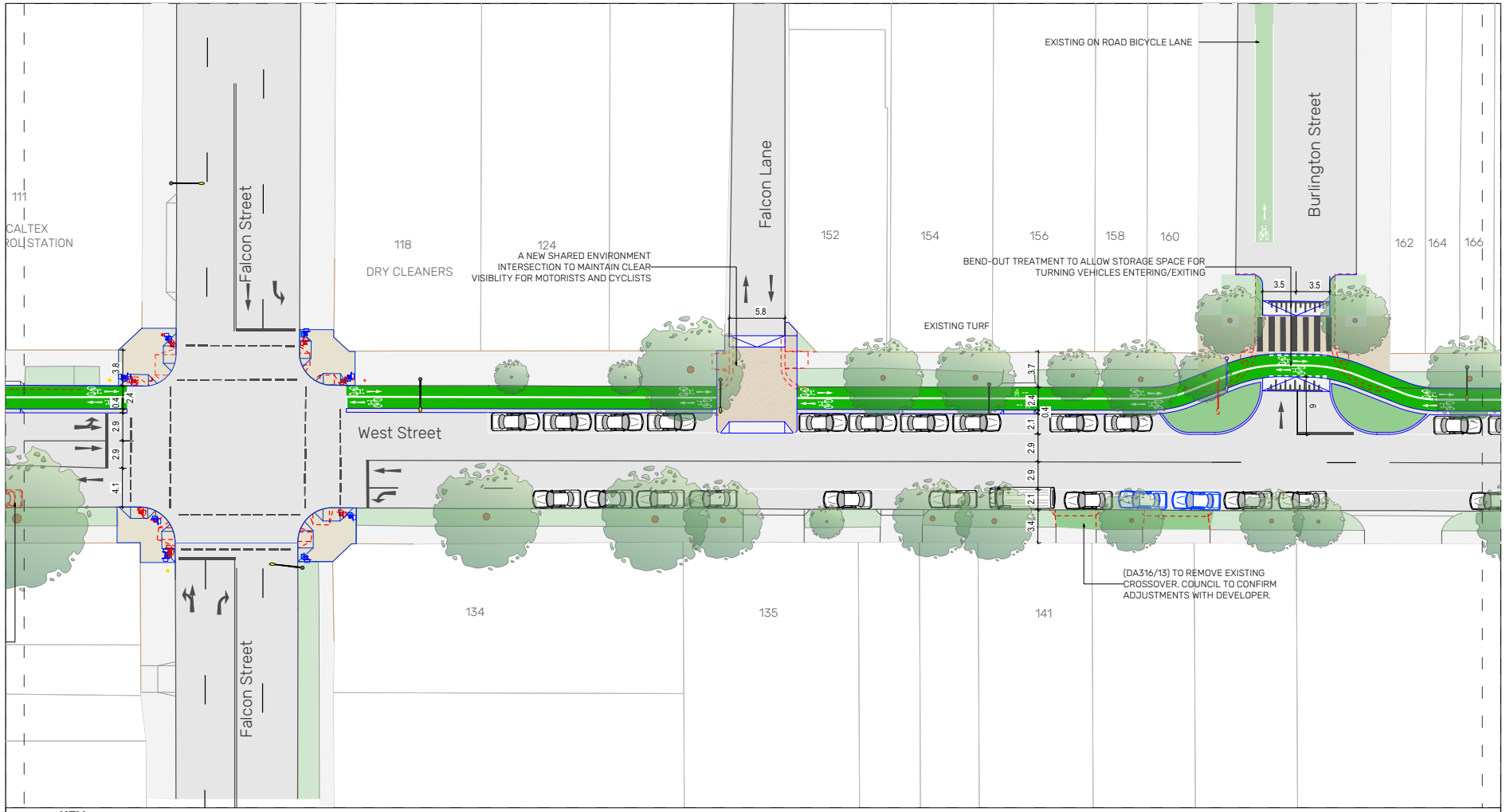
PROJECT: West Street Cycleway

SHEET: 104

DRAWING: Concept Design Option A - Bidirectional Cycleway

REVISION: D



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PROJECT West Street Cycleway

SHEET 105

DRAWING Concept Design Option A - Bidirectional Cycleway

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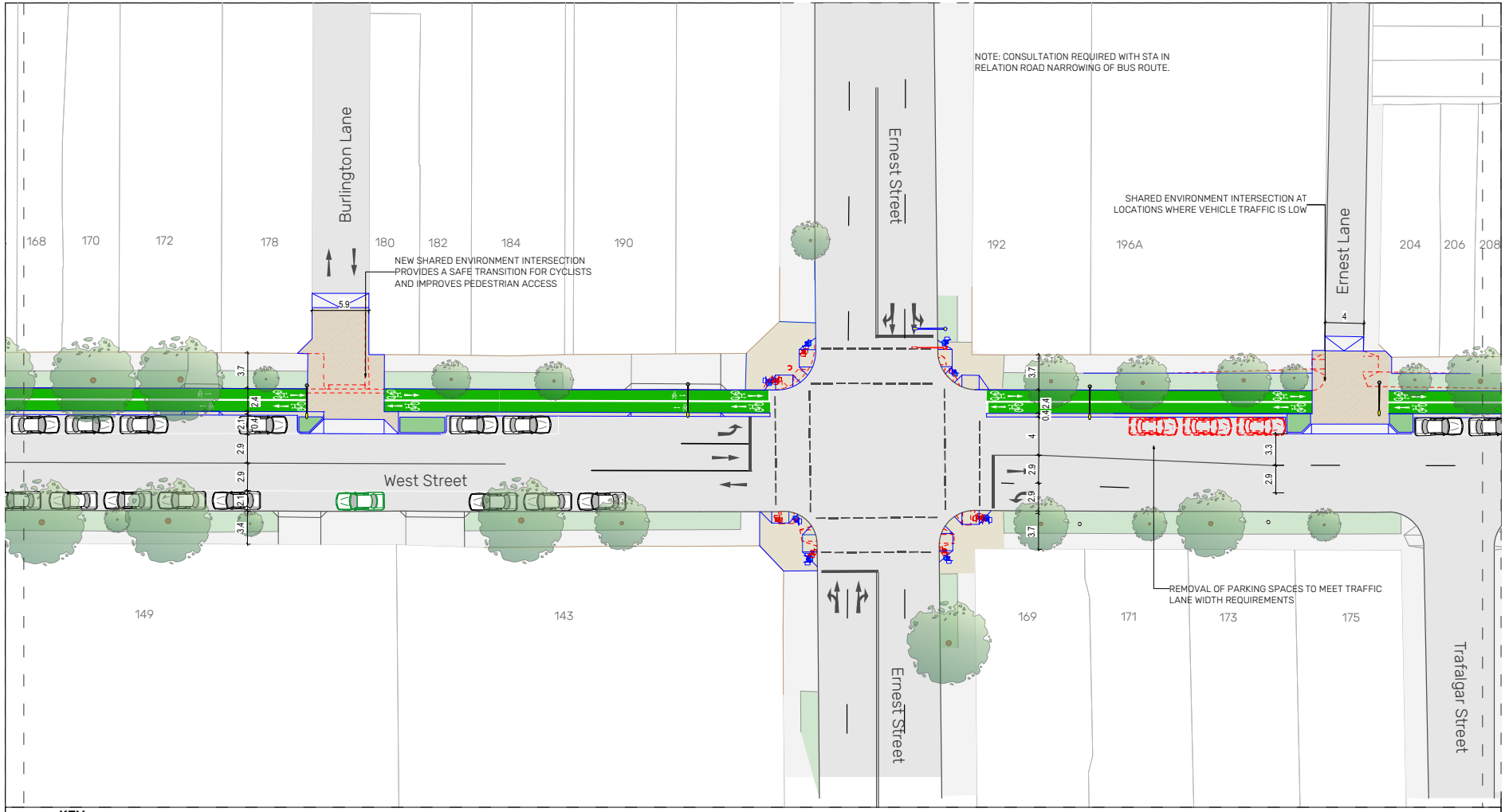

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SHEET 106

DRAWING Concept Design Option A - Bidirectional Cycleway

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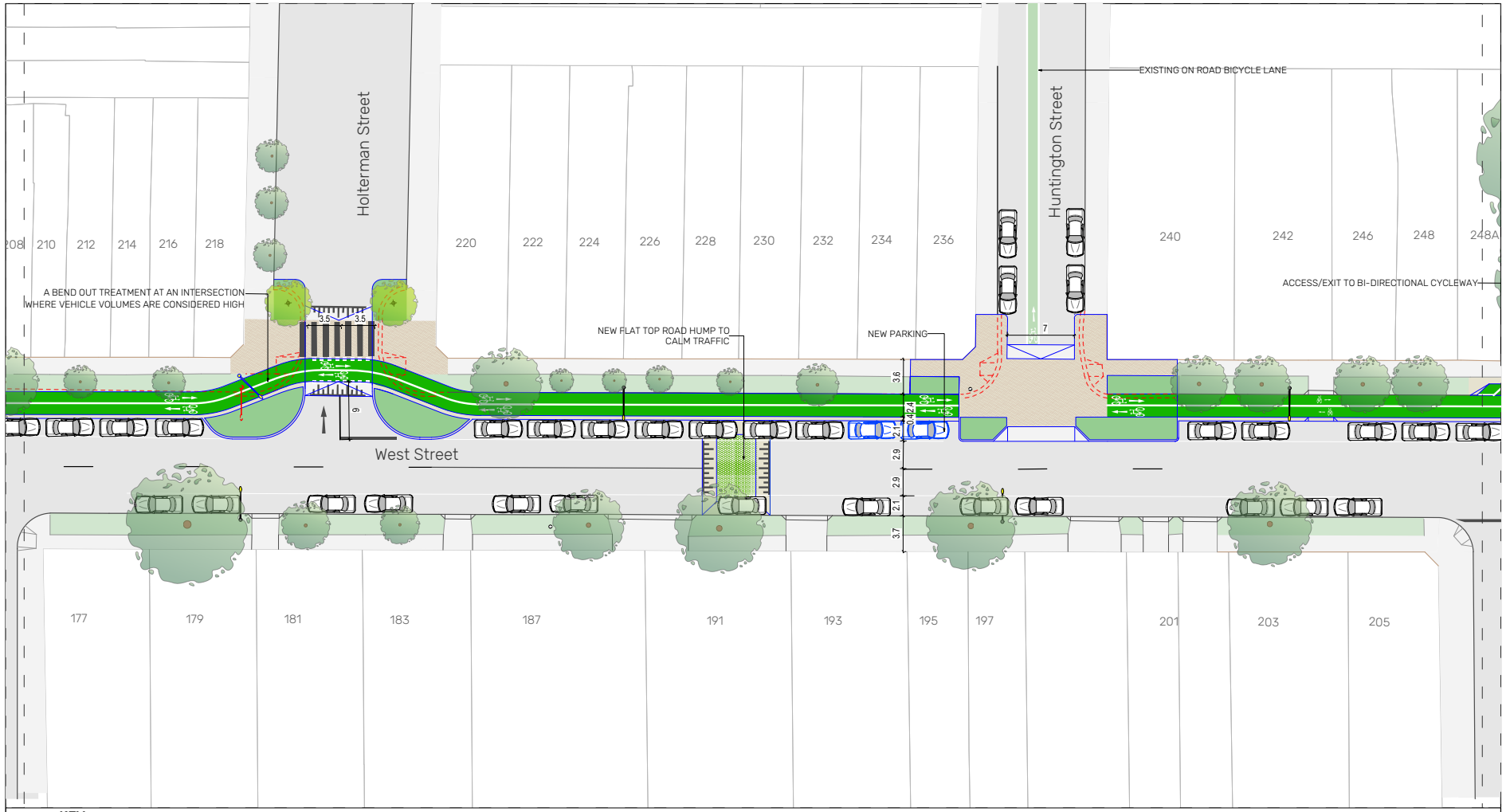

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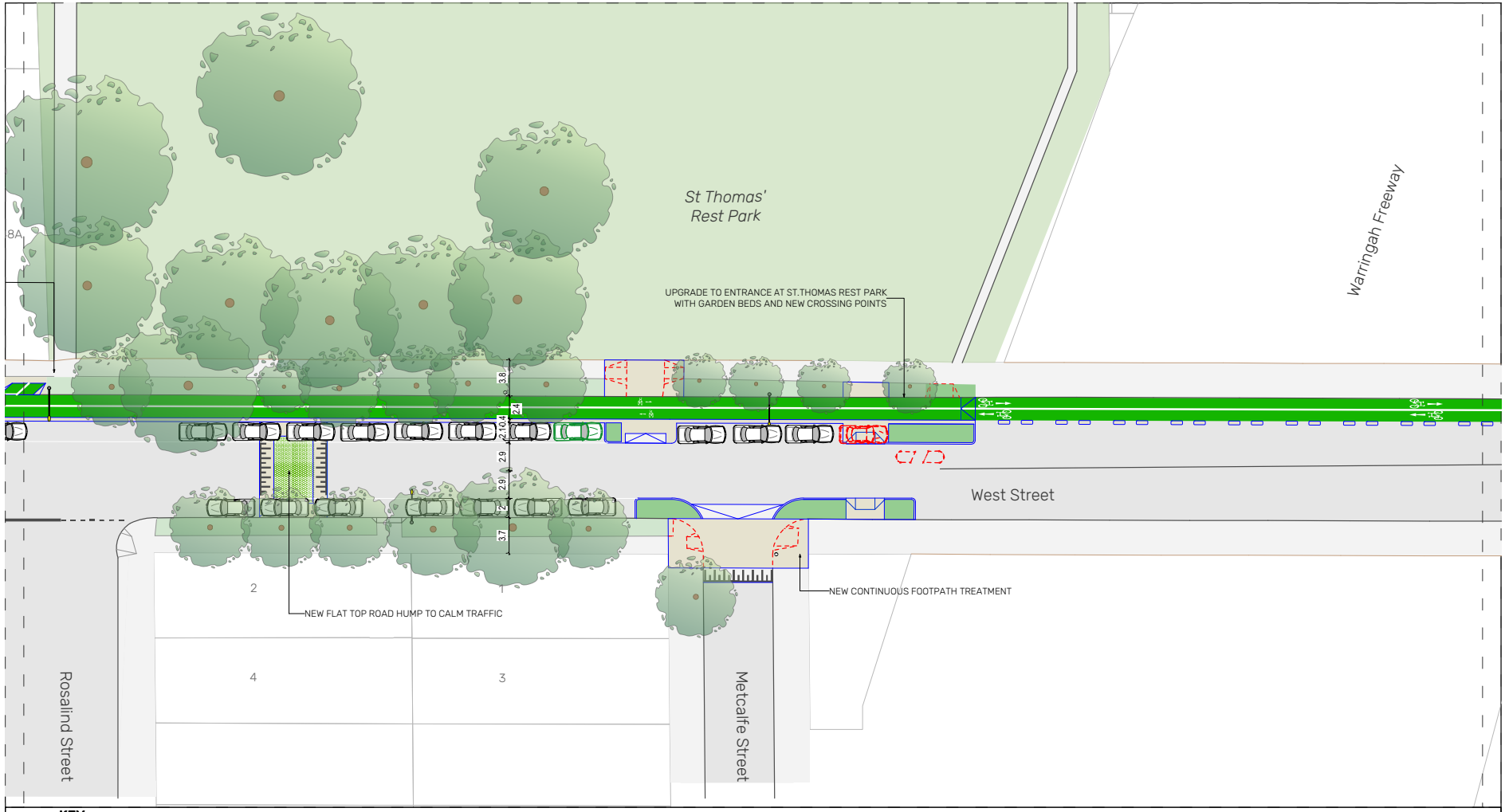
DRAWING Concept Design Option A - Bidirectional Cycleway

REVISION D



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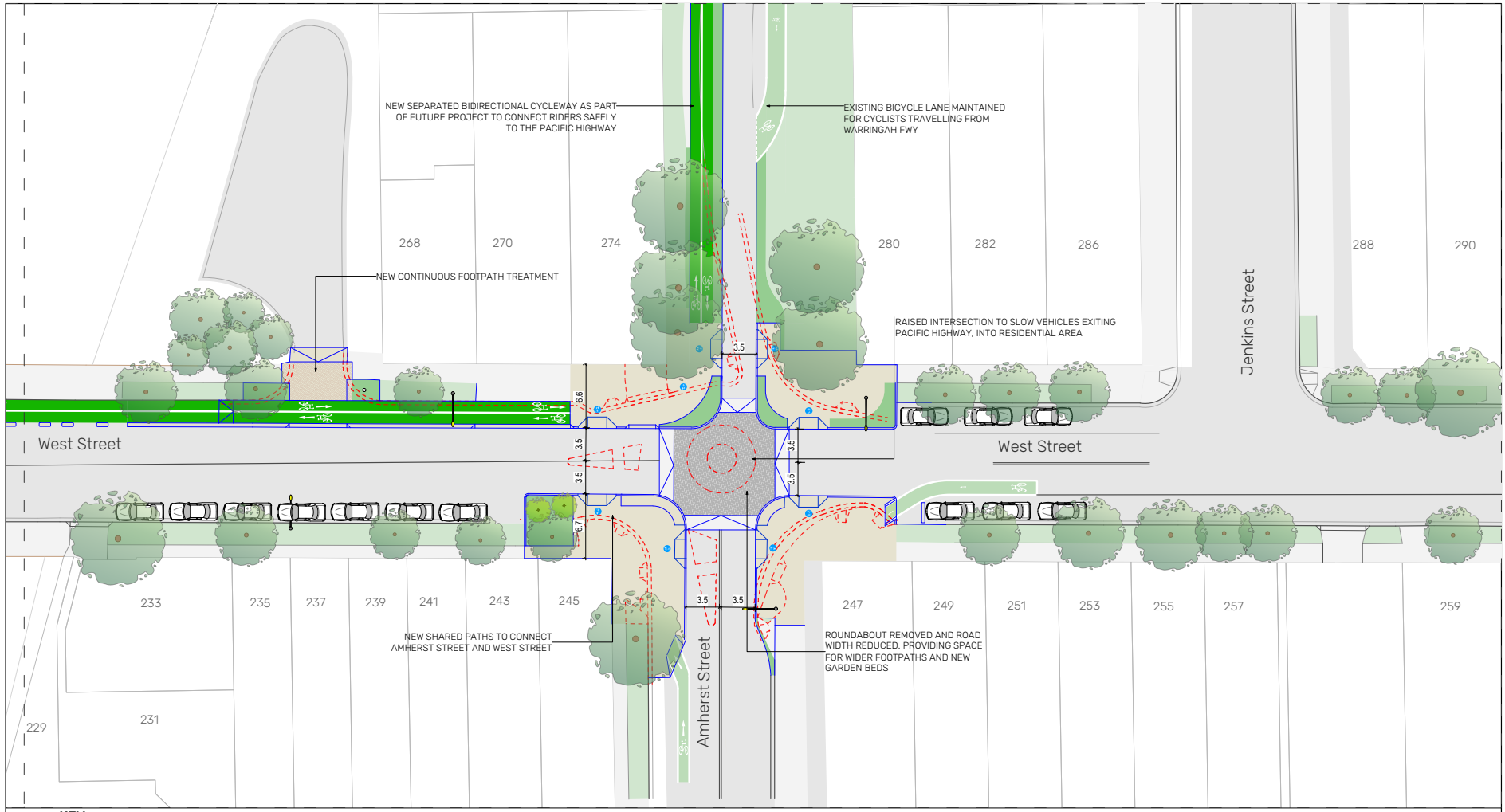

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PROJECT: West Street Cycleway

SHEET: 109

DRAWING: Concept Design Option A - Bidirectional Cycleway

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9.4 OPTION A IMPACT ASSESSMENT

Shown on Table 9.1 is the initial assessment that sets out the impact of the proposal on the existing:

- Road Geometry.
- Turning Permissions.
- Intersection Performance.
- On Street Parking.
- On Street Loading.
- Footpaths.
- Street Trees.

