

North Sydney Integrated Cycling Strategy





North Sydney Integrated Cycling Strategy

Quality Record

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Table of Contents

1. Executive Summary	1
2. Introduction	2
2.1 Background	2
2.2 Purpose of the Integrated Cycling Strategy	3
2.3 Links to North Sydney Community Strategic Plan 2013 -2023	3
2.4 Related Documents	3
2.5 Development of this Strategy	3
2.6 Strategy Framework	5
3. Who is cycling in North Sydney?	6
3.1 Journey to Work Data	6
3.2 Where people ride in North Sydney LGA	7
3.3 Who isn't cycling in North Sydney LGA	8
4. The Existing Network	12
4.1 Issues with the existing network	14
5. Increasing cycling in North Sydney LGA – what Council will do	17
5.1 Next Steps – What Council will do to meet goals for cycling	18
6. Infrastructure Plan	22
6.1 Priority Routes	22
6.2 The Foundation for a Connected Bicycle Network	37
6.3 Priority Route Cost Estimates	39
6.4 Existing Network Improvement Plan	39
6.5 Bicycle Parking Plan	43
6.6 Supporting Infrastructure Plan	46
6.7 Signage Implementation Plan	47
7. Communications Plan	51
7.1 Communication with government organisations	51
7.2 Communications with the community	51
8. Events and Programs Plan	53
8.1 Current Events and Programs	53
8.2 Potential Events and Programs	53
9. Monitoring and Evaluation Plan	55
10. Action Plan	58
10.1 Location Specific Actions	61

Infrastructure Toolkit	81
Existing Bicycle Communications	109
Consultation	111

Appendices

- A: Planning and Policy Context
- B: Funding Opportunities and Sources
- C: Infrastructure, Signage and Parking Toolkit
- D: Existing Conditions Report
- E: Consultation
- F: Concept Designs

Figures

Figure 3.1: heat map of 'Strava' recorded Bicycle Trips	7
Figure 3.2: Kent Street, Sydney	10
Figure 3.3: Bourke Street, Surry Hills	10
Figure 3.4: King Street, Sydney	11
Figure 3.5: College Street, Sydney	11
Figure 3.6: City of Sydney Cycling Counts	11
Figure 4.1: Existing Network Typology Map	13
Figure 6.1: Priority Construction Routes	23
Figure 6.2: Pacific Highway (looking north)	26
Figure 6.3: Pacific Highway (looking south)	26
Figure 6.4: Example bi-directional cycleway within road reserve (Bourke Street, Surry Hills)	26
Figure 6.4: West Street (looking north)	29
Figure 6.5: West Street (looking north)	29
Figure 6.6: Clark Road (looking north)	33
Figure 6.7: Kurraba Road (looking west)	33
Figure 6.8: Holtermann Street (looking east)	35
Figure 6.9: Holtermann Street (looking west)	35
Figure 6.10: Complete Bicycle Network	38
Figure 6.11: Possible Trial for Alternate Bicycle Shoulder Lane Markings	42
Figure 6.12: Possible Trial for Alternate Roundabout Markings	42
Figure 6.13: Proposed Bicycle Parking Locations	43
Figure 6.14: East Malvern Railway Station, Victoria	44

Table of Contents

Figure 6.15:	Bayswater Railway Station, Victoria	44
Figure 6.16:	Repair/Tool Station – Burton Street, Milsons Point	46
Figure 6.17:	Focal Points Map	48
Figure 6.20:	Existing signage	49
Figure 6.21:	Existing signage	49
Figure 6.22:	Proposed Bicycle Network Route Directional Signage	50

Tables

Table 3.1:	Sydney Harbour Bridge - Average Daily Cyclists 2003-2012	6
Table 3.2:	Naremburn Cycleway - Average Daily Cyclists 2008-2012	6
Table 3.3:	2011 Census Journey to Work Data – North Sydney LGA	6
Table 3.4:	Four Types of Cyclists	8
Table 3.5:	Non-regular cyclists preference for separation from vehicles	10
Table 5.1:	Next Steps – Goals, Strategies and Indicators	18
Table 6.1:	Priority Route Cost Estimates	39
Table 6.2:	Existing Network Improvement Plan	41
Table 6.3:	Proposed Bicycle Parking Locations and Estimated Costs	45

1. Executive Summary

North Sydney Council ('Council') has a goal to increase cycling as a sustainable transport option. Increasing cycling can also help to reduce traffic congestion and demand for parking; reduce air and noise pollution; improve community health and wellbeing; and create opportunities for community interaction and connectedness.

Cycling in North Sydney is currently limited by an incomplete and disconnected cycle network. Gaps and difficult sections in the network discourage potential cyclists and lessen the safety and amenity of those riding in the area. Members of the North Sydney Community have told Council that they would like to cycle for everyday transport, but that they feel unable to do so due to poor network connections and concerns about safety.

To improve the overall cycling network and increase cycling participation, Council has worked with GTA Consultants to produce this Integrated Cycling Strategy. The goals of the Strategy are to:

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

To work toward these goals Council will:

- Implement priority routes to address key gaps in the network
- Advocate for step free access to the Sydney Harbour Bridge Cycleway
- Update existing routes and improve quality across the network
- Install coherent and consistent bicycle wayfinding signage
- Install bicycle parking that caters for existing demand and future increases
- Provide supporting infrastructure such as public maps, bicycle pumps and water refill stations to support the cycling network
- Conduct communications, events and programs to promote cycling and increase safety and awareness.

2. Introduction

2.1 Background

Cycling is already part of Council's vision for a sustainable North Sydney. The North Sydney Community Strategic Plan sets a goal for Council to 'encourage sustainable transport'. One of the key objectives relating to this goal is to provide 'a network of accessible, safe and linked cycle paths throughout North Sydney'. Cycling also fits with Council's goals for 'Social Vitality', in that it will provide opportunities for active living and encourage community connectedness and social inclusion, and for 'Living' and 'Built' environments in that it will assist in improving environmental quality and amenity.

While cycling is a part of Council's vision for a sustainable future, cycling participation in North Sydney is currently low. 1.4% of journey to work trips are made by bike and notably, this is lower than comparable areas in Sydney, Brisbane and Melbourne. While short trips taken for transport are hard to measure, it is known that many in the community do not cycle for transport as much as they would like.

Community and stakeholder feedback from those living and cycling in the North Sydney Local Government Area (LGA) indicates that more people would like to cycle for transport and would do so if it was made safer and easier. This latent demand for cycling is well documented. Research^{1,2,3} repeatedly shows that 60-70% of non-regular bike riders would cycle if cycling was made a safer and more convenient option. In the City of Sydney and City of Melbourne, the provisions of safe, efficient and accessible cycling infrastructure has led to immediate increases in cycling numbers and, importantly, participation by a wider cross section of the population. In this context, providing an accessible, safe and connected network is necessary to increase and diversify cycling participation in North Sydney.

Community and stakeholder feedback has also confirmed that the key deterrent for potential riders is the current condition of the network. Parts of the network are seen as dangerous and poorly connected, or inaccessible to less confident, less experienced, older and younger riders. This means that some of those in the community who want to cycle for transport feel unable to do so because of the network.

While the existing network presents a barrier to cycling, North Sydney LGA is an attractive area for cycling and is already a major cycling thoroughfare for cycling commuters. With a concentration of employment centres and high provision of key services and facilities, many of the day to day needs of the community can be accessed via a bicycle trip. Cycling can often be the fastest form of transport for trips under 5km. The area also has a high quality built and natural environment with good access to Sydney Harbour, making it an enjoyable place to ride for both transport and recreation. In addition, North Sydney LGA is a key access point for those travelling to Sydney CBD. Every cyclist that enjoys the pleasure of riding across the Sydney Harbour Bridge rides through North Sydney LGA.

In an effort to increase cycling across the LGA, Council worked with GTA consultants to develop this Integrated Cycling Strategy. The Strategy provides clear goals for cycling in North Sydney and a

¹ AMR Interactive (2009). Research into Barriers to Cycling in NSW. Prepared for NSW Roads and Traffic Authority. July 2009.

² Taverner Research (2009). Sydney Cycling Research. Prepared for City of Sydney. November 2009.

³ Environmetrics Social and Market Research (2006). Sydney Cycling Research: internet survey. Prepared for City of Sydney. November 2006.

systematic approach to assist the delivery of necessary infrastructure improvements and bicycle encouragement programs. The actions proposed are designed to transform cycling in North Sydney, so that cycling is no longer confined to 'strong and fearless' commuter cyclists, but is instead accessible as an everyday transport option for a diverse range of community members.

2.2 Purpose of the Integrated Cycling Strategy

This Integrated Cycling Strategy will be the guiding document for Council's investment in cycling until 2020. The purpose of the Strategy is to:

- Provide a vision, goals and targets for cycling in the LGA
- Identify current issues and needs
- Provide a strategic approach to increasing cycling participation
- Identify key infrastructure projects required to provide a completed cycle network in North Sydney
- Provide a framework for communications, events, monitoring and evaluation.

2.3 Links to North Sydney Community Strategic Plan 2013 - 2023

The North Sydney Community Strategic Plan sets a direction for where the community wants to be in the year 2023. It contains goals, objectives and actions specific to cycling. 'Desired outcome 2.5' is that "Sustainable transport is encouraged" and strategies set out to reach this outcome include:

- 2.5.3 Increase the amount of street space dedicated to sustainable transport modes e.g. bus lanes and integrated network of pedestrian and cycle paths.
- 2.5.5 Improve 'end of trip' facilities for cyclists and walkers e.g. bike parking, showers and change facilities.

These goals, objectives and actions have informed the development of this Strategy as set out in Section 5.

2.4 Related Documents

This document should be read in conjunction with the following Council planning and policy documents:

- North Sydney Community Strategic Plan 2013 -2023
- North Sydney DCP 2013
- Sustainable Transport Action Plan
- Public Domain Style Manual and Design Codes
- North Sydney Bicycle Parking Standard.

2.5 Development of this Strategy

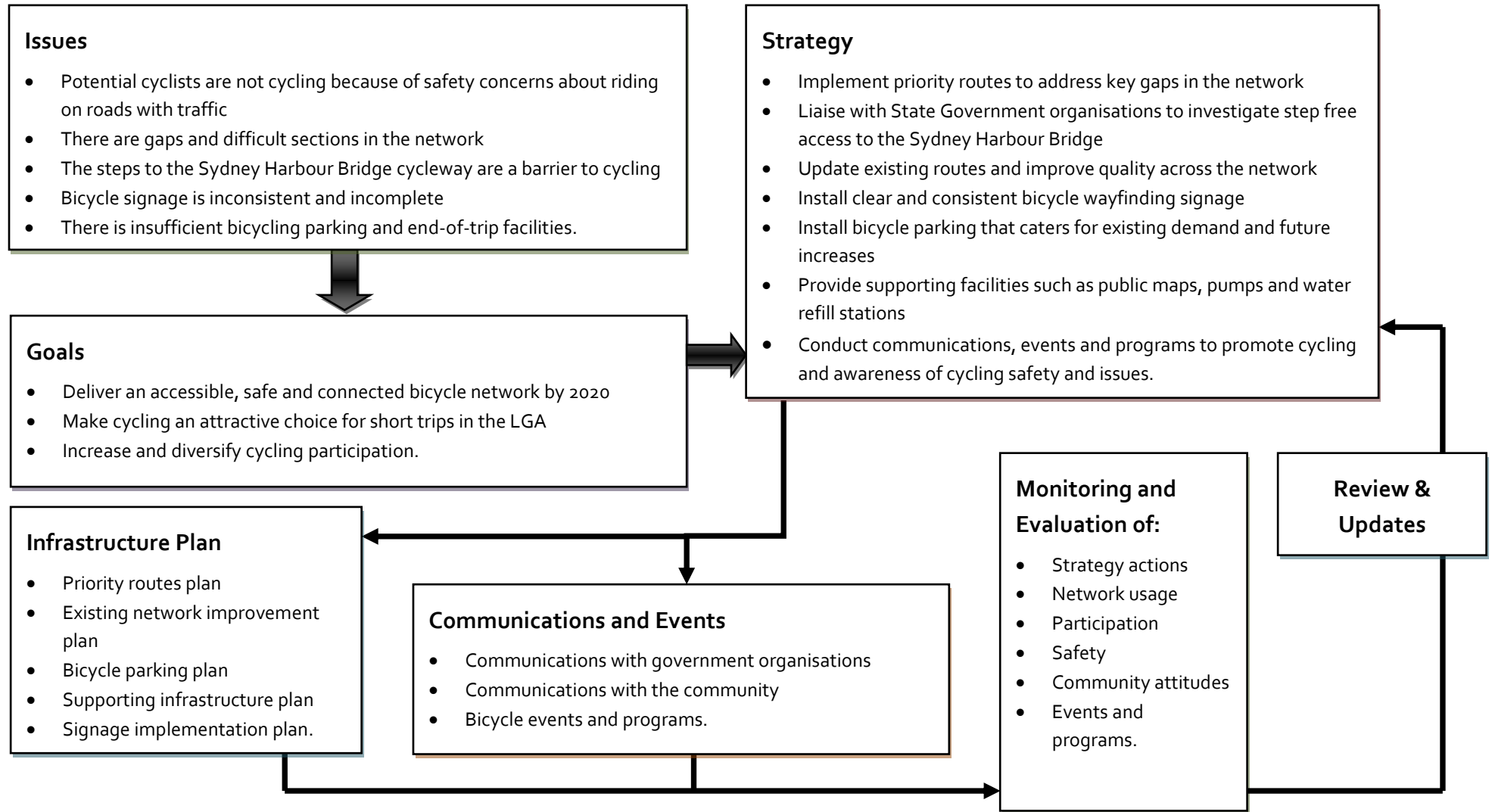
This Strategy was developed using the following process:

- Review of relevant plans policies and strategies, including the previous bicycle planning documents
- Review of the local and policy context
- Review of the North Sydney Bike Plan 2009
- Consultation with key stakeholders and community members
- Saddle surveys of the existing network and key routes
- Detailed analysis of pinch points and missing links
- Consultation with key authorities such as the Roads and Maritime Service (RMS) and Transport for NSW (TfNSW).

More detail about strategy development and processes are available in Appendices A, D and E.

2.6 Strategy Framework

The following chart provides an overview of the Strategy framework and shows the relationship between Issues, Goals and Actions identified by Council.



3. Who is cycling in North Sydney?

Cycling is growing in North Sydney both in terms of total numbers and in terms of mode share. Table 3.1 shows the average daily bicycle trips on the Sydney Harbour Bridge Cycleway which clearly shows significant increases in cycling numbers over the last 10 years and a doubling of bicycle trips from 2006 to 2012.

Table 3.1: Sydney Harbour Bridge - Average Daily Cyclists 2003-2012

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
707	740	804	930	976	1278	1388	1520	1590	1944

Source: Roads and Maritime Services

Table 3.2 shows the daily average bicycle trips on the Naremburn Cycleway. While this is outside North Sydney LGA, it is a key link between the suburbs north and north-west of North Sydney LGA, North Sydney CBD and Sydney CBD. As with the Sydney Harbour Bridge Cycleway, these figures show a steady increase in bicycle trips over the five years to 2012. The increase in cycling at these locations is consistent with broader trends in Sydney. The Australian Cycling Participation Survey 2013 identified a significant increase in cycling participation in Sydney between 2011 and 2013⁴.

Table 3.2: Naremburn Cycleway - Average Daily Cyclists 2008-2012

2008	2009	2010	2011	2012
323	352	363	412	458

Source: http://www.bicycleinfo.nsw.gov.au/tools_and_resources/cycle_count_data.html

3.1 Journey to Work Data

Table 3.3 summarises 2011 census journey to work data for North Sydney LGA which shows 1.4% of all journey to work trips from North Sydney LGA are made by bicycle, double the NSW average of 0.7%. The 2011 data also indicates a strong growth since 2006 - up from 0.8%.

Table 3.3: 2011 Census Journey to Work Data – North Sydney LGA

Travel Mode	Percentage
Car (driver & passenger)	37.3%
Bus	17.3%
Train	14.1%
Walked	12.9%
Worked at home	5.8%
Ferry	2.3%
Bicycle	1.4%
Motorbike/scooter	0.8%
Taxi	0.7%
Other	7.4%

Source: [Bureau of Transport Statistics](#)

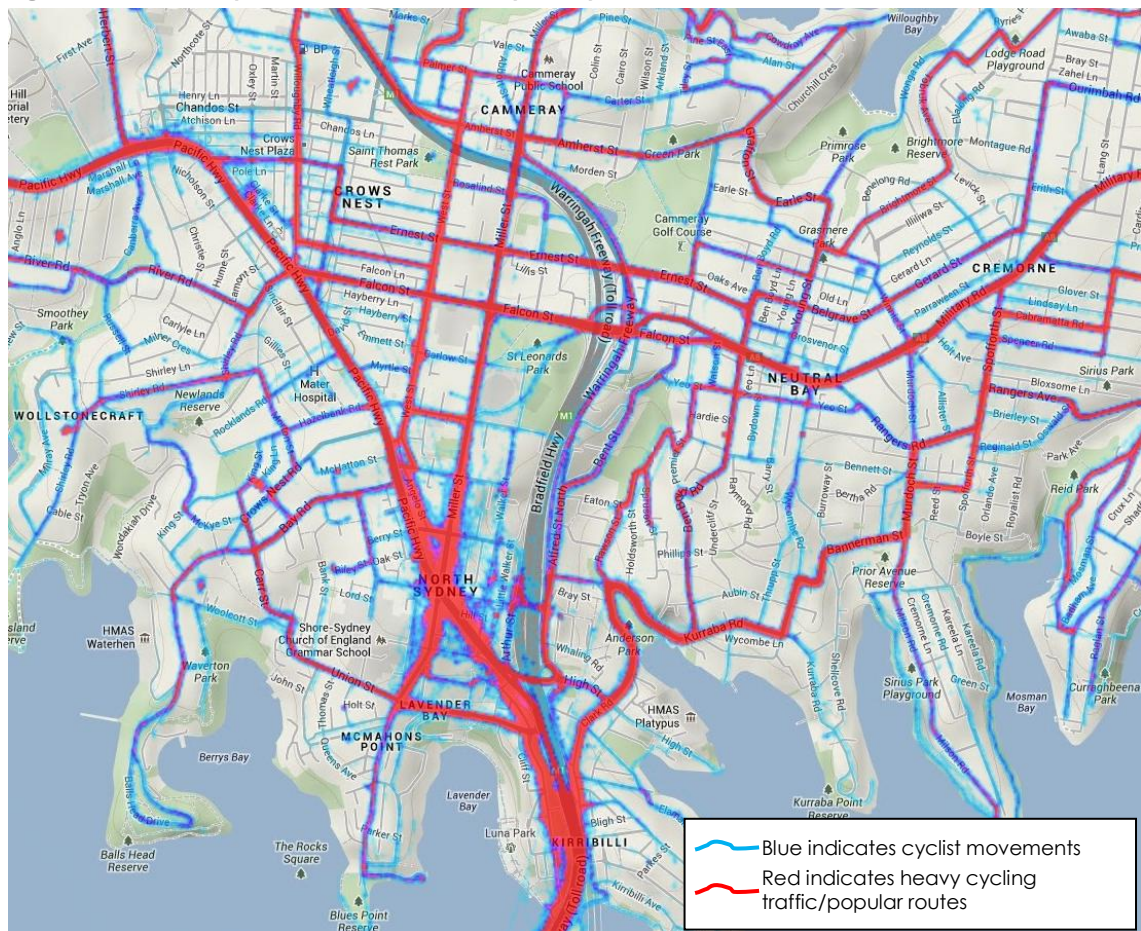
4 [Australian Cycling Participation Survey 2013](#)

3.2 Where people ride in North Sydney LGA

Cycling occurs on all of North Sydney’s streets and cycle paths. Cycling apps such as Strava are useful for identifying high use bicycle routes through data of recorded rides uploaded by members. This data has been collated by raceshape.com and heat maps created which are available to view on the website: <http://raceshape.com/heatmap/>. A heat map showing recorded bicycle trips in North Sydney LGA is shown in Figure 3.1, all of the routes highlighted are evidence of cycle movements. The blue lines indicates use by cyclists, the thicker, red line indicates heavier cycle traffic. This map shows that the following routes attract particularly high volumes of bicycle traffic:

- Sydney Harbour Bridge to North Sydney CBD including Alfred Street South, Middlemiss Street, Lavender Street and Blues Point Road
- Sydney Harbour Bridge to Cremorne and Mosman including Broughton Street, Clarke Road, Kurraba Road, Bannerman Street, Murdoch Street, Rangers Road and Spofforth Street
- Neutral Bay to Mosman including Bennelong Road, Brightmore Street and Tobruk Avenue
- Pacific Highway, Military Road, Miller Street, West Street, Falcon Street, Ernest Street, Amherst Street.

Figure 3.1: heat map of 'Strava' recorded Bicycle Trips



Source: race shape website (<http://raceshape.com/heatmap/>)

3.3 Who isn't cycling in North Sydney LGA

It is likely that many North Sydney households have access to bicycles given that 51% of NSW and Sydney households own a bicycle⁵. Despite this, many people in North Sydney who might consider cycling for both transport and recreation do not cycle regularly.

A 2005 study by the Portland Bureau of Transportation (USA)⁶ categorised the general population into four groups according to their level of cycling competence: 'strong and fearless', 'enthused and confident', 'interested but concerned' and 'no way no how' as shown in Table 3.4. Feedback from the community has identified that the current cycle traffic in North Sydney consists mainly of the 'strong and fearless' group, primarily male sport or commuter cyclists who ride regardless of road conditions. The two far larger groups, the 'enthused and confident' and 'interested but concerned' who would consider cycling for both transport and recreation, do not cycle regularly, largely because they feel that the network is inaccessible at their skill level.

Research specific to North Sydney also indicates that certain groups are underrepresented in cycling in North Sydney. ABS statistics and 2013 Ride to Work Day surveys undertaken by Council indicated that female riders account for only 25% of weekday bicycle traffic. This is consistent with broader participation figures as highlighted by the Australian Cycling Participation Survey⁵ which found greater male participation in cycling across all age groups. Child participation rates are also an issue in North Sydney. Some schools in the LGA have a 'no wheels policy' and do not provide bike storage

Table 3.4: Four Types of Cyclists

<1% <i>strong & fearless</i>
7% <i>enthused & confident</i>
60% <i>interested but concerned</i>
33% <i>no way, no how</i>

The 'strong and the fearless' ride regardless of road conditions: riding is a strong part of their identity and they are undeterred by road conditions.

The 'enthused and confident' are and could be attracted to regular riding by continuing to address the barriers to cycling: shorter trip distances, better bicycle facilities, better end-of-trip facilities.

The 'interested but concerned' hear messages about how easy it is to cycle, but they are afraid to ride. They don't like the cars speeding down their streets. They get nervous thinking about what would happen to them on a bicycle when a driver runs a red light, or passes too fast and too close.

The 'no-way, no-how' group are not interested in cycling at all, for reasons of topography, inability, or simply a complete and utter lack of interest.

⁵ [Australian Cycling Participation Survey 2013](#)

⁶ [Portland Bureau of Transportation](#)

specifically because they see the road network and urban setting as too dangerous to promote riding to school.

The reluctance of many potential cyclists to use the current network and the underrepresentation of certain groups is directly attributable to inadequate cycling infrastructure and associated fears about safety. Feedback from the North Sydney community, as well as responses in broader in Sydney and NSW cycling surveys, repeatedly cites concerns about riding on-road or on shoulder lanes, particularly in or adjacent to busy traffic, as the reason for non participation.

In this context, **the challenge for Council is to provide a cycling network and cycle friendly environment that will tap into latent interest in cycling and encourage those who would like to cycle on the network.**

(The box section on the following page provides further detail about the effect that providing separated facilities has on participation by different groups.)

Community views on infrastructure upgrades and participation

Community members have told Council that upgrades to the network would remove a key barrier to cycling and allow them to cycle for transport. Members of the community stated:

“I don't have a bike and have hardly ridden one since my twenties many years ago. But if (separated bike lanes) go ahead I will be back riding again and cutting back on my car usage”

“I live in Cremorne and would ride a bicycle much more often if it were safer to do so”

“I live in...Waverton. Even though I have a push bike... it is quite intimidating for me to ride my bike to my local centres (i.e. Crows Nest, Kirribilli) and quite often I rather take the train to the city instead. (An improved cycle network) would allow me to shop ... more often in local centres.”

Separated Cycle Facilities – effects on participation

For NSW, 2011 Census data indicates that less than 1% of work trips were made by bicycles – the cyclists that are 'strong and fearless'. To increase the number and mode share of all bicycle trips, the occasional or non-riders of the 'enthused and confident' and 'interested but concerned' demographic must be encouraged to take up cycling.

Australian research conducted in 2008 by RACQ Market and Communications Research revealed that 85% of people support the provision of off-road bicycle paths and 69% of males and 74% of females would bicycle more regularly if dedicated lanes and off-road routes were more readily available (refer to Table 3.5). Recent bicycle counts in the City of Sydney show increases of 60% and 48% in the AM and PM periods, respectively, over the past year on routes where separated cycleways have been constructed. Dedicated cycling lanes and off-road routes must connect to all popular destinations to encourage high levels of uptake.

Table 3.5: Non-regular cyclists preference for separation from vehicles

What would make you bicycle more regularly?	Male	Female
Availability of bicycle dedicated lanes and off road routes	69%	74%
Increased driver awareness of bicycle safety and sharing the road	49%	56%
Availability of bicycle parking or bicycle lockers	33%	41%
Having more cyclists on the road	31%	36%
Increased knowledge of the road rules	12%	22%

Source: Environmetrics Pty Ltd (2006). Sydney Cycleway Research: Internet survey. Prepared for City of Sydney. November 2006.

Implementing safe cycling routes, separated from vehicles, is an effective way to broaden participation in cycling by providing a safe facility which encourages use by non-regular cyclists.

Physically Separated Path Examples

Physically separated bicycle facilities in the City of Sydney have been integral part of the recent growth in cycling in inner Sydney. These facilities improve the safety of cyclists and have been instrumental in promoting cycling for recreational and commuting trips, particularly for less confident cyclists.

Figure 3.2 to Figure 3.5 show recent examples of physically separated path facilities in the City of Sydney.

Figure 3.2: Kent Street, Sydney



Figure 3.3: Bourke Street, Surry Hills



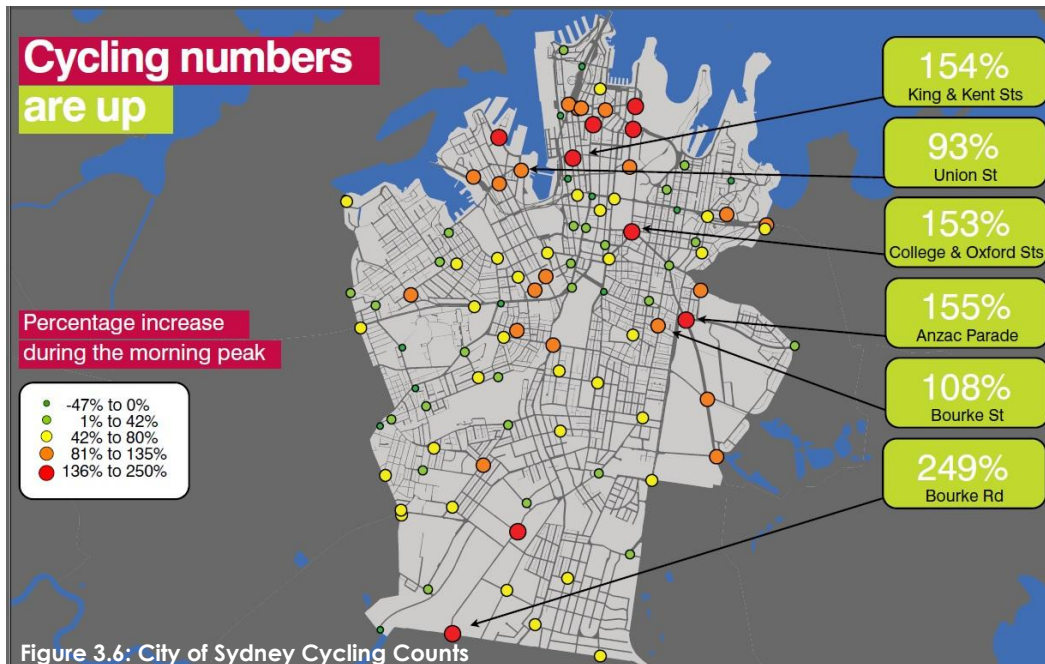
Figure 3.4: King Street, Sydney



Figure 3.5: College Street, Sydney



Figure 3.6 shows the increases in cycling numbers at key locations in the City of Sydney during the morning peak period and in particular at locations where physically separated facilities are provided such as Bourke Street, College Street and Bourke Road.



