

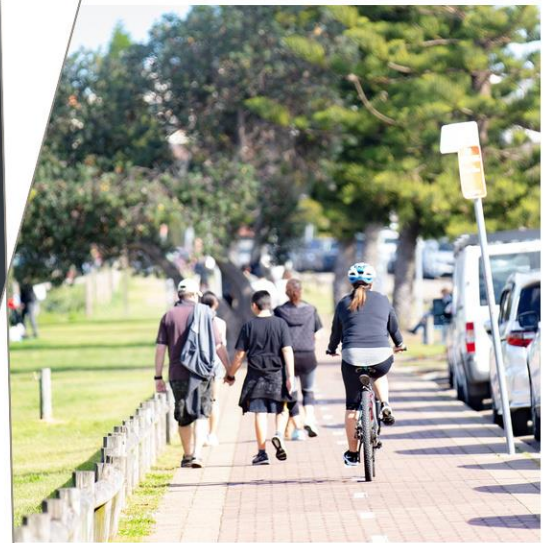
Bayside Council

Bike Plan

80019069

Prepared for
Bayside Council

2 February 2023



Contact Information

Cardno (NSW/ACT) Pty Ltd

ABN 95 001 145 035

Level 9 - The Forum
203 Pacific Highway
St Leonards NSW 2065
Australia

www.cardno.com

Phone +61 2 9496 7700

Document Information

Prepared for	Bayside Council
Project Name	Bike Plan
File Reference	200626 Bayside Bike Plan FINAL.docx
Job Reference	80019069
Date	2 February 2023
Version Number	8

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
1	10/01/2019	Preliminary Draft	Jane Parker Elizabeth Muscat Lukas Labutis Rusiru Wanasinghe	Chris Slenders
2	12/03/2020	Draft	Lukas Labutis Elizabeth Muscat	Chris Slenders
3	21/07/2020	Final	Elizabeth Muscat	Chris Slenders
4	19/11/2020	Final 02	Lukas Labutis Elizabeth Muscat	Chris Slenders
5	25/05/2021	Final 03	Elizabeth Muscat	Chris Slenders
6	15/06/2021	Final 04	Elizabeth Muscat	Chris Slenders
7	25/06/2021	Final 05	Elizabeth Muscat	Chris Slenders
8	26/08/2022	Final	Robbie Allen	Charlotte Lowe

© Cardno. Copyright in the whole and every part of this document belongs to Cardno and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person other than by agreement with Cardno.

This document is produced by Cardno solely for the benefit and use by the client in accordance with the terms of the engagement. Cardno does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by any third party on the content of this document.

Table of Contents

1	Introduction	1
1.1	Transport vision and directions	1
1.2	Purpose and objectives of the Bike Plan	2
1.3	Study area	2
2	Background review	4
2.1	Federal government	4
2.2	State government	7
2.3	Local Government	13
2.4	Neighbouring local government	16
2.5	Cycling infrastructure standards and guidance	17
2.6	Funding opportunities	18
2.7	Future transport projects and initiatives	19
3	Existing conditions	20
3.1	Land use and key destinations	20
3.2	Cycling facilities	21
3.3	Crash history	26
4	Population and travel behaviour	28
4.1	Population	28
4.2	Travel behaviour	28
5	Future land use	35
6	Consultation	37
6.1	Stakeholder consultation	37
6.2	Community consultation	39
6.3	Bayside personas	43
7	Issues and opportunities	45
8	Case studies	48
8.1	Brisbane Bicentennial Bikeway	48
8.2	Protected cyclist intersection in Melbourne	48
8.3	Reducing private vehicle dependency in New York	49
8.4	Tomorrow's Sydney – Travel Choices	50
8.5	Bourke Street cycleway	50
8.6	'Bike Box' bike parking and repair stations	52
8.7	Brisbane Active School Travel program	53
8.8	Bicycle boulevards	54
9	Network development	55
9.1	Direction and strategy	55
9.2	Bicycle network principles	55
9.1	Selection of cycling facilities	56

	9.2	Limitations	57
	9.3	Strategic bicycle network	57
10		Desktop audit	60
	10.2	Network auditing standards	62
	10.3	Findings	64
11		Actions	71
	11.1	Policy recommendations	71
	11.2	Behaviour change initiatives	72
	11.3	Infrastructure improvements	74
	11.4	Priority cycle routes	77
	11.5	Cost estimates	81
12		Summary	84

Appendices

Appendix A Recommended amendments to the DCP

Tables

Table 2-1	Future bicycle related projects and initiatives	19
Table 3-1	Strategic and local centres within Bayside	20
Table 3-2	Crashes by road user	26
Table 4-1	Bayside residential population 2011 and 2016	Error! Bookmark not defined.
Table 5-1	Future committed land use development	35
Table 6-1	Stakeholder consultation outcomes	37
Table 6-2	Bayside personas	44
Table 7-1	Cycling issues	45
Table 7-2	Cycling opportunities	46
Table 9-1	Cycling strategic statements	55
Table 10-1	Audited cycle routes	60
Table 10-2	Network standards criteria	62
Table 10-3	Potential locations for the implementation of each type of cycling facility	63
Table 10-4	Composition of separated cycleways	66
Table 11-1	Policy recommendations	71
Table 11-2	Behaviour change initiatives	73
Table 11-3	Infrastructure improvements	74
Table 11-4	Key cycling route multi criteria assessment	77
Table 11-5	Key cycling routes – multi criteria assessment scoring/ prioritisation	79
Table 11-6	Unit rates	81
Table 11-7	Cost per infrastructure type	82
Table 11-8	Estimated cost per key cycling route	83

Figures

Figure 1-1	Study area	3
Figure 2-1	Economic benefits of cycling	5
Figure 2-2	Urban road hierarchy	6
Figure 2-3	Principal Bicycle Network (existing)	9
Figure 2-4	Safe System – responses to various initiatives	10
Figure 2-5	Sydney green Grid	12
Figure 2-6	Development of Bayside’s LSPS.	14
Figure 2-7	Bayside modal hierarchy	15
Figure 2-8	Four priorities to increase cycling	16
Figure 3-1	TfNSW (formerly RMS) Cycleway Finder	22
Figure 3-2	Future Principal Bicycle Network	23
Figure 3-3	Existing cycling network	24
Figure 3-3	Strava heat map, Bayside LGA and surrounds	25
Figure 3-4	Cyclist crash clusters 2013 - 2018	27
Figure 4-1	Household Travel Survey SA3: Kogarah–Rockdale and Botany regions	29
Figure 4-2	Distance travelled by cyclists to work compared to all modes	30
Figure 4-3	Key destinations for commuters cycling to work	31
Figure 4-4	Transport mode share summary 2017/18	32
Figure 4-5	Botany and Kogarah-Rockdale mode share trends – Household Travel Survey	33
Figure 4-6	Trip purpose 2017/ 2018	33
Figure 4-7	Commuting mode share in 2016	34
Figure 6-1	Survey respondent demographics	40
Figure 6-2	Travel behaviour from survey responses	41
Figure 6-3	Key feedback from the online survey	42
Figure 7-1	Issues and opportunities	47
Figure 8-1	Bicentennial Bikeway	48
Figure 8-2	Protected cycleway concept	49
Figure 8-3	Bourke Street cycleway	51
Figure 8-4	Bike Box facilities	52
Figure 8-5	Road safety presentations at schools	53
Figure 8-6	Bicycle boulevard example	54
Figure 9-1	Provision of different types of cycling facilities	56
Figure 9-2	Strategic bicycle network	59
Figure 10-1	Audited network	61
Figure 10-2	Risk of dooring to cyclists	63
Figure 10-3	Example dooring risk	63
Figure 10-4	Audit findings - shared path width distribution	64

Figure 10-5 Audit findings – shared paths	65
Figure 10-6 On-road cycle lane width	66
Figure 10-7 Audit findings – On road cycle lanes	67
Figure 10-8 Audit findings – bike stencils	69
Figure 10-9 Audit findings – Missing links	70
Figure 11-1 Key cycling routes in network	78

Executive Summary

Purpose

This Bike Plan aims to guide investment in infrastructure to build a safe and connected cycling network, facilitating increased cycling mode share and creating more bicycle friendly local centres.

Transport vision and directions

The transport vision for Bayside as specified by the Draft Bayside Transport Strategy is:

A just, reliable and resilient transport system which supports active, healthy lifestyles and provides 30 minute access to economic, social, recreational and cultural opportunities for everyone.

The key transport directions which align with this vision and guided the development of the Bike Plan are:

- > Connected and integrated;
- > Efficient;
- > Active and vibrant;
- > Inclusive and safe; and
- > Sustainable and innovative.

Existing and future conditions

Bayside is an established Local Government Area (LGA) within Sydney which contains a number of strategic and local centres, and a variety of land uses from residential and employment to the major landholdings of Sydney Airport and Port Botany. Despite the developed nature of the area, cycling infrastructure is lacking and contains numerous gaps. Most cycling facilities provided are on-road facilities with limited separation from vehicle traffic, and do not continuously connect key centres and land uses within Bayside. The current mode share for cycling is around one per cent of all trips taken.

The population of Bayside is forecast to increase by 30 per cent between 2021 and 2036 (refer to **Section 4.1.2**). This will be driven by intensification of land uses, particularly around Mascot Station and Bayside West. As the LGA grows, travel demand and pressure on the road network will increase. There is a strong need to develop the cycling network to facilitate mode shift to sustainable transport and accommodate future cycling demand.

Consultation

Consultation was undertaken with stakeholders and the community (refer to **Section 6**) to identify issues, opportunities and needs. Most cyclists in Bayside ride a few times per week, travelling predominantly for exercise, social reasons or to work. Issues and opportunities identified varied widely, covering domains such as safety, connectivity and efficiency. Key community needs identified included:

- > An increase in the provision and quality of cycleways;
- > Improved legibility of the network;
- > Increased safety and separation;
- > Better links to train stations and employment areas; and
- > More parking.

Recommendations

Using the findings of the study and a desktop audit, a strategic cycling network (refer to **Section 9.3**) was developed for Bayside consisting of existing and proposed cycleways connecting centres and key land uses. The network aims to address the issues and opportunities identified and provide high quality infrastructure to achieve the transport vision and directions. Priority cycle routes for implementation were identified and cost estimates for the overall network were developed, totalling approximately **\$68,159,370** for all routes.

Actions were developed to guide the way forward for Bayside covering policy, behaviour change and infrastructure measures (refer to **Section 11**). These actions should be continuously planned, actioned and monitored to ensure the best outcomes for the Bayside community.

1 Introduction

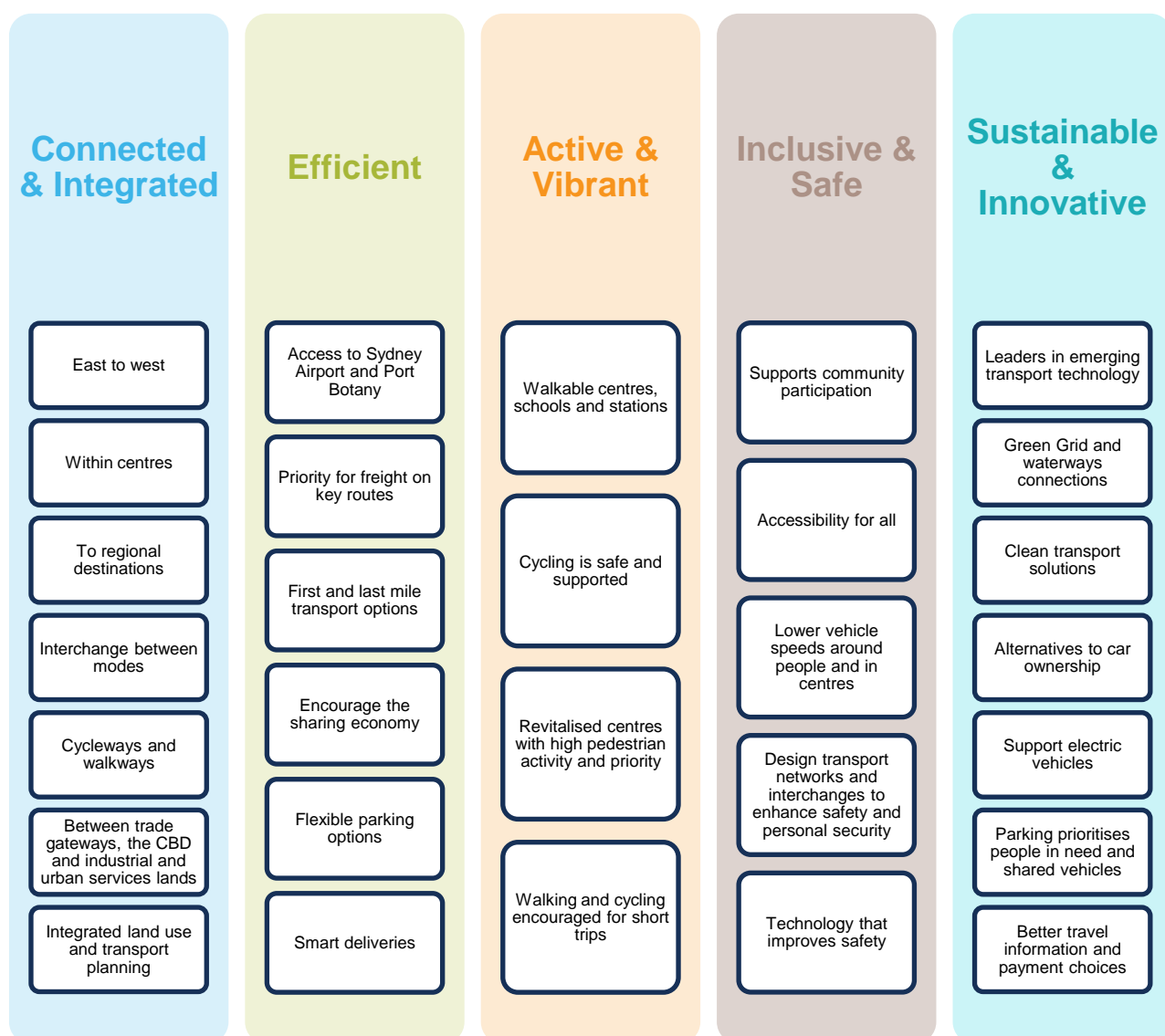
1.1 Transport vision and directions

This Bike Plan is guided by the transport vision and key directions of the Bayside Transport Strategy.

Transport vision

Transport vision
<i>A just, reliable and resilient transport system which supports active, healthy lifestyles and provides 30 minute access to economic, social, recreational and cultural opportunities for everyone.</i>

Transport directions



The Bike Plan sits under the Bayside Transport Strategy and provides more detail, analysis and recommendations in relation to cycling within the Bayside LGA.

1.2 Purpose and objectives of the Bike Plan

The Bayside Transport Strategy identifies the need for a Bike Plan to guide investment in infrastructure to build a safe and connected cycling network, facilitating increased cycling mode share and creating more bicycle friendly local centres.

The objectives of the Bike Plan are to:

- > Improve safe and convenient cycling access to employment, services, schools, social, recreational and cultural areas within Bayside as well as connections to other LGAs;
- > Promote cycling as a sustainable and healthy travel mode, reducing the need to rely on private vehicles and encouraging modal shift to cycling;
- > Make cycling more accessible and attractive as a travel mode for all age groups and cycling abilities;
- > Identify infrastructure requirements and programs for Council and State Government to implement for safe and easy cycling;
- > Implement a program of highly visible infrastructure across the Council road network; and
- > Increase awareness and promote aspects of inclusion and safety to the greater public, including education as to the vulnerability of bicycle riders on the road network.

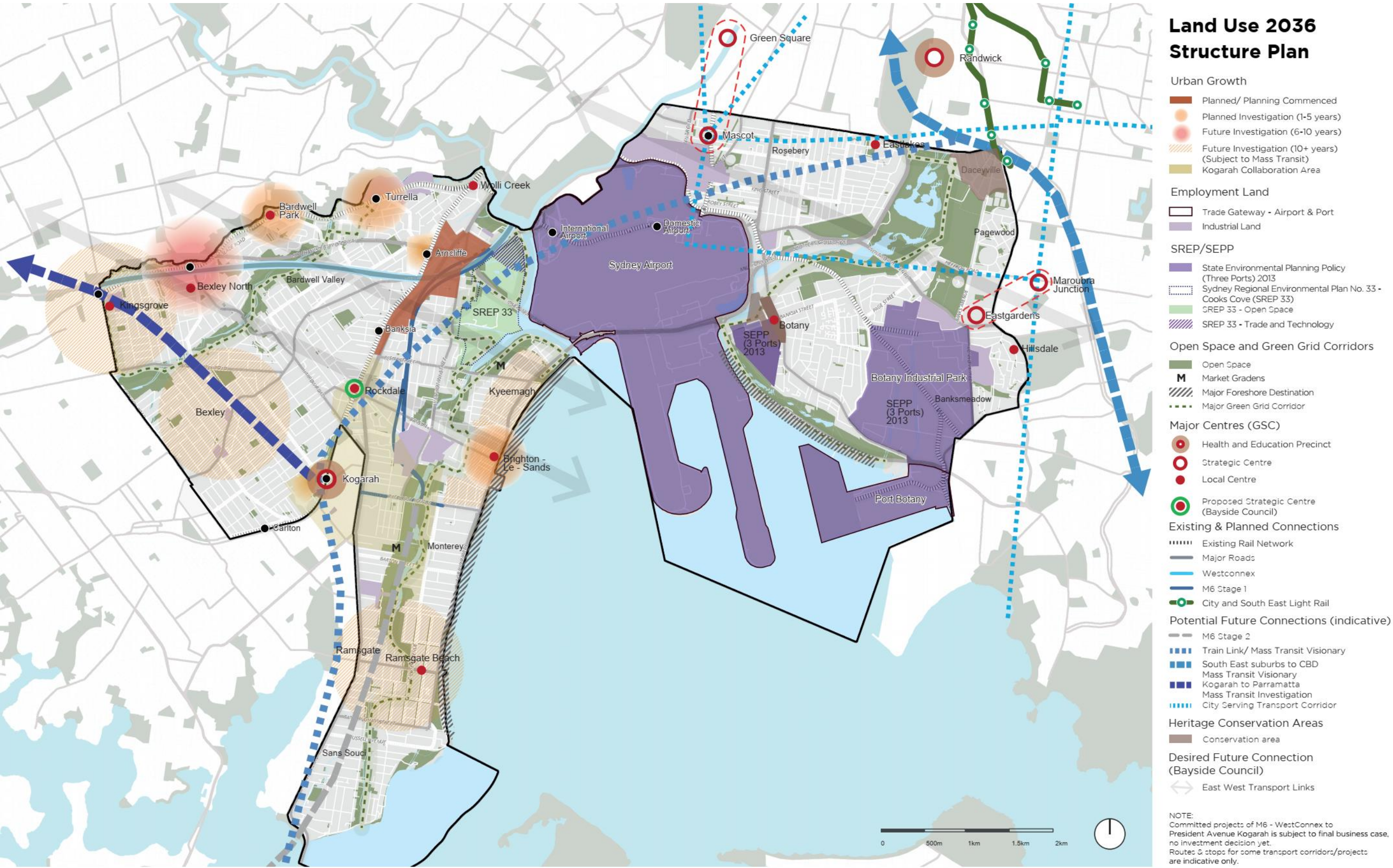
1.3 Study area

Bayside Council was formed in 2016 through the amalgamation of the former City of Botany Bay Council and Rockdale City Council. The Bayside LGA (Bayside) sits entirely within Sydney's Eastern City District as defined by the Greater Sydney Commission, and directly south of the Harbour (Sydney) City CBD. It surrounds Botany Bay from the north, east and west.

Major land uses include Sydney Airport and Port Botany, as well as a number of strategic and local centres, which are shown in **Figure 1-1**. Bayside is neighboured by Randwick City Council to the east, City of Sydney and Inner West Councils to the north, Canterbury Bankstown Council and Georges River Council to the south west and Sutherland Shire Council to the south.

Sydney Airport also acts as a cycling trip generator, however Port Botany employees are discouraged from cycling due to the potential conflict and safety implications from freight vehicles. The potential for conflict between cyclists and freight vehicles is also prominent throughout Bayside on main roads and elicits a need for separation as much as possible.

Figure 1-1 Study area



Source: Bayside Council Local Strategic Planning Statement, 2020

2 Background review

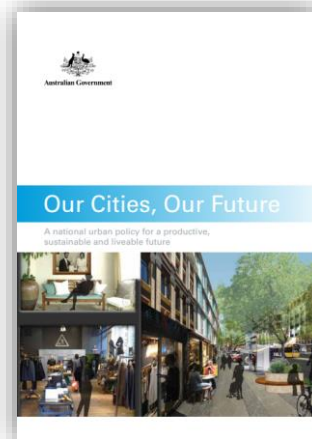
2.1 Federal government

2.1.1 Our Cities, Our Future National Urban Policy (Department of Infrastructure and Transport, 2011)

The National Urban Policy sets out how the government can deliver the aspirations for productive, sustainable and liveable cities. The policy provides directions for Australian cities over the coming decades to meet future challenges and growth, and presents principles, goals and objectives to achieve this. The key objectives in relation to active and public transport are to:

- > Integrate land use and infrastructure and investing in urban passenger transport;
- > Improve accessibility and reduce dependence on private vehicles by improving transport options and reducing travel demand by co-location of jobs, people and facilities; and
- > Support community wellbeing by improving the quality of the public domain and improving public health outcomes.

Key priorities indicated as part of these objectives include connecting centres with active and public transport networks, prioritising non-car transport modes, improving transport options, providing amenable walking and cycling networks and enabling people to travel safely by active or public transport.



2.1.2 National Road Safety Strategy 2021-2032 (Australian Transport Council, 2021) and Action Plan 2018-2020 (Transport and Infrastructure Council, 2018)

The National Road Safety Strategy 2021-2030 aims to provide direction for national action to reduce fatal and serious injury crashes on Australian roads. The strategy is based on the Safe System approach and includes roads, speeds, vehicles and users.

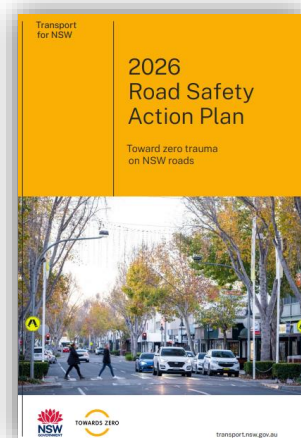
The strategy presents data including cyclist crash statistics and safety improvements from implementation of measures such as improved cycling infrastructure and reduced vehicle speed limits. Recommendations are made to improve safety under each component (roads, speeds, vehicles and users) and include an emphasis on physical separation of cyclists from motorised vehicles and lower speed limits to improve safety when sharing the road.

The latest action plan to support the implementation of the National Road Safety Strategy was developed collaboratively between the Commonwealth, state and territory transport agencies, and endorsed in April 2022 by the Ministers of the Transport and Infrastructure Council.

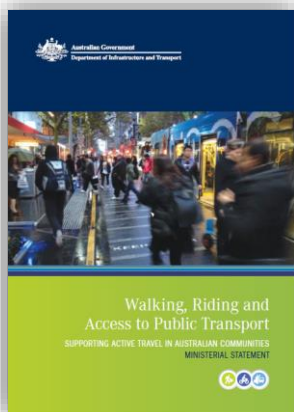
The plan states that “pedestrians and cyclists are vulnerable road users, as they have little or no protection in the event of a collision. Certain groups of pedestrians are particularly vulnerable, such as the elderly, the young and those who are impaired (for example by alcohol or drugs)” (p. 19).

The report notes the reduction in the default urban speed limit from 60 kilometres per hour to 50 kilometres per hour, and the reduction to 40 kilometres per hour in activity centres and CBDs. There is a growing movement internationally which argues that 40 kilometres per hour is still too fast and results in adverse safety outcomes for pedestrians and cyclists, and the report recommends investigating 30 kilometres per hour speed limits in high risk areas.

Various actions are presented to increase road safety and include an action to reduce speed limits to 40 kilometres per hour or lower in pedestrian and cyclist places.



2.1.3 Walking, Riding and Access to Public Transport (Department of Infrastructure and Transport, 2013)



The Department of Infrastructure, Transport, Cities and Regional Development (formerly the Department of Infrastructure and Transport) outlines a national approach for collaboration across all levels of government, business, and the community, to support active travel and public transport.

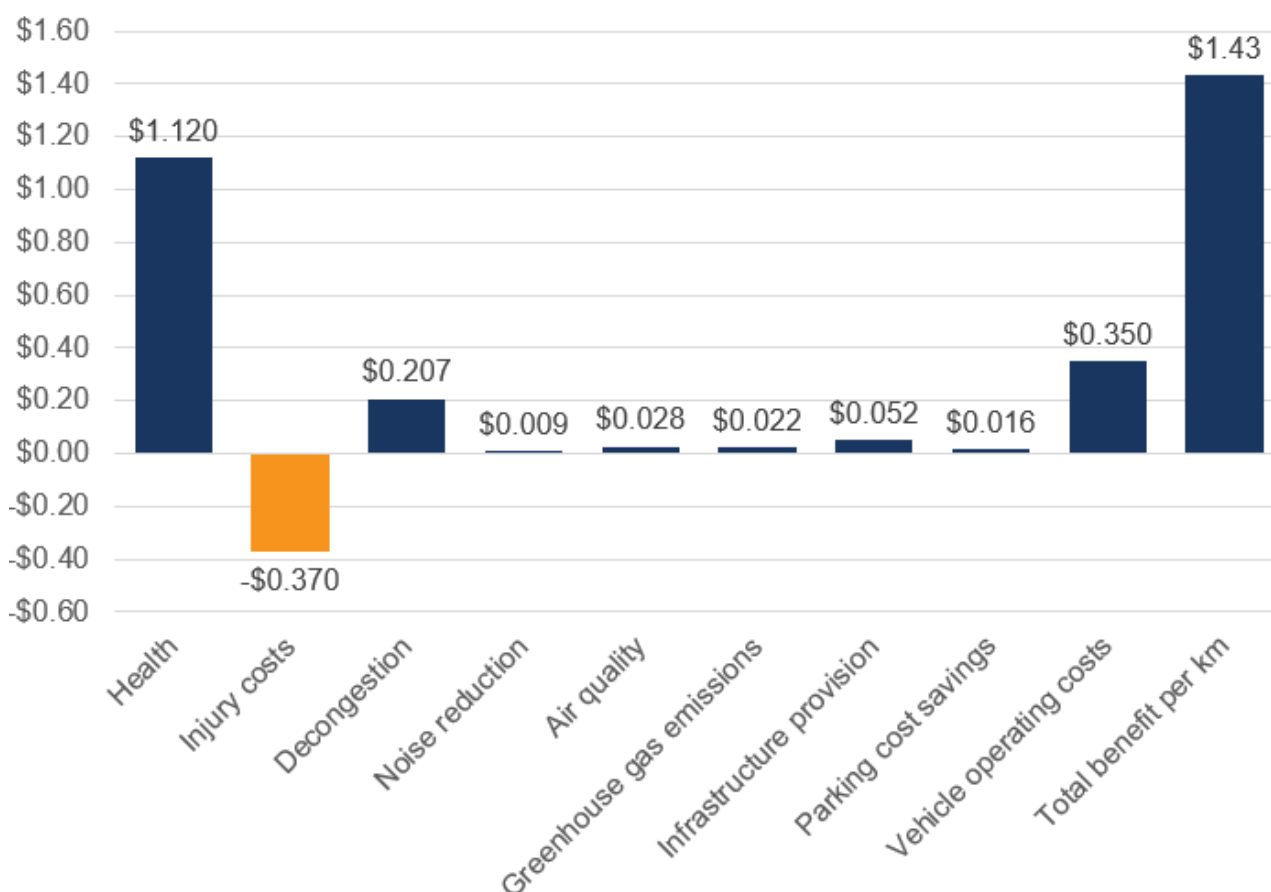
The report identifies a range of typical barriers and opportunities to walking, cycling and accessing public transport, present an economic analysis of the benefits and costs of these travel modes, and summarises principles and actions to support active and public transport.

The key overarching committed actions are:

- > **Plan:** Include walking and riding when planning for land use and transport;
- > **Build:** Build appropriate infrastructure for walking and cycling needs;
- > **Encourage:** Enable greater participation in walking, riding and public transport; and
- > **Govern:** Coordinate across agencies and levels of government.

The economic benefits of walking and cycling are well documented in positive health outcomes. The report indicates that every kilometre walked or cycled by the population has been estimated to deliver net benefits to the economy of up to \$1.43 and \$2.12 respectively, and the cycling benefits are shown in **Figure 2-1**.







Figure 2-1 Economic benefits of cycling



Source: https://infrastructure.gov.au/infrastructure/pab/active_transport/files/infra1874_mcu_active_travel_report_final.pdf, p. 7, viewed 09/01/2020

The report also suggests road hierarchies to consider, noting that pedestrians, bicycles and public transport should always be considered first in urban settings. This urban road hierarchy is highlighted in **Figure 2-2**.

Figure 2-2 Urban road hierarchy

					
Street or road type	Shared Zone with mixed traffic considered on a case by case basis	High pedestrian activity areas	Most urban roads	Urban arterial roads	Motorways and national highway network
Vehicle speed	< 20km/h	15–40km/h	40–60km/h	60–90km/h	90–110km/h
				Pedestrians + bicycles fully separated from vehicles	Pedestrians + bicycles fully separated from road environment
Consider first  Consider last	Pedestrians	Pedestrians	Pedestrians on footpaths		
	Bicycles	Bicycle lane on road	Wide bicycle lane on road or shared path**		
	Public transport	Public transport	Public transport	Public transport	Freight vehicles
	Service vehicles	Service vehicles	Service vehicles	Freight and goods	Public transport
	Goods delivery	Goods delivery	Goods delivery	Service vehicles	Service vehicles
	Private vehicles	Private vehicles	Private vehicles	Private vehicles	Private vehicles

**Level of separation depends on traffic volume.

Source: https://infrastructure.gov.au/infrastructure/pab/active_transport/files/infra1874_mcu_active_travel_report_final.pdf, p. 31, viewed 09/01/2020

2.2 State government

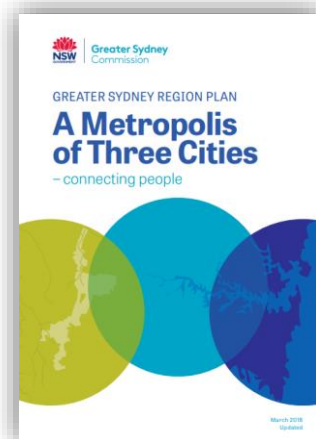
2.2.1 A Metropolis of Three Cities (Greater Sydney Commission, 2018)

A Metropolis of Three Cities (M3C), the current Sydney region plan, is the Greater Sydney Commission's (GSC) plan for Sydney as the population grows to eight million over the next 40 years. M3C is built on the vision of realigning Sydney into three distinct cities; an Eastern Harbour City, a Central River City and a Western Parklands City.

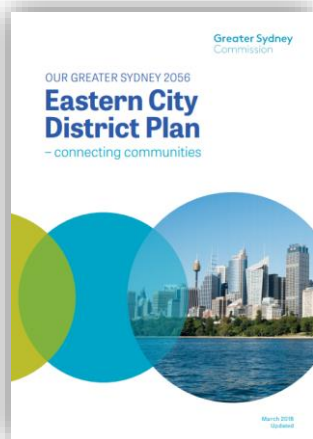
The plan encourages development of the three cities so they can support a large majority of residents with employment opportunities, education, health facilities, services, and great places within 30-minutes travel (walking, cycling or public transport) of their homes. The plan identifies safe and convenient cycling routes as key to achieving this, aiming for walking and cycling to be the mode of choice for short trips.

The Bayside LGA is located in the south-western corner of the Eastern Harbour City. M3C identifies Green Square-Mascot, Eastgardens, Maroubra Junction and Kogarah as the strategic centres within or adjacent to the Bayside LGA. Kogarah is also a nominated Collaboration Area based on its health and education precinct, Green Square-Mascot is a nominated commercial office precinct, and Sydney Airport and Port Botany are identified as trade gateways. The Bayside LGA is in the southern section of the Eastern Economic Corridor, which extends from Sydney Airport through the Harbour CBD to Macquarie Park.

An objective to achieve GSC's vision of a sustainable city is to create a Green Grid that links parks, open spaces, bushland and walking and cycling paths. Benefits of the Green Grid are that parts of it support walking and cycling, encourage healthy lifestyles, reduce emissions, and provide better access to open space.



2.2.2 Eastern City District Plan (Greater Sydney Commission, 2018)



The Greater Sydney Commission is implementing M3C through five district plans, which detail district-specific directions, place-based outcomes, and the actions to achieve these. The Bayside LGA is included in the Eastern City District Plan (ECDP). It references the strategic centres noted in M3C, and nominates local centres in Bayside as Bardwell Park, Bexley North, Botany, Brighton-Le-Sands, Eastlakes, Hillsdale, Kingsgrove, Ramsgate, Rockdale, and Wolli Creek.

In line with FT56 and M3C, the ECDP describes how integrated land use and transport planning can help achieve the 30-minute city through increasing development density near public transit corridors. It sets a target housing supply for the Bayside LGA of 10,150 new dwellings between 2016 and 2021, resulting in 26,900 more people, the second largest housing target noted in the ECDP, after City of Sydney.

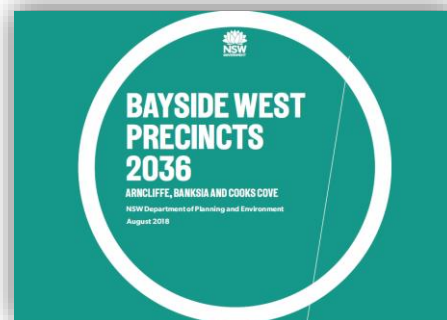
Key actions and planning priorities within the Eastern City District Plan in relation to cycling include:

- > Create and renew great places and local centres (Planning Priority E6) by promoting and investing into active lifestyles and transport through place-based planning;
- > Deliver Green Grid connections (Planning Priority E17) and high quality open space through the priority corridors (Planning Priority E18);
- > Reduce carbon emissions (Planning Priority E19) through the promotion of sustainable transport infrastructure and initiatives;
- > Prioritise infrastructure investments, particularly those focused on access to the transport network, which enhance cycling connectivity within 5 kilometres of strategic centres or 10 kilometres of the Harbour CBD (Action 23c); and
- > Provide for safe walking and cycling throughout the Green Square-Mascot centre and from Mascot Station to Sydney Airport (Action 49e).

2.2.3 Bayside West Precincts 2036 – Arncliffe, Banksia and Cooks Cove (NSW Department of Planning and Environment, 2018)

Bayside West Precincts 2036 sets out strategic land use and infrastructure planning to guide future transformation in the Bayside West Precinct (the Precinct) which includes Arncliffe, Banksia and Cooks Cove. Land use and infrastructure recommendations are based on five main themes, including the theme: Movement. The vision for the Precinct is to be vibrant, attractive and connected. One objective to achieving this is improving accessibility for pedestrians, cyclists and vehicles.

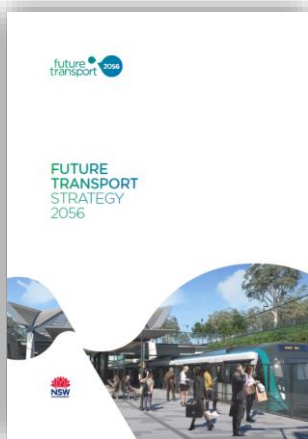
Community consultation was a key element in the preparation of this plan. Consultation identified that existing cycling facilities and routes were inadequate and the Precinct needs new and improved facilities.