Shown on Table 9.1 is the initial assessment that sets out the impact of the proposal on the existing:

Table 9.1 Option A - Impact assessment Street Summary

Option A - Bi-Directional Separated Cycleway (West)					
ITEM	**DESCRIPTION**				
Road Geometry	The bi-directional separated cycleway narrows the existing travel lane widths and utilises 2.9m wide parking lanes on both sides of West Street. Existing travel lanes have been reduced to 2.9m, with the parking lanes on either side of West Street reducing to 2.1m typically.				
Turning Restrictions	The majority of existing permissible movements are proposed to be maintained with the exception of Emmett Street where there is a road closure implemented.				
Intersection Performance	Operational performance will not be altered to any noticeable extent at the Falcon Street and Ernest Street intersections. Modelling indicates that while queuing on the west leg of Amherst Street would increase, the queue would not increase beyond the on-ramp, which is located 175-metres from the West Street intersection.				
Bus Operations	Two northbound bus services (267, 263) are currently operating on West Street, between Ernest Street and Amherst Street. The narrowing of the existing travel lane from 3.5 to 2.9 of road widths will result in unsuitable bus travel lanes, which require a minimum of 3.2m travel lanes. On this basis,consultation with STA is required to agree on rerouting bus services.				
Parking	There is a total of 235 kerbside spaces across both sides of West Street. This includes 6 North Sydney Police spaces and 3 car share spaces. There is a total loss of -18 kerbside parking spaces due to alignment changes. There is also an additional 10 proposed car parking spaces along West Street. This results in a net loss of -8 parking spaces is anticipated.				
	EXISTING	235	PROPOSED	228	NET 8 LOSS
Loading	No changes are proposed to the loading zones on both the eastern and western side of street.				
	EXISTING	9	PROPOSED	9	NET GAIN/LOSS 0
Footpaths	The proposed shared environment intersection, pedestrian crossings and kerb extensions have created 1745 sqm of new footpath amenity. There is a reduction of 39 sqm for the relocation of kerb between Church Street and Ridge Street on the footpath on the eastern side to maintain loading bays.				
	PROPOSED	1586 sqm	LOSS	39 sqm	NET 1547 sqm
Landscape	Around the proposed raised intersection, landscaped build outs have been incorporated within the areas adjacent to the intersection where parking is not permitted. These are proposed to be planted with low level vegetation to maintain appropriate sight distances.				
	PROPOSED	1100 sqm	LOSS	7.4 sqm	NET 1092.6
Street Trees	The 2 tree losses include the following; 2 mature London Plain trees on the eastern side between Pacific Highway and Ridge. The retention value or health of the trees has not been assessed. An additional 12 have been proposed for West Street.				
	EXISTING	163	GAIN	12	NET 10 GAIN

9.5 OPTION A TRANSPORT REVIEW

A review of Option A concept design plans found the following key points:

Road Widths

Traffic lane dimensions are generally acceptable along the route.

Table 9.2 Minimum Road Width Requirements

Lane Type	Minimum widths
General Traffic Route	2.9m
Bus Route (Two-way road)	3.2m
Bus Route (One-way road)	3.5m
Parking Lane	2.1m

The Existing bus route travels between Ernest Street and Amherst Street. Option A proposes a traffic lane width of 2.9m where the State Transit Authority (STA) requires bus routes to be a minimum width of 3.2m. On this basis, consideration should be given to either widening the northbound traffic lane or consult with STA to rerouting bus services.

Pedestrian (Zebra) Crossings

Four new pedestrian crossing are proposed across the proposed route at Burlington St, Ridge St, Hayberry St and Holterman St.

Based on the Roads and Maritime Services guidelines (Supplement to Australian Standard 1742, Part 10 – Pedestrian control and Protection), a zebra crossing may be considered if warrants are met for vehicle and pedestrian volumes.

Warrants vary based on the site location, with crossings anticipated to be used by a high number of children, aged or mobility impaired pedestrians, or to be installed to alleviate safety issues, permitted for a reduced warrant criterion. Roads and Maritime Services warrants are summarised in Table 9.3.

Table 9.3 Pedestrian (Zebra) Crossing Warrants

(i) Normal Warrant: A pedestrian (Zebra) Crossing is warranted where:
(a) the pedestrian flow per hour (P) crossing the road is greater than or equal to 30 AND
(b) the vehicular flow per hour (V) through the site is greater than or equal to 500 AND
(c) the product PV is greater than or equal to 60,000
(ii) Reduced Warrant for sites used predominantly by children and by aged or impaired pedestrians
If the crossing is used predominantly by school children, is not suitable site for a Children's Crossing and in two
counts of one hour duration immediately before and after school hours:-
(a) P ≥ 30 AND
(b) V ≥ 200
a pedestrian (Zebra) Crossing may be installed.
If at least 50% of pedestrians using the crossing are aged or impaired and for each three one hour periods in a typical day
(a) P ≥ 30 AND
(b) V ≥ 200
(c) PV ≥ 60,000
a pedestrian (Zebra) Crossing may be installed
(iii) Special Warrant: In certain circumstances where:
(a) PV ≥ 45,000 (but less than 60,000)
(b) P ≥ 30 AND
(c) V ≥ 500
then consideration can be given to a potential pedestrian crossing site. In such circumstances, council should justify why this location is in need of special consideration

Pedestrian and vehicle volumes for the Hayberry Street-West Street intersection, Holtermann Street, Ridge Street and Burlington Street are not available. However, it is noted that Burlington Street and Ridge Street are suitable for reduced warrants as they are within a School Zone.

9.6 OPTION A INTERSECTION MODELLING

Intersection modelling has been undertaken at the following key intersections:

- Ernest Street-West Street
- Falcon Street-West Street.

The operation of the intersections has been assessed using SIDRA Intersection 8, a computer based modelling package which assesses intersection performance under prevailing traffic conditions. SIDRA calculates intersection performance measures such as 'average delay' that vehicles encounter and the level of service (LoS). SIDRA provides analysis of the operating conditions which can be compared to the performance criteria set out in Table 9.4.

The SIDRA models include an assessment of existing conditions and future conditions including an additional signal phase for cyclists. The existing intersection layouts and recommended proposed layouts are attached in Appendix 3.

The future intersection layouts have been designed to maintain the existing intersection performance as shown in the SIDRA modelling results in Table 9.5.

Amherst Street-West Street

The Amherst Street and West Street intersection is proposed to be converted from a roundabout operation to a give-way control, with West Street being the major road. SIDRA modelling has been undertaken at the intersection, with a give-way controlled layout to assess the impact of this proposal.

The results of the SIDRA analysis indicate that the overall operation of the give-way controlled intersection would continue to operate well, at a level of service (LoS) B. However, the key factor under consideration is the impact to queuing along the Amherst Street western leg of the intersection, which connects to the Warringah Freeway on-ramp, with a view to ensure queuing does not impact Freeway traffic. The results of the SIDRA analysis are summarised in Table 9.5 & 9.6.

Table 9.6 shows that while queuing on the west leg of Amherst Street would increase, the queue would not increase beyond the on-ramp, which is located 175-metres from the West Street intersection.

Table 9.4 Level of Service criteria for intersection operation

Level of Service	Average Delay (seconds per vehicle)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity At signals, incidents will cause excessive delays.	At capacity, requires other control mode
F	Greater than 71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; requires other control mode

Source: Roads and Maritime Guide to Traffic Generating Developments, 2002

Table 9.5 SIDRA Modelling Results

Intersection	Existing				Proposed Option 1A			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Ave. Delay (sec/veh)	Level of Service	Ave. Delay (sec/veh)	Level of Service	Ave. Delay (sec/veh)	Level of Service	Ave. Delay (sec/veh)	Level of Service
Ernest St-West St	28	B	30	C	28	B	24	B
Falcon St-West St	31	C	34	C	31	C	35	C
Amherst St	11	A	12	A	15	B	13	A

Table 9.6 Amherst queue length

Amherst Street (West leg)	Existing		Proposed	
	AM	PM	AM	PM
95%ile Queue (m)	36	38	52	40

9.7 TRANSPORT PLANNING MATRIX

The following Transport Planning and Management Decision Matrix has been adopted from the North Sydney Transport Strategy 2018 to deliver a justified and consistent transport planning and management decision that addresses North Sydney's transport vision and priorities.

The option also scores high in terms of social wellbeing and business amenity as the overall concept would increase green space and canopy cover significantly that would improve civic pride and amenity.

As the option does not improve/decrease fair access to parking it does not score positivity or negatively.

The option score negatively in terms of Business Activity as there are implicated ongoing costs associated with cleaning and maintaining the cycleway.

COMMUNITY TRANSPORT PRIORITY	WILL THE PROJECT:	MAKE WORSE				IMPROVE			NSTS RATING	TOTAL
		-3	-2	-1	0	1	2	3		
Safe Travel	Improve community safety by creating slow speed road environments where more vulnerable road users are protected from higher impact road users and the number of crashes and severity of injuries is minimised?							✓	0.81	2.43
Transport Security	Improve personal security through improved streetscape design, increased street activity and passive surveillance?					✓			0.81	0.81
Social Wellbeing	Provide social spaces where human interaction is given the highest priority and the negative impacts of traffic are minimised, promoting incidental social interaction, increasing civic pride, reducing anti-social behaviour and community policing requirements?							✓	0.65	1.95
Active Health	Provide infrastructure that encourages healthy and active lifestyle/travel choices?							✓	0.65	1.95
Fair Access to Parking	Reduce demand for parking and / or provide more equitable access to existing parking supply?				✓				0.59	0
Environmental Sustainability	Encourage the use of low greenhouse gas emitting transport options?					✓			0.56	0.56
Local Environments	Encourage the use of travel modes that have minimal impact on air quality, water quality and noise?							✓	0.56	1.68
Transport Affordability	Encourage the use of travel options with lower social, health and economic costs and higher social, health and economic benefits?							✓	0.51	1.53
Congestion	Apply travel demand management principles to minimise traffic demand and associated traffic congestion?				✓				0.44	0
Business Amenity	Increase business opportunities by improving the look/ amenity of North Sydney throughout the day and in to the evening						✓		0.38	0.76
Business Activity	Reducing the whole of life cost of transport networks, including the ongoing costs associated with cleaning and maintaining assets?			✓					0.38	-0.38
									TOTAL	**11.29**

9.8 Option B: One way separated bike path

From the Pacific Highway to Ridge Street a two-way cycleway connects to the one way separated bike path which continues until Amherst Street. Between Pacific Highway and Ridge Street, a one way separated bike path was deemed unfeasible due to a lack of road corridor space, which would result in a loss of parking. The one way separated cycleway connects with the proposed Ridge Street bi-directional cycleway, and a number of existing cycle routes alon the route. Along West Street there is minimum alignments to the existing kerbs, lighting and parking. The cycleway lane widths for each direction are 1.85m along the majority of the alignment and 1.75m in areas to maintain minimum travel lane widths.

From Ridge Street to Falcon Street and from Ernest Street to Amherst Street the two way travel lanes have been reduced to a single travel lane for motorists travelling north. Conversion of some sections West Street to a one-way operation will redirect majority of traffic towards Miller Street which runs parallel to West Street. On this basis, to understand the impacts of converting West Street to a one-way operation, a wider traffic modelling assessment is required, with consideration for a network analysis of West Street and Miller Street.

For the following intersections a shared environment intersection has been designated:

- Metcalfe Street
- Huntington Street
- Trafalgar Street
- Ernest Lane
- Burlington Lane
- Falcon Lane
- Hayberry Street

Bend out/in treatments for the following intersections has been implemented:

- Myrtle Street
- Carlow Street
- Emmett Street
- Burlington Street
- Holterman Street
- Rosiland Street

Several new pedestrian crossings are proposed for Option B including at the intersections Amherst Street-West Street, Rosalind Street-West Street, Holtermann Street-West Street and Burlington Street-West Street.

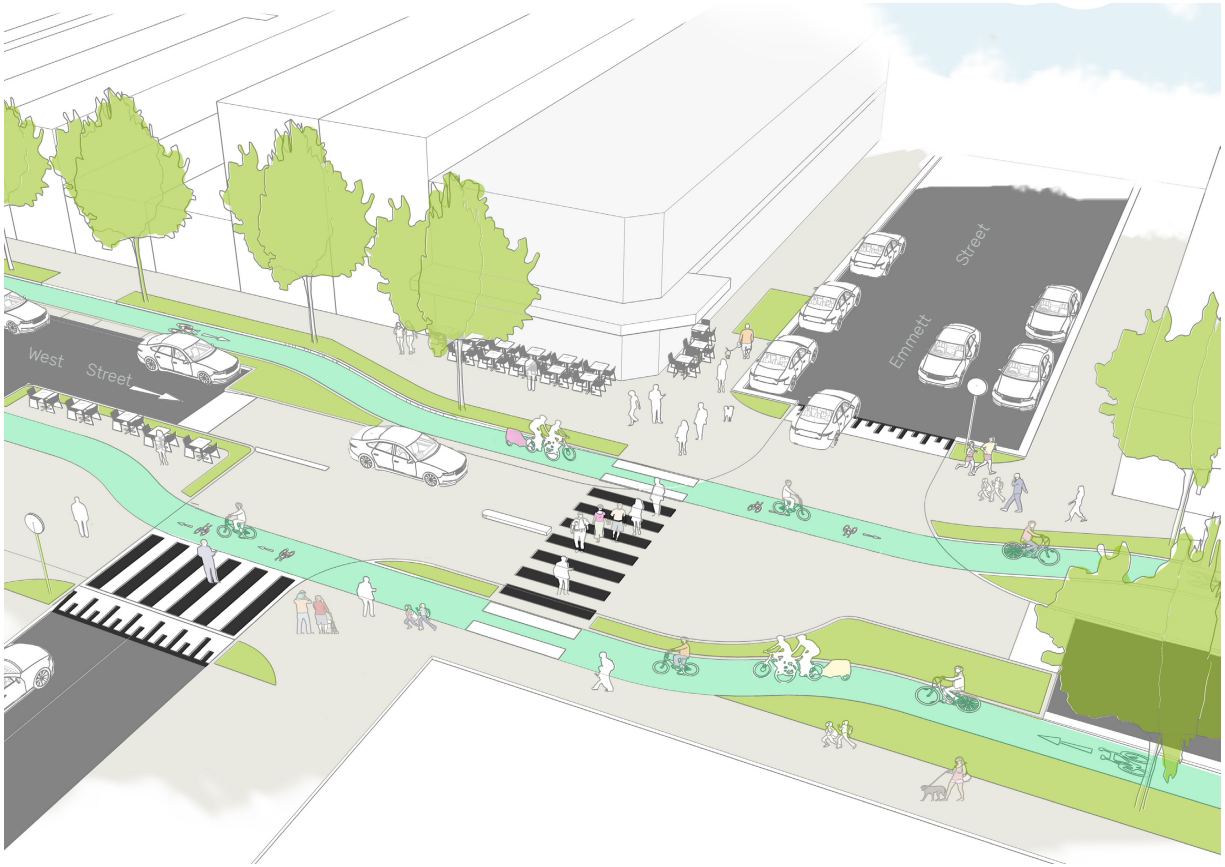
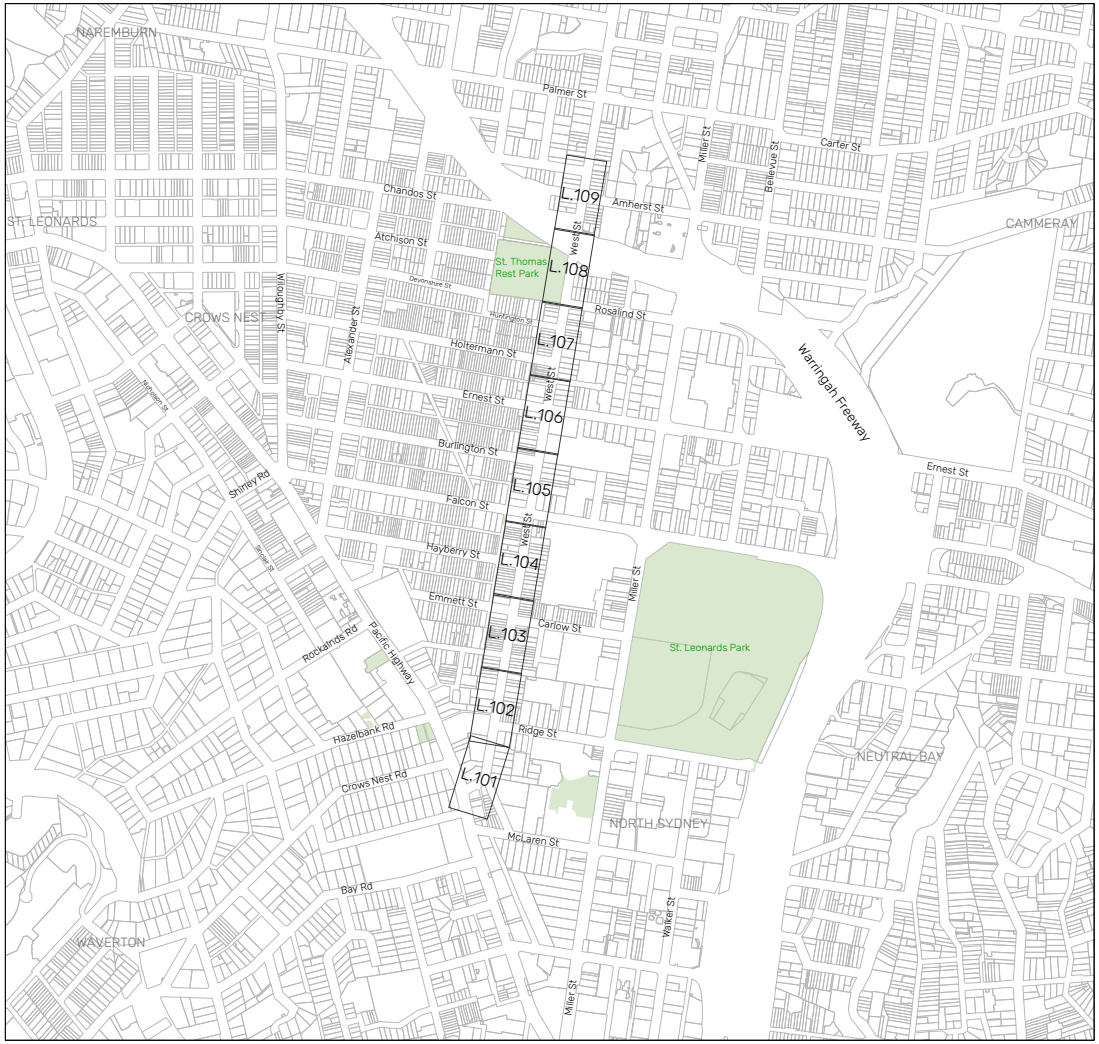


Figure 9-2: Proposed One Way Separated Bike Path - West Street and Emmett Street intersection

West Street - Concept Design - B - Separated One Way Pair

Pacific Highway to Amherst Street, North Sydney



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Drawings (000)			
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Concept Design (100)			
L.101	CONCEPT DESIGN 1 OF 9	1:400 @ A3	D
L.102	CONCEPT DESIGN 2 OF 9	1:400 @ A3	D
L.103	CONCEPT DESIGN 3 OF 9	1:400 @ A3	D
L.104	CONCEPT DESIGN 4 OF 9	1:400 @ A3	D
L.105	CONCEPT DESIGN 5 OF 9	1:400 @ A3	D
L.106	CONCEPT DESIGN 6 OF 9	1:400 @ A3	D
L.107	CONCEPT DESIGN 7 OF 9	1:400 @ A3	D
L.108	CONCEPT DESIGN 8 OF 9	1:400 @ A3	D
L.109	CONCEPT DESIGN 9 OF 9	1:400 @ A3	D