4. The Existing Network

The existing bicycle network is shown in Figure 4.1. (Further details of key existing routes within the existing network are contained in the Existing Conditions Report in Appendix D).

As can be seen in the network map (Figure 4.1), the existing cycleway network in North Sydney comprises a range of infrastructure types. The predominant infrastructure types are on road facilities such as shoulder lanes or mixed traffic routes that are marked with painted stencils or signs. The map shows that on-road/mixed traffic facilities are the only option for travel through busy activity centres and along some major roads.

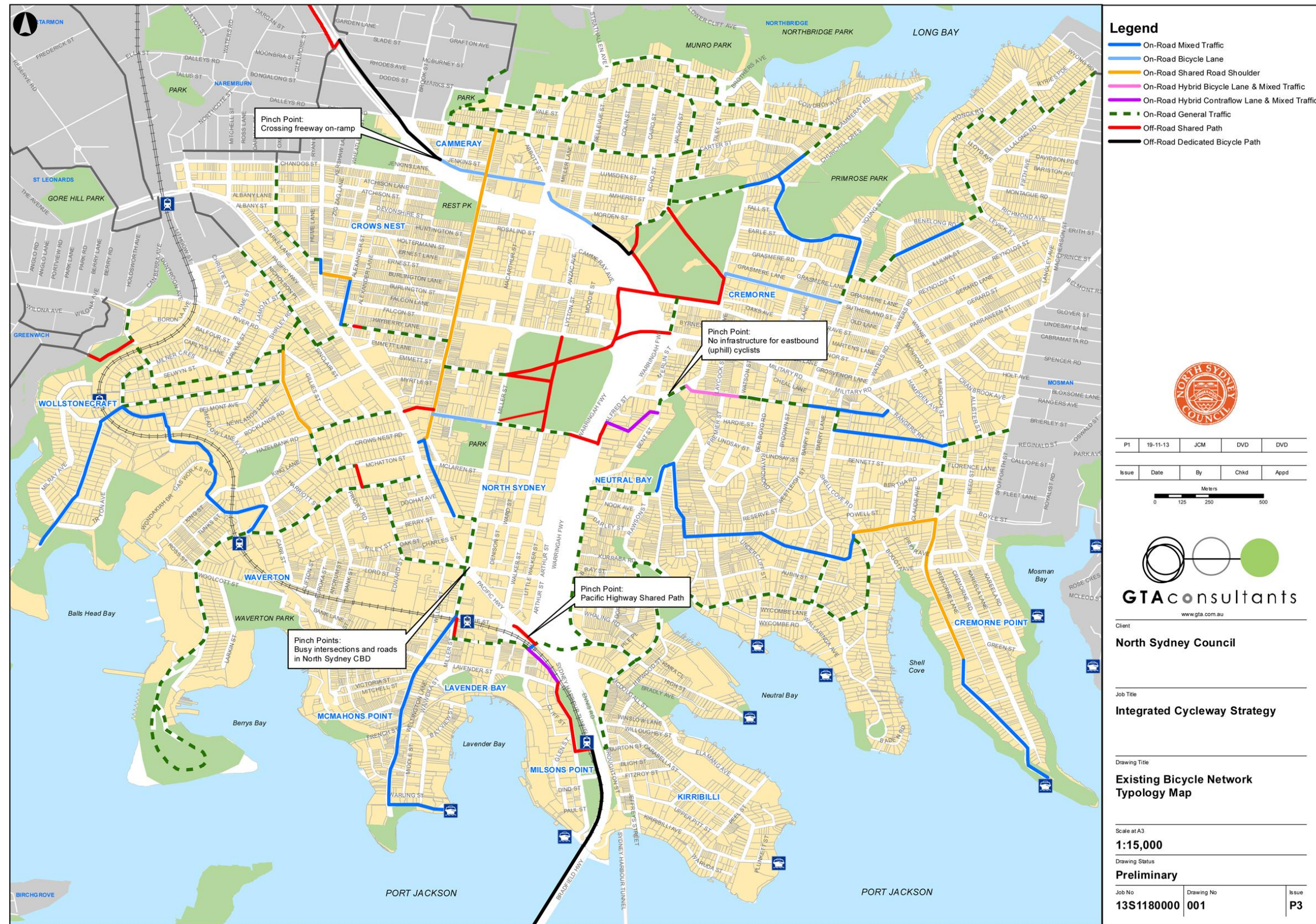
The existing network map also shows that North Sydney LGA currently lacks clear and legible north/south and east west connections. This is despite the area receiving heavy commuter cycle traffic in these directions.

Gaps and difficult sections in the network have a direct impact on the usability and discourage cycling participation. If Council is to satisfy its goals for cycling set out in the 2020 Vision and this Strategy, the gaps and difficult sections need to be completed and improved. This will require significant infrastructure building and investment, particularly for north/south and east/west connections and for routes which travel through activity centres and along busy roads. This investment is vital for providing safe routes, developing an integrated network with connections between all parts of North Sydney, and for encouraging people of all ages and abilities to view cycling as a safe, everyday transport option.

Further analysis of key issues in the current network is provided in Section 4.1 under the following headings:

- The cycling network is disconnected and has significant gaps and difficult sections
- The steps to the Sydney Harbour Bridge Cycleway are a barrier to cycling
- Current bicycle route signage is inconsistent and insufficient
- There is insufficient bicycle parking facilities to cope with current demand or to encourage more cycling.

Figure 4.1: Existing Network Typology Map



4.1 Issues with the existing network

Analysis of data, consultation outcomes and saddle surveys identified a number of key issues with the existing cycling network. These are further detailed below.

The cycling network in North Sydney LGA is disconnected and has significant gaps and difficult sections

In direct conflict to the goal for a 'linked network' set out the *2020 Vision*, the cycling network is missing key connections and has sections that are difficult to negotiate.

Gaps and difficult sections have a significant impact on the amenity and safety of cyclist as:

- cyclists are forced to ride along high volume roads and negotiate busy intersections without formal bicycle facilities
- cyclists encounter pinch points where road space is suddenly lessened and they are forced to merge with fast moving traffic
- cyclists encounter situations which compromise the mobility advantages gained from riding (such as wheel ramps up steps)
- cyclists ride on the footpath to avoid difficult or dangerous sections, increasing the for potential conflict with pedestrians.

The gaps in the network and difficult sections have a negative impact on cycling participation as poor amenity or potentially dangerous sections of road are a disincentive for those who might otherwise take up cycling.

Infrastructure improvements are therefore needed to transform North Sydney LGA's streets and spaces into places where cyclists feel they are safe and belong.

Community and stakeholder feedback highlighted that:

Many who would like to cycle for day to day transport – such as shopping – do not as it would involve negotiating main roads or other difficult and intimidating road sections.

A poor network has a more acute impact on some groups - less experienced, younger and older cyclist.

Infrastructure is most lacking where it is most needed – through busy and high traffic areas and at intersections

A single trip requires cyclists to negotiate inconsistent infrastructure treatments and conditions, resulting in largely safe trips having dangerous sections

Some of the existing bicycle specific infrastructure is impractical or unsuited to the volume and type of use

North Sydney LGA is the obvious missing link between high quality cycling infrastructure in City of Sydney LGA and along the Naremburn Cycleway.

Shoulder lanes along major routes do not provide sufficient separation and are a disincentive to cycling

Some of the safe and efficient infrastructure in the LGA is difficult to access due to missing connections

Cyclists said that North Sydney LGA needs:

"Better cycleways in the centre of the North Sydney" (Male 40 -49 years)

"A continuity of cycle ways for safer travel" (Female, 50 -59years)

"Dedicated bike lanes" (Male, 30 – 39 Years)

"A safer route from North Sydney CBD to the Sydney Harbour Bridge bike lane" (male 50 -59 years)

The steps to the Sydney Harbour Bridge Cycleway are a barrier to cycling

Having to dismount and push bicycles up 55 steps to access the Harbour Bridge Cycleway is a key issue for many cyclists. For some, the steps are an inconvenience that compromises the network, for others (such as those with less mobility or heavy electric or cargo bicycles) they are a serious limitation to their capacity to use cycling for transport and recreation.

Cyclists said that North Sydney LGA needs:

"A ramp at the Harbour Bridge"
(Male, 40-49 years)

Current bicycle route signage is inconsistent and insufficient

Consistent signage is a critical component of an accessible, safe and connected bicycle network. Conspicuous cycle routes that are easy to follow are essential to build the confidence of those using the network and to encourage increases in cycling.

Signage throughout North Sydney LGA has not been centrally coordinated resulting in a variety of signage types and in some cases, an absence of signage at key locations.

Insufficient signage has meant that some cyclists end up on busy and difficult roads rather than safer or higher amenity cycling routes. Coordination with surrounding councils is also needed to ensure that key regional routes are widely known and destinations consistently signed.

There is insufficient bicycle parking facilities to cope with current demand or to encourage more cycling

There is insufficient capacity for bicycle parking in North Sydney LGA to meet demand, which creates a disincentive for people to ride. Informal bicycle parking (to fences, rails etc.) is most prevalent in North Sydney CBD and is evidence that the current provision of outdoor bicycle parking is insufficient. Informal parking potentially leads to a further issue of bicycles obstructing footpaths.

There is also unmet demand for secure bicycle parking. The provision of high quality bicycle parking at train stations, bus stops and ferry wharves is crucial for promoting bicycle use as a component of multi-modal trips (and therefore a critical part of an integrated transport network). Most notably, there is currently no secure bicycle parking provided at North Sydney train station despite it being the fifth busiest station on the Sydney Trains network with over 57,000 customers every day⁷.

³ Bureau of Transport Statistics, Station Ins & Outs, North Sydney Station barrier counts of 57,560 for 2012. <http://visual.bts.nsw.gov.au/barrier/>

The Existing Network

Council owns and manages four secure bike storage lockers in North Sydney CBD. The demand for these lockers exceeds capacity which is indicative of a significant unmet demand for secure parking. Council also receives regular enquiries about secure bike parking options.

5. Increasing cycling in North Sydney LGA – what Council will do

To meet the goals for cycling set out in the 2020 Vision, Council has developed this Strategy for the delivery of cycling infrastructure and communications projects.

Goals

The goals for this Strategy, which build on those in the 2020 Vision are:

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

Budget

Council's budget for cycling projects has increased from 2013 increasing Council's capacity to achieve the Strategy goals. Council's budget for the implementation of Integrated Cycle Strategy Priorities and related projects is as follows:

- 2013/14 = \$160,000
- 2014/15 = \$200,000
- 2015/16 = \$200,000
- 2016/17 = \$250,000.

Council will also work close with State and Federal Government bodies on major regional routes identified in the *NSW Bike Plan* and *Sydney's Cycling Futures* documents, to identify opportunities for funding that will ensure that local routes link with State and Federal routes.

A vision for cycling in North Sydney

North Sydney Local Government Area will have an accessible, safe and connected bicycle network by 2020. People of all ages and cycling abilities will feel comfortable riding in North Sydney; the area will be a convenient and desirable place to ride; rates of cycling will be significantly increased over 2014 levels; and riding will be a convenient and attractive option for a diverse range of transport and recreational uses.

Cycling and cycling infrastructure will also make positive contributions to the streetscapes in North Sydney, and help to create high quality streetscapes and public spaces.

5.1 Next Steps – What Council will do to meet goals for cycling

Table 5.1 outlines what Council will do to achieve the goals of this Strategy and how progress will be measured with further details provided below the table.

Table 5.1: Next Steps – Goals, Strategies and Indicators

GOAL	STRATEGY	INDICATORS
What do we want to achieve?	What we will do	How will we measure progress
<p>Deliver an accessible, safe and connected network by 2020</p>	<ul style="list-style-type: none"> Implement priority routes that address key gaps in the network. Liaise with State Government organisations to investigate step free access to the Sydney Harbour Bridge Cycleway. Update existing routes and improve quality across the network. Install clear and consistent signage. 	<ul style="list-style-type: none"> High priority routes identified in this strategy completed by 2016 with remaining priority routes completed by 2020. A minimum of 80% of those using the network feel that safe and connected routes are a feature of the North Sydney cycle network. Decrease in cycling related collisions/ injury rates over each year of the Strategy. A minimum of 80% of those using the cycle network feel comfortable and safe.
<p>Make cycling an attractive choice for short trips within the LGA.</p>	<p>As above plus:</p> <ul style="list-style-type: none"> Install new bicycle parking facilities that cater for current demand and future increases. Provide supporting facilities (such as water refill stations, pumps or network maps). 	<ul style="list-style-type: none"> Short trips within the LGA being made by bicycle. A majority of residents feel that everyday needs can reasonably be accessed using the cycling network.
<p>Increased and diversify participation in cycling</p>	<p>As above plus:</p> <ul style="list-style-type: none"> Conduct communication, events and programs to promote cycling and awareness of cycling issues. 	<ul style="list-style-type: none"> A 50% increase in cycling trips to and from the LGA by 2020. Short trips within the LGA being made by bicycle. Increased representation of groups currently underrepresented in cycling

Implement priority routes to address key gaps in the network

Council have identified five (5) priority routes that are required to address the key gaps in the existing network.

These routes will act as the primary network or 'main roads' for cycling in the LGA. They will provide regional connections to key destination such as the Sydney CBD and connect to a secondary network of cycle infrastructure to allow the use of bicycles for local trips.

Sections of the priority routes are proposed as separated cycleway. The 2020 Vision states that part of Council's Strategy for reducing the reliance on private motor vehicles will include increasing the amount of street space dedicated to sustainable transport modes including cycle ways. Separated lanes are necessary to ensure that cyclists of different abilities can negotiate busy roads and access all parts of the LGA. Cyclists have told Council that separated or dedicated cycle ways are one of the most important network improvements required in North Sydney LGA.

Building cycleways increases and broadens cycling participation

- The completion of the cycling link between North Ryde and Naremburn in 2007 saw a sharp rise in cyclist numbers which continues to increase every year.
- The installation of dedicated cycle lanes in New York has seen cyclist numbers quadruple over a 10 year period. Cycling is now more commonly used for short trips and errands by a diverse range of people. Over the same period, injury rates have fallen and retail sales along cycle routes increased.

Implementing the five priority routes will enhance cyclist safety, complete missing links, alleviate significant pinch points and provide a connected bicycle network that is easy to use by people living, working and travelling in North Sydney.

The five priority routes are detailed in the infrastructure plan in Section 6.1.

Advocate for step free access to the Sydney Harbour Bridge Cycleway

Council is not the owner or approval body for works on the Harbour Bridge and as such has not included an infrastructure solution for access to the existing bridge cycleway. However, Council does acknowledge that the 55 steps at the Sydney Harbour Bridge at Milsons Point limit the accessibility of the network and will continue to advocate for improved access and liaise with relevant State Government organisations to identify an alternative solution.

Update existing routes and improve quality across the network

Known pinch points or hazards on existing routes will be removed or improved and outdated facilities across the LGA progressively upgraded to current best practice infrastructure.

Part of improving quality across the network will be ensuring that 'every street is a cycling street'. Depending on trip origin and destination, community members are likely to undertake part of their bicycle trip on local roads with no formal cycling infrastructure. Cycling on local roads with low traffic volumes will be encouraged through cycle-friendly road design.

Maintenance will be a key part of improving quality across the network. Road markings and stencils will be renewed where worn and hazards and uneven surfaces repaired.

The Infrastructure Plan (Section 6) includes a strategy for updating existing routes and improving quality across the network.

Install clear and consistent bicycle signage

The 2020 Vision identifies the need for improved directional signage for the cycling network. New signage will be installed and existing signage upgraded where required to ensure that those cycling within the LGA can easily locate bicycle routes and travel between key destinations.

New signage will be intuitive, easy-to-use and legible, especially where cyclists are likely to be travelling at speed. The number of signs at any one point will be minimised while still providing as much information as required by the likely users of the sign. At critical locations signs will be placed to identify the route as well as key destinations.

Making signs legible will not stop at the point of installation. Signs will be maintained to ensure that legibility is not compromised by vegetation growth, graffiti or changes to the surrounding environment.

A plan for signage installation is contained within in the Infrastructure Plan in Section 6.

Install bicycle parking that caters for existing demand and future increases

New bike parking will be installed to fill the gaps in current demand and encourages increases in cycling participation.

A variety of parking types will be implemented to provide for a diverse range of needs.

Council will install on-street parking in key activity centres and at key trip generators such as ferry wharves.

Council will investigate demand and potential sites for publically accessible and secure longer term bike parking options, such as bicycle parking cages.

Provide supporting infrastructure such as public maps, bicycle pumps or water refill stations to support the cycling network

Council recently installed a public bicycle pump and tool stand at the Sydney Harbour Bridge. Feedback from riders is that this facility is highly useful, enhances the amenity of the network and promotes a message that cycling is part of the North Sydney transport network.

Council will continue to investigate opportunities to provide additional facilities – for example network maps or water refill stations along key routes – to support the cycling network.

Conduct communications, events and programs to promote cycling and awareness of safety and cycling issues

Communication with key stakeholder and the community is a vital part of delivering a network that is appropriate to community needs. Communication is also necessary to raise the profile of cycling and awareness of cycling related issues (such as safety).

Section 7 identifies key groups who need to be involved around cycling projects and Council's plan for engaging with these groups.

Increasing cycling in North Sydney LGA – what Council will do

Council already conducts bicycle related events and courses. Council will build upon these by running events which aim to attract new cyclists as the network improves. In particular, new events will focus on encouraging participation by underrepresented groups and promoting cycling for work trips and personal errands. Section 8 provides an Events and Programs Plan.

Ensure that Cycling contributes to 'placemaking' in North Sydney

Cycling projects will be carried out with consideration of broader benefits to the North Sydney community, with the aim being that cycling and cycling infrastructure contributes to high quality streetscapes and public spaces that promote community health and well being. A 'placemaking' approach will help to guide this aim, which means that Council will look to the community's vision for streets and public spaces, and explore ways in which cycling infrastructure can help to realise these visions. In infrastructure terms, this might mean that cycling lanes help to achieve community aspirations for quieter, safer streets with slower traffic speeds, or that public access and public space is improved by delivering new pedestrian facilities and landscaping alongside cycling upgrades.

6. Infrastructure Plan

This section details infrastructure treatments proposed to address the goals set out in this Strategy. The infrastructure plan comprises five key components:

- Priority routes plan
- Existing network improvement plan
- Bicycle parking plan
- Supporting infrastructure and facilities plan
- Signage implementation plan.

6.1 Priority Routes

The priority routes represent the 'arterial routes' of the bicycle network in North Sydney. The routes have been designed to fulfil the following criteria:

- Provide greatest improvements in terms of network accessibility, safety and connectedness
- Respond to key network issues identified in research and consultation
- Encourage more people to take up cycling and occasional riders to cycle more often
- Provide the highest level of service achievable within the current funding context
- Provide access to activity centres, employment areas, public facilities, retail and other key trip attractors within the LGA
- Provide regional links
- Minimise impacts on pedestrians and public transport.

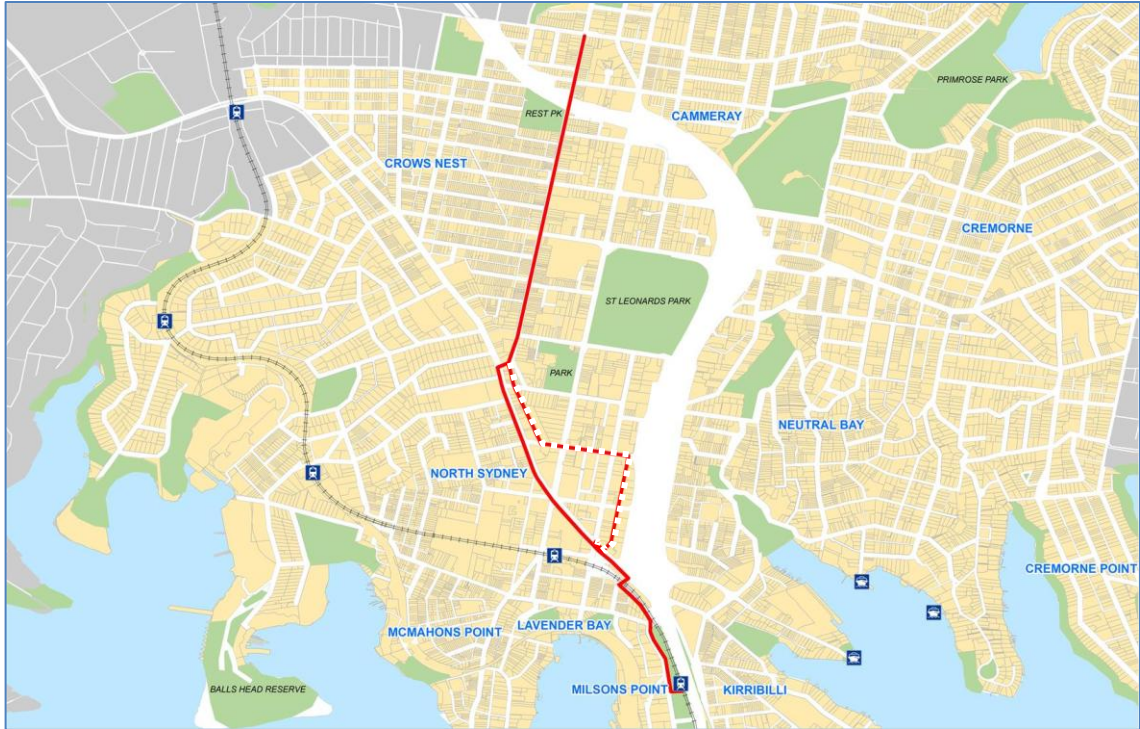
The five (5) priority routes are shown in Figure 6.1. An overview of the infrastructure treatment for each is provided in the table below with further details provided later in this Section. Concept diagrams for each of the routes are provided in Appendix F.

ROUTE	DESTINATION	INFRASTRUCTURE TYPE(S)
Route 1	Sydney Harbour Bridge Cycleway to West Street	Separated bi-directional cycleway within the existing road reserve.
Route 2	North Sydney to Mosman	On-road route is with sections of cycle lanes or other cycle specific infrastructure
Route 3	Sydney Harbour Bridge to Neutral Bay	On-road route with infrastructure upgraded at key points to improve safety and function
Route 4	Cammeray to Crows Nest	Separated bi-directional cycleway within the existing road reserve and on-road route.
Route 5	North Sydney to Cremorne	Variety of infrastructure treatments, including on-road sections, cycle lanes and use of an existing pedestrian/cyclist overpass.

Figure 6.1: Priority Construction Routes



Route 1: Sydney Harbour Bridge to Cammeray via West Street (High Priority)



A separated bi-directional cycleway within the existing road reserve is proposed for this route.

The Sydney Harbour Bridge to Cammeray route is the most important bicycle route in North Sydney LGA. It attracts more traffic than any other in the area and provides a key connection between the North Sydney and Sydney CBDs and suburbs to the north and north-west. At the Alfred Street South end of the route, there are often more than 2000 cycle trips per day, while along West Street an average weekday will likely see more than 700 trips. This indicates that in well in excess of 500 000 cycle trips per year are made along sections of this route. It is also known that there is significant bike traffic along parallel routes, which further indicates the level of demand along the north south corridor. This route is also a critical route for future accessibility within the LGA as it will link to key destinations, regional routes and all other priority routes.

TfNSW has identified a north south connection through North Sydney as a high priority route of regional significance, with construction to begin in the short term.

Feedback from cyclists using the North Sydney network identified that this route, more than any other in the LGA, needs to be upgraded. Many stated that physical separation was required to promote cyclist safety and reduce conflict between all road user groups.

The HarbourLink concept was proposed as a solution to this missing link. HarbourLink was a long-term vision which proposed a 1.6km elevated path along the Warringah Freeway corridor. Given the high cost (indicative capital costs for the project are in the range of \$55 to \$85 million⁸) and potentially lengthy process for such a concept to be realised, alternative infrastructure treatments have been proposed for this route of regional significance.

The proposed route consists of two key sections:

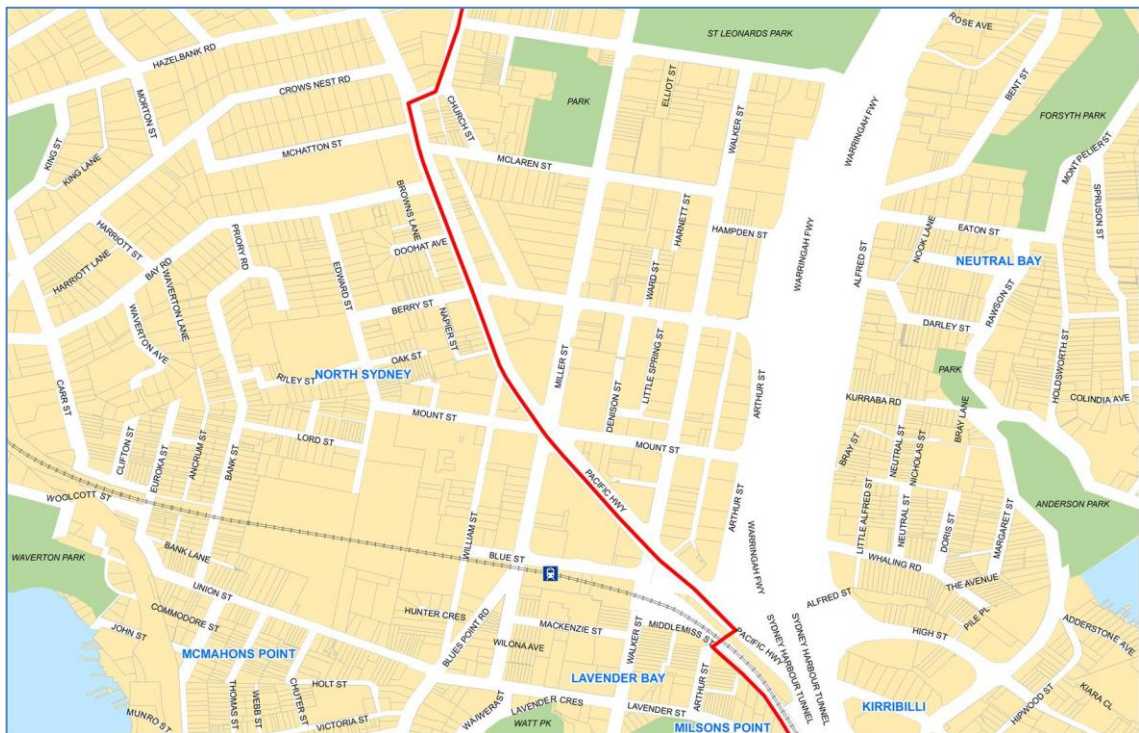
- i Sydney Harbour Bridge to North Sydney (West Street)
- ii North Sydney (West Street) to Cammeray via West Street. (Bi-directional separated on-road cycleway)

Section 1 - Sydney Harbour Bridge to North Sydney

Two potential route alignments were considered to complete this vital missing link:

- i The Pacific Highway (preferred route)
- ii Alternative route via Berry Street and Little Walker Street.