Recommended regional and local cycling upgrades are:

- > Cahill Park to Tempe Recreation Reserve – new pedestrian and cycling bridge over the Cooks River;
- > Princes Highway to Arncliffe West – new pedestrian and cycling path following a section of the Southern and Western Suburbs Ocean Outfall Sewer;
- > A foreshore pedestrian and cycling path along the Cooks River;
- > A new pedestrian and cycling crossing of the Princes Highway from Cahill Park to Brodie Spark Drive;
- > New cycling facilities on Wollongong Road, Allen Street, Bonar Street, Wardell Street, Avenal Street, Burrows Street, Kyle Street, Duncan Street and Argyle Street with a dedicated cycleway along Spring Street; and
- > Upgrades to the existing bicycle network on the north-south route between Arncliffe Station and Banksia Station.

2.2.4 Future Transport 2056 (Transport for New South Wales, 2018)



Future Transport 2056 (FT56) aims to ensure that Greater Sydney will develop and maintain a world class, safe, efficient and reliable transport system over the next 40 years, while anticipating rapid changes in technology.

TfNSW supports the shift from private vehicles to more sustainable transport modes to reduce traffic congestion and vehicle emissions, and improve air quality to create a more sustainable state. Well planned, 30-minute cities will help to enable this shift. Cycling is identified as an efficient and reliable way to access centres, and should be made more desirable for shorter trips.

FT56 aims to increase public transport usage by providing better active transport infrastructure connecting to these services. More people completing shorter trips using active transport will improve network outcomes overall in addition to delivering health, wellbeing and environmental benefits. FT56 identifies that safe, separated cycleways as well as provision of facilities such as secure bicycle storage are key to encouraging people to cycle.

Future directions to investigate to support cycling are:

- > Delivering complete cycling networks;
- > Enabling shared use services in key centres (e.g. bike hire); and
- > Developing and adopting safety standards for new devices entering the market and reviewing existing regulatory frameworks.

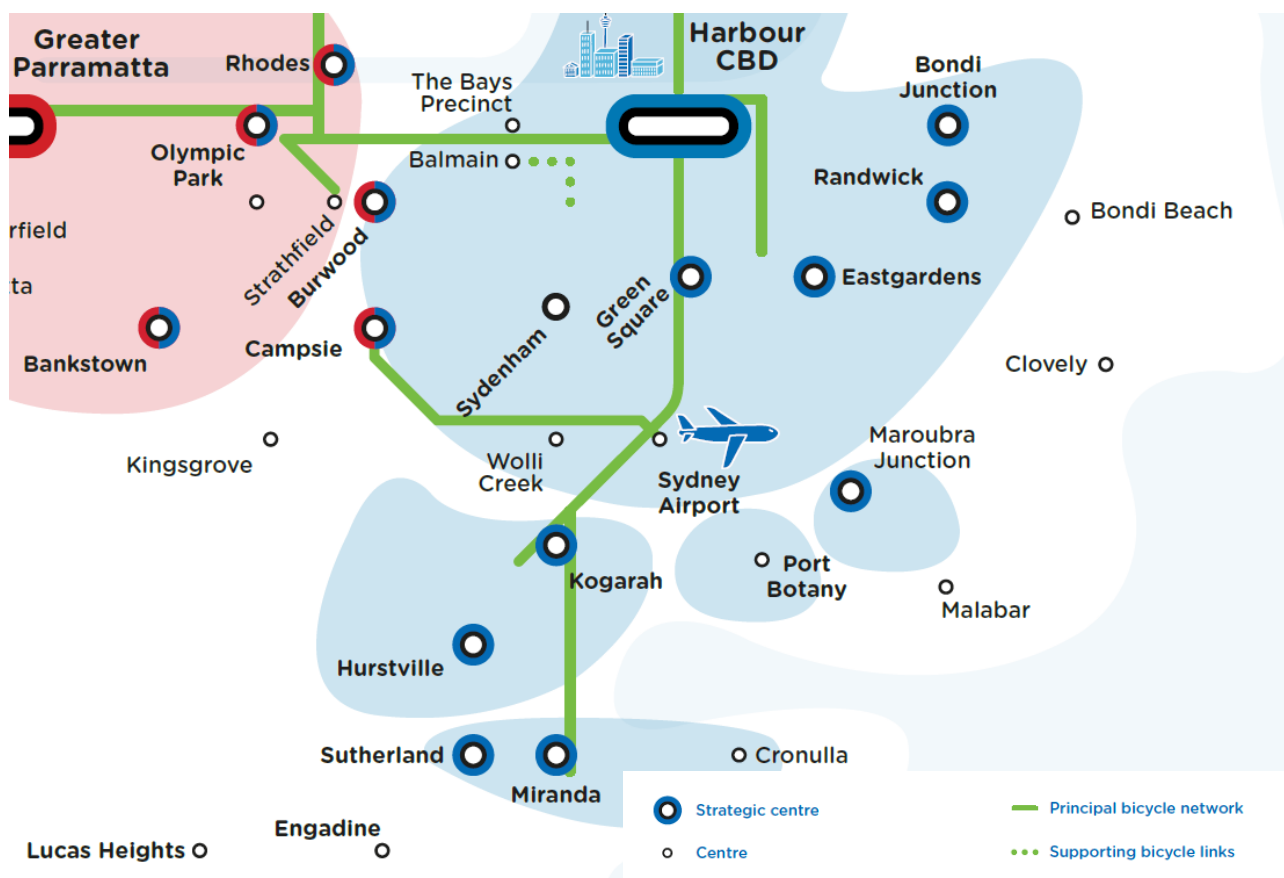
Committed cycling initiatives for Greater Sydney are:

- > Cycling improvements around strategic centres and on the Principal Bicycle Network (0 -10 years);
- > Further investment in cycling connections within five kilometres of strategic centres and on the Principal Bicycle Network (10 – 20 years); and

- > Further investment in cycling connections within five kilometres of strategic centres and on the Principal Bicycle Network (20+ years).

An extract from the existing (2018) Principal Bicycle Network is shown in **Figure 2-3**.

Figure 2-3 Principal Bicycle Network (existing)



Source: Future Transport Strategy 2056, Transport for NSW, 2018

The future Principal Bicycle Network proposed by FT56 is shown in **Figure 3-2**.

2.2.5 Road Safety Plan 2021 (Transport for New South Wales, 2021)

The NSW Road Safety Plan commits the State to the internationally recognised Safe Systems approach and a future where there is a target to have zero fatalities on NSW roads. “Ambitious but achievable”, the plan’s trauma reduction targets can help to guide future investment, and reflect the NSW Government’s commitment to make NSW roads the safest in the country.

Active transport users generally have no protection from road hazards or other vehicles as vehicle drivers do.

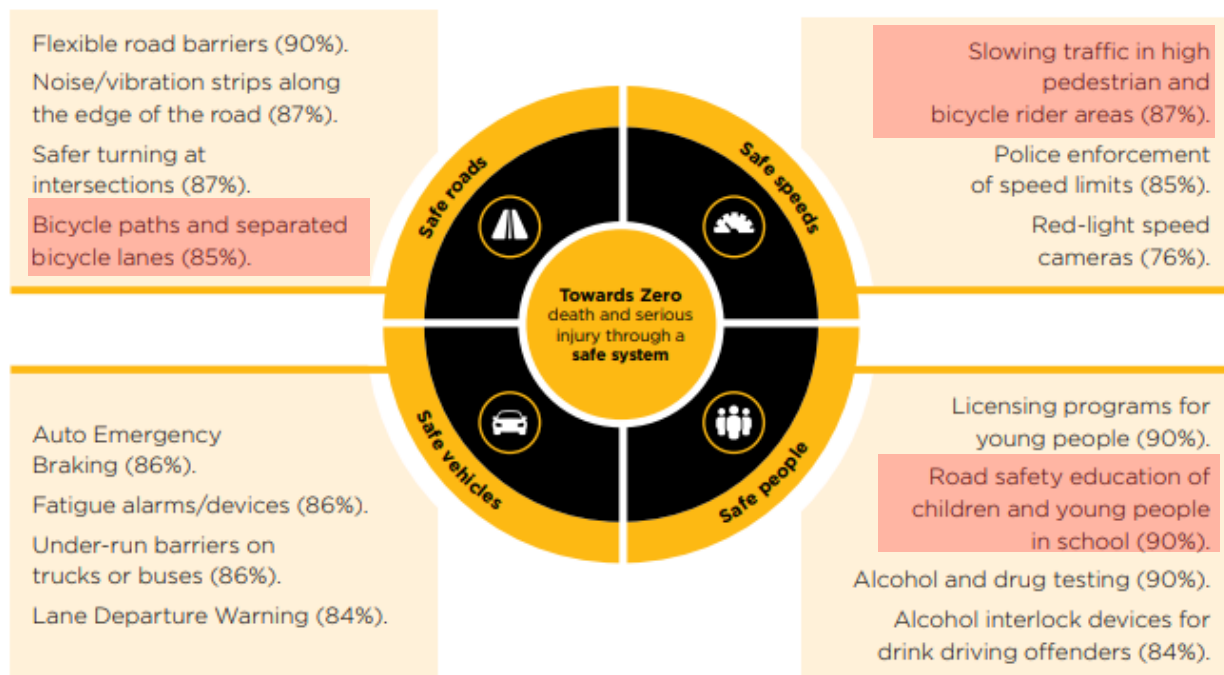
The State’s Priority Target is to reduce road fatalities in NSW by at least 30 per cent from 2008–2010 levels by 2021. By 2026 new targets will be set every ten years, with reviews every five years, to make sure we continue to move Towards Zero fatalities and serious injuries on our roads. By 2056, NSW is to reach an aspirational target of zero fatalities and serious injuries.

For walkers and cyclists, the ‘Towards Zero’ plan suggests the potential for fatal accidents or serious injuries is much higher given they are not protected from impacts. Most suggested safety strategies in the report target driver behaviour.

19 per cent and 25 per cent of fatalities and serious injuries respectively on the road are pedestrians and cyclists. Surveys indicate strong support for bicycle paths and the need to slow traffic in high pedestrian/cyclist activity zones is shown in **Figure 2-4**.



Figure 2-4 Safe System – responses to various initiatives



Source: Road Safety Plan 2021, Transport for New South Wales, 2021, p. 25

2.2.6 The Sydney Green Grid (Office of the Government Architect, 2017)

The Green Grid is a long-term vision to create a network of high quality green spaces that connects communities to the natural landscape. It links tree-lined streets, waterways, bushland corridors, parks and open spaces with centres, public transport and public places.

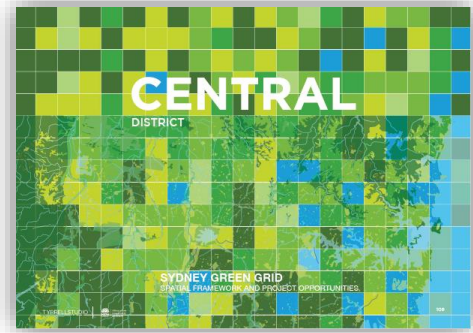
The Green Grid's development is being guided by Planning Priority E17 in the ECDP, which looks to increase the amount of urban tree canopy coverage and complete the missing Green Grid connections.

Further links will be made through enhancements to creek corridors, transport routes, footpaths and cycleways to encourage active transport, help promote healthy living patterns and reduce extremes of urban heat that are anticipated to increase with climate change. Enhancing the amenity of and accessibility to, the Greater Sydney Green Grid will promote a healthier urban environment, improve community access to recreation and exercise, encourage social interaction, support walking and cycling connections and improve resilience.

In relation to the Bayside LGA, the transport corridors identified for the Green Grid are:

- > Cooks River Open Space Corridor;
- > Wolli Creek Regional Park and Bardwell Valley Parklands;
- > Mill Stream and Botany Wetlands Open Space Corridor; and
- > Rockdale Wetlands Open Space Corridor.

The Sydney Green Grid opportunities are shown in **Figure 2-5**.



[illegible]

Source: Central District, Sydney Green Grid Spatial Framework and Project Opportunities, Tyrrell Studio, 2017

2.3 Local Government

2.3.1 Bayside 2032 – Community Strategic Plan (Bayside Council, 2022)

The Bayside 2032 Community Strategic Plan (Bayside 2032) sets the vision, themes and goals to guide the Bayside LGA to 2030. Drawing on community and stakeholder engagement, demographic analysis, Council strategic planning, and State Government planning, Bayside 2032 will inform delivery plans, operational plans and development of new planning controls for the recently formed Council.

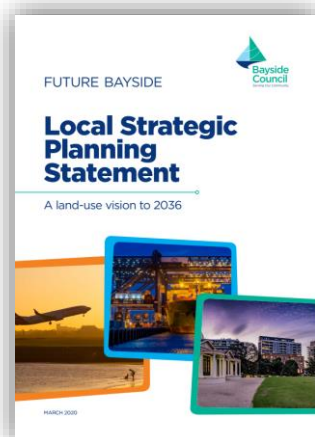
Based on social justice, resilience and good governance principles, the following four themes are outlined which describe the desired future for Bayside:

1. **In 2032 Bayside will be a vibrant place.**
 - Walking and cycling is easy in the City and is located in open space where possible;
 - The public spaces are innovative and put people first;
 - Open space is accessible and provides a range of active and passive recreation opportunities;
 - The community welcomes tourists and visitors to the city; and
 - Traffic and parking issues are thing of the past.
2. **In 2032 the people will be connected in a smart city.**
 - Residents are a healthy community with access to active recreation.
3. **In 2032 Bayside will be green, leafy and sustainable.**
 - The community understands climate change, and are prepared for the impacts;
 - The streetscapes are green and welcoming; and
 - The community have an enhanced green grid/ tree canopy.
4. **In 2032 Bayside will be a prosperous community.**
 - Bayside will be a 30 minute city – residents work locally or work off site – no one has to travel for more than 30 minutes to work; and
 - Residents can easily travel around the LGA – traffic problems/ gridlock are a thing of the past.



2.3.2 Bayside Council Local Strategic Planning Statement, March 2020

Recent changes to the NSW Environmental Planning and Assessment Act of 1979 (the EP&A Act) have led to the re-structuring of planning governance across NSW and metropolitan Sydney. As part of this, each council must now prepare a Local Strategic Planning Statement (or LSPS). These statements define a clear 20-year vision for local land use planning, highlight what is important about the local identity and shared values of each LGA, and incorporate these into future local planning directives which must also align with the long-term strategic goals of the Greater Sydney Commission.



In Sydney, a LSPS should be informed by each LGA's own Community Strategic Plan – and the overarching strategy documents released by the Greater Sydney Commission, which include the metropolitan District Plans. Once an LSPS has been endorsed by the Department of Planning, Industry and Environment (DPIE), State agencies are and Council's will work to give effect to them when deciding on future infrastructure, service delivery. The LSPS will form part of strategic merit tests for Planning Proposals and Local Environment Plan (LEP) amendments.

Bayside's LSPS 2020 has been written to align with the Eastern City District Plan, and shaped by the previously developed Community Strategic Plan, *Bayside 2030*, see **Figure 2-6**. Bayside's LSPS has also been written to encompass the goals of well as the goals of the *Resilient Sydney* project.

The four key themes driving the development of the Bayside LSPS 2020 are:

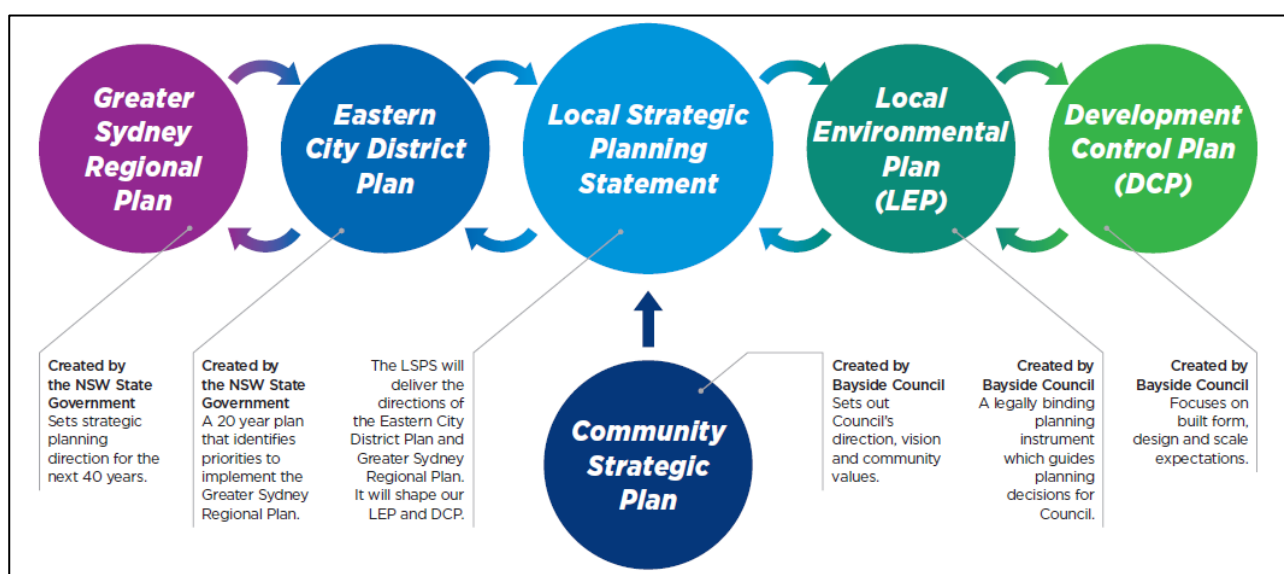
- > Infrastructure and Collaboration;
- > Liveability;
- > Productivity; and,
- > Sustainability.

Supporting these themes, Bayside's LSPS identifies 24 clear planning priorities, which are supported by 148 actions. The most relevant planning priorities for the Bayside Transport Strategy are:

- > Planning Priority B1: Align land use planning and transport infrastructure planning to support the growth of Bayside.
- > Planning Priority B12: Deliver an integrated land use and a 30-minute city.

The Bayside LSPS 2020 will inform the Bayside LEP and Development Control Plan (DCP). The relationship of planning strategic is shown in **Figure 2-6**.

Figure 2-6 Development of Bayside's LSPS.



Source: Local Strategic Planning Statement 2020, Bayside Council

2.3.3 Bayside Transport Strategy (Bayside Council, 2022)

The Bayside Transport Strategy provides the framework for transport policy and infrastructure for Bayside considering the strategic transport context, current transport conditions, and forecast growth in the Bayside LGA.

The Transport Strategy outlines the vision for the future of Bayside, as “a just, reliable and resilient transport system which supports active, healthy lifestyles and provides 30 minute access to economic, social, recreational and cultural opportunities for everyone”. Transport directions that determine priorities for Bayside are:

- > Connected and integrated;
- > Efficient;
- > Active and vibrant;
- > Inclusive and safe; and
- > Sustainable and innovative.

Principles were developed to achieve the vision and directions, and to guide transport strategies and actions for the LGA. They are described further in **Section 9.2**.

The Transport Strategy also presents a modal hierarchy to reflect priorities from the transport vision and support the strategic directions.

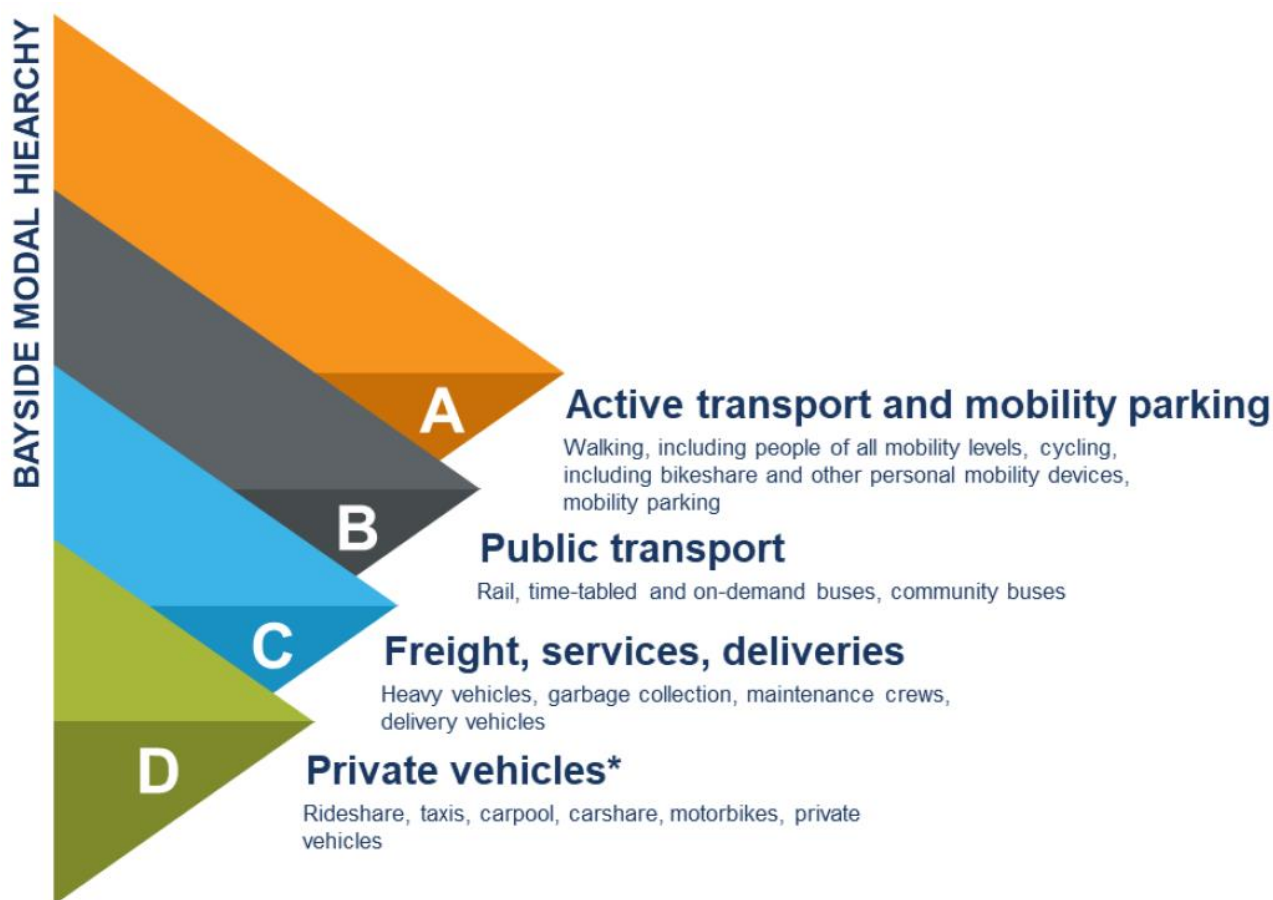


Bayside's transport modal hierarchy **Figure 2-7** reflects the priorities from the transport vision; supporting active, healthy lifestyles and aiming for 30-minute access to economic, social, recreational and cultural opportunities for everyone. The hierarchy indicates an aspiration to prioritise walking and cycling over other transport modes in more locations. It does not apply in all locations separated for specific purposes, i.e. railway or motorway corridors.

It acknowledges that while all transport modes need access and movement, people on foot, bike or in a wheelchair, and people who travel in sustainable and efficient transport vehicles, should be considered first.

Given the road network's complex range of functions, historical development context, and existing travel behaviours, the hierarchy will not necessarily apply in every situation related to street and site planning. Instead, it can be used as a reference and reminder to consider the modes at the top of the hierarchy first, and to focus on providing the safety, space, and connectivity for their needs.

Figure 2-7 Bayside modal hierarchy



**Within private vehicles, a hierarchy of shared transport, followed by no or low emission vehicles (electric vehicles and motorbikes), and then private vehicles with internal combustion engines*

2.3.4 Development Control Plans

The Development Control Plans (DCPs) guide all built form design elements for LGAs, in accordance with zoning and local attributes. DCPs can apply across the LGA or address location specific needs. A summary of relevant cycling elements from each of the former councils' DCPs is listed below. They have informed the transport principles and actions and have been reviewed in relation to cycling aspects.

Bayside Council is preparing a new DCP that will replace the previous Botany Bay and Rockdale Council DCPs.

2.3.4.1 Botany Bay DCP:

- > Adequate, safe, functional and accessible bicycle parking, compatible with proposed development;
- > Safer environment for the community, with better integration and connection of streets and the public domain; and

- > Promote sustainable development that improves transport, parking, access and cycling outcomes.

2.3.4.2 Rockdale DCP

- > Improve the City's sustainable transport network to encourage alternative transport modes and provide better access to the City's attractions;
- > Ensure services and facilities are readily accessible to a broad range of people;
- > Ensure the implementation of best practice sustainability principles;
- > Provide sufficient, convenient and safe on-site car parking while encouraging alternative modes of transport, such as walking and cycling and discourage excessive parking in development close to public transport; and
- > Ensure a safe environment by promoting crime prevention through environmental design and encourage the integration of transport services into the streetscape and public domain.

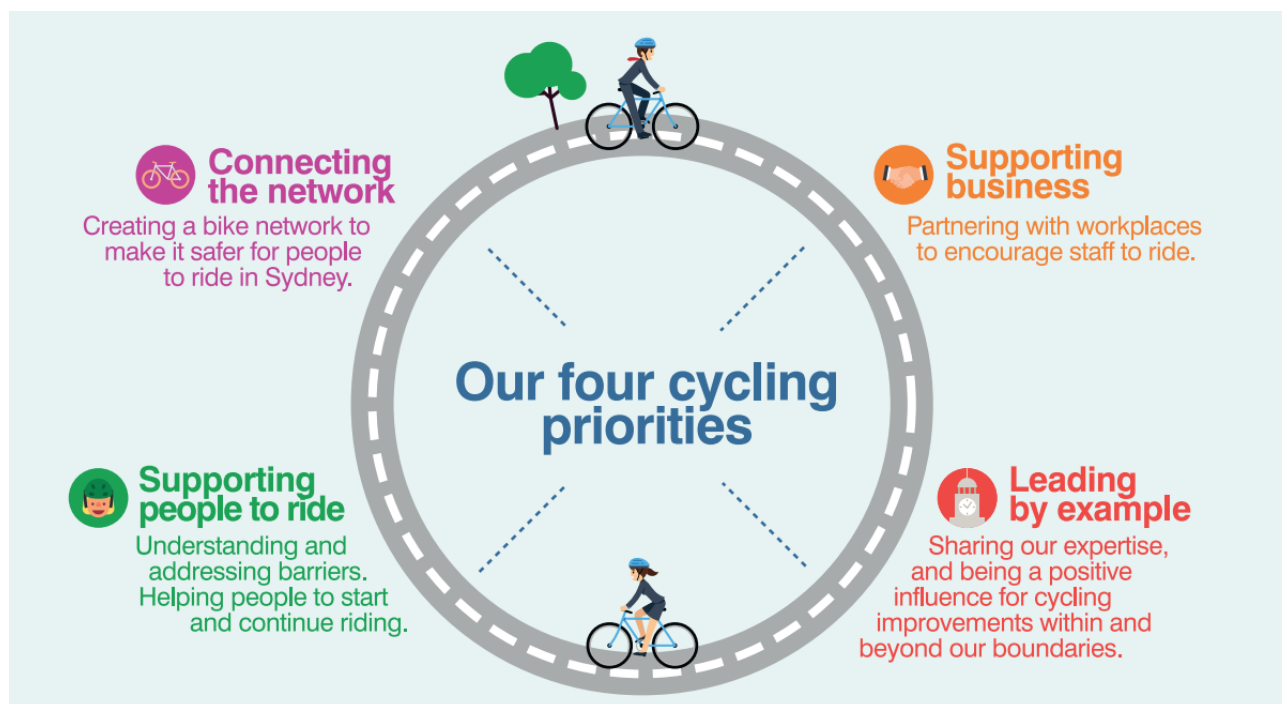
2.4 Neighbouring local government

The Bayside LGA is neighboured by Randwick City Council, City of Sydney Council, Inner West Council, City of Canterbury-Bankstown, Georges River Council and Sutherland Shire Council. City of Sydney Council is the only bordering LGA that has a formal Bike Plan provided on their website.

2.4.1 City of Sydney Cycling Strategy and Action Plan, 2018

The 'City of Sydney Cycling Strategy and Action Plan (2018 – 2030)' is developed based on the four priorities to increase cycling, described in **Figure 2-8**.

Figure 2-8 Four priorities to increase cycling



Source: City of Sydney Cycling Strategy and Action Plan (2018 – 2030)

The Plan identifies bike routes connecting to the Bayside LGA at the following locations:

- > An existing bike route on Bourke Road and Bourke Street, connecting the city of Sydney with Mascot Station and Domestic Airport Station;
- > A planned regional bike route on Dunning Avenue, Harcourt Parade, Primrose Avenue, Gardeners Road and Gordon Street. This route connects the north of Bayside to Green Square; and
- > A planned route along the eastern side of the Alexandra Canal, connecting the International Airport and the Cooks River to Alexandria and Green Square.

A map showing these links is provided in **Section 3.2.1**.

2.4.2 Inner West Council Integrated Transport Strategy, 2019

The transport vision for the Inner West Council is as follows:

Growing numbers of Inner West residents, workers and visitors prefer to walk, cycle and use public transport because it is safe, convenient, enjoyable and healthy. Everyone is connected to their community and local services, and can access educational, retail, cultural and recreational districts, as well as jobs and services across local and regional areas. The transport network enhances local economic vitality, with freight and goods movements separated from people by space and/ or time.

The six values for Inner West's transport network are Safe, Just, Trustworthy, Clean, Comfortable and Viable. Actions to achieve the vision that are relevant to the cycling network are:

- > Integrate the local pedestrian and bike network with the Greenway and develop local Green Grid network;
- > Construct the missing links in the local pedestrian and bike network, identifying sources of funding for improvements to the active transport network;
- > Provide bike lockers at key train stations, bus and light rail stops;
- > Prepare a Bike Plan (to be part of Active Transport Plan);
- > Planning footpaths, cycleways and parking and charging infrastructure that accommodates e-scooters and e-bikes;
- > Advocate for better data on cycling safety and accidents;
- > Encourage the State Government to accommodate bikes on public transport;
- > Review, and upgrade where required, street lighting and active / passive surveillance across the footpath and cycleway networks;
- > Connect the LGA's walking and cycling networks to the active transport facilities provided as part of major projects; and
- > Revise the LEP/DCP to require major new developments to provide through-site links for public access on foot and bicycle.

2.4.3 Randwick City Council Bicycle Plan Route Priorities, 2015

The Randwick City Council Bicycle Plan identifies existing and proposed key cycling routes for the LGA. They are designed to improve links with key destinations such as UNSW, beaches and Heffron Park, and promote use by the whole community. The priorities link with the plans of neighbouring councils including Bayside Council. Key proposed cycling routes linking with Bayside include:

- > Anzac Bikeway – North: To provide a protected bike lane along one of Randwick City Council's busiest cycling routes;
- > South Coogee to Kingsford: To provide a bicycle link between South Coogee and the Kingsford light rail stop;
- > Irvine Street, Royal Street and Paine Street: To provide a link between Anzac Parade bike path and Heffron Park.

2.5 Cycling infrastructure standards and guidance

Standards and guidance relating to cycling infrastructure are provided in key documents including:

- > Guide to Road Design Part 3 – Geometric Design (Austroads, 2016);
- > Guide to Road Design Part 6A – Paths for Walking and Cycling (Austroads, 2017);
- > Guide to Traffic Management Part 4: Network Management (Austroads, 2016);
- > Guide to Traffic Management Part 5: Road Management (Austroads, 2017);
- > Cycling Aspects of Austroads Guides (Austroads, 2017);
- > Cycleway Design Toolbox; Designing for cycling and micromobility (TfNSW, 2020);
- > Summary of Design Principles for Good Bicycle Infrastructure (Bicycle NSW, 2020)
- > AS 1742.9-2000 – Manual of uniform traffic control devices: bicycle facilities (Standards Australia, 2009); and

- > RMS supplements to the Austroads Guides and Australian Standards.

These documents were used in the development of this Bike Plan.

2.6 Funding opportunities

Historically, Bayside Council's cycling budget has been allocated through general revenue or through developer contribution plans. Standard funding opportunities from the public sector aside from these funding streams include the Australian Government's Roads to Recovery program (which is encouraged to be spent on safety improvements) and the identified local road component of the Financial Assistance Grant, as well as the NSW Government's Block Grants, all of which Council is entitled to by default.

Infrastructure can also be funded through asset development by authorities such as NSW Ports, Sydney Water and other agencies.

Other public funding opportunities requiring applications for specific projects include:

NSW Government:

- > **Walking and Cycling Program¹** – a program consistent with the NSW Government priorities and strategies and aimed at working with Councils to:
 - Make walking and cycling a more convenient option for short trips;
 - Reduce congestion on roads;
 - Enable efficient, safe and reliable journey times by prioritising pedestrian and cycling infrastructure;
 - Deliver projects that make walking and cycling safe, comfortable and convenient transport modes; and
 - Enable positive health, wellbeing, social and environmental outcomes.
- > **Community Road Safety Grants²** – grants for initiatives around road safety including education, skills training and awareness.
- > **Local Government Road Safety Program³** – a partnership between TfNSW and local councils to provide funding for a Road Safety Officer and local road safety projects.
- > **Principle Bike Network** – The Principle Bike Network could be developed with leverage from State government infrastructure projects such as Sydney Gateway, M6 Extension and the Botany Freight Rail Duplication.

Principal Bicycle Network

“Transport for NSW are working with local governments and other stakeholders to develop a Principal Bicycle Network / Strategic Bicycle Network, which will provide a safe, connected cycling network and grow the bike-riding mode share in the Greater Sydney area.

The Principal Bicycle Network, which won the award for Great Sustainability Initiative at the 2020 Greater Sydney Planning Awards, is a step towards creating around 6,000 kilometres of bike-riding routes across Greater Sydney, Newcastle, Gosford and Wollongong. These are a mix of cycleway types appropriate to the location, including protected cycleways, shared paths, and bicycle boulevards (low-speed, local-traffic only local streets that prioritise bicycle access).

A safe, connected Principal Bicycle Network could also act as a broader ‘micromobility lane’ to enable and support emerging and future forms of micromobility.

For regional areas, the development of infrastructure for cycling tourism, such as safe networks in regional towns, rail trails and coastal routes, will present ‘transport as tourism’ opportunities that attract visitors to towns and villages, bringing job opportunities and economic benefits.”

<https://future.transport.nsw.gov.au/project-highlights/walking-and-cycling-networks> (viewed August 2022)

¹ <https://www.transport.nsw.gov.au/projects/programs/walking-and-cycling>

² <https://roadsafety.transport.nsw.gov.au/aboutthecentre/communitygrants/index.html>

³ <https://www.rms.nsw.gov.au/business-industry/partners-suppliers/lgr/grant-programs/local-government-road-safety-program.html>

Australian Government:

- > **Black Spot Program⁴** – targeted at road locations where crashes are occurring to increase road safety through infrastructure improvements.

Funding opportunities from the private sector include:

- > Developer contributions through the Section 7.11 (previously S94) plan, which would be updated to reflect the latest infrastructure requirements and works identified;
- > Draft Special Infrastructure Contributions (SICs) for certain items in accordance with the Bayside West Precincts 2036 plan; and
- > Planning Agreements (PAs) between developers and Council or the Department of Planning, Industry and Environment (DPIE).

2.7 Future transport projects and initiatives

Major investment in improvements to the transport system is underway across Sydney, with new city-shaping rail projects, motorway links, on-road public transport priority projects and active transport projects all planned to move Sydney's people and goods more efficiently. Several proposals, planning initiatives and projects related to cycling directly affect the Bayside LGA and are summarised in **Table 2-1**. Not all of these projects are approved to proceed – some are in planning or currently at proposal or business case stage.