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SMM PROJECT No: 17070

PROJECT West Street Cycleway

SHEET 001

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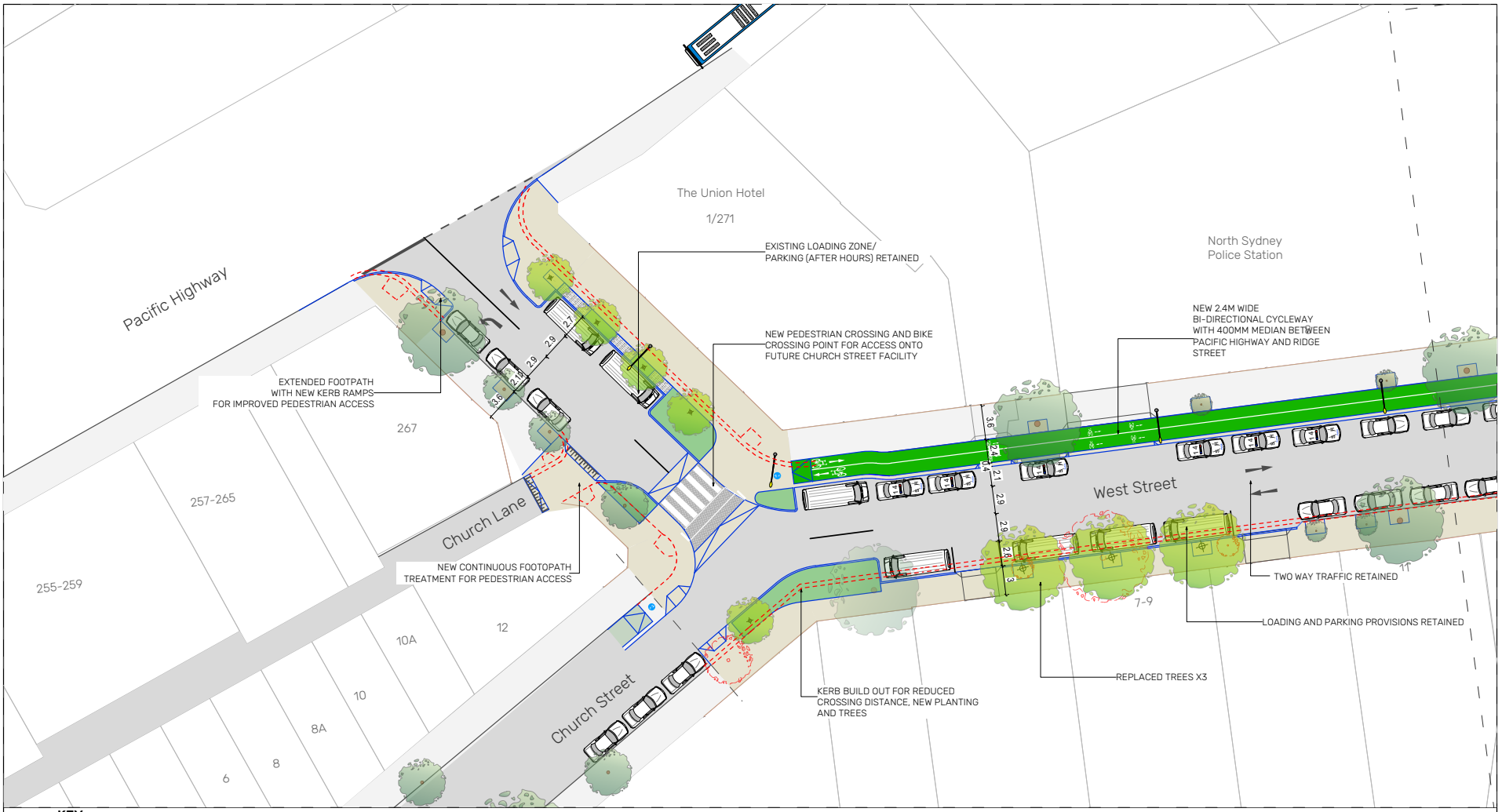

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- Existing light pole
- Existing tree
- Existing traffic signal
- Existing parking
- Bus Stop
- Loading Bay
- Emergency Service parking
- Car Share Parking
- Existing Pavement
- Existing Bike Lane
- New or proposed item
- New cycleway
- New garden bed
- New pavement
- New parking
- New lighting
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- New Tree

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D	Draft Final Concept Design	LH / MD	LH / MD	MS	25/07/18
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B	50% Concept Design	LH / MD	LH / MD	MS	04/06/18
A	DRAFT FOR DISCUSSION	LH / MD	LH / MD	MS	29/05/17

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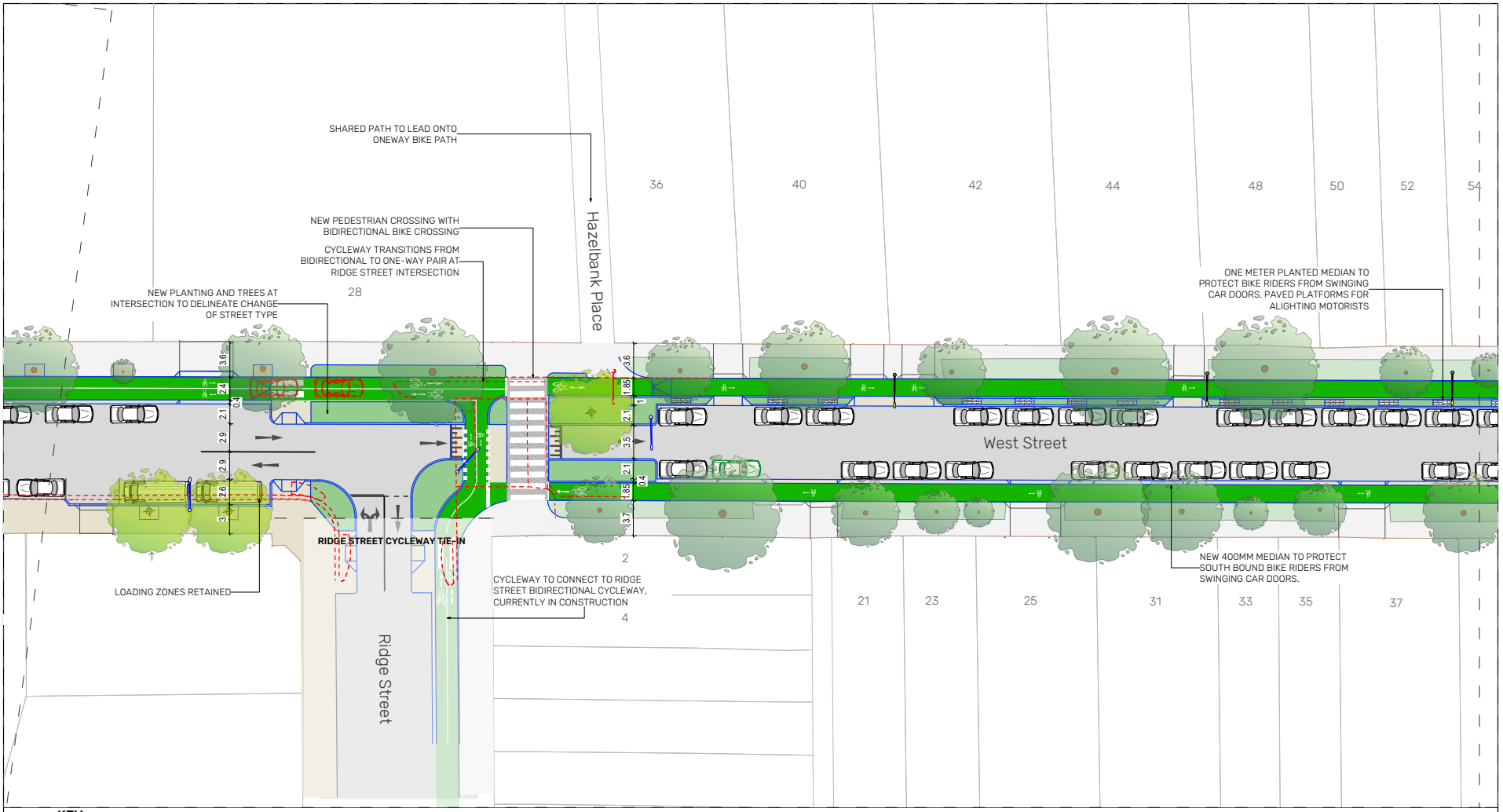
PROJECT West Street Cycleway

SHEET 101

DRAWING Concept Design B - Separated One Way Pair

REVISION D



KEY

- Existing item
- Existing item removed
- Existing light pole
- Existing tree
- Existing traffic signal
- Existing parking
- Bus Stop
- Loading Bay
- Emergency Service parking
- Car Share Parking
- Existing Pavement
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- New pavement
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PROJECT: West Street Cycleway

SHEET: 102

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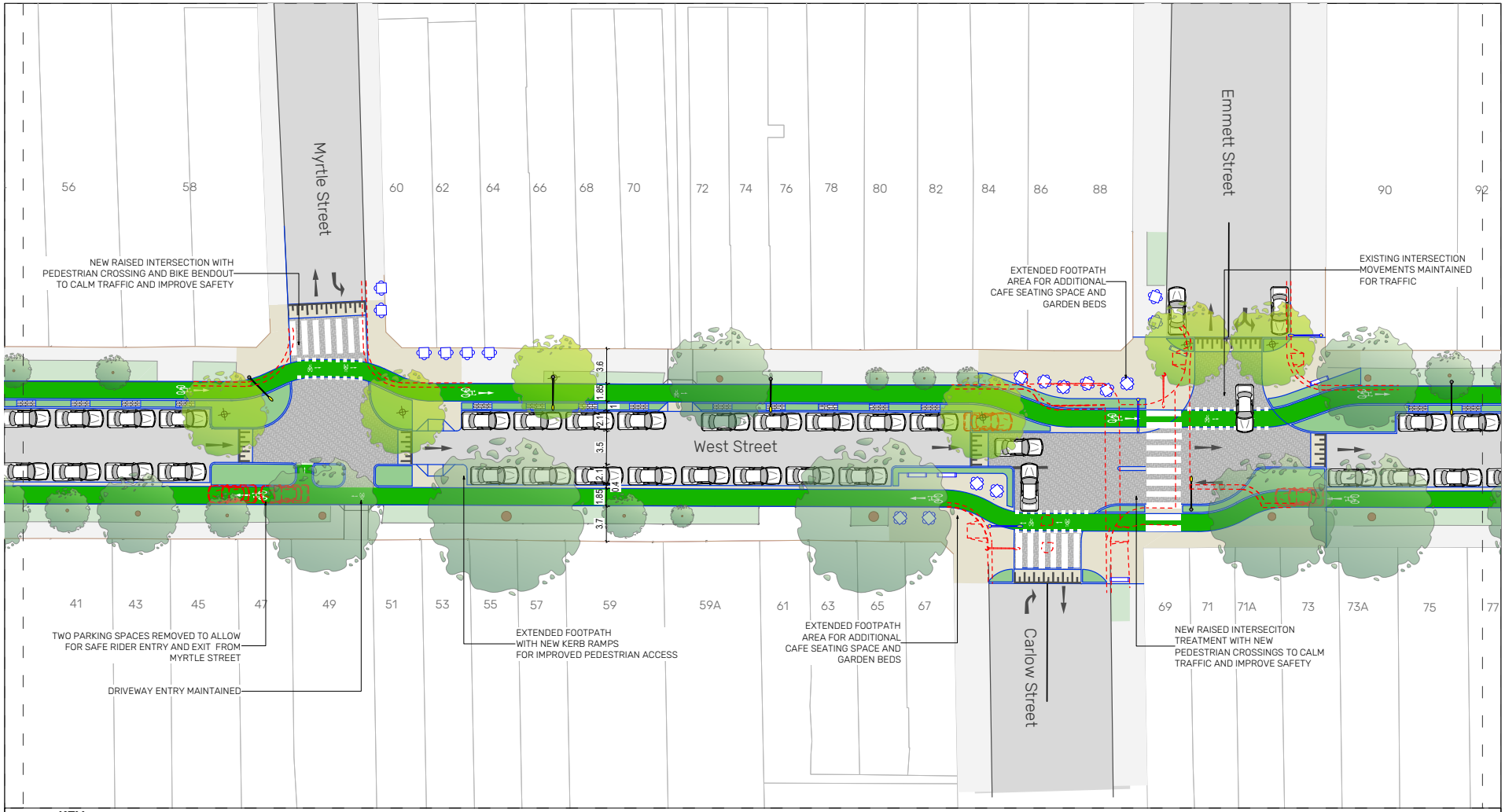

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Existing tree	Car Share Parking	New pavement	
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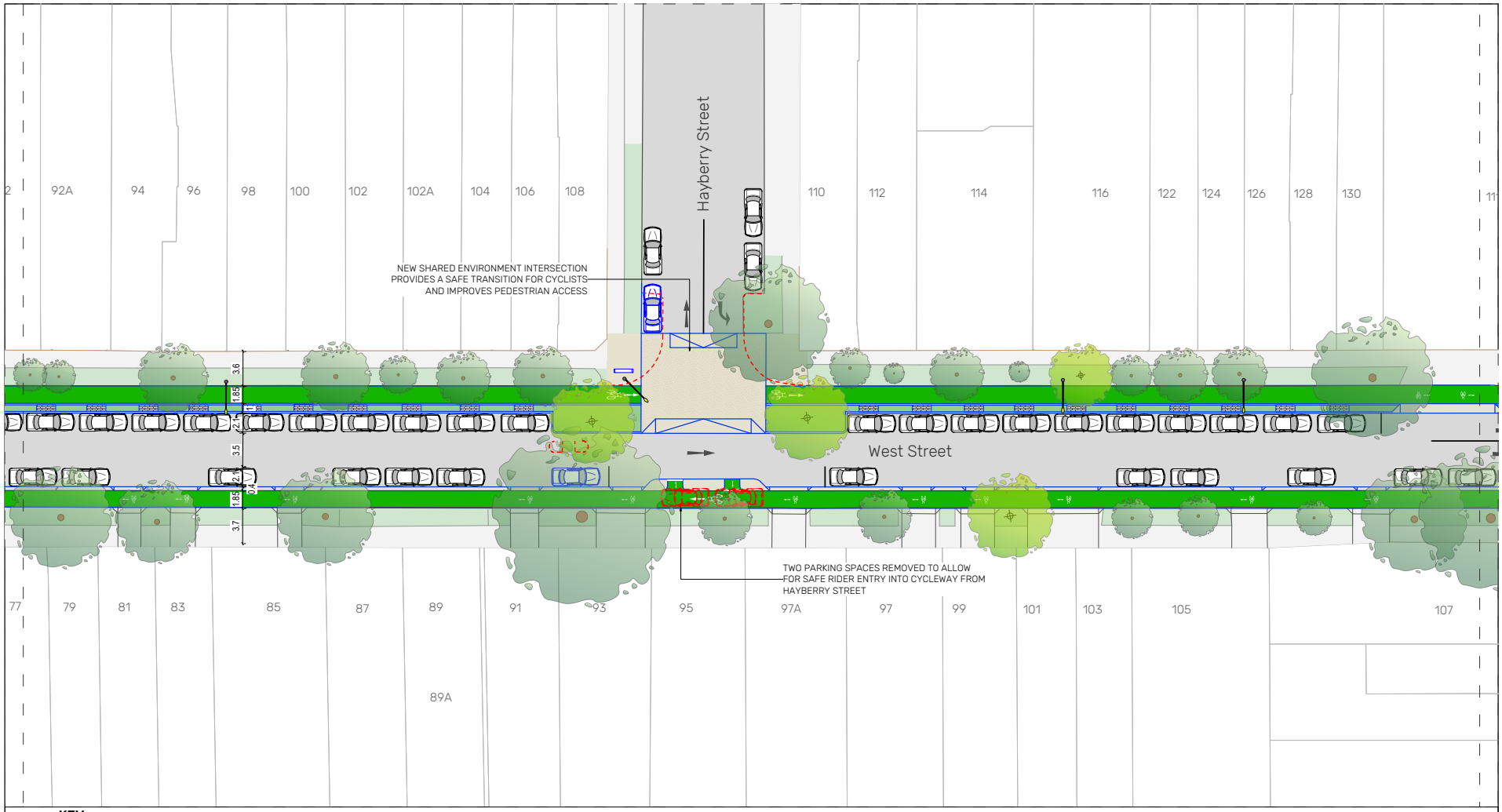

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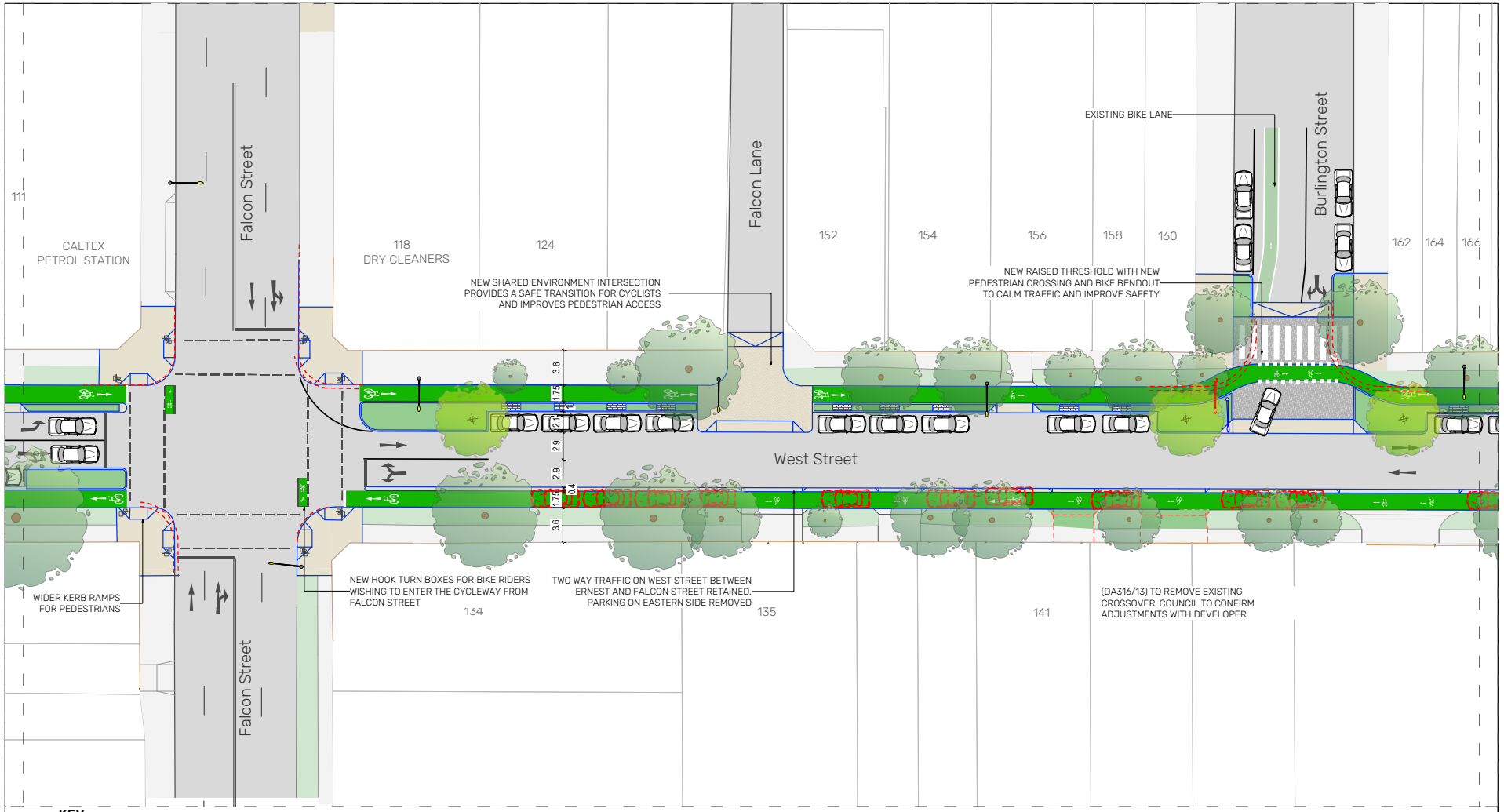