Option 1a - Pacific Highway (preferred route)



The Pacific Highway is a classified State Road and as such Roads and Maritime Services (RMS) is the responsible road authority. RMS has identified the Pacific Highway as a preferred alignment for a North South regional route through North Sydney. This route would consist of a separated bi-directional cycleway in the existing road reserve. The cycleway would run from Lavender Street, Milsons Point to West Street, North Sydney, a distance of approximately 1.2km. A bi-directional cycleway is appropriate for this route for the following reasons:

⁸ Evaluation of the costs and benefits to the community of financial investment in the Naremburn to Harbour Bridge Active Transport Corridor (HarbourLink) (SKM/PWC), 2010.

- There is sufficient road width to accommodate such a facility
- Separation is demonstrated to improve safety for all road users
- This link is of high strategic importance for the overall local and regional bicycle network as it connects North Sydney CBD with the Sydney Harbour Bridge and the Gore Hill Freeway cycleway
- The provision of separated facilities has been shown to increase cycling participation.

This alignment would provide a vital, direct route through North Sydney CBD, significantly improving cyclist safety and comfort as well as network coherence and directness. The Pacific Highway is considered to be the preferred route as it is likely to provide the most direct, easy to follow and usable route. The Pacific Highway through North Sydney CBD is shown in Figure 6.2 and Figure 6.3.

A key challenge of this route alignment is crossing the Pacific Highway as Arthur Street is located on its western side and West Street is located on its eastern side. There are five major signalised intersections along this section and cyclist crossing movements could be incorporated at one of these locations.

As the RMS is the road authority responsible for the Pacific Highway, it is responsible for the design development for this section of the route (likely to be a bi-directional cycleway within the existing road reserve).

Community feedback on this potential alignment noted that the 2.4metre wide separated cycleways used in other parts of Sydney would unlikely be sufficient to cater for the speed, volume and mix of cyclist types along the Pacific Highway section of Route 1, especially given the speed likely on the gradients.

Figure 6.2: Pacific Highway (looking north)



Figure 6.3: Pacific Highway (looking south)

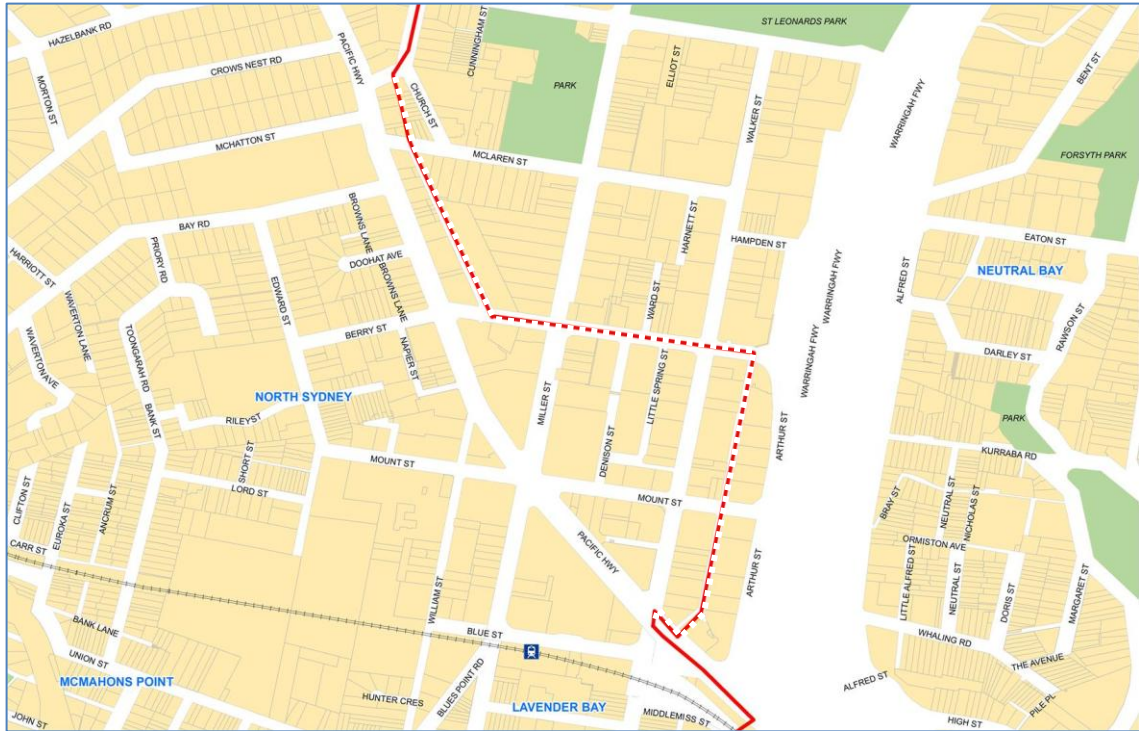


Figure 6.4 Example bi-directional cycleway within road reserve (Bourke Street, Surry Hills)



Option 1b – Alternative Route via Berry Street and Little Walker Street

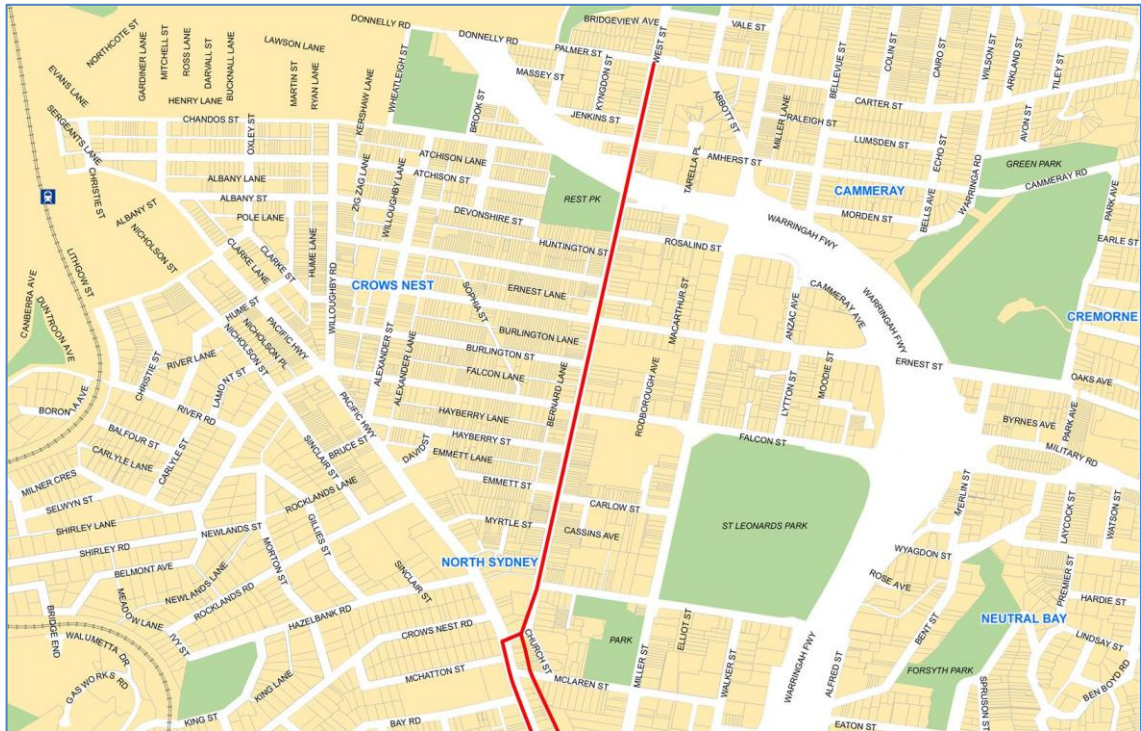
An alternative alignment was initially proposed through North Sydney CBD via Berry Street and Little Walker Street.



Community and stakeholder feedback has indicated that this route option would not provide suitable connection to likely destinations and would not adequately provide for a diverse range of rider types. In view of this feedback, this route will not be considered as an alternative.

A concept design layout showing the alignment of the Sydney Harbour Bridge to West Street route is contained in Appendix F.

Section 2 – North Sydney to Cammeray via West Street



West Street currently functions as one of the key spines of north-south bicycle traffic in northern Sydney. The existing conditions on West Street do not reflect its status as key cycle route and act as a barrier to community members using bicycles to move around and through the LGA.

West Street is the most appropriate north-south route through the LGA as it carries relatively low traffic volumes, has favourable topography, travels through an area of predominantly low density residential land uses and provides links to key destinations points.

West Street is a preferred north-south route to nearby Miller Street as it carries much lower traffic volumes. Miller Street is a sub-arterial road which carries approximately 45,000 vehicles per day⁹ and functions as a major bus corridor.

A separated bi-directional cycleway treatment is proposed along West Street between Amherst Street and the Pacific Highway (a distance of approximately 1.2km). This type of facility has been proposed for the following reasons:

- There is sufficient width to accommodate such a facility and maintain on-street parking
- Separation is demonstrated to improve the safety of all road users , and is particularly relevant on a road network with some of the highest cyclist volumes in northern Sydney
- This link is a high strategic importance for the overall bicycle network as it connects North Sydney CBD with the Gore Hill Freeway cycleway
- The provision of separated facilities has been shown to increase cycling participation.

⁹ Based on recorded RMS Annual Average Daily Traffic (AADT) data for 2005 (www.rta.nsw.gov.au/trafficinformation/downloads/aadtdata_d11.html).

In addition to this the Inner Sydney Regional Bicycle Plan Implementation Strategy recommended an on-road separated bi-directional cycleway on West Street between Church Street and Amherst Street.

Figure 6.4: West Street (looking north)



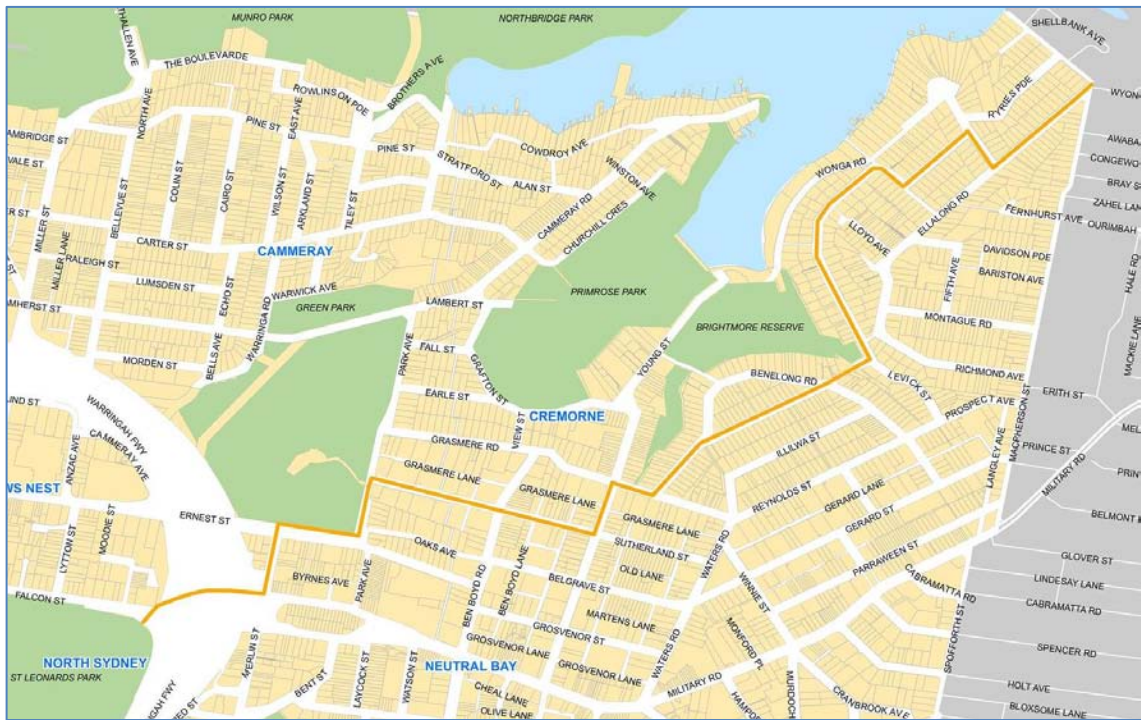
Figure 6.5: West Street (looking north)



Between Ernest Street and Amherst Street, West Street functions as a bus route for the 263 (Crows Nest and Cammeray to City) and 267 (Crows Nest to Chatswood) services. Buses only travel in a northbound direction along this section of West Street. A separated facility can be accommodated along West Street without impacting on these bus services.

A detailed concept design layout showing the route alignment is contained in Appendix F.

Route 2: North Sydney to Mosman (high priority)



An on-road mixed traffic cycle route is proposed for the majority of this route. Difficult sections will be upgraded with dedicated cycle lanes or other cycle specific infrastructure.

Route 2 will provide access between Cremorne and North Sydney CBD and the Sydney Harbour Bridge (via Route 1). It is also proposed as the primary regional link north to Mosman and the Northern Beaches.

East of Park Avenue the route travels along local, residential streets with low traffic volumes that are generally appropriate for a broad range of cyclists. Despite the favourable conditions the route is underutilised due to poor connections to the rest of the network. Based on count data collected along this route, it is estimated that up to 300 cycle trips per day are currently made along this route, however there is significant scope to better utilise this high amenity route by improving connections. The infrastructure treatments proposed below aim to affirm the status of this route as a primary route.

This route will primarily be an on road mixed traffic route. A variety of infrastructure treatments are proposed along this route including:

- Marking the route with mixed traffic bicycle “PS2” logos
- Hybrid treatment of bicycle lanes/mixed traffic treatments on hilly sections
- Marked cycle lanes with green coloured surfacing where there is sufficient space in the road reserve and a need to provide improved delineation
- Signage along the length of the route for travel in both directions.

Sections of the route are proposed as specific cycling infrastructure, including:

- Dedicated bicycle lanes along Merlin Street

- A crossing facility to assist access from Merlin Street across Ernest Street, and upgraded access to the shared path on Ernest Street.

The route will also utilise several existing bicycle facilities including:

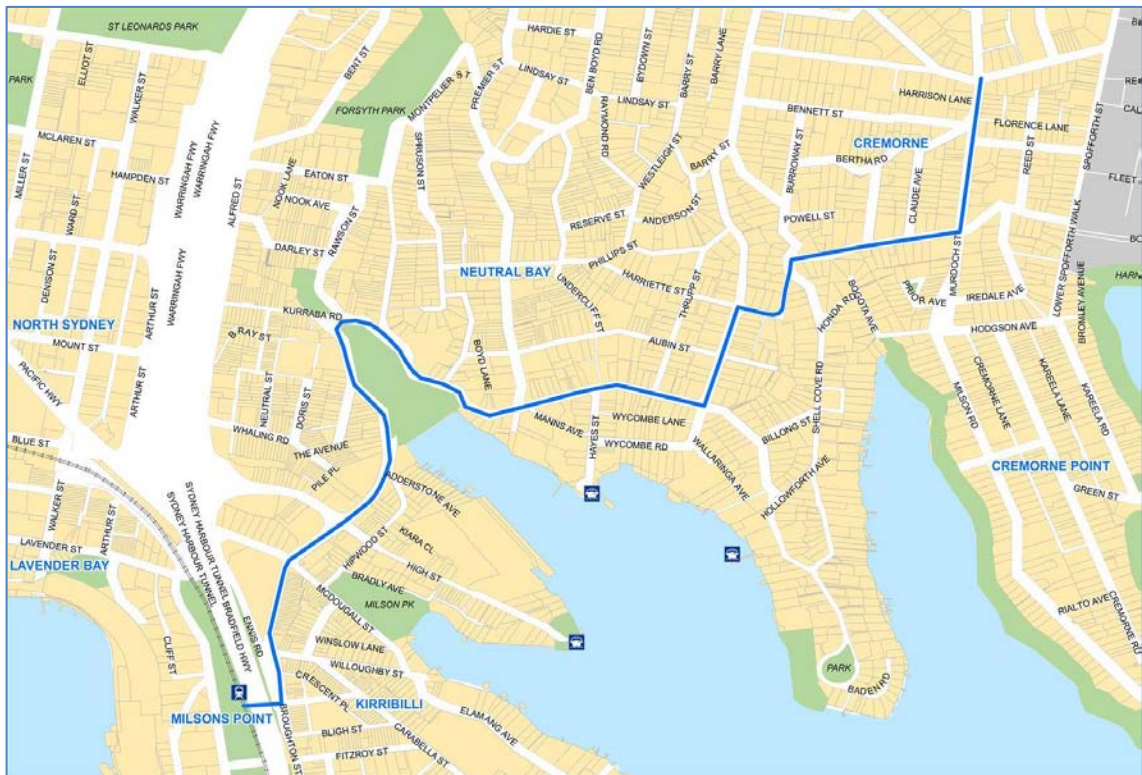
- The dedicated bicycle crossing across Falcon Street at the north-east corner of St. Leonards Park
- The pedestrian and cyclist bridge across the Warringah Freeway
- Shared path sections along Ernest Street and Park Avenue. Widening and renewal of this path will be investigated to ensure that it remains consistent with the quality and usability of the rest of the route.

Access to the route in a westbound direction is currently reliant on signage within the Mosman LGA. Council will liaise with Mosman Council to explore options to promote the westbound use of this link.

The connection of this route to Route 1 (either through or around St Leonards Park) will be determined by a separate North Sydney Council study.

Longer term, Council (in partnership with relevant State Government organisations) will consider the need for of a link between Park Avenue and West Street (Route 1) via a separated bi-directional facility along Ernest Street.

Route 3: Sydney Harbour Bridge to Neutral Bay (Medium Priority)



An on-road mixed traffic cycle route is proposed for this route with infrastructure upgraded at key points to improve safety and function

The Sydney Harbour Bridge to Neutral Bay route provides a connection from Cremorne, Neutral Bay, Mosman and the Northern Beaches to the Sydney Harbour Bridge, without travelling through North Sydney CBD. The route travels via Broughton Street, Clark Road (Figure 6.6), Kurraba Road (Figure 6.7), Wycombe Road, Harriette Street, Bannerman Street and Murdoch Street.

Available data indicates that the 3km long route is currently well patronised despite there being little formal bicycle infrastructure in place. Counts have indicated that a busy day on this route will see more than 500 cycle trips. It has a complex and varied road environment along its length, with variable road widths, significant changes in elevation and on-street parking at many locations. For these reasons the route is challenging for many cyclists.

Figure 6.6: Clark Road (looking north)



Figure 6.7: Kurraba Road (looking west)



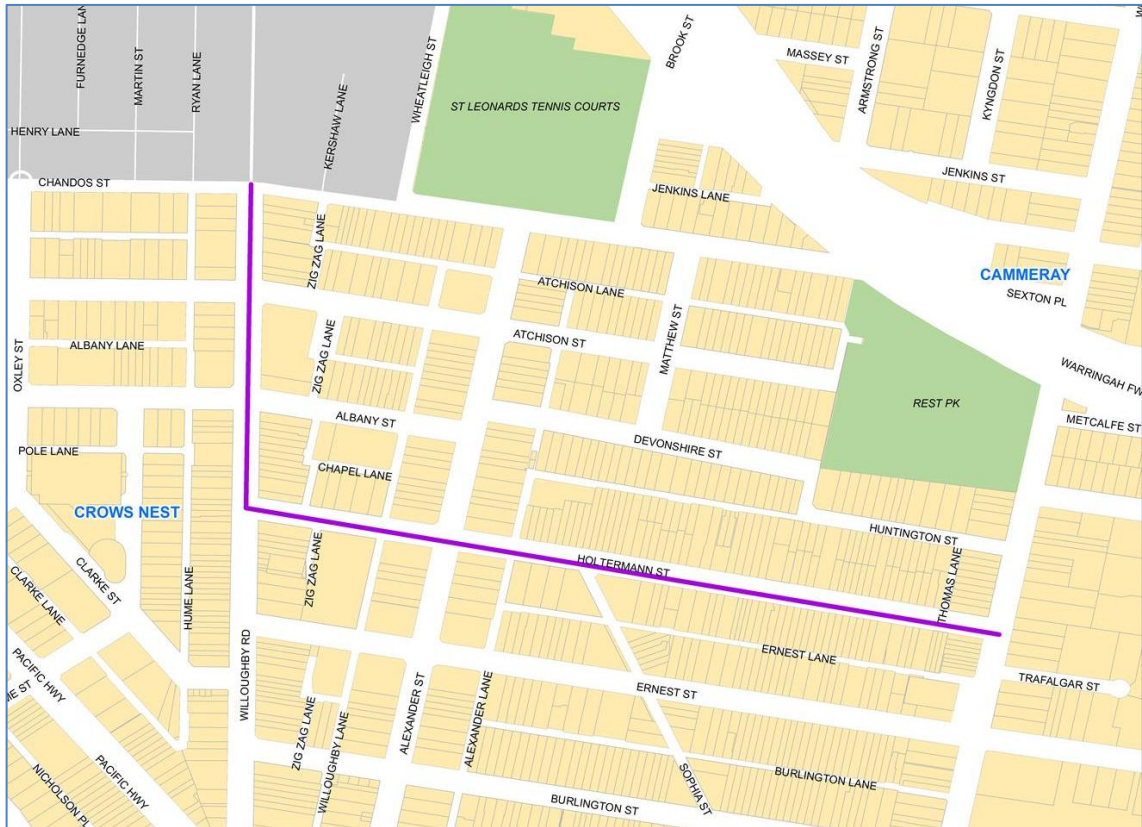
The current high use of this route demands improvements to function and safety. Longer term, the construction of other priority routes identified in this Strategy is intended to encourage use of safer and lower traffic routes.

The improvements identified are relevant to the topography and road environment of each section, however these are subject to detailed investigations, most pertinent of which is a feature and level survey to accurately determine the available road widths, traffic facilities and street furniture. Early discussion with key stakeholders such as RMS, Police and the State Transit Authority (STA) are also important to developing the route.

A number of on-road infrastructure treatments are proposed to improve safety and amenity for all road users, including:

- A head start storage box for southbound cyclists at the Broughton Street/ Ennis Road intersection to assist right turn movements to Burton Street and the Sydney Harbour Bridge cycleway.
- Mixed traffic linemarking along Broughton Street and Clark Road (south of High Street)
- Hybrid bicycle lane for uphill sections and mixed traffic treatments for downhill sections (north of High Street).
- Linemarking to improve delineation at key intersections: Clark Road intersections with High Street and Kurraba Road, as well as Kurraba Road intersections with Ben Boyd Road and Wycombe Road.
- Replacement of sections of the concrete median with line marking to maximise the available road width.
- Providing a bicycle lane on the western (uphill) approach of Kurraba Road to the intersection with Ben Boyd Road.
- Wayfinding signage for both directions of travel along the length of the route (this signage would be reviewed following the completion of routes 3 and 5, so that cyclists are encouraged to use safer and lower traffic routes).

Route 4: Cammeray to Crows Nest (Medium priority)



An on-road mixed traffic cycle route is proposed for Willoughby Road and Holtermann Street.

Willoughby Road is the main road through the Crows Nest retail precinct. A mixed traffic treatment along Willoughby Road with PS-2 road markings is proposed subject to the implementation of a High Pedestrian Activity Area between Albany Street and Falcon Street. This section of Willoughby Road is currently subject to a 40km/h speed limit.

A separated bi-directional facility cannot be readily accommodated on this section of Willoughby Road without significant alteration to the existing main street layout and possibly the loss of on-street parking.

The signalised intersection with Albany Street requires special consideration and most likely marked bicycle lanes with green coloured surfacing to improve delineation. Details will depend on the type of facility developed to the north of the intersection. Consideration could be given to marked bicycle lanes with green coloured surfacing or a separated bidirectional cycleway. Road widths and parking impacts would be important considerations.

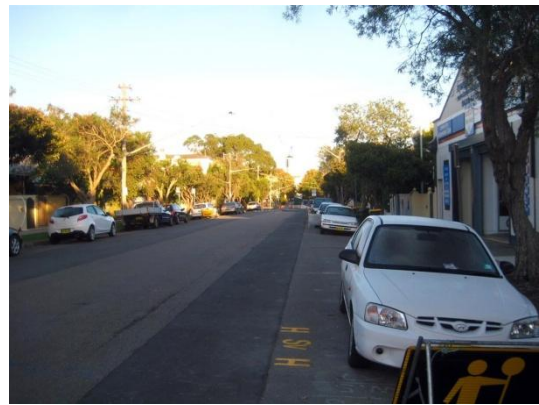
Chandos Street forms the boundary between North Sydney and Willoughby LGA. Council will seek to liaise with Willoughby Council to continue the connection to the Gore Hill Freeway cycleway which provides access to Northbridge, Willoughby, Chatswood, Lane Cove and Macquarie Park.

Holtermann Street (Figure 6.8 and Figure 6.9) provides a connection between the West Street (Route 1) and the Crows Nest retail precinct. This route is not currently marked as a cycle route on the North Sydney bike map, however the installation of angled on-street parking along Holtermann Street is currently being investigated and would narrow traffic lanes/slow traffic speeds allowing a mixed traffic route to be installed that would be accessible to a range of rider types. Alternative treatments to be considered should these parking changes not proceed include cycling lanes along Holtermann Street or parallel streets.

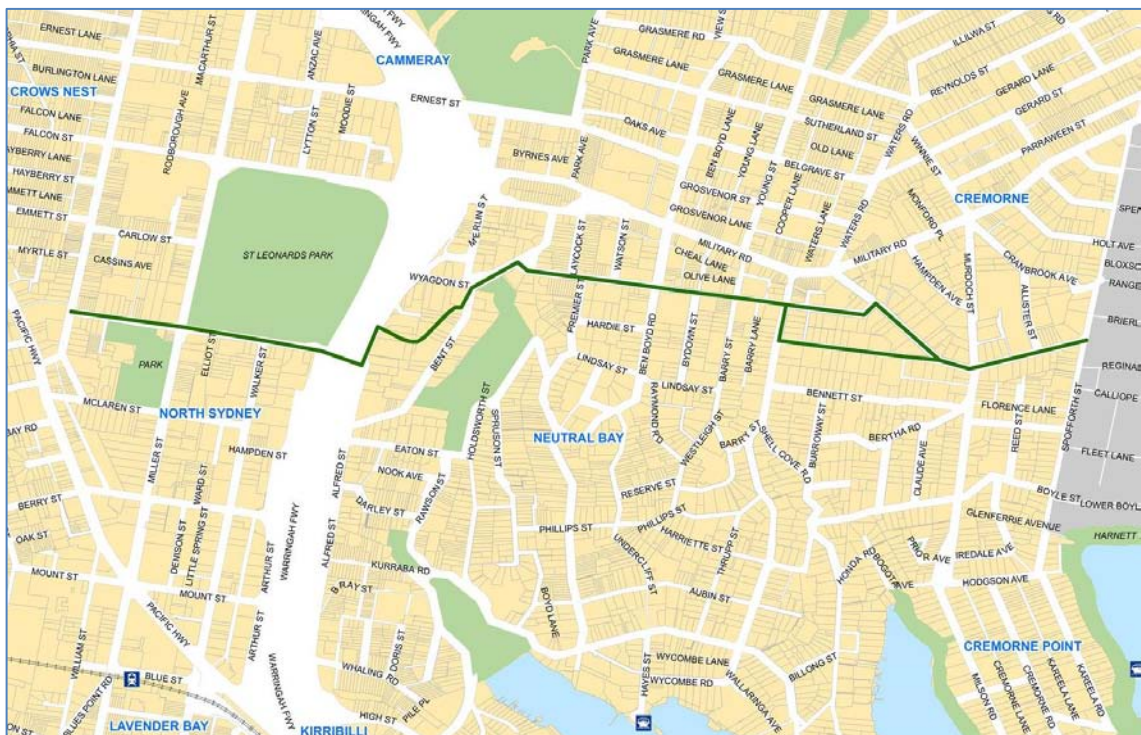
Figure 6.8: Holtermann Street (looking east)



Figure 6.9: Holtermann Street (looking west)



Route 5: North Sydney to Cremorne (medium priority)



A variety of infrastructure treatments are proposed along this route including on-road mixed traffic sections, dedicated cycle lanes and use of an existing pedestrian/cyclist overpass.