Table 2-1 Future bicycle related projects and initiatives

Transport project	Source	Timing	Key details	Outcomes
Greater Sydney Principle Bicycle Network/Stategic Bicycle Corridors	Future Transport 2056 Greater Sydney Services and Infrastructure Plan	Initiatives for Investigation (0-10 years)	Greater Sydney Principle Bicycle Network: FT56 focuses on a connected network supporting a ten kilometres radius of the Harbour CBD and five kilometres catchments to strategic centres. The PBN/SBC is currently at the blueprint stage and a Strategic Business Case is being developed by TfNSW.	An integrated network of cycling paths across Greater Sydney would alleviate some traffic congestion. The health benefits of an improved cycling network which encourages mode share shift are substantial.
Sydney Gateway project	ECDP	Estimated 2025.	The ECDP notes that this would address connections to/ from Mascot Station (located to the north of Sydney Airport). Better connections are needed from the east, south and north, and cycleways to the T2/ T3 Domestic Terminals and one connecting from the west to T1.	Sydney Airport supports a significant employment base, and if employees were able to safely cycle to work, this may alleviate some local road congestion.
M6 Stage 1 shared cycle and pedestrian paths	M6 Stage 1	Stage 1 estimated to open in 2025	The M6 Stage 1 includes plans for an active transport corridor starting from the existing cycleway at Muddy Creek next to Bestic Street, Brighton-Le-Sands, connecting south to Kogarah through Rockdale Bicentennial Park. The plans include a shared cycle and pedestrian bridge over President Avenue.	The M6 shared path would provide local connectivity through the M6 corridor. The route would become regionally significant upon the completion of Stage 2.
Network of protected cycle ways linking major strategic centres	INSW SIS 2018 recommendation Future Transport 2056	For investigation (0-10 years)	This should be delivered in partnership with local government and be integrated with the Greater Sydney Commission Green Grid. Investment in cycling connections within 5 kilometre radials of strategic centres.	An integrated network of cycling paths between strategic centres would alleviate some traffic congestion. The health benefits of an improved cycling network are substantial.

⁴ https://investment.infrastructure.gov.au/infrastructure_investment/black_spot/

3 Existing conditions

3.1 Land use and key destinations

Bayside has a range of land uses and a number of important destinations which generate cycling trips. These are discussed in the following sections. For a more comprehensive review of existing land uses, refer to the Bayside Transport Strategy.

3.1.1 Strategic and local centres

Three of Sydney's 34 strategic centres identified in M3C, Eastgardens-Maroubra Junction, Green Square-Mascot, and Kogarah, are either fully or partly located in the Bayside LGA. Kogarah is also a nominated Collaboration Area based on its health and education precinct, and Green Square-Mascot as a commercial office precinct.

There are currently ten local centres across the Bayside LGA. These support their neighbourhoods with local shops, services, jobs and community facilities. Most local and strategic centres are connected to each other via NSW state roads, with opportunities for widened footpaths to better accommodate walking and cycling.

The strategic and local centres in Bayside are listed in **Table 3-1**.

Table 3-1 Strategic and local centres within Bayside

Centre type	Centres	
Strategic centres	<ul style="list-style-type: none"> Eastgardens-Maroubra Junction; Green Square-Mascot; and 	<ul style="list-style-type: none"> Kogarah.
Proposed strategic centres (Bayside LSPS)	<ul style="list-style-type: none"> Rockdale. 	
Local centres	<ul style="list-style-type: none"> Bardwell Park; Bexley North; Botany; Brighton-Le-Sands; Eastlakes; 	<ul style="list-style-type: none"> Hillsdale; Kingsgrove; Ramsgate Beach; Rockdale; and Wolli Creek.
Other centres	<ul style="list-style-type: none"> Bexley; Banksia; 	<ul style="list-style-type: none"> Arncliffe; and Sans Souci.

3.1.2 Residential

As per the 2021 Census, Bayside LGA was home to 175,201 residents (Profile ID). In 2021 there were 68,219 dwellings (ABS Census). Most of the housing across the Bayside LGA is made up of high density, separated or medium density stock. Between 2016 and 2021, 10,564 additional dwellings were built in the Bayside LGA - an increase of 15 per cent. The Bayside areas with the highest residential densities are the northern parts such as Wolli Creek, Arncliffe, Eastgardens and Mascot. There are also many frontages of high density along portions of the Princes Highway between Kogarah and Wolli Creek.

3.1.3 Recreation and open space

Bayside includes more than 200 hectares of park land, 150 hectares of sports grounds, 100 hectares of natural open space, seven golf courses, two aquatic centres, and four tidal swimming enclosures.

Major green spaces include the M6 road reservation between Ramsgate and Brighton-Le-Sands, Bardwell Creek, Cooks Cove, The Lakes Golf Club and the Bonnie Doon Golf Club. The two aquatic centres are located in Bexley and Botany, ensuring access for the communities on the east and west sides of the LGA. Publicly accessible beaches and foreshores extend from the southern tip of the LGA along the western side of Botany Bay. Small creeks and the Cooks River also provide access to waterways. As part of the expansion of Port Botany, the community was given improved access to Mill Stream Lookout and Foreshore Beach as well as a new boat ramp which was built for recreation use off Foreshore Road.

3.1.4 Education and health

Bayside has 60 child care centres, 14 preschools/ kindergartens, 31 primary schools, nine high schools, and one TAFE. Higher education institutions include the UTS Tech Lab campus in Botany, a NSW TAFE campus in Kogarah, and the University of NSW which is located directly to the north-east of the LGA in Kensington. Smaller private educational institutions like business colleges also operate in larger centres.

3.1.5 Community facilities

Council has a wide range of community facilities across the LGA, including five community or senior citizens' centres, four halls, seven libraries, a local community museum, the George Hanna Memorial Museum, and several other meeting spaces for hire, often located within or adjacent to local centres. Council-organised community groups, learning sessions, and networking events occur across the week in these locations.

3.1.6 Employment and trade

Bayside has 475 hectares of industrial land across the Banksmeadow, Botany, Mascot, Port Botany, Kogarah, Rockdale and Turrella precincts, and together these account for the highest proportion of industrial land in the Eastern City District. While the industrial and employment-focused lands across the LGA support freight logistics, traditional manufacturing and warehousing industries, they are also increasingly home to start-ups, creative, and technology businesses.

Both Sydney Airport and Port Botany are located in Bayside. Sydney Airport is the main national air travel gateway, a major employer, and economically important to the region. Port Botany is the largest dedicated common-use facility of its type in Australia, operating 24 hours per day, seven days a week.

3.1.7 Transport interchanges

There are a number of transport interchanges in Bayside which may generate cycling trips, including:

- > Eastgardens (bus only);
- > Mascot (train and bus);
- > Rockdale (train and bus); and
- > Wolli Creek (train and bus).

3.2 Cycling facilities

3.2.1 Cycling network

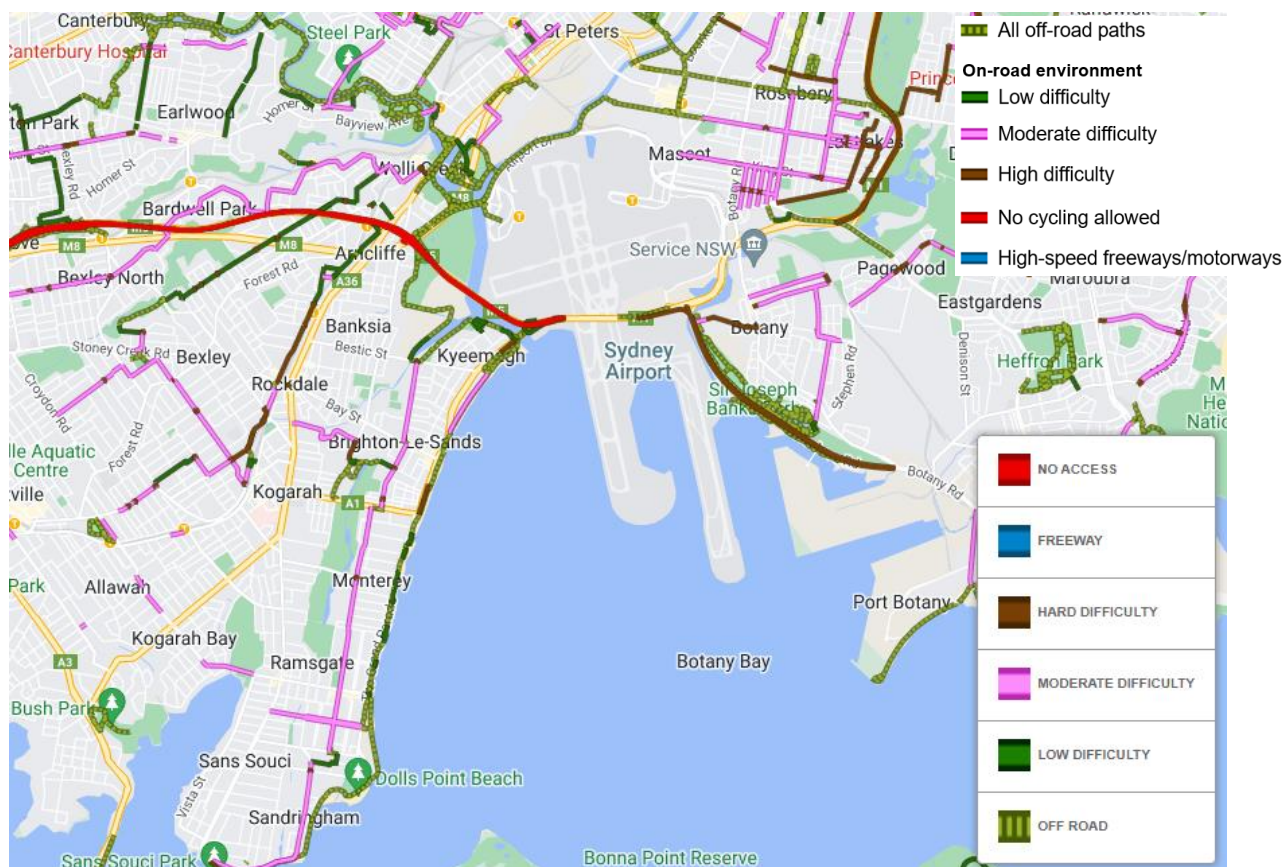
The existing Bayside Council cycling network consists of both on-road and off-road separated links, with coverage across the majority of the LGA. The cycling network is constrained by barriers including Sydney Airport and a number of arterial and major roads which run through the study area. This limits connectivity from east to west, and reduces the availability of safe low traffic on-road connections. In addition, limited separated cycling infrastructure forms a further barrier to encouraging cycling.

East of the airport, these links include east-west off-road connections through Eastlakes and along Coward Street through Mascot, and on-road connections between Sydney Airport/ Botany Bay and Randwick. These areas have been noted to be underserved by bike infrastructure, falling behind the surrounding suburbs and LGAs.

The area west of the airport has a number of on-road connections between Botany Bay and the Canterbury-Bankstown LGA, and also includes key recreational routes such as the Alexandra Canal in former Botany and Grand Parade/ Cook Park cycleway between Mascot and Sans Souci.

The TfNSW Cycleway Finder in **Figure 3-1** shows the lack of a cohesive network and connectivity across the cycling network. Though a number of off-road and on-road low difficulty routes (green) exist close to Botany Bay, in the remainder of the LGA routes are limited and those that exist are mostly medium (pink) to high (brown) difficulty. The route difficulty rating is a rough measure for on-road environments and can be confusing to cyclists since it does not state what it represents or provide an indication of the level of experience required to use each route type.

Figure 3-1 TfNSW) Cycleway Finder



Source: https://roads-waterways.transport.nsw.gov.au/customer-maps/cycleway_finder.html viewed August 2022

The Principal Bicycle Network (PBN) schematic map, as presented in FT56, is shown in **Figure 3-2**. Key existing and committed links include:

- > A north-south link running through the LGA from Green Square to Kogarah and Miranda via Sydney Airport; and
- > An east-west link from Sydney Airport to Campsie via Wolli Creek.

Planned additions to this by 2056 include:

- > An additional link between Sydenham and Kogarah;
- > An additional link between Kogarah and Hurstville; and
- > A connection from the CBD to Kogarah and further west via Port Botany.

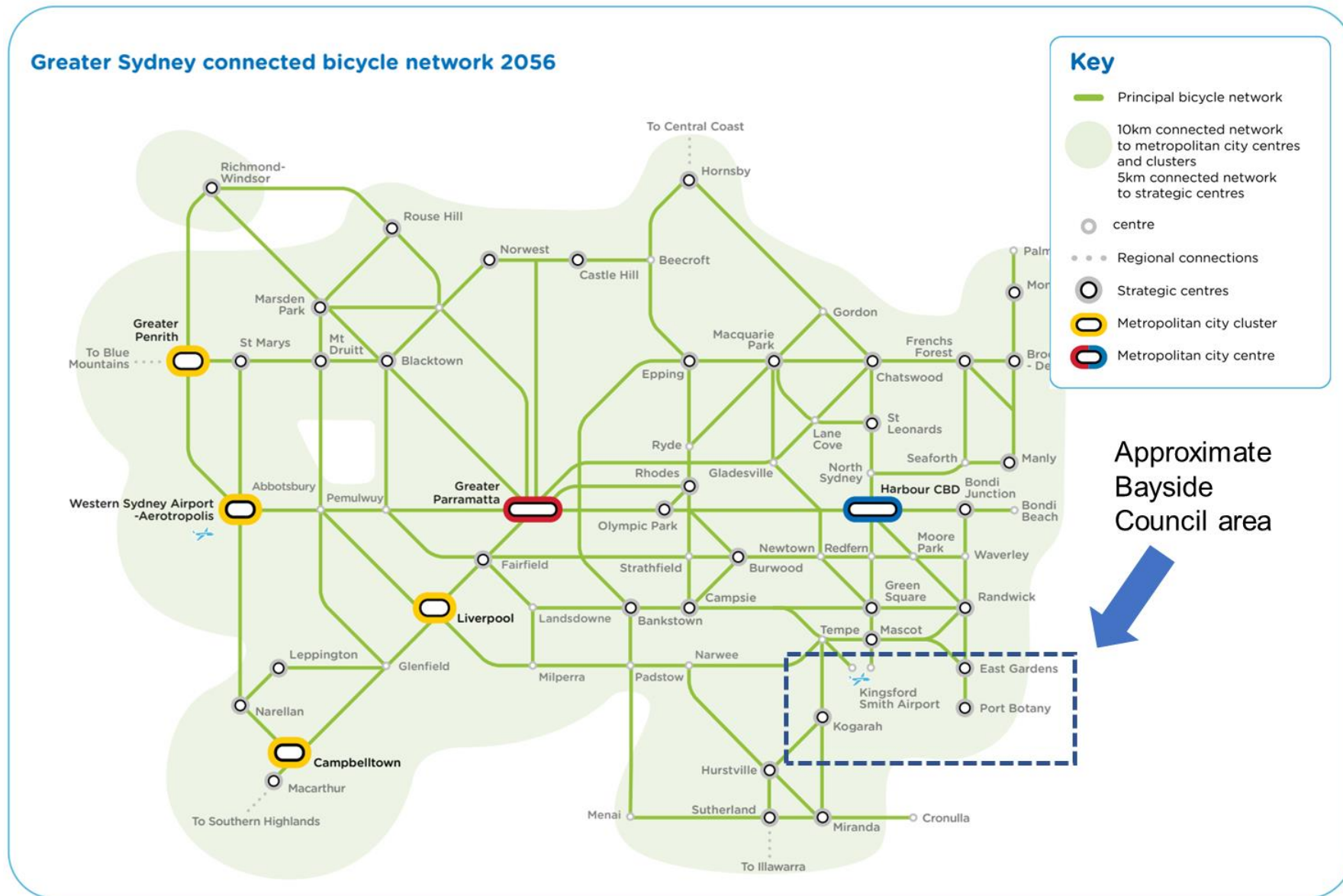
The Sydney Gateway, M6 Stage 1 and Botany Rail Line Duplication projects may provide opportunities to create new cycling infrastructure throughout the LGA. This will include:

- > Relocation of the existing shared path along the southern side of Alexandra Canal between Tempe Reserve and Qantas Drive to the northern side as part of the Sydney Gateway Project; and
- > New shared paths between Bestic Street and Brighton Le Sands as part of the M6 Stage 1.

Cycling infrastructure is not planned to be provided as part of the Botany Rail Line Duplication, however Council is advocating for a cycleway here and the project does not preclude the provision of cycleways by others in the future. The NSW Government will work with Australian Rail Track Corporation and other stakeholders to improve pedestrian and cycling access as part of the project.

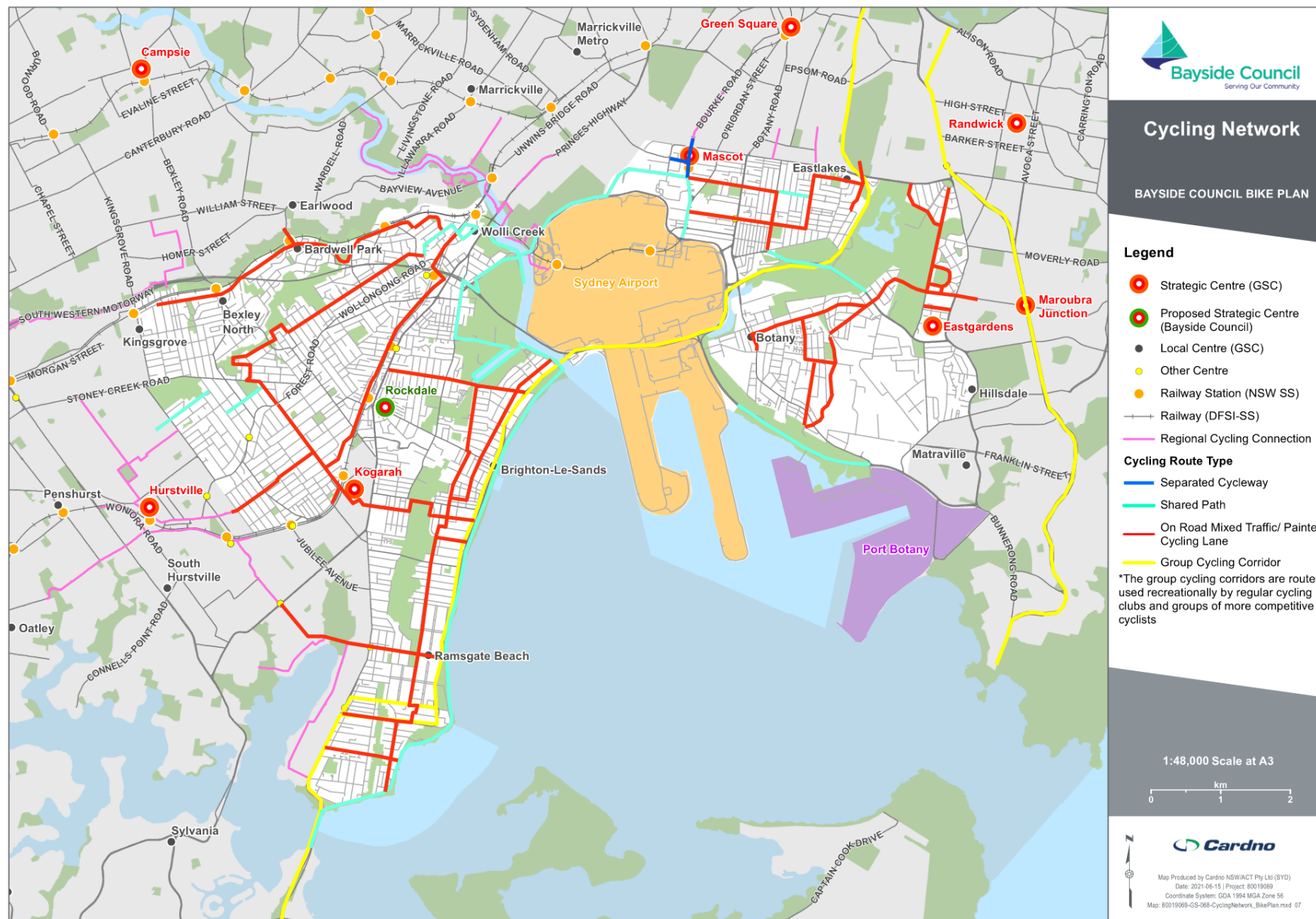
While infrastructure is limited across the LGA, the topography is generally well-suited to cycling. Council's existing cycling network is shown in **Figure 3-3**.

Figure 3-2 Future Principal Bicycle Network



Source: Future Transport 2056, Transport for NSW, 2020

Figure 3-3 Existing cycling network



3.2.2 Cycling demand and key routes

Strava, a tracking application for cycling, shows popular cycling routes logged via a mobile application and provides indicative data on recreational cycling demand. It is estimated that Strava accounts for eight to ten per cent of all road cyclists.

The most popular route in Bayside is along Southern Cross Drive and The Grand Parade, highlighted in red in **Figure 3-3**. This is a route used by regular group rides, particularly on the weekends, with origin points including Centennial Park, and destinations of Cronulla, Sutherland or Waterfall. These 'bunches' typically leave central Sydney around 6am to ride south, and return around 10am along the same arterial roads. This regular practice is popular early in the morning especially on the weekends when the roads are not as busy as weekdays, however the presence of larger groups often require lane merging at certain sections. This has the potential to lead to incidents where the cyclists interact with traffic, particularly with heavy vehicles or high traffic volumes. During weekday peak periods however, this route is not deemed efficient or safe for commuter riders.

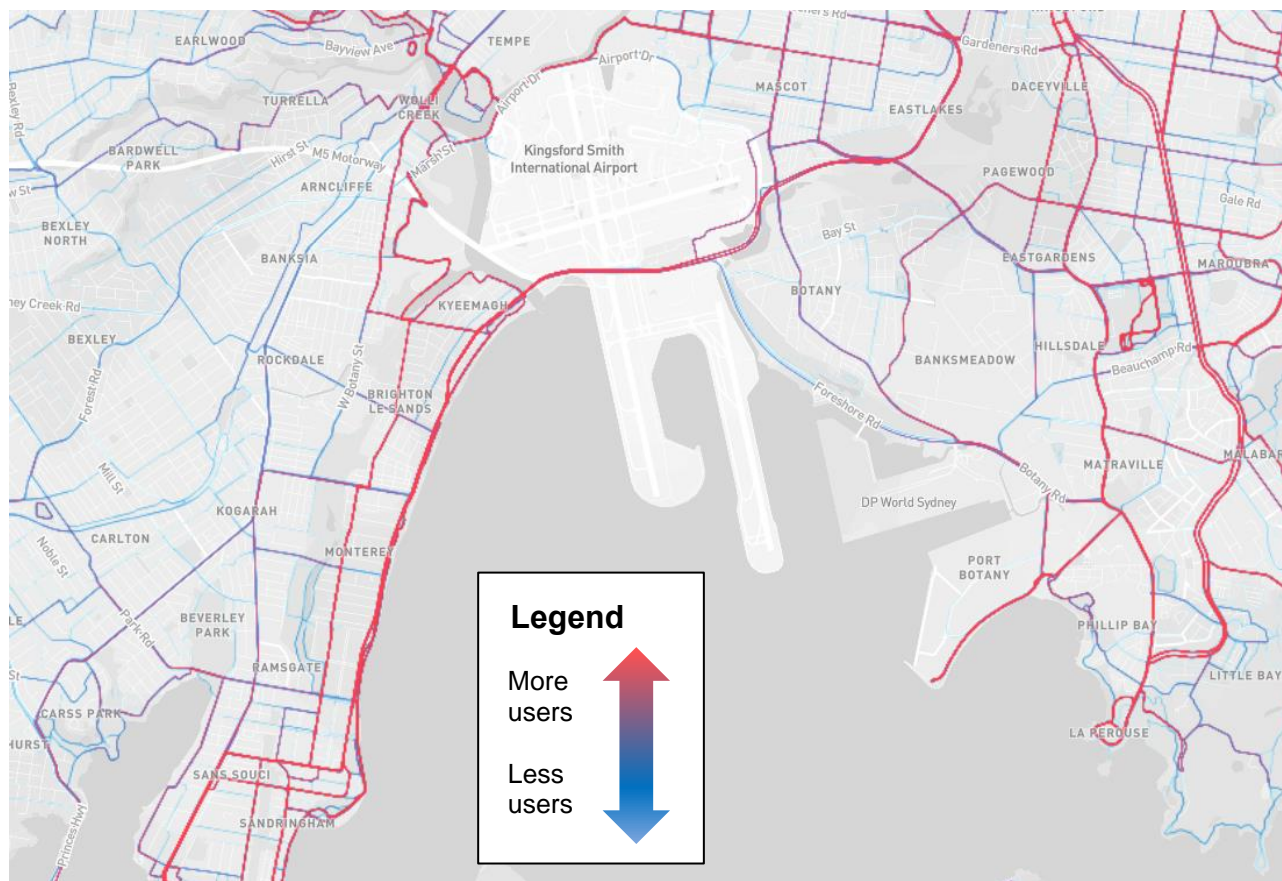


The beaches near the port (eastern side of the LGA) are a popular destination with Bunnerong Road and Anzac Parade often the preferred routes to La Perouse, the most popular cycling destination in the eastern suburbs.

Strava data and the use of 'heat maps' are some of many tools the Bayside Bike Plan has used to determine preferred rider routes to support the expansion of a formal on and off-road cycling network.

While there is some cycling activity in the eastern part of the Bayside LGA around the port, Anzac Parade appears to be a preferred route. The recent cycling connection to Sydney Airport International Terminal is moderately used.

Figure 3-3 Strava heat map, Bayside LGA and surrounds



Source: <https://www.strava.com/heatmap#13.40/151.13801/-33.95977/bluered/all>, viewed 26 February 2019

Overall, with a mode share around one per cent in 2016, cycling demand is not at the level expected for a fringe inner-city LGA where key strategic centres are within easy cycling distance. Major impediments to the mode take-up are the lack of safe cycling infrastructure and roads deemed hostile due to the volume and speed of freight traffic that use them.

3.3 Crash history

3.3.1 Overview

Five-year crash data history was provided by Bayside Council for the amalgamated LGA from 1 April 2013 to 31 March 2018 (inclusive). Overall, there were 4,047 crashes in the Bayside LGA. This included 17 fatal crashes, and 615 resulting in serious injury. Cyclists were involved in 96 of these crashes. The crashes are apportioned according to vulnerability and special vehicle types – for example, if a crash involved a car and pedestrian, it is determined to be a pedestrian crash. Crashes by road user are shown in **Table 3-2**.

Table 3-2 Crashes by road user

Year	Pedestrian	Cyclist	Motorcyclist	Bus	Truck	Car	Total
2013 (from 1 April)	48	12	46	4	201	536	847
2014	47	16	60	11	209	601	944
2015	33	23	47	4	160	464	731
2016	45	16	68	6	169	419	723
2017	44	24	61	8	153	380	670
2018 (to 31 March)	8	5	9	2	33	75	132
Total	225	96	291	35	925	2,475	4,047
Proportion	5.6%	2.4%	7.2%	0.9%	22.9%	61.2%	100%

Source: Crash data, Transport for NSW, supplied 2019

It should be noted that a large number of cyclist crashes are unreported, and the actual number of crashes involving a cyclist may be significantly higher. Reasons for this may include the following scenarios:

- > Minor or no damage to property;
- > No collision crashes i.e. bike rider takes evasive action and crashes;
- > Minor injuries where bike rider is not transported to hospital;
- > Opened car door collisions;
- > Surface condition crashes i.e. wet weather, pot holes, obstacles;
- > Mechanical or user error crashes;
- > Party(s) may not stop and exchange details; and
- > Police reluctance to attend crash site if no injury occurred.

Generally, reported cyclist crashes are those that involved a major injury or hospitalisation, or significant property damage.

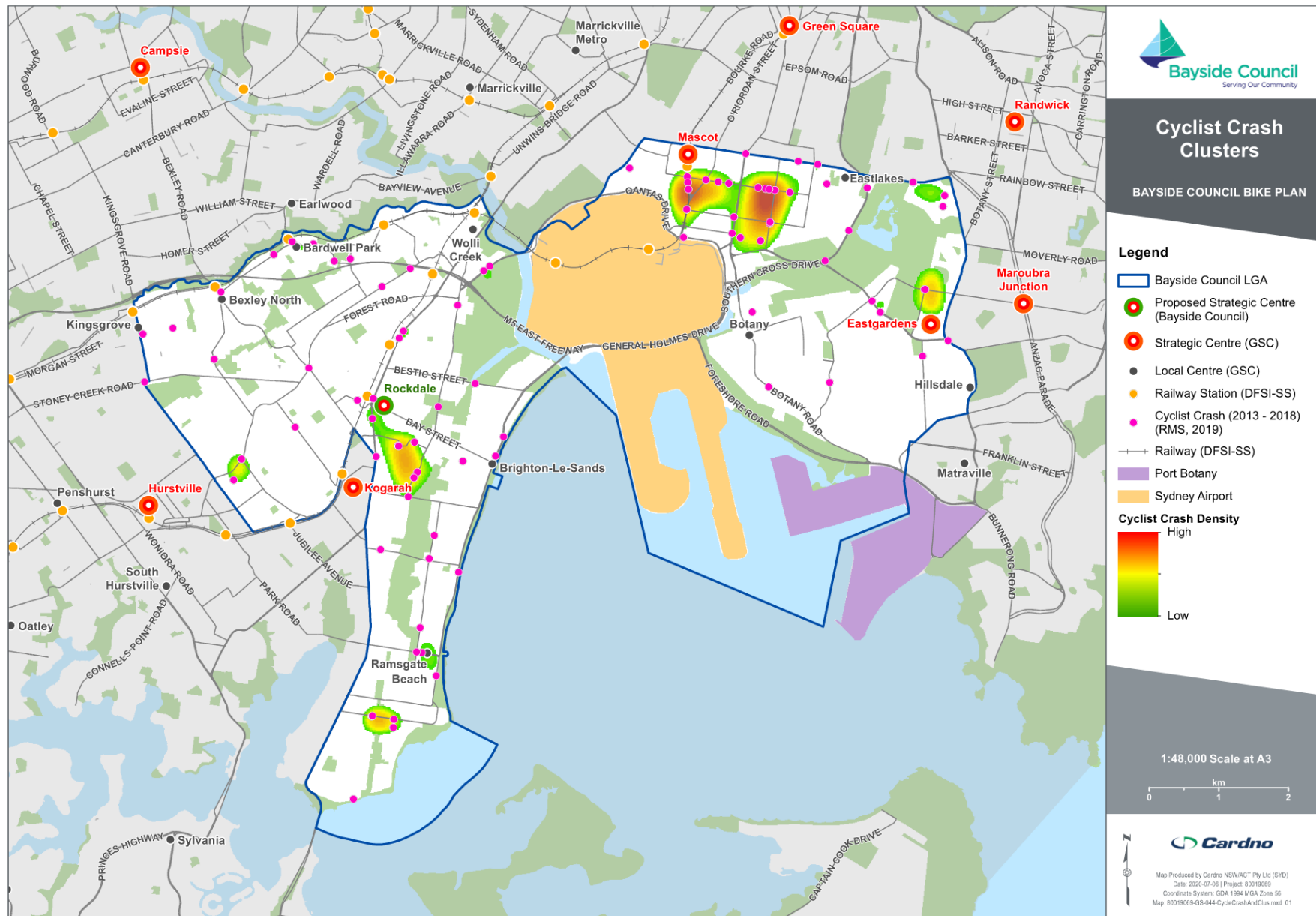
3.3.2 Crash locations

There are three dominant cyclist crash cluster locations in Bayside:

- > **Mascot:** The area including Bourke Street, O'Riordan Street, and Coward Street. This area has an existing separated cycleway on Bourke Street, and a shared path on Coward Street.
- > **Mascot:** The area between Botany Road and Maloney Street, including Coward Street and King Street. This area includes a shared path on Coward Street, but no separated infrastructure on King Street.
- > **Rockdale:** The area south east of Rockdale station on West Botany Street. This area has no existing cycling infrastructure.

Crash locations and clusters in Bayside are shown in **Figure 3-4**.

Figure 3-4 Cyclist crash clusters 2013 - 2018



4 Population and travel behaviour

4.1 Population

4.1.1 Overview

There were 1575,058 residents of the Bayside LGA in 2021, according to the ABS Census 2021, with The area experienced population growth of 15 per cent in the five years since the previous Census survey was undertaken.

Within the population, the split between males and females is 49.5 per cent to 50.5 per cent. Bayside has a higher percentage of population aged 15 or over than Greater Sydney with 83.8 per cent versus 81.3 per cent, and a lower percentage of Australian citizens with 73.7 per cent compared to 79.5 per cent in Greater Sydney.

4.1.2 Future population

Data from the Common Planning Assumptions was used for forecast population numbers. Common Planning Assumptions are a series of data sets produced by the NSW government and associated agencies. The data sets include population growth, economic growth and forecasts, housing supply, metropolitan transport demand, and freight demand.

The Bayside population is forecast to increase by 30 per cent between 2021 and 2036, resulting in a population of 228,700 in 2036. The annual growth percentage for the LGA of 2.3 per cent is significantly higher than the 1.3 per cent annual growth for NSW.

Over the 15 years to 2036, the main changes in population age brackets are predicted as:

- > A decrease of 4.3 per cent in the 15 to 44 age bracket; and
- > An increase of 3.2 per cent in the 65+ age bracket.

The projected population growth indicates that the over 50 age bracket will increase in the LGA by 2036, which is one motivation to provide more infrastructure to encourage greater uptake of cycling, so that it caters to all ages of residents in the future. Recent data indicates that the 20 to 34 age bracket has shown significant increases in the proportion of the population over the last five years⁵. This age group may have less car owners than others, and therefore have a greater desire for dedicated cycling infrastructure.

It is essential to consider the impacts and travel demand of population growth. It is unlikely the travel demand can continue to be accommodated with existing mode share percentages, particularly with existing private vehicle trips on the road network. There will be a greater need for people to walk, ride and use public transport as these modes are more space efficiency and sustainable.

4.2 Travel behaviour

4.2.1 Overview

The Household Travel Survey, conducted continuously by the NSW Government, questions households about their travel behaviour and collates the results by different geographical areas. Data has only been available at the LGA level since 2016/ 2017.