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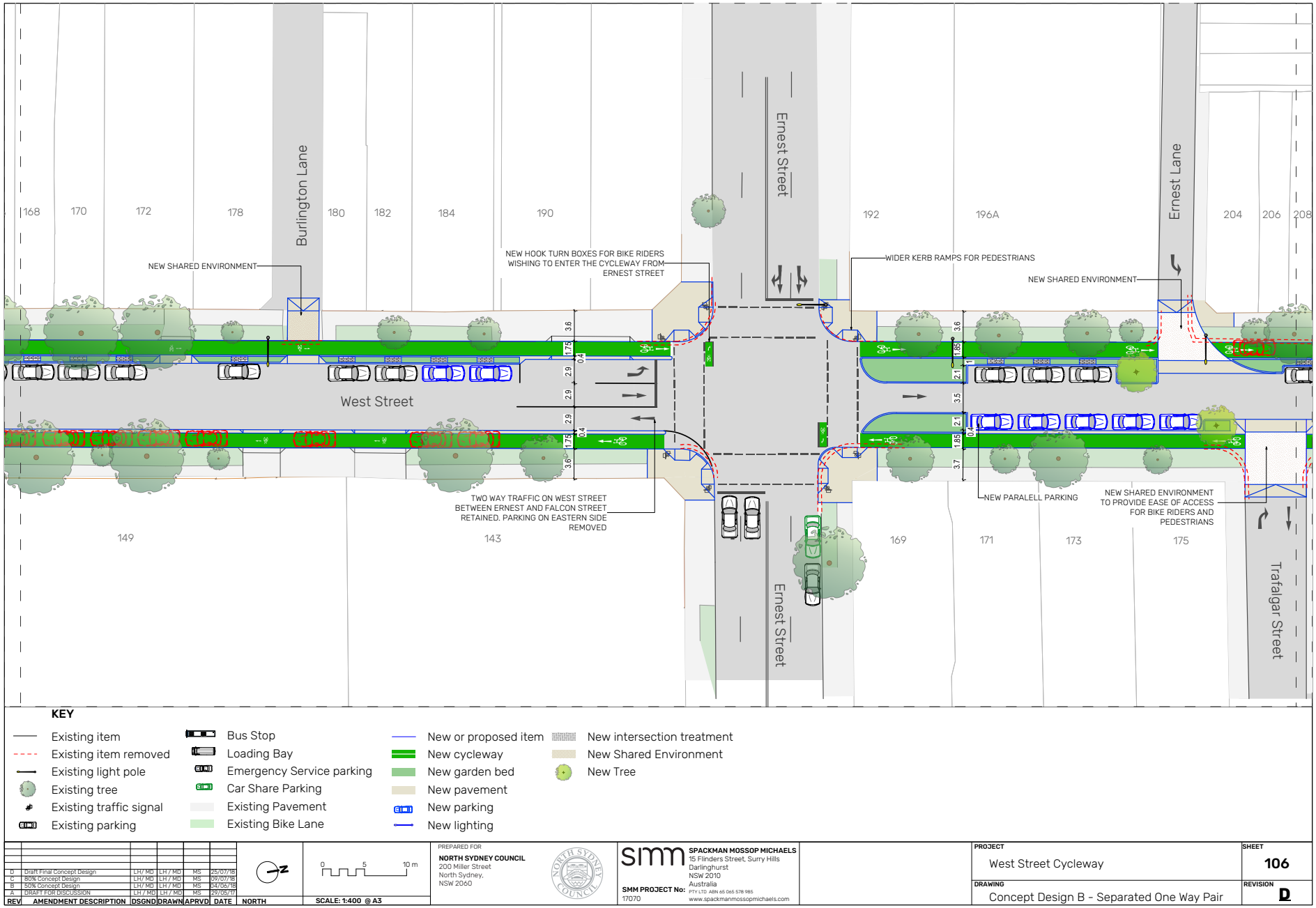

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SHEET: 106
DRAWING: Concept Design B - Separated One Way Pair
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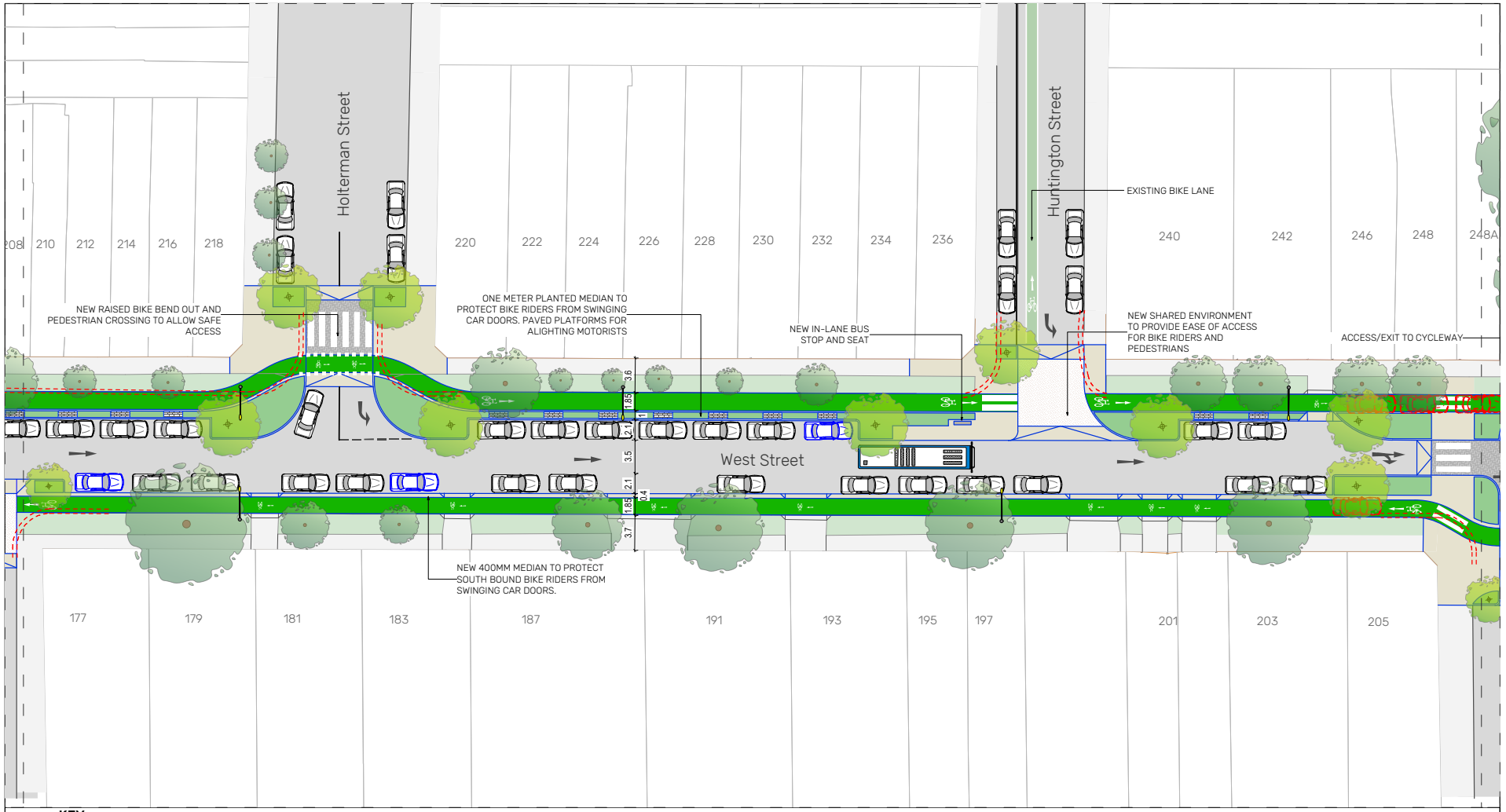

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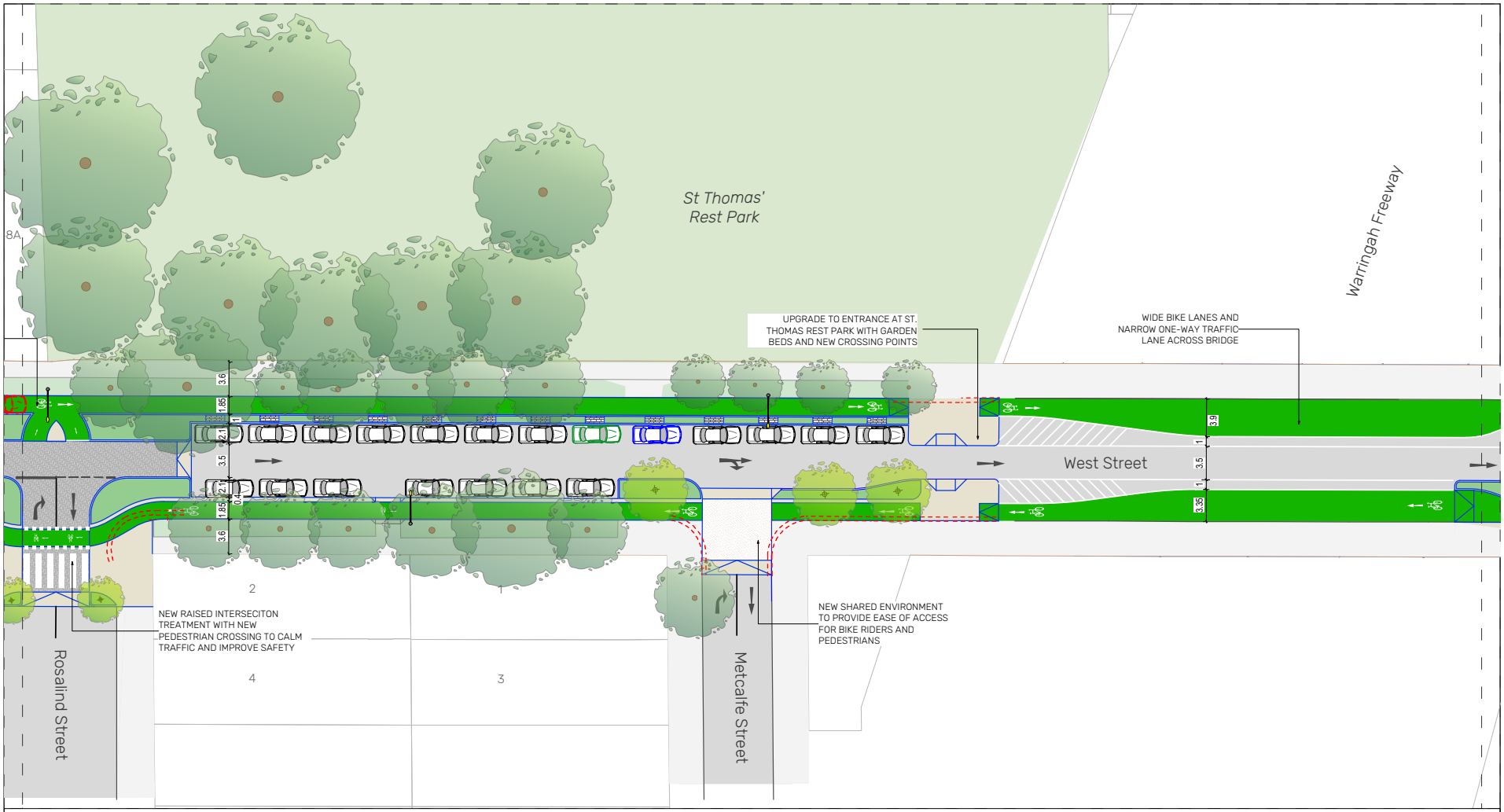
REVISION D



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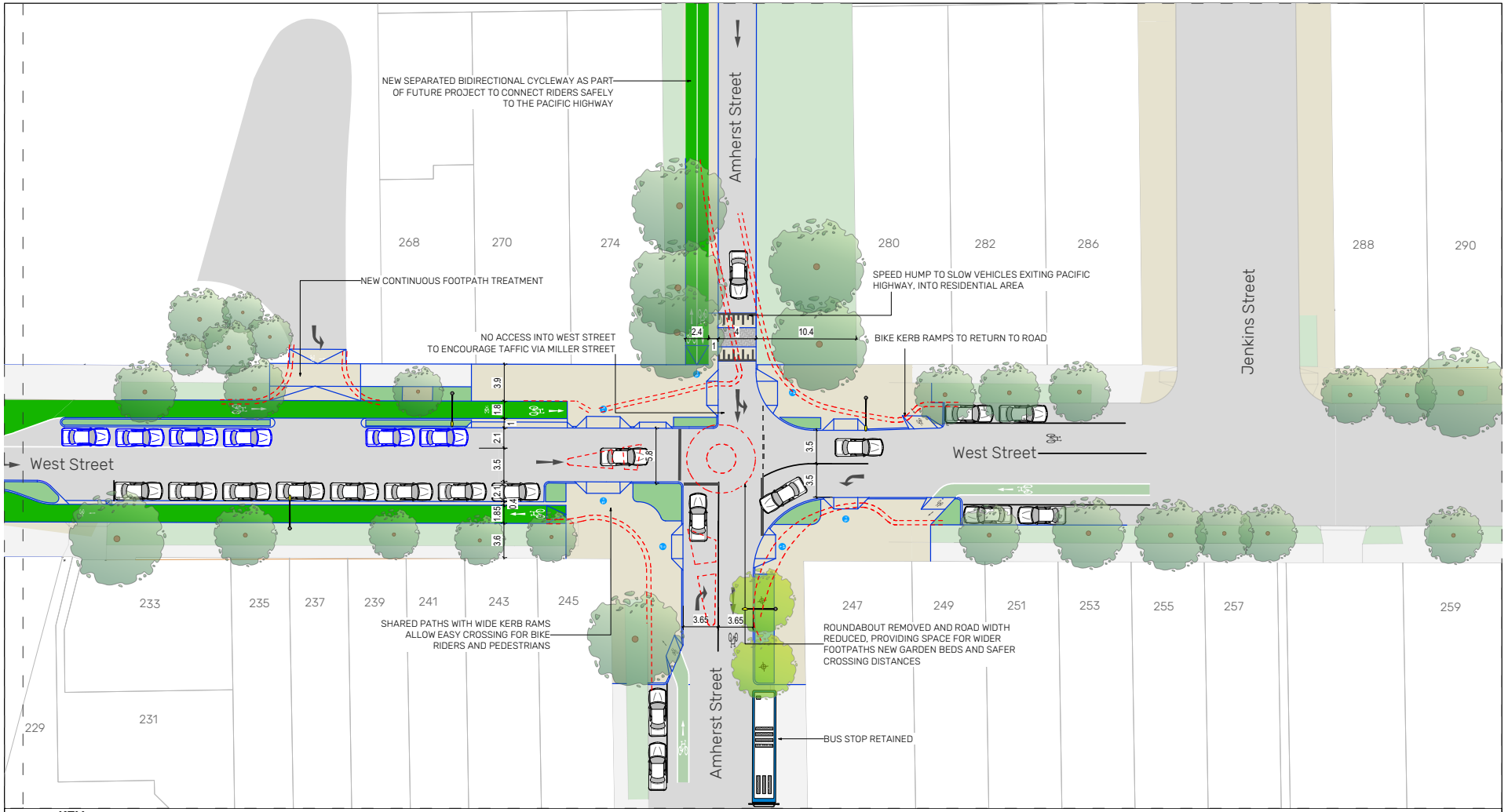

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REVISION D

9.10 OPTION B STREET SUMMARY ASSESSMENT

Table 9.7 identifies the impacts of the proposed one way separated bike path on the existing road geometry, intersection performance, bus operation and parking. It also captures the net loss/gain of footpath space and street trees.

Table 9.7 Option B - Impact assessment Street Summary

Option B - One way separated bike paths	
ITEM	**DESCRIPTION**
Road Geometry	The width of the proposed travel lane narrows to approximately 2.9m in each direction where two way traffic is maintained. From Ridge Street to Falcon Street and Ernest Street to Amherst Street the two way traffic lanes have been altered to a single 3.5m wide traffic lane.
Turning Restrictions	Turning movements to and from side streets (Church Street, Carlow Street, Emmett Street, Hayberry Street, Burlington Street, Holterman Street, Huntington Street, Rosalind Street, Metcalfe Street, Amherst Street) have turning resitrictions in order to facilitate for the one way traffic lane.
Intersection Performance	To be investigate further.
Bus Operations	Two northbound bus services operate on West Street between Ernest Street and Amherst Street. Conversion of West Street to one-way northbound would allow the bus service to be maintained as per existing conditions. An in-lane bus stop is also proposed on West Street before Huntington Street. Further assessment of the estimated delay and queuing impact from an in-lane bus stop may be Required (i.e. review of bus operation times at the existing stop).
Parking	There are currently 235 existing kerbside spaces on both sides of West Street. This includes 6 North Sydney Police spaces and 3 car share spaces. There is a loss of -31 kerbside parking spaces due to alignment changes. There is also an additional 19 proposed car parking spaces along West Street. This results in a total net loss of -15 car parking along the entire route. EXISTING 235 PROPOSED 220 NET 12 LOSS
Loading	No changes are proposed to the loading zones on both the eastern and western side of street. EXISTING 9 PROPOSED 9 NET GAIN/LOSS 0
Footpaths	The proposed shared environment intersection, pedestrian crossings and kerb extensions have created 1745 sqm of new footpath amenity. There is a reduction of 33 sqm for the relocation of kerb between Chruch Street and Ridge Street on the footpath on the eastern side to maintain loading bays. PROPOSED 1745 sqm LOSS 33 sqm NET 1712 sqm
Landscape	Around the proposed raised intersection, landscaped build outs have been incorporated within the areas adjacent to the intersection where parking is not permitted. These are proposed to be planted with low level vegetation to maintain appropriate sight distances. PROPOSED 1354 sqm LOSS 24.8 sqm NET 1329.2 sqm
Street Trees	The 2 tree losses include the following; 1 mature London Plain and a young tree on the eastern side of West Street between Pacific Highway and Ridge. The retention value or health of the trees has not been assessed. An additional 43 trees have been proposed along West Street. EXISTING 163 IMPACT +41 INCREASE OF 41 TREES

9.11 OPTION B TRANSPORT REVIEW

A review of the Option B concept design plans identifies the following key points:

Pedestrian (Zebra) Crossings

Several new pedestrian crossings are proposed for Option B including at the intersection of Amherst Street-West Street, Rosalind Street-West Street, Holtermann Street-West Street and Burlington Street-West Street.

Pedestrian crossing volumes at the intersection of Amherst Street-West Street have been reviewed and do not meet normal warrants which require 50 pedestrians per hour for three separate one-hour periods. The pedestrian crossing volumes at the Amherst Street-West Street intersection are summarised in Table 9.3, which indicate two one-hour periods exceed 50 pedestrians per hour on the southern approach, and only one period on the eastern approach.

Pedestrian and vehicle volumes for the Rosalind Street-West Street intersection, Carlow Street, Holtermann Street and Burlington Street are not available. However, it is noted that Burlington Street is suitable for reduced warrants as it is within a School Zone.

Bus Operation

A northbound bus service currently operates on West Street between Ernest Street and Amherst Street. Conversion of West Street to one-way northbound would allow the bus service to be maintained as per existing conditions.

A secondary option to convert West St to one-way southbound is also under consideration. This would result in the rerouting of the existing 267 and 263 bus routes, via Miller Street.

Consultation with STA is required if one-way southbound traffic is proposed along West Street. An in-lane bus stop is also proposed on West Street before Huntington Street. Further assessment of the estimated delay and queuing impact from an in-lane bus stop may be required (i.e. review of bus operation times at the existing stop).

One-way Traffic Operation

West Street is a key local collector road with the road being used to access major nearby arterial roads including Pacific Highway and Warringah Freeway (via Ernest Street and Falcon Street). Conversion of some sections of West Street to a one-way operation will redirect traffic towards Miller Street which runs parallel to West Street. On this basis, to understand the impacts of converting West Street to a one-way operation, a wider traffic model assessment is required, with consideration for a network analysis of West Street and Miller Street. The key routes for the West Street one-way northbound configuration are shown in Figure 9.3.

The key routes for the West Street one-way southbound configuration are shown in Figure 94.

lote: Only key removed and diverted traffic
novements are presented in this figure. Traffic is
also anticipated to divert via other local roads.

Figure 9-3: One way Northbound

te: Only key removed and diverted traffic
ovements are presented in this figure. Traffic is
o anticipated to divert via other local roads.

Figure 9-4: One way Southbound

9.12 TRANSPORT PLANNING MATRIX

Option B has been assessed using the Transport Planning and Management Decision Matrix, as shown on the page inset. Option B, scores high in terms of safe travel and transport security as cyclists are fully separated from traffic.

The option also scores high in terms of social wellbeing and business amenity as the overall concept would increase green space and canopy cover significantly that would improve civic pride and amenity.

Option B score low in terms of fair access to parking as it would reduce the existing car parking provision on West Street by 12 car parking spaces.

It is suggested that there may be traffic congestion associated with Option B due to conversion of West Street to a one way steet. Thus, it has scored low in this category. However, it should be noted that a wider scope for traffic modelling is required to assess the impact of converting West Street to one-way.

The option score negatively in terms of Business Activity as there are implicated ongoing costs associated with cleaning and maintaining the cycleway.