The route between North Sydney and Mosman via Yeo Street is an established route, however it currently includes missing links. A suite of upgrades are proposed to transform this route into a safe and accessible connection that will provide for commuters to the North Sydney CBD and the Sydney Harbour Bridge cycleway.

Currently the route is predominantly via mixed traffic. The following infrastructure improvements are proposed along the route:

- **Full length of the route** - provide PS2 logos at regular intervals along the mixed traffic sections and hybrid shared lanes
- **Ridge Street** - provide mixed traffic facilities from the freeway overbridge to Walker Street with PS2 logos; green bicycle shoulder lanes from Walker Street to West Street with standard adjustments to the lane configuration at the Miller Street intersection
- **Bent Street** – hybrid eastbound (uphill) contraflow lane and mixed traffic westbound (downhill)
- **Yeo Street intersections (Ben Boyd Road and Wycombe Street)** – signalised intersection upgrades to provide marked bicycle lanes with green coloured surfacing to improve delineation and to reinforce cycling as a legitimate mode of transport at these locations
- **Wycombe Street** – hybrid northbound bicycle shoulder lane (uphill) and mixed traffic southbound (downhill)

- **Harrison Road/ Rangers Road** – intersection improvements to provide 'cut-through' for westbound cyclists
- **Yeo Street** – provide additional threshold between Ben Boyd Road and Wycombe Street with a view to reducing traffic speeds, noting this section is too narrow for more formal cycling facilities
- **Yeo Street** – extension of the route between Wycombe Street and Rangers Road to provide an alternative eastbound route to Harrison Street (particularly in the context of the signalised intersection adjustments). Consider additional thresholds to control traffic speeds.

In addition to the above, there is a need to upgrade signs and markings along the route, such as mixed-traffic 'PS2' road markings, wayfinding signage and One-Way "bicycles excepted" sub-plates (R9-3).

6.2 The Foundation for a Connected Bicycle Network

The implementation of the five priority routes will provide the foundation for a complete and connected bicycle network. They will provide crucial links within the LGA, and connect existing cycle routes that are currently isolated by gaps or difficult road environments. The five routes will also provide a foundation for the delivery of a supplementary or secondary network of cycling infrastructure. The secondary network will be a network of local connections that complement the priority routes to ensure that all parts of North Sydney LGA can be accessed by bicycle. Providing a complete and integrated secondary network will require minor infrastructure projects and upgrades to existing routes. Section 6.4 provides a strategic framework for upgrades to issues within the existing network.

Delivering the priority routes as part of completed cycling network is necessary for Council to meet its goals for cycling. The priority routes respond directly to actions recommended in the 2020 Vision in that they will 'increase the amount of street space dedicated to sustainable transport modes (e.g. in this case cycle lanes)' and 'improve cycle access and connections between open space and recreational facilities for pedestrians and cyclists'. The routes are consistent with the Strategy goals in Section 5 in that they will improve the accessibility, safety and connectedness of the network; make it easier to cycle as part of everyday transport; and provide network conditions that allow cyclists of all ages and abilities to move about the LGA.

Figure 6.10 shows the future bicycle network in North Sydney following the completion of the five priority routes.

Figure 6.10: Complete Bicycle Network



6.3 Priority Route Cost Estimates

Table 6.1: Priority Route Cost Estimates

Route	Description	Length (m)	Key Infrastructure Treatments	Timing	Indicative Cost Estimate
1	Sydney Harbour Bridge to Cammeray (preferred route)	1,250	<ul style="list-style-type: none"> Separated bi-directional cycleway (Pacific Highway) 	2014 (planning) 2015– 16 (construction)	Subject to RMS input
		1,200	<ul style="list-style-type: none"> Separated bi-directional cycleway and associated pedestrian facilities and streetscape upgraded (West Street) 		\$9,768,000
2	North Sydney to Mosman	3,300	<ul style="list-style-type: none"> Mixed Traffic + various location specific treatments 	2014	\$102,070
3	Sydney Harbour Bridge to Neutral Bay	3,000	<ul style="list-style-type: none"> Hybrid bicycle lane and mixed traffic 	2015/2016	\$383,370
4	Cammeray to Crows Nest	850	<ul style="list-style-type: none"> Mixed Traffic 	2014	\$12,000
5	North Sydney to Cremorne	2,500	<ul style="list-style-type: none"> Hybrid bicycle lane and mixed traffic Thresholds (Yeo Street) 	2018	\$83,400
TOTAL		12,220			\$10,348,840

To deliver these routes, Council will need to gain support and funding from internal, State and Federal Government sources. As the priority routes often overlap with major regional routes, Council will seek funding support for these routes from State and Federal Government Agencies such as Transport for New South Wales (TfNSW), the Roads and Maritime Services (RMS) and Infrastructure Australia. Other potential funding sources are identified in Appendix B.

6.4 Existing Network Improvement Plan

While priority routes will address major gaps in the network and provide key connections between existing cycle infrastructure, the delivery of a completed network will also require a number of improvements to existing cycle infrastructure. This section details Council’s approach to delivering these improvements.

Some of the upgrades required are location specific treatments to resolve existing pinch points or hazards. These upgrades are considered in the Action Plan set out in Section 10. Other upgrades involve the replacement of outdated facilities to be progressively applied LGA wide to ensure that existing facilities meet current best practice standards. The following facilities will be considered for upgrade under this Strategy:

- Bicycle shoulder lanes on both at grade and uphill/downhill routes
- Bicycle stencil placement on mixed traffic routes
- Shared paths
- Routes to local schools
- Bicycle hazards in local streets
- Merge points at roundabouts and traffic islands.

Table 6.2 provides an overview of how Council will approach these upgrades. Table C1 in Appendix C provides detail and images relating to the range of infrastructure treatments available to upgrade routes.

Road re-sheeting programs as well as utility service provider works are an opportunity to implement the infrastructure updates – particularly if new pavement or linemarking is due to be installed. Council's Sustainable Transport Officer will regularly review the forward works programs to identify opportunities to upgrade facilities during works.

A need for site specific network upgrades outside of the above are likely to emerge throughout the duration of the Strategy. To ensure that emerging needs are addressed, Council will apply the following network review and monitoring process:

- Provide network reporting facility on the cycling page of Council's website
- Conduct an annual saddle survey of key routes
- Document network issues in a central register document to be maintained by the Sustainable Transport Project Officer
- Provide an annual update on any network issues identified
- Liaise with Bike User Groups and the Sustainable Transport Reference Group to identify priority works.

Table 6.2: Existing Network Improvement Plan

Current Treatment	Issue(s)	Council's Response
Shoulder Lanes (on low gradient roads)	A high proportion of cycling injuries involve collision with the opening door of parked cars. Cyclists feel this treatment compromises safety and de-legitimises presence in the travel lane.	In recognition of the potential issues with shoulder lanes, Council will avoid the implementation of new shoulder lanes and consider upgrading existing shoulder lanes. If the situation arises that shoulder lanes are the only option available to provide a key link, Council will investigate alternate treatments such as one way 'Copenhagen style' or alternative bicycle shoulder lane markings, such as those proposed for Glenferrie Road, Hawthorn, VIC (Figure 6.13).
Shoulder Lanes (on steeper roads) encourage riders to ride in the door zone	Shoulder lane issues exacerbated by higher speeds in the downhill lane	Where possible replace shoulder lanes with hybrid treatment of a wide uphill bicycle lane and downhill mixed traffic markings.
Mixed Traffic (PS2) logos	Some existing mixed traffic bicycle stencils (placed at the left of the lane) encourage cyclists to ride too close to parked traffic.	New mixed traffic PS2 bicycle logos will be moved to the centre of the travel lane.
Shared Paths	Some community concern about the potential for conflict on shared paths	Shared paths will be considered/retained by Council to provide key links/connections in circumstances where traffic levels on surrounding roads exceed the 'mixed traffic' threshold identified in (NSW Bicycle Guidelines, Figure 3.2, p 13) and where a fully separated path cannot be provided. Shared paths are also appropriate in circumstances where pedestrian and cyclist numbers are low and there are adequate opportunities for cyclists to safely pass pedestrians and therefore the likelihood of conflict is minimal. Clear marking and signage on shared paths will be used to indicate the status to users, further measures (signage, marking or education campaigns) will be considered as required to lessen the likelihood of conflict between different user groups. In situations where pedestrian/cyclist traffic levels exceed council will investigate options to provide separated/dedicated cycle facilities.
Routes to local schools	Inappropriate infrastructure to allow school children to cycle to school	Liaise with schools to: <ul style="list-style-type: none"> Identify barriers to cycling within the school catchment Identify feeder route to schools and identify the potential for specific local network upgrades Identify parking and end of trip requirements within schools and provide advice to schools on improving these facilities where appropriate.

<p>Local Streets</p>	<p>Cycling hazards on streets that are not formally identified as part of the cycling network</p>	<p>Council will work to ensure that 'every street is a cycling street' by removing cycling hazards. This will be addressed with new markings during resurfacing works, replacing 'wheel trap' storm water grates with bicycle friendly grates, and through local area traffic management (LATM).</p>
<p>Merge Points at roundabouts or traffic islands</p>	<p>Potential for conflict between cyclists and cars</p>	<p>Carry out, monitor, evaluate and report on a trial with alternate markings on approaches to roundabouts, such as those used in Raglan Street, Preston, VIC (Figure 6.12)</p>
<p>One way streets</p>	<p>Potential to install contra-flow lanes to improve connectivity</p>	<p>Investigate options to install contraflow lanes on one-way streets.</p>

Figure 6.11: Possible Trial for Alternate Bicycle Shoulder Lane Markings

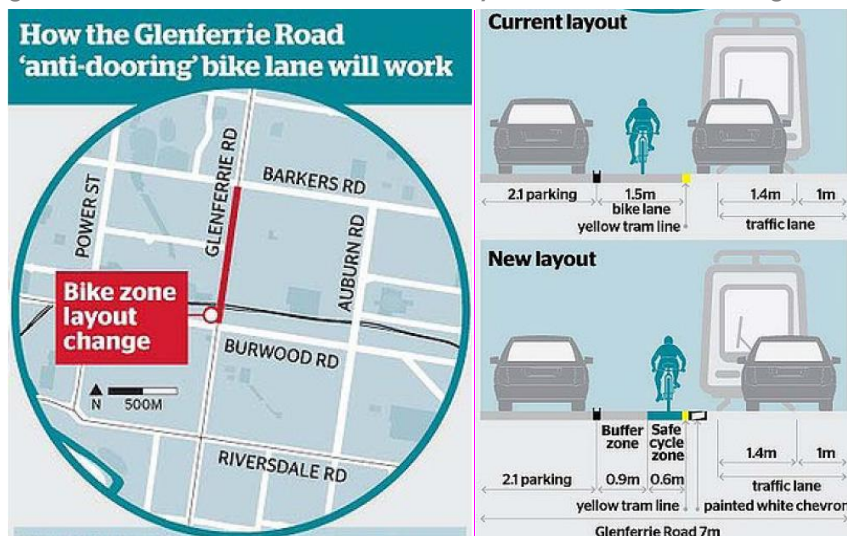


Figure 6.12: Possible Trial for Alternate Roundabout Markings



6.5 Bicycle Parking Plan

New parking will be prioritised at train stations, ferry stops, major bus stops/interchanges, employment centres and trip generators across North Sydney LGA as set out in Figure 6.13.

The exact type and location of parking will be determined through case by case investigations into the demand and costs involved at specific sites. Broadly, the types of parking infrastructure to be considered will include:

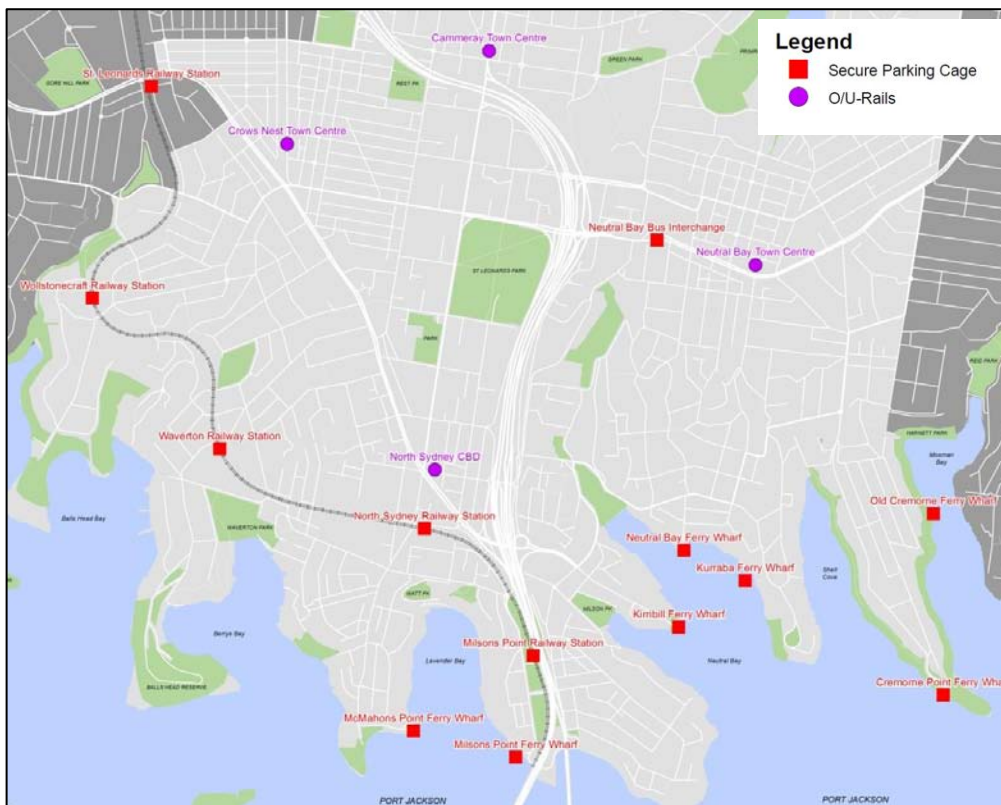
- U-rails and O-Ring in activity centres and at key locations along priority routes. The provision of O-Rings and U-rails will be consistent with Council’s Public Domain Design Manual.
- Secure bicycle parking cages close to key trip generators. As a priority, Council will investigate potential locations within the North Sydney CBD and at Milsons Point and North Sydney stations
- End of trip facilities as part of secure bike parking
- Portable or event bike parking.

Targets and timeframes for the delivery of these facilities have been provided in Table 6.3 below.

All parking infrastructure will also be assessed according to the following criteria:

- i **Functionality** – easy to use, will not damage bike, fits all bike types, is durable and sturdy.
- ii **Convenience** – close to destination, close to bicycle routes, not located in the way of pedestrians or vehicles.
- iii **Security** – has passive surveillance or secures access control.

Figure 6.13: Proposed Bicycle Parking Locations



To assist with decision making about parking locations, Council will provide a web based bicycle parking request tool (Figure C24, Appendix C). This request tool will help to ensure that bicycle parking is installed where it is needed, without the need for an extensive bicycle parking audit. The request facility will be on the Bicycle Parking page of Council’s website and will allow for the upload of supporting materials such as photos.

All new parking facilities installed will be added to the existing bike parking map on Councils website available at http://www.northsydney.nsw.gov.au/Recreation_Facilities/Walking_Cycling/Bike_Parking

Council also requires the delivery of parking facilities in new developments under the North Sydney DCP 2013.

Indicative cost estimates and timelines for the delivery of parking is shown in Table 6.3 below.

Bicycle Parking Cages

Bicycle parking cages provide a high security facility where bicycles are stored in a communal compound area. Cages are preferred for workplaces, commuter parking at public transport stops/stations and at locations or where continuous surveillance is not available. Ideally secure access control would be compatible with the public transport ticketing system.

The provision of secure bicycle parking at train stations, bus stops and ferry wharves is an important component of an integrated transport network, permitting multi-modal trips to be made easily. Some examples of Parkiteer bicycle parking cages used extensively across Victoria are shown below.

Figure 6.14: East Malvern Railway Station, Victoria



Figure 6.15: Bayswater Railway Station, Victoria



Table 6.3: Proposed Bicycle Parking Locations and Estimated Costs

Location	Facility Type	Quantity	Capacity (no. of spaces)	Timing	Indicative Cost (excl. GST)
Train Stations					
North Sydney	Cage	1	40	2016	\$30,000
Milsons Point	Cage	1	40	2016	\$30,000
St. Leonards	Cage	1	Subject to demand study	Subject to demand study	\$30,000
Waverton	Cage	1	Subject to demand study	Subject to demand study	\$15,000
Wollstonecraft	Cage	1	Subject to demand study	Subject to demand study	\$15,000
SUB-TOTAL		5	160		\$120,000
Ferry Wharves					
McMahons Point	Cage	1	Subject to demand study	Subject to demand study	\$15,000
Milsons Point/ Luna Park	Cage	1	Subject to demand study	Subject to demand study	\$15,000
Kirribilli	Cage	1	Subject to demand study	Subject to demand study	\$15,000
North Sydney	Cage	1	Subject to demand study	Subject to demand study	\$15,000
Neutral Bay	Cage	1	Subject to demand study	Subject to demand study	\$15,000
Kurraba Point	Cage	1	Subject to demand study	Subject to demand study	\$15,000
Cremorne Point	Cage	1	Subject to demand study	Subject to demand study	\$15,000
SUB-TOTAL		7	140		\$105,000
Major Bus Stops/Interchanges					
Neutral Bay	Cage	1	Subject to demand study	Subject to demand study	\$20,000
Town/Activity Centres					
North Sydney (Mount Street Pedestrian Mall and surrounds)	O/U-rails	20	40	2014 - 2016	\$4,000
Crows Nest	O/U-rails	12	24	2014 - 2017	\$2,400
Neutral Bay	O/U-rails	12	24	2014 - 2017	\$2,400
Cammeray	O/U-rails	12	24	2014 - 2017	\$2,400
SUB-TOTAL		56	112		\$11,200
TOTAL		64	412		\$256,200

Note 1: Cage costs are indicative only and assume an existing hard standing area for use. Costs are dependent on on-site conditions and availability of services.

Note 2: U-Rail cost based on Cora CBR1F Galvanised type U-rail at \$200 per rail (excluding GST).

6.6 Supporting Infrastructure Plan

North Sydney Council recently installed an electric bike pump and repair/ tool station on Burton Street, Milsons Point at the northern entry point to the Sydney Harbour Bridge cycleway (Figure 6.16).

Other support infrastructure/facilities that will be considered by Council will include additional pumps/tool stands, water refill stations and network maps.

The need for additional supporting facilities will be reviewed annually as part of the Sustainable Transport Action Plan, with potential facilities and sites identified through a combination of consultation with bike user groups, community surveys and analysis of bike count data. Council will consider the installation of new support facilities as part of the planning and delivery of any major new separated bicycle routes.

Figure 6.16: Repair/Tool Station – Burton Street, Milsons Point



6.7 Signage Implementation Plan

Council will install new signage, and update existing signage where required, to ensure cyclists are aware of the routes and bicycle facilities available to them.

Signage is a critical part of an accessible, safe and connected cycle network. Signage improves the efficiency of the network and thus enhances the utility of cycling as a transport option. Without clear and legible signage, those who are unfamiliar with the network may feel unsafe or unsure, and are less likely to use cycling as a transport option.

To guide the installation a bicycle network focal point map has been developed to achieve consistency in the use of named locations. The destinations and trip attractors were identified through from feedback gained during consultation. The focal point map contains of the following details:

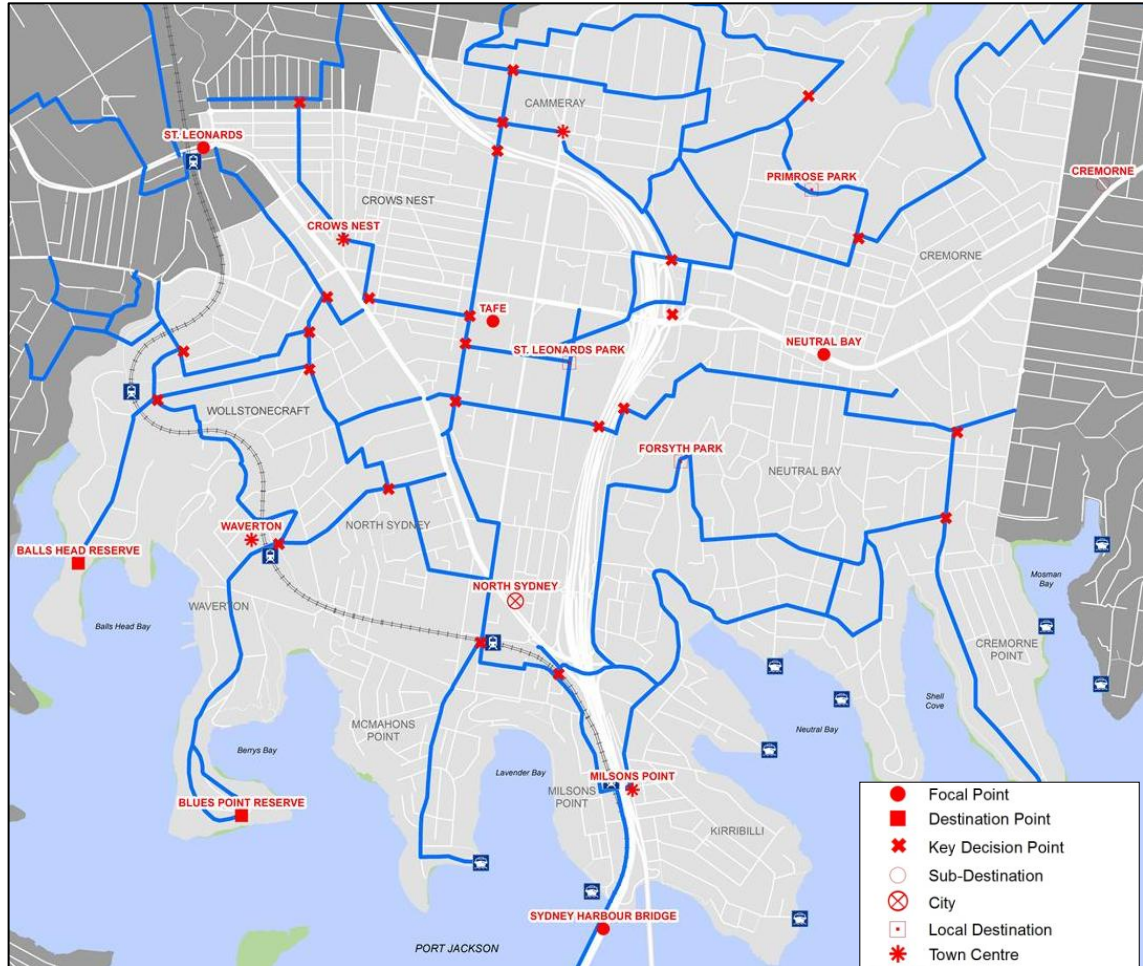
- **Focal points** – significant locations where regional routes start, finish, join or cross.
- **Destination points** – city/ town centres and localities which are located at the ends of regional bicycle routes but are not at a junction with other regional routes.
- **Key decision points** – network junctions which are intersections-only (not focal points).
- **Sub-destinations** – important local centres along a route.
- **City and town centres** – business centres of cities/ towns.
- **Local destinations** – local trip generators located at the termination of local routes.

An excerpt of the plan is shown in Figure 6.17 with a full size plan contained in the Infrastructure and Signage Toolkit (Appendix C).

Focal points, destination points, sub-destinations, local destinations and town centres shown on the focal points map are the destinations which will be used to guide the installation of signage across the bicycle network in North Sydney LGA. The principal forms of signage will include:

- **Intersection Fingerboards** –the primary means of indicating the route direction at key decision points. The focal point destination and one other destination are generally shown on each fingerboard, along with distances.
- **Advanced Direction Boards** –placed before an intersection to indicate the route being followed and the route choices available at the following intersection. Destinations and sub-destinations are used on advanced direction boards and distances are never used.
- **Reassurance Boards** –used between key decision points and on longer straight sections to reassure cyclists they are travelling towards their intended destination.

Figure 6.17: Focal Points Map



Council’s approach to the installation of new signage will be as follows:

- i Signage will be installed in association with all priority routes with intersection fingerboards installed at all key decision points.
- ii Intersection fingerboards will be mounted on existing sign posts where possible to reduce street clutter.
- iii Redundant bicycle signage to be removed/replaced
- iv Council will liaise with the RMS, to ensure consistency between signage.
- v Council will liaise with Mosman, Lane Cove and Willoughby Council’s where possible to ensure routes are signed consistently and in particular the destinations used and distances are consistent.
- vi New signage will be installed if required as part of any major bicycle infrastructure project conducted in the LGA

Council estimates through the *Annual Schedule of Rates*, that \$15,000 a year will be required to deliver and maintain comprehensive signage to complement new routes and LGA wide signage targets proposed in this Strategy.

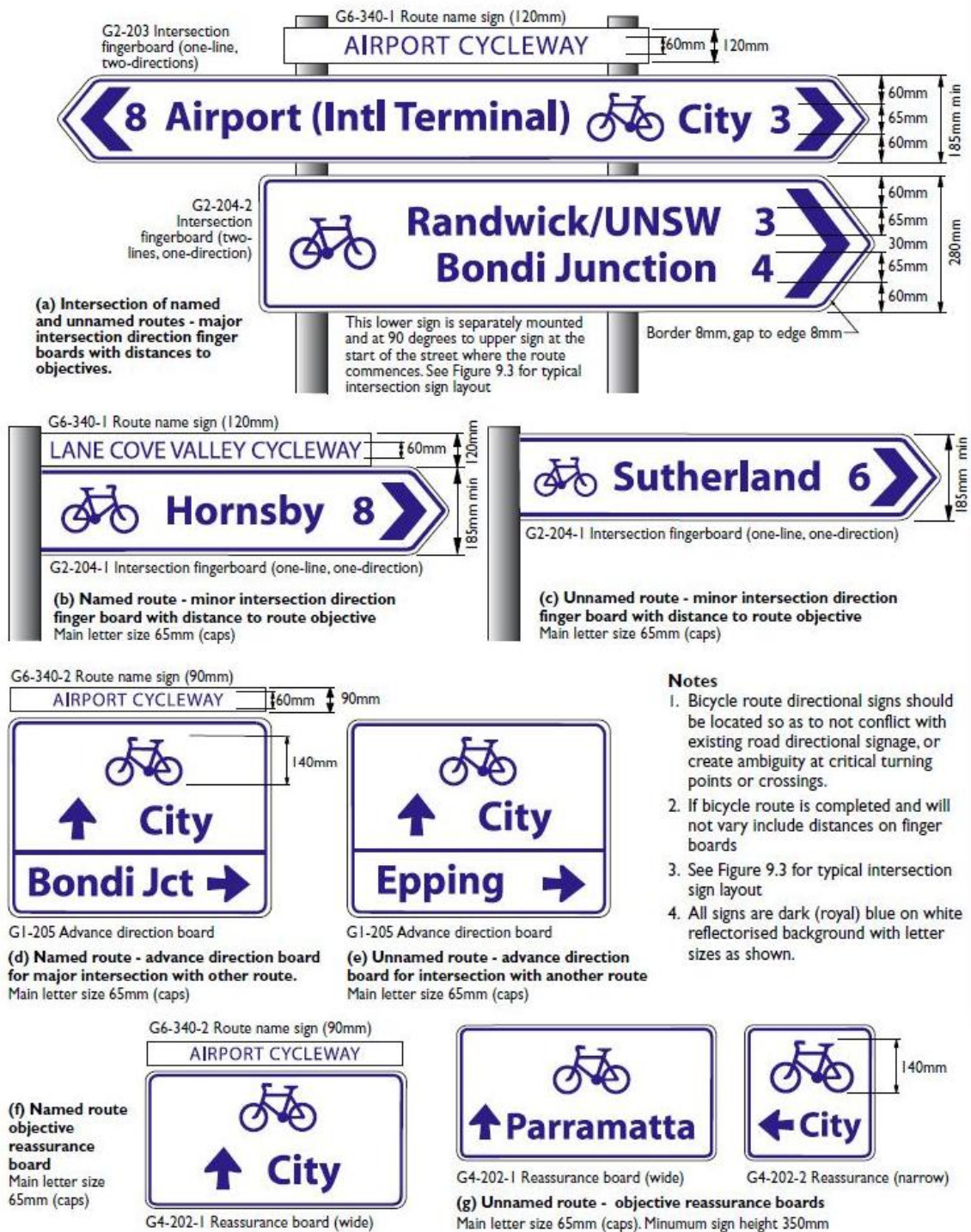
Figure 6.20: Existing signage



Figure 6.21: Existing signage



Figure 6.22: Proposed Bicycle Network Route Directional Signage



Source: NSW Bicycle Guidelines (Figure 94, pg. 73)

7. Communications Plan

This section provides details of Council's plan for engagement with those involved in the planning and delivery of cycling infrastructure.