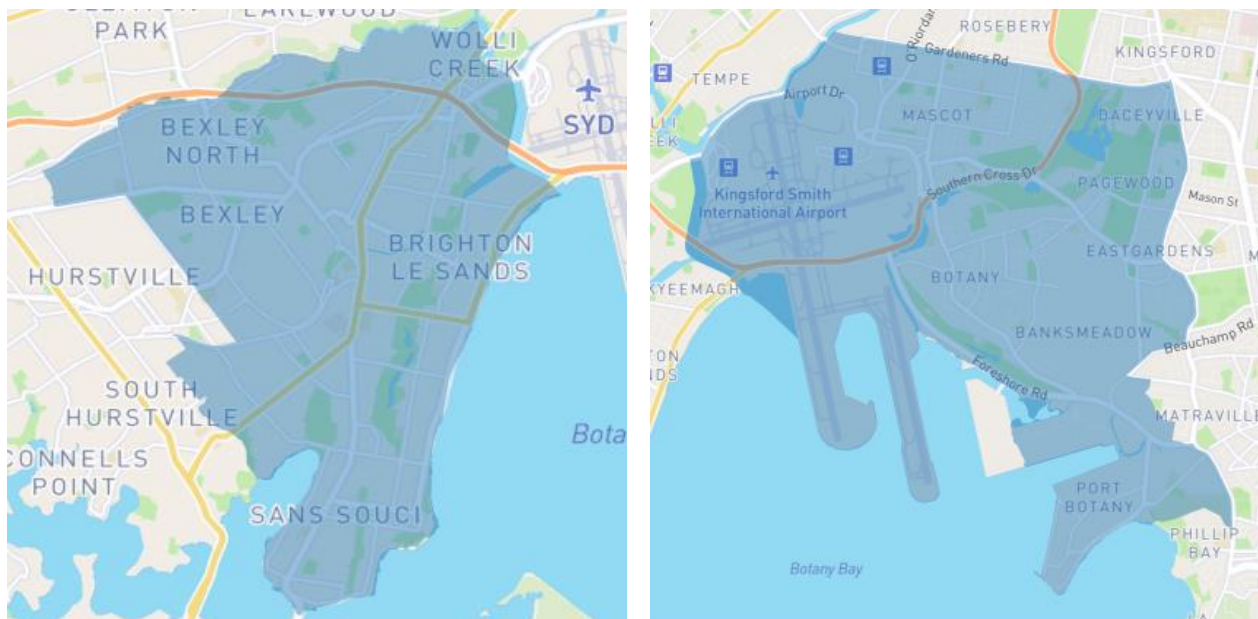
Bayside is covered by the following Household Travel Survey geographical areas:

- > LGA: Bayside LGA (2017/ 2018 data); Botany LGA (2016/ 2017 data); Rockdale LGA (2016/ 2017 data).
- > Statistical Area 3 (SA3): Botany (2007/ 2008 to 2017/ 2018); Kogarah–Rockdale (2007/ 2008 to 2017/ 2018 data).

While the SA3 geographical regions of Kogarah-Rockdale and Botany, shown in **Figure 4-1**, cover a larger area than the Bayside LGA, this data is an important indication of travel trends over time as it extends back to 2007/08.

⁵ Profile.ID, <https://profile.id.com.au/baysidensw/age-sex-pyramid>, viewed 12/11/2020

Figure 4-1 Household Travel Survey SA3: Kogarah–Rockdale and Botany regions



Source: <https://www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts/household-travel-survey-1>, viewed January 2020

4.2.2 Average trip distance

The average trip distance for Bayside residents on a typical weekday was 7.17 kilometres. This is consistent with average trip distances for the Georges River LGA (6.76 kilometres) and Canterbury-Bankstown LGA (7.01 kilometres). The distance is higher than the neighbouring LGAs that sit closer to the Harbour CBD; City of Sydney residents had an average trip distance of 4.02 kilometres, the average for Inner West residents was 5.05 kilometres, and for City of Randwick the average distance was 4.94 kilometres.

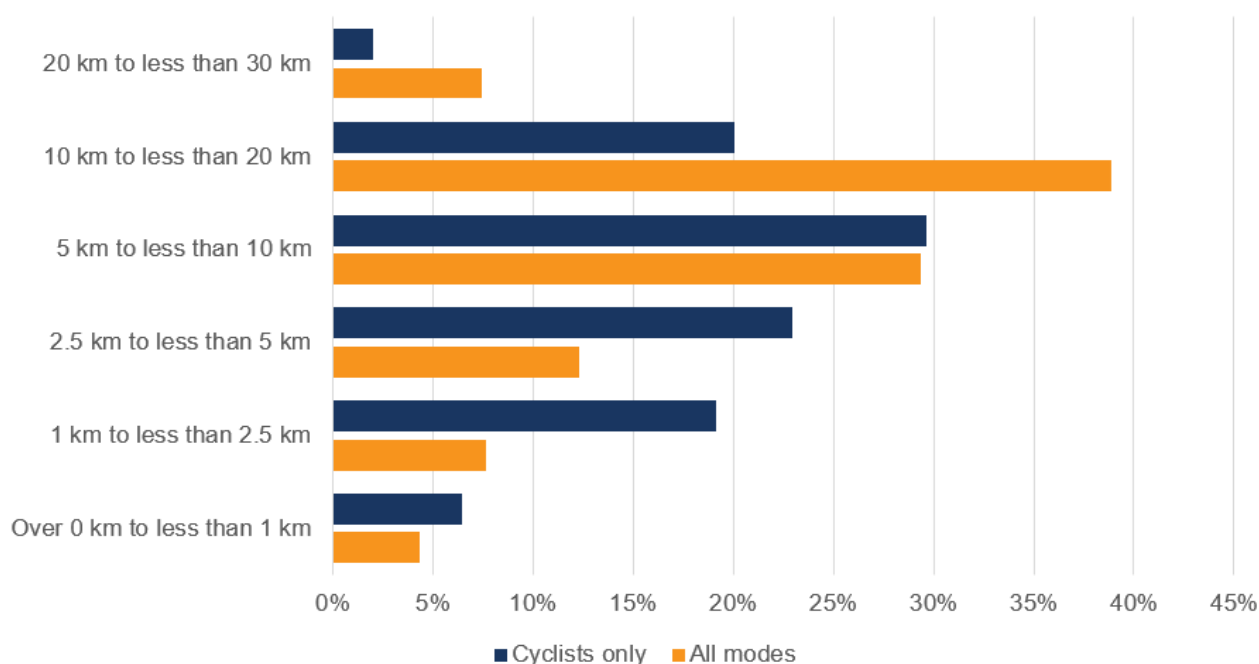
A trip distance of 7.17 kilometres by bicycle would take approximately 15 - 25 minutes, depending on the average speed and the type of bicycle ridden. This is important to consider in the context of promoting increased cycling as a trip length of greater than 15 minutes could be a barrier to some riders. Provision of a safe, separated, and legible network, and providing/ encouraging provision of end of trip facilities could help to address this barrier.

4.2.3 Cycling to work

Bayside residents travelling to work by bicycle typically travel distances greater than 5 kilometres with 50 per cent of cyclists travelling between 5 kilometres and 20 kilometres in order to reach their place of work. Shorter trips are however also common with 19 per cent of cyclists travelling between 1 kilometre and 2.5 kilometres. The data shows that residents in Bayside are willing to cycle to distances up to 20 kilometres, with mode share declining significantly for distances greater than 20 kilometres.

The distance travelled by cyclists to work, compared to all modes, based on ABS data is shown in **Figure 4-2**.

Figure 4-2 Distance travelled by cyclists to work compared to all modes



Data source: Census, Australian Bureau of Statistics, 2016

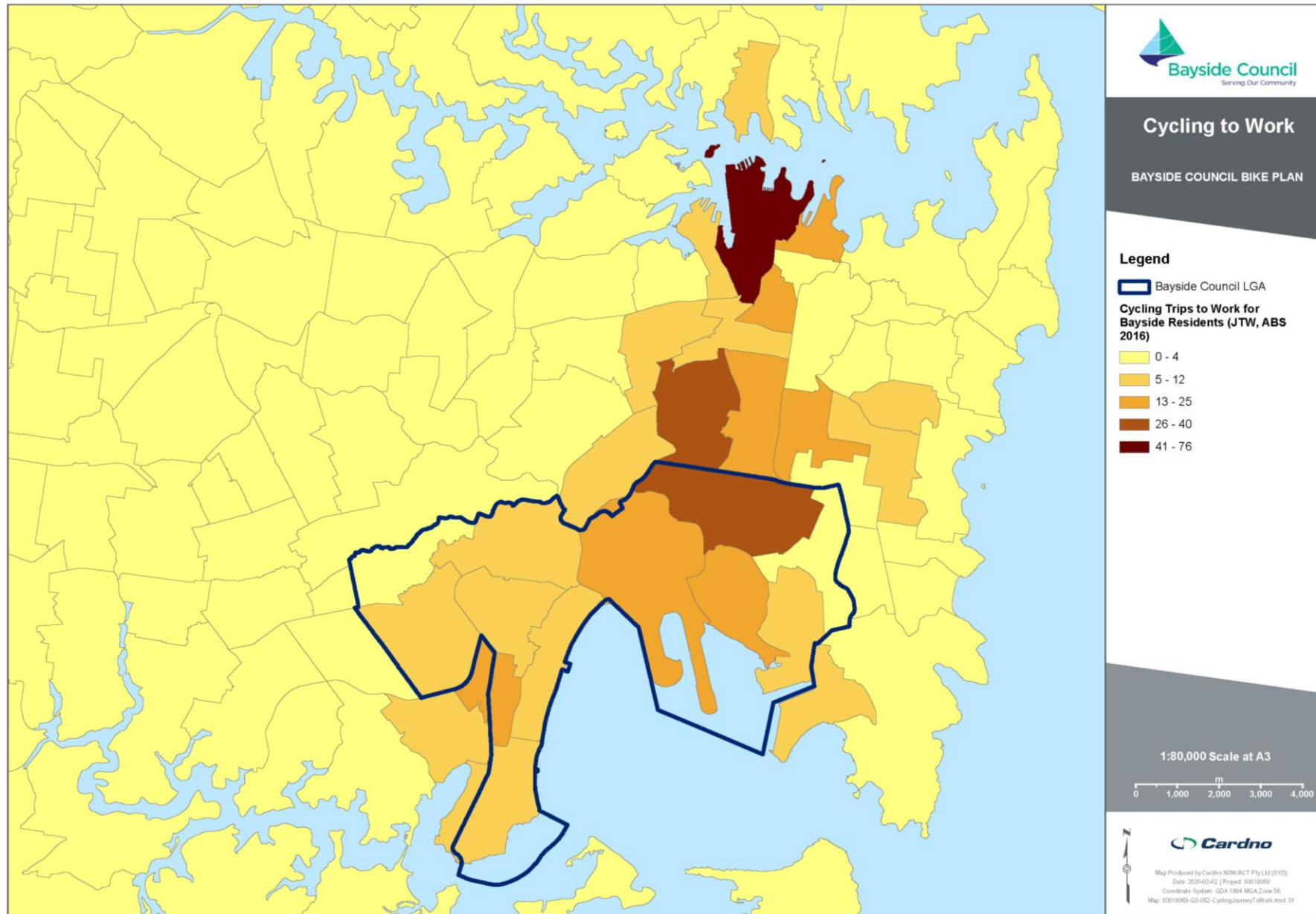
The data indicates that cyclists travel significantly reduced distances compared to other modes, predominantly focused on short trips (less than five kilometres). Many cyclists still travel more than 5 kilometres, and are able to reach the CBD or other employment areas without cycling more than 10 kilometres.

4.2.3.2 Key cyclist destinations

The key destinations for commuters cycling to work are shown in **Figure 4-3**. For perspective with this diagram, a total of approximately 72,100 trips were made by all travel modes.

The data indicates that the SA2 region comprising of Sydney, Haymarket and The Rocks serves as the most popular destination for Bayside residents cycling to work. Other key destinations include Mascot-Eastlakes and Erskineville-Alexandria, producing about half as many trips. A concentration of trips is shown around the Sydney CBD and along the north east fringe of the Bayside LGA. Additionally, Census data obtained from the ABS shows that 61 per cent of trips are made to neighbouring LGAs. This is consistent with distance to work data in **Figure 4-2** showing a majority of cyclists travelling distances greater than 5 kilometres to reach their place of work. A large proportion of cycling trips also occur within the LGA with 29 per cent of trips of all work related trips by residents taking place inside Bayside Council.

Figure 4-3 Key destinations for commuters cycling to work



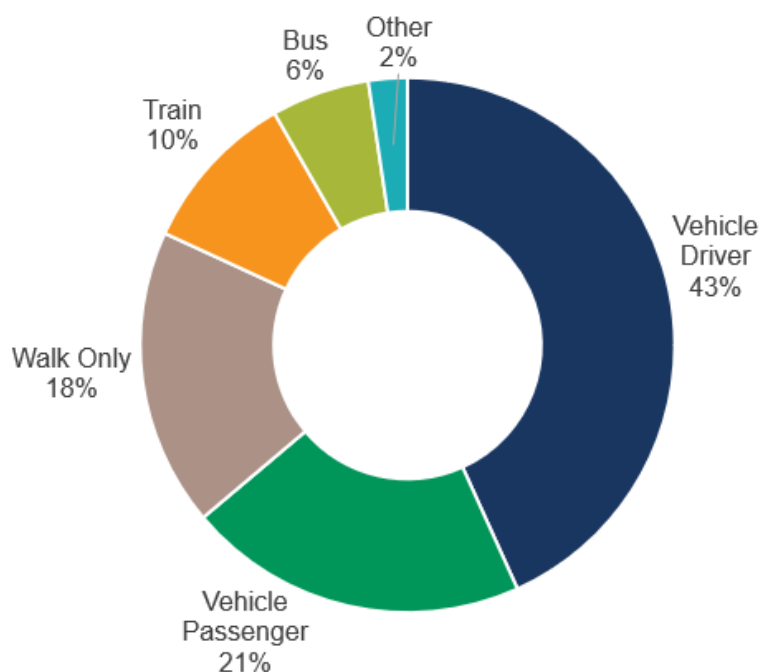
4.2.4 Mode share

Across an average weekday in 2017/ 2018, Bayside residents used private vehicles for 64 per cent of all trips (vehicle driver or passenger), while walking accounted for 18 per cent of trips. Public transport accounted for 16 per cent of trips, with train trips totalling 10 per cent and bus trips 6 per cent.

Bayside residents relied less on private vehicles than the average resident in the Sydney Greater Metropolitan Area, where private vehicle trips accounted for 69 per cent, and were more likely to use public transport than the Sydney Greater Metropolitan Area which had 12 per cent public transport mode share. The walking rate was similar to the 17 per cent for the Sydney Greater Metropolitan Area, however it was lower than that of neighbouring LGAs such as Inner West (33 per cent) and Randwick City Council (23 per cent). The walking mode share was similar to the Georges River LGA (16 per cent), and significantly higher than the Canterbury-Bankstown mode share of 11 per cent.

Cycling trips are included in the 'Other' category, which accounted for 1 per cent of all trips. It is generally assumed that half of 'other' is representative of cycling trips. The Household Travel Survey mode share for the Bayside LGA in 2017/ 2018 is shown in **Figure 4-4**.

Figure 4-4 Transport mode share summary 2017/18



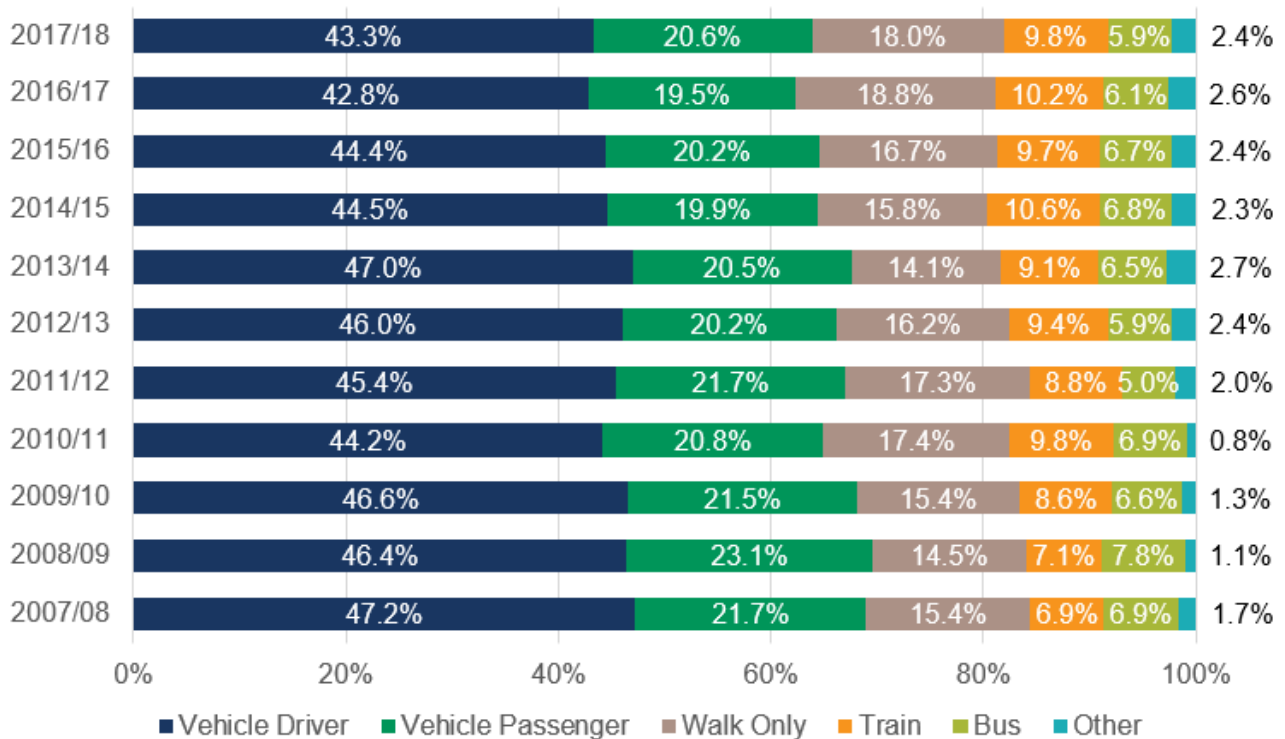
Data source: Household Travel Survey 2017/ 2018, Transport for NSW, 2018

4.2.5 Mode share trends

Analysis of mode share over time indicates changes in transport choices. The Botany and Kogarah-Rockdale SA3 datasets demonstrate a decreasing reliance on private vehicles over a 10-year period. Bus mode share reduced, train mode share increased from 6.9 per cent to 9.8 per cent, and walking mode share grew from 15.4 per cent to 18 per cent.

The Botany and Kogarah-Rockdale SA3 region mode share trends of the past decade from the Household Travel Survey are presented in **Figure 4-5**. Mode share categorised as 'Other', including cycling, has increased since 2011/ 2012.

Figure 4-5 Botany and Kogarah-Rockdale mode share trends – Household Travel Survey

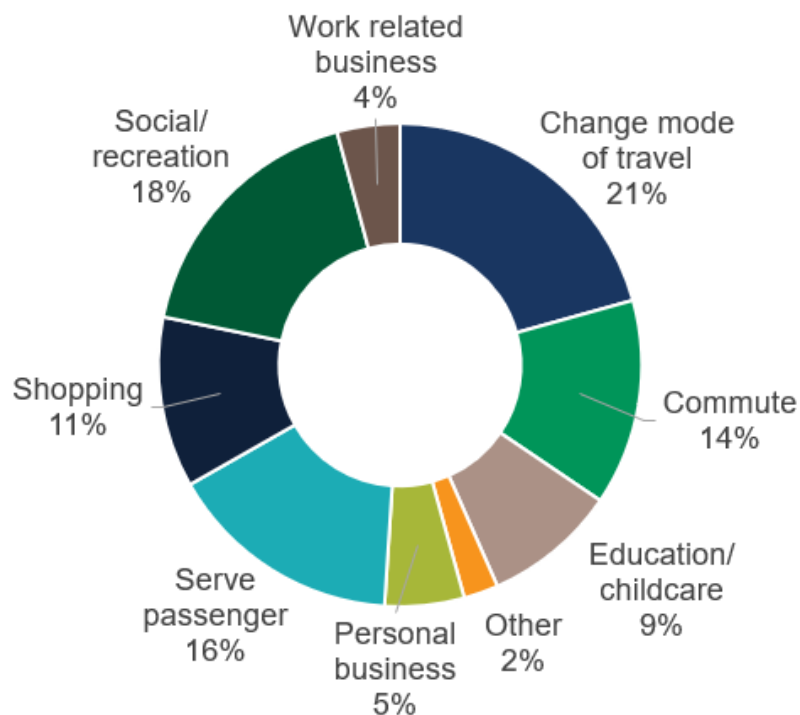


Data source: Household Travel Survey 2007/2018, Transport for NSW, 2018

4.2.6 Trip purpose

Results from the Household Travel Survey show the diversity of trip purposes of Bayside residents. In 2017/2018, the key trip purposes included social/recreation purposes at 18 per cent of trips, serving passengers at 16 per cent of trips, and commuter trips at 14 per cent. The different trip purposes are shown in **Figure 4-6**.

Figure 4-6 Trip purpose 2017/2018



Data source: Household Travel Survey 2007 – 2018, Transport for NSW, 2018

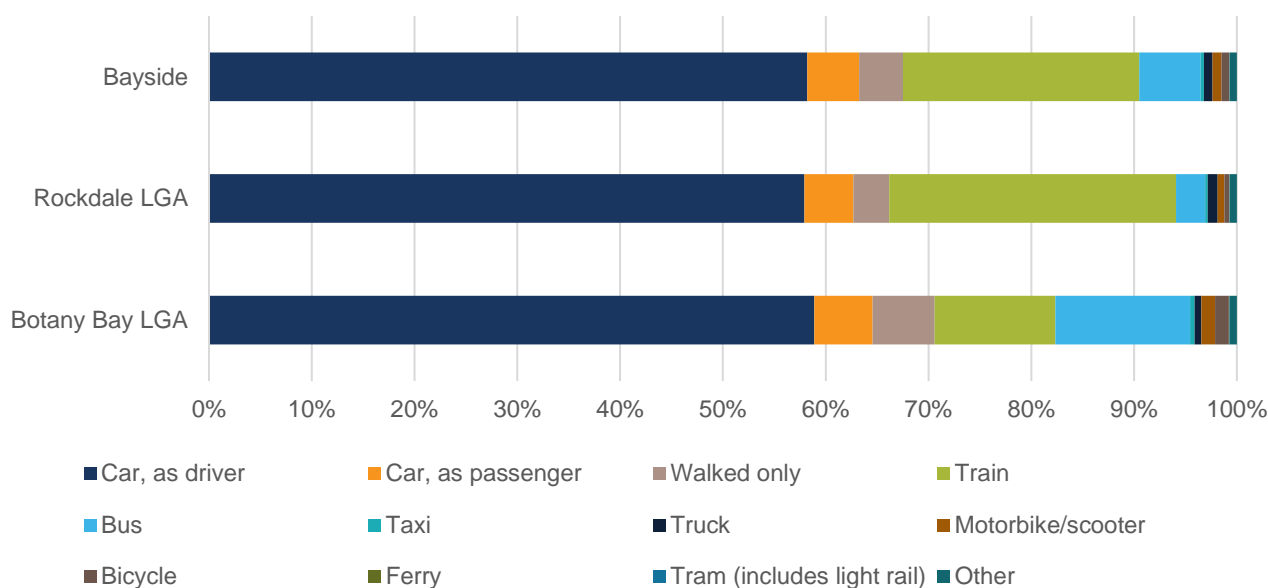
4.2.7 Commuting mode share

Journey to work data from the 2016 (none available for 2021) ABS Census shows that 58.2 per cent of Bayside residents (a combination of Botany Bay LGA and Rockdale LGA) travelled to work by car as the driver and 5.1 per cent as the passenger. Public transport accounted for 29 per cent of commuting trips across the two former LGAs, 30.8 per cent in Rockdale and 24.9 per cent in Botany Bay. The different public transport networks in each former LGA are reflected in the commuting mode share; train journeys made up 27.9 per cent of trips in Rockdale but only 11.8 per cent in Botany Bay, which had a higher bus mode share of 13.1 per cent. Walking had a higher commuting mode share in the former Botany Bay LGA with 6 per cent, whereas walking trips in Rockdale accounted for only 2.8 per cent.

Overall, bicycle mode share for commuting was low in each of the LGAs, but highest in Botany Bay indicating a greater number of cycling trips in the eastern part of the Bayside LGA.

The commuting mode share for the former Botany Bay and Rockdale LGAs in 2016, along with the combined mode share for the newly formed Bayside LGA, is shown in **Figure 4-7**.

Figure 4-7 Commuting mode share in 2016



Data source: *Journey to Work, Australian Bureau of Statistics, 2016*

Despite being a fringe inner city area, the cycling mode share in Bayside is low. Reasons for this may include lack of safe and efficient cycling infrastructure (e.g. separated bike paths), high traffic volumes on major roads, relatively high proportions of heavy vehicles due to areas such as Port Botany, and barriers such as Sydney Airport reducing the permeability of the cycling network within the LGA. Aside from shared paths in recreational areas, the existing cycling network is predominantly on-road mixed traffic routes with almost no separated cycleways. Cycling within the LGA is therefore not well facilitated for less confident cyclists.

5 Future land use

The Greater Sydney Commission forecasts the Eastern City District to grow by 325,000 people, up to 289,000 jobs (across the Harbour CBD and strategic centres) and 157,500 new dwellings by 2036.

Bayside LGA is set to carry a lot of that forecast growth with an amplified provision of housing, employment and freight activity. The Bayside LGA population forecast increase by 53,092 to 228,150 people between 2021 and 2036, an increase of 30 per cent.

When complete in 2025, the M6 extension from Kogarah to WestConnex should divert some traffic off the Princes Highway between Wolli Creek and Rockdale, by reducing the amount of through traffic using this road. Modelling undertaken for the Environmental Impact Statement indicates only a modest reduction in traffic volumes.

There is an opportunity along the bypassed section the Princes Highway, the Grand Parade and the east-west to reallocate road space to active and public transport, and enhance the place value of land uses along these roads. Calming of traffic on these arterials could also support future urban densification in this area and may be used as a mechanism to gain further volume reductions and benefits from the M6 project. Committed future land use changes are presented in **Table 5-1**.

Table 5-1 Future committed land use development

Land use / town centre projects	Source	Location	Key details
Bayside West Precincts 2036	Department of Planning and Environment	Arncliffe, Banksia and Cooks Cove	Introduces a strategy to deliver urban renewal to three nominated precincts close to open space and public transport. Cooks Cove has been identified as a precinct in Bayside West Precinct 2036 that requires investigation by Council.
Communities Plus Program (Social Housing)	Family & Community Services, Proposed Rezoning for Mixed social, affordable and private housing development, RFP	Arncliffe; between Eden Street and Pacific Highway, (Bayside West)	There are currently 142 social housing units on the site which, through the proposed rezoning, could make way for a mix of approximately 600 social, affordable and private dwellings in the future. Uplift of 30 per cent more social housing along with affordable and private housing. Local government strategies that identify opportunities to increase capacity for housing in the Eastern City District include: Botany Bay Urban Design Controls Study 2010.
Mascot Station precinct development	Mascot Station Town Centre Precinct Master Plan	Mascot Station precinct between Gardeners Road, Botany Road, Coward Street and Kent Road	The Master Plan sought to establish a fine-grained network of shopping streets, lanes and arcades allowing a more permeable urban landscape with a walkable town centre. Internal public space adjoins the retail and residential areas. However, the approved developments differed from the Master Plan and many networks are internal only with no through public access.

Other future land uses which are not committed but present opportunities include:

- > **Princes Highway redevelopments and beyond** – the planned M6 Stage 1 project between Kogarah and WestConnex is expected to divert heavy vehicle congestion on surface roads between Wolli Creek and Rockdale. This presents an opportunity to reallocate road space to support a wider range of road users along the Princes Highway, General Holmes Drive and the east-west connecting streets – all of which could help support future urban densification in these areas. The same urban revitalisation densification trends can be anticipated as the M6 progresses further south through the Sandringham Peninsula towards Sutherland Shire.
- > **Sandringham Peninsula** – the ECDP identifies a priority Green Grid corridor running north-south along the Sandringham Peninsula, developed within the surface reservation of the proposed M6 motorway. FT56 indicates a long term (2036-2056) timeframe for investigations for a visionary transport initiative, extending the South East Mass Transit / Train Link to Miranda, which could use part of this alignment.

- > **Sydney Airport** – by international standards, Sydney Airport is very close to the CBD. The airport covers 907 hectares of land adjacent to Botany Bay and sits directly south of the City of Sydney.

The airport precinct generates 368,000 indirect jobs across Australia and more than 30,000 jobs on-site. It contributes \$30 billion a year for both the NSW and Australian economies. The airport currently exports around \$17.6 billion in freight each year. The Sydney Airport Master Plan 2039 predicts a total increase in air passenger numbers of 51 per cent – growing from 43.3 million in 2017 to 65.6 million in 2039. The airport's freight task will increase by 58 per cent, reaching one million tonnes per year. This will result in more employment, more passenger movements to and from the airport, and more vehicle movements, including heavy freight movements.

The airport is not open to active transit commuters wishing to travel through it from one side of the Bayside LGA to the other – and most need to travel around it. The airport's 'northern lands' will in the next few years be transformed from a surface level carpark and freight marshalling area into a motorway extension (the Sydney Gateway) which will help connect freight from WestConnex to the airport precinct itself and support movements to Port Botany.

Part of the stated vision for Sydney Airport in its 2039 Master Plan document is to 'improve environmental outcomes, while being a good neighbour and making a positive contribution to our community'.

Major current and future land uses in accordance with the 2036 structure plan for Bayside are shown in **Figure 1-1**.

6 Consultation

Stakeholder and community consultation were undertaken as part of the Bayside Transport Strategy to capture issues, opportunities and needs of land owners and the community. The consultation involved:

- > Working group meetings;
- > Workshops with stakeholders;
- > Workshops with community members; and
- > An online survey for members of the community (including an interactive map to identify specific locations of issues and opportunities).

An outline of the consultation undertaken and the key findings are presented in the following sections.

Stakeholders' views do not always align with each other. All views are important to understand perceptions and inform the plan irrespective of existing limitations.

6.1 Stakeholder consultation

Consultation with key stakeholders was undertaken by holding workshops throughout September 2019 and recording feedback from each stakeholder. Key stakeholders identified for consultation and the corresponding outcomes in relation to the Bike Plan are summarised in **Table 6-1**.

Table 6-1 Stakeholder consultation outcomes

Stakeholders	Key outcomes
Major land user groups	
<ul style="list-style-type: none"> ▪ NSW Ports (NSWP) ▪ Botany Industrial Park (BIP) 	<ul style="list-style-type: none"> ▪ NSWP do not encourage cycling within the grounds – it is considered too dangerous with container vehicle activity. ▪ BIP encourages cycling to and within the grounds – internal roads have a speed limit of 25 kilometres per hour. ▪ In relation to the proposed off-road bike plan on Denison Street adjacent to the BIP: <ul style="list-style-type: none"> – This could be dangerous with the number of heavy vehicle movements and proximity to dangerous goods. – This infrastructure may increase the risk for BIP and NSWP to the current operation and future development. This would require a new risk assessment to be conducted. – A future separated (off-road) path in Bayside would remove the road conflict risk, which is currently considerable. – This north-south route is well-used by both commuters (to Port Botany or the CBD) or by recreational cyclists travelling from Centennial Park to La Pouse.
State government agencies	
<ul style="list-style-type: none"> ▪ Transport for NSW (TfNSW) 	<ul style="list-style-type: none"> ▪ TfNSW recognises key areas in the Principal Bike Network (PBN) model and the need to work with Councils. Funding opportunities are to be identified. ▪ TfNSW recommended reviewing land uses, roads and amenities next to the airport because it is equally important to create a connected bike plan. There is little that can be done at the airport alone. ▪ Councils are responsible for managing and shaping the local roads (like speed and bicycle boulevards etc.) to cater for cycling. These are low cost opportunities for the PBN.
Adjoining councils	
<ul style="list-style-type: none"> ▪ Inner West Council (IWC) ▪ Georges River Council (GRC) 	<ul style="list-style-type: none"> ▪ IWC is implementing a separated cycleway between St Peters to Newtown through Tempe and Wolli Creek. ▪ IWC have undertaken feasibility studies and early planning for a pedestrian and cycling bridge from Wolli Creek Station and the local town centre to allow for north-south movement. ▪ Development applications near the railway line from Wolli Creek and Rockdale include additional easements for a future cycleway. ▪ IWC preference is for separated cycleways and boulevards instead of shared paths. Cross-LGA border infrastructure should aim to be consistent.

Stakeholders	Key outcomes
	<ul style="list-style-type: none"> In relation to an “Airport orbital” bicycle network concept, some sections may be included in the Sydney Gateway project, others have been completed. Planning is underway for the “East-West Pedestrian Cycling Link (EWPCCL): <ul style="list-style-type: none"> Parallel to Southwest Metro corridor, 4 kilometres on-road and 10 kilometres off-road. Similar concept was proposed for Metro Southwest. IWC would like key bike connections from Bayside LGA to Sydenham, Marrickville and Dulwich Hill required. This would provide opportunities to connect with the existing rail and proposed Metro Southwest. Current Wolli Creek rail bridge proposal would support this local transport connection. GRC do not have a Bike Plan for the whole LGA but there are old (2007/ 2008) bike plans for certain precincts in Kogarah. None were done for Hurstville. Need to anticipate bike paths that might exist for the GRC area. IWC would like a metro Active Transport path link to Sydney Airport because of the proximity and travel demands between the localities. The Kogarah Collaboration Area Place Strategy proposes new or enhanced cycling infrastructure, including walking, cycling and green links at the following locations connecting to George River Council: <ul style="list-style-type: none"> Along the railway south towards Carlton; Jubilee Avenue; Gray Street; and Belgrave Street and South Street. <p>Note: The adjoining Councils of Canterbury-Bankstown, City of Sydney and Randwick City Council were invited to this session but were not able to send representatives on the day. In their absence, reference was made to any existing bicycle documentation and the existing built networks to align recommendations with.</p>
Bayside Council (internal)	<ul style="list-style-type: none"> Infrastructure projects Strategy and policy Asset strategy Waste contracts and DAs Engineering <ul style="list-style-type: none"> Shared paths should be explored in an effort to ‘Connect Town Centres’ along state roads which otherwise serve as key community movement corridors. Suggest shared paths be provided on one side of roads, and pedestrian-only on the other side. The on-road cycling network may not be preferred by less capable (or experienced) riders, and as such motor vehicle speeds and greater awareness / education for the community are key objectives of the bike plan. Dedicated cycling routes need to go around town centres for regional trips (faster facilities). Some cycling routes however need to allow access into the town centres for destination trips (slower/shared facilities). Separated cycling facilities on bus routes do not work because bus stops become islands. Suggest shared pathways or on-road shared lanes on roads that exist as bus routes.
Bus operators	<ul style="list-style-type: none"> Transit Systems State Transit Authority <p>No comments in relation to cycling.</p>
Bicycle advocacy organisations	<ul style="list-style-type: none"> BIKEast (Bicycle User Group representing people on bicycles in Sydney’s Eastern Suburbs) <p>The BIKEast Safe Street Neighbourhoods project involves developing local streets to be safe for all users by supporting the following designs:</p> <ul style="list-style-type: none"> Introduction of 30 kilometre per hour speed zoning; Serving residential needs while maintaining essential vehicular access; Improving amenity through adaptations that serve people’s use and enjoyment; and Making every street a cycle street, for a connected neighbourhood and city. <p>BIKEast recommends to emphasise the importance of an east-west connection via the Giovanni Brunetti Bridge in Wolli Creek, and suggest a new bridge connecting Tempe with Wolli Creek at Tempe Reserve.</p> <p>It is also recommended that Bayside Council consider setting up an Active Travel Advisory Committee, similar to neighbouring councils such as City of Sydney, Randwick City, Waverly and Inner West Councils, where cycling related items can be discussed in further detail at regular intervals throughout the year.</p>

Stakeholders	Key outcomes
<ul style="list-style-type: none"> Bicycle NSW (Largest bicycle advocacy group in NSW, with over 30 affiliated local Bicycle User Groups, aiming to create a better environment for all bicycle riders so that people of all ages and abilities feel safe and confident to enjoy all the benefits of bike riding) 	<p>A key suggestion from Bicycle NSW is that the success of the cycling network in Bayside Council is contingent on the provision of a high-quality, safe and efficient cycling link that circumnavigates Sydney Airport, providing connections to both terminals and connecting the two halves of Council. This link (The Orbital) would provide the backbone that connects several key corridors designed to provide off-road cycling connections.</p> <p>Bicycle NSW recommends the following approaches to be used for local street networks:</p> <ul style="list-style-type: none"> Reduce the speed limit of local streets to 30 kilometres per hour; Reduce the permeability of the street network for motor vehicles to ensure that traffic does not use local streets as rat-runs, thereby ensuring that local streets have low traffic volumes; Improve the permeability of the street network for bicycles by providing connections through parks and by filling gaps in the network; and Create threshold treatments to local street neighbourhoods by extending footpaths across street entrances (continuous footpath treatments).