COMMUNITY TRANSPORT PRIORITY	WILL THE PROJECT:	MAKE WORSE				IMPROVE			NSTS RATING	TOTAL
		-3	-2	-1	0	1	2	3		
Safe Travel	Improve community safety by creating slow speed road environments where more vulnerable road users are protected from higher impact road users and the number of crashes and severity of injuries is minimised?							✓	0.81	2.43
Transport Security	Improve personal security through improved streetscape design, increased street activity and passive surveillance?					✓			0.81	0.81
Social Wellbeing	Provide social spaces where human interaction is given the highest priority and the negative impacts of traffic are minimised, promoting incidental social interaction, increasing civic pride, reducing anti-social behaviour and community policing requirements?							✓	0.65	1.95
Active Health	Provide infrastructure that encourages healthy and active lifestyle/travel choices?							✓	0.65	1.95
Fair Access to Parking	Reduce demand for parking and / or provide more equitable access to existing parking supply?			✓					0.59	-0.59
Environmental Sustainability	Encourage the use of low greenhouse gas emitting transport options?							✓	0.56	1.68
Local Environments	Encourage the use of travel modes that have minimal impact on air quality, water quality and noise?							✓	0.56	1.68
Transport Affordability	Encourage the use of travel options with lower social, health and economic costs and higher social, health and economic benefits?							✓	0.51	1.53
Congestion	Apply travel demand management principles to minimise traffic demand and associated traffic congestion?		✓						0.44	-0.88
Business Activity	Increase business opportunities by improving the look/ amenity of North Sydney throughout the day and in to the evening.						✓		0.38	0.76
Business Activity	While also reducing the whole of life cost of transport networks, including the ongoing costs associated with cleaning and maintaining assets?			✓					0.38	-.38
									TOTAL	**10.94**

9.13 Option C: Mixed traffic / bicycle boulevard

The proposed Bicycle Boulevard has been developed to achieve a lower speed environment within West Street to enable cyclists and motor vehicles to safely share the available roadway. The potential impacts and benefits of the street functions are considered in Table 9.9.

Along the length of the route, the following has been introduced:

Removal of the existing centre line, bicycle lane and car parking lane line markings;

- A narrowing of existing traffic lanes to 2.9m and introduction of a 2.8m central median with street trees;
- Introduction of sharrow pavement markings at 45m intervals along West Street;
- Introduction of sharrow pavement markings at the entry in to each of the cross streets;

and;

- Distinctive pavement treatments for each side road entry to West Street, which could include the use of pavers or imprinted bitumen or concrete.

There is a proposed ban on vehicles travelling south on West Street, with a left turn ban on vehicles travelling from Ernest Street. On West Street, south of Amherst Street; a road closure is introduced to direct traffic towards Millar Street/Palmer Street. Access for residents on West Street will be via Rosiland Street and Ernest Street. Cross Streets that have identified as low traffic, a road closure treatment has been implemented such streets include; Burlington Street and Holterman Street.

The proposed traffic treatments are anticipated to encourage increased use of the route by cyclists for commuting, education, social and leisure purposes. The general reduction in traffic speeds, resulting in a lower speed difference between the majority of vehicles and cyclists is expected to provide a safer environment for less confident cyclists.

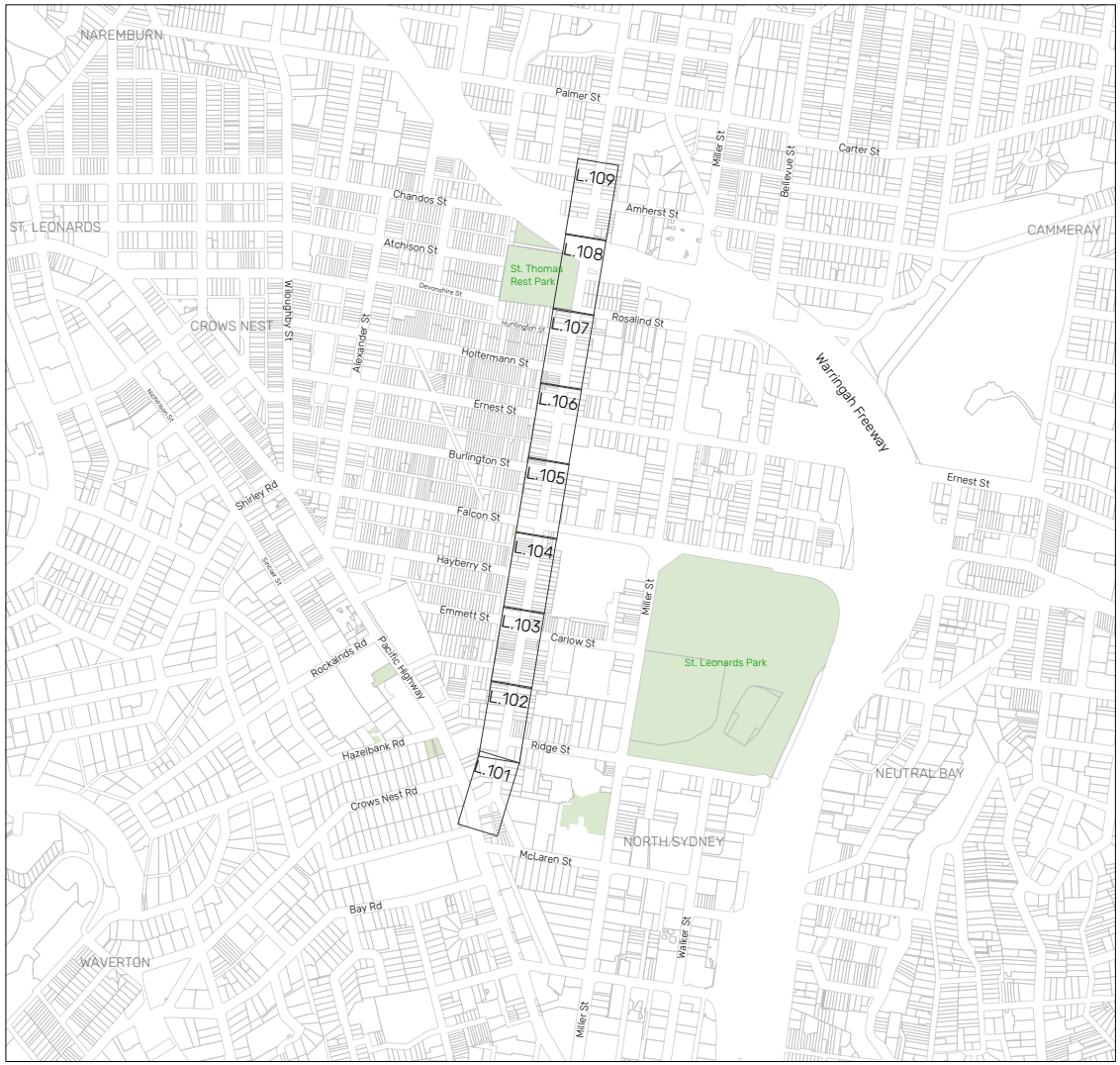
As well as the major use as a commuting route to North Sydney CBD and Sydney CBD, it is anticipated that the route could encourage more local cycling access along existing cycling routes, Primary and Secondary Schools and local businesses in the area.

The overall level of increase in cycling activity will also be dependent on the completion of safe cycling connections along the whole of the proposed North Shore Cycleway, of which West Street will form part.

Figure 9-5: Proposed 3C: Mixed traffic / Bike Boulevard

West Street - Concept Design Option C - 'Bike Boulevard'

Pacific Highway to Amherst Street



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ISSUE	TITLE	SCALE	ISSUE
Drawings (000)			
L.001	COVER PAGE	1:10,000 @ A3	B
Concept Design (100)			
L.101	CONCEPT DESIGN 1 OF 9	1:400 @ A3	B
L.102	CONCEPT DESIGN 2 OF 9	1:400 @ A3	B
L.103	CONCEPT DESIGN 3 OF 9	1:400 @ A3	B
L.104	CONCEPT DESIGN 4 OF 9	1:400 @ A3	B
L.105	CONCEPT DESIGN 5 OF 9	1:400 @ A3	B
L.106	CONCEPT DESIGN 6 OF 9	1:400 @ A3	B
L.107	CONCEPT DESIGN 7 OF 9	1:400 @ A3	B
L.108	CONCEPT DESIGN 8 OF 9	1:400 @ A3	B
L.109	CONCEPT DESIGN 9 OF 9	1:400 @ A3	B

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DRAWING Concept Design Option C - Bike Boulevard

REVISION B

KEY

- Existing item
- Existing item removed
- Existing tree
- Existing garden bed
- New or proposed item
- New cycleway
- New garden bed
- New pavement
- New parking
- New tree
- New cobble/rumble strip
- New Bike Boulevard Marking
- New Bike Boulevard Marking - Side Street
- Existing parking
- Existing bus stop
- Existing loading bay
- Existing special use parking

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SHEET 101
DRAWING Concept Design Option C - Bike Boulevard
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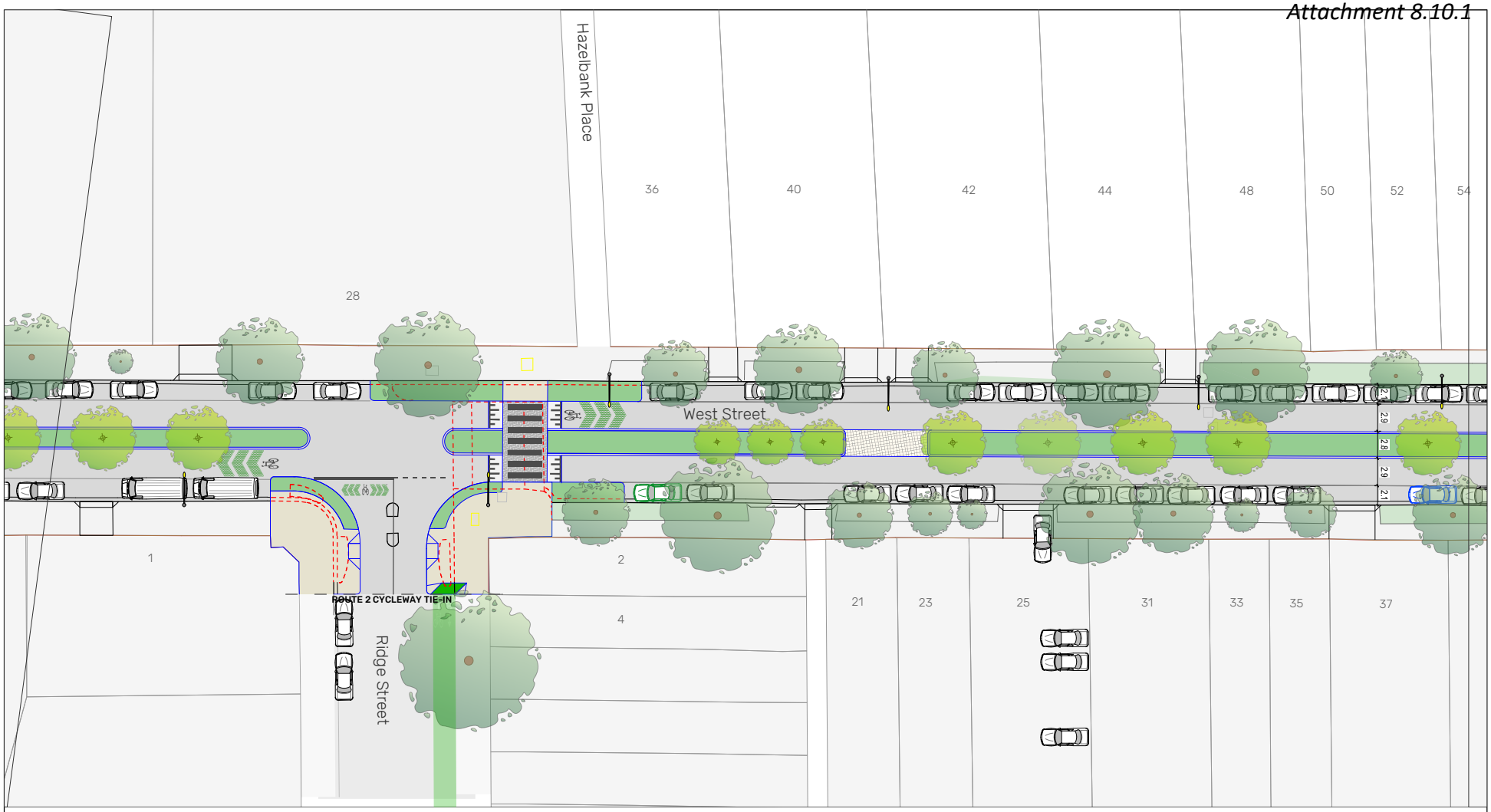

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- New Bike Boulevard Marking
- New Bike Boulevard Marking - Side Street
- Existing parking
- Existing bus stop
- Existing loading bay
- Existing special use parking

REV	AMENDMENT DESCRIPTION	DSGND	DRAWN	APRVD	DATE
B	80% Concept Design	FM / MD	FM / MD	MS	23/07/18
A	50% Concept Design	FM / MD	FM / MD	MS	03/07/18

NORTH

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SCALE: 1:400 @ A3

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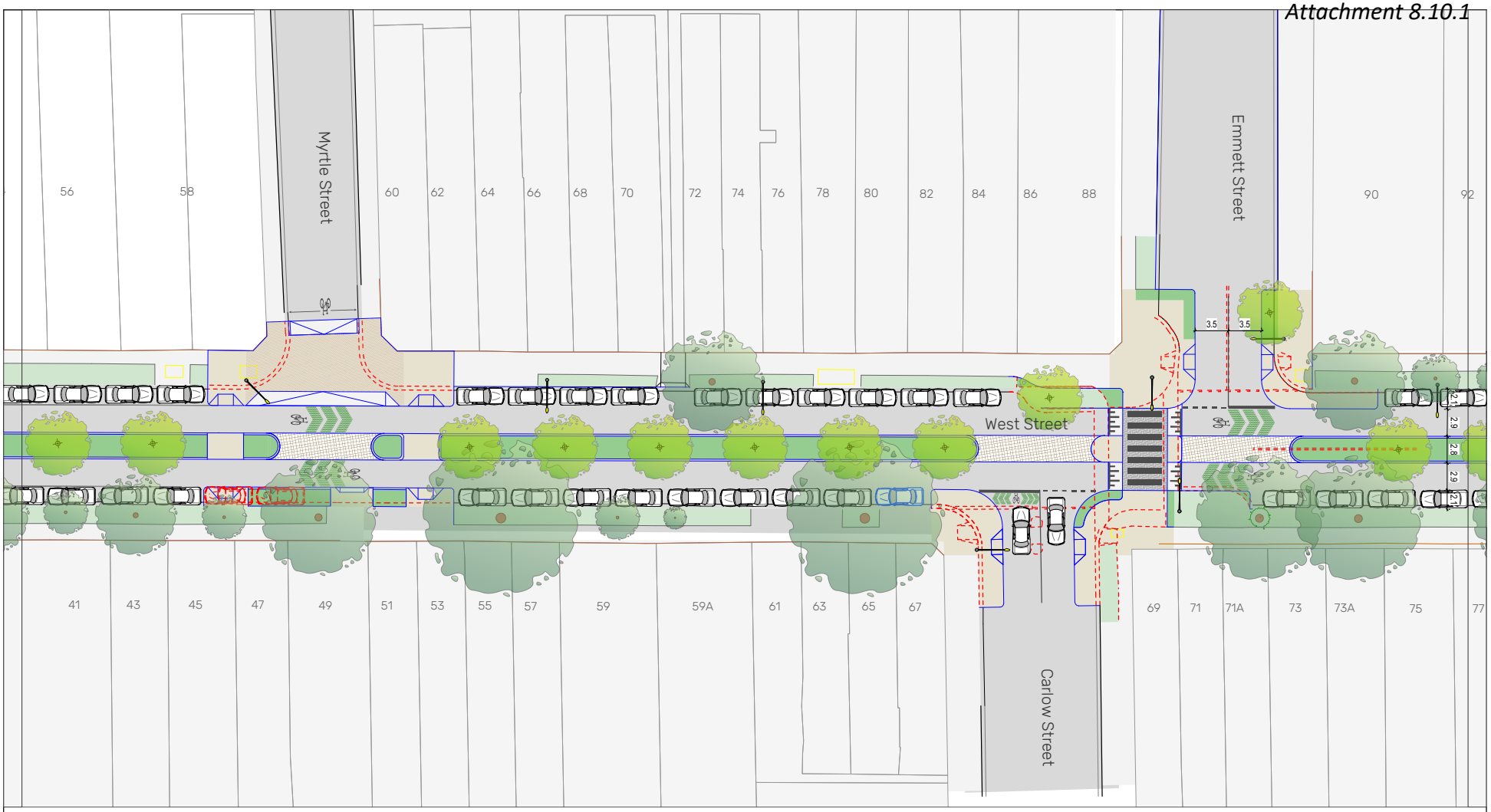
SMM PROJECT No: 17070

PROJECT West Street Cycleway

SHEET 102

DRAWING Concept Design Option C - Bike Boulevard

REVISION B



KEY

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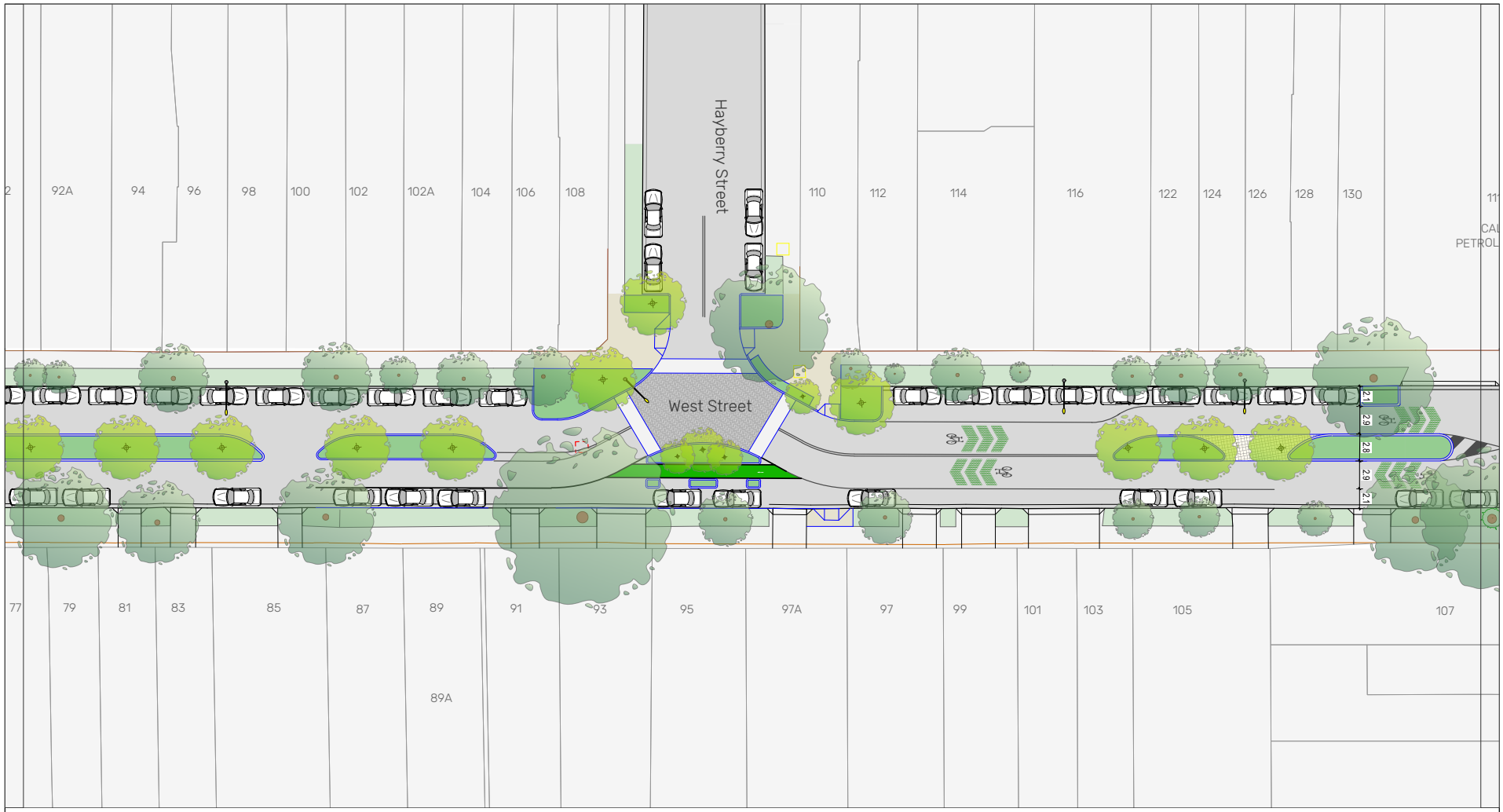