7.1 Communication with government organisations

There is a range of government organisations involved in the delivery of the cycling network. For cycling to become an integrated component of the wider transport network, regular communication with external stakeholder organisations is required. Council will engage in formalised communications with government organisations as set out below.

7.1.1 State Government

Council will liaise with Transport for NSW (TfNSW) and the RMS to develop a reporting mechanism to identify cycling blackspots and opportunities for the progressive implementation of principal bicycle infrastructure along State Road corridors. A standing Traffic Committee meeting item for walking and cycling will be investigated as a means to achieve this level of communication.

Council will also seek to take part in key activities conducted by the Premier's Council for Active Living (PCAL) which is a multi-agency coordination group for the state government. PCAL provides a wealth of information and resources to assist Council's in promoting active travel and workplaces. Council should pursue a working relationship with PCAL to inform and assist the development of active travel programs in North Sydney.

7.1.2 Neighbouring Local Government Areas

Council currently liaises with neighbouring LGA through the North Shore Regional Bicycle Committee and through direct contact. Council will continue with these communications to identify opportunities to plan and deliver projects at the North Sydney boundaries.

7.1.3 Internal Council Communications

Regular communications with internal Council staff will occur to ensure that bicycle infrastructure projects can be coordinated with other departments. The Sustainable Transport Project Officer will be responsible for liaising with different project teams in order to identify and potentially bring forward infrastructure projects.

Council's Sustainable Transport Project Officer will maintain regular contact with works planning staff to identify road re-sheeting projects that offer opportunities to install or upgrade bicycle infrastructure works identified in this Strategy.

7.2 Communications with the community

Council recognises that local cyclists have a practical knowledge of the network that can contribute greatly to the planning and development of an accessible, connected and safe cycling network. Council will ensure that the community is included in the decision making process for key cycling projects through a selection of the following:

- Face to face consultation
- Public comment on key documents
- Council's 'voice box' feedback program
- Communication with Bicycle User Groups (BUGs)
- Surveys
- Quarterly consultation with the Sustainable Transport Reference Group.

Council will also conduct regular communications with both the cycling and non-cycling community to ensure they have up to date information about cycling projects and policies. The community will be updated on cycling infrastructure projects, events and initiatives through a variety of methods including:

- Regular print, email, web media and social media (Including twitter, facebook and Council's webpage)
- Councillor newsletters
- Community newsletters
- Council's half yearly reports
- Workshops or community information sessions related to large projects
- Sustainable Transport Reference Group
- Specific local advertising campaigns (e.g. on bus shelters or banner poles)
- Ward forums (one held per ward per year).

8. Events and Programs Plan

8.1 Current Events and Programs

Several educational and promotional activities are currently undertaken by Council, including:

- Ride to Work Day Breakfast
- Free bicycle maps/ brochures of North Sydney cycling maps (electronic and hard copy)
- Free bicycle maintenance and tune-ups
- Free bicycle maintenance courses.

These activities are promoted through the cycling page on the Council's website which also contains information on road rules and rights for cyclists, a road sense checklist, links to bicycle user groups, cycling network maps and ride descriptions. Feedback indicates that these programs are successful in promoting cycling and Council will continue to run these events and programs.

8.2 Potential Events and Programs

Council will build on existing events and programs to encourage greater participation in cycling, improve knowledge of the network as it improves, encourage underrepresented groups to engage with cycling, and promote awareness of cycling and cycling related issues (e.g. safety). Specific events and programs to be investigated include:

- Guided rides of key routes and new infrastructure
- Valet Parking at Council Events
- Launch day events for new facilities. Launch day ride might include an organised ride that includes new infrastructure and linked sections of the existing network
- Joint programs with local businesses to encourage use of cycling for short trips through incentive schemes
- New maps showing access route to key attractions
- Ongoing 'ride to work' program
- Cycling confidence skill courses specific to particular user groups (women, less frequent riders)
- Events or information to promote awareness of the existing children's cycleway at Brightmore Reserve
- Bike and ride or 'bike bus' (where riders group together) programs encouraging parents to ride to school with their children
- Ride to school programs
- To widen the audience for the cycling message, host and market a Milsons Point or North Sydney bike day and website launch event with the support of BikeNORTH and bike shops.
- Assistance for schools wanted to participate in training and maintenance courses run by Bikewise at Sydney Park (funded by City of Sydney)
- Campaigns to promote awareness of the cycling opportunities as well as safety (including driver awareness). Council is currently collaborating with Lane Cove and Willoughby Councils to pilot of a cycling safety education program where messages are delivered through face to

face interaction. This program will be regularly reviewed and updated to deliver locally specific safety messages. Council will also investigate using existing bicycle safety campaigns, like those available through the Amy Gillett Foundation or the City of Sydney's recent posters that target driver awareness and cyclist's responsibilities.

- Information stalls at local markets and events (suggested during consultation).

Existing new events and programs will be incorporated into the North Sydney events program to encourage cycling as a normal activity to access key events.

Council will examine the need to incorporate multilingual communication into events and programs.

Bicycle programs will be brought under a single action plan and be part of a regular series of programs to increase cycling, promote safe cycling and raise driver awareness.

9. Monitoring and Evaluation Plan

Regular monitoring and evaluation will be used to evaluate the success of the Integrated Cycling Strategy and the extent to which Council is meeting its goals for cycling. Results of monitoring and evaluation activities will be reported regularly to the Traffic Committee, Sustainable Transport Reference Group and North Sydney Councillors. Monitoring and evaluation will centre on six key areas, each is further considered below:

- Actions set out in this Strategy
- Infrastructure Usage
- Cycling Participation
- Community attitudes towards cycling
- Cycling safety
- Event and program outcomes.

The findings of monitoring and evaluation will be reported as part of the annual review of the Sustainable Transport Action Plan with amendments made to the strategy and actions as appropriate.

9.1.1 Actions set out in this Strategy

Council will conduct an annual review of actions set out in this Strategy and report on performance through the Sustainable Transport Action Plan. This will include details of actions completed and incomplete and a review of performance relative to the targets set out in Section 5.

9.1.2 Infrastructure Usage

Council organised bicycle count programs will be implemented to monitor usage and changes in usage. Council will conduct counts in key locations (annually, bi-annually or quarterly depending on the location) to capture the quantity and direction of travel of cyclists. Where possible, data on the age group and gender of cyclists will be collected.

These counts will be conducted at times of peak usage such as on a Tuesday, Wednesday or Thursday for a minimum of one hour from 7:00am to 9:00am and 4:00pm to 6:00pm. Counts will include information about factors influencing usage such as weather conditions.

Potential regular count locations in North Sydney LGA are along popular cyclist routes such as:

- West Street
- Alfred Street
- Sydney Harbour Bridge Cycleway steps
- Shared bicycle and pedestrian bridges across the Warringah Freeway.

Permanent bicycle (and pedestrian) counters will be considered on existing shared paths to monitor use of the shared path network by both cyclists and pedestrians. This monitoring will be used to trigger consideration of physical separation between cyclists and pedestrians.

Permanent bicycle counters will be considered as part of new bicycle infrastructure works as a means of providing robust data about usage to allow for clear evaluation of the outcomes of investment in cycling infrastructure.

Bicycle parking audits will be conducted to assess the use of the parking and inform the provision of additional bicycle parking facilities. When bicycle parking provision is observed to be at least 75% full, additional facilities will be considered.

During the audits, areas with abandoned bicycles will be noted and abandoned bicycles 'tagged' for removal within a fortnight.

9.1.3 Participation

Council will monitor participation and interest in cycling through review of data such as:

- ABS statistics
- Participation numbers for events
- Ride to Work Day survey
- Visits to the North Sydney Council webpage and download of maps
- Direct consultation with cyclists and non-cyclist members of the community
- Direct consultation with businesses with employees who ride to work.

Monitoring of participation will include analysis of participation by groups who are currently underrepresented in cycling, to identify the extent to which Council's investment in infrastructure and programs is leading to diversified participation in cycling.

9.1.4 Safety

Council will monitor crash data through resources such as RMS CrashLink data and report on crash statistics as part of the annual review of this Strategy.

To be reported on CrashLink, a crash must result in \$500 worth of damage, lead to a police call out or a hospital visit, and so Council will also monitor smaller incidents where possible by tracking any reported incidents and mapping these in a bicycle geodatabase.

Any bicycle crash blackspots identified will be reported to the Traffic Committee, the annual Federal Blackspot Program and internal/ external transport stakeholders in order to prioritise responses.

9.1.5 Community attitudes towards the cycling network

Council will undertake regular assessment of attitudes toward the cycling network, the level of comfort felt by those using the networks and perceptions about network safety. This will occur through the annual survey conducted at the Ride to Work Day Breakfast, as well as through face to face interactions during bicycle related events.

Council will also consider conduct of intercept surveys with pedestrians and cyclists following the installation of new infrastructure or signage, to understand if the performance of the new infrastructure.

Council will also seek views from non-cyclists living and working in the LGA particularly with relation to perceptions about the capacity to use the network for transport and day to day errands. Council conducts a Community Feedback Survey every two years – cycling specific questions will be incorporated into future surveys. Council will also make use of existing communications with the business community and chambers of commerce to gather feedback about cycling issues and planning.

9.1.6 Events and Programs

Council will collect feedback on events and programs by collecting data on participation numbers, demographic composition and qualitative feedback. This will be used to evaluate the success of the programs relative to investment and identify strategies to increase effectiveness.

10. Action Plan

	Action	External Involvement	Priority	Scale	Commencement	Targeted Completion
1	Investigate the possibility for a six month trial of separated bi-directional bike lane on West Street	RMS	High	Medium	June 2014	January 2015
2	Planning and detailed design concept for Route 1, Section 2.	General Community Councillors Bike User Groups Sustainable Transport Reference Group RMS TfNSW	High	Medium	January 2015	2015
3	Construction of Route 1, section 2, as set out in Action 2	Contractor	High	Large	2016	2016
4	Liaise with RMS and TfNSW regarding the delivery Section 2 of Route 1	RMS TfNSW	High	Medium	From commencement of Strategy	2016
5	Design and construction/works for treatments proposed on Route 2	Sustainable Transport Reference Group (review where required)	High	Medium	From commencement of Strategy	2015 (design details) (construction to proceed subject to approval by NSC Traffic Committee and RMS)
6	Install line marking, minor upgrades and signage recommended along Route 3 (excluding Merlin Street)	RMS	Medium	Medium	From commencement of Strategy	2016
7	Planning and concept design for Merlin Street and Ernest Road crossing point.	Council/or consultant	High	Medium	2014	2015
8	Liaise with TfNSW and RMS to investigate feasibility of bi-directional separated cycleway connecting Route 3 to Route 1 via Ernest Street	RMS TfNSW	-	-	As opportunities arise	-
9	Study into potential treatments through St Leonards Park (connection between Route 1 and Route 3)	Consultant	High	Medium	From commencement of Strategy	2014 (finalisation of concept) 2015 (construction to commence)
10	Liaise with Mosman Council to review signage and connections to Route 3	Mosman Council	Medium	Small	From commencement of Strategy	

	Action	External Involvement	Priority	Scale	Commencement	Targeted Completion
11	Planning and detailed concept designs for Route 4	RMS TfNSW Consultant Willoughby Council	Medium	Medium	2017	2017
12	Construction/works for Route 4	RMS	Medium	Medium/Large	2018	2018
13	Construction/works for Route 5	RMS	Medium	Medium/Large	2019	2019/2020
14	Implement Existing Network Upgrades as set out in Table 6.2.	Various	-	-	From commencement of plan	As works/funding allows
15	Develop online reporting tool (to report network faults and issues)		Low	Small	2014	2014
16	Conduct annual saddle survey		Low	Small	Annually, one year from Strategy commencement	Duration of Strategy
17	Document network issues into central register		Low	Small	From commencement of Strategy	Duration of Strategy
18	Provide annual report on network issues	Sustainable Transport Reference Group	Low	Small	Annually, one year from Strategy commencement	Duration of Strategy
19	Review network issues and prioritise works required	Sustainable Transport Reference Group Bike user groups	Medium	Small/medium	Ongoing	Duration of Strategy
20	Conduct secure bike parking feasibility study	Council or consultant	Medium/High	Medium	2014	2015
21	Install secure bike parking based on Action 20		Medium	Medium/large	Subject to findings of Action 20	-
22	Install U and O Rails in activity centres and key locations		Medium	Small/medium	2014	Duration of Strategy
23	Develop online parking request tool		Low	Small	2014	2014
24	Add new parking locations to Council' bike parking webpage		Low	Small	Ongoing	-
25	Install bicycle network support facilities		Low	Small/medium	Need reviewed annually, and during the construction of new facilities	Duration of Strategy

	Action	External Involvement	Priority	Scale	Commencement	Targeted Completion
26	Install signage	Neighbouring LGAs	Medium/High	Medium	Immediately after commencement of Strategy and at the delivery of new infrastructure	Duration of Strategy
27	Remove redundant signage		Medium	Low/medium	With new infrastructure and upgrades	2020
28	Liaise with neighbouring Council's regarding signage consistency		Medium	Small	2014	Duration of Strategy
29	Create standing item (traffic committee) to consider infrastructure opportunities and network issues	Traffic Committee TfNSW RMS	Medium	Small	2014	Duration of Strategy
30	Attend North Shore Regional and Bicycle Committee	Various	Medium	Small	Ongoing	Duration of Strategy
31	Communications with Community	Cycling and non-cycling Community	High	Medium	Ongoing	Review actions annually as part of STAP
32	Host Ride to Work Day Breakfast	-	Medium	Small/Medium	Annually	Review actions annually as part of STAP
33	Free cycling maps	-	Medium	Small/Medium	Annually	Review actions annually as part of STAP
34	Free Bike tune-ups	North Sydney Community Centre	Medium	Small/Medium	Quarterly at NSCC and during 'pop up' events	Review actions annually as part of STAP
35	Maintenance Course	North Sydney Community Centre	Medium	Small/Medium	Quarterly at NSCC	Review actions annually as part of STAP
36	Conduct new events as proposed in Section 8	Various	Medium	Various	TBA	Review actions annually as part of STAP
37	Bicycle Count Programs	-	Medium	Small/medium	2014 From the launch of new infrastructure	Review actions annually as part of STAP
38	Bike parking audits	-	Medium	Small/medium	2014 From the launch of new infrastructure	Review actions annually as part of STAP
39	Review Safety	-	High	Small/medium	2014	Review actions annually as part of STAP
40	Review community attitudes towards network	Community	High	Small/medium	2014	Review actions annually as part of STAP

10.1 Location Specific Actions

	Location	Issue	Action	Scale	Targeted Completion
41	Upgrade the street lighting along Middlemiss Street	Poor street lighting	Upgrade Lighting	Medium	2015
42	Pacific Highway shared path (between Arthur Street and Blue Street)	Obstructions caused by trees and signage Conflict point with traffic where path joins road	Investigate the possibility of consolidating signage. Install pavement markings to improve user (i.e. centre lines or 'keep left' markings) Provide markings/path treatment at junction of road and path	Medium/Large	2015
43	St. Peters Park shared path	Metal barriers used as chicane feature	Liaise with relevant internal stakeholders to investigate the potential for separated bike a pedestrian path component (short term)	Medium	2016
44	Spofforth Street	No designated bicycle treatments	Liaise with Mosman Council to determine appropriate bicycle infrastructure treatments	Medium	2015
45	Rangers Road	Pinch point caused by on-street parking adjacent to shops	Review parking restrictions, consider timed peak hour restriction of parking	Medium	2015
46	Brook Street Off Ramp crossing point	While not in North Sydney LGA, this provides a key link to West Street. The current crossing point is difficult and involves crossing two lanes of high speed traffic.	Work with the Roads and Maritime Services (RMS) and Willoughby Council to identify a solution for improved connection	Large	2016

Appendix A

Planning and Policy Context

Planning and Policy Context

There is a strong planning and policy context for cycling in NSW, though funding and implementation has not kept pace with the proposed network strategies and plans. These plans have identified priority regional infrastructure, local bicycle routes, bicycle parking and bicycle encouragement programs.

A1. State Planning and Policy Context

Sydney's Cycling Future

Sydney's Cycling Future sets a direction for cycle planning in Sydney based on a change in culture in Sydney where more people choosing to ride a bike for transport. The document identifies that 70 per cent of NSW residents would like to ride a bike more for everyday transport – and would do so if cycling was made a safer and more convenient option.

The document highlights the need for infrastructure solutions that provide safe separation from motor vehicles and pedestrians wherever possible, and states the following with respect to North Sydney cycle network: the need for a north south connection through North Sydney to cater for regional trips.

"We will work with North Sydney Council to complete the missing link between the Naremburn Cycleway and the Sydney Harbour Bridge.

We are currently investigating three options for this link:

A along West Street

B beside the Warringah freeway

C along Miller Street.

In the longer term, safe and separated cycle connections will be developed to Willoughby, Chatswood and Mosman"

NSW Long Term Transport Master Plan, 2012

The NSW Long Term Transport Master Plan sets the framework for the NSW Government to deliver an integrated, modern transport system. The final version of the NSW Long Term Transport Master Plan was released in December 2012 and sets out 220 short, medium and long term actions to integrate, grow, modernise and manage the transport network across NSW.

The Master Plan sets out five key measures related to cycling:

- i Improved access to user-friendly bike trip information.
- ii A long term NSW Cycling Investment Program to improve the planning, management and delivery of cycleway capital programs, supported by design solutions and standards to reflect customer needs.
- iii A program to increase and improve bike parking at public transport interchanges.
- iv A Connected Cycling Network that targets investment in clearly defined cycleways within a five kilometre radius of major urban centres in the short term and 10 kilometre radius of centres in the longer term.
- v Enhanced cycling routes in regional centres to increase the number of people who cycle.

The Master Plan contains a specific target to double the number of bicycle trips in Metropolitan Sydney by 2016, with further growth in cycling for all trips in NSW by 2031, particularly in urban centres.

The NSW State Plan

The NSW State Plan incorporates a target to “more than double the mode share of bicycle trips made in the Greater Sydney region, at a local and district level, by 2016”. The plan included a priority action complete the construction of the Metro Sydney Bike Network and work with local councils to complete local cycle networks as part of an integrated transport network.

The NSW BikePlan (2010)

Prior to the release of the NSW Long Term Transport Master Plan, the NSW Bike Plan was the primary bicycle planning document used in NSW and outlined state government plans to deliver a safe and practical bicycle network.

The Plan set out a whole-of-government agenda to promote active transport, with infrastructure and encouragement initiatives coming under five broad headings:

- Create connected cycling networks
- Make bike-riding safe for all
- Plan cycling-friendly neighbourhoods
- Grow jobs in cycling
- Get organisations working together to support bike-riding.

The BikePlan used the 7.5km North Ryde to Naremburn cycleway as a case study and an example of the ingenuity needed to accommodate walking and cycling successfully within one of Australia’s busiest transport corridors. The plan identified Naremburn to Sydney Harbour Bridge as a major missing link of the Metro Sydney Bike Network and also stated, “*Work will commence on sections of the new cycleway between Naremburn and North Sydney, while engineering studies will be undertaken for the long-term ‘HarbourLink’ proposal*”.

A2. Regional Planning & Policy Context

Inner Sydney Regional Bicycle Plan

In 2009, the City of Sydney commissioned the *Inner Sydney Regional Bicycle Plan (ISRBP)* to outline a connected bicycle network for 15 inner Sydney Local Government Areas (LGAs), including North Sydney. The plan indicated a target delivery timeframe was between 2010 and 2017. Subsequent documentation included the *ISRBP Network Implementation Strategy and Network Demand Assessment and Economic Appraisal*. The reports reviewed existing bicycle use, assessed and costed proposed corridors, indicating an economic return on investment and a prioritised list of routes, based on a matrix of factors designed to deliver maximum regional connectivity.

In the assessment, North Sydney ranked 11th of the 26 Statistical Local Areas (SLA) assessed based on the 2006 Journey to Work bicycle mode share of 0.8%, scoring highly in the demand results for origin-destination pairs. Table A1 shows the ranking and the associated Benefit Cost Ratio (BCR) for bicycle improvements to each pair.

Table A1: Origin-Destination Pairs and BCR (under AECOM Estimate)

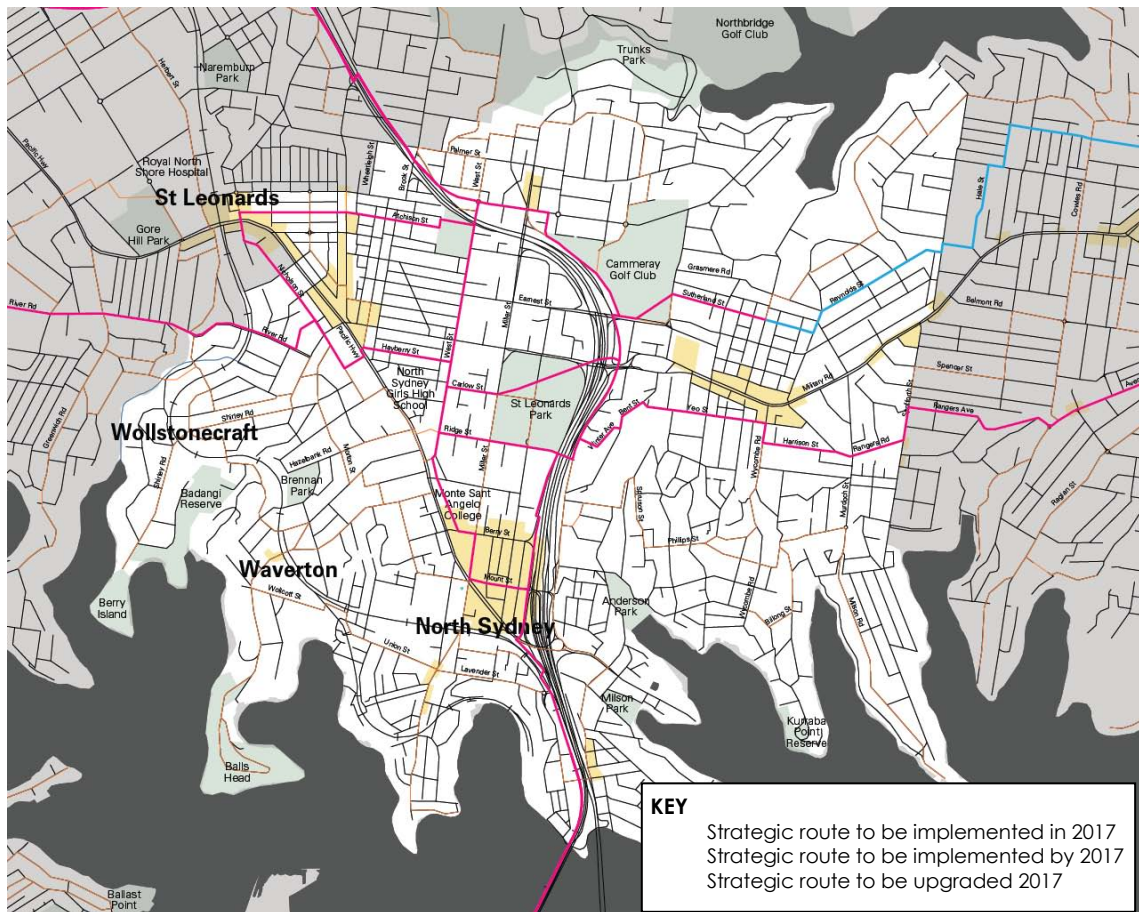
BCR Ranking	Origin LGA	Destination LGA	BCR
16	North Sydney	City of Sydney	2.56
28	Mosman	North Sydney	0.91
28	Manly	North Sydney	0.84
33	North Sydney	Willoughby	0.61
51	Leichhardt	North Sydney	0.38
55	Lane Cove	North Sydney	0.30

Source: Inner Sydney Regional Bicycle Network: Demand Assessment and Economic Appraisal (AECOM), 2010

The treatments identified for North Sydney LGA included separated bidirectional cycleways, shared paths and contraflow bicycle lanes. The treatments for each alignment were indicative and unfunded. The locations identified are shown in Figure A1 and listed alphabetically in Table A2.

The report noted that the Lower North Shore and Sydney CBD is constrained by the limited number of attractive options on approach / departure from the Sydney Harbour Bridge Cycleway, noting the potential of the HarbourLink proposal to significantly increase cycling amenity. Further details on HarbourLink are contained below.