6.2 Community consultation

6.2.1 Local Strategic Planning Statement workshops

Community workshops were held as part of consultation in relation to the Bayside Local Strategic Planning Statement (LSPS) in March 2019. The workshops involved a 'world café' of various issues at several tables, one being for transport matters, and asking the following questions:

1. What are your challenges moving around Bayside?
2. How do you feel about walking, riding and public transport in Bayside?
3. How would you like the future transport network in Bayside to look, considering the increasing residential and employment populations?
4. How would you like to see our town centres be desirable places to live and visit?

Key needs identified in relation to cycling included the following:

- > An increase in the provision and quality of cycleways, particularly separated facilities;
- > Improved legibility of the network, including consistent infrastructure and wayfinding;
- > Higher quality commuter paths;
- > Maintaining safe links past work/ construction sites;
- > Better links to train stations and more parking;
- > Regional access if routes are difficult/ dangerous;
- > Separate walking and cycling paths;
- > Separating cyclists from freight vehicles;
- > Preparation of a bike strategy and network plan;
- > Provision of hire bike facilities; and
- > Cycling access to employment.



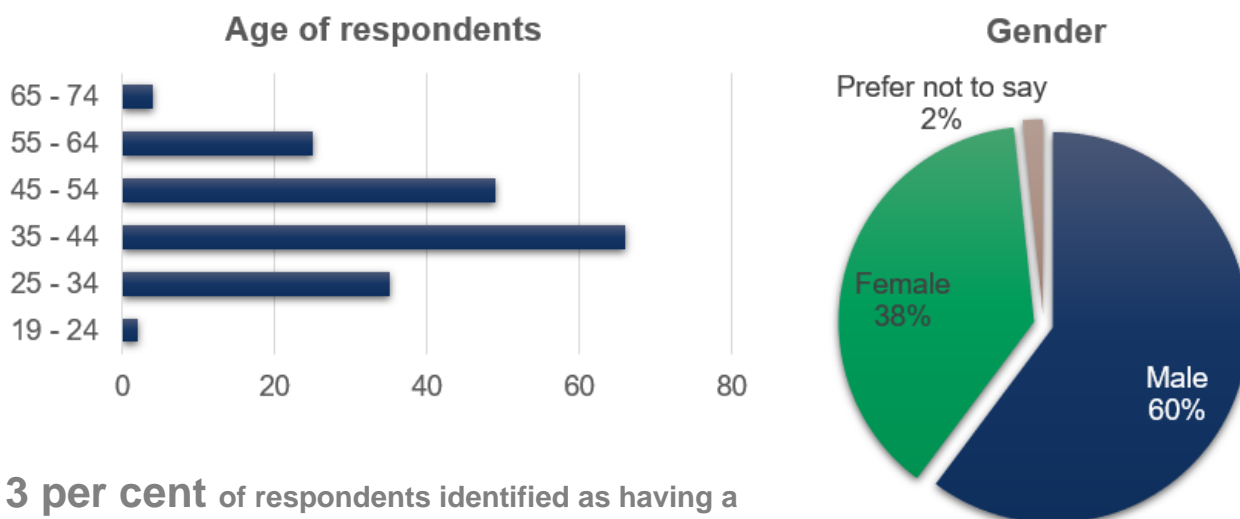
6.2.2 Online survey

An online survey was also provided for people to complete and comment on cycling issues, constraints and ideas for the future. A 'Have Your Say' feedback form was hosted on Council's website for a number of weeks through August and September 2019 as well as an interactive map where people could drop a pin at a geographic location to identify a specific issue or opportunity. This encouraged the community to place markers and comment on their favourite places to ride, issues they have found in the network, and opportunities to improve it.

A total of 238 responses were gathered, including 181 survey responses and 57 pins dropped. A further 401 people downloaded a document or visited a page multiple times without submitting feedback.

Key demographics of the survey respondents are show in **Figure 6-1**.

Figure 6-1 Survey respondent demographics



3 per cent of respondents identified as having a disability.

The key findings of travel behaviour from the survey are presented in **Figure 6-2**.

Key feedback from the online survey including common themes, issues, opportunities and ideas are summarised in **Figure 6-3**.

Selected quotes from survey responses are provided below.

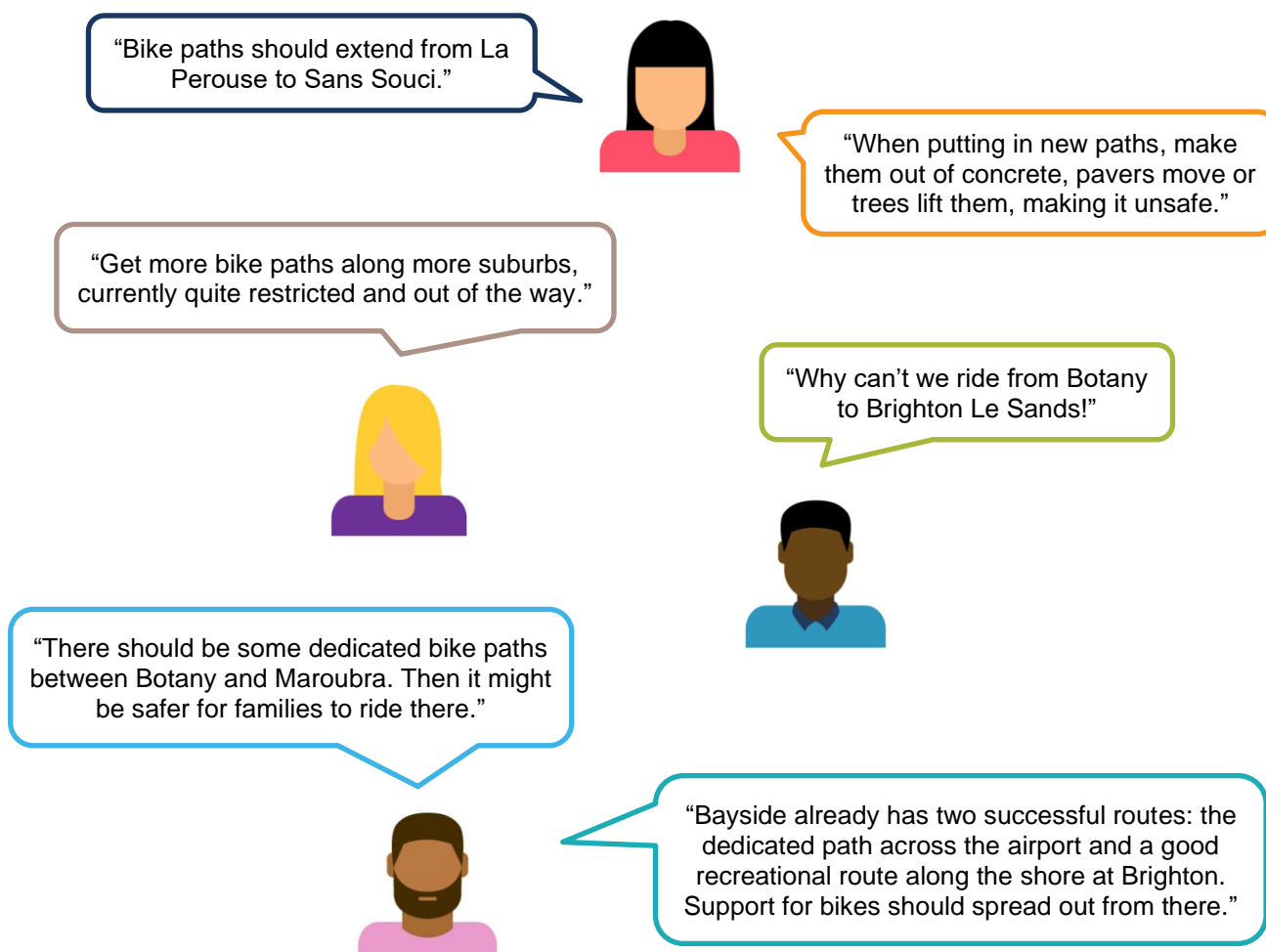


Figure 6-2 Travel behaviour from survey responses

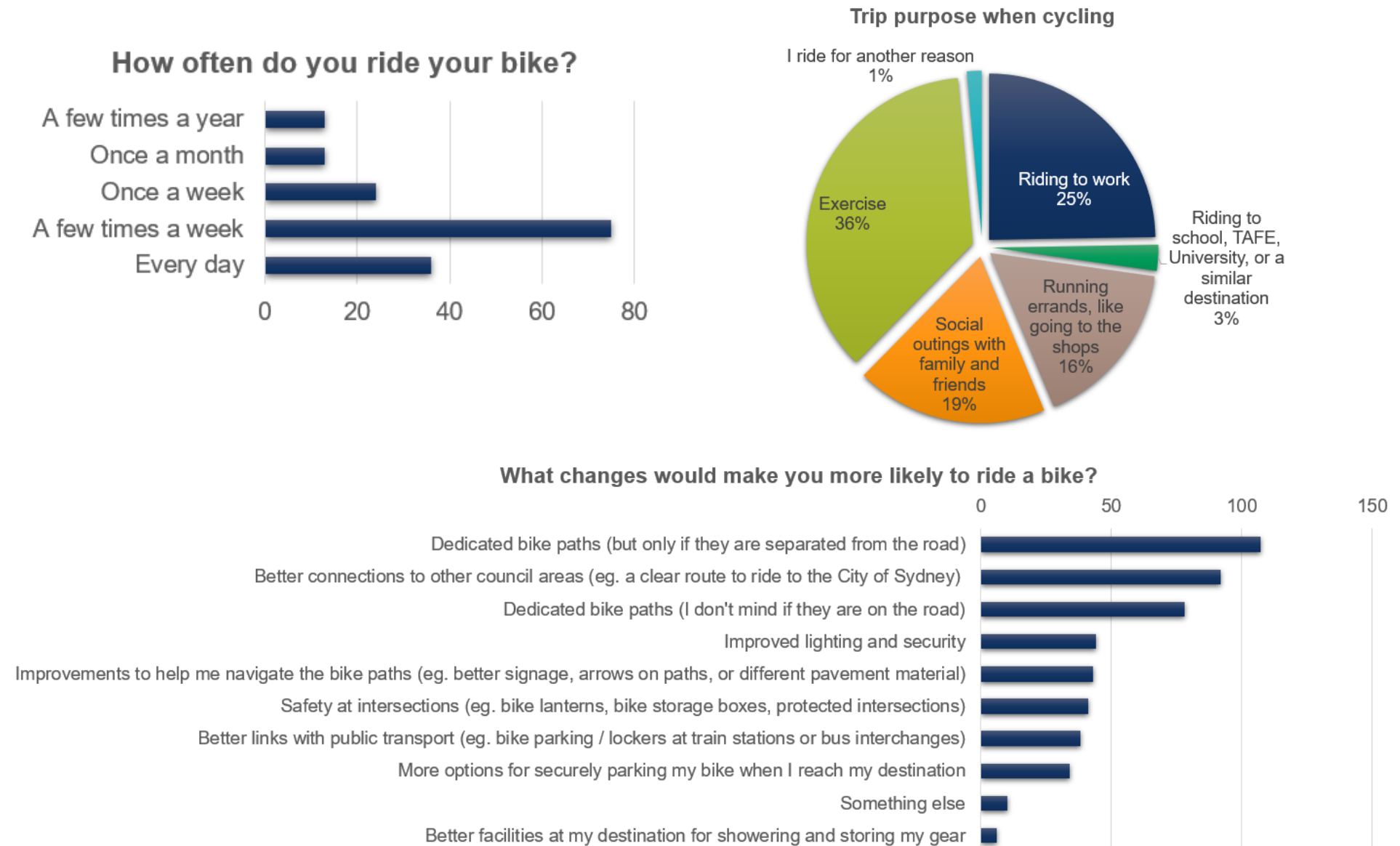


Figure 6-3 Key feedback from the online survey

General

Popular cycling destinations included playgrounds and sports facilities, schools, local shops, public transport hubs and recreational/ scenic cycling routes, particularly around the Cooks River and creeks.

Generally, feedback requested that cycling facilities be separated from cars and pedestrians, as well as more consistent facilities. Maintenance is also required to fix pot holes or other obstructions that become hazardous to cyclists.

End of trip facilities

End of trip facilities including bicycle rings and secure lockers were requested at the following locations:

- > All train stations;
- > Shopping destinations such as Kingsgrove Woolworths, Bexley North shops, Arncliffe shops and Rockdale Plaza; and
- > Sydney Airport.

Bike parking is often full at Mascot Station, and some bike parking is hidden underground and inaccessible such as at Rockdale Plaza.

Missing links

Key origins and destinations that require cycling connectivity were identified as:

- > Botany/ La Prouse and Brighton Le Sands;
- > Mascot and Botany;
- > Eastgardens and the Sydney CBD; and
- > Daceyville and Eastlakes.

Connections are also needed to Sydney Airport, Bexley, Rockdale Plaza and Randwick.

Signage

Bicycle signage and on-road bike symbols were requested to increase driver awareness of cyclists. These were requested at intersections, mid blocks and in shared lanes.

Ideas

Ideas for improvements put forth included using the Brisbane Bicentennial Bikeway as an example for the Cooks River shared path network, using alternative streets for cycling that are quieter with slower traffic, and leveraging cycle links from planned road improvements.

Safety

Safety issues in the cycling network included conflict with vehicles and pedestrians, crossing busy intersections, poor lighting in secluded areas, poor sight lines and dangerous road surfaces.

6.3 Bayside personas

Based on the outcomes of the consultation, five typical personas were identified to represent the demographics, needs and travel behaviour of residents in the Bayside LGA. The personas reflect different types of bicycle riders and were used to inform the cycling issues and opportunities and guide the future network development, highlighting potential barriers to cycling and the needs of various user groups.

It should be noted that there were no submissions from people aged 18 or under.

The five personas identified are presented in **Table 6-2**.

Table 6-2 Bayside personas





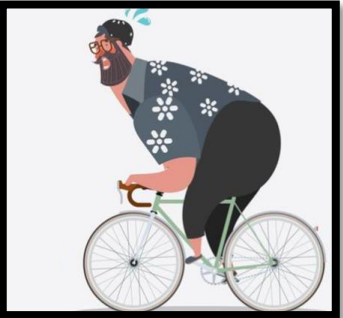
Adrian	Heather	Travis	Isabelle	George
				
Age: 33 Occupation: Accountant Lifestyle: Urban professional Home: Rockdale Cycling type: Strong and fearless	Age: 62 Occupation: Retired mother of two Lifestyle: Home-based Home: Banksia Cycling type: Interested but concerned	Age: 36 Occupation: Baggage handler at Sydney Airport Lifestyle: Hands-on Home: Wolli Creek Cycling type: Enthused and confident	Age: 26 Occupation: Bar manager Lifestyle: Social and active Home: Mascot Cycling type: Enthused and confident	Age: 47 Occupation: Local business owner Lifestyle: Busy and local Home: Brighton-Le-Sands Cycling type: Interested but concerned
Travel behaviour: Adrian cycles to Rockdale Station every day to catch the train into the CBD for work, and sometimes cycles the full distance. On the weekends he usually walks locally or drives for longer trips.	Travel behaviour: Heather walks or drives to run errands and take her grand-kids to school and other places. She is interested in cycling but is concerned about safety and mixing with traffic.	Travel behaviour: Travis rides his bike to work as well as for exercise on the weekends. He is part of a club that regularly cycles longer routes for fun and holds social outings.	Travel behaviour: Isabelle usually drives or catches the train to work but cycles recreationally for exercise a few times a week. Sometimes she also cycles to meet friends at the beach.	Travel behaviour: George walks to work but rides on occasion to keep fit and see friends. He is interested in riding more often but concerned about peak hour traffic and his riding ability.
Motivations: Commuting to work, exercise and accessing local areas.	Motivations: Taking the grand-kids to school, exercise.	Motivations: Exercise, recreation, social life.	Motivations: Exercise, visiting friends.	Motivations: Social, exercise.
Frustrations: Lack of bike parking at the station and lack of commuter cycling routes.	Frustrations: Cycling on-road with vehicles, safety and security.	Frustrations: Poor connections to employment and other LGAs, inconsistent cycling facilities.	Frustrations: Limited routes, sharing roads and paths with vehicles and pedestrians.	Frustrations: Lack of easy and safe routes for occasional cyclists.

Image credit: vecteezy.com

7 Issues and opportunities

Key issues related to cycling in the Bayside LGA identified through the stakeholder and community consultation are summarised in **Table 7-1**, and key opportunities are summarised in **Table 7-2**.

Table 7-1 Cycling issues

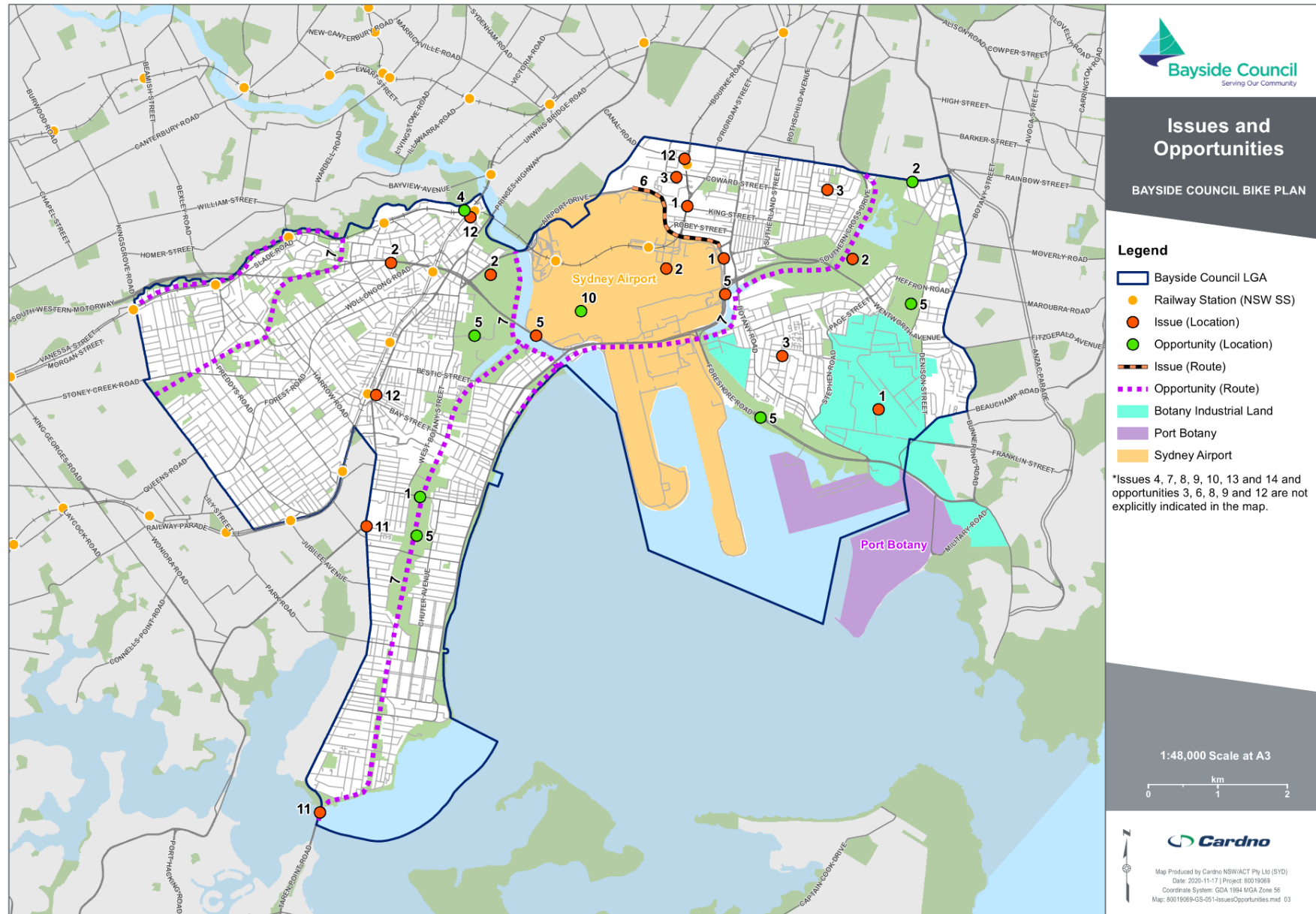
#	Issue
1	Lack of walking and cycling amenity on freight routes, Botany industrial area and other low density industrial areas results in low participation rates. Freight travels through the Mascot Station Town Centre (Bourke Street), a place with high and growing levels of pedestrian activity.
2	Major land uses, like the airport, port, and private golf courses, and arterial roads, act as barriers to walking and cycling and prevent direct routes.
3	Many town centres feel road-focused instead of people-focused, particularly on the eastern side of the LGA.
4	Lack of consistent, continuous, separated, direct, and high quality cycleways (including to cross the LGA, to neighbouring Council areas, link to the foreshore, and around the airport and the port), and lack of bicycle parking at train stations.
5	Concern about on-road safety when cycling, particularly in proximity to heavy vehicles, around the airport and port, and at roundabouts, is a barrier to higher participation.
6	Retention of a (direct) cycling link along Qantas Drive with implementation of the Sydney Gateway project. This is the only off-road link around the airport and will be relocated to the northern side as part of the Sydney Gateway project.
7	Conflict between cyclists and pedestrians on shared paths, but on-road cycling is suitable for select cyclists only.
8	Some personal security issues at night, including a lack of lighting, and dark stretches along pathways and cycleways.
9	Separated cycling paths on bus routes are not preferred because they create bus stop islands. There is a perceived conflict issue between buses and cyclists. It is suggested wide traffic lanes that can accommodate cyclists and buses be provided on shared links.
10	On street car parking is dangerous for cyclists who may be hurt by opening doors.
11	Limited connections to and from destinations in the Sutherland Shire and Georges River LGAs.
12	A lack of available bike parking at stations such as Mascot, Rockdale and Wolli Creek.
13	A lack of off-road cycle paths.
14	On-road linemarking and signage is of poor quality.

Table 7-2 Cycling opportunities

#	Opportunity
1	Land reservation for M6 between Ramsgate and Brighton Le Sands could be available for construction of north-south green active transport link.
2	Collaborative approach to linking regional cycle routes with neighbouring Councils (e.g. the Doncaster Avenue, Kensington cycleway).
3	Grid street network and flat terrain on the western side of the LGA at the San Souci peninsula will support east-west cycle corridors to local centres and train stations.
4	Wolli Creek is a potential interchange between key regional cycling routes that could converge there.
5	Significant green space that aligns with desirable cycling routes within the LGA and regionally, although cycling routes should not impact wetlands.
6	Aligning street tree planting with pedestrian and cycling routes.
7	Four of the Green Grid priority routes travel through or to Bayside LGA.
8	The shared path network can be developed to connect town centres.
9	Increasing options for first and last mile transport, including bicycle couriers and on-demand services, to connect to transport interchanges.
10	Many Sydney Airport workers reside in Bayside and could potentially cycle to work.
11	The Principal Bicycle Network provides a framework for key regional cycle routes.
12	Ability to optimise the on-road environment and non-active street frontages to develop an LGA-wide line marked bicycle network.

The issues and opportunities which refer to specific locations are mapped in **Figure 7-1**.

Figure 7-1 Issues and opportunities



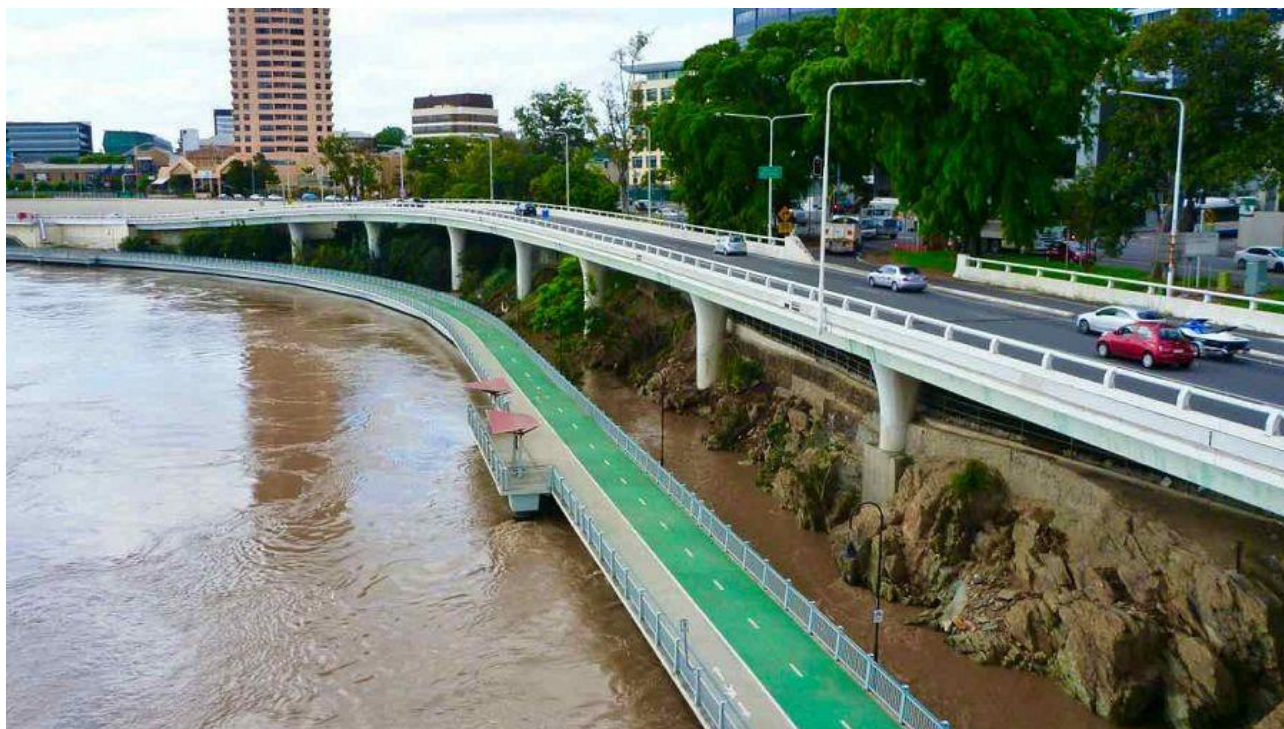
8 Case studies

This section examines example practice for cycleways, cyclist protection and shifting travel behaviour around the world. These present visionary potential of the opportunities for cycling and infrastructure in Bayside.

8.1 Brisbane Bicentennial Bikeway

The Brisbane Bicentennial Bikeway is a shared path and separated cycleway located on the northern bank of the Brisbane River between Toowong Park and the Botanic Gardens. The route is ranked as number five out of 53 countries most popular routes by Eco Counter, a company specialising in pedestrian and cycling counting solutions. Approximately 5,000 people use the cycleway daily, which is set to increase as the Brisbane population does. A section of the path is shown in **Figure 8-1**.

Figure 8-1 Bicentennial Bikeway



Source: <https://rentaltrends.com.au/news-info/article-display/brisbane-bikeway-one-of-the-worlds-most-popular-according-to-electronic-counters,487>, viewed 09/01/2020

The success of a similar cycleway along the Cooks River waterways in Bayside would depend on safe and efficient local cycling paths connecting to the route, making it an attractive and convenient option offering access to a range of destinations.

Relevance for Bayside:

Potential for cycleway along Cooks River.

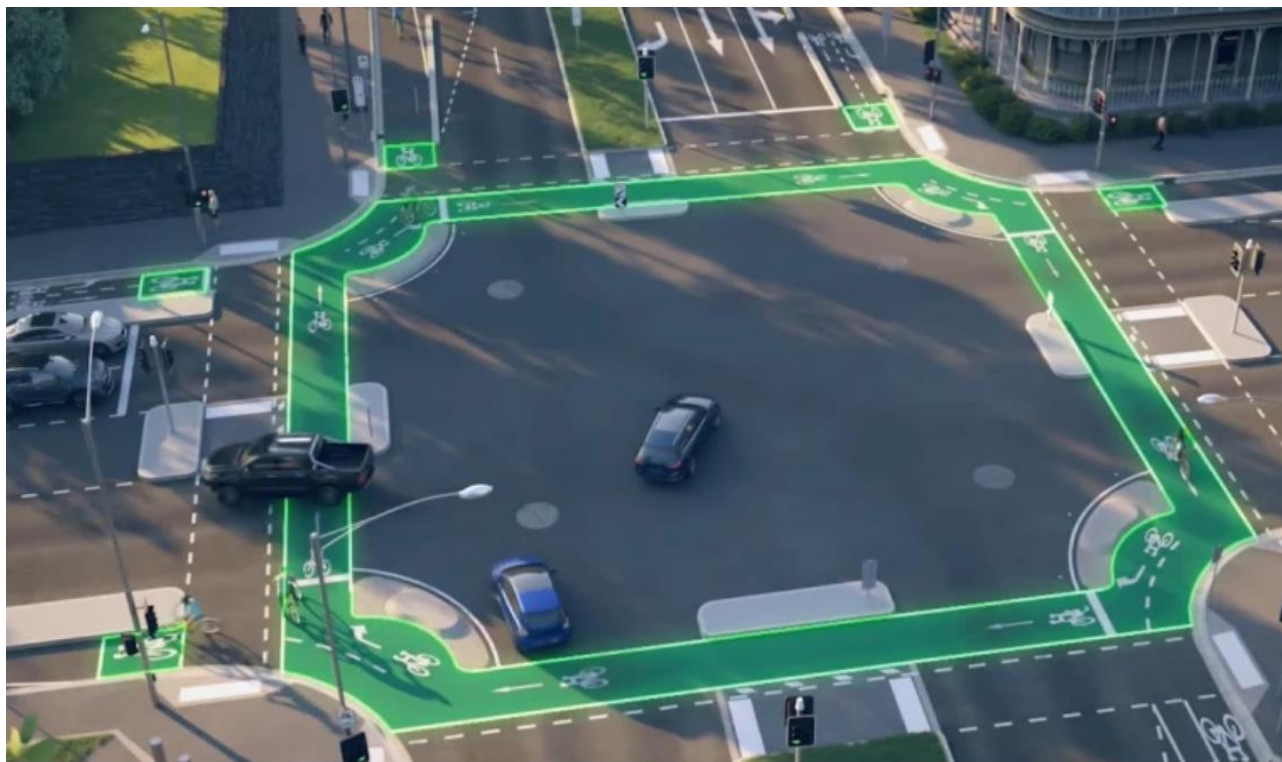
8.2 Protected cyclist intersection in Melbourne

VicRoads is planning the provision of protection for cyclists at the intersection of Albert Street and Lansdowne Street, East Melbourne at the north-western corner of Fitzroy Gardens. The plan was developed due to the history of cyclist crashes occurring at the intersection. The \$1.6 million upgrade includes separated cycle paths, kerb islands, new line markings and signals that allow cyclists and pedestrians to enter the intersection first before vehicles. The geometry creates low vehicle turning speeds means left-turning vehicles face the cycleways at right angles, improving sightlines and safety. Green pavement treatments highlight the cycleways and further improve visibility and awareness of cyclists.

Full protection maximises cyclist priority and safety, however partial protection can be provided as an alternative if space is constrained or traffic capacity must be maintained, as is the case at many existing intersections.

The intersection upgrade concept is shown in **Figure 8-2**.

Figure 8-2 Protected cycleway concept



Source: <https://www.theage.com.au/national/victoria/upgrades-to-melbourne-intersections-to-create-cycling-superhighway-20191103-p536yi.html>, viewed 09/01/2020

Protected cyclist intersections could be provided in areas of Bayside that have historically high numbers of cyclist crashes, and they also provide benefits to pedestrians and act as a traffic calming measure.

Relevance for Bayside:

Consideration for new cycle routes and/ or intersection upgrades.

8.3 Reducing private vehicle dependency in New York

The New York City Council has passed legislation to invest \$1.7 billion in roads infrastructure to improve safety over the next ten years. The upgrades will include more than 400 kilometres of protected bike lanes and over 90,000 square metres of new pedestrian space in an attempt to break car dependency in the city.

Other attempts to reduce the car dependency in the city includes the adoption of congestion pricing which will be introduced in 2021, where drivers will be required to pay in order to enter specific parts of Manhattan.

PlacesForBikes is a program developed by the American organisation, PeopleForBikes, that aims to build and connect great places for the community to ride. The program provides a City Rating system⁶ for US towns, and identifies and rewards those that are improving the fastest. The system helps communities measure the degree of comfort and accessibility to cycle to the places they want to go, and encourages cities to build connected networks.

The ratings are based on the following factors:

- > Ridership;

⁶For further information refer to <https://www.theguardian.com/us-news/2019/nov/01/new-york-city-bike-lanes-car-culture>.

- > Safety;
- > Network;
- > Reach; and
- > Acceleration.

Information for the rating is gathered by community surveys, publicly available data and the Bicycle Network Analysis.

A rating system implemented in Sydney could boost competitiveness between local councils to provide their communities with the best cycling infrastructure. Even without a Sydney-wide rating system, Council could use these factors and gather data to assess the ratings within the Bayside LGA and use these to guide future decisions.

Relevance for Bayside:

Consideration of bold visions of what's possible.

8.4 Tomorrow's Sydney – Travel Choices

The Travel Choices program⁷ is a Travel Demand Management (TDM) program aimed at reducing private vehicle travel demand within the Sydney CBD. The program was originally developed to assist individuals and organisations in adapting to changes to the transport networks within Sydney, largely driven by construction of the light rail and more recently the upgrade of the Epping to Chatswood rail line. The program distributes information and highlights alternative travel options to private vehicles, facilitating sustainable travel by encouraging mode shift, travelling outside peak times, utilising alternative routes and reducing overall travel demand.



TfNSW provides a range of TDM resources⁸ used in the Travel Choices program, with a strong focus on the development of Travel Plans for organisations. The Travel Plan toolkit⁹ and template¹⁰ could be used and distributed to organisations throughout Bayside (and potentially incorporated into planning policy) to facilitate travel behaviour change.

The Travel Choices program has contributed to a 13 per cent reduction in vehicles entering the Sydney CBD in the AM peak hour, as well as a 14.7 per cent increase in public transport trips.

Relevance for Bayside:

Bayside could adopt a similar program / approach and implement TDM measures within the LGA to encourage sustainable travel, particularly promoting cycling. The publicly available resources from Travel Choices could be adapted and the Travel Plan toolkit used to assist organisations within Bayside to adjust their travel behaviour.

8.5 Bourke Street cycleway

The Bourke Street cycleway is a 3.4 kilometre long separated cycleway in the inner city of Sydney between Woolloomooloo and Waterloo. The cycleway was an upgrade of a shared route which separated cyclists from vehicle traffic and pedestrian movements while improving safety and amenity, and generally consists of a two-way separated cycleway with a median and vegetation strip. The route is commonly used by a range of cyclists including commuters, recreational users and students, and the cycleway contributes to the overall design of Bourke Street as a low-speed environment facilitating high amenity places for people.