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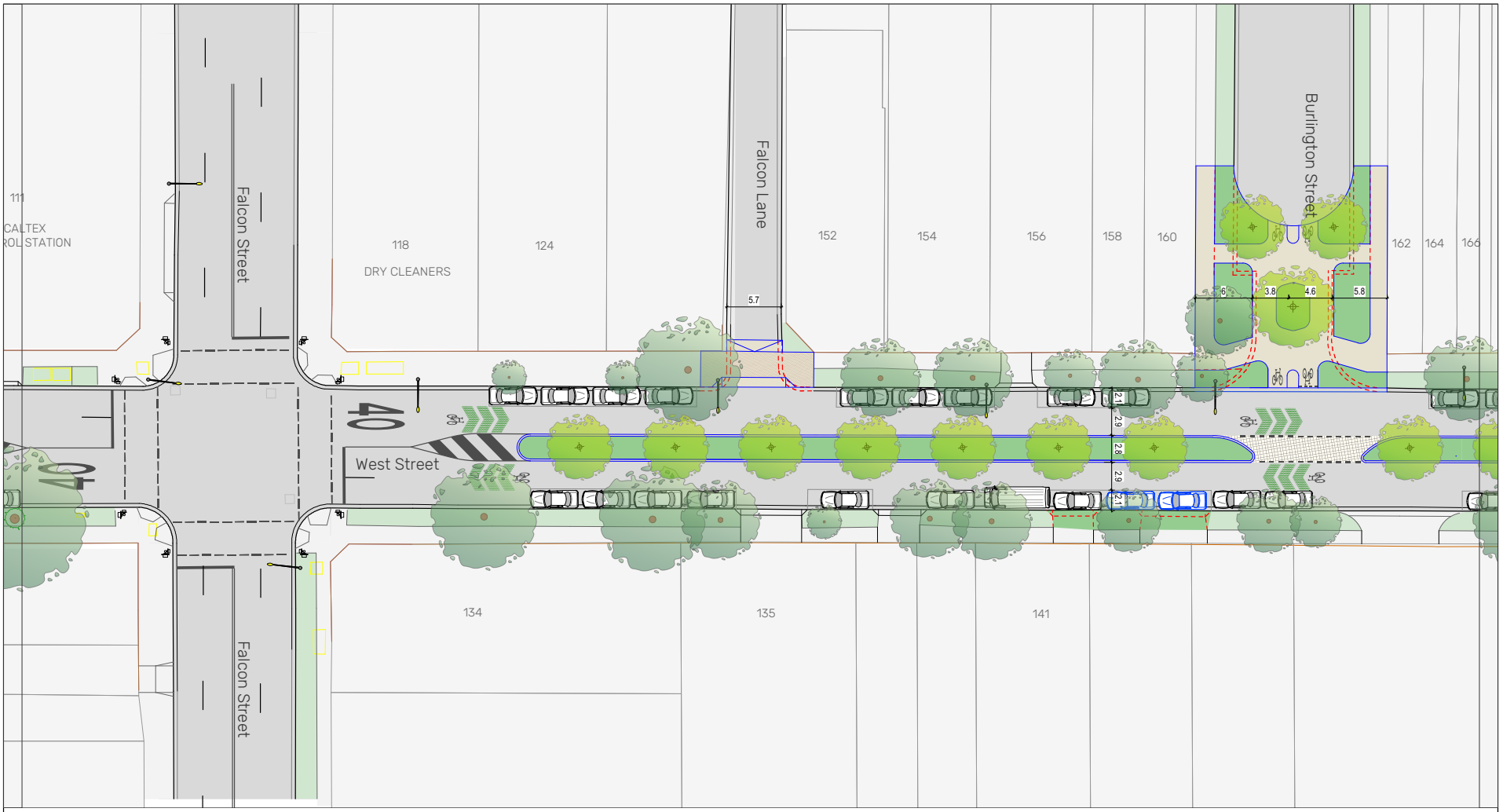

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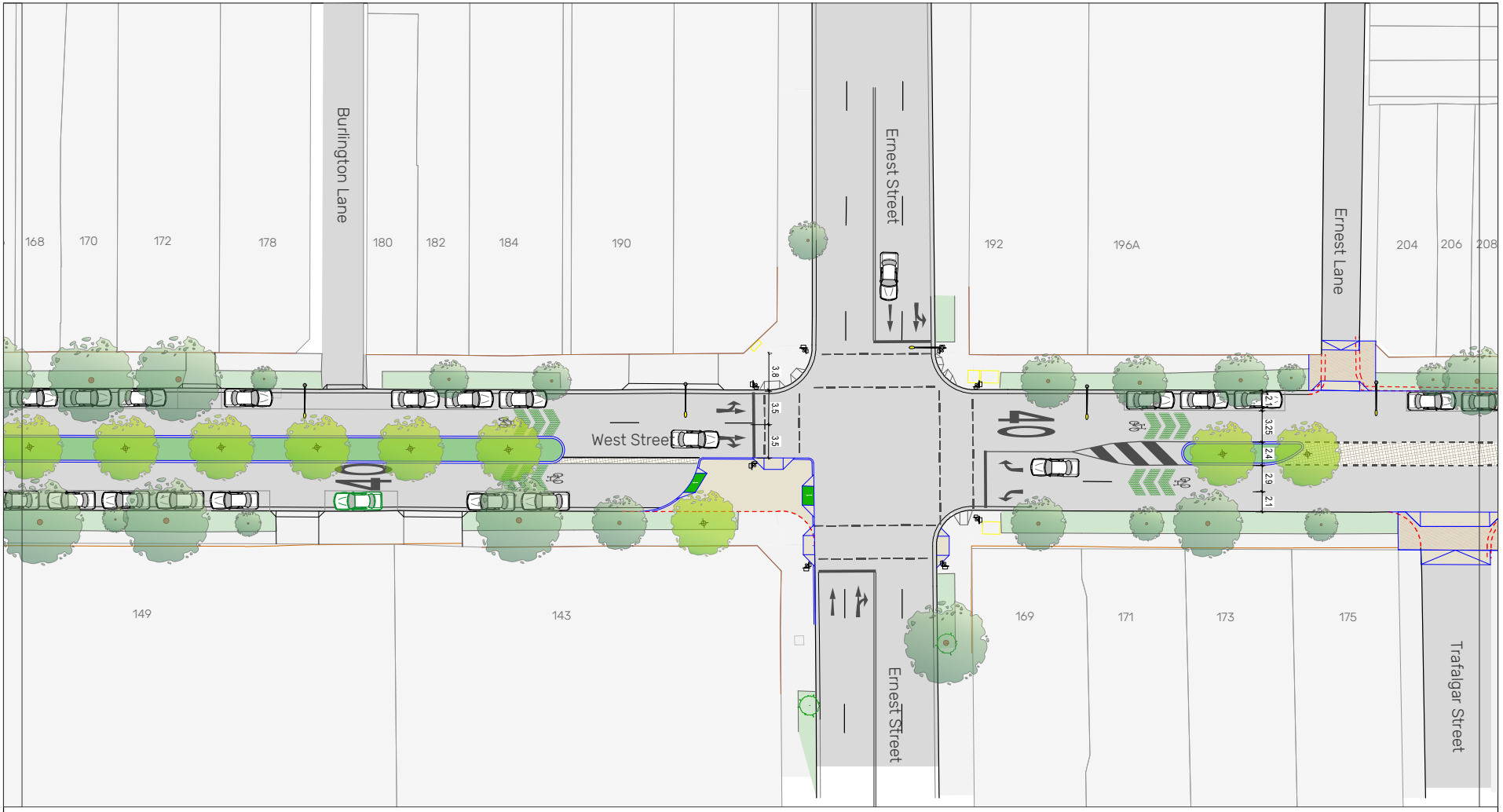
SMM PROJECT No: 17070

PROJECT: West Street Cycleway

SHEET: 105

DRAWING: Concept Design Option C - Bike Boulevard

REVISION: B



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A	50% Concept Design	FM / MD	FM / MD	MS	03/07/18

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PROJECT: West Street Cycleway

SHEET: 106

DRAWING: Concept Design Option C - Bike Boulevard

REVISION: B

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SHEET 107
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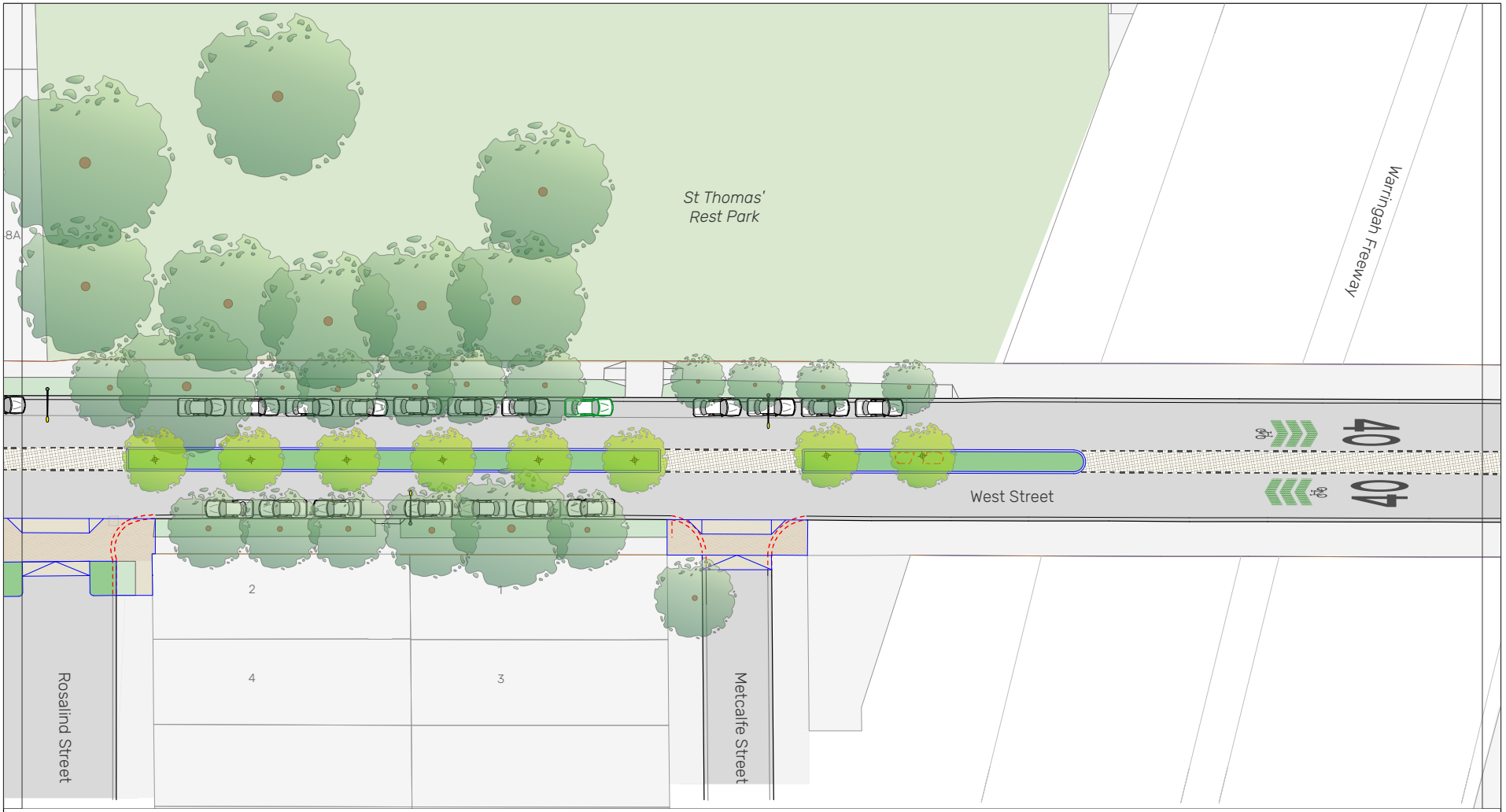
REVISION B



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DRAWING: Concept Design Option C - Bike Boulevard
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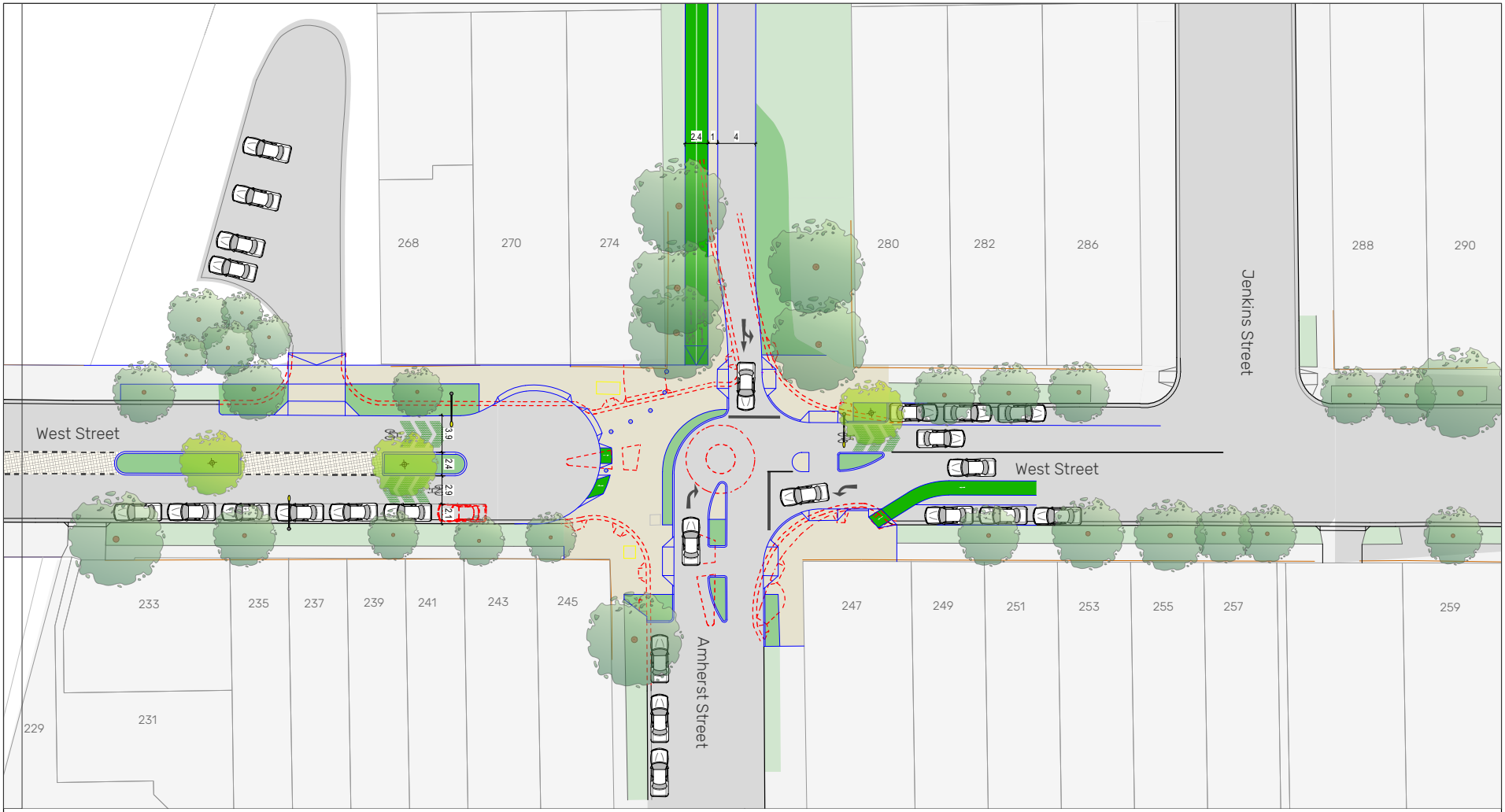

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SHEET: 109
DRAWING: Concept Design Option C - Bike Boulevard
REVISION: B

9.14 OPTION C SUMMARY ASSESSMENT

Table 9.8 shows the impacts of the proposed one way separated bike path on the existing road geometry, intersection performance, bus operation and parking. It also captures the net loss/gain of footpath space and street trees.

Table 9.8 Option C - Impact assessment Street Summary

OPTION C - 'BIKE BOULEVARD'	
ITEM	**DESCRIPTION**
Road Geometry	The existing traffic lanes are reduced from 3.5m to 2.9m with the introduction of a 2.8m central median along the majority of the route. In certain areas the median has been reduced for increase space for traffic lanes where necessary.
Turning Restrictions	Turning restrictions have been implemented between Falcon Street and Ernest Street for left turn vehicles travelling south on West Street. There is a road closure implemented south of Ahmerst Street, West Street with a complete ban on vehicles entering via Amherst Street with dedicated cycle facilities maintaining cyclist entry/exit. Burlington Street and Holterman Street have also been closed with cyclist entry/exit maintained.
Intersection Performance	To be investigate further.
Bus Operations	Two northbound bus services (267, 263) are currently operating on West Street, between Ernest Street and Amherst Street. The narrowing of the existing travel lane from 3.5 to 2.9 of road widths will result in unsuitable bus travel lanes, which require a minimum of 3.2m travel lanes. On this basis,consultation with STA is required to agree on rerouting bus services.
Parking	There are currently 235 existing kerbside spaces on both sides of West Street. This includes 6 North Sydney Police spaces and 3 car share spaces. There is a loss of 3 kerbside parking spaces due to road geometry changes. There is also an additional 4 proposed car parking spaces along West Street. This results in a total net gain of +1 car parking spaces along the entire route.
	EXISTING 235 PROPOSED 236 NET 1 GAIN
Loading	No changes are proposed to the loading zones on both the eastern and western side of street.
	EXISTING 9 PROPOSED 9 NET GAIN/LOSS 0
Footpaths	The proposed shared environment intersection, pedestrian crossings and kerb extensions have created 1978 sqm of new footpath amenity. There is a reduction of 33 sqm for the relocation of kerb between Church Street and Ridge Street on the footpath on the eastern side to maintain loading bays.
	PROPOSED 1978 sqm LOSS 0 sqm NET 1978 sqm
Landscape	Around the proposed raised intersection, landscaped build outs have been incorporated within the areas adjacent to the intersection where parking is not permitted. These are proposed to be planted with low level vegetation to maintain appropriate sight distances. In addition the central median and side street closures also significantly increases the amount of landscaped areas.
	PROPOSED 2689 sqm LOSS 200 sqm NET 2489 sqm
Street Trees	There are no street tree losses along the entire route. An additional 88 trees have been proposed along West Street, within the central median and road closures.
	EXISTING IMPACT TREES GAINED NET +88 GAIN

9.15 OPTION C TRANSPORT REVIEW

A review of the Option C concept design plans identifies the following key points:

Separation of bicycles and motor vehicles

West Street is estimated to have approximately 8,500 vehicles per day with an 85th percentile travel speed of approximately 45km/hr.

Based on the existing number of motor vehicles per day and the 85th percentile speed in West Street, the NSW Bicycle Guidelines provide guidance that bicycle lanes should be provided,

Road Widths

The Option C concept design plan does not show road widths, however the typical road section is understood to include 2.9m wide traffic lanes, 2.1m wide parking lanes and a 2.8m wide central median. The proposed cross section is acceptable except for the section between Ernest Street and Amherst Street which includes a northbound bus route. As per STA guidelines, the northbound traffic lane is required to be a minimum width of 3.2m.

Restricted Traffic Movements

Option C includes a central median along the length of the route. The median would restrict movements to and from driveways and some side streets, thereby reducing traffic movements along West Street. However, a gap in the median has been provided at key streets and driveways to permit all turning movements. It is recommended that a median gap also be provided at the following locations:

- Rosalind Street, which contains up to 90 vehicles per hour in the peak
- Metcalfe street, a no through road providing access to eight dwellings
- Sexton Place, driveway to a small car park.

Intersection Treatments

A combination of two intersection treatments is under consideration for side streets in Option C:

- Shared Environment Intersection: Used at locations where vehicle traffic is low (typically less than 100 two-way vehicles per hour) and therefore is considered appropriate for road users to safely share the road space.
- Kerb Extensions with kerb ramps: Used at locations where vehicle traffic at the site is considered high. As such the existing crossing arrangements via kerb ramps are maintained, however amenity is improved by reducing the width of the road at the crossing. Swept path analysis is required at locations where kerb extensions are provided, to check vehicle manoeuvrability.

Opportunities to improve cycling facilities at the signalised intersections could be considered in the form of bicycle head boxes on West Street. For example, the intersection analysis for

Option A indicates an opportunity to reduce the width of West Street at Falcon Street to three traffic lanes (two southbound and one northbound lane) which would allow for the provision of a bicycle head box and associated connecting cycling lane adjacent the travel lane.