Figure A1: Inner Sydney Regional Bike Plan – North Sydney LGA Strategic Route Implementation Map



Source: Inner Sydney Regional Bicycle Plan Implementation Strategy (AECOM), 2010 (pg. 148)

Table A2: Indicative Treatment Locations – North Sydney LGA

LOCATION	TREATMENT	MODIFICATION	YEAR
Alfred St	Shared path on verge upgrade	Duplicate shared path into no parking zone at right turn into Winter Ave. Bicycle ramp at stairs to Ridge St pedestrian/bicycle bridge.	2010
Alfred St South	Bidirectional cycleway on verge	New footpath works to eastern edge of cycleway	2010
Amherst St (West of West St)	Separated bidirectional cycleway on road		2010
Amherst St (West St to Bellevue St)	Separated bidirectional cycleway on road		2011
Angelo St	Shared zone		2010
Arthur St	Bidirectional cycleway in park		2010
Atchinson St	Separated bidirectional cycleway on road		2010
Bellevue St	Separated bidirectional cycleway on road		2011
Bent St	Separated one way uphill		2010
Berry St	Separated bidirectional cycleway on road		2010
Bruce St	Separated bidirectional cycleway on road		2012
Cammeray Golf Course	Shared path in park		2015
Carlow St	Separated bidirectional cycleway on road		2012
Christie St	Separated bidirectional cycleway on road		2010
Church St	Separated bidirectional cycleway on road		2010
Grasmere	Separated bidirectional cycleway on road		2012
Harrison St	Separated bidirectional cycleway on road		2010
Hayberry St	Mixed zone		2012
Merlin St	Separated bidirectional cycleway on road		
Middlemiss St	Separated contraflow cycle lane		2010
Miller St (Berry St to Elizabeth Plaza)	Separated bidirectional cycleway on verge		2010
Mount St	Separated bidirectional cycleway on road		2010
Nicholson St	Separated bidirectional cycleway on road		2015
Pacific Hwy (Middlemiss St to crossing - 17m)	Separated bidirectional cycleway on road		2010
Prospect Ave	Shared zone		2017
Rangers Rd	Separated bidirectional cycleway on road		2010
Rest Park	Shared path in park		2010
Reynolds St	Mixed zone		2017
Reynolds St / Prospect St cliff	Stairs and bicycle ramp to be installed		2010
Ridge St	Separated bidirectional cycleway on road		2014
River Rd	Separated bidirectional cycleway on road		2012
Lamont St	Separated bidirectional cycleway on road		2012
Sinclair St	Separated bidirectional cycleway on road		2012
Spofforth St	Separated bidirectional cycleway on road		2010
St Leonards park	Shared path in park upgrade		2012
Sutherland St	Standard separated bidirectional		2012
Warringah Fwy (Merrenburn Ave to Amherst St exit)	Freeway cycleway extension		2011
Waters Rd	Separated bidirectional cycleway on road		2017
West St	Separated bidirectional cycleway on road		2010
Winter Ave	Separated contraflow cycle lane		2010
Wycombe St	Separated bidirectional cycleway on road		2010
Yeo St (Wycombe St to Ben Boyd Rd)	Mixed zone		2010
Yeo St (Ben Boyd Rd to Bent St)	Separated bidirectional cycleway on road		2010

Source: Inner Sydney Regional Bicycle Plan Implementation Strategy (AECOM), 2010 (pg. 138)

HarbourLink

The HarbourLink concept proposes to replace the existing 55-steps at the northern end of the Sydney Harbour Bridge Cycleway with a grade separated path from the northern end of the Harbour Bridge extending northwards to Falcon Street, North Sydney. The 1.6km elevated path links the Sydney Harbour Bridge to Ridge Street at the south-eastern corner of St Leonards Park and to Falcon Street along the Warringah Freeway corridor.

The grade separated shared path would bypass road level issues (topography, congestion) and provide a direct link to the broader cycleway network. HarbourLink has the potential to significantly increase cycling safety amenity by bypassing North Sydney CBD and providing a gentler gradient for cyclists.

HarbourLink is currently at a concept stage, with further development dependant on funding for the high costs associated with detailed design and construction. PricewaterhouseCoopers (PWC) and Sinclair Knight Merz (SKM) were engaged by North Sydney Council to undertake a demand study and strategic cost benefit analysis of the 3km Naremburn to Harbour Bridge Active Transport Corridor. This corridor was comprised of two sections:

- **Section 1 – 'The Northern Link':** connecting the southern terminus of the existing Lane Cove Tunnel shared user path at Merrenburn Avenue, Naremburn to Ridge Street, North Sydney, following the alignment of the Warringah Freeway.
- **Section 2 – 'HarbourLink':** connecting Ridge Street, North Sydney with the existing shared user path at the northern end of the Harbour Bridge, following the Warringah Freeway corridor.

Early indicative capital costs for the project were in the range of \$55 to \$85 million.

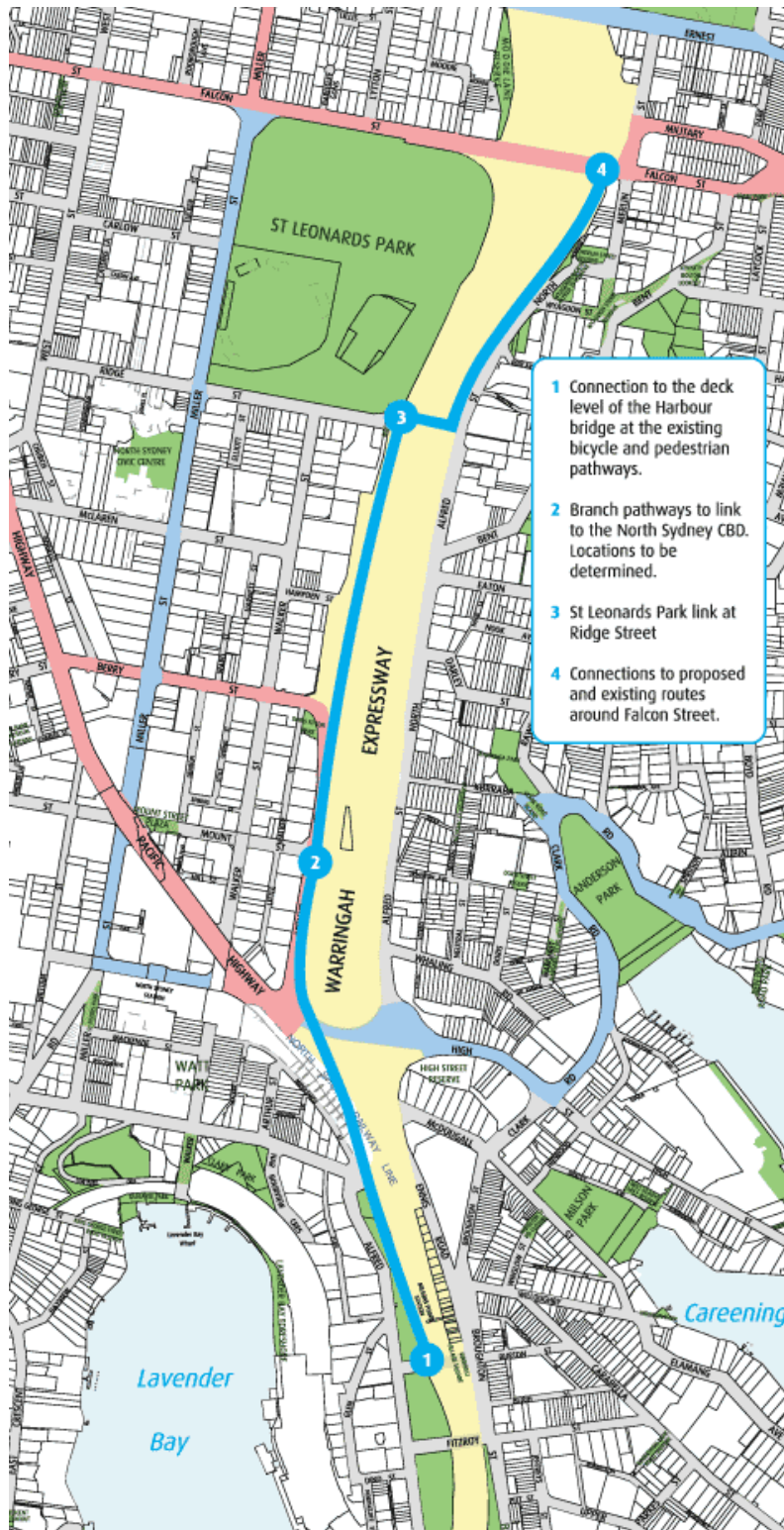
Artists impressions of HarbourLink are shown in Figure A2 and the concept alignment is shown in Figure A3.

Figure A2: Photo montage of HarbourLink - Connection to the Sydney Harbour Bridge



Source: Evaluation of the costs and benefits to the community of financial investment in the Naremburn to Harbour Bridge Active Transport Corridor (HarbourLink) (SKM/PWC), 2010 (Figure 8, pg. 21).

Figure A3: HarbourLink Concept Alignment



Source: Evaluation of the costs and benefits to the community of financial investment in the Naremburn to Harbour Bridge Active Transport Corridor (HarbourLink) (SKM/PWC), 2010 (Figure 7, pg. 20).

A3. Local Planning & Policy Context

Two bicycle infrastructure plans have been developed for North Sydney in the past 10 years:

- i North Sydney Bike Plan 2004 (Arup, North Sydney Council)
- ii North Sydney Bike Strategy 2009 (Arup, North Sydney Council).

During this time bicycle facilities have been opportunistically installed in the North Sydney LGA, particularly as state funding has become available through major infrastructure projects. Further cycling infrastructure, and improvements to existing infrastructure, is necessary to close gaps in the bicycle network and ensure bicycle facilities are attractive to a range of potential cyclist types.

The task of connecting existing North Sydney bicycle infrastructure is challenging. The existing road and footpath networks have established traffic, parking and pedestrian patterns which make it challenging to provide safe, separated infrastructure for cyclists. Footpaths and roads are busy and are constrained by existing services, landscaping and on-street parking operations.

North Sydney Bike Plan, 2004

The North Sydney Bike Plan was prepared in 2004 to review and update the then existing bicycle policy and to assist council in developing future bicycle planning policy. The plan:

- reviewed the existing bicycle network and bicycle use in North Sydney LGA
- analysed the accident history, accident blackspots and accidents involving cyclists
- identified priority routes
- documented community and stakeholder consultation
- identified potential funding sources
- outlined the bicycle parking strategy and an engineering route strategy of prioritised, costed infrastructure improvements.

The Engineering Route Strategy emphasised regional connectivity, with 18 routes identified, ranked and costed across the LGA (Table A3).

The Bike Plan included five key recommendations:

- iii Adopt the recommended bicycle network as the basis of future cycleway planning and management.
- iv Adopt, in principle, the engineering action priorities (Table A3) with funding to be determined by Council as part of its annual budget reviews.
- v Consideration be given to including the works identified for implementation beyond the short term in relevant future works programs.
- vi Seek additional funding from other government and private agencies.
- vii Monitor the implementation of the North Sydney Bike Plan through an appropriate committee or working party to be nominated by Council.

Table A3: Proposed Bicycle Routes (2004 Bike Plan)

Route No.	Description	Priority H - High M - Medium L - Low	Estimated Cost
1	Morton Street, Wollstonecraft to Cremorne via Yeo St.	H	\$47,413
2	Milsons Point Station to Cremorne Point Ferry Wharf	H	\$35,492
3	St Leonard's Station to West Street via Atchison Street	H	\$18,894
4	Palmer Street to Amherst Street	H	\$2,250
5	Cameray Road to Young Street	H	\$6,632
6	North Sydney to Balls Head	L	\$12,928
7	St Leonards to Crows Nest	M	\$29,577
8	Lavender Bay Recreational Route	L	\$72,880
9	Milner Crescent to Shirley Road via Shirley Lane	L	\$800
10	Shirley Road to Bay Road	M	\$1,904
11	Wollstonecraft Station to Greenwich via Smoothey Park	M	\$31,750
12	Wollstonecraft Station to Berry Island Reserve	M	\$1,040
13	Ernest Street to West Street via Cammeray Avenue and Rosalind Street, Cammeray	H	\$12,896
14	North-south route on Waters Road	M	\$14,415
15	Waters Road to Bannerman Street	M	\$11,381
16	Phillips Street to Neutral Bay Wharf	M	\$6,334
17	Miller Street to McMahons Point Wharf	M	\$3,840
18	Miller Street bridge to Cammeray Road	L	\$3,240
Total			\$313,666

Source: North Sydney Bike Plan 2004 (Arup, Table 2, pg. iv)

North Sydney Bike Strategy 2009

The North Sydney Bike Strategy was completed in 2009 and followed on from the North Sydney Bike Plan 2004. The aims of the strategy were:

- to provide Council with a program of works to be implemented in terms of high priority (1-2 years), medium priority (3-5 years), low priority (6-10 years) and very low priority (11+ years)
- to improve the pedestrian and cycling environment and links to encourage an increase in pedestrian and cycling trips.

The bike strategy:

- Reviewed existing bicycle policy and usage in North Sydney
- Reviewed bicycle routes recommended for implementation in the 2004 Bike Plan (9 of the 18 routes were fully implemented)
- Reviewed major regional routes developed by Roads and Maritime Services (RMS) in North Sydney and adjoining LGA's including HarbourLink
- Reviewed bicycle infrastructure types, signage, road markings and standard treatment types, including a unit cost estimate for each treatment type

- Reviewed existing bicycle parking and also recommendations for future bicycle parking types, locations, quantities and associated cost estimates
- Identified potential funding sources
- Outlined an engineering route strategy including prioritised, costed infrastructure improvements
- Detailed stakeholder consultation workshops undertaken on the draft North Sydney Bike Strategy 2009.

The 2009 Bike Strategy identified 20 proposed routes to be implemented in North Sydney LGA as shown in Table A4. The 2009 Bike Strategy adopted a different route numbering system to that used in the 2004 Bike Plan.

Table A4: Proposed Cycle Routes (2009 Bike Strategy)

Route Number	Route Description
1	Wollstonecraft to Mosman
2	Milsons Point Station to Cremorne Point Wharf
3	St Leonards to West Street
4	Palmer Street to Amherst Street
5	Cammeray to Young Street
6	Balls Head Drive
7	St Leonards to Crows Nest
8	Sydney Harbour Bridge to Cammeray
9	Smoothey Park to Morton Street
10	Shirley Road to Bay Road
11	Milner Crescent to Berry Island via Shirley Road
12	Ernest Street to West Street via Rosalind Street
13	Grasmere Reserve to Bannerman Street via Winnie Street
14	Phillips Street to Neutral Bay Wharf
15	Miller Street to McMahons Point Wharf
16	North Sydney CBD to St Leonards
17	Strathallen Avenue to Cammeray Road
18	West Street to Wyong Road
19	Palmer Street to Ernest Street via Cammeray Golf Course
20	Nicholson Street to West Street

Source: North Sydney Bike Strategy 2009 (Arup Table 4, pg. 37)

2020 Vision – North Sydney Community Strategic Plan 2009-2020

North Sydney Council's 2020 Vision represents the North Sydney community's vision of where they want to be in 2020. This plan contained a specific goal to encourage sustainable transport (goal 2.4) with the following related objectives:

- provide a network of accessible, safe and linked pedestrian and cycle paths, integrated with open spaces, throughout North Sydney (2.4.1)

- promote sustainable travel for workplaces and venues in North Sydney (2.4.2)
- provide a network of accessible, safe and linked pedestrian and cycle paths throughout North Sydney (2.4.3).

The 2020 Vision contains the following actions to achieve these goals and objectives:

- i Increase the amount of street space dedicated to sustainable transport modes (e.g. bus lanes and cycle lanes)
- ii Improve 'end of trip' facilities (e.g. bike parking, showers and change facilities) for walkers and cyclists
- iii Improve access and connections between open space and recreational facilities for pedestrians and cyclists
- iv Advocate for funding for walking and cycling facilities
- v Improve directional signage for pedestrians and cycling networks in North Sydney.

Sustainable Transport Action Plan 2010-13

The Sustainable Transport Action Plan consolidated and reported on a number sustainable transport objectives, actions and projects committed to through the North Sydney Council Delivery Program 2010/11-2013/14 and the North Sydney Greenhouse Action Plan 2010-2015.

This Plan also included Council transport projects noting that Council should be a leading example on sustainable transport initiatives and recognised that Council can facilitate and encourage sustainable transport options for staff including:

- Purchasing hybrid or other fuel-efficient vehicles
- Interest-free loans for public transport travel passes
- Secure bike parking
- Council electric bike fleet
- Discounted Bicycle NSW membership.

The Sustainable Transport Action Plan recognised that while transport provision in Sydney is largely the domain of NSW State Government, Council is able to influence aspects of community transport including:

- Managing parking supply, allocation and cost
- Managing traffic on local roads
- Providing pedestrian and bicycle facilities
- Supporting behaviour change programs in schools, businesses and the community
- Providing information about different transport options
- Controlling land use and development
- Lobbying state and federal governments.

The Plan contained the following key actions related to community transport in North Sydney:

- Supporting car share schemes
- Supporting walking school bus schemes
- Resident parking permit schemes
- Providing additional bicycle and pedestrian facilities.

Development Control Plans

Development Control Plan (DCP) 2002 and Draft DCP 2012 encourage the use of bicycles as an environmentally beneficial form of transport and an alternative to the use of private motor vehicles. Both plans set out the minimum on-site bicycle parking requirements for different development types in North Sydney. Both DCPs require developments to provide secure, on-site bicycle parking spaces and storage in accordance with Australian Standard (AS) 2890.3:1993 Bicycle Parking.

Planning Approvals Required

Implementation of priority routes and other facilities proposed in this Strategy will need to be in accordance with relevant planning and approvals processes, policies and legislation including:

- Council Plans and Policies, such as the Local Environmental Plan (LEP)
- Relevant State Planning Policies
- Traffic committee approvals
- RMS approvals
- Other statutory processes (Development Assessment, Review of Environmental Factors, Environmental Impact Assessments).

Delivery of the five priority routes identified in Section 6 will require approval from Council's Traffic Committee, Council and the Roads and Maritime Services (RMS).

Appendix B

Funding Opportunities and Sources

Funding Opportunities and Sources

In the current political environment, there is increasing pressure on the application of limited funding across a wide range of transport-related projects. Therefore it is important to establish a consistent project assessment framework across all transport projects such that the relative merits of (for example) a small cycling project can be compared to a major construction project.

One common tool used for road projects is cost-benefit analysis. Such analysis seeks to derive a benefit-cost ratio (BCR) through valuing in current terms:

- Capital project cost
- Maintenance and other ongoing costs
- Vehicle operating cost (VOC) savings
- Time cost savings per vehicle hour
- Accident cost savings
- Environmental externalities (costs or benefits).

Such analysis can be applied to cycling projects with additional economic parameters included such as health benefits. Such analysis is dependent on the availability of suitable data which can be difficult, particularly for smaller projects. Due to the wide-ranging benefits, quantification can be difficult where these involve other government sectors and indirect links, such as health benefits.

The recommended bicycle network plan proposes high quality infrastructure in line with contemporary community aspirations for bicycle use. There are a number of funding programs which may provide the additional financial support necessary for implementation of both the physical infrastructure and the related social plan to meet current and future community needs.

Three websites that provide further detail:

- <http://www.cyclingresourcecentre.org.au/section/category/funding>
- <http://www.cyclingpromotion.com.au/funding-opportunities.html>
- http://www.bicycleinfo.nsw.gov.au/tools_and_resources/funding_for_cycling_projects.html

A summary of potential funding sources is provided below.

B1. State Government

TfNSW - Long Term Transport Master Plan

This Master Plan contains a specific target to double the number of bicycle trips in Metropolitan Sydney by 2016, with further growth in cycling for all trips in NSW by 2031, particularly in urban centres.

\$27.5 million was allocated to cycling in the 2012-13 budget, \$8.86 million of which will be allocated to match Council funding to deliver approximately 100 local cycleway projects in over 70 different locations as well as support local cycling initiatives such as NSW Bike Week.

Roads and Maritime Services

The RMS's Bicycle Program allocates \$5 million annually to bicycle projects in NSW council areas. This funding program is designed to assist councils with the development and implementation of their local bicycle networks. Full details are available in the Memorandum of Understanding available on the RMS

website: http://www.rta.nsw.gov.au/trafficinformation/downloads/mou_o6o9.pdf. Programs for potential funding include:

- Regional Roads REPAIR Program (22602) – the objective of this program is to provide additional assistance to councils to undertake larger works of rehabilitation, and development on Regional Roads to minimise the long-term maintenance costs of these roads commensurate with their function and usage. Walking and cycling infrastructure could potentially be included within this cost.
- Accident Blackspot Treatments (26301) – the objective of this program is to reduce the occurrence and severity of crashes at known crash locations by installing cost effective treatments, ensuring a road safety return.
- Cycleways (27304) – this program is aimed specifically at designing and constructing new on-road and off-road cycleways that increase the level of network availability in NSW. Funding arrangements fall into two broad categories:
 - State bicycle routes identified in the BikePlan 2010 – 100% funded by the RMS but under the care and control of the Council following completion.
 - Local bicycle routes identified in a Council's Bike Plan – 50/50 funded and to be maintained by Council following completion.
- Bicycle Facilities (27305) – this program is aimed at improving the operation of existing cycleways. Typical projects include upgrades of existing cycleways, retrofitting at existing traffic control signals, installation of kerb ramps and replacement of unsafe drainage grates.
- Bicycle User Support (27306) – this program aims to support cycling through research, training and promotion. Typical projects include bicycle promotion, bicycle use surveys, development and production of cycleway maps and cycling related guidelines.
- Local Government Pedestrian Facilities (27401) – this program helps to provide facilities on local and regional roads to improve pedestrian safety, mobility and access. Shared zones are eligible for funding under this program.

Bike Week Funding

NSW Bike Week is a state-wide NSW Government funded initiative held in September that aims to raise the profile of cycling as a healthy, easy, low cost and environmentally friendly transport alternative for driving short trips. Funding is available to promote local community NSW Bike Week events, which should be designed to encourage cycling in the local community.

B2. NSW Department of Planning and Infrastructure (DoPI)

Sharing Sydney Harbour Access Program

The Sharing Sydney Harbour Access Program is a NSW government initiative to improve public access to and enhance the recreational enjoyment of Sydney Harbour and its tributaries for the people of Sydney and its visitors.

The Sharing Sydney Harbour Access Program is administered by DoPI and provides matching funding for improvements which could be made to the access routes to Sydney Harbour foreshores and waterways. These include on-road and off-road bicycle ways and bicycle storage. Also suggested within

the plan was to improve the ability for ferries to carry bicycles and the storage facilities at ferry wharfs for travellers.

The main sources of Access Program grant funds are:

- Waterways Authority, through WADAMP
- SHFA, through 'seed funds'
- DIPNR, through SRDF.

The Sharing Sydney Harbour Access Program website indicates that in 2007 the Program was extended over five years to provide \$6.75 million until 2013. Each year up to \$1.35 million is distributed on a dollar-for-dollar basis for specific capital works projects such as walking tracks, bicycle paths, new public waterfront parks, jetties, pontoons and boat launching facilities.

Applications typically close in October.

Metropolitan Greenspace Program

The Metropolitan Greenspace Program is administered by the Department of Planning and provides matching funding for improvements which could be made to access regionally-significant metropolitan open space in NSW. Since 1990, up to \$2.5 million has been awarded annually, on a matched funding basis.

The objective of the program is to assist local government in the development and planning of regionally significant open space and to enable more effective use of these areas by the public. The program aims to promote partnerships between State and Local Government. Successful projects in the last round of funding included the Withers Road Cycleway (Hills Shire Council), a feasibility study into the extension of the Cooks River Cycleway (Rockdale City Council) and planning and design of an off-road mountain bike facility (Ku-ring-gai Council).

NSW Environment Trust

The Department of Environment and Heritage (DEH) manages a number of grant programs under the banner of NSW Environment Trust. Each grant program funds projects which rehabilitate or regenerate the environment, or promote environmental education and sustainability. Cycling infrastructure can be incorporated into projects as a way to reduce greenhouse gas emissions by reducing car dependency and increasing cycling. Details of past and present programs are provided on the [DEH website](#).

Office of Communities, Sport and Recreation

The NSW Office of Communities, Sport and Recreation (OCSR) has a number of funding programs available to local governments. Further details on all grant programs are available on the [OCSR website](#), including:

Sport and Recreation Facility Grant Program

This program provides funding to build and upgrade sporting and recreation facilities with the aim of increasing the availability, standard and quality of facilities in NSW. This could include cycling tracks and training facilities. Levels of funding available range from \$500 - \$200,000, with the amount requested being 50% or less of the total project cost.

Sport and Recreation Participation Program

This program provides funding for projects designed to increase regular and on-going participation in sport, recreation or structure physical activity. Objectives include increasing participation, addressing barriers to participation and providing training programs. The funding could be appropriate for a cycling encouragement program.

ClubGRANTS

Clubs that earn over \$1 million annually in gaming machine revenue provide funding for community projects and services, and in turn receive dollar-for-dollar gaming tax deductions. The new ClubGRANTS scheme, announced in 2012 by the State Government, will provide a minimum of \$264 million of funding over the next four years, including approximately \$10 per year for large scale sport, health and community infrastructure projects. This funding can also be used to implement cycling encouragement initiatives like cycling programs, workshops and distributing maps. Further details are available on the [ClubsNSW website](#).

NSW Health and Area Health Services

The Local Health Network incorporating North Sydney is the Northern Sydney Local Health District. The health district annual budget typically allocates funding for health promotion, in areas which promote health-inducing physical activity. In South Western Sydney, this funding has been used to pilot work place travel planning and promote cycling for short trips.

B3. Federal Government

Department of Infrastructure and Transport

The Department of Infrastructure and Transport (DIT) offers a range of funding opportunities under the banner of the Nation Building Program. Details of all programs are provided via the [DIT website](#), including the following:

Roads to Recovery Program

In November 2000, this program was introduced as a single intervention by the Commonwealth to address the specific problem of local roads reaching the end of their economic life, and their replacement being beyond the capacity of local government. Over four years from 1 July 2009, the Australian Government, will provide additional funding of \$1.75 billion. This is in addition to its untied Financial Assistance Grants to councils for roads and other purposes. This program has been used by councils throughout Australia to fund bicycle infrastructure development and upgrades.

Black Spot Program

The Black Spot program began in 1996-97 and is part of the government's commitment to reduce crashes on all roads in Australia – it has approval to run to 2013-14. The program, which provides \$59.5 million per annum, targets road locations where crashes are occurring. Typical projects include upgrading traffic signals and improving roundabouts at dangerous locations. This program has been used by councils throughout Australia to fund bicycle infrastructure development and upgrades.

Liveable Cities Program

The Liveable Cities Program, new in 2011, will provide \$20 million over two years. The program was developed to support state, territory and local governments in meeting the challenges of improving the quality of life in capital and regional cities. The programs encourages government partnerships and foster innovative solutions to promote high quality urban design, improve the quality of open space, and address high levels of car dependency and traffic congestion, among other things. Applications for the program are closed - 2012 application dates have not yet been announced.

B4. Other Funding Opportunities

Reinstatement Works

Following significant corridor upgrades for water, sewer or power, the local road network must be reinstated. These works may be undertaken by the contractor or by council. During the reinstatement works it is an opportune time to deliver bicycle facilities within the existing kerbs.

Private Development

Property developers and property managers levy new buildings to fund local walking and cycling infrastructure nearby. If a development is occurring (such as a shopping centre), bicycle parking facilities and safe bicycle routes around the site can be integrated into the plans encourage cycling for short trips.

Business Improvement Districts

Local business districts may levy members to deliver bicycle infrastructure, including cycleways and bicycle parking. This investment may become a platform for encouragement programs to increase short neighbourhood trips to the centre and can be integrated into the plans to encourage cycling for short trips.

Advertising

Revenue from business and clubs in the local area can provide funding for advertising within the LGA. These advertisements could be cycling related by providing bicycle maps and information and encouragement advertisements.

Cycling Promotion Fund

In the past the Cycling Promotion Fund (CPF) has funded a number of innovative projects that promote and encourage cycling to assist in developing the evidence base that such projects are effective. Although the grants program is inactive, the CPF assists by listing potential funding sources and programs, and continues to offer advice and guidance on the development of effective cycling programs and initiatives.

Appendix C

Infrastructure, Signage and Parking Toolkit

Infrastructure Toolkit

This toolkit provides guidance on when different infrastructure treatments should be provided and aims to assist Council staff and the public in understanding the infrastructure requirements for cyclists.

C1. Infrastructure Treatment Types

A range of bicycle infrastructure types has been used in North Sydney which serves different cycling functions. Table C1 provides examples of different cycling infrastructure from North Sydney and surrounding LGAs which can be used for future cycling projects.