The design was developed through a collaborative process involving the City of Sydney, consultants, TfNSW (formerly RMS) and the local community. Community consultation was undertaken and feedback was used to refine the design and mitigate impacts such as a loss of parking and trees. Upon completion, The City of Sydney ran cycle training courses to encourage travel behaviour change.

⁷ <https://www.mysydney.nsw.gov.au/travel-choices>

⁸ Available at: <https://www.mysydney.nsw.gov.au/travelchoices/tdm> and <https://www.mysydney.nsw.gov.au/travelchoices/resources>

⁹ <http://data.mysydney.nsw.gov.au/documents/Travel%2BPlan%2BToolkit%2B2018.pdf>

¹⁰ <http://data.mysydney.nsw.gov.au/files/Travel+Plan+Template.pdf>

Figure 8-3 Bourke Street cycleway



Source: <https://www.governmentarchitect.nsw.gov.au/resources/case-studies/2017/11/bourke-street-cycleway>, viewed 09/01/2020

There are now five times as many cyclists using the Bourke Street cycleway then there were before the upgrade, and the project has won multiple awards.

The Bourke Street cycleway is an example of how separated cycleways could be implemented throughout Bayside to provide high quality infrastructure while improving amenity. This could be an effective method of addressing community needs for facilities separated from vehicles and pedestrians, and achieving the transport vision for the LGA.

Separated cycleways are typically high quality and effective facilities for cyclists, however they require a significant amount of road space, tend to be costly and can be difficult for Council to approve. Separated cycleways could therefore be prioritised for roads where they may offer the largest benefit, such as those proposed in the strategic cycling network shown in **Figure 9-2**.

Relevance for Bayside:

Consideration for road space repurposing to link in with neighbouring LGA bicycle networks noting this already exists in Mascot.

8.6 'Bike Box' bike parking and repair stations

Various bike parking and repair stations have been provided at the University of Queensland and labelled 'Bike Boxes'. The aim is to promote cycling as a sustainable transport mode to the university, reduce parking and traffic issues and encourage healthy lifestyles. The Bike Boxes contain secure parking for up to 180 bicycles each, as well as end-of-trip facilities including showers, toilets, lockers, clotheslines and irons. Repair facilities are also provided and contain tools for bike repair and maintenance.

Figure 8-4 Bike Box facilities



Source: <https://campuses.uq.edu.au/information-and-services/parking-transport/cycling/parking-facilities>, viewed 09/01/2020

The Bike Box has reduced car parking and traffic congestion issues around the university, although it does require ongoing maintenance, as does any transport facility.

Bike Boxes could be installed at key areas in the Bayside LGA (e.g. Wolli Creek Station, Rockdale, Kogarah and Mascot) to promote cycling and provide a secure facility for bike storage, maintenance and end-of-trip facilities. If constraints are limiting, bike pods could be provided as an alternative, which would provide parking without the end-of-trip facilities for maintenance provisions.

Relevance for Bayside:

Consideration for DCP transport requirements for major land uses and at major transport hubs.

8.7 Brisbane Active School Travel program

The Brisbane Active School Travel (AST) program¹¹ is a travel behaviour change program offered by Brisbane City Council (BCC) to local primary schools. The program was established in 2004 and is aimed at reducing traffic around schools in the AM and PM peak periods by promoting active and public transport as well as carpooling. Over 158 schools have participated, and BCC assists each participating school to develop a travel plan to facilitate travel behaviour change and mode shift towards active and sustainable transport options.

Each school travel plan is supported by initiatives including bicycle skills training, 'Walking Wheeling Wednesday' (allocating one day a week to walk or cycle to school), walking school buses, park and stride, public transport orientation, local access maps, road safety awareness, working advisory groups and carpooling.

Figure 8-5 Road safety presentations at schools



Source: <https://www.healthyactivebydesign.com.au/case-studies/brisbane-active-school-travel-program>

In 2017, the AST program had reduced the number of single-family car trips to participating schools by an average of 23 per cent. Some schools had achieved active transport mode shares of over 60 per cent.

Bayside Council is home to over 40 schools and the introduction of an AST program could bring a range of benefits to students, the community and environment including an increased cycling mode share, improved safety, health benefits, reduced traffic congestion, reduced car parking requirements and improved air quality.

Relevance for Bayside:

Supporting programs for sustainable transport encouragement for all user groups.

¹¹ For further information refer to:

<http://www.activehealthycommunities.com.au/plan/operational-planning/travel-behaviour-change-active-school-travel-plan/>
<https://www.healthyactivebydesign.com.au/case-studies/brisbane-active-school-travel-program>.

8.8 Bicycle boulevards

In the NSW context, bicycle stencils are often used to delegate cycle routes in mixed traffic conditions. Cycling is generally allowed and encouraged on all local streets.

Bicycle boulevards create a built environment that transforms the whole street into a low speed zone. There are currently no standards for 'bicycle boulevards'. Western Australian Department of Transport are currently implementing the infrastructure typology.

https://www.transport.wa.gov.au/mediaFiles/active-transport/AT_CYC_FS_LeakeMayBikeBoulevard.pdf

A recommendation of the Transport Strategy is to review and align speed limits to the movement and place function of a road and the surrounding land uses which would facilitate safer mixed traffic streets and potentially bicycle boulevards at a relatively low cost. Bicycle boulevards should be supported using a 'Safe Systems' approach to manage speeds and potential safety issues on these roads. Wide bike lanes on either side of the road could also be provided, creating narrower vehicle travel lanes in the centre of the road.

An example of a bicycle boulevard is in **Figure 8-6**.

Figure 8-6 Bicycle boulevard example



Source: <https://www.lancompo.org>, viewed August 2022

Relevance for Bayside:

Low cost intervention to expand the bicycle network on local streets.

9 Network development

The development of the future network was guided by the overarching vision for cycling in the LGA and key principles drawn from the Bayside Transport Strategy and community consultation. The strategy and principles behind the future network development are outlined in the following sections.

9.1 Direction and strategy

The Transport Strategy directions apply to the strategic visions for the bicycle network. These links are shown in **Table 9-1**.

Table 9-1 Cycling strategic statements

Transport directions	Cycling strategic statements
Connected & Integrated	Routes connect to where people want to travel, whether it is to their job in a strategic centre, to the shops in a local centre, to a school, or to a train station where they can continue their journey. Quiet laneways and local streets are used by cyclists to avoid high traffic volumes on main roads, and allow cyclists to avoid busy local centres for longer, regional trips. Cycle routes connect to local parks, open green spaces and waterways that provide amenity, short cuts and scenic views. There is no discrepancy in quality or connectivity of infrastructure across the different suburbs of Bayside.
Efficient	Bicycle parking in centres and at train stations allows residents to feel secure about leaving their bike unattended while they continue their day. Businesses and major employers are encouraged to prepare green travel plans and provide end of trip facilities for riders. Visiting riders can easily find their way within Bayside through integrated wayfinding signage at key locations that identifies the safest and quickest routes to key destinations and places of interest. Cycling routes are direct and efficient for travel by bicycle.
Active & Vibrant	Bayside residents enjoy a range of health benefits by participating in cycling either as a mode of transport or as a recreational sport.
Inclusive & Safe	Cycling infrastructure reflects the type of road or path environment on which it is located. Higher speed environments like main roads have separated links that keep cyclists safe from fast moving vehicles. Mixed on-road routes with stencilled line markings are located in low-speed environments where vehicle and cyclist interaction is minimal. Shared path links provide off road space for both pedestrians and cyclists. Cycling in Bayside is a popular choice for shorter trips as it is safe, convenient and fast. Riding a bike is not limited to those who are avid cyclists; people of all ages and abilities feel confident and safe enough to ride to work, retail or for recreation.
Sustainable & Innovative	The use of share bikes is popular and facilitated for short trips in Bayside. The network supports the emergence of micro-mobility, leveraging benefits of bicycle infrastructure investment.

9.2 Bicycle network principles

The following network development principles draw on the over-arching Transport Strategy principles and the community feedback, and were used to develop the future cycling network. The principles are:

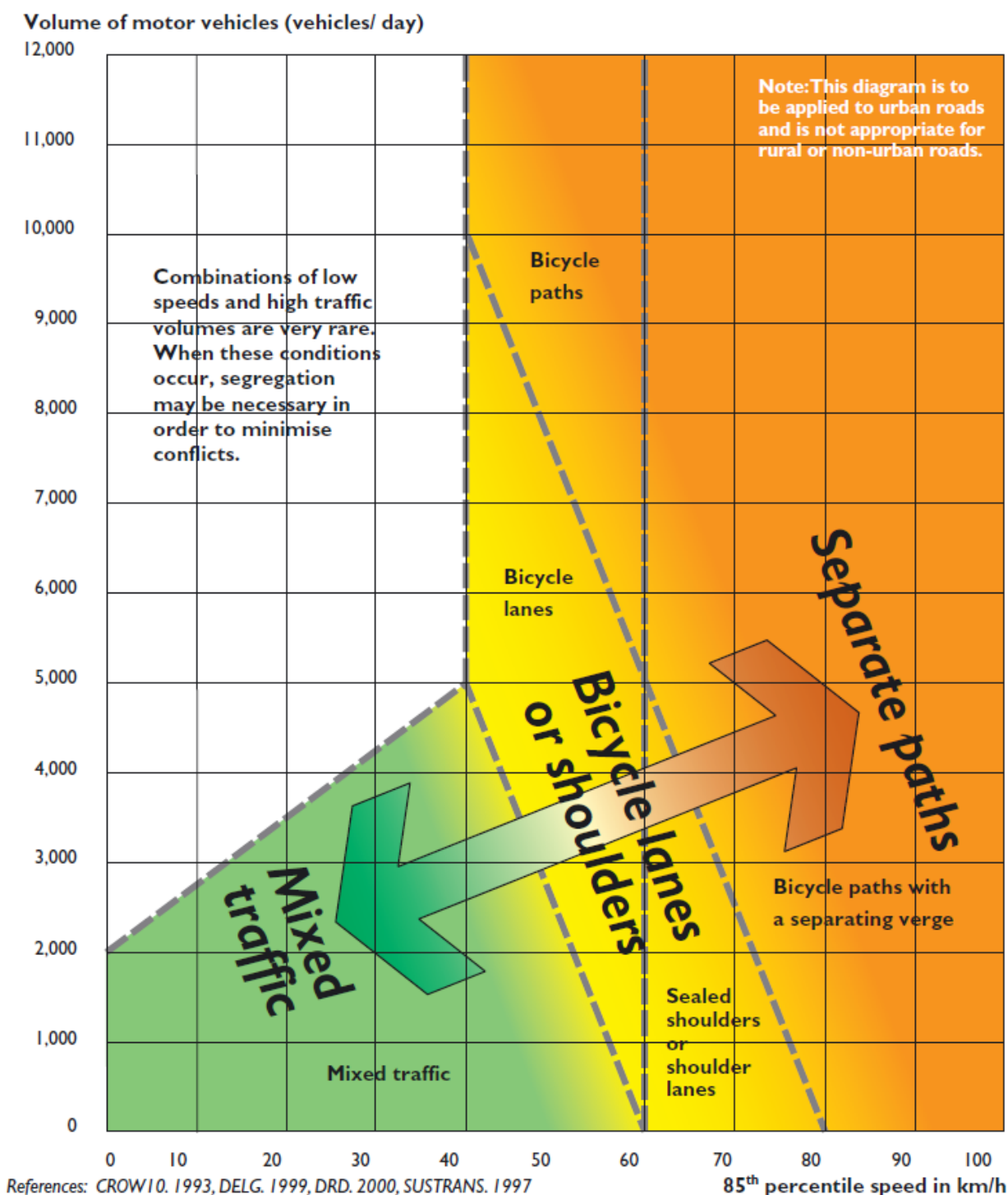
- > **Connectivity:** The network should provide good connections within the Bayside Council area, especially to centres, schools and other transport connections, and connect to infrastructure in neighbouring Councils.
- > **Legibility:** The network should be legible, intuitive, and predictable, with consistent infrastructure and wayfinding.
- > **Safety:** The network should provide people with a safe route to where they want to go, separate from heavy vehicles.
- > **Inclusivity:** The network should be accessible for all types of bicycle riders, including less confident riders.
- > **Efficiency:** The network should provide bicycle riders with a direct connection to their destination.

9.1 Selection of cycling facilities

Different types of cycleways and paths are generally provided for different road and operating environments based on safety and efficiency needs and carriageway space available. Cycling infrastructure can be broadly categorised into mixed traffic facilities, bicycle lanes, shoulder lanes, bicycle paths and separated bicycle paths.

The *NSW Government Cycleway Design Toolbox (2020)* and the *NSW Bicycle Guidelines (RTA, 2011)* provides guidance of when different types of cycleways should be provided based on the traffic volume and operating speed, as shown in **Figure 9-1**. These principles of separation were considered at a high level in the development of the strategic cycling network for Bayside.

Figure 9-1 Provision of different types of cycling facilities



Source: NSW Bicycle Guidelines, RTA, 2011

9.2 Limitations

Due to various constraints facing the Bayside LGA, there are limits to what can be implemented in terms of cycling infrastructure. The key limitations shaping the strategic cycling network include the following:

- > A lack of funding;
- > Spatial constraints and competing demands such as vehicular traffic, and expectations of kerbside parking ;
- > Political will, including sensitivities related to any removal of kerbside car parking
- > The existing mode share being low and causing uncertainty justifying improvements on an economic basis; and
- > Limited existing end-of-trip facilities;

9.3 Strategic bicycle network

Bayside Council is constantly reviewing its bicycle network and working with Transport for New South Wales to identify and develop the Principle Bicycle Network (more regionally referred to as the Eastern Harbour City's Strategic Cycleway Corridors) . The PBN is Sydney's key regional network which is represented by several 'Tier 1' regionally-connective spines through the LGA.

A network has been developed in accordance with the transport directions, strategies, principles and limitations. Consideration has been given to feedback from the community and the general need to separate cycling from busy roads. The network is composed of various cycleway typologies which each serve a function suited to its location. The preference is for regional cycleways to be separated from vehicles and pedestrians.

The bicycle network connects all centres and provides route options across the LGA. It includes the integration of the "Airport Orbital". A visionary concept of a southern Airport link is included which would improve east-west connections and form part of a Botany Bay recreational route.

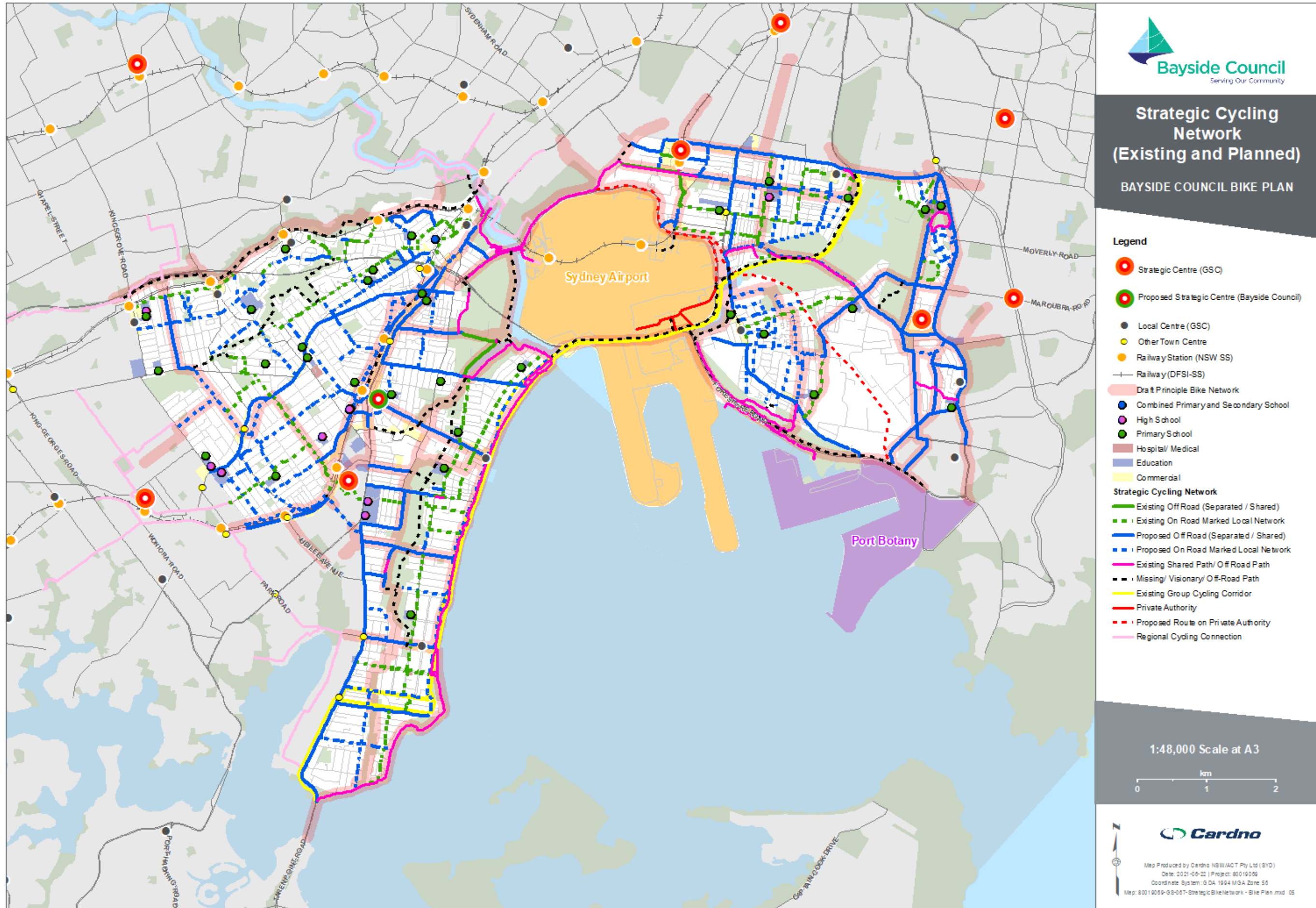
Key features of the implemented bicycle network should include the following:

- > A regional network based on the PBN from which local routes feed into and out of;
- > Improve accessibility and connectivity of all land uses, supporting trips within, from, to, and through Bayside;
- > Separated cycle and vehicular traffic routes along main regional cycleways;
- > Shared paths should aim to be 3.0 - 3.5 metres wide;
- > Reviewing and aligning speed limits to the movement and place function of a road and the surrounding land uses, including lowering speed limits in areas of high pedestrian demand and mixed cycle and vehicular traffic routes;
- > On mixed traffic routes, bicycle riders should be able to safely ride further than one metre from cars (i.e. outside dooring zones) in a slower speed-limited road environment;
- > On mixed traffic routes, activation of kerbsides that are not along habituated land uses along some bicycle routes to be designated as safe shoulder lanes (No Stopping restrictions) e.g. Banks Avenue, Chuter Avenue and Stephen Road;
- > A focus on improving cycling access and safety in proximity to schools, including upgrades of footpaths to shared paths;
- > A smooth surface that receives regular maintenance, sweeping, including vegetation trimming (Council may require new maintenance equipment i.e. narrower path sweeping machines);
- > Signal provisions for bicycles at key intersections along Council cycling routes (i.e. lead-in lanes to storage boxes) this would improve visibility at intersections which is key;
- > Separated facilities and lanterns at signalised intersections, including new dual bicycle / pedestrian lanterns across the Bayside bicycle network;
- > Well-lit paths with energy efficient lighting;
- > Wayfinding signage at key locations;
- > Signage to enhance driver awareness of bicycles on roads; and

- > Measures that support increased motor vehicle awareness of bicycles on roads, such as linemarking and signage.

The strategic bicycle network is shown in **Figure 9-2**.

Figure 9-2 Strategic bicycle network



10 Desktop audit

The strategic cycling network was audited, including a total of 224,568 metres of existing and proposed routes for on and off-road cycling. The audit consisted of a desktop study using aerial imagery and measurement tools from Nearmap and did not include a site visit. The Nearmap aerial imagery was dated at 22 October 2019 and 1 June 2020 during the time of the auditing.

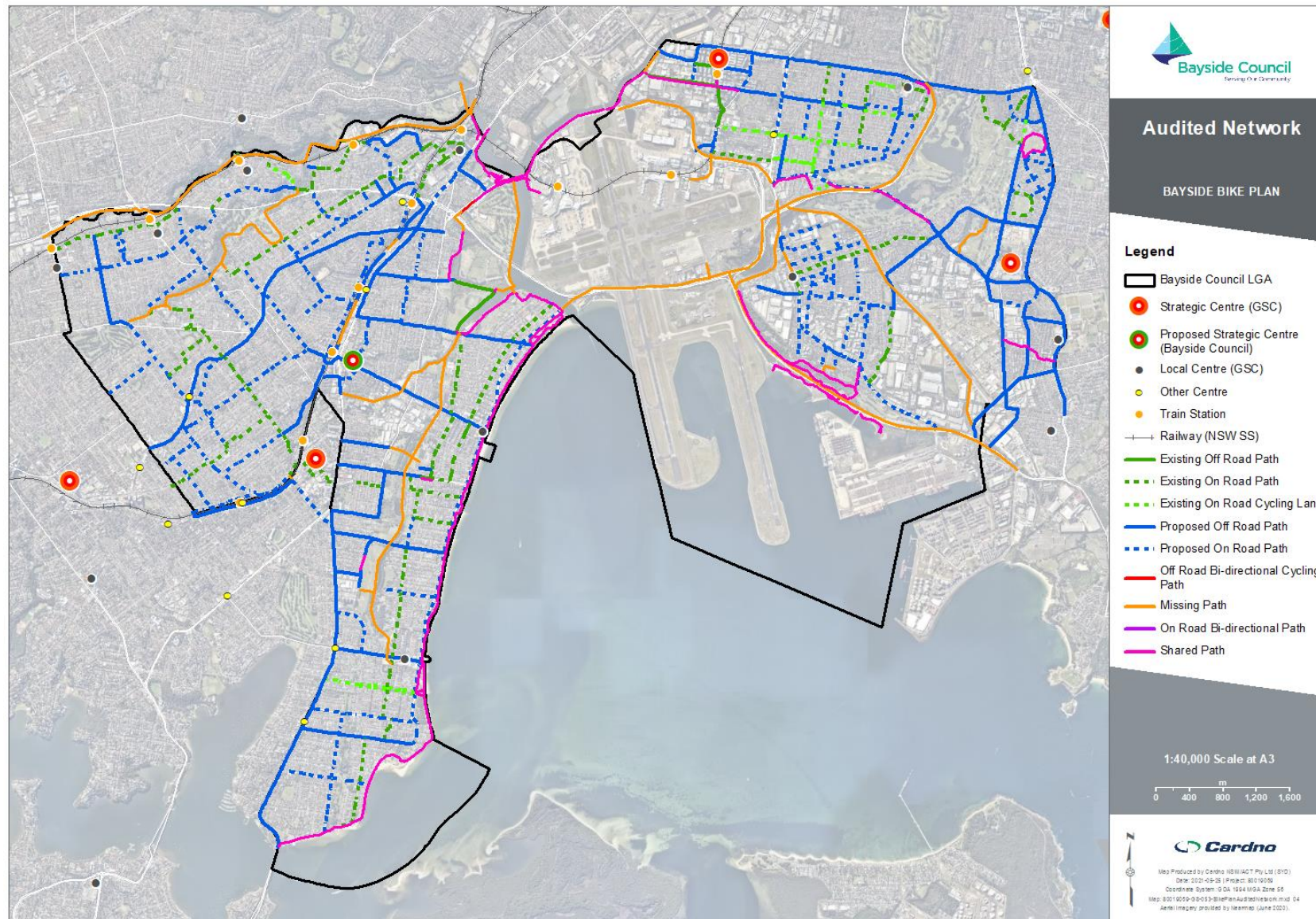
The composition of route types in the network are outlined in **Table 10-1**.

Table 10-1 Audited cycle routes

Path type	Method of audit	Length of route audited (metres)	Percentage of total
Existing off-road cycle path	Road width measurement. Left and right verge width measurement. Cycle path width measurement. Length of path measured.	3,232	1%
Existing on-road cycle path	Road width measurement. Presence and location of bike stencils in relation to parking lane and kerb. Length of path measured.	30,969	14%
Existing on-road cycle lane	Width of on-road cycle lane. Road width measurement. Length of path measured.	8,405	4%
Proposed off-road cycle path	Road width measurement. Left and right verge width measurement. Length of path measured.	55,494	25%
Proposed on-road cycle path	Road width measurement. Length of path measured.	61,241	27%
Shared path	Shared path width measurement. Length of path measured.	26,796	12%
Missing cycle path	Location approximated. Indicative length of path measured.	38,431	17%
Total		224,568	100%

The network audit extent is shown in **Figure 10-1**, and is presented in the supplied KML file.

Figure 10-1 Audited network



10.2 Network auditing standards

Network standards to adopt were decided in consultation with the Bike Plan working group, which consisted of the Cardno project team and members of Bayside Council staff.

The bicycle network standards adopted for the audit are outlined in **Table 10-2**.

Table 10-2 Network standards criteria

Item	Standard	Compliance	Audit source	Example
Shared path	Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (AGRD06A-17); Section 5.1	Minimum 2.5 metre width, preferred minimum 3.5 metre	Location and width measurement using Nearmap	
Separated cycleway (bi-directional)	Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling (AGRD06A-17); Section 5.1	Minimum 1.2 metre lane width, preferred minimum 1.5 metre Minimum 0.4 metre buffer adopted. (Minimums recommended 0.3 – 0.5 metres)	Location and width measurement using Nearmap	
On-road bicycle lane (next to parallel parking)	Guide to Road Design Part 3 Geometric Design (AGRD03-16) Section 4.8	Minimum 1.4 metre width with minimum 1.0 metre buffer from parked cars.	Location and width measurement using Nearmap	
On-road bicycle stencils	Australian Standard Manual of uniform traffic control devices Part 9: Bicycle facilities AS 1742.9:2018 Delineation Section 12 - Pavement markings for bicycle facilities, RTA.	Faded or missing Position on road minimum 0.6 metre from parked cars, typically not closer than 3.0 metre to kerb.	Location and width measurement using Nearmap	
Signage	Australian Standard Manual of uniform traffic control devices Part 9: Bicycle facilities AS 1742.9:2018	Regulatory signs provided generally in accordance with the standard.	Requires additional on site assessment	


Item	Standard	Compliance	Audit source	Example
Parking facilities	Australian Standard Parking facilities, Part 3: Bicycle Parking AS 2890.3:2015	As per standards or functionally acceptable	Requires additional on site assessment	
Missing link	As per proposed infrastructure.	As per proposed infrastructure	Nearmap	N/A

Image sources: *Cycling Aspects of Austroads Guides, Austroads, 2017, Guide to Road Design Part 6A – Paths for Walking and Cycling, Austroads, 2017, NSW Bicycle Guidelines, RTA, 2011 and photos taken by Cardno*

Example locations for where each type of facility could be implemented within Bayside are shown in **Table 10-3**.

Table 10-3 Potential locations for the implementation of each type of cycling facility

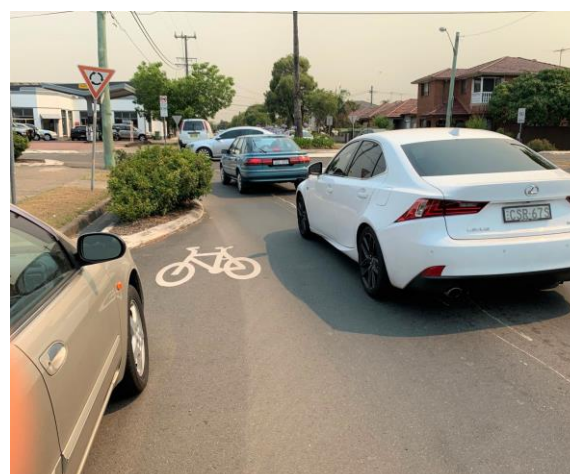
Type of facility	Example locations for implementation
Shared path	<ul style="list-style-type: none"> Princes Highway Bunnerong Road The Grand Parade Gardeners Road
Separated cycleway	<ul style="list-style-type: none"> Coward Street Banks Avenue
On-road bicycle lane	<ul style="list-style-type: none"> Harrow Road
On-road bicycle stencils	<ul style="list-style-type: none"> Caledonian Street Wellington Street

Clearances are also required for on-road bicycle facilities due to car dooring issues – that is, the potential for a driver or passenger within a vehicle to open a car door within the path of a cyclist. This can occur when cycleways are provided adjacent to kerbside parking. The risk of dooring is highlighted in **Figure 10-2** and **Figure 10-3** and can result in serious injury or death.

Figure 10-2 Risk of dooring to cyclists



Figure 10-3 Example dooring risk



Source: *Bicycle NSW*, <https://bicyclensw.org.au/the-door-zone/>, viewed 12/11/2020

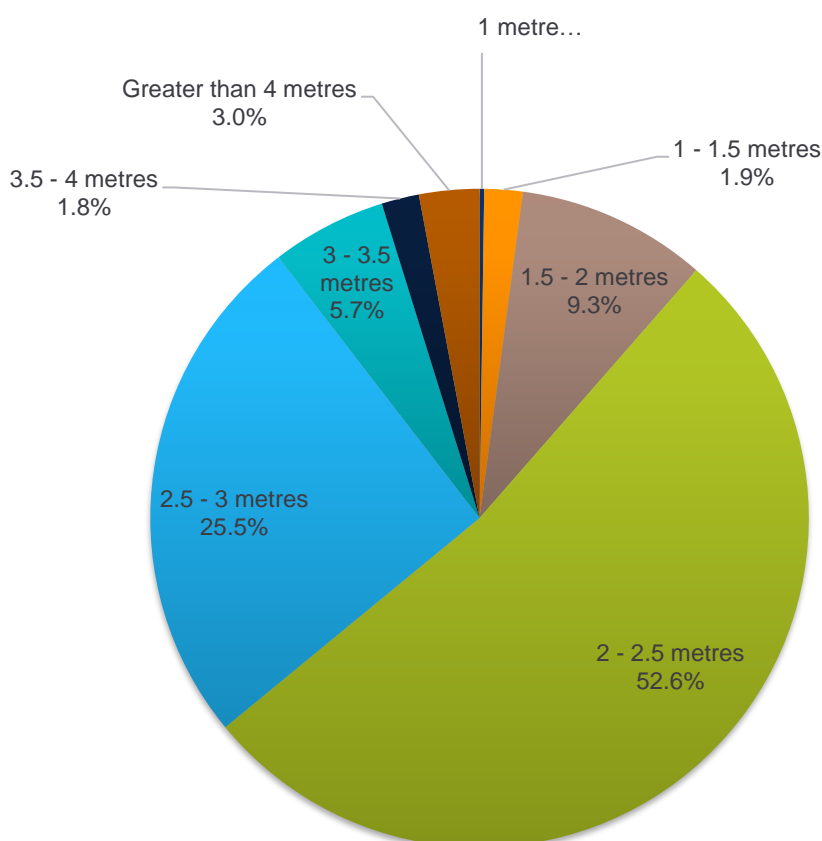
To mitigate the risk of dooring, separation between the cycleway and parking zone should be provided where possible. This should be provided through physical separation by a median if feasible, otherwise visual separation or wider lanes can facilitate a buffer zone.

10.3 Findings

10.3.1 Shared paths

Existing and proposed shared paths in Bayside are generally located along waterways and natural reserves, as well as along high speed roads, for both recreational and commuting uses. Approximately 27 kilometres of shared path was audited in Bayside. The distribution of shared path widths in Bayside is shown in **Figure 10-4**.

Figure 10-4 Audit findings - shared path width distribution

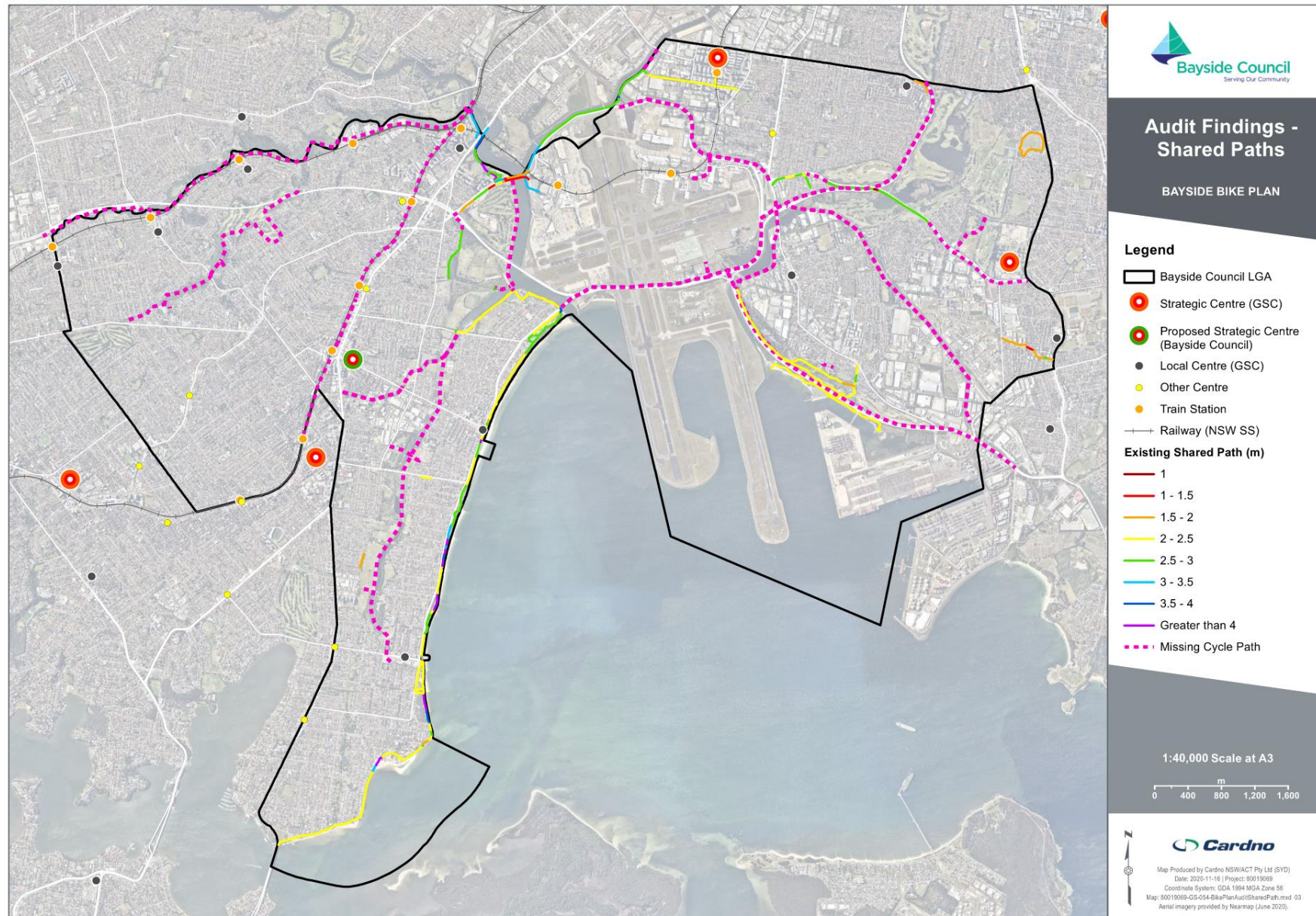


The audit found that 36 per cent of all shared paths had a width greater than 2.5 metres, and 64 per cent had a width of less than 2.5 metres (i.e. were non-compliant). The most common width of shared path was between 2 and 2.5 metres, accounting for 52.6 per cent.