Amherst Street-West Street

Similar to Option A, the Amherst Street and West Street intersection is proposed to be converted from a roundabout operation to a give-way control intersection, with West Street being the major road. A roundabout intersection is recommended to be maintained if possible as roundabouts generally have greater operational capacity compared to give-way control intersections.

9.16 TRANSPORT PLANNING MATRIX

Option C has been assessed using the Transport Planning and Management Decision Matrix, as shown on the page inset. Option C, has been score low in terms of safe travel and transport security as cyclists are mixed with traffic and are not on a separated cycling facilities.

However, the option scores high in terms of social wellbeing and business amenity as the overall concept would increase green space and canopy cover significantly that would improve civic pride and amenity.

As the option does not improve/decrease fair access to parking it does not score positivity or negatively.

COMMUNITY TRANSPORT PRIORITY	WILL THE PROJECT:	MAKE WORSE				IMPROVE			NSTS RATING	TOTAL
		-3	-2	-1	0	1	2	3		
Safe Travel	Improve community safety by creating slow speed road environments where more vulnerable road users are protected from higher impact road users and the number of crashes and severity of injuries is minimised?						✓		0.81	1.62
Transport Security	Improve personal security through improved streetscape design, increased street activity and passive surveillance?					✓			0.81	0.81
Social Wellbeing	Provide social spaces where human interaction is given the highest priority and the negative impacts of traffic are minimised, promoting incidental social interaction, increasing civic pride, reducing anti-social behaviour and community policing requirements?							✓	0.65	1.95
Active Health	Provide infrastructure that encourages healthy and active lifestyle/travel choices?						✓		0.65	1.30
Fair Access to Parking	Reduce demand for parking and / or provide more equitable access to existing parking supply?				✓				0.59	0
Environmental Sustainability	Encourage the use of low greenhouse gas emitting transport options?						✓		0.56	1.12
Local Environments	Encourage the use of travel modes that have minimal impact on air quality, water quality and noise?						✓		0.56	1.12
Transport Affordability	Encourage the use of travel options with lower social, health and economic costs and higher social, health and economic benefits?						✓		0.51	1.02
Congestion	Apply travel demand management principles to minimise traffic demand and associated traffic congestion?				✓				0.44	0
Business Amenity	Increase business opportunities by improving the look/ amenity of North Sydney throughout the day and in to the evening.							✓	0.38	1.14
Business Activity	While also reducing the whole of life cost of transport networks, including the ongoing costs associated with cleaning and maintaining assets?		✓						0.38	-.76
									TOTAL	**9.32**

9.17 OPTION ASSESSMENT

Three cycle concept designs for West Street have been assessed against one another through a imact assessment, North Sydney Transport Planning and Management Decision Matrix and an overview of the potential impacts from a transport perspective.

The Impact Assessment indicates that there are pro's and con's that are associated with each of the concept designs. Typically, each of the options reduce the traffic lanes to gain space for each cycle facility.

Option A, is unsuitable for bus operations along the route which would need to be addressed through consultation with STA to re-route the bus route or a kerb adjustment to gain the additional 300mm required for the traffic lane. This may result in tree loss along the side which the kerb extension is proposed, this would be assessed on the net stage of design development.

Option B has the most losses of car parking spaces along the route with a net loss of 12 car parking spaces. Additionally, loading spaces have been retained for all of the options.

Gains are shared across all of the Options in terms of footpath, landscape and tree provision with Option C contributing to the highest increase. This is due to the road closures at Emmett St, Burlington St, Holterman St, Amherst Street and the southbound traffic lane closure at West St and Falcon St. Additionally, Option C has a 2.8m typical central median that contribute to the increase in landscape and trees.

All three concept designs have been assessed and scored separately against the community transport priorities within the matrix. As identified on Table 9.9 Option A – the Bi-directional cycleway as been identified as the concept design that is most favourable through the Transportation Matrix.

Option A meets many of the community transport priorities and is a low impact on parking, footpath space, street trees, intersection delay and congestion. However, from assessment Option B and C meet many of the traffic management treatments suggested during public consultation. These include lower traffic volumes and speeds on West Street and increasing green space and amenity space.

Subsequently, Option B and C increase open space provision within the study area and provide open space in locations that are closer to residences currently identified in the Open Space Provision Strategy, North Sydney 2009.

Table 9.9 Options Summary

CONCEPT DESIGN OPTION	SUMMARY	MATRIX SCORE
OPTION A	Option A has a high level of improvement to cyclist and pedestrian amenity and generally maintains traffic flows as per existing conditions.	11.29
Option B	Option B has a high level of improvement to cyclist and pedestrian amenity with reduced traffic volumes on West Street and good separation between road users. However, the option would result in significant changes to traffic conditions for the local area and the feasibility of implementing Option B requires further investigation.	10.94
Option C	Option C is considered to have the least impact to traffic and parking with the road layout generally maintained as per existing conditions. Option C offers limited improvement in cycling amenity along West Street. The NSW Bicycle Guidelines provides guidance that with the existing level of traffic per day and the 85th travel speed in West Street, bicycle lanes should be provided.	9.32

10. CONCLUSION

10.1 PREFERRED OPTION

The key aim of the project is to develop cycling infrastructure that will make it possible for a wider range of people to choose cycling as a transport option for both short and long trips, while also maintaining a practical setting for the higher speed regional cycle commuting that occurs along this route.

In accordance with aims set out in Sydney's Cycling Future and the North Sydney Cycling Strategy, the proposed option will need to provide a level of access that will improve transport choice for the community by making cycling accessible to people of all ages and cycling abilities.

Based on the comparison and assessment of the 3 concept design options, Option A: Bi-directional Separated Cycleway has achieved the highest score according to the Transport Matrix. This option also has the least amount of disturbance on existing parking spaces. However, the recommended road widths have not been achieved at some locations including along the bus route between Ernest Street and Amherst Street.

This alignment should be developed in tandem with the re configuration of West Street which connects the missing link between the Sydney Harbour Bridge and Naremburn (the Epping Road Cycleway).

10.2 RECOMMENDATION

The comparison study of all 3 concept design options have highlighted many benefits associated with each concept design. Though Option A score highest and is the preferred option many of the design elements from B and C can be incorporated into Option A.

It should be noted, that a final design option should be explored where the most favourable design aspects of each Concept Design Option can be hybridised into a fourth option to mitigate against associated risks.

10.3 FUTURE TRAFFIC STUDY

Further study and analysis is required as part of the design development of the West Street cycleway. A brief summary of the recommended tasks is listed below:

Area wide traffic management scheme

Both concept options include crossing treatments to improve cyclist and pedestrian amenity including shared environment intersections and new pedestrian (zebra) crossings. Warrants for these treatments have been reviewed where possible, however additional data collection is required to confirm the appropriate treatment.

As an alternative approach, North Sydney Council could consider a whole area wide traffic management scheme with cooperation with the Roads and Maritime Services. Warrants specify the need for a treatment at a particular site, however, an area wide traffic management scheme could be implemented with an aim to change the character of the entire street. Traffic calming devices such as shared environment intersections, pedestrian crossings etc., would be implemented strategically to reduce speeds and improve the amenity of the entire street.

Option A Study Tasks

• Swept paths at key intersections, in particular along the bus route, where road widths and turning circles are anticipated to narrow. The following locations are recommended:

Turning movements to and from side streets (Church Street, Carlow Street, Burlington Street, Huntington Street, Metcalfe Street, Amherst Street) Emmett Street – Council garbage truck undertaking a U-turn at the road closure.

• Obtain two-way traffic volumes on side streets to confirm appropriate intersection treatments i.e. bend out, shared environment etc. Key streets recommended for further study include Holtermann Street, Burlington Street, Emmett Street and Myrtle Street.

• Consultation with STA in relation to changing conditions along the bus route, including road narrowing, provision of a fully mountable roundabout at Amherst Street if swept paths permit.

Option B

• Swept paths at key intersections, in particular along the bus route, where road widths and turning circles are anticipated to narrow. The following locations are suggested, but not limited to:

Turning movements to and from side streets (Church Street, Carlow Street, Emmett Street, Hayberry Street, Burlington Street, Holterman Street, Huntington Street, Rosalind Street, Metcalfe Street, Amherst Street)

• Consultation with STA in relation to changing conditions along the bus route.

• Further analysis of bus route impacts as a result of changing traffic conditions.

• A wider scope for traffic modelling is required to assess the impact of converting West

Street to one-way in some sections. It is recommended that a network traffic model be carried out along West Street and Miller Street between Amherst Street and Pacific Highway.

The recommended study area is shown in Figure 10.1.

Option C

• Swept paths at key intersections, in particular along the bus route, where road widths and turning circles are anticipated to narrow. The following locations are suggested, but not limited to:

Turning movements to and from side streets (Ridge Street, Carlow Street, Emmett Street, Burlington Street, Holterman Street, Rosalind Street, Amherst Street)

Figure 10-1: Network Modelling Study Area

11. APPENDIX A1

11.1 North Sydney Ride to Work Day 2018

North Sydney Council hosted a free breakfast at the base of Sydney Harbour Bridge cycleway, Milsons Point (Burton Street) to support those taking part in national Ride2Work Day. The event was attended by a number of cycling groups.

Spackman Mossop Michaels set up a public consultation stall that provided a medium for commuters and residents to provide input and concerns for their opinions on local conditions on West Street and the surrounding area. These comments were captured through and have been summarized in the table across:

Figure 11-1: Ride to work team

Table 11.1 Ride to work day public consultation summary

North Sydney Ride to Work Day 2018	18.10.2018
Positive elements of the daily cycle	
1	Good flow of traffic on Miller Street
2	St. Thomas Church is beautiful to travel past
3	One way street and one way lane off Pacific Hwy
4	Good contraflow on Huntington Street
5	Jenkin Street Bridge concept
Negative elements of the daily cycle	
1	Too much stop start (traffic lights) delays due to cars
2	Too dark/narrow through St Leonards Park
3	Poor surface of Sydney Roads
4	Close cars passing cyclists
5	Miller Street dangerous for cyclists and close contact with cars
6	Debris on cycleways at road level
7	Slippery cycleways
8	Poor connections at either end of West Street
9	Poor shared path on Pacific Hwy before Miller Street Crossing
10	Shared Path on Pacific hwy has poor sight lines
11	Walker Street has a poor surface
12	Bus lane is dangerous and accident blackspot
13	Pacific Hwy roundabout is dangerous for cyclists
14	Too many cars/buses on Millar Street
15	No shoulder on West Street for cyclists
16	Dangerous bus convergence at Pacific Hwy
17	Poor storage space at St Leonards Park for cyclists
18	Ernest Street dangerous intersections with other road junctions
19	End of Walker Street footpath very poor
20	Amherst St/Freeway very dangerous
21	Brooks St. Crossing - No lights - barrier and light poles
22	Falcon Street & West St intersection 11 to 8 on east side.
23	Falcon Street has a lot of potholes
24	Getting onto West St. is impossible
25	Jenkins Street and West Street has a poor connection
26	Falcon Street intersection poor traffic flow issues

North Sydney Ride to Work Day 2018	18.10.2018
27	West Street needs bike boxes at traffic lights
28	Pacific Hwy roundabout is dangerous for cyclists
29	West Street is dangerous for car dooring
30	Left turn lanes on West St has poor signage and conflict with cars
31	West Street is dangerous for car dooring
32	Brooks Street crossing overpass across the Hwy is dangerous
33	St. Leonards Park - Poor surface and connection
34	Walker Street has heavy traffic
35	West Street and Falcon Street - car dooring from customers at laundromat
36	West Street needs to be slowed for pedestrians and cyclists
37	Copenhagen could influence West Street
38	Rat run for cars from Falcon to Rest Park

APPENDIX A2

11.2 West Street banner feedback

As mentioned in Section 3.2, a public workshop was held that sought feedback from residents, stakeholders and user groups. A method utilised to gather opinion in the first instance was workshop attendees were asked to write their opinions and concerns on a banner of the existing street conditions on West Street. This is captured in the following summary table.

Figure 11-2: Public workshop

Table 11.2 Banner feedback summary

Banner comment	Location	Response
Pedestrian crossing	Church St/West St	
Pedestrian crossing	Union Hotel, West Stre et	
Too many police cars	North Sydney Police Sta- tion	
No to trucks	1 Ridge St/cnr West St	
No to raised crossing	West St/Ridge St - existing raised ped crossing	
Dangerous intersection with bikes & pedestrians	West St/Ridge St - existing raised ped crossing	
Let Police cars park in West St	Ridge St	
30km/h speed zone	*West St Southern end*	
One way zone	West St Southern end	
No to vehicles over 3 tonnes	West St Southern end	
Car Parking	40-44 West St	
Residents can't park	21-23 West St	
Make parking residents only or 1 hour	25 West St	
Change parking residential to 4hr	21-45 West St	
Pedestrian crossing	93/108 West St	
No to vehicles over 3 tonnes	93/108 West St	
Pedestrian crossing	Myrtle St into West St	
Pedestrian crossing	51-53 West St	
Pedestrian crossing	Hayberry St into West St	
One way zone/30km/h speed zone	West St (Hayberry St - Falcon St)	
Need to ensure that cars emerging from driveways have clear view of traffic	110 - 130 West St	
Very dangerous intersection	West St/Falcon St inter- section	
No right turn not enforced	West St/Falcon St inter- section - northbound on West St	
"Parallel/angled parking on one side of the road"	West St/Falcon St inter- sectio	
Bi-directional cycleway on the south	East Travel lane Falcon St	
One way (southbound)	Bernard Lane (between Falcon Street & Lane)	
One Way (westbound)	Falcon Lane	

Banner comment	Location	Response
Road congested with Woolworths vehicles along Alexander St	Falcon Lane	
Traffic reverts in driveway - double white lines or yellow boxed area required	135 West St driveway	
Right turn should be banned	135 West St driveway (coming out)	
There should be a yellow box here	West St/Burlington St	
Speed hump/pedestrian crossing	162 West St	
Needs a speed hump/pe- destrian crossing and Pick up/drop off zone	TAFE NSW	
"Ban right turn as it blocks traffic flow in the morning"	Burlington Lane into West St	
Ban right turn in PM	West St/Ernest St intersec- tion	
"Do/Don't remove 'left hand turn after stopping at all times"	West St/Ernest St inter- section - West St left into Ernest (northbound)	
Roundabout to slow traffic	West St/Rosalind St	
"Speed hump/pedestrian crossing (raised)		
- could slow traffic rat run with pedestrians using park		
- take away no parking + make parking"	West St/Rosalind St - northern	
"Morning traffic rat run for school"	Waringah Overpass	
Pedestrian crossing	268/239 West St	
Pedestrian crossing	270/243 West St	
Remove roundabout	West St/Amherst St roundabout	
Reconfigure road refuge to reduce entry speeds	West St/Amherst St roundabout	
Pedestrian crossing	Amherst St	
Childcare centre planned, will need parking		
Rumble strips to slow traffic	Freeway exit into West St	

Table 11.3 Banner feedback summary

Banner comment	Location	Response
TREES		
Trees in the middle of street (1m)	40-45/58 West St	
Roundabout/trees/plantings	Carlow St/West St	
"Pedestrian crossing with trees at each		
end"	Carlow St into West St	
Calming landscape	97 & 97a West St	
Bike box	West St/Falcon St intersection - West St both directions	
Need separated cycleway in this block	118 block - West St	
"Speed bumps where road refuge is		
- ramp: cycle path to Naremburn"	Metcalfe St	
Cycleway Design		
Invest in bike racks in popular areas	West St & Pacific Highway	
Cycle lane door zone/trees in between	21 West St onwards	
"Bicycle boulevard style would like to		
have been seen in this section"	West St/Emmet St/Carlow St	
Bridge walkway	West St/Falcon St intersection - southern side	
Bike box	West St/Ernest St intersection - West St	
Cyclists hate to cross freeway	Freeway exit - start	
Cycleway is very narrow & too close to cars	Freeway exit into West St	
Issues and Concerns		
If there is a bike path, do bikes need to travel on it instead of the road?'	37 West St	
How will this be impacted by Crows Nest/St Leonards high density development?'		
'Where is the traffic movement plan?		

Banner comment	Location	Response
Change seating to wider area of Carlow St	67 West St - café	
Swingseat - play/park space	Carlow St - southern end	
"New apartments with limited		
parking"	58 West St/Myrtle St	
West St was identified as being the perspective cycleway before Cammeraygal High School site identification at 149 West Street & before Anzac Park Public School was opened and traffic & parking issues & 2 new childcare centres & before 60 unit apartment block opens at 89 West St		
"Should there be alternatives for the cycleway?		
- Alexander St: commercial		
- Miller St: medium/high density fewer driveways"		
Access to a block of units	135 West St driveway	
Access to 70 unit block of units	135 West St driveway	
Dry cleaners block road when turning right onto West St	Falcon Lane (eastbound)	
"Note:		
Traffic jams @ AM peak		
1. cars North to South		
2. cars South to North		
3. right turn from West St to Ernest St"	West St/Ernest St intersection	
Cars speeding	240 West St onwards	
Bus stop slows traffic	bus stop near Huntington St	
Never enough parking		
Garbage trucks will block the road		
More speed bumps along West St		
Lots of dog walking to the park	240 West St onwards	
More times (timed?) parking		

Banner comment	Location	Response
Alternative route to freeway or Miller St	Amherst St	
West St is largely low-rise housing with families and driveways and therefore cars	West St	
Comment post workshop		
"I did raise an opportunity that appears to have been missed, and that is to also incorporate and better utilise the section of land that runs between the eastern end of Metcalfe Street and Miller Street. This could be incorporated with new pedestrian crossing facilites at/near the intersection of Metcalfe and West, and what I consider to be urgent requirement to slow motor vehicle speeds on West Street between Rosalind and Amherst Streets in particular."	Metcalfe St/Miller St.	
"Bike boulevard. This would be an avenue where the street was sill permeable to motor vehicles, and parking is still available and provided, but motor vehicle traffic is significantly de-priorised in the design. Ideally, the boulevard/ avenue would be narrowed, incorporate greenery and generally appear to be less of a throughfare.	West Street	
Bike boulevard that encompasses walkway, cycling path , seating and trees.	West Street	

Figure 11-3: Bicycle boulevard suggestion for participant

Figure 11-4: Bicycle boulevard suggestion for participant

11.3 West Street Group Workshop

The initial banner exercise was then followed by a group activity, where participants designed what individuals. The results are shown below:

Table 11.4 Community workshop summary

Group workshop feedback	Location	Response
Group 1 - West Street/Pacific Hwy		
Pedestrian crossing	Union Hotel	
Shoulder blisters	Church St into West St	
Rat run we should consider making West Street one way	General	
More garden beds	General	
Residential parking only up till Carlow St	9 West St onwards	
Retain resident parking	Police station	
More lighting near Miller St	Group 1 area	
Group 2 - Emmett St & Carlow St		
Garbage collection	General	
No large vehicles at all	General	
"Tidal flow according to the time		
of day"	Emmett St/West St intersection	
"Shoulder blister with possible 'Community		
Garden' or plantings"	Emmett St into West St (eastbound)	
More trees at either end of crossing	Speed hump/pedestrian crossing	
Existing crossing is very narrow - Shoulder blisters with planting (shrubs) - Replace refuge with pedestrian crossing	Carlow St into West St	
Boulevarde: as there are many retail shops	Myrtle St to Falcon St	
Bidirectional: on western side of West St	Pacific Highway to Myrtle St	

Group workshop feedback	Location	Response
Group 3 - Falcon St intersection		
Paving material	West St	
Bike boulevard as preferred option	Group 3 area - general	
Each corner has a greenery shoulder blister	Group 3 area - general	
One Way (westbound)	Falcon Lane	
Very dangerous for cyclists/pedestrians	General	

Group workshop feedback	Location	Response
Group 4 - West Street to - Huntington St		
Comment	Location	Response
Rear to kerb parking - one side only	206-218 West St block	
Pedestrian crossing	Holterman St into West St	
In median parking?'	220-236 West St parking	
Bike boulevard w/ tree barrier	General	
"Group suggestion:		
- Bike boulevard		
- Rear to kerb parking or parking in a median		
w/ trees & barriers		
- Green & slow"	General	

Group workshop feedback	Location	Response
Group 5 - Overpass above Warringah Freeway		
Fix path	Overpass footpath	
Cycleway to Naremburn	Before overpass (eastbound)	

Group workshop feedback	Location	Response
Group 6 - Emmett St & Carlow St		
Improve lighting along West St	General	
More trees	237-245 & 268-270 West	
Make another bike lane going onto freeway from West St	Freeway exit	
Bus stop	Amherst St - start from West St	
High speed commuter cyclists should use a cycleway along the freeway		
West St should be calmed for walking & weekend cyclists		
More Greenery/tree planting on West St		
Driveways are a point of conflict & dangerous for cyclists"	General	
Garbage collection in consideration	241 West St	
Speed hump/pedestrian crossing	Jenkins St/West St - north from West St	
More trees	Jenkins St	
Bike line on both sides of the road (one-way)	General	
"Pedestrian crossing:		
1. People from park can cross to Cammeray shops		
2. Pedestrians can cross safely to bus stop (Amherst St)		
3. Will slow down cars; preventing accidents		
4. A lot of people walking dogs from the park"	Roundabout - West St southern side	
Cycle access to freeway on West St	General	
Build bike racks in popular areas	General	
"Fenced entrance; less dogs running out onto the road"	Park	
Shoulder blister	Sexton Place into West St	

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COMMUNITY ENGAGEMENT STRATEGY

West Street Walking, Cycling and Streetscape Upgrades

Prepared July 2022

Councils are required under the *Local Government Act 1993* to inform the community of issues that potentially affect their way of life. North Sydney Council is committed both in principle and in practice, to engaging on matters affecting the North Sydney community. Community engagement opportunities will be provided across a range of 'engagement' levels.