Table C1: Bicycle infrastructure typology in North Sydney and surrounding LGAs

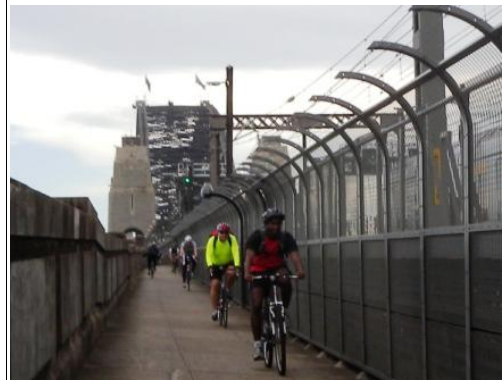
Two-way separated bicycle paths (not in the road reserve)

Two-way cycleways are exclusive bicycle paths that are completely separate from parked cars, vehicle traffic and pedestrians. They provide bi-directional travel on one side of the street off-road and in the road reserve. They can also be located in parks and reserves.

This type of facility is highly desirable as it separates cyclists from pedestrians and vehicle traffic and is located outside of the road. As such, these facilities attract cyclists of all abilities.

Given the predominantly built-up urban form of North Sydney LGA, opportunities for these facilities are limited.

Example: Sydney Harbour Bridge



Two-way separated bicycle paths (in the road reserve)

Two-way cycleways are exclusive bicycle paths that are completely separate from parked cars, vehicle traffic and pedestrians. These facilities provide bi-directional travel along one side of the road and are highly desirable as they provide physical separation between cyclists, pedestrians and vehicle traffic. This type of facility attracts cyclists of all abilities.

While these facilities often require substantial engineering works to implement which needs to be balanced relative to competing demands for space within the road reserve, this type of facility is the preferred infrastructure type for major routes.

Example: Bourke Street, Sydney



Bicycle Lanes

Bicycle lanes are on-road, one-way facilities which designate road space exclusively for cycling which must be legally signposted with bicycle lane signs. In built-up areas, bike-lanes often run adjacent to parked cars and a buffer zone is incorporated to reduce the hazard of drivers opening their car doors. To increase driver awareness, bicycle pavement stencils are often used and green coloured surfacing at intersections.

As bicycle lanes are an on-road facility, they are more likely to encourage more confident cyclists, depending on the speed and volume of traffic in the adjacent traffic lanes.

In North Sydney LGA there is great opportunity to implement bicycle lanes along local and collector roads where there is sufficient width. They are a low cost facility to implement and maintain.

Example: Yeo Street , Neutral Bay



Bus lanes

Bus lanes are legal instruments to control the use of a traffic lane by buses, taxis, hire cars, motor cycles and bicycles. These lanes may be time limited to AM and PM peak periods on weekdays or they may operate 24/7. To provide for a comfortable cycling environment that allows buses and bicycles to pass each other, widths in excess of 4.0m are preferred. Bus lanes are typically marked with red coloured pavement. On cycling routes, bicycle pavement markings may be used to emphasise the presence of cyclists within these lanes. This type of facility generally attracts confident cyclists.

Example: Pacific Highway, North Sydney



Contra-flow bicycle lanes

Contra-flow bicycle lanes are on-road lanes that are signed and marked to allow cycling in the opposite direction of an otherwise one-way street. Lanes are typically fitted with green paint to emphasise the presence of cyclists travelling in the opposite direction. A mixed-traffic facility can also be installed in the direction of vehicle travel as shown on the photo to the right.

This facility type potentially attracts confident cyclists and in slow speed/low volume environments also less confident cyclists.

There is potential to accommodate contraflow lanes along any one-way road provided sufficient width is available so vehicles do not encroach onto the bicycle lane.

Example: Winter Avenue, Neutral Bay



Mixed-traffic

Roads which are linemarked and/or signed for mixed use by motor vehicles and bicycles. Mixed-traffic facilities are suitable for roads with low traffic volumes and speeds, such as quiet residential streets. The main purpose of these facilities is for route guidance and driver awareness of key bicycle routes.

In low traffic environments mixed-traffic facilities are suitable for the enthused and confident and also the interested but concerned. Mixed traffic facilities are generally appropriate on roads with less than 5,000 vpd with a maximum speed limit of 50km/h.

Example: Spruson Street, Neutral Bay



Hybrid shared bicycle lanes and mixed-traffic

Bicycle lane treatments are used in the uphill direction while in the downhill direction roads are linemarked and/or signed for mixed use by motor vehicles and bicycles. Shoulder lane treatments can also be used in the uphill direction.

In the uphill direction this facility type potentially attracts enthused and confident although strong and fearless cyclists may use the travel lane.

In the downhill direction this facility type attracts strong and fearless cyclists. In low traffic environments mixed-traffic is suitable for the enthused and confident and the interested but concerned.

Hybrid treatments are generally appropriate on roads with less than 5,000 vpd with a maximum speed limit of 50km/h

Given the constrained road width and topography of North Sydney LGA, such directional treatments are appropriate at many locations in Waverton, Wollstonecraft and Neutral Bay.

Example: Yeo Street, Neutral Bay



Shared zones

Shared zones are special low speed, mixed-traffic environments which are legally controlled by signs and line markings that restrict the speed limit to 10km/h. Parking is restricted to marked spaces to afford priority to pedestrians. Typically the road environment is designed with special pavements, speed controls and landscaping, with few or no distinguishable footpaths.

Approval for all shared zones must be sought from Roads and Maritime Services (RMS). Any formally designated shared zone is appropriate for use by cyclists of all abilities.

Example: Wells Street, Redfern, City of Sydney



Head Start Storage Areas or 'bike boxes'

Bicycle boxes are line-marked bicycle storage facilities provided at signalised intersection. The 'bike box' allows a cyclist to wait for a traffic signal to change to green at the start of the travel lane, so that they can be clearly seen by other road users. When the signal changes, cyclists have a head start to prepare to ride from a stopped position.

This facility type potentially attracts strong and fearless and enthused and confident riders. These facilities can generally appropriate on roads with less than 10,000 vehicles per day (vpd) and a maximum speed limit of 60km/h. There is the potential to provide head start storage areas at signalised intersections in Crows Nest, Neutral Bay and Cremorne.

Example: Curlew Street and Glenayr Ave, Bondi



Right Turn Lane

Right turn lanes assist cyclists making a right turn by providing a designated area for cyclists to wait for a gap in the oncoming traffic. Physical separation can also be included as it reduces the likelihood of a vehicle entering into the bicycle turn lane (as shown on the photo to the right).

This facility type potentially attracts: strong and fearless (major roads), enthused and confident (general urban streets) and, where physical separation is incorporated, the interested but concerned (connect quiet street routes across busy major roads). Right turn lanes can generally be appropriate on roads with less than 10,000 vehicles per day (vpd) and a maximum speed limit of 60km/h.

Example: Bronte Road, Bronte



General traffic

No specific provisions are made for cyclists. Although most streets are suitable for cycling others are unsafe due to high traffic volumes and speeds. Where an alternate route is not feasible / easily accessible, cyclists will ride on streets with no infrastructure. This facility type potentially attracts: strong and fearless (major roads), enthused and confident (general urban streets) and the interested but concerned (quiet streets).

Example: Miller Street, North Sydney

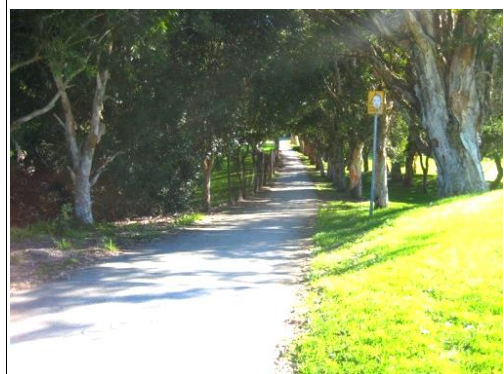


Shared paths (in or not in the road reserve)

Shared paths can be located adjacent to a road or through a park or reserve. They are used by both cyclists and pedestrians with linemarking and/or signage designating their legal status as a shared path and helping to encourage safe use by both user groups. Pedestrians have the right of way on shared paths. There is the potential for conflict between user types when volumes of pedestrians and cyclists are high or when the path width is narrow.

This type of facility attracts cyclists of all abilities and can generally be implemented wherever there is sufficient width to accommodate a 3.0m wide path. Wider paths may be required depending on the volume of cyclists and pedestrians.

Example: Cammeray Golf Course



C2. Advantages and Disadvantages of Facility Types

There are advantages and disadvantages of each facility type, a summary of which is presented in Table C2.

Table C2: Advantages and Disadvantages of Path Types

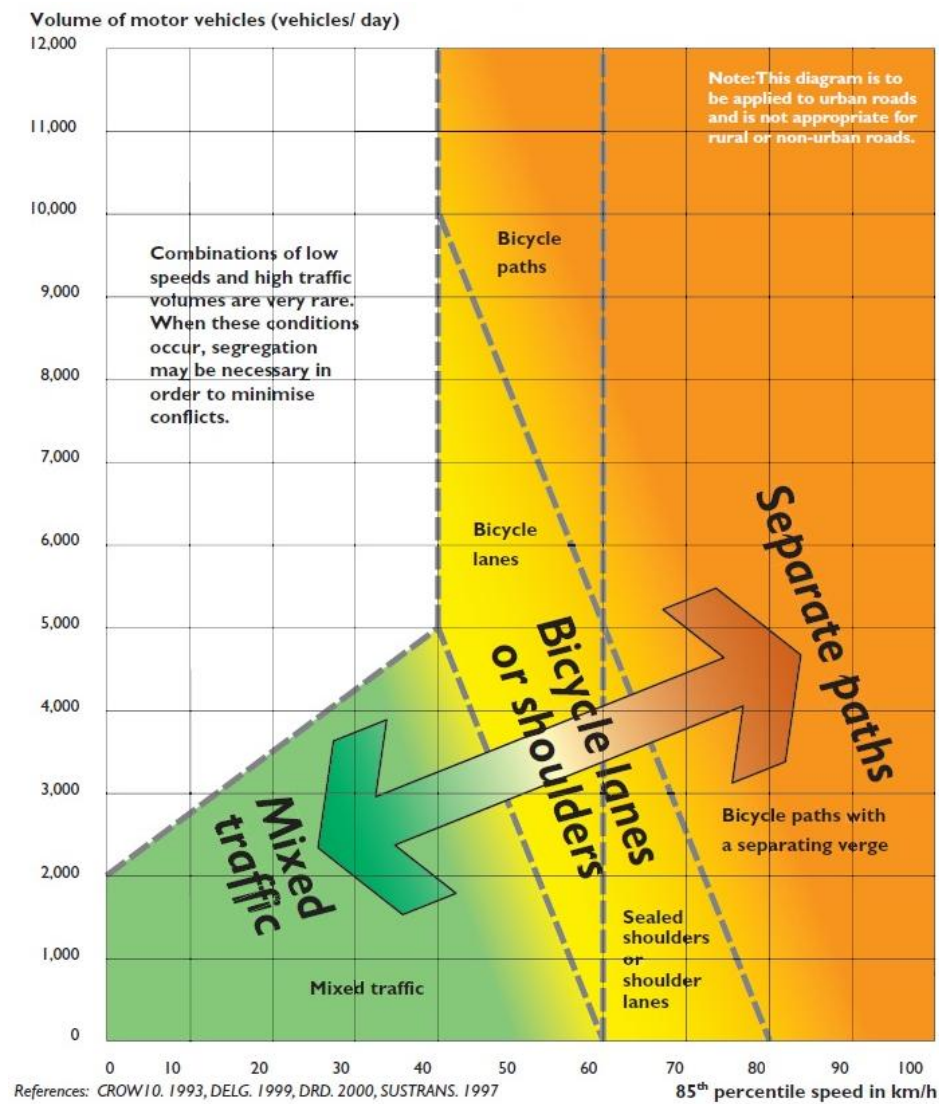
Type of Path	Description	Advantages	Disadvantages	Recommendation
Exclusive Bicycle Path	Legally can only be used by cyclists	<ul style="list-style-type: none"> Cyclists proceed without delays. Usually a higher Level of Service (LOS) i.e. higher speeds, faster travel times. 	<ul style="list-style-type: none"> Sometimes used by pedestrians when their own facilities are relatively poor. 	<ul style="list-style-type: none"> Preferred where there are likely to be significant volumes of commuter cyclists. Care is required to ensure that pedestrians can be accommodated elsewhere.
Shared Path	Shared path with pedestrians	<ul style="list-style-type: none"> Suitable for most users. Useful to cyclists and pedestrians, hence maximises benefit to general community. It is beneficial to vulnerable cyclists where an existing footpath can be adapted/widened. Lower construction cost than separated paths. Require less road reserve space. 	<ul style="list-style-type: none"> Pedestrian-cyclist conflict is common as demand increases or if there is a mix of recreational pedestrians and commuting cyclists. May result in slower speeds and delays for cyclists. Not satisfactory in high usage areas – may discourage walking amongst the young, seniors and people with disabilities. May be ineffective if thorough planning (consultation, observation and demand estimation) has not been carried out. 	<ul style="list-style-type: none"> Shared paths benefit a range of users and are appropriate with modest numbers of pedestrians and cyclists. As demand increases, shared paths but must be managed. Design must be suitable for use and demand. Intersections between path, road and driveways must be addressed. Council must monitor user behaviour on the path.
Separated Path	Separate sections for cyclists and pedestrians.	<ul style="list-style-type: none"> Reduces conflicts between different user types. Allows cyclists to travel at higher speeds making it more desirable for commuter cyclists. Cyclists can ride without the delays which can occur on shared paths. 	<ul style="list-style-type: none"> Higher cyclist speeds are possible, however pedestrians from the separated path can stray into cycling space. Ineffective if pedestrian movement along or across the bicycle path is not minimised. Ineffective if both paths are not of a comparable standard relative to the requirements of each type of user. Higher cost of path due to increased width. 	<ul style="list-style-type: none"> Appropriate if large numbers of cyclists and pedestrians will use them. There should be separation between cyclists and pedestrians (e.g. different path levels).
Cycle Path next to road	Paved in a different colour and texture from adjoining sections. May be separated by a low kerb (common facility in Europe).	<ul style="list-style-type: none"> Can offer a low-stress environment that can be attractive to many cyclists. Particularly helpful for short lengths such as squeeze points in the road carriageway. 	<ul style="list-style-type: none"> In NZ, cyclists on paths are required to give way to other traffic at side roads, which results in delays. Intersections are where cyclists are at highest risk. Path obstructions/visibility issues: <ul style="list-style-type: none"> - inadequate visibility at driveways - frequent or busy driveways - inadequate clearance from opening car doors - bus passengers board and alight from bicycle path - pedestrians encroach on the bicycle path when the footpath is congested or waiting to cross - garbage collection obstructs the path Where cyclists ride in both directions along paths, driveways and side roads may not expect bicycle traffic from both directions. It is less convenient to turn right from bicycle path next to road. It is expensive to establish this facility due to relocating kerb lines. 	<ul style="list-style-type: none"> Between intersections, bicycle paths next to roads can provide attractive and safe facilities for a wide range of cyclists. Consider safety and delay issues at intersections where it's preferable for the path to rejoin the roadway.

Source: Pedestrian-Cyclist Conflict Minimisation on Shared Paths and Footpaths (Austroads 2006)

C3. When is Physical Separation Required?

For on-road bicycle facilities, selection of the appropriate infrastructure treatment is primarily determined by the speed and volume of vehicles on the road. Figure C1 provides guidance on the selection of infrastructure types for urban roads based on traffic speed and volumes. This graph should be referred to when planning all future bicycle routes in North Sydney LGA.

Figure C1: Separation of Bicycles and Vehicular Traffic Graph



Source: NSW Bicycle Guidelines (Figure 3.2, pg. 13), RTA, 2003

Figure C1 shows that physical separation between bicycles and vehicles is required on roads of any speed limit where traffic volumes exceed 10,000 vehicles per day. As a guide, daily traffic volumes¹⁰ for key roads in North Sydney are:

¹⁰ Based on recorded RMS Annual Average Daily Traffic (AADT) data for 2005 (www.rta.nsw.gov.au/trafficinformation/downloads/aadtdata_dl1.html).

- Miller Street – 45,000 vehicles per day
- Falcon Street – 37,500 vehicles per day.

There are currently no on-road physically separated bicycle facilities in North Sydney LGA. Along busy road corridors with high traffic volumes, cyclists are forced to ride on-road or to ride along footpaths where there is the potential for conflict with pedestrians.

C4. Managing Conflict on Shared Paths

Shared paths are used widely across Australia. In five of Australia's eight states and territories, cyclists are allowed to use any footpath. In New South Wales cyclists are not permitted to ride on the footpath.

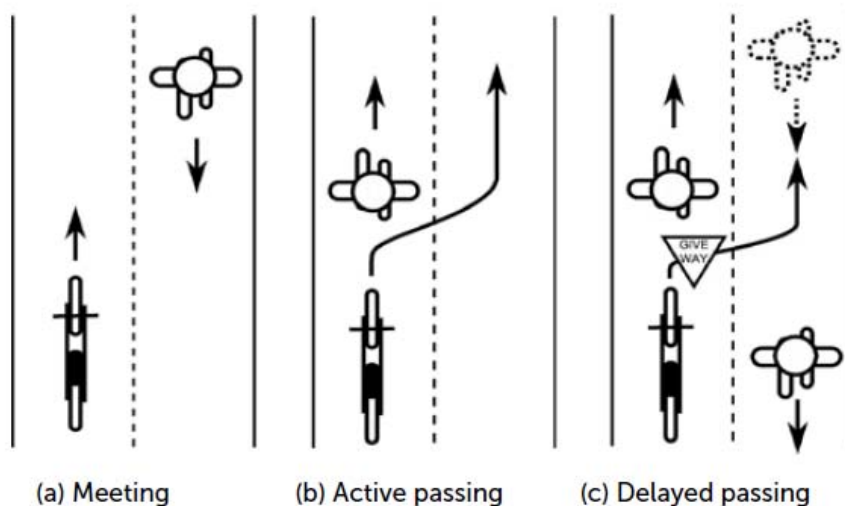
Shared paths are suitable facilities where the path width and volume of pedestrians and cyclists are appropriate to permit cyclists and pedestrians travelling in the same direction to safely pass one another. Pedestrians have right of way on shared paths at all times.

The probability of conflict between users on shared paths increases with high volumes of pedestrians and cyclists and where the path is narrow.

Passings and Meetings

Understanding the movement of path users is important in designing and designating paths for shared use. When pedestrians and cyclists use a shared path they will *meet* other users travelling in the other direction or *pass* slower pedestrians and cyclists travelling in the same direction. Delayed passings occur when faster cyclists must slow down to pass other users travelling in the same direction. Figure C2 shows the interaction and passing movements of shared path users.

Figure C2: Interactions between shared path users



Source: VicRoads Cycle Notes 21, 2012

Design Requirements

The recommended width requirements for shared paths are contained in *Austroads Guide to Road Design Part 6A: Pedestrians and Cyclist Paths*. These width requirements are summarised in Table C3.

Table C3: Shared Path Width Requirements

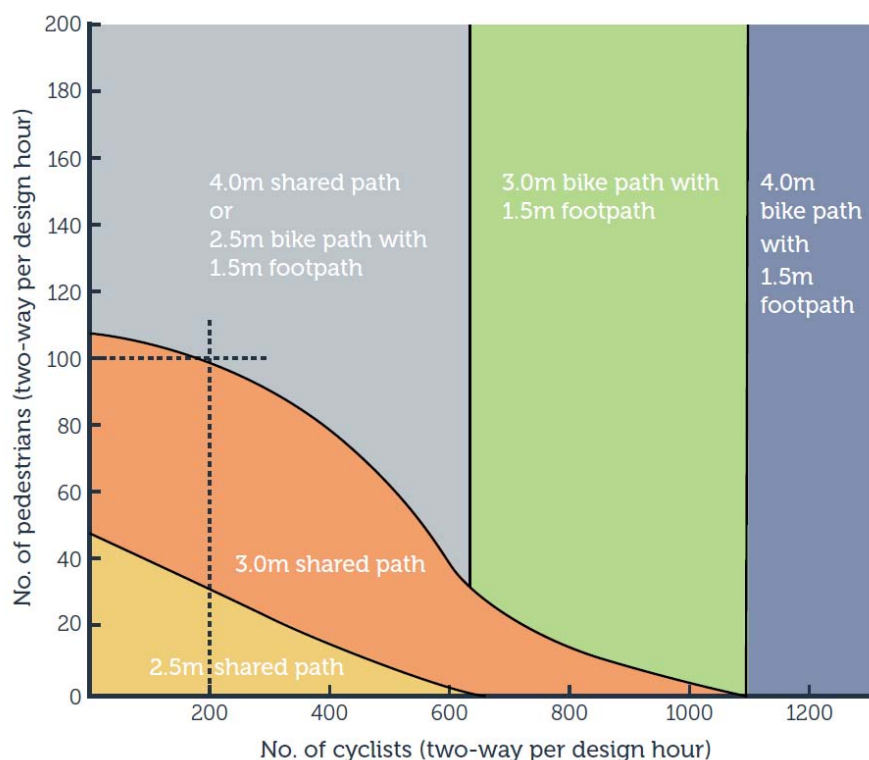
	Path width (m)		
	Local access path	Commuter path	Recreational path
Desirable minimum width	2.5	3.0	3.5
Minimum width – typical maximum	2.5 ¹ – 3.0 ²	2.5 ¹ – 4.0 ²	3.0 ¹ – 4.0 ²

1. A lesser width should only be adopted where cyclist volumes and operational speeds will remain low.
2. A greater width may be required where the numbers of cyclists and pedestrians are very high or there is a high probability of conflict between users (e.g. people walking dogs, roller bladders and skaters etc.).

Source: Austroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths (Table 7.4, pg. 44), 2009

As shown in Table C3, the minimum width of a local access shared path is 2.5m. A wider path should be provided where pedestrian and cyclist volumes are high or where it is deemed that the potential for conflict is high

The direction that path users are travelling also influences interactions on shared paths. When the majority of users are travelling in the same direction, the risk of conflict is reduced as there are fewer movements in opposing directions. Figure C3 provides guidance on path widths based on a 50-50 directional split of path users.

Figure C3: Recommended Path Width (50/50 Directional Split)

Source: VicRoads Cycle Notes 21, 2012

As shown in Figure C3, a 2.5m – 3m wide shared path is appropriate for use with a 50-50 directional split and when the volume of pedestrians and cyclists are low. Low intensity use provides adequate opportunities for users to safely pass one another. In instances of high use, providing a 2.5m wide cycleway with a separate 1.5m wide footpath may be preferable to providing a 4m wide shared path.

Providing sufficient clearance to obstacles such as trees and lamp posts is important to ensure the safety of path users. A lateral clearance of 1.0m is desirable with a minimum of 0.5m required to be provided. Where obstacles are located within this distance next to a path or along the centre of a path, it reduces the available path width and decreases the opportunity for passings. This is pertinent for several locations in North Sydney LGA such as St. Leonards Park as shown in Figure C4 and Figure C5.

Figure C4: St. Leonards Park (looking north)

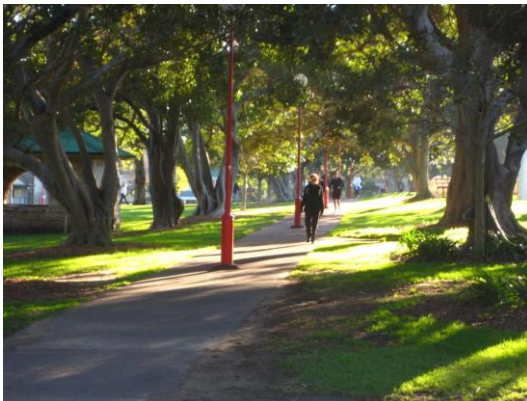


Figure C5: St. Leonards Park (looking south)



Shared paths with high volumes of pedestrians and pedestrians can operate successfully with little conflict between users, provided there is sufficient width available to allow safe passing manoeuvres. An example of this in Prince Alfred Park in Surry Hills is shown in Figure C6.

Figure C6: Shared Path - Prince Alfred Park, Surry Hills



Source Sydney Cycleways website <http://sydneycycleways.net/>

C5. Identifying Shared Paths

Shared paths need to be adequately identified to ensure all users are aware of a path's status. This is particularly important to ensure pedestrians are aware of the presence of cyclists. The black and white R8-2 shared path regulatory sign (see Figure C11) is required at the start of any shared path.

The City of Sydney has prepared a pavement markings guide for hazard management and general educational purposes on shared paths. The guide was prepared to complement the delivery of dedicated bicycle infrastructure with a shared pathways network and has been provided to Greater Sydney LGAs for use.

Signs, symbols and markings were developed to adopt a promotional rather than regulatory tone. Thus, shared paths contribute to the bicycle network *and* act as a promotional tool to encourage pedestrians on the path to consider cycling. The line-marking designates the shared path, with light-hearted images and messages designed to achieve amicable shared path behaviour by both pedestrians and cyclists.

The City of Sydney has indicated that, since the implementation of the shared path network, there has been an extremely low incidence of incidents. This was attributed to the use of awareness marking and signage, outlining rights and responsibilities.

This system is used *in conjunction* with the regulatory signs and markings for shared paths in NSW.

The pavement marking guide uses three tiers, described below and is being trailed at Redfern Street, Redfern and at shared path intersections of the College Street cycleway in Sydney CBD.

Primary Tier

The colour blue is the unifying signifier of the shared path network. The primary tier components are the basic graphics to install and designate the shared path network. This tier consists of the following:

- Shared path pavement marker to denote the start of a shared path.
- A typeface for identifying locations or communicating simple behavioural messages.
- Smaller scale pedestrians and cyclists symbols for general use along the shared path.
- A blue edge line denoting the shared path route.

The elements to be used as part of the primary tier are shown in Figure C7.

Secondary Tier

The secondary tier includes treatment of common zones of higher risk to be managed, including driveways and bus shelters. Some of the secondary tier elements are shown in Figure C8.

Figure C7: Primary Tier Elements



Figure C8: Secondary Tier Elements

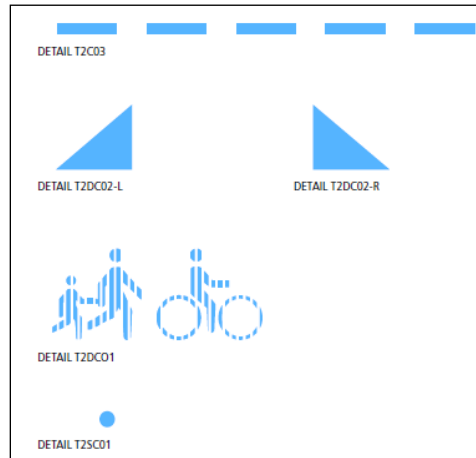
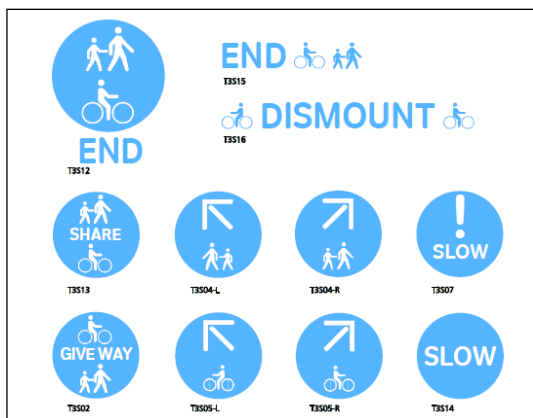


Figure C9: Shared Pathways Pavement Markings Guide – Tertiary Tier Elements



C6. Shared Path Education and Awareness

Educating people on safely using shared paths helps to create a safer environment for all path users. Education and awareness campaigns is an important component of conflict minimisation in shared path environments. These campaigns should focus on promoting the safe and courteous use of shared paths and include the following key messages for each user type:

For Cyclists

- **Give Way** - Always give way to pedestrians, they have right of way at all times.
- **Ring Your Bell** - Ring your bell early to alert walkers of your presence.
- **Slow Down** - Slow down and be courteous to pedestrians, smile!
- **Watch Out** - Pets and children can be unpredictable, always take extra care on shared paths when they are present.