Non-compliant paths widths are an issue due to safety and comfort factors. Paths below the minimum standard width increase the potential for conflict with vehicle traffic or obstacles, creating safety concerns with increased risk of crashes. Narrow paths also tend to be less comfortable for cyclists, reducing the appeal to ride and adversely influencing mode shift.

The audit findings for shared paths are presented in **Figure 10-5**.

Figure 10-5 Audit findings – shared paths



10.3.2 On-road and separated cycleways

Approximately 15 kilometres of on-road cycling lanes were audited in Bayside. The types of lanes are described in **Table 10-4**.

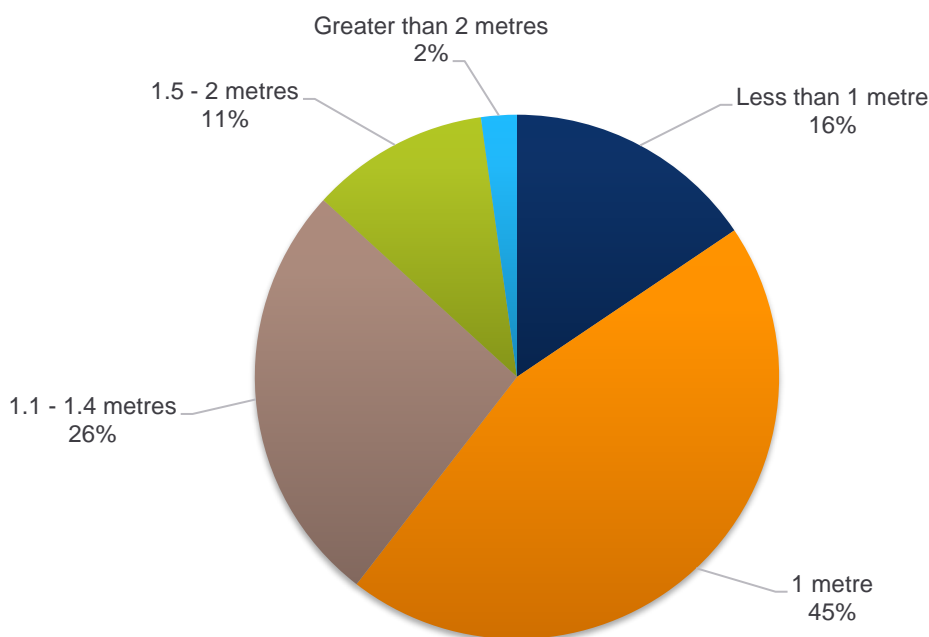
Table 10-4 Composition of separated cycleways

Type of on-road cycle lane	Metres	Percentage of total
Bike stencils located in parking lane (same width for parking and cycling)	3,680	25%
Cycle lane adjacent to parking lane	9,973	67%
Mixed traffic route with no parking on road	1,166	8%
Median separated bi-directional path	133	1%

Two on-road cycle lanes had a buffer zone of one metre from parked cars, located on either side of Heffron Road between Kenny Road and Bunnerong Road. All other on-road cycle lanes that were adjacent to parking spaces did not have a buffer zone for opening car doors.

The widths of all on-road cycle lanes are summarised in **Figure 10-6**, and the locations are shown in **Figure 10-7**.

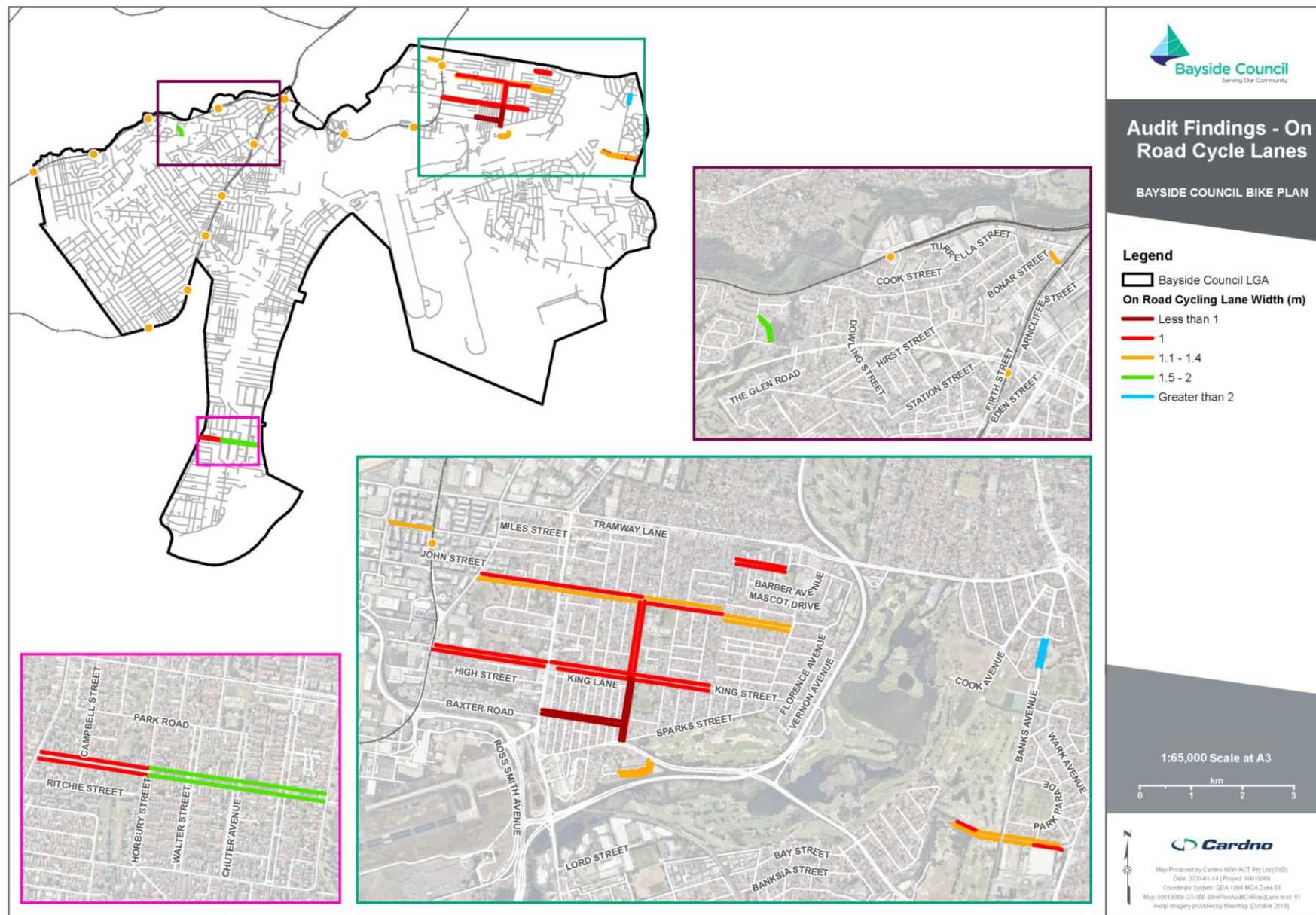
Figure 10-6 On-road cycle lane width



One median separated bi-directional cycle path was audited, located on Bourke Street in Mascot. The width of this path was found to be two metres.

Two on-road separated cycleways were found to have both a compliant width and an appropriate car door buffer zone. These are located on the northern side of Church Avenue between Kent Road and Bourke Street, and the northern side of Heffron Road between Kenny Road and Banks Avenue. All other on-road and separated cycleways were found to be non-compliant.

Figure 10-7 Audit findings – On road cycle lanes



10.3.3 On-road mixed traffic cycleways

42 bike stencils were located on on-road mixed traffic cycling routes on road segments with street parking, and 108 were located on segments with no street parking. All 42 stencils co-located with street parking were positioned either within the parking lane or with no buffer distance to the parking lane. The location and distance from kerb for all audited bike stencils in the strategic network is shown in **Figure 10-8**.

In general bicycle stencils should be located:

- > Approximately 0.5 metres from a kerb if parking is not permitted at any time;
- > Approximately 3.0 metres from a kerb if car parking is permitted, assuming vehicle parking occurs directly adjacent to the kerb.

Although some routes are well marked, most routes contain a very limited number of stencils and more should be provided to indicate the presence of cyclists to motorists. This is particularly true for the eastern side of the LGA where very few stencils are provided.

10.3.4 Missing links

Missing links are identified as incomplete strategic links in the cycling network that are currently obstructed by existing built forms such as railway corridors, green open spaces and private property. Missing links are identified in areas that would provide a continuous route of travel for cyclists. These links require further investigation to be implemented.

Missing cycling links in the network were measured as approximately 38.4 kilometres. These are mostly located in green spaces, along waterways and along high speed roads.

Missing cycling links are shown in **Figure 10-9**.

Figure 10-8 Audit findings – bike stencils

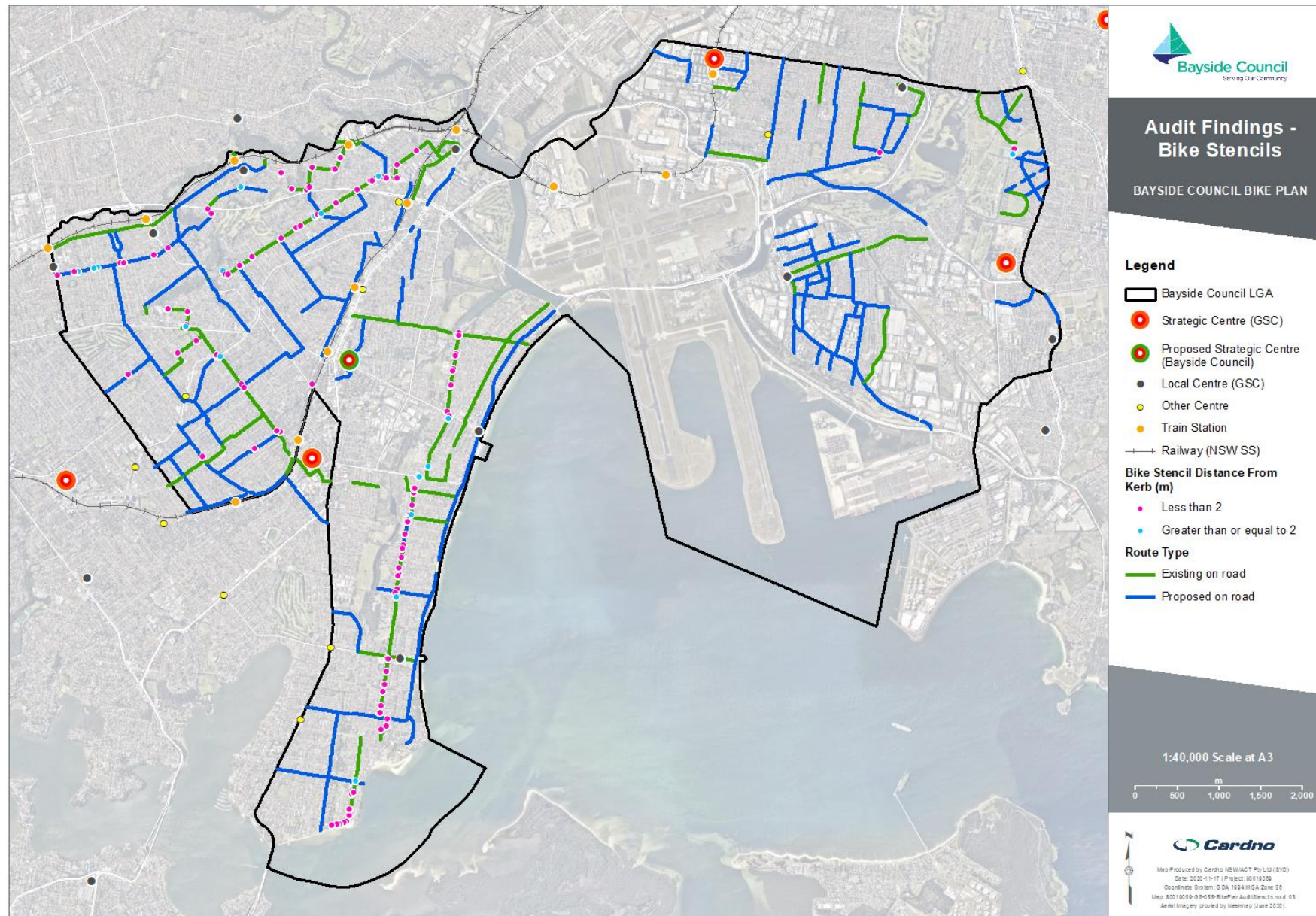
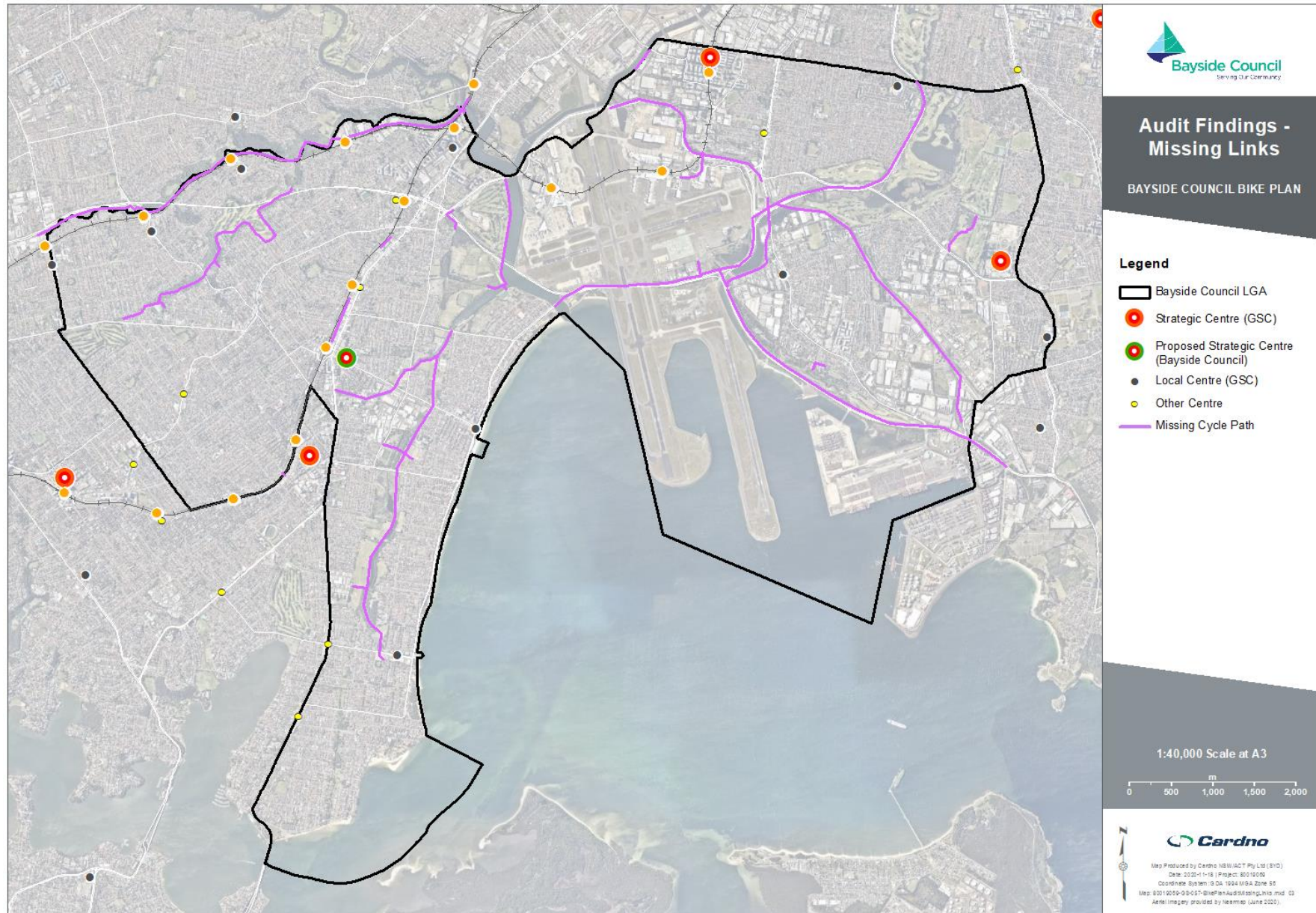


Figure 10-9 Audit findings – Missing links



11 Actions

Following from the consultation, network development and audit, a range of measures have been developed to address the issues and opportunities identified and implement the proposed bicycle network. The measures have been divided into:

1. Policy recommendations
2. Behaviour change initiatives; and
3. Infrastructure improvements.

These are ongoing actions that should be continuously planned, actioned and monitored.

The measures are detailed in the following sections.

11.1 Policy recommendations

As well as physical infrastructure recommendations, policy recommendations were identified to improve safety and amenity for cyclists as part of future development.

The policy recommendations identified are presented in **Table 11-1**.

Table 11-1 Policy recommendations

ID	Recommendation	Rationale
P1	Adopt this Bike Plan and distribute via the Council website.	The Bike Plan must be adopted to facilitate the implementation of all actions.
P2	Develop implementation strategy for the Bike Plan.	An implementation strategy will detail specifically how the Bike Plan will be implemented and how the actions will be undertaken.
P3	Recognise and prioritise the use of road space for movement, including the provision of dedicated cycling space where relevant.	Bayside Council's on-street car parking position, as per Council's website ¹² , is that they recognise the value of on-street parking and a range of strategies are used to provide a fair and equitable mix of parking options. They also recognised that the primary function of roadways is to facilitate safe and efficient transport, and occasionally on-street parking may not be available. The need to provide on-street parking must be balanced against movement needs, and as traffic situations vary over time there may be a need to modify parking arrangements.
P4	Undertake a lighting audit along cycleways and shared paths and include with any new infrastructure.	The audits will identify deficiencies and areas for improvement in terms of safety.
P5	Identify and promote cycling routes to green space.	Routes to green spaces will improve amenity and encourage greater uptake in cycling.
P6	Plan for large redeveloped blocks to be permeable for the public 24/7, and include requirements for through-site links as part of future developments for more direct walking and cycling travel.	Through site links and small blocks will allow for better pedestrian and cyclist connectivity and permeability.
P7	Plan for active transport links to enhance and connect the green grid and open space corridors to those of neighbouring LGAs.	Making use of the Green Grid links will provide opportunities for high quality cycling links to surrounding LGAs.

¹² <https://www.bayside.nsw.gov.au/services/parking>

ID	Recommendation	Rationale
P8	Review the Bayside DCP to improve cycling-related requirements for new developments as set out in Appendix A .	Improvements to requirements such as the quantum of bike parking and end-of-trip facilities will encourage cycling and ensure adequate infrastructure is provided in future developments. Developments that are required to provide through site links must make them publicly accessible at all times.
P9	Advocate for the removal of abandoned bikes on private land such as Mascot Station.	Broken or otherwise abandoned bikes are left at areas such as Mascot Station and occupy parking which would otherwise be available.
P10	Develop a regular working group to plan regional bicycle network development with Inner West Council, Georges River Council, City of Sydney, Randwick City Council, Sutherland Shire Council and TfNSW (e.g. the Doncaster Avenue cycleway).	Consistent, connected regional cycle routes will enhance the cycling network and encourage mode shift.
P11	Require major new developments to produce and implement a travel plan, including promotion of active transport.	Travel plans will encourage and facilitate behaviour change going forward.
P12	Promote Bayside as an active transport friendly council by providing improved cycling facilities such as end of trip facilities for its staff.	Promoting Council's position on active transport will encourage cycling and help shape decisions going forward.
P13	Direct funding to improve cycling conditions on roads with heavy freight traffic, particularly adjacent to the ports and on arterial roads, to increase cycling safety and priority in accordance with the modal hierarchy.	Allocation of sufficient funding for cycling infrastructure is required to effectively achieve desired safety and priority outcomes.
P14	Set up a Bayside Council Active Travel Advisory Committee.	Similar to City of Sydney, Randwick City Council, Waverley Council and Inner West Council, where Cycling related items can be discussed in further detail at regular intervals throughout the year.
P15	Develop a policy of 'Connecting Town Centres' with cycling considerations for funding and implementation.	Connecting town centres with safe cycleways (shared paths/separated paths) will facilitate movement between key land uses and enable cycling as a viable travel mode on key desire lines.
P16	Avoid removal of mature trees or any natural environment degradation in the construction of new cycle facilities.	Elements of the natural environment must be maintained. New cycleway facilities should also seek to identify opportunities for urban greening and increased tree canopy coverage. Any tree removed must be offset with new planting in near proximity in accordance with Council policy.

11.2 Behaviour change initiatives

In addition to infrastructure and policy recommendations, behaviour change initiatives were identified to encourage people to cycle. The implementation of supportive initiatives including education, promotion and incentives will help to break existing travel habits reliant on private vehicles and facilitate modal shift towards sustainable transport modes.

Effective implementation of these initiatives can increase knowledge and understanding of cycling options available, develop skills and confidence, and provide motivation and encouragement to make travel behaviour changes.

The behaviour change initiatives are identified in **Table 11-2**.

Table 11-2 Behaviour change initiatives

ID	Initiative	Rationale
B1	Develop a Council travel plan to encourage sustainable transport options, including improved planning for end of trip facilities and consideration of salary sacrificing for bikes.	As well as facilitating behaviour change at Council, this will set a precedent and lead the way for other employers to follow.
B2	Encourage schools to introduce 'cycling trains' or 'bike buses', where parents/ volunteers ride with children within a certain radius of schools.	This is an inexpensive initiative to encourage cycling and increase safety for students.
B3	Promote the health benefits of cycling, including on Council's website and social media.	Raising awareness of the health benefits of cycling will encourage people to cycle more.
B4	Distribute bike route, parking and end-of-trip facility information to the community and employers.	Informing the community of existing cycling provisions will assist decision-making, improve travel options and make people aware of what is available.
B5	Provide bicycle training courses for the community, including riding skills, maintenance and safety.	Helping people learn how to ride and maintain their bike will remove barriers to cycling, open opportunities and improve safety.
B6	Monitor cycling demand and conduct a travel behaviour survey to monitor behaviour change, measure success and inform implementation of actions going forward.	Ongoing monitoring should be undertaken to assess efficacy, adjust actions as required and facilitate implementation of this Bike Plan over time.
B7	Promote easy and efficient cycling routes such as the Botany to Central Station 'Beat the Bus' ¹³ route.	Promoting the advantages of easy routes and encouraging initiatives to highlight that cycling can be an efficient transport mode will encourage people to try cycling.
B8	Implement Active School Travel programs to encourage students to walk and cycle.	Working with schools to educate parents and children on road safety and the benefits of cycling will encourage cycling and reduce the need for drop-offs.
B9	Hold and promote special activities and events such as 'Ride2Work Day', 'Ride2School Day' and 'Bike Week'.	These types of initiatives can help break existing habits, introduce people to the benefits of cycling and assist them in taking the first step.
B10	Advertise cycling improvements and initiatives (including this Bike Plan) on media platforms including Council's website, community boards and social media.	Awareness of new infrastructure, policy and initiatives will inform the community and encourage mode shift.
B11	Support and promote recreational cycle groups such as social weekend cycles and other cycling events.	Supporting these groups and leveraging off the availability of the foreshore and Cooks River cycleways will help to encourage recreational cycling.
B12	Develop a communications plan, including promoting Council's website and social media platforms and using them to provide updates and information about cycling.	To provide an interactive format for information and community feedback.
B13	Promote the importance of sharing the road and encourage other road users to recognise cyclists as legitimate users.	This is particularly important given the community feedback about sharing the road and safety concerns in mixed traffic environments where separation isn't feasible.
B14	Collaborate with providers and advocate for bicycle hire opportunities for the community, which could include electric bikes and working with developments and other landowners to provide pods at key locations such as train stations.	Bike hire can reduce barriers to cycling and offer convenient, cheap options for travel, particularly for occasional users.

¹³ For further details refer to <https://biketrail.blog/2019/03/14/beat-the-bus-botany-north-to-central-station/>.

ID	Initiative	Rationale
B15	Investigate the use of 'Big Data' from telecommunications companies to monitor cycling behaviour and route choice.	The use of 'Big Data' source could complement existing data and provide greater understanding of how cyclists travel.

11.3 Infrastructure improvements

Infrastructure improvements were identified as part of the network development and audit, based on needs of the future bicycle network, gaps and deficiencies in the existing network and feedback from the consultation.

The infrastructure improvements identified are presented in **Table 11-3**.

Table 11-3 Infrastructure improvements

ID	Improvement	Rationale
In1	Identify consistent standards with neighbouring Councils to be implemented for the region, while being flexible enough to encourage trials of new initiatives and infrastructure typologies.	Consistent infrastructure will add to cyclist confidence and comfort, similar to what private vehicles have throughout Australia.
In2	Implement the strategic bicycle network presented in Figure 9-2 , including a local bicycle network in conjunction with TfNSW's PBN. Priority routes have been identified (Section 11.4) to stage implementation.	Sufficient infrastructure must be provided to ensure adequate connectivity.
In3	Investigate opportunities for the provision of off-road separated cycleways around the Port Botany and Sydney Airport freight and logistics zones including integration with the Botany freight rail duplication, Sydney Gateway and other associated infrastructure projects.	Provision of formal infrastructure in these areas will help separate cyclists from dangerous traffic and improve safe cycling connections.
In4	Review and align speed limits to the movement and place function of a road and the surrounding land uses, including lowering speed limits in areas of high pedestrian demand.	Concerns over safety and sharing the road with vehicles were key issues raised in the community consultation. Lower speed limits will improve safety and on-road cycling experiences, presenting a low-cost solution in appropriate environments where other facilities are not feasible.
In5	Investigate the feasibility of bicycle boulevards.	Bicycle boulevards may be a low cost method to expand the cycle network and provide safety and place benefits in Bayside.
In6	Work with State Government and other stakeholders to investigate opportunities to utilise land in the Green Grid corridors and incorporate cycling links as part of major projects.	A number of opportunities exist which could significantly improve connectivity and provide high quality cycling infrastructure.
In7	Work with major landowners and users such as Sydney Airport Corporation and Botany Industrial Park to provide off-road cycling connections.	These are major employers with many workers living in the LGA. Additional and improved links will facilitate cycling to these destinations and reduce pressure on the road network.
In8	Work with TfNSW and Sydney Trains to provide additional bike parking at train stations and transport interchanges.	Sufficient bike parking is required to facilitate modal transfers and accommodate commuters in peak periods.
In9	Provide ongoing monitoring and maintenance of the bicycle network.	Ensuring a high quality network free from defects will improve safety and encourage people to cycle.

ID	Improvement	Rationale
In10	Provide wayfinding signage at key locations on the network and to bike parking in public locations. This should include significant destinations, focal points, town centres and key land uses.	Wayfinding will help cyclists locate bike parking and find key cycling routes, particularly encouraging non-regular cyclists. Wayfinding and cycling promotion could be included on new bus shelters and other Council assets.
In11	<p>Ensure that any development applications and planning proposals at the following strategic locations include provision for walking and cycling infrastructure:</p> <ul style="list-style-type: none"> ▪ The foreshore at Cooks Cove. ▪ The foreshore of the Cooks River. ▪ The foreshore at Wolli Creek. ▪ The Alexandra Canal. 	To connect with Greater Sydney active transport projects including the Botany Bay to Homebush Bay regional cycling network in line with DPIE's Bayside West precinct plan. This area of Bayside presents opportunities to connect to the Cooks River, Sydney Airport and neighbouring LGA's.
In12	Collaborate with the NSW Government on developing a green active transport link along the M6 corridor, reflecting the Green Grid aims, and providing connections to centres and other destinations surrounding the route.	The land reservation allows a good opportunity to provide a cycling link along the corridor, aligning with the Green Grid and providing north-south connectivity.
In13	<p>Collaborate with the NSW Government on developing the other three Green Grid links located in the Bayside LGA, including the:</p> <ul style="list-style-type: none"> ▪ Wolli Creek Regional Park and Bardwell Valley Parklands; ▪ Mill Stream and Botany Wetlands Open Space Corridor; and ▪ Rockdale Wetlands Open Space Corridor. 	The Green Grid links present ideal opportunities to provide cycling infrastructure and increase cyclist connectivity and amenity within the LGA.
In14	Work with TfNSW to develop the Sydney Airport orbital bicycle route.	The area is currently lacking cycling infrastructure and heavily focused on vehicular travel.
In15	Integrate Mascot's High Street with the Mascot rail precinct with walking and cycling links.	These links will connect the residential region of Mascot with the Mascot business hub and also facilitate connections to major land uses such as the Sydney CBD.
In16	Investigate opportunities for a Wolli Creek cycling interchange facility to integrate routes and interchange with the rail network, as well as infrastructure linking new open spaces and corridors from neighbouring council areas. The interchange facility should include a range of bicycle parking options. This should also include advocating for an active transport connection between Wolli Creek interchange, Waterworth Park and Tempe.	Improved interchange facilities will encourage cycling as a commuting travel mode and reduce reliance on private vehicles to access train stations. This action will also improve north-south connections to and from Bayside.
In17	Identify cycling links in the five to ten kilometre catchment of Kogarah and Mascot strategic centres as well as the proposed Rockdale strategic centre, aligning with the PBN objectives, and ensure high quality walking and cycling paths connect the Bayside's vibrant centres to the PBN.	Highlighting and promoting key regional links in accordance with the PBN, as well as local feeder links connecting to the centres, will help facilitate movement within and to/ from Bayside.
In18	Work with TfNSW to investigate the development of an off-road cycleway along Denison Street, in line with the PBN, to remove cyclists from the dangerous goods and heavy vehicle on-road corridor.	Separation of cyclists from large volumes of heavy vehicles and dangerous goods will improve safety along this corridor.
In19	Consider reallocation of road space in other areas to physically separate cyclists from vehicular traffic.	Separation of cyclists from vehicle traffic is a key measure to increase safety, in line with government objectives and community consultation.

ID	Improvement	Rationale
In20	Upgrade key footpaths within a 800 metre radius of schools to 2 metre wide shared paths to facilitate easy walking and riding. Bumps and expansion joints should be minimised.	Schools should be a focal point for footpath upgrades to facilitate active transport access for students and parents and improve safety.
In21	Ensure bike parking facilities are of high quality, have priority access in line with the modal hierarchy and be of significant quantity to accommodate increases in utilisation.	Bike parking should complement car parking and be placed with convenient access to encourage use.
In22	Provide cycle aspects at crossings to allow riders to continue cycling as they cross roads where possible.	The ability to continue riding across roads will increase convenience and make cycling more attractive as a travel mode.
In23	Support high movement function state roads with shared paths (2.5 metre minimum, 3.5 metre preferred minimum) on each side where feasible, with low-speed signage to manage conflict.	This will support 'connecting town centres' and facilitate daily access to employment, education, shopping and other land uses. Shared paths may not be appropriate directly within town centre environments and the design should be fit for purpose.
In24	Upgrade existing non-compliant cycling facilities (width, separation and linemarking) to bring them up to standard.	Non-compliant infrastructure is a potential safety hazard and may discourage cycling.
In25	Expansion of on road marked cycleway network through line and road markings, including bicycle stencils located at the entrance and exit to each leg of intersections in on-road routes.	On-road marked cycleway routes are lower cost and easier to implement than providing off-road cycleway infrastructure. The provision of bicycle stencils at intersections also increases awareness of cyclists.
In26	Improve the application of on road markings on the road network, especially upon approach to roundabouts, intersections and road width reductions. Detailed design of these elements should meet Austroads standards.	Consider the placement of bike symbols on the road in the centre of the travel lane, but no closer than 1 metre from parked cars, i.e. not to be placed within parking lanes or within the door opening zone of parked vehicles.
In27	Work with TfNSW to improve cycling conditions on the state road network within Bayside.	Improvements to on road bicycle markings and road side signage would significantly improve community awareness of cyclists on main roads and improve safety. Currently there is little awareness on state roads. Road markings should be maintained in line with maintenance required for the entire carriageway.
In28	Remove redundant signage and bollards on the cycling network.	Redundant signage adds to clutter and confusion for cyclists and motorists. Bollards that are not provided in accordance with Austroads standards can be safety hazards and disrupt efficient cycling.
In29	Prioritise the design of cycleways in funding mechanisms so that designs are construction-ready and considered for state funding.	Having cycleway designs 'shovel-ready' will facilitate applications for State Government funding and enable earlier construction.
In30	Investigate non-active kerbside opportunities to formalise the shoulder as a dedicated bike lane where car parking provision is not deemed a priority.	There is a strong need for dedicated cycling infrastructure throughout the LGA, and prioritisation of cycling above parking in appropriate situations aligns with the Bayside modal hierarchy.
In31	Produce a 'Guide to managing conflict on shared paths' with a 'Share the path' program, containing advice regarding cycling speeds and behaviour.	A significant number of shared paths will be contained within the LGA and managing potential conflict will increase safety and encourage both pedestrians and cyclists to use the paths.
In32	Investigate the development of a signage toolkit and linemarking template for shared paths in line with NSW policy and neighbouring LGA's and best practice.	The development of a shared path signage and linemarking toolkit would facilitate the efficient design and implementation of standard, high quality shared paths throughout the LGA.

11.4 Priority cycle routes

In accordance with recommendation In2 from, the strategic bicycle network should be implemented with priority given to key cycling routes within the network. Routes have been identified to allowed for a staged approach in line with funding and other implementation constraints.

These routes have been established with consideration of the following:

- > Connections between strategic and local centres;
- > Regional links supporting access to jobs and services; and
- > Supporting major trip generators and attractors.

The key cycling routes in the strategic cycling network are presented in **Figure 11-1**.

All other links in the strategic cycling network act as local connectors providing access to the key routes.

The key cycling routes are prioritised through a multi criteria analysis to determine the routes with the highest priority, which should be implemented first. The criteria used for this prioritisation are outlined in **Table 11-4**. Each criteria was given a score between 0 and 2, and the total score for each key cycling route determines the priority. The length of each route is also considered, and the final score is given per kilometre of cycling route.

Table 11-4 Key cycling route multi criteria assessment

Criteria	Assessment and scoring
Connects to a strategic centre	0 - Zero strategic centres connected 1 - One strategic centre connected 2 - Two or more strategic centres connected
Connects to a local centre	0 - Zero local centres connected 1 - One local centre connected 2 - Two or more local centres connected
Number of cycling crashes on route	0 - No cycling crashes located on route 1 - Five or less cycling crashes located on route 2 - Six or more cycling crashes located on route
Leverage from major projects and opportunities for cost sharing	0 - No leverage 1 - Small project leverage 2 - Major project leverage
Strategic significance (Principle Bike Network and Sydney Green Grid)	0 - No strategic significance 1 – Located in Sydney Green grid 2 – Located in Principle Bike Network

The multi criteria analysis results for each key cycling route is shown in **Table 11-5**. The key routes were prioritised from 1 to 22, and Wolli Creek to Kogarah has been identified as the highest priority route.

The route scoring and prioritisation is provided for an indicative ranking. As circumstances change during the implementation of cycle routes, other factors may become evident and the value of other factors may need to be reassessed. Opportunities may occur provide lower priority routes before higher priority routes due to major infrastructure, development, grant funding or any other means. All routes are beneficial and should be considered as part of an integrated network and be implemented to realise the ambitions of this Bike Plan.