1. Introduction

This Engagement Strategy outlines the steps Council will take to engage the community on the concept design for the West Street Walking, Cycling and Streetscape Upgrades between Ridge Street and Pacific Highway. The designs include new tree plantings, pavement upgrades and separated cycleway.

The West Street Cycleway (between Ridge Street and Pacific Highway) will complete a missing link in the Priority Route 1 - Sydney Harbour Bridge Cycleway to West Street as identified in Council's *Integrated Cycling Strategy* (ICS). The ICS identifies West Street as a key connection to the North Sydney and Sydney CBD and has an estimated average weekday ridership greater than 700 trips per day.

1.1 Council's Community Engagement Protocol

This Engagement Strategy has been prepared in accordance with Council's *Community Engagement Protocol.* The Protocol is used to determine the level of 'level(s) of impact' applicable to this project/decision (proposal). This proposal has been determined as:

LEVEL OF IMPACT	LEVEL OF ENGAGEMENT
High/Local	Inform/Consult

Council used the framework shown below in Table 1.1 to select the most appropriate 'level(s) of engagement' for this proposal to ensure an appropriate range of engagement 'levels' and methods were offered:

LEVEL	DESCRIPTION
Inform	Providing balanced and objective information to help the community understand problems, alternatives, opportunities and/or solutions
Consult	Obtain public feedback on alternatives and/or decisions
Involve	Work directly with the community throughout the process to ensure that public concerns and aspirations are consistently understood and considered
Collaborate	Partner with the public in each aspect of the decision including the development of alternatives and identification of the preferred solution

Table 1.1 Derived from the IAP2 Public Participation Spectrum

2. Background

West Street Cycleway (between Ridge Street and Pacific Highway) forms a section of *Priority Route 1. Sydney Harbour Bridge Cycleway to West Street* identified in the adopted *North Sydney Integrated Cycling Strategy* (ICS).

Route 1 is a key cycling connection as it connects North Sydney's residents to the Harbour Bridge and the Sydney CBD. The ICS highlights the importance of West Street cycleway, stating that weekday ridership is likely more than 700 trips.

Strategic Merit

Sydney's Cycling Future (Transport for NSW, 2013) identifies connecting Sydney's north to the CBD as a priority cycling link. The West Street Cycleway aligns to a regional scale network, providing a key connection between Sydney's CBD and the suburbs to the north and north-west.

In April 2022, Transport for NSW (TfNSW) released an overview of the Strategic Cycleway Corridors - Eastern Harbour City. The North Sydney cycling connections have been categorised as an immediate opportunity, aligning to the Sydney CBD to Chatswood Corridor. This connection has a desired outcome to:

> *'A safe connection between Milson Point, North Sydney and St Leonards will improve access to Sydney Harbour Bridge and support forecast growth' (p.5)*

The West Street Cycleway is a part of a key cycling connection identified in both Council and State strategies.

3. Community Engagement Strategy

3.1 Who are our community stakeholders?

The Engagement Strategy identifies the following groups to engage with in the local community:

- Government agencies - TfNSW, Road and Maritime Services, Sydney Buses, Sydney Water
- Advocacy groups - Bicycle NSW, Bike North, Bike Sydney, North Shore Bicycle Group
- Precinct Committees - Stanton, Hayberry and Edward
- Residents
- Educational institutions
- Businesses - The Union Hotel, Gold's Gym, cafés and other services
- North Shore Local Area Command - North Sydney Police Station

3.2 Key Communication Messages

- Council is seeking feedback on a final concept design for the West Street Walking, Cycling and Streetscape Upgrades between Ridge Street and Pacific Highway, North Sydney. The design includes new tree plantings, pavement upgrades and separated cycleway.
- the proposed cycleway will complete a missing link in Priority Route 1 Sydney Harbour Bridge Cycleway to West Street identified in Council's *Integrated Cycling Strategy*. West Street is a key connection to the North Sydney and Sydney CBD and has an estimated average weekday ridership greater than 700 trips per day.
- six new trees will be planted in the area to compensate for an existing small tree that will need to be removed.
- the community can provide feedback on the concept design via the online feedback form or map (drop a pin), email or discussing with Council staff in person and online.
- consultation will close on 14 November 2022. All feedback received will be collated and analysed, and where possible, incorporated into the final design. The final design will be reported to the Traffic Committee and subsequently a Council meeting for adoption.
- stakeholders will be kept up to date with progress. Sign up via the Your Say North Sydney webpage to receive updates on upcoming key dates and milestones.
- if approved by Council, construction is due to start in mid-2023.

3.3 Timetable

Community and stakeholder engagement will occur at various times as outlined in key project development phases table:

Phase	***Timing***
1. Research and Scoping (includes preliminary engagement)	2018-2022
2a. Design Consultation (public exhibition)	October to November 2022
2b. Final Design (incorporating feedback)	November 2022
3. Post Exhibition Reporting to Traffic Committee/Council	Early 2023
4. Construction	Mid 2023

3.3.1 Phase 1 - Research/Scoping

Design investigation commenced in 2018. The community design workshop held 22 February 2018 gathered feedback from 35 community member to inform the West Street Cycleway concept design. The final concept design was ready for consultation; however the project was put on hold while designs for major transport projects in North Sydney such as the Sydney Metro, Western Harbour Tunnel and Beaches Link, North Sydney Transport Masterplan were finalised. The project was also awaiting funding, which was allocated in the *North Sydney Council Delivery Program 2022-2026*, adopted 27 June 2022.

3.3.2 Phase 2 - Design Consultation

Council will offer various methods by which the community can participate in Phase 2 public exhibition of the draft concept plan, including face-to-face, online engagement, and written submissions allowing the community to participate through methods and at times that best suit their needs and commitments. Not listed in priority order:

Method	***Target Stakeholders***	***Engagement Level***	***Purpose***
Website (includes Your Say web page)	All	Inform	Provide information about the project and direct people to how they can have a say e.g. consultation opportunities.
Frequently Asked Questions			
Fact Sheet (flyer)			
Signage onsite	Residents Users of existing path		
Social Media: Facebook, Twitter and Instagram	Existing followers and local groups with social media accounts		
Letterbox drop	In vicinity of the proposed project and surrounding area		
Email/Letters	Bicycle advocacy groups, participants of the 2018 workshop		
eNews	Subscribers of Council's various eNewsletters: including Council, Precincts and Business eNews		
Online Information session	All	Inform	1 X online session providing project overview and an opportunity for stakeholders to ask questions.
Onsite Walkthrough	All	Inform	1 X onsite walkthrough of the project site providing stakeholders the opportunity to ask questions
Drop-in Information Stall	All	Inform	Council staff to host stall at the Northside Produce Markets to promote the project and provide opportunity to ask

Method	***Target Stakeholders***	***Engagement Level***	***Purpose***
			questions.
Precinct System[1]	All active Precinct Committees	Inform/Consult	Encourage Precinct Committees to promote consultation opportunity to their members and/or to make a submission
Online Map	All	Consult	Provide location specific feedback via the online map
Submissions			Provide feedback via a series of questions on the Your Say webpage
			Free form feedback accepted by email or posted letter as well as via online form.[2]

Note: In accordance with Council's Community Engagement Framework described on page 1, the 'level of engagement' per engagement method is indicated.

3.3.3 Phase 3 - Post Exhibition Reporting to Traffic Committee/Council

A report will be prepared and submitted to the North Sydney Traffic Committee for review in early 2023. A copy of the consultation report will be included for review.

A report will be submitted to a Council Meeting in early 2023 presenting the collated feedback received during Stage 2, the final design and the Traffic Committee's recommendation for the Council's review and endorsement.

Submitters will be informed of the outcomes.

3.3.4 Phase 4 - Post Exhibition Reporting to Traffic Committee/Council

Council officers will prepare procurement documentation for construction of the West Street Walking Cycling and Streetscape Upgrades. Assuming community support and Council endorsement, construction is due to commence mid-2023.

[1] North Sydney Community Precinct System was established in the late 1970s, encouraging residents, workers, students and property owners to take an active role in providing input into the operations of Council. Precinct Committees are organised by community members and are advisory. Precinct meetings are one avenue for informing Council of community opinion and maintaining two-way communication between community members and Council staff/Councillors.

[2] For more information about how to make a written submission refer to Council's Information Sheet: Making a Written Submission to Council.

4. Opportunity Cost/Rationale

Engaging the community in this proposal may entail financial costs to Council to achieve a high-quality engagement process. If the process is robust, community ownership of the decisions made will ensure efficient outcomes. Insufficient or poor-quality engagement can result in poor long-term decisions requiring further resources to rectify. The aim of a high-quality community engagement process is to make sustainable decisions. The engagement process will help Council staff and/or Councillors to understand the related recommendations rationale.

5. Further Information

For further information contact Council's Max White, Sustainable Transport Project Coordinator, Traffic & Transport Operations Department:

Phone: 9936 8100
Email: yoursay@northsydney.nsw.gov.au
Website: www.northsydney.nsw.gov.au

WEST STREET WALKING, CYCLING AND STREETSCAPE UPGRADES

PROJECT BACKGROUND

North Sydney Council are consulting on a concept design for West Street Walking, Cycling and Streetscape Upgrades between Ridge Street and Pacific Highway. The designs include new tree plantings, pavement upgrades and separated cycleway treatments.

Council is committed to providing the community with all information regarding the final concept design. To accommodate various needs and time constraints, we have provided the following opportunities for understanding the proposed upgrades:

Information Stall - drop by the Northside Produce Markets to view the concept plan and ask questions of Council staff. See web page for details.

Onsite Walkthrough - meet Council staff on West Street to walkthrough the proposal. Opportunity to ask questions and raise any issues. See web page for date and time.

Online Information Session - Council staff will provide an overview of the proposal. Opportunity to ask questions and raise any issues. See web page for date and time.

Bookings are available on the Have Your Say webpage.

HOW TO PROVIDE FEEDBACK

Feedback on the West Street Walking, Cycling and Streetscape Upgrades can be provided in the following ways:

1. via the online submission form
2. via the online map (drop a pin to leave a comment)
3. email yoursay@northsydney.nsw.gov.au
4. post submissions to North Sydney Council, PO Box 12, North Sydney NSW 2059

Please note, all submission must be made through the above format. We cannot accept verbal submission unless a specific request is made to accommodate a need (for example, a disability).

The Have Your Say webpage can be accessed via:

Webpage: ##WEBPAGE##

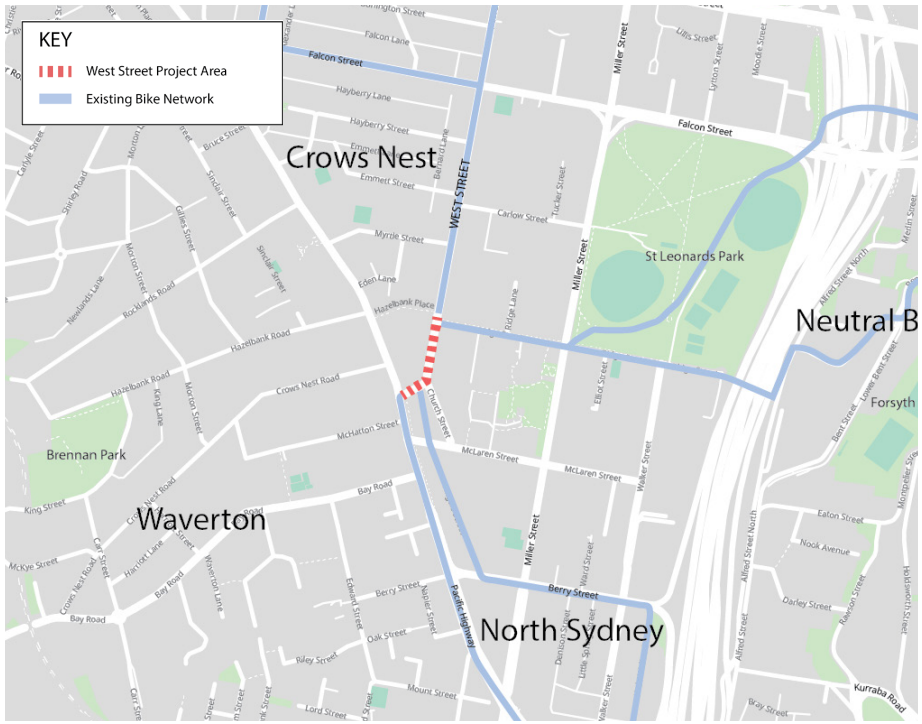
OR scan the QR code

PROPOSED IMPROVEMENTS

West Street Walking, Cycling and Streetscape Upgrades will include the following work:

- connection to local and regional bike routes
- improved pedestrian amenity with new crossing points and shared intersection treatments
- pavement and pram ramp upgrades for improved access
- enhancement of existing verges and streetscape with new garden beds
- five additional trees to be planted along West Street

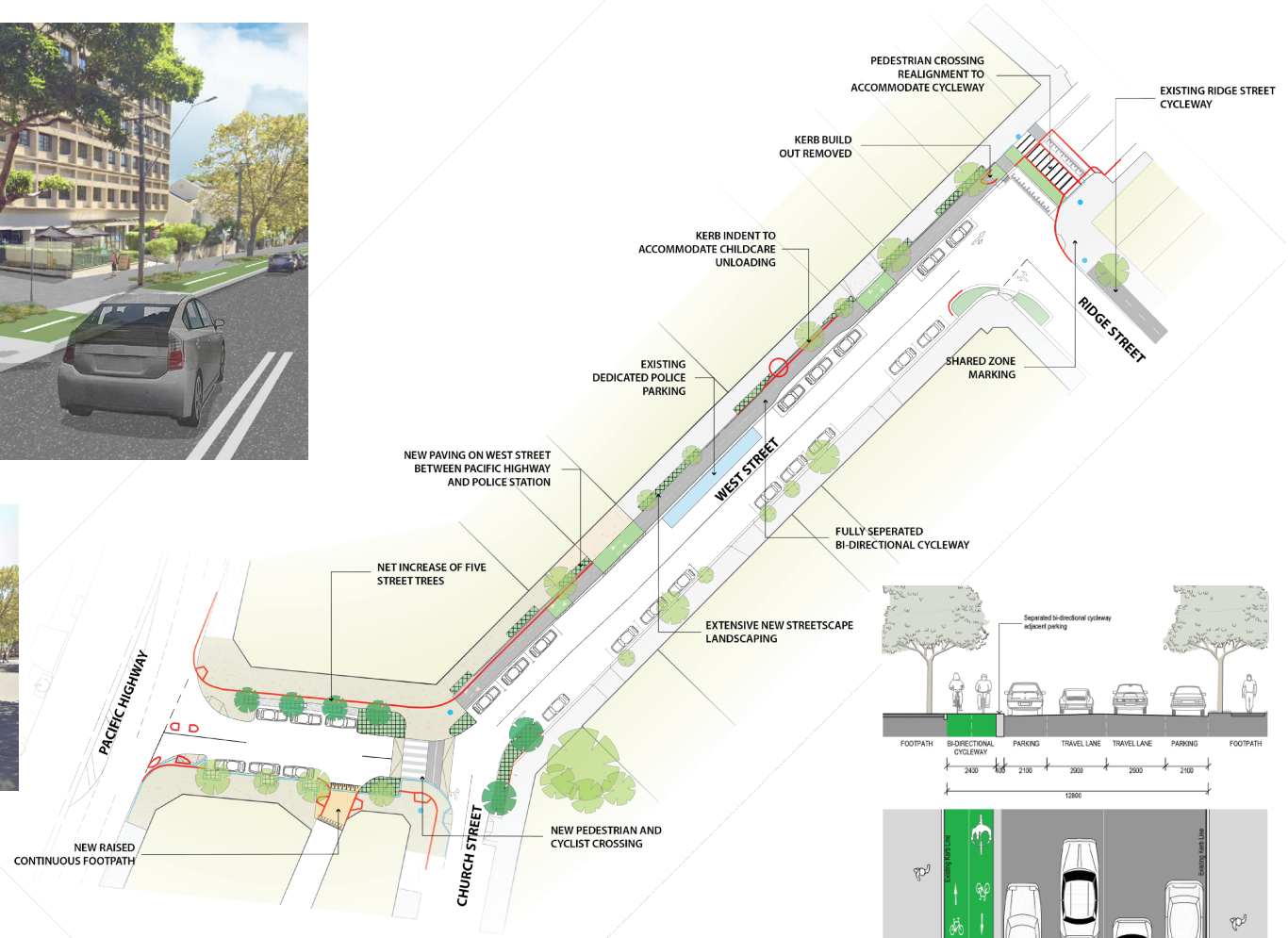
Context Map: West Street Walking, Cycling and Streetscape Upgrades

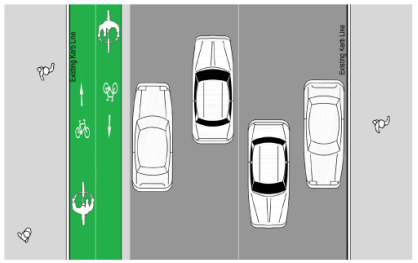


WEST STREET WALKING, CYCLING AND STREETSCAPE UPGRADES

PROPOSED CONDITIONS LOOKING NORTH TOWARDS RIDGE STREET

EXISTING CONDITIONS LOOKING NORTH TOWARDS RIDGE STREET





TYPICAL SECTION SEPERATED CYCLEWAY

TREE COVERAGE

LOSS	GAIN	TOTAL
-1	+6	+5

PARKING

THERE IS NO PARKING LOSS ASSOCIATED WITH THESE WORKS

LEGEND

- EXISTING ITEM TO BE REMOVED
- SEPARATED CYCLEWAY
- CYCLEWAY ACROSS ACCESS POINT
- NEW GARDEN BED
- EXISTING GARDEN BED
- RAISED CONTINUOUS FOOTPATH
- EXISTING TREE RETAINED
- PROPOSED TREE
- REMOVED TREE
- NEW PAVEMENT
- EXISTING FOOTPATH
- SHARED ZONE
- EXISTING CAR PARKING

WEST STREET WALKING, CYCLING AND STREETSCAPE UPGRADES

FREQUENTLY ASKED QUESTIONS

1. What will happen to the trees in the project area?

Council is committed to expanding our tree canopy where possible. For this project, one small tree will be removed and there will be an additional six tree plantings. This amounts to five additional trees in the project area.

2. Why do we need a cycleway on West Street?

West Street, between Pacific Highway and Church Street, is a key connection to the North Sydney and Sydney CBD and has an average weekday ridership greater than 400 trips per day.

3. The initial workshop was held in 2018, why has it taken so long to progress?

A variety of factors have contributed to the delay in the project such as funding, other major infrastructure projects and COVID related delays.

4. What are the main changes proposed along West Street?

The main changes along West Street include:

- kerb realignment
- additional rain gardens
- 100 metre bi-directional cycleway,
- slow speed 'shared zone' footpath for pedestrians and cyclists between Pacific Highway and Church Street
- a new pedestrian and cyclist crossing at the corner of West and Church Street

5. Will there be any loss of parking?

No, there will not be a loss of parking spaces for the West Street Upgrades.

NORTH SYDNEY COUNCIL