For Pedestrians

- **Be Aware** - Be aware of other users and try not to listen to your iPod in shared path environments as it might stop you from hearing a bike bell.

- **Listen for the Bell** - If you hear a bike bell on a shared path, move to the left hand side in a safe manner and allow the bike rider to pass.
- **Be Predictable** - Keep to the left on shared paths and walk in a predictable manner.
- **Be Considerate** - Keep pets under control and ensure children are supervised on shared paths.

Council should promote these simple messages on shared path safety on the walking and cycling pages of their website and include them as part of its communications activities.

**SEE THE COMMUNICATIONS STRATEGY IN SECTION 7 FOR
DETAILS ON COMMUNICATIONS ACTIVITIES**

Share the Path Program

The City of Sydney has developed a Share the Path Program to educate pedestrians on the safe use of shared paths and encourage the courteous use of these facilities. The use of posters in shared path environments such as shown in Figure C10 are an effective means of reinforcing key safety messages and are an important component of the Share the Path Program.

These posters are a low cost and powerful means of promoting the safe and courteous use of shared path. North Sydney Council should utilise these posters as part of communications activities and at all shared path environments across the LGA.

Figure C10: Share the Path Poster



Source: Sydney Cycleways website <http://sydneycycleways.net/>

Many Councils in Greater Sydney have adopted the Share the Path Program for use in their own LGAs. It is understood that North Sydney Council has recently commenced its own Share the Path program in conjunction with Willoughby Council and Lane Cove Council.

Signage Toolkit

There are three categories of cycle signage used in NSW – regulatory, warning and directional. A particular emphasis is placed on the directional component of the signing requirements as this is regarded as one of the more important components of the signing plan.

C7. Regulatory Signage

Regulatory signs, with the use of linemarking, generally define the type of bicycle facility provided. Regulatory signage is always used to define the start of a facility. Defining the end of a facility is generally not necessary, unless the facility is terminated mid-block, or at somewhere other than an intersection.

The regulatory signs to be used for bicycle facilities are contained in the NSW Bicycle Guidelines as shown in Figure C11.

C8. Warning Signage

Warning signs are diamond-shaped yellow signs that are used to warn cyclists of changed or particularly hazardous conditions. They are also used to warn other road users of bicycle movements. The NSW Bicycle Guidelines offer advice on the use of warning signs, as well as associated guidance and advisory signage.

The location for warning signage dependent on the location and facility type, and should be placed to suit the site specific factors. Advice on locating warning signage is contained in Australian Standard AS1742.9 – Manual of Uniform Traffic Control Devices, Part 9 Bicycles Facilities and Part 2, Traffic Control Devices for General Use.

Some of the most commonly used warning signs for use in association with bicycle infrastructure are shown in Figure C12.

Figure C11: Regulatory Signage for Bicycle Facilities

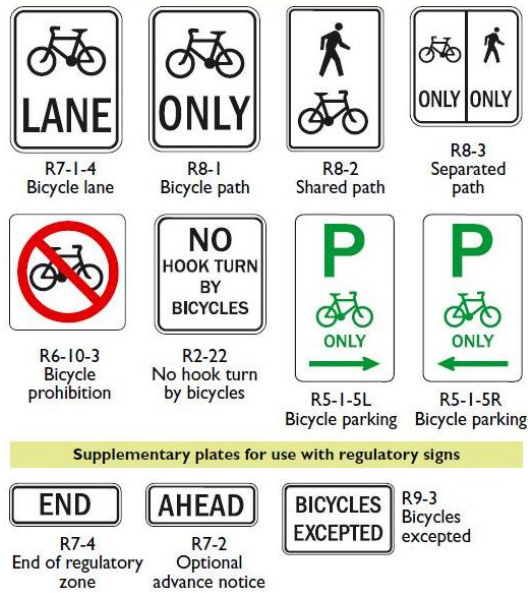


Figure C12: Warning Signage for Bicycle Facilities



Source: NSW Bicycle Guidelines (Figure 9.1, pg. 70 and Figure 9.2, pg 71)

C9. Directional Signage

A key element of the signage plan is the development of the directional signage component. It is important that directional signage be consistent throughout the regional bicycle network, and be located at all relevant intersections to direct cyclists. Care should be taken during signage placement to avoid bicycle directional signage becoming lost in the clutter of other signs, or confusing motorised traffic, particularly when used for on-road routes.

The focal points map (**Error! Reference source not found.**) should be referred to when determining the destinations to display on directional signage and when determining the strategic location for such signage.

Bike Parking Request

A web-based service for residents to request bicycle parking similar to that developed by the City of Sydney (<http://sydneycycleways.net/maps-and-tools/bike-parking>) should be implemented. Offering a bicycle parking request service for residents is a means of 'crowdsourcing' and ensures bicycle parking is installed where it is needed, without the need for an extensive bicycle parking audit. The request facility should be available on the Sustainable Transport page of the North Sydney Council website and enable supporting materials such as photos to be attached.

A sample of the bicycle request form is shown in Figure C24.

Figure C24: Sample bicycle parking request

Request on-street bike parking

1. Bike Parking Request Details

Please provide as much detail as possible: eg existing issues, level of demand *

2. Location for requested Bike Parking

Address *

Post Code *

Location Type *

Shop/Supermarket ▼

Note: The City does not install bicycle parking on private property eg unit blocks, office complexes. Please refer to Cycle Friendly Workplaces

Who will be the most likely users of the bike parking facilities? *

Building tenants/residents

Students

Short term visitors

Commuters

Other

3. Attachments

You may attach up to five (5) images or electronic documents to your message. Max file size 2MB each.

File

No file chosen

Appendix D

Existing Conditions Report

Existing Bicycle Network

There are two categories of bicycle routes as listed in the *NSW Bicycle Guidelines*: regional routes and local routes. The purpose of local routes within the bicycle network is to improve links to regional routes (by connecting these routes to the local street system) and to access points of significant local interest to cyclists (major trip generators).

D1. Key Destinations and Trip Generators

Identifying trip attractors helps to identify those places that cyclists visit and are useful in determining the potential desire lines. The identified destinations and trip generators are then used to determine bicycle network and infrastructure priorities.

During the consultation workshops held in March 2013, participants identified the following destinations as key trip generators in North Sydney LGA:

- North Sydney CBD
- St. Leonards CBD
- TAFE Campus, Crows Nest.

Fine-grain bicycle access to local destinations would include North Sydney shops, convenience stores, schools, libraries, swimming pools and parks.

D2. North Sydney Bicycle Infrastructure

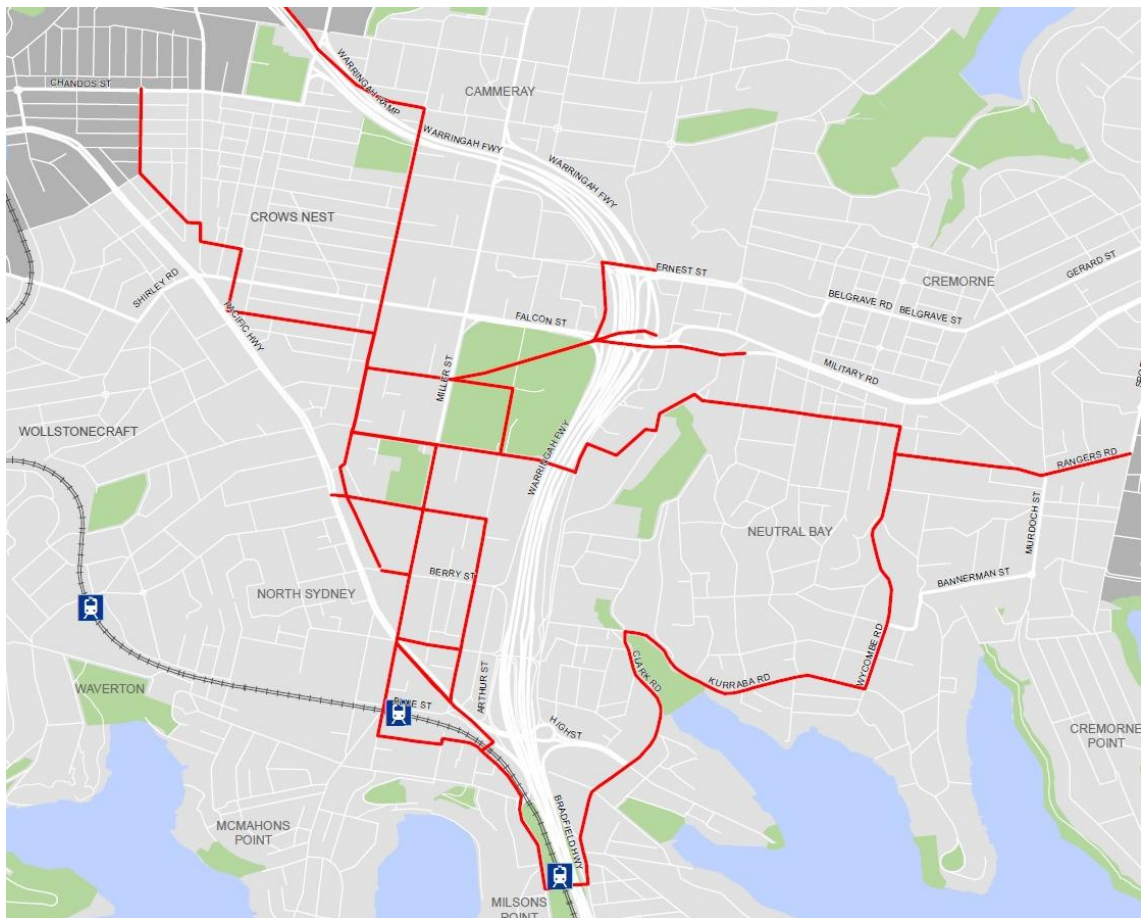
Given the competing demands for the finite road network in North Sydney, implemented routes incorporate a variety of treatments including mixed-traffic lanes, bicycle shoulder lanes, shared user paths and contra-flow lanes. In some instances, routes were signposted in both directions with dedicated bicycle shoulder lanes provided in the uphill direction and mixed-traffic lanes were line-marked in the downhill direction.

There is a wide range of bicycle infrastructure types used in the LGA which serve different cycling functions as shown in Section C1. Whilst some facilities cater to the novice cyclist and promote cycling uptake within the community, the facilities are inconsistent and there are gaps in the network. In some places, the markings on shared paths are illegible so that pedestrians and some cyclists are not aware of the shared nature of these paths. Cyclists use footpaths illegally in locations where they are not confident cycling on-road, particularly where roads have high traffic volumes and speeds.

D3. Saddle Surveys

As part of the review, saddle surveys were undertaken of a sample of bicycle routes to document cycling conditions and observe pedestrian, driver and cyclist behaviour. The surveyed routes were selected based on links to destinations and importance to the greater bicycle network and are shown in Figure D1. The saddle surveys were undertaken between February and May 2013.

Figure D.1: Saddle Survey Routes



Sydney Harbour Bridge to North Sydney and Cammeray (via West Street)

The Sydney Harbour Bridge to Amherst Street, Cammeray route is a major cycle route in the LGA which links Milsons Point with North Sydney CBD and provides access to Willoughby LGA via the Warringah Freeway cycleway. The route is approx. 3.5km in length and was identified as route number 8 of the proposed routes in the 2009 Bike Strategy.

This route consists of a wide range of bicycle infrastructure types and traffic conditions which vary considerably along the length of the route. Cyclists are required to dismount at the northern end of the Sydney Harbour Bridge cycleway and walk down the 55 steps to access Burton Street.

Figure D2: Alfred Street footpath at Milsons Point railway station (looking north)



Figure D3: Alfred Street (looking north)



The route then follows the Middlemiss Street contraflow lane before which has an adjacent downhill mixed traffic lane for southbound cyclists as shown in Figure D4. The contraflow lane and green coloured surfacing were recently refreshed, improving delineation. The street lighting along Middlemiss Street is poor reducing the inter-visibility between cyclists travelling in opposite directions in hours of darkness.

From Middlemiss Street, cyclists are directed to the Arthur Street underpass and north along the shared path on the western side of the Pacific Highway. This path is a pinch point for cyclists due to the numerous trees and signposts between Arthur Street and Blue Street as shown in Figure D5.

From Blue Street cyclists are directed uphill via general traffic along the Pacific Highway into North Sydney CBD and onto Miller Street via a right turn at the signalised intersection. The Pacific Highway and Miller Street have significantly higher traffic volumes in comparison to the local roads used along the route and as such can be intimidating, even for strong and confident cyclists.

Figure D4: Middlemiss Street (looking north)



Figure D5: Pacific Highway shared path (looking north)



The route continues along the on-road cycle lane on Ridge Street (Figure D6) and road shoulders along West Street. Following the Ausgrid cabling working along West Street many of the road markings have not been repainted since the carriageway has been reinstated including the northbound bicycle shoulder lanes as shown in Figure D7.

Figure D6: Ridge Street (looking west)



Figure D7: West Street (looking north)



The West Street/ Amherst Street intersection is a key decision point whereby a left turn provides access to Naremburn, Chatswood and Lane Cove via the Warringah Freeway shared path, a right turn provides access to Cremorne and Cammeray via the Amherst Street shoulder lanes and a through movement also provides access to Naremburn.

The route is reasonably well signposted with wayfinding and directional signage generally in the form of advance direction boards (G1-205), reassurance boards (G4-202-1) and intersection fingerboards (G2-204-1, without distances), however two key intersections are lacking wayfinding signage:

- Pacific Highway/ Miller Street
- Miller Street/ Ridge Street.

Mosman to Wollstonecraft

The 3.1km Mosman to Wollstonecraft route is a key east-west cycle route in the LGA which was identified as route number 1 in the 2009 Bike Strategy. This route also features a range of bicycle infrastructure types and traffic conditions which vary considerably along the length of the route. Within North Sydney LGA this route commences at Spofforth Street, the boundary between North Sydney and Mosman LGAs and continues eastwards to Mosman town centre via Spencer Street.

There is no dedicated bicycle treatment along Spofforth Street and Rangers Road resulting in cyclists riding in general traffic. The road surface of Spofforth Street is generally poor with numerous transverse gaps as a result of the expansion joints in the concrete slab carriageway as shown in Figure D8 and Figure D9. These gaps are located at the edge of the travel lanes where cyclists are likely to ride and present a significant hazard allowing a tyre to become trapped. This a particular hazard for southbound cyclists travelling downhill at speed.

Figure D8: Spofforth Street (looking north)



Figure D9: Spofforth Street near Brierley Street (looking west)



Spofforth Street is a 12.8m wide road and due to the steep topography a hybrid treatment of an uphill (northbound) cycle lane and downhill (southbound) mixed traffic similar to Yeo Street, Neutral Bay would be appropriate.

The presence of on-street parking on the eastern side of Spofforth Street within the Rangers Road intersection is a pinch point for cyclists travelling south and those turning right into Rangers Road. There are no dedicated bicycle treatments along Rangers Road and 'Bicycles Excepted' sub-plates (R9-3) are required for the 'No Left Turn' signs at Harrison Street.

The route continues via general traffic downhill on Yeo Street and into Bent Street a one-way southbound road, bicycles excepted, although some sub-plates (R9-3) are missing. The route then continues uphill via mixed traffic on Winter Avenue, a one-way westbound road where an adjacent bicycle contraflow lane is in place. Cyclists then cross the Warringah Freeway via the existing shared pedestrian/ cyclists bridge and continue on Ridge Street via general traffic before joining the Ridge Street bicycle shoulder lanes, west of Miller Street.

The route continues on Hazelbank Place, a shared path cut-through from West Street to the Pacific Highway where cyclists cross the Highway and continue via general traffic on Hazelbank Road. An intersection fingerboard is in place at the West Street/ Hazelbank Place intersection directing cyclists to Wollstonecraft.

There is a need for dedicated bicycle treatments along the route in the form of mixed traffic (PS-2) logos along Spofforth Street, Rangers Road, Harrison Street and Hazelbank Road. Bicycle warning signage (W6-7) signage is also required at key locations to increase driver awareness of the presence of cyclists. One-Way Bicycles Excepted sub-plates (R9-3) are missing at various locations.

Holtermann Street, Crows Nest (West Street to Willoughby Road)

Holtermann Street is an alternative east-west route to Ernest Street which connects West Street with Willoughby Road. In comparison to Ernest Street, Holtermann Street has significantly lower traffic volumes and provides direct access to the Crows Nest retail precinct.

There are no dedicated bicycle treatments in place along Holtermann Street, east of Alexander Lane. Holtermann Street is a residential street with vertical traffic calming in the form of flat-top road humps which are generally in poor condition further exacerbated by the recent Ausgrid cabling works as shown in Figure D10 and Figure D11.

Figure D10: Holtermann Street (looking east)



Figure D11: Holtermann Street (looking west)



D4. Missing Links and Pinch Points

Missing links between bicycle facilities and pinch points on existing facilities are difficult for cyclists to negotiate and present a barrier to new cyclists. Through the saddle surveys a number of missing links and pinch points were identified.

Table D1 provides a summary of the missing links and pinch-points identified and outlines how these will be addressed. Further description of the missing links and pinch-points are detailed below.

Table D1: Identified Missing Links, Pinch Points and Hazards and Recommended Corrective Actions

Route	Location	Issue	Recommended Corrective Action
Sydney Harbour Bridge to North Sydney and Cammeray (via West Street)	Middlemiss Street	Poor street lighting	<ul style="list-style-type: none"> Upgrade the street lighting along Middlemiss Street
	Pacific Highway shared path (between Arthur Street and Blue Street)	Obstructions caused by trees and signage	<ul style="list-style-type: none"> Implement priority route 1 to provide an alternative separated facility along this section
	West Street	Road shoulder markings worn/absent following utility works	<ul style="list-style-type: none"> Re-mark road shoulders (short-term) Implement priority route 1 to provide an alternative separated facility along this section (medium – long-term)
	Pacific Highway/Miller Street intersection	Lack of wayfinding signage	<ul style="list-style-type: none"> Install G2-204-1 intersection fingerboards
	Miller Street/Ridge Street intersection		
	St. Peters Park shared path	Metal barriers used as chicane feature	<ul style="list-style-type: none"> Implement priority route 1 to provide an alternative separated facility to this section
Mosman to Wollstonecraft	Spofforth Street	No designated bicycle treatments	<ul style="list-style-type: none"> Liaise with Mosman Council to determine appropriate bicycle infrastructure treatments
		Transverse gaps in road surface	<ul style="list-style-type: none"> Liaise with Mosman Council to repair gaps in road surface
	Rangers Road	No designated bicycle treatments	<ul style="list-style-type: none"> Implement priority route 5 to provide a mixed traffic infrastructure treatment
		Pinch point caused by on-street parking adjacent to shops	<ul style="list-style-type: none"> Review parking restrictions, consider timed peak hour restriction of parking

The most critical missing link in North Sydney LGA is between the Sydney Harbour Bridge and West Street, Cammeray. There is a variety of infrastructure types provided along this route, however this is often inadequate, forcing cyclists to ride on-road along very high volume roads (Pacific Highway and Miller Street), negotiate busy intersections or to ride on footpaths. There are a number of pinch points located along this route, such as the Pacific Highway shared path and St. Peters Park as outlined below.

Pacific Highway Shared Path, North Sydney

The shared path between Arthur Street and Blue Street, North Sydney presents a significant pinch-point to cyclists due to the presence of trees and signage along the path which severely limits inter-visibility between path users. The seasonal leaf litter on the path also presents a hazard to cyclists, particularly when wet. This shared path is shown in Figure D12 and Figure D13 and is a vital connection between North Sydney CBD and the Sydney Harbour Bridge cycleway.

Figure D12: Pacific Highway Shared Path (looking south)

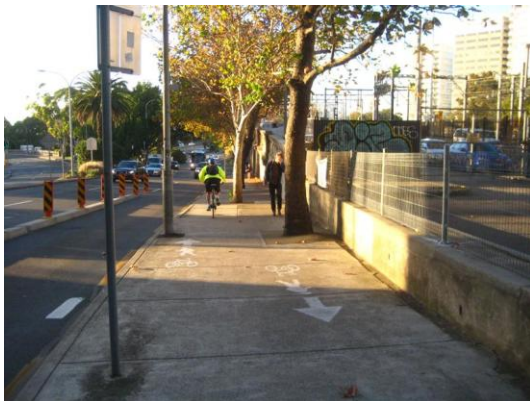


Figure D13: Pacific Highway Shared Path (looking south)



St. Peters Park, North Sydney

The shared pedestrian and cyclist path through St. Peters Park presents a significant pinch point for cyclists due to the presence of metal barriers which form a chicane feature in an attempt to reduce the speed of southbound (downhill) cyclists as shown in Figure D14 and Figure D15.

Figure D14: St. Peters Park shared path (looking north)



Figure D15: St. Peters Park shared path (looking south)



The St. Peters Park shared path connects Blues Point Road with Mackenzie Street and provides a crucial link between North Sydney CBD, Milsons Point and the Sydney Harbour Bridge cycleway via

Miller Street, Mackenzie Street, Middlemiss Street and Alfred Street. Given the proximity of the path to North Sydney CBD, it also functions as a key pedestrian route.

Spofforth Street/ Rangers Road intersection, Cremorne

The presence of on-street parking on the eastern side of Spofforth Street within the Rangers Road intersection is a pinch point for cyclists travelling south and also those turning right into Rangers Road. The presence of parked vehicles and the adjacent concrete median prevents southbound vehicles from overtaking cyclists waiting to turn right into Rangers Road.

Existing Wayfinding Signage

Several cycle routes in North Sydney LGA are sign posted with directional and wayfinding signage such as the Sydney Harbour Bridge to Cammeray route. This signage is generally in accordance with the NSW Bicycle Guidelines predominantly using advance direction boards (G1-205), reassurance boards (G4-202-1) and intersection fingerboards (G2-204-1). Distances to key destinations are generally not included on the existing wayfinding signage. Sydney Harbour Bridge is not included on any directional or wayfinding signage. As a unique and universally understood landmark which provides bicycle access across Sydney Harbour, the inclusion of this focal point would greatly assist cyclists, especially those who are less familiar with the local area.

Old styles of signage with blue backgrounds can still be found on the network as shown in Figure D19 and should be removed to provide a consistent message to cyclists.

Examples of existing wayfinding signage are shown in Figure D16 to Figure D19.

Figure D16: West Street, North Sydney



Figure D17: Church St, North Sydney



Figure D18: Middlemiss Street, Milsons Point



Figure D19: Church Lane, North Sydney



Existing Bicycle Communications

A communications strategy was not part of the 2009 Bike Strategy. The target audiences for communications include cyclists and non-riders, council officers, councillors, external transport agencies and neighbouring LGAs. The following communications materials are currently in use:

- North Sydney cycling map which includes surrounding council areas
- Council website and dedicated cycling webpage (http://www.northsydney.nsw.gov.au/Recreation_Facilities/Walking_Cycling/Cycling) which contains key information and documents related to cycling including:
 - North Sydney cycling map
 - 2009 Bike Strategy
 - 2004 Bike Plan
 - Information on the HarbourLink project
 - Information on cycling safety, hazards and tips
 - Links to cycling groups and the cycling pages of adjacent council areas
 - Information and a YouTube video on the Annual Ride to Work Day – including a free breakfast for cyclists at Bradfield Park
 - An informative YouTube video detailing the Freshwater to North Sydney route which highlights some of the difficulties faced by riders using this route.

North Sydney Council also conducts a quarterly Sustainable Transport Committee Meeting – to consider walking, cycling, public transport and carsharing in a holistic manner.

Appendix E

Consultation

Consultation

E1. Consultation Summary

GTA Consultants acted as facilitators for separate consultation workshops with key stakeholders and bicycle user groups. Key issues arising from these discussions included:

- Interim infrastructure is required before the HarbourLink concept is realised
- Importance of connections from North Sydney to surrounding LGAs
- Encouragement and promotion programs and resources developed by the City of Sydney are available for use by North Sydney Council.

Further details of the consultation are contained below.

E2. Stakeholder Consultation

GTA Consultants acted as facilitators for the stakeholder consultation workshop attended by representatives of Transport for NSW (TfNSW), Roads and Maritime Services (RMS), Department of Planning and Infrastructure, the City of Sydney and Willoughby City Council.

The workshop discussion included:

- Potential network and infrastructure, such as:
 - HarbourLink funding and next steps (on-hold, RMS)
 - Kent Street to Liverpool Street connection to Darling Harbour (2013-14, City of Sydney)
 - Kent Street north to Argyle Street – Mixed traffic lanes to Watson Street (2013-14 City of Sydney)
 - Widen the ramp from southern Sydney Harbour Bridge access (currently on hold, with the Central Sydney Traffic Committee)
 - Supplemental linemarking in use at shared paths “blue line” kerb edge and visual indicators at pinch points, this supplements RMS regulatory signage (City of Sydney, makes this template is available to other Councils)
 - Installing on-street bicycle parking corrals at Redfern Station and Surry Hills at Foveaux Street (2012-13, City of Sydney)
 - Temporary “Share the Path” conflict signage template prepared for shared paths, which clarifies pedestrian and bicycle responsibilities at Bicentennial Park in Glebe and reduced reported conflicts (current, City of Sydney template available to other Councils)
 - Bicycle parking request form on the City of Sydney website for residents and workers to request bicycle parking u-rails or smart poles for their area
<http://sydneycycleways.net/maps-and-tools/bike-parking>
 - Construction Traffic Management Plan requirements include detour arrangements for bicycles when bicycle infrastructure is affected.
- Encouragement and promotion programs (Current City of Sydney measures available to other councils):
 - *Bike Library* at Surry Hills Library, includes an e-bike and a cargo bike for people to trial

- *Try two wheels* program to (re)introduce non-riders to riding a bike
- *Share the path* campaign at areas where pedestrian / bicycle conflict are reported (2 staff operate 4 days a week for 1.5 hours) – the program uses a temporary coffee cart and bicycle maintenance van to encourage pedestrians and riders to stop, staying for the coffee/ bicycle maintenance both groups hear messages about sharing the path, using their bell, being respectful
- *Share the Road* campaign for motorists to give cyclists a metre when passing
- Workplace/ School Travel Plans to encourage walking/ cycling to significant trip generators in North Sydney
- Valet bicycle parking at events and festivals.

Following the stakeholder workshop, participants noted the value of regular regional discussions, noting the Regional Pedestrian and Bicycle Committee offered a bi-monthly forum to continue to advance the delivery of bicycle infrastructure and programs.

E3. Bicycle User Group Consultation

GTA acted as facilitators for a Bicycle User Group meeting to discuss missing links and current bicycle parking requirements. The following missing links were identified:

- HarbourLink from the 55 steps to Naremburn
- Warringah Freeway bus layover shared path missing links to local routes and wayfinding
- Berry Street shared path missing link between Walker Street and Angelo Street
- West Street connections to Crows Nest (via St Thomas Rest Park/ Atchison Street or Holtermann Street)
- Clark Road between High Street and Anderson Park - tricky uphill cycling
- St Leonards Park shared path is too narrow
- North Sydney Oval missing links (connection from overbridge to West Street, along Falcon Street)
- Ridge Street overbridge connection to Alfred Street North
- North Sydney Girl's School missing links (crossing / connections to Pacific Highway, David Street, Emmett Street, Myrtle Street)
- SCEGGS Redland missing links (Allister Street, Cranbrook Avenue, Harrison Street and Spofforth Street)
- North Sydney Demonstration School missing links (crossing / connections to Bay Road, McHatton Street, bicycle lantern for existing signalised crossing of Pacific Highway at Bay Road)
- Kurraba Road / Wycombe Road intersection – conflict with left turn from EB Kurraba into Wycombe NB
- Connections to City of Sydney, Mosman LGA, Lane Cove LGA, Willoughby LGA.

Appendix F

Concept Designs

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