Figure 11-1 Key cycling routes in network

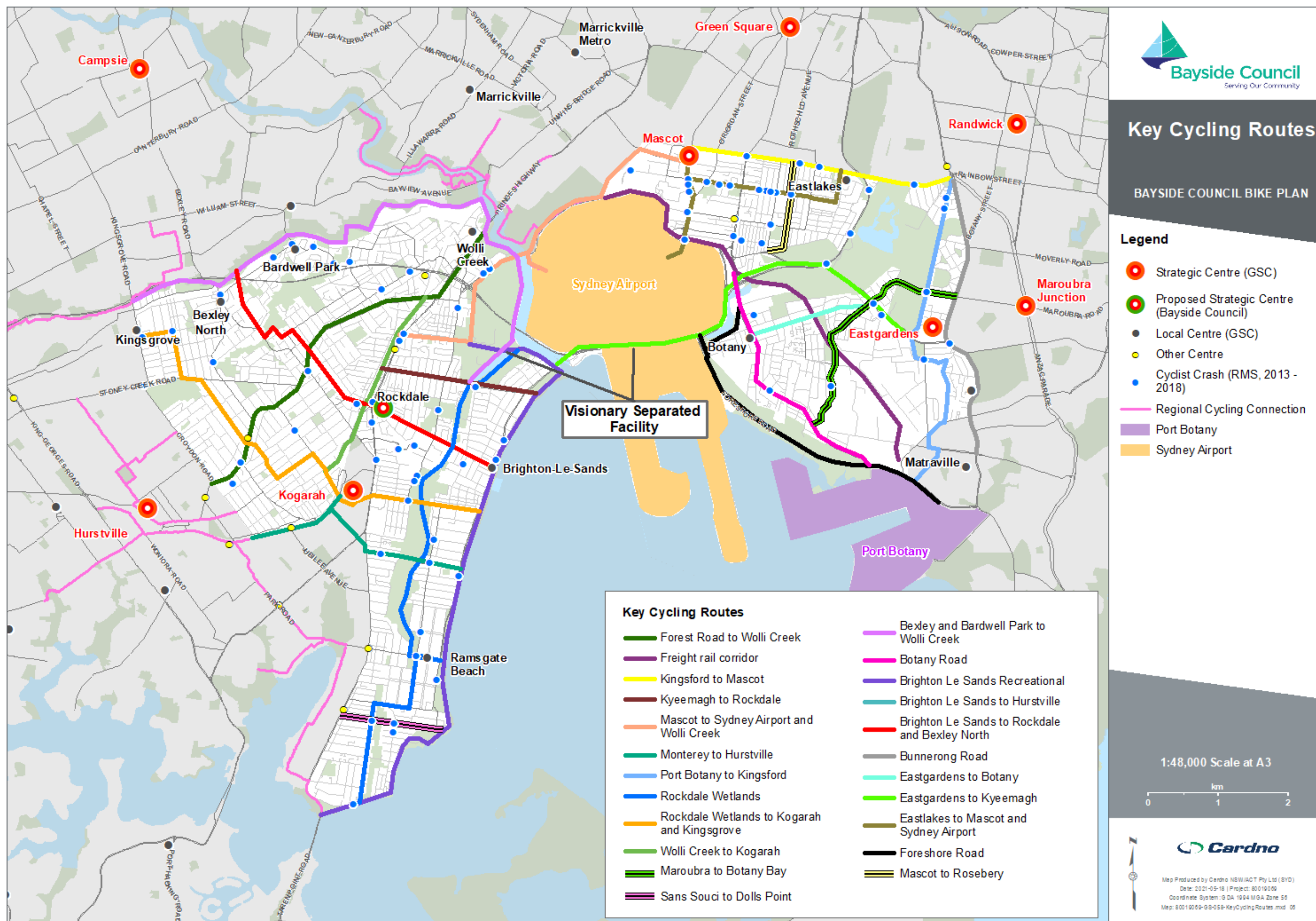


Table 11-5 Key cycling routes – multi criteria assessment scoring/ prioritisation

Key route	Length (km)	Key areas connected	Strategic significance	Connects to strategic centre (0 - 2)	Connects to local centre (0 - 2)	Cycling crashes on route (0 - 2)	Leverage off project/ cost share (0 - 2)	Strategic significance (0 - 2)	Total	Score per kilometre
Wolli Creek to Kogarah	2.9	Connects Wolli Creek with Kogarah along the rail corridor	<ul style="list-style-type: none"> PBN Sydney Green Grid Connection along rail corridor 	2	2	1	0	2	7	2.41
Kingsford to Mascot	4	Connects Kingsford to Mascot via Gardeners Road	<ul style="list-style-type: none"> PBN Sydney Green Grid Connects to train station 	2	2	2	0	2	8	2.00
Eastlakes to Mascot and Sydney Airport	4.1	Connects Eastlakes with Mascot and Sydney Airport via Coward Street	<ul style="list-style-type: none"> PBN Connects to airport. High number of cycling crashes on route 	2	1	2	1	2	8	1.95
Maroubra to Botany Bay	3.5	Connects between Eastgardens and Botany Road in Banksmeadow	<ul style="list-style-type: none"> PBN Connects to Eastgardens strategic centre 	1	0	2	0	2	5	1.43
Monterey to Hurstville	3.7	Connects the Brighton foreshore with Rockdale	<ul style="list-style-type: none"> PBN Sydney Green Grid 	2	0	1	0	2	5	1.35
Port Botany to Kingsford	5.2	North-south connection in east of LGA	<ul style="list-style-type: none"> PBN Sydney Green Grid Connects to Hebron Park 	2	2	1	0	2	7	1.35
Eastgardens to Kyeemagh	6.1	East-west connection across Sydney Airport via a visionary corridor	<ul style="list-style-type: none"> PBN Sydney Green Grid Visionary separated facility. Connects east-west across airport 	2	1	2	1	2	8	1.31
Bunnerong Road	4.2	North-south connection in east of LGA	<ul style="list-style-type: none"> Connects to Hebron Park 	2	2	1	0	0	5	1.19
Brighton Le Sands to Rockdale and Bexley North	5.2	Connects Brighton Le Sands with Rockdale and to the north-west	<ul style="list-style-type: none"> PBN Sydney Green Grid High travel demand between Brighton Le Sands and Rockdale 	1	2	1	0	2	6	1.15
Mascot to Sydney Airport and Wolli Creek	6.2	Connects Mascot with the western side of the Airport via Wolli Creek	<ul style="list-style-type: none"> PBN Sydney Green Grid Sydney Gateway High travel demand on east-west connection across airport Connects to airport 	1	1	1	2	2	7	1.13
Eastgardens to Botany	1.8	Connects east-west across the freight rail line	<ul style="list-style-type: none"> Access across freight rail line 	1	0	1	0	0	2	1.11
Rockdale Wetlands to Kogarah and Kingsgrove	6.7	Connects the Brighton foreshore with Kogarah and north west to Kingsgrove	<ul style="list-style-type: none"> Sydney Green Grid Connects Kogarah to Brighton Le Sands 	1	2	1	1	2	7	1.04
Freight rail corridor	6.4	Freight rail corridor and General Holmes Drive connection to connect the east with the west of LGA	<ul style="list-style-type: none"> PBN Sydney Green Grid Freight rail line duplication 	1	1	0	2	2	6	0.94
Kyeemagh to Rockdale	2.2	Connects Kyeemagh and the foreshore with Rockdale	<ul style="list-style-type: none"> 	0	1	1	0	0	2	0.91

Key route	Length (km)	Key areas connected	Strategic significance	Connects to strategic centre (0 - 2)	Connects to local centre (0 - 2)	Cycling crashes on route (0 - 2)	Leverage off project/ cost share (0 - 2)	Strategic significance (0 - 2)	Total	Score per kilometre
Rockdale Wetlands	8.2	Key green corridor connecting north with south	<ul style="list-style-type: none"> ▪ PBN ▪ Sydney Green Grid 	0	2	0	2	2	6	0.73
Sans Souci to Dolls Point	1.5	Russel Avenue, between Sans Souci centre and waterfront	<ul style="list-style-type: none"> ▪ - 	0	0	1	0	0	1	0.67
Mascot to Rosebery	1.5	Hicks Avenue, Horner Avenue and Gordon Street connection	<ul style="list-style-type: none"> ▪ - 	0	0	1	0	0	1	0.67
Foreshore Road	5.4	Recreational Route between Port Botany and General Holmes Drive.	<ul style="list-style-type: none"> ▪ PBN ▪ Sydney Green Grid ▪ Recreational 	0	1	0	0	2	3	0.56
Botany Road	3.7	Botany Road connection	<ul style="list-style-type: none"> ▪ - 	1	1	0	0	0	2	0.54
Brighton Le Sands Recreational	9.5	Off road recreational route	<ul style="list-style-type: none"> ▪ PBN ▪ Sydney Green Grid ▪ Recreational 	0	2	1	0	2	5	0.53
Forest Road to Wolli Creek	5.8	Forest Road connection	<ul style="list-style-type: none"> ▪ - 	1	1	1	0	0	3	0.52
Bexley and Bardwell Park to Wolli Creek	8.3	Adjacent to rail line along Wolli Creek. Connects between Kingsgrove, Bexley North, Bardwell Park and Wolli Creek.	<ul style="list-style-type: none"> ▪ PBN ▪ Sydney Green Grid ▪ Recreational 	0	2	0	0	2	4	0.48

11.4.2 Implementation

The order of priority for each key cycling route to be improved is shown in **Table 11-5**. Improvements to the key cycling routes should be completed as opportunities allow. Ideally this would be within a 10 year timeframe, by 2030.

11.5 Cost estimates

Strategic cost estimates were prepared for each infrastructure improvements to the bike network. These were based on unit cost rates provided by Council in 2019, and are expected to have increased since that time. These have been used as estimate for project costs for 2019.. Unit rates are outlined in **Table 11-6**.

Table 11-6 Unit rates

Item	Unit	Unit cost
Off Road path (new) - 2.5m width	\$/m	430
Off Road path (new) - 3.0m width	\$/m	540
Off Road path (new) - 3.5m width	\$/m	630
Off Road path (reconstruct) - 2.5m width	\$/m	675
Off Road path (reconstruct) - 3.0m width	\$/m	810
Off Road path (reconstruct) - 3.5m width	\$/m	945
Provide awareness bicycle signage	\$	600
Provide bicycle symbol	\$	150
Remove and relocate bicycle symbol	\$	190
Repaint lines for on-road cycle lane	\$/m length	5
Reconstruct kerb ramp (assume 3.5m ramp width)	\$	3,000
Install signalised crossing	\$	400,000
Install refuge	\$	100,000

The total cost of infrastructure improvements identified is estimated at **\$68,159,369**. A breakdown of the costs for each infrastructure type is outlined in **Table 11-7**.

Table 11-7 Cost per infrastructure type

Infrastructure type	Action	Total cost
Existing on road mixed traffic	Provide bicycle awareness signage (key cycling routes only)	\$55,200
Existing off-road/ shared path	Reconstruct non-compliant off-road/ shared path	\$6,915,229
Proposed off road (within road reserve)	Provide off-road/ shared path	\$37,722,736
Proposed on road mixed traffic	Provide bicycle awareness signage (key cycling routes only)	\$110,400
Missing off-road/ shared path (not within road reserve)	Provide off-road/ shared path	\$23,171,565
Existing on road cycle lane	Remove lanes and provide stencils	\$58,800
Existing bike stencil	Replace existing bike stencil	\$25,840
Missing bike stencil	Provide bike stencil	\$99,600
TOTAL		\$68,159,370

The cost for each key cycling route based on the location is outlined in **Table 11-8**.

Table 11-8 Estimated cost per key cycling route

Key route	Local road	Private	State/ regional road	Total
Wolli Creek to Kogarah	\$1,509,309	\$0	\$55,869	\$1,565,178
Kingsford to Mascot	\$0	\$0	\$2,705,227	\$2,705,227
Eastlakes to Mascot and Sydney Airport	\$935,157	\$302,302	\$16,800	\$1,254,260
Maroubra to Botany Bay	\$6,780	\$0	\$1,829,615	\$1,836,395
Monterey to Hurstville	\$998,849	\$0	\$796,507	\$1,795,356
Port Botany to Kingsford	\$3,235,861	\$117,126	\$925,571	\$4,278,558
Eastgardens to Kyeemagh	\$186,856	\$1,870,975	\$1,529,549	\$3,587,380
Bunnerong Road	\$0	\$0	\$2,810,808	\$2,810,808
Brighton Le Sands to Rockdale and Bexley North	\$295,692	\$0	\$1,474,266	\$1,769,958
Mascot to Sydney Airport and Wolli Creek	\$710,100	\$0	\$750,653	\$1,460,753
Eastgardens to Botany	\$23,250	\$0	\$3,150	\$26,400
Rockdale Wetlands to Kogarah and Kingsgrove	\$981,575	\$0	\$750,564	\$1,732,139
Freight rail corridor	\$0	\$3,639,397	\$0	\$3,639,397
Kyeemagh to Rockdale	\$82,254	\$0	\$1,012,262	\$1,094,515
Rockdale Wetlands	\$2,608,621	\$0	\$281,509	\$2,890,130
Sans Souci to Dolls Point	\$948,109	\$0	\$0	\$948,109
Mascot to Rosebery	\$28,029	\$0	\$0	\$28,029
Foreshore Road	\$583,511	\$0	\$2,625,259	\$3,208,769
Botany Road	\$0	\$0	\$387,746	\$387,746
Brighton Le Sands Recreational	\$2,724,423	\$0	\$0	\$2,724,423
Forest Road to Wolli Creek	\$0	\$0	\$3,538,256	\$3,538,256
Bexley and Bardwell Park to Wolli Creek	\$4,610,240	\$0	\$0	\$4,610,241
Sub-total Priority routes	\$20,468,616	\$5,929,800	\$21,493,611	\$47,892,027
Other routes (remainder of audited network)	\$11,543,734	\$0	\$8,723,609	\$20,267,343
TOTAL	\$32,012,350	\$5,929,800	\$30,217,220	\$68,159,370

12 Summary

This Bike Plan has been developed to support increased cycling participation in the Bayside LGA. The plan focuses on improvements to cycling infrastructure, policy and behavioural change to facilitate easy and safe cycling trips within and connecting to the LGA. Improving the network will encourage greater adoption of walking and cycling by the whole community and help to achieve the vision for Bayside.

The plan aligns with Council and State Government visions for active and sustainable transport choices and was guided by community inputs (written and in workshops) received during the preparation of the Local Strategic Planning Statement. It will support Council's aim to encourage walking and cycling, and ensure equitable and appropriate access to public transport. The Bike Plan:

- > Outlines the local, state, and federal strategic planning context and its applicability;
- > Analyses current population trends and outlines opportunities to increase cycling rates;
- > Summarises the existing transport network conditions and crash data;
- > Presents the key findings arising from the stakeholder and community consultation;
- > Summarises the issues and opportunities identified for the bike network in Bayside;
- > Examines case studies of best practice cycling infrastructure and initiatives;
- > Proposes a safe and convenient bike network to connect to key land uses;
- > Highlights common issues identified as part of the site audit;
- > Suggests improvements and initiatives to address current issues and encourage cycling; and
- > Develops an action plan for implementation, including priorities and strategic costs of the measures identified.

APPENDIX

A

RECOMMENDED AMENDMENTS TO
THE DCP

Recommended amendments to the DCP

Sections of the Bayside DCP (composed of the Botany Bay DCP 2013 and the Rockdale DCP 2011) relevant to cycling were reviewed to consider their appropriateness for future planning of the LGA. Where they were not considered appropriate, recommendations were made for improvement.

The following tables present the relevant clauses identified and any recommendations for improvement.

Table B.1 Botany Bay DCP 2013

Botany Bay Development Control Plan 2013		
Clause number	DCP text	Recommendation
3A Parking and Access		
3A – 1.2 General Objectives	Objective O2: To ensure adequate car and bicycle parking is provided.	Objective supported as it encourages take-up of cycling. Consider adding an objective to provide sufficient end-of-trip facilities for new developments.
3A.2. Parking Provisions of Specific Uses	Objective O1: To allocate adequate bicycle parking.	Objective supported as it encourages take-up of cycling.
	Control C1: All required car and bicycle parking must be provided on-site.	Control supported as it promotes bicycle parking in a desirable location.
	Control C7: In every new building, where the floor space exceeds 600m ² GFA (except for houses and multi-unit housing) bicycle parking equivalent to 10 per cent of the required car spaces or part therefore as required in Table 1 shall be provided.	Consider strengthening the requirement to facilitate cycling and provide more room for mode shift – for example, in relation to office premises, the current requirement would require 1 bicycle space per 400 sqm GFA (1 car space per 40 sqm x 10 per cent). The Rockdale DCP stipulates a requirement of 1 bicycle space per 200 sqm GFA, which better aligns with the cycling objectives.
	Control C8: Residential flat buildings where the floor space exceeds 600m ² GFA shall provide secure bicycle storage as per AS 2890.3.	Control supported as it promotes compliant and convenient facilities.
3A.3 General requirements	Objective O1: To ensure the safe and efficient circulation and manoeuvring of vehicles and minimise the potential of pedestrian and vehicle conflict in the off-street parking facilities.	Consider rewording to state: minimise potential of pedestrian, <i>cycling</i> and vehicle conflict. Off street carparks likely to include bike parking.
	Objective O2: To ensure that off-street parking facilities do not interfere with traffic flow and safety in adjacent public roads or endanger pedestrian traffic on or off the site.	Consider rewording to state: ...or endanger pedestrian <i>and cycling</i> traffic on or off site.
	Other	Consider providing a requirement for end-of-trip facilities, including showers, lockers and maintenance facilities, proportionate to the scale of development.
		Consider providing a requirement to maximise convenient access to the site and connectivity to the cycling network.
3A.3.2 Bicycle Park Design	Objective O1: To ensure bicycle parking is well designed and located.	Objective supported as it improves safety and amenity.
	Control C1: Bicycle parking areas shall be designed in accordance with Australian Standards AS2890.3 and AUSTROADS Guide to Traffic Engineering Practice, Part 14, Bicycles.	Control supported as it ensures compliance.
	Control C2: Bicycle parking and access shall be designed to ensure that potential conflicts with vehicles are minimised.	Control supported as it reinforces safety.

Botany Bay Development Control Plan 2013		
Clause number	DCP text	Recommendation
	Control C3: Bicycle parking is to be secure (lockers, compounds or racks) and located undercover with easy access from the street and building entries.	Control supported as it reinforces safety.
	Control C5: Bicycle parking in the form of racks shall be functional and secure and shall comply with the following: (i) Both wheels and frame must be able to be easily locked to the rack with U-lock, cable or chain without damaging the bicycle; (ii) Parked bicycles must not obstruct pedestrians or vehicles; (iii) The parking area must be weather protected; (iv) The racks must be in a convenient location, near building entrances, and open to view to enhance security; and (v) The parking area must be easily accessible from a bicycle routes, footway or roadway.	Control supported as it ensures adequate and functional parking for bicycles.
3A.3.3 Traffic and Transport Plans and Reports	Objective O2: To ensure development encourages sustainable transport.	Consider adding examples of measures that could be used to encourage sustainable transport, e.g. shared paths, cycleways, bicycle parking.
	Control C4: In order to reduce the on-site parking demand and car dependency, commercial and industrial developments are encouraged to develop Workplace Travel Plans and Transport Access Guides (TAGs). Workplace Travel Plans and Transport Access Guides can assist staff and customers visiting the site by making good use of public transport, cycling, walking and car sharing for commuting work related journeys and hence reduce car based travel demand.	Consider stipulating a requirement to produce Workplace Travel Plans and Transport Access Guides, at least for major developments.
	Control C6: If a Workplace Travel Plan is prepared, it shall be accordance with NSW Premier's Council for Active Living's "Workplace Travel Plan Guidelines - Final Report (April 2010)" The plan shall generally incorporate the following: (i) Encouragement of staff to cycle and/or walk to the workplace; (ii) Encouragement of staff to use public transport to travel to workplace by providing financial incentive; (iii) Adoption of a car sharing and /or car pool scheme; and (iv) Establishment of measurable targets on the number of staff travelling to work by public transport, cycling and walking.	Control supported as it encourages cycling and provides a framework to follow.
3A.3.4 On-Site Loading and Unloading Facilities	Objective O3: To create safe environments for pedestrian and cyclists.	Objective supported as it encourages uptake of cycling by increasing safety.
3D Signage		
3D. 1.4 General Objectives	Objective O2: To promote signage that improves pedestrian amenity and provides clear and concise directions for the community.	Consider amending to include wayfinding signage for cyclists.
	Objective O6: To ensure that signage does not adversely impact on the safety and security of pedestrians, motorists and the general public.	Consider amending wording to state: ...safety and security of pedestrians, <i>cyclists</i> , motorists and the general public.

Botany Bay Development Control Plan 2013		
Clause number	DCP text	Recommendation
3D. 3.1 Illuminated and Animated Signage	Control C5: Illuminated signage must minimise the spill effects or escape of light beyond the subject sign and must not compromise safety for pedestrians, vehicles or aircraft.	Consider amending wording to state: ...must not compromise safety for pedestrians, <i>cyclists</i> , vehicles or aircraft.
	Control C8: Animated signage must not compromise safety for pedestrians, vehicles or aircraft.	Consider amending wording to state: Animated signage must not compromise safety for pedestrians, <i>cyclists</i> , vehicles or aircraft.
3E Subdivision & Amalgamation		
3E.1.2 General Objectives	Objective O8: To ensure that the creation of new lots does not result in a reduction of pedestrian or vehicular connectivity within the existing street network and provides a safe network.	Consider amending wording to state: ...reduction of pedestrian, <i>cyclist</i> or vehicular connectivity within the existing street network.
3E.2.3 Employment Zone Torrens Title	Objective O4: To ensure safe and efficient vehicle, pedestrian and bicycle access within and to and from a site.	Objective supported as it promotes safety.
	Control C2: Any driveway/s required to service allotments must be designed to accommodate the largest vehicles assessing the site (based upon vehicle size identified in AS2890.2). In any case the driveway is not to have a width less than 6 metres at the property boundary. Note: Council may require new road connections to be greater than 6 metres in width if cycleway and/or pedestrian footpaths are required. Any additional works required to the road network will be at the expense of the applicant.	Control supported as it allows for cycleways.
3E.5 Connectivity and Future Development Potential	Control C3: The subdivision of sites greater than 2,000m ² and which have at least two (2) street frontages, must provide through site connectivity in the form of pedestrian pathways, cycle ways or new streets within the new subdivision pattern.	Control supported as it increases cycleway connectivity.
	Control C4: New streets, pedestrian pathways or cycle ways must be dedicated to Council as public land or be the subject of a legal right-of-way for public access. Any land to be dedicated to Council must be developed to Council's standards.	Control supported as it ensures adequate ownership and maintenance of cycling infrastructure.
3I Crime Prevention, Safety and Security		
3I.2 Site Layout, Design and Uses	Objective O6: To encourage walking and cycling in new developments.	Objective supported as it encourages sustainable transport.
	Control C7: Provide pedestrians and cyclists with a choice of formal pathways and routes.	Control supported as it provides cyclists with alternative options and encourages cycling.
3I.3 Building Design	Objective O4: To ensure new developments are well connected to existing pedestrian network and cycle paths.	Control supported as it improves cycling connectivity.
3I.4 Landscaping and Lighting	Objective O4: To ensure landscaping does not interfere with the sightlines or natural surveillance to pedestrian and cyclist pathways, the public domain and open space from the surrounding buildings and streets.	Objective supported as it reinforces line of sight and promotes safety.
3I.5 Public Domain, Open Space and Pathways	Objective O5: To co-locate pedestrian, cycling and vehicular routes, where possible, to maximise activity and natural surveillance.	Objective supported as it promotes safety and amenity, however, consider amending to clarify safe physical separation is required.

Botany Bay Development Control Plan 2013		
Clause number	DCP text	Recommendation
	Control C5: Landscaping must not obscure the lighting or sightline to the surrounding pedestrian/cycling paths and open space. Landscaping must be provided and designed accordingly.	Objective supported as it reinforces line of sight and promotes safety.
	Control C6: Walking and cycling paths are to be an adequate width for both to pedestrians and cyclists and comply with the following five principles: Connection; Convenience; Convivial; Comfortable and Conspicuousness.	Consider providing specific width requirement, e.g. minimum 2.5 metres for shared paths (3m or more preferred).
	Control C7: Pedestrian and cycling paths must comply with Australian Standard 1428.	Control supported as it ensures compliance.
3L.6 Car Parking Areas	Objective O1: To ensure the design and siting of car parking does not reduce pedestrian and cyclist amenity and safety within the car park or in the street.	Control supported as it emphasises safety for cyclists within car parks.
3L.7 Public Facilities	Control C1: Public facilities (i.e. ATMs, bicycle storage, public toilets and telephones) are to be highly visible from public areas. Where possible, these facilities are to be located adjacent to uses or activities with extended trading hours such as restaurants, cafés and convenience stores.	Consider the addition of requirements for convenient access for cyclists to reach public facilities.
3L Landscaping and Tree Management		
3L.2 General Requirements	Control C17: A contrast of paving materials is required to break up large sections of paving and to delineate pedestrian areas, entries, car parks, special use areas or transition zones between different uses. Porous paving is to be utilised wherever possible.	Consider rewording to state: ...to delineate pedestrian areas, entries, <i>shared paths</i> , <i>cycleways</i> , car parks....
6 Employment Zones		
6.2.2 Mascot (West) Business Park Precinct	Control C1: Development shall encourage a higher public transport (including walking and cycling) use and include strategies to encourage and promote car sharing and car pooling strategies. In this respect a Workplace Travel Plan is to be lodged with the development application. The Workplace Travel Plan shall establish measurable targets to achieve the mode share targets stated in the Mascot Town Centre Precinct TMAP - maximum car mode share: 65 per cent by 2021 and 57 per cent by 2031.	Control supported as it encourages take-up of cycling in new development areas, however the wording should be amended to state: ...promote car sharing and car <i>pooling</i> strategies.
	Control C6: Development along Alexandra Canal must comply with the following: (v) A right of carriageway shall be created along the Canal and at the end of Coward Street to provide public pedestrian access to Alexandra Canal foreshore for the purpose of permanent pedestrian or cycle access, stormwater easement requirements and/or access for essential maintenance.	Control supported as it accommodates cyclist access.
7C Child Care Centres		
7C.2 Design, Layout and Location	Control C1: The design and siting of a Early Childhood Education and Care Service shall consider: (vi) Pedestrian and vehicle access.	Consider amending to include cyclist access, rewording to state: (vi) Pedestrian, <i>cycling</i> and vehicle access
	Control C12: Early Childhood Education and Care Service shall not have a direct street frontage or	Consider rewording to state:

Botany Bay Development Control Plan 2013		
Clause number	DCP text	Recommendation
	vehicle access point to a classified road, or any other road which in the opinion of Council is unsuitable for a child care centre, having regards to: (ii) Pedestrian and vehicle safety; and	(ii) Pedestrian, <i>cyclist</i> and vehicle safety
7C.4 Parking and Access	Objective O1: To ensure vehicular and pedestrian access and servicing are suitable for the proposed use;	Consider amending to include cyclists, rewording to state: To ensure vehicular, <i>cyclist</i> and pedestrian access and servicing are suitable for the proposed use.
9A Mascot Station Town Centre Precinct		
9A.1.3 General Objectives	Objective O8: To implement traffic control measures and outcomes that manage and improve local traffic impacts and promote pedestrian safety.	Consider rewording to include cyclists: State: ...improve local traffic impacts and promote pedestrian <i>and cyclist</i> safety....
9A.4.3.3 Site Amalgamation and Subdivision	Objective O6: To establish Bourke Street as the main retail and pedestrian/ cycle street with Church Avenue and Coward Street playing a supporting role.	Objective supported as it aligns with the cycling routes.
9A.4.5.5 Reflectivity	Objective O2: To ensure amenity and safety for pedestrians and motorists.	Consider amending to include cyclists, rewording to state: To ensure amenity and safety for pedestrians, <i>cyclists</i> and motorists.
	Control C1: The placement, orientation and configuration of new buildings and facades must not result in glare that produces discomfort or endangers safety of pedestrians or motorists.	Consider amending to include cyclists, rewording to state:that produces discomfort or endangers of pedestrians, <i>cyclists</i> or motorists...
	Control C4: A reflectivity report examining the effects of possible solar glare on pedestrians and motorists may be necessary, subject to the scope of a proposal and the nature of glazing and reflective materials.	Consider amending to include cyclists, rewording to state: ...effects of possible solar glare on pedestrians, <i>cyclists</i> and motorists may....
9A.5.2 Streets	Objective O1: Design high quality streets with a pedestrian focus that are fully accessible including wide footpaths, encouraging slow vehicular traffic.	Consider encouraging the provision of cyclist facilities, e.g. rewording to state: ...a pedestrian <i>and cyclist</i> focus that are fully accessible including wide footpaths <i>or shared paths and cycleways</i> , encouraging slow vehicular traffic.
9B Botany South		
9B.3.1 Desired Future Character	Objective O5: To encourage pedestrian access through the Precinct, through more permeable street block and promote through site links for pedestrian access at the time of redevelopment.	Consider amending to include cycling access, rewording to state: To encourage pedestrian <i>and cyclist</i> access through the Precinct, through more permeable street blocks and promote through site access at the time of redevelopment.
	Control C55: Entries to Business Parks and individual buildings shall be clearly visible and well signed posted for pedestrians and motorists (refer to Figure 8).	Consider amending to include cyclists, rewording to state: ...shall be clearly visible and well signposted for pedestrians, <i>cyclists</i> and motorists.
9C Wilson Pemberton Street Precinct		

Botany Bay Development Control Plan 2013		
Clause number	DCP text	Recommendation
9C.3.1 Road, Pedestrian and Cycle Network	Objective O1: To develop a road, pedestrian and cycle system to facilitate internal circulation and integration/connection with surrounding road, pedestrian and cycle networks.	Objective supported as it caters for cycleways.
	Control C9: Street lighting is to be coordinated and standardised throughout the precinct, with appropriate pedestrian lighting provided on the pedestrian and cycle routes.	Control supported as it caters for cyclist, however consider rewording to state: ...with appropriate pedestrian <i>and</i> cyclist lighting provided on the pedestrian and cycle routes.
9D 130-150 Bunnerong Road Eastgardens		
9D.1.3 Structure of this Part	Objective O2: To make provision for a network of pedestrian/ cycle paths with links to public transport and a hierarchy of local roads that provide accessibility through the site and connections with its surrounds (e.g. Bunnerong Road and Banks Avenue).	Objective supported as it promotes better connectivity of cycleways.
9D.6.7 Bicycle Parking	Control C2: Communal bicycle racks must be well lit after sunset and before sunrise and be located in an area where passive surveillance is achieved.	Control supported as it reinforces safety for cyclists.

Table B.2 Rockdale DCP 2011

Rockdale Development Control Plan 2011		
Clause number	DCP text	Recommendation
Part 4 General Principles of Development		
4.2 Streetscape and Site Context	Control 12: Pedestrian and cycle thoroughfares are reinforced as safe routes through: <ul style="list-style-type: none"> • appropriate lighting • casual surveillance from the street • minimised opportunities for concealment • landscaping which allows clear sight-lines between buildings and the street • avoidance of blind corners. 	Control supported as it reinforces safety for cyclists.
4.6 Car Parking, Access and Movement	Objective A: To provide sufficient, convenient and safe on-site car parking while encouraging alternative modes of transport, such as walking and cycling.	Objective supported as it encourages active transport.
	Control 1: Development is to provide on-site parking in accordance with the following rates: <ul style="list-style-type: none"> ▪ Multi-dwelling housing/ residential flat buildings/ shop-top housing: 1 bicycle space / 10 dwellings; ▪ Retail and commercial (except for showrooms, bulky good premises, child care centres and motor showrooms): 1 bicycle space / 200 sqm GFA, with 15 per cent to be accessible by visitors; ▪ Child care centres: 1 bicycle space / 10 children. 	Consider strengthening the requirement for residential dwellings to promote an increased cycling mode share.
	Control 23: Provide legible bicycle access between the cycle network and bicycle parking areas, which does not create conflict with pedestrian traffic.	Control supported as it promotes access for cyclists.

Rockdale Development Control Plan 2011		
Clause number	DCP text	Recommendation
	Control 24: All bicycle parking is to be secure and where provided within the public domain must be designed to minimise obstruction of pedestrian movement.	Control supported as it facilitates safe bike parking and minimal conflict with pedestrians.
	Control 25: Design of bicycle parking is to cater to the various users of the development and their differing modes of bicycle parking required, such as: a. parking for employees or residents, and b. visitor parking, which is conveniently located preferably in areas which provide passive surveillance at ground level.	Control supported as it caters for varied cyclist users.
	Control 26: Where bicycle parking is to be provided for residents in basement car parks, it is to be in the form of individual bicycle lockers or within a caged or gated secure area.	Control supported as it promotes improved security for cyclists.
	Control 27: Bicycle parking for non-residential development is to be provided as bike racks within publicly accessible areas or within the parking area.	Consider amending to provide a requirement for the bike parking to be accommodated on-site for employees and in publicly accessible areas for visitors, subject to the specific type of development.
	Control 28: New developments must maintain and enhance existing pedestrian, cycle and public transport networks including bus stops.	Control supported as it promotes an enhanced cycling network.
	Other	Consider providing a requirement for bike parking to comply with AS 2890.3 to ensure compliance and adequate facilities. Consider providing a requirement for new commercial and industrial developments to develop Workplace Travel Plans and Transport Access Guides in a similar fashion to the Botany Bay DCP.
Part 5 Building Types		
5.3 Mixed Use	Control 18: Commercial premises over 200sqm must provide staff toilets and showering facilities within the premises to encourage bicycle usage as well as amenity for staff.	Consider strengthening the requirement to stipulate a certain number of facilities proportionate to the size of development, as well as a requirement for lockers.
Part 6 Other Development		
6.1 Child Care Centres	Objective F: To ensure a safe environment for pedestrians, particularly children, motorists and cyclists around child care centres.	Objective supported as it promotes safety.
Part 7 Special Precincts		
7.1 Wolli Creek	Objective B: To promote pedestrian and cycle links to encourage sustainable travel in the precinct.	Objective supported as it encourages additional cycling infrastructure.
	Objective C: To enhance local pedestrian and cycle routes and link them with regional networks, residential areas, work, shopping and recreation activities and public transport nodes.	Objective supported as it promotes improved cyclist connectivity.
	Control 1: Pedestrian and cycle ways must be implemented as shown on the Open Space and Pedestrian/Cycle Network diagram.	Control supported as it stipulates required infrastructure.

Rockdale Development Control Plan 2011		
Clause number	DCP text	Recommendation
	Control 2: Provide safe pedestrian and cycle access across streets with ground level crossings preferable to pedestrian bridges and overpasses.	Consider amending to highlight potential provisions and priority, rewording to state: Provide safe pedestrian and cycle access across streets with ground level crossings preferable to pedestrian bridges and overpasses, <i>including priority and cycle aspects where relevant.</i>
7.7 Arncliffe and Banksia	Objective F (2.1): To ensure a safe, connected, permeable and legible public domain that caters for the accessibility of pedestrians and cyclists.	Objective supported as it promotes an improved cycling network.
	Objective B (3.1): To encourage improvements to the amenity of the Princes Highway corridor through better landscaping and improved facilities for pedestrians and cyclists.	Objective supported as it encourages improved cyclist amenity.
	Objective E (3.1): To create an attractive and comfortable streetscape for pedestrians and cyclists that comprises of consistent and high quality paving, street furniture, street tree planting, bike stands and bike racks.	Objective supported as it provides for a convenient and comfortable cyclist experience.
	Control 6 (3.1): Any proposed cycle links are to be delivered in accordance with best practice standards. Liaison with Council's Transport Planner is required during the design phase of the planning process.	Control supported as it ensures high quality infrastructure.
	Objective A (3.4): To enhance connectivity through the precinct for pedestrians and cyclists as sites redevelop.	Control supported as it encourages improved cyclist connectivity.
	Objective B (3.4): To ensure the safety of pedestrians and cyclists.	Objective supported as it promotes safety.